Long Term Plan 2018-28
Service Plan for Stormwater Drainage

As at March 2018

Approvals		
Role	**Name**	**Signature and date of sign-off**
Finance Manager	Peter Langbein	Approved February 2018
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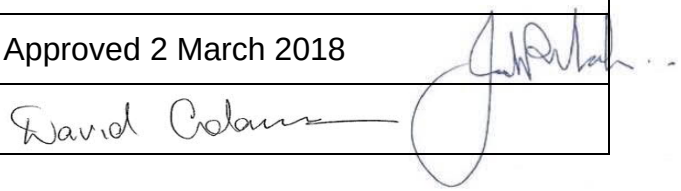
General Manager(s)	David Adamson	

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What does the overall Group of Activities do and why do we do it?

Christchurch City Council builds, owns, operates and maintains water supply, wastewater, stormwater and solid waste networks to provide to support healthy communities and a prosperous economy.

These services are core business for the Council, required by the Local Government Act 2002, and governed by a number of other acts and legislation.

Council implements these services for the community through planning, day to day operations, planned and reactive maintenance, repair and renewal of damaged infrastructure, building new infrastructure and implementing improvements to the system and measures its performance in terms of safety, quality and reliability.

1. What does this activity deliver?

The stormwater network collects and conveys stormwater whilst protecting the community from surface flooding during storm events. The first two years (or three years with rates constrained option) of the Long Term Plan includes both flood protection (delivered by the Land Drainage Recovery Programme) and renewals, but after this approximately 80% of the activity's capital budget is to renew an ageing pipe and waterway network to ensure that Council is able to continue to provide this core service.

The key physical assets used to deliver this activity are:

- The underground conveyance networks (including pipes, manholes, sumps, inlets, outlets etc)
- Open channels and overland flow path (including natural waterways such as rivers, streams and creeks, constructed drainage channels, in-channel structures, lining and retaining walls etc)
- Treatment devices that are not within the Flood Protection and Control Works Activity (ie where there is no flood protection component such as silt traps, gross debris traps or proprietary treatments devices such as the cartridge filters proposed at the new Bells Creek Pump Station site).

Council uses a multi-value approach to stormwater, where the drainage value of the network is considered alongside other values such as ecology, culture, recreation, heritage and landscape. Together these are known as the 'six values' that Council utilises in stormwater drainage and waterway management.

In delivering this service the Council provides a balanced mix of maintenance and renewals to preserve the levels of service as well as capital investment to respond to increasing demands for growth (both greenfield and infill) and improved stormwater discharge quality to address waterway degradation.

This activity is linked to the Flood Protection and Control Works activity.

2. Why do we deliver this activity?

Providing stormwater drainage is core business for the Council, required by the Local Government Act 2002. Effective management of stormwater runoff reduces the risk of flooding, and reduces the impact of stormwater on the receiving environment. A well performing stormwater drainage network contributes to multiple values such as ecology, recreation, culture, heritage, and landscape. It also an important part of developing resilience to hazards and climate change stresses.

The activity must be undertaken in accordance with:

- Local Government Act 2002
- Resource Management Act 1991
- National Policy Statement on Urban Development Capacity 2016
- Health and Safety at Work Act 2015
- Building Act 2004
- Christchurch District Drainage Act 1951
- Christchurch District Plan
- Water Supply, Wastewater and Stormwater Bylaw 2014
- Soil conservation & Rivers Control Act 1941

The stormwater drainage service is critical for achieving and supporting Council's Strategic Priorities, including:

- Safe and sustainable supply water supply and improved waterways including:
    - Water quality and ecological health in our waterways continues to improve over time toward agreed environmental target levels
    - The proportion of our waterways that are safe for contact recreation and that can support mahinga kai is increasing

- Informed and proactive approaches to natural hazard risks:
    - The primary drainage network reduces the risk of habitable floor flooding
    - Christchurch is well prepared for the impacts and consequences of natural hazards and can respond and recover quickly
    - Council infrastructure is able to function following expected natural hazard events
- Maximising opportunities to develop a vibrant, prosperous and sustainable 21st Century city
    - Stormwater drainage is core infrastructure to ensure the city functions well and supports prosperity

The Community Outcomes that relate most directly to the Stormwater Drainage activity are:

- Strong Communities - Safe & Healthy Communities
- Healthy Environment - Healthy waterways
- Healthy Environment - Sustainable use of resources
- Healthy Environment - Unique landscapes and indigenous biodiversity are valued
- Prosperous Economy - Modern and robust city infrastructure and facilities network
- Prosperous Economy - Great place for people, business and investment

3. Specify Levels of Service

The Levels of Service, Performance Measures and Performance Targets for the Stormwater activity are provided below.

Green text indicates a new performance measure.
Black text indicates an unchanged performance measure.
Purple text indicates a performance measure proposed for modification
Red current performance text indicates a performance target that has not been met

Performance Standards Levels of Service	Results	Method of Measurement	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10 2027/28
					Year 1	Year 2	Year 3	
					2018/19	2019/20	2020/21	
Provide and maintain the stormwater drainage system (surface water management systems, such as streams, rivers, utility waterways, basins, structures, pipes)								

Performance Standards Levels of Service		Results	Method of Measurement	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10 2027/28
						Year 1	Year 2	Year 3	
						2018/19	2019/20	2020/21	
14.0.1	Council responds to flood events, faults and blockages promptly and effectively	Community Outcome: Safe & Healthy Communities	Reported in monthly contract reports from the Contractor.	2016/17: 100%		Non-LTP Target 1 Percentage of emergency calls responded to within 2 hours (urban) or 6 hours (rural): ≥95%	Non-LTP Target 1 Percentage of emergency calls responded to within 2 hours (urban) or 6 hours (rural): ≥95%	Non-LTP Target 1 Percentage of emergency calls responded to within 2 hours (urban) or 6 hours (rural): ≥95%	Non-LTP Target 1 Percentage of emergency calls responded to within 2 hours (urban) or 6 hours (rural): ≥95%
		Community Outcome: Safe & Healthy Communities	Reported in monthly contract reports from the Contractor.	2016/17: 100%		Non-LTP Target 2 Percentage of urgent calls responded to within 24 hours: ≥95%	Non-LTP Target 2 Percentage of urgent calls responded to within 24 hours: ≥95%	Non-LTP Target 2 Percentage of urgent calls responded to within 24 hours: ≥95%	Non-LTP Target 2 Percentage of urgent calls responded to within 24 hours: ≥95%
		Community Outcome: Safe & Healthy Communities	Reported in monthly contract reports from the Contractor.	2016/17: 99%		Non-LTP Target 3 Percentage of priority calls responded to within 3 working days (urban) or 5 working days (rural): ≥85%	Non-LTP Target 3 Percentage of priority calls responded to within 3 working days (urban) or 5 working days (rural): ≥85%	Non-LTP Target 3 Percentage of priority calls responded to within 3 working days (urban) or 5 working days (rural): ≥85%	Non-LTP Target 3 Percentage of priority calls responded to within 3 working days (urban) or 5 working days (rural): ≥85%

14.0.1 Cont'd	Council responds to flood events, faults and blockages promptly and effectively	Community Outcome: Safe & Healthy Communities Community Outcome: Safe & Healthy Communities Department of Internal Affairs, Stormwater non-financial performance measure number 3	Reported in monthly contract reports from the Contractor. Reported in monthly contract reports from the Contractor.	2016/17: 99% 2016/17 <30mins		Non-LTP Target 4 Percentage of routine calls responded to within 5 working days (urban) or 10 working days (rural): ≥85% Target 5 The median response time to attend a flooding event*, measured from the time that the territorial authority receives notification to the time that service personnel reach the site: ≤60 mins urban ≤120 mins rural	Non-LTP Target 4 Percentage of routine calls responded to within 5 working days (urban) or 10 working days (rural): ≥85% Target 5 The median response time to attend a flooding event*, measured from the time that the territorial authority receives notification to the time that service personnel reach the site: ≤60 mins urban ≤120 mins rural	Non-LTP Target 4 Percentage of routine calls responded to within 5 working days (urban) or 10 working days (rural): ≥85% Target 5 The median response time to attend a flooding event*, measured from the time that the territorial authority receives notification to the time that service personnel reach the site: ≤60 mins urban ≤120 mins rural	Non-LTP Target 4 Percentage of routine calls responded to within 5 working days (urban) or 10 working days (rural): ≥85% Target 5 The median response time to attend a flooding event*, measured from the time that the territorial authority receives notification to the time that service personnel reach the site: ≤60 mins urban ≤120 mins rural

*A flooding event means an overflow of stormwater from Council's stormwater system that enters a habitable floor. This includes basements

Performance Standards Levels of Service		Results	Method of Measurement	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10 2027/28
						Year 1	Year 2	Year 3	
						2018/19	2019/20	2020/21	
14.0.2	Council manages the stormwater network in a responsible and sustainable manner	Community Outcome: Sustainable use of resources Community Outcome: Sustainable use of resources Department of Internal Affairs, Stormwater non-financial performance measure number 2a	Resident satisfaction surveys Reported in resource consent compliance reports to ECan.	New level of service – no current performance 2016/17: 0		Target 1 Proportion of residents satisfied with the sustainability of stormwater services: ≥50% Target 2 Number of abatement notices regarding Council resource consents related to discharges from the stormwater networks per year: 0	Target 1 Proportion of residents satisfied with the sustainability of stormwater services: ≥50% Target 2 Number of abatement notices regarding Council resource consents related to discharges from the stormwater networks per year: 0	Target 1 Proportion of residents satisfied with the sustainability of stormwater services: ≥55% Target 2 Number of abatement notices regarding Council resource consents related to discharges from the stormwater networks per year: 0	Target 1 Proportion of residents satisfied with the sustainability of stormwater services: ≥65% Target 2 Number of abatement notices regarding Council resource consents related to discharges from the stormwater networks per year: 0

Performance Standards Levels of Service		Results	Method of Measurement	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10 2027/28
						Year 1	Year 2	Year 3	
						2018/19	2019/20	2020/21	
14.0.2 Cont'd	Council manages the stormwater network in a responsible and sustainable manner	Community Outcome: Sustainable use of resources Department of Internal Affairs, Stormwater non-financial performance measure number 2b	Reported in resource consent compliance reports to ECan.	2016/17: 0		Target 3 Number of infringement notices regarding Council resource consents related to discharges from the stormwater networks per year: 0	Target 3 Number of infringement notices regarding Council resource consents related to discharges from the stormwater networks per year: 0	Target 3 Number of infringement notices regarding Council resource consents related to discharges from the stormwater networks per year: 0	Target 3 Number of infringement notices regarding Council resource consents related to discharges from the stormwater networks per year: 0
		Community Outcome: Sustainable use of resources *Department of Internal Affairs, Stormwater non-financial performance measure number 2c*	Reported in resource consent compliance reports to ECan.	2016/17: 0		Target 4 Number of enforcement orders regarding Council resource consents related to discharges from the stormwater networks per year: 0	Target 4 Number of enforcement orders regarding Council resource consents related to discharges from the stormwater networks per year: 0	Target 4 Number of enforcement orders regarding Council resource consents related to discharges from the stormwater networks per year: 0	Target 4 Number of enforcement orders regarding Council resource consents related to discharges from the stormwater networks per year: 0

Performance Standards Levels of Service		Results	Method of Measurement	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10 2027/28
						Year 1	Year 2	Year 3	
						2018/19	2019/20	2020/21	
14.0.2 Cont'd	Council manages the stormwater network in a responsible and sustainable manner	Community Outcome: Sustainable use of resources *Department of Internal Affairs, Stormwater non-financial performance measure number 2d*	Reported in resource consent compliance reports to ECan.	2016/17: 0		Target 5 Number of successful prosecutions regarding Council resource consents related to discharges from the stormwater networks per year: 0	Target 5 Number of successful prosecutions regarding Council resource consents related to discharges from the stormwater networks per year: 0	Target 5 Number of successful prosecutions regarding Council resource consents related to discharges from the stormwater networks per year: 0	Target 5 Number of successful prosecutions regarding Council resource consents related to discharges from the stormwater networks per year: 0
		Community Outcome: Sustainable use of resources	Reported in monthly contract reports from the Contractor.	2016/17: 100%		Non-LTP Target 6 Percentage of all aquatic weed diverted from landfill (mechanical and hand harvested): ≥95%	Non-LTP Target 6 Percentage of all aquatic weed diverted from landfill (mechanical and hand harvested): ≥95%	Non-LTP Target 6 Percentage of all aquatic weed diverted from landfill (mechanical and hand harvested): ≥95%	Non-LTP Target 6 Percentage of all aquatic weed diverted from landfill (mechanical and hand harvested): ≥95%

Performance Standards Levels of Service		Results	Method of Measurement	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10 2027/28
						Year 1	Year 2	Year 3	
						2018/19	2019/20	2020/21	
14.0.3	Council maintains waterway channels & margins to a high standard	Community Outcome: Great place for people, business and investment	Resident satisfaction surveys	2016/17: 39%		Target 1 Proportion of residents satisfied with the condition of waterway channels: ≥37%	Target 1 Proportion of residents satisfied with the condition of waterway channels: ≥37%	Target 1 Proportion of residents satisfied with the condition of waterway channels: ≥40%	Target 1 Proportion of residents satisfied with the condition of waterway channels: ≥50%
		Community Outcome: Great place for people, business and investment	Resident satisfaction surveys	2016/17: 53%		Target 2 Proportion of residents satisfied with the condition of waterway margins: ≥50%	Target 2 Proportion of residents satisfied with the condition of waterway margins: ≥50%	Target 2 Proportion of residents satisfied with the condition of waterway margins: ≥55%	Target 2 Proportion of residents satisfied with the condition of waterway margins: ≥60%

Performance Standards Levels of Service		Results	Method of Measurement	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10 2027/28
						Year 1	Year 2	Year 3	
						2018/19	2019/20	2020/21	
14.0.3 Cont'd	Council maintains waterway channels & margins to a high standard	Community Outcome: Unique landscape and indigenous biodiversity are valued	Resident satisfaction surveys	2016/17: 64%		Target 3 Proportion of residents satisfied with the appearance of waterway margins: ≥60%	Target 3 Proportion of residents satisfied with the appearance of waterway margins: ≥60%	Target 3 Proportion of residents satisfied with the appearance of waterway margins: ≥65%	Target 3 Proportion of residents satisfied with the appearance of waterway margins: ≥75%
		Community Outcome: Unique landscape and indigenous biodiversity are valued	GIS	New level of service – no current performance		Non-LTP Target 4 Total length of bank naturalised per year: 150m	Non-LTP Target 4 Total length of bank naturalised per year: 150m	Non-LTP Target 4 Total length of bank naturalised per year: 200m	Non-LTP Target 4 Total length of bank naturalised per year: 300m

Performance Standards Levels of Service		Results	Method of Measurement	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10 2027/28
						Year 1	Year 2	Year 3	
						2018/19	2019/20	2020/21	
		Community Outcome: Unique landscape and indigenous biodiversity are valued	GIS	New level of service – no current performance		Non-LTP Target 5 No net loss of open waterway and riparian habitat (eg piping or encroachment in to setback): Pass	Non-LTP Target 5 No net loss of open waterway and riparian habitat (eg piping or encroachment in to setback): Pass	Non-LTP Target 5 No net loss of open waterway and riparian habitat (eg piping or encroachment in to setback): Pass	Non-LTP Target 5 No net loss of open waterway and riparian habitat (eg piping or encroachment in to setback): Pass

Performance Standards Levels of Service		Results	Method of Measurement	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10 2027/28
						Year 1	Year 2	Year 3	
						2018/19	2019/20	2020/21	
14.0.4	Stormwater network is managed to minimise risk of flooding, damage and disruption	Community Outcome: Modern and robust city infrastructure and facilities network.	Resident satisfaction surveys	2016/17: 53%		Target 1 Proportion of residents satisfied with the management of Council stormwater systems to ensure flood risk is minimised: ≥50%	Target 1 Proportion of residents satisfied with the management of Council stormwater systems to ensure flood risk is minimised: ≥50%	Target 1 Proportion of residents satisfied with the management of Council stormwater systems to ensure flood risk is minimised: ≥75%	Target 1 Proportion of residents satisfied with the management of Council stormwater systems to ensure flood risk is minimised: ≥80%
		Community Outcome: Modern and robust city infrastructure and facilities network. DIA stormwater non-financial performance measure number 1a	Site inspection reports	2016/17: < 2		Target 2 The number of flooding events that occur: <2	Target 2 The number of flooding events that occur: <2	Target 2 The number of flooding events that occur: <2	Target 2 The number of flooding events that occur: <3

Performance Standards Levels of Service		Results	Method of Measurement	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10 2027/28
						Year 1	Year 2	Year 3	
						2018/19	2019/20	2020/21	
14.0.4 Cont'd	Stormwater network is managed to minimise risk of flooding, damage and disruption	Community Outcome: Modern and robust city infrastructure and facilities network. Department of Internal Affairs, Stormwater non-financial performance measure number 1b	Site inspection reports	2016/17: 0.66		Target 3 For each flooding event, the number of habitable floors affected. (Expressed per 1000 properties connected to the territorial authority's stormwater system.): <0.1	Target 3 For each flooding event, the number of habitable floors affected. (Expressed per 1000 properties connected to the territorial authority's stormwater system.): <0.1	Target 3 For each flooding event, the number of habitable floors affected. (Expressed per 1000 properties connected to the territorial authority's stormwater system.): <0.1	Target 3 For each flooding event, the number of habitable floors affected. (Expressed per 1000 properties connected to the territorial authority's stormwater system.): <0.1

Performance Standards Levels of Service		Results	Method of Measurement	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10 2027/28
						Year 1	Year 2	Year 3	
						2018/19	2019/20	2020/21	
14.0.4 Cont'd	Stormwater network is managed to minimise risk of flooding, damage and disruption	Community Outcome: Modern and robust city infrastructure and facilities network. *Department of Internal Affairs, Stormwater non-financial performance measure number 4*	Number of complaints received through the call centre	2016/17: 8.4		Target 4 Number of complaints received by a territorial authority about the performance of its stormwater system, expressed per 1000 properties connected to the territorial authority's stormwater system: < 10	Target 4 Number of complaints received by a territorial authority about the performance of its stormwater system, expressed per 1000 properties connected to the territorial authority's stormwater system: < 10	Target 4 Number of complaints received by a territorial authority about the performance of its stormwater system, expressed per 1000 properties connected to the territorial authority's stormwater system: < 9	Target 4 Number of complaints received by a territorial authority about the performance of its stormwater system, expressed per 1000 properties connected to the territorial authority's stormwater system: < 8

Performance Standards Levels of Service		Results	Method of Measurement	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10 2027/28
						Year 1	Year 2	Year 3	
						2018/19	2019/20	2020/21	
14.0.4 Cont'd	Stormwater network is managed to minimise risk of flooding, damage and disruption	Community Outcome: Modern and robust city infrastructure and facilities network.	Infonet	New level of service – no current performance		Non-LTP Target 5 Percentage of total stormwater gravity network pipework length at condition grade 5. Based on physical inspection or theoretical model: ≤ 7%	Non-LTP Target 5 Percentage of total stormwater gravity network pipework length at condition grade 5. Based on physical inspection or theoretical model: ≤ 7%	Non-LTP Target 5 Percentage of total stormwater gravity network pipework length at condition grade 5. Based on physical inspection or theoretical model: ≤ 7%	Non-LTP Target 5 Percentage of total stormwater gravity network pipework length at condition grade 5. Based on physical inspection or theoretical model: ≤ 7%

4. What levels of service do we propose to change from the current LTP and why?

The following is a summary of level of service changes.

Amended LTP 2016-25			LTP 2018-28			Rationale
LOS ID	LOS Description	Target (FY17/18)	LOS ID	LOS Description	Target (FY18/19)	
N/A	N/A	N/A	14.0.2 Target 1 LTP	Council manages the stormwater network in a responsible and sustainable manner	Proportion of residents satisfied with the sustainability of stormwater services: ≥50%	Target values amended to align with indicated values from other relevant LOS.
14.1.10	Response times to attend a flooding event	The median response time to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reach the site: 30 minutes	14.0.1 Target 5 LTP	Council responds to flood events, faults and blockages promptly and effectively	The median response time to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reach the site: ≤60 mins urban ≤120 mins rural	Current target of ≤30mins is not being achieved. Auckland City splits into urban and rural, with 60 mins and 120 mins respectively, which is more reasonable /realistic. Christchurch wastewater also split into urban and rural. Accordingly, response target has been split into urban (60 mins) and rural (120 mins) - if such split is not possible, then the response time should be longer (120 min) which is reasonably achievable in covering all localities.
N/A	N/A	N/A	14.0.3 Target 4 Non-LTP	Council maintains waterway channels & margins to a high standard	Total length of bank naturalised per year: 150m	Formalising measurement of a positive action that the Council already takes in this area and ensuring it continues in the future Length amended to align with likely funding available ("modified medium"). Re-classified Non-LTP as techinically focused.
N/A	N/A	N/A	14.0.3 Target 5 Non-ltp	Council maintains waterway channels & margins to a high standard	No net loss of open waterway and riparian habitat (eg piping or encroachment in to setback): Pass	Formalising measurement of a planning-related requirement. Proxy for ecological protection measure. Re-classified as non-LTP due to performance measure being technically focused rather than community outcome focused.
N/A	N/A	N/A	14.0.4 Target 4 Non-LTP	Stormwater network is managed to minimise risk	Percentage of total stormwater gravity network pipework length at	Provides a clear link between the level of service and how this is achieved on a

Amended LTP 2016-25			LTP 2018-28			Rationale
LOS ID	LOS Description	Target (FY17/18)	LOS ID	LOS Description	Target (FY18/19)	
				of flooding, damage and disruption	condition grade 5. Based on physical inspection or theoretical model: ≤ 7%	network-wide basis through renewal of pipes (highest value stormwater asset type) Change from LTP to non-LTP Measure has a technical management focus rather than being community facing.
14.0.11.1	Stormwater system is adequate to deal with flood events up to a 1 in 5 year event.	Total number of flooding events per annum, measured as a 10 year rolling average: <2	14.0.4 Target 2 LTP	Stormwater network is managed to minimise risk of flooding, damage and disruption	The number of flooding events that occur: <2	
14.0.11.2	Stormwater system is adequate to deal with flood events up to a 1 in 5 year event.	For each flooding event, the number of habitable floors affected, expressed as an average per 100,000 properties connected to the territorial authority's stormwater system: 0	14.0.4 Target 3 LTP	Stormwater network is managed to minimise risk of flooding, damage and disruption	For each flooding event, the number of habitable floors affected. (Expressed per 1000 properties connected to the territorial authority's stormwater system.): <0.1	
14.0.13	Three waters strategies, policies and plans to protect or enhance the natural environment including ecosystems, natural and cultural landscapes, freshwater; manage natural hazards; and promote sustainability are developed	Stormwater Management Plans for Banks Peninsula catchments completed by 2020	N/A	N/A	N/A	Removed as not a level of service. New, targeted, levels of service have been introduced.
14.0.12 LTP	Number of complaints received by CCC about the performance of the stormwater system	Number of complaints about the performance of the stormwater systems, per 1000 connected properties: 8	14.0.4 Target 4 LTP	Stormwater network is managed to minimise risk of flooding, damage and disruption	Number of complaints received by a territorial authority about the performance of its stormwater system, expressed per 1000 properties connected to the territorial authority's stormwater system: <10	Values now more closely relate to current performance while setting realistic improvement targets.

Amended LTP 2016-25			LTP 2018-28			Rationale
LOS ID	LOS Description	Target (FY17/18)	LOS ID	LOS Description	Target (FY18/19)	
14.0.1.1	Response times to drainage faults and surface water management issues	Emergency works – urban 2 hours; rural 6 hours: 95%	14.0.1 Target 1 Non-LTP	Council responds to flood events, faults and blockages promptly and effectively	Percentage of emergency calls responded to within 2 hours (urban) or 6 hours (rural): ≥95%	Targets related to management processes/contract KPIs rather than the key outcome (which Target 6 covers)
14.0.1.2	Response times to drainage faults and surface water management issues	Urgent works – urban 24 hours; rural 24 hours: 95%	14.0.1 Target 2 Non-LTP	Council responds to flood events, faults and blockages promptly and effectively	Percentage of urgent calls responded to within 24 hours: ≥95%	Targets related to management processes/contract KPIs rather than the key outcome (which Target 6 covers)
14.0.1.3	Response times to drainage faults and surface water management issues	Priority call outs – urban 3 working days; rural 5 working days: 85%	14.0.1 Target 3 Non-LTP	Council responds to flood events, faults and blockages promptly and effectively	Percentage of priority calls responded to within 3 working days (urban) or 5 working days (rural): ≥85%	Targets related to management processes/contract KPIs rather than the key outcome (which Target 6 covers)
14.0.1.4	Response times to drainage faults and surface water management issues	Routine call outs – urban 5 working days; rural 10 working days: 85%	14.0.1 Target 4 Non-LTP	Council responds to flood events, faults and blockages promptly and effectively	Percentage of routine calls responded to within 5 working days (urban) or 10 working days (rural): ≥85%	Targets related to management processes/contract KPIs rather than the key outcome (which Target 6 covers)
14.0.6	Diversion of all aquatic weed from landfill (mechanical and hand harvested)	≥ 95%	14.0.2 Target 6 Non-LTP	Council manages the stormwater network in a responsible and sustainable manner	Percentage of all aquatic weed diverted from landfill (mechanical and hand harvested): ≥95%	Re-classified as Non-LTP as measure is technical rather than community outcome focused.
14.0.3 LTP	Customer satisfaction with Stormwater Drainage Management	≥ 75%	14.0.3 Target 1 LTP	Council maintains waterway channels & margins to a high standard	Proportion of residents satisfied with the condition of waterway channels: ≥37%	Maximising the benefit and information that can be gained from an existing externally-focused measure by reporting it individually rather than as an overall satisfaction score. NOTE: litter in the waterways was a recurring theme in the verbatim customer satisfaction survey comments Outcome now aligns with target intent. Values now more closely relate to current resident survey results, with realistic improvement targets set.

Amended LTP 2016-25			LTP 2018-28			Rationale
LOS ID	LOS Description	Target (FY17/18)	LOS ID	LOS Description	Target (FY18/19)	
14.0.3 LTP	Customer satisfaction with Stormwater Drainage Management	≥ 75%	14.0.3 Target 2 LTP	Council maintains waterway channels & margins to a high standard	Proportion of residents satisfied with the condition of waterway margins: ≥50%	Values now more closely align with resident survey results, with realistic improvement targets set.
14.0.3 LTP	Customer satisfaction with Stormwater Drainage Management	≥ 75%	14.0.3 Target 3 LTP	Council maintains waterway channels & margins to a high standard	Proportion of residents satisfied with the appearance of waterway margins: ≥60%	Values now more closely align with current resident survey results, with realistic improvement targets set.
14.0.3 LTP	Customer satisfaction with Stormwater Drainage Management	≥ 75%	14.0.4 Target 1 LTP	Stormwater network is managed to minimise risk of flooding, dam age and disruption	Proportion of residents satisfied with the management of Council stormwater systems to ensure flood risk is minimised: ≥50%	Values now more closely reflect current resident survey results with realistic improvement targets set.

5. How will the assets be managed to deliver the services?

The stormwater drainage service is managed according to best practice which aligns with the International Infrastructure Management Manual (IIMM) and to ensure that Council complies with its statutory requirements and achieves the levels of service as expected by the community. Management processes include:

Plan: model current network performance, determine future needs and identify, evaluate and recommend options to achieve an optimal stormwater drainage service

Regulate: issue standards, specifications and bylaws to ensure that the service is safe, reliable and resilient and enforce adherence through the Council's consent processes

Build: conceptualize, design, specify and procure contractors to build new assets

Operate: ensure that stormwater drainage network is operated appropriately, efficiently and effectively

Maintain: perform planned and cyclic maintenance for a reliable and compliant service

Repair and renew: review asset condition in the context of age, material, maintenance, etc. and establish a prioritized programme for asset repair and renewal to ensure effectiveness and efficiency of supply

Customer services: receive, prioritize and respond to customer complaints and requests for services

How are renewal works identified and prioritised?

For the **core renewals**, detailed methodologies are available in the Draft Lifecycle Management Manual with results in the 2018 Land Drainage Asset Management Plan.

At a high level:

- Long term (years 4-30) budget planning is based on installation year and theoretical useful life where the theoretical useful life takes into account material, manufacturer, manufacturing standard, condition assessment results, criticality and vulnerability assessments and expert judgement from literature.
- Short term (years 1-3) budgets and programs identify and prioritise specific renewals projects based on condition assessment results, performance assessment results, criticality, obsolescence and risk.

Reticulation via stormwater pipes and waterway lining are the two most significant asset types and, as such, have been given careful consideration in terms of renewal requirements. Further detail relating the development of renewal programmes for these specific asset types are included below.

Stormwater Pipes Infonet, which is a purpose-built Infrastructure Management System for 3-Waters networks, has recently become available to the 3-Waters asset managers. This has improved access to up-to-date condition (CCTV survey) and asset attribute data plus improved analysis and reporting tools, which have been used to inform long and short-term pipe renewal programmes.

The stormwater pipe renewals programme is focussed on very poor or poor condition pipes that have a much higher probability of failing than pipes that are in good condition. All stormwater pipes have been assigned a criticality grade, which is a measure of the consequences of failure and this has been used to prioritise renewal of the very poor and poor condition pipes. Prioritisation is also based on renewing in conjunction with other programmes, e.g. full road reconstruction, to avoid excavating through new roading works and reducing the performance and life of the road surface. Funding of early renewal of pipes within Otakaro, DCL and Regenerate Christchurch Transport project areas has not been included in this plan due to funding constraints and lack of clarity around construction dates.

Insufficient stormwater reticulation piping renewal will result in the following:

- Failure of pipes under buildings and roads causing damage and disruption
- Increased risk or flooding due to pipe collapses and blockages
- Increased public and operational H&S and flood risk due to poor inlet arrangements (e.g. inaccessible / blockage prone / unsafe grills and openings)
- More reactive work and associated extra cost and disruption
- Increased traffic disruption and property damage due to pipe failure and the consequent unplanned restricted access for hazard isolations and repairs

NOTE: The 2015 LTP Stormwater Reticulation funding levels are considered insufficient and will result in increased risk of the above.

Waterway Lining A significant amount of timber lining was installed between 1974 and 1989 by lining gangs employed by the Drainage Board prior to amalgamation with CCC. With a typical useful life of 40 years, it is anticipated that much of this timber lining will require renewal within the first 10 years of the LTP period.

Physical inspection of much of the waterway lining assets was undertaken in 2015/2016 through the LDRP and this has provided good data on the overall condition of this asset type, which generally confirms what would be expected if considering age and expected useful life alone. Following physical inspection, 8km of waterway lining was assessed as being in poor or very poor condition and requiring renewal within approximately 5 years (from the date of inspection), which will be within the first 3 years of the LTP period. The funding recommended for waterway lining renewal will support renewals at a level that maintains the network in its current overall condition and smooths the renewal spend profile to create a sustainable and deliverable future programme of works.

The renewals programme will support not only like-for-like renewal of lining, but where feasible, will actively promote removal of lining in favour of creating more natural waterway channels, which will provide the following benefits (NOTE: naturalising a waterway is still an engineered solution):

- Greater resilience through less reliance on hard infrastructure solutions
- Support of the 6 values strategic approach, (in particular Environment (biodiversity / Healthy Waterways) and Landscape (great place for people, business and investment)
- Reduced future renewal costs
- Reduced H&S risks associated with the vertical drops of box drains
- Greater protection of waterway corridors from future development

Insufficient waterway lining renewal, which is what will occur if funding were to stay at the 2015 LTP levels, will result in the following:

- More dilapidated assets, many of which are highly visible
- Increased H&S risk associated with large voids along banks caused by material being washed out from behind failed lining and dangerous wood and concrete debris and exposed nails or steel reinforcing
- Increased risk of flooding due to blockages caused by lining failure
- Increased OPEX costs as lining is patch repaired instead of being renewed
- Waterway and ecosystem degradation as a result of bank erosion and undercutting around damaged or missing linings

How are capital projects for growth, backlog and improvements prioritised?

Growth, Backlog and Improved Levels of Service programmes and projects are established through network planning processes for issue identification and assessment. This includes responding to known stormwater drainage issues and areas of planned growth. The majority of these projects are reported under the Flood Protection and Control Works activity.

Earthquake recovery flood mitigation projects delivered through the Land Drainage Recovery Programme (LDRP) will require funding the rates constrained option in financial years 2019 ($13.9M), 2020 ($3M) and 2021 ($6.5M) through this Activity. The projects delivered in these years are high priority projects based on level of flood risk. Beyond these years, all LDRP projects will be delivered through the Flood Protection & Control Works Activity.

6. What financial resources are needed?

Table 6.1 – Current and Proposed Budget

STORMWATER DRAINAGE- STORMWATER DRAINAGE				
	2017/18 Annual Plan	**2018/19**	**2019/20**	**2020/21**
	000's			
Storm Water Drainage System	18,510	15,227	15,789	16,310
EQ - Stormwater Drainage	223	351	364	370
Activity Costs before Overheads	18,734	15,578	16,153	16,679
Corporate Overhead	1,425	1,275	1,341	1,247
Depreciation	13,084	12,794	13,313	13,811
Interest	1,177	1,131	1,309	1,729
Total Activity Cost	**34,420**	**30,777**	**32,116**	**33,466**
Funded By:				
Fees and Charges	21	21	16	17
Grants and Subsidies	-	-	-	-
Total Operational Revenue	**21**	**21**	**16**	**17**
Net Cost of Service	**34,400**	**30,755**	**32,100**	**33,450**
Funding Percentages:				
Rates	99.9%	99.9%	99.9%	100.0%
Fees and Charges	0.1%	0.1%	0.1%	0.0%
Grants and Subsidies	0.0%	0.0%	0.0%	0.0%
Capital Expenditure				
Improved Levels of Service	515	579	601	698
Increased Demand	35,940	2,597	28	596
Renewals and Replacements	35,762	24,420	11,591	21,145
Total Activity Capital	**72,216**	**27,596**	**12,219**	**22,439**

7. How much capital expenditure will be spent, on what category of asset, and what are the key capital projects for this activity?

The planned capital expenditure (capex) over the first five years of the activity reflects a priority to reduce flooding in the Heathcote River through implementation of the Land Drainage Recovery Programme (LDRP).. Over the LTP period, approximately 30% of the total planned capex for this activity relates to LDRP projects.

Beyond 2020 the planned capex for the other priority within this activity – the renewal of the pipes and waterway lining – increases markedly. This is because pipes installed prior to and during the building boom of the 1950's are now at the end of their life, so a large increase in renewals is required. In addition, the earthquakes have reduced expected life of assets. Currently 10% of lined drains and stormwater pipes are in poor or very poor condition and need replacing in the next 1-10 years to avoid failure of the assets, which will cause flooding, damage to other infrastructure, utilities and private property. Implementation of a well-planned and timely programme of renewals avoids creation of a future renewal requirement that would become so large that it would be unmanageable in terms of financial support and resourcing. Over the LTP period, approximately 60% of total planned capex for this activity relates to renewals.

The main drivers for expenditure on stormwater drainage are:

- Infrastructure to facilitate development and ensure a prosperous economy
- A renewals programme based on condition assessments and targeting infrastructure near failure
- Restoring the drainage network to pre-earthquake condition and performance levels in terms of flooding effects in particular
- Improving the city's waterways, in terms of drainage, ecology, culture, recreation, heritage and landscape – the 'six values'

The capital programme as put forward as the recommendation in the Long Term Plan (LTP) is based on the staff assessment of the minimum level of capital works needed to achieve compliance to statutory obligations, meet current Levels of Service and Council objectives as currently defined, and to provide the stormwater drainage service in a sustainable manner in accordance with customer expectations. The recommendation does not include projects being considered for implementation by Otakaro, Regenerate Christchurch or DCL, or works which will decrease the percentage of Condition Grade 5 assets.

The key programmes and projects are shown in Table 7.1, along with the programme or project drivers and implications if delayed or not implemented.

The funding shown in Table 7.1 will result in the deferral of some high priority pipe and waterway lining renewals from the first three years of the LTP to later in the LTP period but allows for necessary coordination with roading projects. The deferral of capex could result in the following outcomes over the first three years of the LTP period:

- Increased flooding when pipes and waterway linings fail
- More disruption to business and residents due to a reactive approach to failures
- Increase in operational expenditure for reactive maintenance and more frequent failures

Table 7.2 shows the remainder of the projects and planned capex that are recommended by staff to meet what are considered minimum acceptable levels of service in a sustainable manner.

The combined projects and capex in the two tables form the recommendation. If this recommendation is not adopted, the levels of service will need to be revised downwards and operational budgets will need to be increased. The listing of projects is not in prioritised order.

The planned capex is shown by the bars in Figure 7.1.

Figure 7.1 Planned Capital Expenditure

Table 7.1 Proposed Capital Programme – Note: all dollars include inflation

CPMS ID	Candidate Title	10 Yrs Plan FY19-28 $'000	3 Yrs Plan FY19-21 $'000	Drivers	Implications if delayed / not implemented
Growth					
3412	Waterways & Wetlands Land Purchases	6,956	568	→ Facilitate development → Provide efficient infrastructure → Maintain or improve water quality → Improve waterways	→ Development delayed → Waterways continue to be degraded → Fragmented, inefficient infrastructure → Non-compliance with consent conditions
329	Technical Equipment - new	326	83	→ Facilitate development → Efficiently managed network	→ Development delayed → Sub-optimal decisions made
Renewal					

324	Stormwater Reticulation Renewals PRG	49,352	8,280	→ Programme for renewal of pipes and nodes (accesses, inlets, outlet etc) and structures → Address current failures in delivering Levels of Service → Renew stormwater pipes in a co-ordinated manner with other infrastructure in the road corridor → Package to allow flexible delivery of high priority renewals identified post-SCIRT → Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Failure of pipes under buildings and roads causing damage and disruption → Increased risk or flooding due to pipe collapses and blockages → Increased public and operational H&S and flood risk due to poor inlet arrangements (e.g. inaccessible / blockage prone / unsafe grills and openings) → More reactive work and associated extra cost and disruption → Increased traffic disruption and property damage due to pipe failure and the consequent unplanned restricted access for hazard isolations and repairs
984	Waterway Lining Renewals PRG	88,957	10,339	→ Programme for the renewal of lining (including retaining walls and stabilisation / protection works) → Naturalisation of lined channels, which provides the following benefits: • Improved resilience • Support of the 6 values strategic approach, • Reduced future renewal costs (where naturalisation is possible) • Reduced H&S risks associated with the vertical drops of box drains • Greater protection of waterway corridors from future development	→ More dilapidated assets, many of which are highly visible → Increased H&S risk associated with large voids along banks caused by material being washed out from behind failed lining and dangerous wood and concrete debris and exposed nails or steel reinforcing → Increased risk of flooding due to blockages caused by lining failure → Increased OPEX costs as lining is patch repaired instead of being renewed → Waterway and ecosystem degradation as a result of bank erosion and undercutting around damaged or missing linings
388	Open Waterway Renewals PRG	6,073	313	→ Programme for addressing channel stability issues → Good management of the waterway and margins using the CCC 6 values approach	→ Increased channel erosion and instability
481	Waterway Structure Renewals PRG	2,807	795	→ Programme for renewal of waterway structures including	→ More dilapidated assets, many of which are highly visible → Increased H&S risk

				weirs, bridges, boat ramps, debris racks, ladders etc → Management of waterway structures supporting a range of functions including waterway access to and over waterways, collection of debris, fish passage, water level and flow control etc.	→ Ecology
37851	SW Hydrometrics Equipment Replacement PRG	305	82	→ Purchase or replacement assets associated with hydrometrics such as rain gauges and river level monitoring equipment.	→ Inability to collect accurate hydrometric data required to monitor and manage the network.
41866	Stormwater Drainage Reactive Renewals PRG	5,447	1.502	→ Reactive renewal of failed assets	→ Unable to respond to unforeseen renewal requirements → Increased OPEX costs
479	Lyttelton Brick Barrels	611	611	→ See CPMS 324 above. Funding for FY19/FY20 pushed back to FY24/FY25 through annual plan review, but proposed create new project under CPMS 324 to complete the outstanding high priority brick barrel renewals in Lyttelton.	
327	Technical Equipment - Replacement	236	83	→ Renewal of technical monitoring equipment to support flood modelling.	→ Inability to collect accurate hydrometric data required to continue modelling the network.
390	Banks Peninsula Stormwater Renewals PRG	364	364	→ Historic programme for renewal of all asset types within Bank Peninsula. Renewals are to be based on asset type rather than geographic location, so this programme will be retired. Beyond FY20.	
333	Minor Piping Projects PRG	0	0	→ Historic programme for piping of troublesome open waterways. Piping of waterways in not considered a renewal activity or in line with strategic aims, so this programme will be retired beyond FY19.	
33624	Highams Drain, Opal Place - Lined Drain Renewal	204	204	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ More dilapidated assets, many of which are highly visible → Increased H&S risk associated with large voids along banks caused by material being washed out from behind failed lining and dangerous wood and concrete debris and exposed nails or steel reinforcing → Increased risk of flooding due to blockages caused by lining failure → Increased OPEX costs as lining is patch repaired instead of being renewed → Waterway and ecosystem degradation as a result of bank erosion and undercutting around damaged or missing linings
33625	Harbour Rd Drain, near Kainga Rd bridge over	42	42	→ Reduce flood risk	→ More dilapidated assets, many of which are highly visible

	Styx River - Lined Drain Renewal			→ Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Increased H&S risk associated with large voids along banks caused by material being washed out from behind failed lining and dangerous wood and concrete debris and exposed nails or steel reinforcing → Increased risk of flooding due to blockages caused by lining failure → Increased OPEX costs as lining is patch repaired instead of being renewed → Waterway and ecosystem degradation as a result of bank erosion and undercutting around damaged or missing linings
33761	Frees Creek, 62/66 Sherborne St - Lined Drain Renewal	69	69	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ More dilapidated assets, many of which are highly visible → Increased H&S risk associated with large voids along banks caused by material being washed out from behind failed lining and dangerous wood and concrete debris and exposed nails or steel reinforcing → Increased risk of flooding due to blockages caused by lining failure → Increased OPEX costs as lining is patch repaired instead of being renewed → Waterway and ecosystem degradation as a result of bank erosion and undercutting around damaged or missing linings
33798	Marine Parade / Cygnet Street - 100m DN300 SW Coastal Outfall Pipe Renewal	4	4	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ More dilapidated assets, many of which are highly visible → Increased risk of flooding due to blockages
33801	Blakistons Drain, 136 Springfield Rd - piping 80m of drain	62	62	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ More dilapidated assets, many of which are highly visible → Increased H&S risk associated with large voids along banks caused by material being washed out from behind failed lining and dangerous wood and concrete debris and exposed nails or steel reinforcing → Increased risk of flooding due to blockages caused by lining failure → Increased OPEX costs as lining is patch repaired instead of being renewed

					→ Waterway and ecosystem degradation as a result of bank erosion and undercutting around damaged or missing linings
33803	Buckleys Road Drain - 76 to 58 Buckleys Rd - piping 135m of drain	55	55	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ More dilapidated assets, many of which are highly visible → Increased H&S risk associated with large voids along banks caused by material being washed out from behind failed lining and dangerous wood and concrete debris and exposed nails or steel reinforcing → Increased risk of flooding due to blockages caused by lining failure → Increased OPEX costs as lining is patch repaired instead of being renewed → Waterway and ecosystem degradation as a result of bank erosion and undercutting around damaged or missing linings
33828	Canal Reserve Drain, Marshland Rd - timber lining renewal	649	370	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ More dilapidated assets, many of which are highly visible → Increased H&S risk associated with large voids along banks caused by material being washed out from behind failed lining and dangerous wood and concrete debris and exposed nails or steel reinforcing → Increased risk of flooding due to blockages caused by lining failure → Increased OPEX costs as lining is patch repaired instead of being renewed → Waterway and ecosystem degradation as a result of bank erosion and undercutting around damaged or missing linings
33829	Truscotts Stream Branch, Ferrymead Park Drive - Lined Drain Renewal (Design)	53	53	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ More dilapidated assets, many of which are highly visible → Increased H&S risk associated with large voids along banks caused by material being washed out from behind failed lining and dangerous wood and concrete debris and exposed nails or steel reinforcing → Increased risk of flooding due to blockages caused by lining failure → Increased OPEX costs as lining is patch repaired instead of being renewed

					→ Waterway and ecosystem degradation as a result of bank erosion and undercutting around damaged or missing linings
34007	Canterbury Creek, 83 Canterbury Street - inlet arrangement improvement	36	36	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Increased risk of flooding due to collapses or blockages
34009	Corsair Bay Drain, 44 Park Terrace - Inlet arrangement improvements (Construction)	38	38	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Increased risk of flooding due to collapses or blockages
34016	Bayview Place Drain, 98 Governors Bay Road - Inlet Arrangement Improvements	36	36	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Increased risk of flooding due to collapses or blockages
34022	Pipers Stream, 9-11 Seafield Rd, Duvauchelle - Erosion Control	30	30	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Waterway and ecosystem degradation as a result of bank erosion and undercutting around damaged or missing linings
34024	2a Waipapa Ave, Stoddart Point, Diamond Harbour - SW Pipe Renewal	3	3	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Increased risk of flooding due to collapses or blockages
34269	Banks Peninsula SW Reactive Renewals	63	63	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Increased risk of flooding due to collapses or blockages
34275	Okana River Lower Tributaries SW Network Condition & Performance Assessment	12	12	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Increased risk of flooding due to collapses or blockages
37069	Ilam Drain, 6 Clonbern Pl - 70m SW pipe installation	186	186	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance	→ Increased risk of flooding due to collapses or blockages

				→ Best practice asset management	
37305	Lyttelton Brick Barrels renewals - high priority structural damage	1,423	1,423	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Increased risk of flooding due to collapses or blockages
37306	Jacksons Creek BB renewal near Selwyn St - Brougham St Intersection	875	875	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Increased risk of flooding due to collapses or blockages
37307	SW Reticulation reactive renewals FY18-19	104	104	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Increased risk of flooding due to collapses or blockages
37308	SW non-return valve renewal work package FY18-19	83	83	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Increased risk of flooding due to collapses or blockages
37309	SW debris & security screen renewal work package FY18-19	83	83	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Increased risk of flooding due to blockages → Increased H&S risk
37310	Work package for high priority SW pipe renewals FY18-19	130	130	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Increased risk of flooding due to collapses or blockages
43802	SW Mains Renewals Affiliated with Roading Works PRG	748	748	→ Reduce flood risk → Reduce risk of damage to other infrastructure and services → Reduce cost of maintenance → Best practice asset management	→ Increased risk of flooding due to collapses or blockages → Failure of pipes under buildings and roads causing damage and disruption
44457	Open Water Systems - Utility Drain Improvements	6,968	920	→ Good management of the waterway and margins using the CCC 6 values approach → Reduce cost of maintenance → Best practice asset management	→ Increased risk of flooding due to collapses or blockages → Waterway and ecosystem degradation as a result of bank erosion and undercutting around damaged or missing linings
Backlog					

37852	SW New Technical Equipment PRG	316	82	→ Purchase on new technical monitoring equipment to support flood modelling.	→ Inability to collect accurate hydrometric data required to improve network models.
Increased Levels of Service					
989	Waterway Ecology and Water Quality Improvement	6.281	958	→	→
Backlog to address increased flood risk due to earthquake effects					
26599	LDRP 500 Upper Heathcote Storage	12,395	12,395	→ Reduce post-earthquake flood risk to the upper and mid reaches of the Heathcote River	→ Flood risk remains above pre-earthquake levels in the upper and mid reaches of the Heathcote River
26892	LDRP 501 Bells Creek	1,689	1,689	→ Repair earthquake damage → Address post-earthquake flood risk in the Bells Creek catchment	→ Flood risk remains above pre-earthquake levels in the Bells Creek catchment
28740	LDRP 503 Cranford Basin Active Management	1,198	1,198	→ Reduce post-earthquake flood risk to adjacent areas, such as Flockton St, St Albans and Mairehau	→ Failure to repair earthquake damage to the drainage network → Post-earthquake flood risk remains
28741	LDRP 506 Dudley Creek tributaries	9.192	0	→ Repair earthquake damage in Shirley Stream, Upper Dudley Creek and St Albans Creek → Address post-earthquake flood risk in the surrounding catchments	→ Failure to repair earthquake damage to the drainage network → Post-earthquake flood risk remains
28744	LDRP 505 Sumner Stream and Richmond Hill Waterway	2,679	0	→ Repair earthquake damage to the drainage network in Sumner → Address post-earthquake flood risk in Sumner	→ Failure to repair earthquake damage to the drainage network → Post-earthquake flood risk remains
35900	LDRP 513 PS205	1,500	1,500	→ Repair Pump Station 205 to provide flood protection of Horseshoe Lake catchment	→ Failure to repair earthquake damage to the drainage network → Post-earthquake flood risk remains
31878	LDRP 517 Residual House Remediation	49,027	10,508	→ Mitigate properties still at risk in a 1 in 10 year annual return interval event → Implement the Flood Intervention Policy	→ Flood Intervention Policy is not enacted → The most vulnerable properties remain at risk
40237	LDRP 520 Wigram East Retention Basin	2705	2705	→ Part of the Upper Heathcote Storage scheme	→ Post-earthquake flood risk remains

8. Are there any significant negative effects that this activity will create?

Effect	Mitigation
Cost to Council / ratepayers of operating stormwater drainage network	Follow documented procedures and industry best practice for cost minimisation. Follow technological developments and implement cost saving initiatives on a continuous improvement basis. Focus process of defining key performance indicators on cost efficiency. Ensure staff are kept updated with technological and operational best practice through attendance at conferences and participation in specialist industry working groups.
Social, cultural and environmental effects of construction works	Management of construction activities to minimise risk of non-compliance with relevant consent conditions.
Social, cultural and environmental effects of stormwater discharges into waterways	Ongoing education and works programme to reduce contaminant load. Develop and deliver stormwater management plans that consider all six values and set appropriate, measurable performance targets. Monitor stormwater discharges and instigate appropriate remedial actions as may be necessary to address potential non-compliances.

9. Does this Service Plan need to change as a result of a service delivery review?

A Service Delivery Review or Exemption report (Section 17A) for this activity has been carried out. Based on the outcome of this report no changes to the service plan or delivery model are required.