



Water & Waste Services



Sewer Sensors

Linda Pearson

Mackay Regional Council

15 September 2016

Business Objectives

The Way the Sewer System Performs has a Significant Impact on ability to meet business objectives

- ◆ **Public Health** – Protecting the health of our community, water, sewerage, waste



The Way the Sewer System Performs has a Significant Impact on our Service Outcomes

💧 Public Health

- ⦿ Recreation Waters
- ⦿ Private Property
- ⦿ Public Areas



Business Objectives

The Way the Sewer System Performs has a Significant Impact on ability to meet business objectives

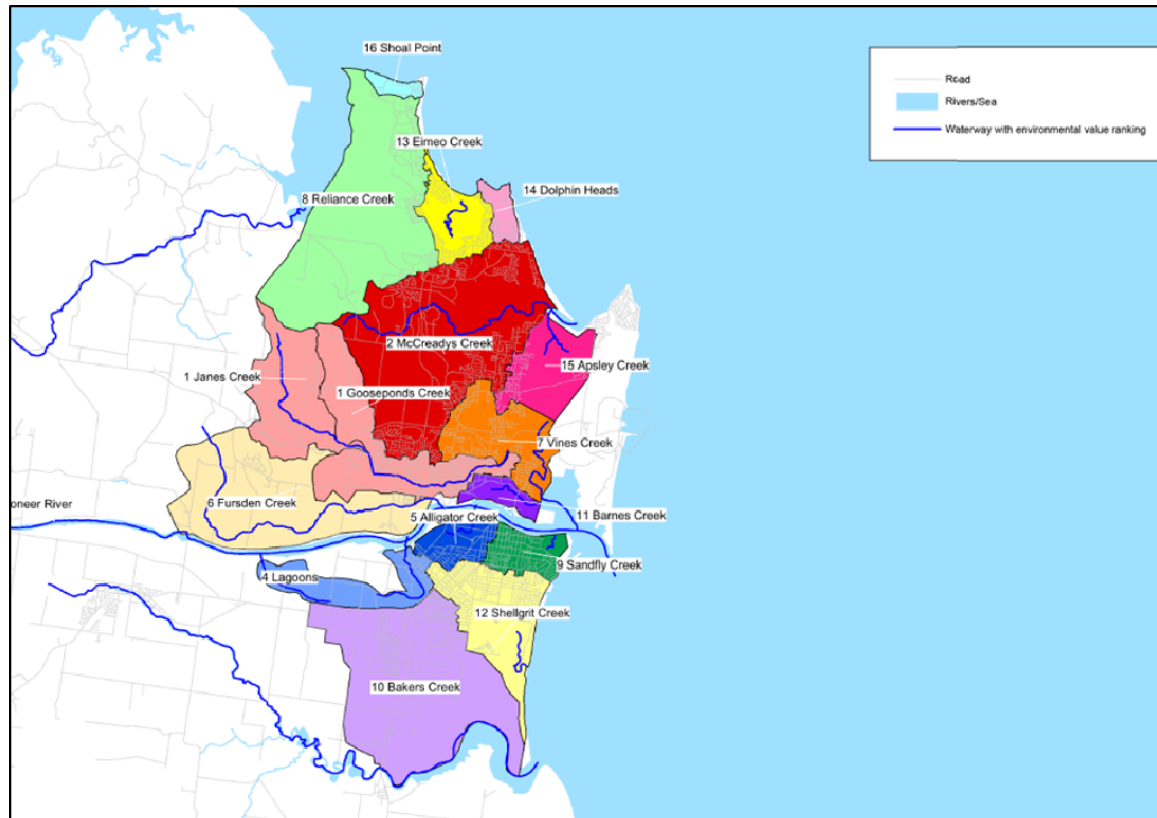
- 💧 **Public Health** – Protecting the health of our community, water, sewerage, waste
- 💧 **Environmental** – Minimise water contamination, noise, dust, fumes



The Way the Sewer System Performs has a Significant Impact on our Service Outcomes

💧 Environment

🕒 Sensitive Receiving Environments



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- 💧 **Environmental** – Minimise water contamination, noise, dust, fumes
- 💧 **Service Levels** – Delivering on Adopted Service levels



The Way the Sewer System Performs has a Significant Impact on our Service Outcomes

💧 Service Standards

- ⦿ Interruption to Services During Rain Events
- ⦿ We have provided porta loos in the past



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- 💧 **Economic** – Reduce the cost to provide the service in the long run



The Way the Sewer System Performs has a Significant Impact on our Service Outcomes

💧 Cost

- ⦿ MRC 200 SPS, flat low lying land with old assets in areas
- ⦿ Historically have spend \$M on trying to fix Inflow & Infiltration (I & I), with broad scale Inspection Programs of both private and public assets
- ⦿ Asset Utilisation

Asset	Value
Sewage Mains, Manholes, Pump Stations	\$580K
Treatment	\$150M
Total	\$630M



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- ◆ **Economic** – Reduce the cost to provide the service in the long run
- ◆ **Reputation** – managing council and water business reputation



Reputation

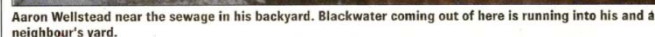


PHOTO: TONY MARTIN 031210362

Backed-up sewerage system adds to residents' problems

Andrew Garry
Staff Writer/Community Columnist

THE city's sewerage system is already at full capacity and it's a problem that's flowing on to angry north, south and east Bay residents.

"After we had 24 inches of rain, the system is already full," Mayor Mayor Clay McGee said yesterday.

"We cannot stretch to our capacity enough — you need extra stormwater running into the sewerage system."

When Berkeley director John Dwyer said it would take 24 hours of flow south for the problem to resolve itself in the sewerage, residents are being asked to conserve water.

"The issue is it's overloaded. If people can conserve water it makes a difference. We do have their washing and flushing the toilet," Mr Dwyer said.

"The issue is the water level must go up even more to clear the problem."

"It is not a good problem for anyone to have. It's a credit to council, we need to treat and pump all of this water out," he said.

City McGee said crews were working on fixing the problem.

SARINA SEWERAGE | Infrastructure fails residents again

Rain kicks up a stink

Emily Smith
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DON'T ask how Helen Taylor's garden grows. It's certainly not a method recommended in any

The Sarina resident, who has spent years urging Mackay Regional Council to fix faulty infrastructure that leaves her yard covered in sewage after a downpour, was growing 'every sort of tomato you could imagine' a couple of years ago but never planted any seeds.

Instead, it was sewage carrying undigested tomato seeds that enabled the plants to take root.

"I picked one of the tomatoes once and thought, 'Can I do this?' But I couldn't bring myself to eat them," she said.

"I thought they were weeds at first. But then I realised they were tomatoes and realised how they got here, because I've seen tomatoes growing near

Yesterday:

- Sarina 124
- Mackay 113
- Moranbah 4.6
- Dysart 21
- Proserpine 15
- Calen 137
- Bowen 18

sewage treatment plants before." Although she decided to get rid of the tomato plants a while ago, sewage again covered the Elizabeth St resident's garden yesterday following weekend rain.

INSET: Tomato plants grow next to Helen Taylor's sewerage outlet. **MAIN:** Tramway Hotel owner Ted Swain is worried sewerage problems will hurt business. PHOTO: EMILY SMITH

"Council have been out this morning and sprayed

Ms Taylor said. "And they brought a port-a-loo out for me on September 11."

"But what council really needs to do is spend the money to fix the Sarina sewerage system. I've been here 10 years and it's always been a problem."

DID YOU KNOW?

Sarina's sewerage infrastructure is designed to flow into the stormwater network in places. However, council said it has spent several million trying fix problems.

He also confirmed "there were relief points in the sewerage network that could overflow to storm water". In wet weather he said this was not a public health concern because the raw sewage was so diluted.

Local News

Sewerage on agenda

COUNCILLORS who vow to fix Sarina's faulty sewerage infrastructure will be ahead of the pack when it comes time for Linda and Kruno Ratkovic to cast their vote.

The Sarina couple are often left literally with "nowhere to go" when heavy rain causes their

At the weekend, Mr Ratkovic had to use a bucket to empty water out of the bowl to stop it

"When we hear a bubbly noise, we know it's about to happen," Mrs.

"We need to (vote for) someone with sewer-

The Tramway Hotel owner Ted Swain also feels let

"We had 240mm one night and the toilet filled in our residence and the

in our residence and the sink in number 12," he said. "I'm worried it will hurt business. Someone could write a bad review on trip advisor about it."

Factors impacting performance of Sewer Network

- 💧 Inflow resulting from direct rainfall
- 💧 Infiltration
- 💧 Blockages and Chokes Reducing Capacity
- 💧 Environmental Issues

Sewer Network is a dynamic complex system.



Defects Reducing Sewer Capacity



Failed Sewer Reline



Debris in Sewer

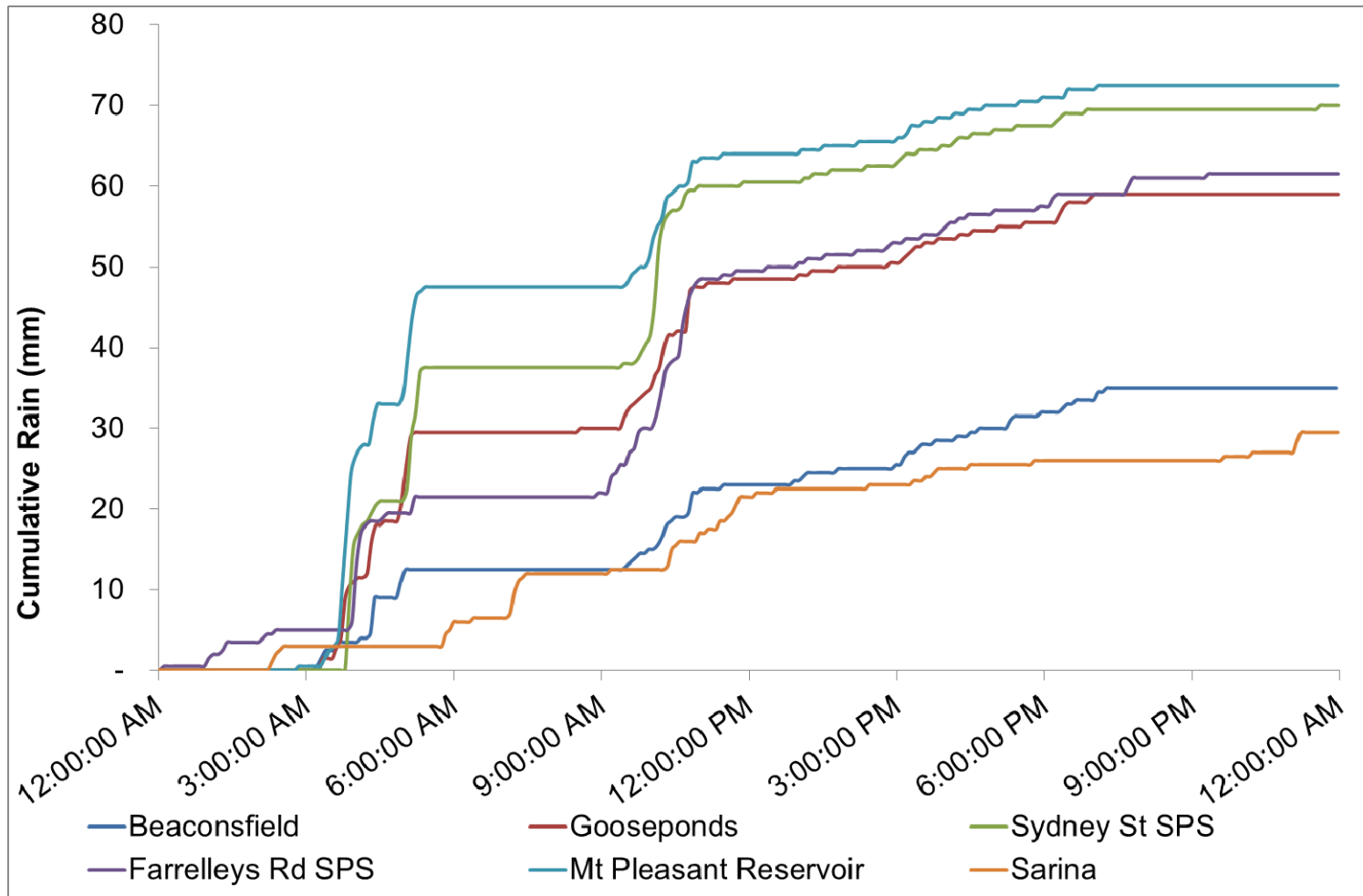


Poor Construction

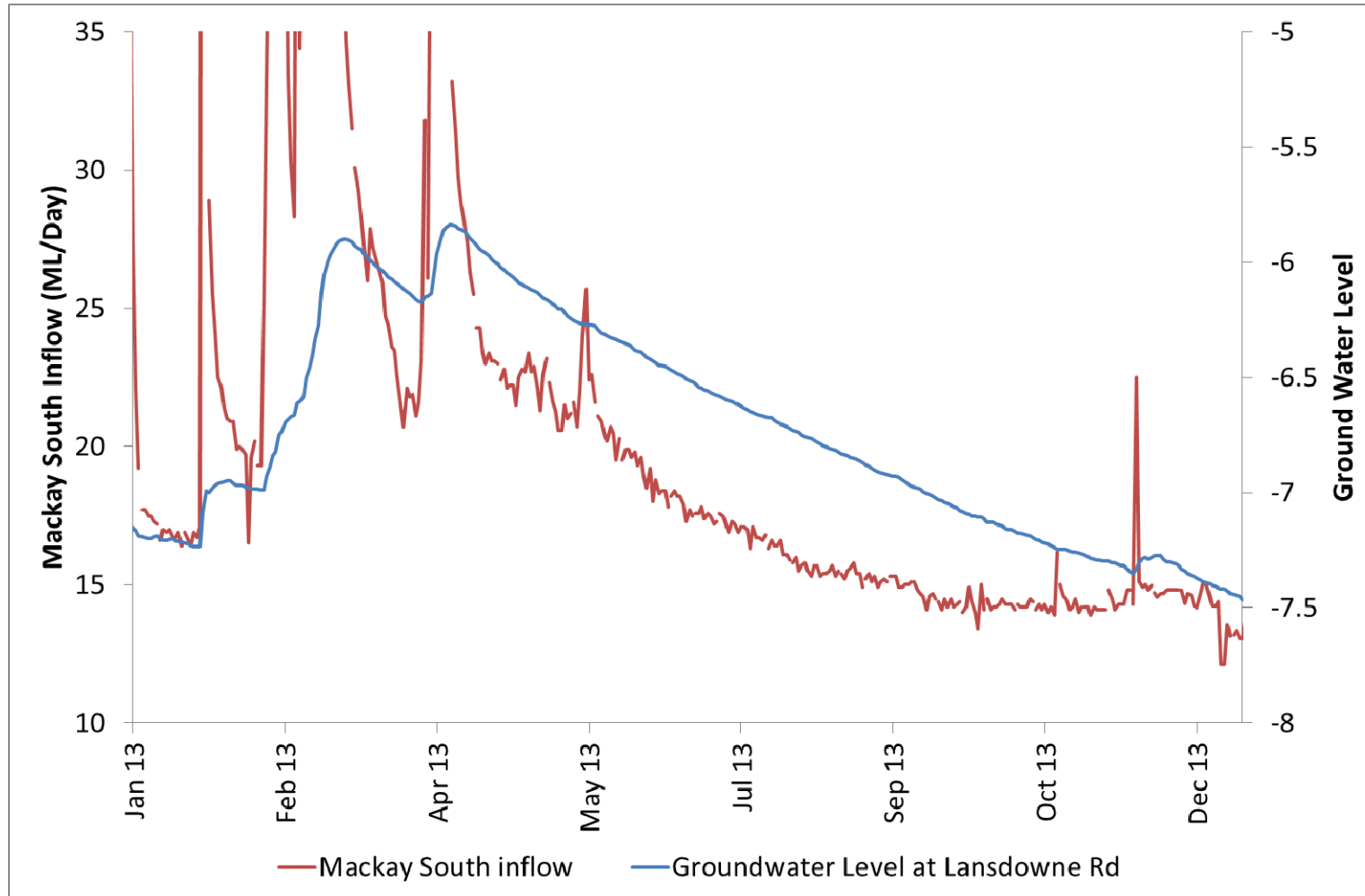


Asset Failure

Rainfall has a big Impact, the amount of rainfall varies considerably across the network



Groundwater levels in Mackay show a close correlation with Infiltration



What are sewer sensors?

- 💧 **Simple on/off level sensors with transmitter**
 - ⦿ Positioned pipe full and overflow level
- 💧 **Leveraging off the communication technology of MiWater**
- 💧 **Cost effective way of data capture**
- 💧 **Ability to have lots of data sample points**



Real time information collection and management

- ◆ To date we have rolled out 75 remote sensors in the network collecting level information real time
- ◆ Preliminary cost indications were total cost to install (\$200-\$500) and operate for 10 years.
- ◆ Continuing to review the prototype



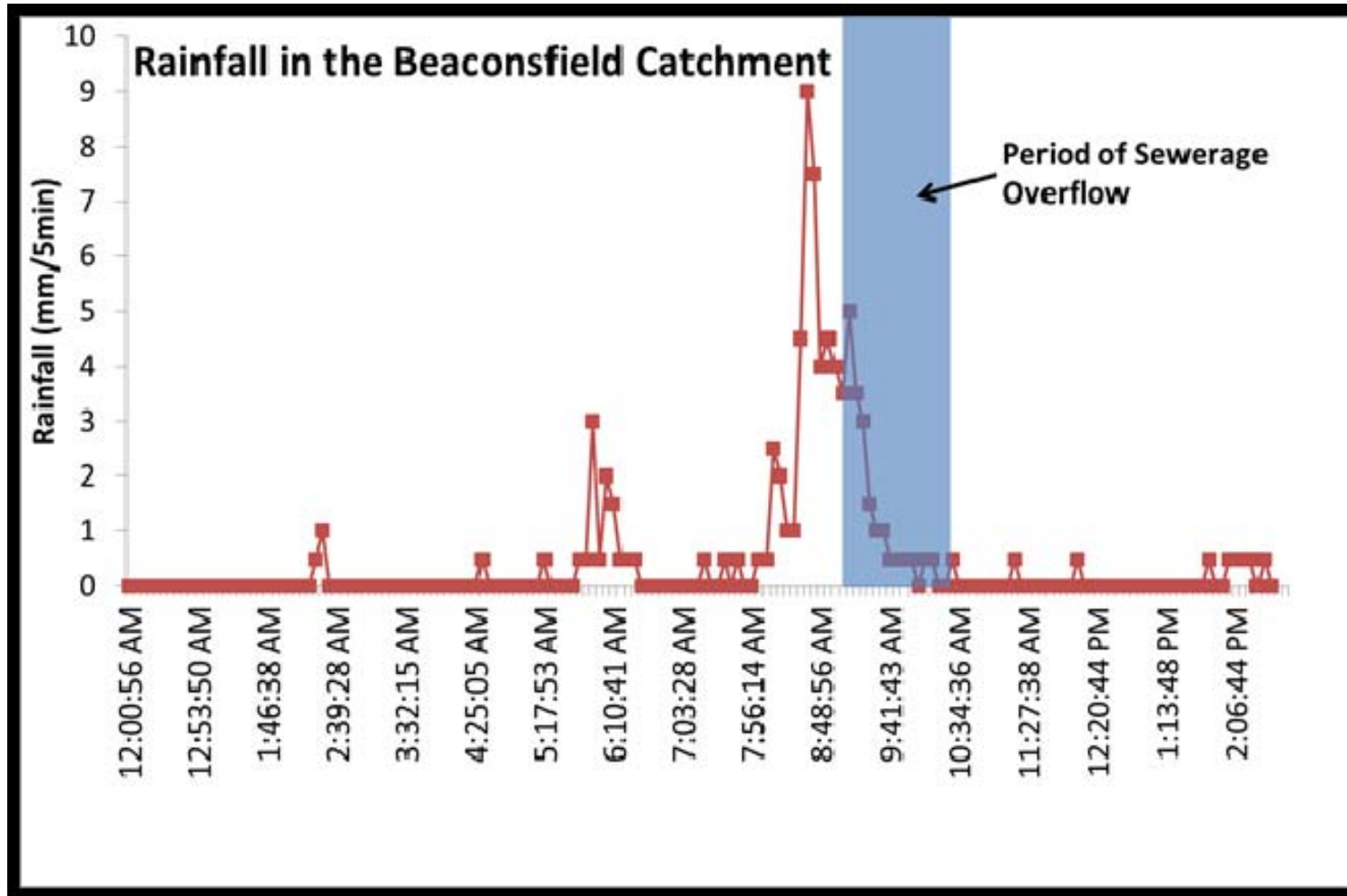
Trial Monitoring Site



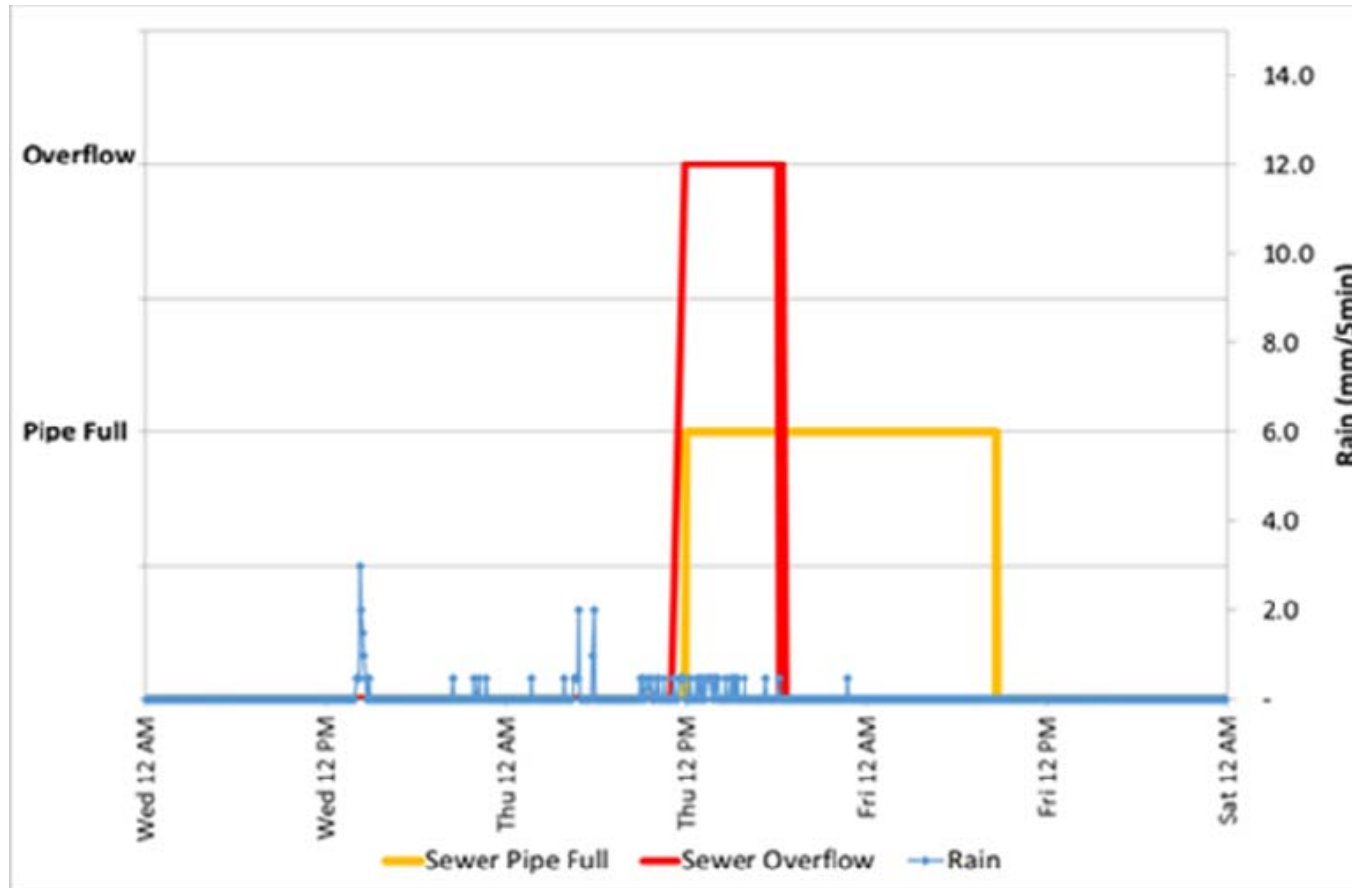
https://web.taggle.com.au/mackay/status					
File Edit View Favorites Tools Help					
MACKAY	2 MANSFIELD DRIVE	11451	LOW	LOW	19:49 15-Apr
MACKAY	PSMC05 GOLDSMITH STREET SPS	11474	LOW	NO SENSOR	19:13 15-Apr
MACKAY	PSWA03 KENNEDY STREET SPS	11488	LOW	NO SENSOR	01:10 15-Apr
MACKAY	PSAN03 BEDFORD ROAD NO 1 SPS	11501	LOW	LOW	19:48 15-Apr
MACKAY	PSNM03 GOOSEPONDS SPS	11504	LOW	LOW	19:09 15-Apr
MACKAY	PSNM15 OASIS DRIVE SPS	11505	LOW	NO SENSOR	19:26 15-Apr
MACKAY	PSWA01 BOLD STREET SPS	11506	HIGH	LOW	19:09 15-Apr
MACKAY	BEACONSFIELD SPS1	11508	LOW	LOW	19:41 15-Apr
MACKAY	PSSA02 PLACE AVENUE SPS	11509	LOW	LOW	19:22 15-Apr
MACKAY	PSBE01 BEACONSFIELD NO 1 SPS	11510	LOW	LOW	18:58 15-Apr
MACKAY	PSBE01 BEACONSFIELD NO 1 SPS	11511	LOW	LOW	19:38 15-Apr
MACKAY	PSMI01 MACKAY-EUNGELLA ROAD SP	11512	LOW	LOW	19:32 15-Apr
MACKAY	PSMP02 SUNCREST COURT SPS	11513	LOW	LOW	19:18 15-Apr
MACKAY	PSNM01 BASSET STREET SPS	11514			
MACKAY	BEACONSFIELD SPS1	11515	LOW	LOW	19:51 15-Apr
MACKAY	PSMC01 SYDNEY STREET SPS	11516	LOW	LOW	19:49 15-Apr
MACKAY	PSSA01 BILTOFT STREET SPS	11517	LOW	LOW	19:10 15-Apr
MACKAY	PSBU01A DUMP ROAD SPS	11518	LOW	NO SENSOR	19:54 15-Apr



Sewer Sensor results - Beaconsfield



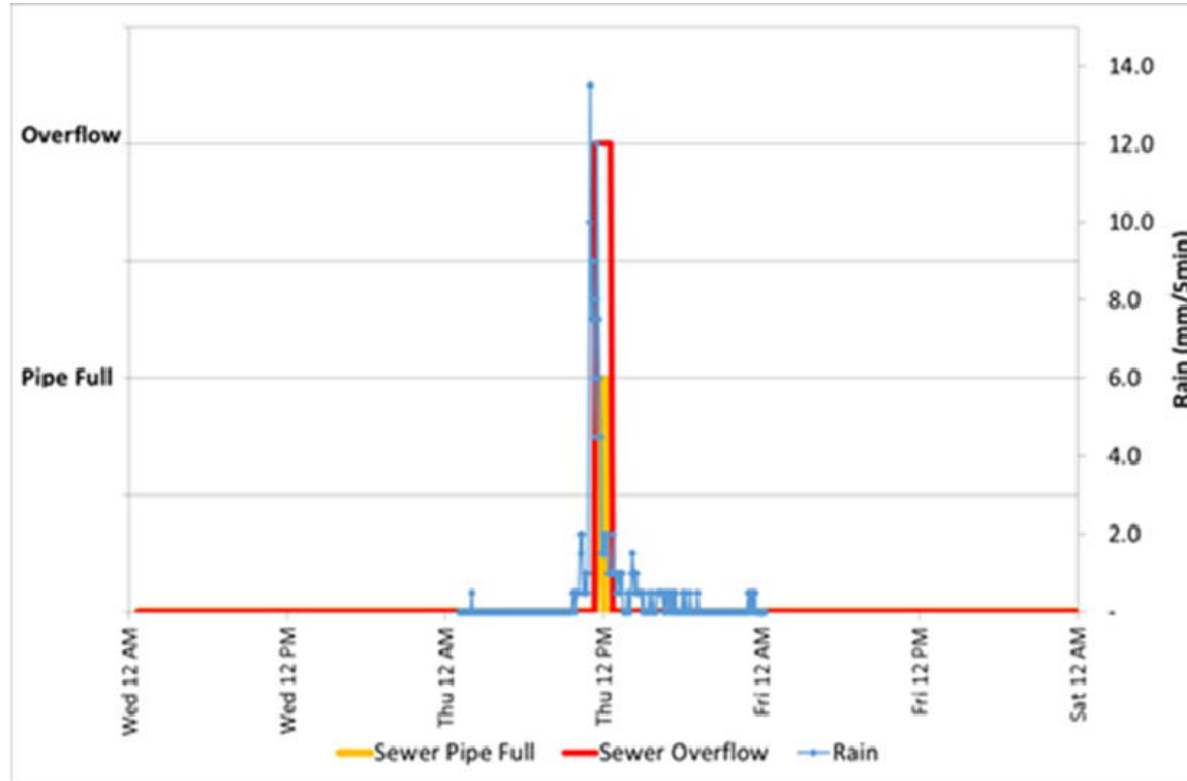
Brewers Road



- ◆ Relatively low rainfall event which leads to overflows
- ◆ Notice the long time the sewer pipe was full



Nicklin Drive



- ◆ Rainfall intensity above 10mm per 5 mins in the Beaconsfield catchment as recorded at the Beaconsfield Pump Station
- ◆ Fast response time indicating inflow
- ◆ This observation indicates that something is not right at the Brewers Road site



Dry Weather Events



Opportunities

- 💧 **Learn the signature of local catchments and sub catchments**
- 💧 **Being able to target investigations including CCTV**
- 💧 **Collection of real time data allows for definition of normal operation and ability to identify patterns**
- 💧 **Using the different technology at minimal cost capital and operational cost**
- 💧 **Operationalisation of the tool then value realised.**



Future - development of MiSewer

