Wellington Water

Addendum Report - Outer Suburbs

WCC Spatial Plan - Three Waters Assessment

March 2020

Our water, our future.

Document information

Quality Assurance

The content of this short report has been prepared with the expert advice of Wellington Water's Chief Advisers and technical staff.

Activity	Name	Title	Signature	Date
Prepared by	Mohammed Hassan	Principal Engineer Investigations		24/03/20
Approved by	Olena Chan	Manager, Land Development		24/03/20

Revision history

Date	Version number	Description of change
13 March 2020	v1	Draft for Comment
19 March 2020	Final	Update with WCC comments

Outer Suburbs Adjusted Growth Scenario

1. Summary

This is an addendum to the "WCC Preferred Growth Scenario – Implications to 3-Waters" (Study) that was submitted to Wellington City Council (WCC) in November 2019.

In late 2019, Wellington City Council carried out further detailed assessments and evaluation work to identify the extent of medium to high density growth for the Wellington City outer suburbs. The adjusted growth scenario for the Wellington City outer suburbs was supplied to Wellington Water to assess any changes to the earlier assessment of November 2019.

A prefeasibility level cost assessment of the three waters infrastructure has been undertaken for the previous 22 growth suburbs and two additional outer suburbs of Churton Park and Hataitai. The summary of changes described in this report are set out in Table 1 below.

Table 1: Summary of changes to the previous November 2019 assessment

Suburb (s)		Change	Description	Cost Band
Churton Park		Yes	New	Cost Band B $25M to $50M
Hataitai		Yes	New	Cost Band C $50M to $75M
Miramar		Yes	Population & Cost Band increase.	Cost Band F - $200M to $550M
Island Bay Johnsonville Karori Kelburn	Newlands Ngaio Tawa	Yes	Population decreases	No change to previous cost bands
Brooklyn Crofton Downs	Khandallah Kilbirnie Lyall Bay	Yes	Population increase	No change to previous cost bands
Aro Valley Berhampore Mount Cook Thorndon Wellington Central	Mt Victoria Newtown Pipitea Te Aro	No	No population changes	No change to previous cost bands

The overall recommendations of the earlier Study remain unchanged. Further detailed investigations would be required to refine the cost estimates and three waters infrastructure requirements following the adoption of the WCC Spatial Plan.

2. Purpose

The purpose of this addendum is to provide an updated assessment of three waters costs for the Outer Suburbs for the WCC Spatial Plan and outlines any changes to the previous assessment of 22 suburbs, and a new assessment of 2 additional outer suburbs as a result of the adjusted population forecast figures.

This follows the "WCC Preferred Growth Scenario – Implications to 3-Waters" that was submitted to WCC in November 2019.

3. Background

The earlier Study provided information for the Wellington City Council's Spatial Plan and aimed to assist WCC's understanding of long term growth demands and the potential impacts on three waters infrastructure. The Study identified the likely demands, potential improvements, or new infrastructure that would be required and associated high level costs of these upgrades.

The Study found that enabling urban growth will require significant investment in existing infrastructure as well as new infrastructure required to meet growth. The existing networks were found to be operating below the expected Levels of Service that were defined for the Study.

WCC provided new population figures for the Outer Suburbs in January 2020 and these have been assessed for any changes to the previous assessment. This includes Churton Park and Hataitai where future intensification is proposed. These 2 suburbs were not included in the first Study.

Each suburb previously identified for growth has been re-assessed and any changes to the previous assessment has been summarised into this paper. For convenience, the ranges to Cost Bands A to F are included here in Table 2 below.

Table 2: The following Cost Band values are used to represent potential 3-Water costs associated with growth

Cost Band	Value
A	$10 to $25M
B	$25M to $50M
C	$50M to $75M
D	$75M to $100M
E	$100M to $200M
F	$200Mto $550M

4. Adjusted Population Figures

The adjusted population figures from January 2020 are shown in Table 3 below.

Table 3: Summary of population changes

Master Suburb List	Additional population proposed (Nov 2019)	Revised Population	Population change
Aro Valley	1100	1100	0
Berhampore	1600	1600	0
Brooklyn	1800	2343	543
Crofton Downs	300	339	39
Island Bay	3500	2111	-1389
Johnsonville	5700	3458	-2242
Karori	6600	6327	-273
Kelburn	1900	1002	-898
Khandallah	2800	3261	461
Kilbirnie	1300	1363	63
Lyall Bay	500	658	158
Miramar	800	1644	844
Mount Cook	2500	2500	0
Mount Victoria	200	200	0
Newlands	2400	1817	-583
Newtown	2900	2900	0
Ngaio	1300	969	-331
Pipitea	2100	2100	0
Tawa	5300	4491	-809
Te Aro	17600	17600	0
Thorndon	1300	1300	0
Wellington Central	2900	2900	0
Churton Park		1302	1302
Hataitai		1262	1262
Growth in Greenfields	11000	11000	
Infill elsewhere citywide	2600	2600	
Total	**80000**	**78147**	**-1853**

5. Assessment

The assessment for the two additional suburbs of Churton Park and Hataitai are set out in the following section.

6. Churton Park

The growth scenario and associated cost band for Churton Park is represented in Figure 1 below.

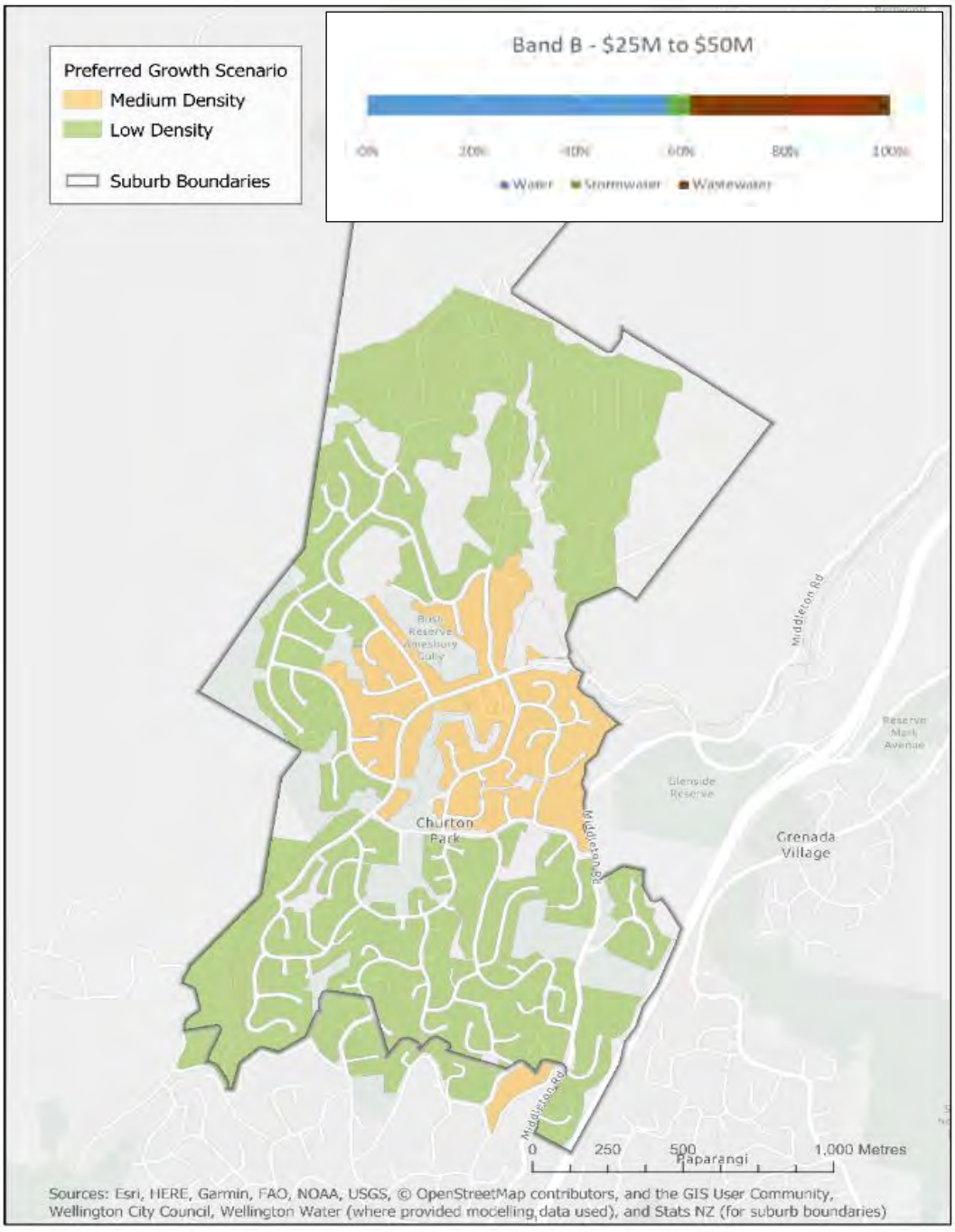

Figure 1: Churton Park growth scenario and cost band breakdown

7. Key Constraints and Potential Improvements

	Existing Constraints	Needed Infrastructure
Water	System performance issues with a predicted pressure drop below 25m for around 30 customers in the Lakewood Avenue and Mallard Grove. There is a current shortfall in storage. A few properties with low water pressure	Potential 2 ML of water supply storage to address the shortfall and a likely upgrade of the existing water supply mains to increase capacity in the system
Wastewater	The aging network and increased wet weather overflows	0.4 ML storage of wastewater required to minimise wet weather overflows. There is a likely upgrade of the gravity trunk main that is currently under capacity.
Stormwater	There are no significant flooding impacts in Churton Park, however, increased impermeable surfaces in this area may cause downstream effects to Tawa – which has known potential for flooding.	New developments would be expected to meet hydraulic neutrality to ensure that flooding impacts do not occur in the downstream sections of the catchment especially at Tawa. Onsite stormwater neutrality is assumed at developers cost. No other major infrastructure upgrades are anticipated at this time. There are potential benefits to retrofitting and installing water sensitive devices around the existing town centre to treat stormwater runoff using devices, for example, rain gardens.

8. Hataitai

The growth scenario and associated cost band for Hataitai is represented in Figure 2 below.

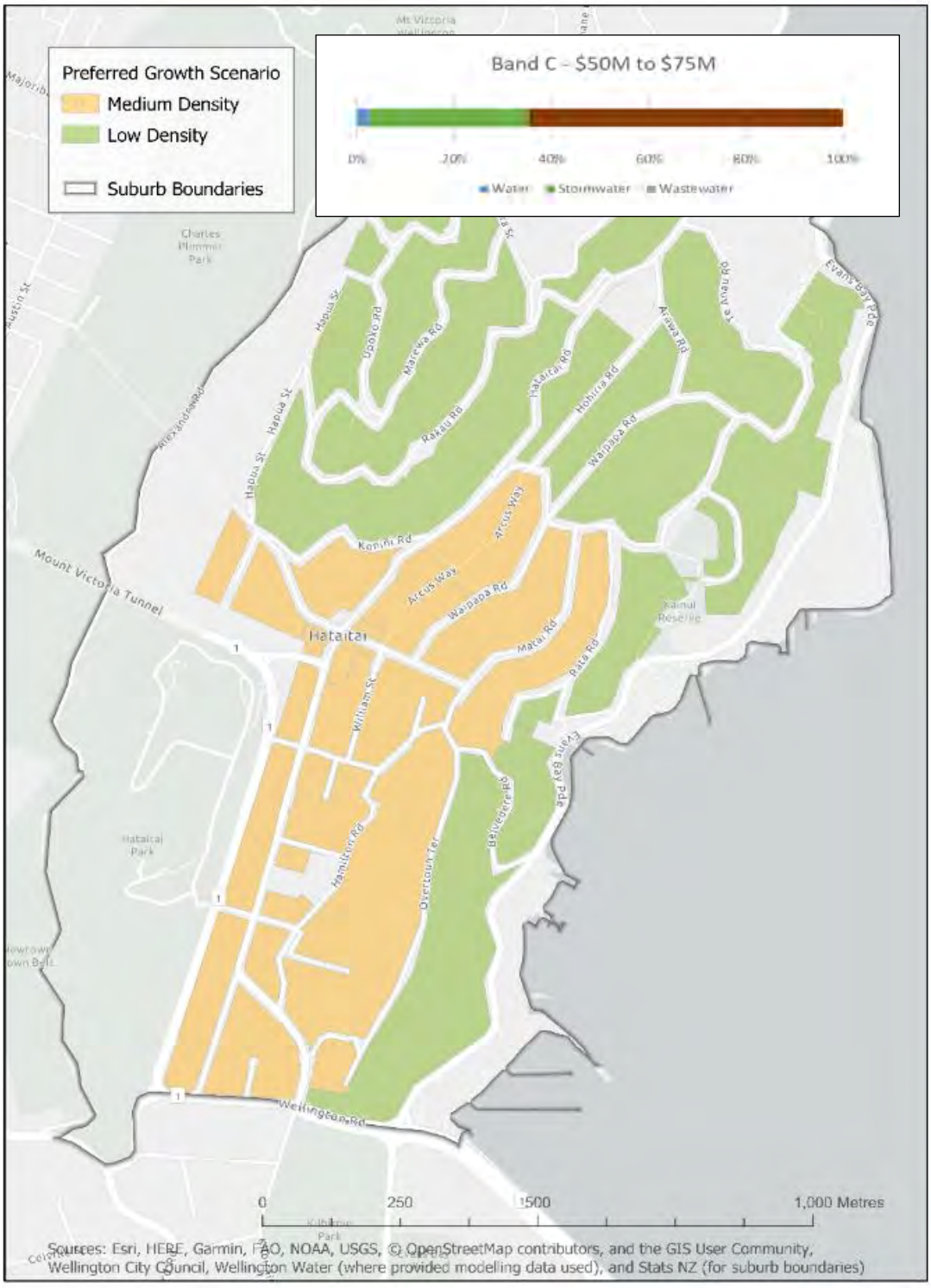

Figure 2 Hataitai growth scenario and cost band breakdown

9. Key Constraints and Potential Improvements

	Existing Constraints	Needed Infrastructure
Water	There are high elevation areas in Maida Vale Road, Waipapa Road, Overton Terrace, Belvedere Road and Hataitai Road where properties have low pressures. Preliminary analysis also indicates a shortfall of 2 ML of storage to accommodate growth.	The storage shortfall could be accommodated in the Miramar storage tank. Upgrading 500m of cast iron pipes on Hamilton Road and Overtoun Road to 150mm PE. Upgrade of 2km of Asbestos Cement pipes over time and 2 ML of additional storage at Miramar.
Wastewater	The aging network and increased wet weather overflows	Likely upgrade of 1.7 km of wastewater gravity mains and replacement of 4 km of poor condition pipes. Share of costs for Moa Point WWTP upgrade. 1.7 km of wastewater gravity main upgrade, 4km of poor condition pipe replacement and contribution to Moa Point Wastewater Treatment Plant upgrade.
Stormwater	Increased impermeable surfaces in this area may cause downstream effects in intensified areas and lower areas of the catchment.	1.4 km of pipe upgrades varying in size from 375mm to 1800 mm dimeter and provision for stormwater quality for medium and high density areas. New developments would be expected to meet hydraulic neutrality to ensure that flooding impacts do not occur in the downstream sections of the catchment. Onsite stormwater neutrality is assumed at developers cost. No other major infrastructure upgrades are anticipated at this time. There are potential benefits to retrofitting and installing water sensitive devices around the existing town centre to treat stormwater runoff using devices, for example, rain gardens.

10. Miramar

The growth scenario and associated cost band for Miramar is represented in Figure 3 below.

Figure 3 Miramar growth scenario and cost band breakdown

11. Key Constraints and Potential Improvements

	Existing Constraints	Needed Infrastructure
Water	System performance issues with a predicted pressure drop for a few properties. There is a current shortfall in storage.	To accommodate projected growth in Kilbirnie, Miramar, Lyall Bay and Hataitai around 13.5 ML of additional storage is required. Approximately 10 ML of this is to cover existing shortfall. Mains upgrade is estimated at 0.7 km to 300mm diameter. 0.7 km of 300mm diameter mains upgrade and 13.5 ML of storage.
Wastewater	The aging network and increased wet weather overflows. Wastewater pipes are under capacity and prone to high I&I. A new pump station with rising main and also gravity mains is required to service the relocated growth area. 4.3 km of poor condition pipe upgrades for water quality and 3.6 km of mains upgrade for capacity.	Approximately 8 km of existing pipe upgrades and replacement. In addition 1 km of 250 mm diameter PE rising main and 2 km of 375 mm diameter concrete pipes as gravity main is required. A new pump station with 110 l/sec capacity is also required to service the relocated growth area.
Stormwater	Existing Miramar town centre area is prone to flooding and any upstream intensification will lead to additional flood flows exacerbating flooding. It is estimated that 2.6km of stormwater pipe upgrades would be required. Flooding can also be exacerbated due to sea level rise.	2.6 km of stormwater pipe upgrades in addition to stormwater treatment devices. To address sea level rise a large pumpstation up to 40 m^3 /s capacity with associated outlet pipe upgrades. Stormwater runoff treatment from medium and high intensity development areas using rains gardens. New developments would be expected to meet hydraulic neutrality to ensure that flooding impacts do not occur in the downstream sections of the catchment. Onsite stormwater neutrality is assumed at developers cost. No other major infrastructure upgrades are anticipated at this time. There are potential benefits to retrofitting and installing water sensitive devices around the existing town centre to treat stormwater runoff using devices, for example, rain gardens.

12. Summary of findings

An updated summary of the growth scenario and associated potential cost bands are presented below.

Table 4: Summary of findings show the population figures and associated cost bands

Growth Area	Population Growth	Investment Cost Band	Cost range
Crofton Downs	339	A	$10 to $25M
Lyall Bay	658	A	$10 to $25M
Ngaio	969	B	$25 to $50M
Churton Park	1302	B	$25 to $50M
Hataitai	1262	C	$50 to $75M
Aro Valley	1100	C	$50 to $75M
Mount Victoria	200	C	$50 to $75M
Berhampore	1600	D	$75 to $100M
Brooklyn	2343	D	$75 to $100M
Kelburn	1002	E	$100 to $200M
Khandallah	3261	E	$100 to $200M
Kilbirnie	1363	E	$100 to $200M
Miramar	1644	F	$100 to $200M
Mount Cook	2,500	E	$100 to $200M
Newlands	1817	E	$100 to $200M
Newtown	2900	E	$100 to $200M
Pipitea	2,100	E	$100 to $200M
Thorndon	1,300	E	$100 to $200M
Wellington Central	2,900	E	$100 to $200M
Island Bay	2111	F	$200 to $550M
Johnsonville	3458	F	$200 to $550M
Karori	6327	F	$200 to $550M
Tawa	4491	F	$200 to $550M
Te Aro	17,600	F	$200 to $550M