

NOTICE OF MEETING



WATER, WASTE AND SEWER ADVISORY COMMITTEE MEETING

A Water, Waste and Sewer Advisory Committee Meeting of Byron Shire Council will be held as follows:

Venue	Conference Room, Station Street, Mullumbimby
Date	Thursday, 21 October 2021
Time	9.00am

Phillip Holloway
Director Infrastructure Services

I2021/1652
Distributed 14/10/21

CONFLICT OF INTERESTS

What is a “Conflict of Interests” - A conflict of interests can be of two types:

Pecuniary - an interest that a person has in a matter because of a reasonable likelihood or expectation of appreciable financial gain or loss to the person or another person with whom the person is associated.

Non-pecuniary – a private or personal interest that a Council official has that does not amount to a pecuniary interest as defined in the Code of Conduct for Councillors (eg. A friendship, membership of an association, society or trade union or involvement or interest in an activity and may include an interest of a financial nature).

Remoteness – a person does not have a pecuniary interest in a matter if the interest is so remote or insignificant that it could not reasonably be regarded as likely to influence any decision the person might make in relation to a matter or if the interest is of a kind specified in the Code of Conduct for Councillors.

Who has a Pecuniary Interest? - a person has a pecuniary interest in a matter if the pecuniary interest is the interest of the person, or another person with whom the person is associated (see below).

Relatives, Partners - a person is taken to have a pecuniary interest in a matter if:

- The person's spouse or de facto partner or a relative of the person has a pecuniary interest in the matter, or
- The person, or a nominee, partners or employer of the person, is a member of a company or other body that has a pecuniary interest in the matter.

N.B. “Relative”, in relation to a person means any of the following:

- (a) the parent, grandparent, brother, sister, uncle, aunt, nephew, niece, lineal descends or adopted child of the person or of the person's spouse;
- (b) the spouse or de facto partners of the person or of a person referred to in paragraph (a)

No Interest in the Matter - however, a person is not taken to have a pecuniary interest in a matter:

- If the person is unaware of the relevant pecuniary interest of the spouse, de facto partner, relative or company or other body, or
- Just because the person is a member of, or is employed by, the Council.
- Just because the person is a member of, or a delegate of the Council to, a company or other body that has a pecuniary interest in the matter provided that the person has no beneficial interest in any shares of the company or body.

Disclosure and participation in meetings

- A Councillor or a member of a Council Committee who has a pecuniary interest in any matter with which the Council is concerned and who is present at a meeting of the Council or Committee at which the matter is being considered must disclose the nature of the interest to the meeting as soon as practicable.
- The Councillor or member must not be present at, or in sight of, the meeting of the Council or Committee:
 - (a) at any time during which the matter is being considered or discussed by the Council or Committee, or

- (b) at any time during which the Council or Committee is voting on any question in relation to the matter.

No Knowledge - a person does not breach this Clause if the person did not know and could not reasonably be expected to have known that the matter under consideration at the meeting was a matter in which he or she had a pecuniary interest.

Non-pecuniary Interests - Must be disclosed in meetings.

There are a broad range of options available for managing conflicts & the option chosen will depend on an assessment of the circumstances of the matter, the nature of the interest and the significance of the issue being dealt with. Non-pecuniary conflicts of interests must be dealt with in at least one of the following ways:

- It may be appropriate that no action be taken where the potential for conflict is minimal. However, Councillors should consider providing an explanation of why they consider a conflict does not exist.
- Limit involvement if practical (eg. Participate in discussion but not in decision making or vice-versa). Care needs to be taken when exercising this option.
- Remove the source of the conflict (eg. Relinquishing or divesting the personal interest that creates the conflict)
- Have no involvement by absenting yourself from and not taking part in any debate or voting on the issue as of the provisions in the Code of Conduct (particularly if you have a significant non-pecuniary interest)

RECORDING OF VOTING ON PLANNING MATTERS

Clause 375A of the Local Government Act 1993 – Recording of voting on planning matters

- (1) In this section, **planning decision** means a decision made in the exercise of a function of a council under the Environmental Planning and Assessment Act 1979:
- (a) including a decision relating to a development application, an environmental planning instrument, a development control plan or a development contribution plan under that Act, but
- (b) not including the making of an order under that Act.
- (2) The general manager is required to keep a register containing, for each planning decision made at a meeting of the council or a council committee, the names of the councillors who supported the decision and the names of any councillors who opposed (or are taken to have opposed) the decision.
- (3) For the purpose of maintaining the register, a division is required to be called whenever a motion for a planning decision is put at a meeting of the council or a council committee.
- (4) Each decision recorded in the register is to be described in the register or identified in a manner that enables the description to be obtained from another publicly available document, and is to include the information required by the regulations.
- (5) This section extends to a meeting that is closed to the public.

BYRON SHIRE COUNCIL
BUSINESS OF MEETING

1. APOLOGIES

2. DECLARATIONS OF INTEREST – PECUNIARY AND NON-PECUNIARY

3. ADOPTION OF MINUTES FROM PREVIOUS MEETINGS

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4. STAFF REPORTS

Infrastructure Services

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4.2	Byron STP Condition 9 Additional Load - Quarterly Report	35

ADOPTION OF MINUTES FROM PREVIOUS MEETINGS

Report No. 3.1 Adoption of Minutes from Previous Meetings

5 **Directorate:** Infrastructure Services

Report Author: Dominika Tomanek, Executive Assistant Infrastructure Services

File No: I2021/1637

10

RECOMMENDATION:

That the minutes of the Water, Waste and Sewer Advisory Committee Meeting held on 30 September 2021 be confirmed.

15

Attachments:

- 1 Minutes 30/09/2021 Water, Waste and Sewer Advisory Committee Extraordinary, I2021/1560
 , page 7 [↓](#)

20

BYRON SHIRE COUNCIL

ADOPTION OF MINUTES FROM PREVIOUS MEETINGS

3.1

Report

The attachment to this report provides the minutes of the Water, Waste and Sewer Advisory Committee Meeting of 30 September 2021.

5

Report to Council

The minutes will be reported to Council on

M I N U T E S O F M E E T I N G



**EXTRAORDINARY WATER, WASTE AND
SEWER ADVISORY COMMITTEE MEETING**

Venue	Conference Room, Station Street, Mullumbimby
Date	Thursday, 30 September 2021
Time	9:00am

*I2021/1560
Distributed 23/09/21*

BYRON SHIRE COUNCIL

ADOPTION OF MINUTES FROM PREVIOUS MEETINGS

3.1 - ATTACHMENT 1

BYRON SHIRE COUNCIL

ADOPTION OF MINUTES FROM PREVIOUS MEETINGS

3.1 - ATTACHMENT 1

BYRON SHIRE COUNCIL

EXTRAORDINARY WATER, WASTE AND SEWER ADVISORY COMMITTEE MEETING
MINUTES 30 SEPTEMBER 2021

**Minutes of the Extraordinary Water, Waste and Sewer Advisory Committee Meeting
held on Thursday, 30 September 2021**

File No: I2021/1560

PRESENT: Cr C Coorey, Cr M Lyon and Cr S Ndiaye

Staff: Phil Holloway (Director Infrastructure Services)

Cameron Clark (Manager Utilities)

Chris Soulsby (Development Planning Officer S94 & S64)

Therese Black (Business Analyst)

Rachel Barden (Administration Support Officer)

Dominika Tomanek (Minute Taker)

Community: Col Draper, David Fligelman, Madeleine Green, Duncan Dey,
and Ben Fawcett

Presenter: David de Haas (GHD)

***Cr Ndiaye (Chair) opened the meeting at 9:06 am and acknowledged that the
meeting was being held on Bundjalung Country.***

APOLOGIES:

Mary Gardner

DECLARATIONS OF INTEREST – PECUNIARY AND NON-PECUNIARY

Madelaine Green declared a pecuniary/non-pecuniary interest . The nature of the interest
being that she resides 1 km away from Resource Recovery Centre.

BYRON SHIRE COUNCIL

ADOPTION OF MINUTES FROM PREVIOUS MEETINGS

3.1 - ATTACHMENT 1

BYRON SHIRE COUNCIL

EXTRAORDINARY WATER, WASTE AND SEWER ADVISORY COMMITTEE MEETING
MINUTES 30 SEPTEMBER 2021

ADOPTION OF MINUTES FROM PREVIOUS MEETINGS

Report No. 3.1 Adoption of Minutes from Previous Meeting
File No: I2021/1528

Committee Recommendation:

That the minutes of the Water, Waste and Sewer Advisory Committee Meeting held on 19 August 2021 be confirmed.

(Dey/Fawcett)

The recommendation was put to the vote and declared carried.

BUSINESS ARISING FROM PREVIOUS MINUTES

There was no business arising from previous minutes.

STAFF REPORTS - INFRASTRUCTURE SERVICE

Report No. 4.1 Workshop - Ocean Shores to Brunswick Valley STP Transfer
File No: I2021/1495

Committee Recommendation:

That Council, in relation to Ocean Shores and Brunswick Valley STP's:

1. Notes the status report.
2. Recommits to reducing I/I in all sewer catchments.
3. Proceeds to detailed design for infrastructure to transfer sewage flows from Ocean Shores STP to Brunswick Valley STP for:
 - a. All current and projected flows to Ocean Shores STP (for the purpose of temporary closure for repairs and flows in excess of wet weather capacity), and,
 - b. With facility to continue to discharge an adjustable proportion of the flows to Ocean Shores STP (up to ~100% of current sewage flows) on an ongoing basis.

BYRON SHIRE COUNCIL

EXTRAORDINARY WATER, WASTE AND SEWER ADVISORY COMMITTEE MEETING
MINUTES 30 SEPTEMBER 2021

4. Investigates options for upgrades to Ocean Shores STP to rectify its prevailing condition, configuration, and redundancy issues, and to improve its efficiency and reliability. The capacity of the upgraded plant would not be required to be increased through the upgrades, and may be marginally reduced where cost effective to do so.
5. Investigates options (including options with no Balancing Pond) for upgrades to Brunswick STP to rectify any prevailing issues (particularly in UV disinfection), and as required to accommodate the fraction of loads which cannot be reliably treated at the upgraded Ocean Shores STP.
6. Receives a forward expenditure strategy based on timing of upgrades in Parts 2 & 3 above, and on growth estimated in Council's planning strategies.
7. Receives a briefing at its next Strategic Planning Workshop.

(Coorey/Fawcett)

The recommendation was put to the vote and declared carried.

The meeting on 30 September 2021 concluded at 11:17 am and has been continued on 1 October 2021 from 9 am – 10 am with the committee members present: Cr Ndiaye, Cr Lyon, Cr Coorey, Col Draper, Duncan Dey, Ben Fawcett and Madelaine Green. David Fligelman and Mary Gardener were apologies.

STAFF REPORTS - INFRASTRUCTURE SERVICES

Report No. 4.1 Inflow and Infiltration - April 2021 update

Directorate: Infrastructure Services

5 **Report Author:** Jason Stanley, Inflow & Infiltration Project Manager

File No: I2021/718

Summary:

10 Byron Shire Council have engaged Environmental Data Services (EDS) to undertake a monitoring assessment to quantify performance of the I&I rectification works within Mullumbimby sewer network.

The flow measurement of the sewer prior and post rectification work is the only true process of determine the benefits and I&I reduction achieved.

15 EDS installed and operated the Hach Marsh Flo-Dar open channel flow meter, which is widely accepted as the industry standard for sewer flow measuring, this was also the preferred instrument to be used by Byron Shire Council.

The flow monitors were installed so that recording period could commence before 1st December 2020. The aim was to measure sewer flows during dry and wet weather to ascertain the effects of rain events on the gravity sewer system.

20 EDS compared both the 2018-19 and 202-21 flow monitoring data to obtain a quantitative figure for the I&I reduction in the Mullumbimby network.

To ascertain the overall reduction to I&I and the improved wet weather load capacity of the Mullumbimby sewer network a like for like result projection has been determined using the existing data results and the specific reduction of I&I achieved with comparison to Sydney Water projects.

25 Having 24.35% of the Mullumbimby assessed network had reification works completed. This % when compared to results from Sydney Water, an estimated reduction of 30-50% to I&I.

30 EDS report summaries the results of the sewer flow monitoring between the two project periods. (attached; *Environmental Data Services Temporary Flow Gauging Report Mullumbimby November 2020 – May 2021, E2021/127616*)

RECOMMENDATION:

That the committee note the report from Environmental Data Services.

5 Attachments:

- 1 Environmental Data Services
Temporary Flow Gauging Report
Mullumbimby November 2020 – May 2021, E2021/127616 , page 14 [↓](#)

10



**Environmental Data Services
Temporary Flow Gauging Report
Mullumbimby November 2020 – May 2021**

for

Byron Shire Council

Contact person for this project:

Sebastian Harper
Project Manager
Work: (07) 5578 3622
Mobile: 0419 716 529
Email: sebastian@e-d-s.com.au
Web: www.e-d-s.com.au





EDS Head Office Location:

Queensland

Unit 12/17 Indy
Court,
Nerang, Gold Coast
QLD, 4211

Commercial-in-Confidence

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ABN 31-729-813-151



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1. Project Summary

Environmental Data Services (EDS) were tasked with monitoring the gravity sewer flow at three manholes (selected by Byron Shire Council) within the Mullumbimby catchment along with the recording of rainfall using the tipping bucket rain gauge (TBRG), this was installed in close proximity to the 3 sewer flow monitoring sites.

EDS installed and operated the Hach Marsh Flo-Dar open channel flow meter, which is widely accepted as the industry standard for sewer flow measuring, this was also the preferred instrument to be used by Byron Shire Council.

The flow monitors were installed so that recording period could commence before 1st December 2020. The aim was to measure sewer flows during dry and wet weather to ascertain the affects of rain events on the gravity sewer system.

Three flow monitoring sites were selected on the Western side of the railway line, sewer manholes A6, K1 & K2. These three manholes were also monitored from December 2018 until the end of March 2019.

This report is to summarise the results of this sewer flow monitoring between the two project periods. EDS is to use both 18-19 and 20-21 data to determine the reduction of inflow infiltration (InI) following rectification works completed in the Mullumbimby sewer network. A critical component of determining flow reductions is to record an accurate average dry weather flows (ADWF) and and similar rainfall event for both project periods. Rainfall volumes and intensities are overlaid with the flow data to determine the sewer response and performance during both ADWF and a comparable rain event.

Between the two monitoring projects Byron Shire Council carried out targeted network rectification works. The rectification works was targeted by identifying the highest risk assets with the scope including (were targeted) reduction to InI can be expected InI. Please refer to below scope of rectification works completed throughout Mullumbimby sewer and stormwater network.

- Structural relining of 27 gravity sewer mains
- Rectification of 18 gravity sewer mains
- Rectification of 22 gravity sewer maintenance holes
- Rectification of 9 stormwater culverts
- Rectification of 7 stormwater maintenance holes

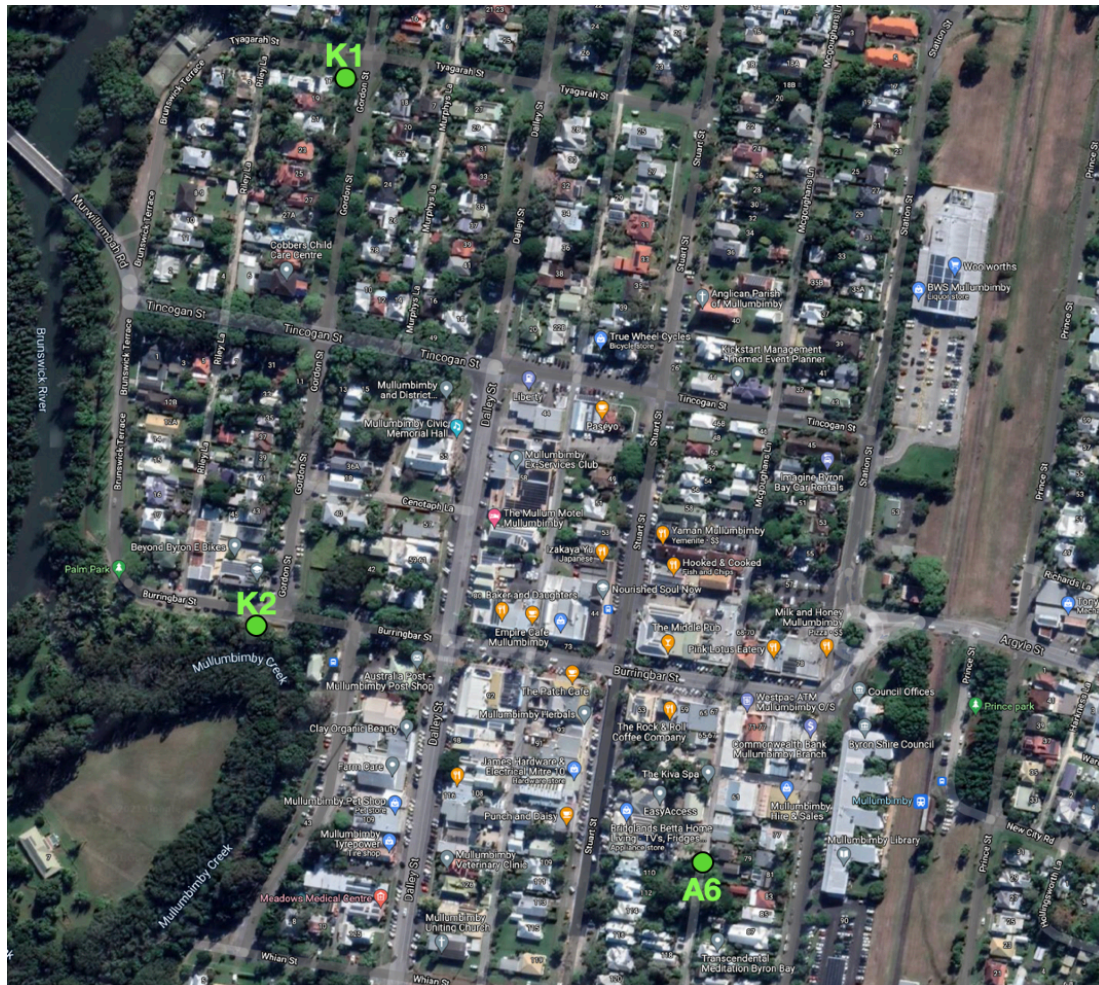
A significant amount of rain was recorded during the 20-21 (1824.6mm) period when compared to the 2018-19 (over 500mm) this posed a challenge when quantifying flow comparisons between the project periods. An anticipated reduction to InI can be expected (as outlined in section 4. Rectification Results, and 7. Conclusion), this is achieved by the implementation of best practice rectification of relining and repairing high risk sewer networks. A summary and comparison of flows are outlined in this report.



2. Locations

Three flow monitors were installed on the Western side of the railway line at sewer manholes K1, K2 & A6.

Manhole A6 is located in McGoughans Lane, K1 on the corner of Tyagarah & Gordons Streets, K2 on Burringbar St.





Manhole A6:

A6 is located in McGoughans Lane.



A6



A6



A6



Manhole K1:

K1 is located on the corner of Tyagarah & Gordons Streets.



K1



K1

Please Note: Small flows were observed during installation and during subsequent dry weather visits.



Manhole K2:

K2 is located on Burringbar St.



K2



K2

EDS Mullumbimby Flow Monitoring 2020-21 Report BSC

8 of 21



3. Findings

Throughout the 2020-21 monitoring period there was significant rain events for the duration of the monitoring period totalling in 1824.6mm falling over the catchment, as a result it is not possible to make wet weather comparisons with the 2018-19 gauging period.



A6



K2



K1

During the latest 20-21 period the sewers were in a surcharge state for each rain event. The sewer surcharge is believed to be a result non controllable factors including record **rainfall**, flooding, elevated water table.

Byron Shire Council advised that a rectification program was carried out following the 2018-19 monitoring project. We were able to observe the results of this rectification program at the manholes where the flow gauges were installed. The manholes and associated inlet & outlet pipes were observed to be in a much better condition.



K2 2018-19



K2 2020-21

The above images show targeted rectification works completed by Byron Shire Council at K2.



The aim of these rectification works is to minimise inflow infiltration into the sewer network. This is widely regarded as industry best practice and the preferred process to achieve a significant reduction of gravity sewer inflow infiltration (*Reference: Water Services Association of Australia (WSAA), Good Practice Guidelines for Management of Wastewater System Inflow and Infiltration, Volumes 1 and 2, 2013*).

4. Rectification Results

Although challenges were encountered when determining specific InI reduction due to the volume of rainfall in the 2020-21 project period, EDS is able to provide a quantitative estimate of the Mullumbimby sewer catchment InI reduction based on past projects and industry outcomes.

EDS was involved both Dapto and Lalor Park Projects completed for Sydney Water where they undertook an extensive source detection investigation by means of initial flow monitoring, CCTV assessment, targeted rehabilitation work, and post rehab flow assessment, with calculated InI reduction.

PROTOTYPE I/I CORRECTION PROJECTS CASE STUDY

(2) Dapto Catchment

The catchment is situated in the Illawarra region immediately west of Lake Illawarra and drains nearly 4500 properties with a drainage area of about 550 hectares. This is a separate sewer system of 80 km in length varying in age from early sixties to very recent (2 - 3 years), 80% being 150 mm VC pipes with rubber ring joints. The catchment drains to SPS 308 and is pumped to the Brook Carrier and then transported to Port Kembla treatment works.

The terrain varies from mostly flat in areas at the bottom of the catchment close to the Lake, which is the older part of the suburb. Most the newer areas in the upstream of the catchment have steep grades (up to 10%). The geology of the catchment varies from soil, shale to rock. The catchment characteristics were defined by 22 mini-catchment (MCs), each of which contained about 3-4 km of sewer. Temporary gauging was carried out for a period of five months to identify the relative leakage severity behaviour of the MCs.

"Problem" MCs were defined as those 14 MCs with the highest leakage indicators, and were included in the scope of work for detailed source detection.

The rehabilitation plan was prepared based on the detailed source detection results/interpretation. 30% of the properties were found to have inflow defects, and it is reported that about 95% of the identified defects of the smoke testing have been rectified.

About 20% of the Sydney Water's sewer and 33% of house service lines were rehabilitated.

Overall rain ingress reduction of 30%, and annual dry weather flow reduction of 128 ML (ie 11%) were achieved. This reduction implies that maximum rainfall ingress severity has been reduced from 8% to 5.5% overall. This analysis was carried out as part of an interim performance measure with the available data, after rehabilitation of the worst third of the identified mini-catchments. But final analysis will be carried out, once adequate data is available after rehabilitation.

The source detection and rehabilitation was completed at a cost about \$5.3M.

The duration of the project from investigation to completion was nearly three and a half years.



(3) Lalor Park Catchment

The catchment is located in the north western region of Sydney, and drains about 4300 properties with a drainage area of about 415 hectares. This separate sewer system has 77 km of sewer with the majority of the reticulation being more than 30 years old.

The catchment is generally flat and was sub-divided into 21 gauged mini-catchments, each of which contained about 3 km of sewer.

The source detection was carried out under turn key contract, the contractor being responsible for developing the rehabilitation plan. This process is no longer used.

Nearly 30% of the house service lines, and about 50% of the Sydney Water's sewer were rehabilitated.

Overall effectiveness analysis was not carried out for this catchment, as half way through the programme a Lalor Park submain amplification was commissioned, which intercepted nearly 50% of the flow from the old submain. Plans are now in place to install a new gauge in the amplified line, to enable effectiveness analysis to proceed. With the available MC data, effectiveness analysis was carried out for the rehabilitated mini-catchments. Results show an average rainfall ingress reduction of 50%; i.e. a reduction in maximum rainfall ingress severity from 11% to 5%.

The total cost the project was about \$5.0M.

Both projects were carried out for Sydney Water, with the results used to develop the industry best practice for sewer InI reduction, and this is now widely adopted by most Australian water authorities and retailers.

High risk areas were identified by recording significant InI, with targeted rehabilitation work based on the severity of ingress.

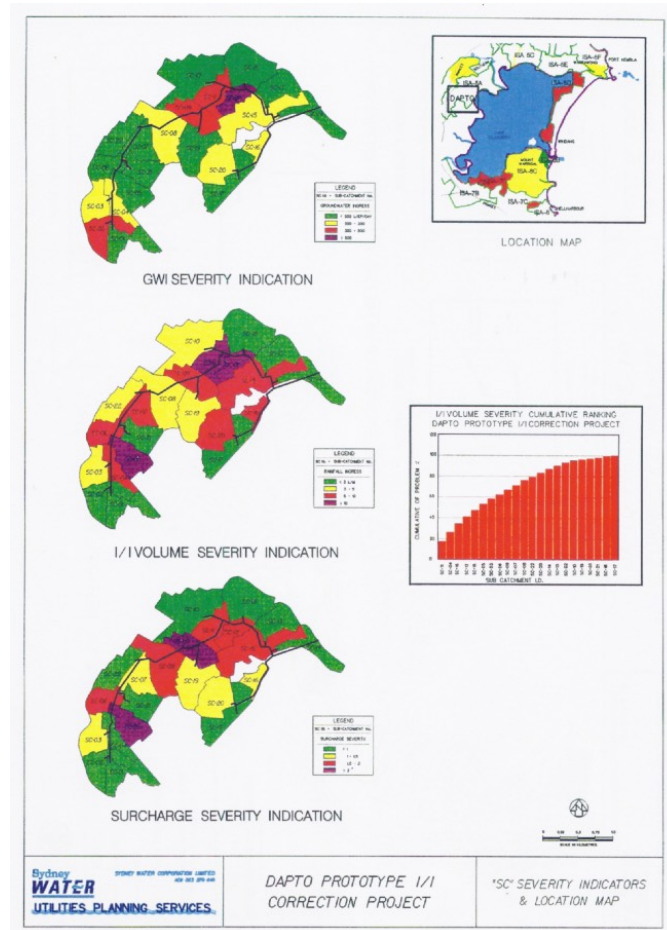
To ascertain the overall reduction to InI and the improved wet weather load capacity of the Mullumbimby sewer network a like for like result projection has been determined using the existing data results and the specific reduction of InI achieved from compared Sydney Water projects.

The Pareto Principal is widely used with rectification works, this states that 85% of the problem is located in 15% of the catchment. The work carried out involved the condition assessment within the gravity sewer network of 115 mains. Following this 28 of the 115 mains were identified as high risk requiring rectification works. This assessment also validated the 10 x ADWF (average dry weather flow) during rain events.

Having 24.35% of the Mullumbimby assessed network had reification works completed. This % when compared to results from Sydney Water, an estimated reduction of 30-50% to InI.



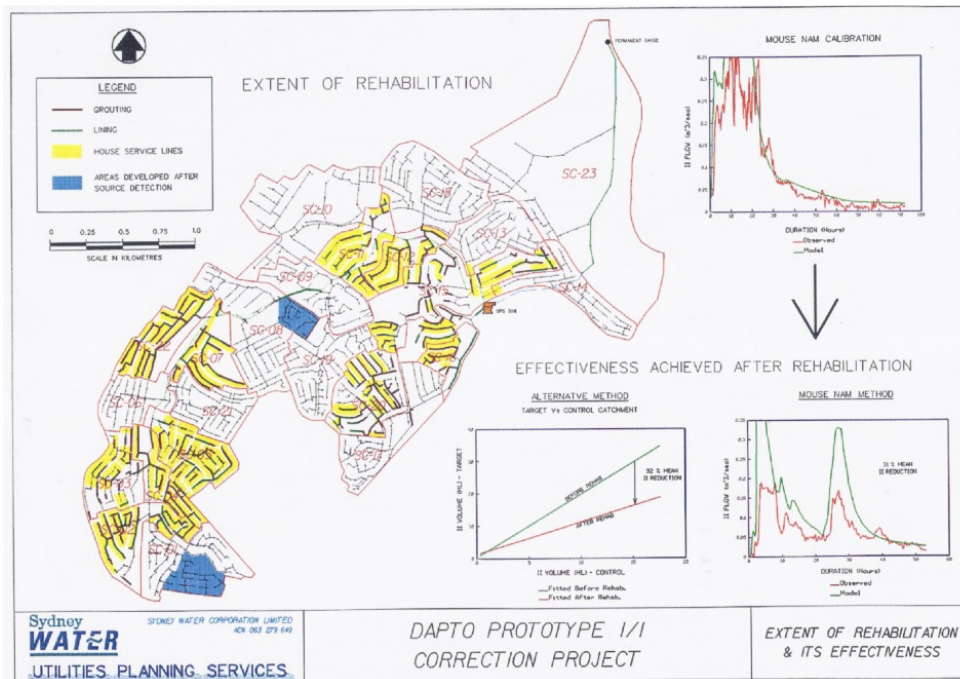
Below plot shows example plot of critical InI areas as identified by EDS with Sydney Water on a like for like project.



These project results help develop the industry best practice for sewer InI reduction, and is now widely adopted by larger Australian water authorities and retailers. To ascertain the overall reduction to InI and the improved wet weather load capacity of the Mullumbimby sewer network a like for like result projection has been determined using the existing data results and the specific reduction of InI achieved on both projects.

Below is an outline of the comparative projects scope;

1. Both projects included;
 - Initial Flow Monitoring
 - Detailed sewer assessments involving CCTV.
 - Target rehabilitation/rectification work
 - Subsequent flow monitoring and reduction of InI.
2. Tim Fleming was project manager on both project working with Sydney Water as liaison & consultant to the rehabilitation firms.
3. All 3 catchments share similar catch proximity to the coast and climate characteristics.



Rehabilitation Effectiveness Sydney Water

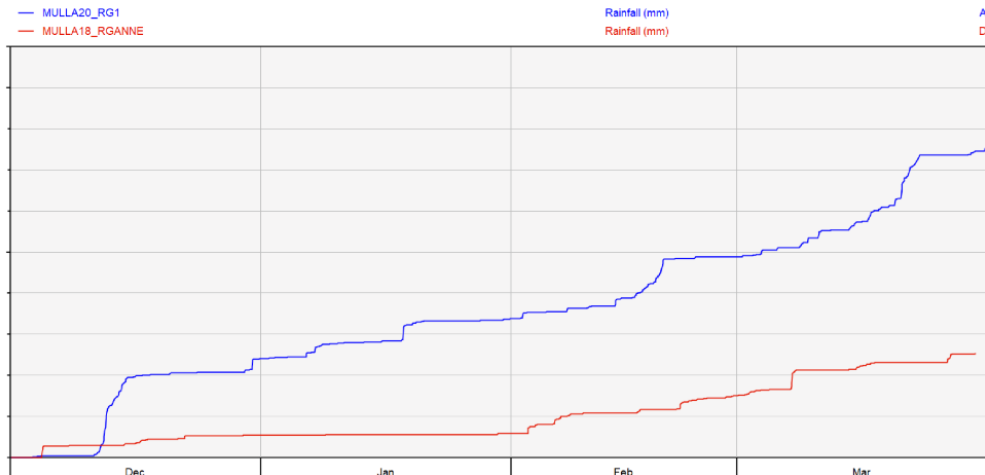
Tim Fleming was a project manager and carried out data analysis on both the 2018-19 and 2020-21 projects. Tim has over 30 years experience both managing and delivering InI studies through out Australia and New Zealand. This provides a unique and in-depth understanding of the benefits achieved by the analysis of pre and post InI reductions in sewer flow data following targeted rectification works.



5. Project Comparisons

Environmental Data Services

Period 4 Month 01/12 to 01/04

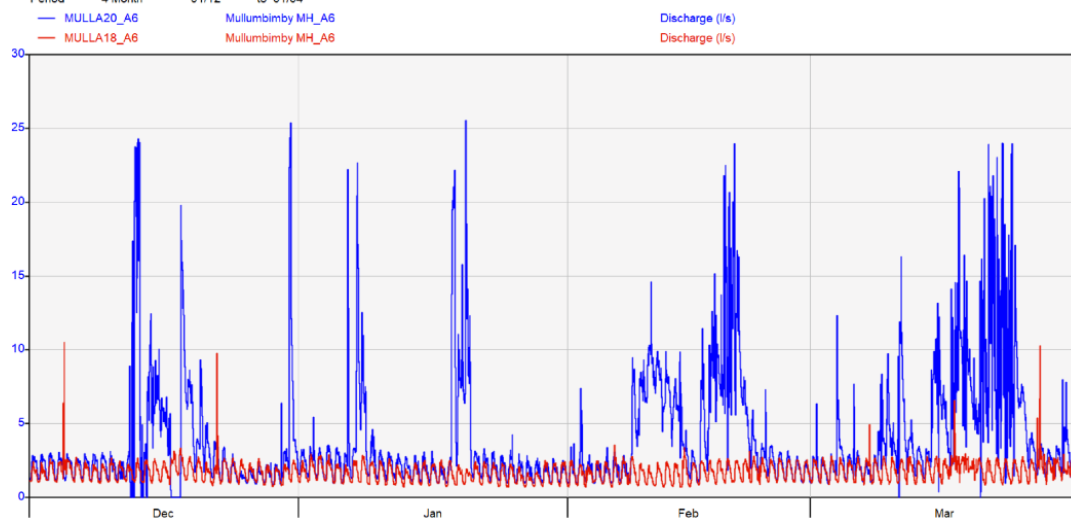


The above plot gives visual comparison of the rainfall recorded from 1/12/18 until 1/4/19 (the red plot) and the rain that was recorded from 1/12/20 until 1/4/21 (the blue plot).

The measurements show that approximately 500mm fell in 2018–2019 whilst over 1800mm fell in 2020–2021.

Environmental Data Services

Period 4 Month 01/12 to 01/04



The above plot gives visual comparison of the rainfall recorded from 1/12/18 until 1/4/19 (the red plot) and the rain that was recorded from 1/12/20 until 1/4/21 (the blue plot).

The dry weather flows are similar, but the rain events caused the manhole to surcharge leading to irregular flow patterns and flows far exceeding anything measured during 2019-20.

This type of consistent rain often leads to the water table rising which means that rain that falls before the water table has dropped has a more marked effect on inflow and infiltration.



6. Recommendations

EDS has noted that the rainfall in Mullumbimby in the last 2 months has settled down with only a total 11mm falling on the 8th of August.

Additional flow monitoring of the existing sites K1, K2, and A6 is recommended to obtain suitable data during 'normal' rain events which would allow for a valid data comparison to the 2018-2019 project period.



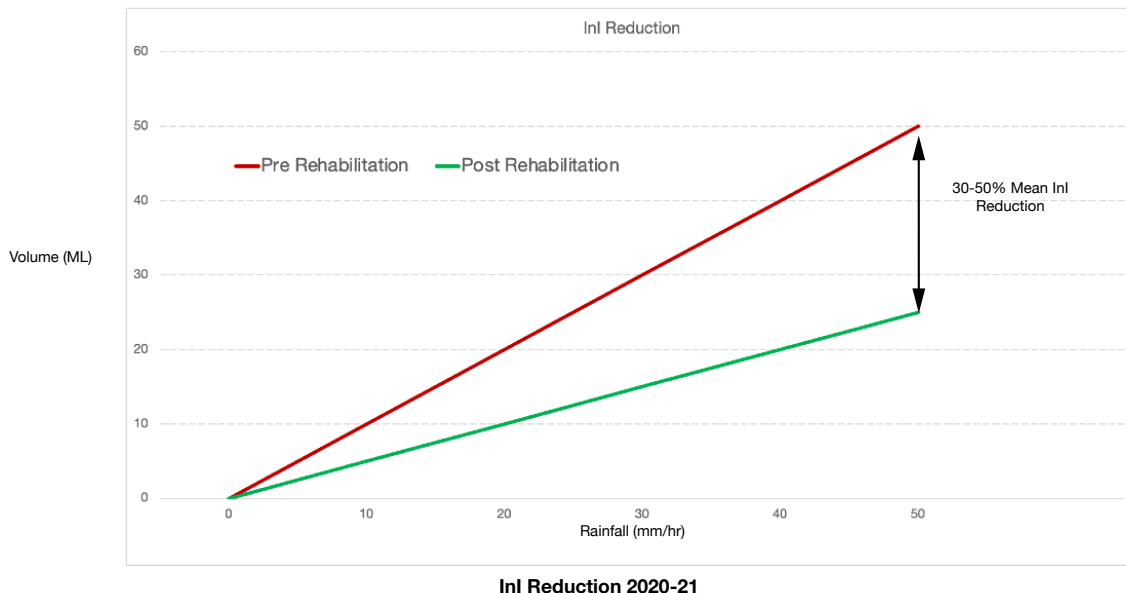
7. Conclusion

Comparing both the 2018-19 and 202-21 flow monitoring data EDS is able to provide a quantitative figure for the InI reduction in the Mullumbimby network. The sewer capacity and the ability to operate without overflow during increased wet weather load is critical. The flow measurement of the sewer prior and post rectification work is the only true process of determine the benefits and InI reduction achieved.

From initial 2018-19 monitoring period peak wet weather flow were reach 10 x ADWF volumes. Following this base level results Byron Shire Council carried out network assessment through 115 mains in the Mullumbimby catchment. The network assessment determined that 28 mains were deemed high risk and required rectification works.

To determine the benefit and decrease of InI post rectification works additional flow monitoring was carried out start December 2020 through to May 2021. During this period a record rainfall was recorded, so to quantify the InI reduction EDS compared like for like results with the data recorded.

Having carried out rectification works at 24.3% of the inspected and applying the Pareto principal, a significant reduction to the InI in the Mullumbimby sewer network has been achieved.



By the implantation of industry best practice and drawing on comparable project outcomes there is a significant improvement in reducing the load to the Mullumbimby Sewer network.

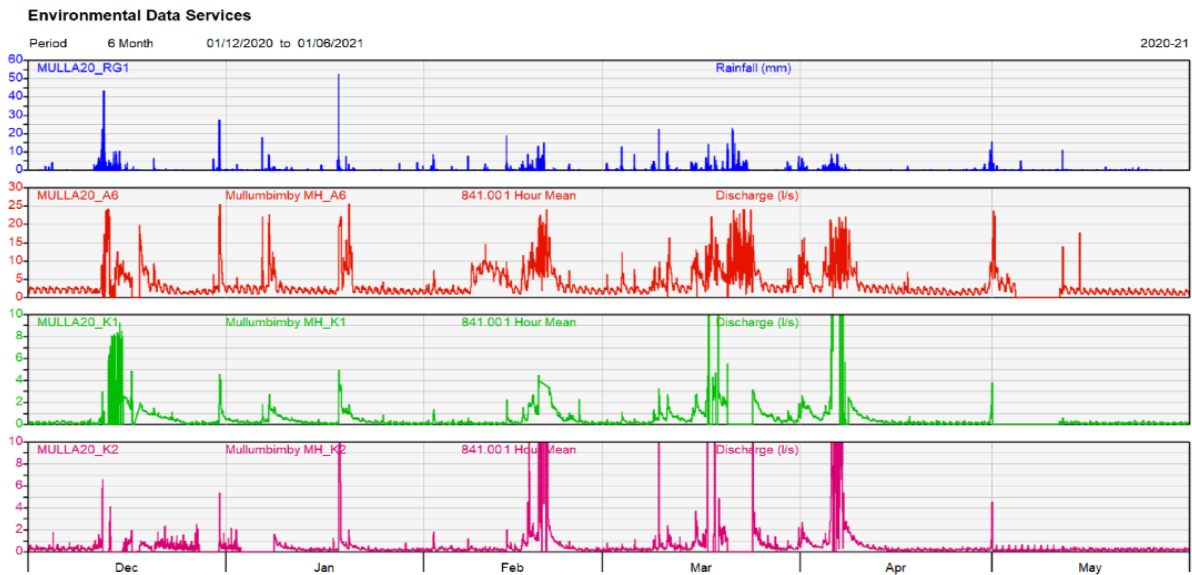
Peak ADWF Pre Rehabilitation:	10 x ADWF
Peak ADWF Post Rehabilitation:	5 x ADWF

Overall load during wet weather events has decreased on average by 30-50% and provides capacity to handle significant rain events without a sewer overload.

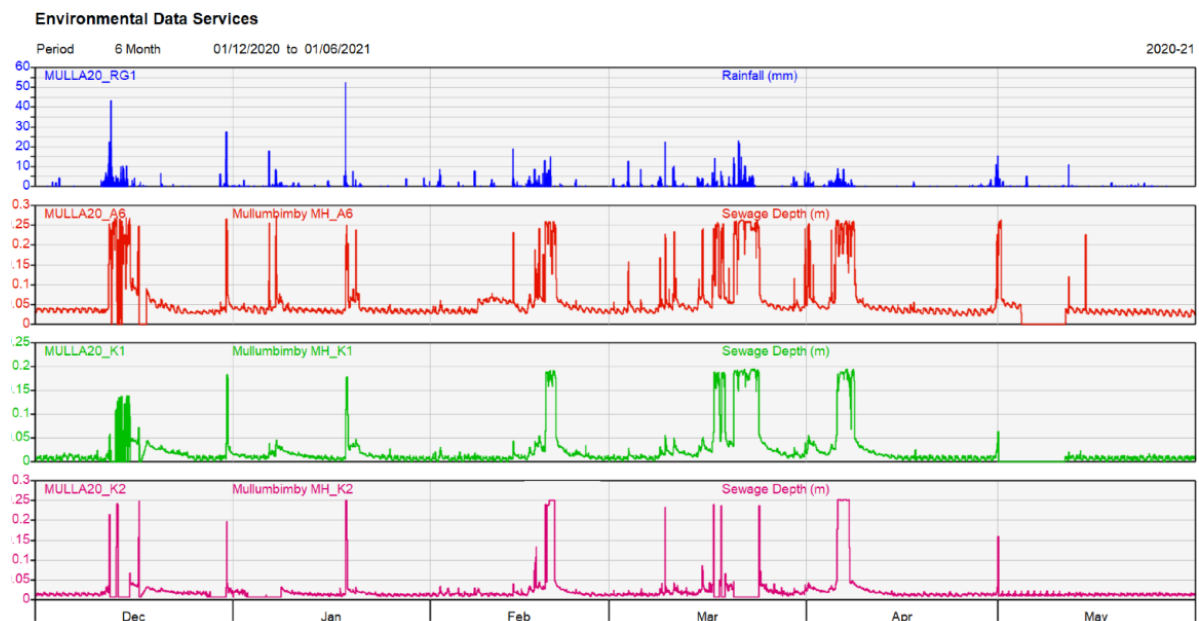


Appendix A Plots

Plot of rainfall and flows at A6, K1 & K2

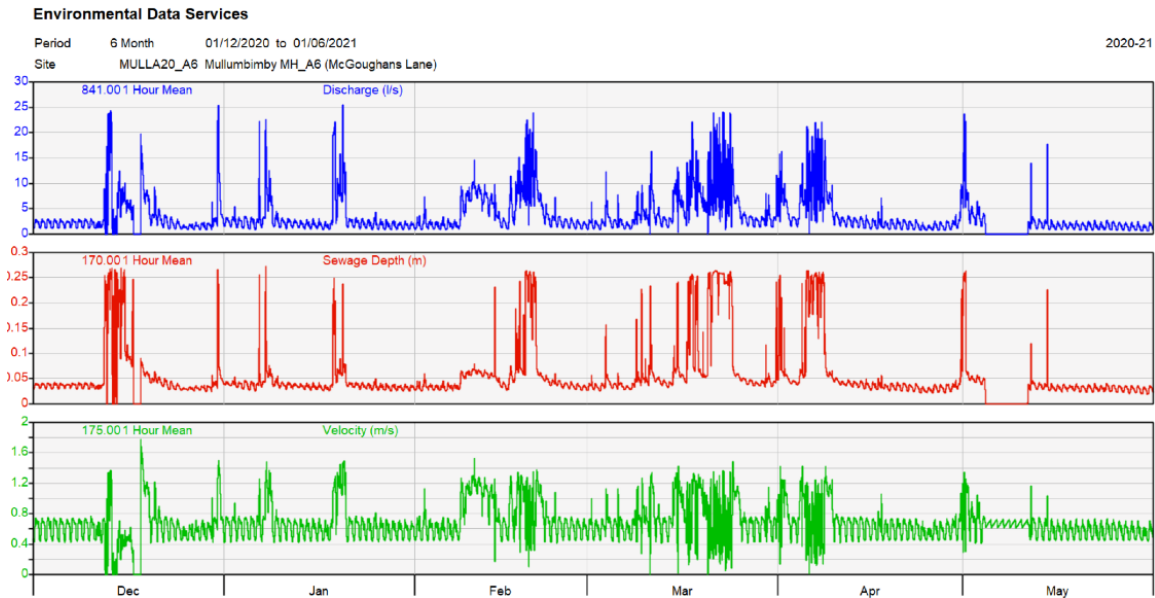


Plot of rainfall and depths at A6, K1 & K2

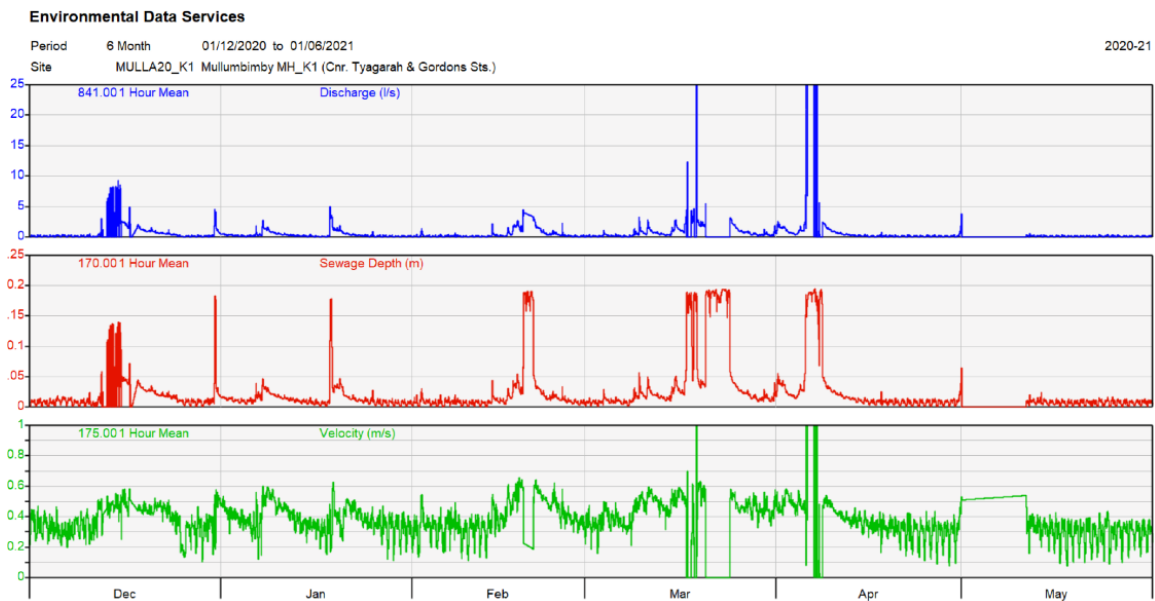




Plot of flow, depth and Velocity at A6

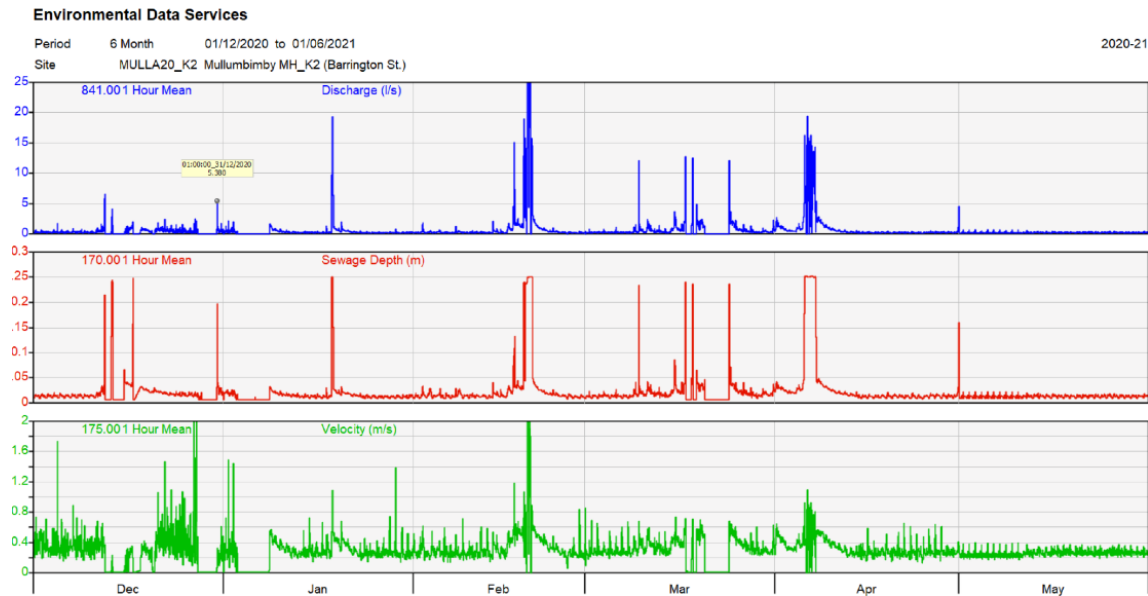


Plot of flow, depth and Velocity at K1





Plot of flow, depth and Velocity at K2



**Appendix B Rainfall Summary**

Site Mullumbimby Rainfall

Variable Rainfall (mm)

Period December 2020 - May 2021

Day	Dec	Jan	Feb	Mar	Apr	May
1		2.4	0.4	7.2	27.4	34
2	0.4	4.6	30.2	0.6	4.4	0.4
3	2.2	0.8	0.2	6	2.8	0.2
4	6	0.8		19.4	16.2	0.4
5		0.2	3.8	8.6	48.6	14.4
6		20.6	0.8	3.4	58	
7	0.2	29.8	15.4	1.2	15.4	0.2
8		12	1	14.2	5.4	
9		1		32.4		0.2
10		3.6	10	0.2	0.2	0.2
11	18.6	4	0.8	35.4		1.6
12	203.6			2.8		13
13	59	0.8	26	0.2		0.2
14	71.2		12.4	8.8		
15	27.6	5	0.4	29.8	0.2	0.2
16	9.8	1.4	25	3.2		
17	3.2		34.8	51.8	5.8	0.2
18	0.2	76.8	33.4	17.4		3.2
19		9.2	95.4	7.4		0.2
20	9.8	9.4	0.4	33.8	0.2	0.6
21	0.2	1.2	2	104	0.2	1.2
22	1			62		0.8
23			7.6	47.2		3
24	0.2	0.2	0.2		0.2	1.8
25	0.2	0.2	0.2			0.6
26					0.6	0.2
27					1.2	0.2
28		3.6		0.2	3	
29	1.8			6	11	
30	54.4	4		10.8	41.6	
31	10.4	3.6		15.6		

**Summary:**

Mean	15.48	6.3	10.73	17.08	8.08	2.48
Maximum	203.6	76.8	95.4	104	58	34
Minimum	0	0	0	0	0	0
Total	480	195.2	300.4	529.6	242.4	77
Wet Days	20	23	21	27	19	23
Total Wet Days		142				

**Report No. 4.2 Byron STP Condition 9 Additional Load -
Quarterly Report**

Directorate: Infrastructure Services

Report Author: Dean Baulch, Principal Engineer, Systems Planning

5 **File No:** I2021/1611

Summary:

This report is for the Committee's information and reviews compliance with the Byron Bay Sewerage Augmentation Scheme - Conditions of Approval (2002).

10 Condition 9(iii) requires that sufficient reuse (recycled water) capacity be available before the acceptance of any additional load at the treatment plant.

15 In the years since the approval was granted (2002 to date) 2,727 Equivalent Tenements (ET) have been approved, resulting in an additional load of 1.61 ML/day at the treatment plant. The current day operating capacity of the reuse system equates to 2.02ML/day or 3,427ET. Therefore the reuse system provides sufficient capacity to accommodate the additional load as defined in the Conditions of Approval.

20

RECOMMENDATION:

That the report is noted.

25

Report

The relevant section from Condition 9 of the Approval is Condition 9(iii), which states, “Additional load at West Byron STP will not be accepted until: availability of sufficient reuse capacity to accommodate 100% of the volume of treated effluent generated by the additional load”.

- 5 “Additional Load” is defined in the report as “any sewage load resulting from development consents after the date of this approval”. Date of Approval is 9 December 2002.

- 10 From December 2002 through to the end of September 2021 2,727 additional sewer Equivalent Tenements (ET) have been approved by Council through development consents. This additional load (including approvals for secondary dwellings) is also adjusted (reduced) based on development applications that have been modified, withdrawn, refused or when the approval expires during the same period. Figure 1 shows the annual approved additional ET load from 2002 to 2021.

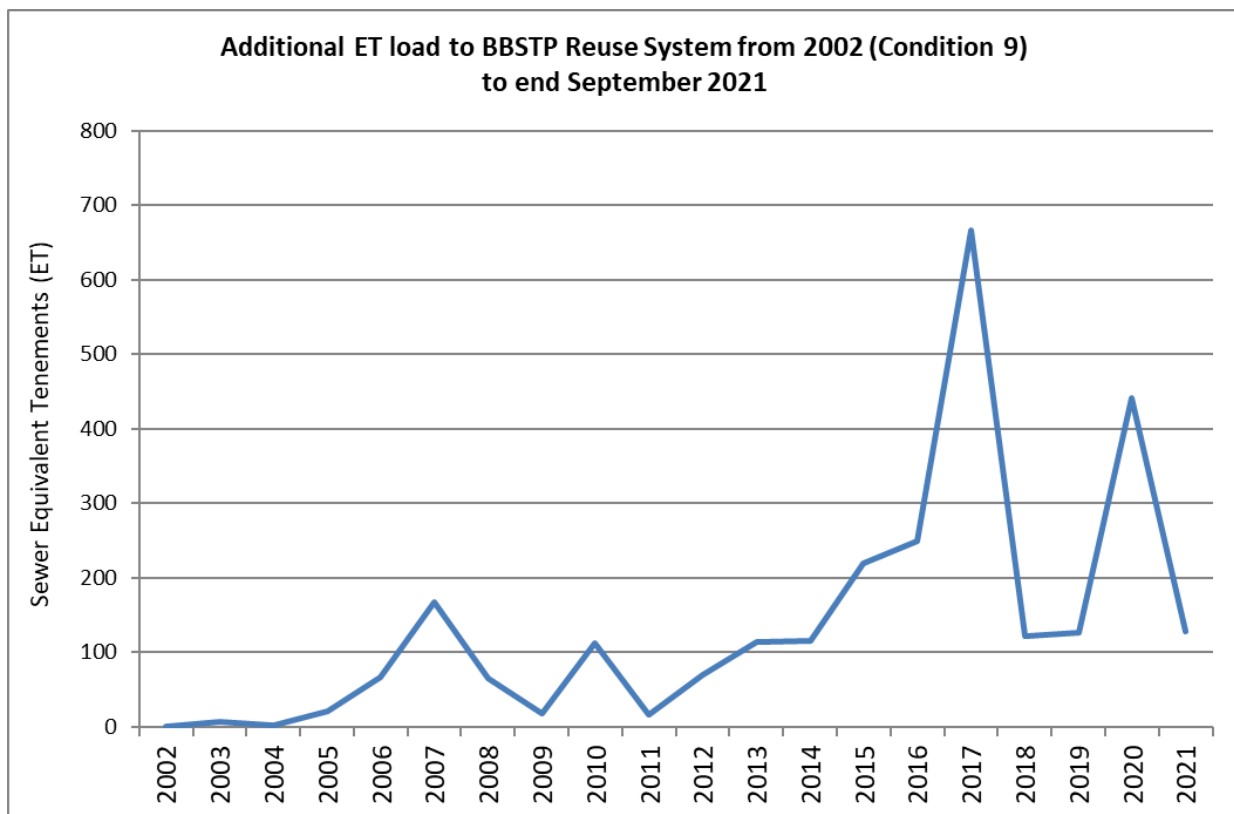


Figure 1 - Equivalent Tenements approved by Council from 2002-2021

- 15 The current day operating capacity of the reuse system to produce treated effluent is 26 Litres per second or 2.25ML/day less 10% of water for filter backwash purposes equates to 2.02ML/day or 3,427ET.

	Current Approved ET	Available Capacity (ET)
Condition 9(iii) Additional Load Calculation	2,727	-
Current effluent reuse system capacity 2020	3,427	700

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Therefore, the existing reuse system provides sufficient capacity to accommodate the additional load as defined in the Conditions of Approval.

Committee Report Tracking Summary: Condition 9. Additional Load at Byron STP	Current Approved ET	Difference (ET)
30 January 2020	2,408	-
30 July 2020	2,478	70
29 October 2020	2,508	30
18 February 2021	2,738	230
29 April 2021	2,749	11
19 August 2021	2,683	(66)
21 October 2021	2,727	44

Note that ET load is adjusted (reduced in some cases) based on development applications that have been modified, withdrawn, refused or the approval expires.

- 5 In terms of the actual reuse volumes for Byron Bay since the system was commissioned the following annual figures are provided:

Calendar Year	Total Urban Reuse Flows (ML)
2006	258.8
2007	336.1
2008	204.4
2009	174.5
2010	257.2
2011	287.4
2012	294.0
2013	287.2
2014	296.9
2015	261.9
2016	221.8
2017	257.3
2018	246.7
2019	424.7
2020	405.2
*2021 up to 30 Sept	299.7

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