In The Matter of the Resource Management Act 1991 ("the Act") And

In The Matter West Melton - Plan Change 67

OFFICER COMMENTS OF SHANE BISHOP

Introduction

1. My name is **SHANE DAVID STEPHEN BISHOP.** I have a degree in Civil Engineering from Canterbury University (BE (Civil) Hons 1996) and am a Member of Engineering New Zealand).

2. I am a Principal Engineer at Stantec New Zealand (Stantec NZ), a firm of consulting engineers providing technical engineering, construction and consulting services for water and natural resources projects. Stantec NZ is part of Stantec Inc, an international professional services company in planning, engineering, architecture, surveying, environmental sciences, project management and project economics for infrastructure and facilities projects.

3. I have been a Principal Engineer at Stantec NZ for more than six years, and employed by the company for more than 24 years in total. The principal functions of my role are associated with investigation, planning and design of '3-Waters' assets: potable water, stormwater and drainage, and wastewater. These functions extend to project and programme management, and design team leadership.

4. I have supported the Selwyn District Council ("the Council") in a role of engineering advisor specialising in wastewater and water planning and development and I am authorised to present this statement on its behalf.

5. I confirm that the matters on which I express an opinion are within my field of

expertise.

Scope of Statement

6. I have considered the plan change application (Plan Change 67) in relation to the water supply, wastewater system and stormwater network operated by Council which might be impacted by this plan change. Where appropriate, I have also addressed the relevant submission points directed to me by the Processing Planner to consider.

7. I have read in particular the September 2020 Infrastructure Report by Davie Lovell Smith included in the PC Application and the supplementary information provided.

Water Supply

8. Submissions have been received from H Stevenson, W Beavon, and J Manera expressing concerns of the impact of the development of the West Melton water supply on existing bores and the ability to supply the community. The operational bore depths range from 78m to 202m deep, each drawing water from semi-confined aquifers through screens installed near the full depth of the well. Given the confining layers, abstracting water from these bores would have little to no effect on wells that draw water from a higher level.

9. The water supply generally provides on-demand' connections via water meters with the exception of Johnson Road being a metered tank supply and a number of properties in West Melton are supplied through a restricted connection (**Refer Appendix 1**).

10. The Greater West Melton Water Supply provides UV treated groundwater to the communities of Edendale, Johnson Road and West Melton.

11. Consents "To take and use Groundwater" (CRC169800, CRC172478, CRC192996 and CRC164009) limit the maximum rate of take to 907,071 cubic metres per year or 1,053,726 cubic metres when CRC192996 irrigation allowance is included. The consents also provide for a combined 7 consecutive day volume of 55,994 cubic metres.

12. Water is sourced from five bores being M35/17757, M35/17758, M35/10751, BX23/0829 and BX23/0590 (of other bores listed within the Consents M35/3673,

M35/5579 and M35/6201 are decommissioned).

13. The peak daily demand (as measured in the 2020 calendar year) was 4,254 m^3 as generated from 878 existing properties.

14. Over the four years since 1 July 2017 the largest 12 month water demand was 588,740 cubic metres. Over the same four year period the greatest 7 consecutive day volume was 25,558 cubic metres. The water supply currently utilises around half of the consented allocation and therefore there is consent capacity available for growth.

15. Currently the physical water supply infrastructure (those assets which abstract, treat, store and pump water) have capacity to meet existing demands and part of planned / proposed future growth requirements. Upgrades are required to accommodate additional growth.

Future Growth Demand

16. In response to the accelerated growth within the Selwyn District, hydraulic models have been used to plan future water infrastructure for a number of water supplies including West Melton.

17. The master planning provides an assessment of the sizing and timing of new infrastructure for new reservoirs, water sources (bores) and pipelines to service growth. Part of the master planning requires a water balance to be developed to forecast growth, using historical peak demand per household. The water balance forecasts the peak instantaneous flow per year versus the water resources available to determine the staging of new bores (**Refer Appendix 1**).

18. West Melton is expected to see growth over the next 30-years and to meet this growth, capacity upgrades are proposed. The Council 2021 – 31 Long Term Plan which includes budget for further upgrades on the West Melton water supply to address capacity constraints.

19. The proposed development would provide water via metered and restricted connections. The additional demand was estimated at 13.89 litres per second.

20. As identified by the applicant, the West Melton water supply was at or approaching capacity at the time of preparing their submission. The Infrastructure report

provides a number of upgrade options to provide for this growth including connection to Edendale (now completed), connection to the Johnson Road bore (no longer viable as the bore is de-commissioned), redevelopment of the Wilfield bore (now completed), construction of a larger reservoir and pipeline upsizing.

21. The details of any specific upgrades required can be addressed more specifically through the subdivision consent and engineering approval process. At this stage, I am satisfied that the applicant has identified that there are a number of feasible measures to provide the required additional capacity for this water supply network.

Fire Fighting Capacity

22. The West Melton scheme was designed as a domestic supply and complies with the NZ Fire Fighting Code of Practice.

23. The September 2020 Infrastructure Report accompanying the plan change states that *"The water supply will be designed in accordance with SDC specifications and SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice. The fire fighting water supply classification will be FW2."*

24. Council confirms that all new subdivisions are required to be designed and constructed in accordance with Selwyn District Councils 'Engineering Code of Practice'. Section 7.5.4 – Fire service requirements, provides the following requirement:

    "The water supply reticulation should comply with the Fire Service Code of Practice. In particular, the reticulation must meet the requirements for firefighting flows, residual fire pressure and the spacing of hydrants.

    Location of hydrants shall comply with SNZ PAS 4509: 2008 with minimum hydrants spacing of 135 metres. Blue RRPM's (cat eyes) shall be installed to offset from the road centreline adjacent to all hydrants. Hydrant Marker posts are to be installed to comply with Section G3.4 of the NZ Fire Service Code of Practice. Hydrant posts are not required in urban areas. The type of hydrant marker required is shown on drawing WS10.0 (see Appendix V).'

25. In summary, the reticulated water supply for this proposed plan change shall be

designed to meet firefighting standards

Conclusion – Water Supply

26. I consider that although additional capacity within the network to fully service this and other West Melton plan changes currently submitted (namely Plan Change 67, Plan Change 74, and Plan Change 77) is not currently available, capacity upgrades are proposed and planned for and therefore future water demand from the proposed plan change can be met

27. It is noted that development contributions are payable for any additional lot developed.

Wastewater

Wastewater - Conveyance

28. Conveyance of the existing wastewater system for West Melton is principally via gravity to catchment pump stations. All flows are conveyed to the current terminal pump station (Gainsborough Pump Station in Rossington Drive) which then pumps wastewater to Councils gravity manhole located at the intersection of Walkers and Runners Roads. Wastewater from West Melton ultimately discharges to the Pines Wastewater Treatment Plant (Pines WwTP) in Rolleston **(refer Appendix 2).**

29. The discharge system was designed by then Duffill Watts & King Ltd in 2006-2007. Construction works were undertaken by BG Contracting Ltd, with completion in late 2007. The Operation and Maintenance manual dated May 2008 states that the system was designed and constructed to serve approximately 700 residential properties. The manual describes the system comprising a pump station, Rising Main (approximately 8000m of DN225 PE100 PN10 pipe) and a gravity main (approximately 2000m of DN225 SN8 uPVC pipe).

30. The design of the pump station, pressure main and gravity network was in line with Councils Engineering Code of Practice. Due to low ground water levels and a modern wastewater network, actual flows observed are significantly less than predicted. Currently, approximately 830 wastewater connections exist (630 are actively used). The system is performing better than designed.

31. Initial hydraulic modelling has been completed by Councils consultant WSP (December 2020) and the results indicate that flows are being 'attenuated' within the falling pressure main resulting in the flow rate observed at the end of the pressure main being far less than that which is pumped into the main.

32. More work including pressure monitoring within the pressure main, flow monitoring at the discharge point of main, and further modelling is required before an absolute ultimate capacity of the system can be confirmed.

33. The September 2020 Infrastructure Report by Davie Lovell Smith states that the proposed plan change area is to be serviced by Low Pressure Sewer discharging to the existing wastewater pump station on Silver Peaks Drive and then onto the main wastewater pump station at Rossington Drive. I accept the conclusion from the Infrastructure Report that the system has capacity to accept and convey flows from the existing catchment and proposed flows from this plan change to the main Rossington Drive pump station.

34. The applicant has provided a number of options to either increase capacity or improve the management of flows within the network including extending the pressure main directly to the Pines Wastewater Treatment Plant, pump upgrades, and the provision of additional wastewater storage at pump stations.

35. There have been a number of Plan Change applications received (Plan Change 67, Plan Change 74, and Plan Change 77) by Council for West Melton which have the potential to impact the solution required to meet growth. The statements I have made regarding wastewater servicing options consider the current Plan Change applications submitted.

36. In a submission from ECan concerns were raised on the capacity of the proposed upgrades as being sufficient to cater for growth. The Infrastructure Report states that extending the Wastewater Rising Main "provides for an additional 447 lots". The total number of lots has been calculated on the basis of the Council Code of Practice requirements for the assessment of pipeline infrastructure, and on peak flows being conveyed. The actual wastewater discharges within the community are lower than defined within the Council CoP due lack of wet weather response within the catchment. As such, there is greater capacity within the existing wastewater

network, and subsequently within the proposed Wastewater Rising Main extension.

37. The details of any specific upgrades required can be addressed more specifically through the subdivision consent and engineering approval process. At this stage, I am satisfied that the applicant has identified that there are a number of feasible measures to provide the required additional capacity for this wastewater network.

Wastewater - Treatment

38. Wastewater is treated at the Pines WwTP in Rolleston and treated effluent disposed of via centre pivot irrigation on surrounding land. Council consulted on the expansion of the Pines WwTP, to cater for growth, as part of the 2021/22 LTP. Pines is currently at or near capacity with upgrades currently underway and additional upgrades planned and budgeted for.

39. The Pines WwTP is designed to be progressively upgraded to accommodate up to 60,000 person equivalents (PE) of incoming flow, with plans to increase the treatment capacity up to 120,000 PE being prepared. The current connected catchment (2021) has a population equivalent of approximately 42,000 – 45,000 PE. Connections from Darfield and from Leeston are planned within the next 3-4 years. These connections along with projected growth are estimated to require additional treatment processes developed on site to meet incoming flows from 2030 onwards. These upgrades are planned and budgeted for within the Selwyn District Council 2021-2031 Long Term Plan.

40. The land surrounding the Pines WwTP has 7 centre pivot irrigators currently irrigating an area of 189 ha, with another 50 ha centre pivot irrigator to be installed this year (2021/22) bringing the total to 239 ha. This equates to servicing for more than 95,000 PE, or more than 75,000 PE if the largest irrigator is not in operation. There are long term plans to expand the irrigation area to cover 302 ha. This equates to servicing for more than 120,000 PE, or more than 100,000 PE if the largest irrigator is not in operation. Ultimately, additional areas within the 486 ha of land consented could be developed for land based disposal, while remaining in compliance with the existing Resource Consent conditions.

Conclusion - Wastewater

41. There is a viable means to treat and dispose of wastewater for this plan change area.

Stormwater

42. The soils beneath West Melton are typically free draining river borne sandy gravels , and the groundwater level has a typical depth 23.7m below the surface.

43. It is anticipated by the applicant that stormwater would discharge to ground via sump to soakhole for public areas and roads, and soakholes on private properties / individual sites. This approach is consistent with the surrounding urban development areas.

44. Resource consent for stormwater discharge from Environment Canterbury will be required before any subdivision consent can be approved.

Conclusion - Stormwater

45. There is a viable means to dispose of stormwater for this plan change area. I would recommend that a stormwater consent is obtained from Environment Canterbury prior to resource consent been applied for from Selwyn District Council.

Overall Conclusion

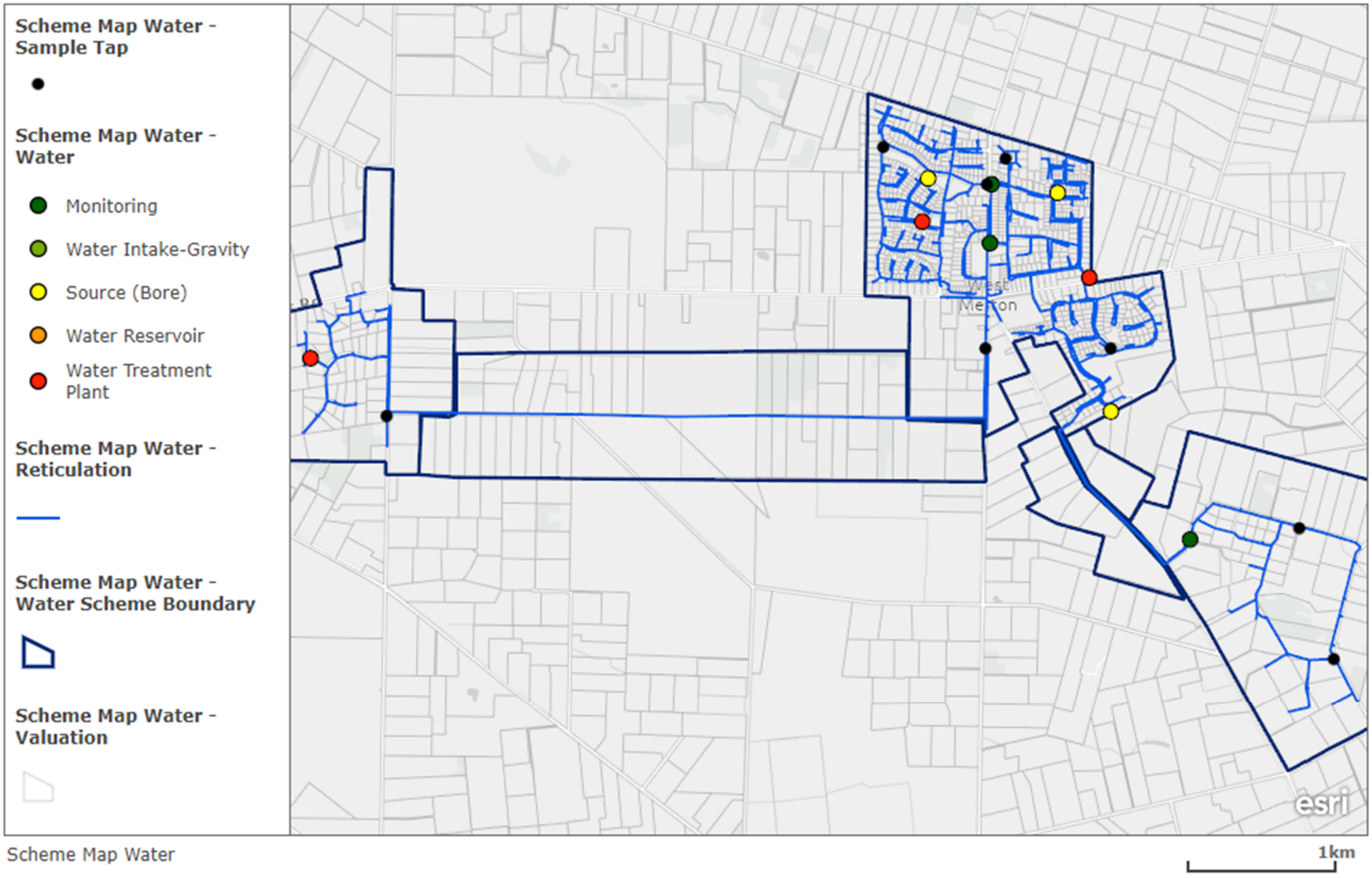
46. There are viable means to provide drinking water, to manage wastewater and to discharge stormwater. On this basis, I support proposed Plan Change 67.

Shane Bishop

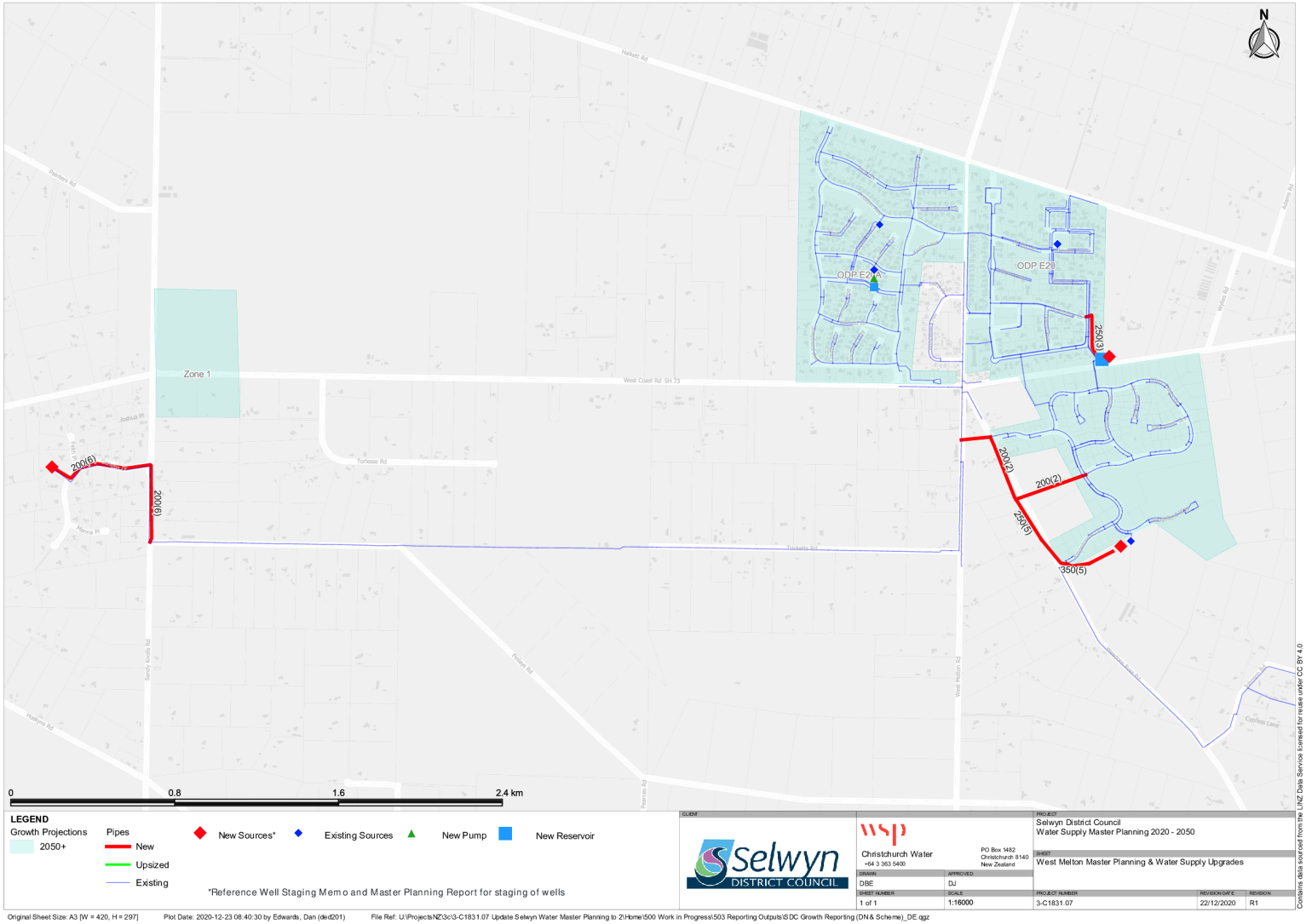
19 August 2021

Appendix 1

Existing West Melton Water Supply – Scheme layout



West Melton Water Supply – Planned Upgrades

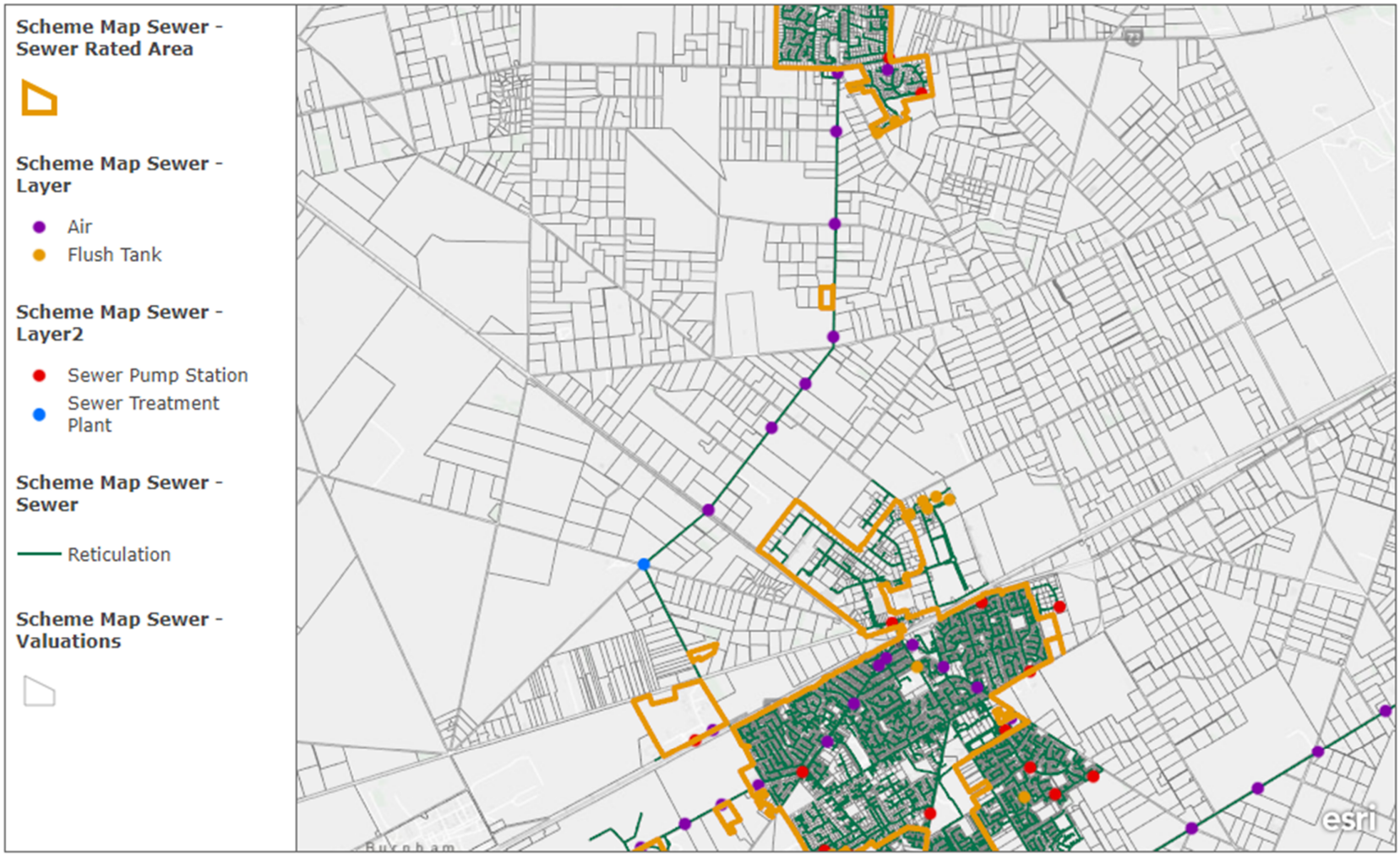


Appendix 2 –

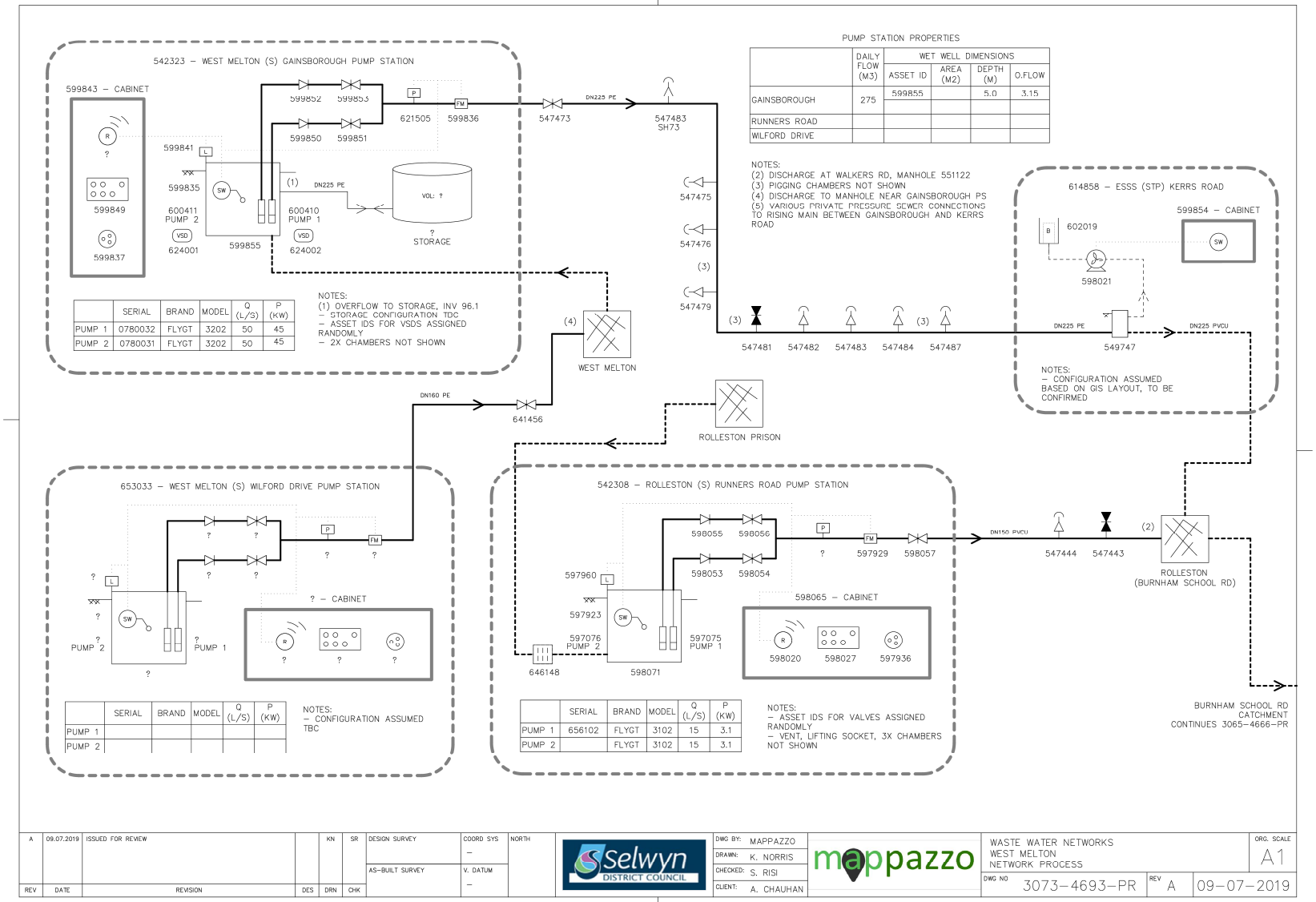
Existing West Melton Wastewater Network - Community

Scheme Map Sewer

Existing West Melton Wastewater Network – Connection to Rolleston Wastewater Network



Scheme Map Sewer


542323 – WEST MELTON (S) GAINSBOROUGH PUMP STATION
599843 – CABINET
599849
599837
599841
599835
600411
PUMP 2
624001
599855
600410
PUMP 1
624002
599852
599853
599850
599851
621505
599836
DN225 PE
VOL: ?
STORAGE
547473
547483
SH73
547475
547476
(3)
547479
(3)
547481
547482
547483
547484
(3)
547487
PUMP STATION PROPERTIES
DAILY FLOW (M3)
WET WELL DIMENSIONS
ASSET ID
AREA (M2)
DEPTH (M)
O.FLOW
GAINSBOROUGH
275
599855
5.0
3.15
RUNNERS ROAD
WILFORD DRIVE
NOTES:
(2) DISCHARGE AT WALKERS RD, MANHOLE 551122
(3) PIGGING CHAMBERS NOT SHOWN
(4) DISCHARGE TO MANHOLE NEAR GAINSBOROUGH PS
(5) VARIOUS PRIVATE PRESSURE SEWER CONNECTIONS TO RISING MAIN BETWEEN GAINSBOROUGH AND KERRS ROAD
SERIAL
BRAND
MODEL
Q (L/S)
P (KW)
PUMP 1
0780032
FLYGT
3202
50
45
PUMP 2
0780031
FLYGT
3202
50
45
NOTES:
(1) OVERFLOW TO STORAGE, INV 96.1
– STORAGE CONFIGURATION TDC
– ASSET IDS FOR VSDS ASSIGNED RANDOMLY
– 2X CHAMBERS NOT SHOWN
614858 – ESSS (STP) KERRS ROAD
599854 – CABINET
602019
598021
DN225 PE
549747
DN225 PVCU
NOTES:
– CONFIGURATION ASSUMED BASED ON GIS LAYOUT, TO BE CONFIRMED
WEST MELTON
(4)
641456
DN160 PE
ROLLESTON PRISON
653033 – WEST MELTON (S) WILFORD DRIVE PUMP STATION
? – CABINET
PUMP 2
PUMP 1
SERIAL
BRAND
MODEL
Q (L/S)
P (KW)
PUMP 1
PUMP 2
NOTES:
– CONFIGURATION ASSUMED TBC
542308 – ROLLESTON (S) RUNNERS ROAD PUMP STATION
598055
598056
598053
598054
597960
597923
597076
PUMP 2
597075
PUMP 1
646148
598071
598065 – CABINET
598020
598027
597936
597929
598057
DN150 PVCU
547444
547443
(2)
ROLLESTON
(BURNHAM SCHOOL RD)
SERIAL
BRAND
MODEL
Q (L/S)
P (KW)
PUMP 1
656102
FLYGT
3102
15
3.1
PUMP 2
FLYGT
3102
15
3.1
NOTES:
– ASSET IDS FOR VALVES ASSIGNED RANDOMLY
– VENT, LIFTING SOCKET, 3X CHAMBERS NOT SHOWN
BURNHAM SCHOOL RD CATCHMENT CONTINUES 3065–4666–PR
A
09.07.2019
ISSUED FOR REVIEW
KN
SR
DESIGN SURVEY
AS–BUILT SURVEY
COORD SYS
V. DATUM
NORTH
REV
DATE
REVISION
DES
DRN
CHK
Selwyn DISTRICT COUNCIL
DWG BY: MAPPAZZO
DRAWN: K. NORRIS
CHECKED: S. RISI
CLIENT: A. CHAUHAN
mappazzo
WASTE WATER NETWORKS
WEST MELTON
NETWORK PROCESS
ORG. SCALE
A1
DWG NO
3073–4693–PR
REV
A
09–07–2019