

Section 2

Annual Performance Report Strategic Management Areas & Geographical Catchments

1 July 2018 to 30 June 2019

Final Draft

30 September 2019



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2 WASTEWATER NETWORK PERFORMANCE

2.1 Strategic Management Area 1: Wellsford

2.1.1 Overview

Wellsford is a rural township focusing on farming and horticulture. State Highway 1 (SH1), passing through both Wellsford and Te Hana townships, is the main road servicing the rural communities. The Wellsford and Te Hana townships are surrounded by rural pastoral land.

Wellsford is located approximately 20 km inland from the Kaipara Harbour. The serviced population of Wellsford was 2,069 (Census, 2013), with 859 connections.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	837	842	851	854	859
Length of sewer (km)	26	26	27	29	29

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1128	Worker Rd WWPS	DPWOR	1	Unnamed tributary (south) of Whakapirau Creek
1129	Armitage Rd WWPS	DPARM	1	Unnamed tributary (north) of Whakapirau Creek
1130	School Rd WWPS	DPSHR	1	Unnamed tributary (south) of Whakapirau Creek
1131	Cemetery WWPS	DPCEM	1	To land
1132	Kellys Hill WWPS	DPKYH	1	Stormwater detention pond
1133	Te Hana WWPS	DPTHA	1	Unnamed tributary of Te Hana Creek.

There have been no changes to the schedule of EOPs in this SMA.

2.1.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
10/07/2018	DPSHR	School Road Wastewater Pump Station	1130	Power Outage	386	10
6/09/2018	DPWOR	Worker Road Wastewater Pump Station	1128	Other – Rising Main Failure	79	0
3/01/2019	DPWOR	Worker Road Wastewater Pump Station	1128	Mechanical/Maintenance	60	0
3/06/2019	DPWOR	Worker Road Wastewater Pump Station	1128	Power Outage	37	1.5

Reported Incidents

There were a total of 9 reported incidents in the Wellsford catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

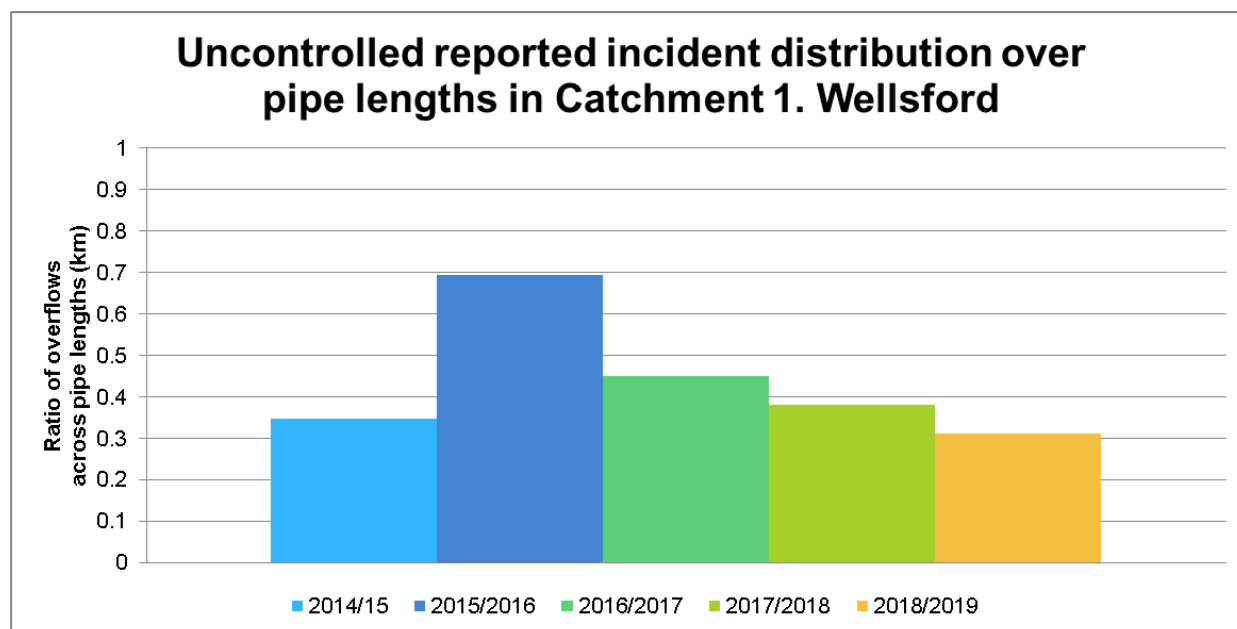
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

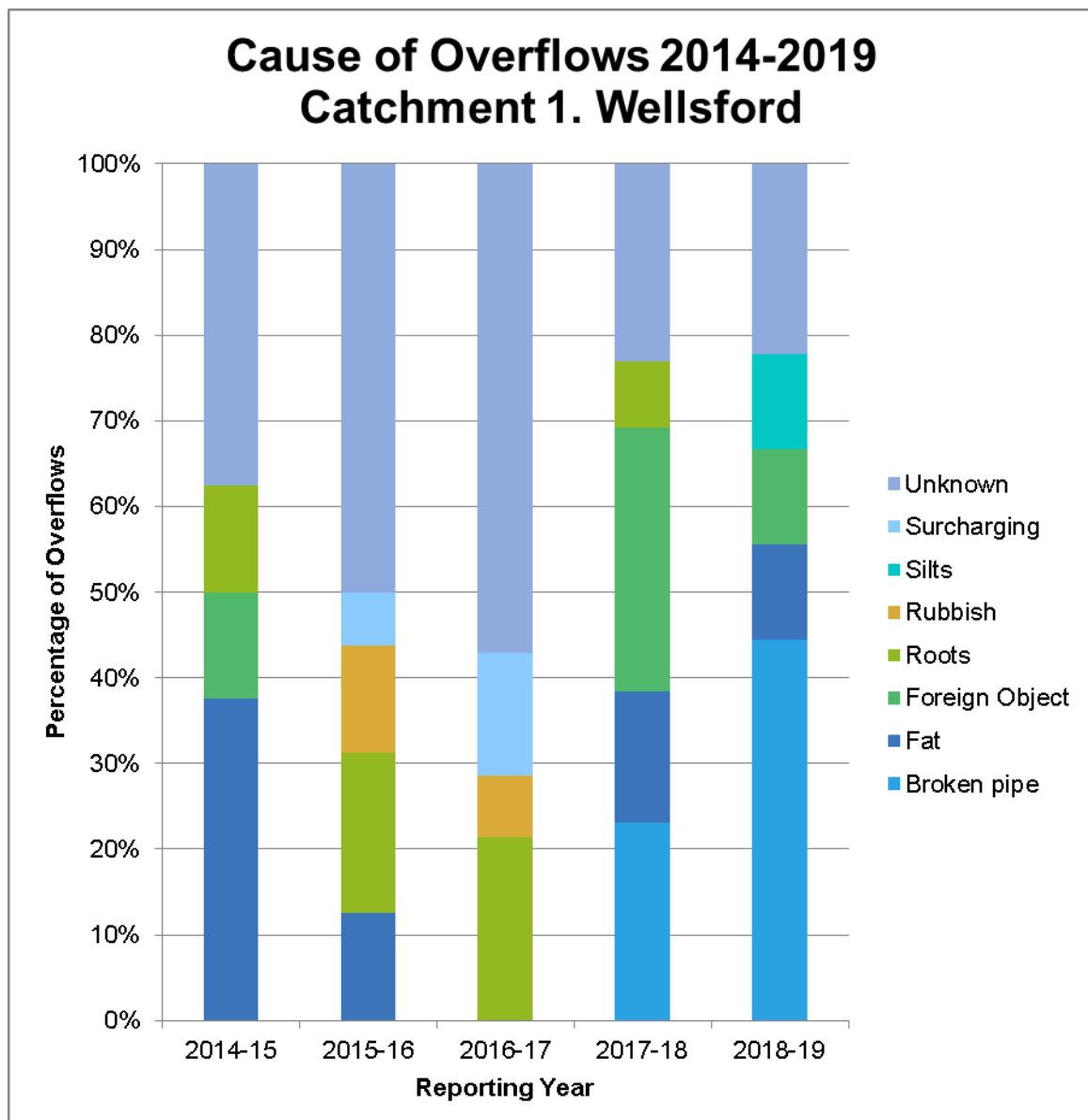
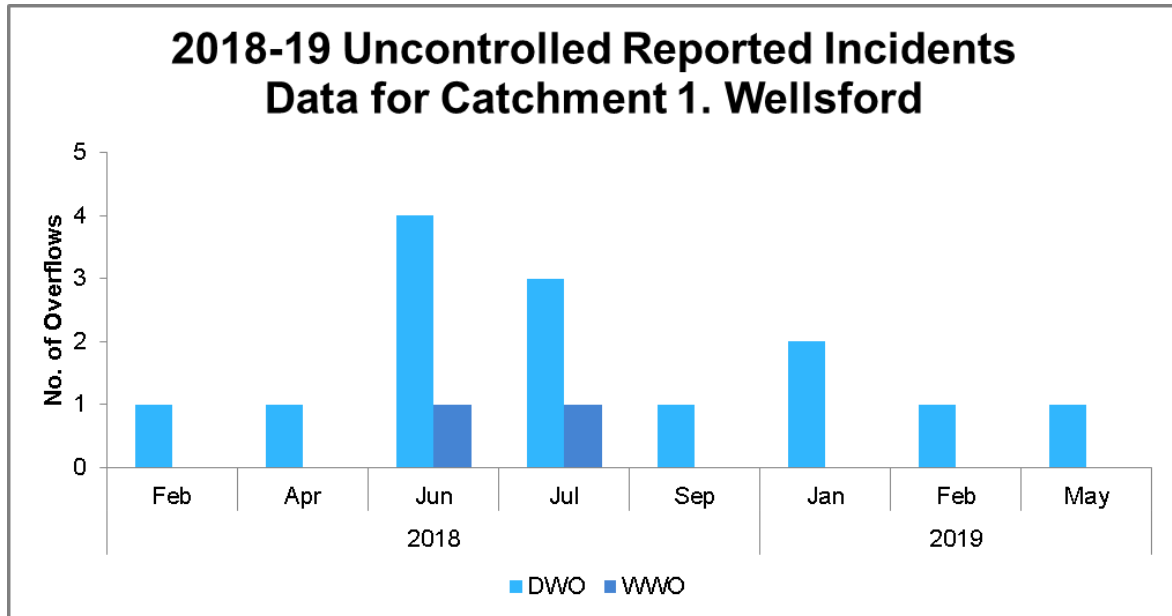
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
7/09/2018	60A Worker Rd	L1	278	Broken pipe	10	Broken rising main and 150mm repaired
17/01/2019	60 Worker Rd	L3	266	Broken pipe	0	

2.1.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.1.4 Wet weather overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPARM	Armitage Wastewater Pump Station	1129	Rain event	166	3
15/07/2018	DPSHR	School Road Wastewater Pump Station	1130	Rain event	494	3
23/07/2018	DPARM	Armitage Wastewater Pump Station	1129	Power Outage	87	12.5
24/12/2018	DPARM	Armitage Wastewater Pump Station	1129	Rain event	128	67
24/12/2018	DPWOR	Worker Road Wastewater Pump Station	1128	Rain event	112	67
12/05/2019	DPARM	Armitage Wastewater Pump Station	1129	Power Outage	73	29

Spatial and temporal variability of rain data may indicate that recorded rain data is not necessarily what is experienced at the site. The cause is taken from validated site data.

2.1.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1128	Worker Rd WWPS	2	2	3	3	1	1	2	Operational investigation
1129	Armitage Rd WWPS	2	1	3	1	2	4	2.2	Continue to monitor
1130	School Rd WWPS	0	0	0	0	1	1	0.4	Continue to monitor
1131	Cemetery WWPS	0.2	0	0	0	0	0	0	Continue to monitor
1132	Kellys Hill WWPS	1.4	0	0	0	0	0	0	Continue to monitor
1133	Te Hana WWPS	0.6	0	0	0	0	0	0	Continue to monitor

2.1.6 Inflow & Infiltration Programme

Inflow and Infiltration (I&I) investigations began with a desktop assessment of SCADA data to investigate high wet weather flows arriving at the wastewater treatment plant and understand I&I network performance. This study has identified high severity I&I subcatchments, and targeted field investigations will start in late 2019.

2.1.7 Improvement Works Programme

No significant network improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019, or are currently planned for the next reporting year.

2.1.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.1.9 Summary

The ratio of overflows across total pipe length has decreased from the reporting period of 2017-18. The overflow history will be analysed and utilised when reviewing future network improvement programmes.

Wellsford I&I network performance and high wet weather flows arriving at the wastewater treatment plant is currently being investigated.

There have been no significant changes made to the network as a whole.

This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.3 Strategic Management Area 2: Omaha

2.3.1 Overview

Omaha is a small beach town on Omaha Bay, north of Auckland. It is located approximately 75 km north of Auckland on a sand spit that adjoins Tawharanui Peninsula and separates Whangateau Harbour from Omaha Bay, and also includes the Matakana and Point Wells townships. The nearest sizable town is Warkworth, approximately 17 km south west of Omaha. The resident population of the Omaha SMA is approximately 1,600 people (Census, 2013), with 1,588 connections, but this population is significantly increased by seasonal tourism.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	1,490	1,553	1,575	1,582	1,588
Length of sewer (km)	45	45	47	55	55

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1117	Taumata Rd WWPS	DPTAU	1	To land
1118	Mangatawhiri Rd WWPS	DPMRI	1	To land
1119	Paraoa Cres WWPS	DPPOA	1	To land
1120	Kokopu St WWPS	DPKOK	1	To land
1121	Broadlands WWPS	DPBRO	1	To land
1122	Esme Grove WWPS	DPEGV	1	To land
1123	North West Anchorage WWPS	DPANC	1	Whangateau Harbour Beach
1124	Success Court WWPS	DPSUC	1	To land
1125	Boat Ramp WWPS	DPBOA	1	To land

There have been no changes to the schedule of EOPs in this catchment.

2.3.2 Dry weather overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 18 reported incidents in the Omaha catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

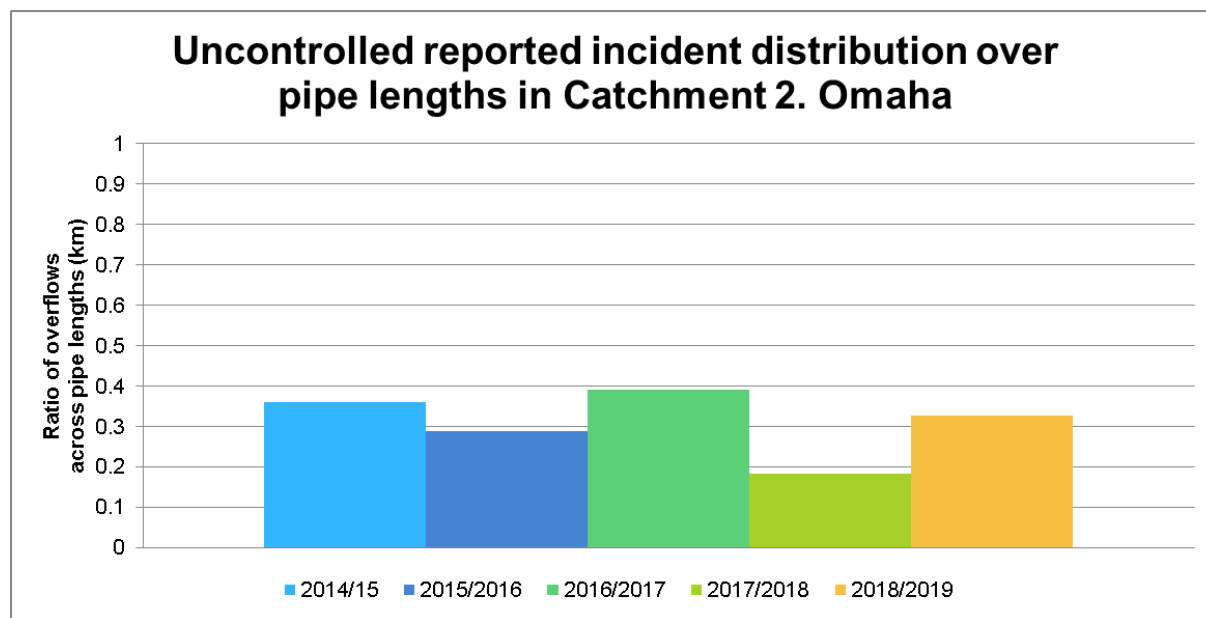
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

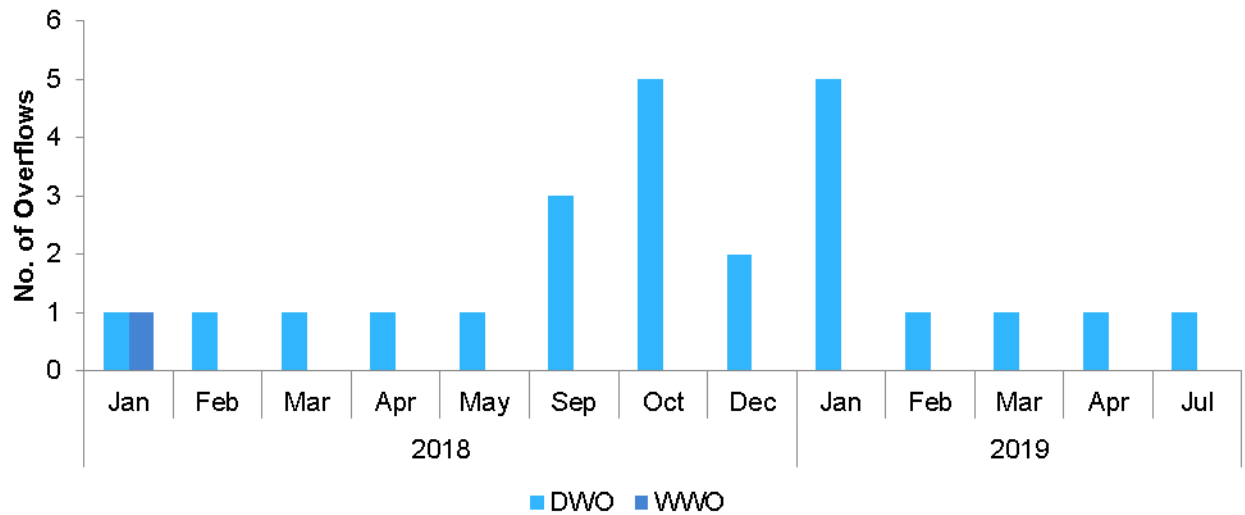
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
10/10/2018	134 Omaha Dr	L1	395	Roots	1	Rootcut chamber
18/10/2018	134 Omaha Dr	L1	303	Roots	0.2	
13/10/2018	2 Dungarvon Pl	L1	186	Fat	0	Cleared fats and roots from main
21/10/2018	2 Dungarvon Pl	L1	96	Roots	0	
7/01/2019	14 Kitty Frazer Lane	L1	227	Unknown	0	Flushed main
8/01/2019	14 Kitty Frazer Lane	L1	66	Roots	0	

2.3.3 Trend analysis of reported incidents

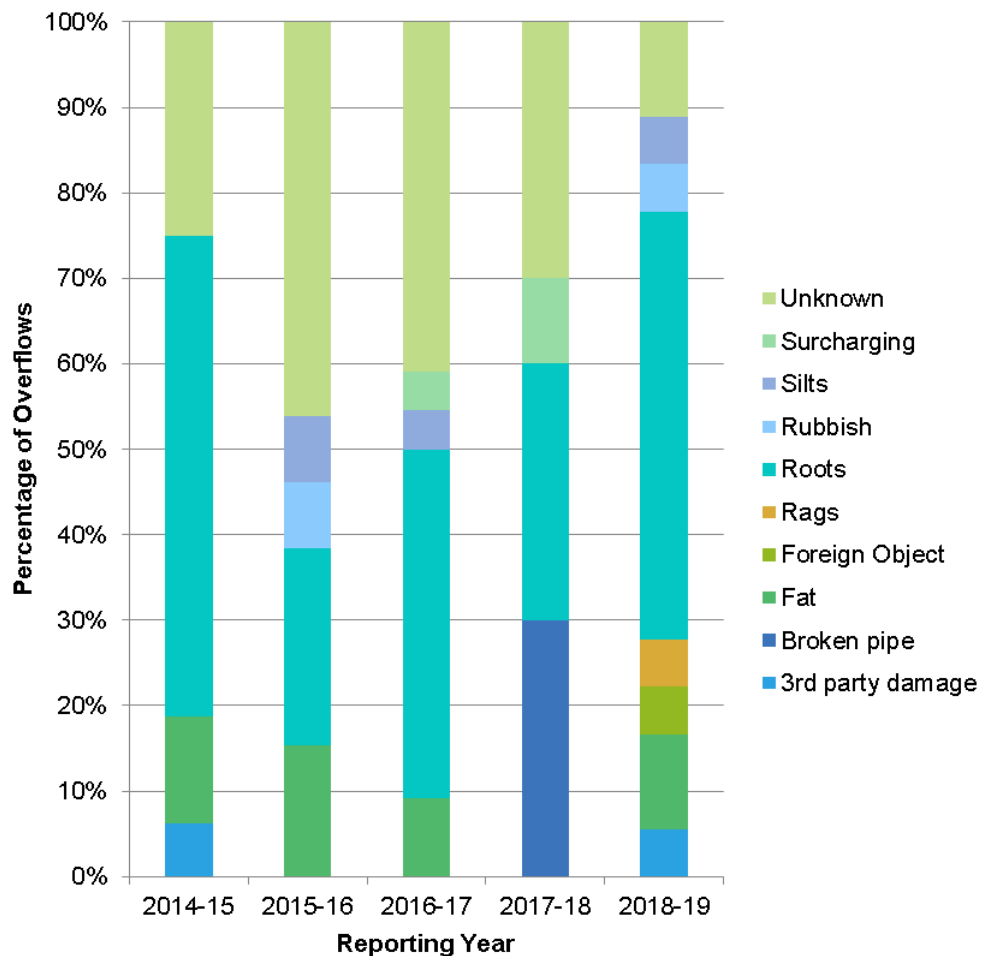
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



2018-19 Uncontrolled Reported Incidents Data for Catchment 2. Omaha



Cause of Overflows 2014-2019 Catchment 2. Omaha



Trend analysis has been carried out where the cause has been identified.

2.3.4 Wet Weather Overflows

Type 1 EOPs – Pump stations

There were no wet weather overflows at pump stations between 1 July 2018 and 30 June 2019.

2.3.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1117	Taumata Rd WWPS	0	0	0	0	0	0	0	Continue to monitor
1118	Mangatawhiri Rd WWPS	0	0	0	0	0	0	0	Continue to monitor
1119	Paraoa Cres WWPS	0	0	0	0	0	0	0	Continue to monitor
1120	Kokopu St WWPS	0	0	0	0	0	0	0	Continue to monitor
1121	Broadlands WWPS	0.6	0	0	0	0	0	0	Continue to monitor
1122	Esme Grove WWPS	0	0	0	0	0	0	0	Continue to monitor
1123	North West Anchorage WWPS	0	0	0	0	0	0	0	Continue to monitor
1124	Success Court WWPS	0	1	0	0	0	0	0.2	Continue to monitor
1125	Boat Ramp WWPS	0	0	1	0	0	0	0.2	Continue to monitor

2.3.6 Inflow and Infiltration Programme

A review of Inflow & Infiltration (I&I) in this catchment will be carried out as part of Watercare's I&I programme; this catchment has not been identified as a priority to date.

2.3.7 Improvement Works Programme

No significant network improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019, or are currently planned for the next reporting year.

2.3.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.3.9 Summary

There have been no pump station overflows in the reporting period of 2018-19. Roots remain a primary cause of overflows, and the density of overflows across pipe length has increased slightly. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. The network has been extended significantly to accommodate the population growth in the region.

This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.5 Strategic Management Area 3: Warkworth

2.5.1 Overview

Warkworth is situated on the banks of the Mahurangi River and at the head of the Mahurangi Harbour with tributaries of the Mahurangi River flowing through the existing and future urban areas. The population of Warkworth was approximately 4,587 in 2013 (Census, 2013), with 2,042 connections. The township is surrounded by rural pastoral land in lowland areas, and plantation and native forestry in the high country. Several indicative future urban areas have been identified surrounding Warkworth.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	1,819	1,859	1,993	1,977	2,042
Length of sewer (km)	47	48	50	59	61

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
790	Palmer St WWPS	DPPAL	1	Mahurangi River
792	Auckland Road Manhole	DSAUC	2	Unnamed tributary (1) of Mahurangi River
1258	Lilburn St WWPS	DPLIL	1	Mahurangi River
1540	1 Elizabeth St	-	2	Unnamed tributary (4) of Mahurangi River

The following EOP was decommissioned and has been removed from the schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
792	Auckland Road Manhole	DSAUC	2	Unnamed tributary (1) of Mahurangi River

2.5.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
4/04/2019	DPLIL	Lilburn Wastewater Pump Station	1258	Power Outage	109	2.5

Reported Incidents

There were a total of 22 reported incidents in the Warkworth catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

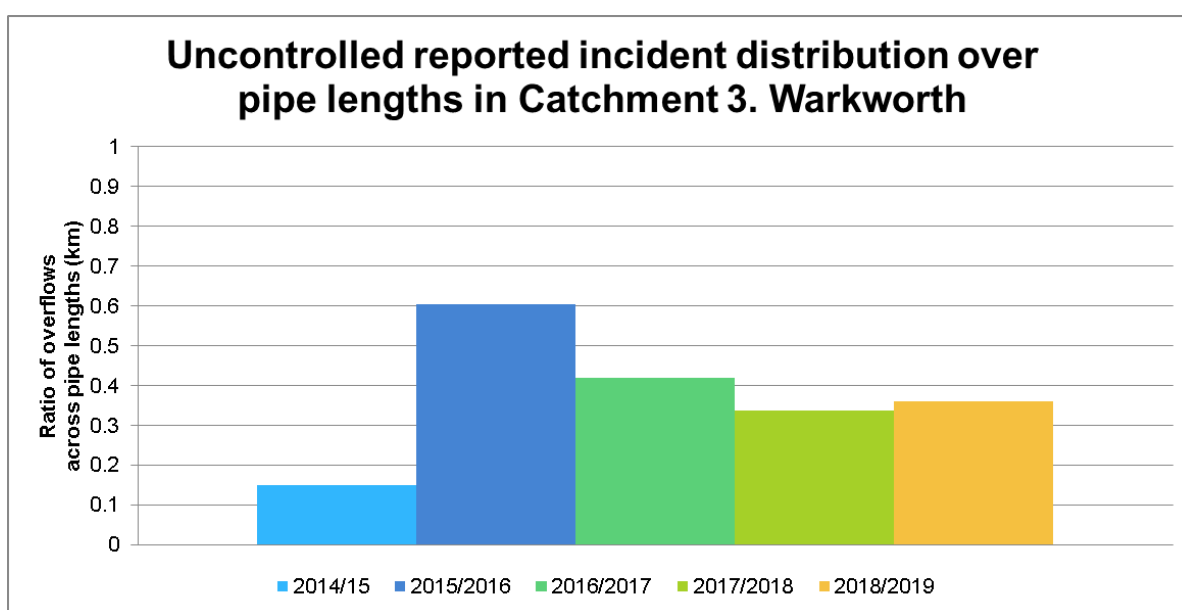
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

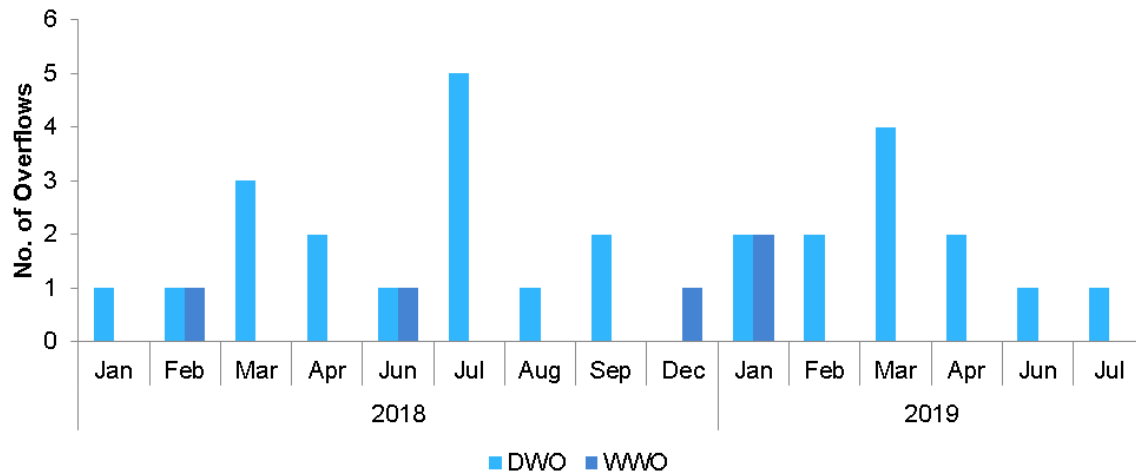
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
7/07/2018	46 Hill St	L1	251	Fat	0	Fats and roots flushed from S/L
16/06/2019	46 Hill St	L1	159	Fat	2.5	
25/04/2018	1 Matakana Rd	L2	421	Unknown	0.5	Broken pipe repaired, dump station unblocked
12/06/2018	1 Matakana Rd	L2	129	Unknown	35.5	
17/04/2019	1 Matakana Rd	L1	200	Unknown	0	
3/03/2019	4/9 Fairwater Rd	L1	213	Fat	0	Large fat blockages removed, Heavy Flush
7/03/2019	4/9 Fairwater Rd	L1	202	Fat	0	
14454373	44-56 Queen St	L1	314	Broken pipe	2.5	Tomo and displaced pipe repaired
14555880	54 Queen St	L1	235	Broken pipe	6	
14/01/2019	22-24 Queen St	L1	199	Unknown	19	Dislodged pipe repaired
21/01/2019	22-24 Queen St	L1	81	Broken pipe	0	

2.5.3 Trend analysis of reported incidents

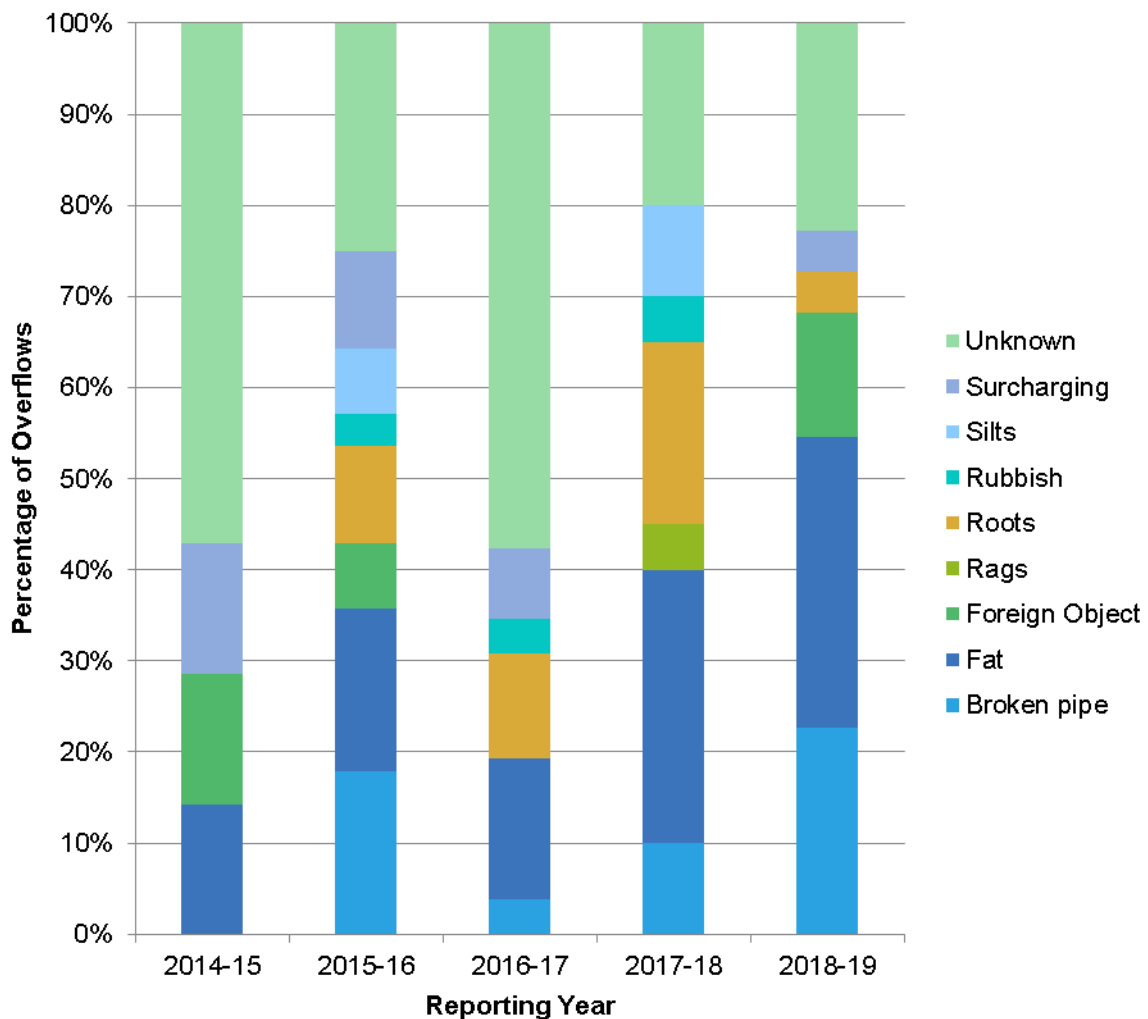
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



2018-19 Uncontrolled Reported Incidents Data for Catchment 3. Warkworth



Cause of Overflows 2014-2019 Catchment 3. Warkworth



Trend analysis has been carried out where the cause has been identified.

2.5.4 Wet Weather Overflows

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPPAL	Palmer Wastewater Pump Station	790	Power Outage	238	84
29/08/2018	DPLIL	Lilburn Wastewater Pump Station	1258	Rain event	137	40
29/08/2018	DPPAL	Palmer Wastewater Pump Station	790	Rain event	249	40
24/12/2018	DPLIL	Lilburn Wastewater Pump Station	1258	Rain event	251	61.5
24/12/2018	DPPAL	Palmer Wastewater Pump Station	790	Rain event	323	61.5
5/06/2019	DPLIL	Lilburn Wastewater Pump Station	1258	Power Outage	31	25.5

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. The cause is taken from validated site data.

2.5.5 Trend analysis of Pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
790	Palmer St WWPS	6	2	4	8	10	3	5.4	Expedited Pump Station Upgrade
1258	Lilburn St WWPS	1.6	0	0	0	0	4	0.8	Continue to monitor

2.5.6 Inflow & Infiltration Programme

Targeted field Inflow & Infiltration (I&I) investigations are commencing in late 2019 within the Elizabeth Street EOP and Palmer Street WWPS subcatchments.

2.5.7 Improvement Works Programme

The current status of the Improvement Works Programme for the Warkworth SMA is described overleaf. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Warkworth to Snells Transfer Pipeline	Design	Installation of a new conveyance sewer from Warkworth to Snells Wastewater Treatment Plant, including intermediate pump station	To cater for population growth	2017-2021

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Warkworth Growth Servicing	Options analysis (Feasibility)	Connection from Development, conveyance from Warkworth to Snells Beach	To cater for population growth	2020-2023

Other improvements works include:

- Operational and site investigations are continuing to identify opportunities for reducing wet weather overflows at the Elizabeth St EOP and Palmer St WWPS.
- A pump station and associated network upgrade is being designed for the Palmer St WWPS.

2.5.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.5.9 Summary

The Palmer St WWPS discharges more frequently than two spills per year and a pump station and associated network upgrade is being designed. Targeted field I&I investigations are commencing in late 2019 within the Elizabeth Street EOP and Palmer Street WWPS subcatchments.

Watercare has recognised population growth patterns in this area, and the 'Warkworth Master Planning / Detailed Catchment Study' improvement work is being planned by Watercare in this area to address the significant growth expected in this catchment; the scope and priority of network upgrades or any mitigation measures will be considered in this context. This network will continue to be monitored and will be responded to accordingly, as per Watercare's policies and procedures. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.6 Strategic Management Area 4: Snells Beach/Algies Bay

2.6.1 Overview

Snells Beach and Algies Bay are two adjacent settlements situated on the east coast of the Mahurangi Peninsula, approximately 10 kilometres from the nearby township of Warkworth. The combined population of Snells Beach and Algies Bay (Census, 2013) was 3,625 people, with 2,065 connections. The land use surrounding the townships on the Mahurangi Peninsula includes agricultural and horticultural land and residential development.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	1,946	1,971	2,000	2,036	2,065
Length of sewer (km)	53	55	56	64	64

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1101	Martins Bay Camp WWPS	DPMBC	1	Martins Bay Beach
1103	Willjames WWPS	DPWLI	1	Unnamed stream (flowing to Algies Bay)
1104	Brigitte View WWPS	DPBTE	1	Stormwater pond (Brigitte View Road)
1105	Alexander WWPS	DPALE	1	Algies Bay Beach
1106	Dalton WWPS	DPDAL	1	Snells Beach
1107	Cornell Circle WWPS	DPCNL	1	Northern arm of Mahurangi Harbour (Cornell Circle)
1109	Tamatea WWPS	DPTMT	1	Snells Beach
1110	Riverleigh WWPS	DPRGH	1	Stormwater pond (Riverleigh Drive)
1111	Sunburst WWPS	DPSNB	1	Snells Beach
1134	Mariners Grove WWPS	DPMRN	1	Algies Bay Beach

There have been no changes to the schedule of EOPs in this catchment.

2.6.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 8 reported incidents in the Snells Beach/Algies Bay catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

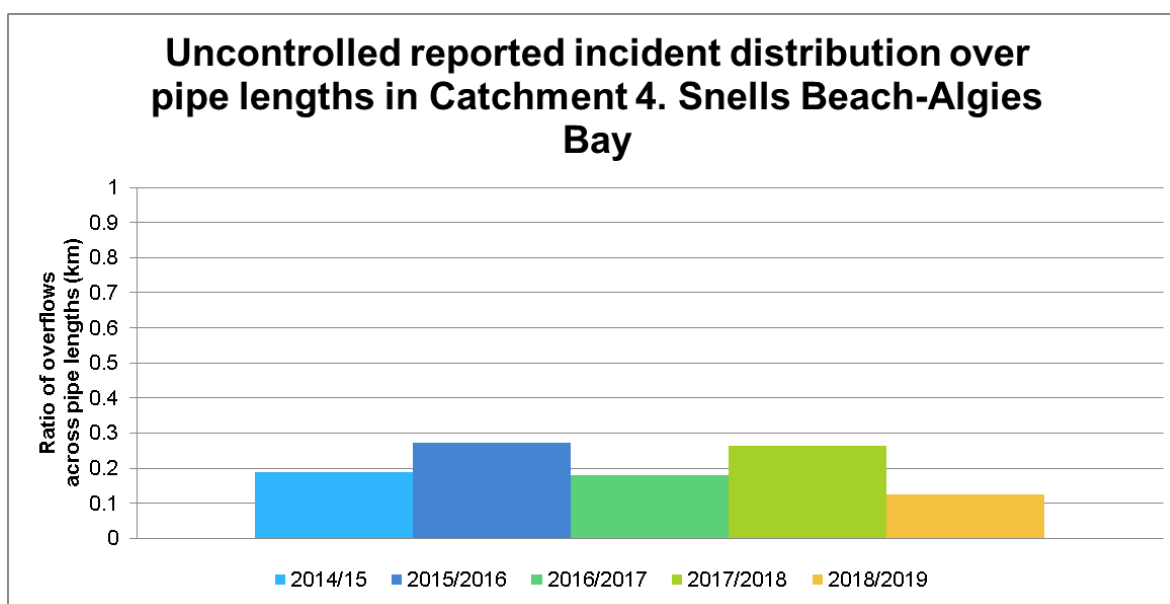
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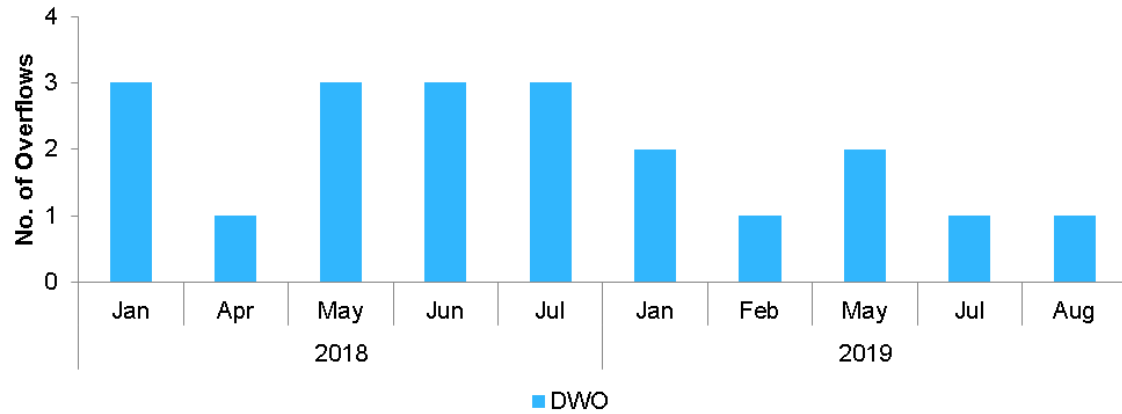
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
11/07/2018	22 Schooner Ave	L1	176	Fat	1	Rocks removed from main, heavy flush
5/05/2019	22 Schooner Ave	L1	549	Foreign Object	0	
11/07/2018	19 Schooner Ave	L1	184	Fat	1	Added to annual flushing list
26/07/2018	19 Schooner Ave	L1	165	Fat	0.5	

2.6.3 Trend analysis of reported incidents

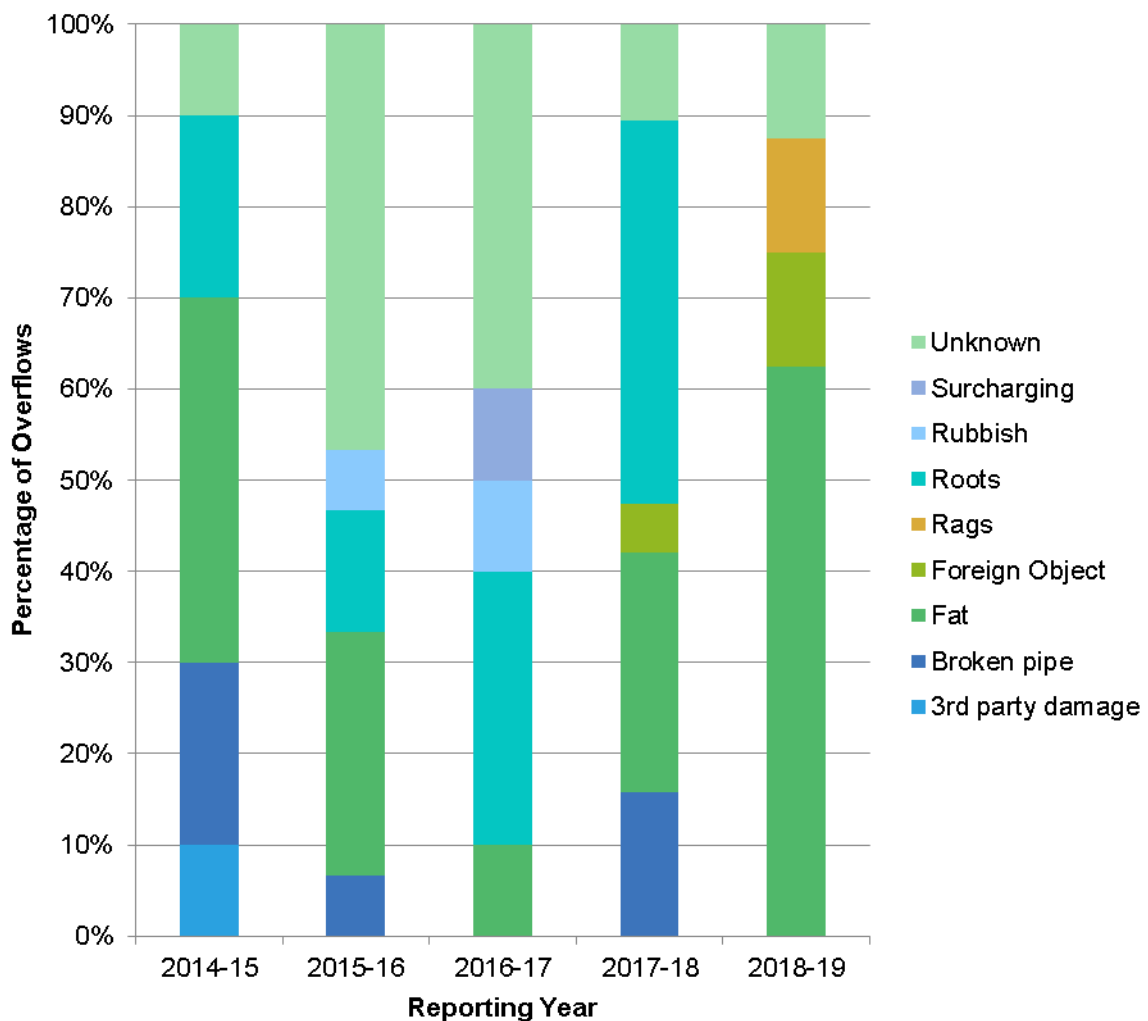
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



2018-19 Uncontrolled Reported Incidents Data for Catchment 4. Snells Beach/Algies Bay



Cause of Overflows 2014-2019 Catchment 4. Snells Beach/Algies Bay



Trend analysis has been carried out where the cause has been identified.

2.6.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1146	52.5
16/07/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	44	1
22/07/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	491	7.5
13/08/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	259	9
22/08/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	247	12.5
22/08/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	53	12.5
23/08/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	711	3
23/08/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	59	3
29/08/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1152	26
29/08/2018	DPTMT	Tamatea Wastewater Pump Station	1109	Rain event	42	26
18/09/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	964	8.5
19/09/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	37	0
22/09/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	571	0
11/10/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	257	16
27/10/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	294	13
24/11/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	303	20
3/12/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	226	17.5
3/12/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	507	17.5
24/12/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	2569	69
24/12/2018	DPDAL	Dalton Wastewater Pump Station	1106	Rain event	137	69
1/04/2019	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	589	39.5
22/04/2019	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	180	15.5
11/06/2019	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	117	0.5

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. Root cause is taken from validated site data.

2.6.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1101	Martins Bay Camp WWPS	0.2	0	0	0	0	0	0	Continue to monitor
1103	Willjames WWPS	0.4	0	0	1	0	0	0.2	Continue to monitor
1104	Brigitte View WWPS	0.8	1	16	34	66	21	27.6	Inflow investigation, capacity upgrade
1105	Alexander WWPS	0.6	0	0	0	0	0	0	Continue to monitor
1106	Dalton WWPS	1.2	0	0	2	2	1	1	Continue to monitor
1107	Cornell Circle WWPS	0.4	0	0	0	2	0	0.4	Continue to monitor
1108	Hamatana WWPS	0	0	0	0	0	0	0	Continue to monitor
1109	Tamatea WWPS	1	0	0	0	1	1	0.4	Continue to monitor
1110	Riverleigh WWPS	0.2	0	0	0	0	0	0	Continue to monitor
1111	Sunburst WWPS	0.	0	0	0	0	0	0	Continue to monitor
1134	Mariners Grove WWPS	0.8	0	0	0	0	0	0	Continue to monitor

2.6.6 Inflow & Infiltration Programme

Smoke testing within the Brigitte View WWPS catchment was undertaken to investigate high incoming flows to the pump station in 2017; no notable issues were identified.

2.6.7 Improvement Works Programme

The current status of the Improvement Works Programme for the SMA is described overleaf. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Complete	Brigitte View WWPS Operational Upgrade	Operational	Highly frequent wet weather overflows	Reduced frequency and volume of wet weather overflows	2018
Planned	Brigitte View WWPS Capacity Upgrade	Operational	High growth and development in the catchment	Development serviced and improved capacity	To be confirmed depending upon development

Detail of the progress of the Brigitte View WWPS investigations and operational improvements is summarised below:

- As mentioned overleaf, smoke testing within the Brigitte View WWPS catchment was undertaken to investigate high wet weather flows.
- A new rising main was constructed at Brigitte View WWPS as part of the Alexander WWPS upgrade; however, the size of the new rising main was determined based upon an incorrect pump configuration and the current pumps could not achieve the expected flows.
- Investigations were undertaken to determine whether a suitable pump configuration to achieve the flows could be installed, however, this was found to be impossible.
- Proposed new development in the upstream catchment is not able to be serviced without an increase in capacity for this pump station, and hence a substantial upgrade is required. This upgrade will be sized to accept growth mitigating wet weather overflows.
- Flow gauging has been undertaken and the property developer is proposing a new pump station be built for the development as well as taking the flows from Brigitte WWPS. Brigitte WWPS will then be decommissioned.

2.6.8 Erosion Control Measures

No works related to erosion control were carried out in this SMA between 1 July 2018 and 30 June 2019.

2.6.9 Summary

Brigitte View WWPS (Type 1 EOP) has discharged more frequently than two spills per year. This WWPS requires upgrading in order to service current populations and the proposed development, along with other major network upgrades will relate to this need. There has been a decrease in the ratio of overflows over pipe length. Trend analysis shows that fats are the most predominant cause of overflows. The overflow history will be analysed and utilised when reviewing future network improvement programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.7 **Strategic Management Area 5: Waiwera**

2.7.1 Overview

Waiwera is located at the southern end of the Waiwera Estuary, and has 129 wastewater connections. This small coastal town is well known for its geothermal springs and coastal and estuarine environments. The town is a major tourism destination and characterised by holiday batches and apartments, motels and Waiwera Thermal Resort. There are also a significant number of residential properties and some light commercial properties. The township is surrounded by bush-clad hills, small farms and lifestyle blocks.

	2014/15	2015/16	2016/17	2016/17	2018/19
No. of connections	128	128	128	129	129
Length of sewer (km)	3	3	3	4	4

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1098	Waiwera Camp WWPS	DPWAC	1	To land
1099	Waiwera Town WWPS	DPWWR	1	Waiwera Estuary
1100	Weranui Road WWPS	DPWER	1	Waiwera Estuary

There have been no changes to the schedule of EOPs in this catchment.

2.7.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

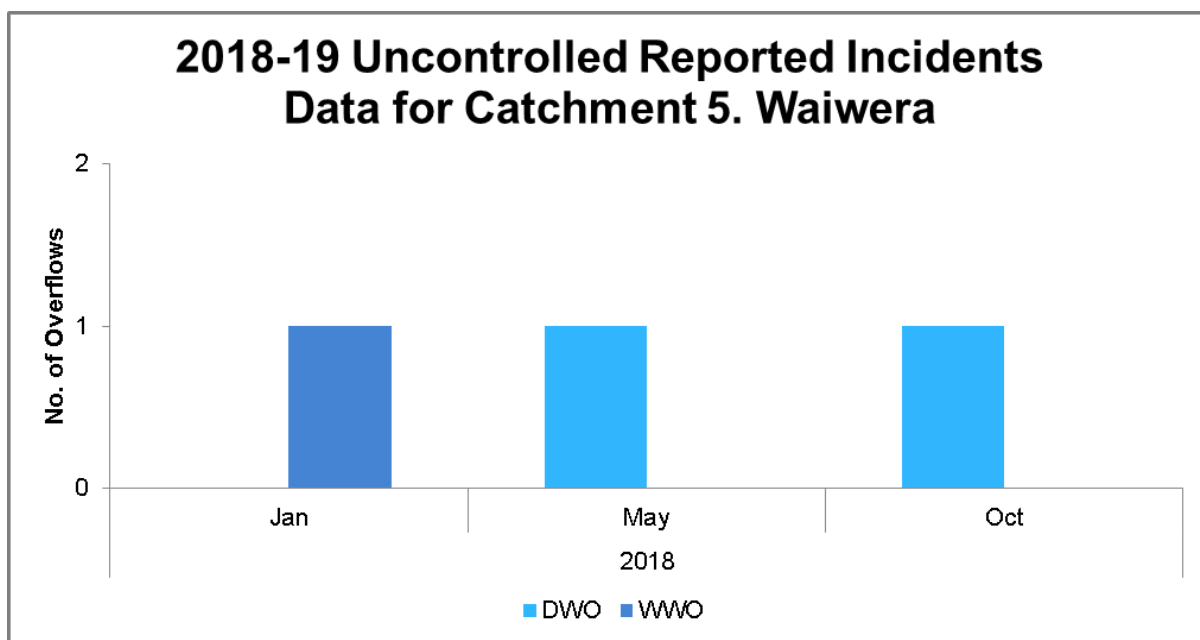
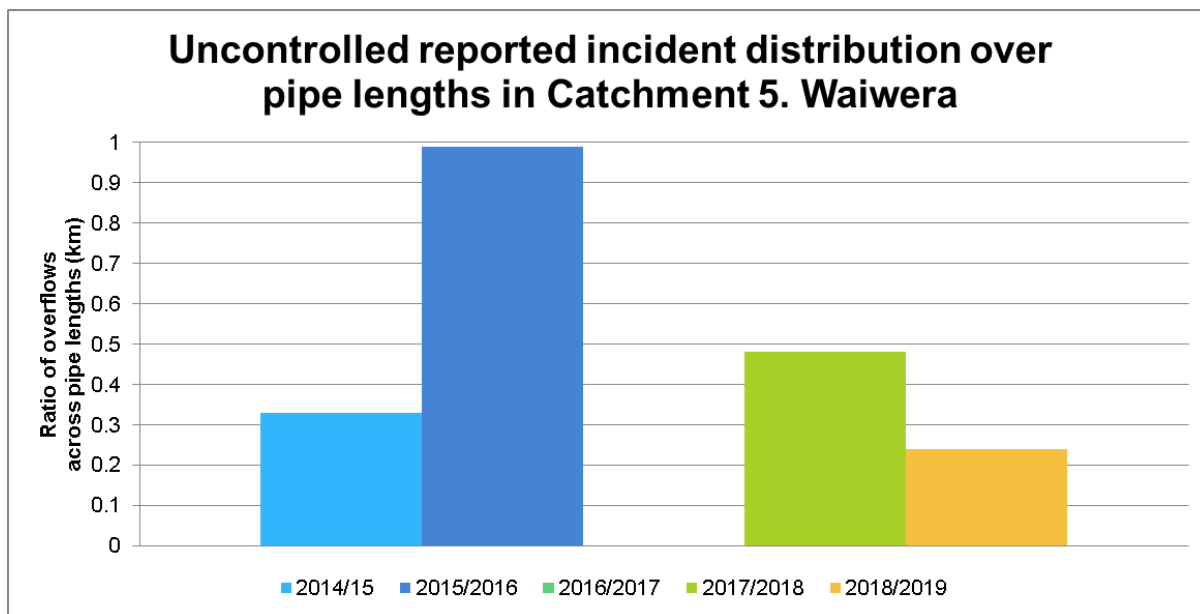
There was a total of one reported incident in the Waiwera catchment.

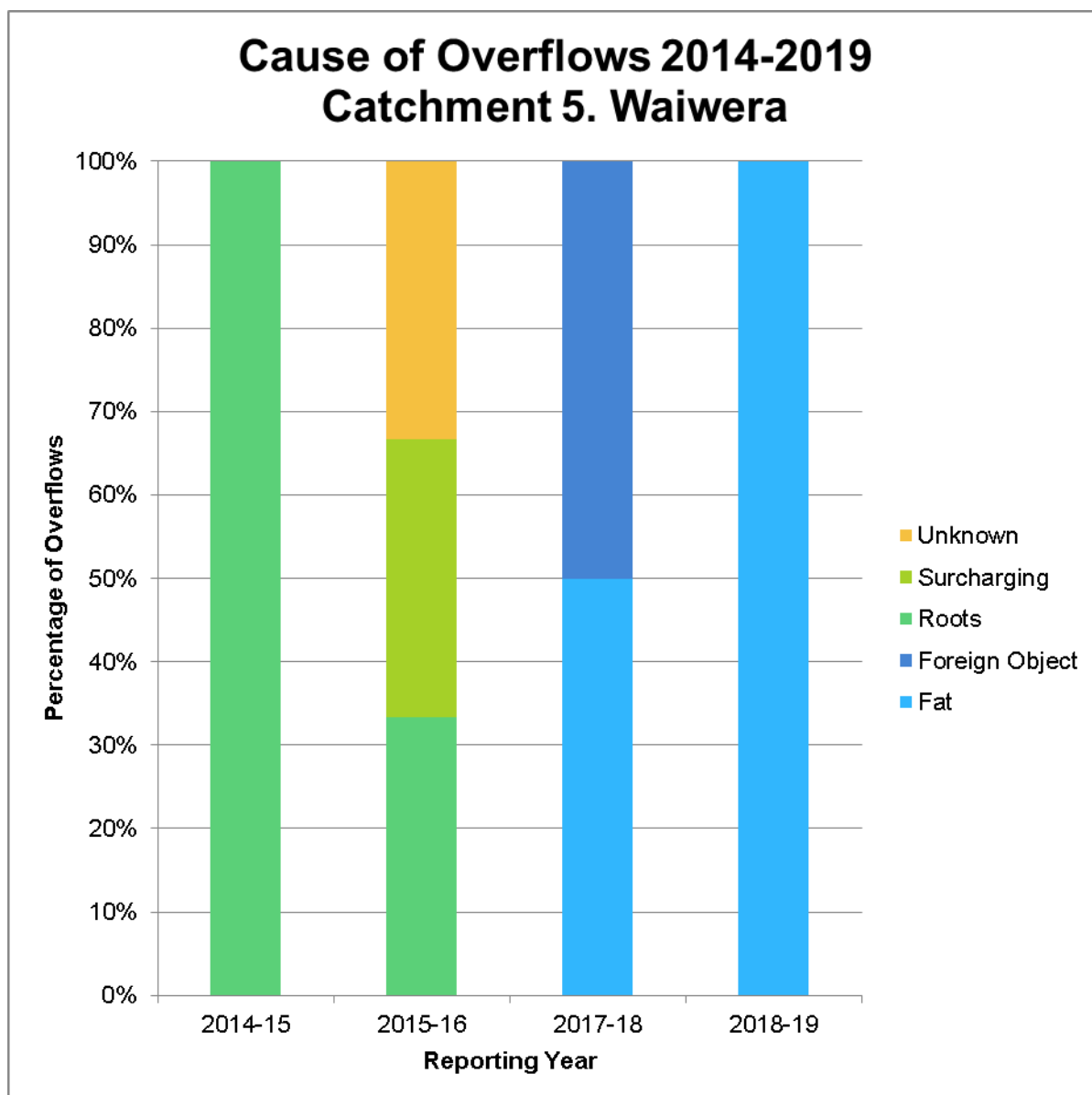
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

There were no repeat uncontrolled reported incidents in the Waiwera catchment.

2.7.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified. There were no overflow incidents in 2016-17 in this catchment.

2.7.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

There were no wet weather overflows at pump stations between 1 July 2018 and 30 June 2019.

2.7.5 Trend analysis of pump station overflows

There have been no wet weather overflows at the EOPs to trend.

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1098	Waiwera Camp WWPS	0.4	0	0	0	0	0	0	Continue to monitor
1099	Waiwera Town WWPS	0.4	0	0	0	0	0	0	Continue to monitor
1100	Weranui Road WWPS	-	0	0	0	0	0	0	Continue to monitor

2.7.6 Inflow & Infiltration Programme

A review of Inflow & Infiltration (I&I) in this catchment will be carried out as part of Watercare's I&I programme; this catchment has not been identified as a priority to date.

2.7.7 Improvement Works Programme

The current status of the Improvement Works Programme for this SMA is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Waiwera Diversion to Hatsfield	Design	Provide a 20l/s pump station, 2,100m of 180mm rising main and 2,500 of 250mm gravity sewer	Cater for growth in the area	2019-2022

2.7.8 Erosion Control Measures

No works related to erosion control were carried out in this SMA between 1 July 2018 and 30 June 2019.

2.7.9 Summary

There continue to be no EOPs which discharged more frequently than two spills per year. The ratio of overflows to pipe length has decreased in this reporting period. The data indicates that dry weather overflows are not currently a concern in this catchment. No significant changes have been made to the network as a whole. The overflow history will be analysed and utilised when reviewing the performance of the new diversion, and for future network improvement and I&I programmes.

This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.8 Strategic Management Area 6: Helensville

2.8.1 Overview

Helensville is situated on the banks of the Kaipara River at the southern end of the Kaipara Harbour. The Kaipara River catchment comprises mostly rural land uses (predominantly pastoral farming), with some plantation forest, horticulture and, increasingly - lifestyle blocks. The Helensville wastewater network was installed in the 1970's, and services the townships of Parakai and Helensville. The Helensville wastewater treatment plant (WWTP) is located between the two townships on a peninsula created by a bend of the Kaipara River. The connected population is 3,953 (Census, 2013), with 1,506 wastewater connections.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	1,461	1,457	1,463	1,476	1,506
Length of sewer (km)	30	30	31	36	36

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1090	Kowhai WWPS	DPKOW	1	Kaipara River
1092	Mill WWPS	DPMIL	1	Kaipara River
1093	Miro WWPS	DPMRO	1	Awaroa Stream
1094	Outfall WWPS	DPOUT	1	Kaipara River
1095	Springs Rd WWPS	DPSPR	1	Kaipara River
1096	Parakai WWPS	DPPAI	1	Kaipara River
1097	Chic Gardens WWPS	DPCIC	1	Kaipara River

There have been no changes to the schedule of EOPs in this catchment.

2.8.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 24 reported incidents in the Helensville catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

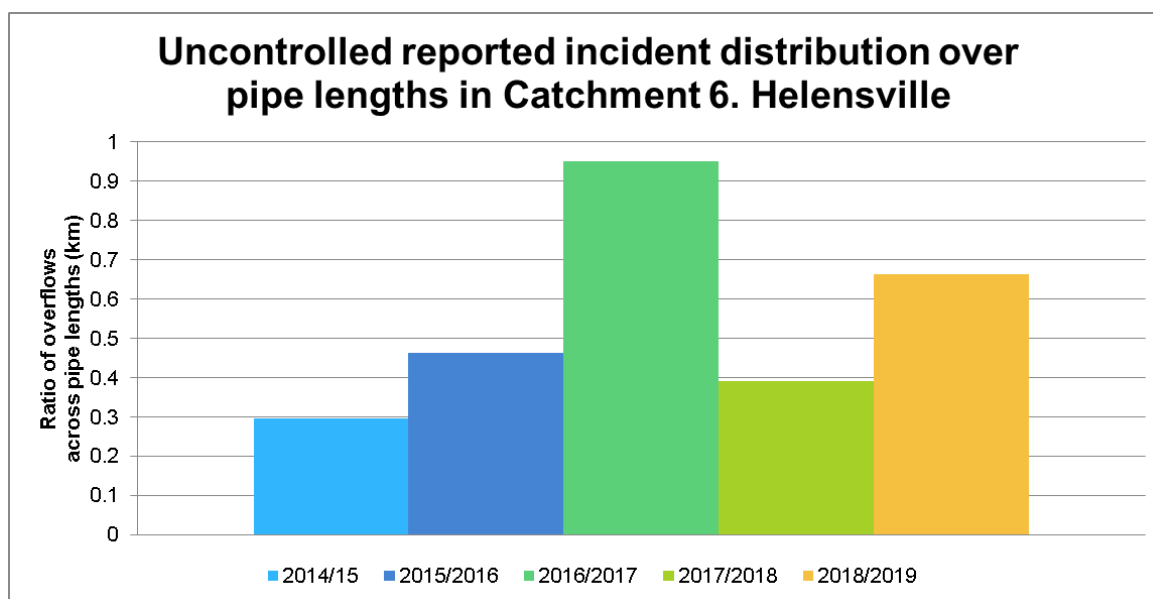
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

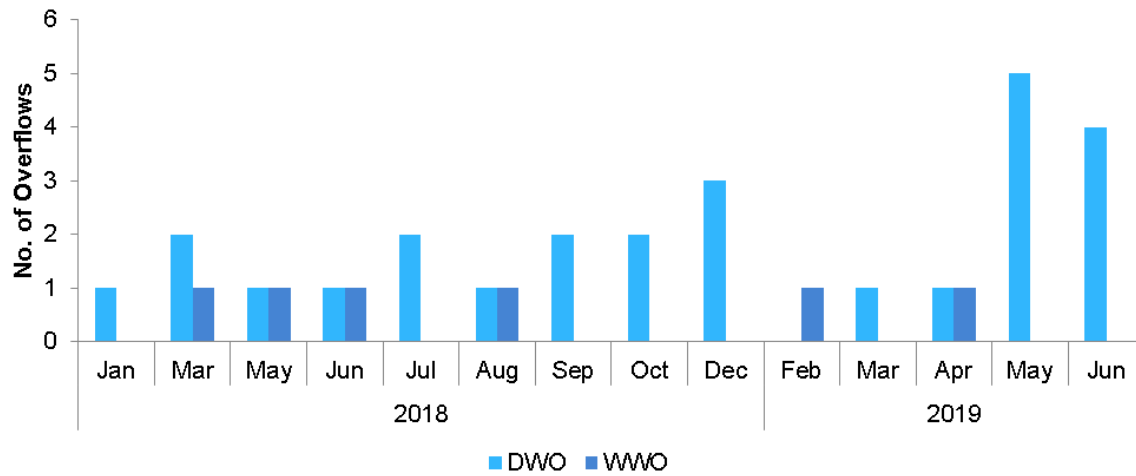
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
2/08/2016	6 Hand Rd	L1	201	Unknown	1	Heavy Flush and rootcut
20/06/2017	6 Hand Rd	L1	86	Roots	0	
27/09/2017	6 Hand Rd	L1	175	Surcharging	0.5	
19/08/2018	6 Hand Rd	L1	616	Roots	0	
22/02/2019	6 Hand Rd	L1	249	Roots	13.5	
1/04/2019	6 Hand Rd	L1	213	Roots	39.5	
14/09/2018	44A Rautawhiri Rd	L1	734	Unknown	0	Fat flushed, manhole repaired
15/09/2018	44A Rautawhiri Rd	L1	123	Unknown	3.5	
24/06/2019	44A Rautawhiri Rd	L1	192	Fat	0.5	
23/06/2019	29 Rautawhiri Rd	L1	251	Roots	5.5	Flushed main, Rootcut
29/06/2019	29 Rautawhiri Rd	L1	574	Roots	0.5	

2.8.3 Trend analysis of reported incidents

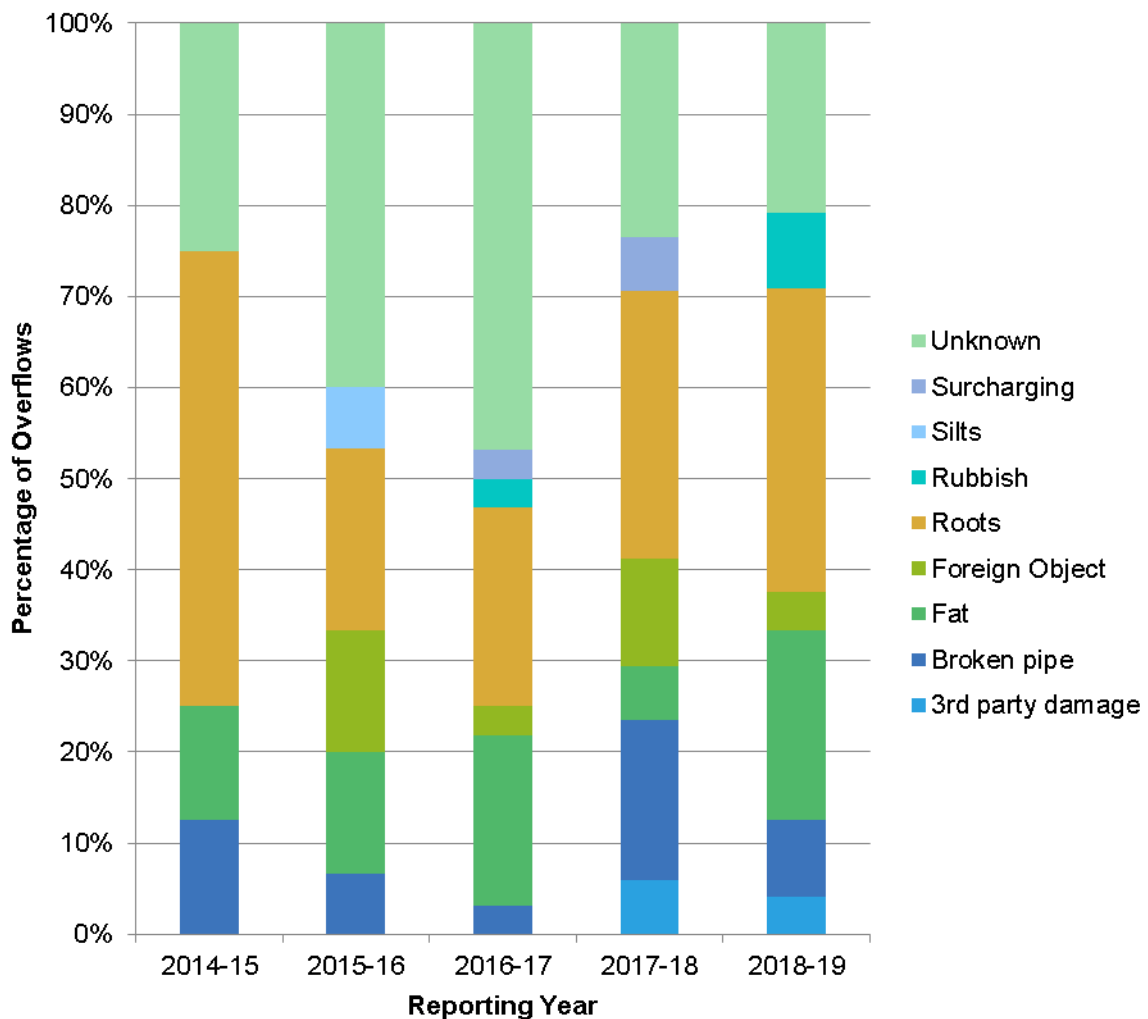
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



2018-19 Uncontrolled Reported Incidents Data for Catchment 6. Helensville



Cause of Overflows 2014-2019 Catchment 6. Helensville



Trend analysis has been carried out where the cause has been identified.

2.8.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPOUT	Outfall Wastewater Pump Station	1094	Power Outage (Flooded Switchboard)	131	52.5

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. The cause is taken from validated site data.

2.8.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1090	Kowhai WWPS	0.80	1	1	0	1	0	0.6	Continue to monitor
1092	Mill WWPS	0.00	0	0	0	0	0	0	Continue to monitor
1093	Miro WWPS	0.20	0	0	0	0	0	0	Continue to monitor
1094	Outfall WWPS	1.20*	0	0	1	1	1	0.6	Continue to monitor
1095	Springs Rd WWPS	0.40*	0	0	1	2	0	0.6	Continue to monitor
1096	Parakai WWPS	0.00	0	0	0	1	0	0.2	Continue to monitor
1097	Chic Gardens WWPS	0.00	0	0	0	0	0	0	Continue to monitor

*Based on 5 years of SCADA data (Jan 2007 – Dec 2011); not reported in NDC AEE.

2.8.6 Inflow & Infiltration Programme

Inflow and Infiltration (I&I) investigations began with a desktop assessment of SCADA data to investigate high wet weather flows arriving at the wastewater treatment plant and understand I&I network performance. This study has identified high severity I&I subcatchments, and targeted field investigations will start in late 2019.

2.8.7 Improvement Works Programme

No significant Improvement Works related to overflows have as yet been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.8.8 Erosion Control

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.8.9 Summary

There were no Type 1 EOPs which discharged more frequently than two spills this year. There has been an increase in the overflow ratio from the previous reporting period. Trend analysis shows an increase in roots as the primary cause. Helenville I&I network

performance and high wet weather flows arriving at the wastewater treatment plant is currently being investigated.

The overflow history will be analysed and utilised when reviewing future network improvement programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

Strategic Management Area 7: Army Bay

2.9 Catchment 7 – Orewa

2.9.1 Overview

Orewa lies on the Hibiscus Coast, just north of the base of the Whangaparaoa Peninsula, approximately 40 km north of central Auckland. The population of Orewa was 12,597 in the 2013 census, with currently 8,179 wastewater connections. The Orewa wastewater network also serves Hatfield Beach, and Silverdale North. Current land use is predominantly residential, with several commercial nodes. Parts of the existing urban area are currently undeveloped and therefore not serviced by wastewater infrastructure. Further, there is an extensive area of indicative future urban area in the west of this catchment. The eastern boundary of the catchment is formed by the coastal environment of Whangaparaoa Bay.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	6,216	6,791	7,402	7,738	8,179
Length of sewer (km)	132	147	155	187	191

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
803	Hatfields Beach WWPS	DPHAT	1	Otanerua Stream
807	Lakeside WWPS	DPLKE	1	Orewa River Estuary
814	Riverside Rd WWPS	DPRVS	1	Unnamed tributary of Orewa River Estuary (east)
819	Terminal WWPS	DPTER	1	Orewa River Estuary
1255	Jelas Rd WWPS	DPJEL	1	Southern arm of Orewa River Estuary
1259	Orewa WWPS	DPORE	1	Orewa River Estuary
1262	Florence Ave WWPS	DPFLO	1	To land
1265	Tauranga Place WWPS	DPTAP	1	Northern arm of Orewa River Estuary
1266	Maygrove WWPS	DPMAY	1	Orewa River Estuary
1269	Orewa Bridge WWPS	DPORB	1	Orewa River Estuary

There have been no changes to the schedule of EOPs in this catchment

2.9.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported incidents

There were a total of 42 reported incidents in the Orewa catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

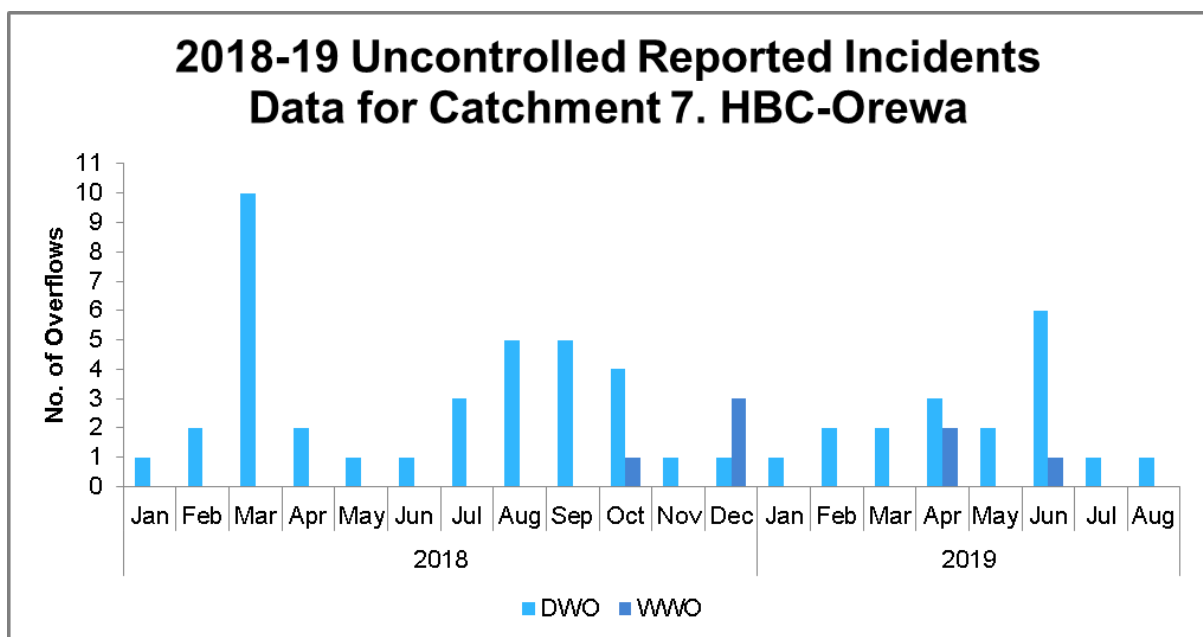
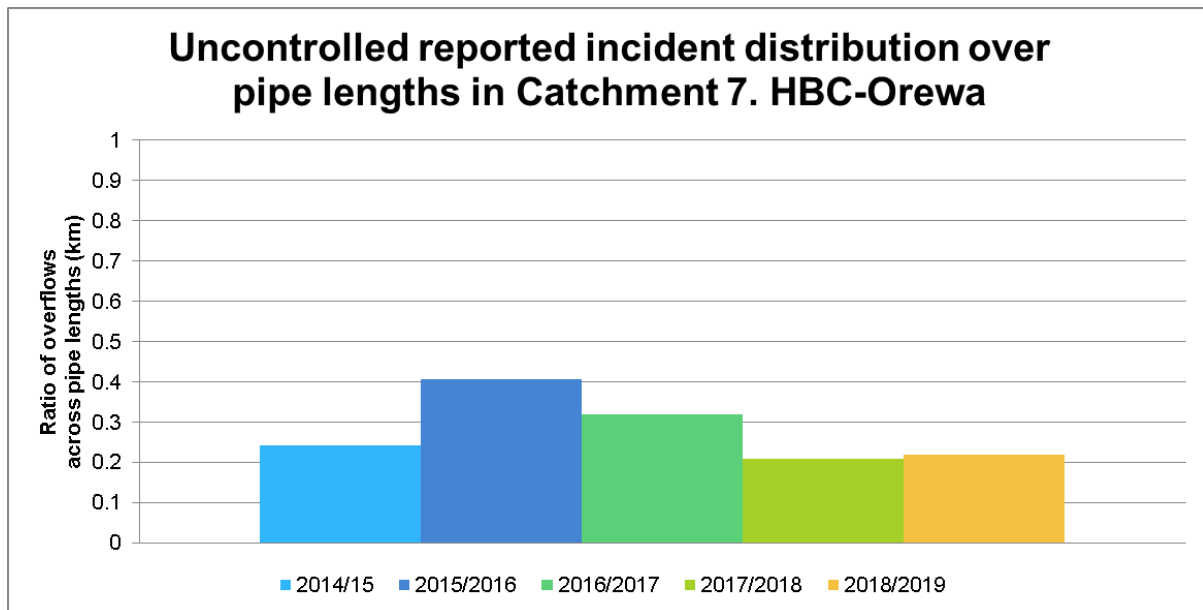
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

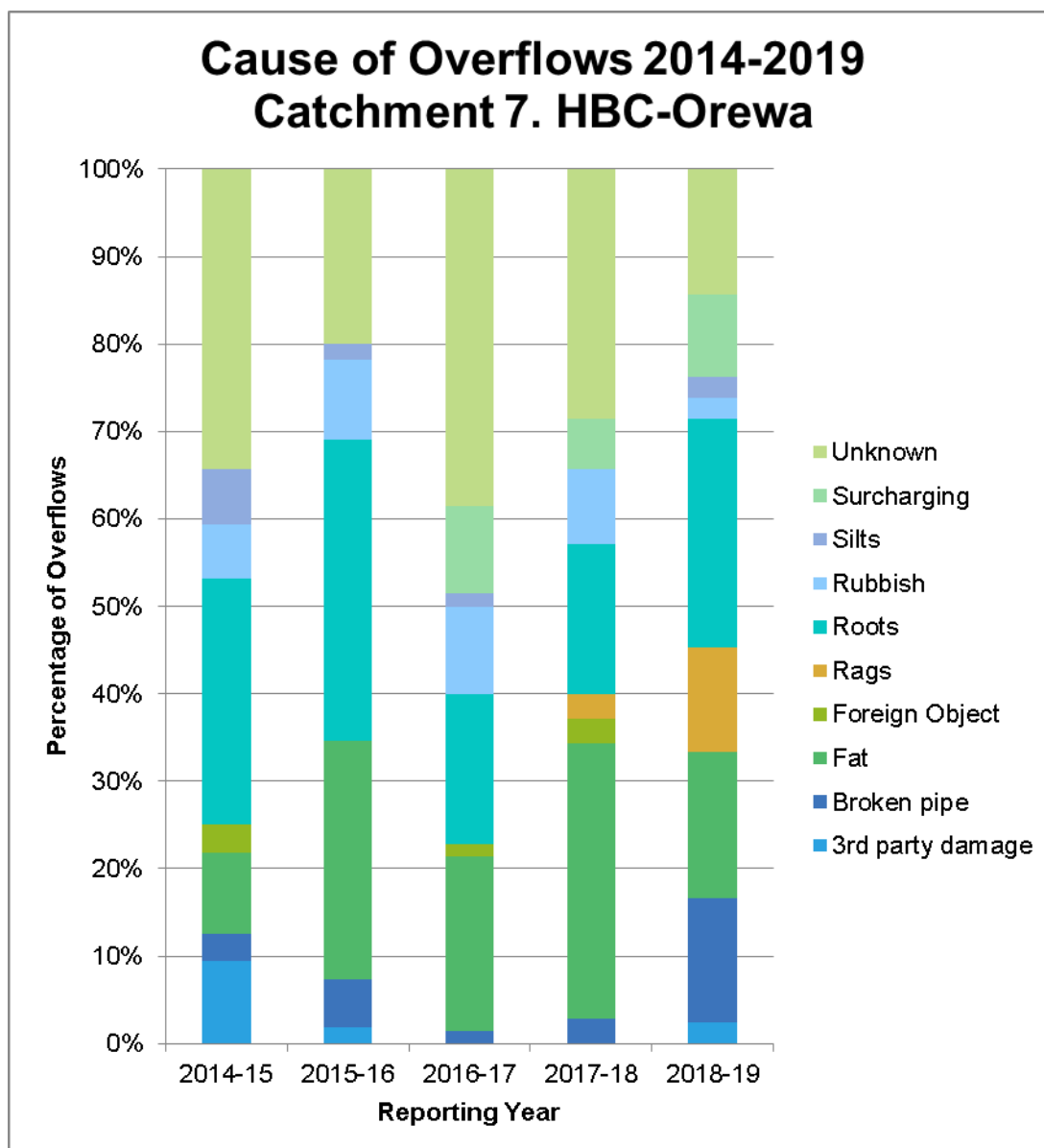
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
4/12/2018	2/14D Moffat Rd	L1	280	Surcharging	7	Surcharging from heavy rain
24/12/2018	2/14D Moffat Rd	L1	171	Surcharging	69	
29/03/2018	Bonair Cres	L1	575	Rags	0	Fat in connection to LPS removed. LPS valve was reopened
31/03/2018	Bonair Cres	L3	482	Fat	0	
10/10/2018	Bonair Cres	L1	139	Broken pipe	0	
16/04/2018	7C Centreway Rd	L1	565	Fat	1.5	Heavy flushed, fat blockages and rags removed
1/07/2018	7C Centreway Rd	L1	249	Rags	7.5	
22/05/2019	306- Hibiscus Coast Hwy	L1	229	Unknown	0	Flushed main, Junction repaired
23/05/2019	306- Hibiscus Coast Hwy	L1	289	Broken pipe	2.5	
18/02/2019	71 Lakeside Dr	L2	165	Unknown	2.5	Flushed main
29/04/2019	71 Lakeside Dr	L3	286	Fat	4	
26/08/2018	9 Maori Hut Rd	L1	130	Roots	0.5	Tomo repaired
26/06/2019	9 Maori Hut Rd	L1	181	Broken pipe	0.5	

2.9.4 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.9.5 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
29/08/2018	DPHAT	Hatfields Beach Wastewater Pump Station	803	Rain event	65	26
24/12/2018	DPHAT	Hatfields Beach Wastewater Pump Station	803	Rain event	173	69
6/04/2019	DPHAT	Hatfields Beach Wastewater Pump Station	803	Rain event	161	23

2.9.7 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
803	Hatfields Beach WWPS	0.4	0	0	1	0	3	0.8	Continue to monitor
807	Lakeside WWPS	0.7	1	0	0	0	0	0.2	Continue to monitor
814	Riverside Rd WWPS	0	0	0	0	0	0	0	Continue to monitor
819	Terminal WWPS	0.1	0	0	0	0	0	0	Continue to monitor
1255	Jelas Rd WWPS	0.4	1	0	0	0	0	0.2	Continue to monitor
1259	Orewa WWPS	0.8	0	0	3	0	0	0.6	Continue to monitor
1262	Florence Ave WWPS	0	0	0	0	0	0	0	Continue to monitor
1265	Tauranga Place WWPS	0	1	0	0	0	0	0.2	Continue to monitor
1266	Maygrove WWPS	0.2	0	0	0	0	0	0	Continue to monitor
1269	Orewa Bridge WWPS	0	0	0	0	0	0	0	Continue to monitor

2.9.8 Inflow & Infiltration Programme

A review of Inflow & Infiltration (I&I) network performance for this catchment is being carried out as part of the Army Bay SMA modelling and planning study; this will inform future I&I field investigations.

2.9.9 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Closure	Army Bay WWTP outfall	Closure	Required to provide an alternative outfall for use during wet weather events	Will provide for growth and allow network restrictions related to WWTP constraints to be removed from trunk pump stations, reducing the risk of spills	2015-2019
Planned	Army Bay SMA options assessment	Studies and investigations	Required to determine local network improvements to reduce overflows, and plan for growth	Identification of preferred upgrade options to manage growth without deteriorating wet weather overflow	2018-2020

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
				frequencies.	
Future	Rodney Hibiscus Coast Servicing	Studies and investigations	Whangaparaoa wastewater transmission augmentation	Reduction of wet weather overflows	2020-2024
Underway	Army Bay WWTP Upgrade	Studies and investigations	Army Bay WWTP capacity increase to meet growth.	Cater for growth in the HBC, Whangaparaoa catchments	2020-2025

2.9.10 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.9.11 Summary

There have been no EOPs which discharged more frequently than two spills per year on average in this reporting period. There has been a slight increase in the density of overflows across the pipe network. Trend analysis shows the most common cause of overflows being roots and fats. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. Hibiscus Coast is a major growth area. The Army Bay SMA modelling and planning study will inform network operational improvements and long-term network performance improvements. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.8 Catchment 8 – Weiti

2.10.1 Overview

The Weiti catchment comprises two main town centres – Silverdale and Stillwater, which are both serviced by the Hibiscus Coast wastewater network. They are part of the area known as the Hibiscus Coast. Stillwater is situated on the west bank of the Weiti River, immediately west of the Whangaparaoa Peninsula. Silverdale is located further upstream, also on the banks of the Weiti River. The population of Silverdale, Stillwater and surrounds was 2,316 in 2013 (Census, 2013), with 1,169 wastewater connections.

The townships are surrounded by rural pastoral land, lifestyle blocks and Weiti Forest, which lies immediately south of Stillwater town. The Silverdale Township consists predominantly of industrial/commercial land use and a small amount of medium and low density residential development.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	1,093	1,100	1,112	1,128	1,169
Length of sewer (km)	39	39	39	45	46

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
795	Blue Gum WWPS	DPBLU	1	Weiti River
798	Duck Creek WWPS	DPDUC	1	Weiti Estuary
801	Foundry WWPS	DPFOU	1	Weiti River
806	Karaka Cove WWPS	DPKKC	1	Unnamed Stream (Karaka Cove)
812	Poplar WWPS	DPPOP	1	Weiti Estuary
817	Stillwater WWPS	DPSTW	1	Weiti Estuary
821	Wade River WWPS	DPWAD	1	Weiti Estuary
822	Weiti WWPS	DPWEI	1	Weiti River
1267	Coastal Heights WWPS	DPCOA	1	Weiti Estuary

There have been no changes to the schedule of EOPs in this catchment.

2.10.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported incidents

There were a total of 24 reported incidents in the Weiti catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

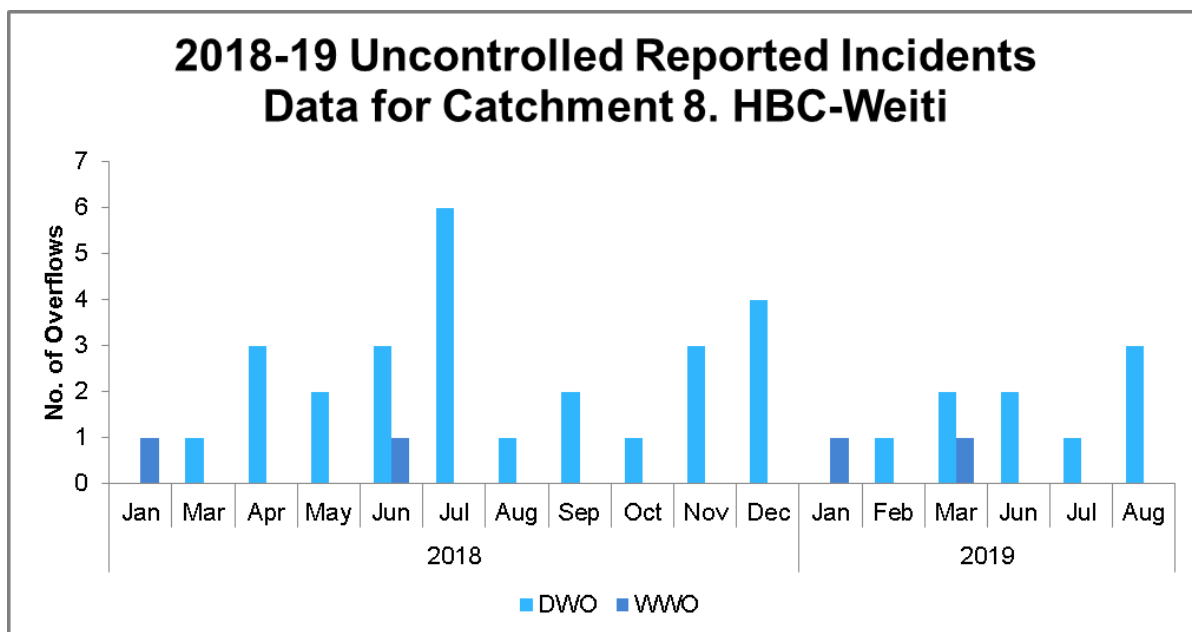
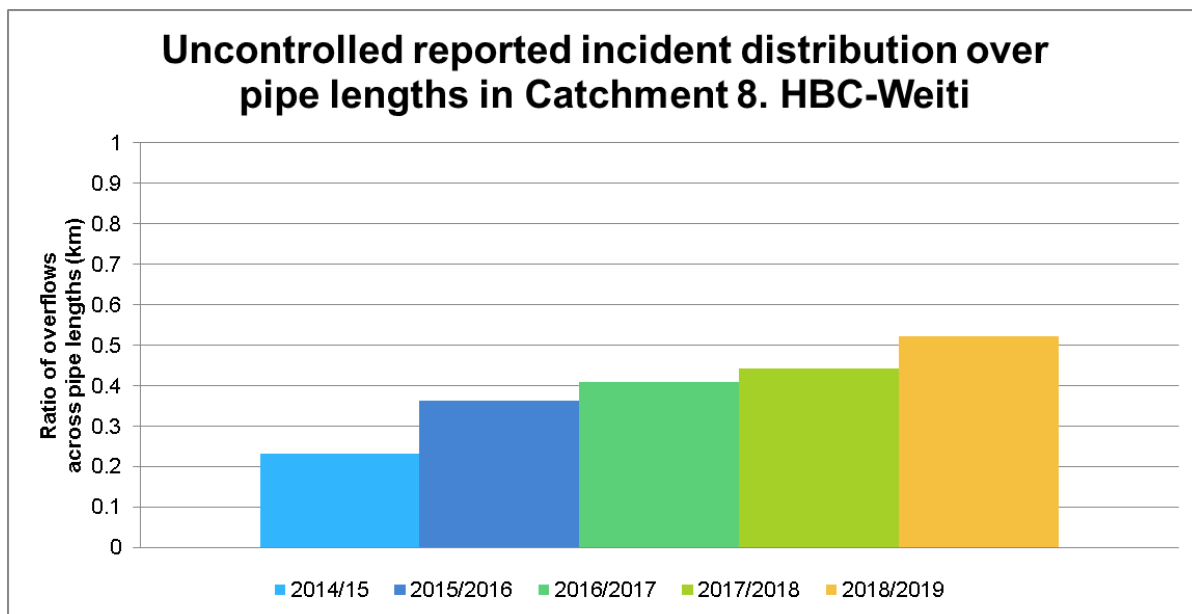
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

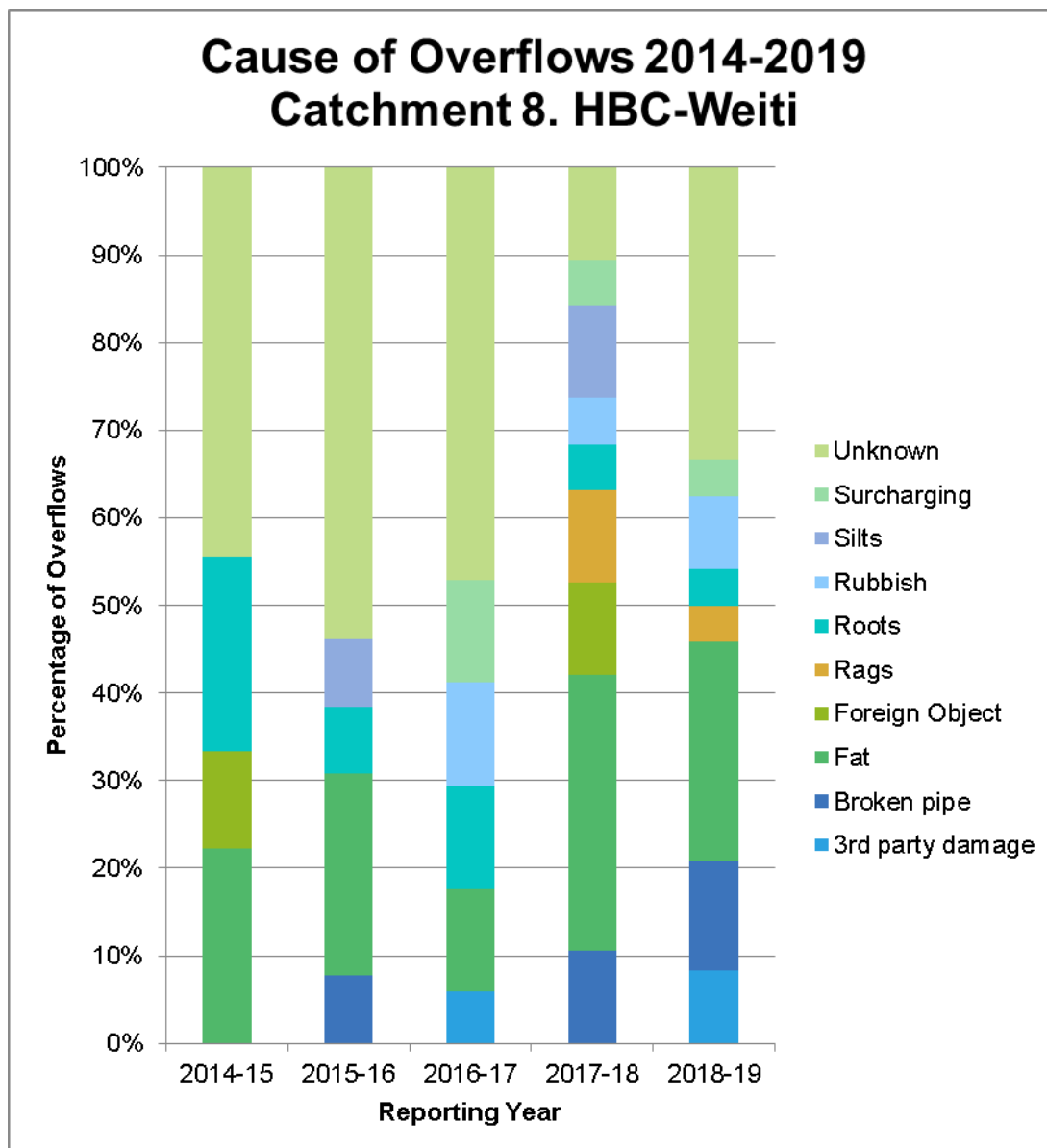
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
12/04/2018	15 Titan PI	L1	606	Foreign Object	4	Debris/fats build up in syphon. Under investigation. Flushed line, rootcut, flushed syphon, joiner coupling tightened.
26/05/2018	15 Titan PI	L2	147	Silts	2.49	
6/07/2018	15 Titan PI	L1	208	Rags	0	
18/07/2018	15 Titan PI	L2	129	Unknown	0	
24/09/2018	15 Titan PI	L1	230	Unknown	6.5	
12/10/2018	15 Titan PI	L1	199	Rubbish	5.5	
8/11/2018	15 Titan PI	L1	159	Unknown	0	
1/12/2018	15 Titan PI	L1	107	Fat	3	
4/12/2018	15 Titan PI	L1	274	Unknown	7	
26/12/2018	15 Titan PI	L1	124	Fat	1.5	
26/12/2018	15 Titan PI	L1	33	Broken pipe	1.5	
15/01/2019	15 Titan PI	L1	160	Surcharging	1.5	
6/06/2019	15 Titan PI	L1	82	Broken pipe	3	
28/06/2019	15 Titan PI	L1	312	Broken pipe	0	
17/03/2017	21 Poplar Rd	L1	510	Fat	0	Heavy fat build up in pipe bridge. Roots and fats removed
5/01/2018	21 Poplar Rd	L1	83	Surcharging	17	
10/06/2018	21 Poplar Rd	L1	719	Rags	0.5	
22/09/2018	21 Poplar Rd	L1	257	Fat	0	
29/08/2017	3 Coastal Hts	L1	160	Fat	0	Heavy flushed line
3/09/2017	3 Coastal Hts	L1	116	Fat	0	
16/03/2019	3 Coastal Hts	L1	253	Unknown	0	

2.10.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.10.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
20/12/2018	DPWEI	Weiti Wastewater Pump Station	822	Mechanical/Maintenance	24	21
24/12/2018	DPDUC	Duck Creek Wastewater Pump Station	798	Rain event	184	69
24/12/2018	DPWEI	Weiti Wastewater Pump Station	822	Rain event	137	69
24/12/2018	DPWAD	Wade Wastewater Pump Station	821	Rain event	92	69
6/04/2019	DPWEI	Weiti Wastewater Pump Station	822	Rain event	16	23

2.10.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
795	Blue Gum WWPS	0	0	0	0	1	0	0.2	Continue to monitor
798	Duck Creek WWPS	0	0	0	1	2	1	0.8	Continue to monitor
801	Foundry WWPS	1.6	0	0	0	1	0	0.2	Continue to monitor
806	Karaka Cove WWPS	0	0	0	0	0	0	0	Continue to monitor
812	Poplar WWPS	0	0	0	0	0	0	0	Continue to monitor
817	Stillwater WWPS	0	0	0	0	0	0	0	Continue to monitor
821	Wade River WWPS	0	0	0	0	0	1	0.2	Continue to monitor
822	Weiti WWPS	5.5	1	0	1	2	3	1.4	Continue to monitor
1267	Coastal Heights WWPS	0.2	0	0	0	0	0	0	Continue to monitor

2.10.6 Inflow & Infiltration Programme

A review of Inflow & Infiltration (I&I) network performance for this catchment is being carried out as part of the Army Bay SMA modelling and planning study; this will inform future I&I field investigations.

2.10.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Closure	Army Bay WWTP outfall	Closure	Required to provide an alternative outfall for use during wet weather events	Will provide for growth and allow network restrictions related to WWTP constraints to be removed from trunk pump stations, reducing the risk of spills	2015-2019

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Army Bay SMA model update and calibration	Studies and investigations	Required to determine local network improvements to reduce overflows, and plan for growth	Calibrated model which can be used to develop options for achieving levels of service. Flow gauging complete.	2015 -2018 (Flow gauging complete)
Planned	Army Bay SMA options assessment	Studies and investigations	Required to determine local network improvements to reduce overflows, and plan for growth	Identification of preferred upgrade options to manage growth without deteriorating wet weather overflow frequencies.	2018-2020
Future	Rodney Hibiscus Coast Servicing	Studies and investigations	Whangaparaoa wastewater transmission augmentation	Reduction of wet weather overflows	2020-2024

2.10.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.10.9 Summary

There were no Type 1 EOPs which discharged more frequently than two spills per year on average. There has been a minor increase in the density of overflows across the pipe network. Trend analysis shows that fats remain the most common cause of overflows. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. Hibiscus Coast is a major growth area. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.11 Catchment 9 – Whangaparaoa

2.11.1 Overview

Whangaparaoa Peninsula is located around 25 km north of Auckland, extending east for 11 km into the waters of the Hauraki Gulf to the north of East Coast Bays. The town of Whangaparaoa sits on the peninsula's south-western shore. The population of Whangaparaoa Peninsula was estimated to be around 28,900 in 2013 (Census, 2013), with 11,918 wastewater connections. Communities along the peninsula include Red Beach, Stanmore Bay, Big Manly, Tindalls Beach, Army Bay, Gulf Harbour, Matakatia, Little Manly, and Arkles Bay. At the end of the peninsula is Shakespear Regional Park. The New Zealand Defence Force owns part of this area.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	11,136	11,316	11,563	11,721	11,918
Length of sewer (km)	271	274	276	318	322

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
793	Arkles Bay WWPS	DPARK	1	Arkles Bay Beach
794	Bay St WWPS	DPBAY	1	Unnamed stream flowing to Red Beach
796	Chelverton WWPS	DPCHE	1	Red Beach
797	Cooper WWPS	DPCOO	1	Stanmore Bay Beach
800	Duncansby WWPS	DPDUN	1	Puawai Bay Beach
802	Glenelg WWPS	DPGLG	1	Puawai Bay Beach
804	Hobbs Bay WWPS	DPHBB	1	Laurie Southwick Parade Stream
805	Hurdlow WWPS	DPHUR	1	Swann Beach
808	Little Manly WWPS	DPLIT	1	Little Manly Beach
809	Manly WWPS	DPMLY	1	Big Manly Beach
810	Matakatia WWPS	DPMIA	1	Matakatia Bay Beach
811	Okoromai WWPS	DPOKO	1	Okoromai Bay Beach
813	Puawai Bay WWPS	DPPUA	1	Puawai Bay Beach
815	Siesta WWPS	DPSIE	1	Coal Mine Bay Beach
816	Stanmore WWPS	DPSTA	1	Unnamed stream flowing to Stanmore Bay
818	Swann Beach WWPS	DPSWB	1	Swann Beach
820	Tindalls WWPS	DPTDL	1	Tindalls Beach
1256	Pine Crest WWPS	DPPIN	1	Stormwater pond at Gulf Harbour Country Club
1260	Pacific Parade WWPS	DPPAC	1	Army Bay Beach
1263	Island View WWPS	DPISV	1	Okoromai Bay

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1272	Roberts Road WWPS	DPROB	1	Laurie Southwick Parade Stream

There have been no changes to the schedule of EOPs in this catchment.

2.11.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
20/06/2019	DPARK	Arkles Bay Wastewater Pump Station	793	Mechanical/Maintenance	45	3.5

Reported incidents

There were a total of 89 reported incidents in the Whangaparaoa catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

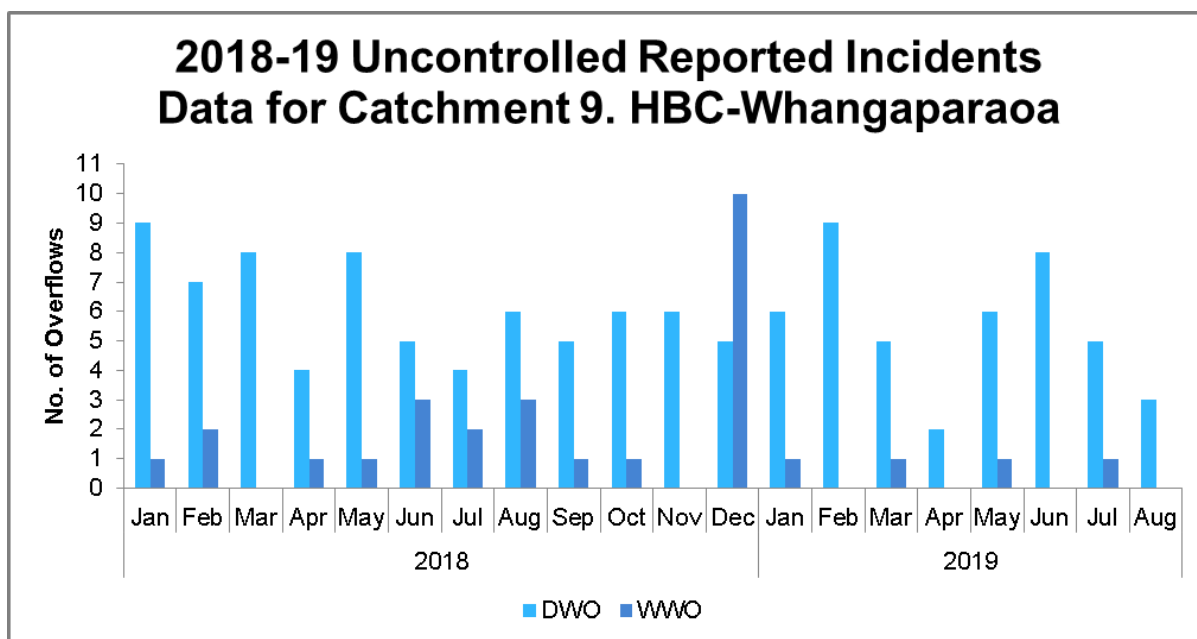
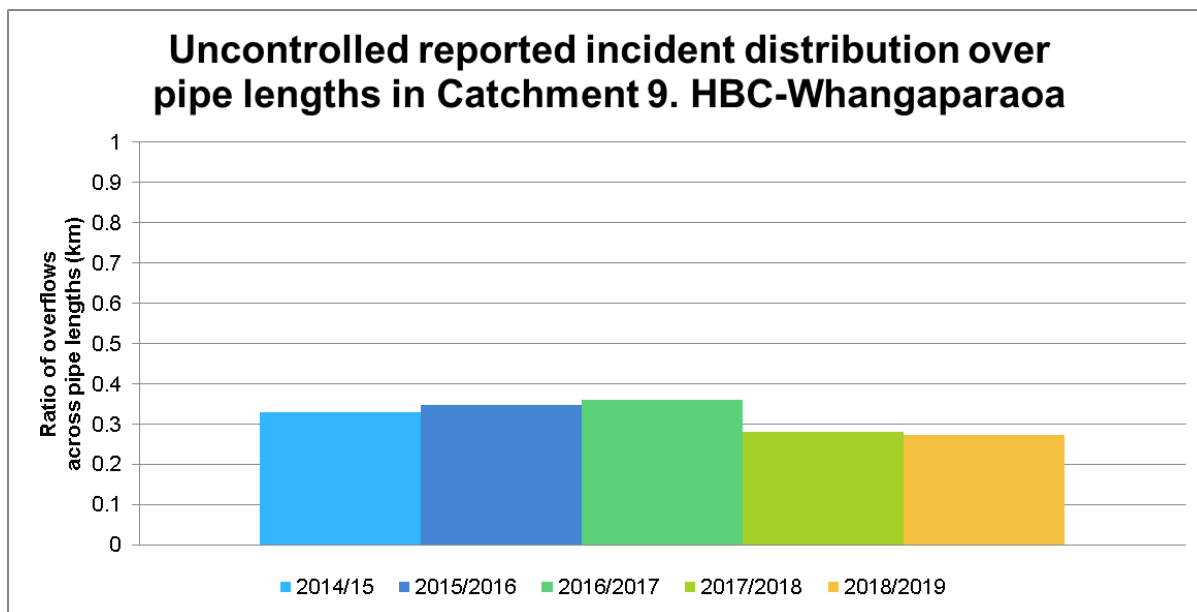
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

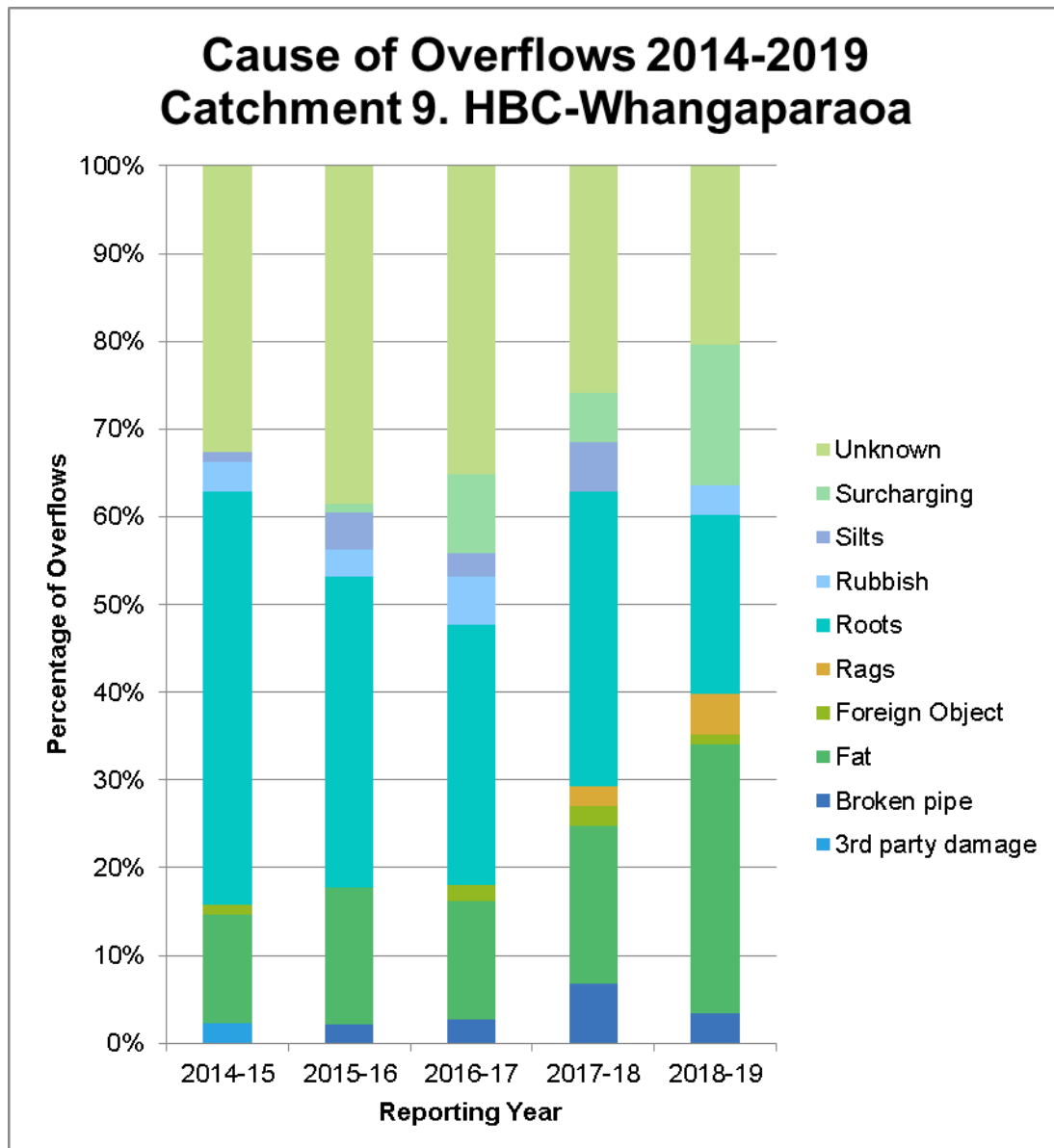
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
28/05/2018	180 Gulf Harbour Dr	L1	260	Broken pipe	1	Flushed main
26/06/2019	180 Gulf Harbour Dr	L1	256	Fat	0.5	
21/07/2018	124 Whangaparaoa Rd	L1	156	Unknown	0	Flushed main
2/08/2018	124 Whangaparaoa Rd	L1	134	Fat	0.5	
5/08/2018	13 Sundown Ave	L1	93	Surcharging	2	Heavy fats, heavy flush
29/08/2018	13 Sundown Ave	L1	89	Surcharging	26	
4/12/2018	13 Sundown Ave	L1	60	Surcharging	7	
13/12/2018	13 Sundown Ave	L1	179	Fat	0	
25/12/2018	13 Sundown Ave	L1	79	Surcharging	11.5	
25/02/2019	13 Sundown Ave	L1	544	Fat	0	
9/07/2017	918 Whangaparaoa Rd	L1	154	Silts	13.51	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
4/06/2018	918 Whangaparaoa Rd	L2	174	Fat	30.41	Dip in the line, heavy flushed Rootcut and fats removed
7/03/2019	918 Whangaparaoa Rd	L2	186	Fat	6	
18/07/2018	11B Penton Rd	L1	431	Unknown	0	Flushed main, dipped pipe
23/09/2018	11B Penton Rd	L1	249	Unknown	0	
4/12/2018	2 Couldrey Cres	L1	220	Surcharging	7	Heavy rain events caused surcharging, continue to monitor
25/12/2018	2 Couldrey Cres	L1	144	Surcharging	11.5	
12/04/2017	136 Whangaparaoa Rd	L1	654	Surcharging	52	Tomo repaired, Concrete in main removed
7/03/2018	136 Whangaparaoa Rd	L1	104	Broken pipe	6	
29/08/2018	136 Whangaparaoa Rd	L1	200	Rubbish	26	
6/11/2018	136 Whangaparaoa Rd	L1	106	Third Party Damage	0	
4/11/2018	18 Ladies Mile	L1	96	Fat	9	Flushed main Flushed main Rootcut
9/11/2018	18 Ladies Mile	L1	167	Roots	3	
11/11/2018	18 Ladies Mile	L1	365	Roots	7.5	
28/10/2018	27 Buccaneer Crt	L1	304	Fat	1.5	Flushed S/L
6/03/2019	27 Buccaneer Crt	L1	240	Unknown	0	
8/03/2019	50 Kensington Tce	L1	149	Roots	14.5	Heavy fat removed, Heavy flushed main
10/03/2019	50 Kensington Tce	L1	283	Fat	0	
3/06/2019	1/130 Brian Cres	L2	121	Fat	0	Flushed main
9/06/2019	1/130 Brian Cres	L1	263	Fat	0	

2.11.3 Trend analysis of reported incidents

The graphs below reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.11.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
29/08/2018	DPOKO	Okoromai Wastewater Pump Station	811	Rain event	70	26
4/12/2018	DPBAY	Bay Street Wastewater Pump Station	794	Rain event	89	7
24/12/2018	DPBAY	Bay Street Wastewater Pump Station	794	Rain event	207	69
24/12/2018	DPOKO	Okoromai Wastewater Pump Station	811	Rain event	107	69
6/04/2019	DPBAY	Bay Street Wastewater Pump Station	794	Rain event	59	23

2.11.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
793	Arkles Bay WWPS	0	0	0	0	0	0	0	Continue to monitor
794	Bay St WWPS	5.1	1	1	1	1	3	1.4	Continue to monitor
796	Chelverton WWPS	0	0	0	0	0	0	0	Continue to monitor
797	Cooper WWPS	0	0	0	0	0	0	0	Continue to monitor
800	Duncansby WWPS	0	0	0	0	0	0	0	Continue to monitor
802	Glenelg WWPS	11.7	1	0	0	0	0	0.2	Continue to monitor
804	Hobbs Bay WWPS	0	0	0	0	0	0	0	Interstation control upgrade – complete
805	Hurdlow WWPS	0	0	0	0	0	0	0	Continue to monitor
808	Little Manly WWPS	0	0	0	0	0	0	0	Continue to monitor
809	Manly WWPS	0	0	0	0	0	0	0	Continue to monitor
810	Matakata WWPS	0	0	0	0	0	0	0	Continue to monitor
811	Okoromai WWPS	0	0	0	1	1	2	0.8	Continue to monitor
813	Puawai Bay WWPS	0	0	0	0	0	0	0	Continue to monitor
815	Siesta WWPS	0	0	0	0	0	0	0	Continue to monitor
816	Stanmore WWPS	0	1	0	1	0	0	0.4	Interstation control upgrade - complete
818	Swann Beach WWPS	0	0	0	0	0	0	0	Continue to monitor
820	Tindalls WWPS	0	0	0	0	0	0	0	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1256	Pine Crest WWPS	0.2	1	1	0	1	0	0.6	Continue to monitor
1260	Pacific Parade WWPS	0	0	0	2	0	0	0.4	Continue to monitor
1261	Onepu WWPS	0	0	0	0	0	0	0	Continue to monitor
1263	Island View WWPS	0.2	0	0	0	0	0	0	Continue to monitor
1272	Roberts Road WWPS	0.2	0	0	0	0	0	0	Continue to monitor

2.11.6 Inflow & Infiltration Programme

Targeted investigations associated with the Red Beach subcatchment were carried out as part of the Safe Networks collaboration with Auckland Council Healthy Waters team in response to poor water quality in the main stormwater channel to Red Beach. The public drainage issues identified have been remediated and private property drainage issues were passed on to Auckland Council's Compliance team.

2.11.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Army Bay SMA Model Update and calibration	Studies and investigations	Required to determine local network improvements to reduce overflows, and plan for growth	Calibrated model which can be used to develop options for achieving levels of service. Flow gauging complete.	2015 -2018
Planned	Army Bay SMA Options Assessment	Studies and investigations	Required to determine local network improvements to reduce overflows, and plan for growth	Identification of preferred upgrade options to manage growth without deteriorating wet weather overflow frequencies.	2018-2020
Future	Rodney Hibiscus Coast Servicing	Studies and investigations	Whangaparaoa wastewater transmission augmentation	Reduction of wet weather overflows	2020-2024
Underway	Army Bay WWTP Upgrade	Studies and investigations	Army Bay WWTP capacity increase to meet growth.	Cater for growth in the HBC, Whangaparaoa catchments	2020-2025

2.11.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.11.9 Summary

There have been no EOPs which have discharged more frequently than two spills per year on average. There has been a decrease in the ratio of overflows across the pipe network. Trend analysis shows that fats are the primary cause of overflows with an increase in surcharging events compared with the previous reporting period. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. Hibiscus Coast is a major growth area and in the long term, the network performance in this catchment will be managed and improved through upgrades identified with the 'Rodney Hibiscus Coast Wastewater Servicing' project. Further investigations in regards to population growth have been conducted by Watercare through improvement works projects. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

Strategic Management Area 8: Rosedale (North Shore)

2.12 Catchment 10 – Long Bay

2.12.1 Overview

The Long Bay/Okura catchment is located on the North Shore of Auckland and has a total land area of approximately 1,100 ha. The catchment is bounded by the Okura River to the north and Long Bay Beach to the east. Torbay and Glenvar are the main residential areas and these are located in the southern part of the catchment. The settlement of Okura is located within the northern part of the catchment and is separated from the suburbs by undeveloped land. At present, the wastewater system covers the residential suburbs and Okura only. The entire area is reticulated to the Rosedale WWTP.

The catchment has developed over recent years and is subject to urban growth. Development associated with the Long Bay Structure Plan area is located within the catchment. Development has already commenced and will continue in the coming years, covering approximately 360 ha and 2,500 lots, which will accommodate an estimated 7,000 people. It will involve some mixed use development and a range of housing. There are currently 3,013 wastewater connections.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	2,577	2,698	2,829	2,894	3,013
Length of sewer (km)	61	63	65	81	81

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
831	97 Awaruku Rd	-	2	Awaruku Creek
832	47 Glenvar Road	-	2	Awaruku Creek
850	14 Battenburg Place	-	2	Awaruku Creek
1228	Deborah WWPS	DPDEB	1	Okura Estuary
1235	Okura WWPS	DPOKU	1	Okura Estuary
1404	Long Bay WWPS	DPLGB	1	Awaruku Creek
1578	Okura River Rd WWPS	DPOKR	1	Unnamed tributary (1) to Vaughan Stream

There have been no changes to the schedule of EOPs in this catchment.

2.12.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 33 reported incidents in the Long Bay catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

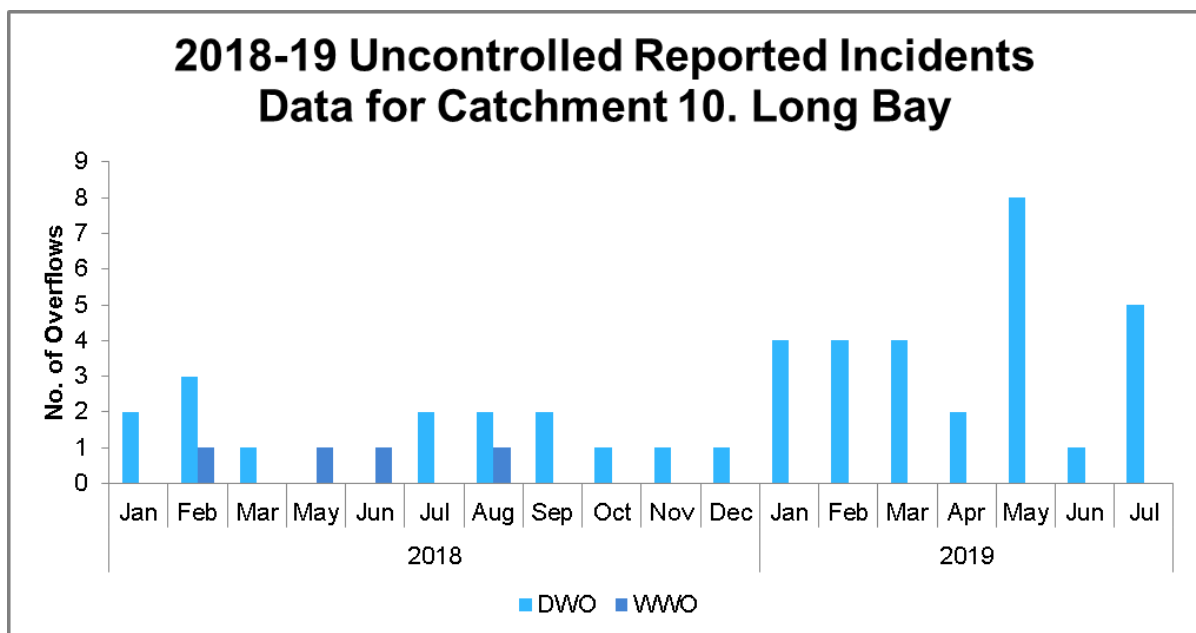
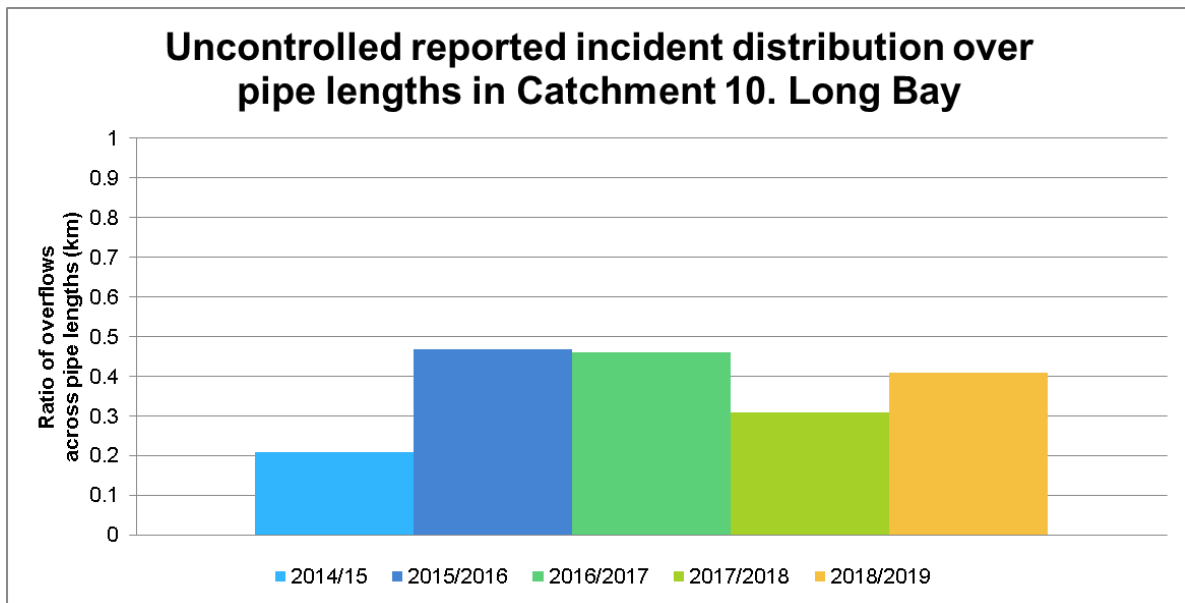
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

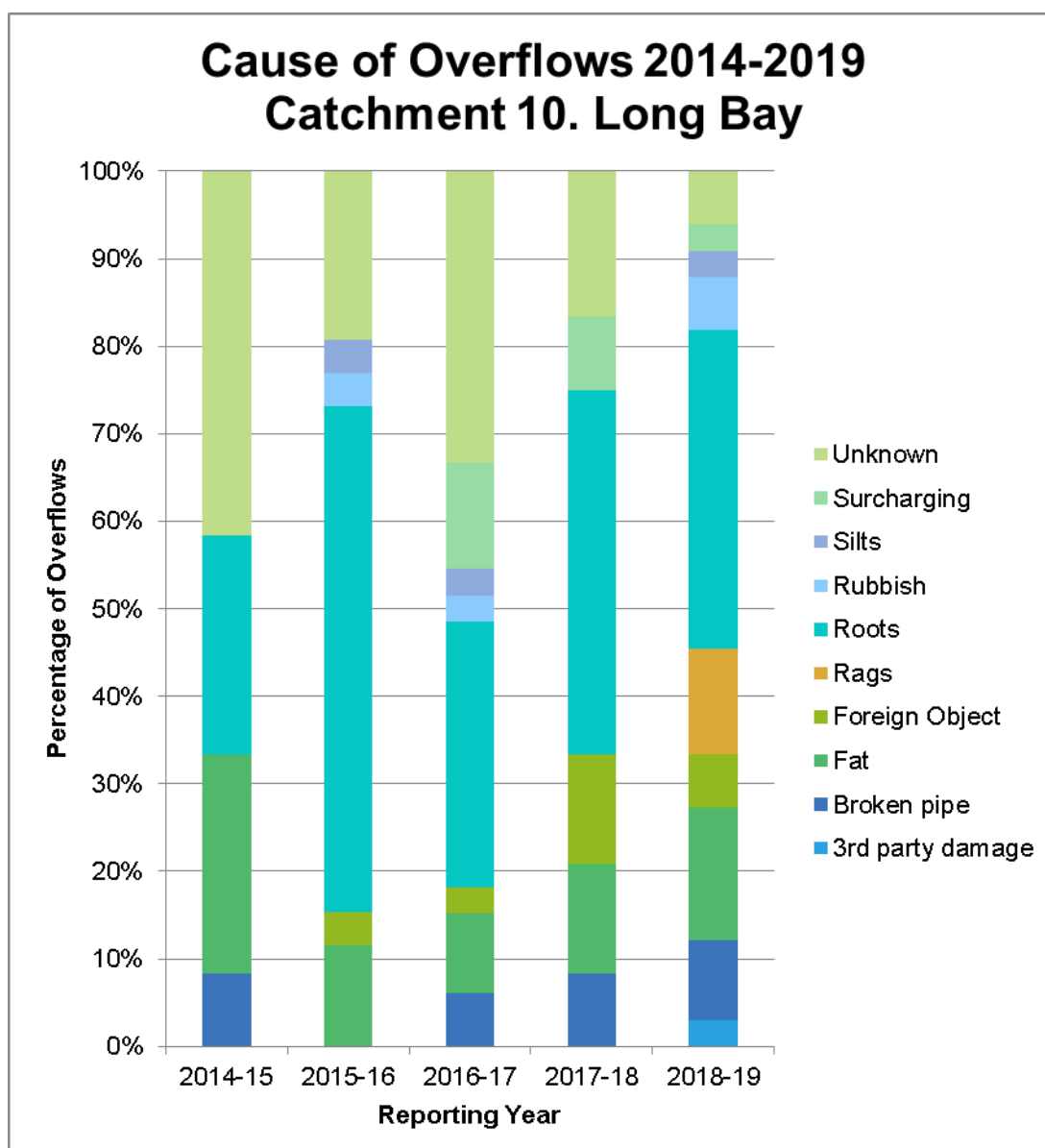
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
10/07/2018	10 Watea Rd	L1	244	Rags	10	Rootcut
14/07/2018	10 Watea Rd	L1	209	Roots	0	
21/10/2018	2/41 Glenvar Rd	L1	214	Rags	0	Heavy fat blockage flushed
12/02/2019	2/41 Glenvar Rd	L3	296	Fat	0	
19/02/2019	2/48 Toroa St	L1	275	Silts	0	Gravel in main, CCTV, Heavy debris and rocks removed
26/02/2019	2/48 Toroa St	L1	103	Foreign Object	0	
18/03/2019	2/48 Toroa St	L1	184	Rubbish	0.5	
18/05/2019	97 Stredwick Dr	L1	252	Roots	1	Rootcut
25/05/2019	97 Stredwick Dr	L1	95	Roots	0	
12/04/2019	1 Deborah Pl	L1	213	Roots	6.5	Rootcut
4/06/2019	1 Deborah Pl	L1	207	Roots	0	

2.12.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.12.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPOKR	Okura River Rd Pump Station	1578	Rain event	240	3

2.12.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1228	Deborah WWPS	0	0	0	0	0	0	0	Continue to monitor
1235	Okura WWPS	0	0	0	0	0	0	0	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1404	Long Bay WWPS	0	0	0	0	0	0	0	Continue to monitor
1578	Okura River Rd WWPS	-	0	0	1	1	1	0.6	Continue to monitor

2.12.6 Inflow & Infiltration Programme

A review of Inflow & Infiltration (I&I) in this catchment will be carried out as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

2.12.7 Improvement Works Programme

No significant improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.12.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2018 and 30 June 2019.

2.12.9 Summary

There have been no EOPs which have discharged more frequently than two spills per year. Trend analysis shows root blockages remain the predominant cause of uncontrolled overflows while surcharging events have decreased. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

2.13 Catchment 11 – East Coast Bays

2.13.1 Overview

The East Coast Bays catchment is located on the North Shore of Auckland. The total land area is approximately 3,000 ha. Land use associated with the East Coast Bays and Lake Pupuke receiving environments, with the exception of Taiaotea Creek, is predominantly residential, with some associated business and recreational land uses. Taiaotea Creek contains the commercial areas of Browns Bay that comprise a significant proportion of the lower catchment, with the rest being residential. The Wairau Creek receiving environment also contains residential land use but has a significant proportion of commercial land use to the west of the Northern Motorway. There are currently 29,766 wastewater connections.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	29,400	29,481	29,551	29,658	29,766
Length of sewer (km)	489	489	489	597	561

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
834	28 Penning Road	-	2	Unnamed tributary of Wairau Creek
835	3 Sidmouth Road	-	2	Mairangi Bay Stream
853	Alma WWPS	DPALM	1	Wairau Stream
854	Sidmouth WWPS (overflow point north)	DPSI1	1	Mairangi Bay
855	Sidmouth WWPS (overflow point south)	DPSI1	1	Mairangi Bay
869	Browns Bay WWPS	DPBRB	1	To land
871	Castor Bay WWPS	DPCBY	1	Castor Bay Stream
909	Killarney WWPS	DPKIL	1	Lake Pupuke
910	Lake View WWPS	DPLAK	1	Lake Pupuke
911	Promenade WWPS	DPPRO	1	Lake Pupuke via stormwater pipe
912	Shea Hospital WWPS	DPSHE	1	Lake Pupuke
913	Hurstmere 3 WWPS	DPHM3	1	Lake Pupuke
914	Hurstmere 2 WWPS	DPHM2	1	Lake Pupuke
915	Hurstmere 1 WWPS	DPHM1	1	Lake Pupuke
916	Eric Place WWPS	DPERI	1	Lake Pupuke
918	Omana WWPS	DPONA	1	Wairau Creek
938	Gray WWPS	DPGYS	1	Winstones Cove
947	Black Rock WWPS	DPBLA	1	Thorne Bay
951	Silverfield Storage Tank	SSSIL, DPWAU	1	Wairau Stream

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1227	Craig Road WWPS	DPCRA	1	Wairau Creek
1229	Beach 2 (Torbay) WWPS	DPBE2	1	Deep Creek
1236	Beach 1 WWPS	DPBE2	1	Beach at Kennedy Park
1237	Churchill Road WWPS	DPCHU	1	Churchill Coast
1238	Portal Place WWPS	DPPTL	1	Churchill Coast
1239	Rock Isle Rd 2 WWPS	DPRO2	1	Waiake Beach
1240	Cliff Road WWPS	DPCLI	1	Toroa Point via open stormwater channel
1576	16 Jutland St	-	2	Unnamed Stream off Jutland Street

The following EOP has been identified as operational and added to the schedule.

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
1595	11 Jonathan Pl	-	2	Wairau Stream	1595
1606	83 Sunnynook Road	-	2	Unnamed tributary of Wairau Stream	EOP discovered on site visit

2.13.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 331 reported incidents in the East Coast Bays catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
7/01/2017	1/16 Tonkin Dr	L1	590	Fat	0	Heavy cleaned of extensive fats Very fatty line flushed with warthog
8/07/2017	16 Tonkin Dr	L1	406	Fat	6.5	
8/09/2017	2/16 Tonkin Dr	L1	210	Unknown	2.45	
6/07/2018	1/16 Tonkin Dr	L1	102	Unknown	0	
27/02/2019	1/16 Tonkin Dr	L1	188	Fat	0	
15051851	1/20-28 Tonkin Dr	L1	1155	Fat	0	Takeaway restaurant tipping oil down GT, flushed main
15054960	1/20-28 Tonkin Dr	L1	237	Fat	0	
24/12/2017	2/13 Jonathan Pl	L1	232	Unknown	0	Collapsed connection replaced. EOP at 11 Jonathan Place
28/01/2018	2/13 Jonathan Pl	L3	145	Rags	0.4	
30/01/2018	2/13 Jonathan Pl	L2	224	Rags	0	
10/02/2018	2/13 Jonathan Pl	L1	411	Unknown	21.8	
13/02/2018	2/13 Jonathan Pl	L1	146	Broken pipe	37	
16/07/2018	2/13 Jonathan Pl	L1	191	Surcharging	32	
16/07/2017	19A Waterloo Rd	L2	494	Roots	0	Flushed main, Heavy fats and roots flushed
5/10/2017	19A Waterloo Rd	L1	-	Fat	0	
15/06/2019	19 Waterloo Rd	L1	340	Fat	3.5	
11/03/2017	6 Linwood Ave	L1	81	Roots	35.33	Added to 6 Monthly Flushing Schedule
23/01/2018	6 Linwood Ave	L1	119	Surcharging	0	
18/07/2018	6 Linwood Ave	L1	109	Surcharging	0.5	
15/04/2018	3/43 Anzac Rd	L1	580	Fat	34.5	Four lines heavy cleaned and CCTV'd, flushed Main and Service Lateral and Pipe lining tape removed
29/06/2018	3/43 Anzac Rd	L2	479	Fat	1.5	
14/08/2018	5/43 Anzac Rd	L1	134	Fat	16	
15/08/2018	5/43 Anzac Rd	L1	123	Foreign Object	9.5	
28/06/2019	4/43 Anzac Rd	L1	118	Fat	0	
6/04/2017	10 Regency Pl	L1	75	Surcharging	0.5	Continue to monitor
23/01/2018	10 Regency Pl	L1	88	Surcharging	27	
27/12/2018	10 Regency Pl	L1	202	Surcharging	0	
4/01/2017	10A Phillipa Pl	L1	488	Unknown	1	Broken pipe repaired, fatberg removed from main
15/01/2017	10A Phillipa Pl	L1	558	Unknown	1.5	
21/01/2017	10A Phillipa Pl	L1	423	Unknown	15	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
23/09/2017	10A Phillipa Pl	L1	464	Fat	0	
1/03/2019	10A Phillipa Pl	L1	376	Unknown	0	
9/03/2019	10A Phillipa Pl	L1	443	Rags	2.5	
11/03/2019	10A Phillipa Pl	L1	312	Roots	0	
6/04/2019	10A Phillipa Pl	L1	272	Fat	6.5	
5/01/2017	31 Kitchener Rd	L1	165	Unknown	0	Continue to monitor Flushed main
5/08/2017	31 Kitchener Rd	L1	383	Roots	0	
9/03/2019	31 Kitchener Rd	L1	155	Roots	2.5	
3/11/2016	18A Beulah Ave	L1	445	Rubbish	0	Concrete removed from line, Flushed main
7/10/2017	18A Beulah Ave	L1	422	Foreign Object	7.5	
26/08/2018	20 Beulah Ave	L1	297	Broken pipe	2.5	
9/03/2019	18 Beulah Ave	L1	100	Unknown	2.5	
17/03/2017	40 Wolsley Ave	L1	441	Silts	0	Heavy rootcut, Flushed mains, heavy fats
31/12/2017	40 Wolsley Ave	L1	65	Unknown	0	
3/07/2018	1/30 Wolsley Ave	L2	250	Fat	1	
3/07/2018	3/28 Wolsley Ave	L2	122	Fat	1	
3/05/2019	1/28 Wolsley Ave	L1	297	Unknown	0	
4/06/2019	1/28 Wolsley Ave	L2	253	Fat	0	
4/10/2018	60 Aberdeen Rd	L3	144	Unknown	0	Heavy flushed main
4/10/2018	60 Aberdeen Rd	L3	144	Unknown	0	
23/01/2018	81 Selwyn Cres	L1	86	Surcharging	14.2	Flushing program underway in addition to Alma WWPS Diversion Project
12/02/2018	81 Selwyn Cres	L1	229	Surcharging	0.2	
14/04/2018	81 Selwyn Cres	L1	90	Surcharging	35	
20/05/2018	81 Selwyn Cres	L1	99	Surcharging	12.8	
15/07/2018	81 Selwyn Cres	L1	273	Surcharging	3	
18/07/2018	81 Selwyn Cres	L1	118	Surcharging	0.5	
29/08/2018	81 Selwyn Cres	L1	369	Surcharging	1	
3/12/2018	81 Selwyn Cres	L1	135	Surcharging	22.5	
28/12/2018	81 Selwyn Cres	L1	235	Unknown	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
1/02/2018	85 Marlborough Ave	L1	448	Foreign Object	50.2	Repaired dropper, Flushed main
6/02/2018	85 Marlborough Ave	L1	181	Power failure	0.2	
9/02/2018	85 Marlborough Ave	L1	108	Broken pipe	18.2	
22/03/2019	85 Marlborough Ave	L1	114	Unknown	0.5	
16/06/2018	39 Wolsley Ave	L1	448	Foreign Object	1	Pipe lining tape blockage removed
20/06/2018	39 Wolsley Ave	L1	475	Foreign Object	94	
10/07/2018	39 Wolsley Ave	L1	120	Foreign Object	10	
16/12/2017	9 Mistletoe Pl	L2	457	Roots	0	Heavy flushed line
24/01/2018	9 Mistletoe Pl	L1	470	Fat	0	
7/05/2019	9 Mistletoe Pl	L1	359	Fat	3	
30/12/2018	1/112 Nile Rd	L1	123	Unknown	0	Flushed main
4/03/2019	1/112 Nile Rd	L2	285	Roots	0	
6/08/2018	1/236 Beach Rd	L1	67	Surcharging	0.5	Continue to monitor
29/08/2018	1/236 Beach Rd	L1	278	Surcharging	1	
16/05/2019	1/27 Ramillies Pl	L1	238	Roots	3.5	Root cut
4/06/2019	1/27 Ramillies Pl	L1	245	Roots	0	
31/01/2019	1/4 Archers Rd	L1	624	3rd party damage	0	Pump bypass for concrete filled pipe, Roots removed from lateral
4/03/2019	1/4 Archers Rd	L1	279	Roots	0	
8/08/2018	1/52 Glencoe Rd	L2	116	Rags	0	Flushed main, CCTV
27/02/2019	1/52 Glencoe Rd	L3	316	Fat	0	
29/03/2019	102A Target Rd	L1	77	Unknown	1.5	Flushed main, Rootcut
7/06/2019	102A Target Rd	L1	195	Roots	15.5	
13/08/2018	11 Jonathan Pl	L3	114	Unknown	0	Flushed main and vacuumed line
27/11/2018	11 Jonathan Pl	L2	236	Unknown	4.5	
7/02/2019	11 Jonathan Pl	L2	262	Fat	0	
24/10/2018	111 Clyde Rd	L1	160	Unknown	0	Flushed S/L

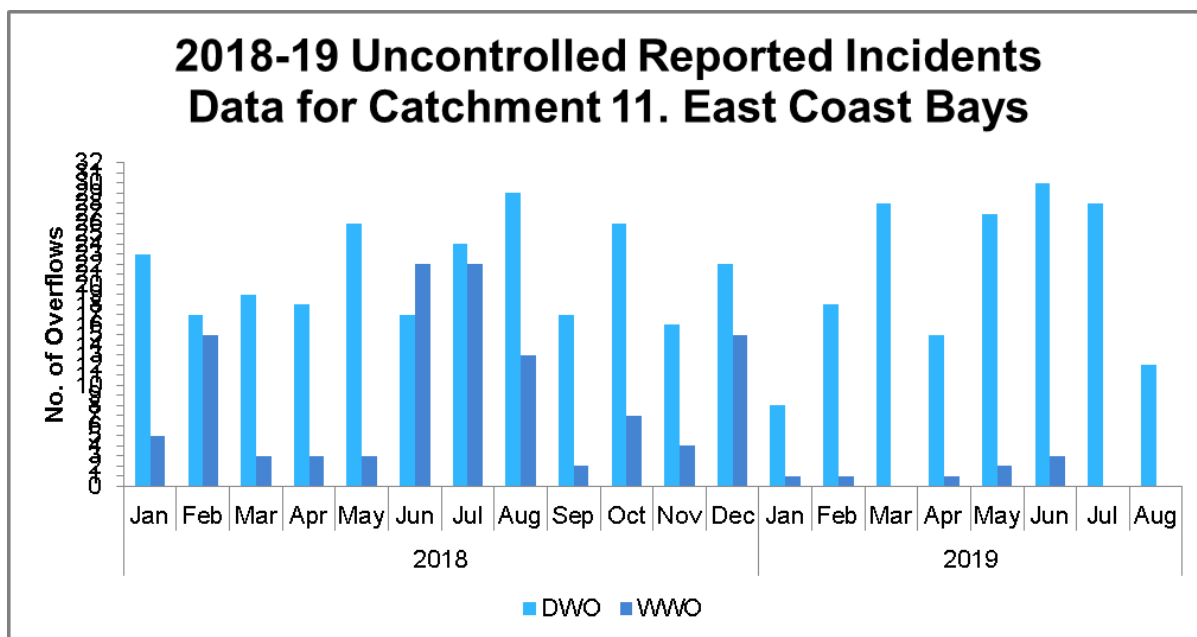
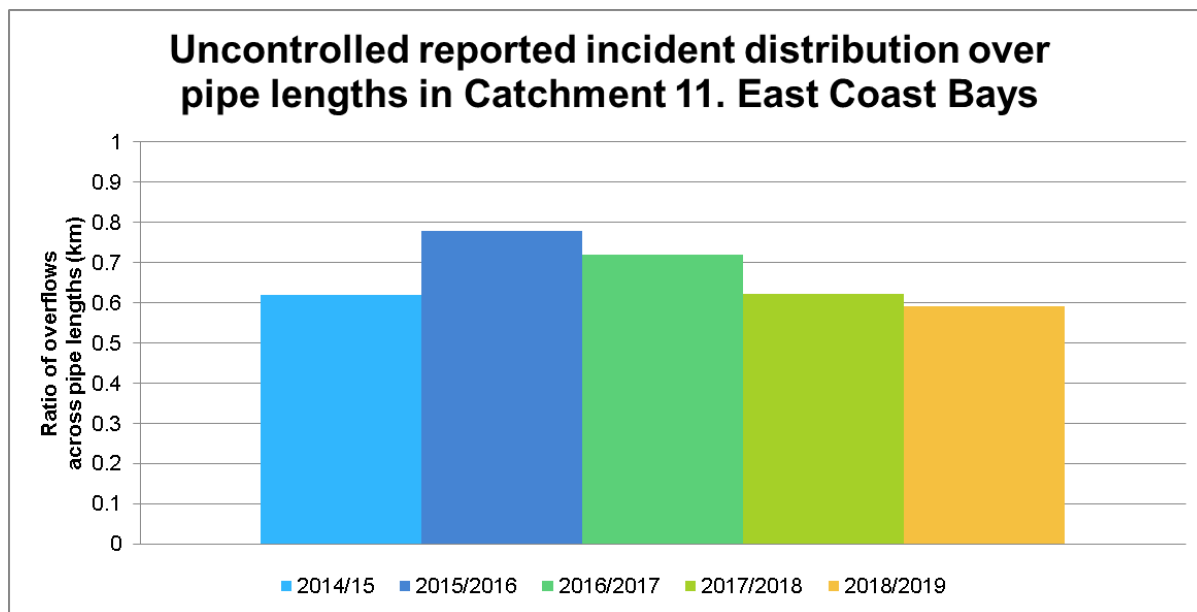
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
6/06/2019	111 Clyde Rd	L1	599	Unknown	4	
21/06/2019	128 Arran Rd	L1	277	Unknown	5	CCTV, rootcut, Concrete in chamber, repaired
27/06/2019	128 Arran Rd	L1	255	Roots	0	
17/09/2018	14 Ashfield Rd	L1	63	Broken pipe	0	Repaired crack in pipe
1/02/2019	14 Ashfield Rd	L1	135	Broken pipe	0	
13/08/2018	15 Bournemouth Tce	L2	693	Fat	0	Flushed main
7/09/2018	15 Bournemouth Tce	L1	271	Roots	10	
17/07/2018	15 The Esplanade	L1	105	Surcharging	3	Continue to monitor
23/12/2018	15 The Esplanade	L1	127	Surcharging	12	
25/12/2018	15 The Esplanade	L1	1185	Surcharging	14	
16/07/2018	16 Hythe Tce	L1	271	Unknown	32	Concrete and rocks removed
19/07/2018	16 Hythe Tce	L1	124	Foreign Object	0	
14/07/2018	167A Beach Rd	L2	218	Unknown	0	Flushed main
21/03/2019	167A Beach Rd	L1	279	Unknown	0	
31/07/2018	18 Inga Rd	L1	179	Fat	0.5	Inspection cap had fallen off, debris entered main
24/09/2018	18 Inga Rd	L1	900	Foreign Object	0	
11/02/2019	2/10 Newstead Ave	L1	155	Roots	0	Rootcut
18/02/2019	2/10 Newstead Ave	L1	381	Roots	0	
15/07/2018	2/11 Woodlands Cres	L1	1062	Surcharging	3	Wet wipes removed from main, Rock removed from channel, Concrete in mains removed
27/07/2018	2/11 Woodlands Cres	L1	156	Rags	0	
6/03/2019	2/11 Woodlands Cres	L1	173	Rags	0	
15/05/2019	2/11 Woodlands Cres	L1	245	Foreign Object	4	
15/06/2019	2/11 Woodlands Cres	L1	258	3rd party damage	3.5	
14/09/2018	2/123 Athena Dr	L1	133	Broken Pipe	0	Repaired faulty sealing
17/09/2018	2/123 Athena Dr	L1	673	Broken pipe	0	
19/07/2018	2/29 Orchard Rd	L1	154	Unknown	0	Dips in line, flushed
19/10/2018	2/29 Orchard Rd	L1	79	Unknown	0	

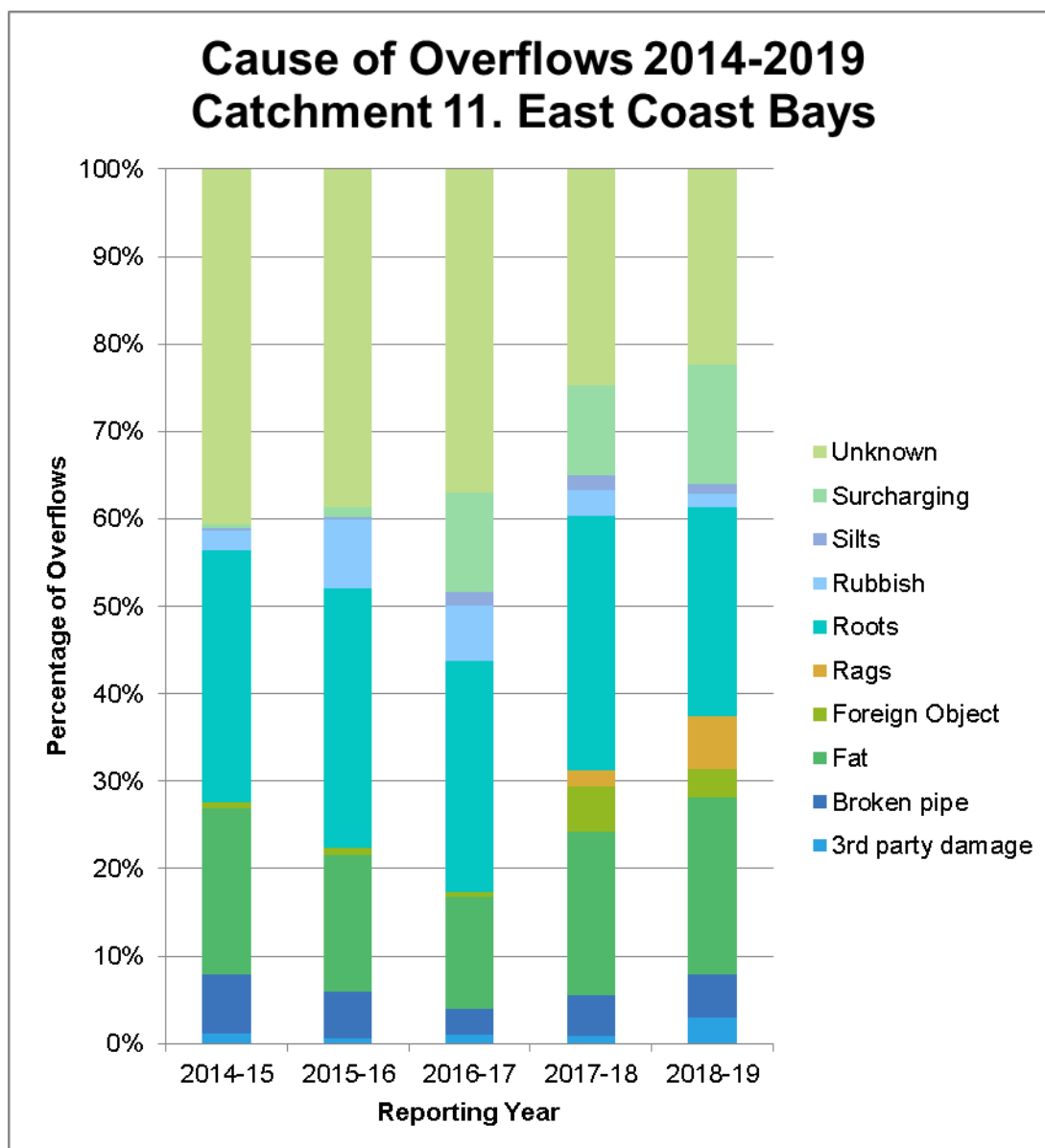
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
30/08/2018	2/44 Nile Rd	L1	64	Surcharging	29.5	Continue to Monitor
26/11/2018	2/44 Nile Rd	L1	220	Surcharging	1.5	
29/08/2018	2/49 Bentley Ave	L2	118	Surcharging	1	Flushed main
31/08/2018	2/49 Bentley Ave	L1	93	Unknown	0	
18/07/2018	2/5 Woodstock Rd	L1	198	Surcharging	0.5	Continue to Monitor
29/08/2018	2/5 Woodstock Rd	L1	373	Surcharging	1	
29/08/2018	2/7 Phillip Pde	L1	203	Surcharging	1	Continue to Monitor
23/12/2018	2/7 Phillip Pde	L1	247	Surcharging	12	
15/07/2018	208 Beach Rd	L2	294	Surcharging	3	Flushed main, wet wipes removed
2/08/2018	208 Beach Rd	L1	83	Rags	0	
15/07/2018	212 Beach Rd	L1	191	Surcharging	3	Continue to Monitor
30/08/2018	212 Beach Rd	L1	32	Surcharging	29.5	
6/08/2018	234 Hurstmere Rd	L1	95	Rags	0.5	Pipe on list to be relined
18/02/2019	234 Hurstmere Rd	L1	120	Broken pipe	0	
2/07/2018	30 Downing St	L1	129	Foreign Object	0.5	Rock removed, Broken dropper repaired
18/07/2018	30 Downing St	L1	169	Broken pipe	0.5	
8/10/2018	30 Greenvally Rise	L1	104	Roots	0	Rootcut, Flushed main
13/10/2018	30 Greenvally Rise	L1	860	Roots	4.5	
22/08/2018	32 Crestview Pl	L1	138	Fat	6.5	Flushed S/L
15/04/2019	32 Crestview Pl	L1	119	Fat	0	
10/09/2018	32 Nigel Rd	L1	113	Roots	0	Rootcut
17/09/2018	32 Nigel Rd	L1	102	Roots	0	
16/07/2018	34 Cranston St	L1	222	Surcharging	32	Continue to Monitor
26/12/2018	34 Cranston St	L1	366	Surcharging	1	
15/07/2018	41 Bond Cres	L1	417	Surcharging	3	Continue to Monitor
27/12/2018	41 Bond Cres	L1	98	Surcharging	0	
27/04/2019	45 Anzac Rd	L1	282	Unknown	0	Flushed main, raised manhole
17/05/2019	45 Anzac Rd	L1	486	Unknown	3.5	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
13/02/2019	46-48 Hillside Rd	L2	241	Roots	0	Roots removed from manhole, Flushed S/L
21/02/2019	46-48 Hillside Rd	L1	218	Unknown	0	
14/08/2018	5/43 Anzac Rd	L1	134	Fat	16	Flushed main, Pipe lining tape removed
15/08/2018	5/43 Anzac Rd	L1	123	Foreign Object	9.5	
7/07/2018	690A Beach Rd	L1	291	Unknown	0	Flushed main
6/10/2018	690A Beach Rd	L1	225	Fat	0	
10/11/2018	88 Sycamore Dr	L1	150	Roots	2	Rootcut
27/02/2019	88 Sycamore Dr	L1	136	Roots	0	
8/11/2018	95 Bruce Rd	L1	70	Unknown	0	Flushed main Removed roots
13/02/2019	95 Bruce Rd	L1	157	Roots	0	

2.13.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.13.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPCBY	Castor Bay Wastewater Pump Station	871	Rain event	895	54.5
15/07/2018	DPBLA	Black Rock Wastewater Pump Station	947	Rain event	166	54.5
15/07/2018	DPSI1	Sidmouth Wastewater Pump Station (Northern Overflow)	854	Rain event	354	54.5
29/08/2018	DPBLA	Black Rock Wastewater Pump Station	947	Rain event	321	45
29/08/2018	DPCBY	Castor Bay Wastewater Pump Station	871	Rain event	116	45
29/08/2018	DPSI1	Sidmouth Wastewater Pump Station (Northern Overflow)	854	Rain event	104	45
23/12/2018	DPCBY	Castor Bay Wastewater Pump Station	871	Rain event	106	41
24/12/2018	DPBLA	Black Rock Wastewater Pump Station	947	Rain event	1489	67
24/12/2018	DPCBY	Castor Bay Wastewater Pump Station	871	Rain event	185	67
24/12/2018	DPALM	Alma Wastewater Pump Station	853	Rain event	88	67
24/12/2018	DPSI1	Sidmouth Wastewater Pump Station (Northern Overflow)	854	Rain event	452	67
24/12/2018	DPCHU	Churchill Wastewater Pump Station	1237	Rain event	43	67

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. The cause is taken from validated site data.

Type 2 EOPs – Network Relief Points

The Type 2 EOP 1576 has a permanent monitor installed. This information is provided as it is available, although it is noted for reference that very few Type 2 locations have monitors installed and this needs to be interpreted with reference to the Wastewater Network Strategy and the overall network performance.

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
14/07/2018	-	16 Jutland St	1576	Rain event	176	3.5
28/08/2018	-	16 Jutland St	1576	Rain event	143	2
23/12/2018	-	16 Jutland St	1576	Rain event	46	41
24/12/2018	-	16 Jutland St	1576	Rain event	157	62.5

2.13.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
853	Alma WWPS	1.8	2	3	7	1	1	2.8	Planned Alma Bay diversion (formerly Forrest Hill upgrade).
854	Sidmouth WWPS (overflow point north)	3.2	5	0	10	2	3	4	Sidmouth WWPS Upgrade and Mairangi Bay Rising Main
855	Sidmouth WWPS (overflow point south)	6.5							
871	Castor Bay WWPS	1.5	5	1	9	4	4	4.6	Castor Bay I&I
909	Killarney WWPS	0	0	0	0	0	0	0	Continue to monitor
910	Lake View WWPS	0	0	0	0	0	0	0	Continue to monitor
911	Promenade WWPS	0	0	0	0	0	0	0	Continue to monitor
912	Shea Hospital WWPS	0.2	0	0	0	0	0	0	Continue to monitor
913	Hurstmere 3 WWPS	0	0	0	0	0	0	0	Continue to monitor
914	Hurstmere 2 WWPS	0	0	0	0	0	0	0	Continue to monitor
915	Hurstmere 1 WWPS	0	0	0	0	0	0	0	Continue to monitor
916	Eric Place WWPS	0	0	0	0	0	0	0	Continue to monitor
918	Omana WWPS	0	0	0	0	0	0	0	Continue to monitor
938	Gray WWPS	0	0	0	0	0	0	0	Continue to monitor
947	Black Rock WWPS	1.8	3	0	5	4	3	2.4	Planned Alma Bay diversion (formerly Forrest Hill upgrade)
951	Silverfield Storage Tank	1.3	2	0	1	0	0	0.6	Continue to monitor
1227	Craig Road WWPS	0.2	0	0	0	0	0	0	Continue to monitor
1229	Beach 2 (Torbay) WWPS	0	0	0	0	0	0	0	Continue to monitor
1236	Beach 1 WWPS	0	0	0	0	0	0	0	Continue to monitor
1237	Churchill Road WWPS	0	0	0	2	0	1	0.6	Continue to monitor
1238	Portal Place	0	0	0	0	0	0	0	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
	WWPS								
1239	Rock Isle Rd 2 WWPS	0	0	0	0	0	0	0	Continue to monitor
1240	Cliff Road WWPS	0	0	0	0	0	0	0	Continue to monitor
869	Browns Bay Pump Station	-	0	0	0	2	0	0.4	Continue to monitor

Type 3 – uncontrolled overflow rolling WWO data from 1 July 2014 – 30 June 2019

The following locations are reported as Type 3 overflow locations.

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/28 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
S17	81 Selwyn Crescent	3.6	-	-	-	4	5	1	Planned Alma Bay diversion (formerly Forrest Hill upgrade).
S18	129A Nile Road	8	-	-	-	-	-	-	Planned Alma Bay diversion (formerly Forrest Hill upgrade).
S19	11 Montrose Terrace	6.2	-	-	4	-	-	1	Sidmouth WWPS Upgrade and Mairangi Bay Rising Main

2.13.6 Inflow & Infiltration Programme

A joint Inflow & Infiltration (I&I) and Auckland Council's Healthy Waters Safe Networks field investigation is reaching completion in Castor Bay catchment. This investigation includes CCTV of the wastewater and stormwater networks, smoke testing and private property drainage inspections. Once the investigation is completed, the public and private issues will be actioned by the relevant teams to be remediated.

2.13.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Alma WWPS Catchment Diversion (Formerly Forrest Hill Wastewater Catchment Diversion)	Options analysis (Feasibility)	Provide 1,100m of 310mm rising main, 60l/s pump station, 350m of 250/335mm rising main and 600m of 300/375/525mm gravity sewer	Improvement of the network, will address wet weather overflows at Alma St WWPS, and known Type 3 overflows within Forrest Hill catchment and cater for growth within Milford and Takapuna	2022-2024
Underway	Castor Bay I&I	I&I Investigations	Pump station performance issues and multiple uncontrolled wet weather overflows	Reduces overflow volume/ frequency and allows for growth	2017-2021
Planned	Wairau Valley wastewater network	Studies and investigations	To resolve suspected Type 3 overflow(s). A detailed model is available for developing solutions	Reduce the frequency of suspected Type 3 overflows	2017-2019
Underway	Wairau pump station rising main upgrades	Project execution	Rising main failed and requires replacement. Will be upsized to increase capacity	Reduces risk of uncontrolled discharges due to asset failure	2017-2018
Underway	Wairau pump station (DPWAU) upgrades	Design	Reduce overflow frequency and risk to public health and environment, reduce risk of asset failure	Reduces overflow volume/ frequency for OF 951 and allows for growth and future improvements in multiple catchment	2022-2024
Underway	Sidmouth WWPS upgrade	Project Execution	Wet weather overflows in existing and future scenarios, and assets in poor condition	Reduces overflow volume/ frequency for OF 854, OF855 and uncontrolled overflows and allows for growth	2012-2022
Underway	East Coast Bays branch sewer upgrade	Project Execution	Wet weather overflows in existing and future scenarios, and assets in poor condition	Reduces overflow volume/ frequency and allows for growth	2015-2021

2.13.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.13.9 Summary

There are four EOPs which currently discharge more than two times per year on average, all of which have identified upgrades to resolve them. The density of overflows in this catchment has decreased in this reporting period, and the main cause was attributed to roots and fats. In the long term, the network performance in this catchment will be improved with the 'Wairau Pump station rising main upgrades', Wairau Pump station (DPWAU) upgrades', 'Sidmouth WWPS Upgrade' and 'East Coast Bays Branch Sewer Upgrade' projects among others, which provide additional capacity in the wastewater network. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.14 Catchment 12 – Devonport-Takapuna

2.14.1 Overview

The Devonport-Takapuna catchment is located on the North Shore of Auckland and comprises the eastern and southern coastal strips of the peninsula. The total land area within the catchment is approximately 280 ha. There are currently 2,534 wastewater connections. Within the catchment, there are no notable surface watercourses, and all discharges are to the marine environment. Land use within the catchment is predominately residential, with commercial areas in Takapuna, Hauraki Corner and Devonport. There are some notable larger land use activities within the area including the Devonport Naval Base and Narrow Neck Naval Facility.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	2,506	2,518	2,522	2,528	2,534
Length of sewer (km)	38	38	38	48	45

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
848	1 Old Lake Road	-	2	Narrow Neck Beach
859	Stanley Point 2 WWPS	DPSEW	1	To land
860	Northboro WWPS	DPNRO	1	St Leonards Beach
879	King Edward Parade WWPS	DPKED	1	Devonport Beach
886	Seacliffe WWPS	DPSFE	1	Seacliffe Coast
949	King Edward Parade Storage Tank	DSKED	1	North Head Reserve
1226	Arawa WWPS	DPAAW	1	Cheltenham Beach

There have been no changes to the schedule of EOPs in this catchment.

2.14.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Overflows

There were a total of 26 reported incidents in the Devonport-Takapuna catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

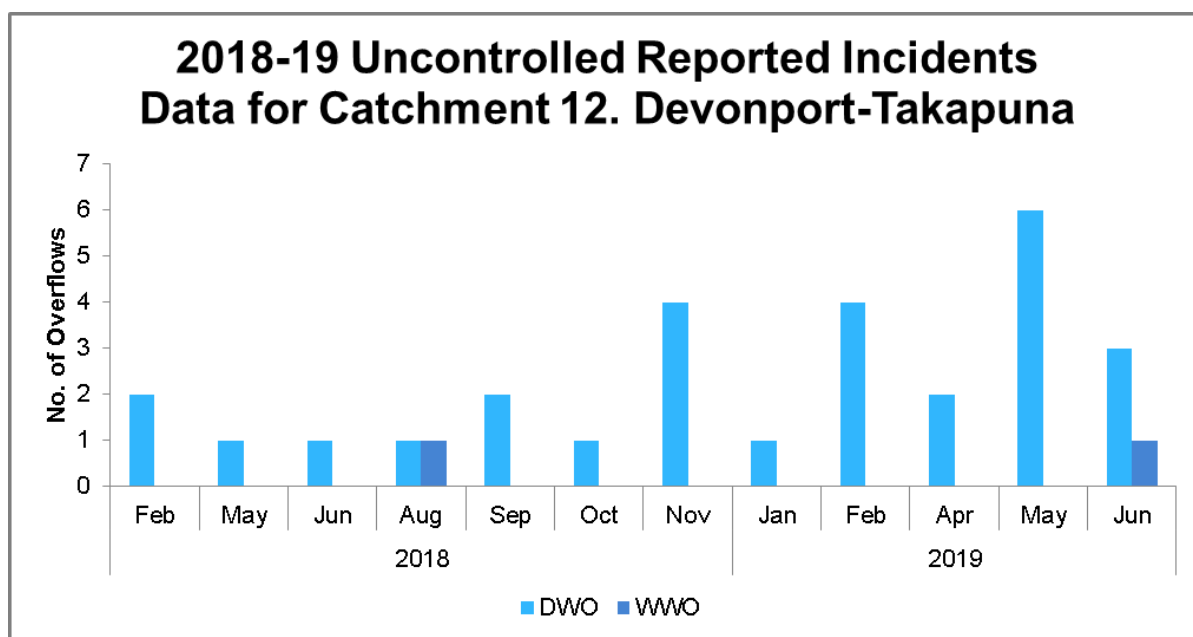
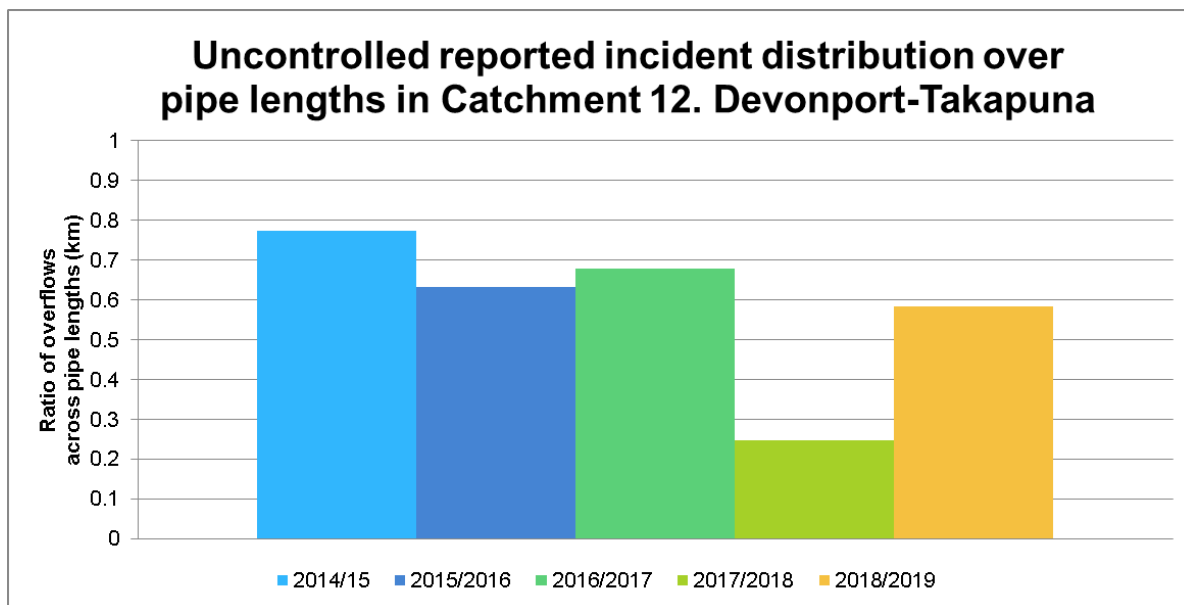
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

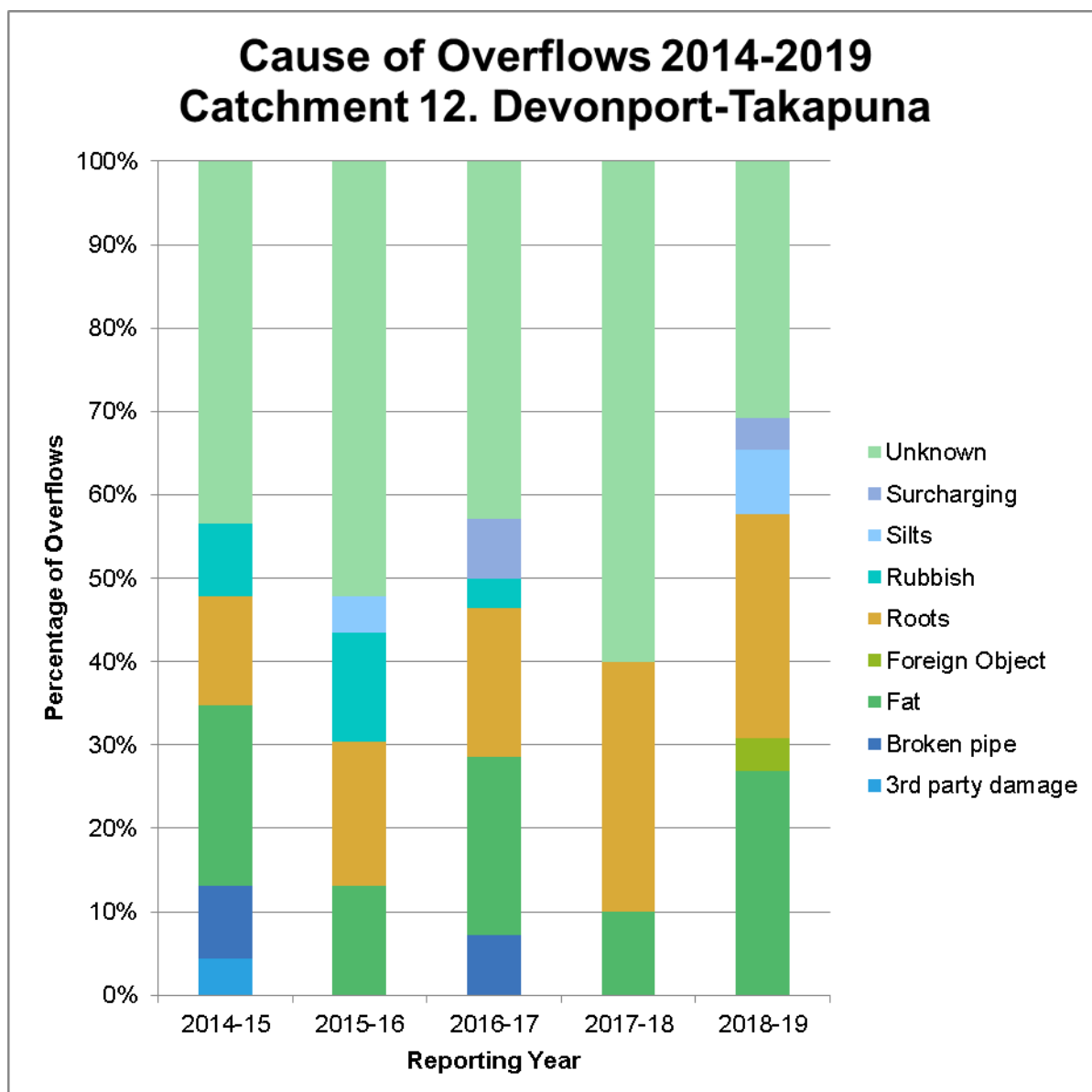
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
27/02/2018	10 Rarere Rd	L1	139	Roots	0	Rootcut, Rock removed from line
22/05/2018	9 Rarere Rd	L1	630	Roots	9.57	
13/11/2018	9 Rarere Rd	L1	383	Roots	0	
19/02/2019	10 Rarere Rd	L1	158	Foreign Object	0	
10/09/2018	1/20 Macky Ave	L1	172	Unknown	0	Rootcut
23/11/2018	1/20 Macky Ave	L1	134	Roots	0	
26/04/2019	2 Victoria Rd	L1	17	Fat	0	Flushed main
29/04/2019	2 Victoria Rd	L1	621	Fat	5.5	Heavy fat, heavy flushed, rodded roots
3/08/2018	32 Oxford Tce	L1	143	Surcharging	0.5	Continue to Monitor
4/10/2018	32 Oxford Tce	L1	155	Roots	0	
9/02/2019	44B Clifton Rd	L1	504	Fat	0	Multiple flushes, Debris removed from channeling, heavy flush
2/05/2019	44B Clifton Rd	L1	182	Silts	0	
29/01/2019	50 Hauraki Rd	L1	251	Unknown	0	Unblocked line
9/02/2019	50 Hauraki Rd	L2	136	Unknown	0	

2.14.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.14.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPNRO	Northboro Tunnel Wastewater Overflow	860	Rain event	338	3
29/08/2018	DPNRO	Northboro Tunnel Wastewater Overflow	860	Rain event	244	1
24/12/2018	DPNRO	Northboro Tunnel Wastewater Overflow	860	Rain event	320	67
25/12/2018	DPNRO	Northboro Tunnel Wastewater Overflow	860	Rain event	228	14

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. The cause is taken from validated site data.

2.14.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
859	Stanley Point 2 WW WWPS	0	1	0	0	0	0	0.25	Continue to monitor
860	Northboro WWPS	5.1	6	1	12	4	4	5.4	Fred Thomas Drive WWPS and Storage Tank (mitigation); Northboro PS upgrade
879	King Edward Parade WWPS	0	3	0	1	0	0	0.8	Continue to monitor
886	Seacliffe WWPS	0	0	0	5	0	0	1	Continue to monitor
949	King Edward Parade Storage Tank	6.5	0	0	0	0	0	0	Continue to monitor
1226	Arawa WWPS	0	0	0	0	0	0	0	Continue to monitor

2.14.6 Inflow & Infiltration Programme

Inflow & Infiltration investigations and reduction works have historically been carried out in this catchment to improve the network performance.

Extensive CCTV and flushing has been undertaken in this area with Auckland Council's Healthy Waters Safe Networks team with only minor public drainage issues found and remedied in the wastewater network.

An option analysis study is currently underway and may identify further targeted field I&I recution investigations in other subcatchments.

2.14.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Complete	Fred Thomas Drive WWPS and storage tank	Closure	Project will address performance and reliability at EOP 852. This project will enable projects (Northboro WWPS upgrade and others) to commence	Will reduce overflow frequency at EOP852 and enable future growth and future projects in upstream catchment to address performance at EOP860	2017

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Wairau pump station rising main upgrades	Project execution	Rising main failed and requires replacement. Will be upsized to increase capacity	Reduces risk of uncontrolled discharges due to asset failure	2017-2018
Underway	Wairau pump station (DPWAU) upgrades	Design	Reduce overflow frequency and risk to public health and environment, reduce risk of asset failure	Reduces overflow volume/ frequency for OF 951 and allows for growth and future improvements in multiple catchment	2022-2024
Planned	Devonport / Takapuna local network upgrades	Option Analysis (Feasibility)	Reduce Type 3 overflows.	Reduces overflow volume/ frequency for OF 951 and allows for growth	
Planned	Northboro WWPS Upgrade	Studies and investigations	Study will identified preferred concept design to reduce overflows at DPNRO by increasing the capacity of the pump station	Reduces overflow volume and frequency for EOP 860 and allows for growth within the contributing catchment	2018 (study), project construction TBC
Underway	Wastewater Main Renewals and Lining Programme	Project Execution	Network wastewater pipe renewal at 38 sites	Upgraded network pipe condition	2015-2018

Minor improvements works include:

- Operational modifications at Northboro WWPS to divert additional catchment away from this pump station to the new Fred Thomas WWPS prior to Northboro WWPS upgrade.

2.14.8 Erosion Control Measures

No works related to erosion control were carried out in this SMA between 17 June 2018 and 30 June 2019.

2.14.9 Summary

The Northboro pump station has discharged more than twice this year. Trend analysis shows roots and fats as the primary causes of uncontrolled overflows. The ratio of overflows to pipe length has increased in this reporting period. In the long term, the network performance in this catchment will be improved with the 'Wairau Pump station rising main upgrades', 'Wairau Pump station (DPWAU) upgrades' and 'Fred Thomas Drive WWPS and Storage Tank' projects. The Devonport / Takapuna local network upgrades have identified local minor upgrades that will be further scoped and implemented depending upon regional prioritisation processes. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes.

This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

2.15 Catchment 13 – Shoal Bay

2.15.1 Overview

The Shoal Bay catchment is located on the North Shore of Auckland. The catchment comprises the areas from Chatswood in the west round to Stanley Bay in the east, and includes the suburbs of Birkenhead, Northcote, Takapuna and Belmont, among others. The area incorporates the coastal bays of Chelsea Bay, Little Shoal Bay, Shoal Bay and Ngataranga Bay around the Waitemata Harbour. Within these catchments are a number of freshwater watercourses including Duck Creek, Little Shoal Bay stream, Onepoto/ Waiurutoa Stream and Hillcrest Creek. The total land area is approximately 2,000 ha and there are currently 17,095 wastewater connections.

The catchment contains predominantly urban land use, with significant residential development. Commercial land uses occur in some centres between Northcote Central and Takapuna. Chelsea Sugar factory is a notable large industrial site within the catchment. There are large open space areas, including volcanic craters, recreational areas and schools. A significant roading network, including the northern motorway, traverses the catchment, including a major interchange area at Takapuna.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	16,900	16,929	16,972	17,022	17,095
Length of sewer (km)	277	277	277	338	315

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
829	28 Waitemata Road	-	2	Shoal Bay via stormwater pipe
830	Lake Northcote WWPS	DPLNO	1	Onepoto Stream
836	24 Patuone Place	-	2	Ngataranga Bay via stormwater pipe
837	10 Charles Street	-	2	Shoal Bay via stormwater pipe
838	39 Kiwi Road	-	2	Ngataranga Bay via stormwater pipe
839	51 Plymouth Cres	-	2	Ngataranga Bay
840	44 William Bond Street	-	2	Ngataranga Bay via stormwater pipe
841	14 Denby Lane	-	2	Shoal Bay via stormwater pipe
842	48 Richmond Ave	-	2	Shoal Bay via stormwater pipe
843	52 Richmond Ave	-	2	Shoal Bay via stormwater pipe
846	26 Waratah Street	-	2	Waiurutoa Stream
847	66 Stanley Point Road	-	2	Ngataranga Bay via stormwater pipe
849	Seabreeze WWPS	DPSEA	1	Ngataranga Stream
851	1 Kauri Glen Road	-	2	Waiurutoa Stream
852	Fred Thomas WWPS	DPFTD	1	Shoal Bay
857	Stanley Point 1 WWPS	DPSN1	1	To land

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
861	Sulphur Beach WWPS	DPSUL	1	Shoal Bay via stormwater pipe
863	Maunganui WWPS	DPMNI	1	Chelsea Bay
880	Ewen Alison WWPS	DPEWE	1	Ngataringa Bay via stormwater pipe
881	Lake Devonport WWPS	DPLDE	1	To land
883	Norwood WWPS	DPNOD	1	Ngataringa Bay
884	Kawerau WWPS	DPKAW	1	Ngataringa Bay
885	Regent WWPS	DPREG	1	Unnamed tributary of Ngataringa Bay
887	Hinemoa WWPS	DPHNM	1	Little Shoal Bay
888	Homewood WWPS	DPHOM	1	Duck Creek and Chelsea Ponds
889	Alfred WWPS	DPAFD	1	Shoal Bay via stormwater pipe
890	Sylvan WWPS	DPSYV	1	Onepoto Stream
898	Havenwood	DPHVN	1	Waiurutoa Stream
899	Arahia WWPS	DPARH	1	Tuff Crater
904	Jim Titchener WWPS	DPJIM	1	Ngataringa Bay via stormwater pipe
905	Bayswater WWPS	DPBYS	1	Shoal Bay
906	Barrys Point Local WWPS	DPBPO	1	Shoal Bay
907	Kitewao WWPS	DPKWO	1	Hillcrest Creek
908	Dominion WWPS	DPDMN	1	Hillcrest Creek via stormwater pipe
948	Exmouth WWPS	DPEXM	1	Tuff Crater via stormwater pipe

The following has been updated in the EOP Schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
852	Fred Thomas WWPS	DPFTD	1	Shoal Bay	Replacement Pump Station with new name

2.15.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Overflows

There were a total of 204 reported incidents in the Shoal Bay catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow.

It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

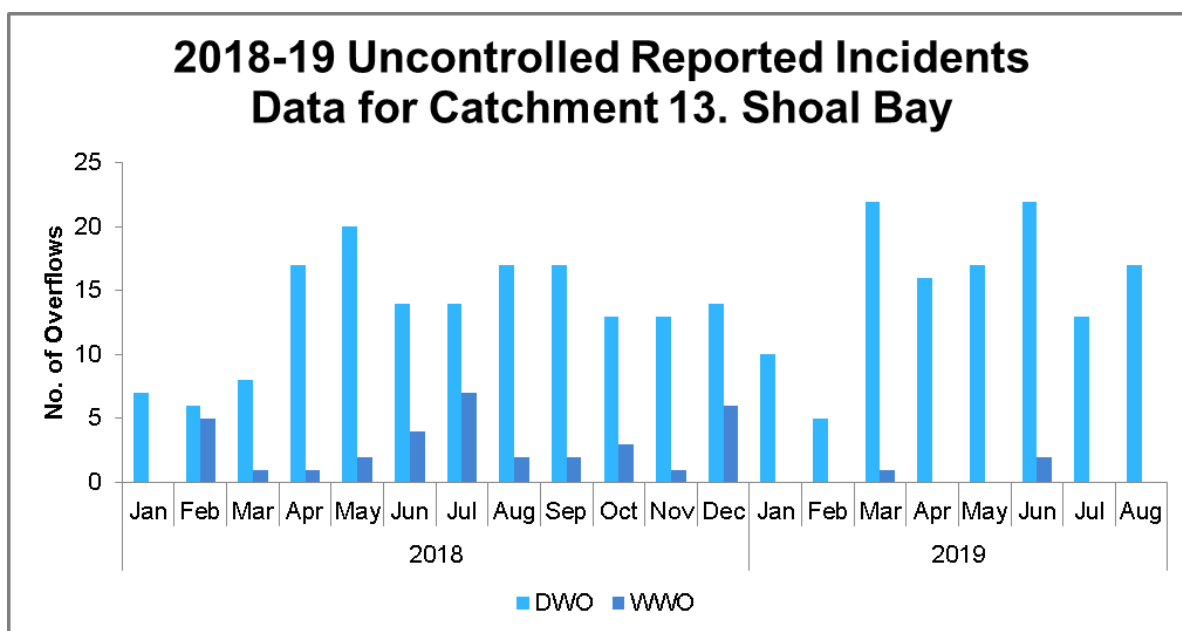
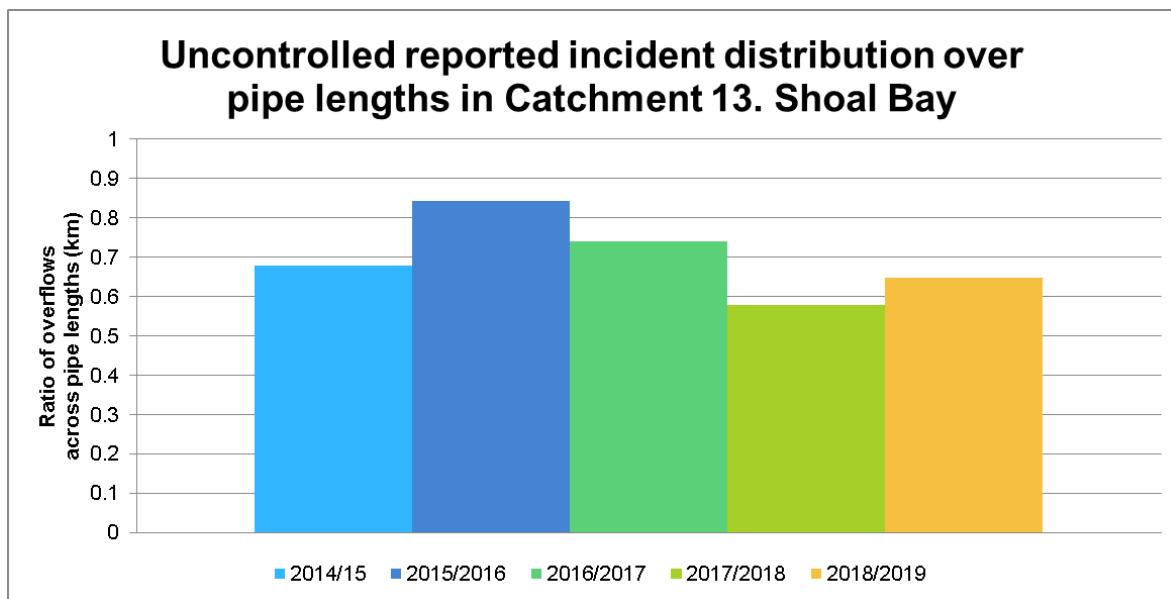
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
12/01/2018	100 Colonial Rd	L1	71	Broken pipe	0	Ongoing issue with landslip, Broken Valve repaired
30/01/2018	100 Colonial Rd	L1	203	Broken pipe	0	
14/12/2018	100 Colonial Rd	L2	1289	Broken pipe	2	
24/06/2017	48 Deuxberry Ave	L1	417	Fat	29	Broken pipe repaired, Unblocked main
21/12/2017	48 Deuxberry Ave	L1	191	Fat	0	
15/12/2018	48 Deuxberry Ave	L1	128	Unknown	0.5	
15/07/2018	28 Waitemata Rd	L1	351	Surcharging	3	Continue to monitor EOP, Rubbish cleared
21/02/2019	28 Waitemata Rd	L1	247	Rubbish	0	
21/02/2019	28 Waitemata Rd	L1	247	Rubbish	0	
4/05/2018	9 Tennyson St	L1	167	Fat	0	Debris and loose lining tape removed Heavy cleaned of fat and rags
12/06/2018	9 Tennyson St	L1	141	Rags	5.5	
29/07/2018	9 Tennyson St	L1	267	Rags	4.5	
15/08/2018	9 Tennyson St	L1	432	Fat	9.5	
12/09/2018	10 Tennyson St	L1	192	Foreign Object	2	
13/09/2017	52A Francis St	L1	169	Fat	0	Flushed main
26/12/2017	52A Francis St	L1	66	Unknown	6	
27/10/2018	52A Francis St	L1	199	Unknown	11	
19/09/2018	1 Kauri Glen Rd	L1	206	Roots	21.5	Roots removed from manhole
15/11/2018	1 Kauri Glen Rd	L1	76	Unknown	0	
18/08/2018	1 Preston Ave	L1	173	Roots	3	Rootcut
6/10/2018	1 Preston Ave	L1	108	Fat	0	
6/12/2018	1/232 Onewa Rd	L1	83	Unknown	3.5	Flushed main Rootcut, CCTV
17/06/2019	1/232 Onewa Rd	L1	202	Roots	3.5	

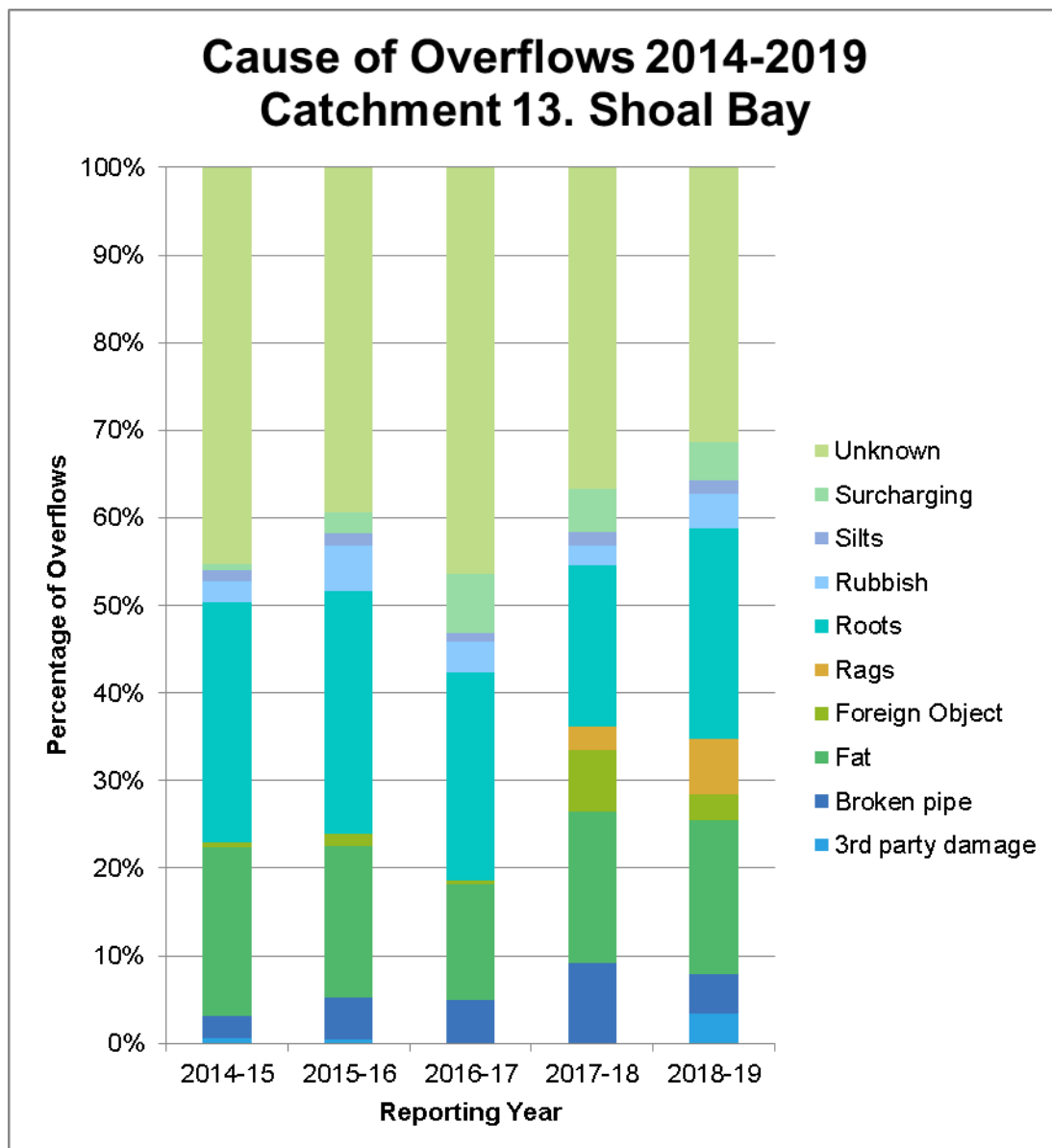
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
18/06/2019	1/232 Onewa Rd	L1	170	Unknown	0	
1/07/2018	10 Richmond Ave	L1	299	Fat	9	Flushed main
20/12/2018	10 Richmond Ave	L1	221	Fat	16	
16/07/2018	10 Trelawny Pl	L1	288	Roots	32	Roots removed from connection
23/12/2018	10 Trelawny Pl	L1	268	Roots	12	
21/07/2018	11 Calman Pl	L2	105	Fat	0.5	Flushed main
31/07/2018	11 Calman Pl	L1	108	Roots	0.5	
22/09/2018	13 Awanui St	L1	212	Roots	6.5	Fat blockage removed with rods, heavy flush
25/03/2019	13 Awanui St	L1	157	Fat	0	
30/04/2019	13 Felstead St	L1	207	Silts	0.5	Heavy sand and silt removed
16/05/2019	13 Felstead St	L1	72	Silts	3.5	
20/05/2019	13 Felstead St	L1	88	Unknown	0	
29/03/2019	145 Chelsea View Dr	L1	170	Unknown	1.5	Fat and large roots removed from main
31/03/2019	145 Chelsea View Dr	L1	298	Fat	2.5	
26/10/2018	17B Fraser Rd	L1	192	Roots	10.5	Flushed main
30/10/2018	17B Fraser Rd	L1	169	Roots	9.5	
20/03/2019	19 Cowper St	L1	158	Unknown	0	Rootcut, large fats removed from main, flushed
20/04/2019	19 Cowper St	L1	114	Unknown	0	
12/06/2019	19 Cowper St	L1	185	Fat	0.5	
10/01/2019	2/39 St Peters St	L1	211	Unknown	0	Continue to Monitor
5/03/2019	2/39 St Peters St	L1	102	Unknown	0	
27/09/2018	22 Maunganui Rd	L1	87	Fat	1.5	Flushed main Rootcut
13/11/2018	22 Maunganui Rd	L1	296	Roots	0	
24/05/2019	22 Maunganui Rd	L1	134	Roots	0	
28/07/2018	22 Portsea Pl	L1	402	Roots	1.5	Rootcut
6/08/2018	22 Portsea Pl	L1	139	Roots	0.5	
3/08/2018	3/3 Mahuta Grv	L2	235	Rubbish	0.5	Roots and rags removed from manhole, Heavy Flush
5/04/2019	3/3 Mahuta Grv	L1	156	Roots	1	
31/01/2019	32 Bayswater Ave	L1	167	Unknown	0	Flushed main Flushed S/L
1/03/2019	32 Bayswater Ave	L1	106	Unknown	0	
23/03/2019	32 Bayswater Ave	L1	274	Unknown	0.5	
21/05/2019	34 Empire Rd	L1	298	Roots	0	Root intrusion

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
8/06/2019	34 Empire Rd	L1	170	Roots	0.5	repaired
15/07/2018	49 Walter St	L1	367	Surcharging	3	Continue to Monitor
4/10/2018	49 Walter St	L2	149	Unknown	0	
3/12/2018	55A Rawene Rd	L1	133	Unknown	22.5	CCTV, jetted main, fats, roots, baby wipes removed
11/12/2018	55A Rawene Rd	L1	105	Rags	0	
29/09/2018	6 Cowper St	L1	76	Fat	0	CCTV, flushed main Removed fat blockage
7/10/2018	6 Cowper St	L1	106	Fat	0	
5/05/2019	6 Cowper St	L1	145	Fat	0.5	
3/04/2019	65 Lake Rd	L1	145	Fat	7.5	Flushed heavy fats
23/04/2019	65 Lake Rd	L1	176	Unknown	1	
20/06/2019	65 Lake Rd	L1	38	Roots	8	
27/11/2018	65 Pearn Cres	L2	119	Unknown	4.5	Flushed heavy fats
10/05/2019	65 Pearn Cres	L1	248	Fat	3.5	
26/05/2019	75A Francis St	L1	389	Roots	0	Rootcut
2/06/2019	75A Francis St	L1	232	Roots	3.5	
18/03/2019	9 Havenwood Pl	L1	148	Unknown	0.5	Flushed S/L and main
6/06/2019	9 Havenwood Pl	L1	217	Unknown	4	
10/03/2019	95 Sylvia Rd	L1	104	Rags	0	Continue to Monitor
11/03/2019	95 Sylvia Rd	L1	52	Unknown	0	

2.15.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.15.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
25/12/2018	DPMNI	Maunganui Storage Tank Overflow	863	Rain event	2431	14
15/07/2018	DPJIM	Jim Tichener Wastewater Pump Station	904	Rain event	160	3
29/08/2018	DPJIM	Jim Tichener Wastewater Pump Station	904	Rain event	16	1
24/12/2018	DPKAW	Kawerau Wastewater Pump Station	884	Rain event	41	67

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. The cause is taken from validated site data.

2.15.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
830	Lake Northcote WWPS	5.6	0	0	1	0	0	0.2	Continue to monitor
849	Seabreeze WWPS	0	1	0	0	0	0	0.2	Continue to monitor
852	Fred Thomas WWPS	7.3	0	0	0	0	0	0	Fred Thomas Drive WWPS and Storage Tank
857	Stanley Point 1 WWPS	-	0	0	0	0	0	0	Continue to monitor
861	Sulphur Beach WWPS	2.3	3	0	0	0	0	0.6	Continue to monitor
863	Maunganui WWPS	6.3	3	0	3	2	1	1.8	Chelsea WWPS Diversion
880	Ewen Alison WWPS	0	0	0	0	0	0	0	Continue to monitor
881	Lake Devonport WWPS	0	0	0	0	0	0	0	Continue to monitor
883	Norwood WWPS	1.4	0	0	0	0	0	0	Continue to monitor
884	Kawerau WWPS	1.6	0	0	3	1	1	1	Continue to monitor
885	Regent WWPS	0	1	0	0	0	0	0.2	Continue to monitor
887	Hinemoa WWPS	0	0	0	0	0	0	0	Continue to monitor
888	Homewood WWPS	0	1	0	0	0	0	0.2	Continue to monitor
889	Alfred WWPS	0	0	0	0	0	0	0	Continue to monitor
890	Sylvan WWPS	2.9	0	0	0	0	0	0	Continue to monitor
898	Havenwood	0.4	0	0	0	0	0	0	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
899	Arahia WWPS	4.1	1	0	5	0	0	1.2	Continue to monitor
904	Jim Titchener WWPS	2	2	0	1	5	2	2	Continue to monitor
905	Bayswater WWPS	0	0	0	0	0	0	0	Continue to monitor
906	Barrys Point Local WWPS	0	0	0	0	0	0	0	Continue to monitor
907	Kitewao WWPS	0	1	0	0	0	0	0.2	Continue to monitor
908	Dominion WWPS	0	1	0	0	0	0	0.2	Continue to monitor
948	Exmouth WWPS	0.7	0	0	0	0	0	0	Continue to monitor

2.15.6 Inflow & Infiltration Programme

Inflow & Infiltration (I&I) reduction works have historically been carried out in Chatswood, Takapuna foreshore, Forrest Hill, Northcote Point catchments to improve the network performance. No further works have been carried out in this period.

2.15.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Complete	Fred Thomas Drive WWPS and storage tank	Closure	Project will address performance and reliability at EOP 852. This project will enable projects (Northboro WWPS upgrade and others) to commence	Will reduce overflow frequency at EOP852 and enable future growth and future projects in upstream catchment to address performance at EOP860	2017
Underway	Wairau pump station rising main upgrades	Project execution	Rising main failed and requires replacement. Will be upsized to increase capacity	Reduces risk of uncontrolled discharges due to asset failure	2017-2018
Underway	Wairau pump station (DPWAU) upgrades	Design	Reduce overflow frequency and risk to public health and environment, reduce risk of asset failure	Reduces overflow volume/ frequency for OF 951 and allows for growth and future improvements in multiple catchment	2022-2024

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Complete	Northcote Branch Sewer (DSNCT) Upgrade Works (formerly TS8)	Closure	Required to maintain service delivery and to reduce the risk of failure	Will provide for growth in the contributing wastewater catchments and allow for an improved level of service	2011-2020
Underway	Chelsea Pump Station diversion to Birkdale	Option Analysis (Feasibility)	Considered to reduce risk of overflows and replace critical asset	Would reduce frequency of overflows	2016-2020
Planned	Northboro WW Pump Station Upgrade	Studies and investigations	Study will identified preferred concept design to reduce overflows at DPNRO by increasing the capacity of the pump station	Will enable future growth and future projects in the Shoal Bay catchment.	2018 (study), project construction TBC
Underway	Northcote-Chatswood Wastewater Network Upgrades (Chelsea Pump Station)	Option analysis (Feasibility)	Provide 60l/s pump station, 900m of 315mm rising main and 700m of 450mm gravity sewer	Increase capacity and reduce uncontrolled overflows	2020-2023
Underway	North Shore Transmission Control Upgrade	Project Execution	Upgrade of electrical and control systems of 20 wastewater Transmission sites	Reduction of uncontrolled wet weather overflows from MH10 Chatswood Branch Sewer and EOP 830 at MH1 Northcote Point Branch Sewer	2017-2019

2.15.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2018 and 30 June 2019.

2.15.9 Summary

There were no EOPs which discharged more frequently than two times per year on average. In the long term, the network performance in this catchment will be improved with such projects as the 'Wairau Pump station rising main upgrades', 'Wairau Pump station (DPWAU) upgrades', 'Fred Thomas Drive WWPS and Storage Tank', 'Northcote branch sewer (DSNCT) upgrade works (formerly TS8)' and 'Chelsea Pump Station Upgrade', which will provide wastewater network capacity. The ratio of overflows to pipe length increased in this reporting period and the main cause of these uncontrolled overflows was attributed to roots. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. No significant changes have been made to the network as a whole. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

2.16 Catchment 14 – Upper Harbour North

2.16.1 Overview

The Upper Harbour North catchment is located on the North Shore of Auckland. The catchment includes the suburbs of Greenhithe, Wainoni, North Harbour, Albany, Albany Village and Rosedale. The northern limit of the catchment follows the boundary of the former North Shore City from Paremoremo Creek, along Brookdale Road, Ridge Road and O'Brien Road to State Highway 17. The northern boundary then continues along Albany Heights Road and Lonely Track Road to East Coast Road. The southern boundary of the catchment generally follows Upper Harbour Drive (State Highway 18) from Greenhithe to the Albany Highway and then Sunset Road to East Coast Road. The eastern extent of the catchment is the ridge following East Coast Road. The total land area is approximately 3,000 ha. There are currently 14,406 wastewater connections.

The catchment contains a mix of urban and rural land uses, including many residential areas that are currently being developed. There have been numerous subdivisions, large medium-density developments in specially zoned areas and infill growth throughout this catchment. There are two large commercial/industrial areas at Albany and North Harbour, as well as the North Harbour Stadium and the Massey University Campus.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	13,753	13,923	14,098	14,267	14,406
Length of sewer (km)	302	307	311	368	345

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
826	Atlas WWPS	DPATL	1	Alexandra Stream
874	Church House WWPS	DPCHH	1	Greenhithe Stream
876	Rosedale WWPS	DPRLE	1	Oteha Stream
877	Kyle No. 1 WWPS	DPKY1	1	Kyle Stream
878	Albany WWPS	DPALB	1	Oteha Stream
920	Kerema WWPS	DPKER	1	Lucas Creek
923	Van Der Bilt WWPS	DPVAN	1	Oteha Stream
924	Remu WWPS	DPREM	1	Greenhithe Coast
925	Koki WWPS	DPKKI	1	Greenhithe Coast
926	Rahui WWPS	DPRAH	1	Greenhithe Coast
927	Awatahi WWPS	DPAWA	1	Lucas Creek
928	Wainoni WWPS	DPWNI	1	Te Wharau Creek
934	Aberly WWPS	DPALY	1	Aberley Creek
944	Mahoney WWPS	DPMHO	1	Lucas Creek
945	Carol Lee Place	DPCLP	1	To Land

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
	WWPS			
946	Kyle No. 2 WWPS	DPKY2	1	Kyle Stream
1231	Oscar WWPS	DPOSC	1	Lucas Creek
1232	Bush WWPS	DPBUS	1	Oteha Stream
1234	Chester WWPS	DPCHS	1	Kyle Stream
1241	Dressage WWPS	DPDRE	1	Orwell Stream

There have been no changes to the schedule of EOPs in this catchment

2.16.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 146 reported incidents in the Upper Harbour North catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

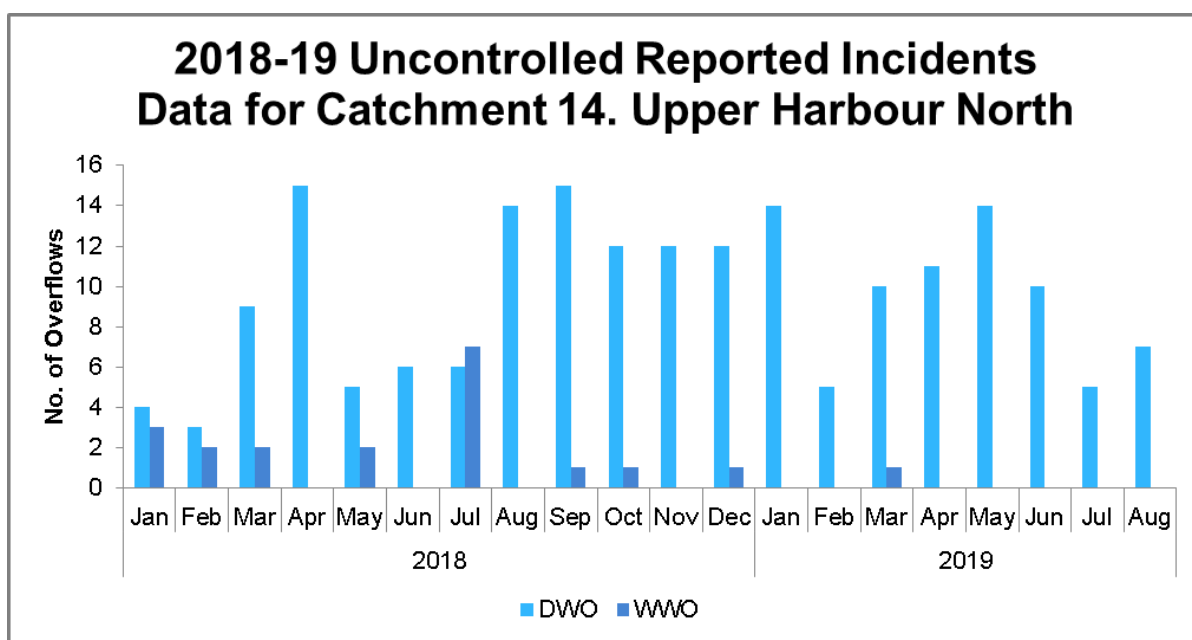
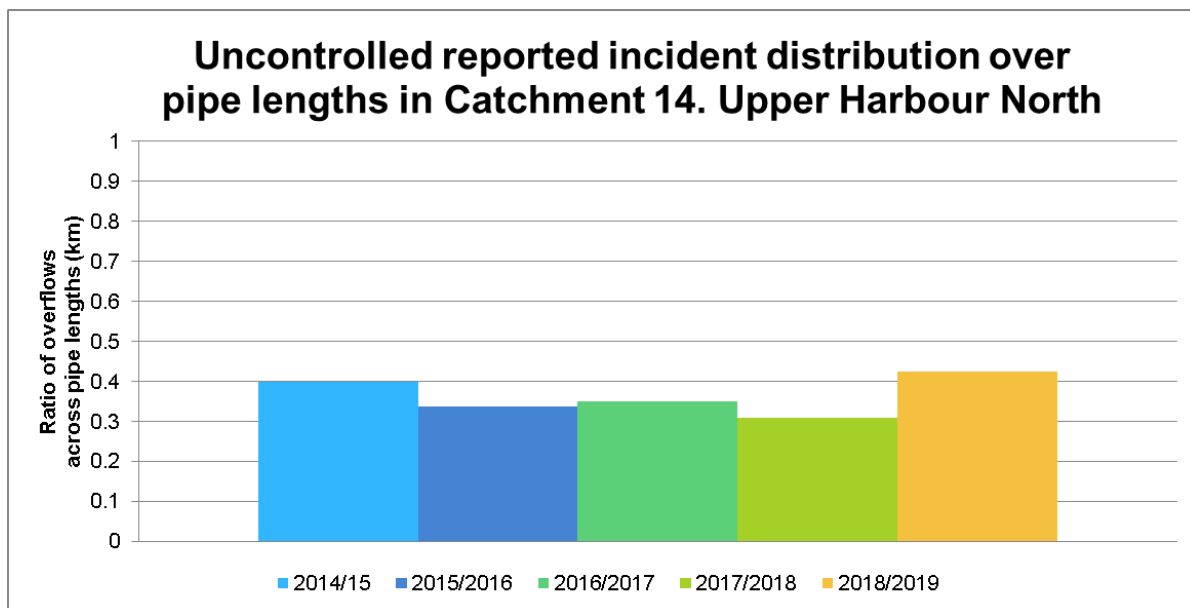
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
9/05/2019	16 Rahui Rd	L1	203	Unknown	0	Flushed main
14/05/2019	16 Rahui Rd	L1	124	Fat	0	
31/01/2017	20 Remu Pl	L1	468	Unknown	0	Pump Station manhole rehaunched Flushed line to PS
9/07/2017	30 Remu Pl	L1	96	Fat	10.5	
19/10/2017	20 Remu Pl	L2	206	Unknown	0	
8/07/2018	20 Remu Pl	L1	270	Foreign Object	0.5	
15/10/2017	35 Outlook Rd	L3	304	Fat	0.5	Heavy flushed Cleared blockage with rods
17/06/2018	35 Outlook Rd	L2	530	Roots	0	
9/04/2019	35 Outlook Rd	L3	254	Unknown	0	

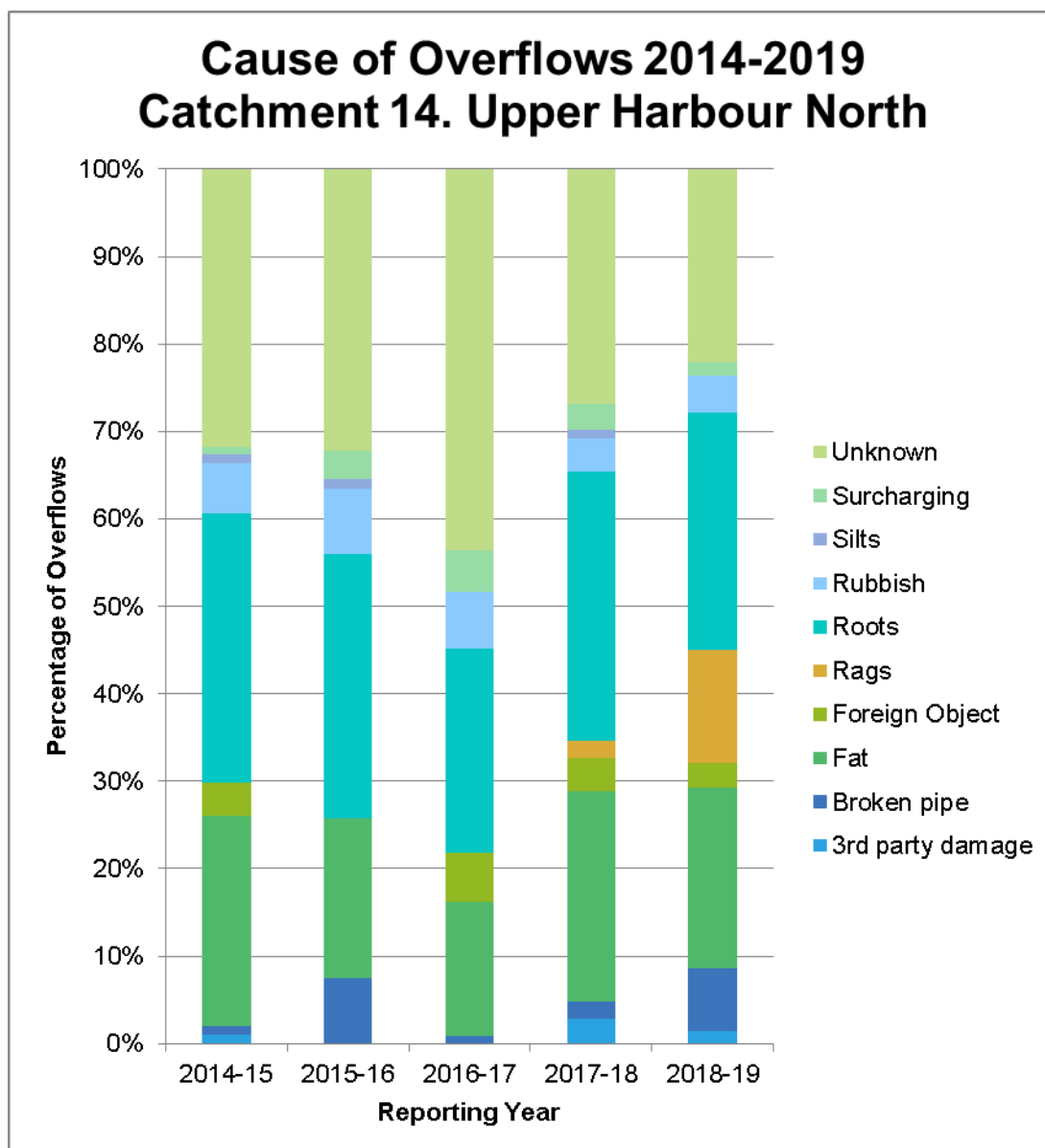
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
1/09/2017	16 Mercury Lane	L1	90	Roots	0.49	Connection and dropper repaired Rootcut
13/09/2017	16 Mercury Lane	L1	273	Roots	0	
16/06/2019	16 Mercury Lane	L1	181	Roots	2.5	
4/09/2017	2/12 Parkhead Pl	L2	111	Fat	0	Heavy flushed
9/04/2018	2/12 Parkhead Pl	L1	183	Rags	0	
6/09/2018	12 Parkhead Pl	L1	202	Roots	0	
6/05/2018	16 Oakford Park Cres	L2	171	Fat	0.5	Heavy flushed
10/05/2018	16 Oakford Park Cres	L3	535	Roots	0.5	
12/08/2018	16 Oakford Park Cres	L3	391	Roots	0	
7/12/2018	11 Scarlet Oak Dr	L1	108	Roots	0.5	Rootcut
3/06/2019	11 Scarlet Oak Dr	L1	95	Roots	1.5	
20/07/2018	12 Ronald Macken Pl	L2	300	Roots	5	Flushed main
16/11/2018	12 Ronald Macken Pl	L1	90	Unknown	0	
13/08/2018	169 Bush Rd	L1	168	Rags	0	Flushed main Blocks at 90 degree bend
23/08/2018	169 Bush Rd	L1	99	Rags	6	
27/08/2018	169 Bush Rd	L1	98	Broken pipe	1	
8/10/2018	18 Lismore Way	L3	1339	Rags	0	Baby wipes removed from main
26/03/2019	18 Lismore Way	L3	216	Fat	0	
9/10/2018	2 Canary Pl	L1	309	Fat	0	CCTV, roots and fat removed Junction repaired, root infiltration removed
10/11/2018	2 Canary Pl	L1	107	Broken Pipe	2	
15/11/2018	2 Canary Pl	L1	113	Broken Pipe	0	
28/11/2018	2 Canary Pl	L1	75	Roots	0	
7/10/2018	27 Unsworth Dr	L1	139	Fat	0	Continue to Monitor
10/10/2018	27 Unsworth Dr	L2	90	Roots	0	
11/07/2018	31 The Avenue	L1	139	Rags	10.5	Wet wipe blockage removed from bypass pump Ongoing issue with landslip at Lucas Point Rd
22/11/2018	31 The Avenue	L1	730	Broken pipe	7	
11/12/2018	31 The Avenue	L1	152	Rags	0	
17/12/2018	31 The Avenue	L1	180	Power Failure	0	
21/01/2019	31 The Avenue	L1	131	Broken pipe	0	
23/01/2019	31 The Avenue	L1	242	Rags	0	
26/01/2019	31 The Avenue	L1	493	Power Failure	0	
4/02/2019	31 The Avenue	L1	141	Power Failure	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
9/03/2019	31 The Avenue	L1	114	Rags	2.5	
23/12/2018	32 Waipuna Pl	L1	119	Roots	12	Roots removed from manhole
10/01/2019	32 Waipuna Pl	L1	74	Roots	0	
23/01/2019	32 Waipuna Pl	L1	120	Unknown	0	
18/07/2018	320 Rosedale Rd	L1	68	Surcharging	0.5	Continue to Monitor
31/10/2018	320 Rosedale Rd	L2	116	Unknown	0	
9/07/2018	33 Omega St	L2	382	Rags	9.5	Broken dropper repaired
14/05/2019	33 Omega St	L2	74	Broken pipe	0	
16/07/2018	37 William Gamble Dr	L2	335	Rubbish	32	Flushed main
6/08/2018	37 William Gamble Dr	L1	227	Rags	0.5	
23/07/2018	40 Caribbean Dr	L1	194	Rags	12.5	Fat blockage removed
6/06/2019	40 Caribbean Dr	L1	264	Fat	4	
11/01/2019	48 Goldfinch Rise	L1	90	Rags	0	Unblocked line. Removed wipes, Rootcut
30/04/2019	48 Goldfinch Rise	L1	225	Roots	0.5	
7/09/2018	5 Unity Dr	L1	563	Roots	10	Roots removed from manhole Heavy fats, heavy flush
13/05/2019	5 Unity Dr	L1	158	Fat	2	
18/06/2019	6 Mercury Way	L1	167	Roots	0	Rootcut, heavy flush
24/06/2019	6 Mercury Way	L1	190	Roots	5	
24/02/2019	7/31 The Avenue	L1	165	Rags	3.5	Rags removed from pump
4/03/2019	7/31 The Avenue	L1	125	Rags	0	
15/03/2019	7/31 The Avenue	L1	207	Broken pipe	0	
15/12/2018	8/31 The Avenue	L1	96	Power Failure	0.5	Bypass pump came unplugged, Removed Baby wipes, On-going issue with landslip at Lucas Point Rd
22/12/2018	8/31 The Avenue	L1	151	Power Failure	1.5	
31/12/2018	8/31 The Avenue	L1	263	Rags	0	
10/01/2019	8/31 The Avenue	L1	58	Unknown	0	
25/01/2019	8/31 The Avenue	L1	147	Rubbish	0	
25/01/2019	8/31 The Avenue	L1	107	Unknown	0	
24/02/2019	8/31 The Avenue	L1	164	Broken pipe	3.5	
9/03/2019	8/31 The Avenue	L1	244	Power Failure	2.5	
28/03/2019	90 Admirals Court Dr	L1	115	Unknown	5.5	Flushed main
26/06/2019	90 Admirals Court Dr	L1	200	Fat	0	

2.16.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.16.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPKY1	Kyle 1 Wastewater Pump Station	877	Rain event	354	3
24/12/2018	DPKY1	Kyle 1 Wastewater Pump Station	877	Rain event	282	67
24/12/2018	DPCHH	Church House Wastewater Pump Station	874	Rain event	172	67
15/07/2018	DPAWA	Awatahi Wastewater Pump Station	927	Rain event	10	3

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. Root cause is taken from validated site data.

2.16.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
826	Atlas WWPS	0	0	0	0	0	0	0	Continue to monitor
874	Church House WWPS	0.4	0	2	2	2	2	1.6	Continue to monitor
876	Rosedale WWPS	0.3	0	0	6	3	0	1.8	Continue to monitor
877	Kyle No. 1 WWPS	1.2	0	2	4	4	2	2.4	Continue to monitor
878	Albany WWPS	0	0	0	0	0	0	0	Continue to monitor
920	Kerema WWPS	0	0	0	0	0	0	0	Continue to monitor
923	Van Der Bilt WWPS	0	0	0	0	1	0	0.2	Continue to monitor
924	Remu WWPS	0	0	0	0	0	0	0	Continue to monitor
925	Koki WWPS	0	1	0	0	0	0	0.2	Continue to monitor
926	Rahui WWPS	0	0	0	0	0	0	0	Continue to monitor
927	Awatahi WWPS	0.2	0	0	0	1	2	0.6	Continue to monitor
928	Wainoni WWPS	0	0	0	0	0	0	0	Continue to monitor
934	Aberly WWPS	0	1	0	0	0	0	0.2	Continue to monitor
944	Mahoney WWPS	0	0	0	0	0	0	0	Continue to monitor
945	Carol Lee Place WWPS	0	0	0	0	0	0	0	Continue to monitor
946	Kyle No. 2 WWPS	0	0	0	0	0	0	0	Continue to monitor
1231	Oscar WWPS	0	0	0	0	0	0	0	Continue to monitor
1232	Bush WWPS	0	0	0	0	0	0	0	Continue to monitor
1234	Chester WWPS	0	0	0	0	0	0	0	Continue to monitor
1241	Dressage WWPS	0	0	0	0	0	0	0	Continue to monitor

2.16.6 Inflow & Infiltration Programme

A review of Inflow & Infiltration (I&I) in this catchment will be carried out as part of Watercare's region-wide programme, where the priority of this catchment will be determined. This catchment has not been identified as a priority to date.

2.16.7 Improvement Works Programme

No significant network improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019. This network

will continue to be monitored and the overflow history will be analysed and utilised when reviewing future network improvement programmes.

2.16.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2018 and 30 June 2019.

2.16.9 Summary

There was one Type 1 EOP which discharged more frequently than two spills per year. The ratio of blockages to pipe length has increased in this reporting period. Trend analysis shows that roots, rags, and fats are the predominant cause of uncontrolled overflows. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. The network has been developed to accommodate for population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.17 Catchment 15 – Upper Harbour South

2.17.1 Overview

The Upper Harbour South catchment is located on the North Shore of Auckland. The catchment includes the suburbs of Beach Haven, Birkdale and parts of Glenfield. The northern limit of the catchment follows Upper Harbour Drive and the Albany Highway and follows Glenfield Road to Mokoia Road to form the eastern boundary. The southern boundary follows Mokoia Road, Balmain Road and Onetaunga Road to west of the Chelsea Sugar Refinery. To the west of the catchment is the inner Waitemata Harbour. The total catchment size is approximately 1,770 ha and there are currently 13,190 wastewater connections.

Land use within the Upper Harbour South catchment is predominantly residential with small areas of commercial activities and a number of schools. The residential land use is reasonably low density compared to other areas in the former NSCC. North of Hellyers Creek and Lignite Creek is mainly rural and reserve land and there are also large reserve areas along Eskdale Stream and Kauri Point.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	13,008	13,053	13,117	13,136	13,190
Length of sewer (km)	219	219	220	260	244

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
844	28 Gazelle Rd	-	2	Hellyers Creek
856	Island Bay WWPS	DPISL	1	Island Bay
862	Kahika WWPS	DPKAH	1	Kaipatiki Creek
891	Valkyria WWPS	DPVIA	1	Soldiers Bay
893	Hadfield 1 WWPS	DPHD1	1	Island Bay
894	Hadfield 2 WWPS	DPHD2	1	Island Bay
897	Caram WWPS	DPCAM	1	Eskdale Stream
900	Rosecamp WWPS	DPRMP	1	Charcoal Bay
901	Cronin WWPS	DPCRO	1	Beach Haven Beach
902	Beachaven WWPS	DPBEN	1	Hellyers Creek
903	Cresta WWPS	DPCRE	1	Hellyers Creek
917	Glendhu WWPS	DPGLU	1	Lignite Stream
930	Albany Church WWPS	DPALC	1	Lignite Stream
943	Neptune WWPS	DPNEP	1	Beach Haven Coast
1442	140 Birkdale Road	-	2	Rangatira Stream
1443	128 Spinella Drive	-	2	Glendhu Reserve Stream

There have been no changes to the Schedule of Engineered Overflow Points.

2.17.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 144 reported incidents in the Upper Harbour South catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

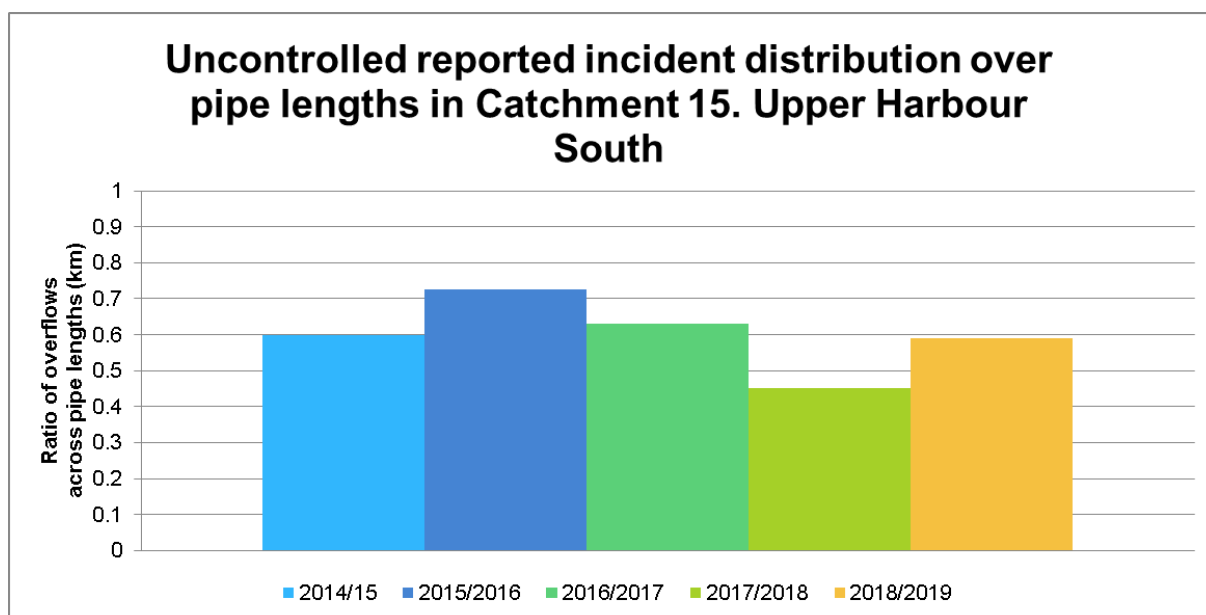
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
30/11/2017	3 Anchor Pl	L1	189	Roots	3	Heavy flushed
23/09/2018	3 Anchor Pl	L1	85	Fat	7.5	
18/09/2017	26 Park Hill Rd	L1	592	Broken pipe	6.86	Ongoing landslip issues, under investigation Foreign objects removed, Rags removed from pump
14/10/2017	26 Park Hill Rd	L1	96	Broken pipe	2.5	
17/11/2017	26 Park Hill Rd	L1	183	Broken pipe	0.5	
19/11/2017	26 Park Hill Rd	L1	117	Broken pipe	2	
20/11/2017	26 Park Hill Rd	L1	444	Broken pipe	0	
24/11/2017	26 Park Hill Rd	L1	364	Broken pipe	0	
4/06/2018	26 Park Hill Rd	L1	441	Broken pipe	15.11	
7/10/2018	26 Park Hill Rd	L1	171	Foreign Object	0	
10/10/2018	26 Park Hill Rd	L1	130	Broken pipe	0	
11/10/2018	26 Park Hill Rd	L1	220	Broken pipe	24.5	
13/10/2018	26 Park Hill Rd	L1	207	Broken pipe	4.5	
2/01/2019	26 Park Hill Rd	L1	330	Rubbish	0	
6/01/2019	26 Park Hill Rd	L1	79	Unknown	0	

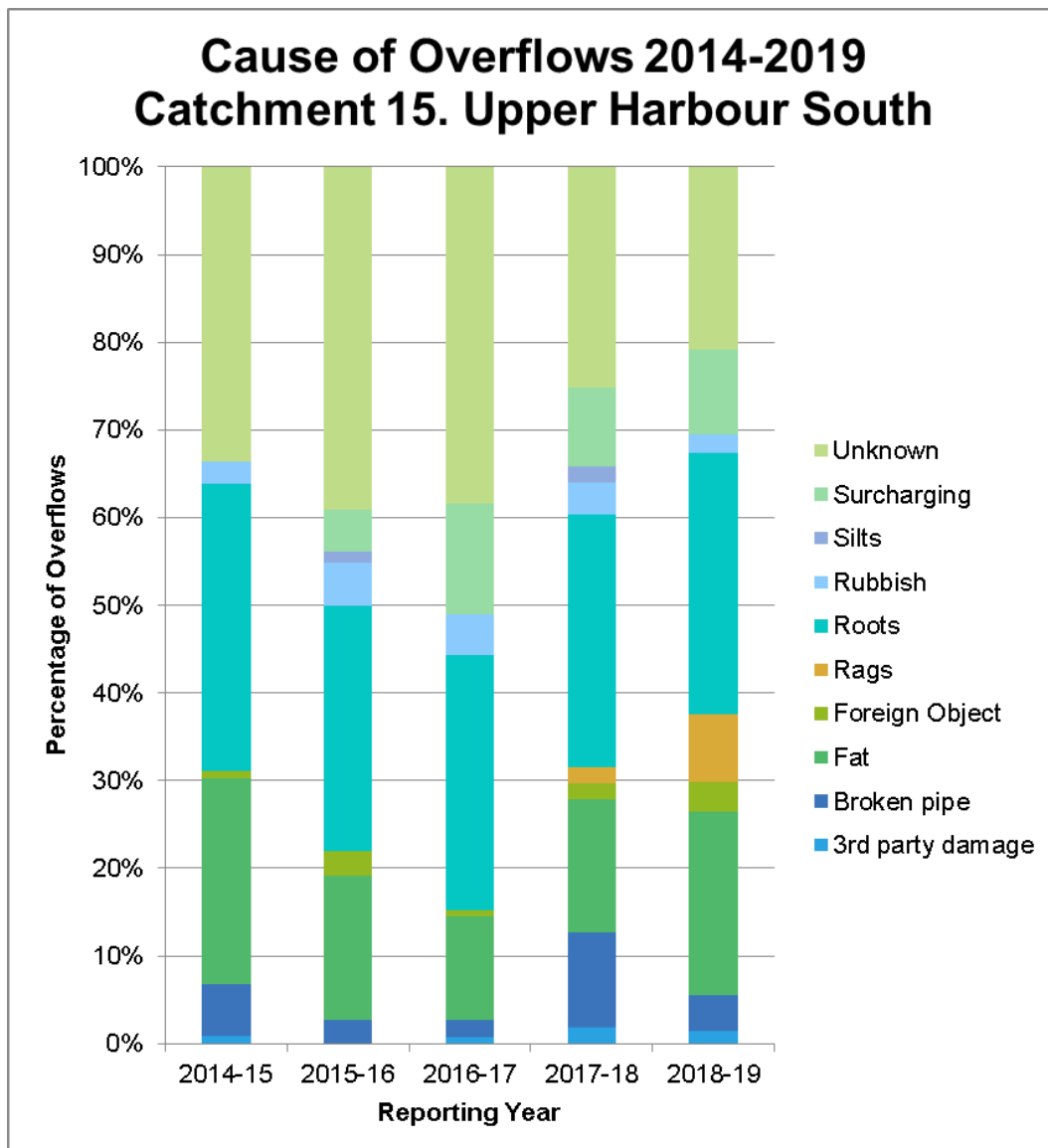
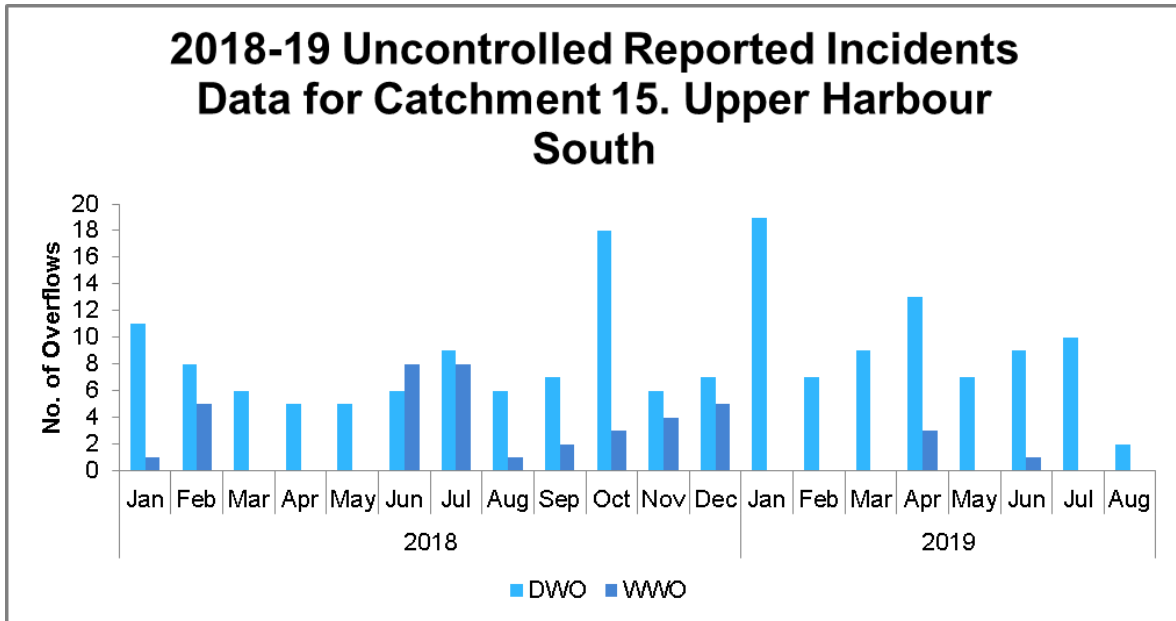
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
19/01/2019	26 Park Hill Rd	L1	81	Rags	0	
27/01/2019	26 Park Hill Rd	L1	137	Rags	0	
15/03/2019	26 Park Hill Rd	L1	395	Rags	0	
3/07/2018	1/215 Beach Haven Rd	L2	119	Fat	1	CCTV, heavy clean Tomo repaired
9/10/2018	1/215 Beach Haven Rd	L1	131	Broken pipe	0	
17/10/2018	107 Lynn Rd	L3	249	Rags	0.5	Rodded blockage Heavy flushed main
21/05/2019	107 Lynn Rd	L3	786	Fat	0	
15/07/2018	113 Beach Haven Rd	L1	203	Surcharging	3	Continue to Monitor
25/11/2018	113 Beach Haven Rd	L1	185	Surcharging	14	
23/05/2019	14 Rambler Cres	L1	283	3rd party damage	1.5	Construction damaged lateral, under investigation
7/06/2019	14 Rambler Cres	L1	98	3rd party damage	15.5	
28/04/2019	2/20 Kauri Rd	L1	118	Roots	10	Flushed main
22/05/2019	2/20 Kauri Rd	L1	285	Roots	1.5	
18/07/2018	2/28 Cresta Ave	L1	178	Roots	0.5	Removed roots Flushed main
4/06/2019	2/28 Cresta Ave	L1	180	Roots	0	
15/07/2018	2/54 Elliott Ave	L1	203	Surcharging	3	Continue to Monitor
24/12/2018	2/54 Elliott Ave	L1	128	Surcharging	67	
16/08/2018	2/79B Salisbury Rd	L1	81	Fat	4.5	Flushed main
13/05/2019	2/79B Salisbury Rd	L1	136	Fat	2	
4/01/2019	22 Park Hill Rd	L1	94	Broken pipe	0	On-going issue with landslip at 26 Park Hill Rd
29/03/2019	22 Park Hill Rd	L1	101	Broken pipe	1.5	
3/06/2019	24 Waverley Ave	L1	72	Fat	1.5	Flushed main Rootcut
16/06/2019	24 Waverley Ave	L1	159	Roots	2.5	
5/11/2018	25 Chippendale Cres	L1	138	Unknown	0.5	Flushed main Vacuumed line. Removed bung
24/01/2019	25 Chippendale Cres	L1	393	Foreign Object	3.5	
5/08/2018	28 Spinella Dr	L1	289	Fat	0	Lampeye pipe repaired
29/08/2018	28 Spinella Dr	L1	232	Surcharging	1	
15/10/2018	28 Spinella Dr	L1	153	Foreign Object	0	
16/10/2018	28 Spinella Dr	L1	123	Roots	0	
15/07/2018	37 Rosecamp Rd	L1	303	Surcharging	3	Unblocked line
28/01/2019	37 Rosecamp Rd	L2	188	Unknown	0.5	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
15/07/2018	47 Gatman St	L1	1379	Surcharging	3	Continue to Monitor
25/11/2018	47 Gatman St	L1	154	Surcharging	14	
28/04/2019	58 Easton Park Pde	L1	219	Unknown	10	Flushed main
4/05/2019	58 Easton Park Pde	L2	245	Fat	0	
20/01/2019	60 Brigantine Dr	L1	125	Unknown	1	Flushed line CCTV, rootcut
20/02/2019	60 Brigantine Dr	L1	210	Roots	2.5	
20/04/2019	60 Brigantine Dr	L1	97	Roots	0	
11/12/2018	82 Eskdale Rd	L3	121	Unknown	0	Heavy roots in manhole removed
25/12/2018	82 Eskdale Rd	L2	172	Unknown	14	
2/01/2019	82 Eskdale Rd	L3	192	Roots	0	
27/11/2018	83 Stott Ave	L1	95	Surcharging	4.5	Continue to Monitor
25/12/2018	83 Stott Ave	L1	203	Surcharging	14	

2.17.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.17.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPKAH	Kahika Wastewater Pump Station	862	Rain event	255	3
25/12/2018	DPKAH	Kahika Wastewater Pump Station	862	Rain event	125	14
15/07/2018	DPCRO	Cronin Wastewater Pump Station	901	Rain event	264	3
15/07/2018	DPISL	Island Bay Wastewater Pump Station	856	Rain event	173	3
17/08/2018	DPALC	Albany Church Wastewater Pump Station	930	Rain event	74	14.5
25/11/2018	DPCRO	Cronin Wastewater Pump Station	901	Rain event	49	14
4/12/2018	DPCRO	Cronin Wastewater Pump Station	901	Rain event	39	2.5
23/12/2018	DPCRO	Cronin Wastewater Pump Station	901	Rain event	40	12
24/12/2018	DPISL	Island Bay Wastewater Pump Station	856	Rain event	133	67
24/12/2018	DPCRO	Cronin Wastewater Pump Station	901	Rain event	225	67
24/12/2018	DPALC	Albany Church Wastewater Pump Station	930	Rain event	77	67

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. Root cause is taken from validated site data.

2.17.5 Trend analysis of pump stations

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
856	Island Bay WWPS	1.2	0	2	2	1	2	1.4	Continue to monitor
862	Kahika WWPS	1	1	0	4	3	2	2	Continue to monitor
891	Valkyria WWPS	0.4	0	0	0	0	0	0	Continue to monitor
893	Hadfield 1 WWPS	0	0	0	0	0	0	0	Continue to monitor
894	Hadfield 2 WWPS	0.2	0	0	0	0	0	0	Continue to monitor
897	Caram WWPS	0	0	0	0	0	0	0	Continue to monitor
900	Rosecamp WWPS	0	0	0	0	0	0	0	Continue to monitor
901	Cronin WWPS	1.8	3	4	7	6	5	5	Study required
902	Beachaven WWPS	0	0	0	0	0	0	0	Continue to monitor
903	Cresta WWPS	0	0	0	0	0	0	0	Continue to monitor
917	Glendhu WWPS	0	0	0	0	0	0	0	Continue to monitor
930	Albany Church	1.2	0	1	2	1	2	1.2	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
	WWPS								
943	Neptune WWPS	0	0	0	0	0	0	0	Continue to monitor

2.17.6 Inflow & Infiltration Programme

A review of Inflow & Infiltration (I&I) in this catchment will be done as part of Watercare's region-wide programme, where the priority of this catchment will be determined. This catchment has not been identified as a priority to date.

2.17.7 Improvement Works Programme

No significant network improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019. This network will continue to be monitored. A study is required to investigate performance at the Cronin WWPS. The overflow history will be analysed and utilised when reviewing future network improvement programmes.

2.17.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2018 and 30 June 2019.

2.17.9 Summary

One EOP discharged more than two wet weather overflows per year on average in this reporting period; this pump station will be investigated for options to address this performance. The ratio of overflows to pipe length has increased in the 2018/19 period, and roots are the leading cause of uncontrolled overflows. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

Strategic Management Area 9: Mangere (Metropolitan Auckland)

2.18 Catchment 16 – Upper Harbour West

2.18.1 Overview

The Upper Harbour West catchment is located to the west of central Auckland on the western side of the Waitemata Harbour. The catchment contains the suburbs of West Harbour, Hobsonville, Whenuapai and Herald Island. The total land area within the catchment is approximately 1,100 ha. The population living in this catchment was approximately 9,270 (Census, 2013) with 4,985 wastewater connections. Land use within the catchment is predominantly residential on the south-eastern side of Hobsonville Road and at Herald Island. The remaining area comprises lifestyle blocks and farm land on the northwest side of the catchment and horticultural land use in the north-east towards Hobsonville.

Parts of the existing urban area are currently not serviced and there are also extensive areas within the catchment identified as future urban area, with proposed future overflow points.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	3,348	3,760	4,415	4,702	4,985
Length of sewer (km)	75	80	112	117	117

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1274	Hobsonville No. 1 WWPS	DPHOB	1	Te Okoriki Inlet
1275	Hobsonville WWPS	DPHOP	1	Wallace Inlet
1529	Whenuapai WWPS	DPWHN	1	Waiairohia Stream
1530	Massey North WWPS	DPMSN	1	Totara Creek
1543	Hobsonville 5 WWPS	DPHO5	1	Bomb Bay
1545	Brickworks Bay WWPS	DPBRK	1	Limeburners Bay
1572	Hobsonville 2 WWPS	DPHO2	1	Te Okoriki Inlet
1573	Hobsonville 4 WWPS	DPHO4	1	Bomb Bay
1582	Scott Point 2 WWPS	DPSC2	1	Nimrod Inlet
1584	Whenuapai Village WWPS	DPWHV	1	Stormwater pond (Tamiro Rd)
1588	Scott Point 3 WWPS	DPSC3	1	Nimrod Inlet
1594	Scott Point 1 WWPS	DPSC1	1	Bomb Bay
1602	Hobsonville 3 WWPS	DPHO3	1	Harrier Point

There have been no changes to the Schedule of Engineered Overflow Points.

2.18.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 35 reported incidents in the Upper Harbour West catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

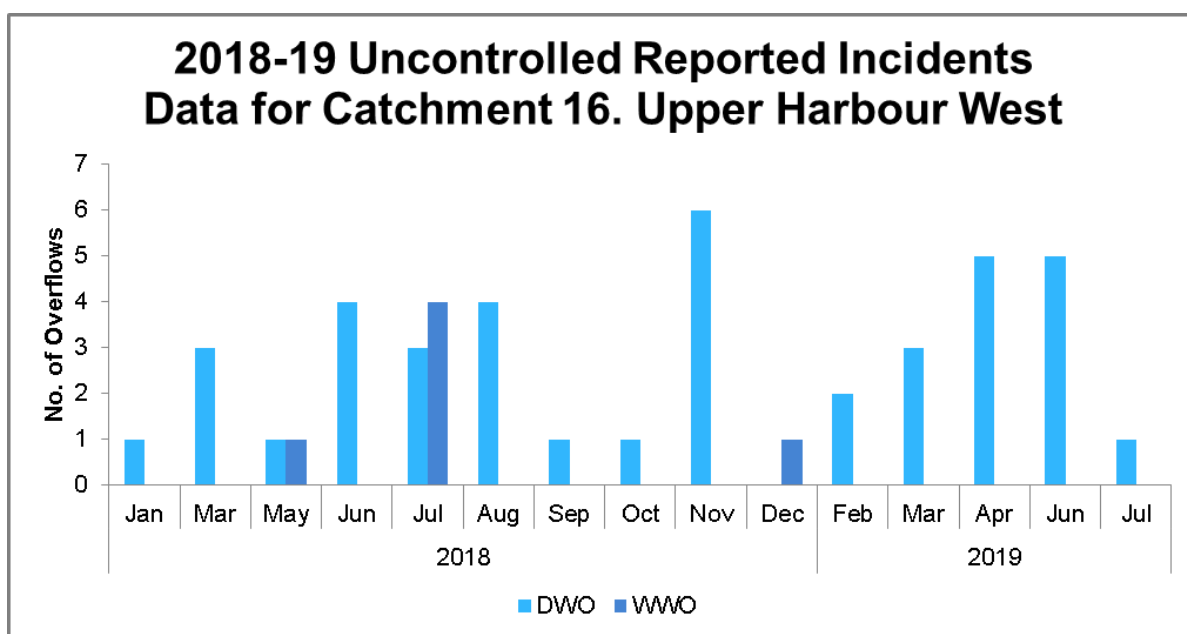
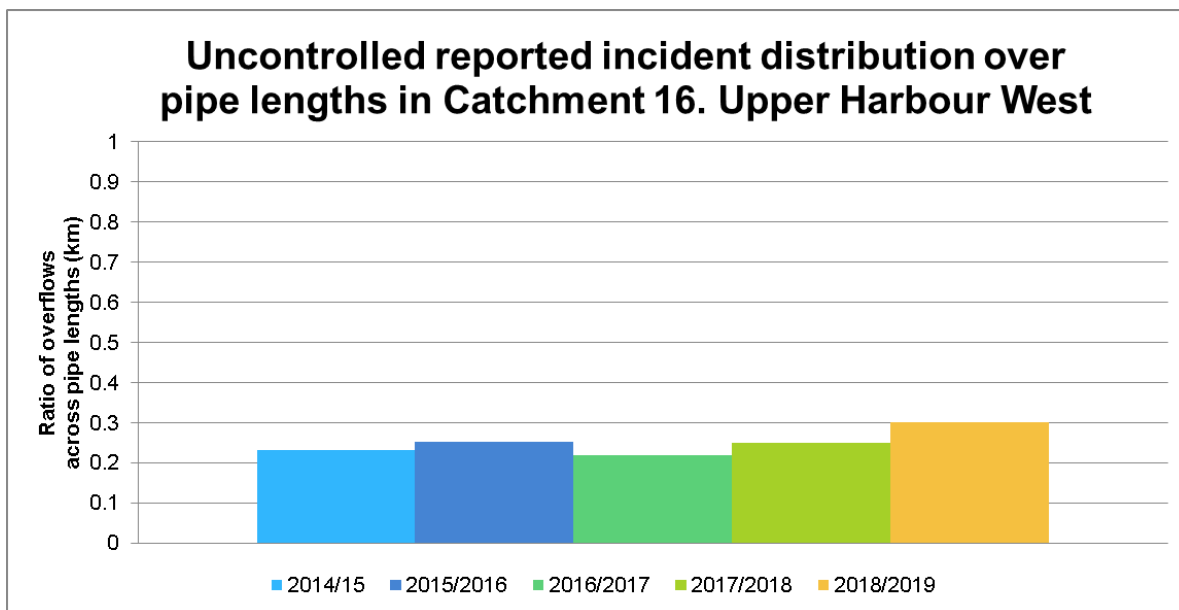
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

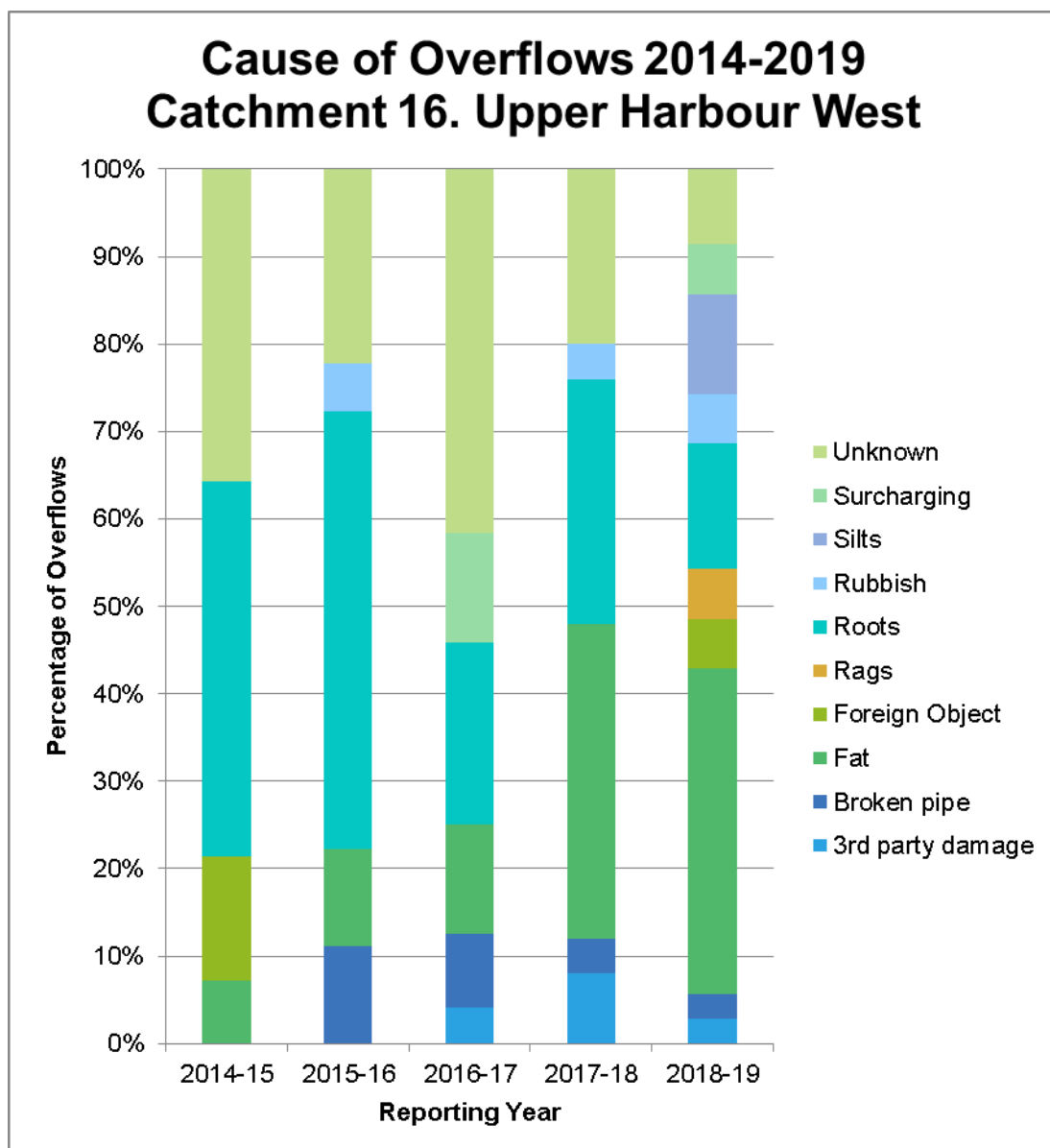
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
23/12/2016	46 Cherub Pl	L1	134	Roots	8.5	CCTV and rootcut Flushed main
27/09/2017	46 Cherub Pl	L1	91	Roots	2	
9/11/2018	46 Cherub Pl	L1	66	Unknown	2.5	
7/04/2019	46 Cherub Pl	L1	140	Roots	0.5	
23/07/2018	103 Glidepath Rd	L1	220	Rubbish	12.5	Concrete piece removed
9/08/2018	103 Glidepath Rd	L1	614	Foreign Object	8.5	
3/07/2018	11 Lagoon Way	L1	106	Roots	1	Rodded roots Flushed main Wipes and fat removed, flushed manhole
21/10/2018	11 Lagoon Way	L1	172	Fat	0	
14/03/2019	11 Lagoon Way	L1	140	Fat	0	
8/06/2019	11 Lagoon Way	L1	112	Rags	0.5	
23/06/2019	17 Fred Taylor Dr	L1	108	Fat	5	Heavy fat, heavy flush
29/06/2019	17 Fred Taylor Dr	L1	271	Fat	0	
4/04/2019	Kohuhu Lane	L1	184	Foreign Object	2	Flushed blockage Fatberg removed from main
27/04/2019	Kohuhu Lane	L1	215	Fat	0	

2.18.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.18.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

There were no wet weather overflows at pump stations between 1 July 2018 and 30 June 2019.

2.18.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1274	Hobsonville No. 1 WWPS	0	0	0	0	0	0	0	Continue to monitor
1275	Hobsonville WWPS	0	0	0	0	0	0	0	Continue to monitor
1529	Whenuapai WWPS	n/a	0	0	0	0	0	0	Continue to monitor
1530	Massey North WWPS	n/a	0	0	0	0	0	0	Continue to monitor
1543	Hobsonville 5 WWPS	n/a	n/a	0	0	0	0	0	Continue to monitor
1545	Brickworks Bay WWPS	n/a	0	0	0	0	0	0	Continue to monitor
1572	Hobsonville 2 WWPS	n/a	n/a	n/a	0	0	0	0	Continue to monitor
1573	Hobsonville 4 WWPS	n/a	n/a	n/a	0	0	0	0	Continue to monitor
1582	Scott Point 2 WWPS	n/a	n/a	n/a	n/a	0	0	0	Continue to monitor
1584	Whenuapai Village WWPS	n/a	n/a	n/a	n/a	0	0	0	Continue to monitor
1588	Scott Point 3 WWPS	n/a	n/a	n/a	n/a	0	0	0	Continue to monitor
1594	Scott Point 1 WWPS	n/a	n/a	n/a	n/a	0	0	0	Continue to monitor

2.18.6 Inflow & Infiltration Programme

A review of Inflow & Infiltration (I&I) in this catchment will be carried out as part of Watercare's region-wide programme, where the priority of this catchment will be determined. This catchment has not been identified as a priority to date.

2.18.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Northern Interceptor - Stage 1	Project Execution	To allow wastewater flows to be diverted from the Northern Strategic Growth Area (NorSGA) and South Rodney (Kumeu / Huapai/Riverhead) to the Rosedale wastewater treatment plant. This balances flows at the treatment plants and provides additional capacity to the Western Interceptor	This project is required to service greenfield growth and avoid capacity-related dry weather overflows. Will reduce the load on the Western Interceptor and also reduce Type 3 overflows S20, S21 and S24	2012-2021
Underway	Waitakere Northern and KHR servicing	Studies and investigations	Capacity - major greenfield development is scheduled in this area. A servicing plan is required.	Ultimately the provision of trunk servicing capacity for north-west FUZ area - distinct from Northern interceptor	Before 2022
Future	Northern Interceptor – Hobsonville to Westgate	Studies and investigations	Northern Interceptor gravity tunnel from Westgate to Hobsonville pump station	Cater to Auckland's growth	2019-2025
Underway	Whenuapai and Redhills Wastewater Scheme (Housing Infrastructure Fund)	Design	320L/s pump station located on Brigham Creek Road; 500mm diameter rising main 2km in length; 1,800mm diameter, 1km long gravity pipeline to link under SH18 linking into the Northern Interceptor, 1km in length; 2,100mm diameter tunnel, 2.8km in length, between Westgate and Hobsonville. The alignment of the tunnel is alongside SH18 and forms part of the Northern Interceptor Scheme, which transfers conveying wastewater to the Rosedale WWTP. 315mm diameter rising main, 1.1km in length, to divert flow from Kumeu, Huapai, Riverhead and the existing Whenuapai township to the new pump station on Brigham Creek Road.	Ultimately the provision of trunk servicing capacity for north-west FUZ area - distinct from Northern interceptor	Before 2022

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Wastewater Main Renewals and Lining Programme	Project Execution	Network wastewater pipe renewal at 38 sites	Upgraded network pipe condition	2015-2018

2.18.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2018 and 30 June 2019.

2.18.9 Summary

There were no EOPs which have discharged more frequently than two spills this year. The ratio of uncontrolled overflows to pipe length has marginally increased in this reporting period. Fats were the most common cause of uncontrolled overflows. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

2.19 Catchment 17 – Henderson Creek

2.19.1 Overview

The Henderson Creek catchment is located to the west of central Auckland and contains the suburbs of Massey, Ranui, Henderson, Te Atatu Peninsula, Te Atatu South, Glen Eden and North Titirangi. The total land area within the catchment is approximately 5,300 ha with 42,144 wastewater connections. There are several notable watercourses in the catchment, including the Waikumete Stream and Oratia Stream, all of which converge on the Henderson Creek. Land use within the catchment is predominantly residential, with commercial areas in Te Atatu Peninsula, Henderson and Glen Eden. Light industrial uses are concentrated in the Henderson Valley and Lincoln areas.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	41,004	41,227	41,488	41,733	42,144
Length of sewer (km)	727	730	732	893	866

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
2	25 Blethyn Place	-	2	Henderson Creek (southern arm)
3	13 Ascot Avenue	-	2	Taikata Stream
4	144-160 Triangle Road	-	2	Rarawaru Stream
5	9 Glenford Lane	-	2	Henderson Creek
6	50 Kingdale Road	-	2	Lincoln Stream
7	14B Woodglen Road	-	2	Waikumete Stream
8	16 Chilcot Road	-	2	Henderson Creek (southern arm)
690	Western WWPS	DPFLN	1	Henderson Creek (southern arm)
691	Te Atatu Central WWPS	DPTEA	1	Harbourview Beach
692	Te Atatu North WWPS	DPTEN	1	Estuary at Orukawai Point
748	Glen Eden Branch MH16	DSGLE	2	Henderson Creek (southern arm)
749	Swanson Branch MH15	DSSWN	2	Huruhuru Creek
1278	135 Millbrook Road	-	2	Waikumete Stream
1539	Blethyn Place Reserve	-	2	Henderson Creek (southern arm)
1556	Upper Glen Eden Storage Tank - Downstream	DSGLE	2	Waikumete Stream
1583	Matipo Road	-	2	Henderson Creek

The following EOPs have been constructed and added to the EOP schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
1557	Upper Glen Eden Storage Tank – On Storage Tank	DSGLE	2	Waikumete Stream	New EOP

2.19.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
13/02/2019	DPFLN	Western Wholesale Wastewater Pump Station	690	Programming Fault	48	0

Reported Incidents

There were a total of 366 reported incidents in the Henderson Creek catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
4/02/2018	133A Henderson Valley Rd	L1	200	Surcharging	47.2	Line diversion to divert high flows. Bung and rope removed
11/02/2018	133A Henderson Valley Rd	L1	767	Surcharging	29.8	
29/04/2018	133A Henderson Valley Rd	L1	177	Surcharging	1	
21/05/2018	133A Henderson Valley Rd	L1	237	Surcharging	5.53	
13/02/2018	133A Henderson Valley Rd	L1	358	Surcharging	37	
14/04/2018	133A Henderson Valley Rd	L1	185	Surcharging	3	
28/04/2018	129 Henderson Valley Rd	L1	348	Surcharging	64	
24/05/2018	133A Henderson Valley Rd	L1	107	Rubbish	2.51	
25/07/2018	133A Henderson Valley Rd	L1	74	Surcharging	0	
11/11/2018	133 Henderson Valley Rd	L1	314	Foreign Object	0	
4/02/2018	153 Don Buck Rd	L1	171	Surcharging	47.2	Continue to monitor Ongoing issue at
13/02/2018	153 Don Buck Rd	L1	203	Surcharging	37	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
25/01/2019	153 Don Buck Rd	L1	513	Rags	0	Aldern Rd
3/07/2017	7 Surman Pl	L1	132	Unknown	0	Flushed and cleared blockage. CCTV, Debris removed from main
5/07/2017	7 Surman Pl	L1	224	Unknown	7.5	
7/03/2018	7 Surman Pl	L1	608	Unknown	2.5	
14/06/2018	7 Surman Pl	L2	398	Fat	0.5	
13/07/2018	7 Surman Pl	L1	123	Fat	2.5	
22/07/2018	7 Surman Pl	L1	300	Unknown	0	
9/08/2018	7 Surman Pl	L1	141	Rags	8.5	
7/09/2018	7 Surman Pl	L1	1252	Unknown	10	
6/01/2018	163 Atkinson Rd	L1	187	Roots	0	Removed roots and wipes, rehaunched manhole
3/03/2018	163 Atkinson Rd	L1	135	Unknown	2.5	
16/12/2018	163 Atkinson Rd	L1	42	Roots	0	
28/04/2018	1/1 Takapu St	L1	217	Surcharging	54.6	Continue to Monitor, Latch installed on manhole
13/02/2018	1/1 Takapu St	L1	538	Surcharging	37	
15/07/2018	1/1 Takapu St	L1	91	Surcharging	3	
24/12/2018	1/1 Takapu St	L1	51	Surcharging	67	
24/12/2018	1/1 Takapu St	L1	286	Surcharging	67	
22/05/2018	207- Lincoln Rd	L1	275	3rd party damage	9.57	Debris blockage removed
5/06/2018	207- Lincoln Rd	L1	493	3rd party damage	4.02	
26/07/2018	207- Lincoln Rd	L1	1090	3rd party damage	0.5	
13/02/2018	10 Celsmere Lane	L1	615	Surcharging	37	Under investigation with Planning team for EOP
3/06/2018	10 Celsmere Lane	L1	547	Surcharging	52.86	
28/04/2018	10 Celsmere Lane	L1	391	Surcharging	64	
15/07/2018	10 Celsmere Lane	L1	47	Surcharging	3	
29/08/2018	10 Celsmere Lane	L1	88	Surcharging	1	
25/12/2018	10 Celsmere Lane	L1	257	Surcharging	14	
25/11/2017	38 Sunline Ave	L1	159	Roots	0	6 Monthly Flushing Programme Rootcut
3/01/2018	Sunline Ave	L2	567	Fat	0	
16/02/2018	38 Sunline Ave	L1	402	Fat	0	
18/02/2019	38 Sunline Ave	L1	207	Roots	0	
3/02/2018	9 Waitoro Lane	L1	304	Surcharging	18	Line diversion i to divert high flows
13/02/2018	9 Waitoro Lane	L1	133	Surcharging	37	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
12/03/2018	9 Waitoro Lane	L1	290	Fat	32	
28/04/2018	9 Waitoro Lane	L1	393	Surcharging	64	
24/12/2018	9 Waitoro Lane	L1	283	Surcharging	67	
19/03/2017	2/5A Konini Rd	L1	405	Unknown	0	Removed large rag blockage. Fats and sanitary items flushed
22/03/2017	2/5A Konini Rd	L1	322	Fat	0.5	
23/12/2017	2/5A Konini Rd	L1	232	Fat	0	
15/07/2018	2/5A Konini Rd	L1	73	Surcharging	3	
24/12/2018	2/5A Konini Rd	L1	89	Surcharging	67	
4/04/2019	2/5A Konini Rd	L1	173	Fat	2	
14/05/2019	2/5A Konini Rd	L1	150	Fat	0	
23/05/2018	2 Mayfair Pl	L1	460	Surcharging	38.77	Heavy flush
26/06/2018	2 Mayfair Pl	L1	503	Surcharging	16.5	
3/07/2018	2 Mayfair Pl	L2	330	Unknown	1	
14/02/2017	1 Rewarewa Rd	L1	392	Fat	3.5	Removed rag blockage. Flushed main
31/01/2018	1 Rewarewa Rd	L1	507	Rags	0	
22/11/2018	1 Rewarewa Rd	L1	88	Unknown	7	
6/04/2018	4 Kopi Pl	L1	206	Unknown	2	Pipe repaired after damage by fence post
19/04/2018	4 Kopi Pl	L1	158	Fat	0	
22/08/2018	4 Kopi Pl	L1	216	Unknown	6.5	
25/08/2018	4 Kopi Pl	L1	245	Fat	2	
27/08/2018	4 Kopi Pl	L1	739	3rd party damage	1	
30/08/2018	4 Kopi Pl	L1	1003	3rd party damage	29.5	
28/07/2018	1 Bruce McLaren Rd	L1	75	Unknown	1.5	Continue to Monitor
28/07/2018	1 Bruce McLaren Rd	L1	138	Rags	1.5	
4/12/2018	1/2 Earl Rd	L1	232	Surcharging	2.5	Continue to Monitor
24/12/2018	1/2 Earl Rd	L1	95	Surcharging	67	
18/10/2018	1/22 Spargo Rd	L1	158	Fat	0.5	Flushed main Fatberg removed from main
15/04/2019	1/22 Spargo Rd	L1	156	Fat	0	
22/10/2018	1/234 Triangle Rd	L1	364	Fat	0	Flushed S/L Flushed main
28/10/2018	1/234 Triangle Rd	L1	249	Fat	2	
15/04/2019	1/234 Triangle Rd	L1	216	Unknown	0	
14/06/2019	1/234 Triangle Rd	L1	207	Unknown	0.5	

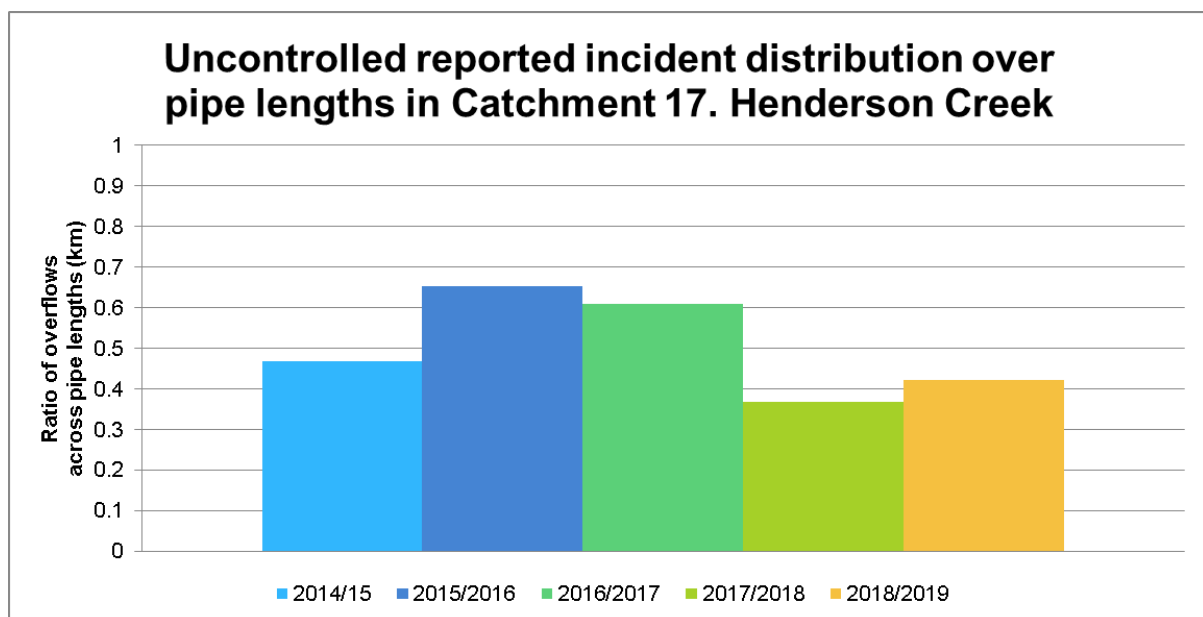
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
17/10/2018	1/31 Ti Nana Cres	L1	293	Broken pipe	0.5	Flushed S/L. Dislodged pipe repaired
28/12/2018	1/31 Ti Nana Cres	L1	222	Unknown	0	
27/11/2018	1/9 Wilson Rd	L1	54	Unknown	4.5	Under investigation
21/12/2018	1/9 Wilson Rd	L1	78	Surcharging	4	
24/12/2018	1/9 Wilson Rd	L1	102	Surcharging	67	
9/11/2018	119 Flanshaw Rd	L1	64	Fat	2.5	Flushed main
10/11/2018	119 Flanshaw Rd	L1	222	Fat	2	
17/10/2018	12 Afton Pl	L1	160	Rubbish	0.5	Rootcut manhole Flushed main
21/10/2018	12 Afton Pl	L1	133	Roots	0	
1/06/2019	12 Afton Pl	L1	108	Unknown	4.5	
29/11/2018	12 Ebony Pl	L1	106	Roots	0	Removed fat blockage
13/06/2019	12 Ebony Pl	L1	248	Fat	0.5	
3/08/2018	13 Tara Rd	L1	142	Unknown	0.5	Continue to Monitor
16/10/2018	13 Tara Rd	L1	245	Fat	0	
27/11/2018	138- Royal Rd	L1	114	Fat	4.5	Flushed main, clay and small stones removed
28/11/2018	138- Royal Rd	L1	341	Silts	0	
3/03/2019	144- Triangle Rd	L3	90	Fat	0	Fats removed from channel Fatberg, Heavy flush
17/05/2019	144- Triangle Rd	L1	105	Unknown	3.5	
22/05/2019	144- Triangle Rd	L1	137	Fat	1.5	
22/07/2018	15 Dellwood Ave	L1	410	Fat	0	Flushed main Large chunks of fat removed
7/01/2019	15 Dellwood Ave	L1	143	Fat	0	
16/01/2019	151B Don Buck Rd	L1	249	Fat	0	Flushed line and cleaned NRV
20/01/2019	151B Don Buck Rd	L1	360	Unknown	1	
25/01/2019	153 Don Buck Rd	L1	513	Rags	0	
7/07/2018	16 Keeling Rd	L1	366	Fat	0	Heavy buildup of Laundromat soap, heavy flushed
21/01/2019	16 Keeling Rd	L1	688	Fat	0	
2/01/2019	17 Aldern Rd	L1	652	Unknown	0	Flushed main, manhole repair
25/01/2019	17 Aldern Rd	L2	288	Rags	0	
4/03/2019	17 Aldern Rd	L2	282	Foreign Object	0	
22/12/2018	2 Chamberlain Rd	L1	297	Foreign Object	1.5	Flushed main
14/01/2019	2 Chamberlain Rd	L1	190	Unknown	11	
22/12/2018	2 Meynell Crt	L1	202	Roots	1.5	Rootcut

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
28/06/2019	2 Meynell Crt	L1	123	Roots	0	
26/09/2018	2/41 Don Buck Rd	L1	215	Roots	2	Roots removed from manhole Flushed fat blockage
29/06/2019	2/41 Don Buck Rd	L1	240	Fat	0	
6/07/2018	22 Candia Rd	L1	1184	Foreign Object	0	Continue to Monitor
11/09/2018	22 Candia Rd	L1	139	Fat	5	
11/09/2018	230 Don Buck Rd	L1	88	Unknown	5	Blockage removed from main
7/03/2019	230 Don Buck Rd	L1	142	Unknown	4	
26/11/2018	27 Garton Dr	L1	82	Unknown	1.5	Rodded blockage Flushed main
6/12/2018	27 Garton Dr	L1	55	Unknown	3.5	
9/01/2019	27 Jadewynn Dr	L2	511	Broken pipe	0	Pipe bridge repaired Landslip issue on-going
4/03/2019	27 Jadewynn Dr	L3	283	Broken pipe	0	
23/05/2019	27 Jadewynn Dr	L1	189	Broken pipe	1.5	
2/01/2019	3 Mulvaney Cres	L1	437	Foreign Object	0	Stones removed from channel Flushed main, fats removed
11/03/2019	3 Mulvaney Cres	L1	41	Fat	0	
16/10/2018	3 Porter Ave	L1	233	Unknown	0	Flushed line
30/01/2019	3 Porter Ave	L1	77	Unknown	0	
16/09/2018	30 Lake Panorama Dr	L1	117	Fat	0	Flushed S/L Rootcut and fats removed
18/09/2018	30 Lake Panorama Dr	L1	446	Fat	1	
27/03/2019	30 Reynella Dr	L3	297	Rags	0	Heavy wet wipe blockage removed
27/06/2019	30 Reynella Dr	L3	0	Fat	0	
31/03/2019	30 Royal View Rd	L1	74	Foreign Object	2.5	Paper flushed from S/L
30/05/2019	30 Royal View Rd	L1	180	Fat	0	
2/10/2018	330 Swanson Rd	L1	154	Rubbish	1.5	Continue to Monitor
19/04/2019	330 Swanson Rd	L1	195	Fat	0	
14/03/2019	37 Aldern Rd	L1	232	Fat	0	Flushed main Roots removed from manhole
1/04/2019	37 Aldern Rd	L1	174	Roots	38	
25/11/2018	4/5A Konini Rd	L1	172	Surcharging	14	Continue to Monitor
4/12/2018	4/5A Konini Rd	L1	140	Surcharging	2.5	
7/12/2018	45 Cedar Heights Ave	L1	205	Fat	0.5	Flushed main Rootcut
11/03/2019	45 Cedar Heights Ave	L1	83	Roots	0	
28/04/2019	50A Awaroa Rd	L1	234	Roots	10	Rootcut
9/05/2019	50A Awaroa Rd	L2	289	Roots	0	

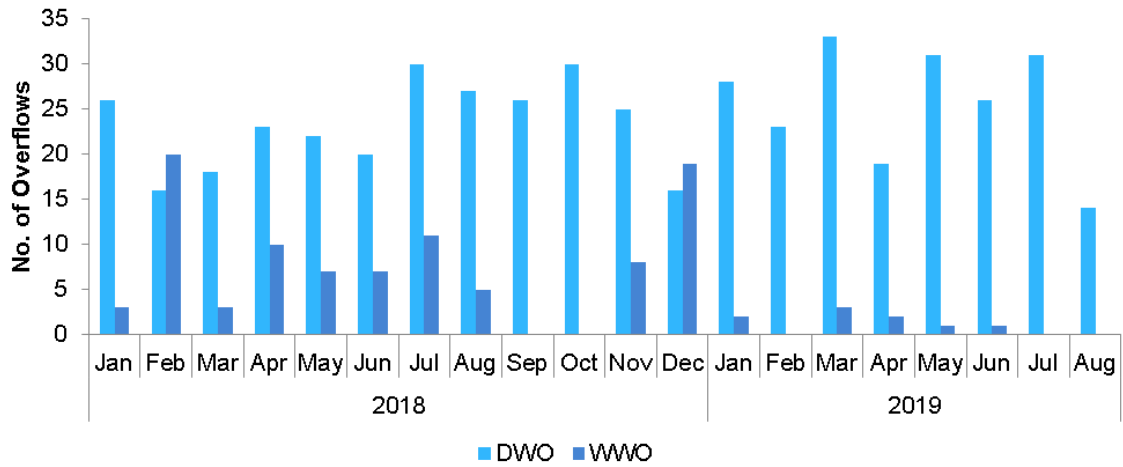
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
9/07/2018	522- Swanson Rd	L2	216	Rubbish	9.5	Debris and stones removed, faulty IP
21/07/2018	522- Swanson Rd	L2	1008	Foreign Object	0.5	
31/07/2018	522- Swanson Rd	L2	412	Fat	0.5	
6/01/2019	56 Kervil Ave	L1	239	Fat	0	Flushed main
17/02/2019	56 Kervil Ave	L1	109	Rubbish	0	
4/04/2019	571 Te Atatu Rd	L1	132	Fat	2	Fat blockage removed from main CCTV
6/04/2019	571 Te Atatu Rd	L1	171	Fat	6.5	
9/04/2019	571 Te Atatu Rd	L1	85	Fat	0	
9/08/2018	76 Ulrich Dr	L2	353	Fat	8.5	Flushed main
26/03/2019	76 Ulrich Dr	L1	163	Unknown	0	
25/11/2018	Starforth Pl	L1	91	Fat	14	Roots removed from manhole
5/03/2019	Starforth Pl	L1	114	Roots	0	
4/07/2018	Swanson Rd	L1	188	Fat	1.5	Flushed main
15/01/2019	Swanson Rd	L1	239	Fat	0.5	

2.19.3 Trend analysis of reported incidents

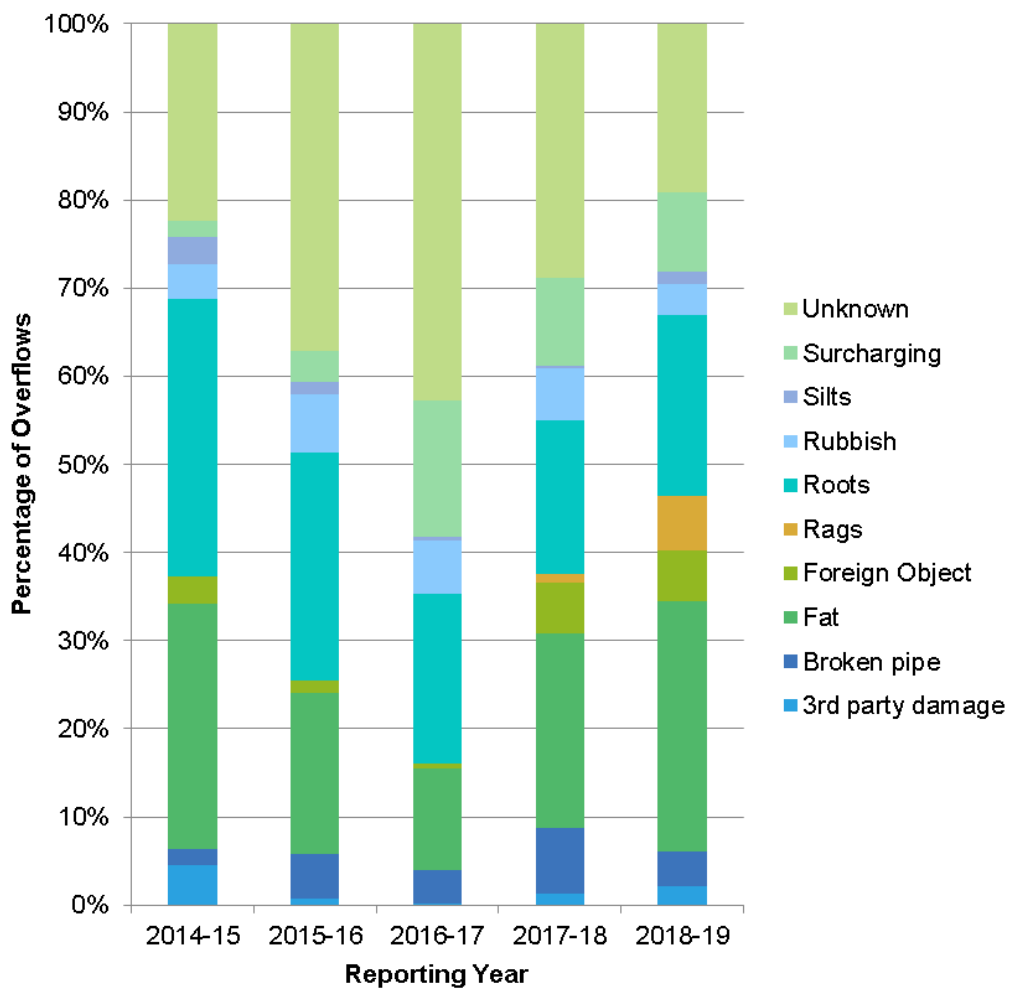
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



2018-19 Uncontrolled Reported Incidents Data for Catchment 17. Henderson Creek



Cause of Overflows 2014-2019 Catchment 17. Henderson Creek



Trend analysis has been carried out where the cause has been identified.

2.19.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPTEN	Te Atatu North Wholesale Wastewater Pump Station	692	Rain event	793	3
15/07/2018	DPFLN	Western Wholesale Wastewater Pump Station	690	Rain event	387	3
24/12/2018	DPTEN	Te Atatu North Wholesale Wastewater Pump Station	692	Rain event	881	67
24/12/2018	DSGLE	Glen Eden Branch MH16	748	Rain event	383	67
24/12/2018	DPFLN	Western Wholesale Wastewater Pump Station	690	Rain event	2267	67
25/12/2018	DPTEN	Te Atatu North Wholesale Wastewater Pump Station	692	Rain event	599	14

2.19.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
690	Western WWPS	1.2	2	0	5	6	2	3	Northern Interceptor
691	Te Atatu Central WWPS	0	0	0	0	0	0	0	Continue to monitor
692	Te Atatu North WWPS	1.2	2	2	12	8	3	5.4	Massey Siphon Upgrade & Northern Interceptor
1217	Easter Parade Wastewater Pump Station	-	0	0	0	2	0	0.4	Continue to monitor

Type 2 – Engineered Overflow Point data

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
748	Glen Eden Branch MH16	-	-	-	-	-	1	1	Continue to Monitor

Type 3 – uncontrolled overflow rolling WWO data from 1 July 2014 – 30 June 2019

The following locations are reported as Type 3 overflow locations.

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
S20	Te Atatu North Branch Sewer MH 1	0.7	0	1	0	0	0	0.2	Operational mitigation measures undertaken. Northern Interceptor project
S21	Te Atatu North Branch Sewer MH 2	2.2	0	0	0	0	1	0.2	Operational mitigation measures undertaken. Northern Interceptor project
S22	Te Atatu North Branch Sewer MH 5	2.7	2	4	3	2	0	2.8	Operational mitigation measures undertaken. Northern Interceptor project
S23	Te Atatu North Branch Sewer MH 6	3.1	4	5	4	1	0	2.8	Operational mitigation measures undertaken. Northern Interceptor project
S24	Whenuapai Branch Sewer MH 10	3	4	2	5	3	4	3.6	Operational mitigation measures undertaken. Northern Interceptor project
S63	Whenuapai Branch Sewer MH 9A	n/a	n/a	3	3	0	1	1.75	Operational mitigation measures undertaken. Northern Interceptor project
S11	Glen Eden Branch Sewer MH 62	1.7	3	3	1	0	0	1.4	Upper Glen Eden Storage Tank and Branch Sewer - construction underway
S23	Glen Eden Branch Sewer MH 63	0.9	3	1	2	0	0	1.2	Upper Glen Eden Storage Tank and Branch Sewer - construction underway
S13	Glen Eden Branch Sewer MH 64	2	-	4	-	0	0	0.8	Upper Glen Eden Storage Tank and Branch Sewer - construction

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
									underway
S14	Glen Eden Branch Sewer MH 69A	1.6	-	3	-	1	0	0.8	Upper Glen Eden Storage Tank and Branch Sewer - construction underway
S15	Glen Eden Branch Sewer MH 79	1	0	1	0	0	0	0.2	Upper Glen Eden Storage Tank and Branch Sewer - construction underway
S16	Glen Eden Branch Sewer MH 88	0.9	-	2	-	1	1	0.8	Upper Glen Eden Storage Tank and Branch Sewer - construction underway
S17	Glen Eden Branch Sewer MH 93A	1.2	2	5	4	2	1	2.8	Upper Glen Eden Storage Tank and Branch Sewer - construction underway
S18	Massey Branch Sewer MH10	3	4	2	4	4	4	3.6	Massey and Swanson Siphon upgrades – design underway
S19	Massey Branch Sewer MH14	1.3	2	1	0	1	0	0.8	Massey and Swanson Siphon upgrades – design underway
S30	121A Millbrook Road	n/a (previously a Type 2)	-	-	-	0	0	0	Continue to monitor

2.19.6 Inflow & Infiltration Programme

Inflow investigations have been completed in the Te Atatu North catchment and compliance is in progress to address private property drainage issues. Additional Inflow & Infiltration I&I field investigations were completed in early 2019. Public network CCTV is planned for future investigation.

2.19.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Northern Interceptor - Stage 1	Project Execution	To allow wastewater flows to be diverted from the Northern Strategic Growth Area (NorSGA) and South Rodney (Kumeu / Huapai/Riverhead) to the Rosedale wastewater treatment plant. This balances flows at the treatment plants and provides additional capacity to the Western Interceptor	This project is required to service greenfield growth and avoid capacity-related dry weather overflows. Will reduce the load on the Western Interceptor and also reduce Type 3 overflows S20, S21 and S24	2012-2021
Underway	Northern Interceptor - Stage 2 – diversion of additional catchments	Option Development (Feasibility)	To allow additional wastewater flows to be diverted from the Waitakere catchments to the Rosedale Wastewater Treatment Plant.	This will reduce the load on the Western Interceptor and reduce the frequency of overflows at Type 3 EOPs S19, 20, 21, 22, 23 and 24.	Dependent upon timing of growth
Complete	Upper Glen Eden storage tank and branch sewer upgrade	Closure	Glen Eden branch sewer has insufficient capacity to convey flows during wet weather and has limited capacity for future growth	Reduction in volume and frequency of wet weather overflows, addresses numerous Type 3 overflows	2018
Complete	Massey and Swanson siphon upgrades	Closure	These are critical assets with a high risk of failure, and require additional capacity to address growth and levels of service	Will reduce risk of asset failure and address Type 3 overflows	2012-2019
Complete	Matipo Rd EOP	Closure	New EOP to mitigate uncontrolled overflow to land with a high risk of adverse public health impacts	Will reduce the frequency and volume of overflows at Type 3 locations	2017
Underway	Whenuapai Branch Type 3 mitigation	Studies and investigations	Further reductions of uncontrolled overflow frequencies prior to resolution through major capital projects	Depending upon the outcomes, further minor capital works with uncontrolled overflows further	2018

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
				reduced	
Underway	Lawsons Creek Branch Sewer Duplication	Project Execution	Lawsons Creek Branch Sewer duplication to cater for growth in West Harbour	Reduces overflow volume/ frequency and allows for growth	2017-2020
Future	Northern Interceptor – Hobsonville to Westgate	Studies and investigations	Northern Interceptor gravity tunnel from Westgate to Hobsonville pump station	This will reduce the load on the Western Interceptor and reduce the frequency of overflows. It will service greenfield growth.	2019-2025
Underway	Red Hills Wastewater Upgrade	Project Execution	Installation of transmission sewer and pump station to service growth	Ready for development by 2022-2026 with bulk wastewater services	2017-2020
Underway	Wastewater Main Renewals and Lining Programme	Project Execution	Network wastewater pipe renewal at 38 sites	Upgraded network pipe condition	2015-2018
Complete	Henderson Valley Road Diversion	Closure	Repeat wet weather overflow area due to capacity restraints	Diversion of network to a separate line with capacity to handle wet weather flow. This will reduce the frequency of overflows.	2018

2.19.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2018 and 30 June 2019.

2.19.9 Summary

There were two Type 1 EOPs which have discharged more frequently than two spills per year. The ratio of uncontrolled overflows in this catchment increased in this reporting period. Fat and roots contributed to the majority of overflows, with surcharging events also contributing a large proportion. In the long term, the network performance in this catchment will be improved with the 'Upper Glen Eden storage tank', 'Massey and Swanson siphon upgrades' and 'Northern Interceptor' and other projects, which will provide wastewater capacity. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. This network will continue to be monitored and will be

responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.20 Catchment 18 – Whau River

2.20.1 Overview

The Whau River catchment covers an area of approximately 25 km² in the western part of the Auckland Isthmus. The Whau River catchment boundary reflects a combination of the topographic and wastewater network catchment boundaries. The catchment includes all or part of the suburbs Te Atatu South, Glendene, Kelston, North Titirangi, Green Bay, Glen Eden, New Lynn, Blockhouse Bay and Avondale, with 22,037 wastewater connections.

The Whau has a long history of commercial and industrial development. Current land use in the catchment is predominantly residential, with substantial pockets of light industrial and commercial development in the Rosebank, Avondale, New Lynn and Glendene areas.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	21,663	21,743	21,840	21,932	22,037
Length of sewer (km)	349	349	349	406	387

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
10	38 La Rosa Street	-	2	Avondale Stream
38	Sceptre Place WWPS	DPSTR	1	Whau River Estuary
41	Riversdale Rd WWPS	DPRVD	1	Whau River Estuary
42	Lidcombe Place WWPS	DPLID	1	Waterview Embayment
44	Ash St WWPS	DPASH	1	Whau River Estuary
607	Rosebank Rd No.1 WWPS	DPRB1	1	Waterview Embayment
609	Endeavour St WWPS	DPEND	1	Blockhouse Bay
617	Holly St No. 1 WWPS	DPHS1	1	Waterview Embayment
618	Holly St No. 2 WWPS	DPHS2	1	Waterview Embayment
621	Kenley Place WWPS	DPKEY	1	Whau River Estuary
622	Lewis St WWPS	DPLEW	1	Blockhouse Bay
625	Mead St WWPS	DPMED	1	Whau River Estuary
629	Patiki Rd WWPS	DPPKI	1	Whau River Estuary
634	Rosebank Rd No. 2 WWPS	DPRB2	1	Waterview Embayment
644	Timothy Place WWPS	DPTIM	1	Whau River Estuary
656	Esmeralda Ave WWPS	DPESM	1	Whau River Estuary
695	St George WWPS	DPWIN	1	Whau Creek
752	Network overflow, Rosebank siphon	DSRSB	2	Whau River Estuary
1536	103 Seabrook Ave	-	2	Manawa Stream

There have been no changes to the Schedule of EOPs.

2.20.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
17/07/2018	DPASH	Ash Street Wastewater Pump Station	44	Power Failure	207	1
18/07/2018	DPASH	Ash Street Wastewater Pump Station	44	Power Failure	263	1.2

Reported Incidents

There were a total of 228 reported incidents in the Whau River catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
5/01/2017	31 Maple St	L1	253	Rubbish	0	Heavy fats and rags removed
21/01/2017	31 Maple St	L1	88	Roots	17	
10/03/2017	31 Maple St	L1	144	Surcharging	78.99	
27/06/2017	35 Maple St	L1	428	Unknown	0.2	
29/10/2017	37 Maple St	L1	254	Fat	0.2	
19/04/2018	37 Maple St	L1	347	Fat	0	
24/08/2018	37 Maple St	L1	91	Rags	2	
15/11/2018	37 Maple St	L1	90	Fat	0	
30/11/2018	31 Maple St	L1	12	Fat	0.4	
15/10/2017	2/34 Copley St	L1	120	Roots	0	Line placed on Programmed Flushing List
23/05/2018	4/36 Copley St	L1	70	Unknown	38	
3/06/2018	4/36 Copley St	L1	643	Surcharging	33.8	
16/07/2018	3/36 Copley St	L1	96	Surcharging	2.2	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
2/06/2018	119 Bolton St	L2	352	Unknown	0	Heavy flushed
9/06/2018	119 Bolton St	L1	437	Foreign Object	0	
7/12/2018	119 Bolton St	L1	266	Unknown	0	
27/09/2017	58A Lantana Rd	L1	449	Unknown	0.2	Large dipped section of pipe, Heavy flushed
25/11/2017	58A Lantana Rd	L1	121	Rubbish	0	
9/12/2017	58A Lantana Rd	L1	121	Unknown	0	
18/06/2018	58A Lantana Rd	L1	174	Unknown	2.4	
15/07/2018	58A Lantana Rd	L1	224	Rubbish	62.4	
28/03/2017	2/61 Beaubank Rd	L1	144	Unknown	0.19	Fat blockage removed
8/11/2017	2/61 Beaubank Rd	L1	207	Fat	7.2	
10/01/2019	1/61 Beaubank Rd	L1	128	Fat	0	
16/09/2017	34 Lyndhurst Rd	L2	240	Rubbish	9	Heavy flushed
13/02/2018	34 Lyndhurst Rd	L1	534	Surcharging	37	
28/08/2018	34 Lyndhurst Rd	L1	107	Unknown	0	
3/09/2018	34 Lyndhurst Rd	L1	229	Unknown	2.4	
21/10/2018	34 Lyndhurst Rd	L2	167	Unknown	0	
9/05/2019	34 Lyndhurst Rd	L1	208	Fat	0	
6/12/2017	110A Mcleod Rd	L1	196	Unknown	1	Rag blockage removed Flushed S/L
22/05/2018	110 Mcleod Rd	L1	140	Rags	7.4	
30/12/2018	110A Mcleod Rd	L1	188	Unknown	0	
3/12/2018	1 Falkirk St	L1	92	Surcharging	36.4	Large dip in line Debris removed from manhole
9/12/2018	1 Falkirk St	L1	827	Broken pipe	0	
17/06/2019	1 Falkirk St	L1	66	Rubbish	2.8	
10/06/2019	1/11 Alston Ave	L1	73	Rubbish	0	Debris removed from S/L Fat and rags removed from main
25/06/2019	1/11 Alston Ave	L1	161	Fat	0	
14/09/2018	1/19 Gardner Ave	L1	163	Roots	0	Heavy flush
17/09/2018	1/19 Gardner Ave	L1	423	Unknown	3.8	
14/10/2018	1/19 Gardner Ave	L1	127	Unknown	0.2	
19/01/2019	1/19 Gardner Ave	L2	333	Unknown	0	
16/07/2018	1/30 Avondale Rd	L1	89	Unknown	2.2	Continue to Monitor
11/10/2018	1/30 Avondale Rd	L1	90	Unknown	13.4	

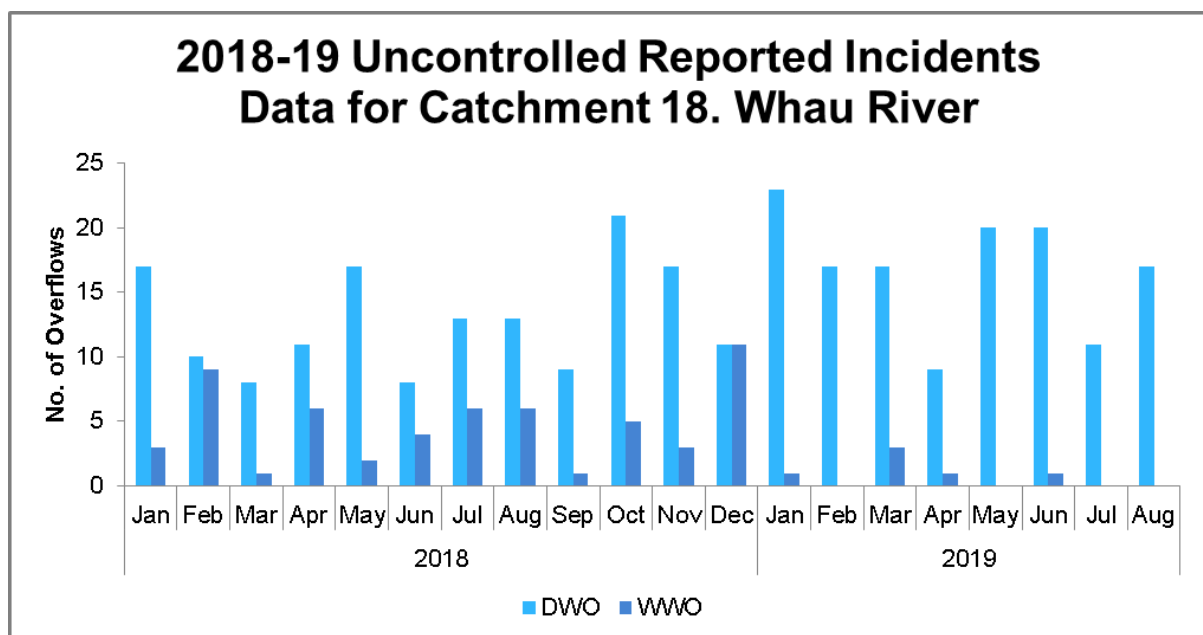
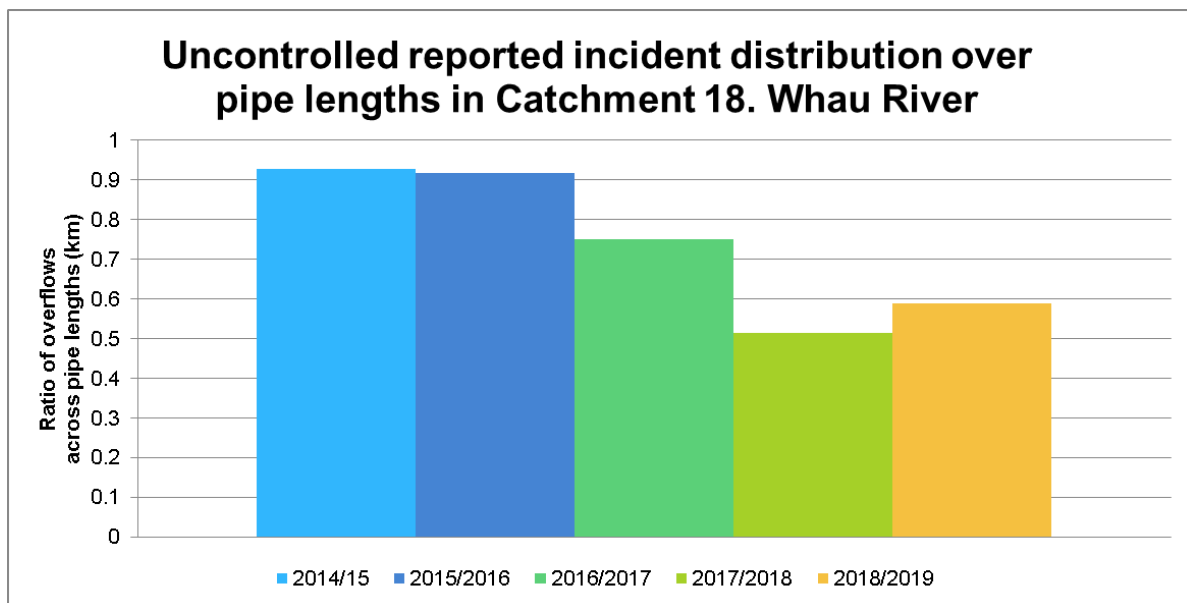
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
30/10/2018	1/7 Juneau Pl	L1	84	Fat	12.6	Flushed main Heavy fats and roots removed
31/10/2018	1/7 Juneau Pl	L1	1309	Fat	1.6	
4/05/2019	102 Ash St	L1	164	Fat	0	Flushed fats in main
19/05/2019	102 Ash St	L1	161	Rubbish	4.2	
17/06/2019	105 Holly St	L1	72	Fat	2.8	Cleared fat from main
25/06/2019	105 Holly St	L1	60	Fat	0	
22/07/2018	12 Avonleigh Rd	L1	385	Fat	8.8	Continue to Monitor
26/11/2018	12 Avonleigh Rd	L1	113	Surcharging	3.2	
24/12/2018	12 Avonleigh Rd	L1	152	Surcharging	84.6	
20/06/2019	125 Ash St	L1	341	Fat	3.6	NRV installed, fats cleared
13/08/2018	127 Ash St	L1	182	Unknown	13.8	
22/10/2018	134 Godley Rd	L2	138	Rags	0	Wet wipe blockage removed
26/11/2018	134 Godley Rd	L1	138	Fat	3.2	
19/12/2018	134 Godley Rd	L1	135	Rags	10.6	
2/07/2018	14 Merchant Ave	L1	171	Roots	3.4	CSE rootcut and heavy flush
5/07/2018	14 Merchant Ave	L1	560	Fat	0	
25/01/2019	2 Rerewai Pl	L1	110	Fat	0	Flushed S/L
8/02/2019	2 Rerewai Pl	L1	297	Unknown	0	
9/08/2018	2 Te Wiata Pl	L1	262	Unknown	0.6	Flushed main
23/08/2018	2 Te Wiata Pl	L1	208	Fat	6	
2/11/2018	2/19 Mitchell St	L1	197	Unknown	0	Junction repaired
5/06/2019	2/19 Mitchell St	L1	79	Broken pipe	14.8	
21/10/2018	2/39 Koromiko St	L1	160	Roots	0	Rodded root blockage
30/10/2018	2/39 Koromiko St	L1	383	Roots	12.6	
31/10/2018	2/39 Koromiko St	L1	326	Roots	1.6	
23/03/2019	223 Titirangi Rd	L1	287	Fat	0	Flushed heavy fat blockage
31/03/2019	223 Titirangi Rd	L1	113	Unknown	0.2	
23/04/2019	223 Titirangi Rd	L1	95	Unknown	2	
10/11/2018	26 Kinross St	L1	777	Broken pipe	0.6	Dislodged pipe, benching repaired
12/11/2018	26 Kinross St	L1	1405	Broken pipe	2.4	
29/08/2018	26 Miro St	L1	71	Fat	17.6	Rags removed from

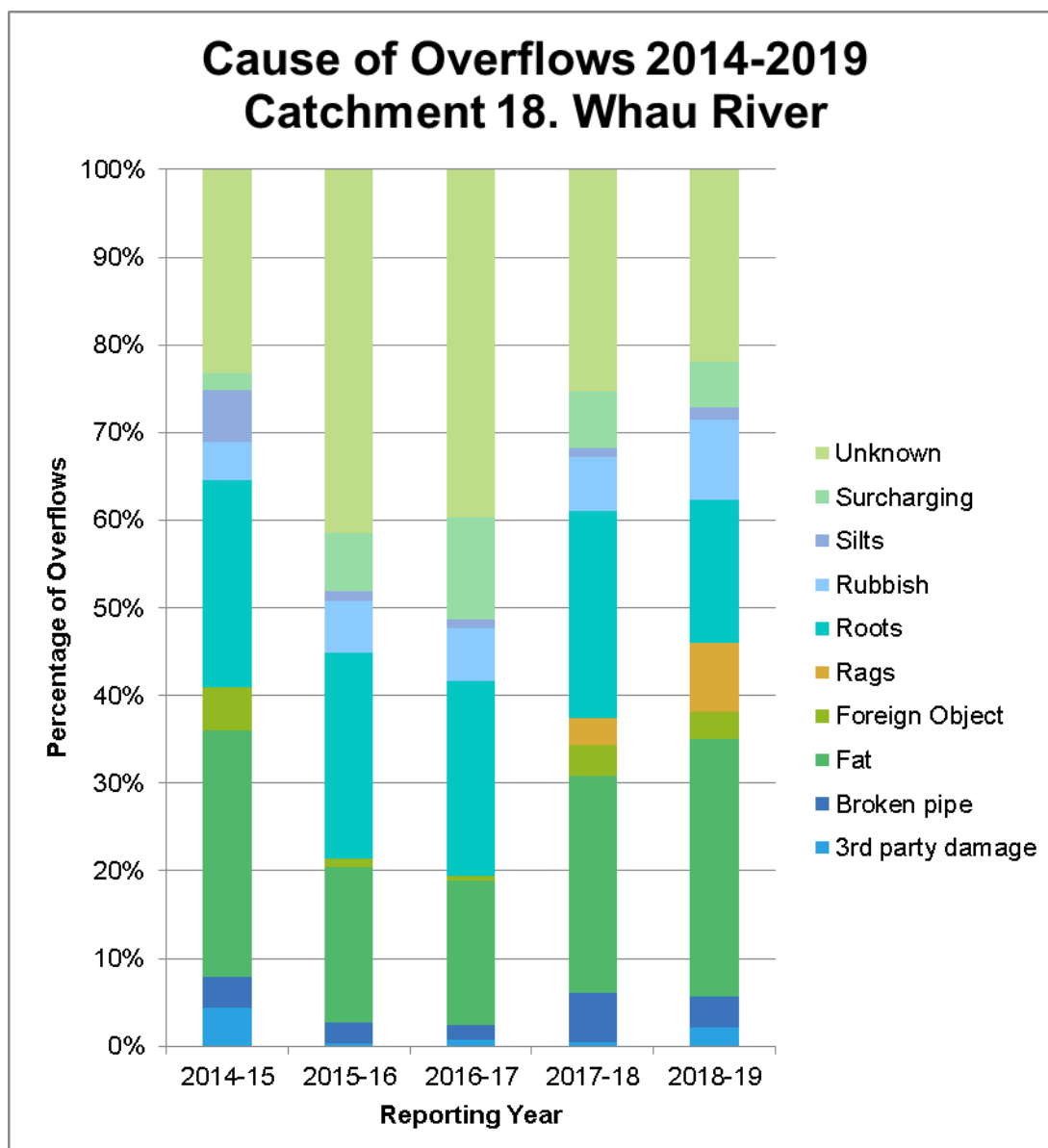
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
23/06/2019	26 Miro St	L1	222	Rags	5.6	S/L
26/05/2019	27 Roland HI	L2	467	Roots	0	Rootcut Flushed main
27/05/2019	27 Roland HI	L1	309	Roots	0	
11/08/2018	28 Miro St	L1	163	Roots	0	Heavy flush
2/01/2019	28 Miro St	L1	276	Unknown	0	
17/02/2019	28 Miro St	L1	239	Fat	0	
28/02/2019	28 Miro St	L1	210	Unknown	0.4	
16/02/2019	3 Palmer Ave	L1	245	Fat	0	Rootcut Flushed fats in main
24/02/2019	3 Palmer Ave	L1	142	Roots	3.6	
8/03/2019	3 Palmer Ave	L1	219	Fat	15.6	
25/03/2019	3 Palmer Ave	L1	514	Unknown	0	
13/05/2019	3 Palmer Ave	L1	67	Fat	2	
25/03/2019	3 Swinburne St	L1	76	Fat	0	Huge fat blockage in manhole, flushed
14/05/2019	3 Swinburne St	L1	186	Unknown	0.2	
25/09/2018	31 Akehurst Ave	L1	166	Unknown	5.2	Continue to Monitor
16/10/2018	31 Akehurst Ave	L1	149	Unknown	0	
22/08/2018	31 Kohekohe St	L1	411	Surcharging	19.8	Benching caused blockage, debris removed
3/09/2018	31 Kohekohe St	L1	580	Broken pipe	2.4	
15/07/2018	32 Glynnbrooke St	L1	357	Surcharging	62.4	Continue to Monitor
28/10/2018	32 Glynnbrooke St	L1	103	Roots	1.4	
25/02/2019	4026- Great North Rd	L1	197	Fat	0	Flushed fat blockage
23/03/2019	4026- Great North Rd	L1	332	Fat	0	
14/05/2019	56 Miro St	L1	128	Fat	0.2	Flushed main
26/05/2019	56 Miro St	L1	258	Roots	0	
17/04/2019	5A Queen Mary Ave	L2	120	Fat	0	Heavy fat, heavy flush
28/05/2019	5A Queen Mary Ave	L1	164	Fat	5.4	
10/01/2019	72 La Rosa St	L1	215	Unknown	0	Patch repair of line
24/01/2019	72 La Rosa St	L1	102	3rd party damage	5.2	
18/07/2018	84 Butterworth Dr	L1	262	Unknown	1.2	Flushed main Flushed junction
5/01/2019	84 Butterworth Dr	L1	136	Unknown	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
12/03/2019	93 Ash St	L1	106	Unknown	0	Flushed S/L
23/05/2019	93 Ash St	L1	137	Unknown	0	
5/08/2018	98 Canal Rd	L1	113	Rubbish	0.8	Rags and roots cleared
8/01/2019	98 Canal Rd	L1	658	Rags	0	

2.20.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where root cause has been identified.

2.20.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	500	62.4
29/08/2018	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	19	17.6
24/12/2018	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	515	84.6
25/12/2018	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	90	22.4
24/12/2018	DPASH	Ash Street Wastewater Pump Station	44	Rain event	1345	84.6

2.20.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
38	Sceptre Place WWPS	1	0	0	0	0	0	0	Continue to monitor
41	Riversdale Rd WWPS	1	0	1	1	0	0	0.4	Continue to monitor
42	Lidcombe Place WWPS	1	0	0	1	1	0	0.4	Continue to monitor
44	Ash St WWPS	1	2	1	2	3	1	2	Continue to monitor
607	Rosebank Rd No.1 WWPS	1	0	0	0	0	0	0	Continue to monitor
609	Endeavour St WWPS	1	1	1	0	0	0	0.4	Continue to monitor
617	Holly St No.1 WWPS	1	0	0	0	0	0	0	Continue to monitor
618	Holly St No. 2 WWPS	1	0	0	0	1	0	0.2	Continue to monitor
621	Kenley Place WWPS	1	0	0	0	0	0	0	Continue to monitor
622	Lewis St WWPS	1	1	3	0	1	0	1	Continue to monitor
625	Mead St WWPS	1	1	0	0	0	0	0.2	Continue to monitor
629	Patiki Rd WWPS	1	0	1	0	0	0	0.2	Continue to monitor
634	Rosebank Rd No. 2 WWPS	1	0	0	0	0	0	0	Continue to monitor
644	Timothy Place WWPS	1	0	0	0	0	0	0	Continue to monitor
656	Esmeralda Ave WWPS	1	0	0	0	0	0	0	Continue to monitor
695	St George WWPS	3.4	3	6	8	11	4	6.4	Central Interceptor Main Works

2.20.6 Inflow & Infiltration Programme

A reactive Inflow and Infiltration (I&I) investigation was undertaken in a small subcatchment in Kelson, New Lynn (Kohekohe Street). Any public issues identified have been remediated, and private property drainage issues have been passed on to Auckland Council's Compliance team.

2.20.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Northern Interceptor - Stage 1	Project Execution	To allow wastewater flows to be diverted from the Northern Strategic Growth Area (NorSGA) and South Rodney (Kumeu / Huapai/Riverhead) to the Rosedale wastewater treatment plant. This balances flows at the treatment plants and provides additional capacity to the Western Interceptor	This project is required to service greenfield growth and avoid capacity-related dry weather overflows. Will reduce the load on the Western Interceptor and also reduce Type 3 overflows S20, S21 and S24	2012-2021
Underway	Northern Interceptor - Stage 2 – diversion of additional catchments	Option Development (Feasibility)	To allow additional wastewater flows to be diverted from the Waitakere catchments to the Rosedale Wastewater Treatment Plant.	This will reduce the load on the Western Interceptor and reduce the frequency of overflows at Type 3 EOPs S19, 20, 21, 22, 23 and 24.	2022-2036
Underway	Central Interceptor – main works and link sewers	Project Execution	This project, as well as addressing numerous wet weather overflows, will also address the risk of failure of the Manukau siphon, and also provide for urban growth. To address growth, level of service, and asset condition risks	The Central Interceptor will have multiple and widespread benefits through immediate improvements in wet weather overflow frequency and enabling upgrades for growth and level of service upgrades through the isthmus	2017-2025
Future	Avondale/Whau Wastewater Catchment Improvements	Studies and investigations	Programme of work to enable growth and reduce wet weather overflows	Reduction of wet weather overflows	2018-2022
Underway	Wastewater Main Renewals and Lining Programme	Project Execution	Network wastewater pipe renewal at 38 sites	Upgraded network pipe condition	2015-2018

2.20.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2018 and 30 June 2019.

2.20.9 Summary

There was one EOP which discharged more frequently than two spills per year on average to date; St George WWPS will be addressed in the long-term by the Central Interceptor improvements and operational improvements will be further investigated in the short-term. Trend analysis shows that roots and fats cause the majority of blockages in this catchment, with a decrease in surcharging this year. In the long term, the network performance in this catchment will be improved with the Central Interceptor project, which will provide wastewater network capacity. The overflow history will be analysed and utilised when reviewing future network improvement I&I programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

2.21 Catchment 19 – Laingholm

2.21.1 Overview

The Laingholm catchment is located in the west of Auckland, along the northern border of the Manukau Harbour, stretching from Green Bay west along the coast to Bokel Bay/Laingholm. The catchment covers an area of approximately 1,030 ha, with the catchment boundary reflecting a combination of topographic and wastewater network catchment boundaries. There are 3,058 wastewater connections.

Land use in the catchment is characterised by residential living in a bush environment, with regenerating bush in the Waitakere Ranges Regional Park bordering the catchment to the west. The catchment includes the suburbs of Laingholm, South Titirangi, a part of Green Bay to the south of Godley Road, and small area of Blockhouse Bay.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	3,039	3,055	3,061	3,054	3,058
Length of sewer (km)	103	104	104	104	120

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
693	Laingholm WWPS	DPLNG	1	Waiohua Creek
694	Wood Bay WWPS	DPWDB	1	Wood Bay

There have been no changes to the Schedule of EOPs.

2.21.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 52 reported incidents in the Laingholm catchment.

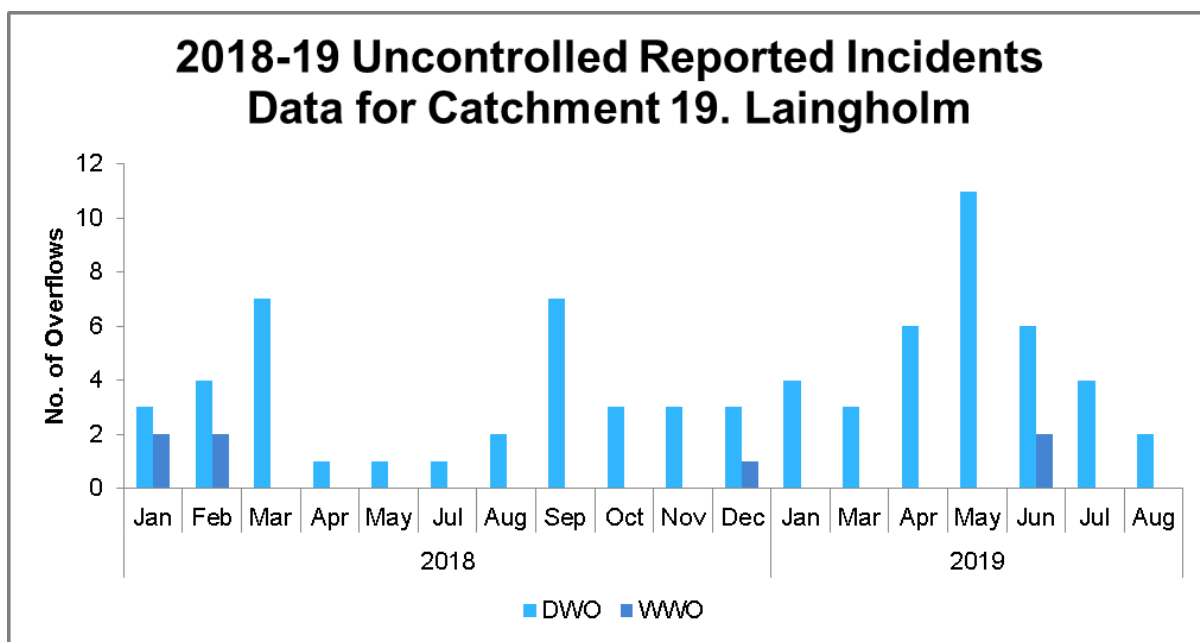
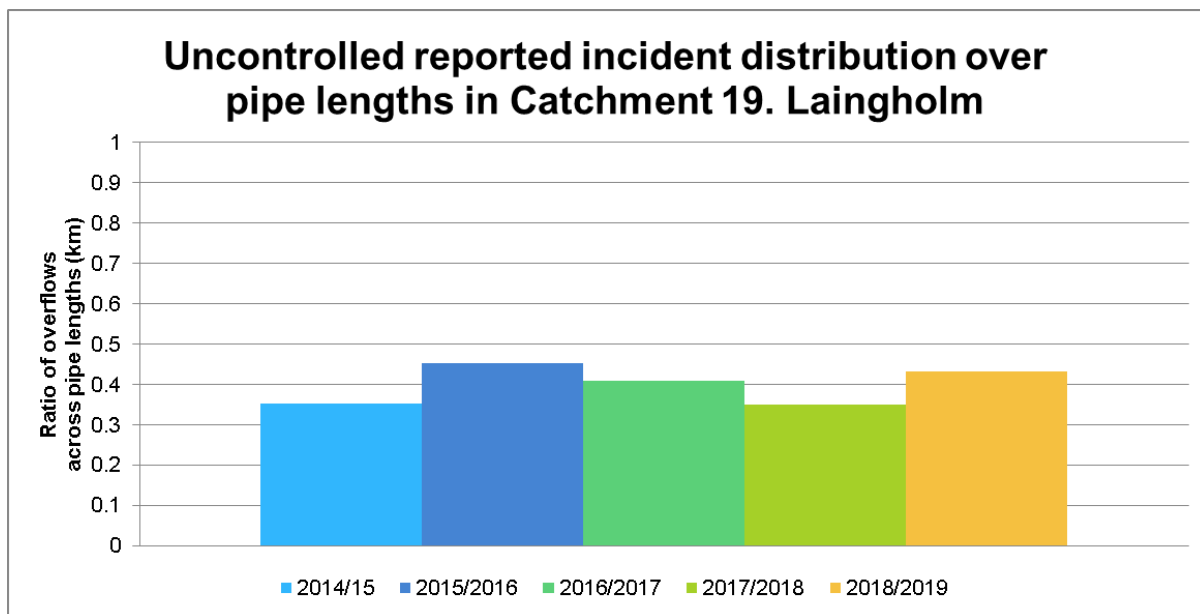
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

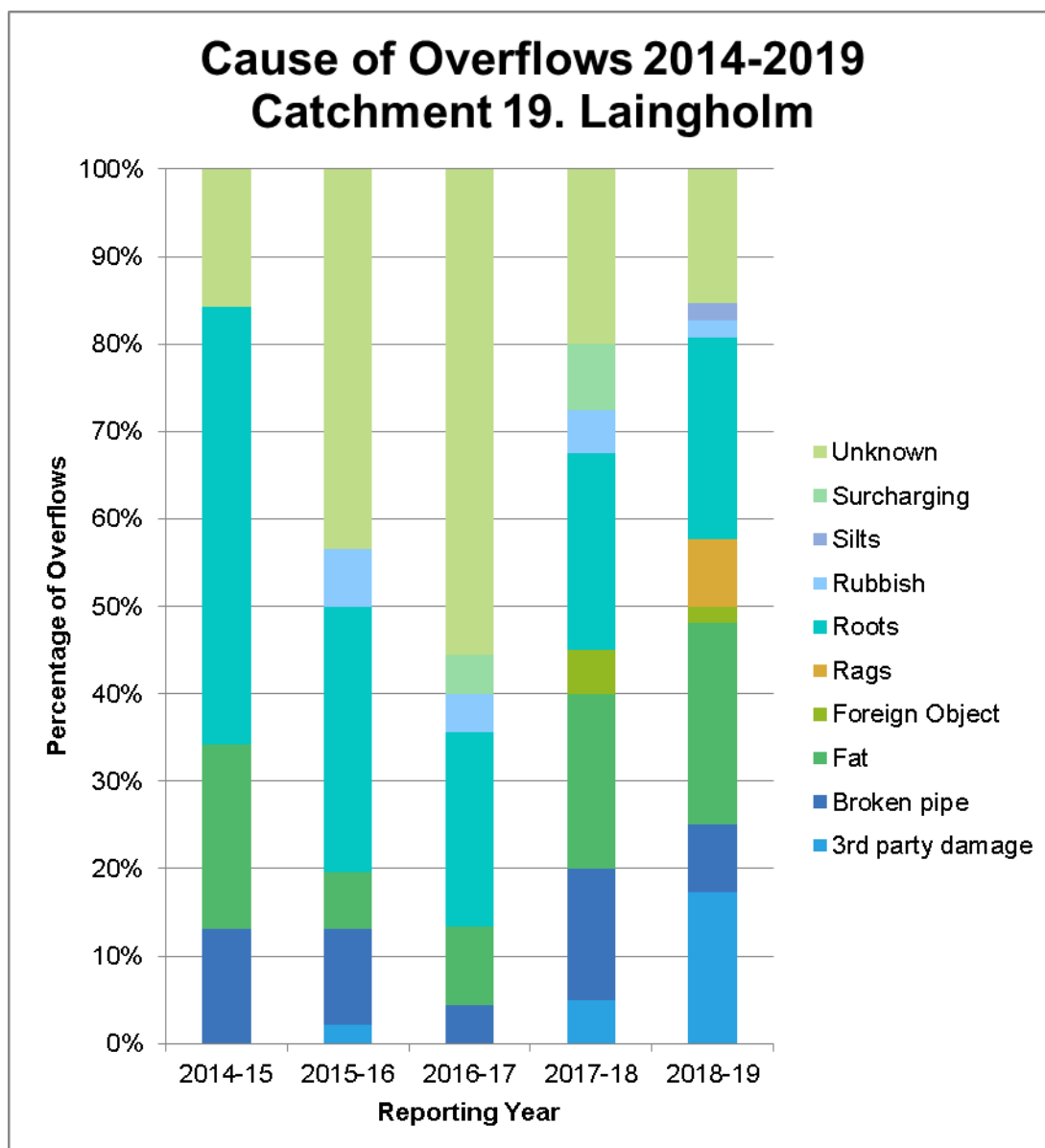
The table overleaf shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
16/09/2018	105 Kauri Point Rd	L1	172	Fat	0	Rootcut
13/12/2018	105 Kauri Point Rd	L2	288	Fat	0	
27/08/2018	20 Western Rd	L1	776	Fat	0	Heavy fats removed Flush x 3, dips in main
20/09/2018	20 Western Rd	L1	545	Fat	0	
8/09/2018	644 South Titirangi Rd	L1	632	Broken pipe	0	Broken pipe repaired
12/09/2018	644 South Titirangi Rd	L1	402	Broken Pipe	0	
6/10/2018	8 Aydon Rd	L1	351	Unknown	0	Chorus line drilled through S/L
15/05/2019	8 Aydon Rd	L1	214	3rd party damage	4	
16/05/2019	8 Aydon Rd	L1	255	3rd party damage	2.2	
19/05/2019	8 Aydon Rd	L1	113	3rd party damage	4.2	
23/05/2019	8 Aydon Rd	L1	657	3rd party damage	0	
25/05/2019	8 Aydon Rd	L1	259	3rd party damage	0	
26/05/2019	8 Aydon Rd	L1	265	3rd party damage	0	
28/05/2019	8 Aydon Rd	L1	176	3rd party damage	5.4	
1/06/2019	8 Aydon Rd	L1	148	Silts	10.2	
7/06/2019	8 Aydon Rd	L1	286	3rd party damage	18.6	
9/06/2019	8 Aydon Rd	L1	108	3rd party damage	0	
2/10/2018	9 Wood Bay Rd	L1	112	Rubbish	6.2	Debris removed from dropper Rags removed from manhole, rehaunch manhole
5/03/2019	9 Wood Bay Rd	L1	132	Rags	0	

2.21.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.21.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

2.21.5 Trend analysis of pump station overflows

There were no wet weather overflows at EOP's to trend.

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
693	Laingholm WWPS	0	0	0	0	0	0	0	Continue to monitor
694	Wood Bay WWPS	0	0	0	0	0	0	0	Continue to monitor
1208	Tamariki Reserve 2 Wastewater Pump Station	0	0	0	0	1	0	0.20	Continue to monitor
27	Jenkins Bay Wastewater Pump Station	0	0	0	0	1	0	0.20	Continue to monitor

2.21.6 Inflow & Infiltration Programme

The Laingholm catchment has been scoped for a joint Inflow & Infiltration and Auckland Council's Healthy Waters Safe Networks investigation. This will include CCTV of the public stormwater and wastewater network, smoke testing and private property drainage inspections. This investigation is planned to begin in late 2019.

2.21.7 Improvement Works Programme

No improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.21.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2018 and 30 June 2019.

2.21.9 Summary

There were no EOPs which have discharged more frequently than two spills per year. A joint I&I and Safe Networks field investigation with Healthy Waters has been scoped and field investigations will start in late 2019. The overflow history will be analysed and utilised when reviewing future network improvement programmes. Roots and fats were the predominant cause of uncontrolled overflows. The network has been slightly extended and no significant changes have been made to the network as a whole. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.22 Catchment 20 – Cox’s Bay

2.22.1 Overview

The Cox’s Bay catchment covers an area of approximately 25 km² in the western part of the central Auckland Isthmus. The catchment boundary reflects a combination of the topographic and wastewater network catchment boundaries. The Cox’s Bay catchment extends from Meola Reef in the west through to Arch Hill and the ridge along Great North Road, Surrey Crescent and Old Mill Road in the south, and the Ponsonby Road ridge line which forms the eastern extent of the catchment. There are 7,609 wastewater connections.

The catchment area is highly developed, being largely residential with local centres in Ponsonby, Grey Lynn and Herne Bay. The pockets of open space dotted throughout the catchment serve mainly as local parks and sports fields.

The wastewater network in the Cox’s Bay area is largely combined, which is reflected in the high number of network EOPs in the catchment.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	7,562	7,572	7,590	7,598	7,609
Length of sewer (km)	96	96	96	97	90

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
194	28 Sarsfield Street	-	2	Home Bay
195	54 Sarsfield Street	-	2	Home Bay
196	8 Sarsfield Street	-	2	Home Bay
197	1 Marine Parade	-	2	Herne Bay
198	22 Marine Parade	-	2	Cox’s Bay
199	57 Marine Parade	-	2	Cox’s Bay
200	28 Sentinel Road	-	2	Home Bay
201	97 Sarsfield Street	-	2	Home Bay
202	69 Hamilton Road	-	2	Home Bay
222	Sussex Street/ Williamson Avenue	-	2	Cox’s Creek
223	36 Scanlon Street	-	2	Cox’s Creek
224	49 Ariki Street	-	2	Cox’s Creek
225	Grey Lynn Park/ Williamson Avenue	-	2	Cox’s Creek
226	123 Williamson Avenue	-	2	Cox’s Creek
227	Elgen Street	-	2	Cox’s Creek
228	Selbourne Street/ Firth Street	-	2	Cox’s Creek
229	30 West End Road	-	2	Cox’s Creek
230	42 Wharf Road	-	2	Kelmarna Creek

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
233	65 Kelmarna Avenue	-	2	Kelmarna Creek
234	75 West End Road	-	1	Cox's Bay
235	52 Fife Street	-	2	Edgars Creek
237	91 Rose Road	-	2	Cox's Creek
238	61 Dryden Street	-	2	Cox's Creek
240	73 Dryden Street	-	2	Cox's Creek
241	55 Hakanoa Street	-	2	Cox's Creek
242	38 Sackville Street	-	2	Cox's Creek
243	58 Hakanoa Street	-	2	Cox's Creek
244	32 Tawariki Street B	-	2	Cox's Creek
246	32 Tawariki Street D	-	2	Cox's Creek
248	Wellpark Reserve	-	2	Edgars Creek
249	5 Larchwood Ave	-	2	Edgars Creek
250	25 Francis Street	-	2	Edgars Creek
251	33 Regina Street	-	2	Cox's Creek
252	22 Parawai Crescent	-	2	Cox's Creek
253	14 Parawai Cr	-	2	Cox's Creek
254	58 Fife Street	-	2	Edgars Creek
256	63a Warnock Street	-	2	Edgars Creek
260	34 Notley Street	-	2	Motions Creek
261	18 Meola Road	-	2	Motions Creek Estuary
262	26 Westmere Crescent	-	2	Motions Creek Estuary
263	36a Westmere Crescent	-	2	Motions Creek Estuary
264	25 Savage Street	-	2	Motions Creek
265	15 Notley Street	-	2	Motions Creek
266	25 Tirotai Crescent	-	2	Motions Creek Estuary
267	216 Garnet Road	-	2	Motions Creek Estuary
268	40 Lemington Road	-	2	Motions Creek Estuary
269	7 Weona Place	-	2	Motions Creek Estuary
270	1 Westmere Park Avenue	-	2	Motions Creek Estuary
271	22 Winsomere Crescent	-	2	Motions Creek Estuary
624	Masefield Avenue WWPS	DPMAC	1	Home Bay
627	Meola Road WWPS	DPMLA	1	Motions Creek Estuary

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
636	Sarsfield Street WWPS	DPSAR	1	Home Bay
652	Webber Street WWPS	DPWEB	1	Cox's Creek
699	Westmere Park Wholesale WWPS	DPWPA	1	Motions Creek Estuary
713	Branch 6 Cox Creek MH2	DSB06MH2	2	Cox's Creek
714	Branch 6 Cox Creek MH11	DSB06 MH11	2	Cox's Bay
715	Branch 7 Arch Hill MH1	DSB07 MH1	2	Motions Creek
738	Orakei Main Sewer MH31	DSORM MH31	2	Cox's Creek
740	Branch 5 Herne Bay MH23	DSB05 MH23	2	Herne Bay
741	Branch 5 Herne Bay MH25	DSB05 MH25	2	Cox's Bay
1019	15 Cremorne Street	-	2	Home Bay

There have been no changes to the Schedule of EOPs.

2.22.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 76 reported incidents in the Cox's Bay catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

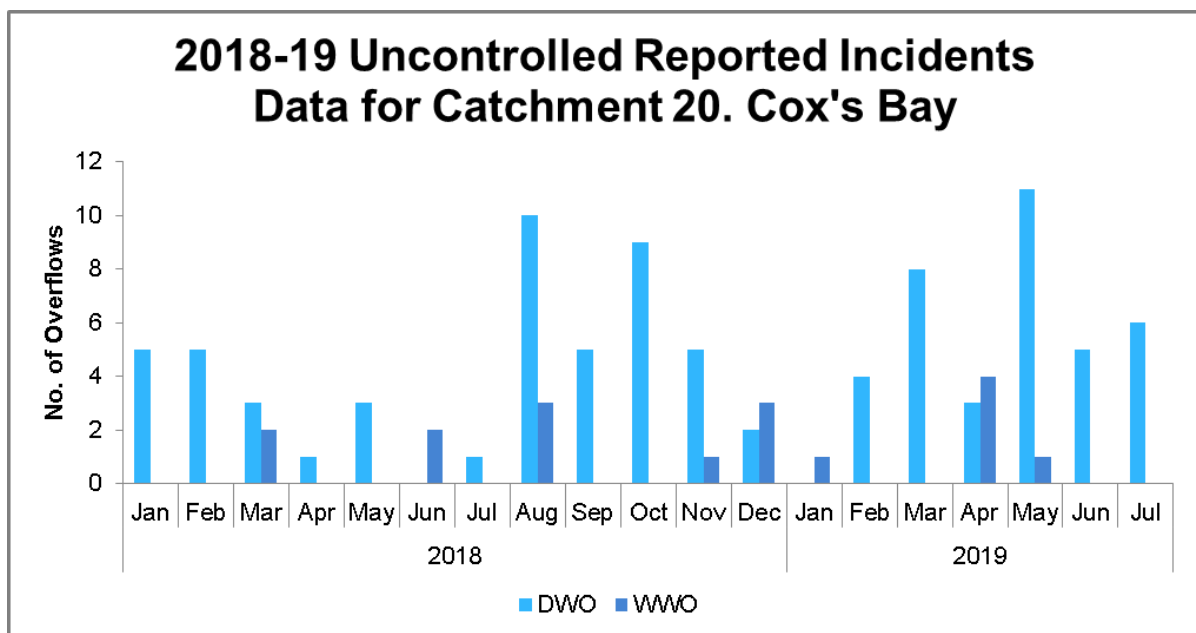
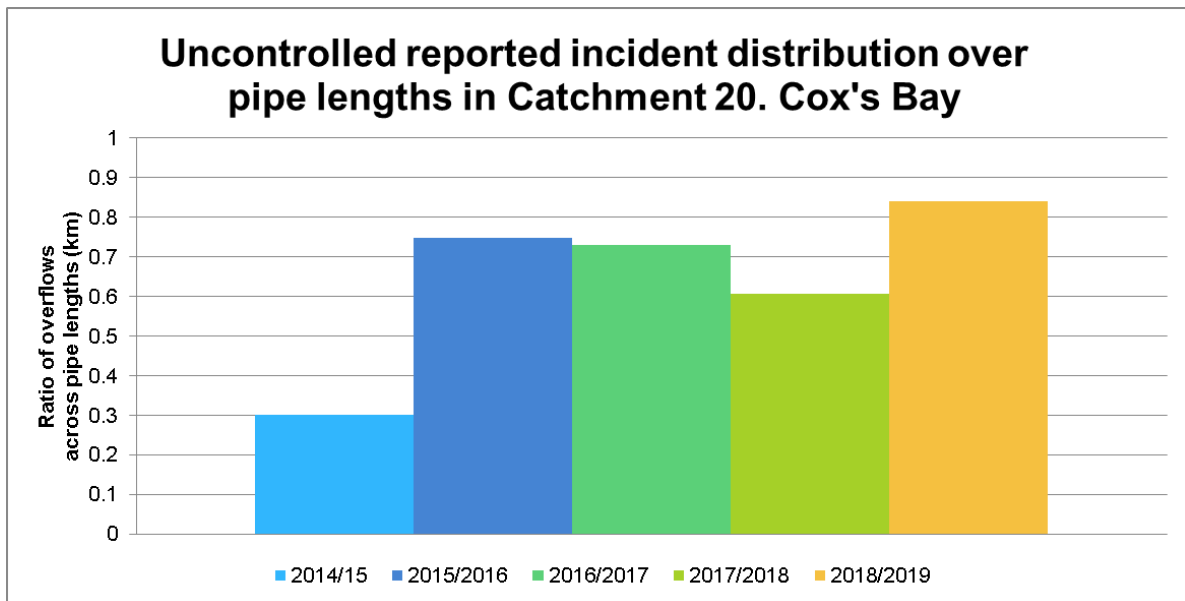
The table overleaf shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period.

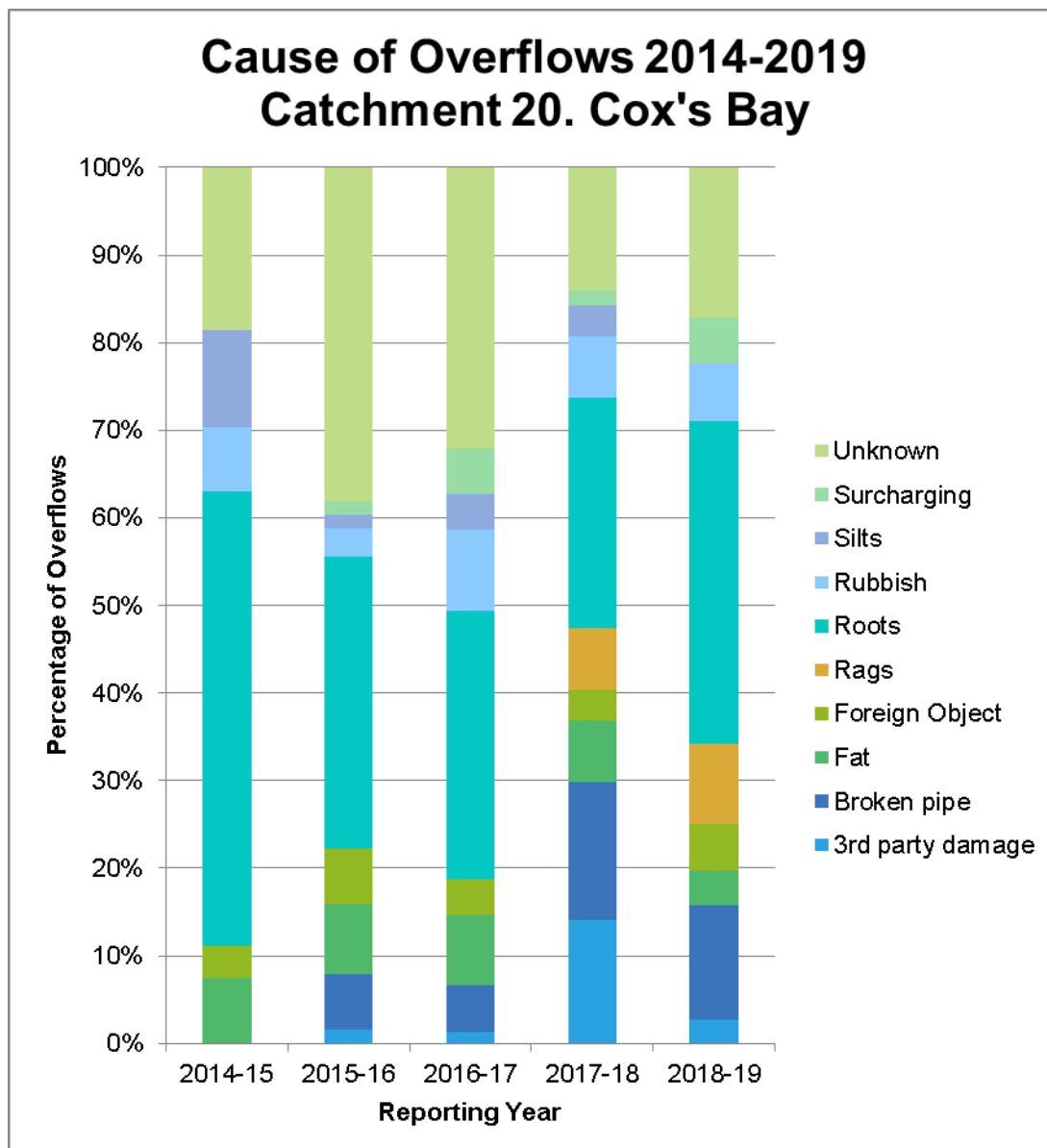
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
25/08/2017	38 Francis St	L1	439	Roots	0	Rocks and roots removed Replaced earthenware
23/03/2018	38 Francis St	L1	79	Rubbish	18.5	
23/04/2019	38 Francis St	L1	222	Roots	16	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
14/09/2016	71 Francis St	L1	466	Roots	0	Root intrusion removed, pipe repaired
2/07/2017	71 Francis St	L1	33	Roots	9	
29/03/2019	71 Francis St	L1	82	Roots	0	
11/03/2019	21 Herne Bay Rd	L1	87	Roots	0	All private drains blocked with roots up to the connection to the main. Rootcut
14/03/2019	21 Herne Bay Rd	L1	81	Roots	0	
14/08/2018	25 Brown St	L1	80	Broken pipe	12	S/L repaired
29/08/2018	25 Brown St	L1	366	Surcharging	26	
18/02/2019	27 Maxwell Ave	L1	1144	Broken pipe	2.5	Collapsed pipe repaired Cleared blockage
18/06/2019	27 Maxwell Ave	L1	88	Unknown	0.5	
4/08/2018	28 Trinity St	L1	1062	Roots	0.5	Rootcut
6/08/2018	28 Trinity St	L1	236	Broken Pipe	0	
13/08/2018	32 Pollen St	L1	47	Rubbish	9	Dropper repaired
28/11/2018	32 Pollen St	L1	1029	Broken pipe	0	
29/08/2018	6 Castle St	L1	182	Roots	26	Dig up S/L and remove roots
18/09/2018	6 Castle St	L1	1125	Broken pipe	8.5	
22/04/2019	6 Castle St	L1	425	Roots	15.5	
9/05/2019	78 Ardmore Rd	L1	93	Unknown	0	CCTV Repaired root intrusion Flushed main
10/05/2019	78 Ardmore Rd	L1	198	Roots	4.5	
21/05/2019	78 Ardmore Rd	L1	203	Unknown	0	
6/08/2018	85 Crummer Rd	L1	41	Unknown	0	Continue to Monitor
13/08/2018	85 Crummer Rd	L1	31	Roots	9	
5/04/2019	88 Sarsfield St	L1	80	Rags	0	Piece of ceramic removed
11/04/2019	88 Sarsfield St	L1	1232	Foreign Object	13	

2.22.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.22.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPWEB	Webber Street Wastewater Pump Station	652	Rain event	445	52.5
24/12/2018	DPWEB	Webber Street Wastewater Pump Station	652	Rain event	315	69

2.22.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
234	75 West End Rd	0	0	0	0	1	0	0.2	Continue to monitor
624	Masefield Avenue WWPS	2	1	0	0	0	0	0.2	Continue to monitor
627	Meola Road WWPS	0	0	0	0	0	0	0	Continue to monitor
636	Sarsfield Street WWPS	0.8	0	0	0	0	0	0	Continue to monitor
652	Webber Street WWPS	0.6	0	2	0	1	2	1	Continue to monitor
699	Westmere Park Wholesale	0	0	1	1	0	0	0.4	Continue to monitor

The Type 2 EOP 738 has a permanent monitor installed. This information is provided as it is available, although it is noted for reference that very few Type 2 locations have monitors installed and this needs to be interpreted with reference to the Wastewater Network Strategy and the overall network performance. The monitor at EOP 233 has been non-operational for the majority of 2016-18 due to a fault.

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
738	Richmond Road, Orakei Main Sewer MH31	0	N/A	5	2	0	3	2	Western Isthmus Water Quality Improvement Programme
233	65 Kelmarna Avenue	-	-	-	-	-	42	42	Western Isthmus Water Quality Improvement Programme

2.22.6 Inflow & Infiltration Programme

Due to the combined sewer network in this catchment, Inflow & Infiltration activities are currently related to the separation of the combined sewer network. Sewer separation options are currently being investigated as part of Western Isthmus Water Quality Improvement Programme of improvement works to reduce wet weather overflows.

2.22.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Grey Lynn Wastewater Model Build and Calibration	Studies and investigations	To be able to identify the preferred works programme to meet target wet weather overflow frequencies and accommodate growth in the catchment.	To identify performance issues and develop network solutions to reduce overflows throughout the catchment and provide for urban growth	2014-2018
Underway	Meola Reef Wastewater Model Build and Calibration	Studies and investigations	To be able to identify the preferred works programme to meet target wet weather overflow frequencies and accommodate growth in the catchment.	To identify performance issues and develop network solutions to reduce overflows throughout the catchment and provide for urban growth	2017-2020
Underway	Central Interceptor – main works and link sewers	Project Execution	This project, as well as addressing numerous wet weather overflows, will also address the risk of failure of the Manukau siphon, and also provide for urban growth. To address growth, level of service, and asset condition risks	The Central Interceptor will have multiple and widespread benefits through immediate improvements in wet weather overflow frequency and enabling upgrades for growth and level of service upgrades through the isthmus	2017-2025
Underway	Western Isthmus Water Quality Improvement Programme	Studies and investigations	To address growth, level of service, and asset condition risks in the Western isthmus and wider catchments. These EOPs typically have very high overflow frequency, as many are in combined wastewater and stormwater catchments	Development of upgrade suite to achieve reduction in wet weather overflow frequencies and to allow for growth. The final scope of this project is under investigation	2018-2028

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Motions Wastewater Catchment Improvements Part of Western Isthmus Programme	Studies and investigations, Option Analysis	Programme of work to enable growth and reduce wet weather overflows	Reduces overflow volume/ frequency and allows for growth	2019-2026
Underway	Herne Bay Wastewater Catchment Improvements Part of Western Isthmus Programme	Studies and investigations, Option Analysis	Programme of work to enable growth and reduce wet weather overflows	Reduces overflow volume/ frequency and allows for growth	2019-2024
Underway	Westmere Wastewater Catchment Improvement Works Part of Western Isthmus Programme	Studies and investigations, Option Analysis	Programme of work to enable growth and reduce wet weather overflows	Reduces overflow volume/ frequency and allows for growth	2022-2028

2.22.8 Erosion Control Measures

No works related to erosion control were carried out in this catchment between 1 July 2018 and 30 June 2019.

2.22.9 Summary

The Cox's Bay area is a historically combined drainage area, and is therefore designed to spill from the Type 2 EOPs in the network. There have been no Type 1 EOPs which have discharged more frequently than two spills per year on average. Trend analysis shows that this catchment has a high proportion of overflows caused by roots. The performance of the network overflows will be addressed primarily by the Central Interceptor main and associated works and the suite of options identified through the Western Isthmus Water Quality Improvement Programme. The overflow history will be analysed and utilised when reviewing future network improvement programmes, and the Grey Lynn and Meola Reef wastewater models will be used to ensure that network upgrades to manage levels of service and new development are appropriately managed. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

2.23 Catchment 21 – Central Auckland (CBD)

2.23.1 Overview

The Central Auckland (CBD) catchment is approximately 9 km² in size, extending from Westhaven Marina in the west to Mechanics Bay in the east, and bordered by the Waitemata Harbour in the north. The landward extent of the catchment is bordered by Shelly Beach Road, Ponsonby Road, Karangahape Road, Khyber Pass Road and Parnell Road. The catchment is characterised by commercial development (low and high-rise office blocks and retail shops), cafes and restaurants, industrial activities (light, automotive), hotels, low, medium and high-density residential living, entertainment complexes, car parks, churches and reserve areas. The harbour edge also incorporates port, ferry and marina activities. Significant open spaces within the catchment include the Auckland Domain, Albert Park and Victoria Park. There are 4,911 wastewater connections.

The wastewater network in the CBD is a mix of combined areas, separated from historically combined, and developed as separated areas, and this is reflected in the number of EOPs in the catchment.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	4,842	4,845	4,858	4,884	4,911
Length of sewer (km)	116	116	117	120	111

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
47	Short Street/ Anzac Avenue	-	2	Waitemata Harbour, CBD Edge
49	Quay Street	-	2	Waitemata Harbour, CBD Edge
50	61 Beach Road	-	2	Waitemata Harbour, CBD Edge
58	41 Kitchener Street	-	2	Waitemata Harbour, CBD Edge
59	27 Victoria Street	-	2	Waitemata Harbour, CBD Edge
74	3a Lower Albert St	-	2	Waitemata Harbour, CBD Edge
76	242 Queen Street	-	2	Waitemata Harbour, CBD Edge
80	Lorne Street/ Victoria Street East	-	2	Waitemata Harbour, CBD Edge
89	292 Queen Street	-	2	Waitemata Harbour, CBD Edge
93	89 Mayoral Drive	-	2	Waitemata Harbour, CBD Edge
95	327 Queen Street	-	2	Waitemata Harbour, CBD Edge
97	301 Queen Street A	-	2	Waitemata Harbour, CBD Edge
99	1 Greys Avenue	-	2	Waitemata Harbour, CBD Edge
108	301 Queen Street B	-	2	Waitemata Harbour, CBD Edge
109	267 Queen Street	-	2	Waitemata Harbour, CBD Edge
112	Wellesley Street West	-	2	Waitemata Harbour, CBD Edge
113	8 Mayoral Drive	-	2	Waitemata Harbour, CBD Edge

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
114	15 Mayoral Drive	-	2	Waitemata Harbour, CBD Edge
115	12 Mayoral Drive A	-	2	Waitemata Harbour, CBD Edge
116	15 Mayoral Drive B	-	2	Waitemata Harbour, CBD Edge
117	67 Vincent Street A	-	2	Waitemata Harbour, CBD Edge
118	162 Cook Street	-	2	Waitemata Harbour, CBD Edge
119	67 Vincent Street B	-	2	Waitemata Harbour, CBD Edge
120	14 Mayoral Drive	-	2	Waitemata Harbour, CBD Edge
121	11 Mayoral Drive	-	2	Waitemata Harbour, CBD Edge
123	12 Mayoral Drive B	-	2	Waitemata Harbour, CBD Edge
127	1 Victoria Street West	-	2	Waitemata Harbour, CBD Edge
128	11 Victoria Street East	-	2	Waitemata Harbour, CBD Edge
129	19 Victoria Street West	-	2	Waitemata Harbour, CBD Edge
130	15 Albert Street	-	2	Waitemata Harbour, CBD Edge
131	Wolfe Street/ Hobson Street	-	2	Waitemata Harbour, CBD Edge
134	Durham Lane	-	2	Waitemata Harbour, CBD Edge
167	74 Cook Street	-	2	Waitemata Harbour, CBD Edge
169	Fanshawe Street/ Nelson Street	-	2	Waitemata Harbour, CBD Edge
172	1 London Street	-	2	Waitemata Harbour, CBD Edge
176	Union Street	-	2	Waitemata Harbour, CBD Edge
178	43 College Hill	-	2	Waitemata Harbour, CBD Edge
180	16 Hackett Street	-	2	Waitemata Harbour, CBD Edge
183	95 Wellington Street	DPWTN	2	Waitemata Harbour, CBD Edge
477	69 St Georges Bay Road	-	2	Waitemata Harbour, CBD Edge
478	22 Avon Street	-	2	Waitemata Harbour, CBD Edge
479	22 Stratford Street	-	2	Waitemata Harbour, CBD Edge
482	11 Farnham Street	-	2	Waitemata Harbour, CBD Edge
487	106 St Georges Bay Road	-	2	Waitemata Harbour, CBD Edge
518	5 Cheshire Street	-	2	Waitemata Harbour, CBD Edge
521	6 Ngahere Terrace	-	2	Waitemata Harbour, CBD Edge
522	3 Domain Drive	-	2	Waitemata Harbour, CBD Edge
524	8 Grafton Road	-	2	Waitemata Harbour, CBD Edge
528	2 Stanley Street	DPCNH	1	Waitemata Harbour, CBD Edge
529	6 - 18 Symonds Street	-	2	Waitemata Harbour, CBD Edge

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
530	5 Alten Street	-	2	Waitemata Harbour, CBD Edge
532	1 Augustus Terrace	-	2	Waitemata Harbour, CBD Edge
534	Mutu Street	-	2	Waitemata Harbour, CBD Edge
535	Bedford Street	-	2	Waitemata Harbour, CBD Edge
536	3 Ferncroft Street	-	2	Waitemata Harbour, CBD Edge
542	38 Whitaker Place	-	2	Waitemata Harbour, CBD Edge
545	Symonds Street/ Grafton Road	-	2	Waitemata Harbour, CBD Edge
551	2 Kari Street	-	2	Waitemata Harbour, CBD Edge
557	3 Glenside Crescent	-	2	Waitemata Harbour, CBD Edge
593	31 Cheshire Terrace	-	2	Waitemata Harbour, CBD Edge
658	Farnham Street Wholesale WWPS	DPFRN	1	Waitemata Harbour, CBD Edge
659	Fanshawe Street Wholesale WWPS	DPFAN	1	Waitemata Harbour, CBD Edge
712	Branch 5 Herne Bay MH2A	DSB05, MH2A	2	Waitemata Harbour, CBD Edge
735	Orakei Main Sewer MH19A	DSORM, MH19A	2	Waitemata Harbour, CBD Edge
737	Branch 4B Hardings Street MH2A	DSB4B, MH2A	2	Waitemata Harbour, CBD Edge
1020	27 New Street	-	2	Waitemata Harbour, CBD Edge
1591	Wynyard Quarter PS	DPWYQ	1	Waitemata Harbour, CBD Edge

There have been no changes to the Schedule of EOPs.

2.23.2 Dry Weather Overflows (DWOs)

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 86 reported incidents in the Central Auckland (CBD) catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location

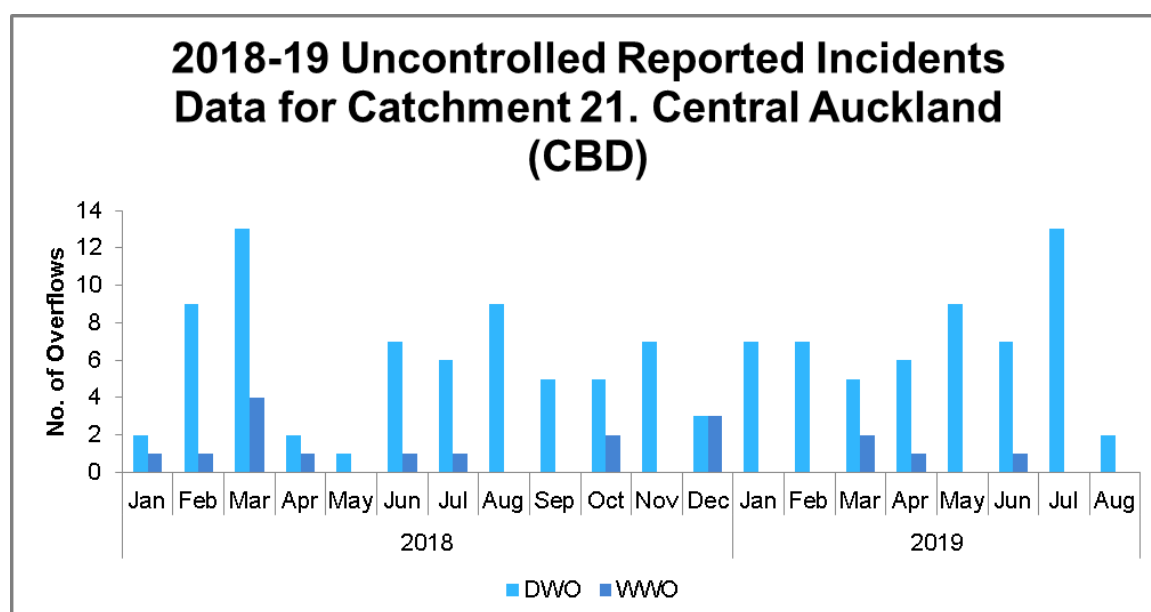
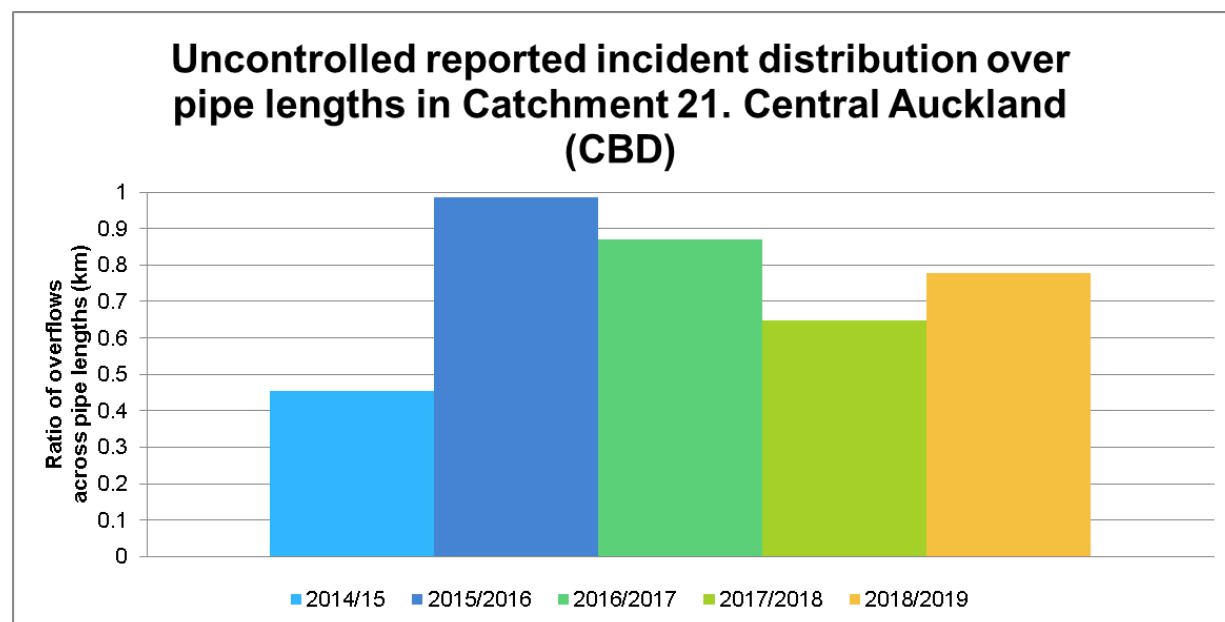
over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

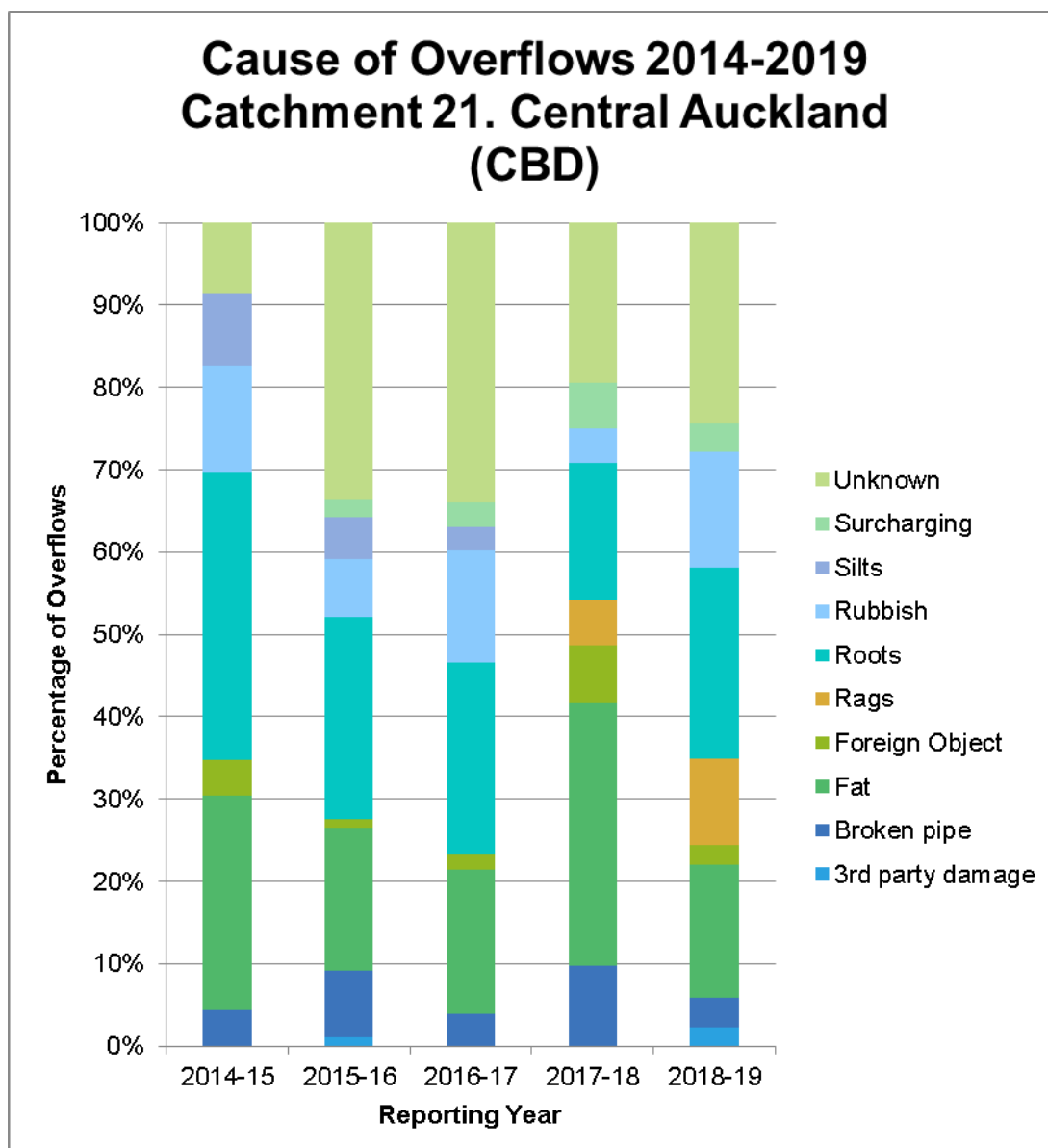
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
26/07/2017	20 Pakenham St-E	L1	144	Fat	0.5	Dips in line, heavy fat build up being investigated by Trade Waste. Restaurants in the area do not seem to be complying with fat discharge limits. Flushed mains and manholes
16/11/2017	14-18 Pakenham St-E	L1	468	Fat	0	
23/02/2018	14-18 Pakenham St-E	L1	550	Unknown	0	
4/03/2018	14-18 Pakenham St-E	L1	218	Fat	0	
30/06/2018	Wtr/14-18 Pakenham St-E	L1	157	Fat	0	
20/09/2018	14-18 Pakenham St-E	L1	193	Fat	0	
25/10/2018	Pakenham St-E	L1	153	Unknown	0	
14/02/2019	Wtr/14-18 Pakenham St-E	L1	343	Rubbish	0	
13/05/2019	Wtr/14-18 Pakenham St-E	L1	219	Fat	4	
20/02/2018	86-102 Customs St-W	L1	367	Fat	0	Heavy fats, heavy flushed
19/06/2018	86-102 Customs St-W	L1	503	Foreign Object	1.5	
27/06/2018	86-102 Customs St-W	L1	470	Foreign Object	0	
14/04/2019	86-102 Customs St-W	L1	74	Fat	0.5	
31/05/2017	487A Parnell Rd	L1	161	Unknown	1.5	Root cut and heavy flushed
17/07/2017	487A Parnell Rd	L1	133	Fat	3.5	
12/09/2017	487A Parnell Rd	L1	60	Unknown	3	
10/06/2019	487 Parnell Rd	L1	107	Roots	0	
20/07/2018	2-8 Nelson St	L1	39	Fat	0.5	Fat, rags, silt removed from main
12/04/2019	2-8 Nelson St	L1	265	Rags	2	
3/08/2018	49-63 Jellicoe St	L1	205	Rags	4	Continue to Monitor
4/08/2018	49-63 Jellicoe St	L1	159	Fat	0.5	
2/02/2019	5 Burrows Ave	L1	418	Unknown	0	Unblocked line Collapsed pipe repaired
18/03/2019	5 Burrows Ave	L1	1296	Broken pipe	1.5	
15/07/2018	5 Hackett St	L1	1422	Surcharging	52.5	Sw pipe capacity issue at catch-up and illegal WW connections
20/12/2018	5 Hackett St	L1	1247	Surcharging	21	
7/07/2018	52 Hepburn St	L1	953	Unknown	0	New Inspection Point cap
8/07/2018	52 Hepburn St	L1	189	Rubbish	4	
6/05/2019	6-20 Jellicoe St	L1	1019	Rags	0	Fats, rags, baby wipes removed from main
10/06/2019	6-20 Jellicoe St	L1	128	Rags	0	
11/10/2018	8 Georgina St	L1	96	Rubbish	16	Debris from

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
19/12/2018	8 Georgina St	L1	152	Rubbish	6.5	construction blocking manhole, removed. Baby wipes removed
27/01/2019	8 Georgina St	L1	127	Fat	0	
2/02/2019	8 Georgina St	L1	57	Rags	0	
20/05/2019	Napier St	L1	1283	Unknown	0	Blockage removed
5/06/2019	Napier St	L1	80	Surcharging	29	

2.23.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.23.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

2.23.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
528	2 Stanley Street	1	0	0	0	0	0	0	Continue to monitor
658	Farnham Street Wholesale WWPS	0	0	0	1	2	0	0.6	Continue to monitor
659	Fanshawe Street Wholesale WWPS	0	0	0	0	0	0	0	Wynyard Quarter Pump station will service growth and divert part of the existing catchment

Where reliable data is available for Type 2 locations, this has been provided, although it is noted for reference that very few Type 2 locations have monitors installed and this needs to be interpreted with reference to the Wastewater Network Strategy and the overall network performance in this catchment.

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
712	Branch 5 Herne Bay MH2A	49	N/A	N/A	64	79	56	66	Central Interceptor and Western Isthmus Water Quality Improvement Programme
180	16 Hackett Street	109	N/A	N/A	61	111	103	91.7	Central Interceptor and Western Isthmus Water Quality Improvement Programme
183	95 Wellington Street	-	N/A	N/A	N/A	N/A	26	26	Central Interceptor and Western Isthmus Water Quality Improvement Programme

2.23.6 Inflow & Infiltration Programme

Parts of this catchment comprise of a combined drainage network, in these areas Inflow & Infiltration (I&I) are currently not being considered and other programme of works are being investigated to address the wet weather overflows. Sewer separation investigation works are currently underway in the Herne Bay catchment. In the separated areas I&I will be considered as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

2.23.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Complete	Franklin Road, Collingwood Street Targeted Wastewater Separation	Closure	This area is combined and the existing network is in poor condition. Separation will reduce the flows to the EOPs. The network will also be rehabilitated to ensure low I&I in future	The proposal will provide for growth, remove two EOPs (185 and 182) and significantly reduce wet weather overflows from EOP 183	2018
Underway	Picton St, Anglesea St, Hepburn St, Collingwood Rd Separation and Sewer Rehabilitation	Optional analysis (Feasibility)	This area is combined and the existing network is in poor condition. Separation will reduce flows to the downstream EOPs. The network will also be rehabilitated to ensure low I&I in future	Will reduce the frequency of overflow EOP 183	2015-2020
Complete	Pump station and rising main to service Wynyard Quarter	Closure	The capacity of the existing wastewater system servicing Wynyard Quarter is insufficient to cater for the proposed change in land use and associated growth	The new pump station will divert flows currently going to EOP 659, reducing overflows at that location and providing for growth	2014-2018
Complete	New gravity sewerage in Wynyard Quarter	Design and Execution	The sewers are in poor condition, with high I&I and tidal ingress. Flat grades have also resulted in operational issues	Reduced overflow frequency and volume at EOP659, and reduced risk of uncontrolled spills from the network	2019-2022
Underway	Queen St Diversion Sewer	Options Assessment	To address growth in the CBD area and the risk of aging assets in poor condition	Proposed to addressed asset risk and frequent discharges at EOP128	By 2025

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Central Interceptor – main works and link sewers	Project Execution	This project, as well as addressing numerous wet weather overflows, will also address the risk of failure of the Manukau siphon, and also provide for urban growth. To address growth, level of service, and asset condition risks	The Central Interceptor will have multiple and widespread benefits through immediate improvements in wet weather overflow frequency and enabling upgrades for growth and level of service upgrades through the isthmus	2017-2025
Underway	Western Isthmus Water Quality Improvement Programme	Studies and investigations	To address growth, level of service, and asset condition risks in the Western isthmus and wider catchments. These EOPs typically have very high overflow frequency, as many are in combined wastewater and stormwater catchments	Development of upgrade suite to achieve reduction in wet weather overflow frequencies and to allow for growth. The final scope of this project is under investigation	2018-2028
Underway	St Marys Bay Wastewater Catchment Improvements	Studies and investigations	Programme of work to enable growth and reduce wet weather overflows	Reduces overflow volume/ frequency and allows for growth	2018-2022
Underway	Hackett Street EOP - New Access Shaft	Design	New Access Shaft to be installed	To remove access and safety issues	2019-2020
Complete	Aotea Square Suspended Sewer Replacement	Closure	Like for like replacement of the 300mm suspended sewer due to poor condition of the existing pipeline		2019-2020

2.23.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2018 and 30 June 2019.

2.23.9 Summary

There have been no Type 1 EOPs which have discharged more frequently than two spills per year on average. The CBD catchment is undergoing significant change, with network reconfiguration and upgrades likely to occur in the longer term to accommodate growth and take advantage of associated projects such as the City Rail Link and Light Rail. The performance of the network overflows will be addressed primarily by the Central Interceptor

main works and the suite of options identified through the Western Isthmus Water Quality Improvement Programme, separation projects, and the Wynyard Quarter upgrades. The network is currently performing well, with some improvements identified under the Upper CBD Options study. Fats and roots are the leading cause of uncontrolled overflows in previous years. The network performance will also be improved with the implementation of the Central and Northern Interceptors. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.24 Catchment 22 – Hobson Bay

2.24.1 Overview

The Hobson Bay catchment is located in the central part of the Auckland Isthmus immediately to the east of the Central Business District (CBD). The catchment covers an area of approximately 3,300 ha, with the catchment boundary reflecting a combination of topographic and wastewater network catchment boundaries. There are 31,350 wastewater connections.

The catchment includes the suburbs of Orakei, Parnell, Newmarket, Remuera, Meadowbank, St Heliers and Mission Bay. It is heavily developed, but mainly residential in character with limited business and industrial activity which is predominantly centred around Newmarket and, to a lesser extent, Parnell.

The wastewater network in this catchment is a mix of combined areas, separated from historically combined, and developed as separated areas, and this is reflected in the number of EOPs in the catchment.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	30,602	30,695	30,835	30,900	31,350
Length of sewer (km)	429	431	432	436	412

Please note that the pipe length data supplied in 2018/19 APR may have changed due to data cleansing and change of the network over time.

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
160	45 Ascot Avenue	-	2	Waiaatarua Reserve Stream
164	23A Inverary Avenue	-	2	To land
193	35 Yattendon Road	-	2	St Heliers Bay
212	54 Speight Road	-	2	Madill's Stream
213	59 Baddeley Avenue	-	2	Madill's Stream
214	64 Hawera Road	-	2	Madill's Stream
215	74 Hawera Road	-	2	Madill's Stream
272	159 Orakei Road	-	2	Unnamed stream flowing to Hobson Bay
273	35 Entrican Avenue	-	2	Unnamed stream flowing to Hobson Bay
274	Tonks Street WWPS	DPTON	1	Hobson Bay
276	58 Kelvin Road	-	2	Meadowbank Stream West
277	126 Ngapuhi Road	-	2	Orakei Creek
279	188 Upland Road	-	2	Hobson Bay
280	12a Woodley Avenue	-	2	Orakei Basin
281	49 Ngapuhi Road	-	2	Meadowbank Stream West
282	118 Ngapuhi Road	-	2	Orakei Creek
284	84 Meadowbank Road	-	2	Orakei Creek

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
285	77 Meadowbank Road	-	2	Orakei Creek
286	44a Benson Road	-	2	Orakei Basin
287	148 Lucerne Road	-	2	Orakei Creek
288	2 Bonnie Brae Road	-	2	Orakei Creek
289	93 Waiatarua Road	-	2	Orakei Creek
295	14 Rangitoto Avenue	-	2	Orakei Basin
296	17 Benson Road	-	2	Orakei Basin
350	44 Rukutai Street	-	2	Unnamed stream - Mission Bay
351	125 Aotea Street	-	2	Unnamed stream - Mission Bay
352	49 Rukutai Street	-	2	Unnamed stream - Mission Bay
353	2b Nihill Crescent	-	2	Unnamed stream - Mission Bay
420	14 Mahuru Street	-	2	Newmarket Stream
421	29 Ayr Street A	-	2	Newmarket Stream
422	27 Morrow Street	-	2	Newmarket Stream
423	8 Remuera Road B	-	2	Newmarket Stream
424	29 Ayr Street B	-	2	Newmarket Stream
425	10 St Marks Road	-	2	Newmarket Stream
427	Kingdon Street	-	2	Newmarket Stream
428	6 Parkfield Terrace	-	2	Newmarket Stream
448	17 Watene Crescent	-	2	Okahu Bay
449	66 Paritai Drive	-	2	Orakei Marina
451	27 Ngapipi Road	-	2	Lower Purewa Creek
452	18 Ngapipi Road	-	2	Lower Purewa Creek
453	12a Okahu Street	-	2	Okahu Bay
454	34-36 Apihai Street	-	2	Okahu Bay
455	63 Reihana Street	-	2	Okahu Bay
456	88 Reihana Street	-	2	Okahu Bay
457	20 Reihana Street	-	2	Okahu Bay
458	88 Paritai Drive	-	2	Lower Purewa Creek
493	32 Takutai Street	-	2	Hobson Bay
494	3 Papahia Street	-	2	Hobson Bay
495	43 Tohunga Street	-	2	Hobson Bay
496	28 Crescent	-	2	Hobson Bay

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
498	Portland Road North Pump Station	DPPL1	1	Waitaramoa Stream
500	20 Spencer Street	-	2	Waitaramoa Stream
501	23a Portland Road	-	2	Waitaramoa Stream
502	21 Ingram Road	-	2	Waitaramoa Stream
503	68 Portland Road	-	2	Waitaramoa Stream
504	20 Standen Avenue	-	2	Waitaramoa Stream
505	9 Scherff Road	-	2	Waitaramoa Stream
506	20 Hapua Road	-	2	Unnamed stream in Thomas Bloodworth Park
507	Portland Road South Pump Station	DPPL2	1	Waitaramoa Stream
508	32 Hapua Street	-	2	Unnamed stream in Thomas Bloodworth Park
509	113 Brighton Road A	-	2	Newmarket Stream
511	158 Bassett Road	-	2	Newmarket Stream
512	3A Laxon Terrace A	-	2	Newmarket Stream
513	3A Laxon Terrace B	-	2	Newmarket Stream
514	63 Tahapa Crescent	-	2	Upper Purewa Creek
515	11 Purewa Road	-	2	Upper Purewa Creek
586	39 Manawa Road	-	2	Remuera Stream
587	24 Manawa Road	-	2	Remuera Stream
588	24 Mahor Avenue	-	2	Remuera Stream
597	296 Victoria Avenue	-	2	Waitaramoa Stream
598	Abbotts Way WWPS	DPABB	1	Waiatarua Reserve Stream
602	Atkin Avenue WWPS	DPATK	1	Unnamed stream - Mission Bay
603	Averill Avenue WWPS	DPAVE	1	Kohimarama Beach
611	Gillies Avenue Pump Station	DPGIL	1	To land
613	Grand Drive WWPS	DPGRA	1	Waiatarua Reserve Stream
620	John Rymer Place WWPS	DPJRP	1	Purewa Stream
626	Meadowbank Road WWPS	DPMEA	1	Meadowbank Stream East
632	Purewa Road WWPS	DPPUR	1	To land
641	St Heliers WWPS	DPSTH	1	St Heliers Bay
642	Tamaki Drive WWPS	DPTAM	1	Madill's Stream
643	Tamaki Yacht Club WWPS	DPTYC	1	Tamaki Yacht Club
663	Kohimarama Wholesale WWPS	DPKOH	1	Madill's Stream
696	Orakei Wholesale WWPS	DPORM	1	Okahu Bay

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
704	Shore Road Wholesale WWPS	DPSHO	1	Unnamed stream in Thomas Bloodworth Park
709	Branch 1A Remuera MH1	DSB01A	2	Okahu Bay
711	Branch 3 Newmarket MH29	DSB03	2	Newmarket Stream
730	Branch 3B Newmarket MH2	DSB03B	2	Judges Bay
733	Branch 3C Newmarket MH1	DSB03C	2	Newmarket Stream
760	Hobson DS Branch MH1	DSB1H	2	Hobson Bay
1405	Stonefields Pump Station	DPSTF	1	Waiaatarua Reserve Stream
1520	Orakei Sewer Main Hobson Diversion - Logan Terrace drop shaft	DSMHD	2	Hobson Bay
1522	15 Dempsey Street	-	2	Unnamed stream flowing to Hobson Bay
1532	84 Reihana St	-	2	Okahu Bay
1574	21 Judges Bay Rd	-	2	Judges Bay
1580	4 St Marks Bay Rd	-	2	Newmarket Stream
1598	21 Ayr St	-	2	Newmarket Stream

There have been no changes to the Schedule of EOPs.

2.24.2 Dry Weather Overflows (DWOs)

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
28/04/2019	DPORM	Orakei Wholesale Wastewater Pump Station	696	Pump blockage due to ragging	59	2.5

Reported Incidents

There were a total of 301 reported incidents in the Hobson Bay catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
11/03/2017	23 Benson Rd	L1	680	Unknown	27.39	Displaced lateral repaired and relined Repaired collapsed pipe
16/03/2017	23 Benson Rd	L1	44	Silts	0	
28/08/2017	23 Benson Rd	L1	637	Fat	13.5	
8/08/2018	23 Benson Rd	L1	1043	Broken Pipe	7.5	
10/05/2017	29 Market Rd	L1	128	Roots	0.5	Flushed main
10/02/2018	29 Market Rd	L1	43	Unknown	19.5	
22/11/2018	29 Market Rd	L1	33	Rubbish	2	
27/01/2019	29 Market Rd	L1	126	Roots	0	
25/06/2017	25A Piccadilly PI	L1	545	Roots	4	Root infiltration removed and epoxy'd
21/03/2018	25A Piccadilly PI	L1	69	Roots	0	
6/10/2018	25 Piccadilly PI	L1	247	Roots	0	
6/08/2017	8 Grand Dr	L1	500	Unknown	1	Flushed main
5/12/2017	8 Grand Dr	L1	186	Fat	0	
21/04/2019	8 Grand Dr	L1	109	Fat	0	
27/10/2016	118 Grand Dr	L1	157	Fat	0.97	Flushed main
14/10/2017	116 Grand Dr	L1	118	Fat	2	
5/12/2018	116 Grand Dr	L1	94	Unknown	8	
29/06/2017	6-22 Mt Carmel PI	L1	178	Fat	0	Heavy flushed Fat blockage removed
28/11/2017	6-22 Mt Carmel PI	L1	578	Unknown	0	
23/07/2018	6-22 Mt Carmel PI	L1	64	Unknown	1	
18/02/2019	6-22 Mt Carmel PI	L1	184	Fat	0.5	
28/01/2018	17 Coldham Cres	L1	436	Unknown	0	Heavy fats and roots removed
11/03/2018	17 Coldham Cres	L1	486	Fat	0	
20/02/2019	17 Coldham Cres	L1	119	Roots	0	
9/03/2018	30 Seascape Rd	L1	475	Foreign Object	0	Fixed cracked pipe, pipes relined
26/05/2018	30 Seascape Rd	L2	407	Broken pipe	1	
16/01/2019	30 Seascape Rd	L1	125	Unknown	0	
7/02/2019	30 Seascape Rd	L1	962	Broken pipe	0	
10/08/2017	4 Berowald PI	L1	240	Unknown	1	Heavy flushed Heavy rags removed
23/04/2018	4 Berowald PI	L1	97	Unknown	0	
4/05/2019	4 Berowald PI	L1	68	Rags	1	

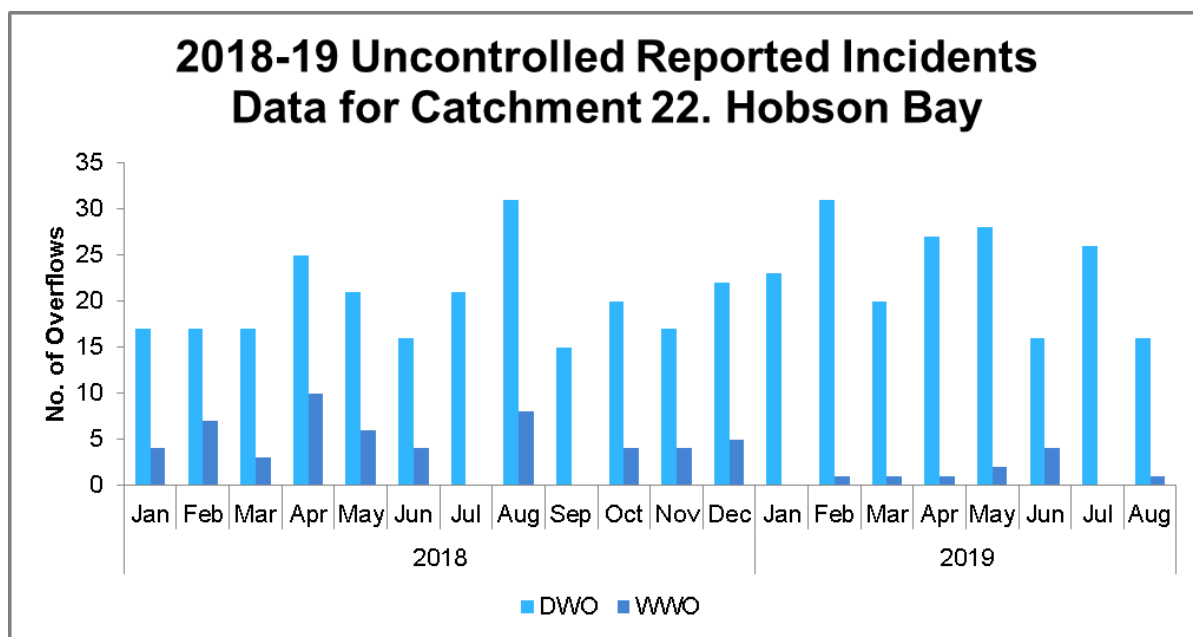
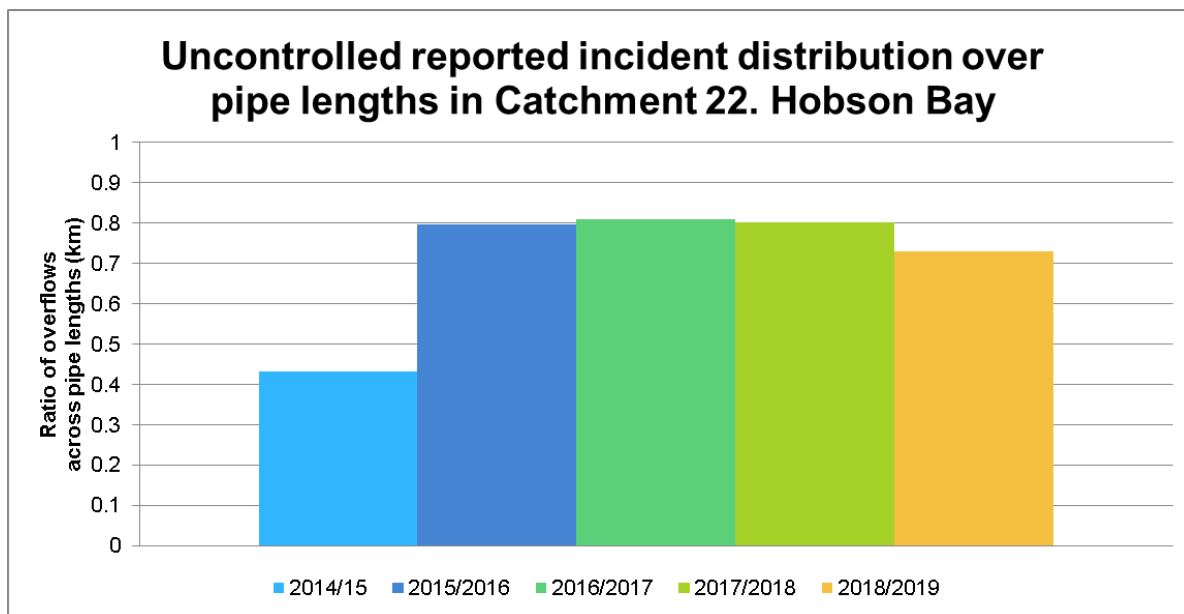
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
15/02/2018	27 Shore Rd	L1	152	Silts	0.5	Abandoned storm water system with cross connection, repair underway
26/05/2018	27 Shore Rd	L1	79	Broken Pipe	1	
31/08/2018	25 Shore Rd	L1	217	Unknown	4	
29/05/2017	1/8 Macmurray Rd	L1	406	Unknown	0.5	Junction repaired, CCTV, rootcut. Pipes being relined
21/08/2017	1/8 Macmurray Rd	L1	253	Roots	0.5	
17/12/2018	1/8 Macmurray Rd	L1	138	Unknown	0	
22/07/2017	31 Rutherford Tce	L1	414	Unknown	14	Rags and debris removed, heavy flush
19/02/2018	31 Rutherford Tce	L1	109	Rubbish	0.5	
20/12/2018	30 Rutherford Tce	L1	133	Roots	22.5	
25/08/2017	49 Ballarat St	L1	220	Fat	0	Heavy flushed Wet wipe blockage and fat removed
30/05/2018	49 Ballarat St	L1	130	Unknown	0	
25/12/2018	49 Ballarat St	L1	183	Fat	28	
17/03/2019	49 Ballarat St	L1	159	Rags	0	
8/08/2018	1 Cowie St	L1	1220	Broken pipe	7.5	Repaired junction
10/08/2018	1 Cowie St	L1	155	3rd party damage	0	
4/01/2019	1/10 Edgerley Ave	L1	234	3rd party damage	0	Concrete in line removed
9/01/2019	1/10 Edgerley Ave	L1	167	3rd party damage	0	
13/01/2019	1/10 Edgerley Ave	L1	154	3rd party damage	0	
20/01/2019	1/10 Edgerley Ave	L1	271	Foreign Object	0.5	
11/10/2018	10 Atherton Rd	L1	114	Rubbish	13	Jettied line
29/11/2018	10 Atherton Rd	L1	132	Unknown	0	
14/02/2019	11 Maungarei Rd	L1	71	Unknown	0	CCTV and flush
16/02/2019	11 Maungarei Rd	L1	186	Roots	0	
1/04/2019	14 Kipling Ave	L1	1347	Surcharging	31	Damaged lateral repaired
24/05/2019	14 Kipling Ave	L1	192	3rd party damage	0	
10/07/2018	15 Parkside St	L1	93	Fat	5.5	Repaired broken S/L
20/06/2019	15 Parkside St	L1	64	Broken Pipe	4	
12/10/2018	1C Bracken Ave	L1	195	Fat	7	Flushed S/L
19/10/2018	1C Bracken Ave	L1	109	Rubbish	0	
22/03/2019	2 Mt Hobson Rd	L1	53	Roots	0	Rootcut
23/03/2019	2 Mt Hobson Rd	L1	250	Roots	0	

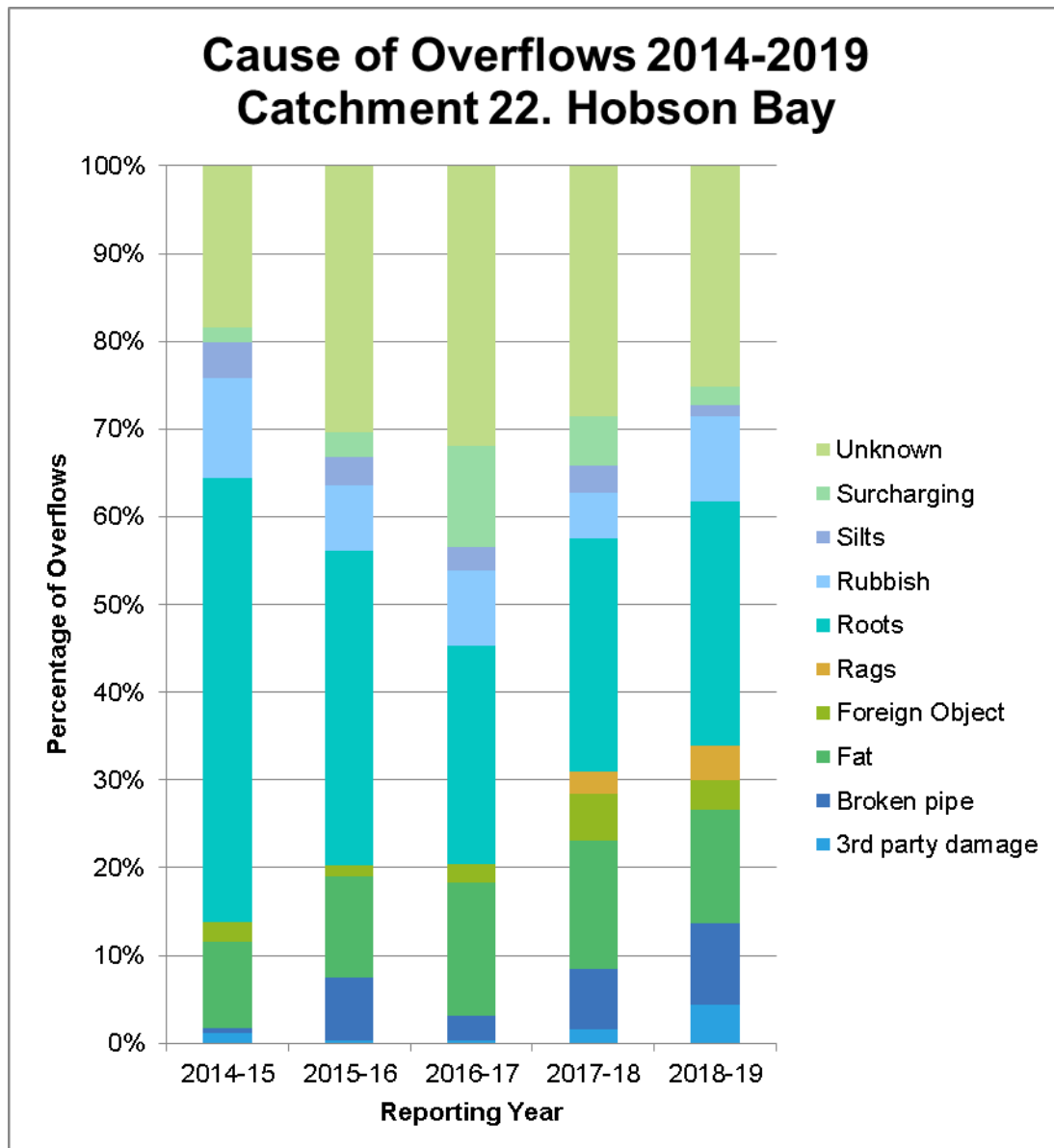
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
5/12/2018	2 Tautari St	L1	114	Roots	8	Rootcut manhole
5/12/2018	2 Tautari St	L2	666	Unknown	8	
16/09/2018	2/58 St Johns Rd	L1	72	Rags	0	Flushed line
29/01/2019	2/58 St Johns Rd	L1	155	Unknown	2.5	
17/08/2018	2/73 Speight Rd	L1	70	Roots	16.5	PVC pipe removed as blockage
17/04/2019	2/73 Speight Rd	L1	48	Foreign Object	0	
14/05/2019	24 Clyde St	L1	86	Roots	0	Cleared roots from main
21/05/2019	24 Clyde St	L1	414	Unknown	0	
12/11/2018	24 Mcfarland St	L1	133	Unknown	3	Flushed blockage
10/04/2019	24 Mcfarland St	L1	418	Unknown	0	
14/08/2018	25 Glover Rd	L1	180	Rubbish	11	Flushed main
13/09/2018	25 Glover Rd	L1	119	Rubbish	0	
28/02/2019	259 St Heliers Bay Rd	L1	622	Unknown	0	Flushed and CCTV
5/06/2019	259A St Heliers Bay Rd	L1	137	Fat	25.5	
30/09/2018	26 Hampton Dr	L1	328	Unknown	0	Continue to Monitor
1/10/2018	26 Hampton Dr	L1	108	Rubbish	0	
22/11/2018	29 Market Rd	L1	33	Rubbish	2	Flushed line
27/01/2019	29 Market Rd	L1	126	Roots	0	
26/08/2018	295 Victoria Ave	L1	94	Foreign Object	0	Concrete removed from main
28/08/2018	295 Victoria Ave	L1	37	3rd party damage	0.5	
29/07/2018	3 Corbett-Scott Ave	L1	108	Unknown	3.5	Continue to Monitor
5/08/2018	3 Corbett-Scott Ave	L1	289	Roots	1.5	
13/05/2019	3/33 Abbots Way	L1	181	Broken Pipe	2	Collapsed pipe repaired
13/05/2019	3/33 Abbots Way	L1	988	Broken Pipe	2	
22/08/2018	32 Glover Rd	L2	105	Fat	7.5	Cleared large fat blockage
18/05/2019	32 Glover Rd	L1	250	Fat	0	
10/12/2018	35 Lillington Rd	L1	72	Rubbish	0	Jetted main, root and fat blockage
18/12/2018	35 Lillington Rd	L1	113	Fat	0	
18/02/2019	37 Rarangi Rd	L1	104	Roots	0.5	Roots removed
22/02/2019	37 Rarangi Rd	L1	75	Roots	14	
9/01/2019	4 Brookland Pl	L1	83	Unknown	0	Vacuumed line

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
21/04/2019	4 Brookland Pl	L1	120	Unknown	0	
31/10/2018	43 Clonbern Rd	L1	770	3rd party damage	0.5	100mm line was capped off by private plumber
2/11/2018	43 Clonbern Rd	L1	302	3rd party damage	0	
14/05/2019	43 Mahoe Ave	L1	110	Roots	0	Fat blockage removed from manhole
20/05/2019	43 Mahoe Ave	L1	118	Fat	0	
25/12/2018	49 Ballarat St	L1	183	Fat	28	Baby wipes removed from main
17/03/2019	49 Ballarat St	L1	159	Rags	0	
23/07/2018	4A Tuhaere St	L1	108	Rags	1	Repaired junction, broken by root infiltration
16/10/2018	4A Tuhaere St	L1	619	Roots	2.5	
26/03/2019	52 Lillington Rd	L1	70	Fat	0	Heavy fat in S/L, flushed
2/06/2019	52 Lillington Rd	L1	69	Roots	5.5	
20/02/2019	54 Allum St	L1	133	Rubbish	0	Unblocked main
2/05/2019	54 Allum St	L1	236	Unknown	0	
2/06/2019	59 Devore St	L1	160	Unknown	5.5	Flushed main
20/06/2019	59 Devore St	L1	84	Roots	4	
19/07/2018	6 Grand Dr	L1	96	Rubbish	1	Jetted main
19/08/2018	6 Grand Dr	L1	108	Unknown	0.5	
7/03/2019	6 Morrow St	L1	318	Unknown	0	Flushed S/L
27/03/2019	6 Morrow St	L1	126	Unknown	0	
29/01/2019	61B Melanesia Rd	L1	196	Fat	2.5	Flushed and vacuumed line
23/02/2019	61B Melanesia Rd	L1	1301	Unknown	6	
23/07/2018	6-22 Mt Carmel Pl	L1	64	Unknown	1	Fat blockage removed
18/02/2019	6-22 Mt Carmel Pl	L1	184	Fat	0.5	
24/09/2018	7 Aumoe Ave	L1	170	Foreign Object	6	Chunks of concrete removed from manhole Roots removed from connection to main
7/10/2018	7 Aumoe Ave	L1	172	Roots	0	
29/04/2019	8 Tulagi Pl	L1	145	Broken Pipe	6	Public root blockage, also private root blockages and a large amount of silt in the main
22/06/2019	8 Tulagi Pl	L1	81	Roots	0	
1/08/2018	Rt 1-3/95 Mountain Rd	L1	87	Unknown	2.5	Broken pipe patched
7/08/2018	Rt 1-3/95 Mountain Rd	L1	55	Broken pipe	0	

2.24.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.24.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPORM	Orakei Wholesale Wastewater Pump Station	696	Rain event	636	56.5
25/12/2018	DPORM	Orakei Wholesale Wastewater Pump Station	696	Rain event	794	28
24/12/2018	DPJRP	John Rymer Place Wastewater Pump Station	620	Rain event	150	60

2.24.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
274	Tonks Street WWPS	1	0	0	0	0	0	0	Continue to monitor
498	Portland Road North Pump Station	0.2	0	0	0	0	0	0	Continue to monitor
507	Portland Road South Pump Station	0.2	0	0	0	0	0	0	Continue to monitor
598	Abbotts Way WWPS	1	0	0	0	0	0	0	Continue to monitor
602	Atkin Avenue WWPS	1	1	0	0	0	0	0.2	Continue to monitor
603	Averill Avenue WWPS	1	0	0	0	0	0	0	Continue to monitor
611	Gillies Avenue WWPS	0	0	0	2	0	0	0.4	Continue to monitor
613	Grand Drive WWPS	1	0	0	0	0	0	0	Continue to monitor
620	John Rymer Place WWPS	1	2	2	3	1	1	1.8	Operational upgrades to address poor performance of pumps.
626	Meadowbank Road WWPS	0.2	0	0	0	0	0	0	Continue to monitor
632	Purewa Road WWPS	-	0	0	0	0	0	0	Continue to monitor
641	St Heliers WWPS	5	0	0	0	0	0	0	Continue to monitor
642	Tamaki Drive WWPS	1	0	0	0	0	0	0	Continue to monitor
643	Tamaki Yacht Club WWPS	1	0	0	0	1	0	0.2	Continue to monitor
663	Kohimarama Wholesale WWPS	5	5*	1	2	0	0	1.6	Kohimarama Storage Tank (completed)
696	Orakei Wholesale WWPS	2	1	2	9	5	2	3.8	Continue to monitor
704	Shore Road Wholesale WWPS	0	1	1	2	0	0	0.8	Continue to monitor
1405	Stonefields WWPS	-	0	0	0	0	0	0	Continue to monitor

Type 2 – Engineered Overflow Point WWO data from 1 July 2014 – 30 June 2019

Where reliable data is available for Type 2 locations, this has been provided, although it is noted for reference that very few Type 2 locations have monitors installed and this needs to be interpreted with reference to the Wastewater Network Strategy and the overall network performance in this catchment.

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
709	Branch 1A Remuera MH1	-	-	-	-	-	1	1	Continue to Monitor

Type 3 – uncontrolled overflow rolling WWO data from 1 July 2014 – 30 June 2019

The following locations are reported as Type 3 overflow locations.

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
S25	Branch 3 MH 14	2.5	n/a	2	2	0	0	1.3	Separation works mitigating performance.

2.24.6 Inflow & Infiltration Programme

Parts of this catchment comprise of a combined drainage network, in these areas Inflow & Infiltration is currently not being considered and other programmes of works are being investigated to address the wet weather overflows such as stormwater and wastewater separation. Joint sewer separation investigations with Auckland Council's Healthy Waters team have taken place in the Okahu Bay subcatchment and included private property drainage inspections. In the remaining separated areas I&I will be considered as part of Watercare's region-wide programme, where the priority of this catchment will be determined

Joint I&I and Auckland Council's Healthy Water Safe Networks investigations have also taken place in the Purewa subcatchment, public drainage network issues have been investigated and are being mitigated and private property drainage issues will be passed on to Auckland Council's Compliance.

A review of I&I network performance for this catchment will be carried out as part of the Branch 1 & 2, and future St Heliers modelling and planning studies; this will further inform field I&I investigations.

2.24.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Complete	St Heliers Reactive I&I Investigations	Inflow and Infiltration	Current system is strained due to growth resulting in increased amount of uncontrolled overflows.	Reduce the amount of uncontrolled overflows in the area.	2017-2018

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Branch 1 and 2 Model Build, Calibration and Options study	Studies and investigations	Model required re-calibration to account for new information on drainage types. Reliable model required, which can then be utilised to develop options to address overflows and predicted growth in the catchment	Identified capital and operational solutions which will be implemented to service growth and meet levels of service	2018 (model has required partial recalibration)
On hold	St Heliers Bay Wastewater Network Upgrade	Project execution	Required to cater to population growth in the area. Current system is strained due to growth resulting in increased amount of uncontrolled overflows.	Will provide for future growth and reduce the amount of uncontrolled overflows in the area.	TBC following modelling and planning study
Future	Newmarket Gully	Studies and investigations	Pipe tunnelled between Hells Gate and Hobson tunnel	Cater for Auckland's growth	2022
Underway	Okahu Bay Separation (Healthy Waters led) and WW upgrades	Design	To address wet weather overflows in the partially combined areas. Also includes additional wastewater upgrades required to ensure level of service outcomes are met	Is expected to reduce high overflow frequencies at EOPs 448, 453, 455, 456, 457 and 696	2020

Minor improvements works include:

- Newmarket (Carlton Gore) Separation. This is a separation project driven primarily by stormwater. The separation will have a minor impact upon the wet weather overflow performance at Newmarket Gully (EOP 733).
- Norman Lesser Drive sewer replacement. This renewals project will reduce the risk of DWOs at uncontrolled locations as a result of asset failure.
- EOP 733 is planned to have screens installed to mitigate the visual and amenity impacts of highly frequent overflows at Hells Gate.
- John Rymer Place WWPS will have operational investigations undertaken to improve the pump performance. It is expected this will result in improved wet weather performance.

2.24.8 Erosion Control Measures

Erosion control is being scoped for a location in a private section of Newmarket Stream in order to protect wastewater assets from land slippage.

2.24.9 Summary

There is one Type 1 EOP which discharged more frequently than two spills per year on average. The Branch 1 and 2 (Hobson) and St Heliers wastewater models will be used to

ensure that network upgrades to manage levels of service and new development are appropriately development and managed. Roots are the leading cause of uncontrolled overflows in this catchment. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. The network has been developed to accommodate for population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

2.25 Catchment 23 – Onehunga

2.25.1 Overview

The Onehunga catchment covers an area of approximately 23 km² and is located on the northern shores of Mangere Inlet and the Manukau Harbour. The catchment extends from Lynfield Cove in the west to Southdown in the east. To the north, the catchment includes the suburbs of Penrose, Greenlane, Royal Oak and Three Kings, and covers the open space areas of Cornwall Park and One Tree Hill Domain. The catchment boundary reflects a combination of topographic and wastewater network catchment boundaries. There are 18,085 wastewater connections.

The catchment is heavily developed, with a large area of business and industrial activity located along the coastal margins of Mangere Inlet and Onehunga Township. Further to the north, the catchment is largely residential and open space zoned land.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	17,836	17,901	17,982	18,017	18,085
Length of sewer (km)	254	254	255	258	242

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
208	25 Aldersgate Rd WWPS	DPAL1	1	Unnamed stream (flowing to Wesley Bay)
209	72 Aldersgate Rd WWPS	DPAL2	1	Wesley Bay
210	Gilleta Rd WWPS	DPGLT	1	Lynfield Cove
470	Walls Rd WWPS	DPWAL	1	Stormwater Detention Pond
604	Ben James Dr WWPS	DPBJD	1	Unnamed stream (flowing to Wesley Bay)
605	Captain Springs Rd WWPS	DPCSR	1	Mangere Inlet North
615	Himalaya Cr WWPS	DPHIM	1	Manukau Harbour edge (between Lynfield Cove and Wattle Bay)
640	44 Sylvania Cr WWPS	DPSY2	1	Manukau Harbour edge (between Lynfield Cove and Wattle Bay)
653	Wesley Bay Glade WWPS	DPWBG	1	Unnamed stream (flowing to Wesley Bay)
668	Hillsborough WWPS	DPONE	1	Onehunga Bay
669	Mt Smart WWPS	DPSMT	1	Mangere Inlet North
674	Pikes Point WWPS	DPPPT	1	Unnamed stream (Miami Parade)
679	Onehunga WWPS	DPONT	1	Mangere Inlet North
705	Lynfield WWPS	DPLYF	1	Wairaki Stream
1178	420 Hillsborough Rd WWPS	DPHBH	1	Waikowhai Bay
1179	25 Royal Viking WWPS	DPRVK	1	Wairaki Stream
1541	40 Beachcroft Avenue	-	2	Onehunga Bay

There have been no changes to the Schedule of EOPs in this catchment.

2.25.2 Dry Weather Overflows (DWOs)

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Uncontrolled Overflows

There were a total of 159 reported incidents in the Onehunga catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

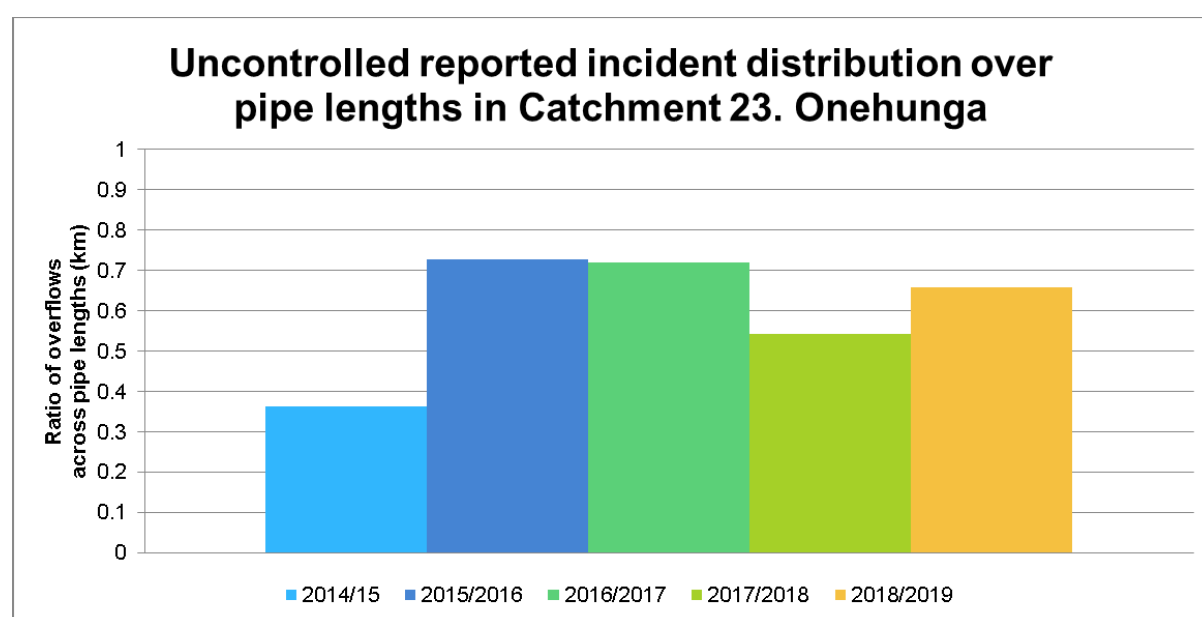
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
22/07/2017	1/38 Inkerman St	L1	203	Unknown	13	Silts removed Flushed S/L
10/03/2018	1/38 Inkerman St	L1	193	Silts	0	
18/06/2019	1/38 Inkerman St	L1	85	Unknown	0	
16/11/2017	30G Beachcroft Ave	L1	103	Unknown	0	NRV installed Rootcut
6/04/2018	30G Beachcroft Ave	L1	151	Unknown	0	
3/08/2018	30G Beachcroft Ave	L1	90	Surcharging	5	
16/01/2019	30G Beachcroft Ave	L1	91	Broken pipe	0	
17/01/2019	30G Beachcroft Ave	L1	155	Roots	0	
18/03/2017	30 Stephen Lysnar Pl	L1	411	Roots	0	Rootcut, heavy flushed, root infiltration patched
6/09/2017	30 Stephen Lysnar Pl	L1	585	Fat	8	
10/03/2019	30 Stephen Lysnar Pl	L1	81	Roots	0	
21/08/2017	1 Athenic Ave	L1	125	Foreign Object	2	Heavy flushed
17/04/2018	1 Athenic Ave	L1	347	Unknown	2	
25/11/2018	1 Athenic Ave	L1	133	Unknown	8.5	
4/12/2018	1 Athenic Ave	L1	51	Surcharging	10	
1/01/2019	1 Athenic Ave	L1	192	Surcharging	0	
16/09/2017	1/27 Seacliffe Rd	L1	132	Unknown	5.5	Fats removed from

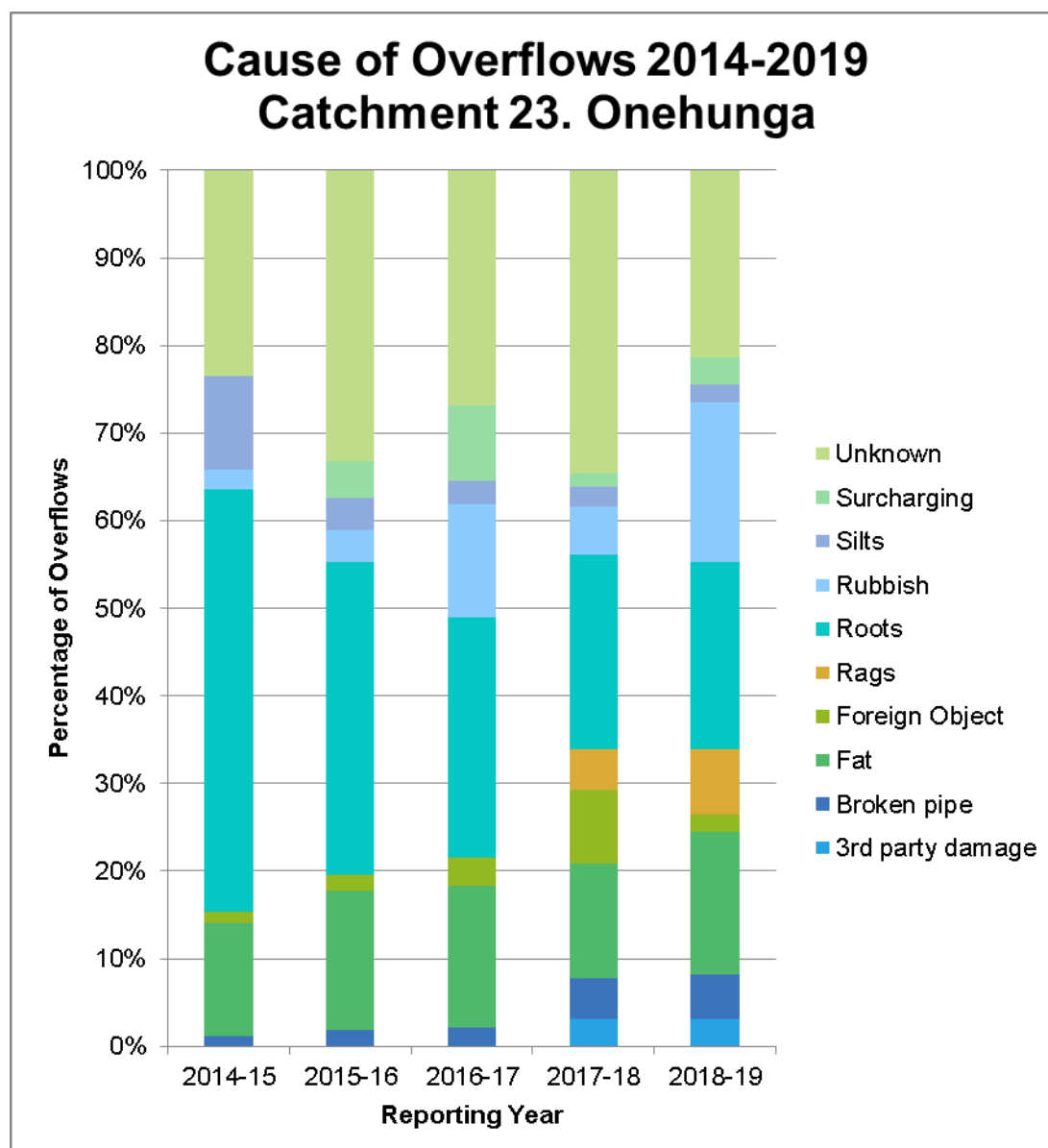
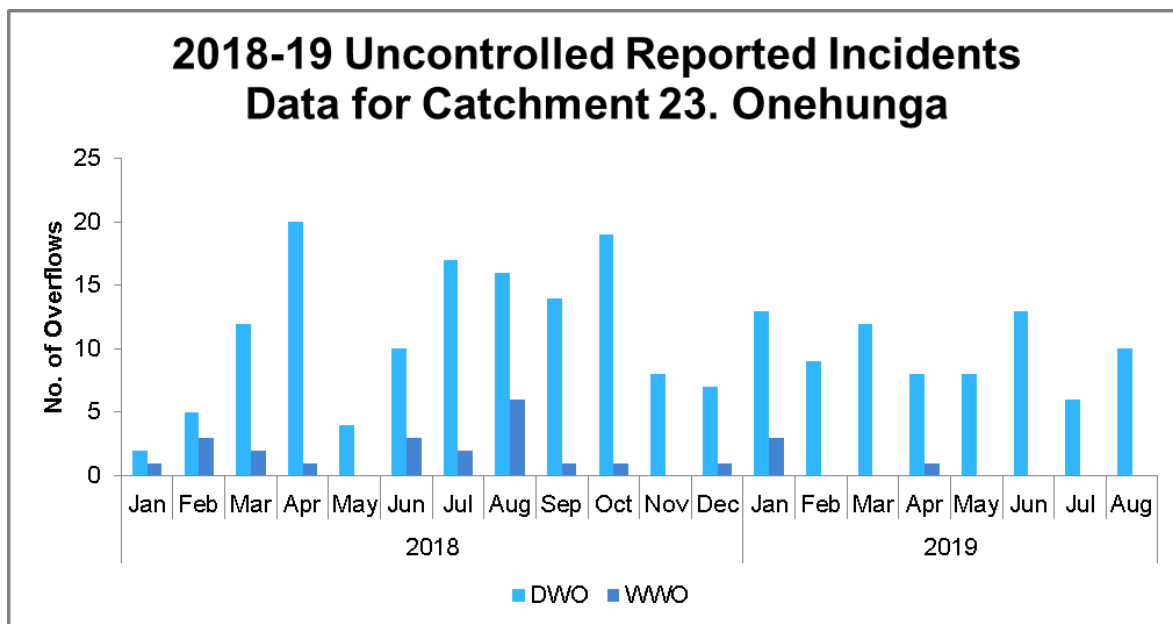
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
21/12/2017	2/27 Seacliffe Rd	L1	101	Unknown	0	main
7/06/2018	1/27 Seacliffe Rd	L1	81	Unknown	1.5	
29/04/2019	1/27 Seacliffe Rd	L1	88	Unknown	8	
6/10/2018	100 Pah Rd	L1	49	Roots	0	Continue to Monitor
23/10/2018	100 Pah Rd	L1	109	Unknown	0	
24/03/2019	12 Quadrant Rd	L1	136	Unknown	0	Flushed S/L
26/03/2019	12 Quadrant Rd	L1	72	Unknown	0	
21/08/2018	13 Adam St	L1	109	Rubbish	5	Rootcut
24/08/2018	13 Adam St	L1	188	Roots	3	
24/09/2018	13 Edmonton Ave	L1	855	Rags	7.5	Continue to Monitor
26/09/2018	13 Edmonton Ave	L1	116	Unknown	1	
10/07/2018	18-24 Botha Rd	L1	129	Rubbish	5.5	Flushed main Heavy fat and toilet paper flushed from main
29/08/2018	18-24 Botha Rd	L1	884	Fat	41	
20/02/2019	18-24 Botha Rd	L1	214	Unknown	0	
8/04/2019	18-24 Botha Rd	L1	83	Rubbish	0	
6/06/2019	18-24 Botha Rd	L1	272	Fat	7	
24/09/2018	19 Kowhatu Rd	L1	90	Fat	7.5	Tap root removed
18/10/2018	19 Kowhatu Rd	L1	190	Roots	1	
14/02/2019	21 Rangipawa Rd	L1	84	Unknown	0	Jetted main Wipes and fat removed
11/03/2019	21 Rangipawa Rd	L1	91	Rubbish	0	
29/03/2019	21 Rangipawa Rd	L1	149	Rags	0	
18/12/2018	269 Mt Smart Rd	L1	345	Silts	0	Heavy fats and silts in main Damaged pipe repaired
18/12/2018	269 Mt Smart Rd	L1	1112	Broken Pipe	0	
14/05/2019	269 Mt Smart Rd	L1	233	Unknown	0	
17/05/2019	269 Mt Smart Rd	L1	743	Fat	0.5	
21/05/2019	269 Mt Smart Rd	L1	120	Fat	0	
19/07/2018	36 Hoskins Ave	L1	1074	Unknown	0	Continue to Monitor
21/07/2018	36 Hoskins Ave	L1	139	Rags	0	
18/09/2018	40A Normans Hill Rd	L1	85	Rubbish	9	Continue to Monitor
6/10/2018	40A Normans Hill Rd	L1	69	Rubbish	0	
16/03/2019	42-46 Rangipawa Rd	L2	196	Unknown	0	Flushed main
24/03/2019	42-46 Rangipawa Rd	L1	74	Rubbish	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
18/06/2019	432 Hillsborough Rd	L1	932	3rd party damage	0	Concrete excavated from main
25/06/2019	432 Hillsborough Rd	L1	93	3rd party damage	0	
19/08/2018	4A Lynfield Pl	L1	214	Fat	0	Bitumen and fats removed
3/06/2019	4A Lynfield Pl	L1	50	Fat	0	
9/01/2019	5/47 Moana Ave	L1	128	Unknown	0	Flushed line
9/01/2019	5/47 Moana Ave	L1	126	Roots	0	
23/08/2018	72 Alfred St	L2	259	Rubbish	3	Flushed main
23/10/2018	72 Alfred St	L2	68	Rubbish	0	
20/07/2018	77 Halsey Dr	L1	90	Roots	2	Roots removed from manhole
16/02/2019	77 Halsey Dr	L1	153	Roots	0	
5/09/2018	8 Grey St	L1	60	Roots	0	Rootcut, blockage below Pohutukawa
7/09/2018	8 Grey St	L1	82	Roots	0.5	
14/01/2019	9 Saran Pl	L1	110	Roots	22.5	Heavy flush
29/06/2019	9 Saran Pl	L1	113	Roots	0	
8/01/2019	9A Buckley Rd	L1	88	Fat	0	Flushed main
16/01/2019	9A Buckley Rd	L1	63	Unknown	0	

2.25.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.25.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPONE	Hillsborough Wholesale Wastewater Pump Station	668	Rain event	64	64.5
24/12/2018	DPONE	Hillsborough Wholesale Wastewater Pump Station	668	Rain event	44	79
29/08/2018	DPAL1	Aldersgate Road 1 Wastewater Pump Station	208	Rain event	178	41
4/12/2018	DPAL1	Aldersgate Road 1 Wastewater Pump Station	208	Rain event	97	10
4/12/2018	DPAL2	Aldersgate Road 2 Wastewater Pump Station	209	Rain event	36	10
24/12/2018	DPAL1	Aldersgate Road 1 Wastewater Pump Station	208	Rain event	684	79
25/12/2018	DPAL1	Aldersgate Road 1 Wastewater Pump Station	208	Rain event	250	25.5
24/12/2018	DPAL2	Aldersgate Road 2 Wastewater Pump Station	209	Rain event	315	79

2.25.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
208	25 Aldersgate Rd WWPS	1	0	3	10	8	4	5	Western Isthmus Water Quality Improvement Programme
209	72 Aldersgate Rd WWPS	4	1	3	7	4	2	3.4	Western Isthmus Water Quality Improvement Programme
210	Gilleta Rd WWPS	1	0	0	0	0	0	0	Continue to monitor
470	Walls Rd WWPS	-	0	0	0	0	0	0	Continue to monitor
604	Ben James Dr WWPS	1	0	0	0	0	0	0	Continue to monitor
605	Captain Springs Rd WWPS	1	0	0	0	0	0	0	Continue to monitor
615	Himalaya Cr WWPS	2	0	0	0	0	0	0	Continue to monitor
640	44 Sylvania Cr WWPS	1	0	0	0	0	0	0	Continue to monitor
653	Wesley Bay Glade WWPS	1	0	0	0	0	0	0	Continue to monitor
668	Hillsborough WWPS	1	2	1	2	3	2	2	Central Interceptor Spine and Links

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
669	Mt Smart WWPS	0.1	0	0	0	0	0	0	Continue to monitor
674	Pikes Point WWPS	0	0	0	0	0	0	0	Continue to monitor
679	Onehunga WWPS	2	0	0	0	0	0	0	Continue to monitor
705	Lynnfield WWPS	0.8	0	0	0	0	0	0	Continue to monitor
1178	420 Hillsborough Rd WWPS	0.6	0	0	1	0	0	0.2	Continue to monitor
1179	25 Royal Viking WWPS	0	0	0	0	0	0	0	Continue to monitor

2.25.6 Inflow & Infiltration Programme

A review of Inflow & Infiltration in this catchment will be done as part of Watercare's region-wide programme, where the priority of this catchment will be determined. This will be confirmed from the outcomes of the Onehunga Wastewater Catchment Options study.

2.25.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Central Interceptor – main works and link sewers	Project Execution	This project, as well as addressing numerous wet weather overflows, will also address the risk of failure of the Manukau siphon, and also provide for urban growth. To address growth, level of service, and asset condition risks	The Central Interceptor will have multiple and widespread benefits through immediate improvements in wet weather overflow frequency and enabling upgrades for growth and level of service upgrades through the isthmus	2017-2025
Underway	Onehunga Catchment Option analysis Investigations	Studies and investigations	Will identify options to address level of service issues and future growth in the catchment	Identification of capital and operational works programme for regional prioritisation	2020

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Oakley Wastewater Model Build and Calibration	Studies and investigations	Will identify options to address level of service issues and future growth in the catchment.	Identification of capital and operational works programme for regional prioritisation	System performance currently being completed
Underway	Western Isthmus Water Quality Improvement Programme	Option Development (Feasibility)	To address growth, level of service, and asset condition risks in the Western Isthmus catchment.	Reduction in wet weather overflow volumes and frequencies	Underway

2.25.8 Erosion Control Measures

No works related to erosion control were carried out in this catchment between 1 July 2018 and 30 June 2019.

2.25.9 Summary

There are two Type 1 EOPs which discharged more frequently than two spills per year; options for managing these will be addressed under the Western Isthmus Water Quality Improvement Programme. Trend analysis shows the ratio of overflow incidents to pipe length has increased, with surcharging, roots, and fats as the leading cause. In the long term, the network performance in this catchment will be planned and managed using the recently calibrated Onehunga wastewater network model and the options implemented from the Western Isthmus Water Quality Improvement Programme investigations, noting that the Central Interceptor project will relieve the trunk network. The overflow history and modelling will be analysed and utilised when reviewing future network improvement and I&I programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.26 Catchment 24 - Mangere

2.26.1 Overview

The Mangere catchment is located to the south of central Auckland and contains the suburbs of Otahuhu, Mangere East, Mangere and Mangere Bridge. There are several watercourses in the area, including Tararata Creek, Harania Creek and Tui Creek, that all converge in the Mangere Inlet. Oruarangi Creek, in the western part of the catchment, drains directly to the Manukau Harbour. There are 14,106 wastewater connections.

Land use within the catchment is largely urban with commercial/industrial uses focused around the Mangere Inlet.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	13,703	13,747	13,894	13,969	14,106
Length of sewer (km)	304	305	307	354	345

Please note that the pipe length data supplied in 2018/19 APR may have changed due to data cleansing and change of the network over time.

Schedule of Engineered Overflow Points

EOP ID	EOP Name	Facility Code	EOP Type	Receiving Environment Name
466	20 Chelsea Avenue	-	2	To Land
468	Saleyards Rd WWPS	DPSAL	1	Tui Creek
582	Sylvia Park WWPS	DPSYL	1	Ann's Creek
664	Favona Rd	DPFAV	1	Harania Creek
672	Westfield WWPS	DPWTF	1	Ann's Creek
677	Black Bridge WWPS	DPTRC	1	Tararata Creek
678	Mangere Bridge	DPMGB	1	Ambury Shoreline via stormwater pipe
680	Otahuhu West	DPOTW	1	Tui Creek
744	Hellabys Trade Waste network overflow	DSHLT	2	Ann's Creek
963	62 Chelburn Crescent	-	2	Unnamed tributary to Harania Creek (south)
973	4 Chalfont Street	-	2	Unnamed tributary to Harania Creek (south)
999	James Fletcher Drive WWPS	DPJFD	1	Harania Creek
1011	Mackenzie Road WWPS	DPMCK	1	Tararata Creek
1015	Savil Drive Link WWPS	DPSAV	1	Unnamed tributary of Harania Creek (East)
1136	Ruaiti Road WWPS	DPRUA	1	Oruarangi Creek
1159	Lambie Court WWPS	DPLAM	1	To Land
1192	Portage Rd WWPS	DPPO1	1	Ann's Creek
1194	Huia Rd WWPS	DPHRD	1	To Land
1577	Oruarangi WWPS	DPORU	1	Oruarangi Creek

EOP 1577, Oruarangi Pump Station has been included within this catchment for reporting purposes, although it is technically outside the consented area. It is consented under discharge permit 48840.

2.26.2 Dry Weather Overflows (DWOs)

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 171 reported incidents in the Mangere catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
13/04/2017	22 Imrie Ave	L1	48	Fat	7.5	On 36 Monthly Planned Flushing Schedule
2/02/2018	22 Imrie Ave	L1	216	Rubbish	0.5	
13/04/2018	22 Imrie Ave	L1	172	Fat	7.5	
29/08/2018	22 Imrie Ave	L1	213	Surcharging	41	
2/10/2016	56 Imrie Ave	L1	94	Unknown	13.71	Fats in main removed, heavy flushed Large grease blockage removed
5/08/2017	56 Imrie Ave	L1	165	Unknown	0	
1/02/2018	56 Imrie Ave	L1	77	Fat	47	
14/05/2019	56 Imrie Ave	L1	120	Fat	0	
23/04/2018	28 Lyncroft St	L1	66	Unknown	0	Connection repaired Heavy Flush of grease in main
14/05/2018	28 Lyncroft St	L1	159	Fat	2	
5/02/2019	28 Lyncroft St	L2	108	Unknown	0	
5/04/2019	28 Lyncroft St	L1	102	Fat	0	
8/04/2019	28 Lyncroft St	L1	104	Fat	0	
5/04/2017	26B Royton Ave	L1	704	Unknown	37.5	Heavy flushed
5/12/2017	26B Royton Ave	L1	545	Fat	0	

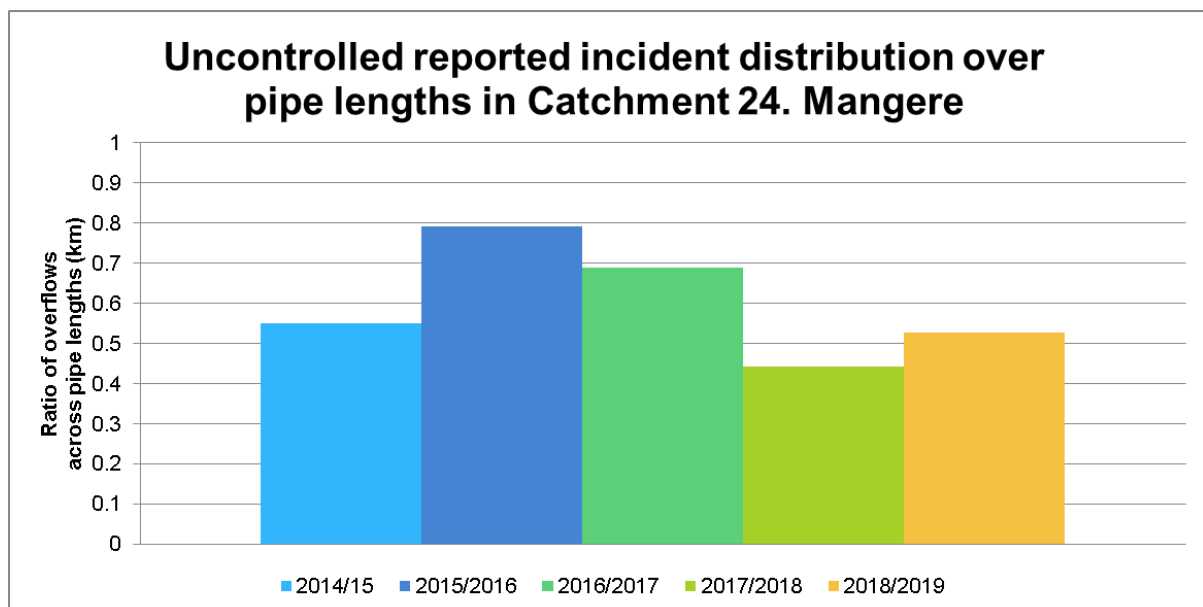
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
18/04/2019	26B Royton Ave	L1	311	Fat	0	
12/02/2018	267 Buckland Rd	L1	138	Unknown	0	Under investigation for I&I
17/04/2018	267 Buckland Rd	L1	585	Broken Pipe	2	
16/07/2018	267 Buckland Rd	L1	238	Surcharging	0.5	
4/12/2018	267 Buckland Rd	L1	160	Surcharging	10	
20/12/2018	267 Buckland Rd	L1	550	Surcharging	43.5	
27/12/2018	267 Buckland Rd	L1	231	Surcharging	0	
16/03/2018	35 Mascot Ave	L1	81	Fat	0	Fats and debris flushed from main
21/04/2018	35W Mascot Ave	L1	293	Fat	3	
18/11/2018	35 Mascot Ave	L1	1217	Foreign Object	0	
27/11/2017	132 Coronation Rd	L1	107	Fat	0	Heavy buildup of fat and rags removed, flushed main
22/06/2018	132 Coronation Rd	L1	115	Fat	0	
6/05/2019	132 Coronation Rd	L2	256	Rags	0	
10/05/2019	132 Coronation Rd	L2	176	Fat	4	
12/09/2017	51 Crawford Ave	L1	158	Rubbish	2	Heavy flush, silts and fat removed
21/05/2018	51 Crawford Ave	L1	228	Rubbish	15	
26/07/2018	51 Crawford Ave	L1	1071	Fat	0	
19/01/2018	31 Gadsby Rd	L1	269	Foreign Object	9.5	Rubbish blocking satellite into Transmission line removed
3/03/2018	31 Gadsby Rd	L1	67	Rubbish	0	
3/03/2018	37 Gadsby Rd	L1	531	Rubbish	0	
22/03/2018	37 Gadsby Rd	L1	154	Surcharging	0	
11/04/2018	37 Gadsby Rd	L1	338	Surcharging	14	
13/01/2018	47 Gadsby Rd	L1	173	Fat	0	
3/03/2018	47 Gadsby Rd	L1	562	Rubbish	0	
21/03/2018	47 Gadsby Rd	L1	380	Surcharging	2.5	
20/12/2018	47 Gadsby Rd	L2	461	Surcharging	43.5	
20/12/2018	37 Gadsby Rd	L1	417	Surcharging	43.5	
16/07/2018	1/43 Nikau Rd	L1	332	Fat	0.5	Heavy fat cleared with penetrator
1/08/2018	1/43 Nikau Rd	L1	188	Fat	4	
19/07/2018	1/46 Nikau Rd	L1	84	Rubbish	0	Jetted blockage
23/07/2018	1/46 Nikau Rd	L1	145	3rd party damage	1.5	
2/10/2018	14 Saleyards Rd	L1	76	Fat	3	Flushed main

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
19/10/2018	14 Saleyards Rd	L1	108	Rubbish	0	
13/07/2018	15 Ashmore Pl	L1	69	Unknown	0	Flushed main
12/08/2018	15 Ashmore Pl	L1	185	Fat	0	
8/03/2019	15 Ashmore Pl	L1	300	Unknown	16.5	
3/09/2018	16 Forbury Pl	L1	1349	Fat	8	Heavy flushed main
2/02/2019	16 Forbury Pl	L1	213	Fat	0	
12/07/2018	160 Tennessee Ave	L1	73	Fat	1	Continue to Monitor
25/07/2018	160 Tennessee Ave	L1	125	Fat	2.5	
14/01/2019	160 Tennessee Ave	L1	164	Surcharging	22.5	
3/10/2018	2/13 Korimako Ave	L2	582	Fat	0	Large rock removed from main
8/10/2018	2/13 Korimako Ave	L1	202	Foreign Object	0	
9/11/2018	21R Norana Ave	L2	167	Fat	3.5	Flushed main
15/11/2018	21R Norana Ave	L1	178	Unknown	0	
26/09/2018	28 Station Rd	L1	139	3rd party damage	1	Vector Thrusting damage
30/09/2018	28 Station Rd	L1	113	3rd party damage	0	
7/01/2019	30 Garus Ave	L1	99	Unknown	0	Heavy flush
8/01/2019	30 Garus Ave	L1	230	Fat	0	
5/02/2019	30 Garus Ave	L1	91	Fat	0	
11/02/2019	30 Garus Ave	L1	224	Fat	0	
15/07/2018	41 Chadwick Cres	L1	93	Fat	64.5	Continue to Monitor
29/08/2018	41 Chadwick Cres	L1	119	Surcharging	41	
2/09/2018	41 Chadwick Cres	L1	127	Fat	18	CCTV Heavy flushed main
3/09/2018	41 Chadwick Cres	L1	171	Fat	8	
26/12/2018	42 Taylor Rd	L1	26	Unknown	0.5	Rootcut
5/01/2019	42 Taylor Rd	L1	171	Roots	0	
16/01/2019	421- Church St-E	L1	259	Fat	0	Large ball of paper removed Flushed main
5/02/2019	421- Church St-E	L1	97	Rubbish	0	
7/04/2019	421- Church St-E	L2	218	Foreign Object	1	
8/04/2019	421- Church St-E	L1	367	Unknown	0	
12/01/2019	50 Station Rd	L1	279	Unknown	0	Continue to Monitor
11/02/2019	50 Station Rd	L1	57	Fat	0	
20/12/2018	54 Mckinstry Ave	L1	350	Surcharging	43.5	Metal rod, fence

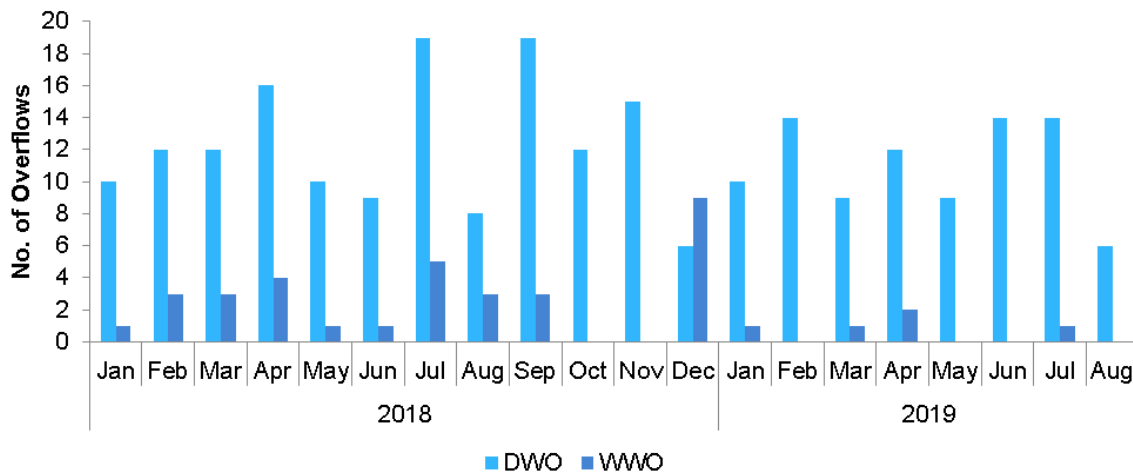
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
11/06/2019	54 Mckinstry Ave	L1	1116	Foreign Object	0	post, rocks, broom head, wood removed from main
11/01/2019	55 Mckinstry Ave	L1	555	Unknown	0	Flushed main
22/03/2019	55 Mckinstry Ave	L1	404	Fat	0	
9/07/2018	67 Bader Dr	L1	225	Fat	5.5	Flushed main
15/07/2018	67 Bader Dr	L1	83	Surcharging	64.5	
15/07/2018	67 Bader Dr	L1	26	Surcharging	64.5	
31/10/2018	70 Huia Rd	L1	75	3rd party damage	0	Broken junction repaired
26/11/2018	70 Huia Rd	L1	167	Broken pipe	7.5	
9/11/2018	8 Rush Pl	L1	43	Fat	3.5	Flushed main, fat removed
26/11/2018	8 Rush Pl	L1	168	Fat	7.5	
6/04/2019	96 Walmsley Rd	L1	1392	3rd party damage	17.5	Earthworks damaged manhole lid, blockage removed, manhole repaired
22/04/2019	96 Walmsley Rd	L1	315	3rd party damage	12.5	
17/06/2019	Station Rd	L1	96	Silts	3.5	Heavy silt, fat and rags cleared from main
19/06/2019	Station Rd	L1	151	Fat	0	

2.26.3 Trend analysis of reported incidents

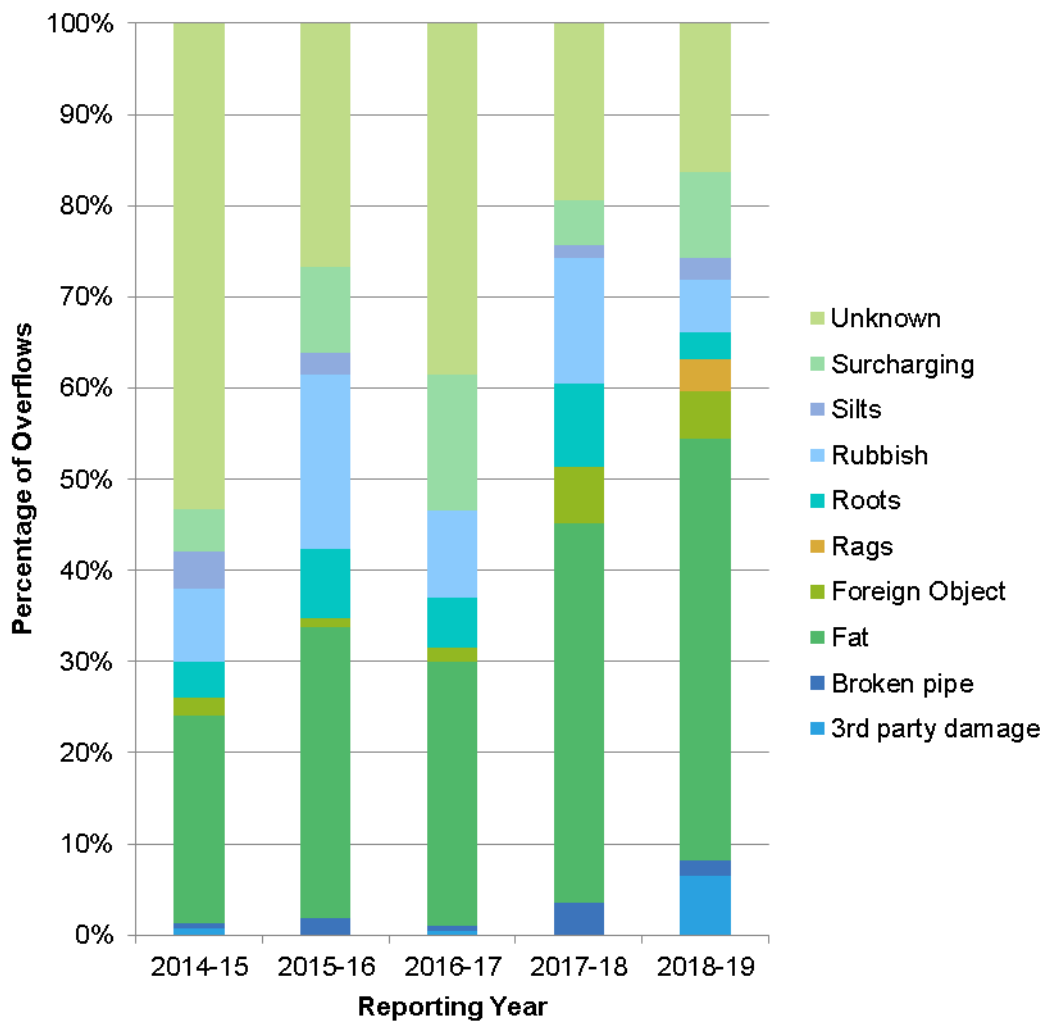
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



2018-19 Uncontrolled Reported Incidents Data for Catchment 24. Mangere



Cause of Overflows 2014-2019 Catchment 24. Mangere



Trend analysis has been carried out where root cause has been identified.

2.26.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPOTW	Otahuhu West Wholesale Wastewater Pump Station	680	Rain event	642	64.5
29/08/2018	DPOTW	Otahuhu West Wholesale Wastewater Pump Station	680	Rain event	1359	41
20/12/2018	DPOTW	Otahuhu West Wholesale Wastewater Pump Station	680	Rain event	178	43.5
24/12/2018	DPOTW	Otahuhu West Wholesale Wastewater Pump Station	680	Rain event	1323	79
25/12/2018	DPTRC	Black Bridge Wholesale Wastewater Pump Station	677	Rain event	391	25.5
9/03/2019	DPOTW	Otahuhu West Wholesale Wastewater Pump Station	680	Rain event	40	14.5
15/07/2018	DPSYL	Sylvia Park Wastewater Pump Station	582	Rain event	47	64.5

2.26.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
468	Saleyards Rd WWPS	1	0	0	0	0	0	0	Continue to monitor
582	Sylvia Park WWPS	1	0	0	0	0	1	0.2	Continue to monitor
664	Favona Rd	1	0	0	0	0	0	0	Continue to monitor
672	Westfield WWPS	4	0	0	0	0	0	0	Continue to monitor
677	Black Bridge WWPS	8	0	3	9	2	1	3	Pump Station upgrade completed. Operational I&I investigation (planned)
678	Mangere Bridge	0	0	0	0	0	0	0	Continue to monitor
680	Otahuhu West	0	1	0	8	7	5	5	Continue to monitor
999	James Fletcher Drive WWPS	0	0	0	0	0	0	0	Continue to monitor
1011	Mackenzie Road WWPS	0.2	0	0	0	0	0	0	Continue to monitor
1015	Savil Drive Link WWPS	0	0	0	0	0	0	0	Continue to monitor
1136	Ruaiti Road WWPS	0.6	0	0	0	0	0	0	Continue to monitor
1159	Lambie Court WWPS	0.2	0	0	0	1	0	0.2	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1192	Portage Rd WWPS	0.2	0	0	0	0	0	0	Continue to monitor
1194	Huia Rd WWPS	0	0	0	0	0	0	0	Continue to monitor
1577	Oruarangi WWPS	0	0	0	0	0	0	0	Continue to monitor
991	Kiwi Esplanade Wastewater Pump Station	-	0	0	0	1	0	0.2	Continue to monitor
1161	Miro Road Wastewater Pump Station	-	0	0	0	1	0	0.2	Continue to monitor

Type 3 – uncontrolled overflow rolling WWO data from 1 July 2014 – 30 June 2019

The following locations are reported as Type 3 overflow locations.

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
S1	34-36 Mascot Ave	1.3	4	2	4	1	0	2.2	Manukau West Catchment Upgrades

2.26.6 Inflow & Infiltration Programme

Field Inflow & Investigations (I&I) have been scoped for the Black Bridge WWPS subcatchment. Targeted field works will start in early 2020.

2.26.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Wastewater Main Renewals and Lining Programme	Project Execution	Network wastewater pipe renewal at 38 sites	Upgraded network pipe condition	2015-2018
Underway	Manukau West upgrades	Variable	Known Type 3 issue locations were identified under this study. A large suite of isolated upgrades were identified to be progressively implemented	Address Type 3 overflows S1 to S5 inclusive) for current and future flows	2017-2025

2.26.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2018 and 30 June 2019.

2.26.9 Summary

There were two Type 1 EOPs which have discharged more frequently than two spills per year on average; the performance will continue to be monitored noting that there has been a recent upgrade where the local network upgrades have conveyed more flow to the pump station. I&I reduction works are planned for early 2020 within the Black Bridge WWPS subcatchments. Trend analysis shows that fat blockages have contributed the most to uncontrolled overflows in this reporting period. The overflow history will be analysed and utilised when reviewing future network improvement programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

2.27 Catchment 25 – Lower Tamaki River

2.27.1 Overview

The Lower Tamaki River catchment is in the east of Auckland. The catchment covers areas around the Tamaki River Estuary including the suburbs of Panmure, Mount Wellington, Tamaki, Point England, Saint Johns, Glen Innes and Glendowie on the west of the estuary and Pakuranga, Sunnyhills, Farm Cove, Half Moon Bay and Bucklands Beach on the east of the estuary. The total land area in the catchment is approximately 2,500 hectares. There are 18,517 wastewater connections.

Land use within the bay is predominantly residential, especially to the east and northwest of the estuary. To the southwest of the estuary, there are areas of commercial/industrial land running from Panmure through Glen Innes. There are also numerous recreational sports fields and schools in the catchment. There has recently been significant residential development adjacent to Mt Wellington in the former Mt Wellington quarry.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	17,806	17,927	18,070	18,218	18,517
Length of sewer (km)	303	304	307	327	314

Schedule Engineered Overflow Points

EOP ID	EOP Name	Facility Code	EOP Type	Receiving Environment Name
161	155 Riverside Avenue	-	2	Lower Tamaki River
162	49 Dunkirk Road	-	2	Lower Tamaki River
163	34 Riverview Road	-	2	Lower Tamaki River
188	6 Concord Place	-	1	Omaru Creek
189	109 Taniwha Street	-	2	Omaru Creek
191	West Tamaki Rd WWPS	DPWTR	1	Lower Tamaki River
596	197-209 Taniwha Street	-	2	Omaru Creek
612	Karaka Bay WWPS	DPKRA	1	Karaka Bay
633	Riddell Rd WWPS	DPRID	1	Riddell Road Beach
681	Pt England WWPS	DPENG	1	Omaru Creek
682	Glendowie WWPS	DPGND	1	Glendowie Stream
706	Dunkirk WWPS	DPDNK	1	Lower Tamaki River
707	Panmure Basin WWPS	DPS018	1	Panmure Basin
745	Glendowie Branch Sewer Relief MH13	DSGLD	2	Omaru Creek
958	Belmire Rise WWPS	DPBEL	1	Wakaaranga Creek
985	Pakuranga North WWPS	DPPKN	1	Wakaaranga Creek
993	The Parade WWPS	DTPPD	1	Bucklands Beach

EOP ID	EOP Name	Facility Code	EOP Type	Receiving Environment Name
1008	Bramley Drive WWPS	DPBRA	1	Lower Tamaki River
1168	Halfmoon Bay Marina WWPS	DPHMB	1	Half Moon Bay Marina via stormwater pipe
1187	Panmure Wharf WWPS	DPPNM	1	Lower Tamaki River
1188	Bridge St WWPS	DPBDG	1	Lower Tamaki River
1189	Watene Rd WWPS	DPWAT	1	Panmure Basin
1406	61 - 67 Felton Matthew Ave	-	2	Omaru Creek
1533	208 Riddell Road	-	2	Stormwater channel
1581	54 Line Road	-	2	Omaru Creek

The following EOP has been removed from the schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
990	Buckland Beach WWPS	DPBBH	1	Little Bucklands Beach	Sealed
1174	Granger Point WWPS	DPGRP	1	Lower Tamaki River	Sealed

2.27.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
23/07/2018	DPENG	Pt England Wholesale Wastewater Pump Station	681	Power Failure	30	1
4/10/2018	DPENG	Pt England Wholesale Wastewater Pump Station	681	Power Failure	18	0

Reported Incidents

There were a total of 218 reported incidents in the Lower Tamaki River catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

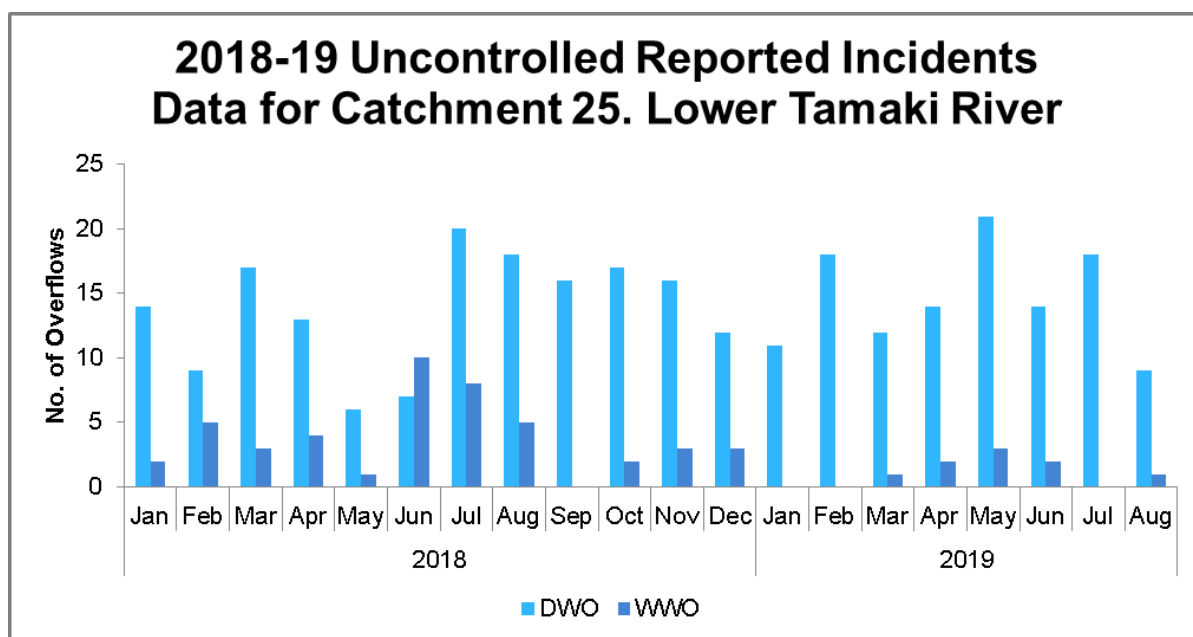
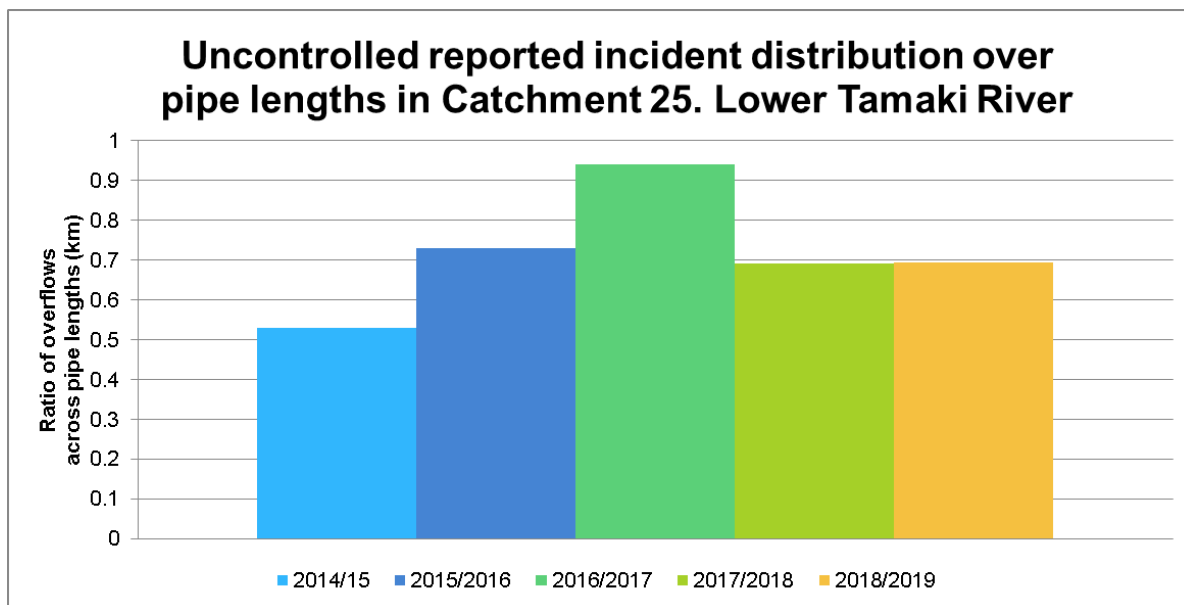
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
17/04/2017	114 Prince Regent Dr	L1	137	Unknown	3	CCTV, heavy fats removed from main, large hole repaired in main
30/01/2018	114 Prince Regent Dr	L1	122	Unknown	0	
18/07/2018	114 Prince Regent Dr	L1	67	Fat	1	
24/09/2018	114 Prince Regent Dr	L1	212	Broken pipe	6	
19/06/2017	2/123 Riddell Rd	L1	313	Unknown	0	Rag blockage removed
3/02/2018	2/123 Riddell Rd	L1	82	Surcharging	26.5	
3/07/2018	1/123 Riddell Rd	L1	153	Rags	0	
19/01/2017	18 Emerson St	L1	131	Fat	5.77	Fat blockage removed, flushed main
30/11/2017	18 Emerson St	L1	126	Unknown	2.5	
19/12/2017	18 Emerson St	L1	618	Fat	0	
22/08/2018	18 Emerson St	L1	186	Fat	7.5	
15/07/2018	2/30 The Parade	L1	1337	Surcharging	56.5	Flushed main
24/07/2018	2/32 The Parade	L1	1131	Rubbish	0.5	
21/01/2017	55 Fordyce Ave	L1	64	Fat	15.38	Fat and roots removed from manhole
23/09/2017	55 Fordyce Ave	L1	104	Roots	0	
25/05/2019	55 Fordyce Ave	L2	150	Fat	0	
26/09/2017	11A Kerswill PI	L1	42	Fat	11	Demolition crew damaged assets, heavy flushed
22/10/2017	11A Kerswill PI	L1	116	Fat	1.5	
28/03/2019	11A Kerswill PI	L2	458	3rd party damage	10	
6/05/2019	11 Kerswill PI	L1	74	3rd party damage	0	
8/03/2019	1 Carlisle St	L1	124	Roots	17.5	Flushed main
16/03/2019	1 Carlisle St	L1	444	Unknown	0	
23/10/2018	11 Aragon Ave	L1	119	Roots	0	Flushed main
24/10/2018	11 Aragon Ave	L1	70	Roots	0	
11/03/2019	15 Belmore Rise	L1	262	Roots	0	CCTV, rootcut
23/03/2019	15 Belmore Rise	L2	86	Roots	0	
2/11/2018	15 Oran Rd	L1	214	Roots	0	Rocks removed
7/11/2018	15 Oran Rd	L1	89	Foreign Object	0	
7/07/2018	1-51//7 Rowlands Ave	L1	277	Fat	0	Heavy flush
23/03/2019	1-51//7 Rowlands Ave	L1	218	Rubbish	0	

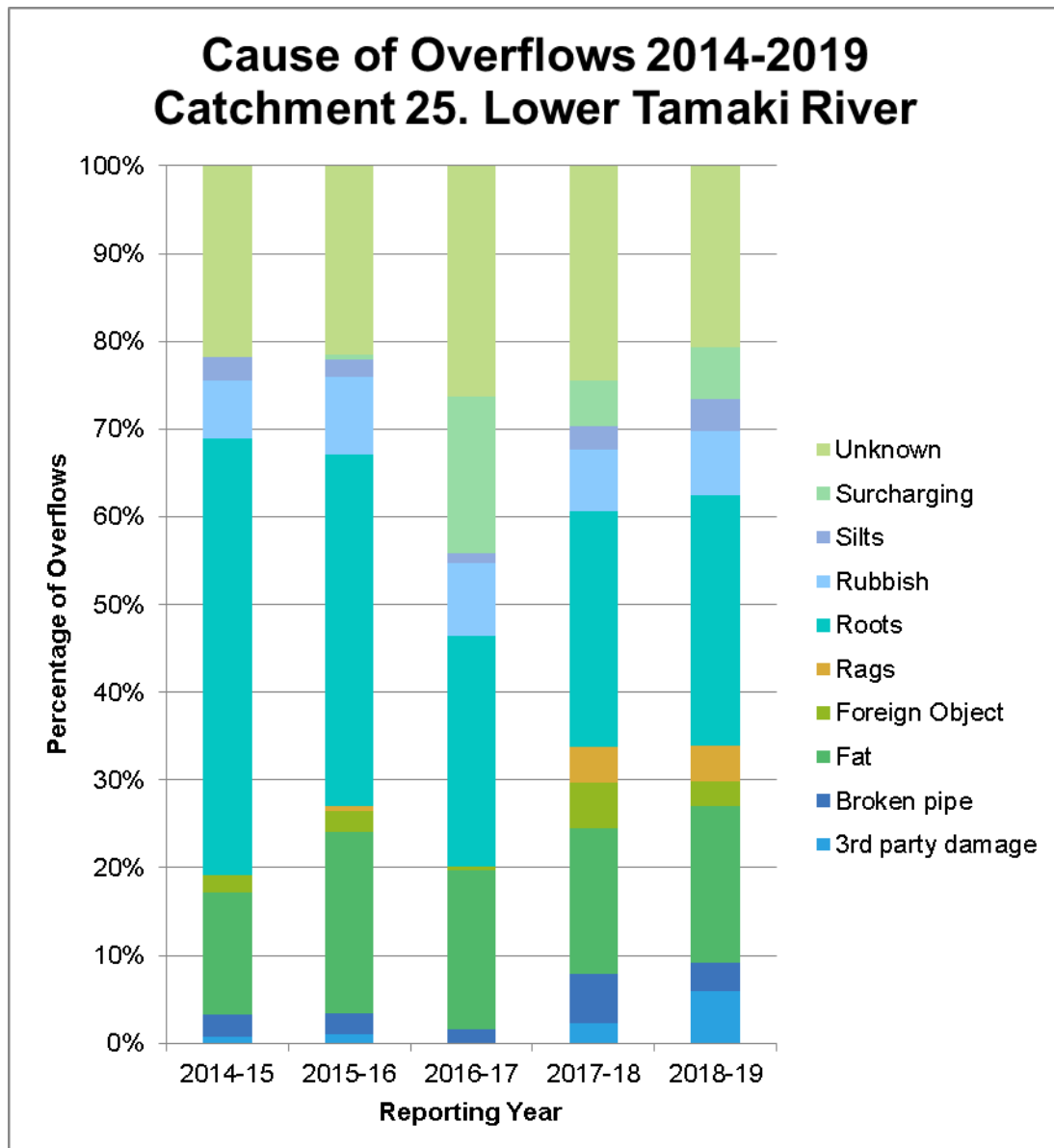
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
26/04/2019	1-51/7 Rowlands Ave	L1	111	Unknown	0	
25/10/2018	15A Rielly PI	L1	253	Unknown	0	Continue to monitor
21/11/2018	15A Rielly PI	L1	45	Rubbish	6.5	
7/02/2019	16 Abraham PI	L2	640	Roots	0	Rootcut
19/02/2019	16 Abraham PI	L1	88	Roots	0	
20/09/2018	195 Mt Wellington Highway	L1	197	Unknown	0	Fat from takeaway store removed
29/09/2018	195 Mt Wellington Highway	L1	67	Fat	0	
24/08/2018	196 Riverside Ave	L1	1080	3rd party damage	3	Fibre thrusting damage repaired
25/08/2018	196 Riverside Ave	L1	121	Unknown	2	
14/09/2018	24 Thorp St	L1	93	Unknown	0	Unblocked S/L
21/09/2018	24 Thorp St	L1	98	Roots	1	
27/11/2018	29 Riverlea Ave	L1	333	Roots	2.5	Telecom cable thrustured through Main
29/11/2018	29 Riverlea Ave	L1	269	Roots	0	
7/12/2018	29 Riverlea Ave	L1	1150	3rd Party Damage	0	
4/04/2019	3 Half Moon Rise	L1	75	Roots	0	Rootcut
5/04/2019	3 Half Moon Rise	L1	283	Roots	0	
13/05/2019	3 Half Moon Rise	L1	444	Roots	2	
23/06/2019	3 Half Moon Rise	L1	111	Roots	5.5	
7/06/2019	3 Manor Park	L1	219	Unknown	24.5	Flushed main
15/06/2019	3 Manor Park	L1	197	Silts	4.5	
24/01/2019	35A Apirana Ave	L1	97	Unknown	2.5	Cleared cobblestone from line
26/01/2019	35A Apirana Ave	L1	137	Foreign Object	0	
1/03/2019	35A Armein Rd	L1	241	Rubbish	0	Heavy fats and concrete chunks removed from main
21/03/2019	35A Armein Rd	L1	124	Fat	0	
8/06/2019	40A Washington Ave	L1	117	Roots	0	Rootcut
13/06/2019	40A Washington Ave	L1	185	Roots	2.5	
27/06/2019	40A Washington Ave	L1	145	Roots	2.5	
18/08/2018	43 Tamatea Ave	L1	150	3rd party damage	4.5	Thrusting damage being repaired

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
24/08/2018	43 Tamatea Ave	L1	137	3rd party damage	3	
17/07/2018	46 Fielding Cres	L1	50	Surcharging	0	Continue to monitor
30/08/2018	46 Fielding Cres	L1	243	Surcharging	0	
5/07/2018	51 Erima Ave	L1	167	Rubbish	0	Bricks, concrete, wood removed from manhole
18/07/2018	51 Erima Ave	L1	288	Foreign Object	1	
31/07/2018	513 Riddell Rd	L1	121	Roots	0	Cleared silts from main
19/07/2018	515 Riddell Rd	L1	1093	Rubbish	1	
15/05/2019	515 Riddell Rd	L1	58	Unknown	3	
18/05/2019	515 Riddell Rd	L1	110	Silts	0	
17/12/2018	519 Ellerslie-Panmure Highway	L1	229	Unknown	0	Flushed large fat blockage
1/04/2019	519 Ellerslie-Panmure Highway	L1	96	Fat	31	
9/10/2018	58 Waipuna Rd	L1	87	Fat	0	Flushed mains, heavy fat chunks removed
16/04/2019	58 Waipuna Rd	L1	386	Fat	0	
26/12/2018	58B Whitehaven Rd	L1	535	Silts	0	Silts removed from chamber
28/12/2018	58B Whitehaven Rd	L1	371	Silts	0	
29/12/2018	58B Whitehaven Rd	L1	276	Silts	0	
4/07/2018	61 Tripoli Rd	L1	378	Rags	0	Heavy flush, CCTV
7/07/2018	61 Tripoli Rd	L1	146	Fat	0	
27/08/2018	617 Riddell Rd	L1	99	Roots	0	Inspection Point installed to remove roots
18/02/2019	617 Riddell Rd	L1	86	Roots	0.5	
15/07/2018	69 Elstree Ave	L1	115	Surcharging	56.5	Continue to monitor
29/08/2018	69 Elstree Ave	L1	87	Surcharging	45.5	
23/07/2018	8 Riddell Rd	L1	84	Unknown	1	Roots removed from manhole
3/10/2018	8 Riddell Rd	L1	143	Roots	0	
14/12/2018	93 Bramley Dr	L1	144	Roots	0	Continue to monitor
30/03/2019	93 Bramley Dr	L1	118	Roots	0	

2.27.3 Trend analysis of Uncontrolled Overflows

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where root cause has been identified.

2.27.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	876	56.5
15/07/2018	DPGND	Glendowie Wholesale Wastewater Pump Station	682	Rain event	56	56.5
17/08/2018	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	190	16.5
29/08/2018	DPGND	Glendowie Wholesale Wastewater Pump Station	682	Rain event	104	45.5
29/08/2018	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	375	45.5
29/08/2018	DPBBH	Bucklands Beach Wholesale Wastewater Pump Station	990	Rain event	71	45.5
24/11/2018	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	26	25.5
24/12/2018	DPGND	Glendowie Wholesale Wastewater Pump Station	682	Rain event	101	60
24/12/2018	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	819	60
25/12/2018	DPGND	Glendowie Wholesale Wastewater Pump Station	682	Rain event	22	28
25/12/2018	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	469	28
6/04/2019	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	11	34
6/06/2019	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	23	4

2.27.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
191	West Tamaki Rd WWPS	1	0	0	0	0	0	0	Continue to monitor
612	Karaka Bay WWPS	1	0	0	0	0	0	0	Continue to monitor
633	Riddell Rd WWPS	1	0	0	1	0	0	0.2	Continue to monitor
681	Pt England WWPS	5	4	5	15	9	8	8.2	Glendowie Branch Sewer Upgrade
682	Glendowie Wholesale WWPS	0	0	0	5	4	4	2.6	Continue to monitor
706	Dunkirk WWPS	2	2	0	1	0	0	0.6	Continue to monitor
707	Panmure Basin WWPS	0.2	0	0	2	0	0	0.4	Continue to monitor
958	Belmire Rise WWPS	1	0	0	0	3	0	0.6	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
985	Pakuranga North WWPS	0	0	0	0	0	0	0	Continue to monitor
990	Buckland Beach WWPS	0	0	0	4	2	1	1.4	Continue to monitor
993	The Parade WWPS	0.8	0	0	0	0	0	0	Continue to monitor
1008	Bramley Drive WWPS	1.6	0	0	0	2	0	0.4	Continue to monitor
1168	Halfmoon Bay Marina WWPS	0.4	0	0	0	0	0	0	Continue to monitor
1174	Granger Point WWPS	0	0	0	0	0	0	0	Continue to monitor
1187	Panmure Wharf WWPS	0.2	0	0	0	0	0	0	Continue to monitor
1188	Bridge St WWPS	0.2	1	0	0	0	0	0.2	Continue to monitor
1189	Watene Rd WWPS	0	0	0	0	0	0	0	Continue to monitor
1145	Manor Park	-	0	0	0	2	0	0.4	Continue to monitor

2.27.6 Inflow & Infiltration Programme

A review of I&I network performance for this catchment is being carried out as part of the Tamaki North modelling and planning study associated with the redevelopment of the area. High severity I&I areas have been identified; this will further inform field I&I investigations together with housing New Zealand's redevelopment information.

Joint I&I and Auckland Council's Healthy Water Safe Networks investigations have also taken place in the Castledine subcatchment, public drainage network issues have been investigated and are being mitigated, and private property drainage issues have been passed on to Auckland Council's Compliance. Further joint field investigations are planned in late 2019 in the Wai-O-Taki Bay area.

2.27.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Glendowie Branch Sewer Upgrade	Project Execution	Overflows from the Point England pump station, and network overflows exceed two spills per year and this is predicted to	Reduced frequency of wet weather overflows at EOPs 188, 189, and 681	2012-2020

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
			increase over time as a result of growth in catchment		
Underway	Tamaki redevelopment catchment upgrades	Modelling and planning investigation study and Options Assessment	There are known high frequency and volume EOPs in this catchment, and high growth with the proposed HNZ redevelopment	The preferred suite and timing of upgrades for this catchment to achieve reduced frequency of wet weather overflows at multiple EOPs and optimising the performance of the Glendowie branch sewer upgrade	2017-2024

2.27.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.27.9 Summary

There were two Type 1 EOPs which has discharged more frequently than two spills per year on average. In the long term, the network performance in this catchment will be improved with the 'Glendowie Branch Sewer Upgrade' and the 'Tamaki Redevelopment catchment upgrade' projects, which will provide capacity in the network. Joint I&I reduction works are underway with Auckland Council's Healthy Waters Safe Networks team. Roots and fats contributed to the largest proportion of uncontrolled overflows. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

2.28 Catchment 26 – Upper Tamaki River

2.28.1 Overview

The Upper Tamaki River catchment is in the southeast of Auckland. The catchment primarily covers areas that drain to the Tamaki River above the Lagoon Drive Bridge. It is the largest geographical catchment of the Auckland wastewater network, and covers the suburbs of Richmond, Middlemore, Mangere East and parts of Mt Wellington in the east, through East Tamaki and Flat Bush to the south, and East Tamaki, Pakuranga Heights, Botany Downs, Highland Park and parts of Howick in the west. There are 59,894 wastewater connections.

Land use within the catchment includes large areas of industrial/commercial land around Mt Wellington and Richmond, as well as significant areas of East Tamaki. The northeast and south of the catchment area is generally residential land, with medium density and more intensive residential development, particularly around Botany Downs. Botany Downs and East Tamaki Heights are areas of the catchment which have very recently developed through expansion and growth. There are rural areas to the east of Flat Bush.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	57,714	58,076	58,593	59,149	59,894
Length of sewer (km)	1035	1039	1061	1248	1203

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
464	Jane Cowie Place WWPS	DPJAN	1	Upper Tamaki River (Middlemore Arm)
465	Otahuhu North East Wholesale WWPS	DPOTA	1	Otahuhu Creek
581	5 Johnson Road	-	2	Unnamed stream (Mt Wellington)
583	18 Skinner Road	-	2	Unnamed stream (Mt Wellington)
584	14 Skinner Road	-	2	Unnamed stream (Mt Wellington)
628	Panama Road WWPS	DPPNA	1	Otahuhu Creek
630	Penrose Road WWPS	DPPEN	1	To Land
648	Tahatai Street WWPS	DPTAH	1	Upper Tamaki River (Middlemore Arm)
667	Pakuranga Wholesale WWPS	DPHIN	1	Upper Tamaki River
670	Sylvia Park Wholesale WWPS	DPSPK	1	Upper Tamaki River
673	Tamaki East Wholesale WWPS	DPTIN	1	Upper Tamaki River
675	Botany Wholesale WWPS	DPBOT	1	Pakuranga Creek
676	Pakuranga South Wholesale WWPS	DPPKS	1	Pakuranga Creek
683	Otara Wholesale WWPS	DPOTB	1	Upper Tamaki River (Middlemore Arm)
684	Middlemore Wholesale WWPS	DPMID	1	Upper Tamaki River (Middlemore Arm)
698	Ormiston Wholesale WWPS	DPOSN	1	Unnamed tributary of Otara Creek (east)

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
747	Otahuhu East Diversion Branch MH4A	DSOTD	2	Upper Tamaki River (Middlemore Arm)
751	Otahuhu North Branch MH12	DSOTN	2	Otahuhu Creek
957	38 Whiteacres Drive	-	2	Unnamed tributary of Pakuranga Creek (Whiteacres Drive)
959	12 Udall Place	-	2	Unnamed tributary of Pakuranga Creek (Highland Park)
960	30 Minaret Drive	-	2	Unnamed tributary of Pakuranga Creek (Highland Park)
961	16 Ingram Crescent	-	2	Unnamed tributary of Otara Creek (west)
969	3 Ross Avenue	-	2	Upper Tamaki River (Middlemore Arm)
970	77 Shirley Road	-	2	Upper Tamaki River (Middlemore Arm)
972	123 Ennis Ave	-	2	Pakuranga Creek
975	16 Windsong Ct	-	2	Unnamed tributary of Pakuranga Creek (Botany Downs)
984	Aviemore Drive WWPS	DPAVI	1	Unnamed tributary of Pakuranga Creek (Highland Park)
998	Burswood Drive WWPS	DPBUR	1	Pakuranga Creek
1004	Stonedon Drive WWPS	DPSDN	1	Pakuranga Creek
1005	Highland Park WWPS	DPHIP	1	Unnamed tributary of Pakuranga Creek (Highland Park)
1010	Hannah Road WWPS	DPHAN	1	Unnamed tributary of Otara Creek (west)
1141	Lloyd Elsmore Park WWPS	DPLLO	1	Unnamed tributary of Pakuranga Creek (Highland Park)
1142	Cascades Road WWPS	DPCAS	1	Pakuranga Creek
1143	Gossamer Drive WWPS	DPGOS	1	Pakuranga Creek
1149	Pelorus Place WWPS	DPPEL	1	Upper Tamaki River
1150	Riverhills Park WWPS	DPRHP	1	Pakuranga Creek
1152	Cryers Road WWPS	DPCRY	1	Pakuranga Creek
1153	Harris Road WWPS	DPHIS	1	Pakuranga Creek
1154	Highbrook Park WWPS	DPHIB	1	Upper Tamaki River
1155	Luke Place WWPS	DPLUK	1	Otara Creek
1156	Lawrence Place WWPS	DPLAW	1	Unnamed tributary of Otara Creek (east)
1181	Ballarat Street 1 WWPS	DPBA1	1	To Land
1182	McDonald Crescent WWPS	DPMCD	1	To Land
1183	Harris Road WWPS	DPHAR	1	To Land
1184	Motu Place WWPS	DPMOT	1	To Land

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1185	Ferndale Road WWPS	DPFER	1	To Land
1186	Banks Street WWPS	DPBNK	1	To Land
1190	Mount Richmond 1 WWPS	DPRD1	1	Otahuhu Creek
1191	Mount Richmond 2 WWPS	DPRD2	1	Otahuhu Creek
1193	Rodney Street WWPS	DPRNY	1	Upper Tamaki River (Middlemore Arm)
1195	Ballarat Street 2 WWPS	DPBA2	1	To Land
1196	Carrs Place WWPS	DPCAR	1	To Land
1200	Joe Stanley Place WWPS	DPJOE	1	Otahuhu Creek
1417	13 Lynley Place, Pakuranga	-	2	Pakuranga Creek
1534	22 Graeme Avenue	-	2	Upper Tamaki River (Middlemore Arm)
1546	Otahuhu North Diversion MH07	D POTN	1	Otahuhu Creek
1549	14 McLean Ave	-	2	Troon Creek

The following EOPs have been removed to the EOP schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
666	Otahuhu North Wholesale WWPS	D POTN	1	666	Decommissioned

2.28.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
31/07/2018	DPMID	Middlemore Wholesale Wastewater Pump Station	684	Power Failure	54	0
28/05/2019	DPMID	Middlemore Wholesale Wastewater Pump Station	684	Other	18	10
18/08/2018	DPRNY	Rodney Street Wastewater Pump Station	1193	Mechanical Fault	457	3
19/09/2018	DPRNY	Rodney Street Wastewater Pump Station	1193	Mechanical Fault	189	0

Reported incidents

There were a total of 536 reported incidents in the Upper Tamaki River catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
24/01/2018	17 Clutha Cres	L1	338	Surcharging	0	Installed NRV, under investigation
2/02/2018	17 Clutha Cres	L1	92	Surcharging	0.5	
11/02/2018	23 Clutha Cres	L1	342	Surcharging	42.5	
3/06/2018	23 Clutha Cres	L1	121	Surcharging	67.5	
15/07/2018	23 Clutha Cres	L1	128	Surcharging	84	
24/12/2018	23 Clutha Cres	L1	149	Surcharging	47	
25/12/2018	23 Clutha Cres	L1	668	Surcharging	25	
27/12/2018	17 Clutha Cres	L1	250	Surcharging	0	
19/06/2019	17 Clutha Cres	L1	301	Foreign Object	0.5	
9/03/2017	1/37 Clydesdale Ave	L1	133	Roots	0	Rootcut
17/01/2018	38 Clydesdale Ave	L1	116	Unknown	0.5	
29/07/2018	1/37 Clydesdale Ave	L1	231	Roots	2	
21/06/2017	73 Preston Rd	L1	500	Fat	0	Under investigation
4/01/2018	73 Preston Rd	L1	84	Fat	47.5	
16/07/2018	73 Preston Rd	L1	528	Surcharging	0	
29/12/2016	157 Edgewater Dr	L1	555	Fat	0	Very heavy fats removed from the service lead, under investigation
14/08/2017	157 Edgewater Dr	L1	201	Fat	1.98	
11/07/2018	157 Edgewater Dr	L2	189	Fat	0.5	
2/10/2018	157 Edgewater Dr	L1	113	Fat	4.5	
12/01/2019	157 Edgewater Dr	L1	149	Fat	0	
13/05/2017	16 Fisher Cres	L1	73	Unknown	0	Very heavy fats removed from the service lead, under investigation
24/02/2018	1/16 Fisher Cres	L1	129	Fat	0	
15/07/2018	1/16 Fisher Cres	L1	157	Surcharging	84	
10/06/2019	1/16 Fisher Cres	L1	38	Fat	0	
4/03/2018	1/107 East Tamaki Rd	L1	273	Fat	0	Fat blockage removed, heavy flush. 1.5m of 100mm pipe removed from main
14/04/2018	1/107 East Tamaki Rd	L1	497	Surcharging	84	
25/12/2018	1/107 East Tamaki Rd	L1	70	Surcharging	25	
15/01/2019	1/107 East Tamaki Rd	L1	68	Foreign Object	3	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
2/12/2017	19 Rongomai Rd	L1	89	Unknown	0	Heavy flushed main, heavy fat blockage removed
1/02/2018	19 Rongomai Rd	L1	110	Surcharging	28	
2/02/2018	17 Rongomai Rd	L1	106	Fat	0.5	
24/12/2018	17 Rongomai Rd	L1	110	Fat	47	
1/01/2019	17 Rongomai Rd	L1	233	Fat	0	
2/03/2019	19 Rongomai Rd	L1	188	Fat	0	
6/04/2017	27 Hallberry Rd	L1	371	Surcharging	0.99	Debris and fat removed from main
12/02/2018	27 Hallberry Rd	L1	89	Rubbish	0.5	
27/12/2018	27 Hallberry Rd	L1	102	Surcharging	0	
16/04/2018	40 Bairds Rd	L1	221	Unknown	3	Under investigation
23/05/2018	40 Bairds Rd	L1	104	Surcharging	25.5	
12/06/2018	40 Bairds Rd	L1	363	Surcharging	38.5	
4/12/2018	40 Bairds Rd	L1	119	Fat	7.5	
1/06/2017	40 Ashton Ave	L1	102	Fat	3	Heavy flushed, fats and rags removed
13/03/2018	40 Ashton Ave	L1	147	Fat	29	
4/04/2019	40 Ashton Ave	L1	80	Fat	0	
3/06/2018	9 Cornwall Rd	L2	435	Surcharging	67.5	Under investigation
13/06/2018	9 Cornwall Rd	L1	463	Surcharging	2.5	
16/07/2018	9 Cornwall Rd	L1	45	Surcharging	0	
23/11/2017	53A Hain Ave	L1	90	Rubbish	0	Under investigation
31/01/2018	53 Hain Ave	L2	277	Unknown	0	
28/05/2018	53 Hain Ave	L1	124	Fat	1	
18/10/2017	71 Hamill Rd	L1	541	Unknown	2.5	Under investigation, issue with stormwater and surcharging
21/10/2017	71 Hamill Rd	L1	221	Unknown	0	
30/10/2017	71 Hamill Rd	L1	60	Unknown	1	
23/01/2018	71 Hamill Rd	L1	476	Surcharging	6.5	
16/07/2018	71 Hamill Rd	L1	1162	Surcharging	0	
16/04/2018	58 Woolfield Rd	L1	484	Fat	3	Under investigation
3/06/2018	58 Woolfield Rd	L1	570	Surcharging	67.5	
20/12/2018	58 Woolfield Rd	L1	1247	Surcharging	24	
17/04/2018	18 Water St	L1	608	Surcharging	1	Heavy flushed
3/06/2018	18 Water St	L1	26	Surcharging	67.5	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
20/12/2018	18 Water St	L1	89	Surcharging	24	
12/07/2017	10 Walters Rd	L1	291	Fat	9	High flows, under investigation
22/07/2017	10 Walters Rd	L1	560	Surcharging	14	
13/08/2017	10 Walters Rd	L1	94	Unknown	7.91	
18/02/2019	10 Walters Rd	L2	74	Roots	0.5	
13/04/2019	10 Walters Rd	L1	95	Fat	0	
27/05/2019	10 Walters Rd	L1	47	Fat	4.5	
28/05/2019	10 Walters Rd	L1	165	Unknown	10	
30/05/2019	10 Walters Rd	L1	133	Fat	0.5	
15/07/2017	477 Great South Rd	L1	76	Fat	0	Wet wipes and fats removed from main
24/10/2017	477 Great South Rd	L1	128	Foreign Object	0.5	
20/02/2019	477 Great South Rd	L2	141	Rags	0	
12/06/2017	40 Tyrone St	L1	106	Unknown	0.5	Continue to monitor
23/01/2018	40 Tyrone St	L1	391	Surcharging	6.5	
21/11/2018	40 Tyrone St	L1	115	Fat	5.5	
25/04/2017	147 Gossamer Dr	L1	144	Roots	0	Rootcut, heavy fats removed, commercial area
25/07/2017	147 Gossamer Dr	L1	493	Fat	1	
4/02/2019	147 Gossamer Dr	L1	219	Fat	0	
4/09/2017	23 Lynton Rd	L1	93	Unknown	0.49	Flushed manhole and main, under investigation
2/05/2018	23 Lynton Rd	L1	361	Unknown	0	
29/06/2018	23 Lynton Rd	L1	100	Unknown	1.5	
20/06/2019	23 Lynton Rd	L1	137	Roots	3.5	
31/03/2017	42 Wedgwood Ave	L1	52	Fat	0	Fat blockages removed, flushed main
1/08/2017	42 Wedgwood Ave	L1	82	Fat	0	
23/02/2019	42 Wedgwood Ave	L1	129	Unknown	4.5	
16/10/2017	3A Frank Grey Pl	L1	188	Rubbish	0	Heavy debris and rags removed
30/10/2017	3A Frank Grey Pl	L1	174	Rubbish	1	
11/11/2017	3A Frank Grey Pl	L1	425	Rubbish	0	
25/01/2019	3A Frank Grey Pl	L1	57	Rags	0	
1/06/2017	711 Great South Rd	L1	645	Fat	0	Heavy flushed
17/07/2017	711 Great South Rd	L1	110	Unknown	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
20/09/2018	711 Great South Rd	L1	344	Fat	0	
19/01/2018	6 Wood Ave	L1	181	Roots	14	Rootcut, under investigation
4/06/2018	6 Wood Ave	L1	33	Surcharging	31	
15/07/2018	6 Wood Ave	L1	84	Surcharging	84	
29/08/2018	6 Wood Ave	L1	154	Surcharging	48	
23/12/2017	5 Bruce Pl	L1	101	Unknown	0	Heavy flush, rubbish removed from main, fat and debris removed from dropper
4/03/2018	5 Bruce Pl	L1	132	Rubbish	0	
27/11/2018	5 Bruce Pl	L1	159	Fat	2	
20/08/2017	188 Pakuranga Rd	L1	175	Roots	2.97	Rags removed from manhole Large root intrusion removed
18/10/2017	188 Pakuranga Rd	L1	284	Unknown	2.5	
21/10/2017	188 Pakuranga Rd	L1	511	Unknown	0	
13/11/2017	188 Pakuranga Rd	L1	58	Unknown	1.5	
20/02/2018	188 Pakuranga Rd	L1	610	Unknown	2.5	
12/07/2018	188 Pakuranga Rd	L1	88	Fat	0.5	
23/02/2019	188 Pakuranga Rd	L1	205	Rags	4.5	
25/04/2019	188 Pakuranga Rd	L1	577	Roots	0	
27/08/2017	28 Windoma Cir	L1	643	Unknown	3.38	Heavy flushed to remove fats, large grease blockage removed
28/11/2017	28 Windoma Cir	L1	107	Fat	0	
10/03/2018	28 Windoma Cir	L1	454	Fat	0	
9/01/2019	28 Windoma Cir	L1	177	Unknown	0	
7/05/2019	28 Windoma Cir	L1	967	Rubbish	0	
9/05/2019	28 Windoma Cir	L1	205	Fat	0	
2/06/2019	28 Windoma Cir	L1	135	Fat	4	
16/11/2017	34 Church St	L1	118	3rd party damage	0	Pipe repaired, main flushed
24/11/2017	34 Church St	L1	81	3rd party damage	0	
24/12/2018	34 Church St	L1	118	Unknown	47	
22/11/2017	1/294 Ellerslie-Panmure Highway	L1	45	Rubbish	0	CCTV, heavy flush
22/06/2018	1/294 Ellerslie-Panmure Highway	L1	102	Fat	0.5	
29/03/2019	1/294 Ellerslie-Panmure Highway	L1	133	Unknown	0	
18/10/2017	13 Nevada Ave	L1	526	Fat	2.5	Rootcut and heavy flush

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
9/05/2018	13 Nevada Ave	L1	402	Unknown	1	
7/12/2018	13 Nevada Ave	L1	197	Roots	0	
14/04/2018	165 Avenue Rd-E	L1	176	Surcharging	84	Under investigation
3/06/2018	165 Avenue Rd-E	L1	31	Surcharging	67.5	
15/07/2018	165 Avenue Rd-E	L1	172	Surcharging	84	
15/04/2018	18 Covina Pl	L1	218	Surcharging	5	Under investigation for cross connections and I&I
3/06/2018	18 Covina Pl	L1	407	Surcharging	67.5	
15/07/2018	18 Covina Pl	L1	1372	Surcharging	84	
26/10/2017	70 Franklyne Rd	L1	163	Fat	2	Blockage of roots and mortar removed, rubbish removed from main
17/11/2017	70 Franklyne Rd	L1	607	Fat	0	
27/06/2018	70 Franklyne Rd	L3	16	Fat	0.5	
11/07/2018	70 Franklyne Rd	L3	13	Rubbish	0.5	
14/02/2018	47 Mataroa Rd	L1	158	Unknown	3.5	Heavy fat removed
23/02/2018	47 Mataroa Rd	L1	188	Unknown	0.5	
10/03/2019	47 Mataroa Rd	L1	85	Fat	0	
25/02/2018	35 Ngaio St	L1	520	Unknown	0	6 monthly flushing schedule, heavy fat cleared from main
27/02/2018	35 Ngaio St	L1	85	Unknown	4	
23/06/2019	35 Ngaio St	L1	225	Fat	4	
25/12/2018	1/107 East Tamaki Rd	L1	70	Surcharging	25	Heavy flush. 1.5m of 100mm pipe removed from main
15/01/2019	1/107 East Tamaki Rd	L1	68	Foreign Object	3	
31/07/2018	1/22 Andrew Baxter Dr	L1	1291	Foreign Object	0	Flushed main
13/08/2018	1/22 Andrew Baxter Dr	L1	392	Silts	6.5	
4/08/2018	1/246 Mt Wellington Highway	L1	257	Unknown	0.5	Flushed main
6/08/2018	1/246 Mt Wellington Highway	L1	110	Fat	0.5	
7/07/2018	1/25 Sandra Ave	L1	196	Rags	0	Flushed main of fats and wipes. Blockage found to be knife wrapped in toilet paper
16/07/2018	1/25 Sandra Ave	L1	71	Foreign Object	0	
1/08/2018	1/25 Sandra Ave	L1	1125	Foreign Object	2.5	
9/01/2019	1/261 Shirley Rd	L1	102	Unknown	0	Unblocked line
30/01/2019	1/261 Shirley Rd	L1	1346	Unknown	0	
1/01/2019	1/300 Panama Rd	L1	1176	Unknown	0	Flushed main Blockage cleared from

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
19/06/2019	1/300 Panama Rd	L1	68	Unknown	0.5	manhole
28/08/2018	1/366 Bucklands Beach Rd	L1	57	Fat	4.5	Continue to monitor
10/09/2018	1/366 Bucklands Beach Rd	L1	170	Fat	1	
25/08/2018	1/63 Cardiff Rd	L1	277	Rubbish	2.5	Continue to monitor
25/12/2018	1/63 Cardiff Rd	L1	1004	Surcharging	25	
23/11/2018	104 Ti Rakau Dr	L1	262	Unknown	0	Heavy flush
16/01/2019	104 Ti Rakau Dr	L1	215	Fat	0	
22/05/2019	109 Reeves Rd	L1	229	Fat	0	Heavy fat, flushed main
27/05/2019	109 Reeves Rd	L1	55	Fat	4.5	
5/07/2018	110A Buckland Rd	L1	225	Fat	0	Large amount of fat removed, Heavy Flush
6/02/2019	110A Buckland Rd	L1	170	Fat	4	
15/02/2019	110A Buckland Rd	L1	205	Fat	0	
6/09/2018	12 Gray Ave	L1	231	Foreign Object	6	Concrete chunk removed, benching repaired Cans, disposable plate and cup removed
21/09/2018	12 Gray Ave	L1	80	Foreign Object	1	
19/10/2018	12 Troon Pl	L1	298	Fat	0	Flushed heavy fats
27/10/2018	12 Troon Pl	L1	185	Fat	12	
16/05/2019	12 Troon Pl	L1	13	Fat	3	
12/10/2018	120 East Tamaki Rd	L1	373	Fat	6.5	Heavy flush due to heavy fat build up downstream of shops
17/10/2018	120 East Tamaki Rd	L1	1292	Fat	1.5	
24/12/2018	13 Perth St	L1	274	Unknown	47	Flushed line
7/02/2019	13 Perth St	L1	98	Fat	0	
2/02/2019	13 Tomuri Pl	L1	95	Roots	0	Jettied main Plastic wedged in IP
9/02/2019	13 Tomuri Pl	L1	153	Foreign Object	0	
15/07/2018	142A Tiraumea Dr	L1	99	Surcharging	84	Continue to monitor
24/12/2018	142A Tiraumea Dr	L1	633	Surcharging	47	
5/02/2019	15 Hedge Row	L1	80	Fat	0	Heavy fat removed from main
12/05/2019	15 Hedge Row	L1	206	Fat	21.5	
28/05/2019	15 Hedge Row	L1	182	Fat	10	
11/07/2018	157 Edgewater Dr	L2	189	Fat	0.5	Cleared fat blockage
2/10/2018	157 Edgewater Dr	L1	113	Fat	4.5	
12/01/2019	157 Edgewater Dr	L1	149	Fat	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
13/03/2019	161 Gills Rd	L1	104	Unknown	0	Fence post damaged main
15/05/2019	161 Gills Rd	L1	493	3rd party damage	4	
6/07/2018	17 Allens Rd	L1	126	Rubbish	0	Rodded fats, rubbish blockage Concrete removed from line
12/07/2018	17 Allens Rd	L1	67	Foreign Object	0.5	
24/12/2018	17 Rongomai Rd	L1	110	Fat	47	Heavy fat blockage removed
1/01/2019	17 Rongomai Rd	L1	233	Fat	0	
15/07/2018	18 Water St	L1	62	Surcharging	84	Continue to monitor
20/12/2018	18 Water St	L1	89	Surcharging	24	
9/05/2019	187 Flat Bush School Rd	L1	285	Unknown	0	Three pieces of wood removed from main
27/05/2019	187 Flat Bush School Rd	L1	196	Foreign Object	4.5	
4/06/2019	19 Edward Ave	L1	122	Fat	0	Heavy grease blockage cleared
20/06/2019	19 Edward Ave	L1	103	Fat	3.5	
15/07/2018	2/15 Alexander Cres	L1	1230	Rubbish	84	Fat blockage removed
26/03/2019	2/15 Alexander Cres	L1	239	Fat	0	
25/12/2018	2/2 Barrie Ave	L1	1139	Surcharging	25	Jettied fat blockage
24/02/2019	2/2 Barrie Ave	L1	117	Fat	1.5	
3/05/2019	2/210 Moore St	L1	166	Fat	0	Heavy fat and rags removed CCTV and heavy flush
14/05/2019	2/210 Moore St	L1	85	Unknown	0	
29/12/2018	2/32 Wedgwood Ave	L1	119	Unknown	0	Heavy Flush Heavy grease deposit removed and rootcut
30/12/2018	2/32 Wedgwood Ave	L1	129	Unknown	0	
2/01/2019	2/32 Wedgwood Ave	L1	220	Fat	0	
20/12/2018	2/38 Capstick Rd	L1	104	Fat	24	Fats removed from manhole
25/12/2018	2/38 Capstick Rd	L1	111	Surcharging	25	
20/03/2019	2/5 Polaris Pl	L1	228	Fat	0	Heavy fat, flushed main
27/03/2019	2/5 Polaris Pl	L1	225	Fat	0	
2/07/2018	22 Edorvale Ave	L1	216	Roots	2	Pipe removed from inside pipe, extensive CCTV and flushing
7/09/2018	22 Edorvale Ave	L1	221	Foreign Object	0	
11/09/2018	22 Edorvale Ave	L1	234	Foreign Object	0.5	
11/07/2018	23 Bob Charles Dr	L1	566	Roots	0.5	Rootcut
21/07/2018	23 Bob Charles Dr	L1	126	Roots	0	
1/08/2018	249 Marua Rd	L1	136	Rubbish	2.5	Rootcut

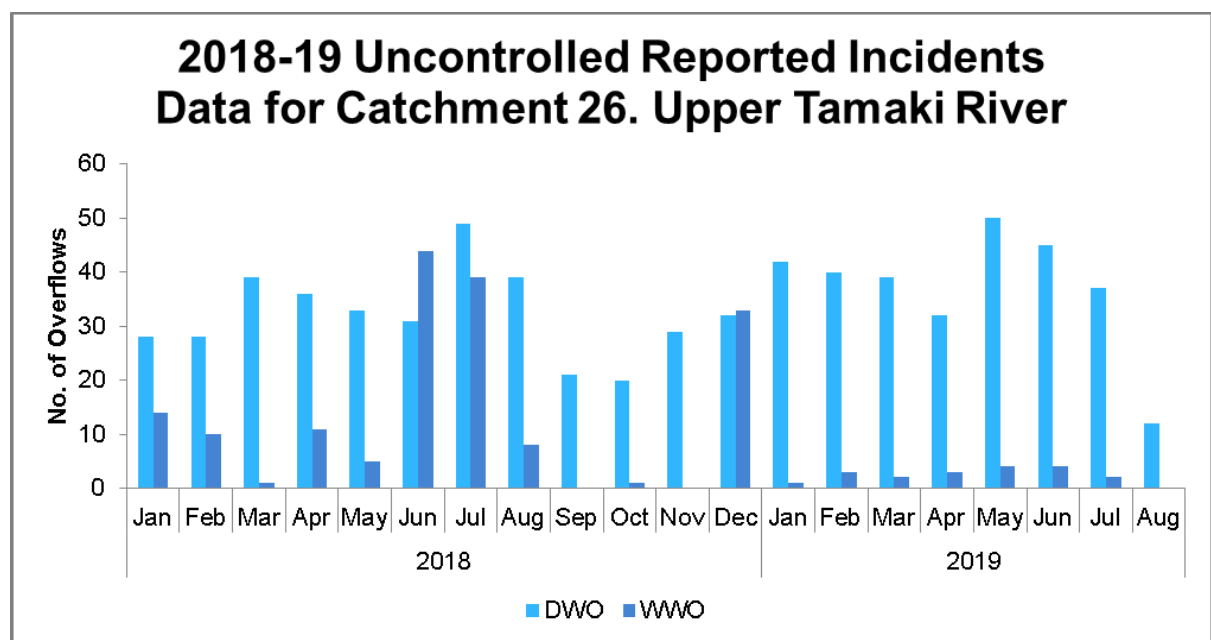
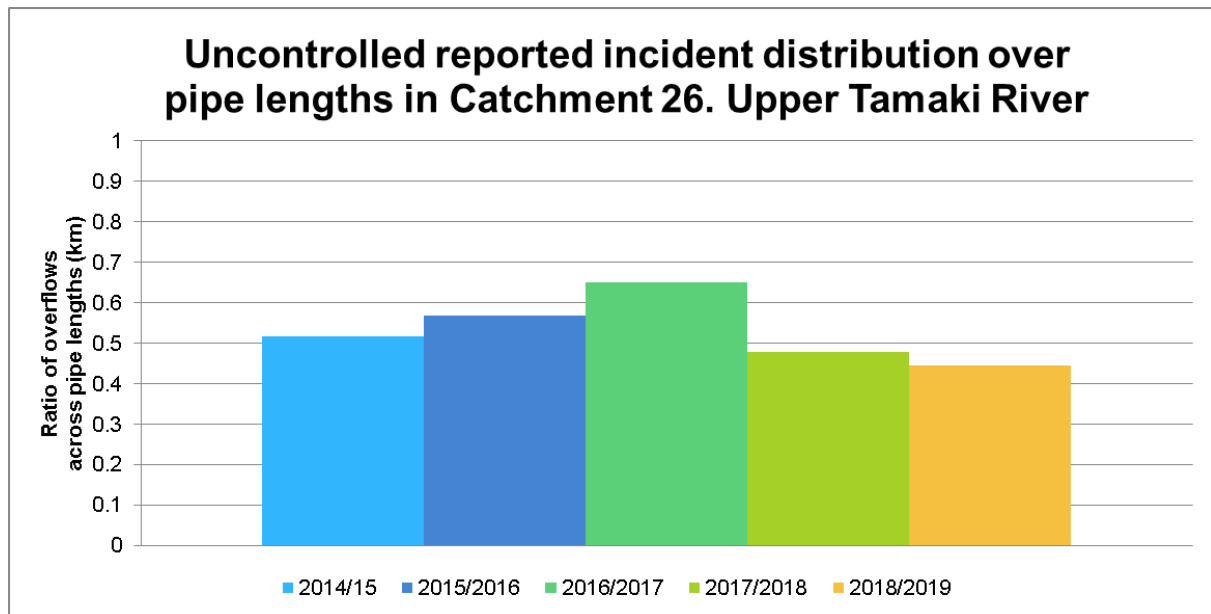
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
1/09/2018	249 Marua Rd	L1	945	Roots	0	
9/07/2018	25 Sandra Ave	L1	1086	Rubbish	5	Blockage found to be a knife wrapped in toilet paper
13/07/2018	25 Sandra Ave	L1	189	Unknown	0.5	
14/07/2018	25 Sandra Ave	L1	99	Foreign Object	1.5	
12/11/2018	27 Eden St	L1	128	Fat	2.5	CCTV, rootcut, large fat removed
19/11/2018	27 Eden St	L1	1352	Roots	9	
15/10/2018	295 Ti Rakau Dr	L1	95	Fat	0	Heavy flush, also private broken pipe
29/11/2018	295 Ti Rakau Dr	L1	1407	Fat	0	
26/12/2018	3 Barrie Ave	L1	449	Fat	0.5	Flushed main Rock removed from outlet
31/12/2018	3 Barrie Ave	L1	346	Foreign Object	0	
13/08/2018	3 Donnor Pl	L3	78	Roots	6.5	Jetted main
17/06/2019	3 Donnor Pl	L1	109	Roots	3	
15/07/2018	3/232 Bucklands Beach Rd	L1	37	Surcharging	84	Unblocked main
9/08/2018	3/232 Bucklands Beach Rd	L1	168	Fat	0.5	
19/06/2019	3/232 Bucklands Beach Rd	L1	386	Fat	0.5	
1/07/2018	3/29 Earlswoth Rd	L3	603	Fat	6	Heavy grease deposit removed and rootcut Flushed, CCTV escalated
15/07/2018	3/29 Earlswoth Rd	L1	324	Surcharging	84	
17/12/2018	3/29 Earlswoth Rd	L2	131	Silts	0	
20/12/2018	3/29 Earlswoth Rd	L1	370	Fat	24	
21/12/2018	3/29 Earlswoth Rd	L1	187	Fat	4	
5/01/2019	3/29 Earlswoth Rd	L1	210	Unknown	0	
15/12/2018	30 Sidey Ave	L1	118	Surcharging	6	Continue to monitor
20/12/2018	30 Sidey Ave	L1	213	Surcharging	24	
16/08/2018	31 Firth Cres	L1	253	Fat	0.5	Flushed and rootcut Fats and towels removed from main Wipes removed from private chamber
1/10/2018	31 Firth Cres	L1	64	Foreign Object	0	
4/04/2019	31 Firth Cres	L1	112	Rags	0	
26/03/2019	320 Panama Rd	L1	190	Fat	0	Root/fat blockage removed Flushed main Wet wipe blockage removed
13/04/2019	320 Panama Rd	L1	199	Fat	0	
31/10/2018	321 Panama Rd	L1	111	Rags	0.5	
19/01/2019	34A Gossamer Dr	L2	567	Rags	0	Flushed line Unblocked main, root intrusion removed
17/03/2019	34A Gossamer Dr	L4	1313	Unknown	0	

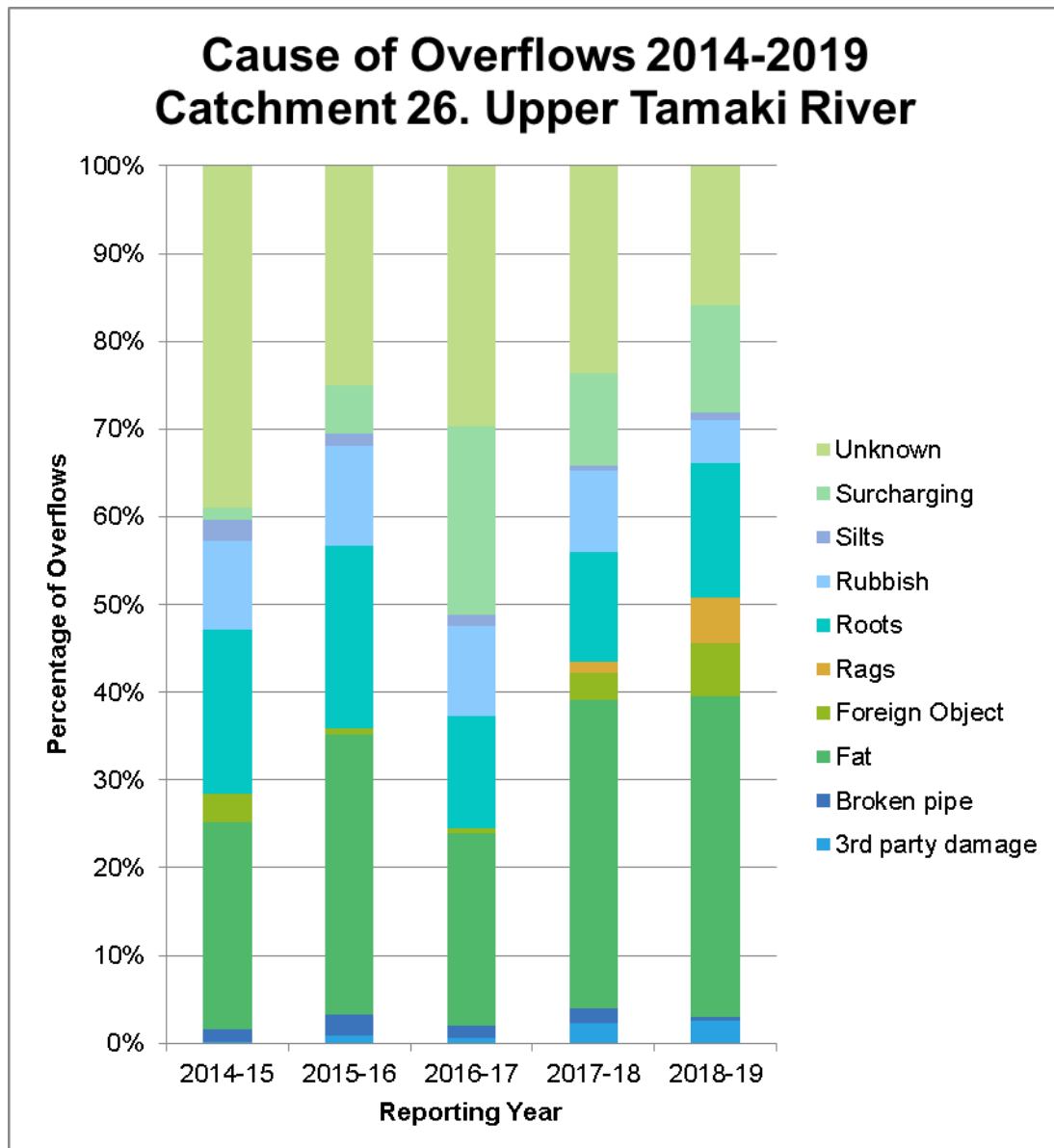
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
1/04/2019	35 Great South Rd	L1	89	Fat	25	Rock removed, heavy flush
30/04/2019	35 Great South Rd	L1	59	Foreign Object	0	
11/06/2019	36 Jolson Rd	L1	157	Foreign Object	0	Fats and wipes removed from main Rootcut
17/06/2019	36 Jolson Rd	L1	117	Rags	3	
24/06/2019	36 Jolson Rd	L1	93	Roots	0	
17/07/2018	4 John Broad Pl	L1	169	Unknown	0.5	Continue to monitor
23/07/2018	4 John Broad Pl	L1	164	Fat	2.5	
14/07/2018	40A Ennis Ave	L1	215	Fat	1.5	Fat and debris removed
20/07/2018	40A Ennis Ave	L1	309	Fat	1.5	
16/12/2018	44 Raglan St	L1	135	Rags	1.5	Fats and wipes removed from main
17/12/2018	44 Raglan St	L1	141	Fat	0	
11/04/2019	46 Belinda Ave	L1	90	Foreign Object	4	Debris (roofing tiles) removed from manhole
18/04/2019	46 Belinda Ave	L1	445	Foreign Object	0	
22/04/2019	46 Belinda Ave	L1	1289	Rubbish	14.5	
20/12/2018	5 Polaris Pl	L1	151	Foreign Object	24	Fat blockage and wood plank removed from main
25/02/2019	5 Polaris Pl	L1	83	Rags	0	Heavy fats and wipes removed from manhole
15/05/2019	52 Huia Rd	L1	162	Fat	4	Plunged manhole, removed fats
4/06/2019	52 Huia Rd	L1	825	Fat	0	Cleared fats and paper from manhole
15/07/2018	538B Great South Rd	L1	353	Surcharging	84	Continue to monitor
19/07/2018	538B Great South Rd	L1	89	Surcharging	1.5	
9/03/2019	54A Fairburn Rd	L1	795	Surcharging	13	Rootcut
16/06/2019	54A Fairburn Rd	L1	838	Roots	3	
15/07/2018	58 Woolfield Rd	L1	281	Surcharging	84	Continue to monitor
20/12/2018	58 Woolfield Rd	L1	1247	Surcharging	24	
7/07/2018	6 Pamir Rd	L1	252	Roots	0	Rodded roots Heavy flush of debris and fats
16/12/2018	6 Pamir Rd	L1	153	Fat	1.5	
17/12/2018	6 Pamir Rd	L1	239	Fat	0	
20/08/2018	6 Waimate St	L1	282	Fat	1.5	Continue to monitor
25/08/2018	6 Waimate St	L1	291	Unknown	2.5	
15/07/2018	6 Wood Ave	L1	84	Surcharging	84	Continue to monitor
29/08/2018	6 Wood Ave	L1	154	Surcharging	48	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
3/08/2018	60 Hallberry Rd	L1	91	Fat	5	Jetted main, large fat/rag blockage
20/12/2018	60 Hallberry Rd	L1	114	Rags	24	
15/02/2019	60 Highbrook Dr	L2	178	Fat	0	Flushed main, paper towels and fat removed
25/02/2019	60 Highbrook Dr	L2	123	Unknown	0	
28/02/2019	60 Highbrook Dr	L1	161	Foreign Object	0	
4/06/2019	60 Highbrook Dr	L1	196	Fat	0	
10/06/2019	60 Highbrook Dr	L1	97	Fat	0	
13/06/2019	60 Highbrook Dr	L1	15	Fat	0.5	
10/07/2018	64 Archmillen Ave	L1	222	Roots	7	Fats and roots removed from manhole
17/07/2018	64 Archmillen Ave	L1	264	Fat	0.5	
24/08/2018	73 Edendale Rd	L1	107	Roots	1.5	Roots removed from main
25/03/2019	73 Edendale Rd	L1	85	Roots	0	
30/08/2018	735 Chapel Rd	L1	221	Roots	0	Rootcut
2/05/2019	735 Chapel Rd	L1	298	Roots	0	
11/03/2019	78 Glenmore Rd	L1	176	Roots	0	Large root blockage removed from manhole, manhole hole repaired
13/03/2019	78 Glenmore Rd	L1	420	Roots	0	
29/08/2018	8 Udall Pl	L1	292	Surcharging	48	Continue to monitor
24/12/2018	8 Udall Pl	L1	683	Surcharging	47	
6/01/2019	81S Gray Ave	L1	174	Unknown	0	Heavy flush and CCTV
7/01/2019	81S Gray Ave	L1	255	Fat	0	
5/12/2018	98 Howe St	L1	111	Fat	5.5	Jetted main
3/04/2019	98 Howe St	L1	751	Unknown	0	

2.28.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.28.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPOTA	Otahuhu North East Wholesale Wastewater Pump Station	465	Rain event	683	84
29/08/2018	DPOTA	Otahuhu North East Wholesale Wastewater Pump Station	465	Rain event	45	48
20/12/2018	DPOTA	Otahuhu North East Wholesale Wastewater Pump Station	465	Rain event	27	24
24/12/2018	DPMID	Middlemore Wholesale Wastewater Pump Station	684	Rain event	266	47
24/12/2018	DPOTA	Otahuhu North East Wholesale Wastewater Pump Station	465	Rain event	708	47
25/12/2018	DPOTA	Otahuhu North East Wholesale Wastewater Pump Station	465	Rain event	495	25
15/07/2018	DPPEL	Pelorus Place Wastewater Pump Station	1149	Rain event	639	84
15/07/2018	DPPNA	Panama Road Wastewater Pump Station	628	Rain event	91	84
24/12/2018	DPPNA	Panama Road Wastewater Pump Station	628	Rain event	180	47

2.28.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
464	Jane Cowie Place WWPS	1	0	0	0	0	0	0	Continue to monitor
465	Otahuhu North East Wholesale WWPS	1	0	0	8	0	0	1.6	Continue to monitor
628	Panama Road WWPS	1	0	0	0	0	2	0.4	Continue to monitor
630	Penrose Road WWPS	0.6	1	0	0	0	0	0.2	Continue to monitor
648	Tahatai Street WWPS	1	0	0	0	0	0	0	Continue to monitor
666	Otahuhu North Wholesale WWPS	6	1	2	0	5	5	2.6	Continue to monitor
667	Pakuranga Wholesale WWPS	8	2	2	13	1	0	3.6	Howick Diversion / Catchment upgrades
670	Sylvia Park Wholesale WWPS	2	0	0	2	4	0	1.2	Continue to monitor
673	Tamaki East	0.1	0	0	0	0	0	0	Continue to

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
	Wholesale WWPS								monitor
675	Botany Wholesale WWPS	0	0	1	0	0	0	0.2	Continue to monitor
676	Pakuranga South Wholesale WWPS	0.1	0	0	1	1	0	0.4	Continue to monitor
683	Otara Wholesale WWPS	0	0	2	13	1	0	3.2	Otara Branch Sewer / Catchment Upgrades
684	Middlemore Wholesale WWPS	4	1	0	9	3	1	2.8	Continue to monitor
698	Ormiston Wholesale WWPS	0	0	0	0	0	0	0	Continue to monitor
984	Aviemore Drive WWPS	0.4	0	0	0	1	0	0.2	Continue to monitor
998	Burswood Drive WWPS	1	0	0	0	1	0	0.2	Continue to monitor
1004	Stonedon Drive WWPS	0.4	0	0	0	0	0	0	Continue to monitor
1005	Highland Park WWPS	1.2	0	0	0	3	0	0.6	Continue to monitor
1010	Hannah Road WWPS	0.4	0	0	0	0	0	0	Continue to monitor
1141	Lloyd Elsmore Park WWPS	0	0	0	0	0	0	0	Continue to monitor
1142	Cascades Road WWPS	0.4	0	0	0	0	0	0	Continue to monitor
1143	Gossamer Drive WWPS	2.8	0	0	0	0	0	0	Continue to monitor
1149	Pelorus Place WWPS	1.8	0	0	0	2	1	0.6	Continue to monitor
1150	Riverhills Park WWPS	0.8	0	0	0	0	0	0	Continue to monitor
1152	Cryers Road WWPS	0.6	0	0	0	0	0	0	Continue to monitor
1153	Harris Road WWPS	0.4	0	0	0	0	0	0	Continue to monitor
1154	Highbrook Park WWPS	0	0	0	0	0	0	0	Continue to monitor
1155	Luke Place WWPS	0.2	0	0	0	0	0	0	Continue to monitor
1156	Lawrence Place WWPS	0	0	0	0	0	0	0	Continue to monitor
1181	Ballarat Street 1 WWPS	0.2	1	0	0	0	0	0.2	Continue to monitor
1182	McDonald Crescent	0.4	0	1	1	0	0	0.4	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
	WWPS								
1183	Harris Road WWPS	0	0	0	0	0	0	0	Continue to monitor
1184	Motu Place WWPS	0	0	0	0	0	0	0	Continue to monitor
1185	Ferndale Road WWPS	0	0	0	0	0	0	0	Continue to monitor
1186	Banks Street WWPS	0.2	0	0	0	0	0	0	Continue to monitor
1190	Mount Richmond 1 WWPS	0	0	0	0	0	0	0	Continue to monitor
1191	Mount Richmond 2 WWPS	0.8	0	0	0	0	0	0	Continue to monitor
1193	Rodney Street WWPS	1.4	6	0	0	0	0	2	Suspected 2014/15 year was over-reported.
1195	Ballarat Street 2 WWPS	0.6	0	0	0	0	0	0	Continue to monitor
1196	Carrs Place WWPS	0.4	0	0	0	0	0	0	Continue to monitor
1200	Joe Stanley Place WWPS	1.2	0	0	0	0	0	0	Continue to monitor
1009	Arwen Place Wastewater Pump Station	-	0	0	0	1	0	0.2	Continue to monitor

Type 2 EOPs – Network Relief rolling WWO data from 1 July 2014 – 30 June 2019

The Type 2 EOPs 1534 and 1549 have a permanent monitor installed at these facilities. This information is provided as it is available, although it is noted for reference that very few Type 2 locations have monitors installed and this needs to be interpreted with reference to the Wastewater Network Strategy and the overall network performance in this catchment.

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1534	Graeme Ave	n/a	n/a	1	9	7	4	4.2	Continue to monitor
1549	14 Mclean Ave	-	-	-	-	1	3	2	Continue to monitor

Type 3 locations rolling WWO data from 1 July 2014 – 30 June 2019

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
S6	Millhouse Reserve	1.3	0	0	0	2	0	0.4	Howick Diversion / Catchment Upgrade
S59	Otara Branch MH17	n/a	n/a	2	5	4	4	3	Otara Branch Sewer / Catchment Upgrades
S60	Otara Branch MH16A	n/a	n/a	2	6	5	2	3	Otara Branch Sewer / Catchment Upgrades
S58	Otara Branch MH18	n/a	n/a	2	5	3	3	2.6	Otara Branch Sewer / Catchment Upgrades
S7	11 Crown Crescent	2	0	0	0	0	0	0	Otara Branch Sewer / Catchment Upgrades
S66	Bucklands Beach Branch MH19A	-	2	0	7	3	2	2.4	Howick Diversion / Catchment Upgrade

2.28.6 Inflow & Infiltration Programme

A review of Inflow & Infiltration (I&I) network performance for this catchment is being carried out as part of the Otara wastewater catchment upgrade project. High severity I&I areas have been identified; this will further inform field I&I investigations. Field I&I investigations are planned for 2020 within the Otara wastewater network.

2.28.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Manukau North local wastewater network improvements	Various stages	Network is under capacity for current and future demands	Reduce frequency of overflows to less than two per year for current and future flows.	2015-2020
Underway	Manukau West upgrades	Variable	Known Type 3 issue locations were identified under this study. A large suite of isolated upgrades were identified to be progressively implemented	Address Type 3 overflows S1 to S5 inclusive) for current and future flows	2017-2025

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Tamaki redevelopment catchment upgrades	Options Assessment	There are known high frequency and volume EOPs in this catchment, and high growth with the proposed HNZ redevelopment	The preferred suite and timing of upgrades for this catchment to achieve reduced frequency of wet weather overflows at multiple EOPs and optimising the performance of the Glendowie branch sewer upgrade	2017-2024
Underway	Howick Diversion/Catchment Upgrades and Manukau North local wastewater network improvements	Studies and Investigations	Several overflows from the Howick catchment currently exceed two spills per year from both controlled and uncontrolled locations. This will increase with predicted growth	Expected to reduce overflows in this catchment to less than two per year for current and future flows.	2021-2025
Underway	Otara Catchment Capacity Upgrades	Design	Overflows from the Otara catchment currently exceed two spills per year from both controlled and uncontrolled locations	Expected to reduce overflows in Otara and address Type 3 overflows for current and future populations	2015-2023
Underway	Glendowie Branch Sewer Upgrade	Project Execution	Overflows from the Point England pump station, and network overflows exceed two spills per year and this is predicted to increase over time as a result of growth in catchment	Reduced frequency of wet weather overflows at EOPs 188, 189, and 681	2012-2020

Minor improvements works include:

- Howick and Sylvia Park pump replacements: These are renewal projects that will improve the wet weather performance at EOPs 662 and 670 (although these are compliant), and reduce the risk of dry weather overflows.
- Middlemore and Otahuhu North East Pump Stations: Concept options to manage the wet weather performance of these pump station will be investigated in the Mangere SMA model for further detailed investigation and regional prioritisation.

2.28.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.28.9 Summary

Four Type 1 EOPs discharged more than two times per year on average in this reporting period. In the long term the Otara and Howick upgrade projects will provide significant additional network capacity and improve the wet weather performance in this catchment. The overflow history will be analysed and utilised when reviewing future network improvement programmes. I&I field investigations are planned for early 2020. The ratio of uncontrolled overflows to pipe length decreased in 2017/18, with the predominant factor being fats. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.29 Catchment 27 – Cockle Bay

2.29.1 Overview

The Cockle Bay catchment is located along the eastern coast of the Bucklands Beach peninsula. It is a long narrow catchment, which extends along the coastline from Musick Point in the north to Shelly Park and the Maungamaungaroa Creek in the south, incorporating Eastern Beach, Mellons Bay, Howick Beach and Cockle Bay. There are 5,160 wastewater connections.

Land use in the Cockle Bay catchment is predominantly low to medium density residential, with pockets of open space and local retail and commercial areas. There are no industrial sites within the catchment. The many beaches, reserves and walkways in this catchment provide significant recreation opportunities for residents and visitors to the area, particularly through access to the coast.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	5,131	5,131	5,146	5,149	5,160
Length of sewer (km)	104	104	104	123	119

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
662	Howick WWPS	DPHOW	1	Howick Beach
976	Sandspit Road WWPS	DPSAN	1	Shelly Park Beach
1013	Estuary Views WWPS	DPEST	1	Maungamaungaroa Creek
1139	Chisbury Terrace WWPS	DPCHI	1	Maungamaungaroa Creek
1140	Ramoana Mews WWPS	DPRNA	1	Maungamaungaroa Creek
1172	Mellons Bay WWPS	DPMEB	1	Mellons Bay
1173	Cockle Bay WWPS	DPCOC	1	Cockle Bay

There have been no changes to the schedule of EOPs in this catchment.

2.29.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported incidents

There were a total of 45 reported incidents in the Cockle Bay catchment.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

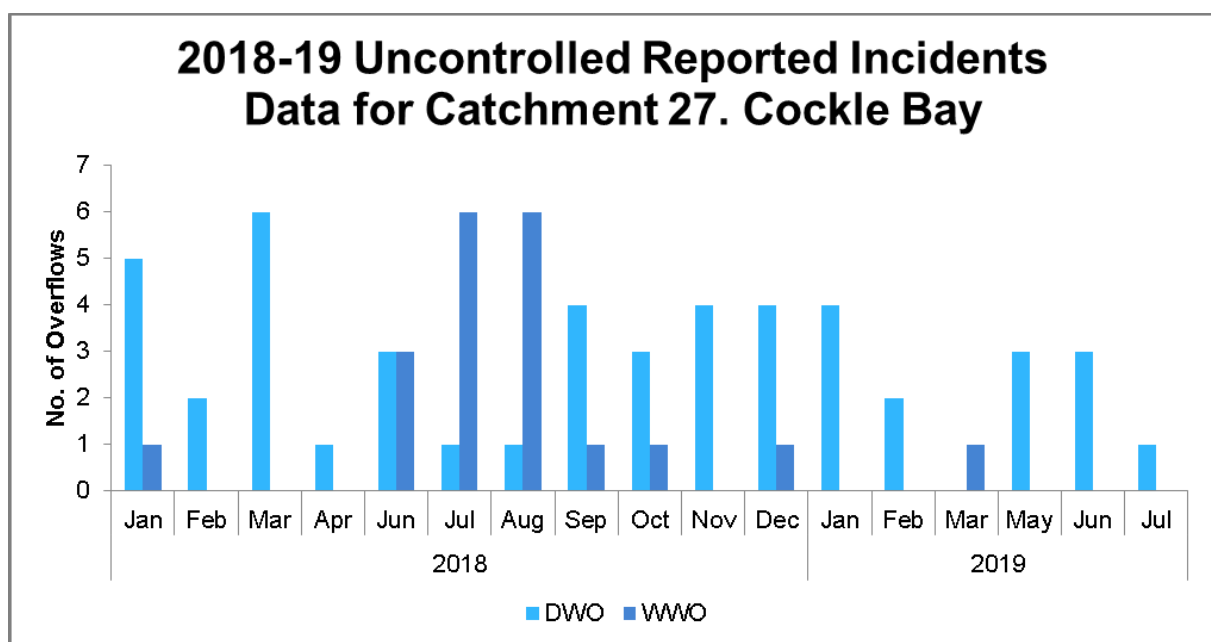
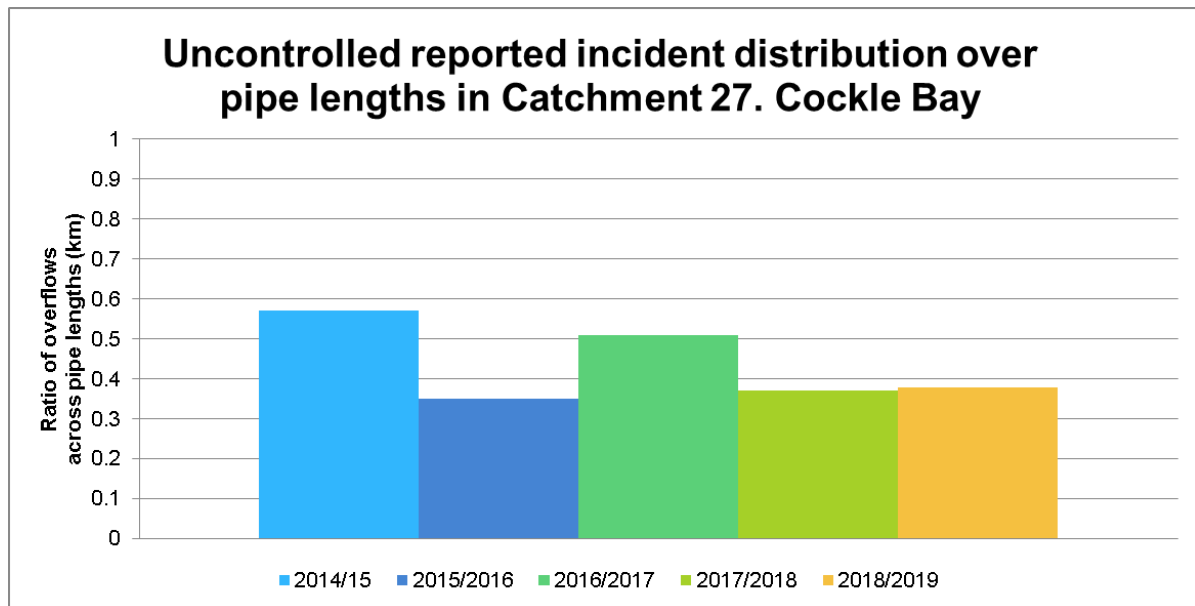
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over

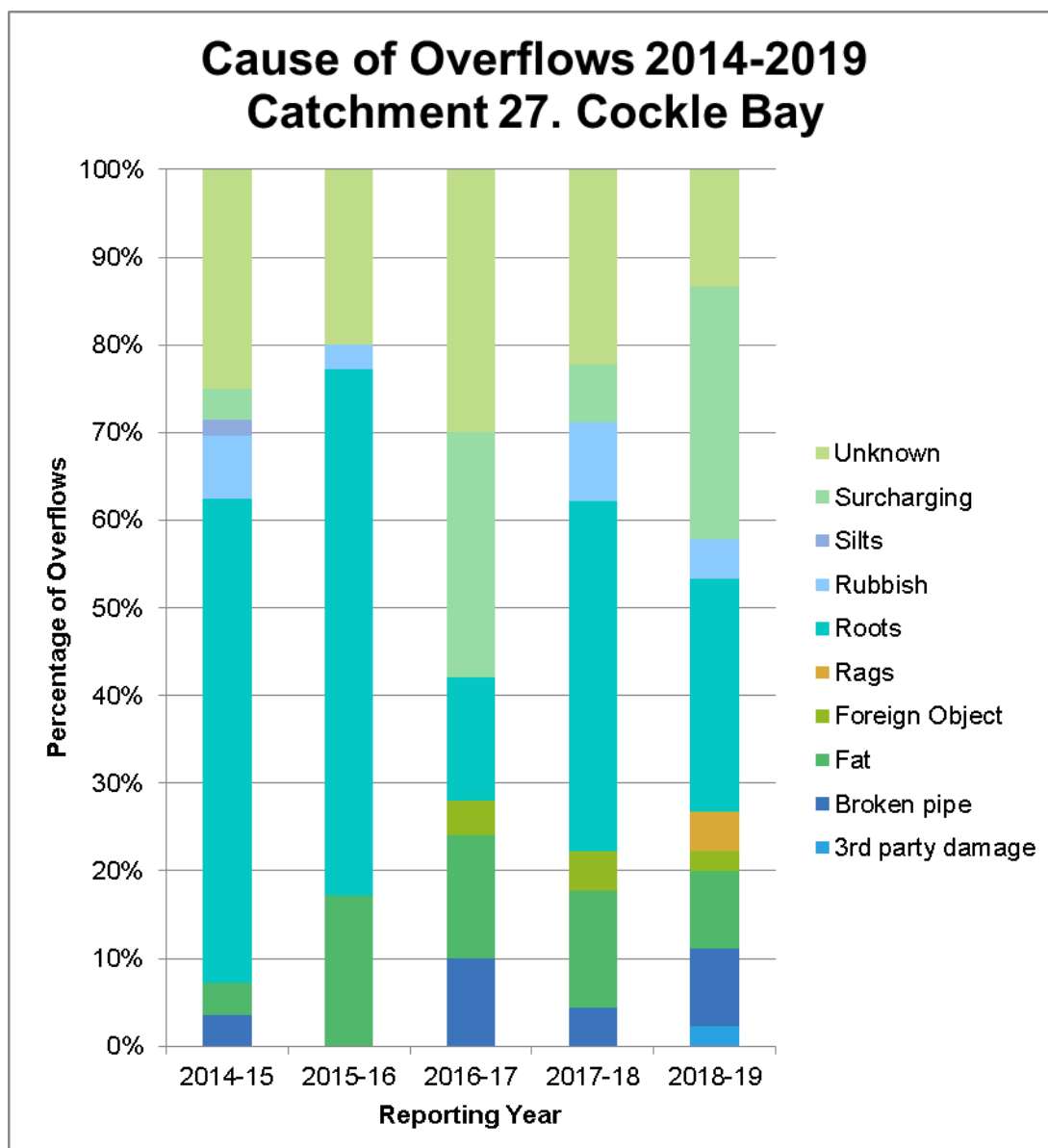
a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
3/06/2018	43A Advene Rd	L1	61	Surcharging	67.5	Under investigation – flushed main
14/06/2018	43A Advene Rd	L1	121	Surcharging	1	
15/07/2018	43A Advene Rd	L1	22	Surcharging	84	
21/01/2019	1/184 Bucklands Beach Rd	L1	60	Unknown	0	Unblocked main
22/01/2019	1/184 Bucklands Beach Rd	L1	105	Roots	0	
14/02/2019	17B Colmar Rd	L1	1104	Broken pipe	0	Faulty pipe replaced
8/03/2019	17B Colmar Rd	L1	900	Broken pipe	16	
15/07/2018	204 Mellons Bay Rd	L1	13	Surcharging	84	Continue to monitor
29/08/2018	204 Mellons Bay Rd	L1	85	Surcharging	48	
15/07/2018	27 Selwyn Rd	L1	316	Surcharging	84	Continue to monitor
29/08/2018	27 Selwyn Rd	L1	67	Surcharging	48	
20/11/2018	3/44 Sale St	L1	1238	Broken pipe	8.5	Displaced joint repaired Flushed main
3/12/2018	3/44 Sale St	L1	120	Unknown	17.5	
15/07/2018	55 Trelawn Pl	L1	70	Surcharging	84	Surcharging remediated
29/08/2018	55 Trelawn Pl	L1	42	Surcharging	48	

2.29.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where root cause has been identified.

2.29.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPHOW	Howick Wholesale Wastewater Pump Station	662	Rain event	464	84
29/08/2018	DPHOW	Howick Wholesale Wastewater Pump Station	662	Rain event	125	48
24/12/2018	DPHOW	Howick Wholesale Wastewater Pump Station	662	Rain event	131	47

2.29.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
662	Howick WWPS	0	0	2	4	4	3	2.6	Howick interceptor diversion / Catchment Upgrade
976	Sandspit Road WWPS	0.8	0	0	0	0	0	0	Continue to monitor
1013	Estuary Views WWPS	0.8	0	0	0	0	0	0	Continue to monitor
1139	Chisbury Terrace WWPS	0.2	0	0	0	0	0	0	Continue to monitor
1140	Ramoana Mews WWPS	0.4	0	0	0	0	0	0	Continue to monitor
1172	Mellons Bay WWPS	0	0	0	0	0	0	0	Continue to monitor
1173	Cockle Bay WWPS	0	0	0	0	0	0	0	Continue to monitor

Type 3 locations rolling WWO data from 1 July 2014 – 30 June 2019

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
S63	Mellons Bay Branch MH16	n/a	n/a	n/a	6	3	5	4.5	I&I investigations underway to reduce wet weather flows. Reconfigure EOP at storage tank to protect against uncontrolled spills
S64	204 Mellons Bay Rd	n/a	n/a	n/a	3	2	2	2.5	I&I investigations underway Reconfigure EOP at storage tank to protect against uncontrolled spills

2.29.6 Inflow & Infiltration Programme

Currently carrying out further field I&I investigations CCTV, pipe flushing, and completing I&I remedial works in the Mellons Bay and Cockle Bay catchments. Monitors have recently been installed within the network to understand I&I performance.

2.29.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Network improvements – Mellons Bay	Option analysis (Feasibility)	Type 3 overflows have been identified in this location	Along with I&I remediation, network changes to mitigate wet weather overflows	2019-2022
Underway	Howick Diversion (Howick Catchment Upgrades)	Option Analysis (Feasibility)	Several overflows from the Howick catchment currently exceed two spills per year from both controlled and uncontrolled locations. This will increase with predicted growth	This project will be scoped to consider the current and future flows from the Cockle Bay catchment.	2015-2025

2.29.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2018 and 30 June 2019.

2.29.9 Summary

This catchment was greatly affected by storm events in recent years. These surcharging overflows have accounted for 33% of all overflows in the area. The ratio of overflows to pipe length has increased slightly, with roots and surcharging making up the majority of overflows in this reporting period. There was one EOP which discharged more frequently than two spills per year on average. There are network performance constraints associated with large build-up of debris/silts in the lines and high I&I which is evident in the recently identified Type 3 overflow locations; these will be addressed through the I&I programme and associated network improvements. The Howick Diversion/Catchment upgrade project will enable future network improvements and provide for growth. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

2.30 Catchment 28 – Puhinui

2.30.1 Overview

The Puhinui catchment includes a number of suburbs within Manukau, including Papatoetoe, Puhinui, Wiri, Homai, Mangere and Weymouth. The catchment is located about 18 km southeast of Auckland city centre, to the north-east of Manukau Harbour. There are 19,581 wastewater connections.

The catchment consists predominantly of residential, industrial and commercial land uses, with a small amount of horticultural land. The Auckland Airport is located to the west of the catchment, on the northern side of the Manukau Harbour.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	18,780	18,933	19,058	19,290	19,581
Length of sewer (km)	372	368	375	446	427

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
685	Puhinui WWPS	DPPUH	1	Puhinui Stream
688	Papatoetoe West WWPS	DPPPW	1	Unnamed stream – Hillside Rd
689	Weymouth North WWPS	DPWYN	1	Puhinui Creek
962	53R Raglan Street	-	2	Unnamed Stream in Aorere Park
971	35 St George Street	-	2	Unnamed stream – Hillside Rd
1138	McLaughlins Road 1 WWPS	DPMC1	1	Puhinui Stream
1163	Manurewa West WWPS	DPMNW	1	Puhinui Creek
1164	Settlers Cove WWPS	DPSET	1	Unnamed stream (flowing to Weymouth Beach)
1165	Weymouth Domain WWPS	DPWEY	1	Weymouth Beach
1175	McLaughlins Road 2 WWPS	DPMC2	1	Unnamed tributary of Puhinui Stream – McLaughlin Rd
1177	Malaspina Place 1 WWPS	DPMP1	1	Unnamed stream – Kohuora Park
1535	145-147 Wyllie Rd	-	2	Puhinui Stream
1586	Harbour Ridge Drive Pump Station	DPHAB	1	Puhinui Stream

2.30.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
2/02/2019	DPPPW	Papatoetoe Wholesale Wastewater Pump Station	688	Power Failure	42	0
6/03/2019	DPPPW	Papatoetoe Wholesale Wastewater Pump Station	688	Power Failure	40	0

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
5/05/2019	DPPPW	Papatoetoe Wholesale Wastewater Pump Station	688	Power Failure	56	0

Reported Incidents

There were a total of 184 reported incidents in the Puhinui catchment. No overflows discharged into, or around the Tangata Whenua Management Area watercourse. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
15/01/2018	1/10 Phoenix Pl	L1	95	Fat	0	Flushed main, fats and roots removed
15/03/2018	Phoenix Pl	L1	137	Roots	2.5	
11/06/2018	1/10 Phoenix Pl	L1	135	Fat	20.5	
6/08/2018	1/10 Phoenix Pl	L2	205	Fat	0.5	
19/09/2017	1/147 Wyllie Rd	L1	613	Foreign Object	2.5	Heavy buildup of fat removed
15/11/2017	147 Wyllie Rd	L1	52	Fat	0.5	
11/04/2019	2/147 Wyllie Rd	L2	350	Fat	10.5	
17/07/2017	35 Finlayson Ave	L1	99	Unknown	0	Heavy fat and debris removed from main
20/07/2017	35 Finlayson Ave	L1	528	Fat	11	
25/04/2018	35 Finlayson Ave	L1	129	Fat	0.5	
4/05/2019	35 Finlayson Ave	L1	144	Fat	0	
16/06/2019	35 Finlayson Ave	L1	185	Fat	2.5	
15/09/2017	116 Puhinui Rd	L1	219	Fat	5	Roots, fat, debris, wipes removed from main
6/10/2017	116 Puhinui Rd	L1	38	Fat	1.45	
9/08/2018	116 Puhinui Rd	L1	1405	Rags	0.5	
11/05/2017	38 Skipton St	L1	496	Rubbish	16	Under investigation by Planning, main flushed
16/07/2017	38 Skipton St	L1	192	Fat	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
6/10/2017	38 Skipton St	L1	661	Foreign Object	1.45	
8/11/2018	38 Skipton St	L1	148	Rubbish	2.5	
23/11/2017	97 Malaspina Pl	L1	228	Rubbish	0	Lines in area flushed, fat blockage removed
26/11/2017	86 Malaspina Pl	L1	641	Rubbish	0	
18/01/2018	86 Malaspina Pl	L1	120	Surcharging	33.5	
18/01/2018	99 Malaspina Pl	L1	64	Surcharging	33.5	
20/01/2018	99 Malaspina Pl	L1	456	Unknown	0	
12/06/2019	99 Malaspina Pl	L1	283	Fat	0	
10/03/2017	2/50 Ramsey St	L1	95	Unknown	76.5	Under investigation. Lines flushed and CCTV
14/09/2017	2/50 Ramsey St	L1	153	Fat	0	
15/07/2018	50 Ramsey St	L1	148	Surcharging	84	
12/05/2017	54 Moncrieff Ave	L1	549	Surcharging	59.5	Under investigation
14/09/2017	54 Moncrieff Ave	L1	124	Foreign Object	0	
2/12/2018	54 Moncrieff Ave	L1	241	241	9	
5/10/2017	2/21 Elizabeth Ave	L1	86	Unknown	0	Tomo repaired
27/10/2017	2/21 Elizabeth Ave	L1	178	Unknown	7	
30/10/2017	21 Elizabeth Ave	L1	74	Unknown	1.5	
19/01/2018	2/21 Elizabeth Ave	L1	71	Rubbish	14	
12/05/2018	2/21 Elizabeth Ave	L1	49	Broken pipe	11.5	
17/05/2018	2/21 Elizabeth Ave	L1	565	Rubbish	2	
1/07/2018	2/21 Elizabeth Ave	L1	84	Rubbish	6	
5/07/2018	2/21 Elizabeth Ave	L1	137	Rubbish	0	
24/06/2017	38 Lendenfeld Dr	L1	78	Rubbish	4.5	Broken pipe repaired, removed large blockage of rags, flushed main
4/08/2017	38 Lendenfeld Dr	L1	82	Broken pipe	0.5	
22/11/2018	38 Lendenfeld Dr	L1	1139	Rags	4	
26/08/2016	49R Pah Rd	L1	307	Fat	1.7	Heavy fats flushed
15/07/2017	49R Pah Rd	L1	218	Unknown	0	
9/04/2019	49R Pah Rd	L1	150	Fat	0	
17/04/2019	49R Pah Rd	L1	125	Fat	0	
3/05/2017	11 Topaz Pl	L1	150	Fat	0	Heavy flushed Plank of wood removed from manhole
20/02/2018	11 Topaz Pl	L1	120	Rubbish	7.5	
9/11/2018	11 Topaz Pl	L1	243	Foreign Object	4	

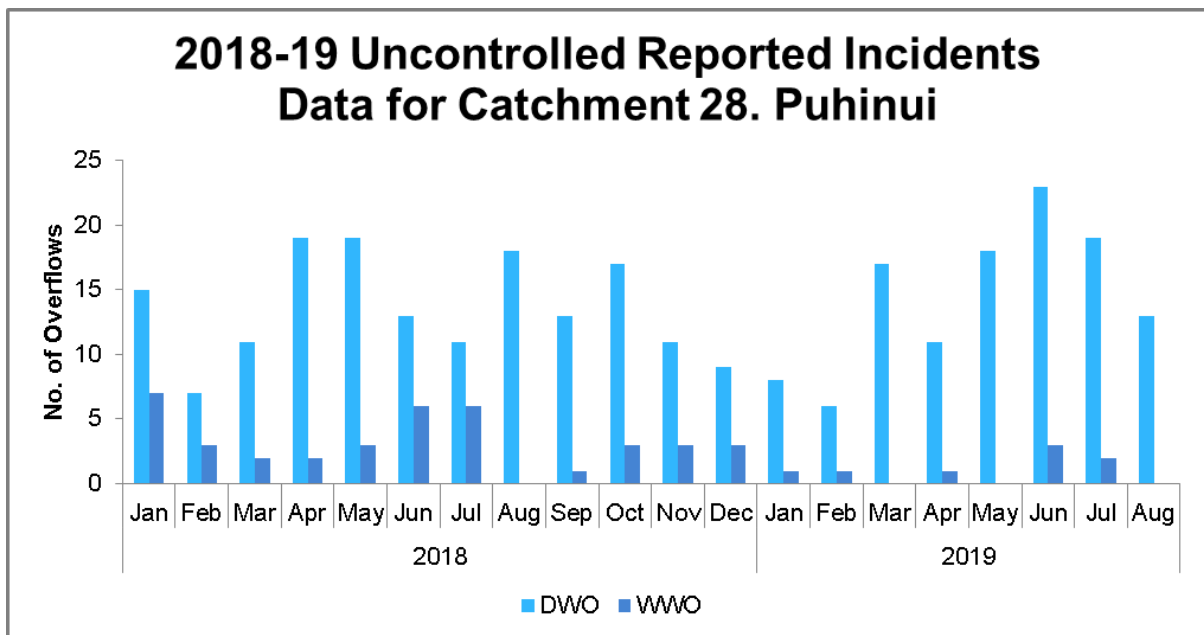
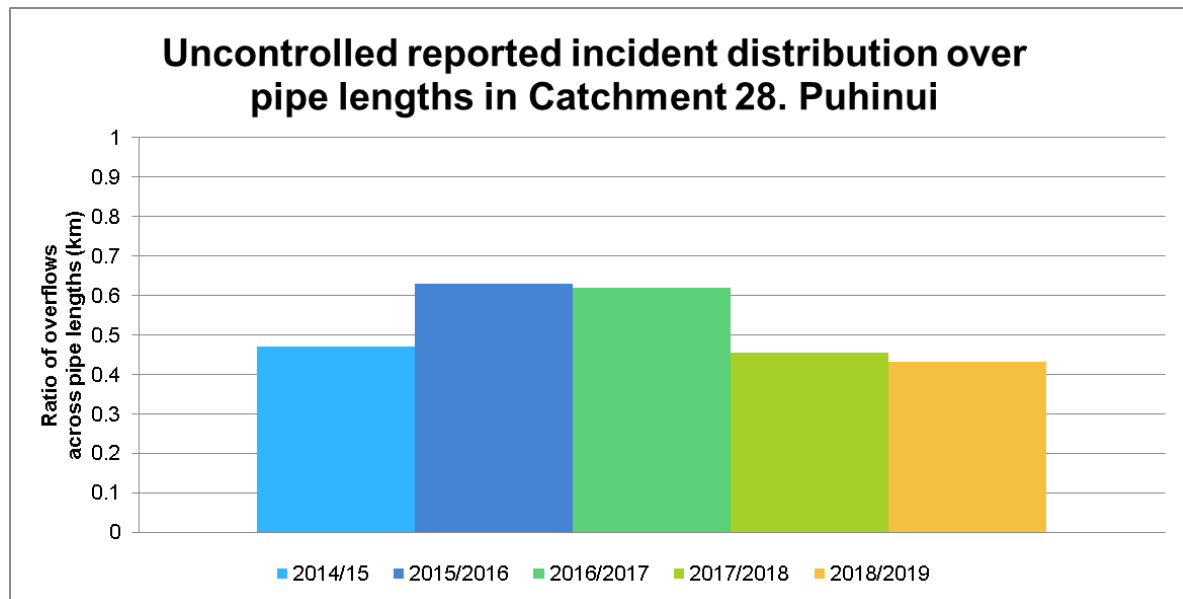
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
13/05/2017	1 Heathberry Cl	L1	532	Unknown	0	Heavy fats removed from main. On 36 Monthly Planned Flushing Schedule
4/11/2017	1 Heathberry Cl	L1	93	Fat	10.5	
19/10/2017	12 Ferndown Ave	L1	148	Unknown	0	
13/03/2018	13 Ferndown Ave	L2	79	Fat	2.5	
6/05/2018	1 Heathberry Cl	L1	629	Rubbish	1	
25/12/2018	1 Heathberry Cl	L1	106	Unknown	22.5	
13/01/2017	58 Alabaster Dr	L1	527	Fat	1.5	Fats removed from main Heavy flushed main
3/09/2017	58 Alabaster Dr	L1	222	Fat	0.5	
28/10/2018	58 Alabaster Dr	L1	1330	Foreign Object	2	
8/05/2018	4 Brooks Way	L1	470	Unknown	0	Issue with a siphoned service lateral. Collaborated with Healthy Waters to remove siphon
15/05/2018	4 Brooks Way	L1	476	Broken pipe	0.5	
21/05/2018	4 Brooks Way	L1	477	Broken pipe	5.5	
26/05/2018	4 Brooks Way	L1	544	Unknown	1.5	
28/05/2018	4 Brooks Way	L1	19	Broken pipe	1	
3/06/2018	4 Brooks Way	L1	115	Broken pipe	61	
7/06/2018	4 Brooks Way	L1	54	Broken pipe	1	
9/06/2018	4 Brooks Way	L1	82	Broken pipe	0	
23/06/2018	4 Brooks Way	L1	394	Broken pipe	0.5	
30/06/2018	4 Brooks Way	L1	156	Broken pipe	0	
3/07/2018	4 Brooks Way	L1	954	Broken pipe	0.5	
7/07/2018	4 Brooks Way	L1	797	Broken pipe	0	
13/07/2018	4 Brooks Way	L1	208	Broken pipe	0.5	
12/04/2017	2/140A Browns Rd	L1	239	Unknown	69	Heavy grease and rag blockages removed
2/07/2017	2/140A Browns Rd	L1	643	Unknown	9.5	
25/08/2018	1/140A Browns Rd	L1	91	Fat	3	
25/12/2018	2/140A Browns Rd	L1	120	Rubbish	22.5	
4/03/2019	2/140A Browns Rd	L1	321	Fat	0	
27/03/2019	2/140A Browns Rd	L1	983	Unknown	0	
13/05/2019	1/140A Browns Rd	L1	1132	Rags	1	
5/10/2017	10B Cramond Dr	L1	331	Fat	0	Heavy fat jetted from main, flushed S/L
19/10/2017	10B Cramond Dr	L1	168	Unknown	0	
4/09/2018	10B Cramond Dr	L1	318	Fat	0.5	

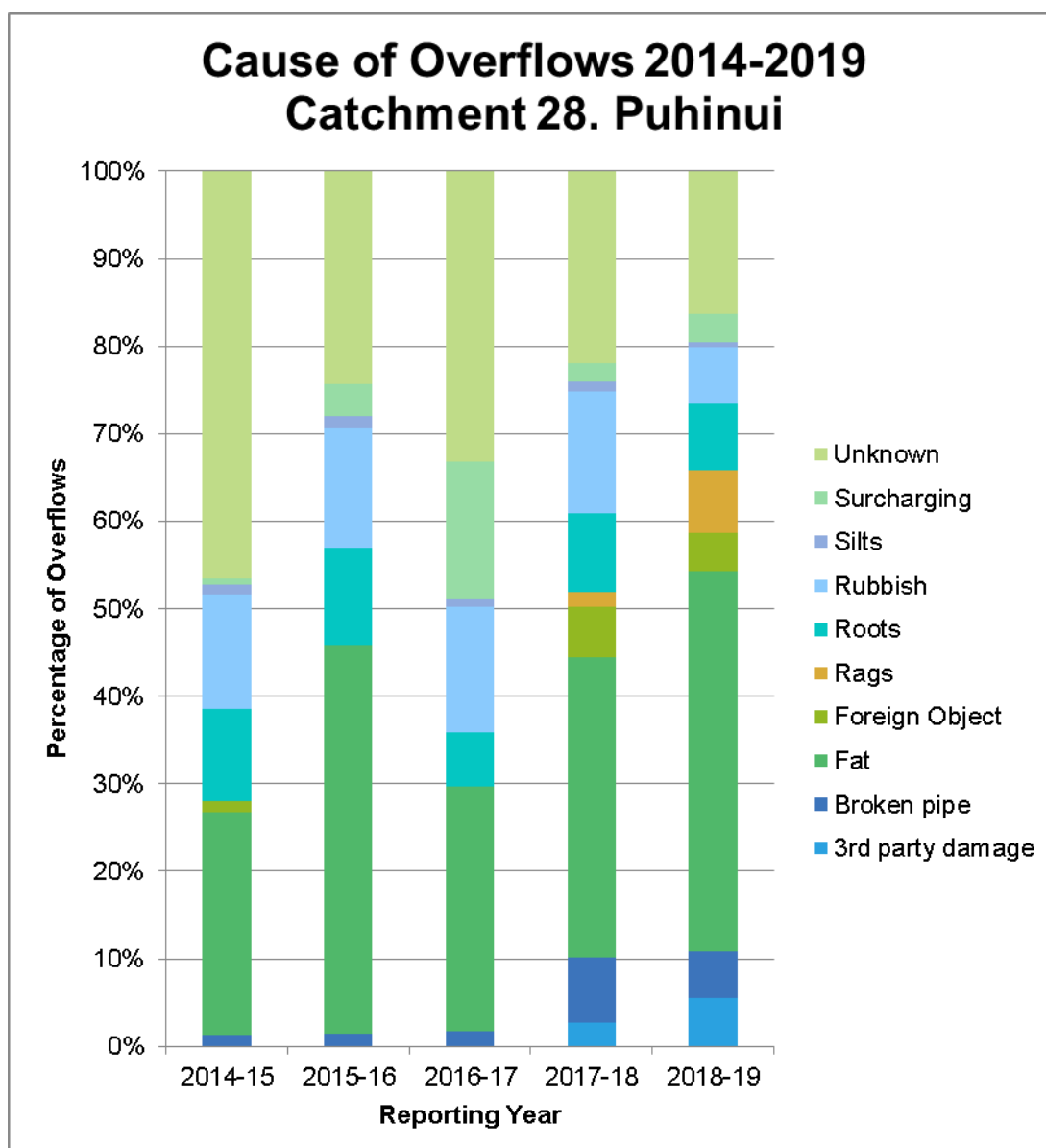
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
10/02/2018	56 Lawrence Cres	L1	290	Unknown	14	Fats and debris removed from main, rootcut
3/06/2018	56 Lawrence Cres	L1	9	Surcharging	61	
6/06/2018	56 Lawrence Cres	L1	510	Fat	9.5	
6/01/2019	56 Lawrence Cres	L1	896	Roots	0	
26/04/2018	2 Nicholas Gibbons Dr	L1	525	Rubbish	0	Roots, wipes, fats removed from manhole
7/06/2018	2 Nicholas Gibbons Dr	L1	116	Fat	1	
9/06/2019	2 Nicholas Gibbons Dr	L1	122	Rags	0	
4/09/2018	10 Mepal Pl	L1	379	Roots	0.5	Rootcut Flushed main
1/10/2018	10 Mepal Pl	L1	116	Roots	0	
17/03/2019	12 Staten Pl	L1	129	Unknown	0	Manhole raised Noncompliant connection
31/03/2019	12 Staten Pl	L1	237	3rd party damage	0	
19/11/2018	124 Wiri Station Rd	L1	376	Fat	9.5	Joint displacement under investigation
14/01/2019	124 Wiri Station Rd	L1	173	Unknown	19	
8/05/2019	124 Wiri Station Rd	L1	334	Broken pipe	0	
5/08/2018	17 Freyberg Ave	L1	18	Foreign Object	0	Rocks removed, flushed main
7/08/2018	17 Freyberg Ave	L1	1020	Fat	0	
13/10/2018	18 Everglade Dr	L1	134	Fat	1.5	Rock and fats removed
23/12/2018	18 Everglade Dr	L1	283	Foreign Object	22	
4/08/2018	2 Brouder Pl	L1	99	Fat	0.5	Heavy fats removed
4/08/2018	2 Brouder Pl	L1	4	Rubbish	0.5	
11/05/2019	2 Brouder Pl	L1	202	Fat	0	
5/05/2019	2 Finlayson Ave	L1	204	Fat	0	Fats and rubbish removed, Heavy Flush
15/05/2019	2 Finlayson Ave	L1	152	Unknown	3.5	
30/06/2019	2 Finlayson Ave	L1	333	Rubbish	0	
2/10/2018	2/100 Portage Rd	L1	180	Roots	6	CCTV, root intrusion in S/L Construction causing blockages, flushed
31/03/2019	2/100 Portage Rd	L1	1110	Roots	0	
3/06/2019	2/100 Portage Rd	L2	32	3rd party damage	0	
1/07/2018	2/21 Elizabeth Ave	L1	84	Rubbish	6	Continue to monitor
5/07/2018	2/21 Elizabeth Ave	L1	137	Rubbish	0	
13/04/2019	2/8 George St	L1	320	3rd party damage	0	Concrete in the line removed
20/04/2019	2/8 George St	L1	167	3rd party damage	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
30/10/2018	21 Olive Cres	L1	97	Fat	5	Fat blockage removed from main Flushed main
2/11/2018	21 Olive Cres	L1	155	Fat	0	
13/05/2019	21 Olive Cres	L1	303	Fat	1	
27/10/2018	25 Gibbons Rd	L1	127	Fat	11.5	Tomo sinkhole, CCTV Flushed main
2/04/2019	25 Gibbons Rd	L1	61	Broken pipe	0	
15/06/2019	25 Gibbons Rd	L1	266	Fat	2.5	
24/06/2019	3 Garth PI	L1	112	Fat	2	Flushed main Cleared unknown blockage
27/06/2019	3 Garth PI	L1	246	Unknown	0	
15/07/2018	30 Janese PI	L1	180	Surcharging	84	Continue to monitor
19/07/2018	30 Janese PI	L1	304	Surcharging	1.5	
18/03/2019	4 Cinnamon Rd	L1	158	Fat	7.5	Fats, baby wipes and wood removed from main
13/05/2019	4 Cinnamon Rd	L1	121	Rags	1	
20/10/2018	4 Garth PI	L2	171	Fat	0	Heavy fat blockage flushed
13/04/2019	4 Garth PI	L1	54	Fat	0	
28/09/2018	71 Manston Rd	L1	130	Unknown	0.5	Fat and wipes removed
9/10/2018	71 Manston Rd	L1	136	Rags	0	
24/01/2019	738 Great South Rd	L1	151	Fat	1.5	Flushed line
28/01/2019	738 Great South Rd	L1	87	Fat	0	

2.30.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where root cause has been identified.

2.30.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
27/10/2018	DPPPW	Papatoetoe Wholesale Wastewater Pump Station	688	Rain event	24	11.5

2.30.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
685	Puhinui WWPS	0	1	0	2	0	0	0.6	Continue to monitor
688	Papatoetoe West WWPS	0	0	0	0	3	1	0.8	Continue to monitor
689	Weymouth North WWPS	0	0	1	1	0	0	0.4	Continue to monitor
1138	McLaughlins Road 1 WWPS	0.2	0	0	0	0	0	0	Continue to monitor
1163	Manurewa West WWPS	0.8	1	0	0	0	0	0.2	Continue to monitor
1164	Settlers Cove WWPS	0.8	0	0	0	0	0	0	Continue to monitor
1165	Weymouth Domain WWPS	1.4	0	0	0	0	0	0	Continue to monitor
1175	McLaughlins Road 2 WWPS	0.8	0	0	0	0	0	0	Continue to monitor
1177	Malaspina Place 1 WWPS	1	0	0	0	0	0	0	Continue to monitor

Type 2 EOPs – Network Relief rolling WWO data from 1 July 2014 – 30 June 2019

The Type 2 EOP 1535 has a permanent monitor installed. This information is provided as it is available, although it is noted for reference that very few Type 2 locations have monitors installed and this needs to be interpreted with reference to the Wastewater Network Strategy and the overall network performance in this catchment.

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1535	Wyllie Rd	n/a	n/a	n/a	7	14	3	8	Network pipe upgrade likely to be required following performance review of trunk upgrade projects

2.30.6 Inflow & Infiltration Programme

A review of Inflow & Infiltration (I&I) in the remainder of this catchment will be done as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

2.30.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Option Analysis (Feasibility)	Hingaia WWPS and storage Upgrade	Studies and investigations	Major greenfield growth is projected in the Southern Region, with significant development progressing short term in the Hingaia PS which needs to be serviced	Provide capacity for immediate growth without increasing wet weather overflows.	Before 2022
Planned	Southern Interceptor Augmentation	Studies and investigations	Major greenfield growth is projected in the Southern Region, and significant upgrades are required to service this growth without deterioration in capacity.	Provide capacity for growth without increasing wet weather overflows.	2017-2035

2.30.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2018 and 30 June 2019.

2.30.9 Summary

There have been no Type 1 EOPs which have discharged more frequently than two spills per year on average. Trend analysis shows that fats contribute to the majority of uncontrolled overflows. In the long term, the network performance in this catchment will be improved with the 'Southern Interceptor Augmentation' projects, which will provide additional capacity in the network. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

2.31 Catchment 29 – Pahurehure Inlet

2.31.1 Overview

The Pahurehure Inlet catchment is located in south Auckland, encompassing Manurewa, Weymouth, Wattle Downs, Takanini, Hingaia, and Drury. The total land area within the catchment is around 2,430 ha. The Papakura Stream discharges on the northern side of the Inlet and several other smaller streams also drain to the Inlet. There are 14,560 wastewater connections.

Land use within the catchment is predominately residential, with commercial areas in Manurewa and Papakura, a small commercial area in Drury, and a large industrial/commercial area in Takanini.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	14,066	14,220	14,355	14,429	14,560
Length of sewer (km)	548	558	565	626	608

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
686	PS 84 Manurewa South	DPSIN	1	Papakura Stream
687	Manurewa West WWPS	DPMW	1	Waimahia Creek
708	Weymouth Wholesale WWPS	DPWYM	1	Hazards Rd Foreshore
746	Southern Interceptor transmission system overflow	DSSIN	2	Pahurehure Inlet Basin 1
759	Drury/Hingaia Wastewater WWPS	DPHNG	1	To land
965	105R Beaumonts Way	-	2	Papakura Stream
966	17 McDougall Street	-	2	Papakura Stream
967	14 Percival Street	-	2	Unnamed stream near Percival Street
974	2 Browning Street	-	2	Papakura Stream
987	St Anne's Cres WWPS	DPSAC	1	St Anne's Foreshore
997	Waimarino Rd WWPS	DPWNO	1	Waimahia Creek
1012	Horlicks Place WWPS	DPHOR	1	Papakura Stream
1166	Roys Road WWPS	DPRYS	1	Te Pua Point
1171	Aberdeen Cres WWPS	DPABE	1	To land
1575	Papakura North MH08	-	2	Papakura Stream to Inlet

There have been no changes to the schedule of EOPs in this catchment.

2.31.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 178 reported incidents in the Pahurehure catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

NOTE: No wastewater discharges reached the Tangata Whenua Management Area.

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
12/04/2017	210 Great South Rd	L1	240	Surcharging	69	CCTV and heavy flush
3/07/2017	210 Great South Rd	L1	606	Fat	0	
9/05/2019	210 Great South Rd	L1	108	Unknown	0	
1/07/2017	29 Aarts Ave	L1	418	Unknown	32	NRV Installed With Planning for long term solution
2/07/2017	1/29 Aarts Ave	L1	105	Rubbish	9.5	
22/07/2018	1/29 Aarts Ave	L1	110	Surcharging	7	
26/12/2018	1/29 Aarts Ave	L1	1187	Surcharging	0	
21/02/2018	30 Sandwich Dr	L1	158	Fat	2.5	Heavy flush, fats and debris removed
25/02/2018	30 Sandwich Dr	L1	164	Fat	0	
9/10/2018	30 Sandwich Dr	L1	106	Rubbish	0	
18/01/2017	59 Beaumonts Way	L1	595	Fat	0	Fat and debris removed from main
12/01/2018	59 Beaumonts Way	L1	197	Unknown	0	
10/10/2018	59 Beaumonts Way	L1	218	Fat	0	
25/09/2017	76S Russell Rd	L1	236	Fat	0	Fats and debris removed. Large rock removed
12/12/2017	76S Russell Rd	L1	198	Fat	1	

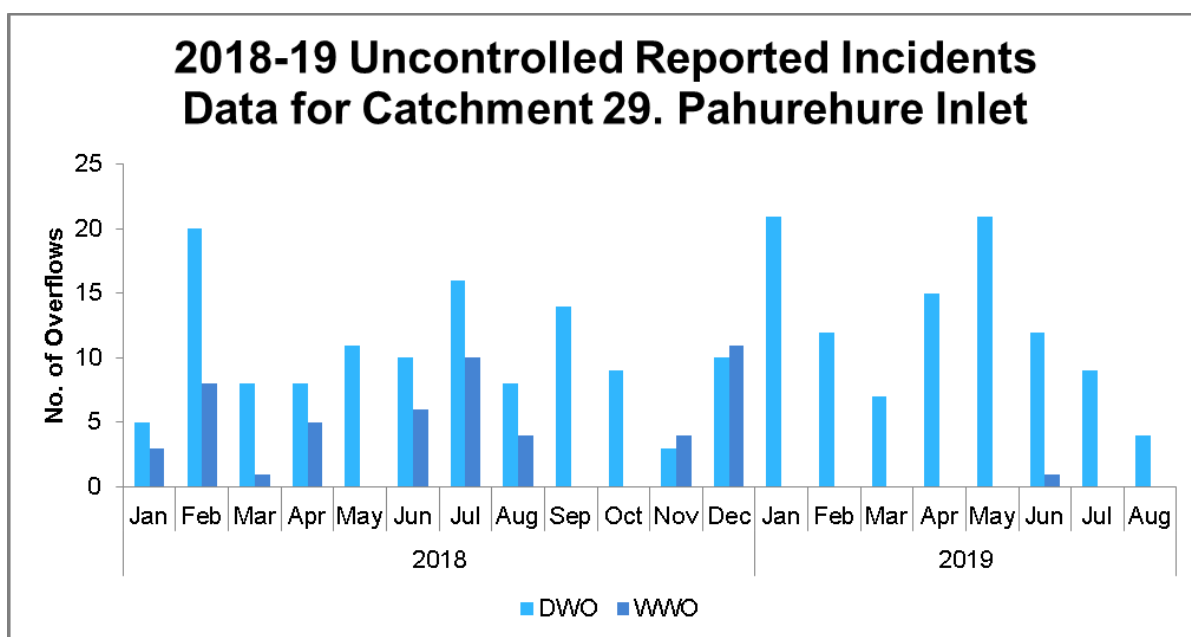
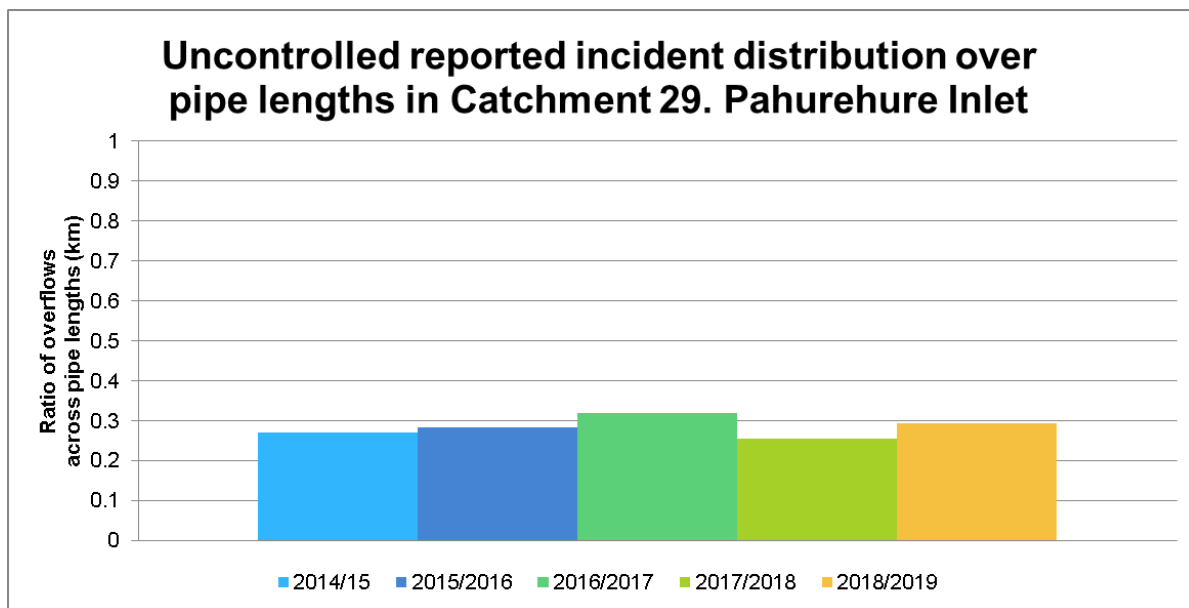
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
20/12/2017	76S Russell Rd	L1	333	Rubbish	1	following CCTV. Heavy grease removed from main
20/02/2018	76S Russell Rd	L1	92	Unknown	7.5	
12/04/2019	76S Russell Rd	L1	127	Fat	5.5	
12/04/2017	6 Rimu Rd	L1	181	Unknown	69	Rubbish and fats removed from main
15/02/2018	6 Rimu Rd	L2	172	Rubbish	0.5	
19/02/2018	6 Rimu Rd	L1	611	Rubbish	0	
28/05/2019	6 Rimu Rd	L1	376	Fat	8	
24/11/2017	33 Leaver Pl	L1	263	Rubbish	0	Fat and plastic removed from main
7/03/2018	33 Leaver Pl	L1	231	Rubbish	11	
20/12/2018	33 Leaver Pl	L1	689	Unknown	47.5	
22/12/2018	33 Leaver Pl	L1	292	Unknown	2	
27/01/2018	10 Nield Rd	L1	244	Surcharging	2	I&I under investigation
11/02/2018	10 Nield Rd	L1	192	Unknown	39	
23/08/2018	10 Nield Rd	L1	490	Surcharging	2.5	
29/08/2018	10 Nield Rd	L1	34	Surcharging	40	
16/06/2018	121 Beaumonts Way	L1	150	Fat	11.5	Heavy fats removed, flushed main
30/06/2018	121 Beaumonts Way	L1	103	Fat	0	
10/07/2018	121 Beaumonts Way	L1	243	Fat	7	
15/07/2018	121 Beaumonts Way	L1	371	Surcharging	84	
28/01/2019	1 Browning St	L1	44	Unknown	0	Silts and debris removed from main
9/02/2019	1 Browning St	L1	111	Silts	0	
5/09/2018	14 Dreadon Rd	L1	296	Fat	0	Wet wipes and debris removed
27/04/2019	14 Dreadon Rd	L1	159	Rags	0	
28/01/2019	14 Fleming St	L1	49	Rags	0	Wet wipes and debris removed
18/02/2019	14 Fleming St	L1	169	Unknown	2	
26/04/2019	14 Fleming St	L1	1389	Fat	0	
4/02/2019	17 Poutini Pl	L1	928	Unknown	0	Heavy fats flushed
5/04/2019	17 Poutini Pl	L1	438	Fat	0	
9/05/2019	18 Reremanu Pl	L1	80	Unknown	0	Jetted main
25/05/2019	18 Reremanu Pl	L1	268	Fat	0	
10/09/2018	2 Arnwood St	L1	524	Fat	0.5	Heavy fats removed Jetted line
4/02/2019	2 Arnwood St	L1	191	Fat	0	

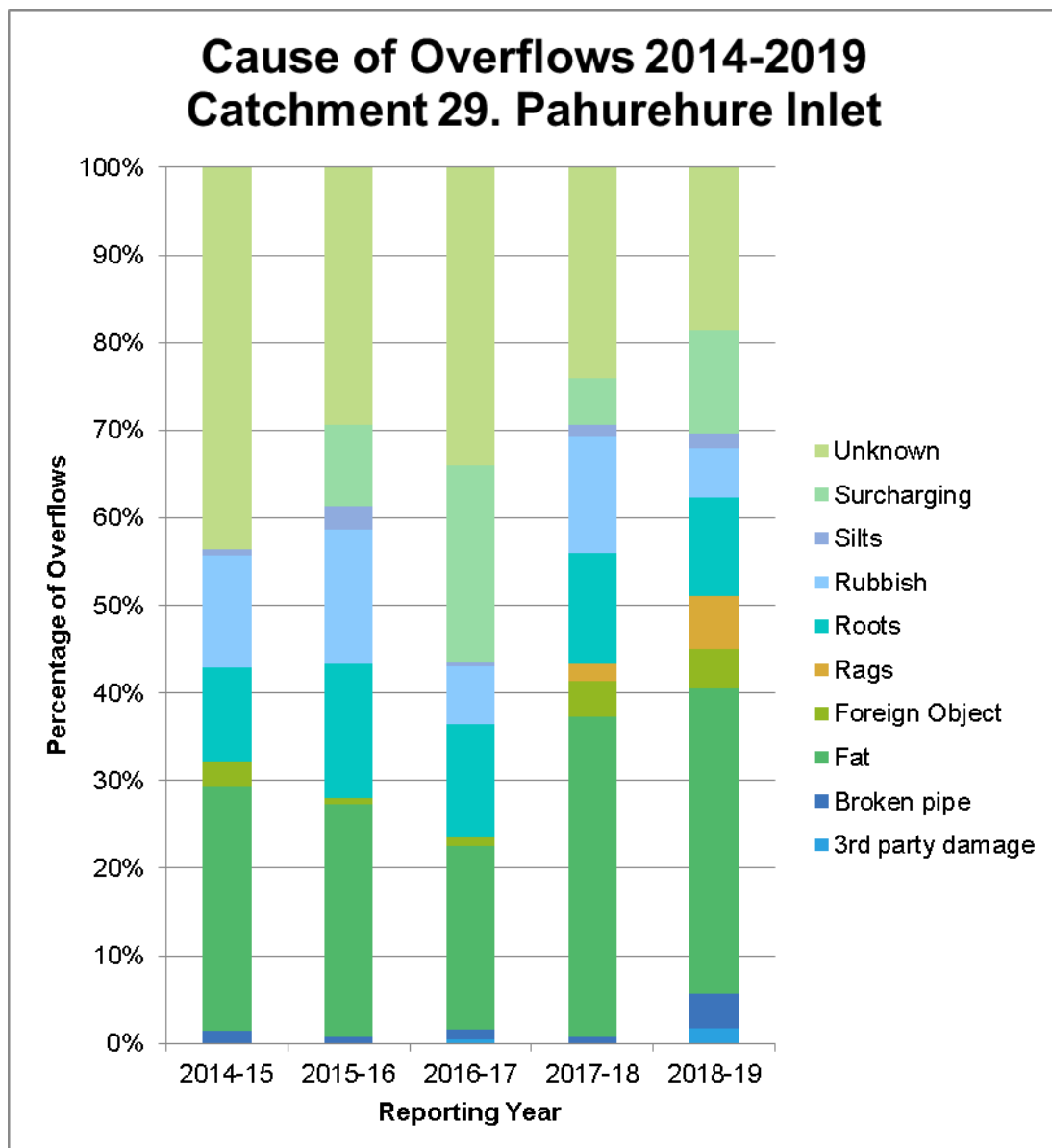
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
16/07/2018	2 Foxlaw St	L1	271	Surcharging	0	Continue to monitor
20/12/2018	2 Foxlaw St	L1	63	Surcharging	47.5	
12/08/2018	21 Coxhead Rd	L1	421	Fat	0	CCTV, flushed blockage
16/08/2018	21 Coxhead Rd	L1	60	3rd party damage	2.5	
6/05/2019	21 Coxhead Rd	L1	187	Roots	0	
15/07/2018	21 Crampton Pl	L1	1349	Surcharging	84	Jetted main, large fat chunks removed, CCTV
22/12/2018	21 Crampton Pl	L1	177	Fat	2	
6/05/2019	23 Ferguson St	L1	189	Rags	0	Large grease and rag blockage removed
9/05/2019	23 Ferguson St	L1	179	Rags	0	
16/04/2019	25 Beaumonts Way	L2	202	Rubbish	0	Jetted mains, CCTV, under investigation
1/06/2019	25 Beaumonts Way	L1	126	Fat	9.5	
15/12/2018	3/53 Russell Rd	L1	372	Unknown	2	Jetted line
22/01/2019	3/53 Russell Rd	L1	1274	Fat	0	
25/01/2019	3/53 Russell Rd	L1	174	Fat	0	
23/04/2019	31A Estuary Rd	L1	97	Unknown	1	Heavy fat removed from main
22/05/2019	31A Estuary Rd	L1	326	Fat	0	
25/08/2018	34 Becker Dr	L1	54	Surcharging	3	Flushed main
13/03/2019	34 Becker Dr	L1	151	Fat	0	
26/02/2019	37 Halver Rd	L1	223	Broken pipe	0	Broken pipe repaired Concrete removed from main
18/06/2019	37 Halver Rd	L1	700	Foreign Object	0	
5/10/2018	39R Wattle Farm Rd	L1	189	Unknown	0	Flushed from WWPS
7/01/2019	39R Wattle Farm Rd	L1	156	Rubbish	0	
24/01/2019	4 Kirton Cres	L1	112	Unknown	1.5	Unblocked manhole
16/05/2019	4 Kirton Cres	L1	175	Unknown	3.5	
1/07/2018	4/44 Jellicoe Rd	L1	163	Fat	6	Flushed main, continue to monitor
18/07/2018	4/44 Jellicoe Rd	L1	147	Surcharging	1.5	
21/07/2018	4/44 Jellicoe Rd	L1	164	Surcharging	0	
22/10/2018	42 Rogers Rd	L1	210	Roots	0	Unblocked line Broken main repaired
23/01/2019	42 Rogers Rd	L1	172	Unknown	0	
10/02/2019	42 Rogers Rd	L2	108	Broken Pipe	0	
26/11/2018	5 Trimdon St	L1	102	Surcharging	12	Fat/rags/bottles

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
22/06/2019	5 Trimdon St	L1	350	Rags	0	removed from main
12/09/2018	57 Mcannalley St	L1	120	Fat	0	Heavy flushed main
29/09/2018	57 Mcannalley St	L1	117	Fat	0	
4/10/2018	6 Tui Cres	L1	355	Unknown	0	Heavy flush Fat and debris removed from main, protruding lateral, CCTC, under investigation
23/10/2018	6 Tui Cres	L1	508	Unknown	0	
20/12/2018	6 Tui Cres	L1	160	Unknown	47.5	
23/12/2018	6 Tui Cres	L1	730	Surcharging	22	
25/12/2018	6 Tui Cres	L1	681	Surcharging	22.5	
25/12/2018	6 Tui Cres	L1	148	Fat	22.5	
5/09/2018	64 Wordsworth Rd	L1	239	Unknown	0	Flushed main Large fat blocks removed
19/09/2018	64 Wordsworth Rd	L1	135	Fat	1	
6/07/2018	7 Mahia Rd	L1	69	Fat	0	Flushed main
2/08/2018	7 Mahia Rd	L1	1168	Fat	0	
27/04/2019	7 Mahia Rd	L1	188	Fat	0	
26/05/2019	70 Mcannalley St	L1	79	Fat	0	Heavy fats removed, jetted main
27/05/2019	70 Mcannalley St	L1	90	Fat	0	
14/12/2018	8 Horlicks Pl	L1	116	Surcharging	26.5	Heavy flush
1/02/2019	8 Horlicks Pl	L1	1177	Fat	0	
7/01/2019	89 Mahia Rd	L1	153	Roots	0	Rootcut/heavy flush Fat and wet wipes removed
9/01/2019	89 Mahia Rd	L1	236	Roots	0	
26/04/2019	89 Mahia Rd	L1	32	Rags	0	
1/05/2019	89 Mahia Rd	L1	150	Fat	0	
27/05/2019	89 Mahia Rd	L1	509	Rags	0	

2.31.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where root cause has been identified.

2.31.4 Wet Weather Overflow (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPWYM	Weymouth Wholesale Wastewater Pump Station	708	Rain event	96	84
15/07/2018	DPHNG	Drury/Hingaia Wholesale Wastewater Pump Station	759	Rain event	563	84
15/07/2018	DPMW	Manurewa West Wholesale Wastewater Pump Station	687	Rain event	340	84
20/12/2018	DPHNG	Drury/Hingaia Wholesale Wastewater Pump Station	759	Rain event	44	47.5
24/12/2018	DPHNG	Drury/Hingaia Wholesale Wastewater Pump Station	759	Rain event	122	61.5
25/12/2018	DPWYM	Weymouth Wholesale Wastewater Pump Station	708	Rain event	91	22.5
25/12/2018	DPHNG	Drury/Hingaia Wholesale Wastewater Pump Station	759	Rain event	455	22.5
25/12/2018	DPMW	Manurewa West Wholesale Wastewater Pump Station	687	Rain event	567	22.5

2.31.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
686	PS 84 Manurewa South	1	0	0	2	1	0	0.6	Continue to monitor
687	Manurewa West WWPS	6	1	3	4	3	2	2.6	Continue to monitor
708	Weymouth Wholesale WWPS	-	0	0	3	2	2	1.4	Continue to monitor
759	Drury/Hingaia Wastewater WWPS	-	0	2	6	1	4	2.6	Hingaia WWPS and storage Upgrades
987	St Anne's Cres WWPS	1	0	0	0	0	0	0	Continue to monitor
997	Waimarino Rd WWPS	0.8	1	0	0	0	0	0.2	Continue to monitor
1012	Horlicks Place WWPS	0.4	0	0	0	0	0	0	Continue to monitor
1166	Roys Road WWPS	0	1	0	0	0	0	0.2	Continue to monitor
1171	Aberdeen Cres WWPS	0.4	0	0	0	0	0	0	Continue to monitor

2.31.6 Inflow & Infiltration Programme

A review of I&I in the remainder of this catchment will be done as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

2.31.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Drury Opaheke Servicing Study	Studies and investigations	Capacity - Major greenfield development is scheduled in this area. A servicing plan is required.	Ultimately the provision of trunk servicing capacity for Southern FUZ area - distinct from Southern Interceptor Projects to be defined.	Before 2022
Underway	Hingaia WWPS and Storage Upgrade	Design	Major greenfield growth is projected in the Southern region, with significant development progressing the short term in the Hingaia area which needs to be serviced	Provide capacity for immediate growth without increasing wet weather overflows	Before 2022
Planned	Southern Interceptor Augmentation	Studies and investigations	Major greenfield growth is projected in the Southern Region, and significant upgrades are required to service this growth without deterioration in capacity.	Provide capacity for growth without increasing wet weather overflows.	2017-2035
Underway	Drury West Trunk Sewer Development	Project Execution	Provide wastewater service to the Bremner Road/Auranga development and Drury West	Provide additional wastewater capacity in Drury West	2017-2018
Underway	Drury South Trunk Sewer Development	Concept Design	130l/s package pump station and 1,110m ³ storage, approximately 1.5km of 450mm gravity sewer and dual rising main approximately 1km.	Provide additional wastewater capacity in Drury South	2019-2020

Minor improvements works include:

- Mahia Trunk Main: This renewals project will reduce the risk of Dry Weather Overflows at uncontrolled locations as a result of asset failure.

2.31.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2018 and 30 June 2019.

2.31.9 Summary

There were two Type 1 EOPs which discharged more frequently than two spills per year on average in this reporting period. In the long term, the network performance in this catchment will be improved with the Hingaia WWPS and Storage Upgrade, the 'Southern Interceptor'. Trend analysis shows that fats are the primary cause of overflows, and the density of overflows has increased slightly. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. The network has been significantly extended and developed to accommodate for population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.32 Catchment 35 – Kumeu-Huapai-Riverhead

2.32.1 Overview

The Kumeu-Huapai-Riverhead catchment covers an area of approximately 1,270 ha in rural north-west Auckland. There are no existing EOPs in the catchment; the proposed overflows would cater for future growth identified in the Auckland Plan and proposed Auckland Unitary Plan. There are currently 1,894 wastewater connections.

The catchment includes the settlements of Kumeu and Huapai and the surrounding rural area, and the small settlement of Riverhead to the east. It takes in the catchments of many small streams and unnamed tributaries to Kumeu River, as well as part of the catchment of Kumeu River. There are no coastal environments within the catchment.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	735	1,087	1,430	1,643	1,894
Length of sewer (km)	47	53	59	72	76

There are no EOPs in the Kumeu-Huapai-Riverhead area.

2.32.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 16 reported incidents in the Kumeu/Huapai/Riverhead. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

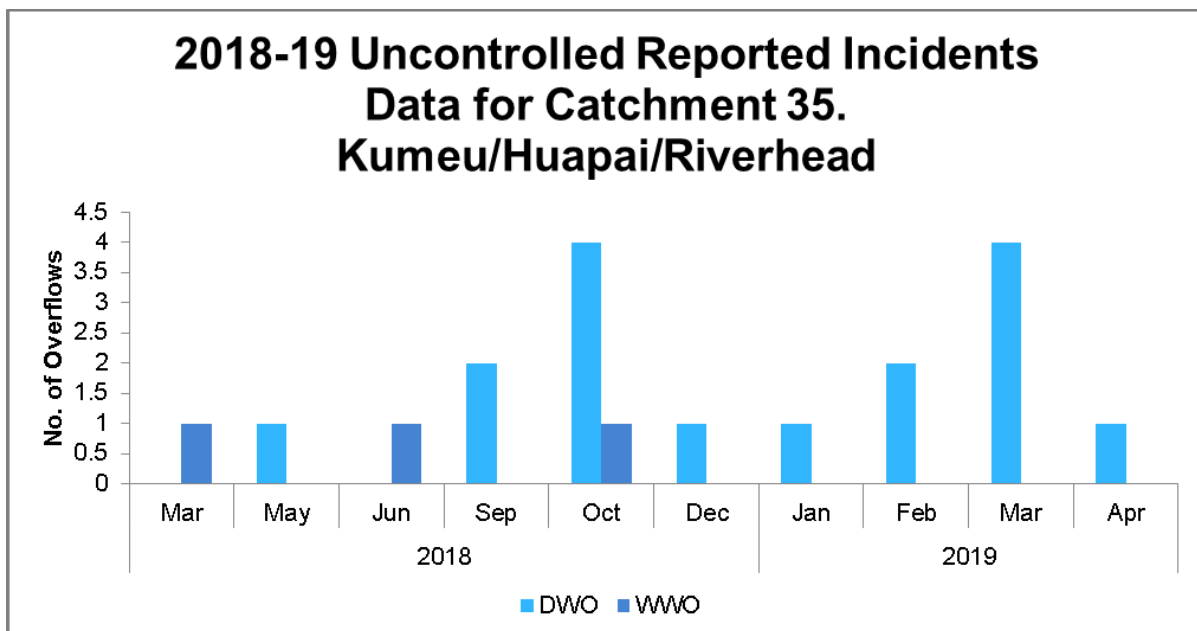
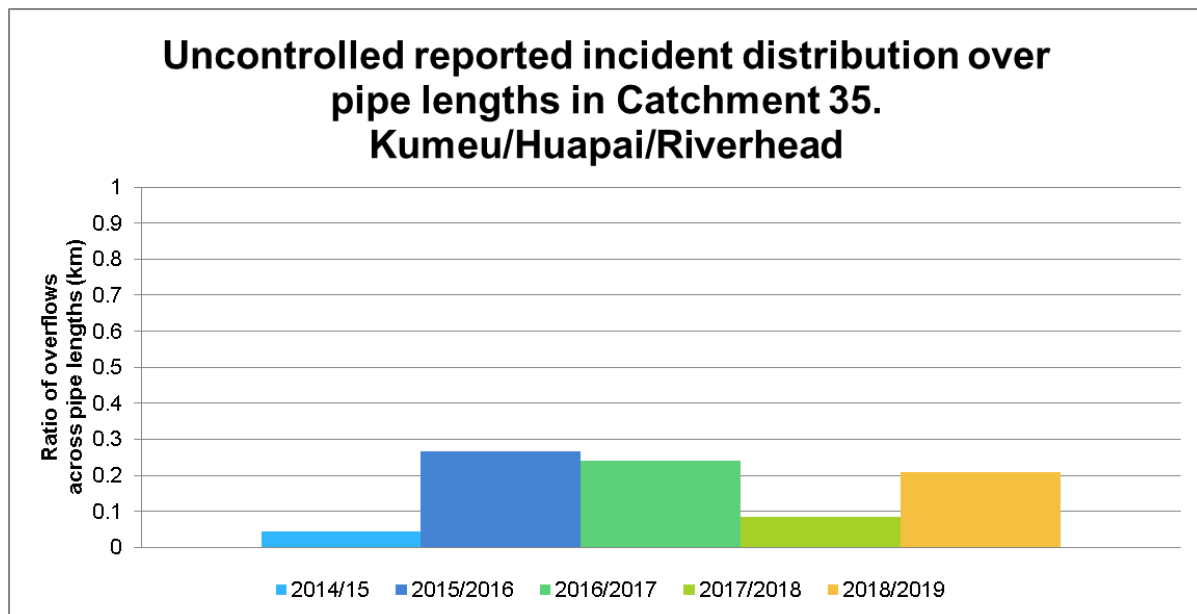
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

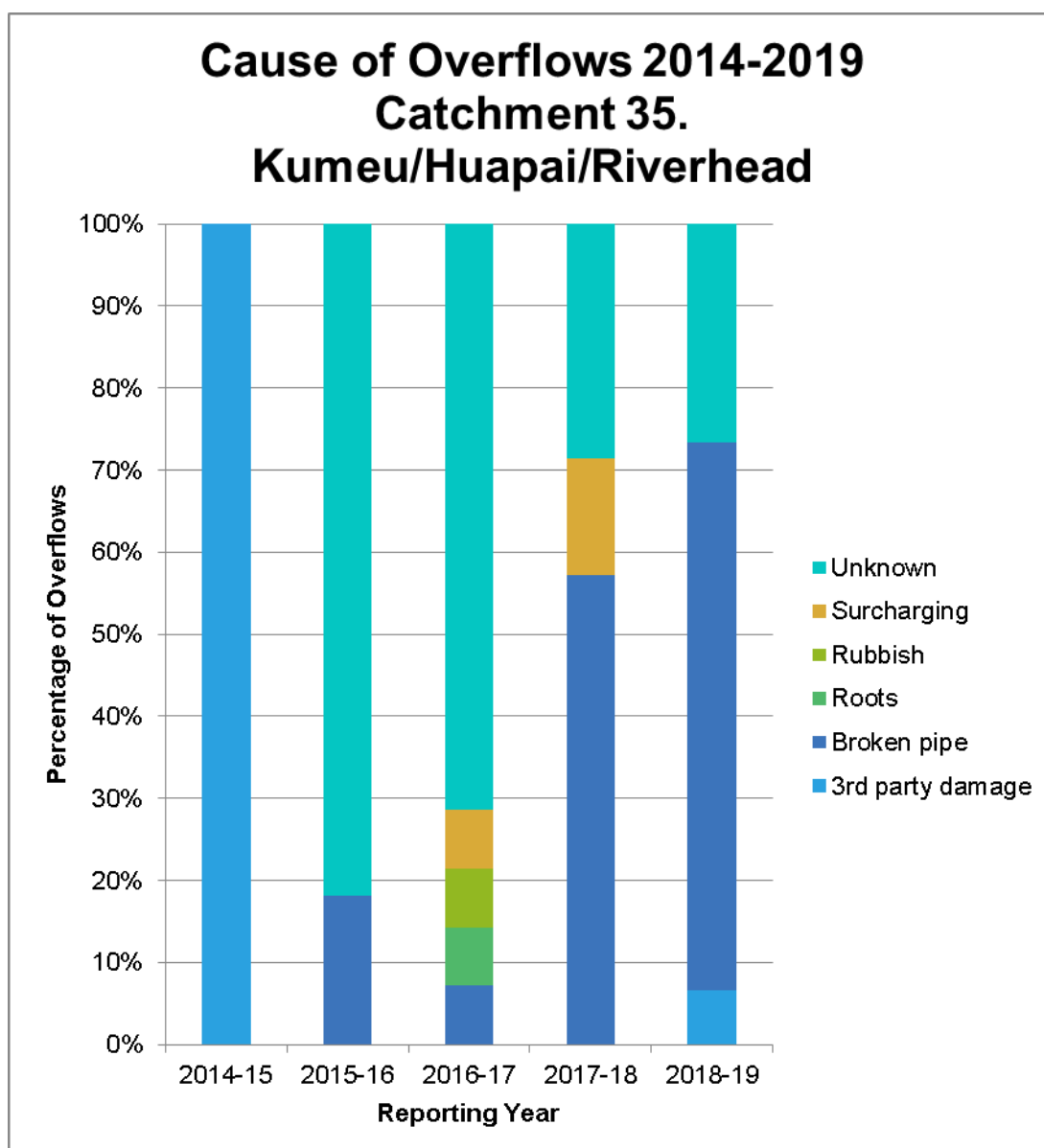
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
12/04/2017	6 Josh Rd	L2	140	Broken pipe	2.8	Valve issue with LPS repaired
3/07/2017	6 Josh Rd	L1	103	Broken pipe	21.6	
1/07/2017	6 Vinistra Rd	L1	463	Unknown	0	LPS issue

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
2/07/2017	6 Vinistra Rd	L1	132	Unknown	0	resolved

2.32.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where root cause has been identified.

2.32.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

There were no wet weather overflows at pump stations between 1 July 2018 and 30 June 2019.

2.32.5 Trend analysis of pump station overflows

Note: There are no pump stations in this catchment.

2.32.6 Inflow & Infiltration Programme

A review of I&I in this catchment will be done as part of Watercare's region-wide programme; this catchment has not been identified as a priority to date.

2.32.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Northern Interceptor - Stage 1	Project Execution	To allow wastewater flows to be diverted from the Northern Strategic Growth Area (NorSGA) and South Rodney (Kumeu / Huapai/Riverhead) to the Rosedale wastewater treatment plant. This balances flows at the treatment plants and provides additional capacity to the Western Interceptor	This project is required to service greenfield growth and avoid capacity-related dry weather overflows. Will reduce the load on the Western Interceptor and also reduce Type 3 overflows S20, S21 and S24	2012-2021
Underway	Whenuapai and Redhills Wastewater Scheme (Housing Infrastructure Fund)	Design	320L/s pump station located on Brigham Creek Road; 500mm diameter rising main 2km in length; 1,800mm diameter, 1km long gravity pipeline to link under SH18 linking into the Northern Interceptor, 1km in length; 2,100mm diameter tunnel, 2.8km in length, between Westgate and Hobsonville. The alignment of the tunnel is alongside SH18 and forms part of the Northern Interceptor Scheme, which transfers conveying wastewater to the Rosedale WWTP. 315mm diameter rising main, 1.1km in length, to divert flow from Kumeu, Huapai, Riverhead and the existing Whenuapai township to the new pump station on Brigham Creek Road.	Ultimately the provision of trunk servicing capacity for north-west FUZ area - distinct from Northern interceptor	Before 2022

2.32.8 Erosion Control Measures

No works related to erosion control were carried out in this SMA between 1 July 2018 and 30 June 2019.

2.32.9 Summary

There are currently no EOPs within this area, and no network performance issues relating to overflows. Trend analysis shows an increase in the ratio of overflows to pipe length in this region. This area is expecting to have high growth, and this will need to be accommodated without system performance deteriorating; this will be achieved by capital works identified in the servicing strategies and the Northern Interceptor project. The network has been

developed to accommodate for population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

2.33 Catchment 36 – Western Isthmus (Central Interceptor)

2.33.1 Overview

The Central Interceptor catchment covers an area of approximately 43 km² in the western part of the Auckland Isthmus. Approximately 85% of the Central Interceptor catchment is residential. A further 9 % is industrial and the remainder is made up of relatively small proportions of commercial property, open space and motorways. The Central Interceptor catchment extends across the catchments of four urban streams. The catchment boundary reflects a combination of topographic and wastewater network catchment boundaries. While network upgrading works have occurred over the years, the network in the Central Interceptor catchment area effectively remains a combined sewer system. There are 44,638 wastewater connections in the Western Isthmus.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	43,983	44,095	44,270	44,443	44,638
Length of sewer (km)	617	618	619	625	589

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
36	37 Saltaire Street	-	2	Waterview Inlet (Saltire Street)
37	3 Kelvinside Terrace	-	2	Small tributary of Whau Creek 2
39	Avondale Racecourse	-	2	Small tributary of Whau Creek 1
40	17 Victor Street	-	2	Waterview Inlet (Saltire Street)
139	18 Wainoni Avenue	-	2	Coast near Bambury Close
146	68 Smale Street	-	2	To land
148	64 Smale Street	-	2	To land
152	Joan Street WWPS	DPJOA	1	Point Chevalier Beach
211	520 Blockhouse Bay Road	-	2	Tributary of Whau Creek (Blockhouse Bay Reserve)
308	94 Haverstock Road	-	2	Meola Creek (Haverstock Road)
309	29 Euston Road	-	2	Meola Creek (Haverstock Road)
316	98 Moa Road	-	2	Lower Meola Creek
317	1102 Great North Road	-	2	Meola Creek (north of SH 16)
319	1064 Motions Road	-	2	Lower Meola Creek
320	71 Moa Road	-	2	Lower Meola Creek
321	76 Premier Avenue	-	2	Lower Meola Creek
322	20 Kanuka Street	-	2	Lower Meola Creek
323	53 Premier Avenue A	-	2	Lower Meola Creek

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
324	53 Premier Avenue B	-	2	Lower Meola Creek
325	28 Pasedena Road	-	2	Lower Meola Creek
327	3 Parr Road	-	2	Meola Creek (north of SH 16)
328	1054 Great North Road	-	2	Meola Creek (north of SH 16)
333	79 Moa Road	-	2	Lower Meola Creek
337	252 Meola Road	-	2	Lower Meola Creek
338	99 Moa Road	-	2	Lower Meola Creek
341	25 Parkdale Road	-	2	Meola Creek (Rawalpindi)
342	13 Rawalpindi Street	-	2	Meola Creek (Rawalpindi)
346	13 Segar Avenue	-	2	Meola Creek (Rawalpindi)
347	13 Novar Place	-	2	Meola Creek (north of SH 16)
349	58 Walmer Road	-	2	Lower Meola Creek
354	29 East St	-	2	Upper Motions Creek
355	4a West Terrace	-	2	Upper Motions Creek
357	1 Ian McKinnon Drive	-	2	Upper Motions Creek
359	17-23 Exmouth Street	-	2	Upper Motions Creek
360	5 Harold Street	-	2	Upper Motions Creek
362	9 Karaka Street	-	2	Upper Motions Creek
369	5 Suffolk Street	-	2	Upper Motions Creek
375	39 King Street	-	2	Upper Motions Creek
376	31 Bond Street	-	2	Upper Motions Creek
377	36 King Street	-	2	Upper Motions Creek
378	10 Burgoyne Street	-	2	Upper Motions Creek
379	30 Potatau Street	-	2	Upper Motions Creek
382	24 Central Road A	-	2	Upper Motions Creek
383	24 Central Road B	-	2	Upper Motions Creek
385	52 Cooper Street	-	2	Upper Motions Creek
386	39 Commercial Road	-	2	Upper Motions Creek
389	21 Gundry Street	-	2	Upper Motions Creek
390	21 Edinburgh Street	-	2	Upper Motions Creek
392	400 Great North Road	-	2	Upper Motions Creek
394	42a Tuarangi Road	-	2	Upper Motions Creek
395	15 Fourth Street	-	2	Upper Motions Creek

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
397	52 Kingsland Avenue	-	2	Upper Motions Creek
398	27 Fourth Street	-	2	Upper Motions Creek
404	31 Ivanhoe Road	-	2	Upper Motions Creek
409	731 Great North Road	-	2	Upper Motions Creek
411	28 Springfield Road	-	2	Upper Motions Creek
412	PSW25 Overflow	-	2	Upper Motions Creek
413	727 Great North Road	-	2	Upper Motions Creek
430	5 Gifford Avenue	-	2	Oakley Creek (Wesley)
432	2 Mayn Avenue	-	2	Oakley Creek (Wesley)
439	17 Tait Street B	-	2	Oakley Creek near New North Road
440	3 Waitati Place	-	2	Oakley Creek near New North Road
559	1401 Great North Road A	-	2	Lower Oakley Creek
561	49 Herdman Street	-	2	Lower Oakley Creek
562	11 Waterbank Crescent	-	2	Lower Oakley Creek
563	1443 Great North Road	-	2	Oakley Creek (Oakley Creek Walkway)
565	65 Oakley Avenue	-	2	Waterview Inlet (Seaside Avenue)
566	64 Fir Street	-	2	Waterview Inlet (Seaside Avenue)
567	16 Seaside Avenue	-	2	Waterview Inlet (Seaside Avenue)
568	71 Alverstone Street	-	2	Waterview Inlet (Seaside Avenue)
571	102 Penney Avenue	-	2	Whau Creek (White Swan Road)
572	375 Blockhouse Bay Road	-	2	Whau Creek
573	4 Margate Road	-	2	Whau Creek
574	5 Shoreham Street	-	2	Tributary of Whau Creek (Shoreham Street)
575	164 St Georges Road	-	2	Whau Creek
578	32 Miranda Street	-	2	Whau Creek
594	75 Wolverton Street	-	2	Whau Creek
606	Connolly Avenue WWPS	DPCLY	1	To land
608	Cowley Street WWPS	DPCOW	1	To land
616	Waterbank Crescent WWPS	DPWTB	1	Lower Oakley Creek
650	Walker Road 1 WWPS	DPWA1	1	Walker Road
700	Wainui Avenue Wholesale WWPS	DPWNU	1	Meola Creek Mouth
701	Oliver Road Wholesale WWPS	DPOLV	1	Meola Creek Mouth

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
702	Harbour View Road Wholesale WWPS	DPHRB	1	Raymond Reserve
703	Wright Road Wholesale WWPS	DPWRI	1	Coast near Wright Road
716	Branch 7 Arch Hill MH22	DSB07	2	Upper Motions Creek
717	Branch 7 Arch Hill MH42C	DSB07	2	Upper Motions Creek
718	Branch 7 Arch Hill MH44	DSB07	2	Upper Motions Creek
719	Branch 7 Arch Hill MH46	DSB07	2	Upper Motions Creek
720	Branch 7 Arch Hill MH48	DSB07	2	Upper Motions Creek
721	Branch 7 Arch Hill MH49	DSB07	2	Upper Motions Creek
722	Branch 7 Arch Hill MH52	DSB07	2	Upper Motions Creek
723	Branch 8 Mt Albert MH2	DSB08	2	Meola Creek (Rawalpindi)
724	Branch 8 Mt Albert MH3	DSB08	2	Meola Creek (Rawalpindi)
725	Branch 8 Mt Albert MH6	DSB08	2	Meola Creek (Rawalpindi)
726	Branch 8 Mt Albert MH18	DSB08	2	Meola Creek (Rawalpindi)
727	Branch 8 Mt Albert MH30 (Haverstock Road)	DSB08	2	Meola Creek (Haverstock Road)
728	Branch 8 Mt Albert MH31	DSB08	2	Meola Creek (Haverstock Road)
732	Orakei Main Sewer MH38	DSORM	2	Lower Meola Creek
734	Edendale Branch MH1	DSEDB	2	Meola Creek (Lyon Avenue)
736	Orakei Main Sewer MH51A	DSORM	2	Oakley Creek (Oakley Creek Walkway)
739	Branch 8 Mt Albert MH7	DSB08	2	Meola Creek (Rawalpindi)
742	Branch 7A MH1	DSB07A	2	Upper Motions Creek
1197	Great North Road WWPS	DPGN2	1	Small tributary of Whau Creek 1
1198	Wingate Street WWPS	DPWNG	1	Whau River
1461	4 Haycock Avenue	-	2	Whau Creek (White Swan Road)
1479	29 New Bond Street	-	2	Upper Motions Creek
1502	84 Wolverson Rd	-	2	Whau Creek
1505	13 Sefton Ave	-	2	Upper Motions Creek
1506	1/94 School Rd	-	2	Upper Motions Creek
1508	37 Commercial Rd	-	2	Upper Motions Creek
1511	2 Harold Street	-	2	Upper Motions Creek
1514	Heron Park	-	2	Waterview Inlet (Saltaire Street)
1515	Branch 7 MH34	-	2	Upper Motions Creek

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1518	Hendon Ave (New Branch 9 Diversion)	DSB09B	2	Oakley Creek (Allan Wood Reserve)
1519	Phyllis reserve	-	2	Oakley Creek (Oakley Creek Walkway)
1523	Suffolk Street (A)	-	2	Upper Motions Creek
1524	17 Fleet Street	-	2	Upper Motions Creek
1525	22 - 24 Randolph Street	-	2	Upper Motions Creek
1526	Branch 9 MH91A	DSB09	2	Oakley Creek (Keith Hay Park)
1531	62 Olsen Ave	-	2	Tributary of Oakley Creek
1537	Suffolk Street (B)	-	2	Upper Motions Creek
1538	30 Potatau St (B)	-	2	Upper Motions Creek
1547	Miranda Reserve (B)	-	2	Whau Creek
1548	3/42 Fairlands Ave	-	2	Waterview Inlet (Saltaire Street)
1589	153 Whitney St	-	2	Whau Creek

There have been no changes to the schedule of EOPs in this catchment.

2.33.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
2/08/2018	DPOLV	Oliver Road Wholesale Wastewater Pump Station	701	Power Failure	144	0.5
24/09/2018	DPOLV	Oliver Road Wholesale Wastewater Pump Station	701	Power Failure	490	6.5

Reported Incidents

There were a total of 368 reported incidents in the Western Isthmus (Central Interceptor) catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
20/12/2017	34 Stoddard Rd	L1	476	Unknown	3	On Annual Planned Flushing Schedule
26/12/2017	34B Stoddard Rd	L1	228	Unknown	4	
4/01/2018	40 Stoddard Rd	L1	525	Unknown	46	
30/05/2018	34C Stoddard Rd	L2	141	Rags	0	
9/08/2018	34C Stoddard Rd	L1	158	Fat	0	
13/08/2018	34C Stoddard Rd	L2	180	Fat	9	
15/03/2019	40 Stoddard Rd	L1	194	Unknown	0	
8/08/2016	805 Great North Rd	L1	606	Rubbish	0.53	Monthly checks, heavy flushed
2/06/2017	805 Great North Rd	L3	320	Rubbish	16.5	
26/08/2018	805 Great North Rd	L3	1161	Surcharging	0.5	
20/06/2017	2165 Great North Rd	L1	131	Unknown	0	Silts removed from main Jetted manhole
28/08/2017	2165 Great North Rd	L1	251	Silt	10	
25/07/2018	2163 Great North Rd	L1	88	Silts	1.5	
24/04/2019	2163 Great North Rd	L1	91	Rubbish	0	
29/03/2017	20 Boyce Ave	L1	108	Rubbish	36	Heavy roots and displaced joint repaired
16/12/2017	20 Boyce Ave	L1	363	Roots	0	
14/03/2019	20 Boyce Ave	L1	390	Roots	0	
19/01/2018	1288 New North Rd	L1	367	Unknown	8	Heavy fats removed, NRV installed Debris removed from main Root intrusions patched. Under investigation
1/03/2018	1288 New North Rd	L1	170	Rags	0	
13/03/2018	1288 New North Rd	L1	139	Unknown	1	
1/05/2019	1288 New North Rd	L1	149	Fat	0	
25/06/2019	1288 New North Rd	L1	45	Rubbish	0	
12/02/2018	1189 New North Rd	L1	598	Fat	0	Heavy flushed
18/06/2018	1189 New North Rd	L1	149	Foreign Object	1.5	
2/07/2018	1189 New North Rd	L1	137	Unknown	2	
22/08/2017	46A Roseman Ave	L2	599	Foreign Object	0	Under investigation, CCTV and flushed
10/12/2017	46 Roseman Ave	L2	305	Unknown	0	
2/04/2018	46A Roseman Ave	L1	336	Unknown	0	
24/10/2018	46A Roseman Ave	L1	203	Fat	0	
6/09/2017	103 White Swan Rd	L1	383	Surcharging	11	Extremely shallow manhole which always overflows during rain. Manhole
10/09/2017	103 White Swan Rd	L1	203	Surcharging	6	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
12/09/2017	103 White Swan Rd	L1	250	Surcharging	3	replaced with T-Junction
16/09/2017	103 White Swan Rd	L1	90	Surcharging	3	
30/11/2017	103 White Swan Rd	L1	117	Surcharging	9	
2/02/2018	103 White Swan Rd	L1	150	Surcharging	0	
12/02/2018	103 White Swan Rd	L1	454	Surcharging	0	
14/04/2018	103 White Swan Rd	L1	143	Surcharging	53	
17/04/2018	103 White Swan Rd	L1	230	Surcharging	2	
31/08/2018	103 White Swan Rd	L1	98	Unknown	0	
3/09/2018	103 White Swan Rd	L1	74	Fat	2	
21/06/2017	14 Skipper Ave	L1	175	Rubbish	0	Large rag blockage removed Large rocks, fat, silts flushed from main, CCTV
24/01/2018	14 Skipper Ave	L1	646	Rags	0	
16/04/2019	14 Skipper Ave	L1	224	Fat	0	
23/04/2019	14 Skipper Ave	L1	341	Unknown	16	
29/04/2019	14 Skipper Ave	L1	56	Foreign Object	4	
5/04/2017	13 Mt Roskill Rd	L1	527	Surcharging	30.5	Rootcut
17/02/2018	13 Mt Roskill Rd	L1	448	Roots	0	
15/07/2018	13 Mt Roskill Rd	L1	1138	Surcharging	52.5	
15/12/2017	8 Prospect Tce	L1	241	Roots	0	Rootcut, heavy fat and wipes, NRV installed
18/12/2017	8 Prospect Tce	L1	108	Roots	0	
1/08/2018	8 Prospect Tce	L1	135	Unknown	0	
22/01/2019	8 Prospect Tce	L1	139	Rags	0	
8/04/2019	8 Prospect Tce	L1	267	Fat	0	
21/11/2017	Brabham Pl	L1	139	Unknown	0	CCTV, heavy flush
28/04/2018	Brabham Pl	L1	204	Fat	0	
27/07/2018	Brabham Pl	L1	143	Rubbish	4	
26/12/2018	3 Brabham Pl	L1	163	Unknown	1.5	
7/07/2017	5A Marconi Pl	L1	270	Surcharging	6.49	Rootcut, flushed fats from main
11/07/2017	5A Marconi Pl	L1	168	Roots	3.24	
22/09/2018	5A Marconi Pl	L1	61	Fat	0	
27/09/2016	32 Fearon Ave	L1	386	Unknown	0	Flushed main
8/07/2017	32 Fearon Ave	L1	182	Unknown	8.65	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
5/03/2019	32 Fearon Ave	L1	118	Unknown	0	
18/05/2017	137 Whitney St	L1	101	Unknown	9.86	Heavy flushed
16/03/2018	137 Whitney St	L1	154	Roots	0	
27/04/2019	137 Whitney St	L1	100	Fat	0	
15/11/2018	1/30 Don Croot St	L1	115	Roots	0	Rootcut
21/04/2019	1/30 Don Croot St	L1	126	Roots	0	
4/02/2019	10 Bright St	L1	86	Broken pipe	0	Pipe repaired from root infiltration
7/03/2019	10 Bright St	L1	216	Roots	6	
8/04/2019	100 Marsden Ave	L1	113	Roots	0	Flushed main Toys removed from main
16/04/2019	100 Marsden Ave	L1	81	Foreign Object	0	
20/09/2018	103 Whitney St	L1	80	Foreign Object	0	Pipe and hose removed from construction site Drain coil removed from manhole
8/11/2018	103 Whitney St	L1	98	Rubbish	0	
6/12/2018	103 Whitney St	L1	144	Foreign Object	7	
31/05/2019	103 Whitney St	L1	91	Foreign Object	25.5	
10/03/2019	11 Ted William St	L1	121	Fat	0	Removed fats from main
17/03/2019	11 Ted William St	L1	85	Unknown	0	
3/10/2018	11 Water St	L1	596	Foreign Object	0	Concrete chunk and baby wipes removed from main
28/05/2019	11 Water St	L1	764	Rags	4.5	
9/07/2018	1343A Dominion Rd-X	L1	66	Fat	4.5	Flushed fat and roots Rootcut
27/04/2019	1343A Dominion Rd-X	L1	1329	Roots	0	
3/02/2019	14A Marion Ave	L1	58	Unknown	0	Heavy debris flushed from main
19/06/2019	14A Marion Ave	L1	106	Rubbish	0	
8/12/2018	167 Carrington Rd	L1	324	Roots	0	Unblocked min
8/02/2019	167 Carrington Rd	L1	215	Unknown	0	
29/11/2018	17 Dundale Ave	L1	105	Roots	0	Continue to monitor
24/12/2018	17 Dundale Ave	L1	106	Surcharging	69	
29/12/2018	171 Hendon Ave	L1	102	Unknown	0	Blockage removed
2/03/2019	171 Hendon Ave	L1	155	Unknown	0	
20/05/2019	184 St Andrews Rd	L1	107	Roots	0	Fats and roots removed, heavy flush and rootcut
26/05/2019	184 St Andrews Rd	L1	164	Fat	0	
19/08/2018	19 Dundale Ave	L1	282	Fat	0	Heavy flushed main

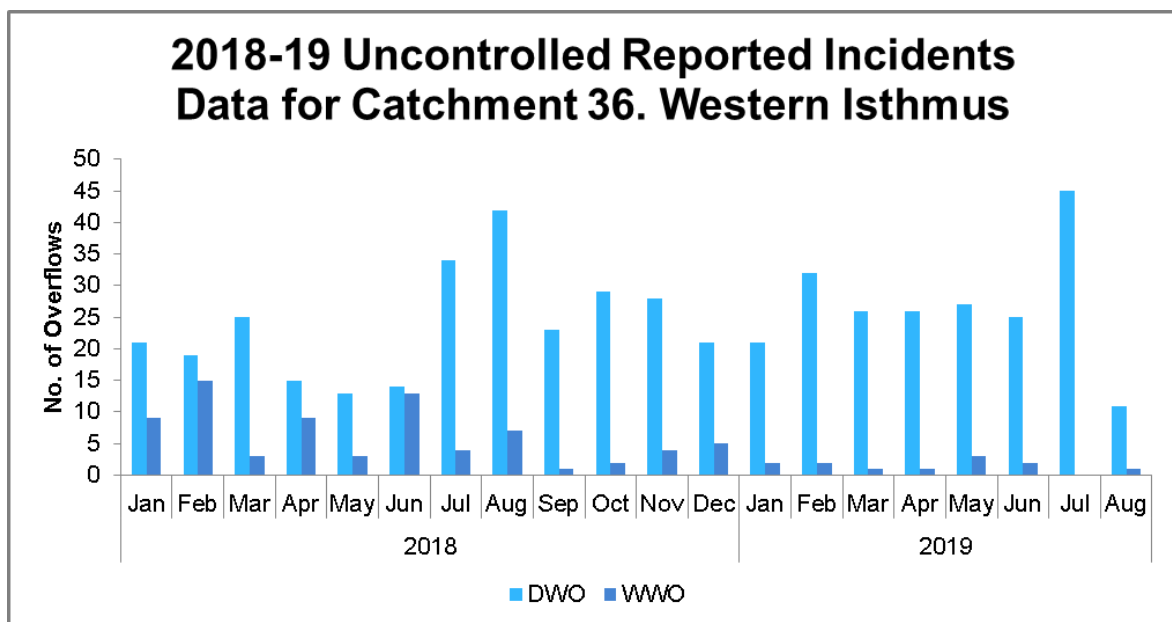
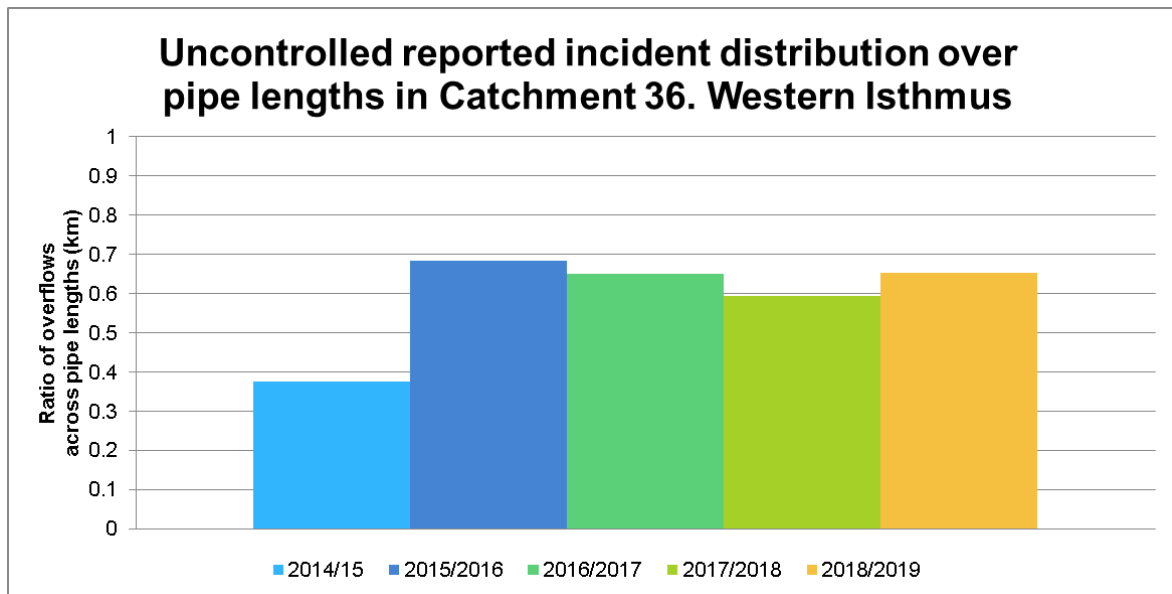
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
4/04/2019	19 Dundale Ave	L1	131	Unknown	0	
20/08/2018	19 Eldon Rd	L1	286	Broken pipe	3.5	Collapsed pipe repaired Tomo repaired
19/11/2018	19 Eldon Rd	L1	92	Broken pipe	1.5	
30/08/2018	194A Stoddard Rd	L1	187	Fat	0.5	Heavy fats removed from line
20/09/2018	194A Stoddard Rd	L1	142	Fat	0	
10/08/2018	1A Balfron Ave	L1	182	Rags	0	Demolition works damaged main Lots of fat removed, CCTV, drain clean
26/11/2018	1A Balfron Ave	L1	81	Fat	6.5	
8/12/2018	1A Balfron Ave	L1	122	3rd party damage	0	
9/12/2018	1A Balfron Ave	L1	91	Fat	0	
23/02/2019	2 Robertson Rd	L1	167	Roots	3	Rootcut Paper removed
25/02/2019	2 Robertson Rd	L1	116	Rubbish	0	
24/08/2018	2 Wexford Rd	L1	229	Rags	2.5	Flushed main
30/08/2018	2 Wexford Rd	L1	177	Silts	0.5	
11/11/2018	2/44 Leslie Ave	L1	245	3rd party damage	7.5	Collapsed manhole under repair
3/01/2019	2/44 Leslie Ave	L1	171	Broken pipe	0	
22/07/2018	2157B Great North Rd	L1	116	Fat	7.5	Jetted main
10/05/2019	2157B Great North Rd	L1	89	Rubbish	4.5	
25/07/2018	2163 Great North Rd	L1	88	Silts	1.5	Flushed main
24/04/2019	2163 Great North Rd	L1	91	Rubbish	0	
15/11/2018	2165 Great North Rd	L1	86	Rubbish	0	
16/10/2018	22 Pinewood St	L1	691	Broken Pipe	0	Lampye repaired
19/10/2018	22 Pinewood St	L1	553	Broken pipe	0	
31/10/2018	24 Whitmore Rd	L1	119	Unknown	0	Fat removed from main
27/03/2019	24 Whitmore Rd	L1	26	Fat	0	
6/08/2018	251 Blockhouse Bay Rd	L1	169	Roots	0	Rootcut
9/08/2018	251 Blockhouse Bay Rd	L1	86	Fat	0	
4/07/2018	27 Sanft Ave	L1	157	Rubbish	2.5	Flushed main
25/07/2018	27 Sanft Ave	L1	111	Fat	1.5	
9/05/2019	2A Princes Ave	L1	1292	Unknown	0	Flushed S/L
4/06/2019	2A Princes Ave	L1	1351	Fat	0	
25/12/2018	38 Stoddard Rd	L1	112	Surcharging	11.5	Cleared fat blockage

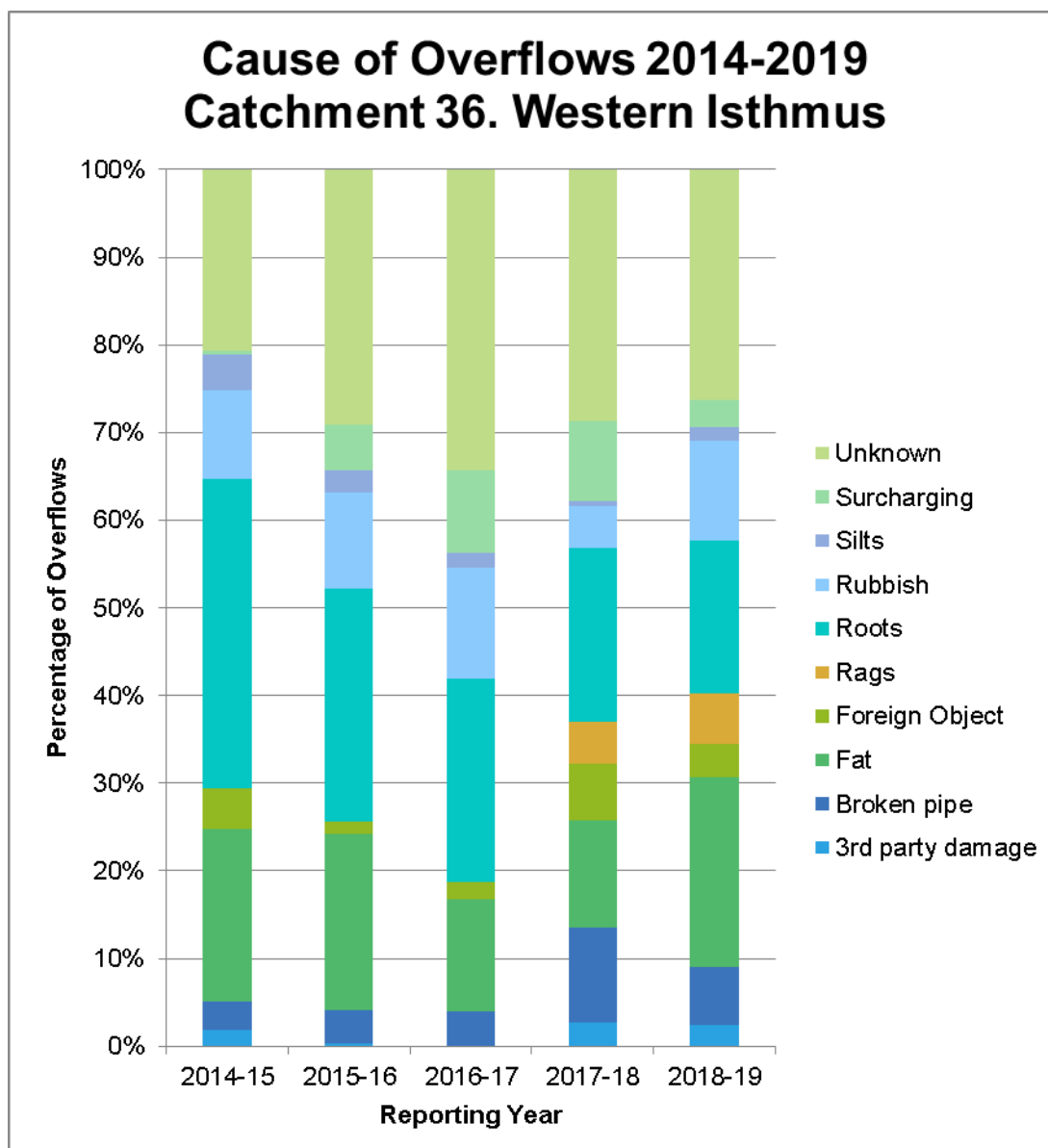
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
27/12/2018	38 Stoddard Rd	L1	131	Fat	0	
13/09/2018	41 Freeland Ave	L2	162	Unknown	0	Flushed main
7/11/2018	41 Freeland Ave	L1	123	Rubbish	0	
9/05/2019	41 Freeland Ave	L1	146	Fat	0	
9/08/2018	41 Paice Ave	L1	176	Roots	0	Flushed main Repaired poor dropper connection
17/08/2018	41 Paice Ave	L1	322	Broken pipe	12	
18/09/2018	43 Formby Ave	L1	100	Unknown	8.5	Blockage in junction repaired Service lead replaced
24/09/2018	43 Formby Ave	L1	271	Broken pipe	6.5	
26/07/2018	43 Wingate St	L1	235	Unknown	0.5	Continue to monitor
5/08/2018	43 Wingate St	L1	106	Rubbish	2	
15/09/2018	490 Richardson Rd	L1	66	Rags	0	Jettied main
1/02/2019	490 Richardson Rd	L1	858	Rags	2.5	
1/07/2018	5 Wrights Spur	L1	82	Unknown	7.5	Flushed roots and fat from main
15/02/2019	5 Wrights Spur	L1	196	Fat	0	
8/08/2018	52 Sanft Ave	L1	94	Broken pipe	8	Protruding lateral repaired Flushed main
9/09/2018	52 Sanft Ave	L1	139	Unknown	0	
25/10/2018	52 Sanft Ave	L1	145	Unknown	0	
4/12/2018	52 Sanft Ave	L1	85	Surcharging	7	
5/07/2018	54 Mt Eden Rd	L1	1106	Rubbish	0	Unblocked S/L
4/03/2019	54 Mt Eden Rd	L1	120	Unknown	0	
9/08/2018	54 Stoddard Rd	L3	257	Fat	0	Heavy fat Flushed main
13/08/2018	54 Stoddard Rd	L2	87	Fat	9	
16/08/2018	68 Tuarangi Rd	L1	81	Silts	0	Flushed main Hard fats removed
24/08/2018	68 Tuarangi Rd	L1	213	Rags	2.5	
30/08/2018	68 Tuarangi Rd	L1	138	Fat	0.5	
22/12/2018	69 Herdman St	L1	104	Unknown	0.5	Broken junction repaired
2/05/2019	69 Herdman St	L1	1220	Broken pipe	0	
26/05/2019	7 Currie Ave	L1	172	Fat	0	Heavy roots and fat, Heavy clean
17/06/2019	7 Currie Ave	L1	195	Fat	3	
19/06/2019	7 Currie Ave	L1	60	Roots	0	
22/01/2019	7 Kimber Hall Ave	L1	144	Roots	0	Flushed line Concrete in main removed
30/03/2019	7 Kimber Hall	L1	1330	3rd party	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
	Ave			damage		Customer unplugged bypass pump
31/03/2019	7 Kimber Hall Ave	L1	1342	3rd party damage	0	
31/01/2019	7 Marshall Laing Ave	L1	249	Unknown	0	Flushed line
26/06/2019	7 Marshall Laing Ave	L1	766	Unknown	0.5	
2/12/2018	74 Huia Rd	L1	114	Rags	0	Flushed S/L
10/05/2019	74 Huia Rd	L1	228	Unknown	4.5	
12/05/2019	74 Huia Rd	L1	163	Roots	15	
6/08/2018	740 Sandringham Rd-X	L1	110	Fat	0	Flushed main of heavy fats
7/08/2018	740 Sandringham Rd-X	L1	51	Unknown	0	
5/12/2018	8 Freeland Ave	L1	91	Surcharging	4	Flushed main
25/12/2018	8 Freeland Ave	L1	139	Unknown	11.5	
6/03/2019	81A Carrington Rd	L2	210	Unknown	0	Flushed syphon and sealed inspection point
8/04/2019	81A Carrington Rd	L1	155	Foreign Object	0	
26/07/2018	9 Partridge St	L1	73	Fat	0.5	Unblocked main
18/02/2019	9 Partridge St	L1	330	Fat	2.5	
28/03/2019	9 Partridge St	L1	459	Unknown	7	
10/04/2019	9 Partridge St	L1	278	Unknown	0	

2.33.4 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where root cause has been identified.

2.33.5 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPOLV	Oliver Road Wholesale Wastewater Pump Station	701	Rain event	510	52.5
24/12/2018	DPWNG	Wingate Street Wastewater Pump Station	1198	Rain event	90	69
24/12/2018	DPOLV	Oliver Road Wholesale Wastewater Pump Station	701	Rain event	125	69

2.33.6 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
152	Joan St WWPS	-	0	0	0	0	0	0	Continue to monitor
606	Connolly Avenue WWPS	-	0	0	0	0	0	0	Continue to monitor
608	Cowley Street WWPS	-	0	0	0	0	0	0	Continue to monitor
616	Waterbank Crescent WWPS	-	0	0	0	0	0	0	Continue to monitor
650	Walker Road 1 WWPS	-	0	0	0	0	0	0	Continue to monitor
700	Wainui Avenue Wholesale WWPS	-	0	0	5	0	0	1	Continue to monitor
701	Oliver Road Wholesale WWPS	-	13	13	11	4	2	8.6	Oliver St Catchment Diversion Project completed in 2018
702	Harbour View Road Wholesale WWPS	-	0	0	0	0	0	0	Continue to monitor
703	Wright Road Wholesale WWPS	-	0	0	0	0	0	0	Continue to monitor
1197	Great North Road WWPS	-	0	0	0	0	0	0	Continue to monitor
1198	Wingate Street WWPS	-	0	1	1	0	1	0.6	Continue to monitor

Type 2 EOPs – Network Relief points rolling WWO data from 1 July 2014 – 30 June 2019

The following Type 2 EOPs 725, 727 732 and 734 have permanent monitors installed. This information is provided as it is available, although it is noted for reference that very few Type 2 locations have monitors installed and this needs to be interpreted with reference to the wastewater network description in the AEE document. This is a combined catchment and the overflows are operating as designed. EOPs 725 and 732 have not had reliable data throughout the year and are not included.

EOP ID	Facility Name	AEE Frequency (CI)	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
727	Branch 8 Mt Albert MH31 (Haverstock Road)	103	N/A	63	69	76	68	69	Central Interceptor Main Works
734	Edendale Branch Sewer MH 01 (Lyon Ave)	86	N/A	N/A	71	56	53	60	Central Interceptor Main Works

Type 3 location rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
S49	43 Dundale Ave	n/a	n/a	n/a	4	3	1	2.6	Western Isthmus Water Quality Improvement Programme

2.33.7 Inflow & Infiltration Programme

Parts of this catchment comprise of a combined drainage network, in these areas Inflow & infiltration (I&I) is currently not being considered and other programmes of works are being investigated to address the wet weather overflows such as separation investigation projects. In the separated areas I&I will be considered as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

2.33.8 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Central Interceptor – main works and link sewers	Project Execution	This project, as well as addressing numerous wet weather overflows, will also address the risk of failure of the Manukau siphon, and also provide for urban growth. To address growth, level of service, and asset condition risks	The Central Interceptor will have multiple and widespread benefits through immediate improvements in wet weather overflow frequency and enabling upgrades for growth and level of service upgrades	2017-2025

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
				through the isthmus	
Complete	Oliver St WWPS catchment diversion	Closure	The Oliver St WWPS is undersized for the current contributing catchment, resulting in frequency wet weather overflows	Reduction in overflows from EOP 701	2015-2018
Underway	Western Isthmus Water Quality Improvement Programme - Waterview North and South separation	Design / Option analysis (Feasibility) /	To address wet weather overflows in the partially combined areas. Post separation works wastewater network may require additional wastewater upgrades to ensure level of service outcomes are met	Is expected to reduce high overflow frequencies at EOPs 559, 561, 562, 566, 568, 568	2015-2022
Underway	Oakley Wastewater Model Build and Calibration	Studies and investigations	To be able to identify the preferred works programme to meet target wet weather overflow frequencies and accommodate growth in the catchment.	To identify performance issues and develop network solutions to reduce overflows throughout the catchment and provide for urban growth	2015-2019
Underway	Meola Reef Wastewater Model Build and Calibration	Studies and investigations	To be able to identify the preferred works programme to meet target wet weather overflow frequencies and accommodate growth in the catchment.	To identify performance issues and develop network solutions to reduce overflows throughout the catchment and provide for urban growth	2017-2020

Underway	Grey Lynn Wastewater Tunnel Part of Central Interceptor Project	Project Execution	A new 4.5m (initial estimate only) diameter tunnel 1.6km long	Increased capacity and reduction in wet weather overflows at EOPs 244 and 246, and to facilitate future catchment improvements	On-going
Underway	Meola Wastewater Catchment Improvements	Studies and investigations	Programme of work to enable growth and reduce wet weather overflows	Reduction of wet weather overflows	2022-2025

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
	Part of Western Ishtmus Programme of Works				
Underway	Avondale/Whau Wastewater Catchment Improvements Part of Western Ishtmus Programme of Works	Studies and investigations	Programme of work to enable growth and reduce wet weather overflows	Reduction of wet weather overflows	2018-2022
Underway	Oakley Wastewater Catchment Improvements Part of Western Ishtmus Programme of Works	Studies and investigations	Programme of work to enable growth and reduce wet weather overflows	Reduction of wet weather overflows	2020-2023
Underway	Point Chevalier Catchment Improvements Part of Western Ishtmus Programme of Works	Studies and investigations	Programme of work to enable growth and reduce wet weather overflows	Reduction of wet weather overflows	2022-2025

Minor improvements works include:

- Mewburn uncontrolled overflow remediation: There is a known Type 3 location (not previously identified as it is within the Western Isthmus (Central Interceptor) catchment. It is proposed to improve the manhole hydraulics to reduce the risk of uncontrolled discharges.
- Waterview Glade EOP reconstruction: This project is required due to transport works, and will marginally improve the wet weather performance at EOP 563, and reduce the likelihood of asset failure and risk of Dry Weather Overflows.
- Installation of screens: EOPs 572, 568, 566, and 342 will have screens installed to mitigate the visual and amenity impacts of highly frequent overflows as planned works.
- Releasing throttles: the continuation pipe at EOP 409 has been upgraded to allow greater flows to be passed forward prior to a spill, resulting in a predicted decrease in overflow frequency from > 52 times per year to less than 2, and a reduced risk of dry weather overflows related to blockages.

2.33.9 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2018 and 30 June 2019.

2.33.10 Summary

Roots and fat were the main contributors to uncontrolled overflows. This catchment is primarily combined, and the network wet weather controlled and uncontrolled overflows will be addressed in the long term under the Central Interceptor project and the suite of improvement works identified under the Western Isthmus Water Quality Improvement Programme and related initiatives. The network has been slightly extended and will continue to be monitored and responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

2.34 Strategic Management Area 10: Oneroa

2.34.1 Overview

Waiheke Island is located in the Hauraki Gulf approximately 17 km east of the Auckland CBD. At 9,324 ha in size, Waiheke is the second largest island in the Hauraki Gulf. It is 26 km long and 19 km across at its widest point, and has rolling hills that reach 230 m in height.

The island is the most populated of the Hauraki Gulf Islands, with approximately 8,000 permanent residents and 3,400 temporary residents (e.g. holiday home owners), although the population swells to over 25,000 people in the summer holiday season. Only a small proportion of the island is currently serviced, with a connected population of only 38, with the rest of the connections being non-residential.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	36	36	36	36	38
Length of sewer (km)	3	3	3	3	3

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
657	Oneroa WWPS	DPONR	1	Oneroa Beach

There have been no changes to the schedule of EOPs in the Oneroa SMA.

2.34.2 Dry Weather Overflows (DWOs)

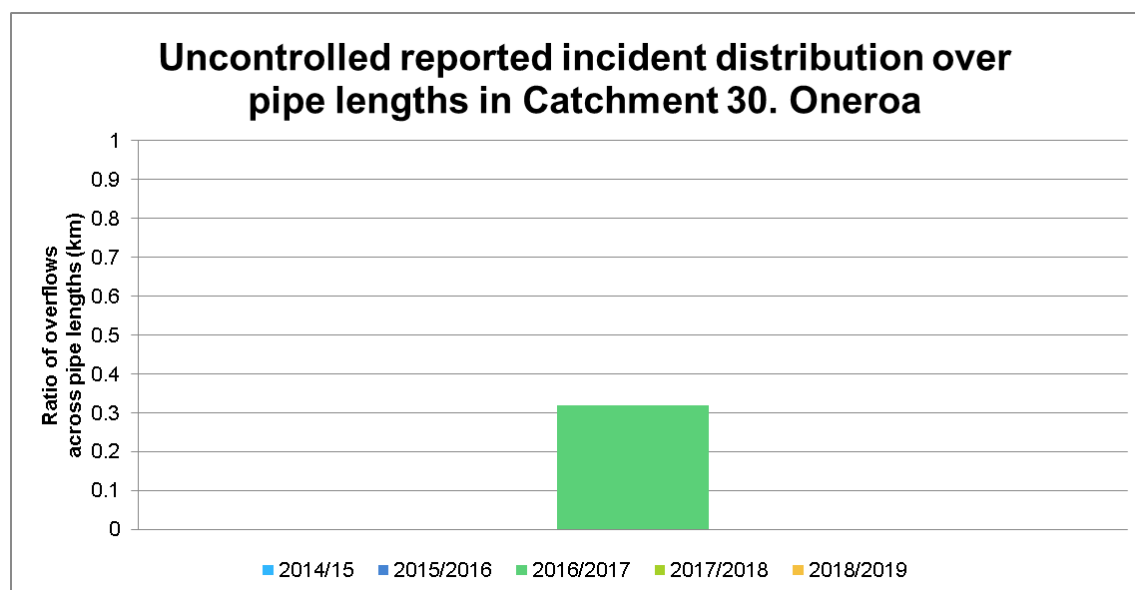
Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported incidents

There were 0 reported incidents in the Oneroa catchment.

2.34.3 Trend analysis of reported incidents



2.34.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

There were no wet weather overflows at pump stations between 1 July 2018 and 30 June 2019.

2.34.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
657	Oneroa Waiheke WWPS	1.2	0	0	5	0	0	1.25	Pumps replaced

2.34.6 Inflow & Infiltration Programme

I&I investigations began in 2017 to investigate high wet flows arriving at the wastewater treatment plant. This included smoke testing and private property drainage inspections. In 2018 the network was flushed and CCTV'd with identified public network issues being fixed. Further I&I reduction works are planned for 2020, including a desktop review of as-built drainage plans and confirmation through field inspection.

2.34.7 Improvement Works Programme

No significant improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.34.8 Erosion Control Measures

No works related to erosion control were carried out in this SMA between 1 July 2018 and 30 June 2019.

2.34.9 Summary

The network in this SMA is extremely small, and the pump station does not discharge more frequently than two times per year on average. I&I investigation works are on-going. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur, with proposals for growth and development in Waiheke being monitored. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.35 Strategic Management Area 11: Beachlands-Maraetai

2.35.1 Overview

The Beachlands-Maraetai catchment includes two seaside suburbs located about 23 km east of central Auckland. The serviced population living in the Beachlands-Maraetai area was estimated to be around 7,000 in 2013 (Census, 2013), with 2,969 wastewater connections. The total land area within the catchment is approximately 530 ha. Land use within the catchment is predominantly residential. Beachlands has marina facilities at Pine Harbour Marina, and Maraetai has a small boat ramp and breakwater.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	2,440	2,562	2,750	2,863	2,969
Length of sewer (km)	70	73	78	89	92

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1016	Hawke Crescent WWPS	DPHAW	1	Sunkist Bay (via stormwater pipe)
1017	Omana Esplanade WWPS	DPOMA	1	Omana Beach (via stormwater pipe)
1079	Maraetai Domain WWPS	DPMTI	1	Unnamed stream flowing to Maraetai Beach
1080	Te Pene WWPS	DTPPN	1	To Land
1081	Te Puru WWPS	DPTPP	1	Unnamed stream flowing to Kelly's Beach (south)
1083	Third View WWPS	DPTVW	1	Unnamed stream flowing to Kelly's Beach (north) (via stormwater pipe)
1084	Karaka Road WWPS	DPKKA	1	Unnamed stream flowing to Pine Harbour Marina (south)
1085	Sunkist Bay Reserve WWPS	DPSKB	1	Sunkist Bay Beach
1086	Toomer Place WWPS	DPTOO	1	Unnamed stream flowing to Pine Harbour Marina (north)
1087	Pine Harbour Marina WWPS	DPPHM	1	Unnamed stream flowing to Pine Harbour Marina (south)
1542	New Avenues WWPS	DPNAV	1	Unnamed stream flowing to Pine Harbour Marina Beach (south)

There have been no changes to the schedule of EOPs in the Beachlands-Maraetai SMA.

2.35.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 16 reported incidents in the Beachlands-Maraetai catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

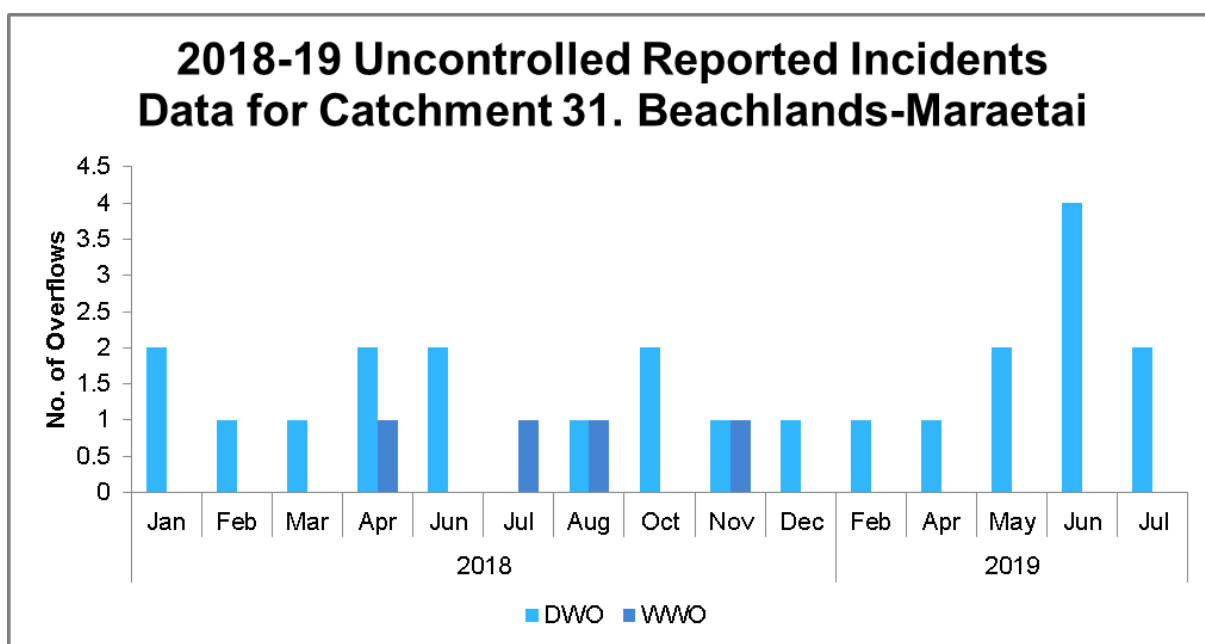
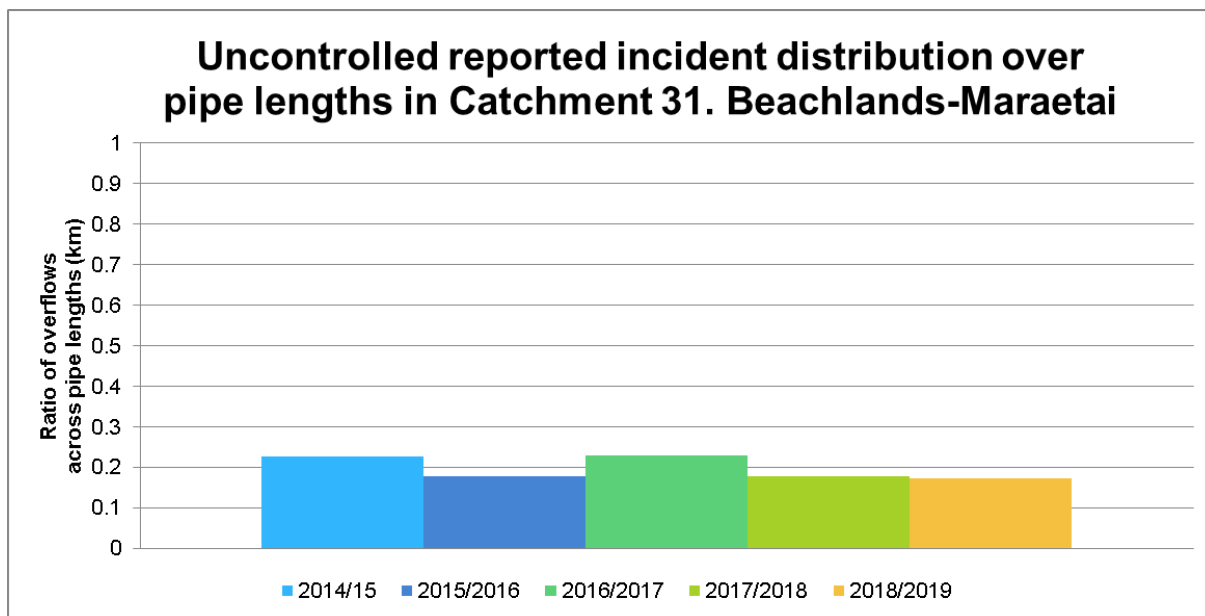
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

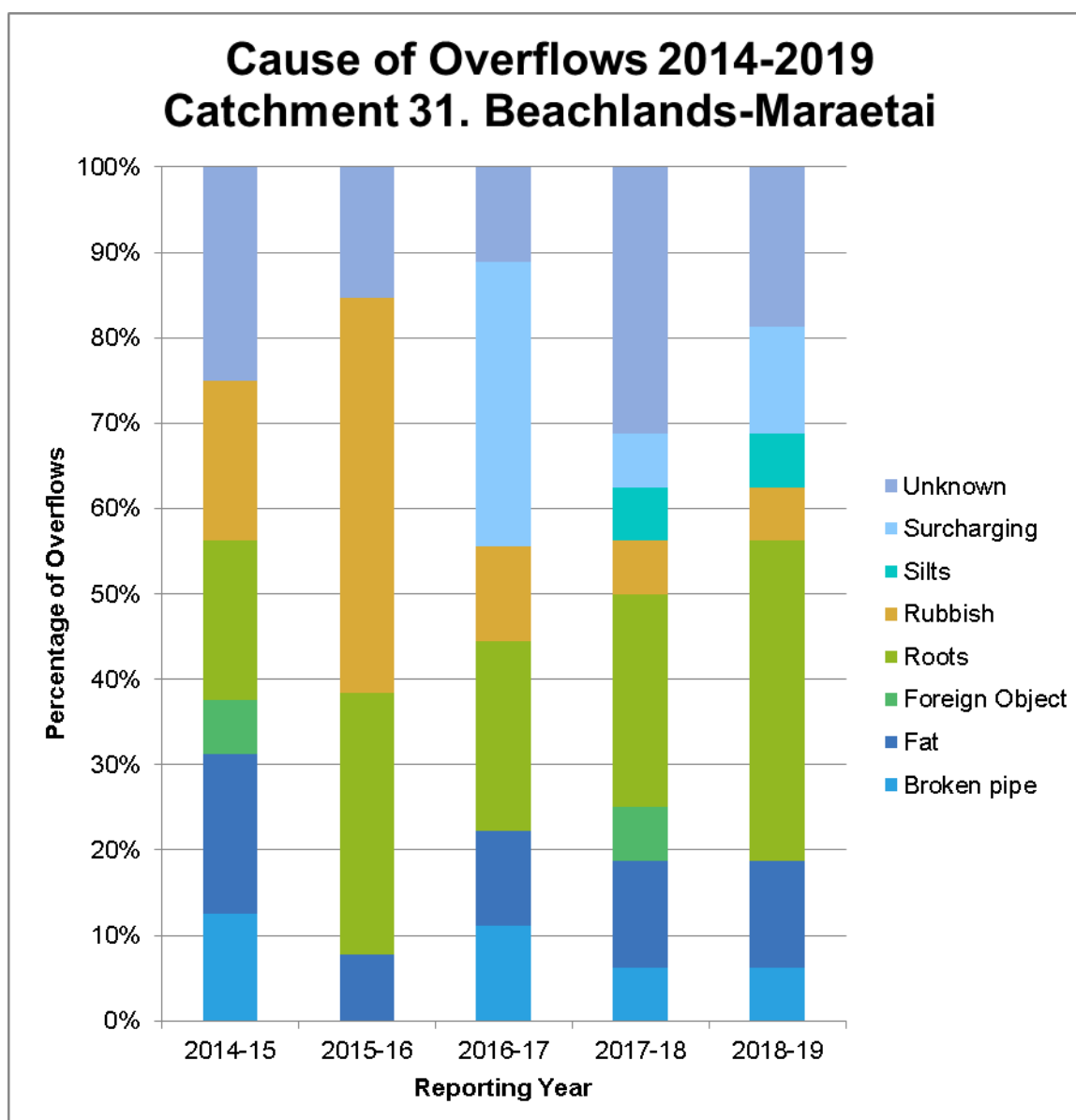
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
17/07/2017	76 Maraetai Dr	L1	204	Unknown	0	CCTV, rootcut, flushed main
4/04/2018	76 Maraetai Dr	L1	117	Unknown	3	
15/10/2018	76 Maraetai Dr	L1	273	Roots	0	
4/06/2019	76 Maraetai Dr	L1	6	Roots	0	
29/06/2019	119B Maraetai Dr	L1	317	Unknown	0	Unknown obstruction removed, flushed Service Lead
30/06/2019	119B Maraetai Dr	L1	363	Unknown	0	
28/01/2018	8 Sunkist Bay Rd	L1	500	Broken pipe	0	Broken dropper repaired Large grease blockage removed
19/02/2018	8 Sunkist Bay Rd	L1	149	Unknown	0	
9/11/2018	8 Sunkist Bay Rd	L1	111	Rubbish	2.5	
19/05/2019	8 Sunkist Bay Rd	L1	126	Fat	1.5	

2.35.4 Trend analysis of reported incidents

The graphs overleaf reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.35.5 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
15/07/2018	DPMTI	Maraetai Domain Wastewater Pump Station	1079	Rain event	294	84
15/07/2018	DPTVW	Third Avenue Wastewater Pump Station	1083	Rain event	808	84
16/07/2018	DPTVW	Third Avenue Wastewater Pump Station	1083	Rain event	725	0
29/08/2018	DPTVW	Third Avenue Wastewater Pump Station	1083	Rain event	442	48
12/10/2018	DPMTI	Maraetai Domain Wastewater Pump Station	1079	Rain event	63	6.5
24/12/2018	DPMTI	Maraetai Domain Wastewater Pump Station	1079	Rain event	830	47
24/12/2018	DPTVW	Third Avenue Wastewater Pump Station	1083	Rain event	420	47

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
26/12/2018	DPOMA	Omana Esplanade Wastewater Pump Station	1017	Rain event	38	0.5
1/04/2019	DPMTI	Maraetai Domain Wastewater Pump Station	1079	Rain event	148	25

2.35.6 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1016	Hawke Crescent WWPS	1.2	1	0	2	1	0	1	Continue to monitor
1017	Omana Esplanade WWPS	1.2	0	0	2	1	1	0.8	Continue to monitor
1079	Maraetai Domain WWPS	0	0	0	5	7	4	3.2	Pump replaced
1080	Te Pene WWPS	0.4	0	0	0	0	0	0	Continue to monitor
1081	Te Puru Park WWPS	1	0	0	0	0	0	0	Continue to monitor
1082	Te Puru WWPS	1.8	0	0	0	0	0	0	Previously completed upgrade
1083	Third view WWPS	0	1	0	2	1	4	1.6	Continue to monitor
1084	Karaka Road WWPS	0.6	0	0	1	0	0	0.25	Continue to monitor
1085	Sunkist Bay Reserve WWPS	1.2	1	0	2	1	0	1	Continue to monitor
1086	Toomer Place WWPS	1.4	0	0	4	1	0	1.25	Continue to monitor
1087	Pine Harbour Marina WWPS	0	0	0	2	0	0	0.5	Continue to monitor
1542	New Avenues WWPS	0	0	0	0	0	0	0	Continue to monitor

2.35.7 Inflow & Infiltration Programme

Reactive inflow investigations began in late 2018 within the wastewater network to investigate high flows arriving at the treatment plant. Salinity testing was carried out at the pump stations and identified high salinity levels at some pump stations. This led to a targeted CCTV investigation which identified issues in the public wastewater network (broken pipes along Maraetai Road allowing tidal water ingress); these pipes have now been fixed.

Further I&I reduction works are planned in 2020 following a review of I&I in the remainder of this catchment which will be done as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

2.35.8 Improvement Works Programme

No significant improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019. The Okaroro Drive Rising Main is currently being monitored for surges in pressure as a cause of overflows in recent years.

2.35.9 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.35.10 Summary

The Maraetai Domain WWPS was affected by storm events and king tides in 2018, and discharged more than two times on average in this reporting period. The treatment plant experienced higher than usual flows and reactive I&I investigations found issues within the network of tidal ingress. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes.

There has been significant growth in the Beachlands-Maraetai catchment, with the New Avenues WWPS being constructed to service new development. There are no significant issues with the performance of the network over the period covered by this report. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.36 Strategic Management Area 12: Clarks Beach

2.36.1 Overview

Clarks Beach is a small coastal village located on the south-western shore of the Manukau Harbour between the Waiuku River and Clarks Creek. The Clarks Beach wastewater network services the townships of Waiau Beach, Glenbrook and Clarks Beach. Land use includes residential properties along with the Clarks Beach Golf Club, Clarks Beach Camping Ground and surrounding rural activities. There are 705 wastewater connections.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	696	699	701	703	705
Length of sewer (km)	15	15	16	16	16

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1034	Yacht Club WWPS	DPYAC	1	Waiuku Estuary
1035	Wilsons Access WWPS	DPWAS	1	Clarks Beach
1036	Stella Dr WWPS	DPSLA	1	To Land
1037	Halls Access WWPS	DPHLA	1	Clarks Beach
1040	Clarks Beach Oxidation Ponds WWPS	DPCBO	1	To Land
1041	Stevenson Rd WWPS	DPSTV	1	To Land
1042	Knights Walkway WWPS	DPKNI	1	Clarks Beach
1043	Hoskins Clarks Beach WWPS	DPHOS	1	Clarks Beach
1044	Crisp Rd WWPS	DPCRI	1	Clarks Beach
1045	Keven Rd WWPS	DPKEV	1	Waiau Beach
1046	Channel View Rd WWPS	DPCHV	1	Waiau Beach
1047	Glenbrook Beach St WWPS	DPGLB	1	Glenbrook Beach
1603	84 Torkar Rd	-	2	Clarks Beach

There have been no changes to the schedule of EOPs in the Clarks Beach SMA.

2.36.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 3 reported incidents in the Clarks Beach catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

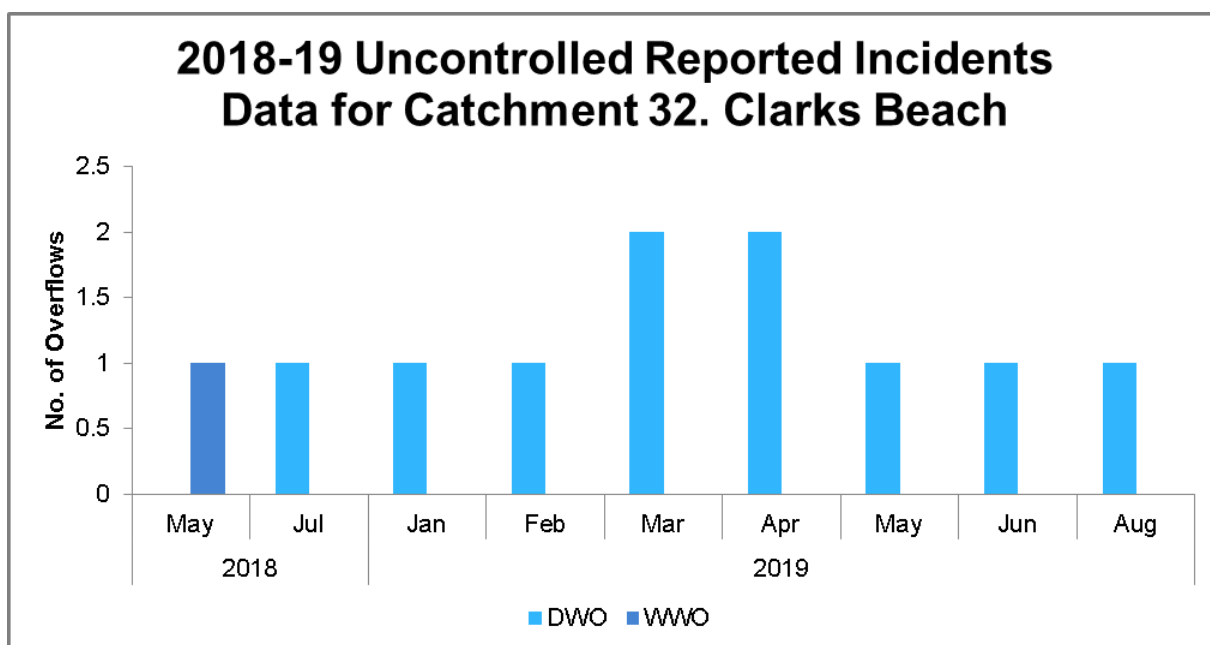
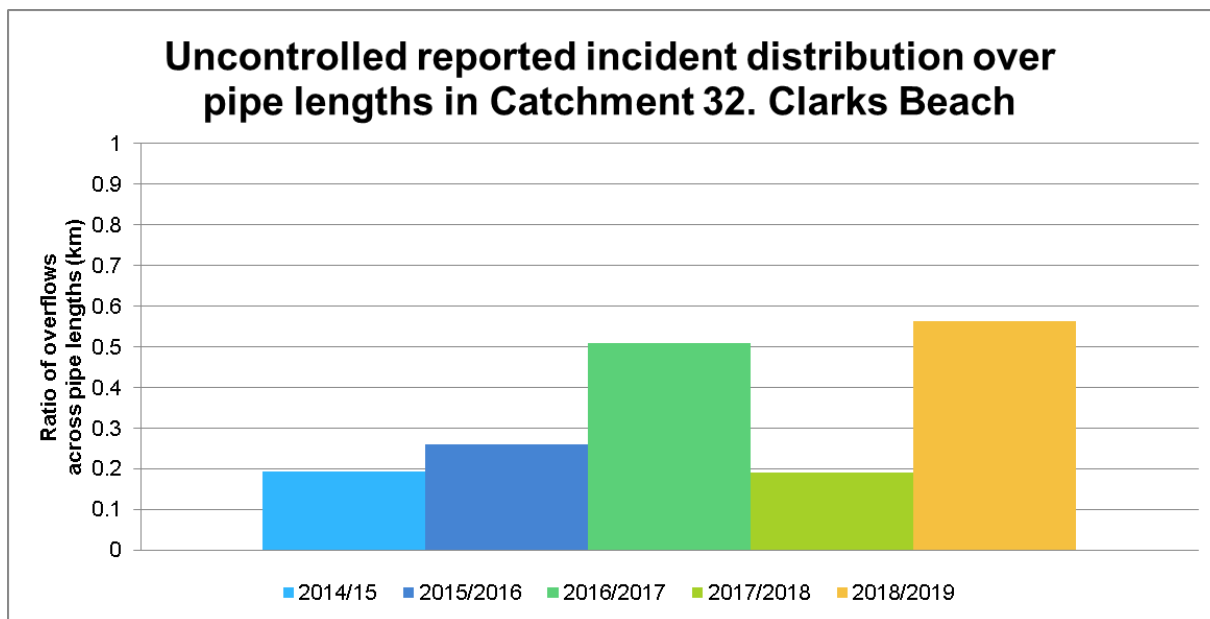
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

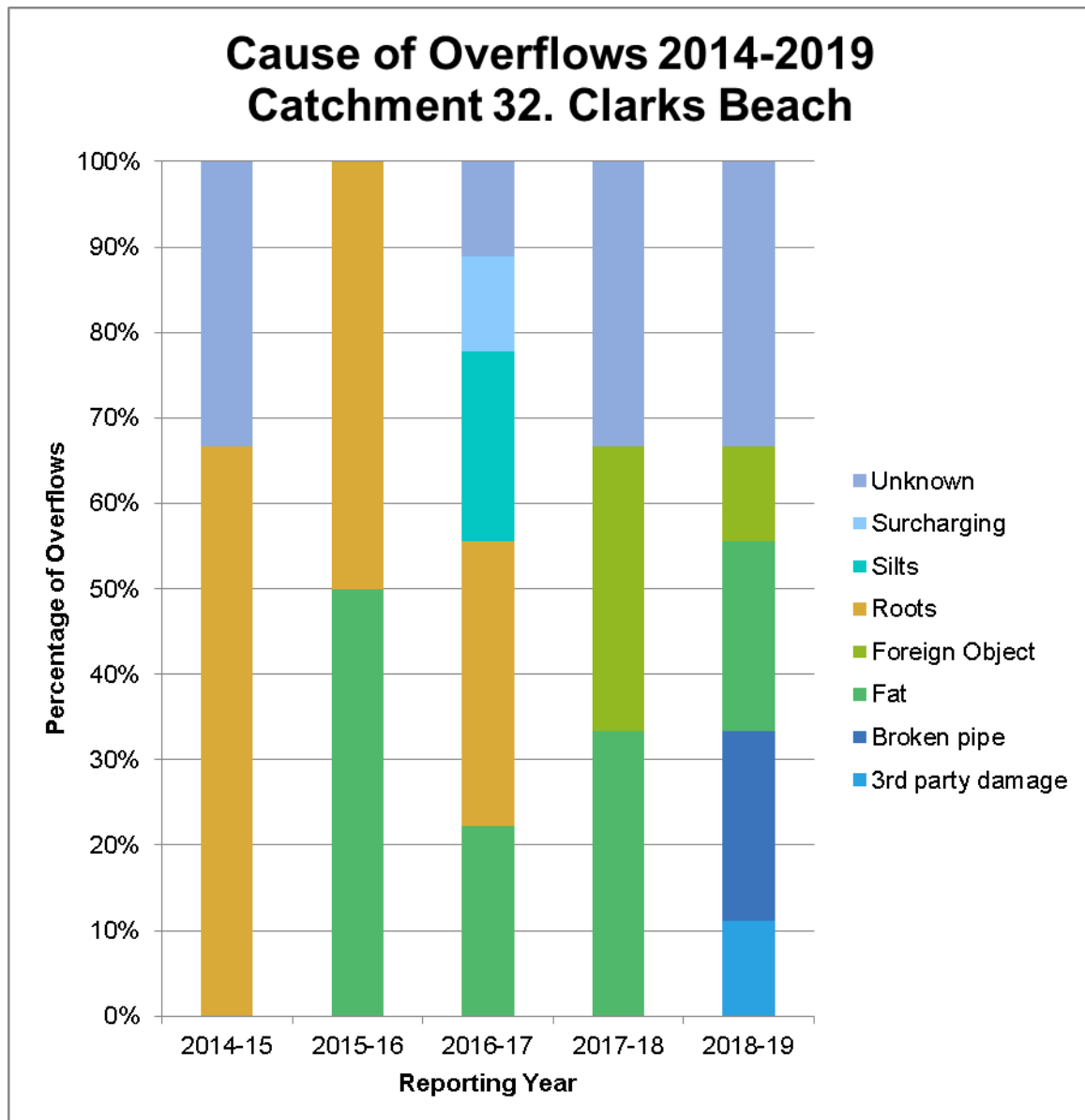
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
6/02/2019	A/14 Keven Rd	L1	56	Broken Pipe	0	Repaired dislodged pipe
5/03/2019	A/14 Keven Rd	L1	1146	3rd party damage	0	
23/04/2019	1 Cliff Lane	L1	236	Unknown	0	Stones removed from channeling
25/04/2019	1 Cliff Lane	L1	148	Foreign Object	0.5	

2.36.1 Trend analysis of reported incidents

The below overleaf reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





2.36.2 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

There were no wet weather overflows at pump stations between 1 July 2018 and 30 June 2019.

2.36.3 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1034	Yacht Club WWPS	0	0	0	1	0	0	0.2	Continue to monitor
1035	Wilsons Access WWPS	0	0	0	0	0	0	0	Continue to monitor
1036	Stella Dr WWPS	0	0	0	0	0	0	0	Continue to monitor
1037	Halls Access WWPS	0	0	0	0	0	0	0	Continue to monitor
1040	Clarks Beach Oxidation Ponds WWPS	0	0	0	0	0	0	0	Continue to monitor
1041	Stevenson Rd WWPS	0	0	0	0	0	0	0	Continue to monitor
1042	Knights Walkway WWPS	0	0	0	0	0	0	0	Continue to monitor
1043	Hoskins Clarks Beach WWPS	0	0	0	0	0	0	0	Continue to monitor
1044	Crisp Rd WWPS	0	0	0	0	0	0	0	Continue to monitor
1045	Keven Rd WWPS	0.6	0	0	0	0	0	0	Continue to monitor
1046	Channel View Rd WWPS	0	0	0	0	0	0	0	Continue to monitor
1047	Glenbrook Beach St WWPS	0.2	0	0	0	0	0	0	Continue to monitor

2.36.4 Inflow & Infiltration Programme

Revisited private property drainage inspection issue locations in late 2018 in Clarks Beach, Waiau Beach and Glenbrook Beach. Private property drainage issues were passed on to Auckland Council's Compliance Team. Further I&I investigations – CCTV are planned for 2020.

2.36.5 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on work completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Planned	South West Servicing Study	Studies and investigations	Significant population growth is expected to be enabled through the proposed South West servicing scheme	Forecast growth will be accommodated without deterioration in performance.	2019-2025

Clarks Beach is located within the South West Growth area, which Watercare has identified as requiring a strategic management approach. There is expected to be minimal impact upon the Clarks Beach wastewater network performance as a direct result of this project, although this will be confirmed following future stages of the servicing strategy; network capacity for growth will be managed in accordance with Watercare's policies and procedures.

Minor improvements works include:

- Pump drawdown testing throughout the catchment to confirm operational performance has been completed.
- Renewal of the Keven Road Pump station to reduce the risk of wet well failure resulting in dry weather overflows (planned works).

2.36.6 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.36.7 Summary

On-going I&I investigations were carried out in 2018/2019. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.37 Strategic Management Area 13: Waiuku

2.37.1 Overview

Waiuku Township is located at the southern end of the Waiuku Estuary, a tidal arm of the Manukau Harbour, and has a population of approximately 8,700 residents, with 3,105 wastewater connections. The remaining population is located outside of the reticulated wastewater network and is serviced by on-site wastewater disposal.

The Waiuku Catchment consists of approximately 420 ha of predominantly residential and rural land, with some light commercial land. There is one golf course, eight parks of significant size, and several schools.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	2,951	2,993	3,045	3,070	3,105
Length of sewer (km)	59	59	59	60	59

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1022	NZ Steel WWPS	DPNZS	1	Rangiwha Creek
1023	Bayview WWPS	DPBYV	1	Rangiwha Creek
1024	Lina Place WWPS	DPLNA	1	Rangiwha Creek Tributary
1025	Kowhai Place WWPS	DPKAI	1	Golf Course Creek
1026	King St WWPS	DPKNG	1	Waiuku Creek
1027	Fernleigh Ave WWPS	DPFGH	1	Waiuku Stream Tributary
1028	Kitchener Rd WWPS	DPKAO	1	Waiuku Stream
1029	Rangiwha Rd WWPS	DPRGW	1	Sandspit Beach
1030	Edgewater Parade WWPS	DPEDP	1	Waiuku Creek
1031	Owens Rd WWPS	DPOWE	1	Waiuku Creek
1032	Kendallvale Dr WWPS	DPKEN	1	Awaroa River Tributary
1033	Breaker Grove WWPS	DPBCR	1	To Land

There have been no changes to the schedule of EOPs in the SMA.

2.37.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported Incidents

There were a total of 21 reported incidents in the Waiuku catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

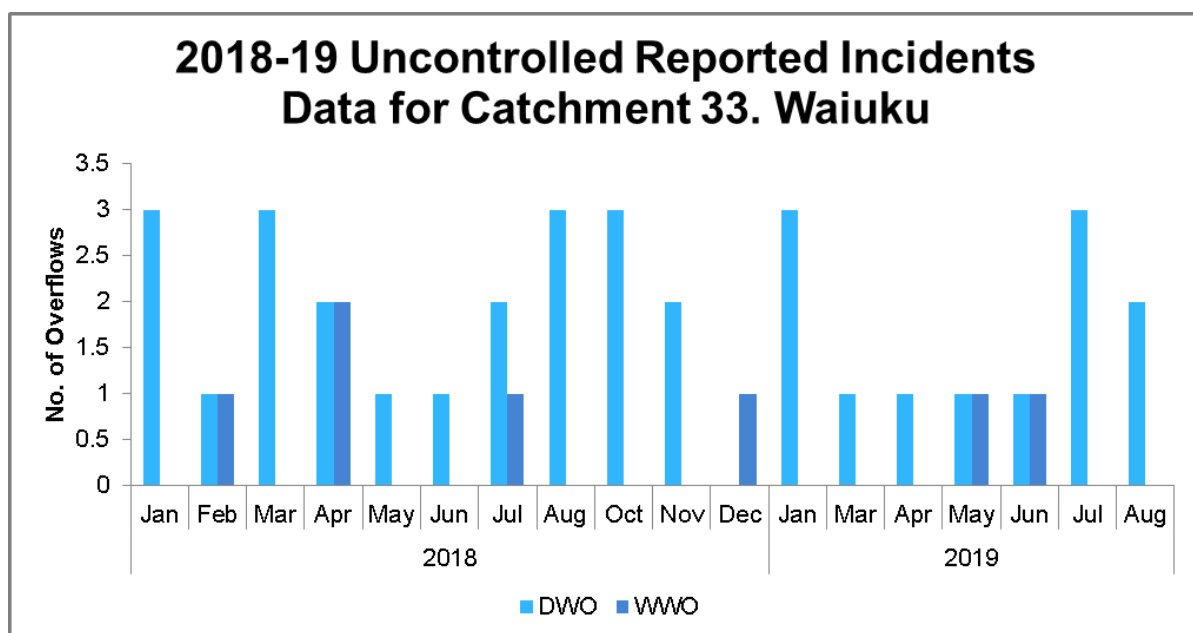
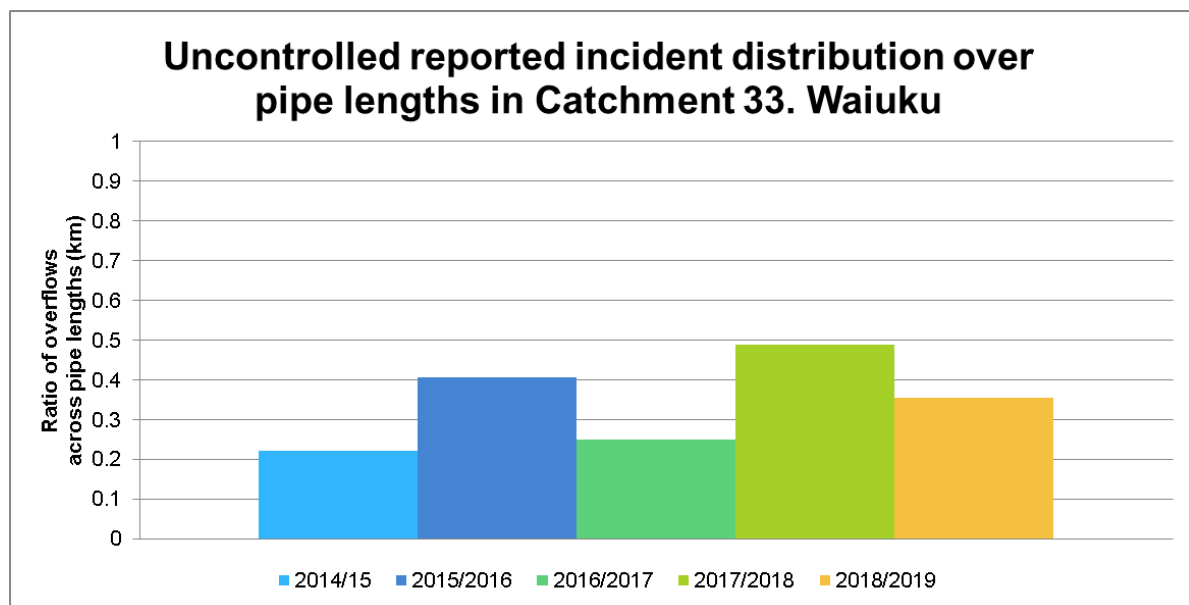
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

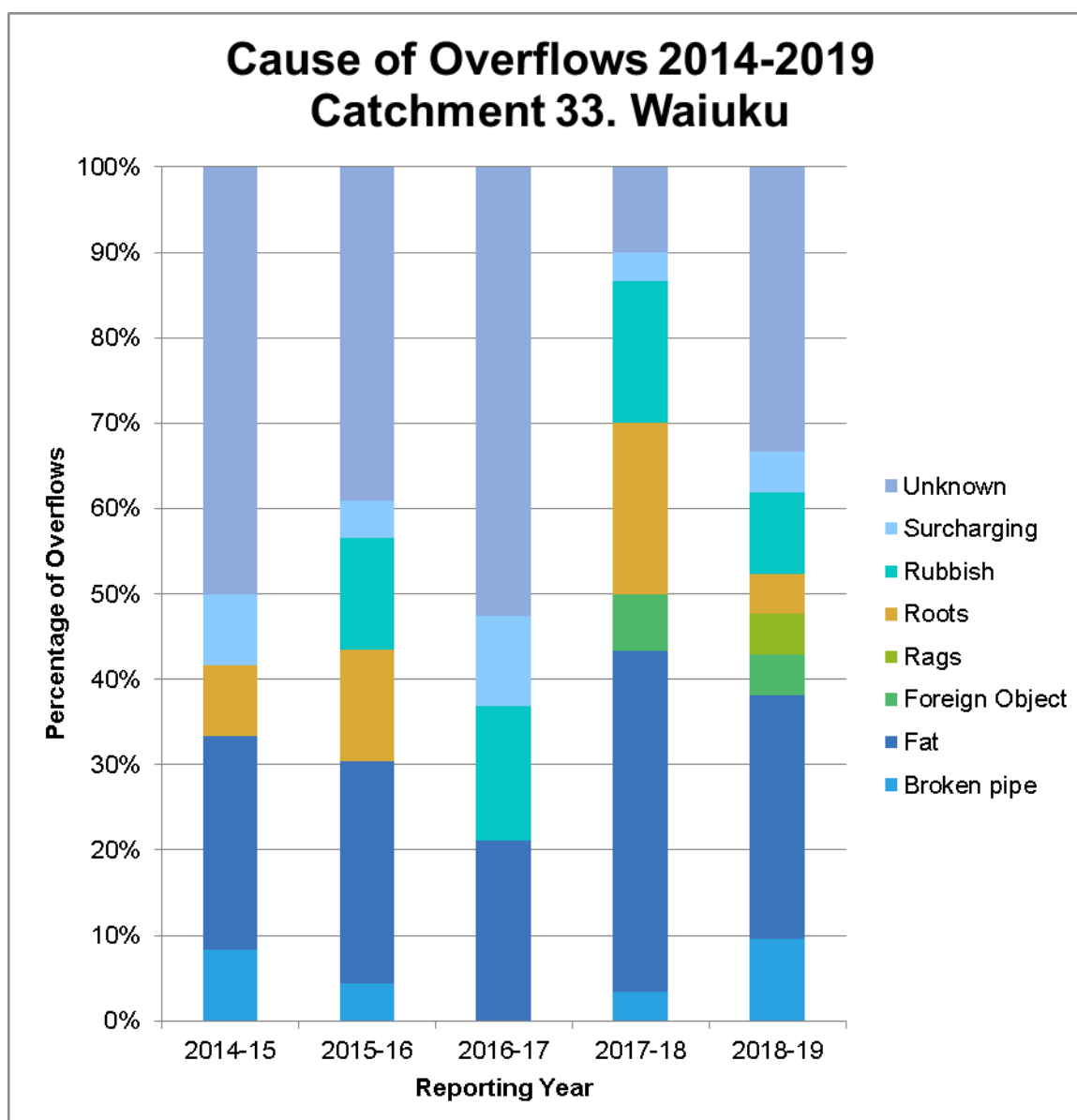
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
30/01/2017	2 Totara St	L1	352	Fat	0	Jetted main, cleared fat buildup
14/12/2017	2 Totara St	L1	48	Fat	10	
7/04/2019	2 Totara St	L1	168	Fat	0.5	
13/05/2017	106 Racecourse Rd	L1	106	Unknown	0	Cleared blockages
2/12/2017	106 Racecourse Rd	L1	535	Unknown	0	
26/10/2018	106 Racecourse Rd	L1	115	Rubbish	3.5	
3/11/2016	36 Victoria Ave	L1	513	Surcharging	1	Heavy flushed main, heavy fats removed from main
20/08/2017	36 Victoria Ave	L1	161	Fat	10	
10/08/2018	36 Victoria Ave	L1	126	Fat	0	
17/12/2017	22 Lina Pl	L1	560	Roots	0.5	Rootcut, flushed main
12/04/2018	22 Lina Pl	L1	461	Roots	7	
26/08/2018	22 Lina Pl	L1	169	Unknown	0	
19/07/2018	100 Queen St	L1	287	Fat	9	Jetted fat blockage
3/06/2019	100 Queen St	L1	147	Unknown	0	
22/05/2019	17 Collingwood Rd	L1	1110	Unknown	0.5	Jetted main Lateral repaired
31/05/2019	17 Collingwood Rd	L1	1398	Broken pipe	28	
3/10/2018	173 Colombo Rd	L1	157	Unknown	0.5	Heavy flush
10/01/2019	173 Colombo Rd	L1	272	Rubbish	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
12/01/2019	173 Colombo Rd	L1	1394	Foreign Object	0	
3/11/2018	35 Riverside Dr	L1	116	Fat	0.5	Blockage cleared
5/06/2019	35 Riverside Dr	L1	168	Unknown	15.5	

2.37.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.37.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
24/12/2018	DPFGH	Fernleigh Avenue Wastewater Pump Station	1027	Rain event	1570	55.5

2.37.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
1022	NZ Steel WWPS	0	1	0	2	0	0	0.6	Continue to monitor
1023	Bayview WWPS	0	0	0	0	0	0	0	Continue to monitor
1024	Lina Place WWPS	0	0	0	0	0	0	0	Continue to monitor
1025	Kowhai Place WWPS	0	0	0	0	0	0	0	Continue to monitor
1026	King St WWPS	0	0	0	0	0	0	0	Continue to monitor
1027	Fernleigh Ave WWPS	0	0	0	0	0	1	0	Continue to monitor
1028	Kitchener Rd WWPS	0	0	0	0	0	0	0	Continue to monitor
1029	Rangiwhea Rd WWPS	0	0	0	0	0	0	0	Continue to monitor
1030	Edgewater Parade WWPS	0	0	0	0	0	0	0	Continue to monitor
1031	Owens Rd WWPS	0	0	0	0	0	0	0	Continue to monitor
1032	Kendallvale Dr WWPS	0	0	0	0	0	0	0	Continue to monitor
1033	Breaker Grove WWPS	0	0	0	0	0	0	0	Continue to monitor

2.37.6 Inflow & Infiltration Programme

A review of I&I in this catchment will be done as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

2.37.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on work completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Planned	South West Servicing Study	Studies and investigations	Significant population growth is expected to be enabled through the proposed South West servicing scheme	Forecast growth will be accommodated without deterioration in performance.	2019-2025

Waiuku is located within the South West Growth area, which Watercare has identified as requiring a strategic management approach. There is expected to be minimal impact upon the Waiuku wastewater network performance as a direct result of this project; network

capacity for growth will be managed in accordance with Watercare's policies and procedures.

2.37.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.37.9 Summary

There were no EOPs which discharged more frequently than two spills per year on average in this reporting period. Trend analysis shows an increase in the density of overflows in this region with fat and rubbish being major factors. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been slightly extended and no significant changes have been made to the network as a whole. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

2.38 Strategic Management Area 14: Pukekohe

2.38.1 Overview

The Pukekohe catchment is situated at the southern edge of the Auckland Region, approximately 50 km south of central Auckland. The population of the catchment was approximately 20,700 in 2013 (Census, 2013), with 8,412 wastewater connections. The catchment is made up of the Pukekohe urban area, as well as the Patumahoe Township and Paerata Business Park to the north, and Buckland and Tuakau townships to the south.

	2014/15	2015/16	2016/17	2017/18	2018/19
No. of connections	7,772	7,929	8,153	8,262	8,412
Length of sewer (km)	152	153	168	164	167

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
825	Franklin Rd WWPS	DPFRA	1	Unnamed tributary of Whangapouri Creek (Franklin Rd)
1243	Fletchers WWPS	DPFRS	1	Stormwater pond (Fletcher Lane)
1244	Wecks WWPS	DPWEC	1	To Land
1245	Mareretu WWPS	DPMTU	1	To Land
1246	North east WWPS	DPNES	1	To Land
1247	Cape Hill Rd WWPS	DPCHR	1	Whangapouri Creek
1248	Lochview WWPS	DPLOC	1	Stormwater pond (Lochview Reserve)
1249	Isabella Dr WWPS	DPISA	1	To Land
1250	Dublin Rd WWPS	DPDUB	1	To Land
1251	Marble Wood WWPS	DPMRW	1	To Land
1252	Kauri Road WWPS	DPKRD	1	To Land
1253	Colin Lawrie 2 WWPS	DPCL2	1	Whangapouri Creek
1254	Anselmi Ridge WWPS	DPANS	1	Whangapouri Creek
1550	Pukekohe Raceway Pump Station	DPPKE	1	Unnamed tributary of Tutaenui Stream
1551	Buckland's Pump Station	DPBUK	1	Tutaenui Stream
1579	Pamela Christine WWPS	DPPAM	1	Stormwater Pond (Pamela Christine Rd)
1585	Rowles Rd Pump Station	DPROW	1	Stormwater pond (Wai Shing Place)
1587	Jutland Road Pump Station	DPJUT	1	Unnamed tributary of Whangapouri Creek (Adams Rd)

There have been no changes to the schedule of EOPs in the SMA.

2.38.2 Dry Weather Overflows (DWOs)

Type 1 – Pump station

There were no dry weather overflows at pump stations between 1 July 2018 and 30 June 2019.

Reported incidents

There were a total of 61 reported incidents in the Pukekohe catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

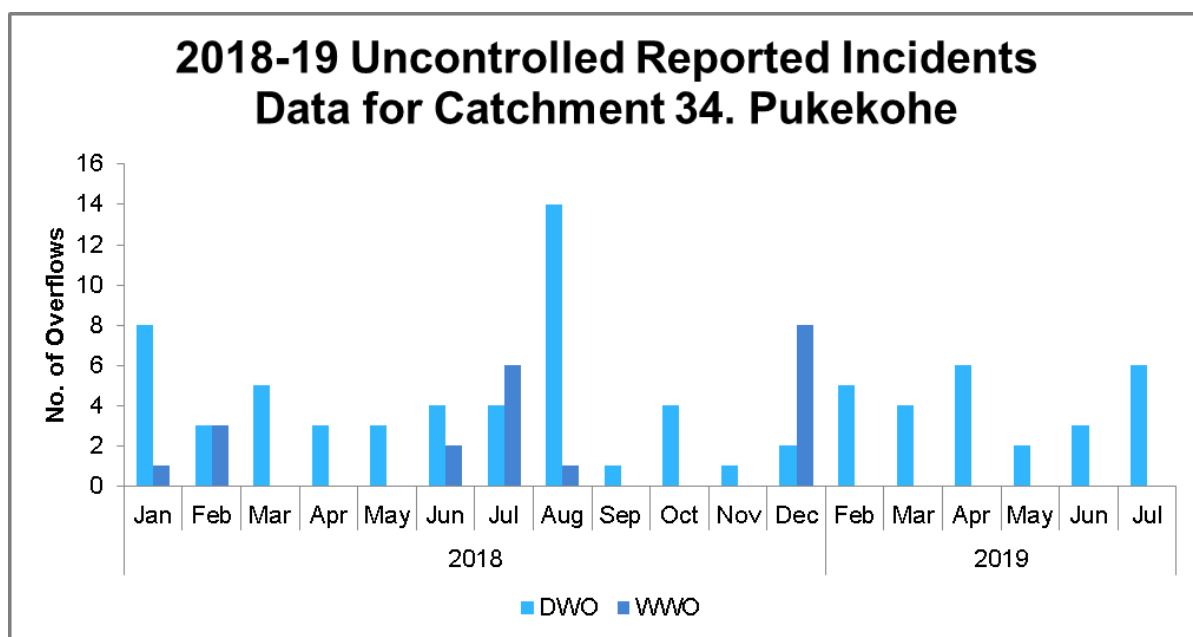
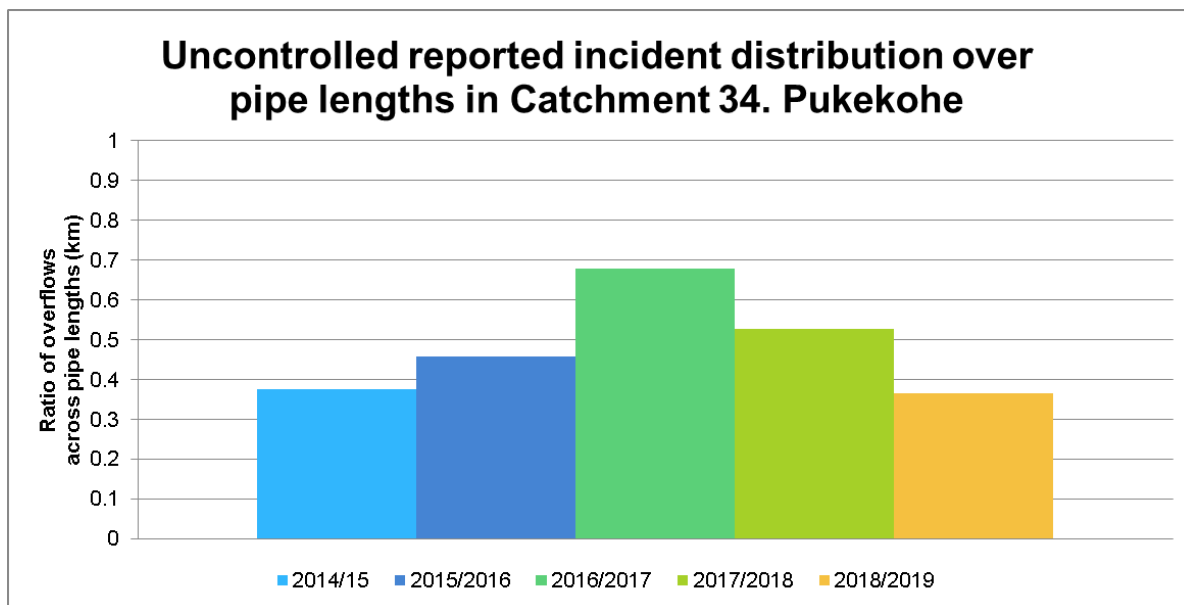
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

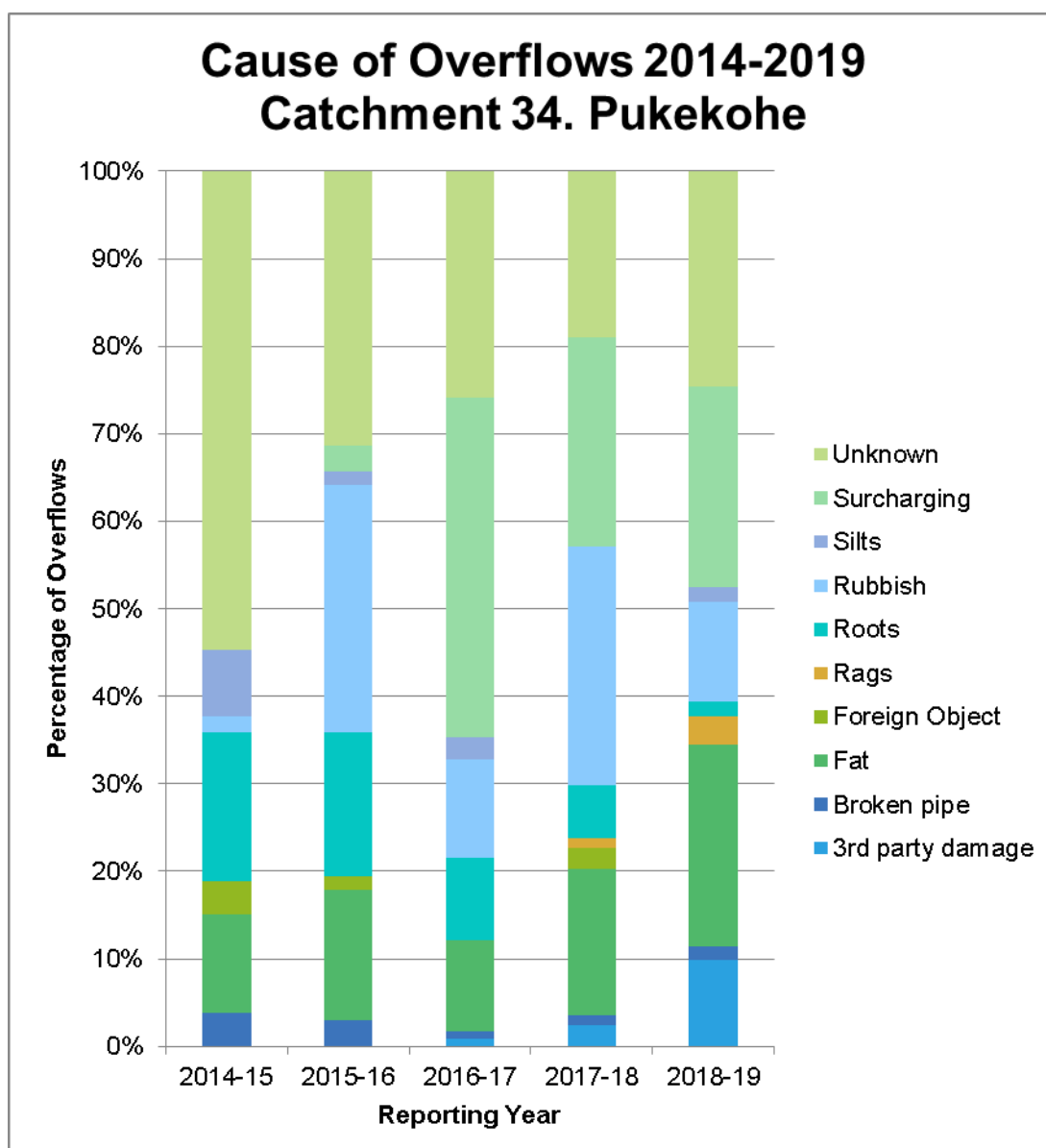
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
13/05/2018	9 Bale Way	L1	169	Unknown	10	Heavy fats and metal in main, heavy flushed
27/05/2018	9 Bale Way	L1	204	Unknown	10	
12/10/2018	9 Bale Way	L1	228	Unknown	9.5	
28/03/2019	9 Bale Way	L1	160	Fat	7.5	
9/11/2017	4 Frank Hewitt St	L1	125	Rubbish	0	Rag blockage removed Flushed fat and debris blockage
13/11/2017	4 Frank Hewitt St	L1	127	Rubbish	0	
11/02/2019	4 Frank Hewitt St	L1	82	Fat	0	
16/02/2019	4 Frank Hewitt St	L1	200	Fat	0	
2/10/2017	91 Seddon St	L1	125	Unknown	4.5	Root intrusion repaired
18/10/2017	91 Seddon St	L1	64	Unknown	0.5	
31/08/2018	91 Seddon St	L1	121	Unknown	1.5	Flushed main
1/08/2018	148 Kitchener Rd	L1	1033	3rd party damage	0	Thrusting damage repaired Jetted main
2/08/2018	148 Kitchener Rd	L1	181	3rd party damage	1	
10/08/2018	148 Kitchener Rd	L1	203	3rd party damage	0	
7/08/2018	154 Kitchener Rd	L1	206	3rd party damage	0	
19/08/2018	154 Kitchener Rd	L1	238	Unknown	0	
19/03/2019	19 Rainsford Rd	L1	219	Rubbish	0	CCTV, Heavy debris

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
25/03/2019	19 Rainsford Rd	L1	412	Rubbish	0.5	flushed from manhole
17/12/2018	2 Valleyside Way	L1	587	Surcharging	5	Continue to monitor
24/12/2018	2 Valleyside Way	L1	457	Surcharging	55.5	
26/12/2018	2 Valleyside Way	L1	260	Surcharging	0.5	
15/07/2018	21 Thomas Moore Pl	L1	396	Surcharging	66	Continue to monitor
24/12/2018	21 Thomas Moore Pl	L1	453	Surcharging	55.5	
15/07/2018	298 Upper Queen St	L1	98	3rd party damage	66	Vector thrust pipe, repaired
20/07/2018	298 Upper Queen St	L1	1348	Surcharging	0.5	
15/12/2018	66 Birdwood Rd	L1	373	Fat	6.5	Fats removed from main
26/12/2018	66 Birdwood Rd	L1	137	Surcharging	0.5	
25/08/2018	76 Kayes Rd	L1	391	Fat	2	Unblocked main
17/10/2018	76 Kayes Rd	L1	1351	Unknown	0.5	
10/06/2019	76 Kayes Rd	L1	173	Unknown	0.5	
18/08/2018	B/11 Laurelwood Ave	L1	588	Fat	1.5	Heavy flushed main
26/08/2018	B/11 Laurelwood Ave	L1	95	Roots	0	
5/07/2018	Harris St	L1	501	Rubbish	0	Dipped pipe, removed metal and debris, flushed 4 x assets
6/08/2018	Harris St	L1	497	Fat	0	

2.38.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.





Trend analysis has been carried out where the cause has been identified.

2.38.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
25/12/2018	DPCHR	Cape Hill Road Wastewater Pump Station	1247	Rain event	300	38.5

2.38.6 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2019

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	2018/19 WWOs	Rolling Avg	Improvement work (if applicable)
825	Franklin Rd WWPS	0.3	0	0	0	0	0	0	Continue to monitor
1243	Fletchers WWPS	0	0	0	0	0	0	0	Continue to monitor
1244	Wecks WWPS	0	0	0	3	0	0	0.6	Continue to monitor
1245	Mareretu WWPS	0	0	0	0	0	0	0	Continue to monitor
1246	North east WWPS	0	0	0	0	0	0	0	Continue to monitor
1247	Cape Hill Rd WWPS	1	0	0	0	0	1	0.2	Continue to monitor
1248	Lochview WWPS	0	0	0	0	0	0	0	Continue to monitor
1249	Isabella Dr WWPS	0.6	0	0	4	0	0	0.8	Continue to monitor
1250	Dublin Rd WWPS	0	0	0	0	0	0	0	Continue to monitor
1251	Marble Wood WWPS	0	0	0	0	0	0	0	Continue to monitor
1252	Kauri Road WWPS	0	0	0	0	0	0	0	Continue to monitor
1253	Colin Lawrie 2 WWPS	0.6	0	0	0	0	0	0	Continue to monitor
1254	Anselmi Ridge WWPS	0	0	0	0	0	0	0	Continue to monitor
1579	Pamela Christine Pump Station	-	0	0	0	1	0	0.2	Continue to monitor

2.38.7 Inflow & Infiltration Programme

Reactive Inflow & Infiltration investigation was carried out within the new development associated with the Jutland Rd WWPS subcatchment to investigate high flows arriving at this pump station. Smoke testing and private property drainage inspections; nothing notable was found. Further investigation into the connection of rainwater tanks to the networks is planned for 2020.

A further review of I&I network performance for this catchment will be done as part of the option assessment (modelling and planning study); this will inform further I&I investigations.

2.38.8 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway (enforcement stage)	Northern Pukekohe Reactive I&I Investigations	Inflow and Infiltration	Mitigate high flows entering the northern pump stations to improve operational performance in wet weather.	Lower risk of wet weather overflows and provision of capacity for future growth.	2016-2018
Underway	Wastewater Main Renewals and Lining Programme	Project Execution	Network wastewater pipe renewal at 38 sites	Upgraded network pipe condition	2015-2019
Underway	Pukekohe Options Analysis	Options Analysis (Feasibility)	Solve capacity issues at Franklin PS and downstream of Jutland PS as well as to develop an understanding of works needed to convey flows from future growth (developer driven/Watercare requirements)	Improvement of the network, will address wet weather capacity issues at Franklin PS and increase capacity downstream of Jutland Road PS discharge. Understand future requirements to cater for growth within Pukekohe	2019-2023

2.38.9 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2018 and 30 June 2019.

2.38.10 Summary

There were no EOPs which discharged more frequently than two spills per year. The density of overflows has decreased in this reporting period with surcharging and fat blockages causing the majority of overflows. Reactive I&I investigation was carried out to investigate asset performance at a new pump station. The overflow history will be analysed and utilised when reviewing future network improvement and I&I programmes. The network has been extended and developed to accommodate for population growth in the region; the Pukekohe Trunk Sewer Upgrade will service the Pukekohe catchment and is sized to cater for future growth. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.