

Message

From: Crook, Jonathan [Jonathan.Crook@sew.com.au]
Sent: 22/01/2025 6:05:26 PM
To: Morris, Helen [Helen.Morris@sew.com.au]; Pullen, Greta [Greta.Pullen@sew.com.au]
Subject: RE: Night flow analysis for Waller Place PR Zone


Hi Greta, Helen,

So I've had a quick look at the numbers. Comparing the quarters there does seem to be a bit of a seasonal difference between Summer and Winter in the difference between inflow and usage. Whether this points to unmetered irrigation, loss of water through the valves into other areas of our network, short term small (repaired) leakage/burst events, or is simply due to the fact we only have data at a 90-day interval for analog meters and reconciliation is difficult, I am not sure. However the numbers I have seen do not give any indication of a long-term significant leak event in the area.

Even if we attempt a water balance in the area (which I really wouldn't recommend using analog meters), we are looking at water loss of between 0.02L/s and 0.15L/s which is a small number and falls right within the range provided by the minimum nightly flows that Nico provided (0.006 to 0.3 L/s). In the circumstance, I would strongly suggest that minimum nightly flows are a much better measure of water loss as in such a small area with few properties it doesn't take much in the way of inaccurate or missing bills to impact the usage patterns.

Such a small area can, yes, create a seemingly large percentage of NRW when doing a tricky reconciliation (5-30%) but the minimum nightly flow and low discrepancy in winter would have me looking first at other explanations than leakage.

Hope this helps.

I am on leave tomorrow (back Friday) but give me a call if you want me to talk through anything. I have included my calculations ( [McCrae Incident NRW.xlsx](#)) though it's not particularly well documented so don't really expect you to follow it all.

Jonathan Crook

PI

From: Morris, Helen <Helen.Morris@sew.com.au>
Sent: Wednesday, 22 January 2025 4:52 PM
To: Pullen, Greta <Greta.Pullen@sew.com.au>; Crook, Jonathan <Jonathan.Crook@sew.com.au>
Subject: RE: Night flow analysis for Waller Place PR Zone

Hello,

I have attached the consumption data for those customers pulled from insight, I have a sql query that pulls out those specific addresses too if you would like that also JC?

Thanks again,

Helen

From: Pullen, Greta <Greta.Pullen@sew.com.au>
Sent: Wednesday, 22 January 2025 3:54 PM
To: Crook, Jonathan <Jonathan.Crook@sew.com.au>; Morris, Helen <Helen.Morris@sew.com.au>
Subject: FW: Night flow analysis for Waller Place PR Zone

Hi Jonathan

Seeq inflow to zone and customers in the zone attached.

@Morris, Helen – do you have the consumption data for the meters out of Insight to share?

If we could analyse the last (fully billed) four quarters of consumption against inflow to the zone to establish NRW for each quarter. If possible, can we note what amount of bills have been estimated.

Thanks JC

Cheers
Greta

From: McCreesh, Declan <Declan.McCreesh@sew.com.au>
Sent: Monday, 20 January 2025 2:50 PM
To: Pullen, Greta <Greta.Pullen@sew.com.au>; Macwilliams, Nico <Nico.Macwilliams@sew.com.au>; Morris, Helen <Helen.Morris@sew.com.au>
Subject: RE: Night flow analysis for Waller Place PR Zone

Hi Greta
Yes, please extend your analysis back for the entire year to check for consistency.
Thanks
Declan

From: Pullen, Greta <Greta.Pullen@sew.com.au>
Sent: Monday, 20 January 2025 2:46 PM
To: Macwilliams, Nico <Nico.Macwilliams@sew.com.au>; McCreesh, Declan <Declan.McCreesh@sew.com.au>; Morris, Helen <Helen.Morris@sew.com.au>
Cc: Gent, Carl <Carl.Gent@sew.com.au>; Hook, John <John.Hook@sew.com.au>; Crook, Jonathan <Jonathan.Crook@sew.com.au>; McClurg, Ben <Ben.Mcclurg@sew.com.au>; Gava, Giuliano <Giuliano.Gava@sew.com.au>
Subject: RE: Night flow analysis for Waller Place PR Zone

Hi Nico

Thanks for info – agree it is an imperfect method as we are comparing mechanical meters (which slow down over time) against instrumentation. We usually apply a 2% (WSAA standard) error across the meter fleet when doing the water balance for the regulator. I don't know what type of FM the one in this case is but I imagine it cuts out at low flow and have no idea of accuracy band.

Due to the level of inherent inaccuracy, please advise if you would like us to continue. Sounds like you are happy with the MNF method?

@Morris, Helen if the team advises, could you look at the other 3 quarters before the one we looked at to have a total of 12 months if possible? And provide breakdown of bill estimation?

If we get a similar result perhaps it's worth checking the shut valves if you think this information is valuable.

Thank you

Greta Pullen
Non-Revenue Water Manager



WatersEdge 101 Wells Street
Frankston VIC 3199

M PI



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From: Macwilliams, Nico <Nico.Macwilliams@sew.com.au>
Sent: Monday, 20 January 2025 12:11 PM
To: Pullen, Greta <Greta.Pullen@sew.com.au>; McCreesh, Declan <Declan.McCreesh@sew.com.au>
Cc: Gent, Carl <Carl.Gent@sew.com.au>; Hook, John <John.Hook@sew.com.au>; Morris, Helen <Helen.Morris@sew.com.au>; Crook, Jonathan <Jonathan.Crook@sew.com.au>; McClurg, Ben <Ben.Mcclurg@sew.com.au>; Gava, Giuliano <Giuliano.Gava@sew.com.au>
Subject: RE: Night flow analysis for Waller Place PR Zone

Hi Dec,
I can confirm that the PRV WB149 only supplies a single hydraulic zone with approximately 100 customers.

Greta,
I demonstrated on Friday how the zone is physically connected to its neighbouring zones but hydraulically isolated through shut valves.
Given the age of assets and network pressures, there's always a possibility that these valves are letting through ever so slightly.
However, based off the night flow analysis both John and I have conducted, very little baseline flow within the zone is being measured, somewhere between **0.006L/s and 0.3L/s** for minimum night flows.
Flowrates of this magnitude are too low to measure accurately with the existing flowmeter; however it does tell us that there isn't an alarming rate of flow being picked up by our instrumentation at night, hence supports the dialogue of low network leakage in the area.

From my understanding there are quite a few factors that could contribute towards the discrepancy in cumulative volumes between billing meter and flow meter data:

- Meter error/inaccuracies. Especially for low flows on the flow meter
- Assumptions, if any, made on billing meters (e.g. Estimated usage)
- Bursts and leaks within the network

- Unsealed zone boundaries (Unlikely based off night flow analysis)
- Operational hydrant flushing for various reasons
- Human error

Even if each of these only contributed to a small volume, the relative impact on the mass balance could be significant due to small size of the zone. (Average daily demand of only ~45kL/d)

I believe it'd be worth having a comparison against a few more billing cycles as a sanity check on the initial findings before the information is relayed to the incident team.

Please let me know if further clarification on any of the items listed above is needed.

Kind Regards,

Nico Macwilliams

Asset Integration Senior Engineer



WatersEdge 101 Wells Street
Frankston VIC 3199

From: Pullen, Greta <Greta.Pullen@sew.com.au>

Sent: Sunday, 19 January 2025 9:19 PM

To: McCreesh, Declan <Declan.McCreesh@sew.com.au>; McClurg, Ben <Ben.Mcclurg@sew.com.au>; Gava, Giuliano <Giuliano.Gava@sew.com.au>; Macwilliams, Nico <Nico.Macwilliams@sew.com.au>

Cc: Gent, Carl <Carl.Gent@sew.com.au>; Hook, John <John.Hook@sew.com.au>; Morris, Helen <Helen.Morris@sew.com.au>; Crook, Jonathan <Jonathan.Crook@sew.com.au>

Subject: Re: Night flow analysis for Waller Place PR Zone

Hi Declan

We looked at the zone only however the schematic below shows that is it's not interconnected to another zone - due to the abnormal result we would like you to confirm this.

Thanks

Greta

From: McCreesh, Declan <Declan.McCreesh@sew.com.au>

Sent: Sunday, January 19, 2025 1:45:52 PM

To: Pullen, Greta <Greta.Pullen@sew.com.au>; McClurg, Ben <Ben.Mcclurg@sew.com.au>; Gava, Giuliano <Giuliano.Gava@sew.com.au>; Macwilliams, Nico <Nico.Macwilliams@sew.com.au>

Cc: Gent, Carl <Carl.Gent@sew.com.au>; Hook, John <John.Hook@sew.com.au>; Morris, Helen <Helen.Morris@sew.com.au>; Crook, Jonathan <Jonathan.Crook@sew.com.au>

Subject: RE: Night flow analysis for Waller Place PR Zone

Hi Greta

The zone we are looking at is the Waller Place PR Zone only.

The flow meter is located at the PRV however I believe the SCADA tag is associated with the Waller Place pump station WP208. Nico can confirm this.

Dec

From: Pullen, Greta <Greta.Pullen@sew.com.au>

Sent: Saturday, 18 January 2025 2:56 PM

To: McClurg, Ben <Ben.Mcclurg@sew.com.au>; Gava, Giuliano <Giuliano.Gava@sew.com.au>; McCreesh, Declan <Declan.McCreesh@sew.com.au>

Cc: Gent, Carl <Carl.Gent@sew.com.au>; Hook, John <John.Hook@sew.com.au>; Morris, Helen <Helen.Morris@sew.com.au>; Crook, Jonathan <Jonathan.Crook@sew.com.au>

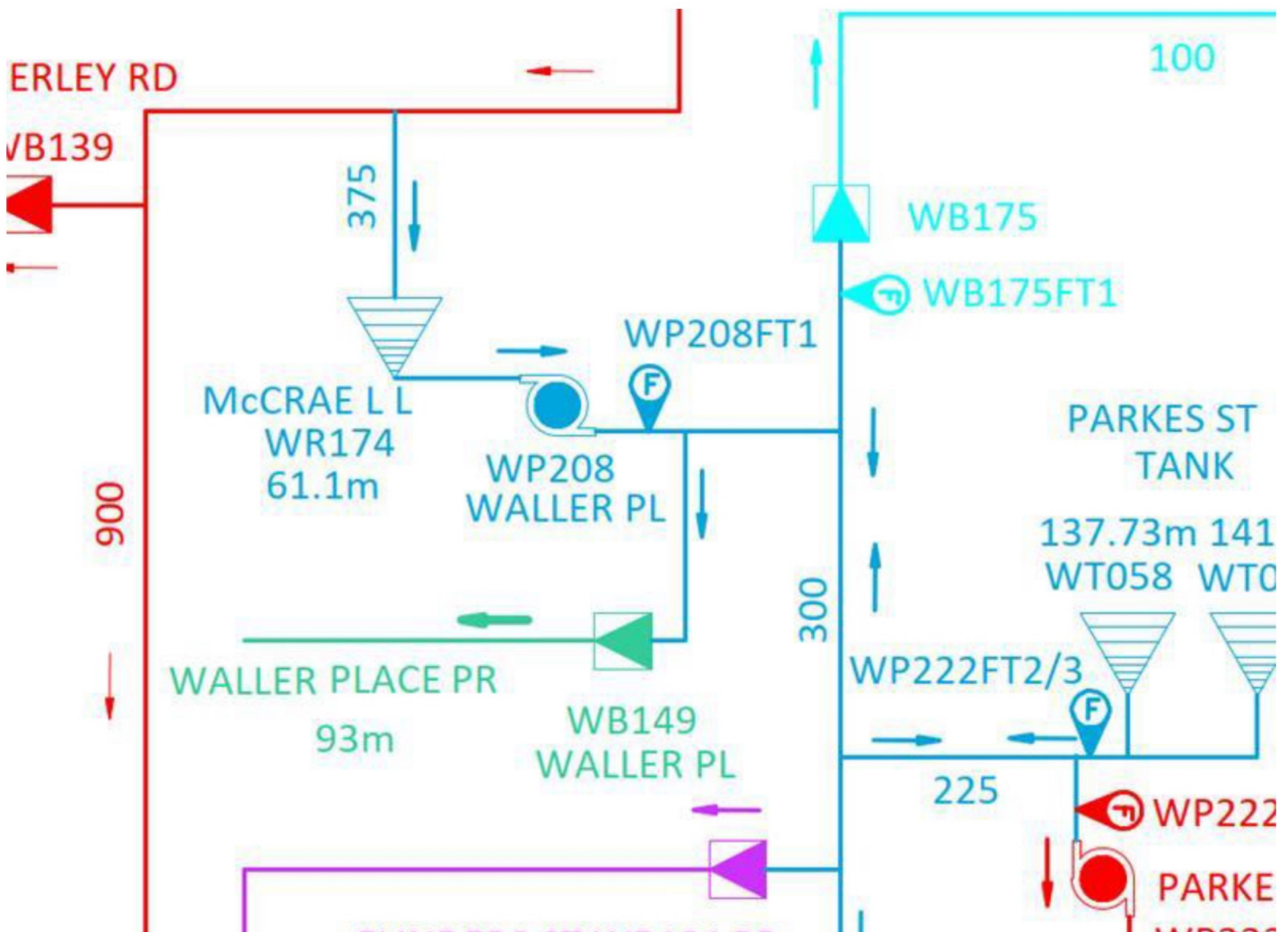
Subject: RE: Night flow analysis for Waller Place PR Zone

Hi all

We pulled the data from the meters in the area and compared to the inflow of the zone but this calculation was indicating losses of 33% which seems too high and abnormal.

I looked at the zone from the schematic drawing (below) and thought it was a contained zone as drawn but the calcs would indicate water flows through to another zone.

Water Ops – can you please advise if the zone is as pictured below or feeds another zone? If it does, we may need to balance the connected zone or have outflow data.



Thank you

Greta Pullen
Non-Revenue Water Manager



WatersEdge 101 Wells Street
Frankston VIC 3199

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From: Pullen, Greta
Sent: Friday, 17 January 2025 2:18 PM
To: McClurg, Ben <Ben.Mcclurg@sew.com.au>; Gava, Giuliano <Giuliano.Gava@sew.com.au>; McCreesh, Declan <Declan.McCreesh@sew.com.au>
Cc: Gent, Carl <Carl.Gent@sew.com.au>; Hook, John <John.Hook@sew.com.au>; Morris, Helen <Helen.Morris@sew.com.au>
Subject: RE: Night flow analysis for Waller Place PR Zone

Hi all

To update: we are working on a zone balance. Once complete we can compare the NRW % in this zone to the wider network ~14%.

Thanks

Greta Pullen
Non-Revenue Water Manager



WatersEdge 101 Wells Street
Frankston VIC 3199

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From: Pullen, Greta

Sent: Friday, 17 January 2025 1:53 PM

To: McClurg, Ben <Ben.Mcclurg@sew.com.au>; Gava, Giuliano <Giuliano.Gava@sew.com.au>; McCreesh, Declan <Declan.McCreesh@sew.com.au>

Cc: Gent, Carl <Carl.Gent@sew.com.au>; Hook, John <John.Hook@sew.com.au>; Morris, Helen <Helen.Morris@sew.com.au>

Subject: RE: Night flow analysis for Waller Place PR Zone

Hi all

If there is a flow meter into the zone we may be able to do a water balance of the last quarter. I can look when the last read was and get Helen (NRW analyst) to see if we can. It's worth noting the zone is small and error on the incoming FM (if exists) and mechanical property meters may be considerable.

Please let me know what you would like us to do.

Thanks

Greta Pullen

Non-Revenue Water Manager



WatersEdge 101 Wells Street
Frankston VIC 3199

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From: McClurg, Ben <Ben.Mcclurg@sew.com.au>

Sent: Friday, 17 January 2025 1:46 PM

To: Gava, Giuliano <Giuliano.Gava@sew.com.au>

Cc: Gent, Carl <Carl.Gent@sew.com.au>; Pullen, Greta <Greta.Pullen@sew.com.au>; Hook, John <John.Hook@sew.com.au>

Subject: RE: Night flow analysis for Waller Place PR Zone

Hi Giuliano

Please see below graph of night usage extended back to July 2022.

It looks like we don't have the data in this zone to accurately state leakage rates. Digital meters would have helped here. Greta has provided non-revenue water rates across our network that could possibly be used if anyone thinks that would be helpful.

Happy to discuss.

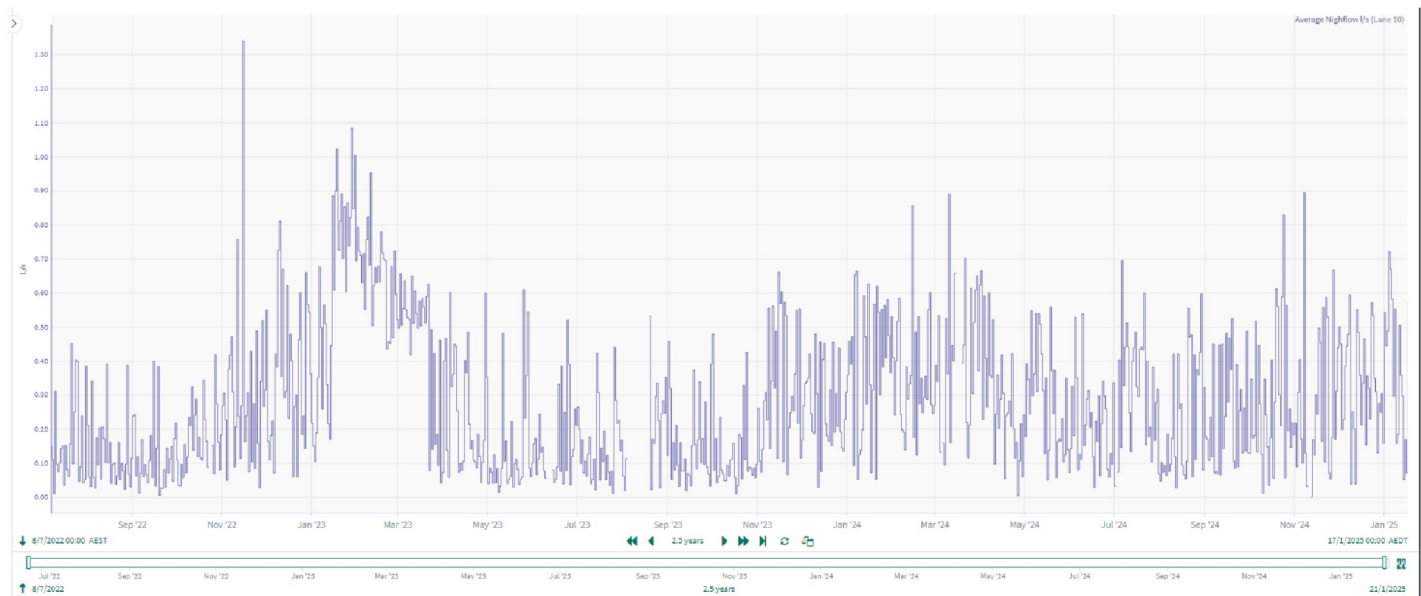
Cheers
Ben

From: Hook, John <John.Hook@sew.com.au>
Sent: Friday, 17 January 2025 12:02 PM
To: McClurg, Ben <Ben.Mcclurg@sew.com.au>
Cc: Gent, Carl <Carl.Gent@sew.com.au>; Pullen, Greta <Greta.Pullen@sew.com.au>
Subject: RE: Night flow analysis for Waller Place PR Zone

Hi Ben,

Answering Q's in red

See extended average nightflow (2-4) (avg'd) to Jul 2022



can you also give me an indication of what the typical night flow is so we have some comparison. Do we have an estimate for lost, non revenue, unaccounted for, leakage in that zone and how that compares to other areas. This would be a very useful fact if we can say with confidence something like.

“The data tells us that the leakage in that area is XX% lower than we would typically expect across our area”. You get the objective here?

The best we can do here is look at whole region leakage report as below and applying it here.

Until a full rollout of digital meters here (94) we couldn't say if it's leakage on our network vs legitimate usage vs leaks on of the properties..

Thanks

John

From: Pullen, Greta

Sent: Friday, 17 January 2025 11:01 AM

To: Hook, John <John.Hook@sew.com.au>

Subject: RE: Night flow analysis for Waller Place PR Zone

Hi John

See snip below from the SEW NRW Calc reported last year.

There have been no Sotto sensors installed in the area unfortunately.

TYPE	INDEX	ITEM	Volume (ML)
Total Non-Residential Water Use		Metered + Own Use + Unmetered Authorised Consumption	37,402.0
REAL LOSSES			
INPUTS			
	47	Real Losses	15,340.1
	48	Length of Water Main	9,938.0
	49	No of service connections	645,135
	50	No of days	366
KPI			
	51	Real losses (kL/km)	1,543.6
	52	Real losses (kL/km/day)	4.22
	53	Real Losses (kL/connection/day)	0.065

I can query the area in regards to Sotto sensors.

Cheers

Greta Pullen

Non-Revenue Water Manager



WatersEdge 101 Wells Street
Frankston VIC 3199

M



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From: McClurg, Ben <Ben.Mcclurg@sew.com.au>
Sent: Friday, 17 January 2025 10:29 AM
To: Hook, John <John.Hook@sew.com.au>
Cc: Gent, Carl <Carl.Gent@sew.com.au>
Subject: FW: Night flow analysis for Waller Place PR Zone
Importance: High

Hi John

As discussed, can you please look at extending the night flow analysis back to July 22.

Let me know how you go with Greta re leakage data for the network. Happy to be involved in a Teams call if required.

Cheers
Ben

From: Gava, Giuliano <Giuliano.Gava@sew.com.au>
Sent: Friday, 17 January 2025 10:00 AM
To: McClurg, Ben <Ben.Mcclurg@sew.com.au>
Subject: FW: Night flow analysis for Waller Place PR Zone
Importance: High

Hi Ben,

Hoping you can assist with the enquiry below. If not, please let me know.

Regards
Giuliano

From: McCreesh, Declan <Declan.McCreesh@sew.com.au>
Sent: Friday, 17 January 2025 9:52 AM
To: Gava, Giuliano <Giuliano.Gava@sew.com.au>
Subject: RE: Night flow analysis for Waller Place PR Zone

Hi Giuliano

Glad I copied you in then. If we can get this today please that would be fantastic. We are getting a lot of attention on this as I'm sure you can imagine. Lara wants to issue a statement today as well.

Dec

From: Gava, Giuliano <Giuliano.Gava@sew.com.au>
Sent: Friday, 17 January 2025 9:36 AM
To: McCreesh, Declan <Declan.McCreesh@sew.com.au>
Subject: RE: Night flow analysis for Waller Place PR Zone

Hi Declan,

Carl is on leave today and Monday.

I'll reach out to Ben and see if he is able to assist in the meantime.

What is the timing expectations for this information?

Regards
Giuliano

From: McCreesh, Declan <Declan.McCreesh@sew.com.au>
Sent: Friday, 17 January 2025 9:21 AM
To: Gava, Giuliano <Giuliano.Gava@sew.com.au>
Subject: FW: Night flow analysis for Waller Place PR Zone

Hi Giuliano
Just keeping you in the loop with this one, and a further request of Carl's team.
Dec

From: Lloyd, Tim <Tim.Lloyd@sew.com.au>
Sent: Friday, 17 January 2025 8:18 AM
To: Ramamurthy, Prerna <Prerna.Ramamurthy@sew.com.au>; Reichwald, Andrea <Andrea.Reichwald@sew.com.au>;
McCreesh, Declan <Declan.McCreesh@sew.com.au>; Gent, Carl <Carl.Gent@sew.com.au>
Subject: RE: Night flow analysis for Waller Place PR Zone

Hi there, sorry, each answer leads to a few more questions! As well as extending this to July 2022, can you also give me an indication of what the typical night flow is so we have some comparison.

Do we have an estimate for lost, non revenue, unaccounted for, leakage in that zone and how that compares to other areas. This would be a very useful fact if we can say with confidence something like; "The data tells us that the leakage in that area is XX% lower than we would typically expect across our area". You get the objective here?

Thank you, and @Gent, Carl great work turning this around so quickly. Appreciated.

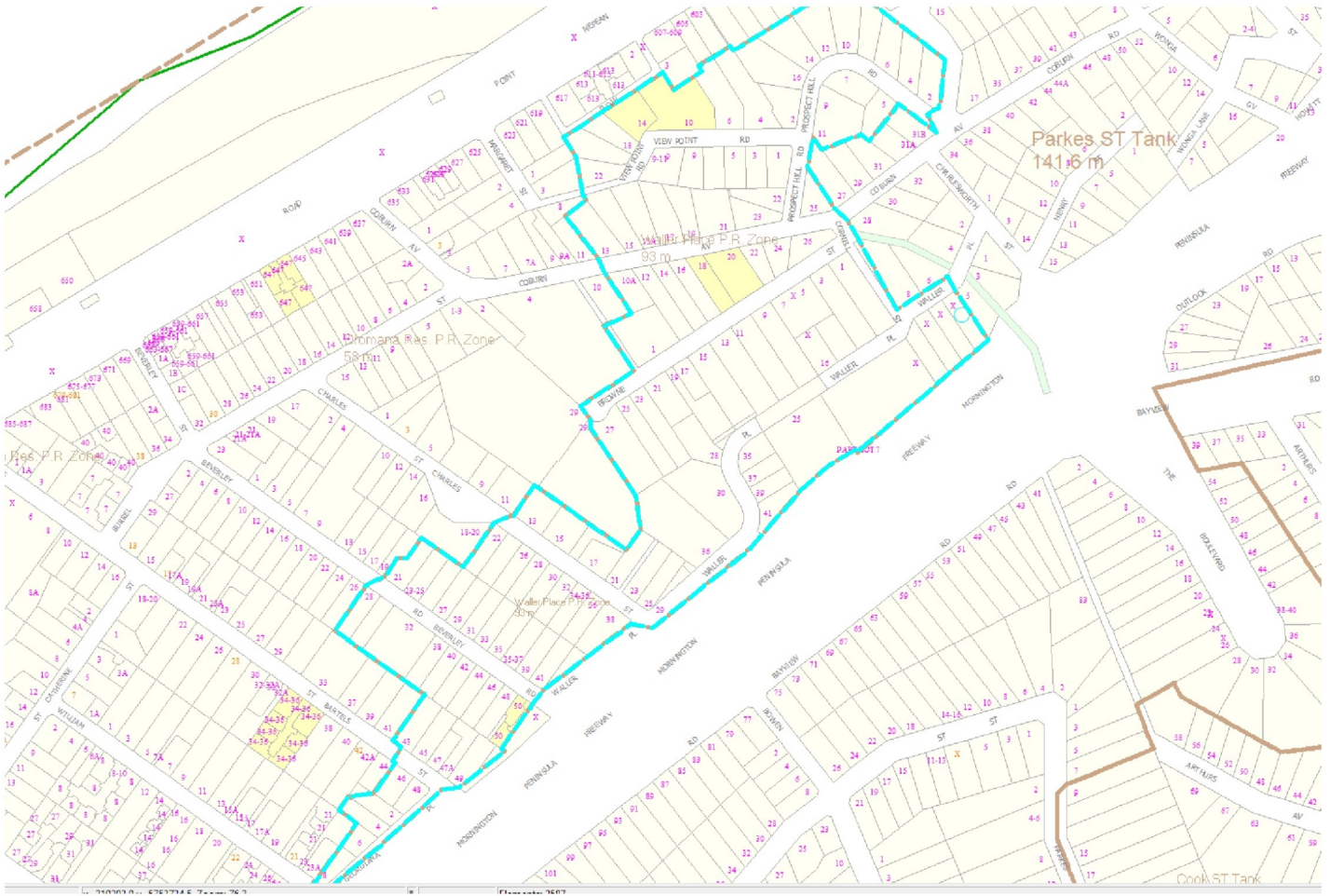
Tim

From: Ramamurthy, Prerna <Prerna.Ramamurthy@sew.com.au>
Sent: Thursday, 16 January 2025 4:55 PM
To: Reichwald, Andrea <Andrea.Reichwald@sew.com.au>; Lloyd, Tim <Tim.Lloyd@sew.com.au>
Subject: FW: Night flow analysis for Waller Place PR Zone

Night time flows are consistently low (less than 1 l/sec)

From: McCreesh, Declan <Declan.McCreesh@sew.com.au>
Sent: Thursday, 16 January 2025 4:50 PM
To: Ramamurthy, Prerna <Prerna.Ramamurthy@sew.com.au>
Cc: Peril, Marc <Marc.Peril@sew.com.au>; Pham, Dat <Dat.Pham@sew.com.au>
Subject: FW: Night flow analysis for Waller Place PR Zone

Hi Prerna
See information as requested below. Night time flows are consistently low and as expected for the Waller Place distribution zone and seasonal usage patterns.
The Waller Place Pressure Reduced Distribution Zone area is shown below as well (marked in blue).
Regards
Declan



From: Gent, Carl <Carl.Gent@sew.com.au>
Sent: Thursday, 16 January 2025 4:30 PM
To: McCreesh, Declan <Declan.McCreesh@sew.com.au>
Cc: Gava, Giuliano <Giuliano.Gava@sew.com.au>
Subject: RE: Night flow analysis for Waller Place PR Zone

Hi Declan,

Below are the nightflows only (between 2-4am each day. The units are l/sec.



Thanks
Carl

From: McCreesh, Declan <Declan.McCreesh@sew.com.au>
Sent: Thursday, 16 January 2025 3:57 PM
To: Gent, Carl <Carl.Gent@sew.com.au>
Cc: Gava, Giuliano <Giuliano.Gava@sew.com.au>
Subject: RE: Night flow analysis for Waller Place PR Zone

Hi Carl
Thanks for the quick turnaround on this. A graph would be great if you can produce it.
Dec.

From: Gent, Carl <Carl.Gent@sew.com.au>
Sent: Thursday, 16 January 2025 3:14 PM
To: McCreesh, Declan <Declan.McCreesh@sew.com.au>
Cc: Gava, Giuliano <Giuliano.Gava@sew.com.au>
Subject: RE: Night flow analysis for Waller Place PR Zone

Hi Declan,

We have checked flows through the flowmeter downstream of the PRV for Waller Place PR Zone over a period of several years and there does not appear to be any reportable differences in the night flows. **The night flow is extremely low (less than 1 l/sec) and relatively consistent.**

Do you need any further evidence of this? Graphs Ect.?

Regards
Carl

From: McCreesh, Declan <Declan.McCreesh@sew.com.au>
Sent: Thursday, 16 January 2025 12:50 PM
To: Gent, Carl <Carl.Gent@sew.com.au>
Subject: RE: Night flow analysis for Waller Place PR Zone

Thanks Carl.
Greatly appreciated.
Dec

From: Gent, Carl <Carl.Gent@sew.com.au>
Sent: Thursday, 16 January 2025 12:50 PM
To: McCreesh, Declan <Declan.McCreesh@sew.com.au>
Cc: Gava, Giuliano <Giuliano.Gava@sew.com.au>; Ramamurthy, Prerna <Prerna.Ramamurthy@sew.com.au>
Subject: RE: Night flow analysis for Waller Place PR Zone

Hi Declan

Yes, I will get someone onto it straight away.

Regards
Carl

From: McCreesh, Declan <Declan.McCreesh@sew.com.au>
Sent: Thursday, 16 January 2025 12:27 PM
To: Gent, Carl <Carl.Gent@sew.com.au>
Cc: Gava, Giuliano <Giuliano.Gava@sew.com.au>; Ramamurthy, Prerna <Prerna.Ramamurthy@sew.com.au>
Subject: Night flow analysis for Waller Place PR Zone

Hi Carl

As you may be aware we have a declared an Incident to manage the impact from the land slip in McCrae. As part of the investigation we need to ensure that we do not have any water leaking in this area that may have contributed to the issue. We have already undertaken leak detection in this zone and didn't uncover anything alarming.

A request has been made to review the night flows over the last 18 months for the Waller Place PR Zone to determine if there has been anything of note. Can your team assist with this urgent request?

Thanks

Declan

Declan McCreesh

Group Manager Network Operations



WatersEdge 101 Wells Street
Frankston VIC 3199

T +613 9552 3441

M PI



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