

Report

# Omokoroa Peninsula Stormwater Management Plan - Addendum

Prepared for Western Bay of Plenty District Council

Prepared by Beca Limited

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For further guidance see WI05/08.

## Revision History

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## Document Acceptance

Action	Name	Signed	Date
Prepared by	<b>Gareth Hall</b>		15/11/2017
Reviewed by	<b>Keith Frenz</b>		15/11/2017
Approved by	<b>Graham Levy</b>		15/11/2017
on behalf of	Beca Limited		

Beca 2017 (unless Beca has expressly agreed otherwise with the Client in writing).

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## Executive Summary

In 2002 Western Bay of Plenty District Council published a Stormwater Management Plan (SMP) addressing planned growth on the Omokoroa Peninsula.

Since the Omokoroa SMP was adopted in 2002, there has been a lot of development including land use and hydrological changes, developments in stormwater management, statutory updates and new data has become available. In March 2017, Western Bay of Plenty District Council commissioned Beca Limited to provide an addendum to the 2002 SMP that addresses these changes.

### Land Use Update

At the time of the 2002 SMP, there was almost no urban development south of the railway. Rural areas between the railway and the northern (urban) end of the peninsula was also significantly undeveloped. Since then, much of the rural land north of the railway has been developed, has consent for development or has plans for development. Some stormwater devices (ponds and wetlands) have also changed and new devices have emerged. An overview of the current devices in Omokoroa is shown in Map 2.

### Hydrological and Engineering Update

In the 2002 SMP, hydrological analysis and device design was completed using a series of manual calculations. For this addendum, a 2D model has been developed to help understand the natural overland flow paths and also the flows received by each of proposed stormwater devices. Two development scenarios (2002 land use and future land use) have been modelled and compared to define the stormwater devices.

This addendum has calculated the stormwater quality volume. Appendix 2 (Table A) shows the water quality volume for each of the ponds (shown in Map 8 and Map 9) based on the area the pond will treat. Total volumes range from 900 m<sup>3</sup> to 38,000 m<sup>3</sup>, with an overall volume of 295,600 m<sup>3</sup> for Omokoroa. In addition, flood peak attenuation volume has been calculated for each device. The locations chosen for each of the devices are similar to those present in the previous report.

Cost estimates for the infrastructure required for stormwater management have not been provided in this Addendum as it was removed from the scope and will instead be included in the upcoming Structure Plan.

### Statutory Update

All stormwater resource consents associated with the Omokoroa Peninsula have been reviewed. The key findings of this review include the following:

- Resource consent 61768 provides for the comprehensive management of stormwater within the area of the Omokoroa Peninsula Stormwater Management Plan. This consent requires a stormwater monitoring programme
- Some older consents have expired, and others have been or will need to be transferred to RC61768 as part of the SMP

A review of the relevant Regional and District Plans was also undertaken for the ongoing implementation of the Omokoroa SMP and included the following plans:

- BoPRC Regional Water and Land Plan 2008 (RWLP)
- BoPRC Proposed Coastal Environment Plan

- WBoPDC Operative District Plan 2012
- WBoPDC Development Code 2009
- Omokoroa Structure Plan (2016)
- WBoPDC Asset Management Plan (AMP) – Stormwater 2013

### **Implementation Plan**

Most of the 2002 implementation actions have been addressed through District Plan provisions, the Development Code and more specifically through the requirements of RC61768 conditions. Based on the review of the previous implementation plan, the following aspects of the Implementation Plan need to be considered.

- There is no 100 year flood model available for Omokoroa
- Actions to avoid, remedy or mitigate environmental effects need to be identified as required by the consent conditions
- There was no specific reference to the impervious area requirements in the WBoPDC District Plan or the Development Code
- No soak pits are to be used in steeper areas or where there are sensitive soils
- Education of the general public, property developers and contractors should be a focus for both Regional and District Council

Guidance for developers has been provided in this addendum which will also assist in the implementation of the SMP and the Omokoroa Structure Plan. Guidance covers the various schedules and plans that should be highlighted to developers; what consents developers should be made aware of; design standards of stormwater systems; encouragement of innovative methods to manage and treat stormwater to appropriate standards; and Erosion and Sediment Control guidelines for earthworks.

It has also been recommended that the Stormwater Management Plan is consistent with the objectives and policies of the RWLP and in accordance with the consent conditions.

### **Upcoming Structure Plan**

This SMP Addendum provides some elements relevant to stormwater infrastructure development and management on the peninsula. However, as part of the Structure Plan process, further effort should be undertaken for various components of stormwater management planning including:

- Design rainfall data: there are significant differences between the Development Code design rainfall figures, the latest HIRDS v3 rainfall, and that use by TCC for Tauranga. Further, there needs to be an update to account for longer climate change horizons, in accordance with current planning at a regional level. We recommend that if possible this be undertaken before further modelling and sizing of infrastructure for the Structure Plan and for upcoming development is committed
- Constraints mapping: As part of the Structure Plan, we expect that there will be a thorough review of stormwater-related constraints (both in terms of protecting of water bodies, avoiding flood hazards, and also setting aside land for infrastructure). This is a critical element of ensuring compatibility of the development and infrastructure with the environment

- Land use planning: The nature of the land use planned, including percentage of imperviousness, potential for contaminant discharges, and provision for stormwater infrastructure and secondary flow paths, will be an important component in identifying the location and form of different land uses
- Modelling: The current rain on grid models will need to be updated to account for any changes to design rainfall depths and current land assumptions. Rain on grid 2D model should be adequate for new development areas with no detail available on pipe systems. The modelling might also assist in refining secondary flow paths and flood risk areas
- Device sizing: Based on the land use and updated modelling, device sizing (ponds etc) will need to be refined. Land use planning might also influence the location of some devices. Once devices have been updated based on the Structure Plan land use, capital cost estimates for stormwater infrastructure can be identified
- Implementation Plan: This addendum identifies further work needed on implementation plan for future development

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# 1 Introduction

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## 1.1 Background

In July 2002, a Stormwater Management Plan (SMP) for the Omokoroa Peninsula was prepared for Western Bay of Plenty District Council (WBoPDC) by Beca Carter Hollings & Ferner Ltd. It formed part of a Structure Plan (SP) study for future urban development of the Peninsula. The SMP covers the entire Omokoroa Peninsula north of SH2.

The 2002 SMP looks at the management and discharge of stormwater on the Peninsula under current and expected future land uses. The key objectives of the SMP are to:

- describe existing stormwater management practices
- identify existing stormwater management problems (quality and quantity)
- identify the effects of current and proposed future practices on the receiving environment (i.e. the streams of the Peninsula, and Tauranga Harbour)
- propose remedial measures and management practices to achieve acceptable environmental outcomes from stormwater management, even with development
- provide the technical basis for application by Western Bay of Plenty District Council to Bay of Plenty Regional Council (BoPRC) for a comprehensive discharge consent for all stormwater discharges on the Peninsula

A stormwater discharge consent was granted in 2003.

Since the Omokoroa SMP was adopted in 2002, there has been a lot of development including land use and hydrological changes, developments in stormwater management, statutory updates and new data has become available. In March 2017, Western Bay of Plenty District Council commissioned Beca Limited to provide an addendum to the 2002 SMP that addresses these changes.

## 1.2 Scope of this document

This addendum to the 2002 Omokoroa SMP has been prepared for the Western Bay of Plenty District Council by Beca Limited. The addendum is not a re-publication of the SMP but rather an update to recognise changes since 2002 including:

- Changes to land use and infrastructure
- Engineering standards and updated flows and stormwater management devices, including costs
- Statutory changes and current context
- Implementation plan update and guidance for ongoing implementation
- Revised maps



## 2 Changes since SMP 2002

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### 2.1 Current land use

At the time of the 2002 SMP, there was almost no urban development south of the railway. Rural areas between the railway and the northern (urban) end of the peninsula was also significantly undeveloped.

Since then, much of the rural land north of the railway has been developed, has consent for development or has plans for development. South of the railway, particularly in the north eastern corner, there are significant areas that have either been consented, or are subject to development planning.

The status of all these areas is mapped in Map 1.

### 2.2 Current devices

Since the 2002 SMP, some devices (ponds and wetlands) have changed and new devices have emerged. An overview of the current devices in Omokoroa is shown in Map 2.

### 2.3 Current Structure Plan (Stage 2)

The current structure plan for the area between the railway and SH2 is shown in Map 3. There are significant areas shown as Future Urban in the District Plan.

### 2.4 Land use assumptions

The land use assumed for the updated modelling and definition of devices is shown in Map 4 and Map 5.

### 2.5 Constraints

The original scope of this Addendum was intended to include an update of any stormwater-related constraints that have emerged in regional or district planning documents since the previous SMP (which contained a constraints map). However, with WBoPDC planning to develop an updated Structure Plan for the remaining areas in the near future, which would likely include a more comprehensive update of constraints identification and mapping, it was agreed this should be omitted from the current scope. It would be included in the upcoming Structure Plan work.

## 3 Hydrological and Engineering Update

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### 3.1 Introduction

Previously the hydrological analysis and device design was completed using a series of manual calculations. For this update, a 2D model has been developed to help understand the natural overland flow paths and also the flows received by each of proposed stormwater devices.

The method chosen was a Rain on Grid (ROG) approach. This method provides adequate definition and has the advantage of accurately defining catchments by providing flow to each stormwater device. For an overview of the modelling extent, refer to Map 6. The model surface was built using LiDAR flown in 2010 which was then converted to a triangulated mesh. The maximum triangle size has been limited to 200 m<sup>2</sup> in rural areas. This was reduced to 50 m<sup>2</sup> on roads and in water courses. The triangle size was reduced in these areas to ensure the model could calculate flow along roads and streams as this is where most of the overland flow converges.

Two development scenarios have been modelled and compared to define the stormwater devices. The first scenario is the 2002 land use scenario. Land use for this scenario has been defined based on the aerial imagery dated 2003-01. In the second scenario, the future land use map from the Structure Plan has been used. Land use in Omokoroa under these different scenarios is shown in Map 4 and Map 5.

The tide level has not been explicitly modelled, but a 1.09 m MSL<sup>1</sup> was used as a boundary. A tide level of 3.29 m MSL has then been added to the flood model results and affected areas along the low-lying coastal margins. This level represent the 100 year ARI tide level and is based on the Bay of Plenty Regional Councils (BoPRC) Hydrological and Hydraulic Guidelines (table 4.3), but has had 1.25 m of sea level rise applied reflecting the 2130 scenario TCP 8.5 median (rather than 0.49 m to 2090 that is described in BoPRC guideline).

### 3.2 Design rainfall

The rainfall depths used during the update modelling are based on NIWA's High Intensity Rainfall Design System (HIRDS) including an allowance of 3°C increase for climate change. HIRDS data lists a total rainfall depth of 344 mm for a 100 year 24 hour event. A full list of HIRDS figures are shown in Table 1.

We note that the WBoPDC "Development Code: Design" (Chart SW2A dated October 2008) appears to use design rainfall depths based on Katikati rainfall data with climate change to 2040, although it also states that they are from HIRDS v1.5b. The HIRDS v3 data we have used should supersede this data. We have also added 3°C of climate change which is significantly more than what was allowed for in the Development Code. Despite this, climate change estimates from HIRDS v3 are still lower than the figures in the Development Code, varying from 75% to 90% for more frequent storms, to similar values for the 1% Annual Exceedance Probability (AEP) storms.

We have also compared the Development Code and HIRDS v3 to the Tauranga City Council (TCC) design rainfall figures, which include climate change to 2055. Our conclusion from all of this is that the Development Code design rainfall depths are significantly more conservative than HIRDS v3 and generally more conservative than TCC. The design rainfall depths have a significant influence on infrastructure sizing, and we recommend that consideration be given to review the figures in the Development Code due to advances

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<sup>1</sup> MSL for Tauranga: <http://www.linz.govt.nz/sea/tides/tide-predictions/standard-port-tidal-levels>

in tools, data and climate change predictions (including the 3°C change of climate horizon being promoted by BoPRC).

Table 1: HIRDS rainfall depths including climate change (mm).

ARI (y)	AEP	0.17h	0.33h	0.5h	1h	2h	6h	12h	24h	48h	72h
1.58y	0.63	10.7	16.5	21.2	32.7	42.7	64.8	84.4	110.1	132.8	148.1
2y	0.50	11.7	18.0	23.1	35.5	46.4	70.5	91.9	119.7	144.4	161.0
5y	0.20	15.1	23.4	30.2	46.7	61.0	93.2	122.0	159.3	192.7	215.6
10y	0.10	18.0	27.9	36.0	55.8	73.3	112.6	147.3	193.3	235.2	263.2
20y	0.05	21.2	33.1	42.7	66.5	87.3	134.7	177.0	232.7	284.0	318.6
30y	0.03	23.3	36.3	47.1	73.7	97.0	150.2	197.9	260.8	317.4	356.1
40y	0.03	24.9	38.9	50.5	78.7	103.7	160.6	211.5	278.6	339.9	381.9
50y	0.02	26.3	40.9	53.2	83.0	109.2	169.0	222.7	293.4	358.6	403.4
60y	0.02	27.4	42.8	55.4	86.6	114.0	176.3	232.3	305.9	374.0	420.6
80y	0.01	29.3	45.6	59.3	92.5	121.8	188.4	248.1	326.6	399.4	449.3
100y	0.01	30.9	48.1	62.4	97.3	128.2	198.3	261.1	343.7	420.4	472.8

These depths have been converted to a 24 hour hyetograph using a nested storm method. This method allows the test of a range of (critical) durations within one rainfall profile.

The rainfall event has been applied to the model as net or excess rainfall. This means the losses (infiltration) have been calculated and removed from the rainfall hyetograph before it has been applied to the model surface. Figure 1 shows the nested rainfall hyetograph (blue) and the losses are plotted on top of this (red). The remaining rainfall is then applied to the model.

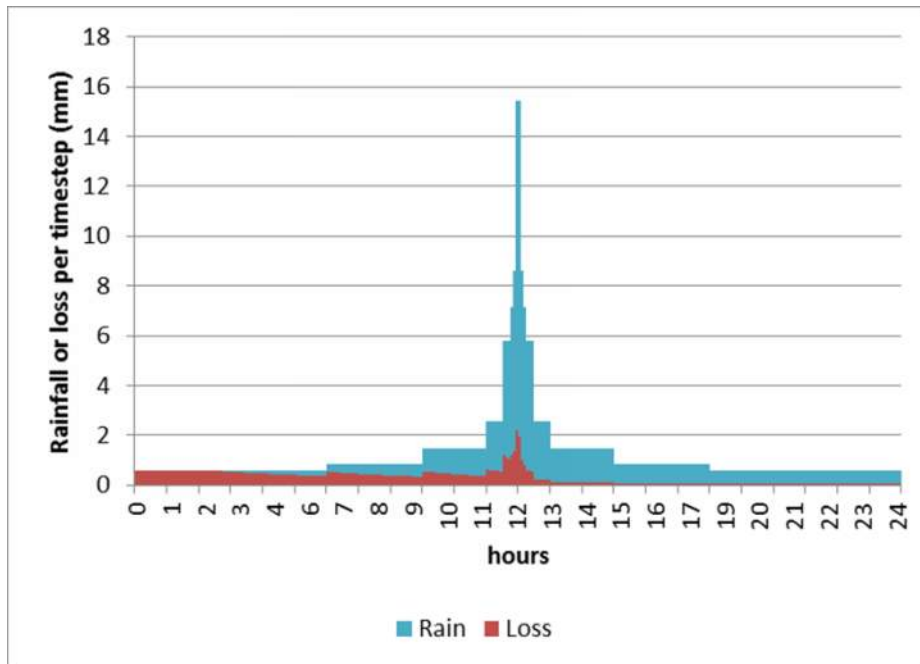


Figure 1: Design rainfall hyetograph including loss

Losses are based on the Soil Conservation Service (SCS) curve number method (similar to that used by Auckland Council, technical publication 108). Curve numbers are based on soil type and land use cover. The curve numbers used for each of the land use and soil types are shown in Table 2.

### 3.3 Existing pipe network modelling

The scope work for this SMP addendum does not include any modelling of pipe systems. However, WBoPDC has had modelling undertaken of all pipe systems in the area north of the railway, as shown in Map 6. At some stage, there may be merit in creating full 1D/2D coupled models for the pipe and overland flow systems. However, in the meantime, the pipe network modelling is useful for understanding service level of the infrastructure, while the 2D rain on grid modelling undertaken for this addendum provide guidance on where secondary flow and flooding is likely to occur ( Refer Map 7).

### 3.4 Future land use modelling

The future land use maps used in the modelling has been based on the structure plan zoning. The zone and soil type dictate which curve number or runoff was applied to each area. Table 2 shows the curve number for each soil type (A, B or C) and the land use zoning. The soil types were previously mapped and have been relied upon for this update. Soils in groups B and C were identified in the Omokoroa catchment. The Land use maps (Map 4 and Map 5) show the soil type used in each zone.

Table 2: Impervious area assumptions and weighted curve numbers.

Scenario	Land use	Percent Impervious [%]	Soil Group A	Soil Group B	Soil Group C
2002 Base	Rural/reserve (Orchards)	2	33.3	58.8	72.5
	Rural residential	15	47.9	66.6	77.6
	Medium density residential	50	68.5	79.5	86.0
	High density residential	80	86.2	90.6	93.2
Structure Plan	Rural residential	15	47.9	66.6	77.6
	Medium density residential	50	68.5	79.5	86.0
	Industrial	72	81.0	88.0	91.0
	Future Urban -->Medium Density	50	68.5	79.5	86.0
	Commercial	85	89.0	92.0	94.0
	Residential	80	86.2	90.6	93.2
	Stormwater Reserves	0	39.0	61.0	74.0

### 3.5 Hydrological effects

As expected, in areas that have changed from rural to residential, causing an increase in impervious area, the peak flows have increased. This is the main driver to provide flood detention. The required flood peak detention volume has been calculated such that runoff is held back so that the peak flow from each catchment under the future structure plan development scenario is no higher than under the 2002 development scenario.

The process followed for this was:

- Based on the previous locations for stormwater devices, extract the flow from the 2002 model which reaches the device location
- Using the structure plan scenario model extract the flow at the same location
- Analyse the two hydrographs and calculate the required storage to match the peak flows from the developed land to peak flows before development
- Check catchment areas serviced for each basin identifying any gaps and adding any required devices

### 3.6 Stormwater quality

The calculation of stormwater quality volume is based on the Auckland Council method. This method uses a rainfall depth equivalent to a 1/3 of the 2 year ARI 24 hour event (one third of 119.7 mm) as the volume that requires treatment. In this case the depth used is 40 mm.

The rainfall depth is then multiplied by the catchment area and runoff coefficient (based on land use and the 2 year 24 hour event) for each catchment. This has not been modelled. The pervious and impervious areas are calculated separately then combined to give a water quality treatment volume. These are then added to the required detention to give a total volume.

Appendix 2 (Table A) shows the water quality volume for each of the ponds (shown in Map 8 and Map 9) based on the area the pond will treat.

Pond OM23 contains the water quality volume for both OM23 and 23-1.

### 3.7 Stormwater management devices

Map 8 and Map 9 shows the location of each of the stormwater devices based on the volumes provided in Appendix 2 (Table A). All of the devices shown have been assumed to be 2 m deep with areas adjusted to meet this.

The locations chosen for each of the devices are similar to those present in the previous report. Three new ponds (ND1-3) have been added to ensure all development flows are captured and treated before release.

Appendix 2 (Table A) shows total volumes range from 900 m<sup>3</sup> to 38,000 m<sup>3</sup> and an overall volume of 295,600 m<sup>3</sup> for Omokoroa based on the current Structure Plan.

### 3.8 Stormwater infrastructure costs

Providing cost estimates for the infrastructure required for stormwater management was included in the original scope of this Addendum. However, WBoPDC are planning to develop an updated Structure Plan for the remaining areas in the near future, which could change the sizing and layout of devices as shown in this report, and therefore cost estimates have been omitted from the current scope. They will now be included in the upcoming Structure Plan work.

## 4 Statutory Update

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### 4.1 Stormwater discharge consents

The stormwater resource consents associated with the Omokoroa Peninsula have been provided by WBoPDC for review. Commentary on each consent is provided in Table 1 of Appendix 3 – Planning Review Memo. The following summary is provided.

Two resource consents have expired (RC02 5191 – to discharge stormwater from a 12 lot residential subdivision and RC60714 – discharge stormwater from Waterview Terrace into the harbour). It is assumed the activity covered by these consents have been captured under the Stormwater Management Plan (SMP) required by RC61768.

Resource consent 61768 provides for the comprehensive management of stormwater within the area of the Omokoroa Peninsula Stormwater Management Plan. This consent requires a stormwater monitoring programme.

Resource consent 61917 for discharging stormwater to ground from the Omokoroa Green Waste Facility expires on the 28 February 2018 and a renewal consent needs to be lodged as soon as possible in order for the stormwater discharge to be lawfully discharged after the expiry date.

Resource consent 65388 for discharging stormwater from a 3.7 hectare residential catchment to a pond (Lily Pond) draining to the Tauranga Harbour will need to be transferred to RC61768 as part of the SMP (if it hasn't already).

### 4.2 Regional and District Plans

A review of the relevant Regional and District Plans has been undertaken for the ongoing implementation of the Omokoroa SMP. Commentary on each of the plans are provided.

#### 4.2.1 BoPRC Regional Water and Land Plan 2008 (RWLP)

The RWLP is regularly updated to reflect national policy statements that are being promulgated. The most recent updates include;

- 28 June 2011; Insert policies A4 and B7 from the National Policy Statement for Freshwater Management into the Regional Plan (Policy 43A Discharges to Water and Land and Policy 68A Take and Use of Surface Water and Groundwater); and
- 8 October 2014; Insert new paragraph from policy A4 of the National Policy Statement for Freshwater Management 2014 into the Regional Plan (Policy 43A Discharges to Water and Land).

The SMP must be consistent with Policy 43 and 43A in consideration of the cumulative effects of the discharge of contaminated stormwater on the coastal environment. The appropriate actions to *avoid, remedy or mitigate* such effects have been addressed through the requirements of the consent conditions, such as; to implement the stormwater monitoring program required by the existing comprehensive consent RC61768 (Condition 17). A stormwater monitoring program is assumed to have been developed and is being implemented.

The conditions of RC61768 also provide for Policy 43 and 43A. In order to comply with these conditions, WBoPDC as the consent holder, should be able to demonstrate actions around their maintenance programme in the Asset Management Plan and potentially develop a stormwater pollution prevention bylaw to address stormwater discharges from high risk industrial or commercial premises.

### **Regional Water and Land Plan (RWLP) - Discharge of Stormwater Provisions**

Issues identified in the RWLP regarding stormwater include:

- The lack of integrated and comprehensive management of stormwater may increase adverse effects on the environment
- There is the potential for stormwater to transport contaminants, which adversely affect receiving environments
- Excessive rates and volumes of stormwater discharged from point sources can lead to erosion and scour
- Increased volumes of stormwater are being diverted, concentrated and discharged to streams, rivers, lakes and coastal waters from developed areas as a result of the creation of impermeable surfaces that reduce the natural infiltration of rainwater, and a lack of reuse of stormwater

Best practice in managing any adverse impacts of stormwater is primarily achieved through the resource consent process and compliance with relevant conditions of consent. For the SMP, the relevant resource consent and associated conditions is RC61768. The consent conditions provide actions (monitoring, maintenance, recording and reporting) for WBoPDC that are consistent with the objectives and policies of the RWLP.

The *Stormwater Strategy* for the Bay of Plenty region and the *Stormwater Design Guidelines* provide comprehensive guidance to city and district councils and the community about the best practicable options. The WBoPDC has developed their own stormwater strategy that is consistent with these guidance documents. The SMP should reference the WBoPDC stormwater strategy documents.

The *Erosion and Sediment Control Guidelines* for earthworks have been extensively reviewed. The latest revised guidelines should be implemented as required on all earthworks activities. The SMP should reference the latest BoPRC guidelines (2010/01).

#### **4.2.2 BoPRC Proposed Coastal Environment Plan**

The Proposed Regional Coastal Environment Plan (PRCEP) is effectively operative and has specific policies regarding stormwater discharges to the coastal environment. The SMP is consistent with the relevant policies through the implementation of the existing resource consent RC61768 and the associated conditions of consent including design and monitoring requirements. The SMP could provide a review process for progressive improvement to the stormwater discharge quality to the coastal environment.

## 4.3 Western Bay of Plenty District Council Plans

### 4.3.1 WBoPDC Operative District Plan 2012

The Operative Plan 2012 is the culmination of the Proposed Plan First Review process (a review of the Operative Plan 2002). It became operative on 16 June, 2012. The following provisions are considered relevant to the SMP.

- Chapter 4 – Information requirements for any resource consent applications
- Chapter 5 – Natural Environment

The most relevant is *Chapter 12 – Subdivision*, where the key stormwater management policies are defined in *12.4.5 Stormwater* and include policies from 12.4.5.1 to 12.4.5.16. The SMP is considered consistent with these policies through the implementation of the existing resource consent RC61768 and the associated conditions of consent including design and monitoring requirements.

### 4.3.2 WBoPDC Development Code 2009

The 2009 Development Code provides a means of compliance when designing, constructing and maintaining engineering works that are required;

- to fulfil conditions imposed by a resource consent
- for works that fall within the requirements of the District Plan, if a consent is not required such as a permitted activity condition
- for capital or maintenance works commissioned by Council

The works apply to urban, rural residential and rural applications. Any alternative means of compliance submitted for approval (i.e. different design methods or philosophy or principles) will be considered on a case by case basis. The Code is one document, divided into two main sections, Design and Construction

The stormwater design and construction requirements are provided in section *5.1.2 - Flowpaths*, *5.1.3 - Freeboard*, *5.1.4 - Rainfall Intensity*, *5.1.5 - Stormwater Consents*, and *CS5/6 Stormwater Construction*.

As WBoPDC wish to promote innovation and flexibility in the design and servicing of subdivision and development, this can lead to developments that are more responsive to the local environment. It may also result in more efficient use of infrastructure services. To this end WBoPDC has incorporated development guidelines within the Development Code which identify best practice approaches and consentable solutions to subdivision and development and encourage developers to consider these approaches when designing a development. Thus the Development Code is seen as being one means of compliance and alternatives are encouraged.

#### Joint Infrastructure Development Code

Western Bay Council and Tauranga City Council are working together to create a single infrastructure and engineering compliance document that will provide consistency and simplicity for the industry. The Joint Infrastructure Development Code will replace Tauranga City's Infrastructure Development Code and Western Bay's 2009 Development Code.

The joint document is not being built from scratch. Instead, the two existing Codes are being compared to each other. The joint code was scheduled to be produced by the end of October 2016, however, this has been delayed and is still to be completed.



#### 4.3.3 Omokoroa Structure Plan (2016)

The Omokoroa structure plan is located in the District Plan within Chapter 12 – Subdivision and Development with the detail in Appendix 7 – Structure Plans (Section 4). Various plans included in the Structure Plan include; Roading Projects Plan, Walkway Plan, Omokoroa Services, Road Catchments, Boundaries and Earthworks procedures.

#### 4.3.4 WBoPDC Asset Management Plan (AMP) – Stormwater 2013

Assets within this asset management plan collect and dispose of stormwater runoff within WBoPDC's urban communities. As the service provider and owner of public stormwater assets, WBoPDC is responsible for providing funding for the development of new assets for growth and demand, operations and maintenance, asset renewals and the disposal of assets at the end of their service lives. Council's stormwater assets include stormwater reticulation (i.e. pipes and manholes), pump stations and outlets into waterways, ponds and drainage reserves. Stormwater works identified in the Omokoroa Structure Plan Stage 2 have been postponed beyond the LTP 2012-2022. This is a result of the slowing of growth assumed in Council's new forecasts. In terms of funding major stormwater projects within Omokoroa, there is funding allocated in 2018/2019 period.

## 5 Implementation Plan

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### 5.1 Review of previous Implementation Plan

Most of the Implementation actions have been addressed through District Plan provisions, the Development Code and more specifically through the requirements of RC61768 conditions. The table provided in the Planning Review Memo (Appendix 3) provides further review and comment on the implementation actions.

### 5.2 Revised Implementation Plan

Based on the review of the implementation plan, the following aspects of the Implementation Plan need to be considered.

- There is no 100 year flood model available for Omokoroa. The 2 year and 100 year ARI flood peaks assessment is not required (can't require this at present if WBoPDC doesn't have a 100 year model), however, low impact design and attenuation ponds etc. are recommended through policies of the District Plan. While there is no overall plan, as subcatchments progressively develop modelling of the development and adjacent areas can be used to confirm that appropriate attenuation is achieved by detention ponds, and to refine the local extent of flood risk. These should be required on each new development. Alternatively, WBoPDC might choose to develop a comprehensive 1D/2D coupled model for the peninsula that can be used to test the performance of proposed developments
- Actions to avoid, remedy or mitigate environmental effects need to be identified as required by the consent conditions, such as; to implement the stormwater monitoring program required by the existing comprehensive consent RC61768 (Condition 17). Assumed to have been developed and is being implemented
- There was no specific reference to the impervious area requirements in the WBoPDC District Plan or the Development Code. Incorporation into District Plan or Development Code could be something that is recommended in particular as the Implementation Method makes a specific recommendation that has not been implemented – WBoPDC should at least know why it has not been implemented
- No soak pits are to be used in steeper areas or where there are sensitive soils. RC61768 condition 6.1 - The use of soakholes is minimised
- The education of the general public, property developers and contractors should be a focus for both Regional and District Council. On-going implementation through WBoPDC publications and workshops as required

### 5.3 Guidance for developers

The following points are specific for developers and will assist in the implementation of the SMP and the Omokoroa Structure Plan.

- Various schedules and plans are set out in the Omokoroa Structure Plan including the infrastructure schedule which highlights to developers that stormwater projects (ponds/ reticulation) are required to be 100% developer funded
- Developers should be made aware of the Omokoroa stormwater consent RC61768 which outlines the existing consented infrastructure in the area (refer to Figures in RC61768)

- Encourage stormwater systems to be designed, constructed and maintained to appropriate design standards that are consistent with the requirements of this regional plan, and the principles of Low Impact Design
- Encourage use of innovative methods to manage and treat stormwater to appropriate standards before it is discharged to streams, rivers, lakes and coastal waters. This includes, but is not limited to, swales, infiltration systems, wetlands, and other stormwater management and treatment methods that are appropriate to the site and individual circumstances
- The Erosion and Sediment Control Guidelines for earthworks have been extensively reviewed. The latest revised guidelines should be implemented as required on all earthworks activities. The developers should be aware of the latest BoPRC guidelines (2010/01)

## 5.4 Recommendations for Stormwater Management Plan

To be consistent with the objectives and policies of the RWLP and in accordance with the consent conditions, the following recommendations for SMP should be considered;

- WBoPDC to prepare a 1 in 100 year flood model as the basis for implementing the SMP, Infrastructure Development Code and District Plan provisions
- Implement changes to the District Plan and Infrastructure Development Code to provide for a maximum of 80% impervious area in high density and commercial areas, 50% in medium density residential areas, and 15% in rural residential and reserve areas
- Implement other changes necessary to support implementation of low impact design solutions
- Use management measures to minimise the contamination of urban stormwater, including:
  - (a) At-source management of contaminants.
  - (b) Use of best practicable options to reduce levels of contaminants entering surface water bodies.
  - (c) Treatment of stormwater prior to discharge to receiving environments where appropriate.
  - (d) Prevention of inappropriate discharges of contaminants to stormwater systems, such as appropriate site management, and appropriate disposal of wastes.
- Encourage measures to reduce the volume of stormwater discharged to the environment from urban areas, including:
  - (a) The appropriate design of subdivisions and other land use developments to minimise stormwater runoff, such as minimising the increase in the area of impermeable surfaces and retaining natural flood retention areas.
  - (b) On-site management and disposal of stormwater to soakage, where practicable and appropriate.
  - (c) Storage and reuse of stormwater, including for irrigation or creation of aquatic habitats, where practicable and appropriate.
  - (d) Retention or creation of non-structural stormwater controls, where appropriate.

- Manage the discharge of stormwater from industrial or commercial sites, particularly from high risk facilities (identified in Schedule 4 of the RWLP), where such discharges are made to a council stormwater system. Contaminants from industrial or commercial tradewaste, or from the storage of hazardous materials and waste products, should not be allowed to discharge to a stormwater system, or to land where the contaminants may enter the stormwater system. Contaminated stormwater from industrial or commercial sites is to be appropriately treated to reduce contaminants to acceptable levels prior to discharge to stormwater systems.
- A stormwater pollution prevention bylaw, similar to TCC's, to address stormwater discharges from high risk industrial or commercial premises could be developed and implemented as part of compliance with the consent conditions and with the BoPRC RWLP
- Actions to avoid, remedy or mitigate environmental effects need to be identified as required by the consent conditions, such as; to implement the stormwater monitoring program required by the existing comprehensive consent RC61768 (Condition 17). Assumed to have been developed and is being implemented
- Joint Infrastructure Development Code –review status and consider review of specific requirements associated with Omokoroa development areas to ensure they reflect the Structure Plan and consent conditions
- The Stormwater Strategy for the Bay of Plenty Region and the Stormwater Design Guidelines provide comprehensive guidance to city and district councils and the community about the best practicable options. The WBoPDC has developed their own stormwater strategy that is consistent with these guidance documents. The SMP should reference the WBoPDC stormwater strategy documents
- The Erosion and Sediment Control Guidelines for earthworks have been extensively reviewed. The latest revised guidelines should be implemented as required on all earthworks activities. The SMP should reference the latest BoPRC guidelines (2010/01)

## 6 Upcoming Structure Plan

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It is our understanding that in the near future WBoPDC will be developing a Structure Plan covering development of the remaining areas of the peninsula. This SMP Addendum provides some elements relevant to stormwater infrastructure development and management on the peninsula. However, as part of the Structure Plan process, further effort should be undertaken in certain elements of the stormwater management planning.

### 6.1 Design rainfall data

As highlighted earlier in this report, there are significant differences between the Development Code design rainfall figures, the latest HIRDS v3 rainfall, and that use by TCC for Tauranga. Further, there needs to be an update to account for longer climate change horizons, in accordance with current planning at a regional level. We recommend that if possible this be undertaken before further modelling and sizing of infrastructure for the Structure Plan and for upcoming development is committed. This should be undertaken in consultation with the BoPRC.

### 6.2 Constraints mapping

As part of the Structure Plan, we expect that there will be a thorough review of the various constraints that affect development potential, protection of important features, and location of infrastructure in the Structure Plan area. Stormwater-related constraints (both in terms of protecting of water bodies, avoiding flood hazards, and also setting aside land for infrastructure) will be undertaken. This is a critical element of ensuring compatibility of the development and infrastructure with the environment.

### 6.3 Land use planning

The nature of the land use planned, including percentage of imperviousness, potential for contaminant discharges, and provision for stormwater infrastructure and secondary flow paths, will be an important component in identifying the location and form of different land uses.

### 6.4 Update modelling

The current rain on grid models will need to be updated to account for any changes to design rainfall depths, and also for differences in land from the assumptions in the current work. For new development areas with no detail yet available on pipe systems, the rain on grid 2D model should be adequate. The modelling might also assist in refining secondary flow paths and flood risk areas.

### 6.5 Update stormwater device details

Based on the land use and updated modelling, device sizing (ponds etc) will need to be refined. The land use planning might also influence the location of some devices, depending on the nature of development that is identified.

Once devices have been updated based on the Structure Plan land use, capital cost estimates for stormwater infrastructure will be able to be identified.

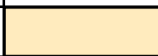



## 6.6 Implementation plan

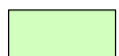
This Addendum to the SMP identifies some further work needed on implementation plan for future development. In principle this should be sufficient to also cover the new Structure Plan area, unless there are material changes to the nature and form of development relative to what is currently occurring on the peninsula.

Appendix 1

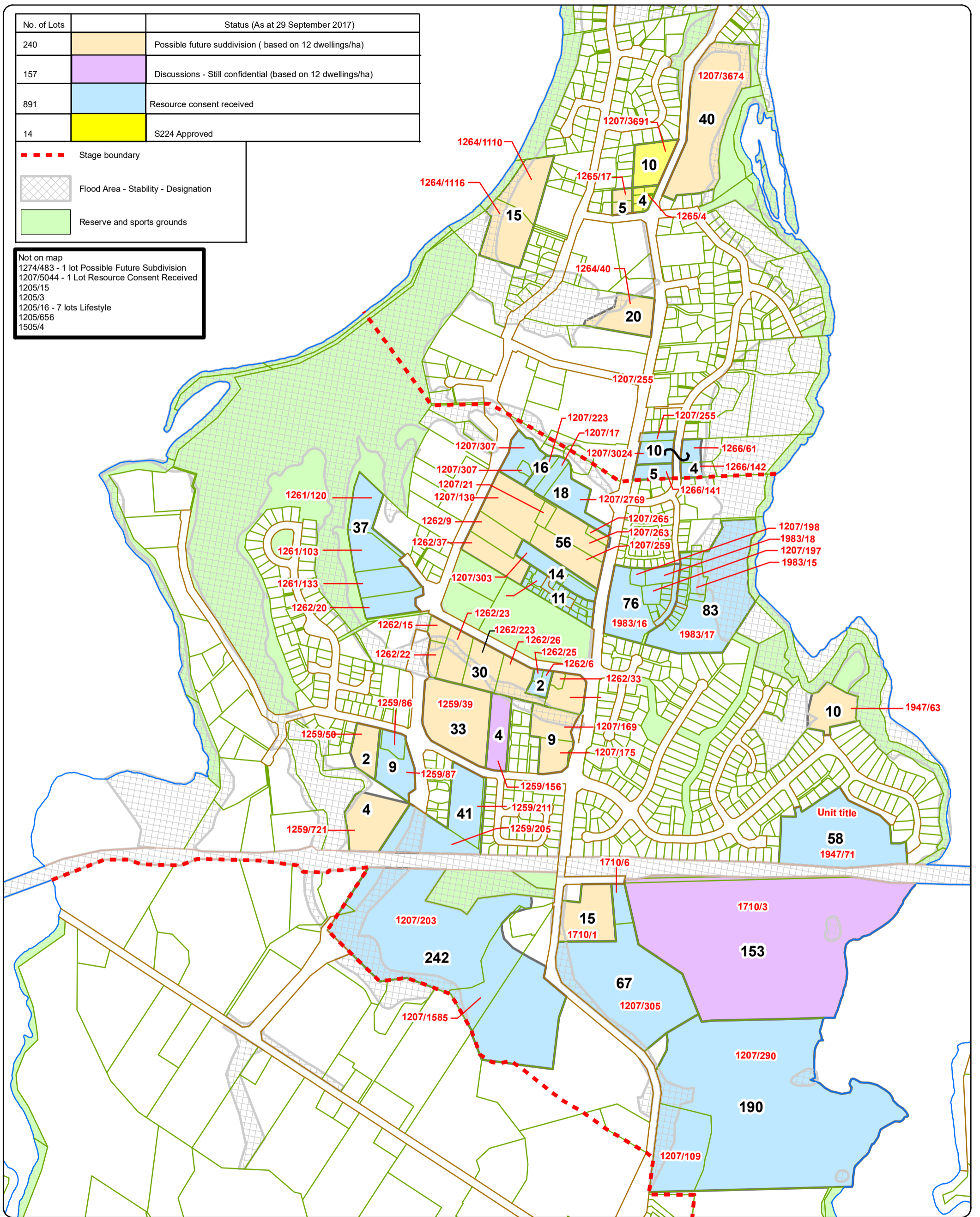
## Maps



No. of Lots		Status (As at 29 September 2017)
240		Possible future subdivision ( based on 12 dwellings/ha)
157		Discussions - Still confidential (based on 12 dwellings/ha)
891		Resource consent received
14		S224 Approved

-  Stage boundary
-  Flood Area - Stability - Designation
-  Reserve and sports grounds

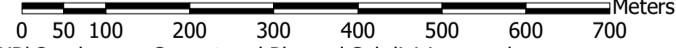
Not on map  
 1274/483 - 1 lot Possible Future Subdivision  
 1207/5044 - 1 Lot Resource Consent Received  
 1205/15  
 1205/3  
 1205/16 - 7 lots Lifestyle  
 1205/656  
 1505/4



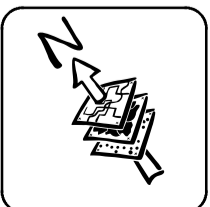
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Email: [gis@westernbay.govt.nz](mailto:gis@westernbay.govt.nz)  
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 Operator: mbl  
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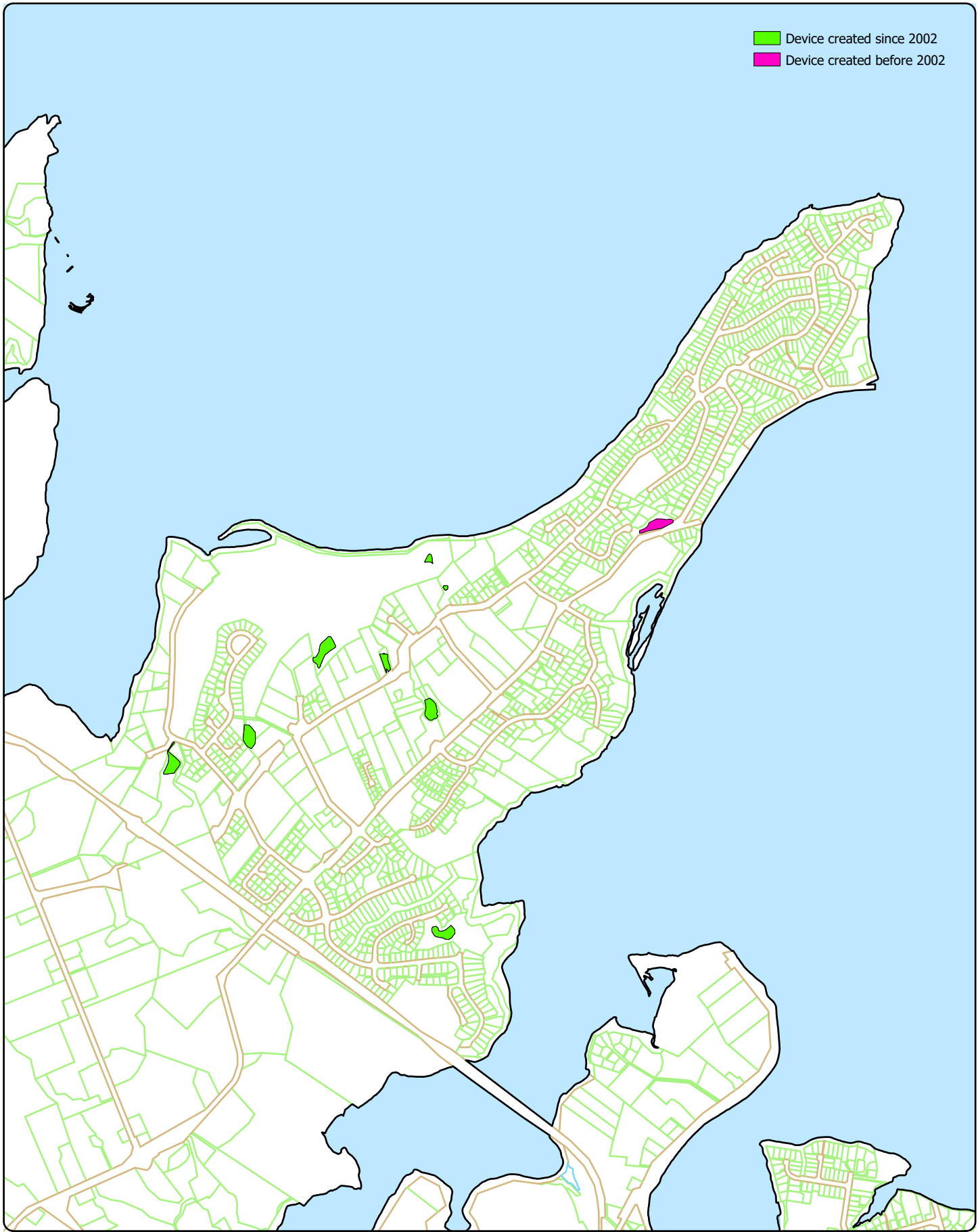
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Map 1: Omokoroa  
 Current and Planned Subdivisions  
 Along with Proposed Dwelling Counts







- Device created since 2002
- Device created before 2002

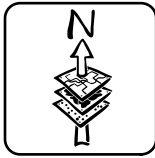
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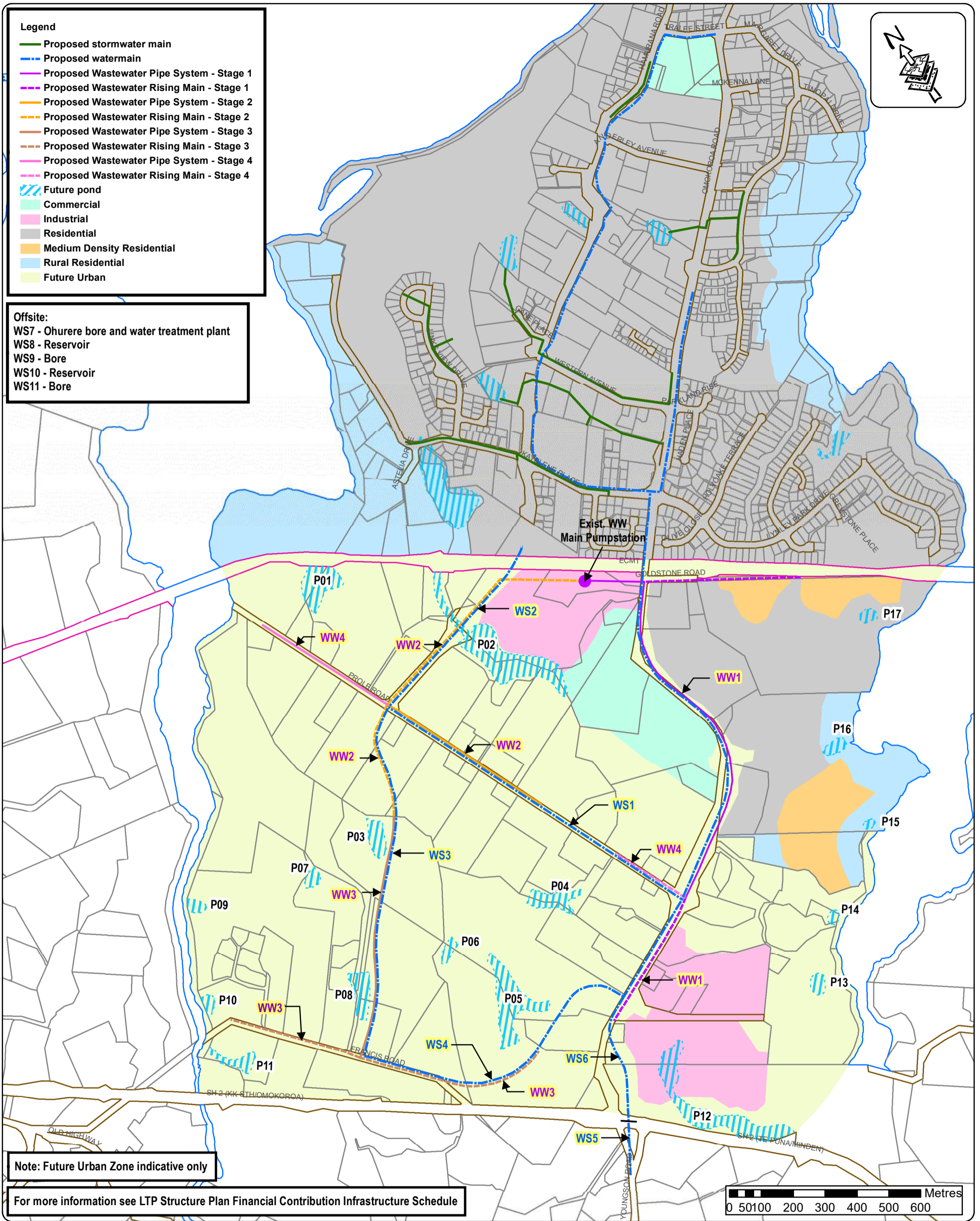
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 Date: 15-Nov-17  
 Operator: mbl  
 Project: 19561 - Omokoroa Stormwater Management Plan

Scale A4 -1:20,000  
 0 70 140 280 420 560 Meters



**Map 2: Current Devices (Ponds and Wetlands)  
 in Omokoroa**





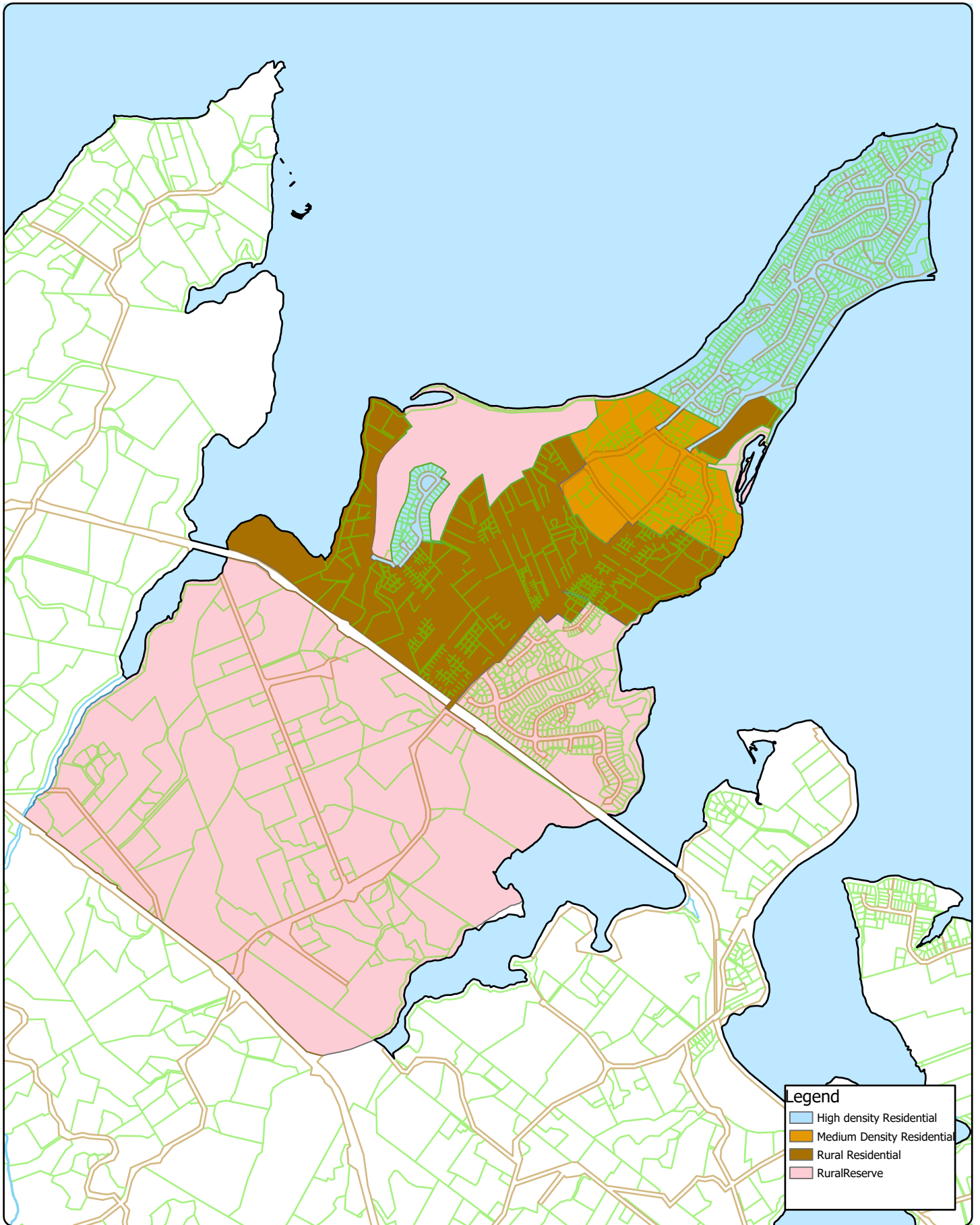
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 Date: 14/11/2017  
 Operator: kjw  
 Map: E:\Shape\MLB\Map\Structure Plans\Omokoroa Services.mxd

Scale A3 - 1:11,000  
 0 100 200 400 600 800 Meters



Map 3: Current Structure Plan  
 Omokoroa Services



**Legend**

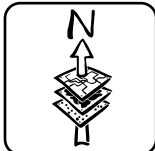
- High density Residential
- Medium Density Residential
- Rural Residential
- RuralReserve

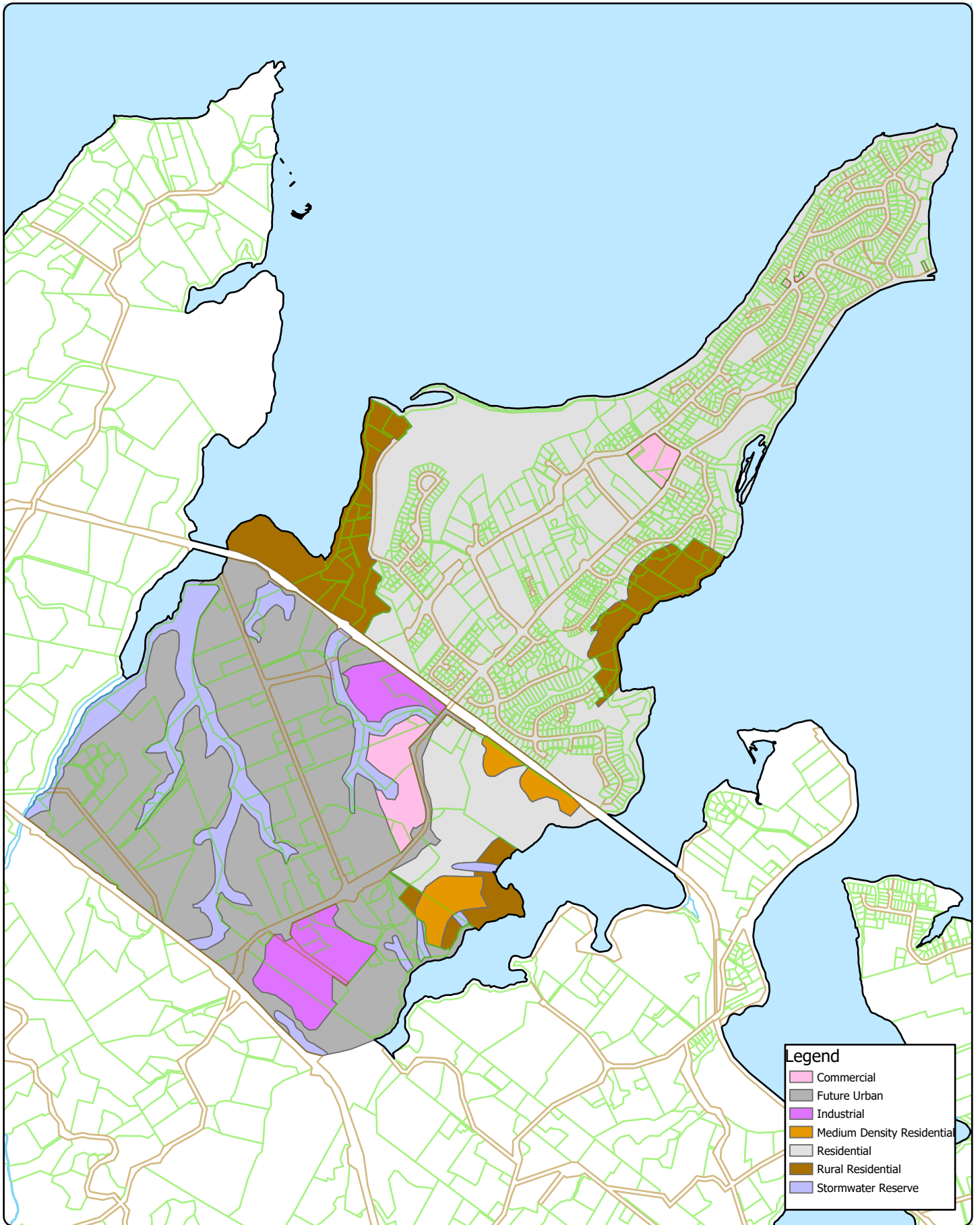
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 Date: 14/11/2017  
 Operator: kjw  
 Project: 19561 - Omokoroa Stormwater Management Plan - Land Use



Map 4: Omokoroa Land Use 2002





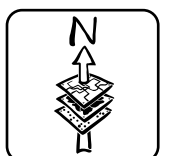
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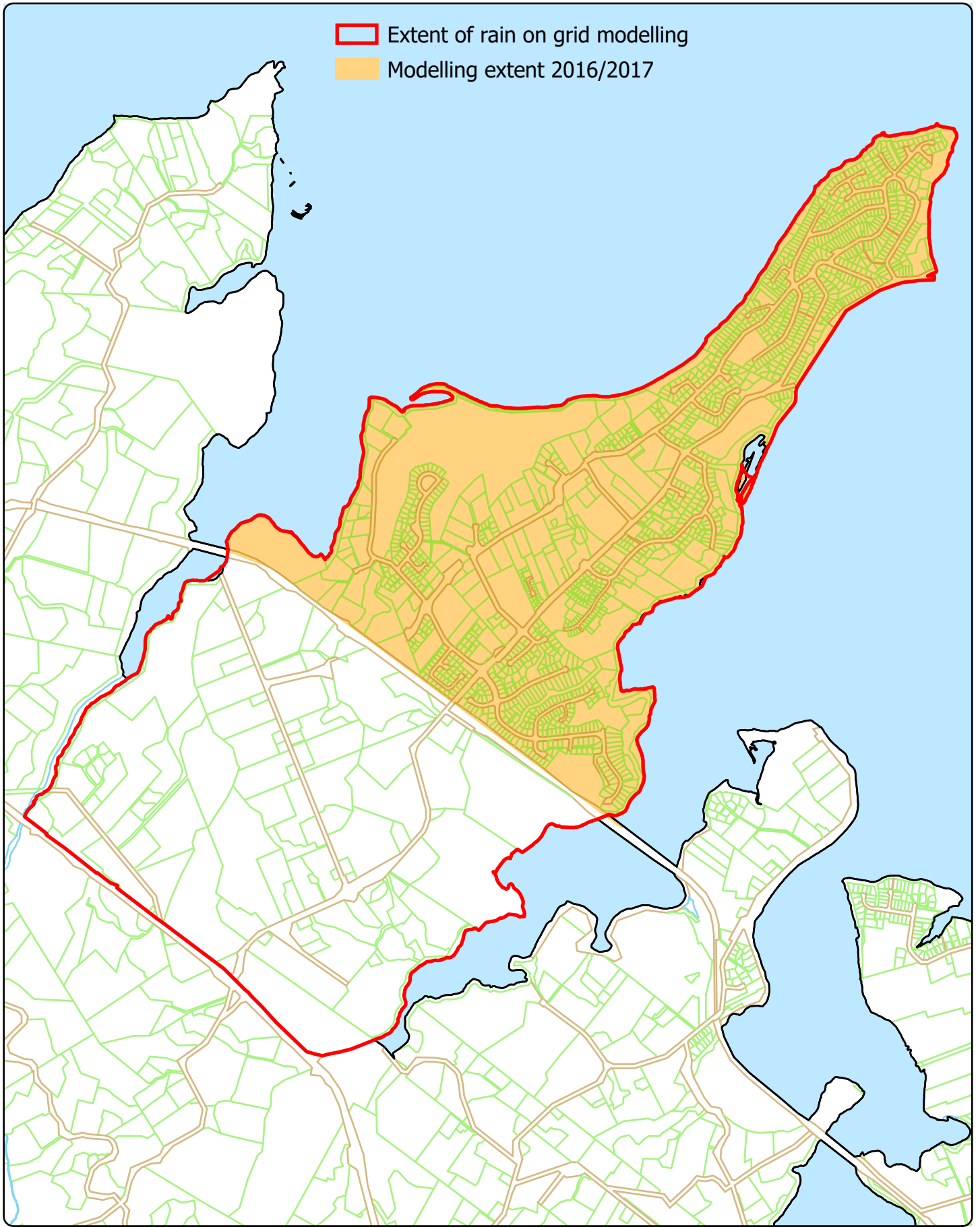
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 Date: 14/11/2017  
 Operator: kjw  
 Project: 19561 - Omokoroa Stormwater Management Plan - Land Use

Scale A4 -1:25,000



Map 5: Omokoroa Future Land Use





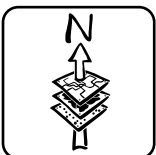
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 Operator: mbl  
 Project: 19561 - Omokoroa Stormwater Management Plan - Rain

Scale A4 1:25,000



Map 6: Modelling Extent





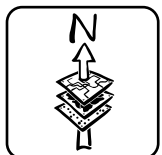
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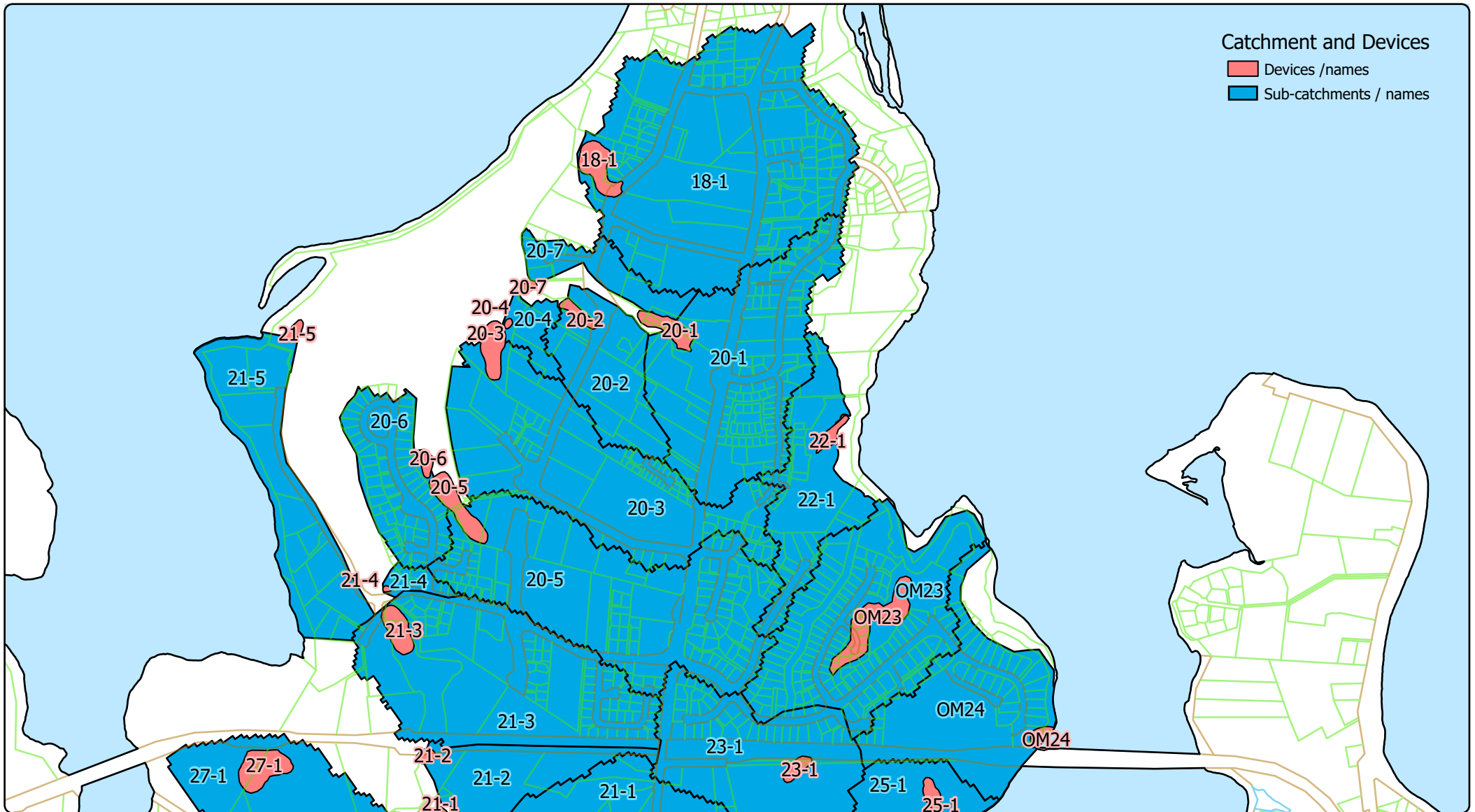
Email: [gis@westernbay.govt.nz](mailto:gis@westernbay.govt.nz)  
 Date: 14/11/2017  
 Operator: kjw  
 Project: 19561 - Omokoroa Stormwater Management Plan - Flooding Plan

Scale A4 1:25,000



**Map 7: Omokoroa Flooding Extent**





Catchment and Devices

- Devices / names
- Sub-catchments / names

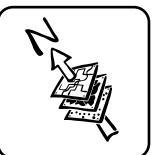
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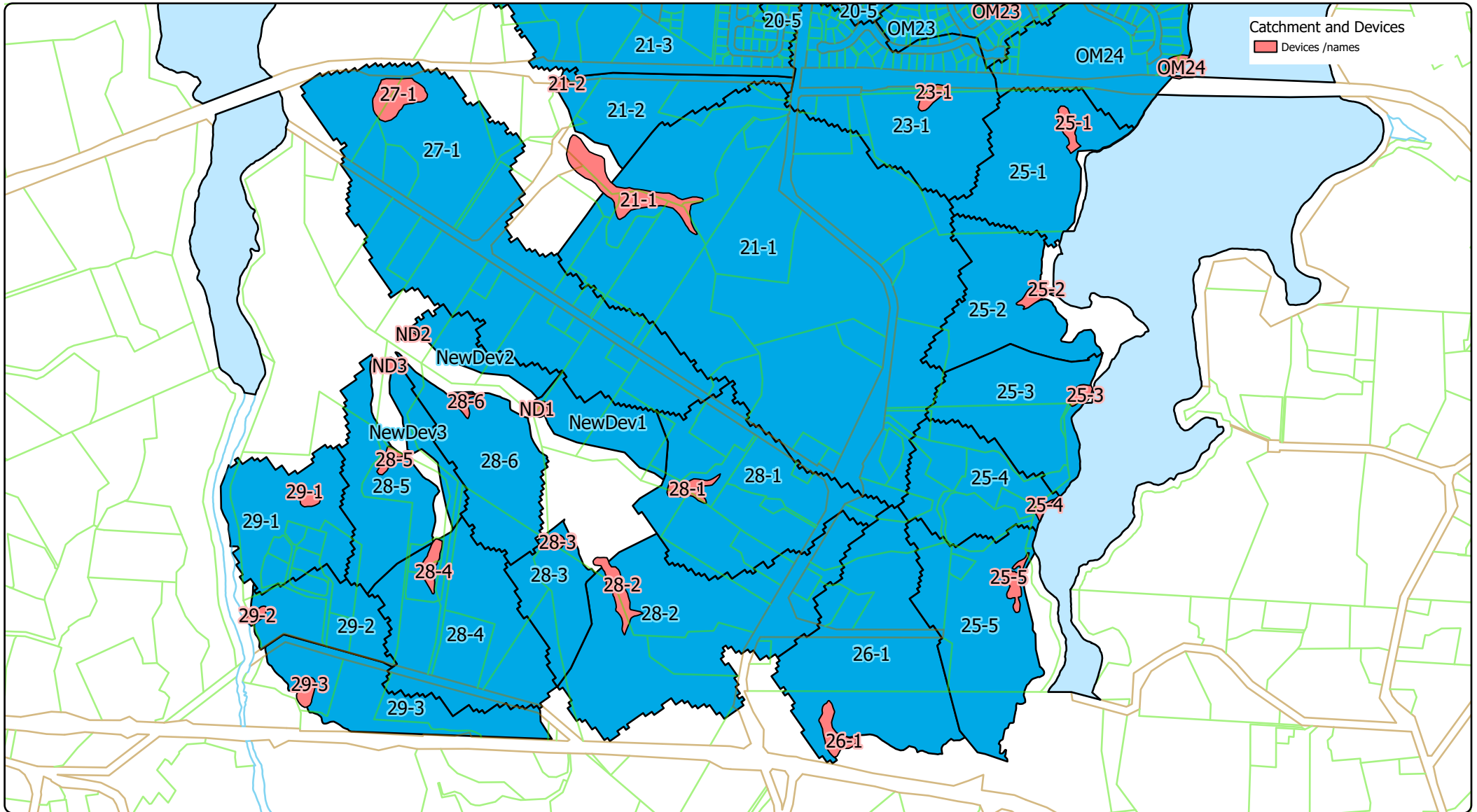
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 Date: 16-Nov-17  
 Operator: mbl  
 Project: 19561 - Omokoroa Stormwater Management Plan - Catchment and Devices

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Map 8: Omokoroa Catchments and Devices - North





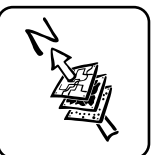
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 Date: 14/11/2017  
 Operator: kjw  
 Project: 19561 - Omokoroa Stormwater Management Plan - Catchment and Devices

Scale A4 - 1:13,428



Map 9: Omokoroa Catchment and Devices - South





Appendix 2

## Stormwater Management Devices



Table A: Stormwater Management Devices

Pond Number	Area Served by pond [ha]	Water Quality Volume [m <sup>3</sup> ]	Flood Detention Volume [m <sup>3</sup> ]	Total Pond Volume [m <sup>3</sup> ]	Q100 Inflow [m <sup>3</sup> /s]	Q100 Outflow [m <sup>3</sup> /s]	Type of pond
18-1	33.9	11,000	6,000	17,000	13.74	12.53	SWQ and Det
20-1	20.1	6,200	5,900	12,100	8.48	6.45	SWQ and Det
20-2	7.8	2,600	2,700	5,300	3.34	2.54	SWQ and Det
20-3	22.0	7,200	6,500	13,700	7.29	5.35	SWQ and Det
20-4	1.9	700	200	900	0.36	0.32	SWQ and Det
20-5	25.1	8,200	9,800	18,000	10.49	7.26	SWQ and Det
20-6	1.7	2,500	800	3,300	2.70	2.70	SWQ and Det
20-7	3.4	1,200	700	1,900	1.49	1.29	SWQ and Det
21-1	64.1	16,900	21,100	38,000	23.72	16.92	SWQ and Det
21-2	6.4	1,900	900	2,800	1.78	1.49	SWQ and Det
21-3	21.8	6,300	6,200	12,500	8.02	6.46	SWQ and Det
21-4	1.0	400	300	700	0.50	0.45	SWQ and Det
21-5	12.1	2,100	1,000	3,100	2.82	2.78	SWQ and Det
22-1	9.3	2,400	2,500	4,900	4.11	3.07	SWQ and Det
23-1	16.8	-	7,200	7,200	4.32	2.36	Detention only (SWQ in device OM23)
25-1	9.9	3,000	3,900	6,900	5.18	3.45	SWQ and Det
25-2	8.9	2,300	2,400	4,700	4.12	3.00	SWQ and Det
25-3	9.4	2,100	2,300	4,400	3.57	2.63	SWQ and Det
25-4	8.2	1,800	2,000	3,800	3.17	2.39	SWQ and Det
25-5	12.7	3,100	3,700	6,800	5.52	4.02	SWQ and Det
26-1	17.6	5,200	5,500	10,700	7.36	5.21	SWQ and Det
27-1	36.6	8,600	11,200	19,800	9.29	6.35	SWQ and Det
28-1	16.0	3,900	4,000	7,900	5.62	4.18	SWQ and Det
28-2	21.6	4,900	8,200	13,100	8.43	5.36	SWQ and Det
28-3	5.0	1,100	900	2,000	1.61	1.24	SWQ and Det
28-4	14.8	3,500	4,300	7,800	5.27	3.86	SWQ and Det
28-5	7.9	1,700	2,000	3,700	3.33	2.54	SWQ and Det
28-6	8.9	2,200	1,200	3,400	2.57	2.20	SWQ and Det
29-1	9.0	1,800	1,500	3,300	2.32	1.71	SWQ and Det
29-2	5.6	1,300	1,500	2,800	2.14	1.56	SWQ and Det
29-3	8.2	2,000	2,700	4,700	4.20	2.97	SWQ and Det
OM23	19.8 (+16.8)	6,200 (+5,000)	16,600	27,800	10.49	5.75	Water quality for 23-1 included
OM24	13.5	4,300	5,600	9,900	5.17	2.84	SWQ and Det
ND1	4.1	1,000	1,900	2,900	3.43	2.91	SWQ and Det (new device)
ND2	2.8	800	600	1,400	1.35	1.19	SWQ and Det (new device)
ND3	2.3	700	700	1,400	1.36	1.17	SWQ and Det (new device)
SUM	490.2	136,100	154,500	295,600			

Appendix 3

## Planning Review Memo

## Memorandum

**To:** Gareth Hall

**Date:** 6 July 2017

**From:** Chris Moore

**Our Ref:** 3362540

**Copy:**

**Subject:** Omokoroa Stormwater Management Plan - Planning Review

### 1 Update of Omokoroa Peninsula Stormwater Management Plan (2002) Implementation Methods

Most of the Implementation actions have been addressed through District Plan provisions, the Development Code and more specifically through the requirements of RC61768 conditions. The following table provides further review and comment on the implementation actions.

Omokoroa SMP Implementation Methods.	WBOPDC Review	Beca Comment										
1. <i>The provisions of the WBOPDC Subdivision and Development Code of Practice is a means of compliance with the standards of the District Plan.</i>	Partially Addressed – District plan changes	Yes- Agree the DP and Development Code have design and construction parameters that need to be met.  The subject of stormwater reticulation, treatment and disposal are to be addressed in accordance with Section 12.4 (includes the Omokoroa Structure Plan) and Council’s Development Code.										
2. <i>District Plan change to ensure that the provisions of this CMP and consent are applied comprehensively to all developments on the Omokoroa Peninsula.</i>	Addressed – District Plan flood hazard and structure plan is consistent with 2002 CMP	Agree. And also addressed through RC61768 conditions as well.										
3. <i>No building shall be located in the 100 year flood plain.</i>	Partially Addressed – District Plan requires properties to be built 500mm above the 50year flood hazard (modelling undertaken in 2005 by Duffil Watts).	The Development Code 5.1.3 – Freeboard above design flood level shall be provided as shown for different structures for a 50 year flood level, not for a “100 year flood plain”.  <table border="1"> <thead> <tr> <th>Type of Structure</th> <th>Freeboard to 50 year Flood Level</th> </tr> </thead> <tbody> <tr> <td>Non-habitable residential buildings, garage floors etc</td> <td>200 mm</td> </tr> <tr> <td>Commercial and industrial floors</td> <td>300 mm</td> </tr> <tr> <td>Habitable dwelling floors</td> <td>500 mm</td> </tr> <tr> <td>Major communal facilities related to supply of electricity, telecommunications and water supply and wastewater disposal systems and bridges</td> <td>500 mm</td> </tr> </tbody> </table>	Type of Structure	Freeboard to 50 year Flood Level	Non-habitable residential buildings, garage floors etc	200 mm	Commercial and industrial floors	300 mm	Habitable dwelling floors	500 mm	Major communal facilities related to supply of electricity, telecommunications and water supply and wastewater disposal systems and bridges	500 mm
Type of Structure	Freeboard to 50 year Flood Level											
Non-habitable residential buildings, garage floors etc	200 mm											
Commercial and industrial floors	300 mm											
Habitable dwelling floors	500 mm											
Major communal facilities related to supply of electricity, telecommunications and water supply and wastewater disposal systems and bridges	500 mm											
4. <i>Where there is little risk of the flooding of dwellings the 100 year flood will be allowed to pass through the</i>	Partially addressed – Developments have a requirement to ensure flood flows are able to pass. However no	As per above freeboard requirements in the Development Code.  No 100 year flood model available for Omokoroa.										

## Memorandum

<p><i>catchment with minimal detention, but where the risk to dwellings is significant there must be adequate measures taken to protect the at risk areas.</i></p>	<p>comprehensive 100 year stormwater flood model is available for Omokoroa.</p>	
<p>5. All developments must provide a stormwater management plan demonstrating:</p> <ul style="list-style-type: none"> <li>- that their primary stormwater drainage discharges to an approved drainage system,</li> <li>- how they will pass surface flows from above without causing erosion or flooding of buildings,</li> <li>- how surface flows will be captured, or pass safely downstream,</li> <li>- management of runoff peaks to downstream so they are no greater than from the pre-development catchment, or are fully managed through to the harbour receiving environment.</li> </ul>	<p>Addressed – This is a requirement of all subdivisions.</p>	<p>Agree: WBOPDC District Plan Chapter 4 – Information requirements for any resource consent applications;</p> <p><i>The following information (as applicable) shall be submitted with any application for a resource consent:</i></p> <p><i>The subjects of water supply, wastewater and stormwater reticulation and disposal are to be addressed and where these are to be provided a detailed description on how this is to be achieved is required. Aspects such as source of supply, discharge points, quantities likely, other resource consents required and the location of any waterways, wetlands and ponding areas shall be addressed in the report.</i></p> <p>This includes Chapter 12 – Subdivision and Development provisions</p> <p>Addressed through RC61768 conditions as well.</p>
<p>6. The reduction of impervious areas should be promoted, particularly in the high-density areas. A maximum of 50% impervious area is recommended in high density and commercial areas, 35% in medium density residential areas, and 15% in rural residential and reserve areas</p>	<p>Partially addressed – Council restricts build coverage on a site to 40% however no control over the total impervious area for a site.</p>	<p>There is no specific reference to this in the DP or the Development Code.</p> <p>Incorporation into DP or Development Code could be something that is recommended in particular as the Implementation Method makes a specific recommendation that hasn't been implemented.</p> <p>Addressed through RC61768 conditions as well – Condition 6.4</p> <p><i>The consent holder shall, wherever practicable, minimise the area of impervious surface area contributing to stormwater runoff.</i></p>

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<p>7. <i>The 2 year and 100 year ARI flood peaks are not to be increased over the runoff rates for pasture. This can be achieved through a range of measures including low impact design, attenuation ponds etc.</i></p>	<p>Not sure - I don't think we require new developments to undertake this assessment</p>	<p>Agree – this assessment is not required however, low impact design and attenuation ponds etc are recommended through policies of the DP.</p> <p>Partially addressed in RC61768 Condition 6.5 <i>The consent holder shall, wherever practicable, utilise swales and other low impact design measures to reduce the rate and volume of stormwater runoff</i></p> <p><i>Can't require this at present if WBDC doesn't have a 100 year model.</i></p>
<p>8. <i>Catchments where the streams have ecological significance must have a minimum total volume of water quality and flood detention ponds equal to that required for the 100 year flood event. These catchments are OM23, OM26, OM27 and OM28.</i></p>	<p>Addressed– Ponds in the CMP have been developed as required. Design maybe based on historical rainfall figures/methodology</p>	<p>Addressed through RC61768 condition 6.8</p> <p><i>Notwithstanding condition 5.1, for catchments described as OM23, OM26, OM27 and OM28 on Figure 6.2 of the Omokoroa Peninsula Stormwater Management Plan Revision 3 July 2002, the consent holder shall ensure that the water quality ponds and flood detention ponds shall have the capacity to pass the 100 year flood event, with appropriate attenuation where this is necessary, without damage to the pond system.</i></p>
<p>9. <i>No soak pits are to be used in steeper areas or where there are sensitive soils. Those in use must be decommissioned and replaced with a discharge that does comply with the standards.</i></p>	<p>Addressed – Council have been working hard to ensure no soakage in Omokoroa</p>	<p>Through what mechanism? DP/Development Code?</p> <p>RC61768 condition 6.1 - <i>The use of soakholes is minimised</i></p>
<p>10. <i>Infiltration should be promoted by the use of swale drains in the flatter areas (1-5% average gradient).</i></p>	<p>Not Addressed – To my knowledge we have not promoted the use of swales</p>	<p>Policies in both the RWLP and the WBOPDC DP (12.4.5.6) promote/ provide for this.</p> <p>RC61768 condition 6.1 - <i>Wherever practicable, stormwater overflows from pipes, drains or swales be directed through defined overland flow paths</i></p>
<p>11. <i>There shall be no top-of-cliff discharges. The single residential coastal outfalls should be combined to larger outlets. These outlets should be subject to specific design</i></p>	<p>Addressed</p>	<p>Addressed through the requirements of RC61768</p>
<p>12. <i>All development areas of any size shall pass stormwater</i></p>	<p>Addressed – I think</p>	<p>Agree- Addressed through the requirements of RC61768 conditions</p>

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<p><i>runoff through a treatment device before it is discharged to the sea. This could be those shown in Figure 6.2 of the SWMP, or equivalent devices installed by the developer to the Council's satisfaction.</i></p>		
<p>13. <i>Best management practice for sediment and contaminant removal is to be required on all commercial and industrial sites and roads. This would require developers to show how the adverse effects of their developments are managed. 75% removal of sediment is the minimum requirement</i></p>	<p>Not sure</p>	<p>Addressed through RC61768 conditions;</p> <p>Condition 6.14 <i>The consent holder shall ensure, that where stormwater from industrial or commercial premises which potentially discharges contaminants to the stormwater system, is not subject to a relevant industry code of practice, the discharge of stormwater is subject to the Best Practicable Option for stormwater treatment and control</i></p> <p>Condition 8.2 <i>The consent holder, shall design and construct stormwater treatment devices authorised pursuant to this consent, to remove as a minimum 75 percent of suspended sediment on a 10 year average basis</i></p>
<p>14. <i>All new subdivisions to treat stormwater for removal of sediment, to a standard of 75% gross removal (according to ARC TP10 methods or equivalent). This may be achieved by a combination of drainage design features (e.g. swales) and end-of-pipe solutions.</i></p>	<p>Addressed – Generally through the construction of ponds. However one mechanical stormwater treatment device has been installed in Lynley Park (not yet vested in Council)</p>	<p>Also addressed through requirements of RC61768 conditions. As per above.</p>
<p>15. <i>All stormwater treatment devices must have adequate access for maintenance purposes</i></p>	<p>Addressed</p>	<p>Agree. RC61768 - <i>Condition 16 – Maintenance of Stormwater Treatment Devices</i> (Conditions 6.1- 6.3)</p>
<p>16. <i>Stream and riparian areas are to be enhanced with protection works and</i></p>	<p>Not Sure</p>	<p>Addressed in RC61768 - <i>Condition 8– Works in Watercourses</i> (Conditions 8.1- 8.11)</p>

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<i>planting.</i>		
17. <i>All site developments (both subdivision earthworks and subsequent building excavations and earthworks) shall comply with the provisions of EBOP publication TR28, Erosion and Sediment Control Guidelines for Earthworks</i>	Addressed – Earthworks consents	Agree.
18. <i>The education of the general public, property developers and contractors should be a focus for both Regional and District Council.</i>	Not Addressed – limited public education	On-going implementation through Council publications and workshops as required.
19. <i>All on-line structures with natural channel upstream to provide for fish passage. Council to incorporate cascading weirs or other suitable permanent fish passage (for eels and inanga) into the outlet works of all in-stream structures</i>	Not Sure	Addressed in RC61768 - <i>Condition 8– Works in Watercourses</i> (Conditions 8.1-8.11)  Condition 8.3 -  <i>Notwithstanding condition 5.1, each structure placed in a watercourse with viable habitat upstream of the structure shall be constructed to provide for fish passage upstream of the structure such as providing cascading weirs within the outlet works of all structures</i>

## 2 Review Stormwater Consents and District Plan Rules

### 2.1 Resource Consents

The following resource consents associated with stormwater were provided by WBOPDC for review.

Resource Consent Number	Purpose	Expiry Date	Comment
02 5191	<i>To discharge stormwater from a 12 lot residential subdivision</i>	30 April 2014.	Expired - has this consent been renewed? or is the discharge now captured under RC61768 as part of the SWMP Figure 6.2?



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			(this is included in the WBOPDC SW asset management plan)
60714	<i>To authorise the discharge of stormwater from Waterview Terrace Omokoroa into Tauranga Harbour, and to authorise and alter an existing pipe and outfall structure in the Coastal Marine Area.</i>	31 October 2010.	Expired - has this consent been renewed? or is the discharge now captured under RC61768 as part of the SWMP Figure 6.2
61768	<i>To provide for the comprehensive management of stormwater within the area as shown on Figure 6.2 of the Omokoroa Peninsula Stormwater Management Plan Revision 3 July 2002 and Addendum.</i>	31 May 2023	General Stormwater Principles Maintenance of Stormwater Treatment Devices.  The consent holder shall develop a stormwater monitoring programme.
61777	<i>For the purpose of discharging stormwater from the emergency containment pond to an ephemeral stream forming part of an un-named tributary of Tauranga Harbour via a stormwater outfall structure located on the bed of the stream.</i>	31 May 2028.	Stormwater Quality Post Emergency Discharge of Sewage  Stormwater Monitoring Post Emergency Discharge of Sewage
61917	<i>For the purpose of discharging stormwater from the Omokoroa Green Waste Facility, Omokoroa Road, Omokoroa to ground.</i>	28 February 2018.	Expiring soon - will this consent be renewed? Or is the discharge captured under RC61768 as part of the SWMP Figure 6.2? – Need to know location.
65388	<i>For the purpose of discharging stormwater from a 3.7 hectare residential catchment to a pond (Lily Pond) draining to the Tauranga Harbour.</i>	31 May 2028.	

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### 2.2 Bay of Plenty Regional Council (BOPRC) Plans

#### 2.2.1 BOPRC Regional Water and Land Plan 2008 (RWLP)

The RWLP is regularly updated to reflect national policy statements that are being promulgated. The most recent updates include;

- **28 June 2011**; Insert policies A4 and B7 from the National Policy Statement for Freshwater Management into the Regional Plan (Policy 43A Discharges to Water and Land and Policy 68A Take and Use of Surface Water and Groundwater); and
- **8 October 2014**; Insert new paragraph from policy A4 of the National Policy Statement for Freshwater Management 2014 into the Regional Plan (Policy 43A Discharges to Water and Land).

**Policy 43** *To take appropriate action to avoid, remedy or mitigate the cumulative effects of discharges of contaminants to water or to land where such discharges are having an adverse effect on water quality, the life-supporting capacity of soil, or the coastal environment.*

**Policy 43A** *When considering any application for a discharge the consent authority must have regard to the following matters:*

- (a) *the extent to which the discharge would avoid contamination that will have an adverse effect on the life-supporting capacity of fresh water including on any ecosystem associated with fresh water; and*
- (b) *the extent to which it is feasible and dependable that any more than minor adverse effect on fresh water, and on any ecosystem associated with fresh water, resulting from the discharge would be avoided; and*
- (c) *the extent to which the discharge would avoid contamination that will have an adverse effect on the health of people and communities as affected by their secondary contact with fresh water; and*
- (d) *the extent to which it is feasible and dependable that any more than minor adverse effect on the health of people and communities as affected by their secondary contact with fresh water resulting from the discharge would be avoided.*

*This policy applies to the following discharges (including a diffuse discharge by any person or animal):*

- (a) *a new discharge; or*
- (b) *a change or increase in any discharge – of any contaminant into fresh water, or onto or into land in circumstances that may result in that contaminant (or, as a result of any natural process from the discharge of that contaminant, any other contaminant) entering fresh water.*

**Comment:** The SMP must be consistent with Policy 43 and 43A in consideration of the cumulative effects of the discharge of contaminated stormwater on the coastal environment. The appropriate actions to *avoid, remedy or mitigate* such effects have been addressed through the requirements of the consent conditions, such as; to implement the stormwater monitoring program required by the existing comprehensive consent RC61768 (Condition 17).

Other conditions of RC61768 that provide for Policy 43 and 43A include;

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6.10 *The consent holder shall carry out its routine stormwater operational and maintenance activities in a manner which avoids, as far as practicable, the discharge of contaminants to the receiving environment.*

6.11 *The consent holder shall carry out regular street and cesspit cleaning operations to minimise the quantity of contaminants entering and discharging from the stormwater system to the receiving environment.*

6.12 *The consent holder shall inspect all industrial and commercial premises that potentially discharge contaminants to the stormwater system to ensure compliance with the relevant industry code of practice for stormwater discharge and treatment.*

6.13 *The consent holder shall ensure that all stormwater from industrial or commercial premises which potentially discharges contaminants to the stormwater system, complies with the relevant industry code of practice (where such a code exists).*

6.14 *The consent holder shall ensure, that where stormwater from industrial or commercial premises which potentially discharges contaminants to the stormwater system, is not subject to a relevant industry code of practice, the discharge of stormwater is subject to the Best Practicable Option for stormwater treatment and control.*

In order to comply with these conditions, WBOPDC as the consent holder, should be able to demonstrate actions around their maintenance programme in the Asset Management Plan and potentially develop a stormwater pollution prevention bylaw (as per TCC) to address stormwater discharges from high risk industrial or commercial premises.

### **RWLP - Discharge of Stormwater Provisions**

Issues identified in the RWLP regarding stormwater include:

- *The lack of integrated and comprehensive management of stormwater may increase adverse effects on the environment;*
- *There is the potential for stormwater to transport contaminants, which adversely affect receiving environments;*
- *Excessive rates and volumes of stormwater discharged from point sources can lead to erosion and scour;*
- *Increased volumes of stormwater are being diverted, concentrated and discharged to streams, rivers, lakes and coastal waters from developed areas as a result of the creation of impermeable surfaces that reduce the natural infiltration of rainwater, and a lack of reuse of stormwater*

### **Implementing the RWLP:**

#### *Discharge of Stormwater*

Best practice in managing any adverse impacts of stormwater is primarily achieved through the resource consent process and compliance with relevant conditions of consent. For the SMP, the relevant resource consent and associated conditions is RC61768. The consent conditions provide actions (monitoring, maintenance, recording and reporting) for WBOPDC that are consistent with the objectives and policies of the RWLP.

The **Stormwater Strategy for the Bay of Plenty Region** and the **Stormwater Design Guidelines** provide comprehensive guidance to city and district councils and the community about the best

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practicable options. The WBOPDC has developed their own stormwater strategy that is consistent with these guidance documents. The SMP should reference the WBOPDC stormwater strategy documents.

The **Erosion and Sediment Control Guidelines** for earthworks have been extensively reviewed. The latest revised guidelines should be implemented as required on all earthworks activities. The SMP should reference the latest BOPRC guidelines (2010/01).

### 2.2.2 BOPRC Proposed Coastal Environment Plan

The Proposed Regional Coastal Environment Plan (RCEP) is effectively operative and has specific policies regarding stormwater discharges to the coastal environment. These include;

**Policy CD 13** - *Apply the policies and methods in Section 4.2 – Discharge of Stormwater of the Regional Water and Land Plan to encourage or require integrated and comprehensive stormwater management.*

**Policy CD 14** - *Require the appropriate management of stormwater quality to maintain, and where necessary enhance, water quality in the coastal marine area, including:*

*(a) The use of source controls to minimise the contamination and sediment loading of stormwater;*

*(b) The use of best practicable options to reduce the levels of contaminants and sediments entering coastal waters;*

*(c) Treatment of stormwater prior to discharge when necessary to minimise the contamination and sedimentation of receiving environments; and*

*(d) The prevention of inappropriate discharges of contaminants to stormwater systems.*

**Policy CD 15** - *Require new stormwater discharge rates and volumes, and new stormwater discharge outlet structures, to be designed and managed to avoid or mitigate erosion and scour.*

**Policy CD 16** - *Require monitoring of stormwater discharges to the coastal environment at a frequency that corresponds with the scale and significance of the effects of the discharge.*

**Policy CD 17** - *Include a review clause in resource consents for the discharge of stormwater to the coastal marine area where necessary to provide for progressive improvement to discharge quality in the future (including the defining of appropriate contaminant loads).*

**Comment:** The SMP is consistent with the above policies through the implementation of the existing resource consent RC61768 and the associated conditions of consent including design and monitoring requirements. The SMP could provide a review process for progressive improvement to the stormwater discharge quality to the coastal environment.

## 2.3 Western Bay of Plenty District Council Plans

### 2.3.1 WBOPDC Operative District Plan 2012

The Operative Plan 2012 is the culmination of the Proposed Plan First Review process (a review of the Operative Plan 2002). It became operative on 16 June, 2012 except for specific provisions relating to Matakana Island which are operative from 19 December, 2015.

The following provisions are considered relevant to the SMP.

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Chapter 4 – Information requirements for any resource consent applications;

*The following information (as applicable) shall be submitted with any application for a resource consent:*

*The subjects of water supply, wastewater and stormwater reticulation and disposal are to be addressed and where these are to be provided a detailed description on how this is to be achieved is required. Aspects such as source of supply, discharge points, quantities likely, other resource consents required and the location of any waterways, wetlands and ponding areas shall be addressed in the report.*

Chapter 5 – Natural Environment;

*Development proposals shall ensure that any run-off or stormwater resulting from the establishment of the activity does not lead to siltation, sedimentation or a reduction of water quality in natural watercourses, wetlands and groundwater that leads to adverse effects on identified natural habitats and ecosystems.*

Chapter 12 – Subdivision;

The subject of stormwater reticulation, treatment and disposal are to be addressed in accordance with Section 12.4 and Council's Development Code.

The key policies in this section are defined in 12.4.5 Stormwater and include;

**12.4.5.1** *Stormwater systems shall be provided or extended in accordance with Rule 12.4.3 and reticulation shall be provided for the subdivision in such a manner as to enable each lot to be connected to the Council system.*

**12.4.5.2** *The Regional Council discharge consents shall be provided as applicable.*

**12.4.5.3** *Each new or existing site shall be individually connected to the reticulated stormwater system in accordance with Council's Development Code.*

**12.4.5.4** *In Rural and Lifestyle Zones, developers are required to assess the potential downstream effects on neighbouring properties of the future residential development, dwelling, driveway, private way, hard stand area and re-contouring in terms of existing flowpaths, stormwater collection and discharge. In these zones, where effects are considered more than minor, Council may require some level of mitigation including reticulation (private or public), outfall controls, easements, discharge consents and notices restricting development.*

**12.4.5.5** *A stormwater reticulation and disposal system shall be provided that is adequate to safeguard people from injury or illness and to protect property from damage caused by surface water.*

**12.4.5.6** *A primary flow path for flood waters shall be provided as a system of stormwater pipes (or other alternative proven designs, including swales and wetlands, giving regard to operation and maintenance approved by Council) designed to cope with the runoff from the design flood.*

**12.4.5.7** *A secondary flow path shall be provided as the overland route taken by floodwaters when the primary path is unable to cope either because of blockages or because the hydraulic capacity of the primary path is exceeded by a larger than design flood.*

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**12.4.5.8** *The secondary flowpaths shall be designed and sized assuming full blockage of the upstream reticulation system.*

**12.4.5.9** *Where practical, overland stormwater flowpaths shall be combined with pedestrian or cycle access if these are required.*

**12.4.5.10** *Secondary flowpaths that either:*

*(a) Provide connection between two existing or proposed public roads (or combination of the two); or*

*(b) Provide connection between an existing or proposed public road and an existing or proposed esplanade reserve and provide a tangible benefit in terms of pedestrian access shall be vested in Council as local purpose reserve (access) with provision made for the flowpath. Where there is no tangible benefit they shall be vested and developed as local purpose reserve (drainage).*

**12.4.5.11** *In the case of a local purpose reserve, the flowpaths may be required to be hardsurfaced, or otherwise developed in accordance with specific consent conditions and Council's Development Code including calculation and design of required capacity.*

**12.4.5.12** *The balance of the local purpose reserve (access) shall otherwise be developed in accordance with specific consent conditions or Council's Development Code requirements.*

**12.4.5.13** *Where flowpaths provide connection to only one existing or proposed road or other feature and otherwise run through private property (e.g. private way) the flowpath shall be within a defined channel or swale including calculation and design of capacity. The flowpath shall be protected by an easement in favour of Council and a consent notice on the title prohibiting ground re-shaping and the erection of any barriers to the flowpath.*

**12.4.5.14** *Where a dwelling is to be built in an area that is not possible to be serviced with a stormwater system, a stormwater disposal system shall be provided exclusive of any identified natural hazard area, that will safeguard people from injury or illness and protect property from damage caused by surface water.*

**12.4.5.15** *Discharge to ground soakage may be allowed subject to the criteria as outlined in Council's Development Code.*

**12.4.5.16** *No additional stormwater is to be discharged into the rail corridor or designation without the prior approval from the Railway Owner or Operator.*

### 2.3.2 WBOPDC Development Code 2009

The 2009 Development Code provides a means of compliance when designing, constructing and maintaining engineering works that are required;

- to fulfil conditions imposed by a resource consent
- for works that fall within the requirements of the District Plan, if a consent is not required such as a permitted activity condition
- for capital or maintenance works commissioned by Council

The works apply to urban, rural residential and rural applications. Any alternative means of compliance submitted for approval (i.e. different design methods or philosophy or principles) will be considered on a case by case basis.

The Code is one document, divided into two main sections, Design and Construction

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The following stormwater design and construction requirements are given below.

### 5.1.2 Flowpaths

*In designing the stormwater system, both the primary and secondary flowpath shall be identified to ensure the stormwater management system provides a minimum standard of flood protection according to the following criteria:*

- i. **5 year return period flood (20% AEP)** The minimum design standard for any primary piped stormwater system in the Western Bay of Plenty District.*
- ii. **10 year return period flood (10% AEP)** The minimum design standard for stormwater systems to protect important recreation fields, and streets without alternative access.*
- iii. **50 year return period flood (2% AEP)** For design of primary and secondary stormwater systems to protect urban, commercial and industrial areas.*
- iv. **100 year return period flood (1% AEP)** For design of primary and secondary stormwater systems to protect major communal facilities related to supply of electricity, gas telecommunications water supply and wastewater facilities and bridges.*

### 5.1.3 Freeboard

*Freeboard above design flood level shall be provided as shown.*

Type of Structure	Freeboard to 50 year Flood Level
Non-habitable residential buildings, garage floors etc	200 mm
Commercial and industrial floors	300 mm
Habitable dwelling floors	500 mm
Major communal facilities related to supply of electricity, telecommunications and water supply and wastewater disposal systems and bridges	500 mm

### 5.1.4 Rainfall Intensity

*Designers should use the rainfall tables in the drawings attached to this design standard. These tables have been created using the rainfall intensity values from the NIWA Software package HIRDS V1.5b and have been adjusted to allow for climate change to the year 2040 as documented in the Ministry for the Environment – Climate Change Effects and Impacts Assessment publication 2008 and any revised editions.*

### 5.1.5 Stormwater Consents

*In addition to other requirements relating to permanent discharges of stormwater to a natural watercourse or the sea and onto land, the consent holder shall be responsible for obtaining any consent(s) relating to the construction or ongoing operation of the development.*

*The Developer is responsible for obtaining all necessary consents for the discharge of stormwater. These include, but may not be limited to, Regional Council consents for the discharge, both during and after construction, and the permissions from landowners where additional stormwater is being discharged to their properties as a result of development. The developer must note that their consents may be required even when the development activity is a permitted activity under the WBOPDC District Plan.*

### CS5/6 Stormwater Construction

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**5/6.1 Scope:** *This section sets out the requirements for the construction or upgrade and maintenance of district stormwater & wastewater drainage systems. It covers the specifications for constructing, testing and maintaining drainage systems.*

*All pipes shall be installed in accordance with the approved design, manufacturer's specification and this Code. New systems shall be maintained throughout the maintenance period. Maintenance shall include but not be limited to sound engineering practices.*

*Evidence of a regular maintenance contract, including contact details shall be submitted for Council approval prior to the consideration by Council of the release of either the s224 certificate or certificate of practical completion.*

WBOPDC wishes to promote innovation and flexibility in the design and servicing of subdivision and development acknowledging that this can lead to developments that are more responsive to the local environment. It may also result in more efficient use of infrastructure services. To this end WBOPDC has incorporated development guidelines within the Development Code which identify best practice approaches and consentable solutions to subdivision and development and encourage developers to consider these approaches when designing a development. Thus the Development Code is seen as being one means of compliance and alternatives are encouraged.

### Joint Infrastructure Development Code

Western Bay Council and Tauranga City Council are working together to create a single infrastructure and engineering compliance document that will provide consistency and simplicity for the industry. The Joint Infrastructure Development Code will replace Tauranga City's Infrastructure Development Code and Western Bay's 2009 Development Code.

The joint document is not being built from scratch. Instead, the two existing Codes are being compared to each other. Requirements that are the same in both documents will be adopted and where differences are found decisions will be made (where appropriate) to either:

- Adopt the current TCC standard and remove the Western Bay standard
- Adopt the current Western Bay standard and remove the TCC standard
- Adopt both standards where (appropriate to do so)
- Adopt a new standard already planned to be completed during the three year review of either council's document

The joint code was scheduled to be produced by the end of October 2016 however, this has been delayed and is still to be completed.

### 2.3.3 Omokoroa Structure Plan (2016)

For new growth areas Council has prepared structure plans which provide a development framework for future development and which assist in coordinating subdivision in the identified areas.

The structure plans are supported by Council's Development Code. This sets out compliance with minimum standards for servicing subdivision and development so as to ensure health and safety requirements as well as long term operational and maintenance requirements are met.

The Omokoroa structure plan is located in the District Plan within Chapter 12 – Subdivision and Development with the detail in Appendix 7 – Structure Plans (Section 4). Various plans included in



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the Structure Plan include; Roading Projects Plan, Walkway Plan, Omokoroa Services, Road Catchments, Boundaries and Earthworks procedures.

### 2.3.4 WBOPDC Asset Management Plan (AMP) – Stormwater 2013

Assets within this asset management plan collect and dispose of stormwater runoff within WBOPDC's urban communities. As the service provider and owner of public stormwater assets, WBOPDC is responsible for providing funding for the development of new assets for growth and demand, operations and maintenance, asset renewals and the disposal of assets at the end of their service lives. Council's stormwater assets include stormwater reticulation (i.e. pipes and manholes), pump stations and outlets into waterways, ponds and drainage reserves.

The Stormwater AMP records the procedures which Council has adopted for the maintenance and development of stormwater networks. The AMP also has strategies to find more environmental friendly ways to dispose of stormwater.

Stormwater works identified in the Omokoroa Structure Plan Stage 2, which caters for growth, have been postponed beyond the LTP 2012-2022. This is a result of the slowing of growth assumed in Council's new forecasts.

In terms of funding major stormwater projects within Omokoroa there is some funding allocated in 2017/2018 period.

#### 1.6.4 Summary of Major Projects and Activities

Project Description	\$,000									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Wahi Beach Stormwater Works Programme	139	316	550	1070	150	393	75	476	45	290
Stormwater Upgrades Walnut Ave	0	0	0	300	0	0	0	900	450	0
Katikati Stormwater Works Programme	0	75	0	0	180	0	0	0	0	0
Te Puke Stormwater Works Programme	40	0	0	898	760	475	300	670	280	0
Omokoroa Stormwater Works Programme	0	0	0	0	0	355	60	0	0	0

## 3 Recommendations

To be consistent with the objectives and policies of the RWLP and in accordance with the consent conditions, the SMP should;

- WBDC to prepare a 1 in 100 year flood model as the basis for implementing the SMP, IDC and DP provisions.
- Implement changes to the DP and IDC to provide for a maximum of 80% impervious area in high density and commercial areas, 50% in medium density residential areas, and 15% in rural residential and reserve areas
- Implement other changes necessary to support implementation of low impact design solutions
- Use management measures to minimise the contamination of urban stormwater, including:
  - (a) At-source management of contaminants.
  - (b) Use of best practicable options to reduce levels of contaminants entering surface water bodies.

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- (c) Treatment of stormwater prior to discharge to receiving environments where appropriate.
- (d) Prevention of inappropriate discharges of contaminants to stormwater systems, such as appropriate site management, and appropriate disposal of wastes.
- Encourage measures to reduce the volume of stormwater discharged to the environment from urban areas, including:
  - (a) The appropriate design of subdivisions and other land use developments to minimise stormwater runoff, such as minimising the increase in the area of impermeable surfaces and retaining natural flood retention areas.
  - (b) On-site management and disposal of stormwater to soakage, where practicable and appropriate.
  - (c) Storage and reuse of stormwater, including for irrigation or creation of aquatic habitats, where practicable and appropriate.
  - (d) Retention or creation of non-structural stormwater controls, where appropriate.
- Manage the discharge of stormwater from industrial or commercial sites, particularly from high risk facilities (identified in Schedule 4 of the RWLP), where such discharges are made to a council stormwater system. Contaminants from industrial or commercial tradewaste, or from the storage of hazardous materials and waste products, should not be allowed to discharge to a stormwater system, or to land where the contaminants may enter the stormwater system. Contaminated stormwater from industrial or commercial sites is to be appropriately treated to reduce contaminants to acceptable levels prior to discharge to stormwater systems.
- A stormwater pollution prevention bylaw, similar to TCC's, to address stormwater discharges from high risk industrial or commercial premises could be developed and implemented as part of compliance with the consent conditions and with the BOPRC RWLP.
- Is there a monitoring plan in place? Actions to avoid, remedy or mitigate environmental effects need to be identified as required by the consent conditions, such as; to implement the stormwater monitoring program required by the existing comprehensive consent RC61768 (Condition 17). Assumed to have been developed and is being implemented. Has there been any review of the results from the monitoring program?
- Joint Infrastructure Development Code –review status and consider review of specific requirements associated with Omokoroa development areas to ensure they reflect the Structure Plan and consent conditions.
- The Stormwater Strategy for the Bay of Plenty Region and the Stormwater Design Guidelines provide comprehensive guidance to city and district councils and the community about the best practicable options. The WBOPDC has developed their own stormwater strategy that is consistent with these guidance documents. The SMP should reference the WBOPDC stormwater strategy documents. – Do WBOPDC have a Stormwater Strategy?
- The Erosion and Sediment Control Guidelines for earthworks have been extensively reviewed. The latest revised guidelines should be implemented as required on all earthworks activities. The SMP should reference the latest BOPRC guidelines (2010/01).

## 4 Guidance to Developers

- **Omokoroa Structure Plan:** various schedules and plans are set out in the Omokoroa Structure Plan including the infrastructure schedule which highlights to developers that stormwater projects are 100% developer funded.

## Memorandum

### Infrastructure Schedule

Project	Developer	Funding Source(%)			
		Council Financial Contributions	Council Rates	Other	
Water Supply			72.6%	27.4%	
Wastewater	Reticulation		73.0%	11.0%	16.0%
Stormwater	Ponds		93.4%	6.6%	
	Reticulation	100.0%			
Transport – refer to detailed schedule following					

- Developers should be made aware of the Omokoroa stormwater consent RC61768 which outlines the existing consented infrastructure in the area (refer to Figures in RC61768).
- Encourage stormwater systems to be designed, constructed and maintained to appropriate design standards that are consistent with the requirements of this regional plan, and the principles of Low Impact Design.
- Encourage use of innovative methods to manage and treat stormwater to appropriate standards before it is discharged to streams, rivers, lakes and coastal waters. This includes, but is not limited to, swales, infiltration systems, wetlands, and other stormwater management and treatment methods that are appropriate to the site and individual circumstances.
- The Erosion and Sediment Control Guidelines for earthworks have been extensively reviewed. The latest revised guidelines should be implemented as required on all earthworks activities. The SMP should reference the latest BOPRC guidelines (2010/01).

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