PART X URBAN RELEASE AREA CONTROLS

X1. Where do controls for urban release areas apply?

This Part of the DCP applies to land identified as an Urban Release Area (URA) on the CVLEP 2011 Urban Release Area Map (URA map). Land identified as an URA triggers compliance with the requirements in Part 6 of the LEP.

X2. What are the aims of the urban release area controls?

The general aims of the urban release area controls are to:

- provide guidance and greater clarity for future development of identified URA's;
- provide and plan for efficient urban release areas that will maximise the opportunities for urban development in a socially, economically and environmentally sustainable manner;
- prevent the ad hoc development of individual land holdings within URAs in an isolated context and in a manner that may prejudice the orderly development and overall future function of development both within and adjacent to the URA;
- prevent land fragmentation, through inappropriate large lot subdivision, which may prevent the orderly development of the release area for urban housing;
- ensure that development is at a density that respects the natural and man-made constraints and hazards of the land;
- provide mixed housing opportunities, through encouraging a range of housing types and sizes to develop a diverse and rich local community; and,
- Encourage the preparation area plans for each URA.

X3. Background

This Part of the DCP is intended to complement Part 6 of CV LEP 2011 which applies to land identified as a URA on the CVLEP 2011 URA Map.

The controls for URAs apply to those areas of land shown distinctively coloured and lettered "Urban Release Area" on the CVLEP 2011 URA Map. As new urban release areas are added by amendments to the CVLEP 2011, the Residential Zones DCP and any other relevant DCPs may be amended accordingly to reflect the additions. Land identified as an URA triggers compliance with the requirements set out in Part 6 (Urban Release areas) of the LEP.

Planning for URAs has emerged from a combination of longer term growth management planning by Council as well as well as being recognised by the 2009 Mid North Coast Regional Strategy (MNCRS).

The MNCRS includes maps of growth areas designated to contain expected housing and employment land in the Region over the next 25 years. The strategy acknowledged (p.17) that:

"..not all land identified within the growth areas or local growth management strategies will be developed for urban uses. The rezoning of land or the development of existing zoned land within the growth areas for urban, commercial or industrial uses will be subject to more detailed investigations to determine capability and future yield. Land that is subject to significant natural hazards and/or environmental constraints will be excluded from development.

Other land may be required for open space, drainage, maintenance of interurban breaks or environmental uses/buffers and will be protected for these purposes".

It is Councils intention to provide DCP provisions for URAs via a single DCP within Council's existing DCP framework rather than separate, individual or one-off

PART X URBAN RELEASE AREA CONTROLS

DCPs for individual land parcels or groups of land parcel.

X4. Purpose and structure

X4.1 The purpose of this Part of the DCP is to give more detailed guidance to parties wishing to develop land identified as an URA in the CVLEP 2011.

X4.2 This Part is structured so as to provide more detailed guidance, controls and provisions for specific urban release areas via individual schedules to this Part.

X4.3 The schedules to this Part provide more detailed guidance, controls and provisions for specific URAs than that contained in the CVLEP 2011, and indicates certain specific objectives and controls (requirements, standards etc) for the various URAs, not otherwise included in the broader DCP.

X5. Relationship with Clarence Valley Local Environmental Plan 2011

The purpose of Part 6 of the LEP is to ensure that development on land identified as a URA occurs in a logical and cost-effective manner. In this regard, Part 6 requires that:

(a) satisfactory arrangements to be made for public infrastructure before land in an urban release area can be subdivided for the proposed urban purpose, and
(b) development consent must not be granted for development on land (in a URA) unless a development control plan that provides for the matters specified in clause 6.3 (3) has been prepared for the land.

X6. Relationship with This DCP and other plans

This Part of the DCP should also be read in conjunction with:

- Parts A - D and Parts H – J in particular of the Clarence Valley Residential Zones DCP 2011 (CVRZDCP 2011);
- Councils CVLEP 2011 in relation to controls for retail land-use;
- Council Policies in particular NR Design Manuals, Bike Plan and Pedestrian access and Mobility Plans and Biodiversity Draft DCP.

In the event of any inconsistency between this Part and any other part of CVRZDCP 2011 or any other plan or policy of Council, this part will prevail to the extent of the inconsistency.

X7. Development Control Plan Requirements

A DCP providing for provisions for Part 6 urban release areas is required to provide for all of the following:

(a) a staging plan for the timely and efficient release of urban land making provision for necessary infrastructure and sequencing,
(b) an overall transport movement hierarchy showing the major circulation routes and connections to achieve a simple and safe movement system for private vehicles, public transport, pedestrians and cyclists,
(c) an overall landscaping strategy for the protection and enhancement of riparian areas, remnant vegetation, wildlife corridors and native flora and fauna habitats, including visually prominent locations, and detailed landscaping requirements for both the public and private domain,
(d) a network of passive and active recreational areas,
(e) stormwater and water quality management controls,
(f) amelioration of natural and environmental hazards, including bush fire, flooding and site contamination and impacts on adjoining agricultural land, and, in relation to natural hazards, the safe occupation of, and the evacuation from, any land so affected,
(g) detailed urban design controls for significant development sites,

PART X URBAN RELEASE AREA CONTROLS

(h) measures to encourage higher density living around transport, open space and service nodes,
(i) measures to accommodate and control appropriate neighbourhood commercial uses,
(j) suitably located public facilities and services, including provision for appropriate traffic management facilities and parking,
(k) measures to conserve Aboriginal cultural heritage on the land.

Part 6 of the LEP also sets out additional requirements to be met by the DCP for specific urban release areas (Clarenza, West Yamba and Junction Hill). Where an Urban Release Area is identified in the LEP for a development outcome other than residential (e.g. employment centre) Council may require additional matters to be included in the DCP.

X8. Compliance with Objectives and Controls in this Plan

Clauses in this plan contain objectives and controls relating to various aspects of development.

The Objectives enable Council and applicants to consider whether a particular proposal will achieve the development outcomes established for West Yamba.

The Controls establish standards, which if met, mean that development should be consistent with the objectives. However, in some circumstances, strict compliance with the controls may not be necessary, or may be difficult to achieve because of the particular characteristics of a development site. In these situations, Council may grant consent to a proposal that does not comply with the Controls in this plan, providing the intent (i.e. the Objective/s) of the Controls is achieved.

X9. Area Plans

Area plans, addressing clause 6.3 (3) CVLEP 2011 matters may be prepared for each URA to help coordinate the strategic planning and manage site constraints, infrastructure provision and multiple land ownerships. The various land owners may collectively collaborate to prepare such a plan for a URA. However Area Plans will not be considered to be DCPs for the purpose of interpreting Part 6 of the LEP.

PART X URBAN RELEASE AREA CONTROLS

SCHEDULE X1 – WEST YAMBA URBAN RELEASE AREA

1. Background

Planning for a future urban precinct at West Yamba dates back to the mid -1990's with urban zoning and urban release area provisions first coming to fruition in April 2010 when Amendment No. 20 to Maclean LEP 2001 (MLEP 2001) came into effect. This provided for approximately 121.3 ha of urban zoned land [2(c) Urban Residential]; or 127.4 ha of urban zoned land including road reserves within the urban release area (URA). This later became zoned R1 General Residential when Clarence Valley LEP 2011 (CVLEP 2011) came into effect. Amendment No. 20 to MLEP 2001 (*"Amendment No. 20"*) also introduced urban release area provisions similar to the current "Part 6 Urban Release Area" CVLEP 2011 provisions. The location of the West Yamba Urban Release Area (WYURA) is shown at Figure X1.1.

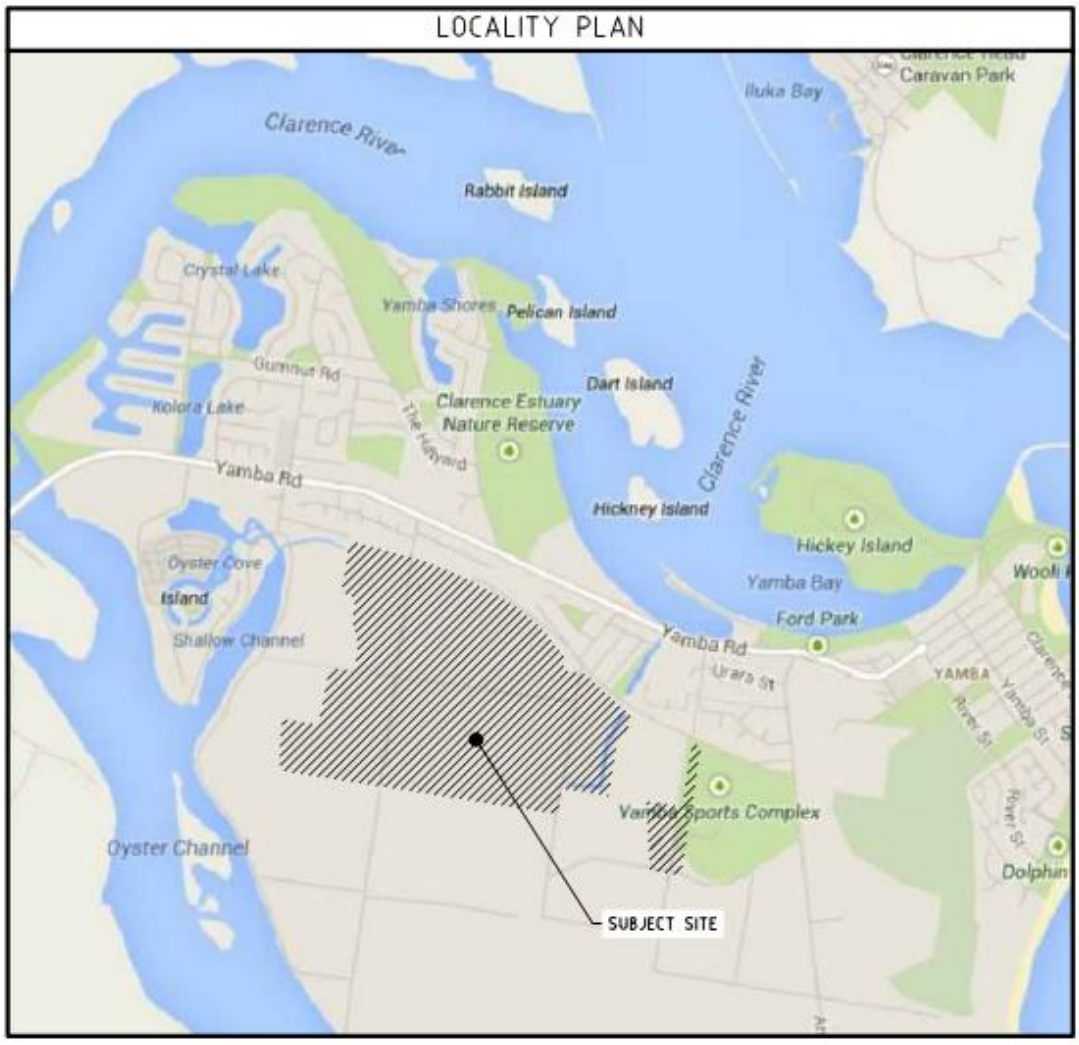

Figure X1.1

PART X URBAN RELEASE AREA CONTROLS

The quantum and footprint of the West Yamba urban zoning was influenced and informed by the extensive strategic planning history which acknowledged the difficult environmental constraints of the area. It envisaged a development outcome that would see the future West Yamba urban development develop at an average density of about 10 single dwelling equivalents per hectare based predominantly on the relatively highly constrained context of the location and environment. The urban zoning should be capable of yielding 1144 dwellings/lots based on the notional average density (10 single dwelling equivalents per hectare). Unfortunately legal drafting constraints would not permit desired density or population outcomes to be articulated into the amended LEP both at the time of *"Amendment No. 20"* and the CVLEP 2011.

The West Yamba area is also one of the growth areas mapped and designated in the 2009 MNCRS referred to in Part X.3 above. Refer to the Strategy's Growth Area Map 1 – Clarence North (p.50). More specifically the strategy indicated that West Yamba was one of the growth areas with significant issues with a process underway to determine any development potential and the resolution of the following issues (Appendix 2 of Strategy):

- Establishment of the final boundaries through the LEP process
- Extent of any development potential is to be consistent with a final Floodplain Risk Management Plan.

2. Staging and Servicing

Background

Whilst the DCP encourages a staging of development in an orderly and logical sequence it does not prescribe a specific staging plan or sequence. A logical sequence of development would see the gradual development/release and servicing of land from generally north to south over time.

Parcels most remote from existing services and infrastructure within the URA and seeking to develop and release ahead of those more proximate existing services and infrastructure would be expected to meet the full cost of provision, extension, upgrading of services/infrastructure.

The landowner group known as West Yamba Landowners Consortium which collectively own land parcels east of Carrs Drive has broadly indicated that the majority of its collective holdings would form part of an extensive Stage 1 development. A development application (DA) for the residential subdivision part Lot 1722, DP 1035524, 22 Carrs Drive Yamba into 161 residential lots was lodged on 20 October 2014. This DA was also accompanied by a site specific development control plan which indicates a 3 stage staging plan for the residential subdivision of part Lot 1722. This parcel in conjunction with the West Yamba Landowners Consortium holdings can form part of a large Stage 1 in a broad West Yamba staging plan.

Objectives:

01. To facilitate the logical, orderly and staged release of residential lots across the urban release area.

02. To require urban services and infrastructure to be delivered and available in a timely, coordinated and cost effective manner.

03. To minimize the life cycle costs of the provision and operation of service infrastructure.

04. To connect all lots in the WYURA to reticulated services and other essential urban services.

05. To encourage the equitable sharing of infrastructure provision costs amongst the various developer parties.

Controls:

C1. Consent will not be granted for the subdivision of land unless it is generally consistent with the indicative Staging Plan.

C2. A Servicing Strategy to the satisfaction of the consent authority to be lodged prior to consent being granted for a DA to subdivide land within the WYURA.

C3. The Servicing Strategy should address but not necessarily be limited to:

(a) The provision of hydraulic, telecommunication and electricity services.

(b) Proposed utilities networks and their relationship to adjacent properties, including links to adjacent properties.

(c) Capacities of the utility services and the impact of the proposed development on remaining service capacity.

(d) Options for utility service provision and a preferred option.

(e) Implications of the servicing options for other landowners in the release area.

(f) Proposed cost sharing arrangements with other landowners for any shared utility infrastructure including facility upgrades.

(g) Details of consultations with servicing authorities in the preparation of the Servicing Strategy.

C4. Departures from the Servicing Strategy endorsed by Council may be permitted if justified by a supporting study to the satisfaction of the consent authority. At a minimum, the supporting study must address the environmental, capital and operational costs and implications of the variation including the implications for other development stages.

C5. Developers are required to pay for the upgrade of lead in and other major infrastructure, such as carrier mains, pumping stations, reservoirs and treatment plants.

C6. Easements may need to be provided in certain circumstances and the need for such should be identified at an early stage in pre-DA and subdivision design in consultation with Council staff and if necessary other land owners.

C7. All urban lots in WYURA are to be serviced by reticulated water and sewerage services unless an alternative servicing study and strategy is undertaken which justifies an alternative means of providing such services. The servicing strategy must be to the satisfaction of the consent authority prior to the granting of development consent.

C8. Any offsite easements and infrastructure required to enable runoff from any stage of the URA to be conveyed to waterways in a managed fashion are to be registered and the infrastructure connected prior to the release of the subdivision certificate for that stage.

2. Transport Movement Hierarchy and road network design and provision

Background

The West Yamba LES/LES Review envisaged a hierarchy of roads with Carrs Drive as the main (collector) north-south access route with Golding Street and Miles Street as the collector roads. The LES also assumed Yamba bypass is required. At this stage planning and development scenarios will have to assume that the Yamba bypass at least in some form will occur at some stage.

The West Yamba LES/LES Review also indicated that:

1. road design and layout should be integrated into stormwater management and the open space system with water cycle management influencing road design through the provision of grass swales instead of traditional kerb and gutter street design at all levels.

2. roads as 'edge roads' will be permitted in the buffers to environmental protection zones (and other open space) to assist in protection of the natural areas and provide access for bushfire control and maintenance.

A traffic study has also previously been undertaken for the WYURA by Urban Research and Planning Pty Ltd (URAP). However that traffic study is considered out of date and in need of updating. In the absence of a single updated traffic study for the whole URA it will be necessary for individual DAs to be supported by a whole of URA contemporary traffic study or Transport Management Plan to help guide the nature and timing of road network and traffic facilities upgrades associated with the ultimate development of the URA.

Under the current Yamba Urban By-pass and Urban Intersections Contributions Plan 2000 development within West Yamba will pay a per lot contribution toward “Stage 1” roadwork’s/upgrades which include but are not limited to:

- bypass road – Angourie Rd to Golding Street
- bypass road – Golding Street to Shores Drive
- roundabout – bypass road/Angourie Rd
- roundabout – bypass road/Golding Street
- roundabout – bypass road/Shores Drive.

An indicative Road Hierarchy Plan has been developed for the URA as shown in Figure X1.2. This depicts the broader collector road and local street layout based on and relative to existing roads within the area as well as indicating possible future roundabouts.

Objectives:

01. Establish the road hierarchy within the WYURA and design road networks which are consistent with the intended road function.

02. Ensure the broader road system is generally consistent with the indicative Road Hierarchy Plan.

03. Ensure residents and other users enjoy safe convenient vehicular, pedestrian and bicycle networks.

04. Maximise vehicular, cyclist and pedestrian connectivity within the WYURA and to other parts of Yamba.

05. Encourage safe vehicle speeds throughout the WYURA.

PART X URBAN RELEASE AREA CONTROLS

06. Ensure that the impact of the ultimate development of the WYURA on road and transport infrastructure outside of the WYURA is also considered, in particular the staging of development to meet future traffic flows and the road hierarchy.

07. Provide a road network for the WYURA that integrates with the wider Yamba road network in a manner that disperses traffic and ensures resilience against failure of the wider network from an early stage in the development of the area.

08. Take into consideration the recommendations of any updated traffic studies for the WYURA in relation to traffic generation, associated provision for and upgrades to necessary road infrastructure and timing of provision.

Controls:

C1. All development applications for subdivision are to be generally in accordance with the indicative Road Hierarchy Plan.

C2. Consent will not be granted to the subdivision of land unless a contemporary Transport Management Plan (TMP; or equivalent transport or traffic study) has been completed to the satisfaction of (and lodged with) the consent authority. Such plan/study should address a range of matters including:

- traffic volumes
- triggers for the provision of infrastructure and upgrades, including early staging of an eastern connection to the wider traffic network according to lot yields across the WYURA and/or development of land in proximity to that connection
- an assessment of the impact of the development on the road system internal and external to the site and URA
- proposed road hierarchy including access points and intersections associated with collector and key local roads within and adjacent to the WYURA
- pedestrian and cyclist networks
- identification of road upgrades
- intersection upgrades, and,
- the cumulative impact of development on the road network.

C3. The road, cycle and pedestrian network is to be generally consistent with the proposed road hierarchy plans identified in any TMP/ traffic study; and should reflect the staging of and anticipated traffic flows for the WYURA over a 10 - 20 year period.

C4. Consent will not be granted for the subdivision of land unless a 'Bike Plan and Pedestrian Access and Mobility Plan' (PAMP) has been completed to the satisfaction of (and lodged with) the consent authority. Such plan should:

(a) Identify in design detail where footways and cycle ways are required so that provision can be made in the width of the road reserves.

(b) Complement Council's existing Bike Plan and Pedestrian Access and Mobility Plan as it relates to Yamba including Carrs Drive from Yamba Road to Miles Street and the future second stage access proposal as well as integrate the Transport Movement Hierarchy into Councils current network mobility Plan.

(c) Consider the recommendations and findings of any updated TMP/ traffic study.

C5. Alternative intersections/access points other than those identified in any updated TMP/ traffic study are to be supported by a traffic study to the satisfaction of the consent authority.

C6. The positioning and design of movement networks must give priority to:

a) Facilitating efficient walking, cycling and public transport networks;

b) Providing destination points, encouraged by signage and directions, and

c) Retaining and complementing natural topography, and utilising the extensive drainage reserve network throughout the WYURA.

C7. A subdivision certificate will not be issued to a specific stage of development unless pedestrian and cycle links are consistent and integrate with this Part and any TMP, updated TMP/traffic study and PAMP.

C8. Any pedestrian path/s and cycleway/s identified by any updated TMP/ traffic study are to be constructed at the developers expense and are required to connect to any existing shared off road pedestrian paths/cycle-ways.

C9. Road network designs are to allow for "permeability" throughout the subdivision to facilitate the cycle & mobility plan, with dead ends to be avoided.

Note: The use of low speed "share ways" to connect cul-de-sac heads and the like is acceptable.

C10. The length of any proposed cul-de-sacs is to be limited so the end point is visible from the access point to prevent drivers inadvertently turning into a dead end.

C11. Required road, intersection, cycleway and pedestrian networks upgrades are to be upgraded at the expense of developers where there is no current section 94 Contributions Plan in place to cover the construction/upgrade of such facilities.

Note: although updated TMPs/traffic studies are likely to identify required road network upgrades, expected road network upgrades are likely to include but not be limited to the following:

<u>External to the WYURA</u>

(a) Roundabout - Carrs Drive/Yamba Road;

(b) Roundabout – Deering Street (Yamba Bypass), near Golding and Cox Streets;

(c) Possible Roundabout – Treelands Drive/Yamba Road – subject to updated Traffic Impact Assessment (TIA); and

(d) Possible Roundabout – Shores Drive/Yamba Road – subject to updated Traffic Impact Assessment.

<u>Within the WYURA</u>

(a) Construction/upgrading of Carrs Drive and Miles Street as the collector roads to a minimum design level of 1.7m AHD or 20 ARI immunity; and,

(b) Construction of all other proposed roads and streets servicing future subdivision and lots.

PART X URBAN RELEASE AREA CONTROLS

C12. Direct access to proposed individual urban lots will not be permitted to/from Miles Street and Carrs Drive. All lots backing onto the roads are to be accessed via the internal street network.

PART X URBAN RELEASE AREA CONTROLS

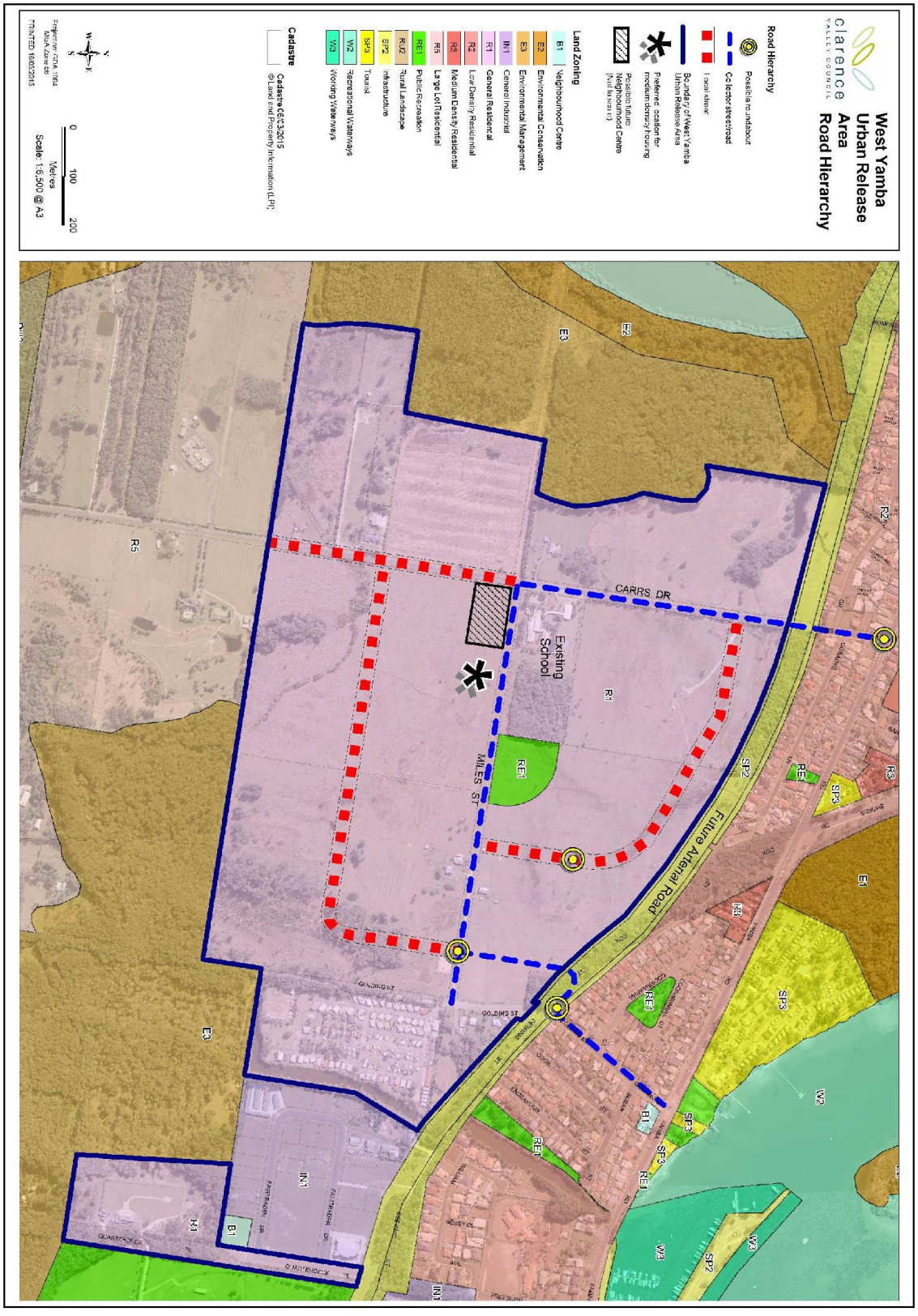

Figure X1.2 – indicative road hierarchy plan

4. Landscaping strategy – biodiversity, environmental conservation and management and managing visual amenity

Background

The WYURA is host to identified ecological endangered communities (EEC's) predominantly Swamp sclerophyll forest EEC but also Freshwater wetland EEC. Swamp sclerophyll forest EECs occurs on Lots 46 and 47 DP 751395 and Lot 1722 DP 1035524. Freshwater wetland EECs also occur on Lots 46 and 47 DP 751395.

Strategies and measures will be needed providing for the protection of EECs and the retention of good condition native vegetation.

Objectives:

O1. Establish a residential precinct including high quality streetscape and public domain areas, in an attractive landscaped setting designed to takes account of stormwater management planning and biodiversity management objectives.

O2. Minimise and mitigate impacts upon existing EEC's and to integrate with new native landscaping, water management systems and structures.

O3. Ensure that existing EECs are not adversely impacted directly and indirectly by development and where direct impact or disturbance cannot be avoided to ensure the impact upon EECs is not significant.

O4. Plan, develop, rehabilitate and revegetate native communities and areas of biodiversity significance and enhance their preservation through Vegetation Management Plan/s (VMPs).

O5. Protect and enhance the natural features and the utilization of the proposed drainage reserves located around the WYURA.

O6. Incorporate the PAMP into the overall landscaping theme/strategy through providing destination points, seating and shade areas, signage and interpretation of native communities.

O7. Provide suitable street trees throughout the subdivision and a 'linear landscape treatment' for the land fronting Carrs Dive and Miles Street in order to create an attractive corridor consistent with the Yamba Street Tree Master Plan.

O8. Create a precinct entry and softened landscape features around and within the proposed neighbourhood centre site and adjoining St James School through tree planting with shade trees and the creation of shelter elements.

Controls:

C1. Consent will not be granted for the subdivision of land unless a Vegetation Management Plan (VMP) has been completed to the satisfaction of (and lodged with) the consent authority.

C2. VMP requirements include:

(a) to be supported by a Freshwater Wetland Management Plan (FWMP) where new Wetland areas are proposed to be established.

(b) to have regard to and integrate as far as possible stormwater management proposals in the stormwater management plan.
(c) details of the location of significant vegetation, including habitat tree and trees with hollows; and management strategies for habitat trees to be retained.
(d) the location of development and disturbance footprints (including proposed roads, drainage areas/structures, landfilling and likely/indicative future building footprints) relative to significant vegetation.
(e) details of the clearing of native vegetation relative to the proposed development footprint to accommodate the proposed development.
(f) details of the proposed ongoing vegetation management regime in the context of the proposed subdivision, which may include such measures as Section 88B instruments to designate building footprints.
(g) native tree/shrub planting schedules outlining appropriate management practices to ensure the integrity of the remnant native vegetation (including EEC's) is maintained and to guide revegetation and new works.

C3. Submission of a Habitat Restoration Plan (HRP) that complies with Council's proposed Offsetting policy.

C4. Consent will not be granted for the subdivision of land unless a Landscaping Strategy has been completed to the satisfaction of (and lodged with) the consent authority.

Note: A Landscaping Strategy can be in the form of a concept plan at the DA stage and a detailed plan at the Construction Certificate stage (this should be confirmed with the consent authority prior to lodgement of a DA for subdivision).

C5. Landscaping Strategy requirements include:

(a) details of the proposed landscaping of the public domain, such as tree planting, landscape treatments, including any paving and street furniture;

(b) a schedule of the species and the planting locations consistent with the List of Recommended Street Trees for Clarence Valley;

(c) technical details of the planting and initial maintenance regime;

(d) an assessment of ongoing maintenance requirements;

(e) the location of existing trees, highlighting those with hollows and those are proposed to be remove and retained;

(f) details of the restoration of any riparian areas; and

(g) Demonstration of consistency with:

- the required VMP as it relates to EEC and biodiversity requirements;
- stormwater management proposals in the stormwater management plan;
- Council's Tree Management Policy, Clarence Valley Urban Tree Management Strategy and Yamba Street Tree Master plan.

Note: Consultation with Council's Open Spaces and Facilities section is highly recommended.

C6. Street trees are to be planted to:

(a) soften the streetscape;
(b) act as traffic calming measures through perceived narrowing the road;

(c) provide shade to footpaths and roads; and,
(d) enhance amenity.

C7. Natural watercourses are to be protected and revegetated where appropriate to enhance the visual amenity, prevent soil erosion, and to protect the quality of receiving waters with a treatment commensurate with their role in the water management system. Riparian vegetation along watercourses is to be re-established using locally occurring native species from locally sourced seed stock and in accordance with NSW Office of Water guidelines.

5. Open space and recreation

Background

The original "Amendment No. 20" rezoning of the WYURA provided for a formally zoned area of open space – an area of 1.57 ha of Lot 18 DP 1090409, zoned to 6(a) Open space area under Maclean LEP 2001. This was carried forward in the CVLEP 2011 by the zoning the land to RE1 Public Recreation.

Features of the longer term strategic planning leading to the zoning of West Yamba for urban development included that open space:

- also form part of the storm water management system; and
- be visible and also accessible to housing areas and have road frontage.

The West Yamba strategic planning did not envisage any active open space elements.

Objectives:

01. Ensure any open space provided is well located, accessible and capable of functioning for a diverse range of purposes including passive recreational, aesthetic environmental and drainage management;

02. Ensure that any open space provided is easy to develop and maintain;

03. Ensure open space provides informal and formal settings;

04. Provide an inter-connected passive open space and recreation network which supports the WYURA residential community and provides connectivity to broader public open space areas, as well as safe and attractive recreation spaces which are distributed throughout the Neighbourhood.

05. Incorporate community art, signage and park furniture in a pleasant and welcoming environment and support the transport management hierarchy through creating areas for bike ways, paths and street furniture.

06. Ensure key environmental areas such as drainage paths, vegetation communities and areas of ecological value are protected and managed and form part of the overall open space and recreation network.

07. Provide for an integrated and sustainable approach to the design and provision of open space and urban water management generally.

Controls:

C1. Open space areas are to be linked by pedestrian and cycle paths to provide an accessible network of open space.

C2. Open space/recreation areas are to be located and sized to maximise connections to adjoining land uses and local roads; provided open space is to have a road frontage.

C3. Open space shall also form part of the stormwater management system for the area but should not be the recipient of "end of pipe" stormwater treatment and management measures.

C4. Proposed open space areas are to demonstrate ease of development and maintenance (short and long term).

PART X URBAN RELEASE AREA CONTROLS

C5. Tree and vegetation planting in open space areas are use native species to assist in stormwater management, biodiversity protection as well as enhancing local character.

C6. Proposals for open space areas and management shall be clearly detailed and articulated in required Landscaping Strategies, Vegetation Management Plans and Stormwater Management Plans and should also be consistent with Council's *"Clarence Valley Open Space Strategic Plan"* (May 2012).

Note: Consultation with Council's Open Spaces and Facilities section is highly recommended when proposing areas that will have an exclusive open space function or a multiple purpose which includes an open space function.

6. Natural and environmental hazards - Flood and Fill Management

Background

The 'Lower Clarence Flood Model Update 2013' report adopted by Council in March 2014, gives a 1 in 100 year ARI flood height for this area of West Yamba of RL 2.1 metres AHD which, with a freeboard of 0.90m gives a flood planning (residential floor) level of RL 3.0m AHD. The Extreme (Probable Maximum Flood) height for this area of West Yamba is RL 3.8 m AHD. An accessible refuge area at this level is required for the West Yamba development area.

Following the adoption of the above report, the 1 in 20 year level for West Yamba has been modified to RL 1.7m AHD.

Objectives:

01. Ensure that flood and drainage impacts are considered for the development of the entire WYURA and not just in relation to the development of individual land parcels within the WYURA.

02. Minimise flood and drainage impacts of the development in the WYURA on adjoining residential neighbourhoods and property including ensuring that there is no net increase in the number of existing dwellings whose habitable floor levels become inundated by the ultimate filling and development of the entire WYURA.

03. Ensure that the future development of WYURA is undertaken in accordance with the 'Lower Clarence Flood Model Update 2013 – September 2013', adopted by Council in March 2014 or any subsequent model update that Council may adopt.

04. Ensure that any stage of the overall WYURA development is successfully integrated and does not prejudice or detrimentally impact overland flow path/s, existing watercourses and stormwater management network.

05. Ensure that Acid Sulphate Soil impacts are assessed and appropriately managed.

Note: Clause C27 of this DCP and clause 7.1 Acid Sulphate Soils CVLEP 2011 must also be complied with.

Controls:

C1. The consent authority must not grant consent to the commencement of land fill or other earthworks associated therewith unless an Earthworks Management Plan (EMP) is prepared to ensure that level of finished lots are is at least at the level of the 1 in 100 year flood event, whilst also maintaining an effective drainage network, overland flow path/s and meeting other development standards of Council.

C2. Where surface soils are stripped and there is a potential for sulphate soils to be disturbed, measures are to be identified in the EMP and are to be in place to manage this occurrence and neutralise any ASS contamination outside of the treatment site.

C3. A EMP must include the following:

(a) A statement of environmental effects/impacts including assessment and management acid sulphate soils.

(b) All required licencing approvals from State Government Authorities.

(c) Staging Plans and detail of finished survey levels for fill.

(d) Area and extent of fill requirements, supported by engineering design detail.

(e) dredge location/s and proposed pipe routes to WYURA.

(f) maintenance and management plan for the period of the dredging at and in the vicinity of the URA.

(g) The design and location of all stormwater drainage corridors.

(h) Overland flow paths to reach local estuaries/waterways (including Oyster channel) and the URA drainage reserve/floodways.

(i) The required widths/depths of overland flow paths.

(j) A program of works detailing actions and duration of filling activity and compaction.

C4. The consent authority must not grant consent to the erection of a building or the carrying out of works on land to which this plan applies, if the carrying out of the proposed development would:

(a) be inconsistent with an EMP; and,

(b) detrimentally increase the potential flood affectation on other development or property in WYURA or result in a risk to human life.

7. Stormwater management and water quality

Background

Stormwater management and water quality is a key issue and governing constraint to the development of the WYURA. Both the long term strategic planning for the WYURA and Parts H Sustainable Water Controls and J Subdivision and Engineering Controls of this DCP emphasise a 'water sensitive urban design' (WSUD) approach to stormwater management for development. This approach requires managing water use and runoff at the lot level and emphasises the reuse of stormwater.

Discharged stormwater should not be allowed to compromise the health of nearby natural waterways nor should it be permitted to compromise, whether by water quality or quantity, the integrity of nearby endangered ecological communities (EECs) or other vegetation communities whether under zoned protection or not.

It is therefore important that the Parts H and J requirements of this DCP be addressed and met except as otherwise varied in this Part of the DCP.

A conceptual Stormwater Network Plan has been developed for the URA as shown in Figure X1.3.

Objectives:

01. Ensure stormwater management associated with the WYURA has regard to the findings of and complements flood modelling and assessment across the entire WYURA.

02. Ensure that stormwater management areas incorporate functional passive open space.

03. Emphasise a stormwater management system across the entire WYURA that treats and manages stormwater as close to the source(s) as possible.

04. Ensure that stormwater discharge from residential subdivisions does not compromise the health of nearby natural waterways or the integrity of nearby endangered ecological communities (EECs) or other vegetation communities.

05. Ensure that a WSUD approach to stormwater management is consistently applied to development and integrated across the entire WYURA.

Controls:

C1. All development applications for subdivision are to be generally in accordance with the conceptual Stormwater Network Plan except where more detailed and approved Stormwater Management Plan/s (SMP) justify variation.

C2. A SMP or SMPs for the WYURA must be completed to the satisfaction of (and lodged with) the consent authority outlining appropriate management practices to ensure the maintenance of existing hydrological and water quality conditions.

Note – Clause 1.03 Stormwater Management Plans of NRDC Section D10 Handbook of Stormwater Drainage Design setouts out the specific requirements that a SMP must address.

C3. When lodging detailed design outcomes with various DAs for subdivision the SMP will require the following to meet the following objectives and measures:

(a) Details of drainage works, to be in accordance with NRDC, and BMT WBM flood impact assessments and consistent with the outcomes presented in the DCP – including demonstrating that there will be no worsening of flood impacts and to the satisfaction of Council.

(b) An overall conceptual / strategic plan of the development area including drainage network solutions for both minor and major systems is required, including calculations.

(c) Any upgrades to existing infrastructure or the construction of new control structures to facilitate the operation of the flooding and drainage system for any development area is to be identified, documented and costed. The future risk, liability and maintenance cost to Council should be considered - for example any 'causeway' crossing of Golding Street.

(d) life cycle cost analysis and include a maintenance management plan of WSUD facilities in public domain areas.

(e) The proposed lot layout must provide a flood impact assessment and consider existing natural and proposed flow-paths and 1% AEP flood widths.

(f) Water quality and quantity issues are to be identified and addressed in accordance with NRDC and demonstrate compliance to NSW Water Quality Objectives in NSW Office of Environment and Heritage. A neutral or beneficial affect is to be achieved (NorBe) for stormwater quality and quantity throughout the WYURA.

(g) Gross pollutant traps and first flush systems shall be provided to protect downstream wetlands, water-bodies and waterways.

(h) Integration of measures and proposals and consistency with:

- required Landscaping Strategy and VMPs
- Council's *Clarence Valley Open Space Strategic Plan*
- The design for the collector road and local street network

C4. Construction of the required stormwater management system/infrastructure (including its various components) and any required upgrades of existing stormwater management system/infrastructure are to be at the expense of developers.

C5. Construction water quality impacts are to be mitigated through appropriate erosion and sediment controls in accordance with Managing Urban Stormwater - Soils and Construction ('The Blue Book').

PART X URBAN RELEASE AREA CONTROLS

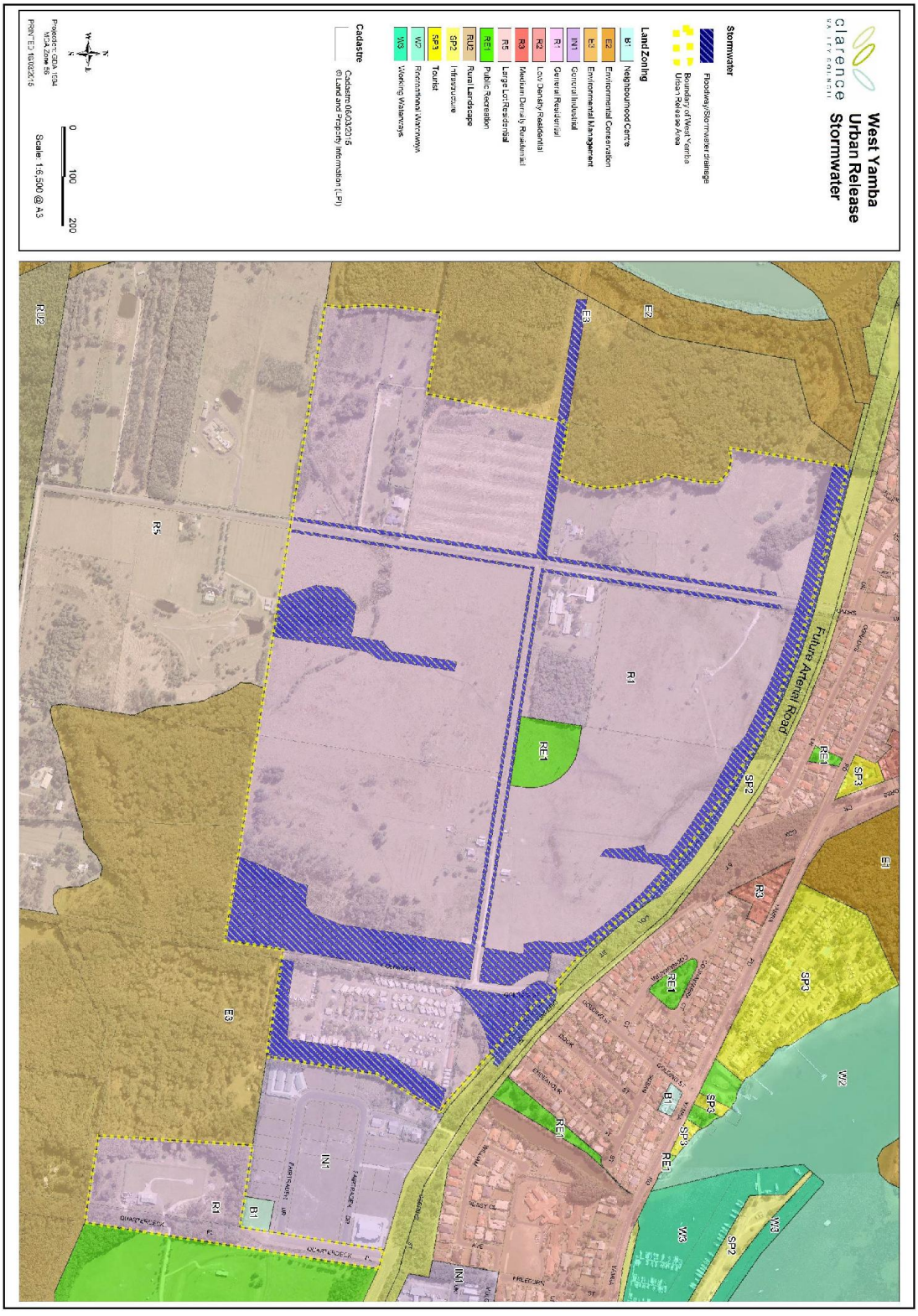

Figure X1.3 - conceptual Stormwater Network Plan

8. Hazard management – other natural and environmental hazards

Background

With a relatively flat topography, minimal large stands of woodland and located inland from existing waterways and estuarine systems the WYURA is free from most hazards common to coastal areas. The site is not designated or mapped as Bush Fire Prone land. However flooding, the impact of tidal surge as well as flood evacuation procedures and acid sulfate soils (ASS) are essential hazard considerations. The WYURA is predominantly mapped as class 2 acid sulfate soils. Section 6 of this Schedule addresses flooding and fill management.

The NSW State Emergency Services (SES) has already prepared the Clarence Valley Local Flood Plan which includes the Yamba Sector. This plan has been accepted by the Clarence Nambucca SES Region Controller and the Clarence Valley Local Emergency Management Committee. However, the existing plan may need to be updated as a consequence of the impending urban development within the WYURA.

Objectives:

01. Ensure appropriate management procedures and processes are in place to deal with identified hazards.

02. Ensure that an updated evacuation plan/strategy and safe evacuation routes are in place taking into account the proposed urban development within the WYURA and taking into account contemporary flood impact assessments for the WYURA.

Controls:

C1. The consent authority must not grant consent to the carrying out of development within the WYURA unless the applicant provides documentary evidence that it has consulted with the SES with respect to any required updating (including details of those requirements) of the existing Clarence Valley Local Flood Plan (as it relates to the Yamba Sector) as a consequence of the future urban development of the WYURA.

C2. Any required updating of the existing Clarence Valley Local Flood Plan (as it relates to the Yamba Sector) should consider the findings and recommendations of contemporary flood impact assessments for the WYURA.

C3. DAs are to identify and document those activities associated with constructing and developing the subdivision and its component infrastructure and services that are likely to result in the disturbance of ASS.

Note: The WYURA is predominantly mapped as class 2 acid sulfate soils. See also section 6 of this Schedule for further ASS controls.

PART X URBAN RELEASE AREA CONTROLS

9. Urban design

Background

It is not proposed that urban design be necessarily prescribed due to the proliferation other statutory and non-statutory instruments, policies and guidelines – for instance complying development for housing under State Environmental Planning Policy (Exempt and Complying Development Codes) 2008. The constraints and location context of the WYURA and the need to accommodate these may to some extent govern subdivision and urban design.

Parts C and J of this DCP require development including subdivision to consider the NSW Coastal Design Guidelines (Coastal Council 2003).

Objectives:

O1. Create a safe and interesting urban environment that meets the diverse and changing needs of the community and offers a wide choice in good quality housing.

O2. Create a mix of lot sizes, residential densities and housing types to create a unique and appealing residential area including the identification of a preferred location for medium density development.

Note: Figure X1.2 indicates the preferred location for medium density development.

O3. Achieve high quality built form and aesthetics of buildings, streetscapes and public spaces.

O4. Ensure that a range of land uses are provided that generally conform to the character of the broader Yamba area

O5. Ensure that subdivision layouts capitalise on and complement the natural environment and rural outlook and that the footprint of urban lots and their required supporting infrastructure do not compromise the natural environment and character of the area.

O7. Establish a neighbourhood identity through appropriate landscaping.

O8. Enhance community interaction and outdoor activity.

O9. Ensure that development incorporates ESD principles and WSUD for both subdivision design and construction of buildings, including solar access.

O10. Provide walkable neighbourhoods with convenient access to neighbourhood shops, parks and community facilities, with less dependence on cars for travel.

O11. Ensure provision active street-land use interfaces, aimed at improving personal safety and increased surveillance/activity particularly adjacent to the school site and in the vicinity of any future neighbourhood shop precinct.

O12. Facilitate new development which supports the efficiency of public transport and provides safe, direct access to the bus network for residents.

PART X URBAN RELEASE AREA CONTROLS

O13. Provide a variety of lot sizes and housing types to cater for the diverse housing needs of the community at a density that can ultimately support the provision of local services.

O13. Provide attractive well planted streetscapes which integrate with key environmental areas, cycleways, open space, and drainage reserves.

O14. Consider the NSW Coastal Design Guidelines in planning and designing subdivisions, neighbourhoods and built form in the WYURA.

O15. Ensure house design considers population health implications specific to WYURA.

Controls:

C1. Subdivision layouts within the WYURA should feature a clear and identifiable road hierarchy to achieve permeability and inter-connectivity.

C2. Planning and design of subdivisions, neighbourhoods and built form development are to demonstrate consistency with NSW Coastal Design Guidelines and in particular Part 2 Design Principles for Coastal Settlements.

C3. Lot layout and internal networks are to be inter-connected and designed to achieve maximum benefit from solar access and to encourage the provision of energy saving design solutions.

C4. Whilst a range of residential lot sizes is encouraged, lot sizing and configuration should demonstrate, at the individual lot scale, capability to accommodate adequate onsite stormwater management.

C5. No direct vehicular access will be allowed off either Miles Street or Carrs Drive being collector roads.

C6. Access to the WYURA is to be constructed off the existing access points (Yamba Road and Carrs Drive) and the internal road pattern is to provide a link between these two points. Over time further access points will be developed as the subdivision and road planning develops and a new roundabout is created at the northern end of Golding Street.

C7. Native vegetation communities to be retained in WYURA are to be identified. New vegetation communities, street plantings and corridor plantings are to integrate with these existing areas to form cohesive landscaped communities.

C8. Special pavement and landscape materials are to be used to distinguish between pedestrian and cycle ways and connections to the proposed street network and landscaped communities.

C9. The drainage reserve areas are to incorporate an inter-connected, multi-purpose pathway with a 1.5m wide trail extending around the perimeter of the WYURA site and connecting to other bike and pedestrian corridors.

C10. All costs associated with the construction of roads, bicycle and pedestrian networks are to be borne by the respective developer parties.

C11. Dwelling design should incorporate screened outdoor living area that will protect against vector carried disease.

PART X URBAN RELEASE AREA CONTROLS

10. Neighbourhood commercial development

Background

"Amendment No. 20" envisaged that a future West Yamba neighbourhood centre would be located on an accessible site in close proximity to the existing school in Carrs Drive. The West Yamba Landowners Consortium propose a local neighbourhood centre on Lot 46 DP 751395, Miles Street (corner Miles St and Carrs Drive). CVLEP 2011 permits *"neighbourhood shops"* (retail floor area not exceeding 100 m^2) with Council consent in the R1 General Residential zone.

Objectives:

01. Create a vibrant neighbourhood centre as a focus for the urban release area, comprising a mix of uses including convenience neighbourhood retail floor space and having high quality urban design, streetscapes and public domain areas.

02. Allow the creation of neighbourhood scale retail and service node to encourage a sense of community and a meeting place for local residents.

03. Ensure that a neighbourhood centre within the WYURA meet the needs of future residents and workers and does not adversely impact the existing retail hierarchy outlined in the Yamba Retail Commercial Strategy 2002.

04. Encourage provision and co-location of medical and health facilities within a neighbourhood centre.

    Note: clause 57 of State Environmental Planning Policy (Infrastructure) 2007 permits Health services facilities with the consent of the Council in the R1 zone.

Controls:

C1. A proposed WYURA neighbourhood centre should be located:
- in close proximity to the existing school;
- with pedestrian and cycle path accessibility; and
- as central as possible to the majority of future residential development.

Note: Figure X1.2 depicts an indicative location of a future neighbourhood centre.

C2. The local road system adjoining the neighbourhood centre is to be designed to accommodate or facilitate accessibility by public transport and its passengers (eg buses and bus stops).

C3. The design of the neighbourhood centre is to incorporate appropriate landscaping.

PART X URBAN RELEASE AREA CONTROLS

11. Public Infrastructure and Services

Background

All land at West Yamba (i.e. both the WYURA and the R5 zoning) is currently included under the Sewerage DSP. The upgrade of the Yamba Sewage Treatment Plant, which was included in the DSP, provided treatment capacity for West Yamba. Section 5.3 of the Yamba Wastewater Strategy Part 1, adopted by the then Maclean Shire Council at its meeting of 10 July 2002, indicates that all options for servicing the future growth area would be required to "pump directly to the Yamba STP" and Section 3.2 of the EIS for the Yamba Sewerage Augmentation adopted by Council at its meeting of 13 December 2005 indicated "It should also be noted that the costs associated with the construction of a new sewer system in West Yamba would be borne by developers and not by Council directly". A specific Sewerage DSP is therefore not require for West Yamba as the current DSP covers the contribution required for headworks to service the development (STP upgrade), while all transfer works to the STP are at the cost of developers.

A servicing strategy will be required before urban development can be connected to the upgraded Yamba Sewerage Treatment Plant.

Completed subdivision development would require construction of a rising main to the sewerage treatment plant (STP) with a developer/s liable to pay the full cost of this unless initial or "early stage" West Yamba developer parties can negotiate cost sharing arrangements with other developer/land holder parties within the WYURA.

Existing water mains are unlikely to have adequate capacity for the potential number of residential lots in the WYURA. As at April 2015 Council has not undertaken detailed hydraulic modelling of the water supply system in this area. If subdivision development occurs before hydraulic modelling is completed, the intended developer will be required to investigate water supply requirements.

Other infrastructure such as energy/electricity and telecommunication services/NBN will also need to be planned for and provided for the developed WYURA. Satisfactory arrangements will need to be made with designated State and Local Authorities to determine availability, timing and cost arrangements, including the payment of contributions where required.

Note: This section of Schedule X1 does not deal with stormwater management or transport management/road infrastructure. These are dealt with in sections 7 & 2 of this Schedule, respectively.

Objectives:

O1. Provide the essential infrastructure needs of the WYURA in a timely, efficient and cost effective manner.

O2. Minimise the life cycle cost of provided infrastructure within the WYURA.

O3. Satisfy and gain the required approvals from Council and relevant Authorities in relation to the augmentation, duplication or upgrade of infrastructure services required of the future development within the WYURA.

O4. Adequately assess and cost essential infrastructure in WYURA so that the different developer/land holder parties can facilitate equitable financial and cost sharing agreements to fund the necessary infrastructure works.

O5. Put in place appropriate planning and design works to ensure that services can

be laid in pre-designed road cross sections throughout the subdivision layout.

Controls:

C1. The consent authority must not grant consent to the carrying out of any works unless there is in place for WYURA a Servicing Strategy, to Council's satisfaction, which outlines the sequencing, cost and program of water and sewer infrastructure requirements.

C2. Sewer design type throughout the WYURA is to be a "pressure sewer" design.

C3. Water network modelling will be required at detailed design stage to determine the size and location of trunk mains and provide details of any augmentation, duplication or upgrades to existing water infrastructure required as a result of future development.

C4. Council must be satisfied, prior to releasing a construction certificate for any stage of the subdivision of the WYURA that satisfactory arrangements are in place with Essential Energy in relation to the underground supply of electricity to the land to be developed. Developers/applicants for DAs for subdivision should consult with Essential Energy as part of their DA preparation process and should include evidence of such consultation with the lodged DA.

Note: Essential Energy do not have any requirements in the medium term to change the existing 11KV or 66kV overhead infrastructure in the West Yamba area, between Carrs Drive & Golding Street. If there is a requirement from the Clarence Valley Council or developers to underground the existing 11KV or 66kV assets in the proposed development areas, Essential Energy will allow that requirement.

C5. Any developer will be required to appoint a level 1 & 3 Authorised Service Provider (ASP) to request a Design Information Pack (DIP) to comply with the Essential Energy design standards and requirements for the under grounding of the overhead infrastructure.

Note: Essential Energy would be able to supply from its existing distribution network up to 1MVA of load in real terms which will service 25% of the proposed 1,000 new lots. The existing network needs to be upgraded to cater for the new subdivision and greater Yamba long-term requirements; this will require sufficient lead time from the developers to Essential Energy to install the distribution infrastructure to increase the required capacity.

C6. Council must be satisfied, prior to releasing a construction certificate for any stage of the subdivision of the WYURA that satisfactory arrangements are in place with Telstra and the NBN for pit and pipe infrastructure (including trenching, design and third party certification) that enables the area to be 'Fibre Ready'.

PART X URBAN RELEASE AREA CONTROLS

12. Aboriginal cultural heritage

Background

A Cultural Heritage Assessment Report has been prepared for the WYURA for Bob Pavitt Planning by Everick Heritage Consultants in 2011. The original DCP Project Area had been assessed for cultural values in 1996 by archaeologist Adrian Piper. The brief for this project was to update the assessment to ensure it meets the standards of the NSW Office of Environment and Heritage (OEH) *Code of Practice for Archaeological Conduct in New South Wales* (2010) (Code of Practice).

The assessment involved a literature review, heritage register searches, consultation with the Aboriginal community and a field inspection. The results of the overall assessment is summarised as follows:

- No physical evidence of Aboriginal Objects or Places was identified within the Project Area.
- One registered site (Golding Road Midden) was listed on the AHIMS register. This site was unable to be identified during the field inspection.
- Other than the Golding Road Midden site, no other areas were identified that were considered reasonably likely to contain Potential Archaeological Deposits (PADs).
- Consultation with the Birrigan Gargle Local Aboriginal Land Council (BGLALC) identified no places of cultural (spiritual) significance.
- No items of historic heritage significance were identified within the Project Area.

Objectives:

01. Protect identified Aboriginal Objects or Places within the Project Area of WYURA

02. Protect identified Potential Archaeological Deposits (PADs).

03. Consult with the BGLALC to establish if there were places of cultural (spiritual) significance

04. Protect items of historic heritage significance were identified within the Project Area.

Controls:

C1. DAs for subdivision and development within the URA are to demonstrate adequate:

(a) assessment of cultural heritage values and protection and management of cultural heritage values including due diligence assessment in accordance with the *Code of Practice for Archaeological Conduct in New South Wales* (2010) (Code of Practice).
(b) consultation with the OEH and BGLALC.

ENV Solutions

Engineering the Future

PRELIMINARY CONTAMINATION ASSESSMENT

Proposed Residential Subdivision

22 Carrs Drive Yamba

For:

Yamba Residential Subdivision PTY LTD

April 2015

Environmental Engineering Solutions

ENV Solutions Pty Ltd ABN 46856079490

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Table of Contents

EXECUTIVE SUMMARY 4

1 INTRODUCTION 5

2 SCOPE OF WORKS 6

3 METHODOLOGY 8

4 SITE IDENTIFICATION 9

5 SITE CONDITION AND SURROUNDING ENVIRONMENT 10

5.1 Surrounding Environment 10
5.2 Topography 10
5.3 Soils 10
5.4 Flooding 11
5.5 Acid Sulphate Soils 11
5.6 Groundwater Resources 11

6 SITE HISTORY 12

6.1 Site History Overview 12
6.2 Historical Aerial Photographs 14
6.3 POEO Act Public Register Search 15
6.4 Contaminated Land – Record of Notices Search 15
6.5 Section 149 Certificates 15
6.6 Cattle Dip Site Locator 16
6.7 Areas of Environmental Concern 16

7 SITE INSPECTION 18

7.1 Site Inspection Overview 18
7.2 Agricultural/Horticultural Activities 18
7.3 Fuel Tank 19
7.4 Residence 19
7.5 Summary of Site Inspection 19

8 SAMPLING AND ANALYSIS PLAN 20

8.1 Sampling Objective 20
8.2 Field Investigations 20
8.3 Sampling Methodology 21
8.4 Field Quality Assurance/Quality Control (QA/QC) 21

9 ASSESSMENT CRITERIA 22

9.1 Soils Assessment Criteria 22
9.2 Assumptions and Limitations of Criteria 22

10 LABORATORY ANALYSIS RESULTS 24

10.1 Results 24

11 CONCLUSIONS 25

13 REFERENCES 27

14 GLOSSARY 28

16 FIGURES 29

17 ATTACHMENTS 38

18 DOCUMENT CONTROL: 6

List of Tables/Figures

Table 1: Site Identification Details 9

Table 2: Aerial Photo Chronology 14

Table 3: POEO Act Public Register Search 15

Table 4: Cattle Dip Site Locations 16

Table 5: Herbicide Data 18

Table 6: Sampling Details 20

Figure 1 Site Location 30

Figure 2: Site Layout 31

Figure 3: Acid Sulphate Soils Map 32

Figure 4: Groundwater Bores 33

Figure 5: Historical Aerial Photos 34

Figure 6: Cattle Dip Site Location 35

Figure 7: Site Sampling Plan 36

Figure 8: Laboratory Results 37

Executive Summary

ENV Solutions Pty Ltd (ENV) has been engaged by Yamba Residential Subdivision PTY LTD to undertake a Preliminary Contaminated Site Investigation to support a development application and Environmental Impact Assessment for a proposed residential subdivison on Lot 1722 DP 1035524.

A desk-top site history assessment of the site and adjacent areas was undertaken. Information to assist in the site history was collected and collated. A site inspection was undertaken to identify potential areas of contamination around the 11 ha development area.

Based on the desk-top site history assessment and the site inspection, it was considered that two areas of environmental concern (AEC) required further investigation:

- Agricultural use including cattle grazing.
- Above ground fuel tank

Three potential contaminants of concern were identified for the site:

- organo-chlorine pesticides/herbicides;
- metals (Ag use); and,
- metals TRH, BTEX and PAH (Fuel tank).

Systematic soil sampling was undertaken on the site, 16 samples were collected and 4 composite samples analysed for the potential contaminants of concern. A single Judemental soil sample was also submitted from under the above ground fuel tank. None of the samples submitted resulted in levels reaching or exceeding the relevant assessment criteria (HIL A) and were consistent with natural background levels (NEPM, 2013).

Based on the findings of this assessment, it is submitted that further investigation is not required and that the site is suitable for the proposed use.

1 Introduction

ENV Solutions has been engaged by Yamba Residential Subdivision PTY LTD to undertake a Preliminary Contamination Assessment to inform and support a development application and Environmental Impact Assessment for a proposed residential subdivision at 22 Carrs Drive, Yamba.

The property is decribed in real terms as Lot 1722 DP 1035524 and is shown on Figure 1. It is proposed that there will be a change of use for the property from agricultural use (cattle grazing) to residential (proposed residential subdivision).

2 Scope of Works

Clause 7(1) of State Environment Planning Policy No 55 – Remediation of Land (SEPP 55) states that:

"(1) A consent authority must not consent to the carrying out of any development on land unless:

(a) it has considered whether the land is contaminated, and

(b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and

(c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

(2) Before determining an application for consent to carry out development that would involve a change of use on any of the land specified in subclause (4), the consent authority must consider a report specifying the findings of a preliminary investigation of the land concerned carried out in accordance with the contaminated land planning guidelines.

(3) The applicant for development consent must carry out the investigation required by subclause (2) and must provide a report on it to the consent authority…"

This Preliminary Contamination Assessment has been prepared to address these SEPP 55 requirements. The proposed change of land use is from existing agriculture (cattle grazing) to residential.

The Preliminary Contamination Assessment takes the form of a Stage 1 – Preliminary Investigation which has been prepared in accordance with the *Managing Land Contamination Planning Guidelines* (Department of Urban Affairs [DUAP] and Environment Protection Authority [EPA] 1998) and the *Guidelines for Consultants Reporting on Contaminated Sites* (EPA, 2000).

This Stage 1 Preliminary Investigation:

- describes the site conditions and surrounding environment;
- provides a summary of the site history;
- identifies past and present potentially contaminating activities and potential contaminant types;
- provides a preliminary assessment of the site contamination;
- assesses the need for further investigations;
- assesses soil sample analysis results against relevant criteria; and
- assesses the suitability of the site for the proposed use.

3 Methodology

This Stage 1 Preliminary Investigation has been undertaken to identify the potential for contamination at the site. A desk-top site history assessment and site inspection have been conducted as part of the investigation.

The desk-top site history assessment encompassed the site and adjacent areas. Information used to assist in the assessment was collected and collated from the following sources:

- available site history details;
- NSW Land and Property Information (LPI) – Historic Title Search;
- Historical aerial photographs;
- NSW Office of Environment and Heritage's (OEH) *Protection of Environment Operations Act 1997* (POEO Act) Public Register;
- OEH's Contaminated Land – Record of Notices; and
- NSW Primary Industries: Cattle dip site locator.

The site inspection included:

- identification of potential sources and areas of contamination;
- preliminary soil sampling at areas identified as potentially contaminated during the site inspection; and
- further systematic soil sampling across the site.

4 Site Identification

Table 1 provides identification details of the subject land relevant to the Stage 1 Preliminary Investigation.

Table 1: Site Identification Details

Site Address	22 Carrs Drive, Yamba
Site Area	Total site – approximately 15.8 ha
Real Property Description	Lot 1722 DP 1035524
Local Government Area	Clarence Valley
Zoning	R1 – General Residential – CVLEP, 2011 E3 – Environmental Management – CVLEP, 2011
Site Features	Predominantly previously cleared land (zoned R1). Existing dwellingsituated in south-east corner of the site with access to Carrs Drive. An area of undisturbed vegetation (zoned E3) in south-west corner of the site.
Elevation	Estimated between 1.0 – 2.0 m AHD. Site will require filling.
Existing Land Use	Agricultural – Cattle Grazing
Proposed Land Use	Residential
Surrounding Environment	The subject land is situated at the edge of a R1 – General Residential area. According to local government land zoning the broader locality is predominated by a mix of general and low density residential as well as areas of environmental management and conservation to the west. Land immediately to the north of the site is characterised by numerous dwellings. Undisturbed vegetation and a natural water body are situated to the west with previously cleared land to the south and east of the site. St James Catholic Primary School is situated to the south-east of the site on the corner of Carrs Road and Miles Street.

5 Site Condition and Surrounding Environment

A desk-top study of the site was undertaken to establish the physical characteristics of the site and surrounding environment.

5.1 Surrounding Environment

The subject land is situated at the edge of a R1 – General Residential area. According to local government land zoning the broader locality is predominated by a mix of general and low density residential as well as areas of environmental management and conservation to the west.

Land immediately to the north of the site is characterised by numerous dwellings. Undisturbed vegetation and a natural water body are situated to the west with previously cleared land to the south and east of the site.

St James Catholic Primary School is situated to the south-east of the site on the corner of Carrs Road and Miles Street.

5.2 Topography

The subject land is situated on the flood plain of the Clarance River. The property has elevations ranging from 1 - 2 m AHD. There are slight undulations on the site including low-lying swampy areas which could be natural or anthropogenic.

5.3 Soils

The soil landscape of the subject site is classified by Morand (2001) as Iluka (IL). This Aeolian soil landscape is typified low to gently undulating Quaternary (Holocene and Pleistocene) sand sheets. Low beach ridges are common on Holocene sand. Slopes 0-2%; relief 1-3m; elevation 1-5m. Mix of uncleared areas of open-forest and closed-forest (littoral rainforest).

Limitations – acid, highly erodible, non-cohesive, infertile soils with very low available water holding capacity and high permeability.

5.4 Flooding

There are numerous water bodies within the vicinity of the site, the closest of which is Oyster Channel located to the west. The Clarence Valley LEP (2011) shows the majority of the site would be affected by the 1 in 20 year flood event.

It is believed that the development site would be filled to alleviate flooding.

5.5 Acid Sulphate Soils

The site is mapped as being Class 2 Acid Sulfate Soils (ASS) as indicated in **Figure 3**. Therefore works below the ground surface or by which the groundwater table is likely to be lowered are likely to have an ASS impact. An Acid Sulfate Soils Management Plan shall be prepared as part of CC documentation.

5.6 Groundwater Resources

A search of existing licensed groundwater bores was undertaken on 6 April 2015 using the NSW Natural Resource Atlas (NRA). The search indicated that one groundwater bore is located immediately north of the proposed development with a further seven bores located within 300 m of the northern site boundary. A map showing groundwater bores in the vicinity of the site is shown on **Figure 4**.

6 Site History

A desk-top site history assessment was undertaken to determine the chronological history of the site and possible sources and locations of contamination. Information used to assist in the desk-top site history assessment was collected and collated from the following sources:

- Review of available site history details;
- A Site History Statement from the current owner;
- Historical aerial photographs;
- OEH's POEO Act Public Register;
- OEH's Contaminated Land – Record of Notices; and
- NSW Primary Industries: Cattle dip site locator.

The findings of the desk-top site history assessment are summarised below.

6.1 Site History Overview

A Site History Assessment was completed by Maroun Stephen dated 17 March 2015. A copy of the signed site history statement is included in **Attachment 1**. Results are summarised below.

Length of association of knowledge of the property

- Maroun Stephen has owned the property for the past seven years.
- No information is known about previous owners.

Land Use

- The land has been used for cattle grazing for the past seven years.
- There are no known cattle dips on or off the site.
- No information is known about previous land uses.

Permits/Licences

- There are no known permits, licences or approvals for present or past site uses.

Historical Use of Adjacent Land

- No information is known about the historical use of adjacent land..

Chemicals used on site

- No chemicals are used or stored on-site.
- There are no known waste disposal areas, spills or possible contaminant sources on or off-site.

Tanks

- There are no known existing or former underground or above ground tanks.

Manufacturing/Industry

- There have been no known manufacturing/industry processes on-site.

Asbestos

- No asbestos has been used in past or present buildings.

Water Use

- There is no use of ground/surface water on-site.
- There are no known bores/pumps on-site.

Sewage Disposal

- One septic tank currently services the site. It is located at the current dwelling in the south-east corner of the site.

Indicators of Contamination

- There are no areas of soil discolouration, bare soil patches, poor plant growth or stress, odours or complaints from neighbours.
- There are no other indictors of contamination.

6.2 Historical Aerial Photographs

Copies of the historical aerial photographs are provided in Figure 5**Error! Reference source not found.**. A summary of the aerial photography is presented in Table 2 below:

Table 2: Aerial Photo Chronology

	Historical Aerial Photographs Observations
1958	Vegetation cleared on an to the west of the site. Yamba Road Visible. Single residential dwelling noted on Yamba Road. Carrs Drive Fomed, posssibly dirt. Site appears to be pasture possibly used for grazing.
1978	Three or four houses north of the site along Yamba Road. Vegetation re-establishing to the west of the site. Pockets of vegetation visible on site, some of which remain today. Vegetated are to west of site appears to have been logged. Site appears to be pasture possibly used for grazing.
1998	Residential subdivisions appearing along Yamba Road to East and West of Site and or under construction. Logged area in the west portion of site re-vegetating. School evident to the east of site along Carrs Road. Carrs Road Paved. Site appears to be pasture possibly used for grazing.
2012 (Fig 6)	Residential areas to the north of the site almost fully developed. Development to the west completed. Natural area in the west portion of the site completely revegetated. Balance of site appears to be pasture used for grazing.

6.3 POEO Act Public Register Search

The OEH's POEO Act Public Register was searched for the area surrounding the site and only two licences are currently issued. Two surrendered and three revoked licences were also identified in the surrounding area. Licence details are provided in Table 3.

Table 3: POEO Act Public Register Search

Number	Name	Location	Type	Status	Issued Date
12486	AUSTRALIAN DREDGING SERVICES PTY LTD	Shores Drive & Park Avenue, YAMBA, NSW 2464	POEO licence	Revoked	13-Jun-06
3025	AXSEVEN PTY LTD	MICALO ISLAND MICALO ROAD, YAMBA, NSW 2464	POEO licence	Revoked	29-Oct-01
1659	CLARENCE VALLEY COUNCIL	ANGOURIE ROAD, YAMBA, NSW 2464	POEO licence	Issued	22-Sep-00
11942	CMT CONSTRUCTIONS PTY LIMITED	PARK AVENUE, YAMBA, NSW 2464	POEO licence	Revoked	28-Oct-03
10547	DOUGHERTY BROS PTY LTD	DEERING & FREEBURN STREETS, YAMBA, NSW 2464	POEO licence	Surrendered	21-Jun-00
12166	FOURTEENTH FLOOR AGENCIES PTY. LTD.	Orion Drive, YAMBA, NSW 2464	POEO licence	Surrendered	1-Mar-05
10896	YAMBA MARINA PTY LIMITED	3 YAMBA ROAD, YAMBA, NSW 2464	POEO licence	Issued	12-Dec-00

Source: POEO Act Public Register (Date Accessed: 7/4/2015)

6.4 Contaminated Land – Record of Notices Search

The OEH's Contaminated Land – Record of Notices was searched (accessed 7 April 2015) for the area surrounding the site. No records were found in the vicinity.

6.5 Section 149 Certificates

The Section 149 Certificate for the property is presented in Attachment 2.

This records that the land is deemed not declared significantly contaminated. (Part 13).

6.6 Cattle Dip Site Locator

The NSW Primary Industries Science and Research: Cattle Dip Site Locator was accessed on 7 April 2015. A search of the site indicated that three cattle dips are located in the vicinity, one of which is adjacent to the site.

Table 4 details the location of the cattle dips.

Table 4: Cattle Dip Site Locations

	Cattle Dip 1	Cattle Dip 2	Cattle Dip 3
Dip Name	Yamba	Micalo	Grays Lane
Road	Carrs Drive	Micalo Road	Palmners Channel Road
Town	Yamba	Yamba	Yamba
LGA	Clarence Valley	Clarence Valley	Clarence Valley
Co-ordinates	E: 532090 N: 6743230	E: 529940 N: 6743520	E: 526930 N: 6741050
Distance from Site	250m	Over 2km	Over 5km

Source: NSW DPI Cattle Dip Site Locator (www.dpi.nsw.gov.au/agriculture/livestock/health/images/information-by-species/cattle/ticks/cattle-dip-site-locator)

The location of cattle dip 1 (Yamba) relevant to the site is shown on **Figure 6**.

A 200m radius investigation zone is recommended around cattle dip sites (DIPMAC 1995). As the site is approximately 250m from the Yamba cattle dip and seperated from the site with a drainage channel. No further investigation is required.

6.7 Areas of Environmental Concern

Based on the desk-top site history assessment, one Area of Environmental Concern (AEC), considered to be a source of potential contaminants of concern may have occurred in or within the vicinity of the site, being:

- agricultural use: cattle grazing.

Section 3.3.2 of the *Managing Land Contamination – Planning Guidelines SEPP 55 – Remediation of Land* (DUAP & EPA, 1998) states that *"further information is required when a subject site is in the vicinity of or associated with an activity listed in Table 1*

but it is unknown whether contamination exists". The following activities (or related activities) from Table 1 were conducted on the site or in the vicinity of the site:

- Agricultural/horticultural activities.

Given the above, an inspection of the site was conducted to obtain further information about the AECs.

7 Site Inspection

7.1 Site Inspection Overview

James Foster (Environmental Engineer) undertook a site inspection on the 30th March 2015. The purpose of the site inspection was to obtain further information about the AECs identified during the desk-top site history assessment and to identify any additional AECs on the site. Photos from the site inspection are presented in Attachment 3. A summary of the site inspection is provided below.

7.2 Agricultural/Horticultural Activities

Based on the site history and the aerial imagery, the site has been primarily used for grazing purposes primarily horses and cattle.

Possible contamination from routine farming operations would be the use of herbicides as part of general farm operations and and pesticides used to control insect pests on cattle and or horses.

Typical Herbicides used on farms are presented in Table 5.

Table 5: Herbicide Data

Herbicide	Active Ingredient	½ Life
Round-up	Glyphosphate	2-174 Days
Paraquat	1,1' dimethyl – 4,4' bipyridinium dichloride (Quaternary)	~1000 Days
Diuron	DCMU (3-(3,4-dichlorophenyl)-1,1-dimethylurea) (Anilides/Anilines)	~90 Days

Given the reasonably short half-life of glyphosphate pesticides, it is highly unlikely that they will be found in any ground contamination. Therefore, the more persistent organo-chlorines and heavy metals were targeted in our investigation.

The use of Diruon was suspended from use in Australia from November 2011.

7.3 Fuel Tank

A single above ground diesel fuel tank was noted along the southern side of the property. This appeared empty but may have preiously been used in its current position. A Judgemetal soil sample was taken below this to identify if any hot-spot existed.

7.4 Residence

A single residence and associated storage sheds are located on the southern end of the property. No additional AECs were identified, no surface staining was evident and the location of the effluent disposal area was not apparent.

7.5 Summary of Site Inspection

Based on the site inspection, it is considered that tow AEC require further investigation:

- Agricultural use grazing (horses and cattle); and
- Above ground fuel tank believed to have contained diesel fuel.

Agricultural activities have been conducted in the majority of the site.

From the information provided, the persistent Potential Contaminants of Concern (PCOC's) from grazing are a range of organochlorine pesticides and heavy metals. Around the fuel tank the PCOC's include, total recoverable hydrocarbons, poly-aromatic hydrocarbons, BTEX and heavy metals.

The proposed change of use will affect an area of approximately 11 ha within the lot. The balance of the site will remain in its current land use (primarily drainage areas and natural vegetation).

8 Sampling and Analysis Plan

Section 2.1 of the *Sampling Design Guidelines* (EPA, 1995) states that a preliminary sampling and analysis program may be required where investigations indicate possible sources of contamination. Given the above, sampling and analysis have been undertaken at the site.

8.1 Sampling Objective

In accordance with *Sampling Design Guidelines* (EPA, 1995), the rationale behind sampling is to gather information concerning the location, nature, level and extent of contamination found within the proposed development area. As the type of contamination sought is not circular (hot-spot) but widespread (equal distribution over a paddock), 16 samples were collected from within the development. The laboratory composited these samples into 4 samples to reduce the analysis cost.

A single judgemental sample was taken below the above ground fuel tank.

8.2 Field Investigations

The field sampling investigation was conducted on the 30th March 2015. This involved the collection of 17 samples. The location of the sampling is shown in **Figure 7**. The samples were collected from below the root zone to 100mm below ground level in accordance with the *Sampling Design Guidelines* (EPA, 1995). Compositing details are shown in **Table 6**.

Table 6: Sampling Details

Sample No.	Depth (mm)	Composite
S1	0-100	C1
S2	0-100	
S3	0-100	
S4	0-100	
S5	0-100	C2
S6	0-100	
S7	0-100	
S8	0-100	
S9	0-100	C3
S10	0-100	

S11	0-100	
S12	0-100	
S13	0-100	C4
S14	0-100	
S15	0-100	
S16	0-100	
J01	0-100	NA

8.3 Sampling Methodology

Soil samples were collected in the field by ENV's qualified Environmental Engineers. Soil samples were collected using a fresh glove hand from the shovel as soon as they were removed from the ground. Samples were sealed in plastic bags and chilled prior to dispatch to the Lab. Sample J01 was sampled into a Glass jar as requiured for volatile analytes.

8.4 Field Quality Assurance/Quality Control (QA/QC)

Sampling equipment (shovel) was cleaned thoroughly between each sample location by washing in a mixture of water and phosphate-free detergent prior to a thorough rinsing in freshwater and drying with a paper towel.

All samples were placed into their relevant containers and stored in an iced esky and transported to the SCU Environmental Analysis Laboratory for testing.

Chain of Custody (COC) documents and Lab Results were recorded for each sample and are provided at **Attachment 4**. The COC indicates the sample number, time sampled, sampler and analytical requirements.

9 Assessment Criteria

For the purpose of assessing site contamination of soil at the site, investigation levels from OEH's approved guidelines have been selected for the protection of human health and ecological impacts via exposure to contaminants.

9.1 Soils Assessment Criteria

OEH recommends using the National Environment Protection Measure (NEPM) for assessing soil contamination, which includes a range of investigation levels for various land uses that are designed to be used for guidance purposes to determine if further investigation is needed (NEPM, 2013). For the purpose of this investigation the following soil assessment criteria from *Schedule B1 Guideline on the Investigation Levels for Soil and Groundwater* (NEPM, 2013) has been adopted:

- NEPM Health Investigation Levels exposure setting A (HIL A) for Residential land use.

The function of the NEPM HILs is to be an indicator for contamination, and they are not to be used as maximum permissible levels that would preclude the intended land use. The NEPM guidelines recommend further investigation and health risk assessments are undertaken where soil exceeds the HILs.

9.2 Assumptions and Limitations of Criteria

The selected criteria have been sourced from various documents which are currently accepted by the OEH. The threshold and background levels contained in these documents have been established through toxicity tests and field and laboratory experiments. In some cases, insufficient data currently exists to provide thresholds. In these cases, the data is simply used as an indicator of the presence and extent of contamination.

The NEPM HILs have been derived considering all exposure routes including ingestion, dermal exposure and inhalation, however most HILs have been derived and are based on oral ingestion exposure pathways. These investigation levels are used as a guide for further investigation if investigation levels are exceeded.

10 Laboratory Analysis Results

The soil sample laboratory analysis results for the site and relevant assessment criteria are presented in **Figure 8**.

For composite sampling, the assessment criteria presented in have been divided by 4.

10.1 Results

None of the samples submitted resulted in levels reaching or exceeding the relevant assessment criteria and were consistent with natural background levels (NEPM, 2013).

11 Conclusions

ENV has undertaken a Stage 1 – Preliminary Investigation for the Project in accordance with the *Managing Land Contamination Planning Guidelines* (DUAP and EPA, 1998).

This investigation is to inform and support a development application for a residential subdision of the site

This Stage 1 – Preliminary Investigation has:

- Described the site condition and surrounding environment;
- Provided a summary of the site history;
- Identified past and present potentially contaminating activities and potential contaminant types;
- Provided a preliminary assessment of the site contamination;
- Assessed the need for further investigations;
- Assessed soil sample analysis results against relevant criteria; and
- Assessed the suitability of the site for the proposed use.

A desk-top site history assessment and a site inspection have been conducted as part of the Stage 1 – Preliminary Investigation. The desk-top site history assessment encompassed the site and adjacent areas. Information used to assist in the site history was also collected and collated from the following sources:

- Review of available site history details including a site history statement;
- Historical aerial photographs;
- OEH's POEO Act Public Register;
- OEH's Contaminated Land – Record of Notices; and,
- NSW Primary Industries Cattle Dip Site Locator.

The site inspection included:

- An inspection of the site to identify potential areas of contamination; and
- Preliminary soil sampling at areas identified as potentially contaminated during the site inspection.

Based on the desk-top site history assessment and the site inspection, it was considered that two AEC required further investigation:

- Agricultural use including cattle grazing.
- Above Ground fuel tank

Two potential contaminants of concern were identified for the site:

- Pesticides/herbicides;
- Metals; and,
- TRH, BTEX, PAH (fuel tank)

Given the above, a Preliminary sampling and analysis plan was undertaken. A total of 17 samples were analysed for the potential contaminants of concern from within the proposed development area.

None of the samples submitted resulted in levels reaching or exceeding the relevant assessment criteria and were consistent with natural background levels (ANZECC, 2013).

Based on the above assessment it is assessed that further investigation is **not required** and that the **site is suitable** for the proposed residential development.

13 References

1. *Australian and New Zealand Environment Conservation Council ANZECC, 1992. Environmental Soil Quality Guidelines.*
2. *Department of Urban Affairs and Planning and the Environment Protection Authority (1998). Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land.*
3. *Environment Protection Authority (1995) Sampling Design Guidelines.*
4. *Environment Protection Authority (2000) Guidelines for Consultants Reporting on Contaminated Sites*
5. *Office of Environment and Heritage Contaminated Land: POEO Public Register* - <http://www.environment.nsw.gov.au/prpoeoapp/searchregister.aspx>
6. *Office of Environment and Heritage Contaminated Land: Record of Notices - <http://www.environment.nsw.gov.au/prclmapp/searchregister.aspx>*
7. *Swartjes, F.A. (1999) Risk-based Assessment of Soil and Groundwater Quality in the Netherlands: Standards and Remediation Urgency. Risk Analysis 19(6): 1235-1249*
8. *National Environment Protection Council (1999) National Environment Protection (Assessment of Site Contamination) Measure.*
9. *Agency for Toxic Substances and Disease Registry (2005) Division of Toxicology ToxFAQs*
10. *National Environment Protection Council (2013) National Environment Protection (Assessment of Site Contamination) Amended Measure Schedule B1 Guideline on the Investigation Levels for Soil and Groundwater*

14 Glossary

Below is a list of commonly used abbreviations in the report:

AEC – Areas of Environmental Concern

COC – Chain of Custody

DPI – Department of Primary Industries

ENV – ENV Solutions PTY LTD

EPA – Environment Protection Authority (now known as Office of Environment Heritage)

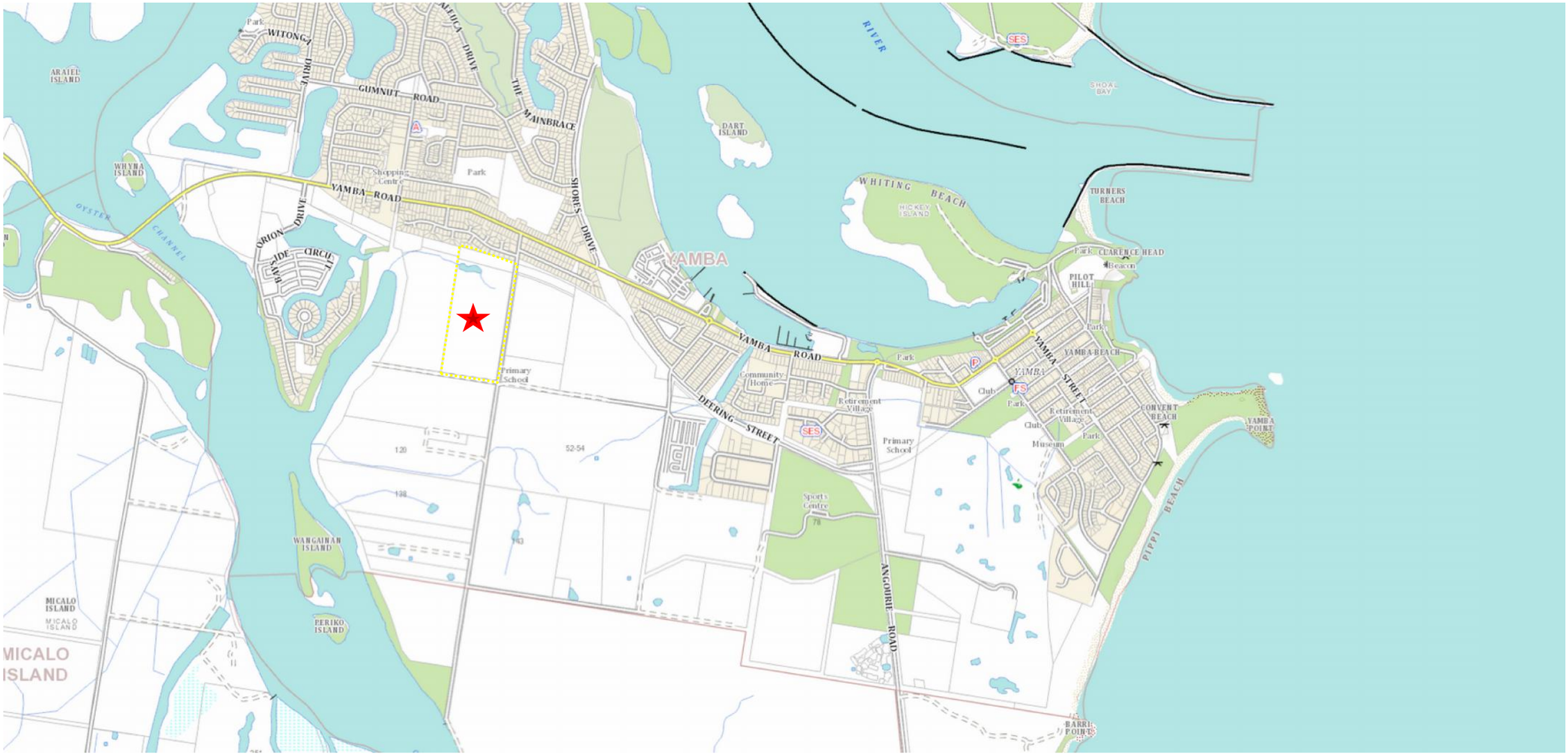
HILs – Health Investigation Levels (for soil)

NEPM – National Environment Protection Measure

OEH – Office of Environment & Heritage

QA/QC – Quality Assurance and Quality Control

16 Figures



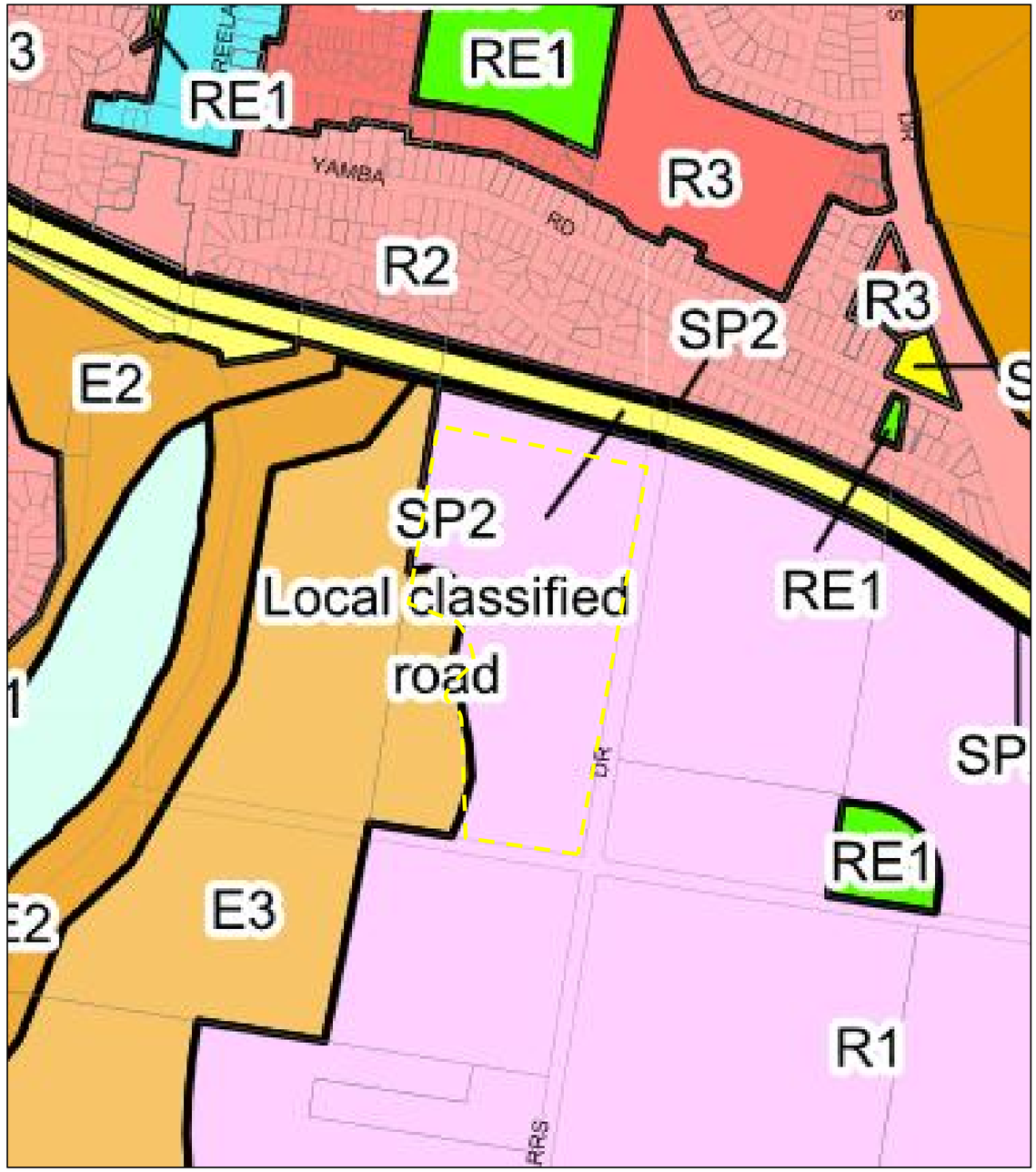
Site Boundary

Site Location

Imagery Coursety of Six Maps 2015
Not To Scale

Project: **Carrs Drive Yamba**
Job No: **14350**
Date: **30/04/2015**
By: **James Foster**
Figure 1: Location Plan

ENV SOLUTIONS PTY LTD



N

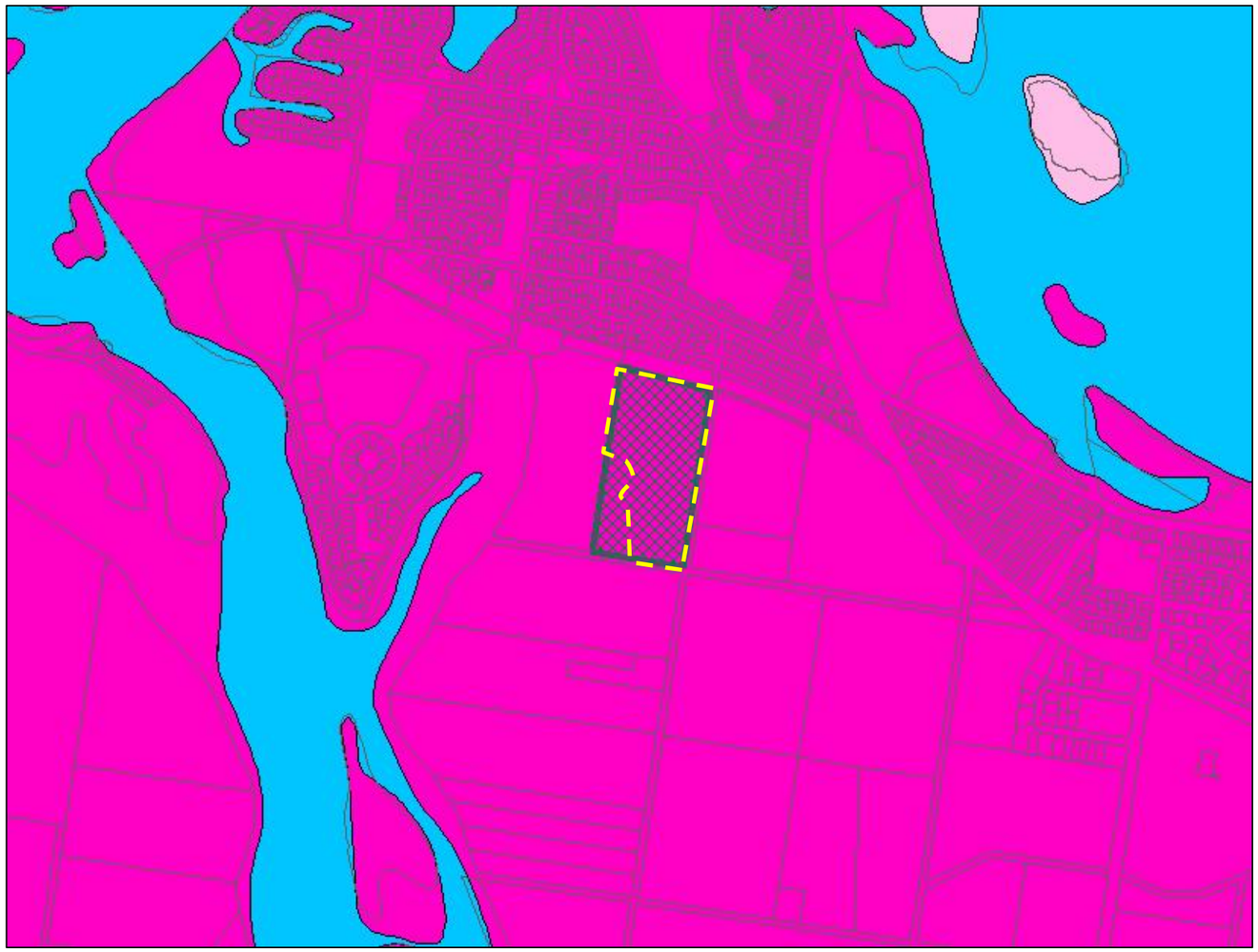
Site Boundary

Source Clarence Valley LEP (2011)
Not To Scale

ENV SOLUTIONS PTY LTD

Project: **Carrs Drive Yamba**
Job No: **14350**
Date: **15/04/2015**
By: **James Foster**

Figure 2 Land Use Zoning



Acid Sulfate Soil

1	Class 1
2	Class 2
3	Class 3
4	Class 4
5	Class 5

Site Boundary

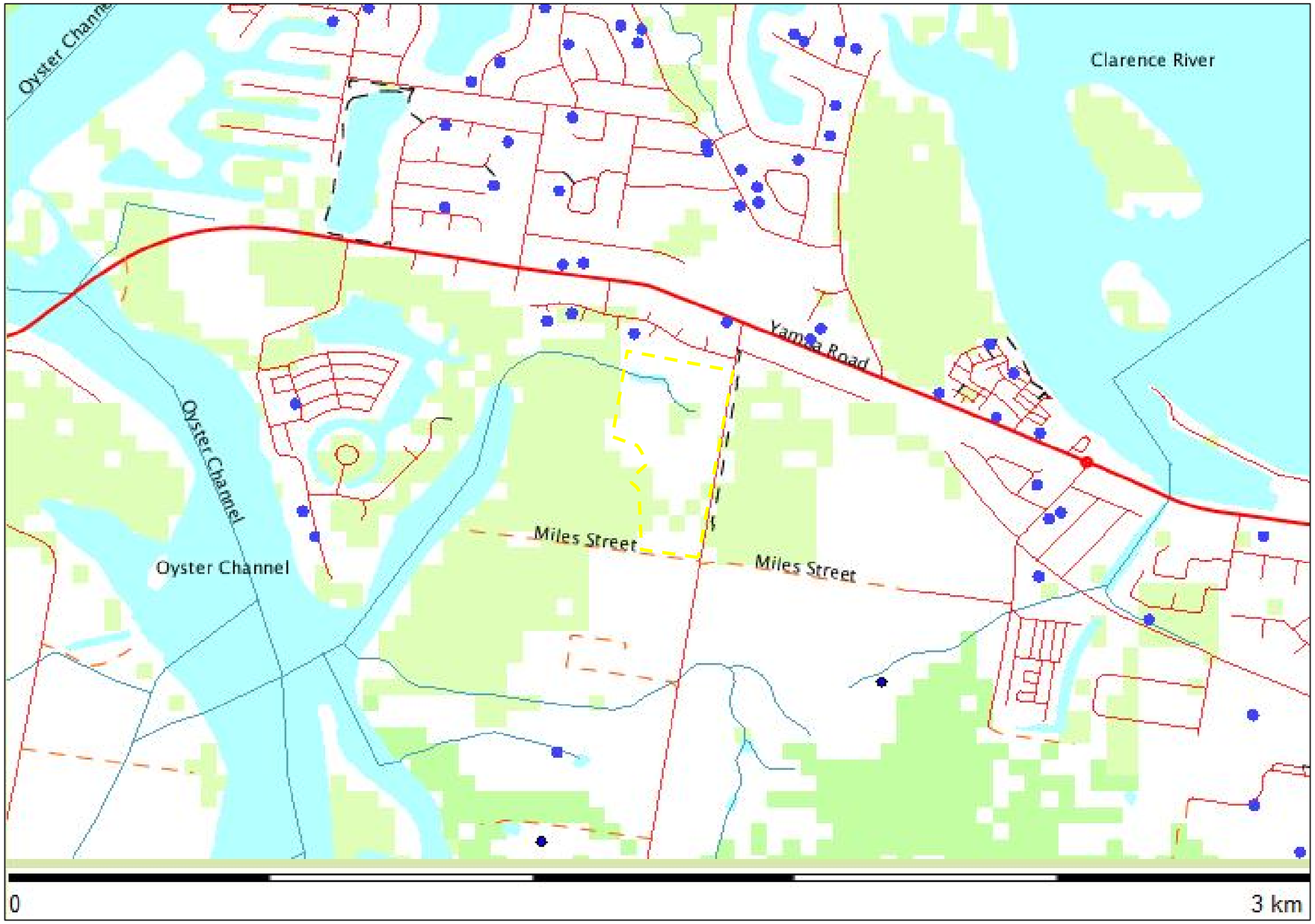
Source: CVLEP, 2011
Not To Scale

ENV SOLUTIONS PTY LTD

Project: **Carrs Drive Yamba**
Job No: **14350**
Date: **15/04/2015**
By: **James Foster**

Figure 3: Acid Sulphate Soils Mapping

N



N

Site Boundary

Licensed Groundwater Bores

Source: NSW Natural Resource Atlas, 6 April 2015

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Date: **15/04/2015**
By: **James Foster**

Figure 4: Groundwater Bores

1958

1978

1998

Imagery Coursety of NSW Department of Lands

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Project: **Carrs Drive Yamba**
Job No: **14350**
Date: **15/04/2015**
By: **James Foster**

Figure 5: Aerial Photography

Site Boundary

Cattle Dip

Imagery Coursety of Six Maps 2015
Source: NSW DPI Cattle Dip Site Locator
Not To Scale

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Project: **Carrs Drive Yamba**
Job No: **14350**
Date: **15/04/2015**
By: **James Foster**

Figure 6: Cattle Dip Site Location

N

Site Boundary

Sampling Location and Number

Imagery Coursety of Six Maps 2015
Not To Scale

ENV SOLUTIONS PTY LTD

Project: **Carrs Drive Yamba**
Job No: **14350**
Date: **30/03/2015**
By: **James Foster**
Figure 6: Sampling Plan

ANALYTE	C1 Samples (1,2,3,4)	C2 Samples (5,6,7,8)	C3 Samples (9,10,11,12)	C4 Samples (13,14,15,16)	J01	*Detection Limits (routine)*	*RESIDENTIAL A Guideline Limit* *Composite - Column A*	*Individual - Column A*
MOISTURE %	21	28	18	20	21	*<1*	..	..
SILVER (mg/Kg DW)	<1	<1	<1	<1	<1	*<1*	*na*	*na*
ARSENIC (mg/Kg DW)	4	5	4	4	4	*<1*	*25*	*100*
LEAD (mg/Kg DW)	12	10	6	8	10	*<0.5*	*75*	*300*
CADMIUM (mg/Kg DW)	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*	*5*	*20*
CHROMIUM (mg/Kg DW)	10	13	8	9	16	*<1*	*(<25)*	*(<100)*
COPPER (mg/Kg DW)	5	5	5	10	6	*<1*	*1,500*	*6,000*
MANGANESE (mg/Kg DW)	31	32	22	69	66	*<1*	*950*	*3,800*
NICKEL (mg/Kg DW)	5	6	4	4	7	*<1*	*100*	*400*
SELENIUM (mg/Kg DW)	1	<1	<1	<1	<1	*<1*	*50*	*200*
ZINC (mg/Kg DW)	17	16	11	22	34	*<1*	*1,850*	*7,400*
MERCURY (mg/Kg DW)	0.02	0.02	0.01	0.01	0.02	*<0.05*	*10*	*40*
IRON (% DW)	0.95	1.17	1.10	1.51	1.51	*<0.01*	*na*	*na*
ALUMINIUM (% DW)	1.02	1.28	0.81	0.93	1.64	*<0.01*	*na*	*na*
BERYLLIUM (mg/Kg DW)	1	1	<1	<1	...	*<1*	*15*	*60*
BORON (mg/Kg DW)	2	3	1	2	...	*<1*	*1,125*	*4,500*
COBALT (mg/Kg DW)	2	2	1	2	...	*<1*	*25*	*100*
PESTICIDE ANALYSIS SCREEN								
DDT+DDE+DDD (mg/Kg)	<0.1	<0.1	<0.1	<0.1	...	*<0.1*	*60*	*240*
Aldrin + Dieldrin (mg/kg)	<0.1	<0.1	<0.1	<0.1	...	*<0.1*	*2*	*6*
Chlordane (mg/kg)	<0.1	<0.1	<0.1	<0.1	...	*<0.1*	*13*	*50*
Endosulfan (mg/kg)	<0.1	<0.1	<0.1	<0.1	...	*<0.1*	*68*	*270*
Endrin (mg/kg)	<0.1	<0.1	<0.1	<0.1	...	*<0.1*	*3*	*10*
Heptachlor (mg/kg)	<0.1	<0.1	<0.1	<0.1	...	*<0.1*	*2*	*6*
HCB (mg/kg)	<0.1	<0.1	<0.1	<0.1	...	*<0.1*	*3*	*10*
Methoxychlor (mg/kg)	<0.1	<0.1	<0.1	<0.1	...	*<0.1*	*75*	*300*
Other Organochlorine Pesticides (mg/Kg)	<0.1	<0.1	<0.1	<0.1	...	*<0.1*	..	..
HYDROCARBON ANALYSIS RESULTS								
BTEX								
Benzene (mg/Kg)	...	...	...	...	<0.2	*<0.5*		*1*
Toluene (mg/Kg)	...	...	...	...	<0.5	*<0.5*		*160*
Ethylbenzene (mg/Kg)	...	...	...	...	<1	*<0.5*		*55*
Total m+p-Xylenes (mg/Kg)	...	...	...	...	<2	*<1*		*40*
o-Xlylene (mg/Kg)	...	...	...	...	<1	*<0.5*		*40*
Xylenes (ortho.meta & para)	...	...	...	...	<3	*<0.15*		*40*
Total BTEX (mg/Kg)	...	...	...	...	ND	*<1*		..
Total Recoverable Hydrocarbons								..
C10-C14 Fraction (mg/Kg)	...	...	...	...	<50	*<50*		..
C15-C28 Fraction (mg/Kg)	...	...	...	...	<100	*<100*		..
C29-C36 Fraction (mg/Kg)	...	...	...	...	<100	*<100*		..
Sum of C6-C36 (mg/Kg)	...	...	...	...	ND	*<100*		..
>C10-C16 Fraction (mg/Kg)	...	...	...	...	<50	*<50*		..
>C10-C16 less Naphthalene (mg/Kg)	...	...	...	...	<50	*<50*		*1,000*
>C16-C34 Fraction (mg/Kg)	...	...	...	...	<100	*<100*		*3,500*
>C34-C40 Fraction (mg/Kg)	...	...	...	...	<100	*<100*		*10,000*
Polyaromatic Hydrocarbons (PAH)								
Naphthalene (mg/Kg)	...	...	...	...	<0.1	*<0.1*		..
Acenaphthylene (mg/Kg)	...	...	...	...	<0.1	*<0.1*		..
Acenaphthene (mg/Kg)	...	...	...	...	<0.1	*<0.1*		..
Fluorene (mg/Kg)	...	...	...	...	<0.1	*<0.1*		..
Phenanthrene (mg/Kg)	...	...	...	...	<0.1	*<0.1*		..
Anthracene (mg/Kg)	...	...	...	...	<0.1	*<0.1*		..
Fluoranthene (mg/Kg)	...	...	...	...	<0.1	*<0.1*		..
Pyrene (mg/Kg)	...	...	...	...	<0.1	*<0.1*		..
Benzo(a)anthracene (mg/Kg)	...	...	...	...	<0.1	*<0.1*		..
Chrysene (mg/Kg)	...	...	...	...	<0.1	*<0.1*		..
Benzo(b)&(k)flouranthene (mg/Kg)	...	...	...	...	<0.2	*<0.1*		..
Benzo(a)pyrene (BaP TEQ) (mg/Kg)	...	...	...	...	<0.1	*<0.1*		*1*
Indeno(1,2,3-c,d)pyrene (mg/Kg)	...	...	...	...	<0.1	*<0.1*		..
Dibenzo(a,h) anthracene (mg/Kg)	...	...	...	...	<0.1	*<0.1*		..
Benzo(g,h,i)perylene (mg/Kg)	...	...	...	...	<0.1	*<0.1*		..
Sum of reported PAHs (mg/Kg)	...	...	...	...	ND	*ND*		*300*

1a. HIL A Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry), also includes childcare centres, preschools and primary schools.
(REFERENCE: Health Investigation Guidelines from NEPM (National Environmental Protection, Assessment of Site Contamination, Measure), 2013; Schedule B1).

17 Attachments

Attachment 1	Site History Statement
Attachment 2	S149 Certificate
Attachment 3	Site Photos
Attachment 4	Laboratory Documentation Results and COC

ATTACHMENT 1

ENV SOLUTIONS

Engineering for the Future

SITE HISTORY ASSESSMENT

Site Address: Lot 1722, Lot 5 + Lot 51

Subject Land:

Length of association or knowledge of the property

- Provide details of how you know about the property (ie prior or current owner, neighbour, family owned land etc) and the length of time that you have had such association or knowledge

7 years.

Land Use

- Chronological list of past and present land uses with associated time periods. For agricultural land uses please include crop types.
- Location of any cattle dip sites on or off-site.
- Attach additional sheets as necessary and any supporting documents, photographs, etc.

GRAZING

Permits/Licences

- Provide details of any permits, licences, approvals etc for past site uses.

—

Historical Use of Adjacent Land

- Brief overview of historical use of adjacent land, if known.

—

Chemicals

- Provide list of any chemicals (herbicides, insecticides, fuels, oils etc) used on site. State the purpose of chemical use, application (e.g. directly on crop or dipped inside sheds) and the time periods used.
- List storage, waste disposal areas, spills, and possible contaminant sources – on and off site.

—

ENV SOLUTIONS
Engineering for the Future

Tanks

- Provide details and locations of any former or existing underground/above ground tanks.

—

Manufacturing/Industrial

- Description of any manufacturing/industrial processes on the site, including locations and dates.

N.A.

Asbestos

- Provide details of any asbestos used in past or present buildings.

N.A.

Water Use

- Describe any usage of ground/surface waters and bore/pump locations.

N.A.

Sewerage Disposal

- Describe any sewerage disposal areas.

1 septic tank - current dwelling

Indicators of Contamination

- Describe any areas of soil discolouration, bare soil patches, poor plant growth or stress, odours, complaints from neighbours etc.

N.A.

Any other pertinent information

Name Maroun Stephen Date 17/3/2015

Signature

MAROUN STEPHEN

ATTACHMENT 2

clarence
VALLEY COUNCIL

Outline Planning Consultants
Pty Ltd
Suite 18 Pittwater Business Park
5 Vuko Place
WARRIEWOOD NSW 2102

Date of Issue 07 October 2014
Your Ref. N/A
Certificate No. PLAN2014/2063
Receipt Details:

634979 02/10/2014 $133.00

Property Number: 132104
Property Address: 22 Carrs Drive YAMBA NSW 2464
Legal Description: Lot 1722 DP 1035524
Owner: Yamba Residential Subdivision Pty Ltd

PLANNING CERTIFICATE

Issued under Section 149(2) of the Environmental Planning and Assessment Act, 1979

Note: the information provided in sections 1 to 19 below is provided under section 149(2) of the Environmental Planning and Assessment Act 1979

1. Relevant planning instruments and development control plans

Text and zoning maps for the relevant local environmental plan/s and development control plan/s can be downloaded from Councils website – www.clarence.nsw.gov.au. Text for the relevant local environmental plan/s can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

A. Local Environmental Plans

Clarence Valley Local Environmental Plan 2011 applies to the land.

Zone E3 Environmental Management

1 Objectives of zone

- To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values.
- To provide for a limited range of development that does not have an adverse effect on those values.
- To prevent inappropriate development in geologically hazardous areas so as to minimise erosion and other adverse impacts on escarpment areas.
- To ensure that development does not unreasonably increase the demand for public services or public facilities.
- To ensure development is not adversely impacted by environmental hazards.

- To protect prominent hillsides, ridgelines, other major natural features, riparian areas and water catchment areas.

2 Permitted without consent

Extensive agriculture; Home-based child care; Home occupations; Home occupations (sex services).

3 Permitted with consent

Animal boarding or training establishments; Bed and breakfast accommodation; Camping grounds; Caravan parks; Dual occupancies (attached); Dwelling houses; Eco-tourist facilities; Emergency services facilities; Environmental facilities; Environmental protection works; Farm buildings; Farm stay accommodation; Flood mitigation works; Forestry; Home businesses; Home industries; Recreation areas; Roads.

4 Prohibited

Industries; Multi dwelling housing; Residential flat buildings; Retail premises; Seniors housing; Service stations; Warehouse or distribution centres; Any other development not specified in item 2 or 3.

Clarence Valley Local Environmental Plan 2011 applies to the land.

Zone R1 General Residential

1. Objectives of zone

- To provide for the housing needs of the community.
- To provide for a variety of housing types and densities.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.

2. Permitted without consent

Home-based child care; Home occupations; Home occupations (sex services).

3. Permitted with consent

Attached dwellings; Boarding houses; Caravan parks; Child care centres; Community facilities; Dual occupancies; Dwelling houses; Educational establishments; Environmental protection works; Exhibition homes; Exhibition villages; Flood mitigation works; Food and drink premises; Group homes; Home businesses; Home industries; Hostels; Information and education facilities; Multi dwelling housing; Neighbourhood shops; Places of public worship; Recreation areas; Residential flat buildings; Respite day care centres; Roads; Semi-detached dwellings; Seniors housing; Shop top housing; Tourist and visitor accommodation.

4. Prohibited

Any development not specified in item 2 or 3.

B. Proposed local environmental planning instruments

The subject land IS affected by a planning proposal for a proposed environmental planning instrument (Local Environmental Plan or LEP) which aims to protect, maintain and improve native biodiversity. It applies to development on land that is identified as having existing native vegetation as shown on the Existing Native Vegetation Map, except where land is zoned R1 General Residential, R2 Low Density Residential, R3 Medium Density Residential, B1 Neighbourhood Centre, B2 Local Centre, B3 Commercial Core, B5 Business Development, RU3 Forestry or E1 National Parks and Nature Reserves under the Clarence Valley Local Environmental Plan 2011. Enquiries should be directed to Council's Environmental Services Section on Ph (02) 6643 0200.

C. Development Control Plan

The Clarence Valley Development Control Plan - Development in Residential Zones applies to the carrying out of development on the land.

D. State Environmental Planning Policies (SEPP)

Text for the relevant state environmental planning policies can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

The land is affected by State Environmental Planning Policies No 1, 4, 6, 15, 21, 22, 30, 32, 33, 36, 44, 50, 55, 62, 64, 65, Housing for Seniors or People with a Disability 2004, Building Sustainability Index (BASIX) 2004, Major Development 2005, Infrastructure 2007, Mining, Petroleum Production and Extractive Industries 2007, Temporary Structures 2007, Exempt and Complying Development Codes 2008, Rural Lands 2008, Affordable Rental Housing 2009, State and Regional Development 2011 and North Coast Regional Environmental Plan 1988.

The land is affected by State Environmental Planning Policy No. 71 - Coastal Protection.

E. Proposed state environmental planning instruments

There are NO proposed State environmental planning policies that apply to the land that is or has been the subject of community consultation or public exhibition, unless otherwise stated within this certificate.

2. Other relevant local environmental planning provisions

Note: The following advice is relevant to the local environmental plan/s identified in Section 1A of this Certificate.

A. Minimum land dimensions for erection of dwelling house

The minimum lot size for dwelling purposes as indicated by the Lot Size Map in the Clarence Valley Local Environmental Plan 2011 is 3 hectares for that part of the land zoned E3.
There is no minimum lot size for dwelling purposes for that part of the land zoned R1. Other development standards may apply.

B. Critical habitat

The subject land is NOT known to include or comprise critical habitat as defined in the *Threatened Species Conservation Act 1995* or Part 7A of the *Fisheries Management Act 1994*.

C. Heritage conservation area

The land is NOT located within a heritage conservation area (however described) under the local environmental planning instrument.

D. Item of environmental heritage

The land does NOT have located on it an item of environmental heritage (however described) under the local environmental planning instrument.

3. Complying development

Note: Text for the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

Notwithstanding the advice in Parts 3A to 3I (inclusive) below, for complying development to occur it must comply with all relevant requirements and other development standards of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

Where advice regarding whether or not complying development can occur, under relevant Codes listed at Parts 3A to 3I (inclusive) below, indicates that complying development cannot occur on any part of the subject land then such advice takes precedence over any other advice in the same Part that indicates complying development may be able to occur on part of the subject land.

A. General Housing Code

Complying development under this Code may not be carried out on any part of this land. The land is wholly affected by Class 1 or Class 2 acid sulfate soils as identified on the Acid Sulfate Soils Map in the *Clarence Valley Local Environmental Plan 2011*.

B. Rural Housing Code

Complying development under this Code may not be carried out on any part of this land. The land is wholly affected by Class 1 or Class 2 acid sulfate soils as identified on the Acid Sulfate Soils Map in the *Clarence Valley Local Environmental Plan 2011*.

C. Housing Alterations Code

Complying development under this Code may be carried out on the whole of this land.

D. General Development Code

Complying development under this Code may be carried out on the whole of this land.

E. Commercial and Industrial Alterations Code

Complying development under this Code may be carried out on the whole of this land.

F. Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may not be carried out on any part of this land. The land is wholly affected by Class 1 or Class 2 acid sulfate soils as identified on the Acid Sulfate Soils Map in the *Clarence Valley Local Environmental Plan 2011*.

G. Subdivisions Code

Complying development under this Code may be carried out on the whole of this land.

H. Demolition Code

Complying development under this Code may be carried out on the whole of this land.

I. Fire Safety Code

Complying development under this Code may be carried out on the whole of this land.

4. Coastal protection

Council has not been notified by the Department of Public Works whether the land is affected by the operation of section 38 or 39 of the *Coastal Protection Act, 1979*.

4A Information relating to coasts and beaches

Either an order has NOT been made under Part 4D of the Coastal Protection Act 1979 in relation to temporary coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), or where such an order has been made the Council is satisfied that the order has been fully complied with.

The Council has NOT been notified under section 55X of the Coastal Protection Act 1979 that temporary coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land).

4B Annual charges for coastal protection services under Local Government Act 1993

The owner (or any previous owner) of the land has NOT consented in writing to the land being subject to annual charges under section 496B of the *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

[Note. "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the Local Government Act 1993.]

5. Mine subsidence

The land is NOT proclaimed to be within a mine subsidence district within the meaning of section 15 of the *Mines Subsidence Compensation Act, 1961*.

6. Road widening and road realignment

The land is NOT affected by any road widening or road re-alignment under Division 2 of Part 3 of the *Roads Act 1993*, any environmental planning instrument, or any resolution of Council, unless otherwise stated within this certificate.

7. Council and other public authority policies on hazard risk restrictions

Hazard Risk Restrictions (generally)
The subject land is NOT affected by a policy adopted by the Council, or by any other public authority and notified to the Council, that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding), unless otherwise stated within this certificate.

Acid Sulfate Soil
The subject land IS mapped AS BEING potentially affected by Acid Sulfate soils, as indicated on the Acid Sulfate Soils Planning Map held by Council.

Any Other Risk - Contaminated Land
Council has adopted a policy on contaminated land. This policy will restrict development of land which is affected by contamination, which has been used for certain purposes, in respect of which there is not sufficient information about contamination, which is proposed to be used for certain purposes, or in other circumstances outlined in the policy.

8. Flood related development controls

A. Flood controls on certain residential development

The land is considered to be located below the flood planning level. Hence, development on the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls. Details are contained in the local environmental planning instrument and relevant development control plan/s.

B. Flood controls on other development

The land is considered to be located below the flood planning level. Hence, development on the land for any purpose (other than development referred to in item 8A above) is subject to flood related development controls. Details are contained in the relevant local environmental planning instrument/s and relevant development control plan/s.

9. Land Reserved for Acquisition

No environmental planning instrument or proposed environmental planning instrument referred to in item 1A, 1B, 1D or 1E of this certificate applies to this land that provides for the acquisition of the land by a public authority as referred to in Section 27 of the *Environmental Planning and Assessment Act 1979*, unless otherwise stated within this certificate.

10. Contributions plans

The Clarence Valley Contributions Plan 2011 applies to the land. It identifies contributions for open space and community facilities applicable to residential development and a Section 94A levy for all other development.

The Section 94 Contributions Plan for Rural Roads applies to the land.

The Section 94 Contribution Plan for Street Trees in Urban Subdivisions applies to the land.

The Section 94 Contributions Plan Yamba Urban Bypass & Urban Intersections applies to the land except for provisions of that plan that relate to contributions from non-residential developments.

In accordance with the above Contributions Plan/s, Council may require, as a condition of consent for certain developments, that works be carried out or contributions be paid towards the provision of works, services or amenities. Applicants intending to carry out developments should make their own enquiries regarding such possible contributions. In some cases, the Council may not be able to determine the exact requirements for works or contributions until a development application has been lodged and assessed.

11. Biodiversity Certified Land

The land is NOT biodiversity certified land (within the meaning of Part 7AA of the *Threatened Species Conservation Act 1995*), unless otherwise stated in this certificate.

12. Biobanking Agreements

The land is NOT land to which a biobanking agreement under Part 7A of the *Threatened Species Conservation Act 1995* relates, unless otherwise stated in this certificate.

13. Matters arising under the Contaminated Land Management Act 1997 (CLM Act)

Note: The following advice is by section 59 (2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate.

The land is NOT within land declared to be significantly contaminated land, subject to a management order, subject of an approved voluntary management proposal, subject of an ongoing maintenance order or subject to a site audit statement within the meaning of the Contaminated Land Management Act 1997, unless otherwise stated within this certificate.

14. Bushfire prone land

The subject land is indicated on Council's bushfire prone land map as NOT being bush fire prone land.

15. Property vegetation plans

Council HAS NOT been notified that a property vegetation plan (PVP) under the Native Vegetation Act 2003 applies to the land.

16. Orders under Tree (Disputes Between Neighbours) Act 2006

Council has NOT been notified of an order made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on the land.

17. Directions under Part 3A

There is NO direction, issued by the Minister for Planning, in force under section 75P(2)(c1) of the Act to the effect that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the *Environmental Planning and Assessment Act 1979* does not have effect.

18. Site compatibility certificates and conditions for seniors housing

Note: Text for the *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

A. Site Compatibility Certificate

There is NO current site compatibility certificate issued under clause 25 of *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* in respect of proposed development on the land, unless otherwise stated within this certificate.

B. Conditions for seniors housing

No condition of a consent to a development application granted after 11 October 2007 in respect of the land has been granted containing a statement setting out any terms of a kind referred to in clause 18(2) of *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004*, unless otherwise stated within this certificate.

19. Site compatibility certificates for infrastructure

Note: Text for the *State Environmental Planning Policy (Infrastructure) 2007* can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

There is NO current site compatibility certificate issued under clause 19 of *State Environmental Planning Policy (Infrastructure) 2007* in respect of proposed development on the land, unless otherwise stated within this certificate.

20. Site compatibility certificates and conditions for affordable rental housing

Note: Text for the *State Environmental Planning Policy (Affordable Rental Housing) 2009* can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

A. Site Compatibility Certificate

There is NO current site compatibility certificate (affordable rental housing) issued under *State Environmental Planning Policy (Affordable Rental Housing) 2009* in respect of proposed development on the land, unless otherwise stated within this certificate.

B. Conditions for affordable rental housing

No condition of consent to a development application in respect of the land has been granted containing a statement setting out any terms of a kind referred to in clause 17(1) or 37(1) of *State Environmental Planning Policy (Affordable Rental Housing) 2009*, unless otherwise stated within this certificate.

21. Paper subdivision information

The land is NOT subject of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot pursuant to Part 16C of the *Environmental Planning and Assessment Regulation 2000.*

22. Site verification certificates

The land is NOT subject of a current site verification certificate that sets out the Director-General's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land—see Division 3 of Part 4AA of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*, unless otherwise stated within this certificate.

23. Other Advice Issued by Council

The following additional advices are issued by Council in good faith pursuant to Section 149(5) of the Environmental Planning and Assessment Act, 1979

Development Servicing Plans

Council's Development Servicing Plans for Water Supply and Sewerage Services apply in those areas serviced by a Council water supply scheme and sewerage scheme respectively. Enquiries as to whether the land the subject to this certificate is within a water supply or sewerage scheme area should be directed to Council's Water Cycle Section.

Water and Sewer Connection

Properties which consist of more than one lot for ratings purposes, and pay a single sewer and/or water access charge, are entitled to a single water and/or sewer connection. If additional water and/or sewer connections are required (for example when lots are sold separately) then the appropriate fee in Council's Fees and Charges, including a capital contribution, is applicable for any new connections.

If the property is a vacant lot, or is charged a water vacant and/or sewer vacant charge, please contact Council's Water Cycle section to determine the appropriate connection fee.

Copies of relevant documents referred to in this Certificate may be available on request from Council, or by visiting its website at www.clarence.nsw.gov.au. Text for legislation referred to in this Certificate can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

SECTION 149(5)

THIS CERTIFICATE IS DIRECTED TO THE FOLLOWING RELEVANT MATTERS AFFECTING THE LAND PURSUANT TO SECTION 149(5)

A. Tree Preservation Order

A tree preservation order under clause 5.9 of the Clarence Valley Local Environmental Plan 2011 applies to the land as specified in Part E of the Clarence Valley Council Development in Residential Zones Development Control Plan.

B. Development Consents

A development consent has NOT been issued over the subject land within the last five years.

C. Contaminated Land (additional information)

Council records do not have sufficient information about previous use of this land to determine if the land is contaminated, consideration by the applicant of Council's policy on Contaminated Land and relevant State legislation is warranted. Interested persons should make their own enquiries regarding the extent of any actual contamination of the land.

D. Mid North Coast Regional Strategy

The Mid North Coast Regional Strategy (March 2009) applies to all land within the Clarence Valley Local Government Area. The primary purpose of this Strategy is to ensure that adequate land is available and appropriately located to accommodate the projected housing and employment needs of the Region's population over the 25 years. The Strategy represents an agreed NSW Government position on the future of the Mid North Coast to 2031. It is the pre-eminent planning document for the Mid North Coast and complements and informs other relevant local and State planning instruments. The Strategy applies to the period 2006-2031 and it is intended to be reviewed every five years. The Strategy can be downloaded from the NSW Department of Planning website, www.planning.nsw.gov.au.

NOTE: When information pursuant to Section 149(5) is requested the Council is under no obligation to furnish any of the information supplied herein pursuant to that Section. Council draws your attention to Section 149(6) which states that a Council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-Section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate.

PLEASE NOTE:

The Environmental Planning and Assessment Amendment Act 1997 commenced operation on 1 July 1998. As a consequence of this Act the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment (Amendment) Regulation 1998, Environmental Planning and Assessment (Further Amendment) Regulation 1998 and Environmental Planning and Assessment (Savings and Transitional) Regulation 1998.

Disclaimer

This certificate contains information provided to Clarence Valley Council by third parties and is as current as the latest information available to Council at the time of production of this document. Council does not warrant the accuracy of the information contained within the information provided by third parties and has not independently verified the information. Please contact Council staff on 6643 0200 should you wish to obtain a listing of the information provided by third parties that has been relied upon in the production of this document. It is strongly recommended that you contact the relevant third parties to confirm the accuracy of the information.

David Harrison.

For and on behalf of the
GENERAL MANAGER

ATTACHMENT 3

Plate 1: Fuel Tank

Plate 2: Existing Dwelling

Plate 3: Site overview

Plate 4: Site Overview

Plate 5: Storage Structure

ATTACHMENT 4

CHAIN OF CUSTODY

Environmental Analysis Laboratory

Delivery Address:

Environmental Analysis Laboratory
Southern Cross University
PO Box 157 (Military Road)
LISMORE NSW 2480

Phone: 02 6620 3678
Mobile: 0419 984 088 (Lab Manager)
Fax: 02 6620 3957
Email: eal@scu.edu.au
Website: www.scu.edu.au/eal

Submitting Client Details

Your Job Reference: 14350 - CARRS DRIVE YAMBA
School/Dept: ENV SOLUTIONS
Contact Person: JANET FOSTER
Phone:
Mobile: 0421519354
Fax:
Email: Jane@envsolutions.com.au
Postal Address: PO Box 248 Ballina NSW 2478

Billing Details

Quote Id: E0738
School/Dept:
Contact Person: x 17 soil
Phone:
Mobile:
Fax:
Email:
Postal Address:

Payment Method: - Internal Transfer

GL & Project Code: _____

	Date	Signed
Relinquished By: J Foster	30/3/15	
Delivery: None / Ice / Ice bricks / Acidified / Filtered / Other:		
Received By:	30.3.15	
Condition on receipt: Ambient / Cool / Frozen / Other:		

Comments:
PRELIM CONTAM ASSESSMENT
RESIDENTIAL

Sample preservation: NIL

INVOICE PLEASE

Sample Analysis Request

Price List Code (e.g. SW-PACK-06)

Lab Sample No.	Sample Name	DEPTH		Sample Type (e.g. water, leaf, soil)	Composite						
1	S1	0-100		Soil	1						
	S2	"		"		C1					
	S3	"		"							
4	S4	"		"							

CHAIN OF CUSTODY

Comments:

Sample preservation:

Lab Sample No.	Sample Name	Depth		Sample Type (e.g. water, leaf, soil)	Composite		SS PAHs 008	8 Metals	PAH	BTEX	TRH
	S 5	0-100		Soil							
	S 6	"		"		C2					
	S 7	"		"							
	S 8	"		"							
	S 9	"		"							
	S 10	"		"		C3					
	S 11	"		"							
	S 12	"		"							
	S 13	"		"							
	S 14	"		"		C4					
	S 15	"		"							
16	S 16	"		"							
C1	C1	Composite		Soil			X				
C2	C2	"		"			X				
C3	C3	"		"			X				
C4	C4	"		"			X				
17	J01	0-100		Soil				X	X	X	X

Environmental Analysis Laboratory
Division of Research
Southern Cross University

Sample Receipt Notification (SRN)

Project:	**EAL/E0738**
Customer:	Env Solutions Pty Ltd
Contact:	James Foster
Client Job ID:	14350-Carrs Drive Yamba
No. of Samples	17 x soil; 4 x Composites.
Date Received:	30 MAR 2015
Comments:	C1=1-4 C2=5-8 C3=9-12 C4=13-16
Biller:	**Env Solutions Pty Ltd** - James Foster - Phone Not Provided

Division of Research
Southern Cross University
PO Box 157 Lismore NSW 2480

T: (02) 6620 3678
F: (02) 6620 3957
E: eal@scu.edu.au
W: scu.edu.au/eal
ABN: 41 995 651 524

Test Request

Sample Text ID	Client Sample ID	Basic Metals Scan - Total Acid Extractable (SS-PACK-004)	Contaminated Site Assessment 3 (SS-PACK-008)	Petroleum Compounds Assessment 1a (SS-PACK-017)	Soil Compositing (SS-PREP-004)	PAH (SS-SING-020)
E0738/(C)001	Samples(1,2,3,4)	0	1	0	0	0
E0738/(C)002	Samples(5,6,7,8)	0	1	0	0	0
E0738/(C)003	Samples(9,10,11,12)	0	1	0	0	0
E0738/(C)004	Samples(13,14,15,16)	0	1	0	0	0
E0738/001	S1	0	0	0	1	0
E0738/002	S2	0	0	0	1	0
E0738/003	S3	0	0	0	1	0
E0738/004	S4	0	0	0	1	0

Sample Receipt Notification (SRN) for EAL/E0738

		Basic Metals Scan - Total Acid Extractable	Contaminated Site Assessment 3	Petroleum Compounds Assessment 1a	Soil Compositing	PAH
		SS-PACK-004	SS-PACK-008	SS-PACK-017	SS-PREP-004	SS-SING-020
E0738/005	S5	0	0	0	1	0
E0738/006	S6	0	0	0	1	0
E0738/007	S7	0	0	0	1	0
E0738/008	S8	0	0	0	1	0
E0738/009	S9	0	0	0	1	0
E0738/010	S10	0	0	0	1	0
E0738/011	S11	0	0	0	1	0
E0738/012	S12	0	0	0	1	0
E0738/013	S13	0	0	0	1	0
E0738/014	S14	0	0	0	1	0
E0738/015	S15	0	0	0	1	0
E0738/016	S16	0	0	0	1	0
E0738/017	J01	1	0	1	0	1
Total		1	4	1	16	1

Sample Receipt Notification (SRN) for EAL/E0738

Test Descriptions

Test List Item	Item Description
SS-PREP-004	**Soil Compositing** EAL can composite samples and store the individual samples for at least 2 months to allow for individual testing if required. Charge per individual sample used in the composite.
SS-PACK-004	**Basic Metals Scan - Total Acid Extractable** Dry and Grind Metals (Al, As, Cd, Cr,Cu, Fe, Pb, Mn, Hg, Ni, Se, Ag, Zn)
SS-PACK-008	**Contaminated Site Assessment 3** Dry and Grind Basic Texture Metals (Cu, Pb, Cd, Zn, As, Se, Fe, Mn, Ag, Cr, Ni, Al, Hg, B, Co, Be) Pesticides (OCs) SUBCONTRACTED
SS-PACK-017	**Petroleum Compounds Assessment 1a** TPH(C10-C36) and BTEX (equivalent to TPHC6- C9) SUBCONTRACTED
SS-SING-020	**PAH** SUBCONTRACTED

RESULTS OF SOIL ANALYSIS

17 soil samples supplied by Env Solutions Pty Ltd on 30th March, 2015 - Lab Job No. E0738
Soil samples supplied were composited by EAL into 4 composite samples for analysis
Analysis requested by James Foster. **Your Job: 14350-Carrs Drive YAMBA**
(PO Box 248 BALLINA NSW 2478).

ANALYTE	METHOD REFERENCE	Composite Sample 1 Samples(1,2,3,4)	Composite Sample 2 Samples(5,6,7,8)	Composite Sample 3 Samples(9,10,11,12)	Composite Sample 4 Samples(13,14,15,16)	*RESIDENTIAL A Guideline Limit*		*COMMERCIAL/ INDUSTRIAL D Guideline Limit*		*Background*
						Composite - Column A	*Individual - Column A*	*Composite - Column D*	*Individual - Column D*	*Range*
	Job No.	*E0738/1*	*E0738/2*	*E0738/3*	*E0738/4*	*See note 1a*	*See note 1a*	*See note 1d*	*See note 1d*	*See note 2*
MOISTURE %	c	21	28	18	20	..	..	..	..	..
SILVER (mg/Kg DW)	*a*	<1	<1	<1	<1	*na*	*na*	*na*	*na*	*na*
ARSENIC (mg/Kg DW)	*a*	4	5	4	4	*25*	*100*	*750*	*3,000*	*0.2-30*
LEAD (mg/Kg DW)	*a*	12	10	6	8	*75*	*300*	*375*	*1,500*	*<2-200*
CADMIUM (mg/Kg DW)	*a*	<0.5	<0.5	<0.5	<0.5	*5*	*20*	*225*	*900*	*0.04-2.0*
CHROMIUM (mg/Kg DW)	*a*	10	13	8	9	*(<25)*	*(<100)*	*(<900)*	*(<3,600)*	*0.5-110*
COPPER (mg/Kg DW)	*a*	5	5	5	10	*1,500*	*6,000*	*60,000*	*240,000*	*1-190*
MANGANESE (mg/Kg DW)	*a*	31	32	22	69	*950*	*3,800*	*15,000*	*60,000*	*4 - 12,600*
NICKEL (mg/Kg DW)	*a*	5	6	4	4	*100*	*400*	*1,500*	*6,000*	*2-400*
SELENIUM (mg/Kg DW)	*a*	1	<1	<1	<1	*50*	*200*	*2,500*	*10,000*	*na*
ZINC (mg/Kg DW)	*a*	17	16	11	22	*1,850*	*7,400*	*100,000*	*400,000*	*2-180*
MERCURY (mg/Kg DW)	*a*	0.02	0.02	0.01	0.01	*10*	*40*	*183*	*730*	*0.001-0.1*
IRON (% DW)	*a*	0.95	1.17	1.10	1.51	*na*	*na*	*na*	*na*	*na*
ALUMINIUM (% DW)	*a*	1.02	1.28	0.81	0.93	*na*	*na*	*na*	*na*	*na*
BERYLLIUM (mg/Kg DW)	*a*	1	1	<1	<1	*15*	*60*	*125*	*500*	*na*
BORON (mg/Kg DW)	*a*	2	3	1	2	*1,125*	*4,500*	*75,000*	*300,000*	*na*
COBALT (mg/Kg DW)	*a*	2	2	1	2	*25*	*100*	*1,000*	*4,000*	*na*
PESTICIDE ANALYSIS SCREEN										
DDT+DDE+DDD (mg/Kg)	*c*	<0.1	<0.1	<0.1	<0.1	*60*	*240*	*900*	*3,600*	*<0.1*
Aldrin + Dieldrin (mg/Kg)	*c*	<0.1	<0.1	<0.1	<0.1	*2*	*6*	*11*	*45*	*<0.1*
Chlordane (mg/kg)	*c*	<0.1	<0.1	<0.1	<0.1	*13*	*50*	*133*	*530*	*<0.1*
Endosulfan (mg/kg)	*c*	<0.1	<0.1	<0.1	<0.1	*68*	*270*	*500*	*2,000*	*<0.1*
Endrin (mg/kg)	*c*	<0.1	<0.1	<0.1	<0.1	*3*	*10*	*25*	*100*	*<0.1*
Heptachlor (mg/kg)	*c*	<0.1	<0.1	<0.1	<0.1	*2*	*6*	*13*	*50*	*<0.1*
HCB (mg/kg)	*c*	<0.1	<0.1	<0.1	<0.1	*3*	*10*	*20*	*80*	*<0.1*
Methoxychlor (mg/kg)	*c*	<0.1	<0.1	<0.1	<0.1	*75*	*300*	*625*	*2,500*	*<0.1*
Other Organochlorine Pesticides (mg/Kg)	*c*	<0.1	<0.1	<0.1	<0.1	..	..	..	..	*<0.1*

METHODS REFERENCE

a. 1:3 Nitric/HCl digest - APHA 3125 ICPMS
b. 1:3 Nitric/HCl digest - APHA 3120 ICPOES
c. Analysis sub-contracted - Envirolab report no.125985

NATA
Accreditation No. 14960.
Accredited for compliance with ISO/IEC 17025.

NOTES

1a. HIL A - Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry), also includes childcare centres, preschools and primary schools.
1b. HIL B - Residential with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments.
1c. HIL C - Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. This does not include undeveloped public open space.
1d. HIL D - Commercial/industrial, includes premises such as shops, offices, factories and industrial sites.
(REFERENCE: Health Investigation Guidelines from NEPM (National Environmental Protection, Assessment of Site Contamination, Measure), 2013; Schedule B1).
2. Environmental Soil Quality Guidelines, Page 40, ANZECC, 1992.

Additional NOTES

DW = Dry Weight. na = no guidelines available

Organochlorine pesticide (OC's) screen: (HCB, alpha-BHC, gamma-BHC, Heptachlor, delta-BHC, Aldrin, Heptachlor Epoxide, gamma-Chlordane, alpha-chlordane, Endosulfan 1, pp-DDE, Dieldrin, Endrin, pp-DDD, Endosulfan 2, pp-DDT, Endrin Aldehyde, Endosulfan Sulphate, Methoxychlor)

checked:.....

18 Document Control:

Filename:	14350 Carrs Dr Yamba Preliminary Contam Assessment 20150430
Job No.:	14260
Author:	James Foster
Client:	Yamba Residential Subdivision PTY LTD
File/Pathname:	https://d.docs.live.net/864290396696383a/Documents/01 Jobs/14350 - Carrs Rd Yamba Contamination/01-Admin/01-Reports/14350 Carrs Dr Yamba Preliminary Contam Assessment 20150430.docx

Revision No:	Date:	Issued By	
		Name	Signed
DRAFT	30/04/15	J Foster	
1			
2			

Scope of Engagement:

This report has been prepared by ENV Solutions PTY LTD (ENV) ABN 46856079490 at the request of Yamba Residential Subdivision PTY LTD for the purpose of and is not to be used for any other purpose or by any other person or corporation.

This report has been prepared from the information provided to us and from other information obtained as a result of enquiries made by us. ENV accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may use or rely on this document for a purpose other than that described above.

ENV declares that it does not have, nor expects to have, a beneficial interest in the subject project.

To avoid this advice being used inappropriately it is recommended that you consult with ENV before conveying the information to another who may not fully understand the objectives of the report. This report is meant only for the subject site/project and should not be applied to any other.

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : SUB2014/0016

Client Service ID : 180833

Carmen Landers

50 River Street
Maclean New South Wales 2463

Attention: Carmen Landers

Email: carmen.landers@clarence.nsw.gov.au

Date: 08 July 2015

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 51, DP:DP861895 with a Buffer of 50 meters, conducted by Carmen Landers on 08 July 2015.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

3 Marist Place, Parramatta NSW 2150
Locked Bag 5020 Parramatta NSW 2220
Tel: (02) 9585 6380 Fax: (02) 9873 8599

ABN 30 841 387 271
Email: ahims@environment.nsw.gov.au
Web: www.environment.nsw.gov.au

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : SUB2014/0016

Client Service ID : 180834

Carmen Landers

50 River Street
Maclean New South Wales 2463

Attention: Carmen Landers

Email: carmen.landers@clarence.nsw.gov.au

Date: 08 July 2015

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 51, DP:DP861895 with a Buffer of 200 meters, conducted by Carmen Landers on 08 July 2015.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

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- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

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Email: ahims@environment.nsw.gov.au
Web: www.environment.nsw.gov.au

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : SUB2014/0016

Client Service ID : 180836

Date: 08 July 2015

Carmen Landers

50 River Street
Maclean New South Wales 2463

Attention: Carmen Landers

Email: carmen.landers@clarence.nsw.gov.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 51, DP:DP861895 with a Buffer of 1000 meters, conducted by Carmen Landers on 08 July 2015.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

4	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
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- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

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OYSTER CHANNEL

LOT 162
(18.611ha)

LOT 52

LOT 8
(1.697 ha)

STAGE 1

STAGE 2

STAGE 3

MILES STREET

CARRS DRIVE

1
DP790910
'ST JAMES PRIMARY SCHOOL'

STAGING

STAGE 1 57 LOTS
STAGE 2 54 LOTS
STAGE 3 50 LOTS
161 LOTS

0 20 40 60 80 100
Meters

SCALE : - 1 : 1,500 @ A1
- 1 : 3,000 @ A3

T:\Projects\14140 Yamba Subdivision\dwg\DA\14140_P01_Subdivision Plans.dwg

REVISIONS

No.	DESCRIPTION	DRN	APP	DATE
A	PRELIMINARY ISSUE	A.H	K.R	23.09.14
B	REVISED TO COUNCIL COMMENTS	A.C	K.R	21.01.15
C	REVISED FOR FUTURE MOTORWAY & CARRS DRIVE	D.N.	K.R.	30.03.15
D	REVISED TO COUNCIL COMMENTS	A.C	K.R	30.04.15
E	REVISED TO COUNCIL COMMENTS	A.C	k.r	29.06.15

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planning engineering landscape design management

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CAMDEN
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F 61 2 4655 5024
E camden@siteplus.com.au

Height Datum	A.H.D
Drawn	AH
Designed	AH
Checked	KR
Approved	KR

Client Title: YAMBA RESIDENTIAL SUBDIVISION PTY LTD

Dwg Status: FINAL

Local Authority: CLARENCE VALLEY

Dwg Title: PROPOSED LAYOUT
LOT 1722 DP1035524
CARRS DRIVE YAMBA
SUBDIVISION PLAN

Ref & Dwg No	14140.DA1.P01
Sheet No	Sheet 01 of 01
Scale	1:1500 @ A1
Date	07.07.14
Rev	E
	A1

Department of Primary Industries
Office of Water

Contact: Vanessa Sultmann
Phone: 02 6676 7382
Fax: 02 6676 7388
Email: vanessa.sultmann@water.nsw.gov.au
Our ref: 30 ERM2014/0995
Our file: 9058756
Your ref: MS14/0016 CVC:1375570

The General Manager
Clarence Valley Council
Locked Bag 23
Grafton NSW 2460

Attention: Carmen Landers

28 October 2014

Dear Sir/Madam

Re: Integrated Development Referral – General Terms of Approval
Dev Ref: SUB2014/0016
Description of proposed activity: 161 Lot Subdivision
Site location: 22 Carrs Drive, Yamba

I refer to your recent letter regarding an integrated Development Application (DA) proposed for the subject property. Attached, please find the Office of Water's General Terms of Approval (GTA) for works requiring a controlled activity approval under the *Water Management Act 2000* (WM Act), as detailed in the subject DA.

Please note Council's statutory obligations under section 91A (3) of the *Environmental Planning and Assessment Act 1979* (EPA Act) which requires a consent, granted by a consent authority, to be consistent with the general terms of any approval proposed to be granted by the approval body.

If the proposed development is approved by Council, the Office of Water requests that these GTA be included (in their entirety) in Council's development consent. Please also note the following:

- The Office of Water should be notified if any plans or documents are amended and these amendments significantly change the proposed development or result in additional works on waterfront land (which includes (i) the bed of any river together with any land within 40 metres inland of the highest bank of the river, or (ii) the bed of any lake, together with any land within 40 metres of the shore of the lake, or (iii) the bed of any estuary, together with any land within 40 metres inland of the mean high water mark of the estuary).

- Once notified, the Office of Water will ascertain if the amended plans require review or variation/s to the GTA. This requirement applies even if the proposed works are part of Council's proposed consent conditions and do not appear in the original documentation.

- The Office of Water should be notified if Council receives an application to modify the development consent and the modifications change any activities on waterfront land.

- The Office of Water requests notification of any legal challenge to the consent.

As the controlled activity to be carried out on waterfront land cannot commence before the applicant applies for and obtains a controlled activity approval, the Office of Water recommends the following condition be included in the development consent:

> "The Construction Certificate will not be issued over any part of the site requiring a controlled activity approval until a copy of the approval has been provided to Council".

The attached GTA are not the controlled activity approval. The applicant must apply (to the Office of Water) for a controlled activity approval **after consent** has been issued by Council **and before** the commencement of any work or activity on waterfront land.

Finalisation of a controlled activity approval can take up to eight (8) weeks from the date the Office of Water receives all documentation (to its satisfaction). Applicants must complete and submit (to the undersigned) an application form for a controlled activity approval together with any required plans, documents, the appropriate fee and security deposit or bank guarantee (if required by the Office or Water) and proof of Council's development consent.

Application forms for the controlled activity approval are available from the undersigned or from the Office of Water's website:
www.water.nsw.gov.au Water licensing › Approvals › Controlled activities

The Office of Water requests that Council provide a copy of this letter to the applicant.

The Office of Water also requests that Council provides the Office of Water with a copy of the determination for this development application as required under section 91A (6) of the EPA Act.

Yours Sincerely

Patrick Pahlow
Senior Water Regulation Officer
Office of Water - Water Regulation, North & North Coast

General Terms of Approval

for work requiring a controlled activity approval under s91 of the Water Management Act 2000

Our Reference: 30 ERM2014/0995 **File No:** 9058756

Site Address: 22 Carrs Drive, Yamba

DA Number: SUB2014/0016

LGA: Clarence Valley Council

Number	Condition
Plans, standards and guidelines	
1	These General Terms of Approval (GTA) only apply to the controlled activities described in the plans and associated documentation relating to SUB2014/0016 and provided by Council. Any amendments or modifications to the proposed controlled activities may render these GTA invalid. If the proposed controlled activities are amended or modified the NSW Office of Water must be notified to determine if any variations to these GTA will be required.
2	Prior to the commencement of any controlled activity (works) on waterfront land, the consent holder must obtain a Controlled Activity Approval (CAA) under the Water Management Act from the NSW Office of Water. Waterfront land for the purposes of this DA is land and material in or within 40 metres of the top of the bank or shore of the lake identified.
3	The consent holder must prepare or commission the preparation of: (i) Vegetation Management Plan (ii) Works Schedule (iii) Soil and Water Management Plan
4	N/A
5	The consent holder must (i) carry out any controlled activity in accordance with approved plans and (ii) construct and/or implement any controlled activity by or under the direct supervision of a suitably qualified professional and (iii) when required, provide a certificate of completion to the NSW Office of Water.
Rehabilitation and maintenance	
6	The consent holder must carry out a maintenance period of two (2) years after practical completion of all controlled activities, rehabilitation and vegetation management in accordance with a plan approved by the NSW Office of Water.
7	The consent holder must reinstate waterfront land affected by the carrying out of any controlled activity in accordance with a plan or design approved by the NSW Office of Water.
Reporting requirements	
8	The consent holder must use a suitably qualified person to monitor the progress, completion, performance of works, rehabilitation and maintenance and report to the NSW Office of Water as required.
Security deposits	
9	N/A
Access-ways	

Our Reference: 30 ERM2014/0995 **File No:** 9058756

Site Address: 22 Carrs Drive, Yamba

DA Number: SUB2014/0016

LGA: Clarence Valley Council

Number	Condition
10	N/A
11	N/A
Bridge, causeway, culverts, and crossing	
12	N/A
13	N/A
Disposal	
14	The consent holder must ensure that no materials or cleared vegetation that may (i) obstruct flow, (ii) wash into the water body, or (iii) cause damage to river banks; are left on waterfront land other than in accordance with a plan approved by the NSW Office of Water.
Drainage and Stormwater	
15	N/A
16	The consent holder must stabilise drain discharge points to prevent erosion in accordance with a plan approved by the NSW Office of Water.
Erosion control	
17	The consent holder must establish all erosion and sediment control works and water diversion structures in accordance with a plan approved by the NSW Office of Water. These works and structures must be inspected and maintained throughout the working period and must not be removed until the site has been fully stabilised.
Excavation	
18	The consent holder must ensure that no excavation is undertaken on waterfront land other than in accordance with a plan approved by the NSW Office of Water.
19	N/A
Maintaining river	
20	The consent holder must ensure that (i) river diversion, realignment or alteration does not result from any controlled activity work and (ii) bank control or protection works maintain the existing river hydraulic and geomorphic functions, and (iii) bed control structures do not result in river degradation other than in accordance with a plan approved by the NSW Office of Water.
21	N/A
River bed and bank protection	
22	N/A
23	N/A
Plans, standards and guidelines	
24	N/A
25	N/A

Our Reference:	30 ERM2014/0995	**File No:** 9058756
Site Address:	22 Carrs Drive, Yamba	
DA Number:	SUB2014/0016	
LGA:	Clarence Valley Council	

Number	Condition
26	N/A
27	N/A
END OF CONDITIONS	

www.water.nsw.gov.au
Room 2, 135 Murwillumbah Street MURWILLUMBAH 2484 : PO Box 796 MURWILLUMBAH NSW 2484
t + 61 2 66767380 I f + 61 2 66767388 I e information@water.nsw.gov.au I ABN 72 189 919 072

CARRS DRIVE WEST YAMBA
TRAFFIC IMPACT ASSESSMENT

FOR

SITEPLUS

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Studio 203, 3 Gladstone Street
Newtown NSW 2042
P: (02) 9557 6202

Project No: P2053 Version No: 002 Issue date: 5 June 2015

DOCUMENT CONTROL SHEET

Issue History

Report File Name	Prepared by	Reviewed by	Issued by	Date	Issued to
P2053.001R – Carrs Drive West Yamba TIA	B. James / A. Piggott	A. Bitzios	A. Bitzios	13/05/2015	Ken Rootsey ken@siteplus.com.au
P2053.002R – Carrs Drive West Yamba TIA	A.Bitzios	S.Brooke	A. Bitzios	5/06/2015	Ken Rootsey ken@siteplus.com.au

CONTENTS

Page

1. BACKGROUND 1
1.1 DEVELOPMENT DETAILS 1
1.2 SCOPE 1
1.3 REPORT OUTLINE 2
2. TRAFFIC ASSESSMENT 3
2.1 EXISTING ROAD NETWORK 3
2.2 BACKGROUND TRAFFIC VOLUMES 3
2.2.1 Growth Rates 3
2.2.2 Forecasted 2026 Background Traffic Volumes 4
2.3 DEVELOPMENT TRAFFIC GENERATION 4
2.4 TRAFFIC DISTRIBUTION 4
2.5 DESIGN TRAFFIC VOLUMES 6
2.6 INTERSECTION ASSESSMENTS 6
2.6.1 Treelands Drive / Yamba Road Intersection 6
2.6.2 Shores Drive / Yamba Road Intersection 9
2.6.3 Carrs Drive / Yamba Road Intersection 12
2.7 GOLDING STREET CONNECTION 14
2.8 TRAFFIC ANALYSIS SUMMARY 15
2.8.1 Funding of Upgrades 15
3. COST APPORTIONMENT 16
4. TRAFFIC IMPACT ASSESSMENT FOR DEVELOPMENT #2 ONLY 17
4.1 OVERVIEW 17
4.2 YEAR 2026 TRAFFIC ASSESSMENT 17
4.2.1 Year 2026 Traffic Volumes – Background Traffic + Development #2 Only 17
4.2.2 Year 2026 Traffic Assessment – Background Traffic + Development #2 Only 17
4.3 AUSTROADS TURN WARRANTS ASSESSMENT 18
4.4 INFRASTRUCTURE CONTRIBUTIONS – DEVELOPMENT #2 PROCEEDS ONLY 18
5. CONCLUSION 20

Tables

Table 2.1: Surrounding Road Network Summary
Table 2.2: Development Traffic Splits per Year
Table 2.3: Existing Treelands Drive / Yamba Road Intersection – 2026 SIDRA Results
Table 2.4: Existing Treelands Drive / Yamba Road Intersection – Year of Failure SIDRA Results
Table 2.5: Treelands Drive / Yamba Road Signalised Intersection – 2026 SIDRA Results
Table 2.6: Existing Shores Drive / Yamba Road Intersection – 2026 SIDRA Results
Table 2.7: Existing Shores Drive / Yamba Road Intersection – Year of Failure SIDRA Results
Table 2.8: Shores Drive / Yamba Road Signalised Intersection – 2026 SIDRA Results
Table 2.9: Existing Carrs Drive / Yamba Road Intersection – 2026 SIDRA Results
Table 2.10: Existing Carrs Drive / Yamba Road Intersection – Year of Failure SIDRA Results
Table 2.11: Carrs Drive / Yamba Road Roundabout Intersection – 2026 SIDRA Results
Table 2.12: Capacity Analysis Summary – Background and Design Scenarios
Table 4.1: SIDRA Performance Summary – Yamba Road and Carrs Drive Intersection
Table 4.2: SIDRA Performance Summary – Yamba Road and Shores Drive Intersection

Figures

Figure 1.1: Indicative Site Location and Subject Intersections in Study Area
Figure 2.1: 2015 Background Traffic Volumes
Figure 2.2: 2026 Forecasted Background Traffic Volumes
Figure 2.3: Development Traffic Distributions
Figure 2.4: Development Traffic Volumes – Year 2016 (First Stage Release)
Figure 2.5: Development Traffic Volumes – Year 2026 (Full Yield)
Figure 2.6: 2026 Design Traffic Volumes
Figure 2.7: Treelands Drive / Yamba Road Intersection – Existing Geometry
Figure 2.8: Treelands Drive / Yamba Road Intersection – Proposed Signalised Upgrade

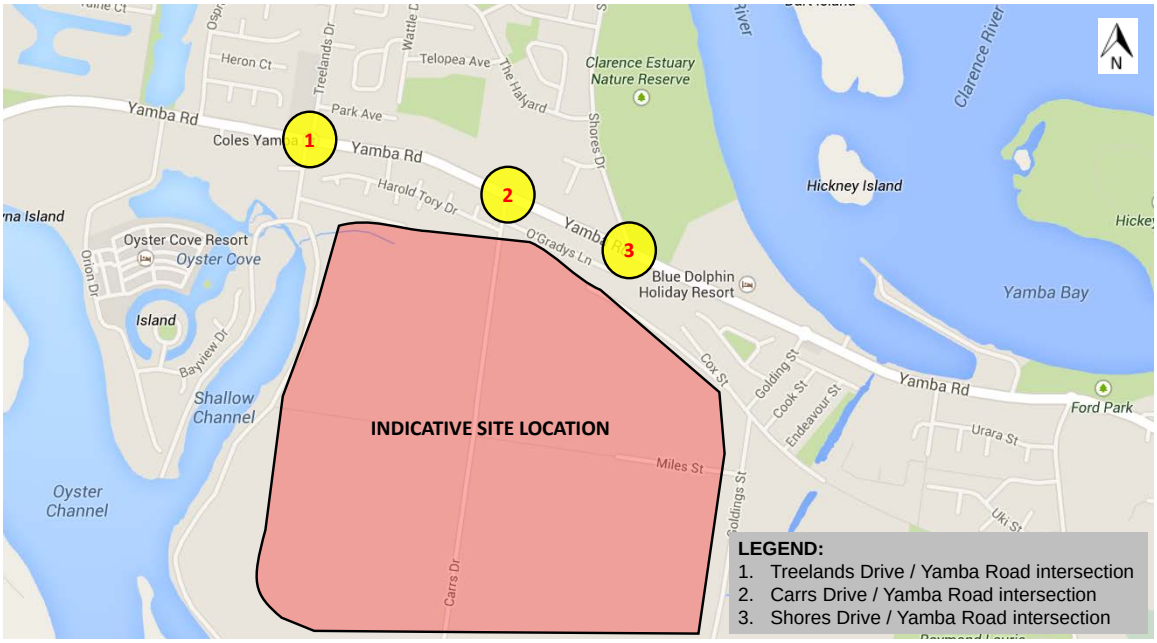
Figure 2.9: Shores Drive / Yamba Road Intersection – Existing Geometry
Figure 2.10: Shores Drive / Yamba Road Intersection – Proposed Signalised Upgrade
Figure 2.11: Carrs Drive / Yamba Road Intersection – Existing Geometry
Figure 2.12: Carrs Drive / Yamba Road Intersection – Proposed Roundabout Upgrade

1. BACKGROUND

Bitzios Consulting has been commissioned by Siteplus Pty Ltd to undertake traffic analysis of the West Yamba road network with the addition of two (2) residential subdivision developments located on Carrs Drive in Yamba, NSW. The analysis specifically relates to the impact on the following intersections (defined as the 'study area') over a forecast future year scenario of 10 years of cumulative background traffic growth at 3% growth per annum. Capacity assessments for the following intersections were undertaken to facilitate suitable access for the proposed sub-divisions for this design year / horizon:

- Treelands Drive / Yamba Road intersection;
- Carrs Drive / Yamba Road intersection; and
- Shores Drive / Yamba Road intersection.

The indicative site location and the three intersections defined within the study area are shown below in Figure 1.1.



Source: Google Maps

Figure 1.1: Indicative Site Location and Subject Intersections in Study Area

1.1 DEVELOPMENT DETAILS

Two (2) residential subdivisions are proposed on Carrs Drive. The first residential subdivision, referred to as 'Proposed Subdivision 1' herein, is located on the eastern side of Carrs Road and is planned to include upto 800 residential lots.

The second residential subdivision, referred to as 'Proposed Subdivision 2' herein, is located on the western side of Carrs Road and is planned to include to 161 residential lots.

1.2 SCOPE

The scope of this assessment includes:

- traffic surveys at the three intersections defined in the study area;
- distribution of the development generated traffic onto the external road network based on distributions derived from the traffic survey peak hour results;
- determine the sequential "year-by-year" traffic generated by the site from 2016 onwards to 2026 based on an estimated construction rate of 90 lots per annum;
- assess each intersection using SIDRA Intersection 6 to determine design life of existing configuration with and without development; and

- provide advice in regards the timing/staging of upgrades and design requirements for upgrading the existing intersection both to ensure sufficient capacity to accommodate development generated traffic.

This assessment focuses on the intersection capacity and design life as the development is constructed over time. While this assessment does make mention of upgrade configurations, no detailed analysis has been undertaken on the allowable intersection area and detailed design requirements relating to constructability and any subsequent impacts or requirements to adjacent parcels of land. It is expected that following acceptance of the intersection capacity assessments, further assessments will be undertaken with respect to the detailed design requirements of the proposed intersection upgrades in consultation with Clarence Valley Council.

1.3 REPORT OUTLINE

The report has been structured as follows:

- Section 1 – Introduction: defines the project background, purpose and scope;
- Section 2 – Traffic Assessment: is a cumulative impact assessment of the proposed West Yamba developments;
- Section 3 – Cost Apportionment: specifies the cost apportionment for infrastructure upgrades on the basis of the cumulative impacts and their associated mitigation measures;
- Section 4 – Development#2 Traffic Assessment: is an impact assessment solely relating to the impacts associate with Development#2 and how the mitigation measures may be stage constructed; and
- Section 5 – Conclusion: provides recommendations for measures appropriate to mitigate the forecast development impacts.

2. TRAFFIC ASSESSMENT

2.1 EXISTING ROAD NETWORK

The subdivisions are proposed to be accessed by the existing Carrs Drive / Yamba Road intersection. All roads within this assessment are under the jurisdiction of the Clarence Valley Council. A summary of the surrounding road network has been provided in Table 2.1.

Table 2.1: Surrounding Road Network Summary

Road Name	Jurisdiction	No. of Lanes (two-way)	Hierarchy	Median Divided	Posted Speed	Details
Yamba Road	Clarence Valley	2	Local Arterial	No	50	East-West arterial road providing access to the Pacific Motorway (M1) and Yamba Town Centre.
Carrs Drive	Clarence Valley	2	Local Access	No	60	North-south road providing residential access.
Treelands Drive	Clarence Valley	2	Local Sub-Arterial	No	50	North-south road providing access to Yamba shopping centre and residential areas.
Shores Drive	Clarence Valley	2	Local Access	No	50	North-south road providing residential access.

2.2 BACKGROUND TRAFFIC VOLUMES

Traffic surveys were undertaken on 23 April 2015 at the three intersections defined in the study area in order to capture current background traffic volumes. The AM and PM peak hour results from the survey are shown below in Figure 2.1. Electronic copies of the original traffic survey data can be provided upon request.

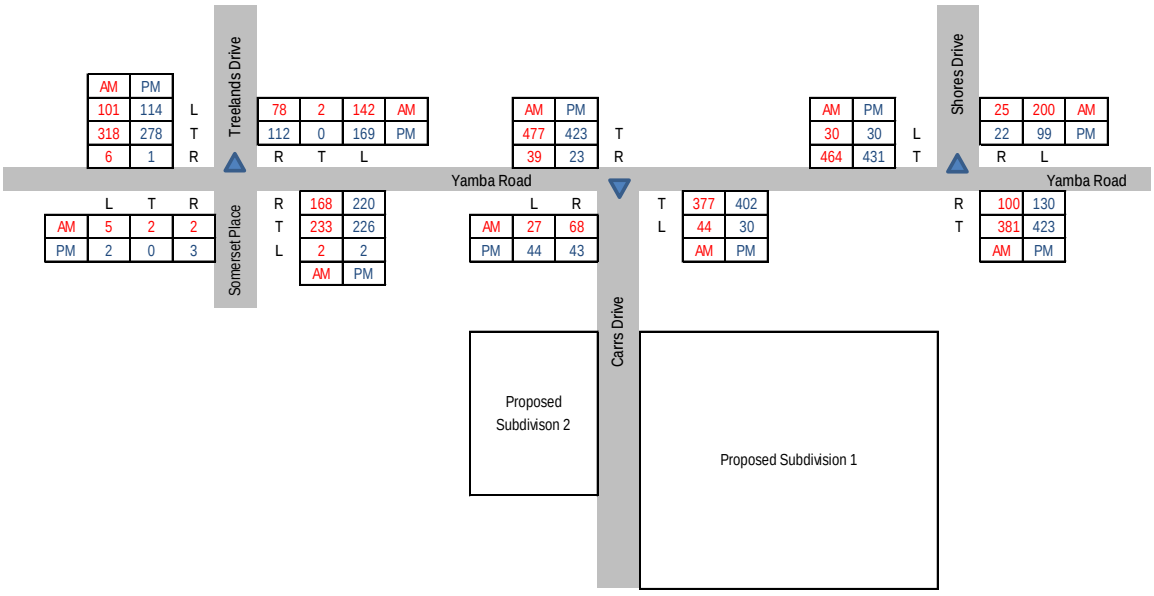


Figure 2.1: 2015 Background Traffic Volumes

2.2.1 Growth Rates

As stipulated by Council, a growth rate of 3% compounding per annum has been adopted for all traffic movements at the three intersections in the study area except for turning movements at Carrs Drive. Background growth associated with this area is expected to be absorbed by the proposed development.

2.2.2 Forecasted 2026 Background Traffic Volumes

The forecasted peak hour 2026 background traffic volumes are shown in Figure 2.2 and have been determined by applying the growth rates provided in Section 2.2.1 to the 2015 peak hour volumes obtained in the traffic survey.

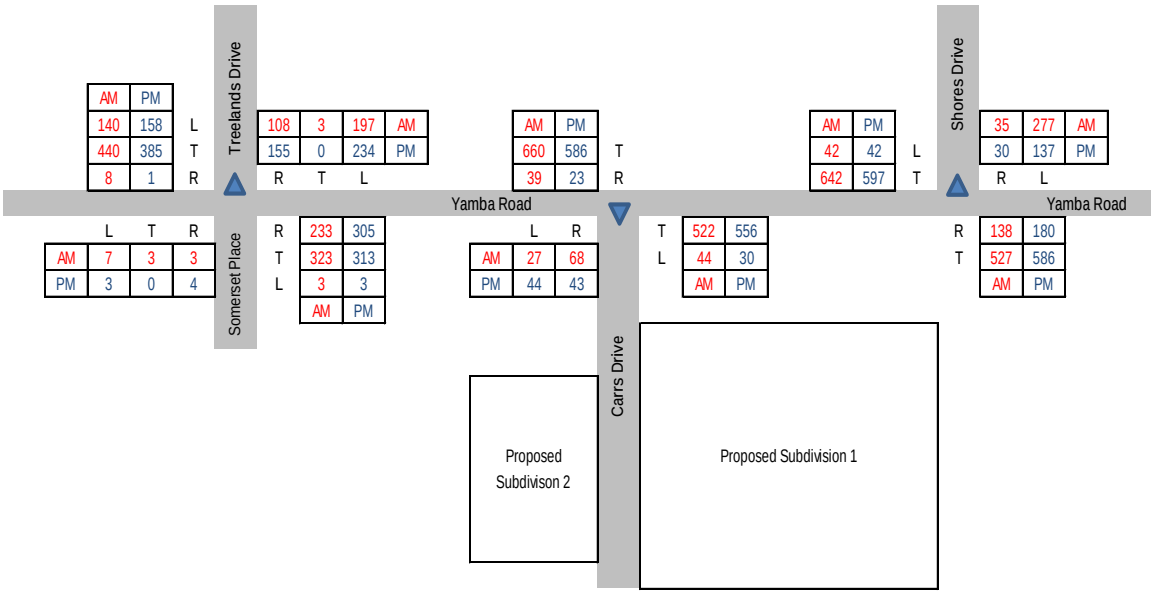


Figure 2.2: 2026 Forecasted Background Traffic Volumes

2.3 DEVELOPMENT TRAFFIC GENERATION

The proposed subdivisions have been assessed based on the assumption that the combined developments will produce 90 standard residential dwellings per year. The Roads and Maritime Services (RMS) *Guide to Traffic Generating Developments – Technical Direction (May 2013)* provides a traffic generation rate of 0.71 trips per dwelling in the AM peak and 0.78 trips per dwelling in the PM peak. Therefore, each year from 2016 to 2026, the proposed development will generate a total of 65 vehicles per hour and 72 vehicles per hour during the AM and PM peak hour respectively.

2.4 TRAFFIC DISTRIBUTION

The development traffic directional splits are summarised in Table 2.2 below.

Table 2.2: Development Traffic Splits per Year

Traffic Movement	AM Peak	PM Peak	1 Year AM Peak	1 Year PM Peak
IN	40%	70%	26 trips / hour	50 trips / hour
OUT	60%	30%	39 trips / hour	22 trips / hour

Based on the traffic survey data, the distributions of development traffic volumes are shown overleaf in Figure 2.3.

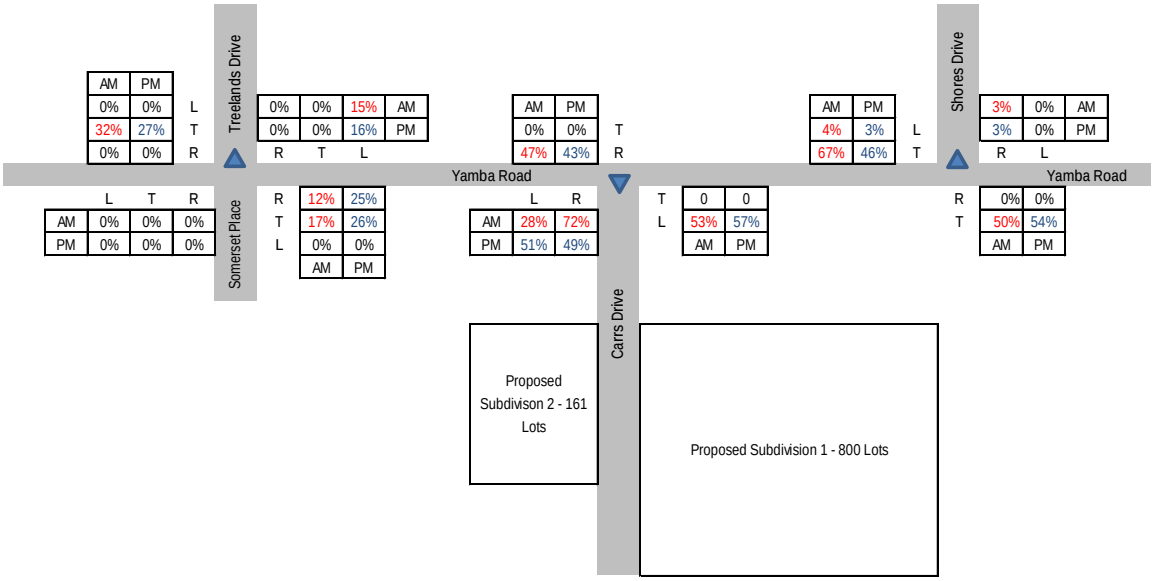


Figure 2.3: Development Traffic Distributions

Figure 2.4 and Figure 2.5 below illustrate the development traffic volumes distributed onto the network for 2016 (first stage release) and 2026 (full yield) respectively.

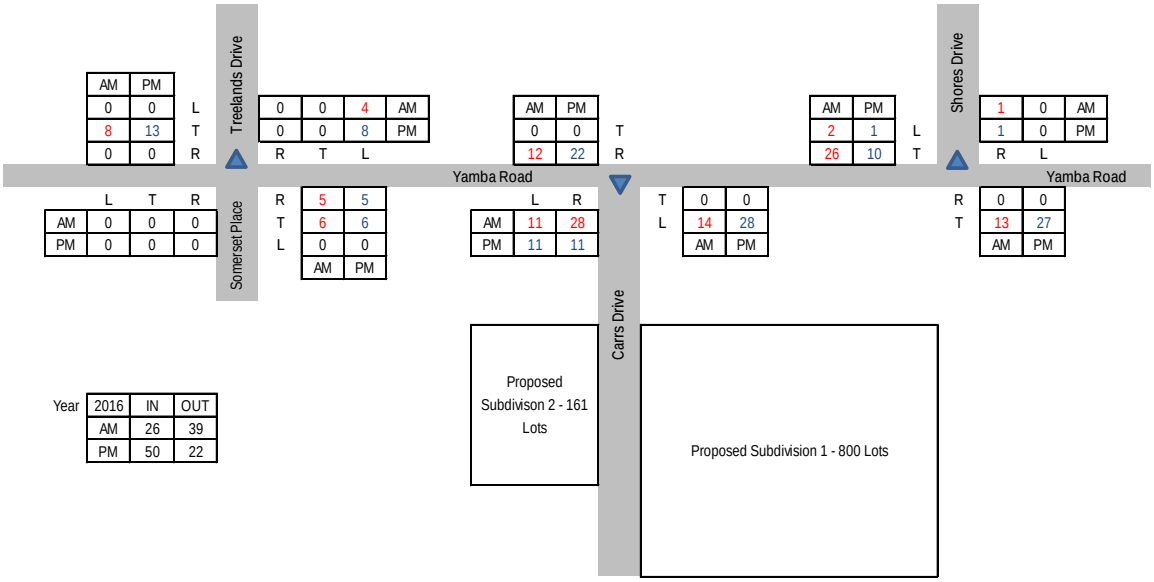


Figure 2.4: Development Traffic Volumes – Year 2016 (First Stage Release)

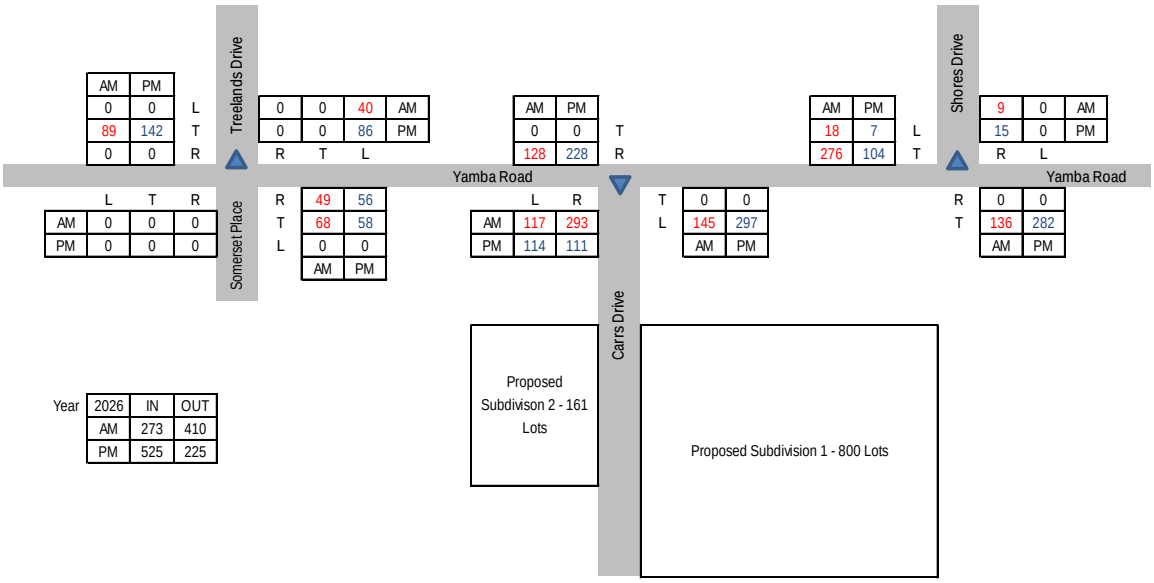


Figure 2.5: Development Traffic Volumes – Year 2026 (Full Yield)

2.5 DESIGN TRAFFIC VOLUMES

The design traffic volumes have been determined by combining the background traffic volumes to the respective development traffic volumes. The 2026 design traffic volumes are shown below in Figure 2.6 and have been used in the intersection assessment in the following subsection.

Figure 2.6: 2026 Design Traffic Volumes

2.6 INTERSECTION ASSESSMENTS

Analysis has been undertaken of the Treelands Drive / Yamba Road intersection, Shores Drive / Yamba Road intersection and Carrs Drive / Yamba Road intersection using SIDRA Intersection 6.

The analysis initially assesses each intersection at design year 2026. Where failure occurs prior to 2026, a year-by-year assessment has been undertaken in order to determine year of failure for background traffic volume conditions and design traffic volume conditions. The following subsections document the analysis results and identify any potential upgrades to mitigate the impacts of the proposed developments.

The individual SIDRA files can be provided electronically upon request.

2.6.1 Treelands Drive / Yamba Road Intersection

Treelands Drive / Yamba Road is a four-way priority controlled intersection. A copy of the geometric intersection layout from SIDRA is shown overleaf in Figure 2.7. It must be noted that while the Treelands Drive approach does not incorporate two line marked approach lanes, there is sufficient width for motorists to queue side-by-side for a short distance if a left turning motorists was bypassing a right turning motorist, or vice-versa. Therefore, the geometry modelled in SIDRA includes a short through/right turn lane to reflect practical site operations.

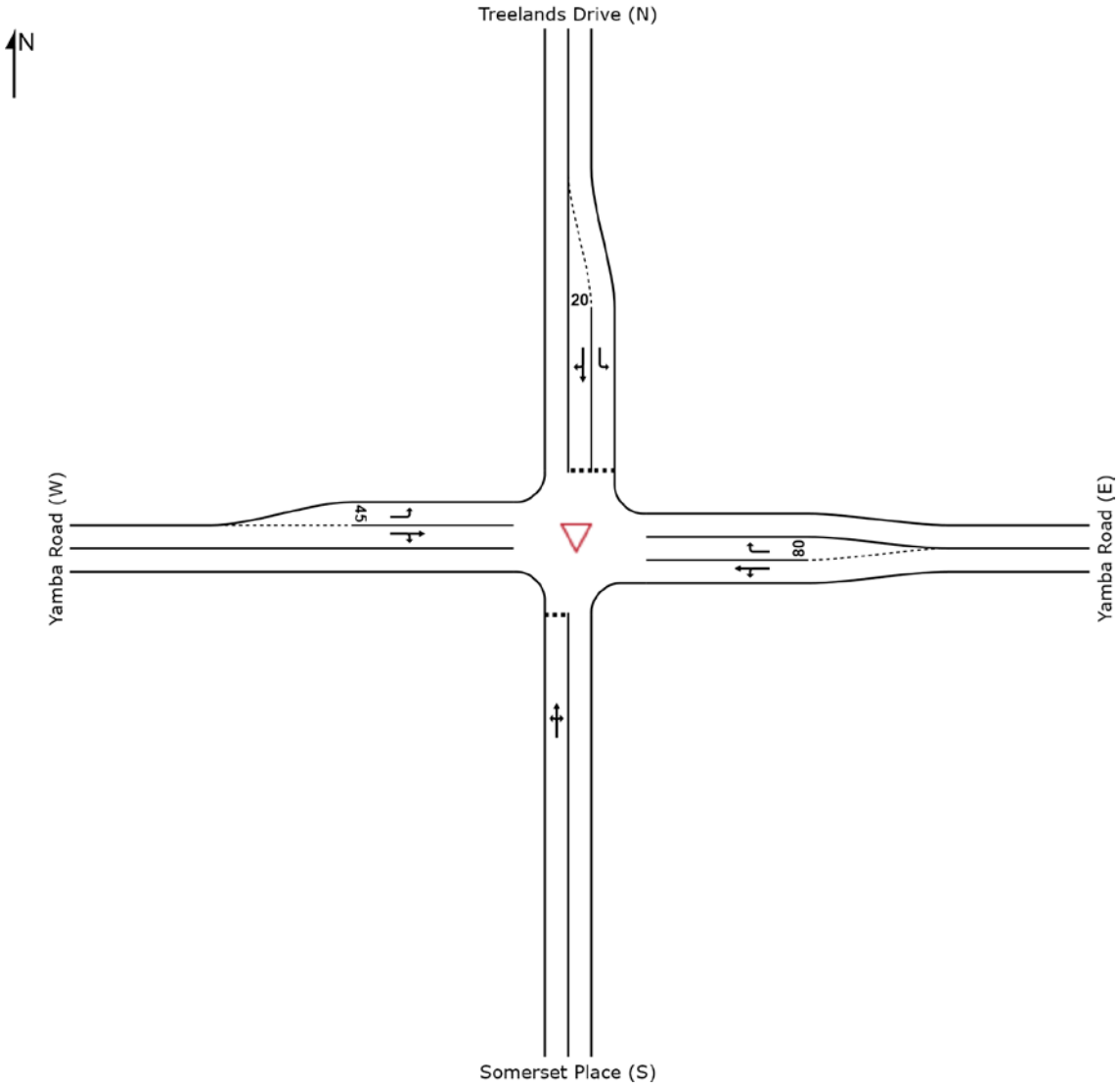


Figure 2.7: Treelands Drive / Yamba Road Intersection – Existing Geometry

The SIDRA assessment results for design year 2026 are summarised in Table 2.3 below.

Table 2.3: Existing Treelands Drive / Yamba Road Intersection – 2026 SIDRA Results

2026 AM Peak Results						
Intersection Leg	*Background Traffic*			*Design Traffic*		
	DOS	*Average Delay (s)*	*Queue (m)*	*DOS*	*Average Delay (s)*	*Queue (m)*
South: Somerset Place	0.06	19	2	0.10	30	3
East: Yamba Road	0.34	5	12	0.47	6	20
North: Treelands Drive	0.86	35	38	1.41	158	193
West: Yamba Road	0.25	3	16	0.30	4	23
2026 PM Peak Results						
Intersection Leg	*Background Traffic*			*Design Traffic*		
	DOS	*Average Delay (s)*	*Queue (m)*	*DOS*	*Average Delay (s)*	*Queue (m)*
South: Somerset Place	0.05	26	2	0.12	54	3
East: Yamba Road	0.42	6	18	0.62	8	32
North: Treelands Drive	1.17	99	159	2.19	387	450
West: Yamba Road	0.21	3	13	0.29	4	22

As shown in Table 2.3, the subject intersection in its existing geometry will fail in terms of operational performance limits for a priority controlled intersection (DOS < 0.8) before year 2026 in both the background traffic volumes scenario and design traffic volumes scenario. A year-by-year assessment has been undertaken in order to determine the year of failure for the scenarios analysed. The assessment determined the following failure years for each scenario:

- Background traffic volumes: 2026 AM peak and 2022 PM peak
- Design traffic volumes: 2023 AM peak and 2020 PM peak

The SIDRA results for each scenario at their respective failure years are shown below in Table 2.4.

Table 2.4: Existing Treelands Drive / Yamba Road Intersection – Year of Failure SIDRA Results

Year of Failure AM Peak Results						
Intersection Leg	*Background Traffic (Failed 2026)*			*Design Traffic (Failed 2023)*		
	DOS	*Average Delay (s)*	*Queue (m)*	*DOS*	*Average Delay (s)*	*Queue (m)*
South: Somerset Place	0.06	19	2	0.07	23	2
East: Yamba Road	0.34	5	12	0.38	5	2
North: Treelands Drive	0.86	35	38	0.92	41	7
West: Yamba Road	0.25	3	16	0.27	4	3
Year of Failure PM Peak Results						
Intersection Leg	*Background Traffic (Failed 2022)*			*Design Traffic (Failed 2020)*		
	DOS	*Average Delay (s)*	*Queue (m)*	*DOS*	*Average Delay (s)*	*Queue (m)*
South: Somerset Place	0.04	22	1	0.04	25	1
East: Yamba Road	0.35	5	13	0.38	5	15
North: Treelands Drive	0.80	26	36	0.88	32	44
West: Yamba Road	0.19	3	11	0.21	3	13

The Treelands Drive / Yamba Road intersection operates within acceptable limits (DOS < 0.8) for a priority controlled intersection until year 2022 with background traffic volumes. The additional development traffic loading on this intersection brings forward the year of failure by two (2) years to 2020. On this basis, no mitigation measures are required by the proposed developments until year 2020 for up to 360 residential lots.

A proposed upgrade to a signalised intersection is therefore recommended to cater for the subject intersection beyond 360 residential lots. As the subject intersection is expected to fail before the 2026 design year with background traffic volumes, the upgrade to a signalised intersection is expected to occur regardless of the development. A proposed signalised intersection upgrade is assessed in the following subsection.

Potential Intersection Upgrade (Signalised)

The intersection layout used in the analysis for the proposed signalised upgrade is shown overleaf in Figure 2.8. This layout incorporates lengthened turn lanes to accommodate design year 2026 vehicle queues for the southbound shared through/right turn lane and the westbound right turn lane.

The signal phase sequence adopted for the analysis is a single diamond overlap with split approach on the side streets. Eastbound and westbound filter right turns are permitted during A Phase.

A signalised intersection was chosen in lieu of a roundabout as it will provide for safer pedestrian and cycle crossing moments to the local shops and is expected to be more cost effective to construct.

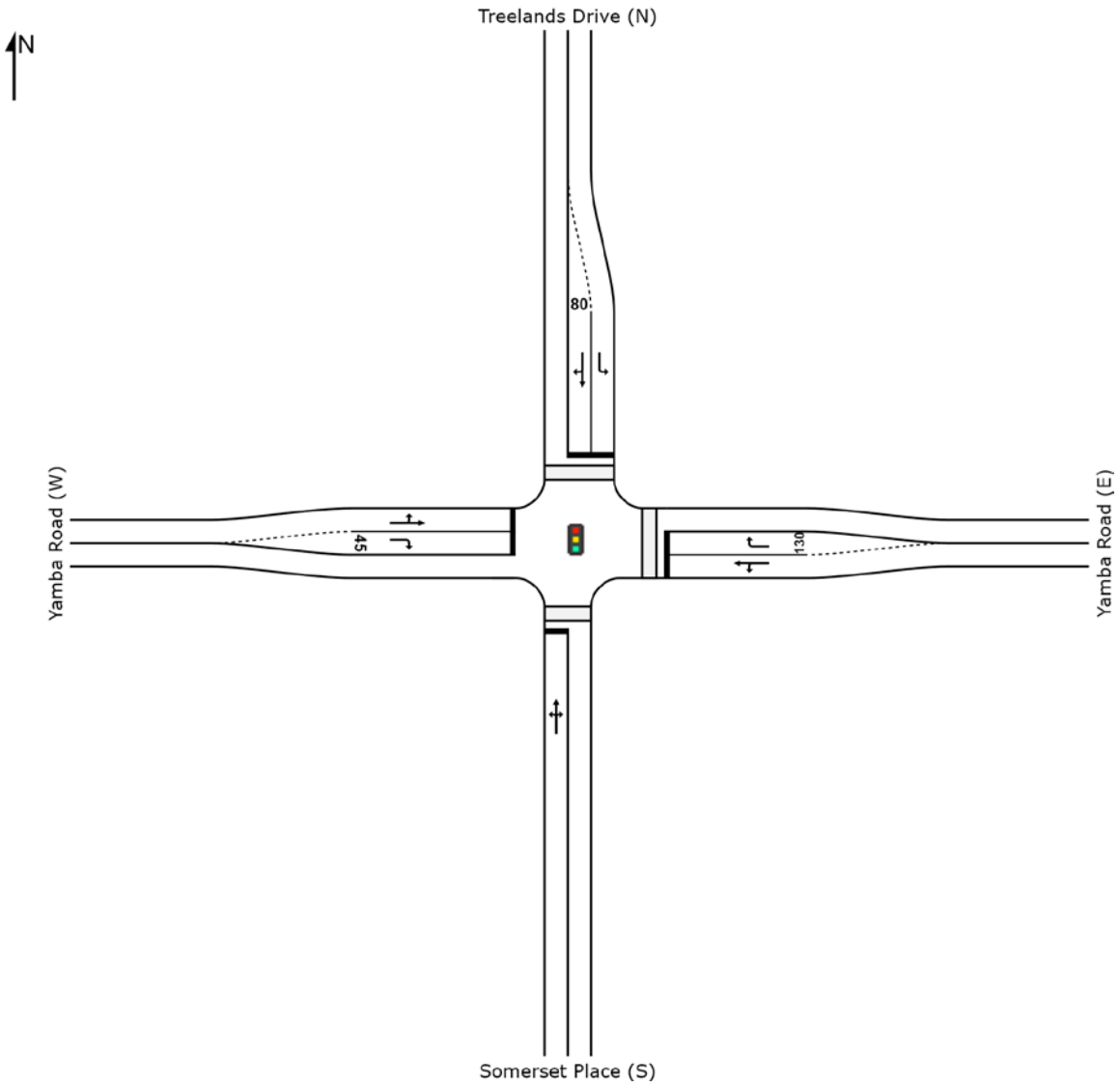


Figure 2.8: Treelands Drive / Yamba Road Intersection – Proposed Signalised Upgrade

Assessment of the proposed configuration was undertaken for year 2026 design traffic volumes. A summary of the SIDRA results are shown below in Table 2.5.

Table 2.5: Treelands Drive / Yamba Road Signalised Intersection – 2026 SIDRA Results

2026 Design Traffic Volumes						
Intersection Leg	*AM Peak Traffic*			*PM Peak Traffic*		
	DOS	*Average Delay (s)*	*Queue (m)*	*DOS*	*Average Delay (s)*	*Queue (m)*
South: Somerset Place	0.10	59	6	0.08	64	4
East: Yamba Road	0.74	25	103	0.84	33	123
North: Treelands Drive	0.58	43	74	0.77	44	98
West: Yamba Road	0.74	25	217	0.84	35	277

As shown in Table 2.5 above, the proposed signalised upgrade for the Treelands Drive / Yamba Road intersection is expected to operate within acceptable performance limits in terms of degree of saturation, average delays and vehicle queues at year 2026 with design traffic volumes.

2.6.2 Shores Drive / Yamba Road Intersection

Shores Drive / Yamba Road is a three-way priority controlled intersection. A copy of the geometric intersection layout from SIDRA is shown overleaf in Figure 2.9. It must be noted that while the Shores Drive approach does not incorporate two line marked approach lanes, there is sufficient width for motorists to

queue side-by-side for a short distance if a left turning motorists was bypassing a right turning motorist, or vice-versa. Therefore, the geometry modelled in SIDRA includes a short right turn lane to reflect practical site operations.

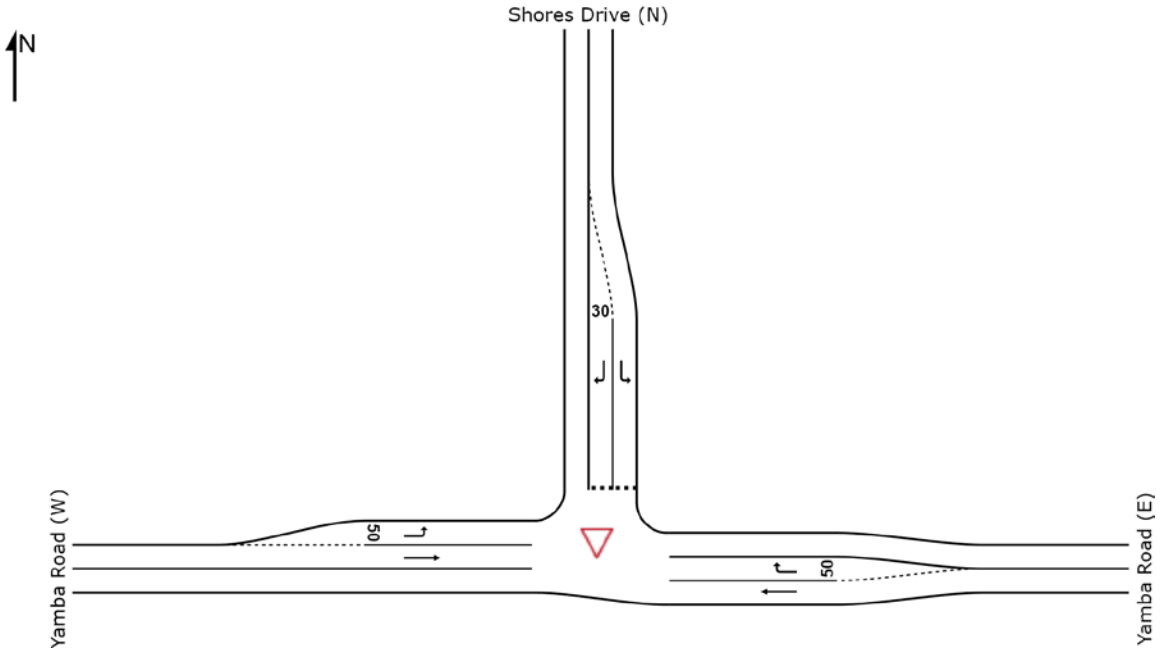


Figure 2.9: Shores Drive / Yamba Road Intersection – Existing Geometry

The SIDRA assessment results for design year 2026 are summarised in Table 2.6 below.

Table 2.6: Existing Shores Drive / Yamba Road Intersection – 2026 SIDRA Results

2026 AM Peak Results						
Intersection Leg	*Background Traffic*			*Design Traffic*		
	DOS	*Average Delay (s)*	*Queue (m)*	*DOS*	*Average Delay (s)*	*Queue (m)*
East: Yamba Road	0.29	3	8	0.44	4	14
North: Shores Drive	0.51	18	20	1.57	139	108
West: Yamba Road	0.35	1	0	0.50	1	0
2026 PM Peak Results						
Intersection Leg	*Background Traffic*			*Design Traffic*		
	DOS	*Average Delay (s)*	*Queue (m)*	*DOS*	*Average Delay (s)*	*Queue (m)*
East: Yamba Road	0.32	3	10	0.48	3	12
North: Shores Drive	0.33	18	8	1.57	193	110
West: Yamba Road	0.33	1	0	0.38	1	0

As shown in Table 2.6, the subject intersection in its existing geometry will operate within operational performance limits for a priority controlled intersection (DOS < 0.8) at year 2026 in the background traffic volumes scenario.

However, the results indicate that the addition of development traffic in year 2026 will cause the subject intersection to fail. A year-by-year assessment has been undertaken in order to determine the year of failure for the design traffic scenario. The assessment determined that the design traffic volumes cause the intersection to fail at year 2024 in both the AM and PM peak periods. The SIDRA results for each peak period at the 2024 failure year is shown overleaf in Table 2.7.

Table 2.7: Existing Shores Drive / Yamba Road Intersection – Year of Failure SIDRA Results

Year of Failure AM Peak Results			
Intersection Leg	*Design Traffic (Failed 2024)*		
	DOS	*Average Delay (s)*	*Queue (m)*
East: Yamba Road	0.35	3	11
North: Shores Drive	0.91	48	29
West: Yamba Road	0.46	1	0
Year of Failure PM Peak Results			
Intersection Leg	*Design Traffic (Failed 2024)*		
	DOS	*Average Delay (s)*	*Queue (m)*
East: Yamba Road	0.43	3	10
North: Shores Drive	0.93	62	30
West: Yamba Road	0.36	1	0

The additional development traffic loading on this intersection brings forward the year of failure to 2024. On this basis, no mitigation measures are required by the proposed developments until year 2024 for up to 720 residential lots.

A proposed upgrade to a signalised intersection is therefore recommended to cater for the subject intersection beyond 720 residential lots. This upgrade is assessed in the following subsection.

Potential Intersection Upgrade (Signalised)

The intersection layout used in the analysis for the proposed signalised upgrade is shown below in Figure 2.10. This layout incorporates adjusted/lengthened turn lanes to accommodate design year 2026 vehicle queues for the southbound right turn lane and the westbound right turn lane.

The signal phase sequence adopted for the analysis is a lagging right turn sequence. The westbound right turn is permitted to filter during A Phase. A signalised intersection was chosen to enable local residents to safely cross Yamba Road. It is also likely to be more cost effective than a roundabout.

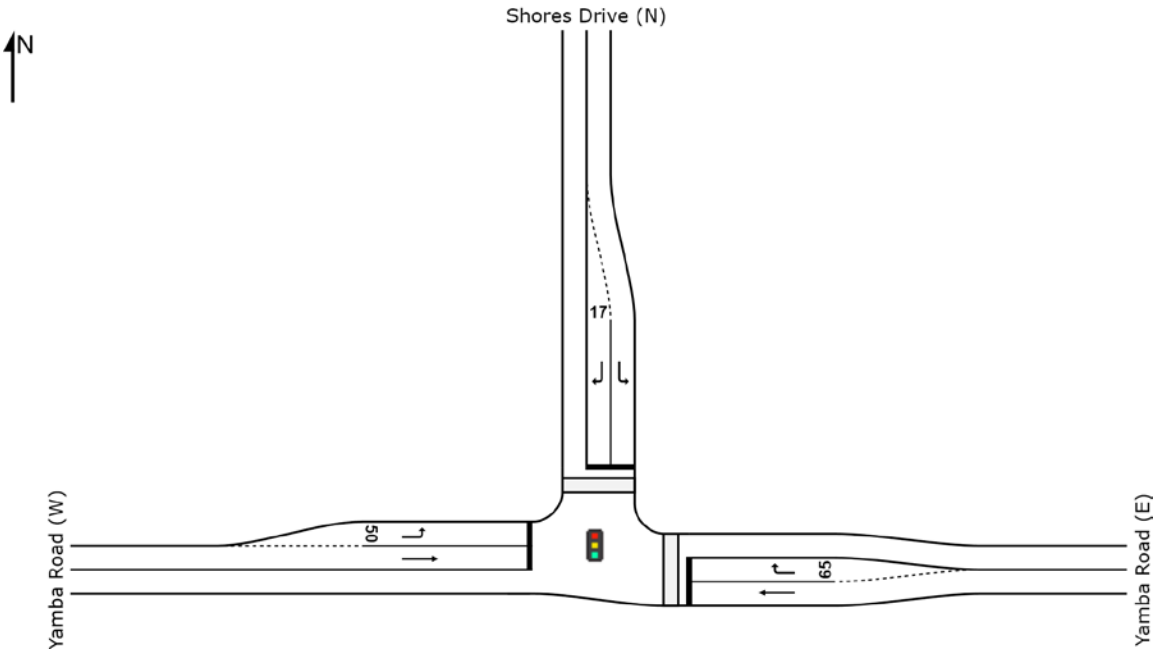


Figure 2.10: Shores Drive / Yamba Road Intersection – Proposed Signalised Upgrade

Assessment of the proposed configuration was undertaken for year 2026 design traffic volumes. A summary of the SIDRA results are shown overleaf in Table 2.8.

Table 2.8: Shores Drive / Yamba Road Signalised Intersection – 2026 SIDRA Results

2026 Design Traffic Volumes						
Intersection Leg	*AM Peak Traffic*			*PM Peak Traffic*		
	DOS	*Average Delay (s)*	*Queue (m)*	*DOS*	*Average Delay (s)*	*Queue (m)*
East: Yamba Road	0.57	12	98	0.87	20	202
North: Shores Drive	0.80	52	97	0.27	29	30
West: Yamba Road	0.85	19	276	0.82	22	189

As shown in Table 2.8 above, the proposed signalised upgrade for the Shores Drive / Yamba Road intersection is expected to operate within acceptable performance limits in terms of degree of saturation, average delays and vehicle queues at year 2026 with design traffic volumes.

2.6.3 Carrs Drive / Yamba Road Intersection

Carrs Drive / Yamba Road is a three-way priority controlled intersection. A copy of the geometric intersection layout from SIDRA is shown below in Figure 2.11. It must be noted that while the Carrs Drive approach does not incorporate two line marked approach lanes, there is sufficient width for motorists to queue side-by-side for a short distance if a left turning motorists was bypassing a right turning motorist, or vice-versa. Therefore, the geometry modelled in SIDRA includes a short left turn lane to reflect practical site operations.

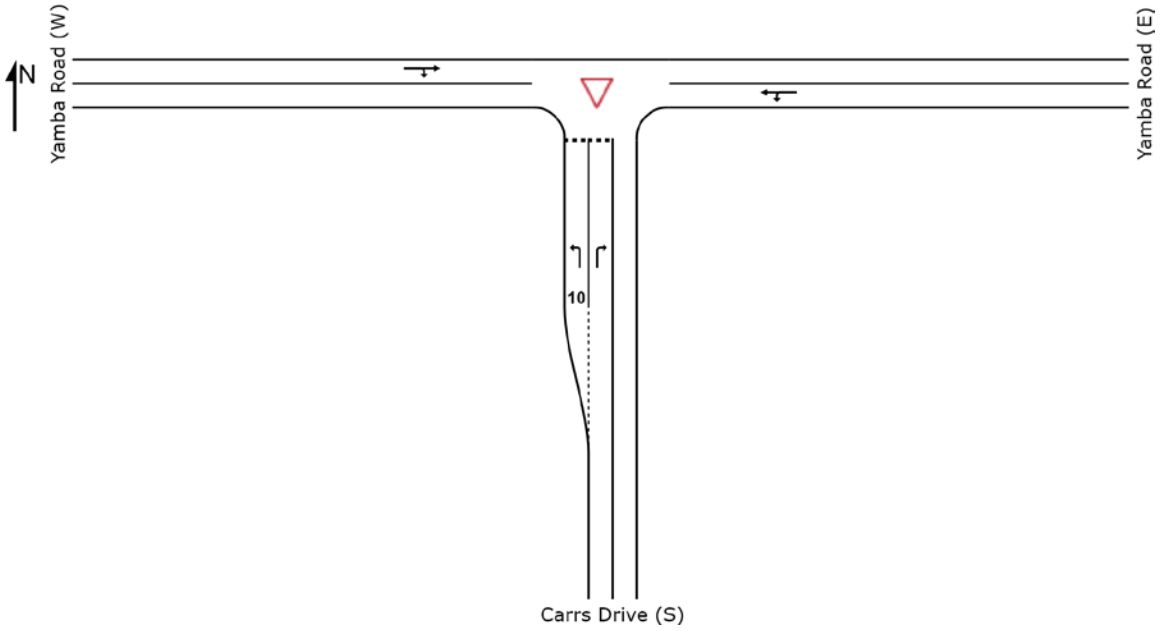


Figure 2.11: Carrs Drive / Yamba Road Intersection – Existing Geometry

The SIDRA assessment results for design year 2026 are summarised in Table 2.9 below.

Table 2.9: Existing Carrs Drive / Yamba Road Intersection – 2026 SIDRA Results

2026 AM Peak Results						
Intersection Leg	*Background Traffic*			*Design Traffic*		
	DOS	*Average Delay (s)*	*Queue (m)*	*DOS*	*Average Delay (s)*	*Queue (m)*
South: Carrs Drive	0.29	17	7	2.36	906	1028
East: Yamba Road	0.31	1	0	0.39	2	0
West: Yamba Road	0.41	6	43	0.60	13	75

2026 PM Peak Results						
Intersection Leg	*Background Traffic*			*Design Traffic*		
	DOS	*Average Delay (s)*	*Queue (m)*	*DOS*	*Average Delay (s)*	*Queue (m)*
South: Carrs Drive	0.16	13	4	1.25	148	180
East: Yamba Road	0.32	1	0	0.49	3	0
West: Yamba Road	0.35	6	34	0.83	34	131

As shown in Table 2.9, the subject intersection in its existing geometry will operate within operational performance limits for a priority controlled intersection (DOS < 0.8) at year 2026 in the background traffic volumes scenario.

However, the results indicate that the addition of development traffic in year 2026 will cause the subject intersection to fail. A year-by-year assessment has been undertaken in order to determine the year of failure for the design traffic scenario. The assessment determined that the design traffic volumes cause the intersection to fail at year 2021 in the AM peak period and year 2025 in the PM peak period. The SIDRA results for each peak period at the respective failure years is shown below in Table 2.10.

Table 2.10: Existing Carrs Drive / Yamba Road Intersection – Year of Failure SIDRA Results

Year of Failure AM Peak Results			
Intersection Leg	*Design Traffic (Failed 2021)*		
	DOS	*Average Delay (s)*	*Queue (m)*
South: Carrs Drive	0.91	36	50
East: Yamba Road	0.32	2	0
West: Yamba Road	0.44	7	46
Year of Failure PM Peak Results			
Intersection Leg	*Design Traffic (Failed 2025)*		
	DOS	*Average Delay (s)*	*Queue (m)*
South: Carrs Drive	1.04	69	79
East: Yamba Road	0.47	3	0
West: Yamba Road	0.75	25	102

The additional development traffic loading on this intersection brings forward the year of failure to 2021. On this basis, no mitigation measures are required by the proposed developments until year 2021 for up to 540 residential lots.

A proposed upgrade to a roundabout intersection is therefore recommended to cater for the subject intersection beyond 540 residential lots. This upgrade is assessed in the following subsection.

Potential Intersection Upgrade (Roundabout)

The intersection layout used in the analysis for the proposed roundabout upgrade is shown overleaf in Figure 2.12. The internal diameter of the roundabout has been proposed at 10m with a two-lane circulating width of 9m.

A roundabout was chosen as a suitable treatment to assist with calming traffic along Yamba Road. Pedestrian/cycle crossing provisions have been nominated at Treelands Drive to provide safe pedestrian crossing access to the shops. Pedestrian movements towards Yamba town centre are expected to be retained on the southern side of Yamba Road.

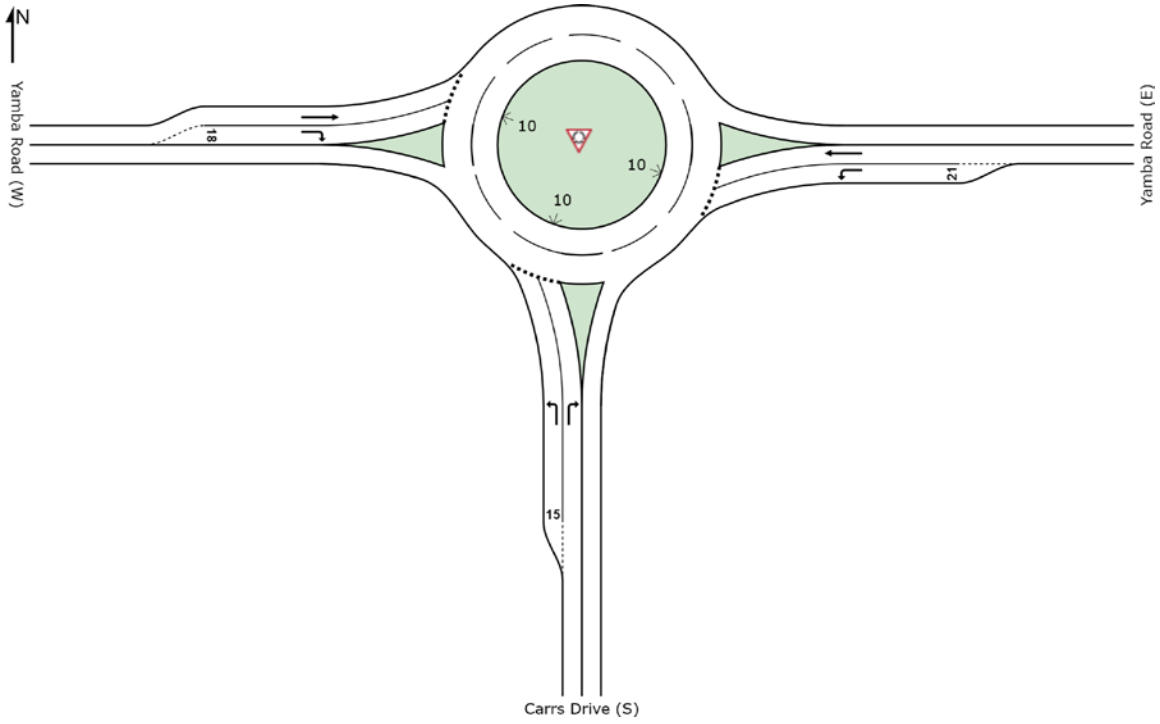


Figure 2.12: Carrs Drive / Yamba Road Intersection – Proposed Roundabout Upgrade

Assessment of the proposed configuration was undertaken for year 2026 design traffic volumes. A summary of the SIDRA results are shown below in Table 2.11.

Table 2.11: Carrs Drive / Yamba Road Roundabout Intersection – 2026 SIDRA Results

2026 Design Traffic Volumes						
Intersection Leg	*AM Peak Traffic*			*PM Peak Traffic*		
	DOS	*Average Delay (s)*	*Queue (m)*	*DOS*	*Average Delay (s)*	*Queue (m)*
South: Carrs Drive	0.47	12	26	0.22	11	10
East: Yamba Road	0.47	7	27	0.54	7	31
West: Yamba Road	0.76	13	72	0.51	7	31

As shown in Table 2.11 above, the proposed roundabout upgrade for the Carrs Drive / Yamba Road intersection is expected to operate within acceptable performance limits in terms of degree of saturation, average delays and vehicle queues at year 2026 with design traffic volumes.

The following design and layout advice should be considered when installing a roundabout at the Carrs Drive / Yamba Road intersection:

- design is expected remain consistent with other roundabouts on Yamba Road and take into consideration the available road reserve and property access driveways in proximity. In this regard, it is noted that Yamba Road includes existing 'larger' roundabouts at Golding Street and Angourie Road. In addition to this, Wolli Street / River Street includes a smaller mountable roundabout which may be considered if space is an issue;
- consideration in the design should include the exit and approach speeds through the roundabout as well providing adequate lateral deflection to control vehicle turn paths through the intersection; and
- the largest design service vehicle is expected to be a 12.5m HRV which is equivalent to a large removalist vehicle and/or school bus.

2.7 GOLDING STREET CONNECTION

It is understood that a potential connection from Carrs Drive to Golding Street is proposed in future. It must be noted that if this connection proceeds, this will significantly change the road impacts at the Carrs Drive and Shores Drive intersections caused by the proposed developments. A revised impact assessment is

recommended should this connection proceed as the nexus between the Shores Drive upgrade and the proposed development has the potential to be substantially reduced / removed.

2.8 TRAFFIC ANALYSIS SUMMARY

The capacity assessment undertaken in Section 2.6 for each intersection in the study area has been consolidated and summarised below in Table 2.12. This table illustrates on a year-by-year basis whether the respective intersection is operating under capacity, approaching capacity or over capacity for background traffic volumes conditions and design traffic volumes conditions.

As shown in Table 2.12, the required year of upgrade and associated maximum number of residential lots that can be constructed by the proposed developments is summarised as follows:

- Treelands Drive / Yamba Road intersection – year 2020 for up to 360 residential lots;
- Shores Drive / Yamba Road intersection – year 2024 for up to 720 residential lots; and
- Carrs Drive / Yamba Road intersection – year 2021 for up to 540 residential lots.

Table 2.12: Capacity Analysis Summary – Background and Design Scenarios

Year	Lots	Treelands Intersection Capacity Rating		Shores Intersection Capacity Rating		Carrs Intersection Capacity Rating	
		Background	*Design*	*Background*	*Design*	*Background*	*Design*
2016	90	✓	✓	✓	✓	✓	✓
2017	180	✓	✓	✓	✓	✓	✓
2018	270	✓	✓	✓	✓	✓	✓
2019	360	✓	—	✓	✓	✓	✓
2020	450	✓	×	✓	✓	✓	—
2021	540	—	×	✓	✓	✓	×
2022	630	×	×	✓	✓	✓	×
2023	720	×	×	✓	—	✓	×
2024	810	×	×	✓	×	✓	×
2025	900	×	×	✓	×	✓	×
2026	961	×	×	✓	×	✓	×

**Note that "✓" intersection is under capacity, "—" intersection is approaching capacity and "×" intersection over capacity and requires upgrade.*

2.8.1 Funding of Upgrades

The traffic impact assessment of the three nominated intersections has shown that upgrades are required at all locations. It is clear from the traffic impact assessment that the applicant is responsible for the upgrade to the Carrs Drive intersection, particularly considering the proportion of turn movements added to the intersection as part of the proposed development.

The assessment revealed that background traffic growth forms a significant proportion of the impact at the Treelands Drive intersection and to a lesser degree the Shores Drive intersection. The applicant may choose to approach Council to discuss their future traffic management plan for this section of road and what process should be adopted to determine an appropriate funding contribution to these upgrades. It is not believed equitable to expect the applicants to fund the entire upgrades to both the Shores Drive and Treelands Drive intersections. It should also be noted that in both cases it is the 'right turn – out' movement from the northern approach that is mostly affected, of which the proposed development does not exacerbate. It is moreso the fact that the increase in through traffic volumes from both background traffic and development traffic that makes it more difficult for these vehicles to exit onto the main road network.

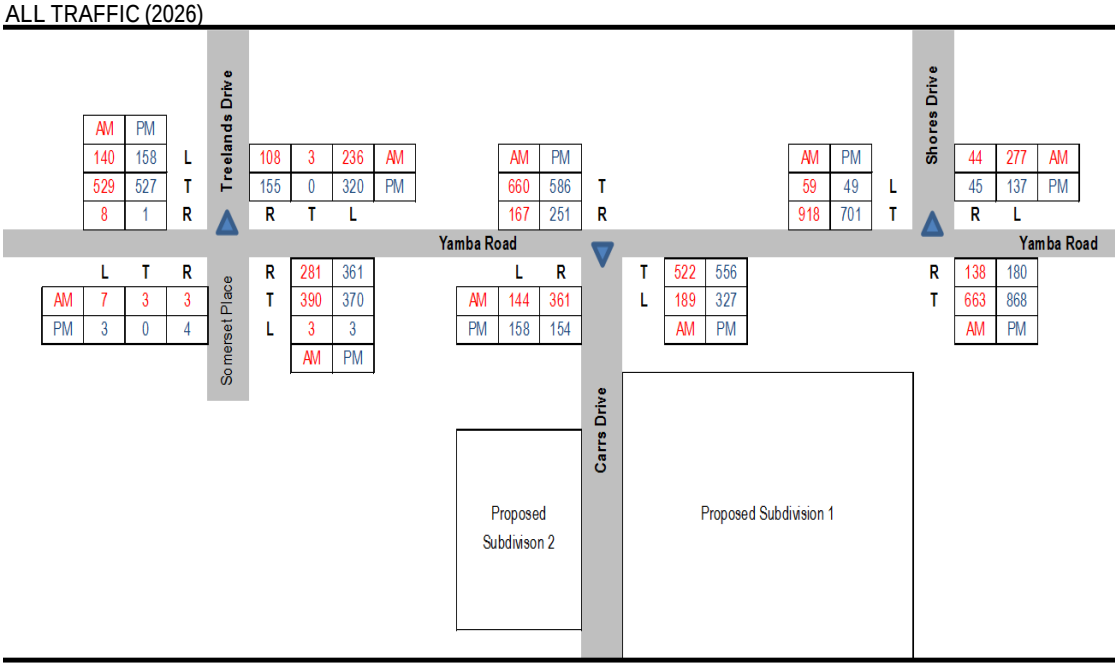
3. COST APPORTIONMENT

A summary of the cost apportionment for the associated developments is included below.

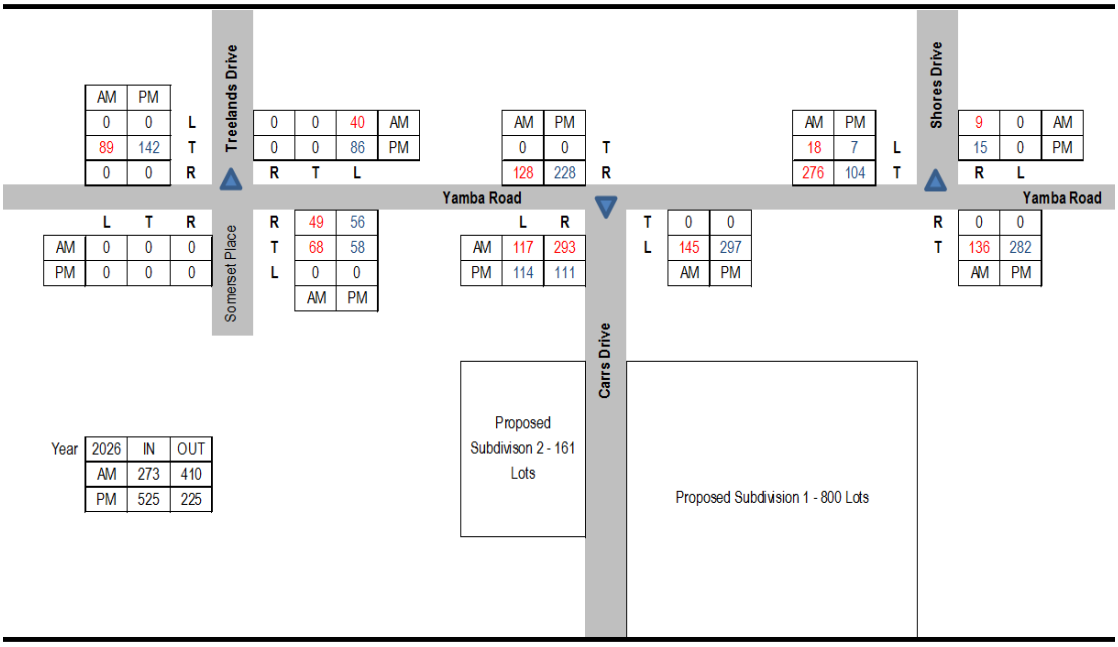
INTERSECTION	2026 (AM+PM) Total Traffic	2026 (AM+PM) Development Traffic	% Developer Contribution	Infrastructure Cost (2015$ Strategic Costing)	Developer Contribution (2015$)	Comment
Treelands Drive	3613	588	16%	$1,200,000	$195,294.77	Full contribution required at Carrs Drive intersection as this intersection does not fail without the development.
Carrs Drive	see comment		100%	$500,000	$500,000.00	
Shores Drive	4079	835	20%	$1,000,000	$204,707.04	
					$900,001.80	

Number of lots proposed	961 Lots
Contribution per lot ($2015)	$936.53 per Lot

ALL TRAFFIC (2026)



DEVELOPMENT TRAFFIC (2026)



Year	2026	IN	OUT
	AM	273	410
	PM	525	225

4. TRAFFIC IMPACT ASSESSMENT FOR DEVELOPMENT #2 ONLY

4.1 OVERVIEW

The main driver for the completion of the traffic impact assessment relates to the desire for Development #2 to proceed with the submission of a development application. The traffic assessment (Section 2) and subsequent cost apportionment (Section 3) relies on the delivery of 961 lots to support the 'cost per lot levy'.

To satisfy the requirements for the applicant for Development #2, an assessment has been conducted on the assumption that only 161 lots are delivered over the 10 year design horizontal. The results of the assessment is included below, which also gives due consideration to infrastructure staging opportunities should Development #1 proceed in parallel.

4.2 YEAR 2026 TRAFFIC ASSESSMENT

4.2.1 Year 2026 Traffic Volumes – Background Traffic + Development #2 Only

The revised traffic volumes for the scenario where only Development #2 proceeds in included in Figure 4.1 below.

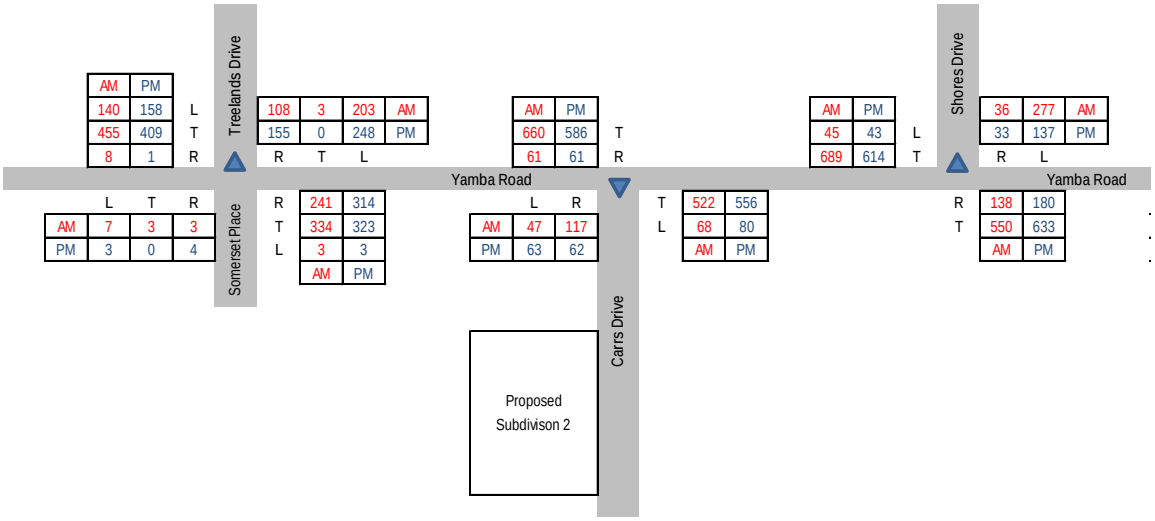


Figure 4.1: 2026 AM and PM Traffic Volumes with Development #2 Only

4.2.2 Year 2026 Traffic Assessment – Background Traffic + Development #2 Only

A summary of the SIDRA results for the Carrs Drive and Shores Drive intersections are included in Table 4.1 and Table 4.2 respectively. An assessment of the upgrade requirements to Treelands Drive is not essential as the 'without development' scenario requires this upgrade to occur in any case, and the developers' cost apportionment is based on its level of contributing impact (an apportionment of traffic volumes).

Table 4.1: SIDRA Performance Summary – Yamba Road and Carrs Drive Intersection

2026 Background Traffic + Development #2 Only						
Intersection Leg	*AM Peak Traffic*			*PM Peak Traffic*		
	DOS	*Average Delay (s)*	*Queue (m)*	*DOS*	*Average Delay (s)*	*Queue (m)*
South: Carrs Drive	0.53	21	15	0.25	14	6
East: Yamba Road	0.33	1	0	0.35	1	0
West: Yamba Road	0.43	7	49	0.40	7	43

Table 4.2: SIDRA Performance Summary – Yamba Road and Shores Drive Intersection

2026 Background Traffic + Development #2 Only						
Intersection Leg	*AM Peak Traffic*			*PM Peak Traffic*		
	DOS	*Average Delay (s)*	*Queue (m)*	*DOS*	*Average Delay (s)*	*Queue (m)*
East: Yamba Road	0.30	3	8	0.35	3	10
North: Shores Drive	0.55	20	22	0.43	21	10
West: Yamba Road	0.38	1	0	0.34	1	0

The results of the 2026 modelling shows that for a traffic capacity perspective no upgrades are warranted at either the Carrs Drive or Shores Drive intersections.

4.3 AUSTROADS TURN WARRANTS ASSESSMENT

Notwithstanding the results shown in Section 4.2, a turn warrants assessment as per Austroads Guidelines is required to ensure safe intersection operations at the Carrs Drive intersection.

Figure 4.1 below shows the results from the turn warrants assessment.

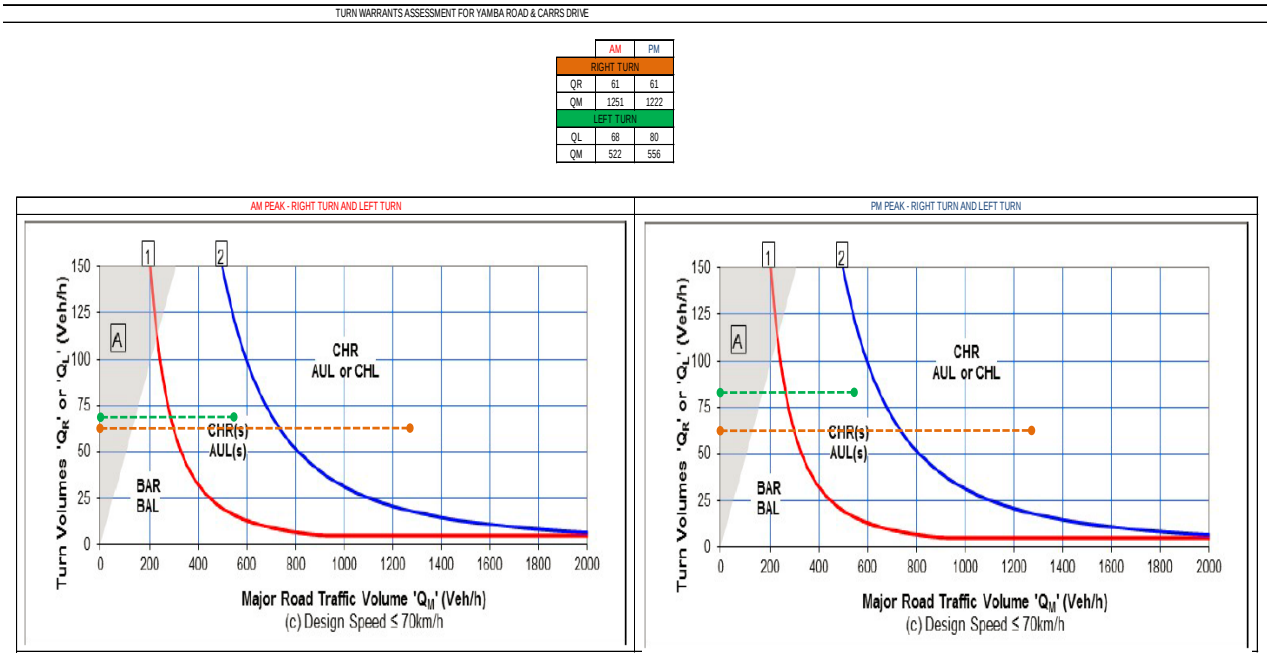


Figure 4.1: Turn Warrants Assessment – 2026 with Development#2 Only

The assessment highlights that the development triggers the need to install right and left turn pockets at the Carrs Drive intersection. Given the corridor width constraints and the future plan to include a roundabout at this location, it would be considered to be more appropriate to construct a single lane circulating roundabout. This will be subject to agreement being reached on the provision of a small diameter roundabout within the confines of the existing narrow road corridor in the interim. A large diameter roundabout will introduce third party impacts as well as increased construction costs.

4.4 INFRASTRUCTURE CONTRIBUTIONS – DEVELOPMENT #2 PROCEEDS ONLY

If Development #2 only proceeds in the 10 year design horizon the applicant will be required to upgrade the Carrs Drive intersection to a roundabout. However, the need to upgrade Shores Drive intersection is no longer required. In addition the contributions towards Treelands Drive intersection is now less than 5% and therefore is not considered to be a requirement. The development related traffic for the combined AM and PM peak period is 99 trips as compared to the total of 3,126 trips which equates to a 3.2% proportion. This

proportion is considered negligible and is offset by the proportion of existing traffic that would benefit from the Carrs Drive roundabout treatment.

Under the cumulative development scenario a 'cost per lot' contribution of $936.53 was calculated which equates to a total contribution of $150,780.74 for Development#2. Whilst the applicant of Development#2 would be required to upgrade the Carrs Drive intersection, the accompanying additional storage lanes determined to be required under the cumulative development impacts at the roundabout is no longer required under the single development approach. It is envisaged that the applicant for Development #2 should be able to construct a single lane roundabout in the order of $150,000-$200,000. As such, the requirement to construct a single lane roundabout at the Carrs Drive intersection would be considered to be a suitable offset to the traffic impacts generated by Development#2. This is however subject to agreement being reached on the provision of a small diameter roundabout within the confines of the existing narrow road corridor in the interim. A large diameter roundabout will introduce third party impacts as well as increased construction costs.

5. CONCLUSION

The key findings from the traffic assessment for the proposed residential developments located on Carrs Drive, West Yamba, are as follows:

- the proposed combined developments have been assessed on the basis of a household purchase rate of 90 dwellings per year. This assessment analysed the impacts of the proposed developments on the Treelands Drive / Yamba Road intersection, Carrs Drive / Yamba Road intersection and the Shores Drive / Yamba Road intersection over a 10 year design period between 2016 and 2026;
- based on the purchase rate of 90 dwellings per year, the proposed developments combined generate a total of 65 trips per hour per annum and 72 trips per hour per annum in the AM and PM peak periods respectively;
- the capacity analysis was undertaken using SIDRA Intersection 6 and determined the required year of upgrade and associated maximum number of residential lots that can be constructed by the proposed developments, which is summarised as follows:
  - Treelands Drive / Yamba Road intersection – year 2020 for up to 360 residential lots;
  - Shores Drive / Yamba Road intersection – year 2024 for up to 720 residential lots; and
  - Carrs Drive / Yamba Road intersection – year 2021 for up to 540 residential lots.
- The assessment assumed that the Treelands Drive and Shores Drive intersection would be most affordably upgraded to traffic signals, also providing safe pedestrian/cycle crossing facilities whilst Carrs Drive would encompass a roundabout;
- Carrs Drive is expected to be 100% funded by the developers, whilst funding contributions only would be required for the Treelands Drive and Shores Drive intersection upgrade which would require further discussion with Council as the best way for this to proceed. It should be noted that in both cases it is the 'right turn – out' movement from the northern approach that is mostly affected, of which the proposed development does not exacerbate. It is moreso the fact that the increase in through traffic makes it more difficult for these vehicles to exit onto the main road network;
- Cost apportionment calculations for the Carrs Drive (100%), Shores Drive (20%) and Treelands Drive (16%) intersection upgrades suggest a roads infrastructure contribution of $936.53 per lot is appropriate;
- If Development#2 is only to proceed, from a traffic capacity perspective no upgrades are warranted for the intersections along Yamba Road. However, under Austroads Guidelines for intersection turn warrants Carrs Drive would be required to include right turn and left turn facilities into Carrs Drive. It would be more appropriate for the applicant of Development#2 to construct a single lane roundabout at this intersection in lieu, as it also aligns well with the ultimate preferred arrangement. The cost to construct the single lane roundabout is expected to be in the order of the cumulative 'cost per lot' calculated contribution. This will be subject to agreement being reached on the provisioning of a small diameter roundabout within the confines of the existing narrow road corridor in the interim. A large diameter roundabout will introduce third party impacts as well as increased construction costs.

BMT WBM

West Yamba FIA (Land West of Carrs Drive) Final Report

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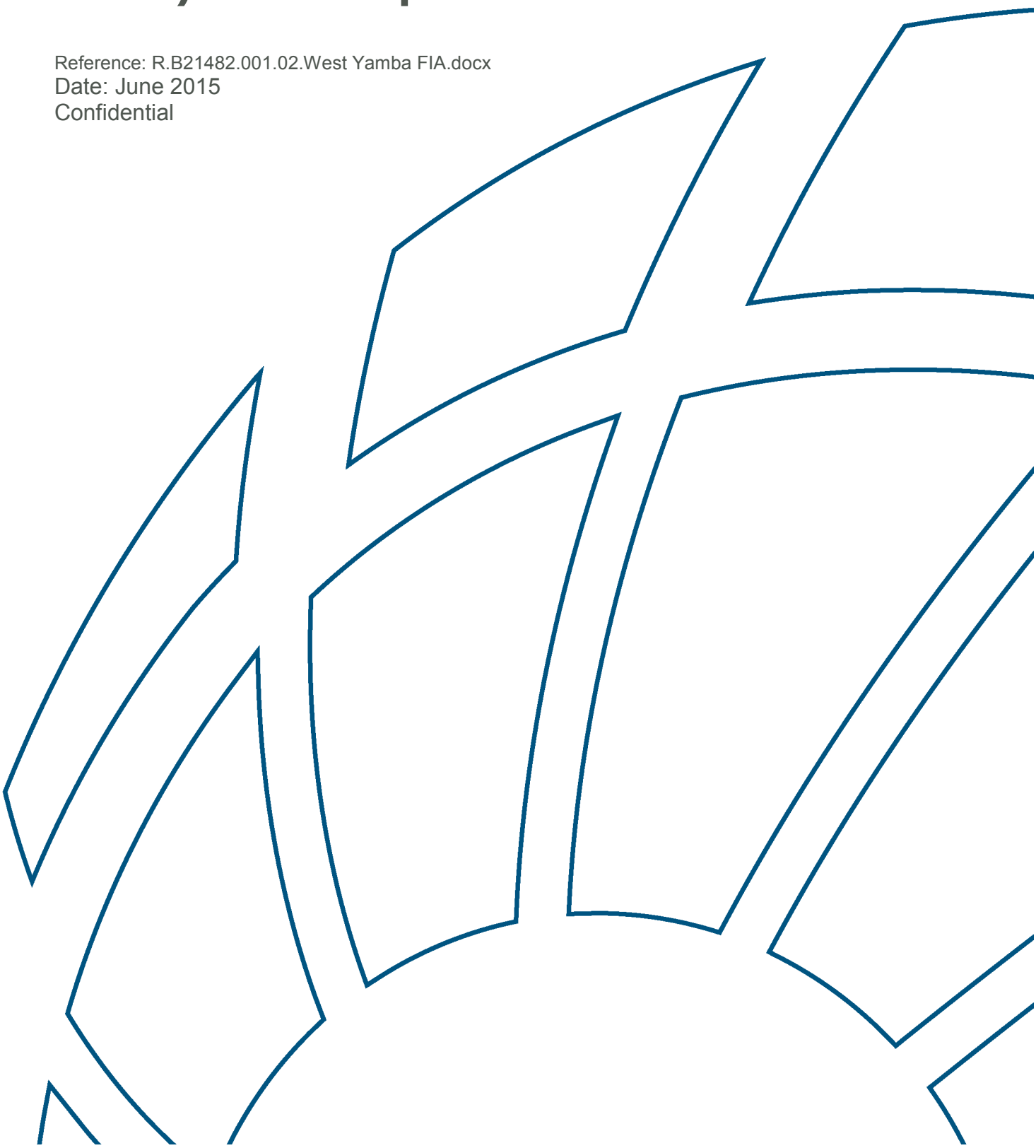

West Yamba FIA (Land West of Carrs Drive)
Final Report

Prepared for:	Site Plus Pty Ltd
Prepared by:	BMT WBM Pty Ltd (Member of the BMT group of companies)

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Synopsis: **West Yamba Flood Impact Assessment**

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Executive Summary

Site Plus Pty Ltd on behalf of Yamba Residential Subdivision Pty Ltd commissioned BMT WBM to undertake a flood impact assessment of a proposed development at Yamba, New South Wales. The development is for Lot 1722 in DP 1035524, Lot 51 in DP861895 and Lot 8 in DP1062514.

This report documents the outcomes of the flood impact assessment. It has been prepared to assess the existing riverine and tidal surge flood risk and potential changes to the flood risk resulting from the development of the West Yamba Urban Release Area (WYURA).

A refined hydraulic model of the lower Clarence River was used for the assessment. The model was refined from Clarence Valley Council's 2013 hydraulic model by incorporating a higher resolution terrain representation. This provided improved output resolution across the proposed development and the entire WYURA. Comparisons of river levels were made between the adapted model and Council's model, which showed that the refined models were generally in good agreement and therefore considered suitable for use in the assessment.

The design flood events adopted by Council contain a storm surge component and riverine flood component. At West Yamba it is the storm surge component which results in the greatest flood levels for the 20 and 100 year ARI events.

Peak baseline design flood elevations at the site are lower than the corresponding flood elevations in much of Yamba. Flooding to West Yamba from storm surge relies on overtopping of Yamba Road (with more minor flow passing through culverts under Yamba Road). Flow passing over Yamba Road and into West Yamba is limited to the duration of the peak of the tide and so resulting flood levels are lower than for areas elsewhere in Yamba where there is no overtopping constraint.

The model was utilised to recommend minimum fill and habitable floor levels for the proposed development, which have been incorporated in the current development proposal.

Peak 20 year and 100 year ARI flood elevations at West Yamba are approximately 1.7 and 2.1 mAHD respectively.

The flood impact assessment found that the proposed development will not result in any significant peak flood level impacts for the 5 and 20 year ARI design flood events. Minor residual flood level impacts to existing dwellings are predicted for the 100 year ARI event following mitigation.

It is recommended that the flood modelling is revisited and updated at detailed design stage to refine the floodway design.

Contents

Executive Summary i
1 Introduction 1
2 Site and Development Description 2
3 Flood Model Used in Assessment 4
3.1 Council Model 4
3.1.1 Tidal Boundary 4
3.2 West Yamba Model 5
3.2.1 Model Schematisation 5
3.2.2 Baseline Model 9
3.2.3 Developed Case Model 9
4 Baseline Flood Behaviour 11
4.1 Introduction 11
4.2 Peak Flood Elevations 11
4.3 Pattern of Inundation 15
4.4 Comment on Flood Planning Levels 16
4.5 Baseline Flood Behaviour Conclusions 17
5 Flood Impact Assessment 18
5.1 Introduction 18
5.2 20 Year ARI Event Impacts Summary 18
5.3 100 Year ARI Event Impacts Summary 18
5.3.1 100 Year ARI Event (Riverine Only) 18
5.3.2 100 Year ARI (Site only) 19
6 Conclusions and Recommendations 24
6.1 Conclusions 24
6.2 Recommendations 24
7 References 26
Appendix A Model Comparison Plots A-1

List of Figures

Figure 2-1 West Yamba Location 3
Figure 3-1 Lower Clarence Flood Model Design Tidal Boundaries 4
Figure 3-2 Storm Tide / Catchment Flooding Response Time (Harwood) 5

Contents

Figure 3-3	West Yamba Model Extent	8
Figure 3-4	West Yamba Proposed Elevations and Key Drainage Features	10
Figure 4-1	5 Year ARI Baseline Peak Flood Elevations	12
Figure 4-2	20 Year ARI Baseline Peak Flood Elevations	13
Figure 4-3	100 Year ARI Baseline Peak Flood Elevations	14
Figure 4-4	Flood Levels with time (Location PO_1)	15
Figure 4-5	Flood Levels with time (Location PO_2)	16
Figure 5-1	West Yamba Peak Flood Level Impact (20 Year ARI)	20
Figure 5-2	West Yamba Peak Flood Level Impact (100 Year ARI)	21
Figure 5-3	West Yamba Riverine Only Peak Flood Level Impact (100 Year ARI)	22
Figure 5-4	Site Only Peak Flood Level Impact (100 Year ARI)	23
Figure A-1	20 Year ARI Model Comparison (Location TS_1)	A-1
Figure A-2	20 Year ARI Model Comparison (Location TS_2)	A-1
Figure A-3	20 Year ARI Model Comparison (Location TS_3)	A-2
Figure A-4	100 Year ARI Model Comparison (Location TS_1)	A-2
Figure A-5	100 Year ARI Model Comparison (Location TS_2)	A-3
Figure A-6	100 Year ARI Model Comparison (Location TS_3)	A-3

1 Introduction

Site Plus Pty Ltd on behalf of Yamba Residential Subdivision Pty Ltd commissioned BMT WBM to undertake a flood impact assessment of a proposed development at Yamba, New South Wales. The development is for Lot 1722 in DP 1035524, Lot 51 in DP861895 and Lot 8 in DP1062514. The majority of the development is to be located within Lot 1722 in DP 1035524 where 161 residential lots are to be created.

The site is part of the wider West Yamba Urban Release Area (WYURA). Clarence Valley Council (CVC) has previously stated that any flood impact assessment for proposed development at West Yamba needs to take the entire release area into account when assessing flood risk. This flood impact assessment therefore includes the entire release area although detailed information on developed land form was only available for use for the subject site. Assumptions have been used in relation to the development of the remainder of the WYURA as documented in Section 2.

2 Site and Development Description

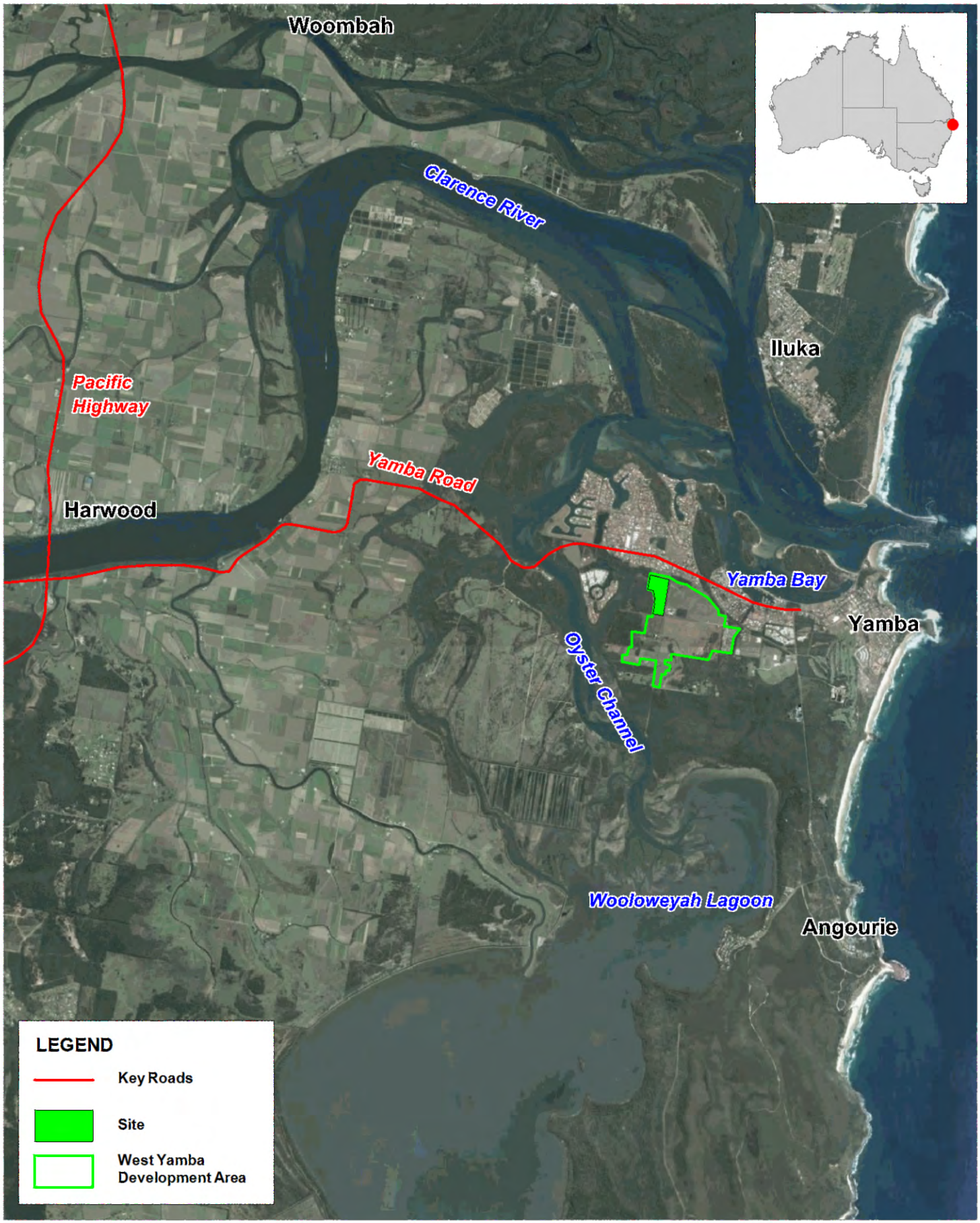
Much of the WYURA is zoned as 'R1 General Residential' in the Clarence Valley Local Environment Plan 2011. In total the WYURA R1 land occupies approximately 116ha of which approximately 12ha is proposed to be developed by Yamba Residential Subdivision Pty Ltd into residential development. This 12ha of residential zoned land is referred to as 'the site' for the purposes of this assessment.

The site is predominantly flat, low lying land in close proximity to the tidal waters of the Clarence River, Oyster Channel and Lake Wooloweyah. Existing ground elevations typically vary between 1m and 2m AHD and due to its low lying nature, the land is generally flood prone. Figure 2-1 shows the location of the WYURA and the subject site.

Filling is to be undertaken to a sufficient level to enable minimum floor height requirements to be achieved. Minimum floor heights are based on relevant planning levels which, in turn, are based on the 100 year ARI design flood level with additional allowances for climate change and freeboard.

A Digital Terrain Model (DEM) has been provided for the subject site that meets the height requirements. For other residential areas of the WYURA it has been assumed that they are to be filled above the 100 year ARI flood level for the purposes of this assessment.

A floodway is incorporated into the design to assist with flood mitigation purposes as per the original intent of the Maclean LEP (2001). This floodway is located outside of the site and so mitigation relies on an offsite solution.



Title:
West Yamba Location

Figure: 2-1

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3 Flood Model Used in Assessment

3.1 Council Model

The flood model used in the West Yamba assessment is based upon that adopted by Council as part of the Lower Clarence Flood Model Update Study (BMT WBM, 2013). This model was originally developed by BMT WBM in 2004 as part of the Lower Clarence Flood Study Review (WBM, 2004). The 2013 version of the model was resolved by Council for adoption on 18 March 2014 and accordingly that version of the model was recommended to be used to inform flood impact assessments in support of planning decision making. From herein the adopted model is referred to as the 'Council model'.

The Council model is fully calibrated and is based on LiDAR data captured in 2010. It is a multi-domain model with higher resolution domains for Grafton and Maclean and a relatively coarse scale domain for all other areas. Yamba falls within the coarse scale domain and has a grid resolution of 60m. Of particular note for Yamba are the assumptions around the way in which the modelled tidal (storm surge) boundary is applied. This is outlined below.

3.1.1 Tidal Boundary

The design ocean levels used in Council's model remain unchanged from those originally defined by the Lower Clarence River Flood Study (PWD, 1988). These ocean boundaries are shown in Figure 3-1. It can be seen that the peak ocean level for the 100 year ARI event is 2.6mAHD in elevation and occurs at approximately 18 hours into the design model run.

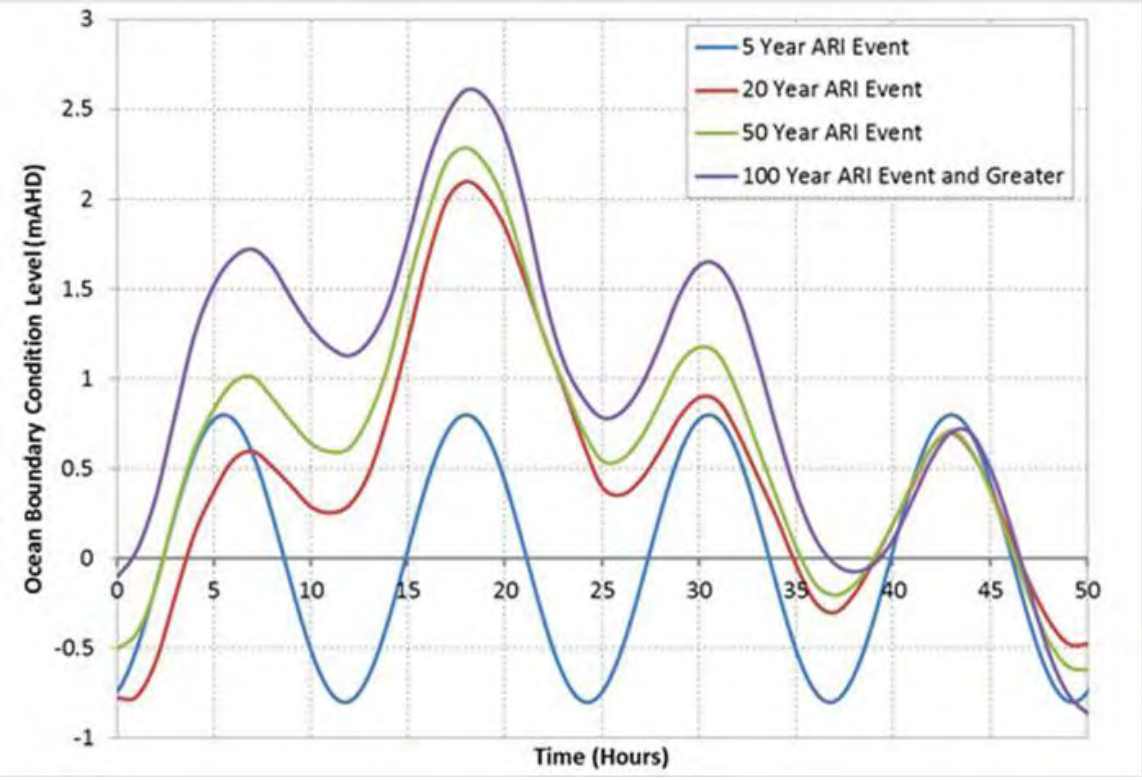


Figure 3-1 Lower Clarence Flood Model Design Tidal Boundaries

The Council model assumes that the peak in catchment rainfall coincides with the storm tide peak, thereby representing a slow moving storm which crosses the coast and moves inland. This boundary configuration results in backwater storm tide inundation at Yamba prior to the arrival of catchment flooding in the lower reaches. This is illustrated in Figure 3-2 where the 100 year ARI design flood level is plotted for Harwood. Harwood was selected as the riverine flood peak is clearly distinguishable. At Yamba, which is closer to the ocean boundary, the riverine flood peak is less pronounced and is lower than the storm tide peak flood level (see Section 4.3).

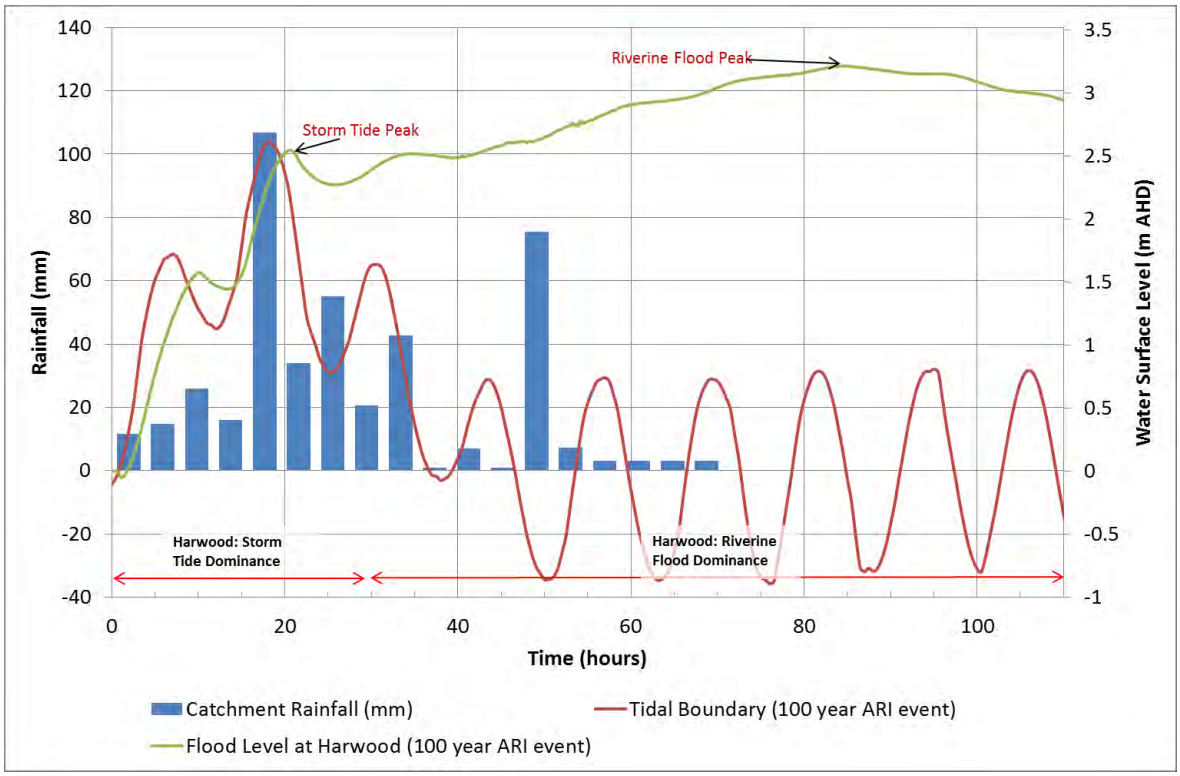


Figure 3-2 Storm Tide / Catchment Flooding Response Time (Harwood)

Due to the size of the Clarence River catchment there is a significant delay between the rainfall and response of the river. Coinciding the storm tide and catchment flooding peaks at the river entrance is therefore considered to be overly conservative and has not been assessed.

3.2 West Yamba Model

3.2.1 Model Schematisation

Yamba is modelled with a 60m grid schematisation in Council's model. Whilst this is appropriate at the catchment scale and for ascertaining whether or not developments are likely to result in flood impacts, it remains a relatively coarse tool for quantifying such impacts.

A refined version of the Council model has been developed to allow for higher spatial resolution output at West Yamba. The first part involved curtailing the Council model by removing the upper part of the model. Constrictions in the terrain through which all flow passes are generally the most appropriate locations for curtailing models as the flow through that location can be easily extracted

(as opposed to a wide floodplain where flow patterns may be complex). With the exception of Yamba Hill, the land surrounding Yamba is generally very flat and low lying. The closest available constriction is at Maclean, approximately 23km upstream from Yamba and so this location was selected as the upstream boundary of the refined model.

The second part involved extracting a water level hydrograph from Council's model at this revised Clarence River upstream boundary location and applying this hydrograph to the West Yamba model. Whilst inflows are generally represented as flow hydrographs, the tidal nature of the model meant that the changes in direction of flow were best represented with a water level hydrograph. Rainfall inflows were applied for the internal area within the model domain in the same way as for the Council model. One additional external inflow was applied for the Esk River tributary.

Other minor improvements made to the baseline model were as follows:

- Inclusion of culvert details for Kolora Lake
- Inclusion of assumed culvert details for Deering Street
- Inclusion of assumed culvert details for Yamba Road.

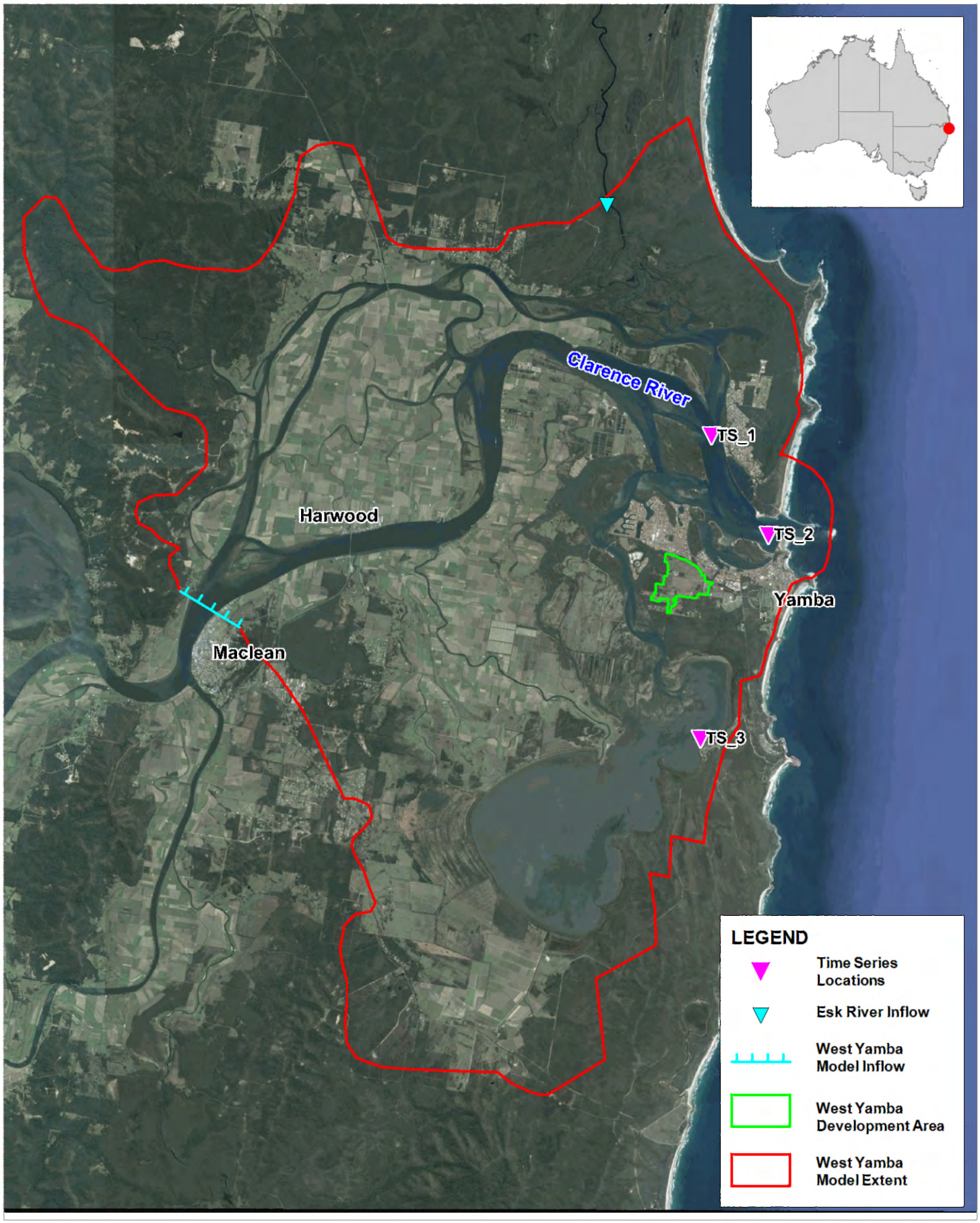
The West Yamba model extent is shown in Figure 3 3 along with the locations of the main Clarence River model inflow, the Esk River tributary inflow and the proposed West Yamba development area. Also shown are three reporting locations used for comparing output from the West Yamba model to Council's model.

The revised model remains significant in terms of its extent. A trade-off between the cell resolution and excessive model run times showed that a 20m grid cell model resulted in an appropriate compromise for modelling the entire design flood events. However, at Yamba it is the storm surge component as opposed to the riverine flood component that results in the higher flood elevations. As the storm surge peak passes after around 20 hours of model simulation then reduced length model runs can be undertaken and as a consequence a higher resolution schematisation can be made without excessive model run times. Therefore two sets of models have been used as follows:

- A 20m grid schematisation which runs for a sufficient length of time to include both the storm surge peak and the delayed river flood peak; and
- A higher resolution 10m grid schematisation which runs for a sufficient length of time to pass the dominant (at Yamba) storm surge component only.

Comparisons were made of the water level within the main Clarence River channel between the original Council model, the 20m model and the 10m model to ensure that the models were in general agreement. Three locations were checked in proximity to the West Yamba site for the 20 and 100 year ARI events. These three locations are shown in Figure 3 3. Time series plots of water levels at these locations are included in Appendix A. Very good agreement was achieved between all three models with almost identical results at the flood peak in the Clarence River. Levels in Wooloweyah Lagoon were slightly under predicted for the 20 year ARI event compared to Council's model but typically these elevations were not sufficient to affect the site.

The report makes clear which model has been used where results are presented. Typically the 20m grid model is used to understand the flood behaviour and the 10m model is used to more accurately define the extent and quantify the peak level impacts.



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West Yamba Model Extent

Figure: 3-3

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3.2.2 Baseline Model

The baseline model represents a scenario modelled with existing terrain elevations. The base terrain input data is the same as that used in the Council model (i.e. derived from 2010 LiDAR data and includes the same bathymetric survey of the Clarence River).

Other than changes to the model associated with re-schematising to a finer model resolution, the only changes made to the baseline model were as follows:

- The inclusion of culverts connecting a small channel under both Deering Street and Yamba Road and thereby connecting the channel to Yamba Bay; and
- Inclusion of culverts connecting Kolora Lake to Crystal Lake and the Clarence River.

Supplied information and assumptions based on LiDAR were used to ascertain the culvert dimensions and invert levels.

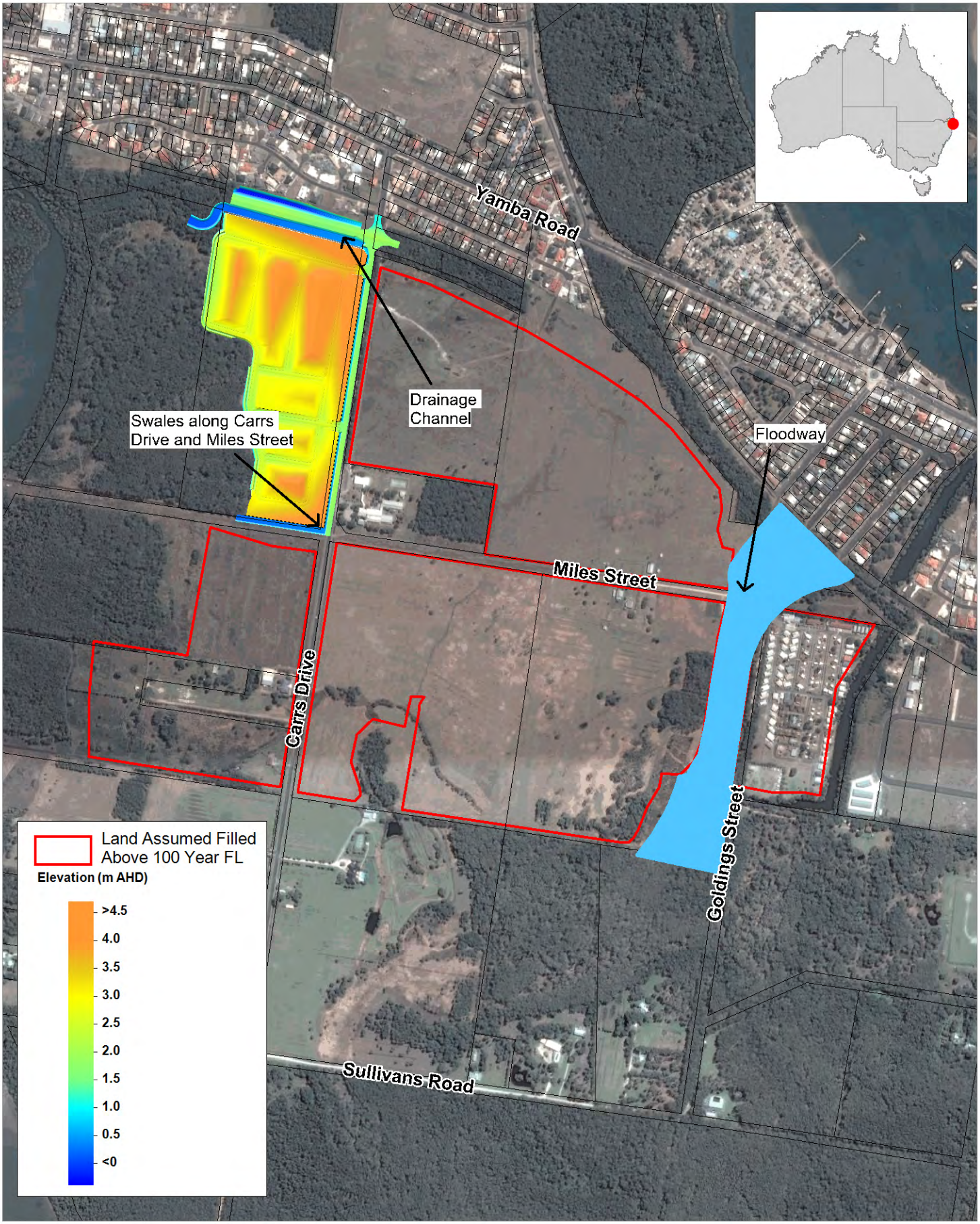
3.2.3 Developed Case Model

The West Yamba development has been included in a 'developed case' model. This model is the same as the baseline model except for the inclusion of the proposed development as an area of raised fill in the model terrain along with a floodway through the site. A Digital Elevation Model (DEM) has been provided for the subject site and this has been incorporated into the model. Key features are:

- Inclusion of fill, typically above 3mAHD and above the 100 year ARI flood level at all locations
- A swale drain along the northern perimeter of the site with an associated box culvert under Carrs Drive of 2 x 3.6m x 0.65m
- Inclusion of a length of the proposed West Yamba Bypass highway to the north of the site
- Swale drains alongside the western side of Carrs Drive
- A swale drain alongside Miles Street to the south of the site.

For the remainder of the WYURA area the assumption has been made that this is to be filled to be above the 100 year ARI flood level with the exception of the main roads through the site. The main roadways and swales are modelled as 1D elements inserted into the 2D model. Minor features of the swales such as culverts at road crossings have generally not been included at this conceptual design stage as the model is not at a sufficiently fine resolution for their inclusion. An exception is the culvert under the northern end of Carrs Drive which has been modelled as a 1D element. However it is noted that this culvert is drowned out during significant flood events and its inclusion has minimal bearing on flood results. It is assumed that all other minor culverts under flooded roadways would have negligible influence during riverine flood events. They will still need consideration for local stormwater issues but it is assumed that they can be adequately sized at the detailed design stage. The model assumes a low roughness for the swales analogous to that of a concrete lined swale.

Proposed West Yamba landform elevations as included in the flood model along with the key features described above are shown in Figure 3-4.



Title:

West Yamba Proposed Elevations and Key Drainage Features

Figure: 3-4

Rev: A

N

0 200 400m

Approx.Scale

BMT WBM

www.bmtwbm.com.au

Filepath : "I:\B21482_I_br_West_Yamba_FIA2\DRG\FLD_003_150511_Modelled_Fill_Elevations_and_Drainage.wor"

4 Baseline Flood Behaviour

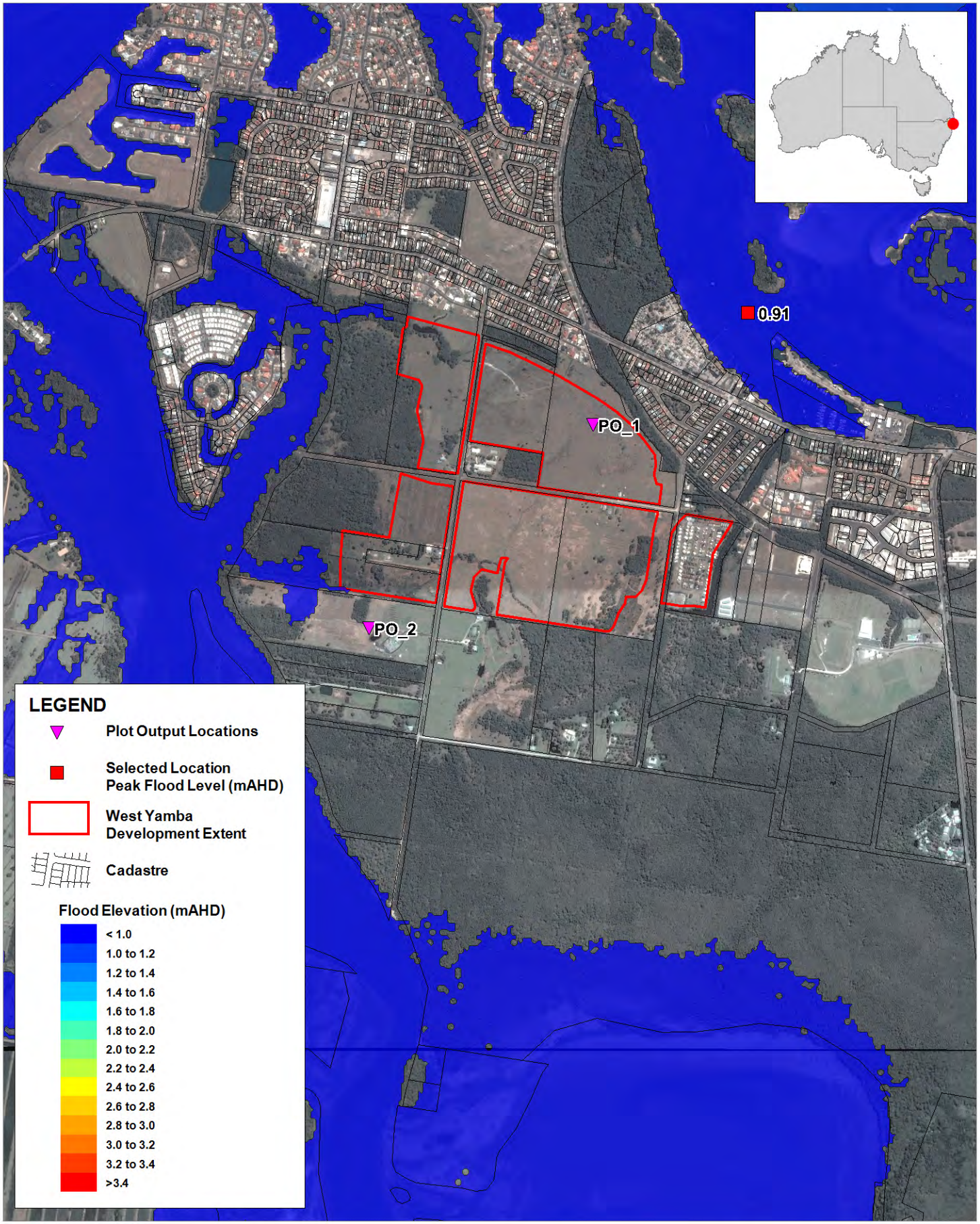
4.1 Introduction

The baseline model represents the existing case (i.e. a pre-developed case). An understanding of the baseline flood behaviour helps to inform the site design. This section describes the baseline flood behaviour as it relates to the Yamba area.

4.2 Peak Flood Elevations

Figure 4-1 to Figure 4-3 present maps of the baseline peak flood elevations across the study area for the 5, 20 and 100 year ARI flood events. Annotated levels have been included at various locations across the WYURA. For the 5 year ARI there is no predicted inundation of the site or the remainder of the WYURA area zoned for residential. In this event it is the riverine flood component which results in the higher levels (as there is no storm surge component for this design event)[1]. Therefore the 20m resolution model has been used for plotting peak flood elevations in Figure 4-1. The 20 and 100 year ARI events show predicted inundation of the site during the baseline event. The peak levels are from the storm surge component and so the higher resolution 10m model has been used to plot peak flood elevations in Figure 4-2 and Figure 4-3.

[1] The Yamba Flood Risk Management Plan (2009) attributes a nominal value of 1.5mAHD to the 5 year ARI flood level at Yamba which is higher than the value of 0.9mAHD resulting from the hydraulic modelling.



Title:

West Yamba 5 Year ARI
Peak Baseline Flood Elevations (20m model)

Figure: 4-1

Rev: A

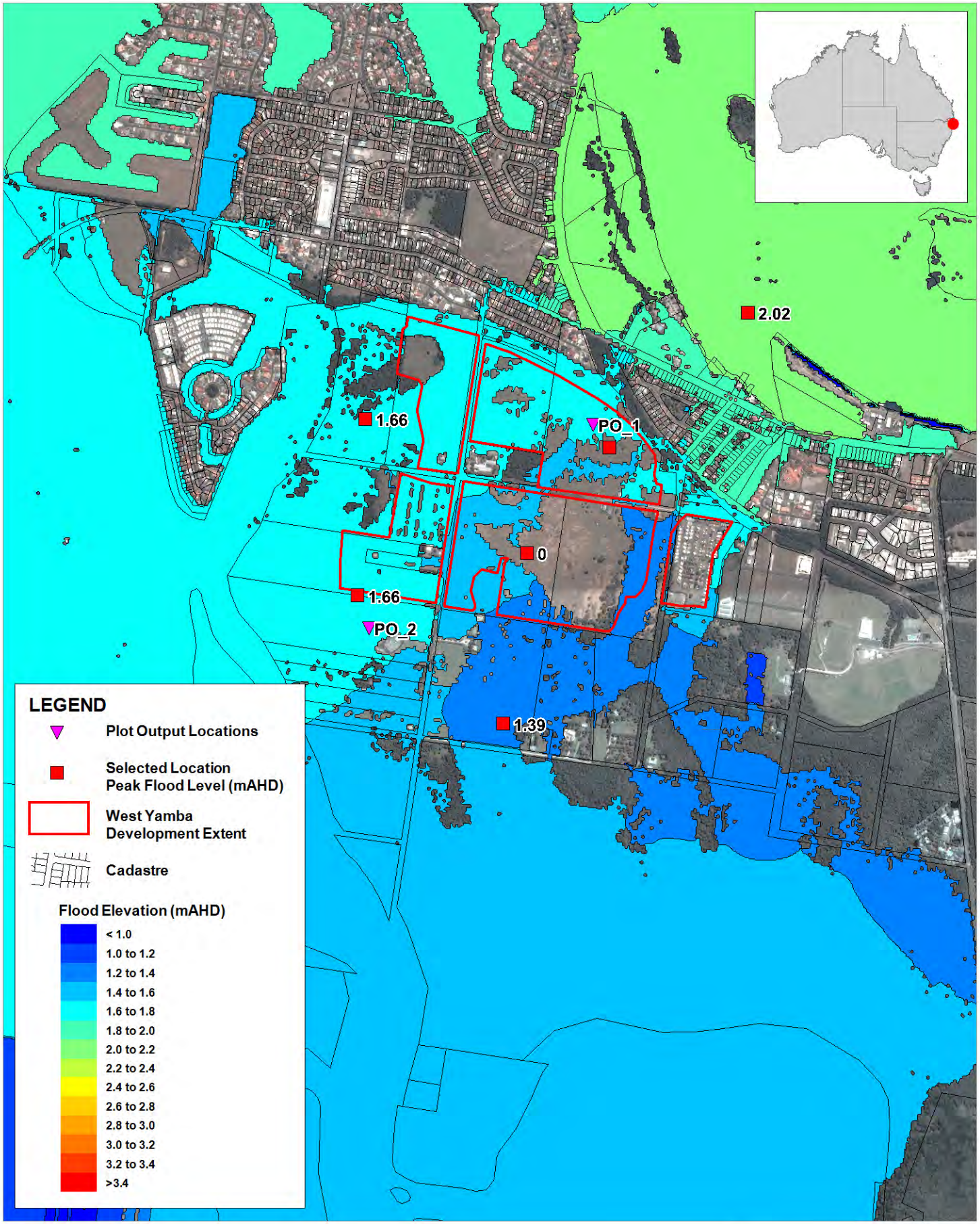
N

0 400 800m

Approx. Scale

BMT WBM
www.bmtwbm.com.au

Filepath : "I:\B21482_I_br_West_Yamba_FIA2\DRG\FLD_004_150511_Q5_Peak_Baseline_Flood_Elevations_20m.wor"



Title:

West Yamba 20 Year ARI
Peak Baseline Flood Elevations (10m model)

Figure: **4-2**

Rev: **A**

N

0 400 800m

Approx. Scale

BMT WBM
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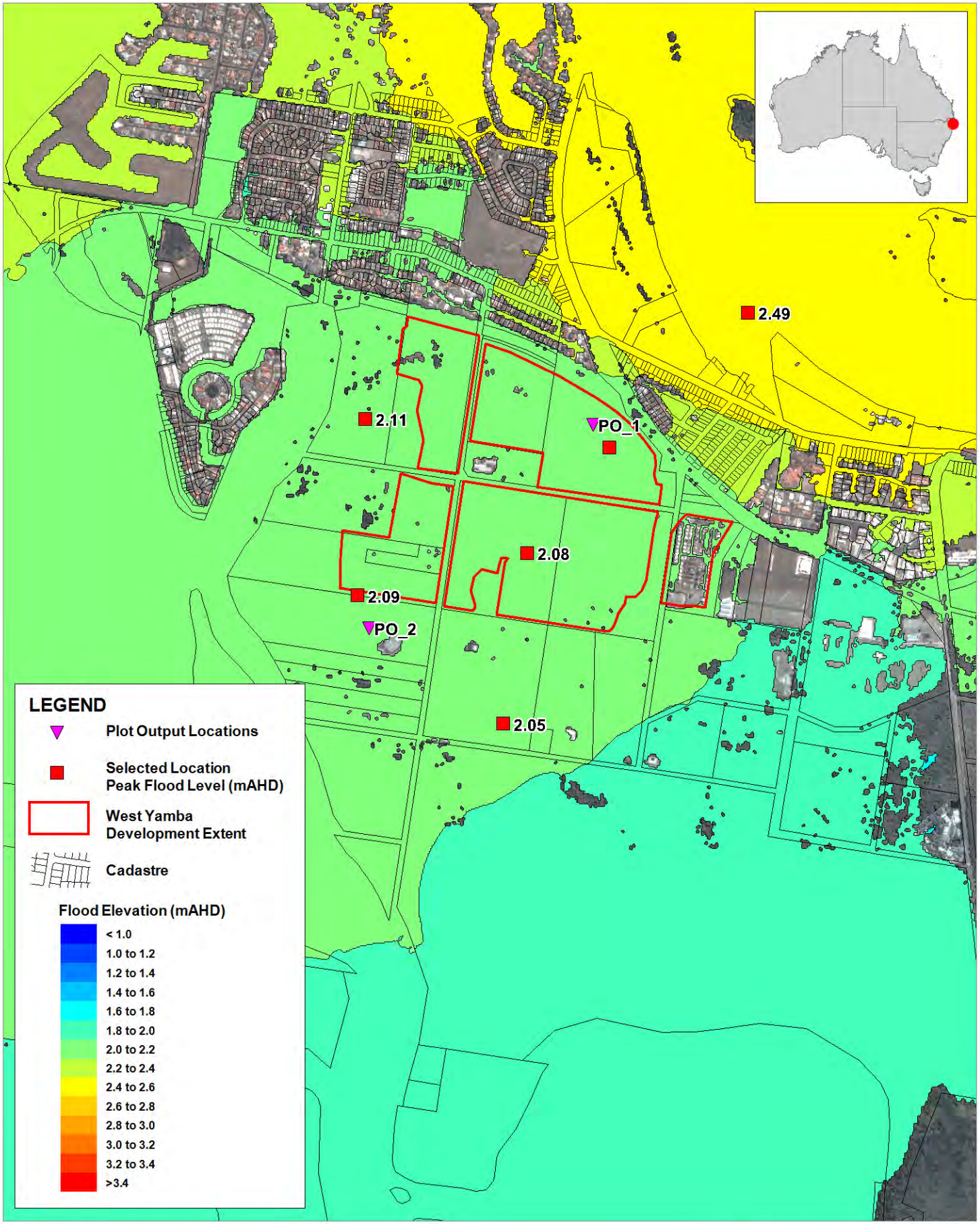
Filepath : "I:\B21482_I_br_West_Yamba_FIA2\DRG\FLD_005_150511_Q20_Peak_Baseline_Flood_Elevations_10m.wor"



Title:

West Yamba 100 Year ARI
Peak Baseline Flood Elevations (10m model)

Figure: **4-3**

Rev: **A**

N

0 400 800m

Approx. Scale

BMT WBM
www.bmtwbm.com.au

Filepath : "I:\B21482_I_br_West_Yamba_FIA2\DRG\FLD_006_150511_Q100_Peak_Baseline_Flood_Elevations_10m.wor"

4.3 Pattern of Inundation

Figure 4-4 and Figure 4-5 plot the change in baseline flood elevations over time at the reporting locations shown in Figure 4-1 to Figure 4-3. For both locations the following points are noted:

- The 5 year ARI event does not inundate the area of the site or the remainder of the WYURA under baseline conditions.
- During the 20 year ARI event there is widespread inundation of the site from the storm surge peak with levels peaking around 1.66mAHD. There is only very minor inundation from the secondary riverine flood peak as it coincides with high tides.
- Two peaks can be distinguished in the 100 year ARI event. The first peak results in the maximum water level and can be attributed to the storm surge component of the model design inputs. This peak level is approximately 2.1mAHD and inundates the entire site area. The second peak follows approximately 80 hours (3 days, 8 hours) later and is attributed to the riverine flood. The 100 year ARI riverine flood peak elevation is approximately 1.85mAHD across the WYURA.

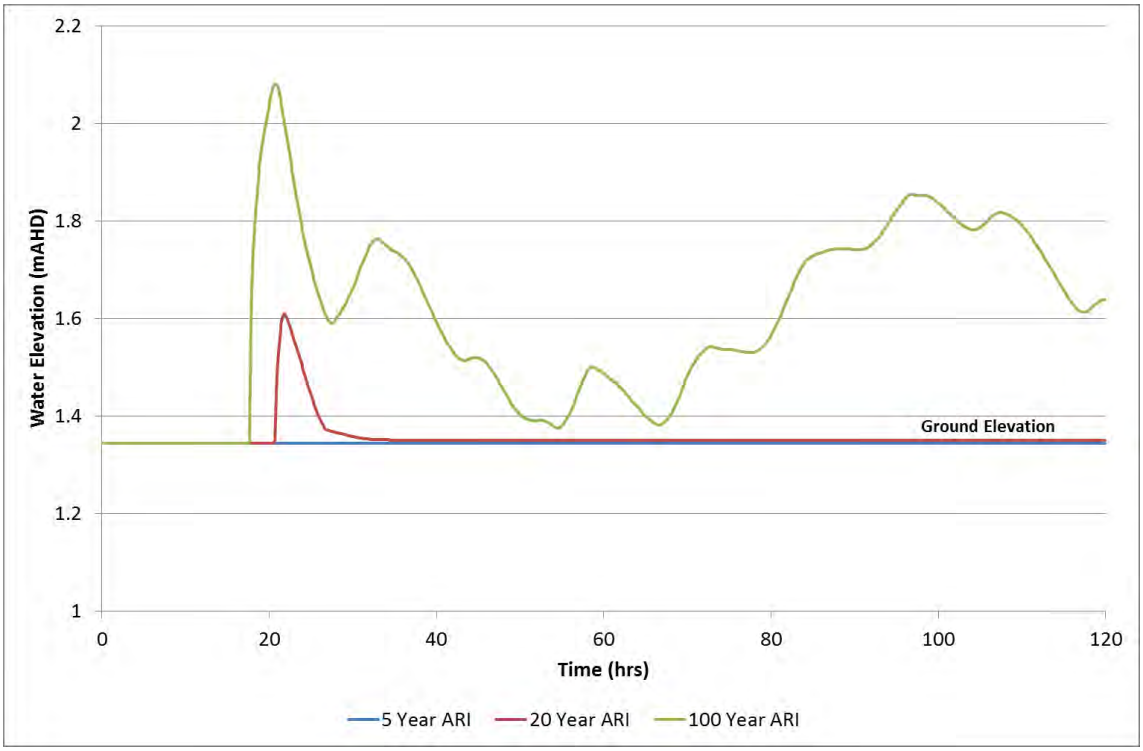


Figure 4-4 Flood Levels with time (Location PO_1)

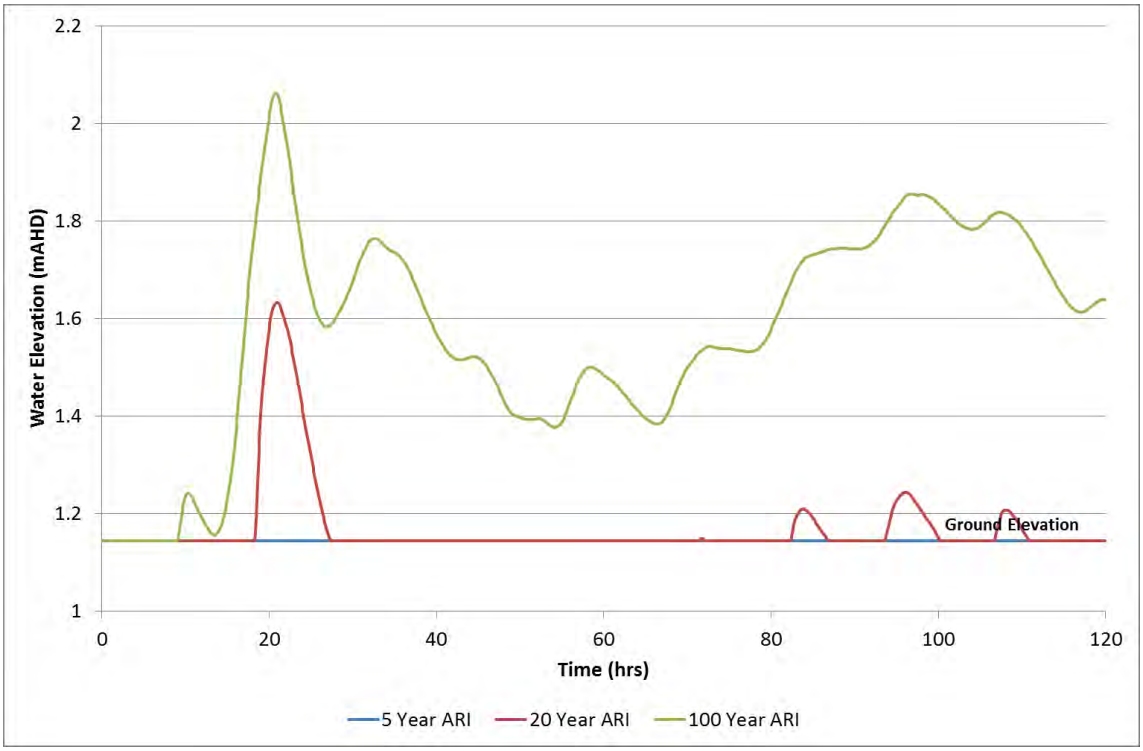


Figure 4-5 Flood Levels with time (Location PO_2)

4.4 Comment on Flood Planning Levels

Council had previously adopted a minimum habitable floor height for residential development for the WYURA of 3.24mAHD which was in accordance with the *Yamba Floodplain Risk Management Plan* (Webb, McKeown & Associates, 2009). This plan lists the components that define this flood level as follows:

- 100 year ARI level of 2.34mAHD
- Plus 0.5m freeboard
- Plus 0.4m climate change allowance.

This 100 year ARI flood level was informed by the hydraulic model developed as part of the *Lower Clarence Flood Study Review* (WBM, 2004) which has since been superseded by more recent modelling for Council in the *Lower Clarence Flood Model Update Study* (BMT WBM 2013). Furthermore the level of 2.34mAHD was the adopted level for Yamba for which the flood mechanisms vary somewhat as the WYURA site does not directly front Yamba Bay. Flooding to West Yamba from storm surge therefore relies on overtopping of Yamba Road (with more minor flow passing through culverts under Yamba Road). Flow passing over Yamba Road and into West Yamba is limited to the duration of the peak of the tide and so resulting flood levels are lower than for areas elsewhere in Yamba where there is no overtopping constraint.

The 100 year ARI flood levels have generally increased to around 2.5mAHD in Yamba as part of the *Flood Model Update Study*. However for West Yamba the peak levels are approximately

2.1mAHD. These levels are also confirmed by the more detailed modelling undertaken as part of this study.

As such, it is considered appropriate to base fill and habitable floor level requirements on the assessed 100 year ARI flood level of 2.1mAHD.

4.5 Baseline Flood Behaviour Conclusions

The following conclusions can be drawn from the baseline assessment of flood behaviour:

- The site is inundated by the 20 year and 100 year ARI events but not the 5 year ARI event.
- Peak flood elevations across the WYURA are approximately 1.7mAHD and 2.1mAHD for the 20 and 100 year ARI events respectively.
- Peak inundation levels at West Yamba are lower (typically by 0.4m) than corresponding levels on the northern side of Yamba Road. This is due to the elevated Yamba Road constraining overtopping.
- Peak inundation levels at West Yamba are the result of the storm surge component in the model. It is therefore considered appropriate to use the validated higher resolution 10m model to map the peak flood level impacts for the 20 year and 100 year ARI events.

Due to the potential for inundation of the site from the 100 year ARI riverine flood wave component (in addition to storm surge inundation), albeit at a lower peak level, it is important to ensure that any development does not create impacts for this riverine flood component. As impact maps are generally based on the maximum flood level, which at West Yamba result from storm surge, then any potential impacts resulting to the riverine flood component are ‘masked’ in the peak level impact maps. Additional model runs were therefore undertaken for the 100 year ARI which only included the riverine flood component. Model runs were completed for both the baseline and developed case scenarios in order to generate an impact map which is presented in Section 5.

5 Flood Impact Assessment

5.1 Introduction

The flood impact assessment compares the design peak flood levels from the baseline case to those predicted under the developed case. As the entire site is flood free during the 5 year ARI event then only predicted impacts for the 20 year and 100 year ARI events have been plotted. These impacts are shown in Figure 5-1 and Figure 5-2 respectively. Impacts are shown for any variance in peak flood level by +/- 0.03m or more.

Further maps are presented as follows:

- Figure 5-3 presents an impact map for a 100 year ARI, riverine only event. This assesses the impact of the development for a design catchment flood without storm surge.
- Figure 5-4 presents a 100 year ARI impact map where only the site has been included in the developed case. The filling associated with the remainder of the WYURA has not been included in the model. The floodway is also not present in this scenario. Whilst the assessment is required to address the impacts of the whole of the WYURA, it is also useful to understand the relative impact of the site in isolation.

Summary descriptions of the impacts are provided in the remainder of this section.

5.2 20 Year ARI Event Impacts Summary

Due to the proposed filling, the areas of the site which were shown to be inundated during the baseline assessment are now shown to be dry. Predicted impacts are limited to the immediate perimeter of the WYURA and are not predicted to occur to any existing dwellings. Impacts of up to 0.04m are predicted for localised areas along the northern perimeter and up to 0.13m along the southern perimeter localised around the southern end of the Carrs Drive. Small decreases in peak flood levels of up to 0.03m are predicted in the vicinity of Endeavour, Cook and Golding Streets. This is largely attributed to the inclusion of the floodway.

5.3 100 Year ARI Event Impacts Summary

As for the 20 year ARI event, areas of the site which were shown to be inundated during the baseline assessment are now shown to be dry. The general pattern shows increased flood levels along the northern perimeter of the site. These increases in peak flood level are up to 0.12m but typically these mapped impacts are confined to within 100m of the site perimeter and do not impact on existing dwellings. Minor impacts (less than the +/- 0.03m tolerance used for the mapping) extend across some dwellings in this 100 year event.

A minor decrease in peak 100 year ARI flood levels of up to 0.04m is predicted to the south of the West Yamba site. No further impacts, positive or negative were identified.

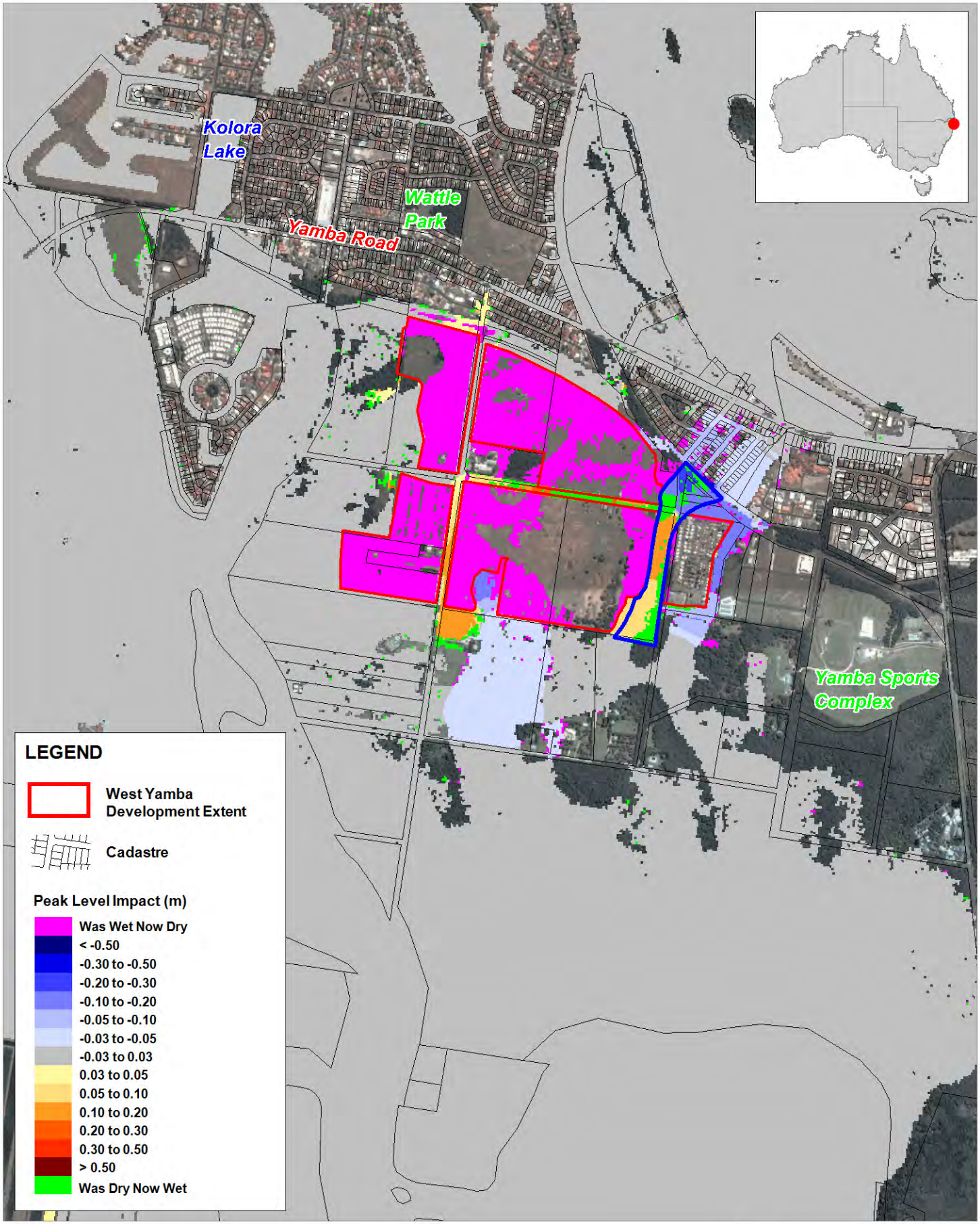
5.3.1 100 Year ARI Event (Riverine Only)

For reasons discussed in Section 4.5, impact mapping of the 100 year ARI riverine only event was undertaken. The tidal and storm surge components of the model were removed in order to

ascertain the impact of the development for a design catchment flood without storm surge. These impacts are presented in Figure 5-3. It can be seen that there are no predicted impacts to dwellings as a result of the West Yamba filling for the 100 year ARI riverine only event. There are predicted impacts in the existing channel passing under Deering Street and Yamba Road. This is a result of the floodway conveying more water into this channel. Whilst the assessment undertaken for this report is considered suitable for the planning assessment, it is recommended that the floodway design is refined and tested across a wider range of flood magnitude events and combinations of flood and surge conditions as part of its detailed design to ensure no worsening to nearby properties.

5.3.2 100 Year ARI (Site only)

Figure 5-4 presents a 100 year ARI flood impact map for the site only (excluding the remainder of the WYURA). It can be seen that the site, which was shown to be inundated in the baseline, is now dry. No impacts are shown in the mapping as a result of the filling. Interrogation of the output files show flood levels increase by less than 0.01m (below the mapping tolerances) along the northern perimeter of the site.



Title:

West Yamba 20 Year ARI
Peak Flood Level Impact (10m model)

Figure: **5-1**

Rev: **A**

N

0 400 800m

Approx. Scale

BMT WBM
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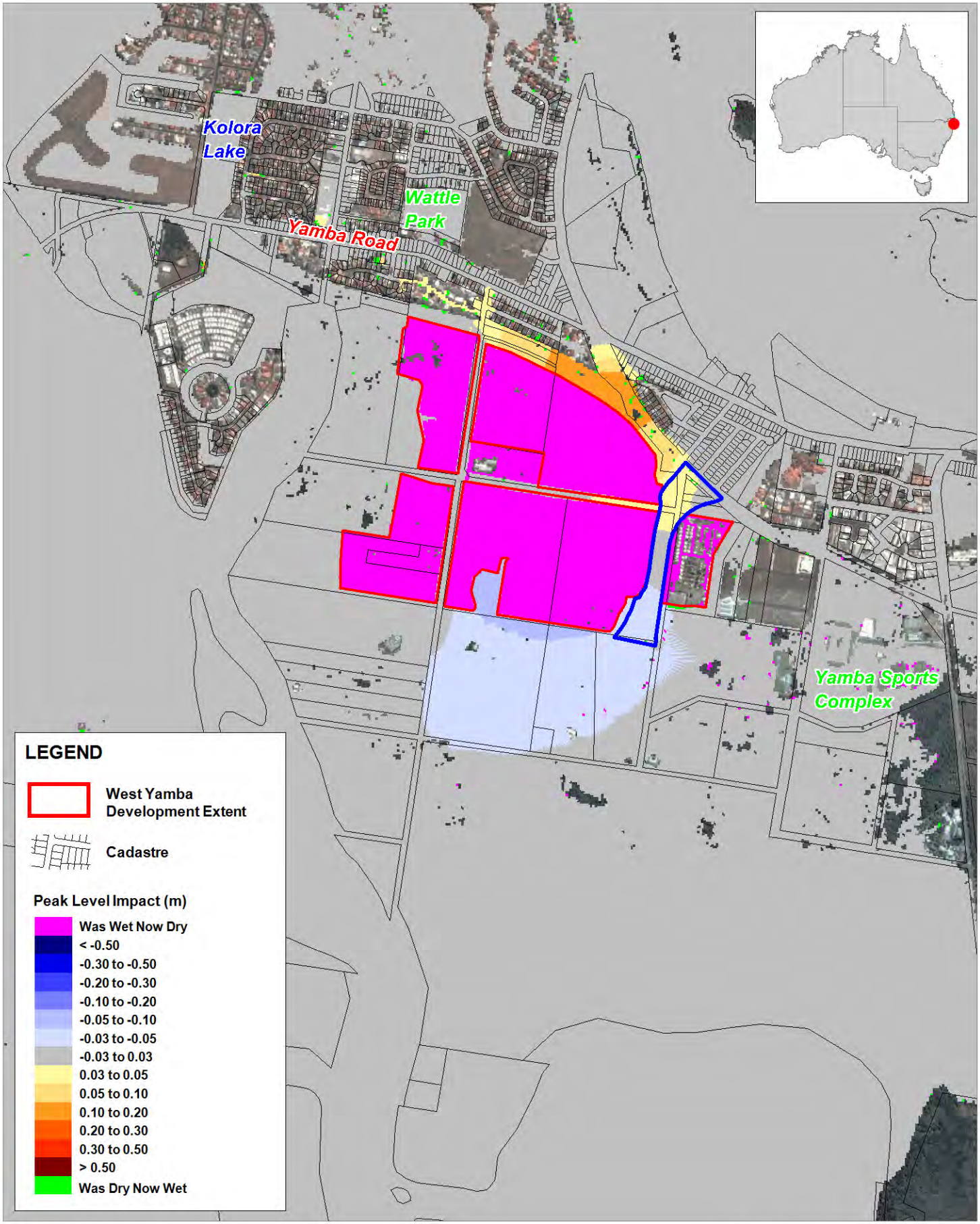
Filepath : "I:\B21482_I_br_West_Yamba_FIA2\DRG\FLD_011_150625_Q20_Peak_Flood_Level_Impact_10m_v006.wor"



Title:

West Yamba 100 Year ARI
Peak Flood Level Impact (10m model)

Figure: **5-2**

Rev: **A**

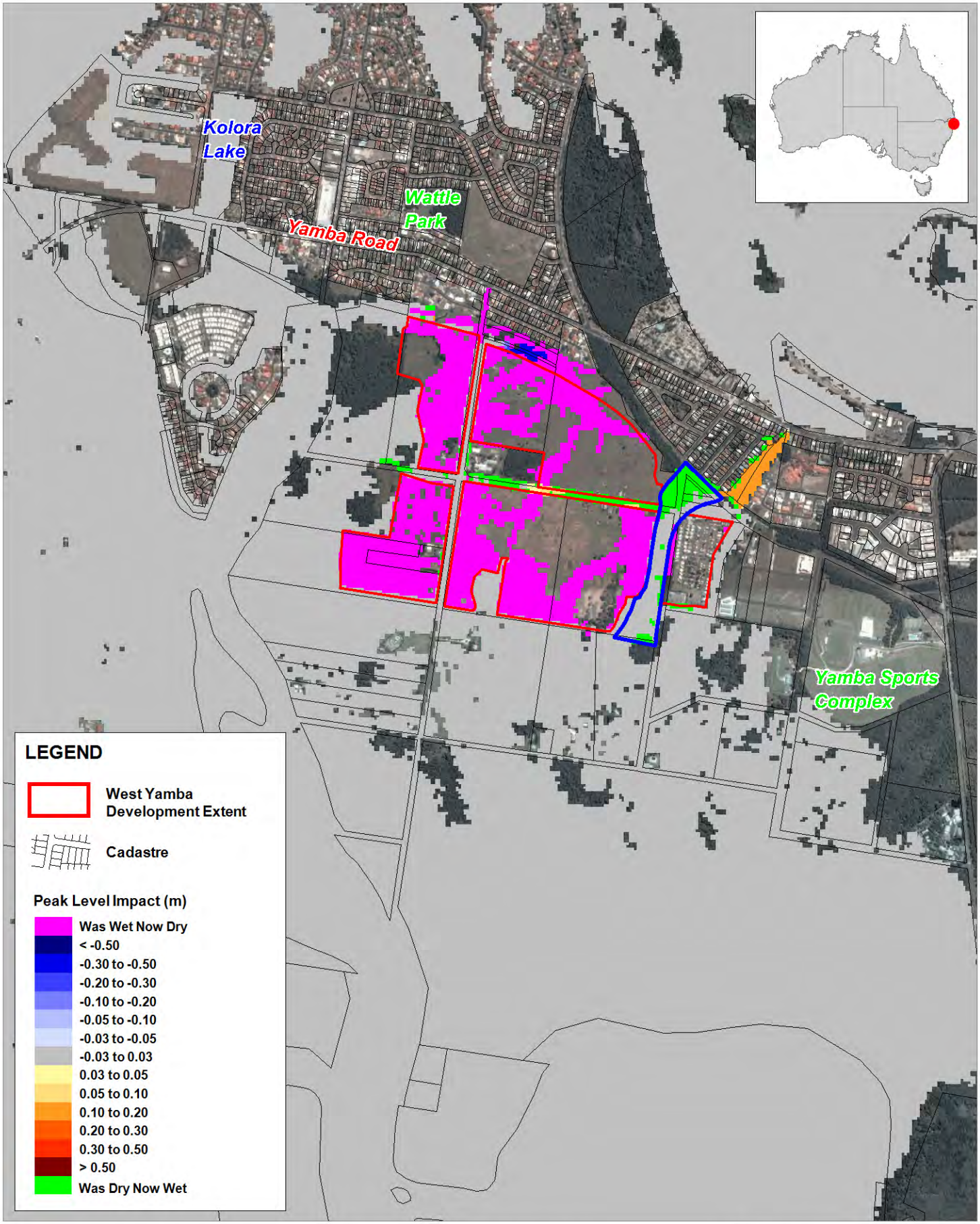
N

0 400 800m

Approx. Scale

BMT WBM
www.bmtwbm.com.au

Filepath : "I:\B21482_I_br_West_Yamba_FIA2\DRG\FLD_012_150625_Q100_Peak_Flood_Level_Impact_10m_v006.wor"



Title:

West Yamba 100 Year ARI (Riverine Only Flood) Peak Flood Level Impact (20m model)

Figure: 5-3

Rev: A

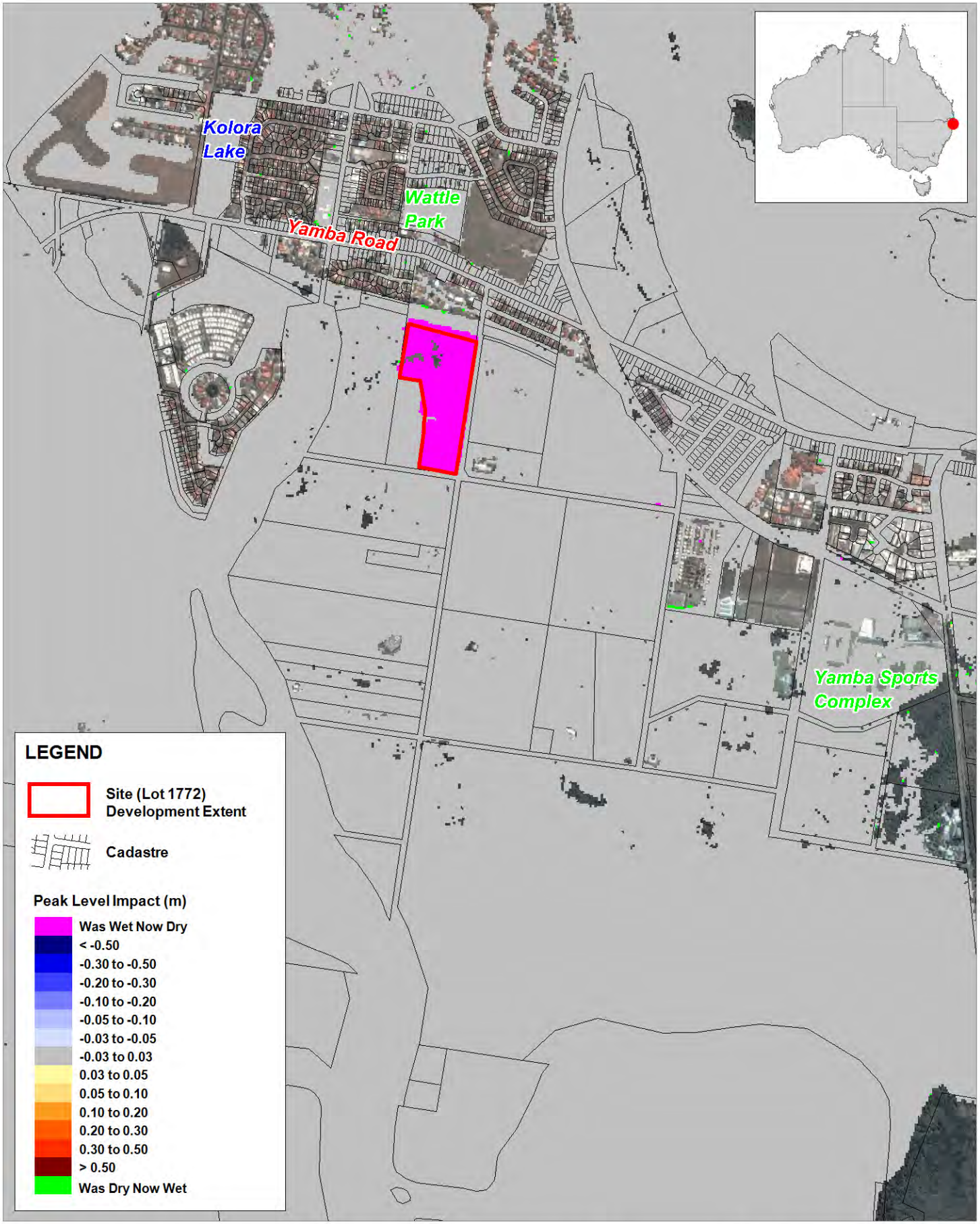
N

0 400 800m

Approx. Scale

BMT WBM
www.bmtwbm.com.au

Filepath : "I:\B21482_I_br_West_Yamba_FIA2\DRG\FLD_013_150625_Q100_no_tide_Peak_Flood_Level_Impact_20m_v006.wor"



Title:

West Yamba 100 Year ARI (Site Development Only) Peak Flood Level Impact (10m model)

Figure: **5-4**

Rev: **A**

N

0 400 800m

Approx. Scale

BMT WBM
www.bmtwbm.com.au

Filepath : "I:\B21482_I_br_West_Yamba_FIA2\DRG\FLD_014_150626_Q100_site_only_Peak_Flood_Level_Impact_10m_v006a.wor"

6 Conclusions and Recommendations

6.1 Conclusions

The following key conclusions are drawn from this study:

- The site and WYURA are shown to be inundated by the 20 and 100 year ARI events but not the 5 year ARI event under baseline (existing) conditions.
- Peak flood elevations at West Yamba are approximately 1.7mAHD and 2.1mAHD for the 20 and 100 year ARI events respectively.
- Peak baseline inundation levels at West Yamba are lower (typically by 0.4m) than corresponding levels on the northern side of Yamba Road. This is due to the elevated Yamba Road constraining overtopping.
- Peak design flood levels at West Yamba occur as a result of storm surge (as opposed to riverine / catchment flooding) based on Council's adopted design scenarios.
- Mitigation of the WYURA relies principally on a large floodway located outside of the site area.
- No notable flood level impacts are predicted for the 5 and 20 year ARI events.
- The mitigated 100 year ARI event shows some impacts (increases in peak flood level) greater than 0.03m limited to the perimeter of the WYURA. These are not predicted to affect existing dwellings or other receptors within the tolerances shown.
- No flood level impacts to dwellings are predicted for a 100 year ARI riverine only flood, i.e. a flood with no tidal/storm surge component. Peak level increases were observed along the channel between Deering Street and Yamba Road as a result of additional conveyance of floodwater by the floodway.
- Modelling of the site only, i.e. without the remainder of the WYURA, shows no significant impacts on peak flood levels.

6.2 Recommendations

(1) The design of the proposed floodway should be refined and reassessed at the detailed design stage following any proposed modifications. If design events and their underlying assumptions, such as allowances for storm surge, are updated then the development should be assessed with the updated design events.

(2) Local stormwater features such as culverts under the main internal roads should be determined based on sizing for local stormwater events. During storm surge and / or riverine flood events the roads convey floodwater and sizing of local drainage culverts will not have a significant effect on regional flood behaviour.

(3) The PMF (Probable Maximum Flood) event has not been included in this assessment. Interrogation of Council's flood model indicates that peak PMF levels are in the order of 3.7mAHD. This would inundate the West Yamba site and the wider area apart from Yamba

Hill. A Flood Emergency Management Plan should therefore be prepared including a safe evacuation plan and / or provision of an area of safe refuge above the PMF level.

7 References

WBM (2004) “Lower Clarence River Flood Study Review”, Prepared for Clarence Valley Council, March 2004.

BMT WBM (2013) “Lower Clarence Flood Model Update 2013”, Prepared for Clarence Valley Council, September 2013.

Appendix A Model Comparison Plots

Figure A-1 to Figure A-6 compare results from the Council model with the revised West Yamba models (both 20m and 10m grid resolutions). The locations TS_1, TS_2 and TS_3 are shown in Figure 3-3. Note that the 10m model only runs to 30 hours which is sufficient to capture the storm surge peak.

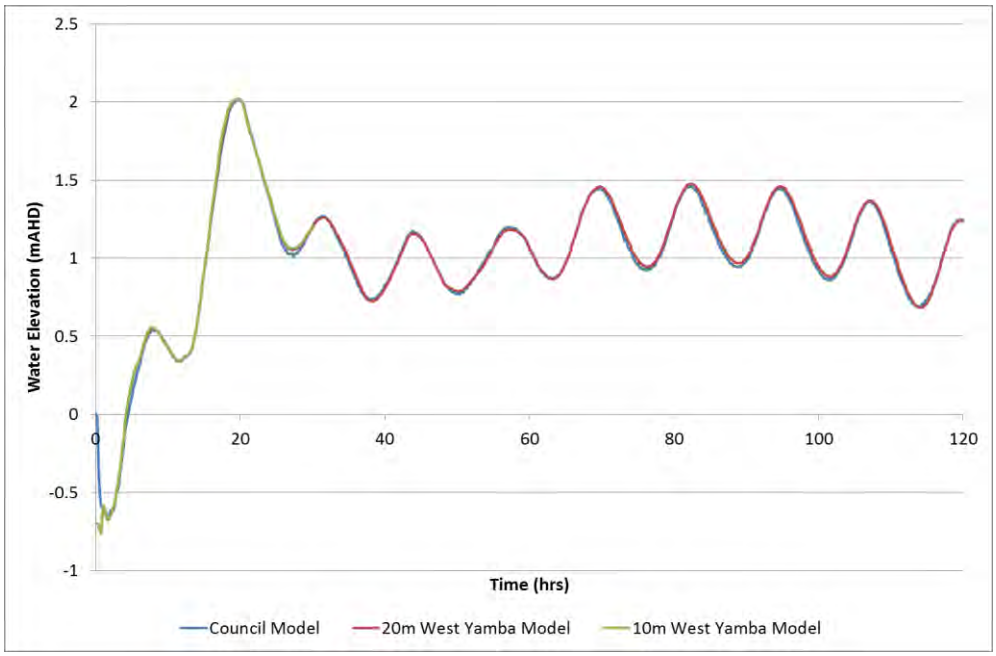


Figure A-1 20 Year ARI Model Comparison (Location TS_1)

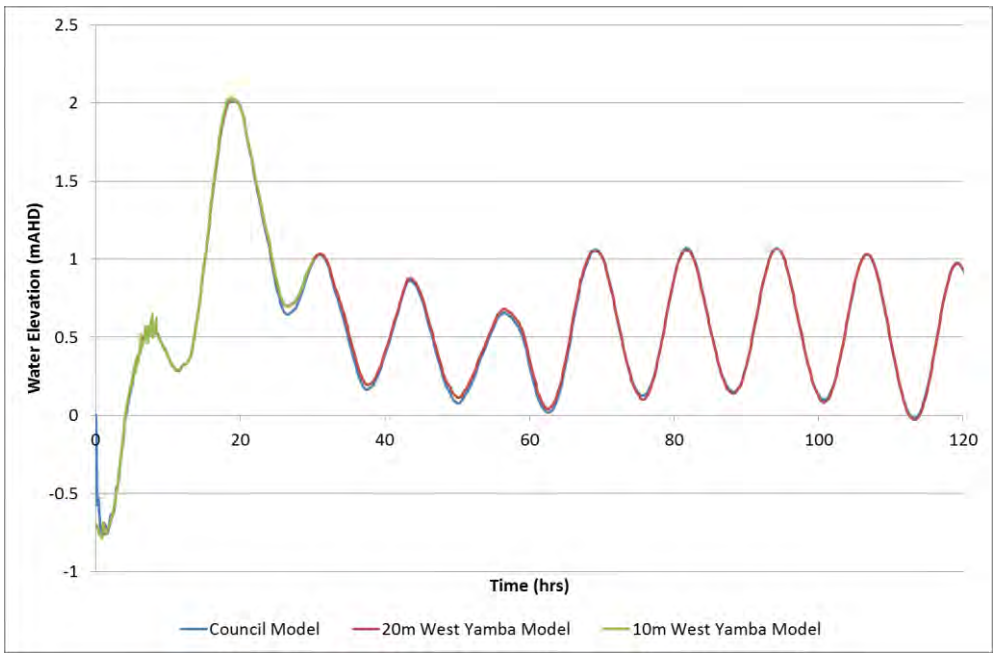


Figure A-2 20 Year ARI Model Comparison (Location TS_2)

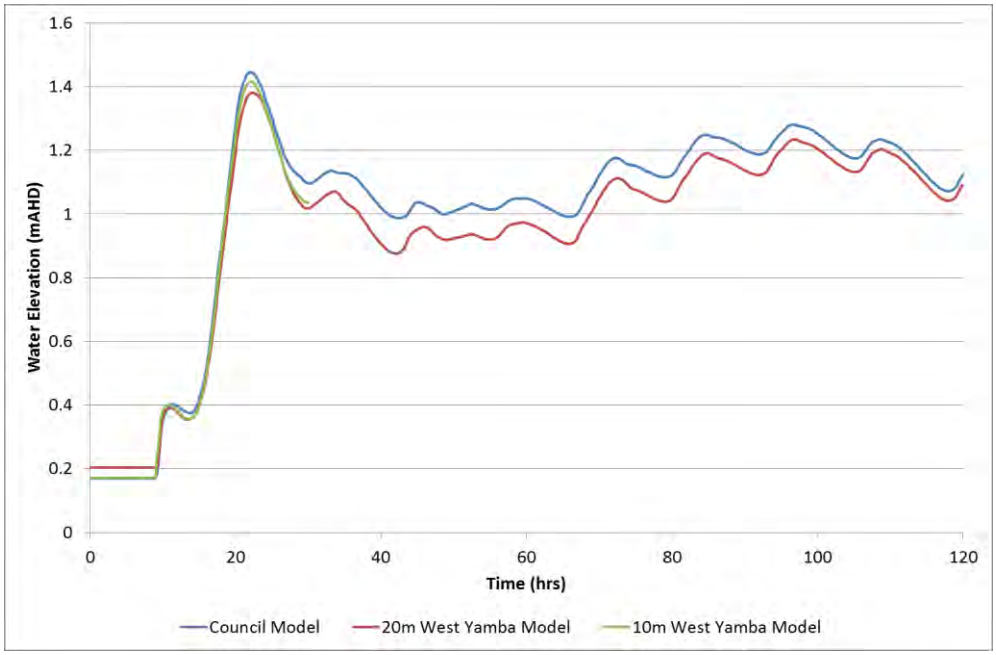


Figure A-3 20 Year ARI Model Comparison (Location TS_3)

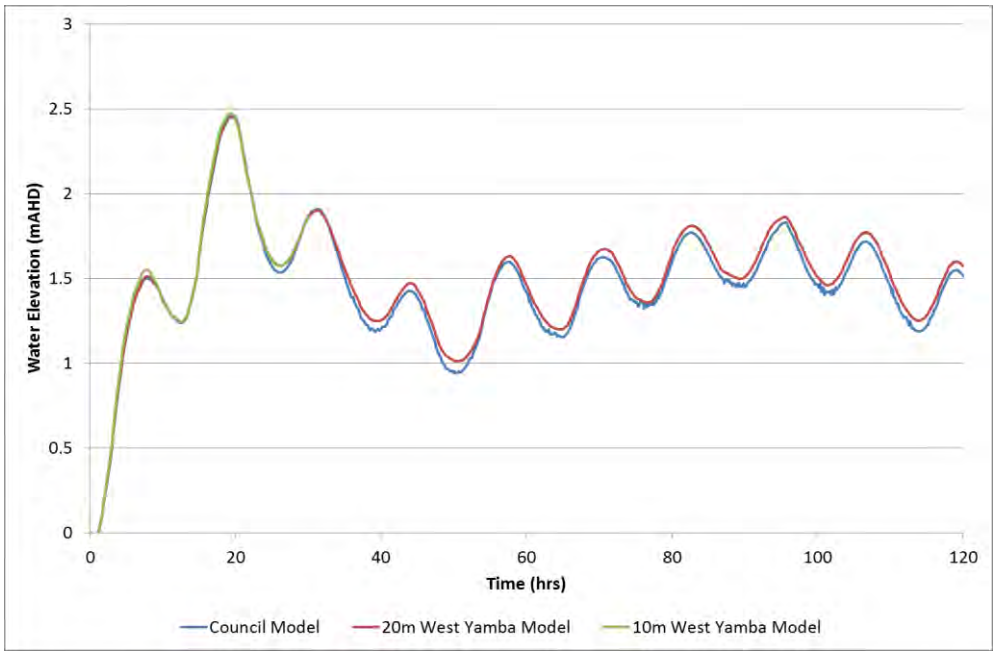


Figure A-4 100 Year ARI Model Comparison (Location TS_1)

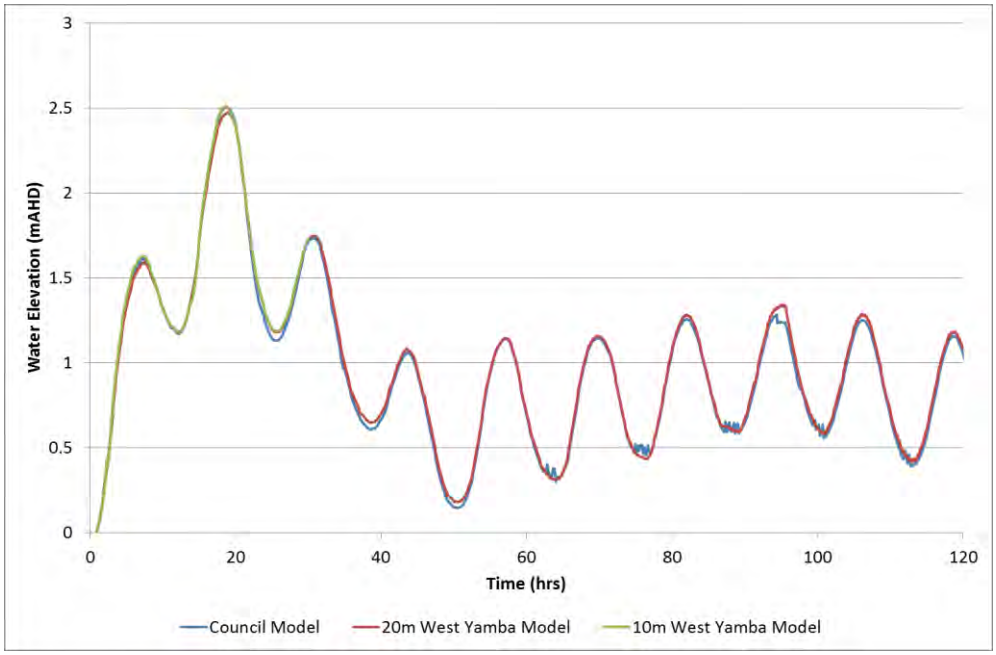


Figure A-5 100 Year ARI Model Comparison (Location TS_2)

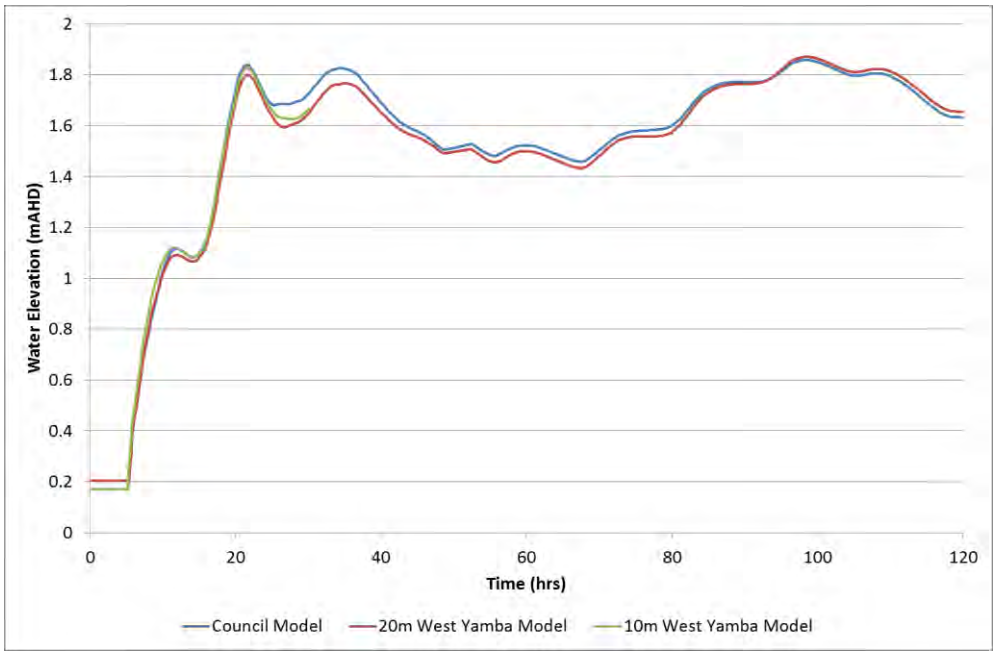


Figure A-6 100 Year ARI Model Comparison (Location TS_3)

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