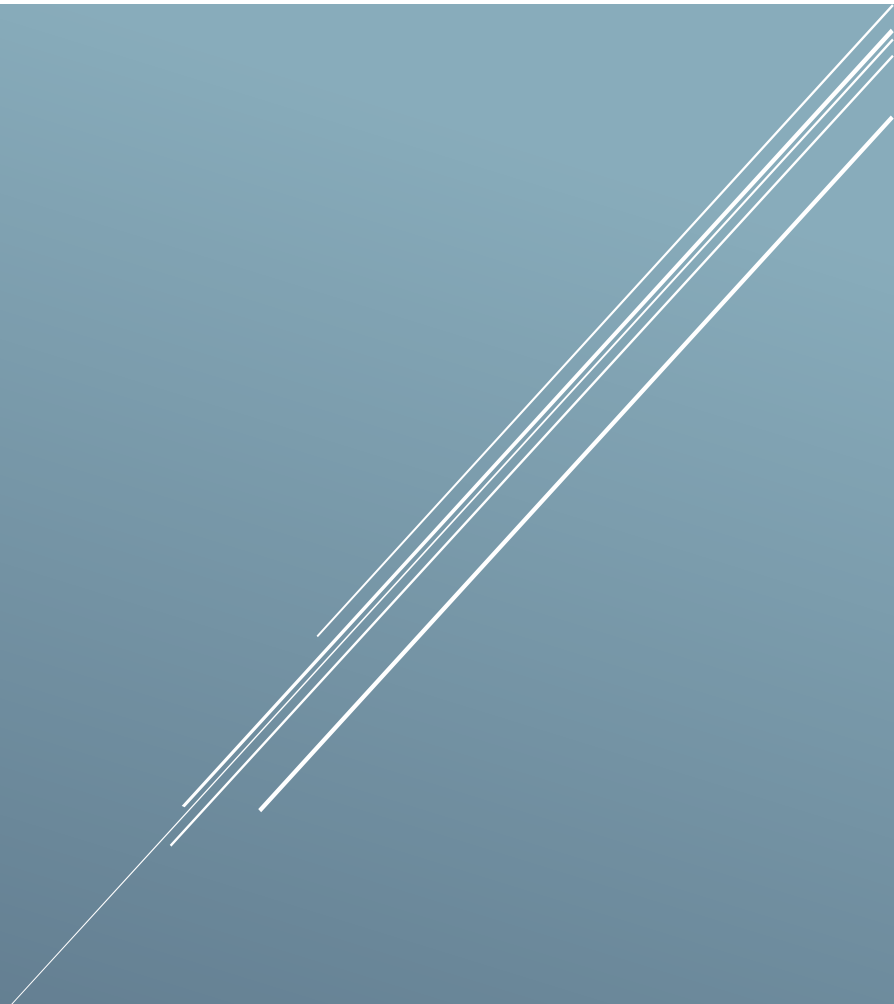


Appendix D – Precinct Sewage Considerations



SUNNYSIDE ESTATE

Precinct sewage considerations

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1. Introduction

In response to the initial submissions for the proposed LEP Variation for the Sunnyside Estate development the following advice was received from WWCC:

"I confirm that Council is requesting that the planning proposal investigates, and has consideration to, infrastructure provision across a wider precinct than just the planning proposal subject site. A wider precinct area was identified, and is referenced in your planning proposal, in the 2013 Spatial Plan and this should be considered as the minimum area for further investigation and assessment for infrastructure. We would also request that this area be extended to include rural residential areas between your site and the wider precinct area (as referenced from the Spatial Plan 2013). This consideration should include that area of rural residential development through to the existing urban development".

"I have included a plan with this email which provides an indicative area for investigation and reflects that described above" (refer Figure 1).

"Following our meeting, further discussions with our Infrastructure team have identified that there are potential issues with the capacity of the Koorngal Sewerage Treatment Plant and its ability to cater for expansion and intensification across the catchment. It is anticipated that your investigations will provide further information and detail that will assist with this planning and analysis to determine the capacity of the sewerage treatment plant and any staging required to cater for any future expansion and intensification of development in the catchment."



Figure 1: indicative area for investigation (source: WWCC 2020)

The indicative area for investigation is shown in Figure 1 and comprises approximately 1,111 hectares including the proposed Sunnyside Estate (110ha).

2. Zoning

The current zoning within the indicative area for the investigation comprises R5 (Large Lot Residential), RU6 (Transition) and a small area of RE1 (Public Recreation) to the north and RU1 (Primary Production) to the south.

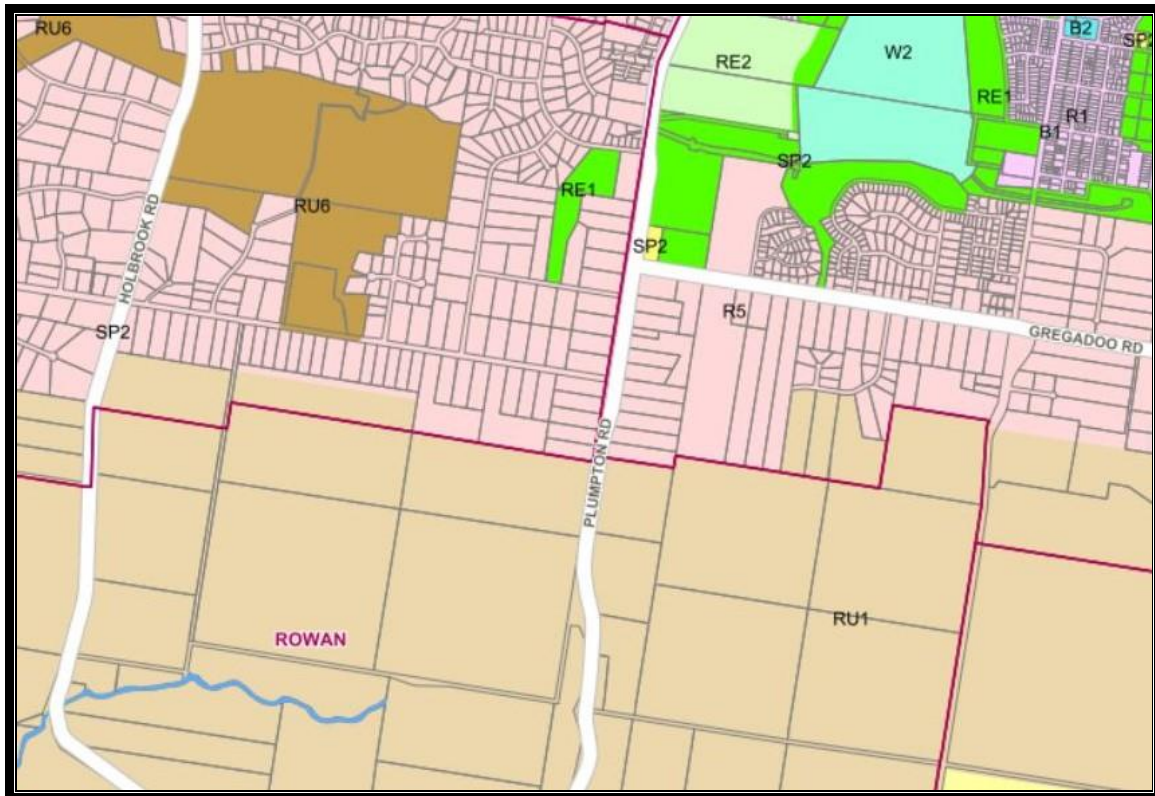


Figure 2: Zoning (source: WWCC)

3. Existing Topography

The topography for the indicative area for the investigation is detailed in Figure 3.

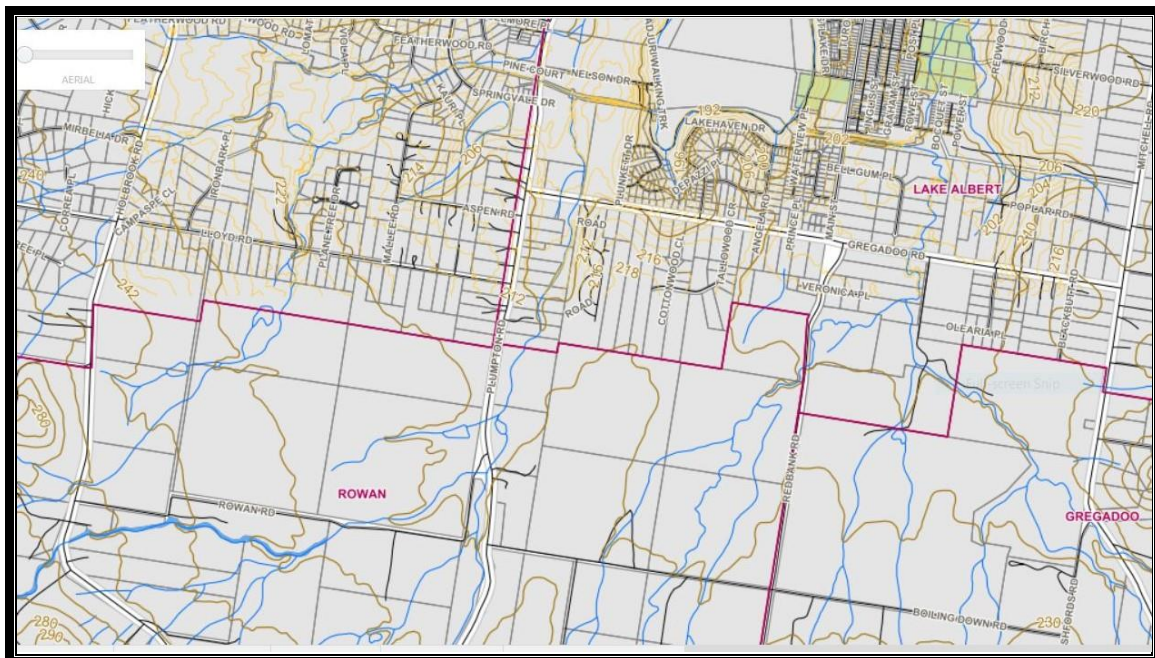


Figure 3: ground contours (Source: WWCC)

4. Existing sewer network

The existing sewer network in the indicative area for the investigation is detailed in Figures 4 and 5. Figure 4 details the location of the proposed Sunnyside Estate development (red rectangle) and the connection point for the sewer outfall from the estate as advised by WWCC – red cross at the intersection of Nelson Road and Plumpton Road.

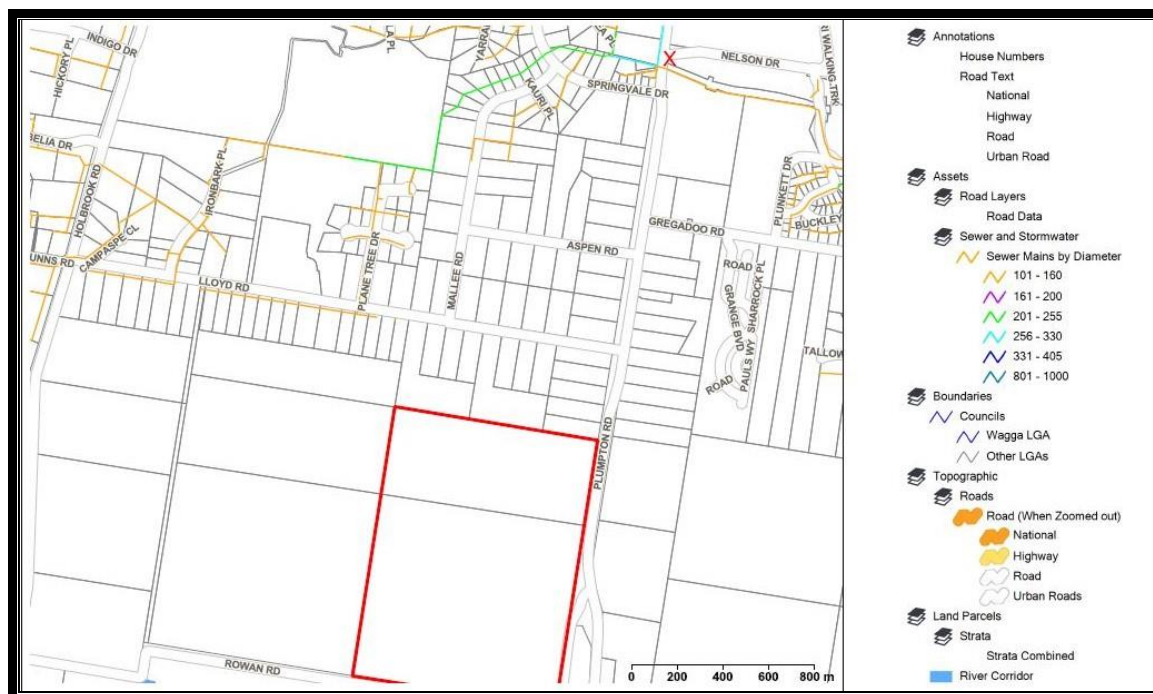


Figure 4: Sewer network (source WWCC 2020)

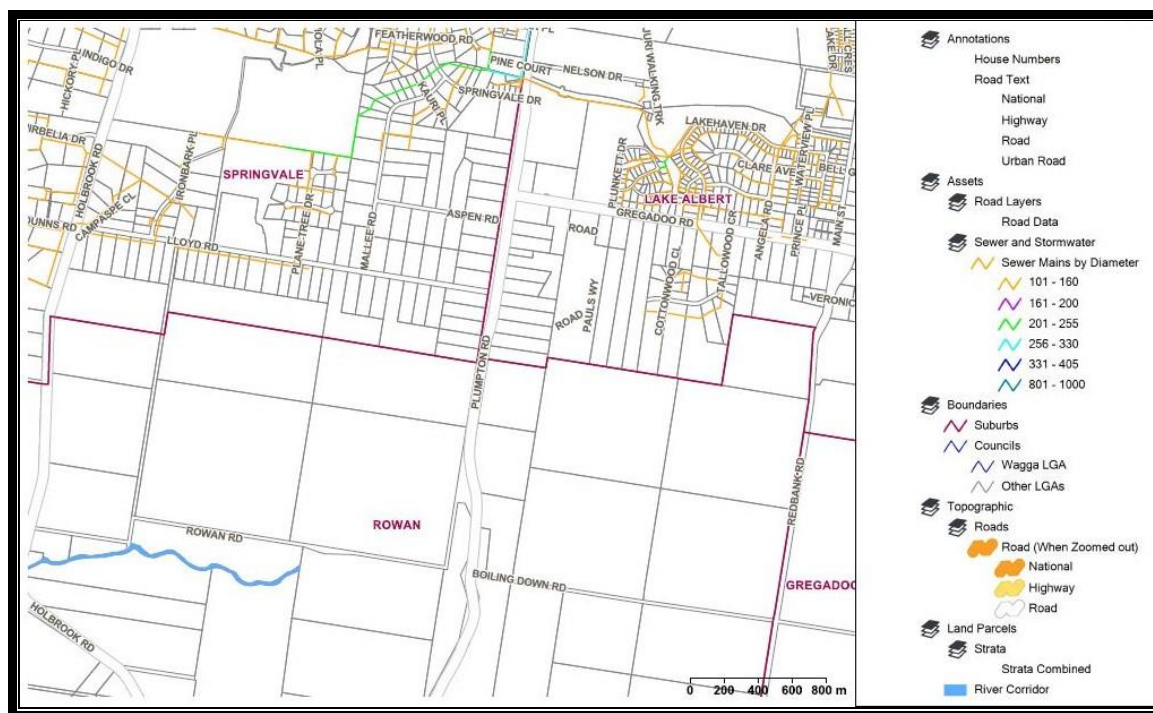


Figure 5: sewer network (source WWCC 2020)

5. Sewage Treatment Plants

There are three main sewage treatment plants (STPs) currently servicing the Wagga Wagga area, these STPs are at Narrung Street, Koorungal and Forest Hill. There are also two minor STPs, one at Uranquinty and one at Tarcutta. Effluent reuse is also active in Wagga Wagga. Each sewage treatment plant has to be licensed under the Environment Protection Authority (EPA). For more information visit the EPA.

We understand from WWCC that the sewage from the indicative area for the investigation flows to the STP located at Vincent Road, Koorungal, approximately 8 km southeast of the CBD. The main objective of the plant is to treat sewage collected from the areas of Koorungal, Tatton, Lake Albert, and the pressure sewer from East Wagga and Gumly Gumly.

The treatment load primarily consists of domestic sewage with a light industrial area located within the sewer catchment. The first step in the process consists of screening and grit removal. Following these stages, the flow splits into two process streams for further treatment. Approximately 15% is treated through primary sedimentation, trickling filtration and secondary filtration. The remaining 85% passes through a newer treatment process and includes primary sedimentation, high rate trickling filtration, aeration and secondary sedimentation.

All effluent flows into tertiary ponds. Waste sludge is digested and held in two lagoons, where it is removed to landfill when required. The final effluent from the process is discharged into either the Murrumbidgee River via Marshall's Creek or into the network of effluent reuse/irrigation projects administered by Council.

The current and future loading for the Koorungal Sewage Treatment Plant as detailed in the *Development Servicing Plan No 1: Sewage Services WWCC* (adopted by WWCC July 2013) is detailed in Table 1:

Parameter	2016	2021	2026	2031	2041
Load – Equivalent Tenements (ET)	8,024	8,208	8,304	8,431	8,730
EP/ET ratio	2.47	2.48	2.48	2.47	2.47
Load – Equivalent persons	19,805	20,331	20,573	20,806	21,544
Average Dry Weather Flow (ML/d)	4.2	4.3	4.3	4.4	4.5

Table 1: Koorungal STP Current and future loading

The upgraded (before 2013) Koorungal Sewage Treatment Plant has a nominal capacity of 20,000EP or 4.5ML/day. The capacity was projected (in 2013) to be exceeded on an EP basis between 2016 and 2021, and on a volume basis by 2041. The projections indicate the capacity would be exceeded by 8% which was considered to be less than an economic plant upgrade. As a consequence, no further upgrade was recommended or costed in the DSP.

Based on the above, and assuming the 2021 ET is as per the nominated number, the Koorungal STP has the capacity to manage an additional 522 ET across the catchment after which the Koorungal STP will require upgrading or a second STP constructed to manage future flows from its catchment.

The RFQ2021-530 Sewer Network Capacity Model states “ *while the Koorungal treatment works don’t service an identified growth area, they service an area where infill development is becoming more popular. There are concerns about the capacity of this treatment works to service the infill development.*”

We understand from the EPL-392-Koorungal-STP-monitoring-data that the Koorungal Sewerage Treatment Plant was compliant with its licence requirements through 2020.

6. Koorungal Sewage Pumping Station

The Koorungal Sewage Pumping Station services almost the entire residential catchment of the Koorungal Sewerage Treatment Plant. The Koorungal SPS was replaced in 2002 with a larger station.

The current and future loading for the Koorungal SPS as detailed in the *Development Servicing Plan No 1: Sewage Services WWCC* (adopted by WWCC July 2013) is detailed in Table 2:

Parameter	2016	2021	2026	2031	2041
Load – Equivalent Tenements (ET)	6,717	6,867	6,942	7,047	7,287
Peak Dry Weather Flow (l/sec)	82	84	84	86	88
Peak Dry Weather Flow (l/sec)	277	283	286	290	300

Table 2: Koorungal SPS Current and future loading

Development Servicing Plan noted that no works were proposed as part of the DSP.

Based on the above, and assuming the 2021 ET is as per the nominated number, the Koorungal SPS has the capacity to manage an additional 420ET across the catchment after which the Koorungal SPS may require upgrading or a second SPS constructed to manage future flows from its catchment.

7. Site characteristics and indicative masterplan

The area to the north of the proposed Sunnyside Estate is zoned as RU6 and R5 and has large lot rural type dwellings across the area whereas the area to the east and west of the proposed Sunnyside Estate and the proposed Sunnyside Estate area itself have limited dwellings, mostly being dwellings associated with the productive farms.

The broad site characteristics of the area located south of Lloyds Road are generally as shown in Figure 6. An indicative masterplan for the area and how the adjacent areas could integrate with the Sunnyside Estate development is shown in Figure 7.

Site Characteristics



Figure 6: site characteristics (source: Siva Projects 2020)

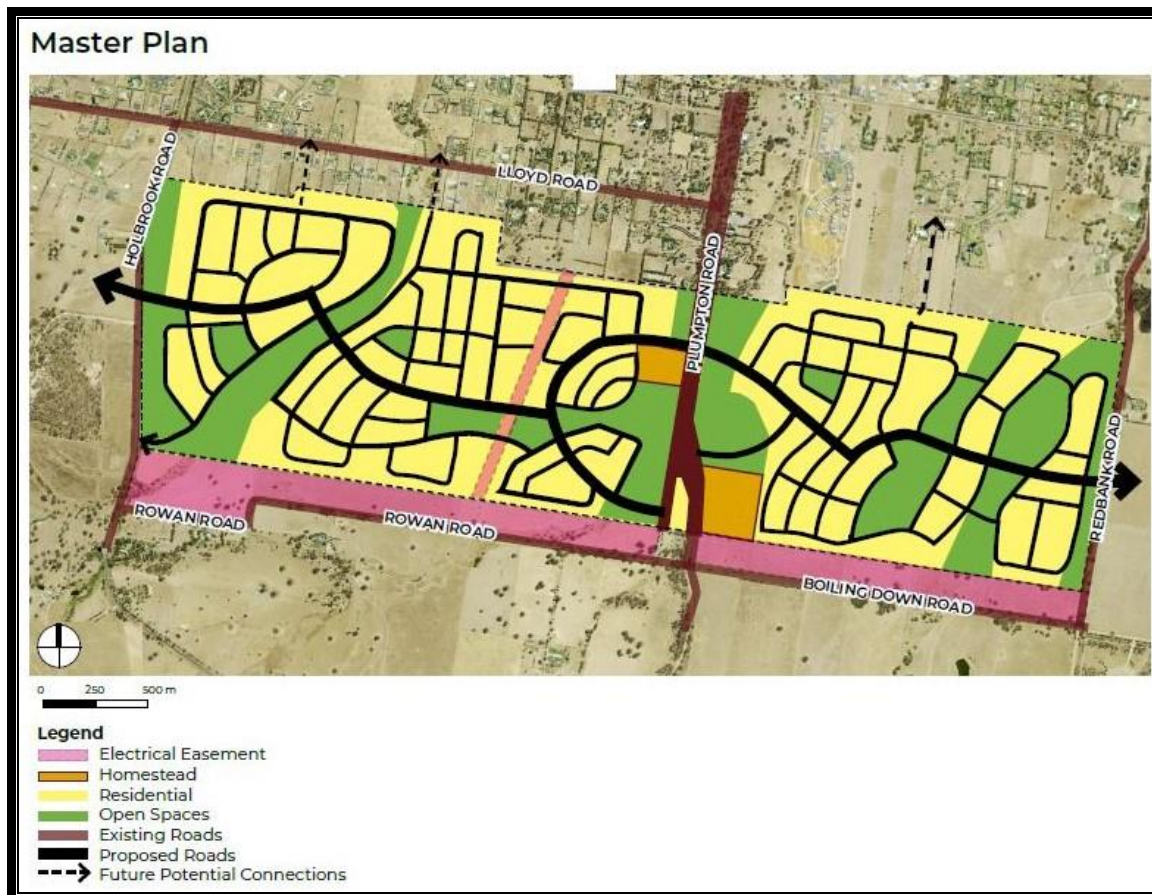


Figure 7: Indicative masterplan (source: Siva Projects 2020)

8. Dwelling yield assessment

Wagga wagga City Council advised that the assessment of the potential development within the area should be based on dwellings of 1,200sqm blocks or 8 dwellings per hectare as per the draft Local Strategic Planning Statement (page 40, par 3) development assumption.

The area across the south of the indicative area for the investigation being un-developed rural land (yellow area Figure 8) could be developed in a planned manner whereas the areas across the northern part of the indicative area for the investigation (blue area Figure 8) currently has housing on large blocks hence redevelopment would be constrained by the existing dwellings and various owners' decisions whether to redevelop or subdivide their blocks.

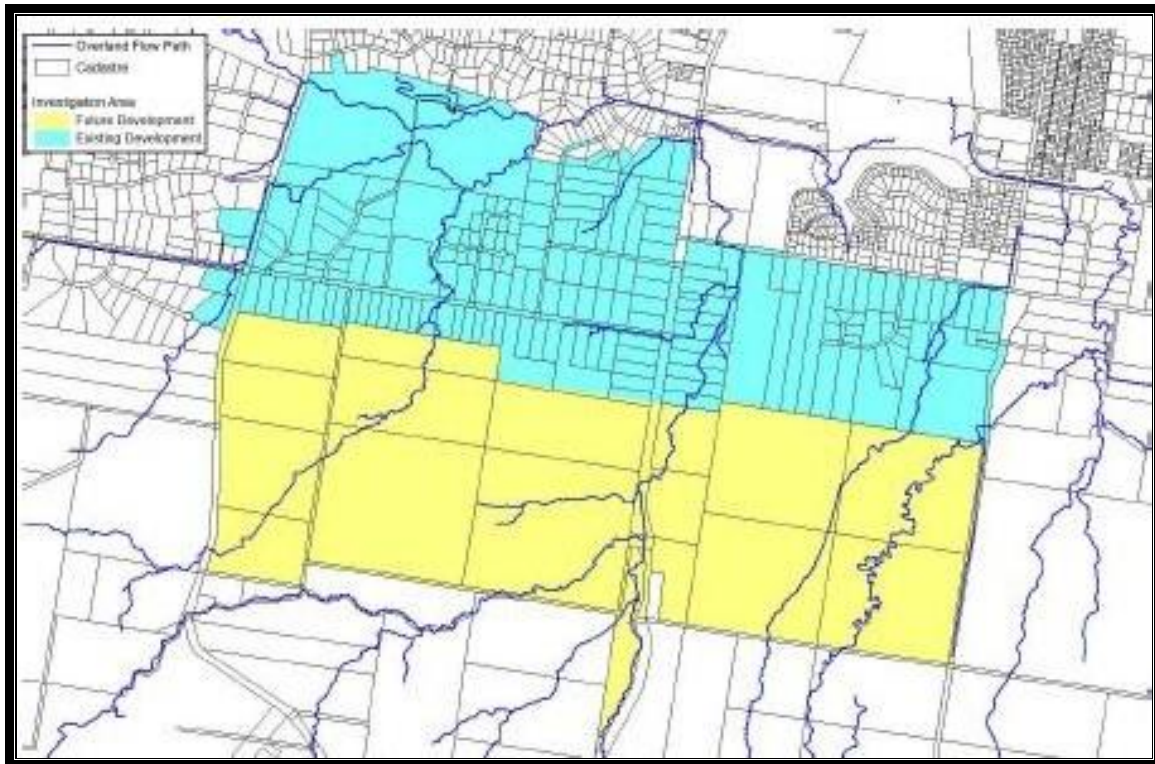


Figure 8: developed and undeveloped areas in the indicative area for the investigation

The concept plan for the proposed Sunnyside Estate which covers 110ha has the following land take:

Landuse	Ha	% of estate
Residential	48.75	44.32%
Shop	0.56	0.51%
Homestead	3.25	2.95%
Open space corridors	25.19	22.90%
Ponds/wetlands	4.20	3.82%
Roads	11.70	10.64%
Electrical easements	16.35	14.86%
Totals	110.00	100.00%

Table 3: Sunnyside Estate landuse (source: Siva Projects 2020)

The areas to the east and west of the proposed Sunnyside estate both have significant areas of open space/waterway areas/wetlands.

As noted above, the indicative area for the investigation comprises approximately 1,111ha of land. Assuming 30% of the area is dedicated to roads, wetlands, open space, easements etc. and 8 dwellings per hectare the yield for the indicative area for the investigation would be 6,222 dwellings, say 6,000 dwellings (or 6,000 ET) and at 2.6 persons per dwelling this would equate to a potential population of 15,600 people. (1ET = 2.6 persons per tenement in 2011 and expected to decrease to approx. 1ET = 2.47 in 2031).

9. Sewage catchments

The indicative area for the investigation will have several sewage catchments based on the topography of the site. Based on the topography and creek lines in the indicative area for the investigation there would be three broad catchments, namely:

- Eastern catchment (refer Figure 9)
- Central catchment (refer Figure 10)
- Western catchment (refer Figure 11)



Figure 9: Eastern catchment, approx. 251ha (source: Sixmaps 2021)

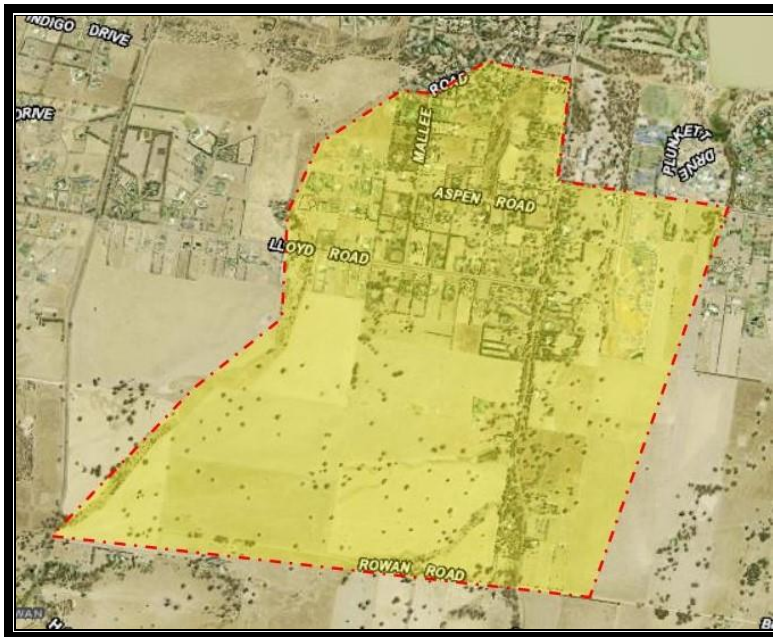


Figure 10: Central catchment approx. 597ha (source: Sixmaps 2021)



Figure 11: Western catchment approx. 263ha (source: Sixmaps 2021)

The western catchment is approx. 263hectares in size and extends from Holbrook Road to the creek to the east. The undeveloped rural area to the south of R5 area along Lloyds Road is approx. 92ha while the R5 (and RU6) developed area to the north is approx. 171ha. A sewer would likely be constructed along the western side of the creek and join the outfall sewer in Plumpton Road near its intersection with Springvale Drive.

The central catchment is approx. 597hectares in size and is centered on Plumpton Road with land of both sides of the road falling towards Plumpton Road. The undeveloped rural area to the south of R5 area along Lloyds Road is approx. 333ha while the R5 developed area to the north is approx. 264ha. An outfall sewer would be constructed along Plumpton Road to Nelson Road connecting with the existing sewer network.

The eastern catchment is approx. 263hectares in size and extends from the low ridge to the east of Plumpton Road across to Redbank Road with a low point being near the intersection of Gregadoo Road and Main Street. Subject to levels and falls a sewer could be constructed from this location to Plumpton Road to connect with the outfall sewer from the central catchment. If levels do not allow such a sewer connection, a pump station would be required at this location and could also discharge into the Plumpton Road sewer. The undeveloped rural area to the south of an extended line from the R5 area along Lloyds Road is approx. 166ha while the R5 developed area to the north is approx. 86ha.

10. Sewage flows

The indicative sewer flows, pipe diameter and minimum grades detailed in Table 4 and 5 (refer Appendix A for parameters and sewer sizing information) have been determined for two scenarios. The information is provided for both the R5 and RU1 sub-catchments and the total catchments and then the western and eastern areas combined as the pipes would connect with the sewer in Plumpton Road near its intersection with Springvale Drive. It has been assumed that the developable area is residential however it is likely some commercial areas may be introduced into the developments and that would potentially increase the sewage discharge.

The first scenario, presented in Table 4, is that the indicative area for the investigation (both the R5 and RU1 areas) would be redeveloped to a density of 8 dwellings per hectare (i.e., the remainder of the area after allowing 30% of the area for roads, wetlands, parks etc.).

The second scenario, presented in Table 5, is that the indicative area for the investigation would be redeveloped to a density of 8 dwellings per hectare for the RU1 areas and to a density of 6 dwellings per hectare for the R5 areas (i.e., the remainder of the area after allowing 30% of the area for roads, wetlands, parks etc.). The rationale behind the reduced dwelling density in the R5 area is the including fragmented ownership and that not everyone would want to redevelop their blocks and the existing dwellings if retained would not allow for well-planned suburb or a maximum yield as some blocks would potentially end up being significantly larger than 1200sqm.

In each case presented in the tables, in some cases the pipe diameter can be reduced if a steeper grade can be adopted.

Catchment	Area (ha)	Part areas (ha)	Approx. ET	Population (2.6*ET)	Approx. sewage flow (l/sec)	Indicative pipe dia. (mm)	Min indicative pipe grade (%)
Eastern	251						
R5		86	479	1,245	32.3	225	0.50
RU1		166	927	2,410	57.6	225	0.49
combined		251	1,406	3,655	83.1	300	0.72
Central	597						
R5		264	1,478	3,844	86.9	300	0.66
RU1		333	1,865	4,848	106.6	300	1.18
combined		597	3,343	8,692	179.2	375	1.02
Western	263						
R5		171	958	2,490	59.2	225	1.69
RU1		92	515	1,340	34.5	225	0.57
combined		263	1,473	3,829	87.5	300	0.80
Central + western	860						
R5 & RU1 combined		860	4,816	12,522	248.20	375	1.96
Central + western + eastern	1111						
R5 & RU1 combined		1111	6,222	16,176	312.22	450	1.18

Table 4: Sewer flows, pipe diameters and grades at 8 dwellings per ha all areas

Catchment	Area (ha)	Part areas (ha)	Approx. ET	Population (2.6*ET)	Approx. sewage flow (l/sec)	Indicative pipe dia. (mm)	Min indicative pipe grade (%)
Eastern	251						
R5		86	359	934	25.0	150	2.50
RU1		166	927	2,410	57.6	225	1.59
combined		251	1,286	3,343	76.8	300	0.62
Central	597						
R5		264	1,109	2,883	67.4	225	2.18
RU1		333	1,865	4,848	106.6	300	1.18
combined		597	2,974	7,731	161.4	375	0.83
Western	263						
R5		171	718	1,867	46.0	225	1.01
RU1		92	515	1,340	34.5	225	0.57
combined		263	1,233	3,207	74.0	300	0.57
Central + western	860						
R5 & RU1 combined		860	4,207	10,938	219.9	375	1.54
Central + western + eastern	1,111						
R5 & RU1 combined		1,111	5,493	14,282	279.2	375	2.48

Table 5: Sewer flows, pipe diameters and grades at 6 dwellings per ha R5 and 8 dwellings per ha RU1 areas

Based on the sewer network depicted in Figures 4 and 5 there are some 50 plus dwellings in the R5 catchment areas shown in blue in Figure 8 that are presently connected to the sewage system. No reduction has been made for these dwellings in Tables 4 and 5

11. Sewer network upgrade

As noted in Sections 5 and 6 of this report, the Koorungal Sewage Pump Station and the Koorungal Sewage Treatment Plant have limited spare capacity and based on Reference 3 and assuming the 2021 ET noted in the document is approx. correct, the SPS and STP have spare capacity of approx. 400to 500 ET.

The Koorungal SPS and rising main could be upgraded or may need to be augmented and a new SPS constructed. The Koorungal STP would need to be upgraded / expanded to manage the additional load should part or all the indicative area for the investigation be developed. Should the area shown in blue in Figure 8 be redeveloped or development intensified and the area in yellow not developed the Koorungal SPS and the Koorungal STP would still require upgrading. The augmentation / upgrade would not be required immediately however WWCC would need to initiate further studies as to the possible alternatives for the Koorungal SPS / rising main and the Koorungal STP upgrades.

Upgrading / augmentation of the SPS and rising main and the STP could be staged over time to mirror the requirements of the full development of the indicative area of the investigation.

Based on the sewer network detailed on Figures 4 and 5 it appears that the sewer running north from the intersection of Plumpton Road and Nelson Drive would require upgrading or augmentation should the indicative area for the investigation be developed and discharged through this sewer.

Should the area shown in blue in Figure 8 be redeveloped or development intensified and the area in yellow not developed the sewer running north from the intersection of Plumpton Road and Nelson Drive may still require upgrading.

Interrogation of the WWCC sewer model and discussions with the WWCC Sewage Engineers would be required to further analyse the required upgrading of the Plumpton Road sewer and possible alternatives within the catchment for diverting sewage flows or for an alternative route for discharge from the eastern catchment to that discussed above, i.e., via Plumpton Road.

12. Proposed Sunnyside Estate

The proposed Sunnyside Residential Estate with circa 400 dwellings would be developed over a period of several years with possibly 50 to 100 blocks in the initial stage then subsequent stages of approx. 50 blocks per year depending on demand. In this development scenario, the maximum sewage discharge from the residential estate would not occur for approx. 8 to 10 years and would absorb all the spare capacity in the Koorringal SPS and the Koorringal STP. It is however unrealistic to assume the spare capacity in the Koorringal SPS and the Koorringal STP could be dedicated to this development and not allow other areas within the catchment to be redeveloped over the same period of the Sunnyside development occurring.

13. References

1. Sunnyside Estate Wagga Wagga, Preliminary Sewage Report, August 2020 John Randall Consulting Pty Ltd
2. Sewerage Code of Australia, Water Services Association of Australia (WSAA)
3. Development Servicing Plan No 1: Sewage Services WWCC (adopted by WWCC July 2013)
4. Addendum to WWCC DSP No 1 2013
5. Wagga Wagga Draft Local Strategic Planning Statement - September 2020
6. Wagga Wagga City Council website
7. Email WWCC 18th May 2020, sewer network (Peter Ross, Manager Technical & Strategy)
8. Email WWCC December 2020, sewer network layout
9. Wagga Wagga City Council Engineering Guidelines for Subdivisions and Development Standards
10. RFQ2021-530 Sewer Network Capacity Model - WWCC

Appendix A – sewer parameters and sizing

The following tables detail the parameters used and the indicative sewage flows and pipe dia and grades detailed in the report.

k	1.50	mm
d/D	1.00	
EP/ET	2.60	
ADWF	180	L/d/EP
Ave Lot Area	1200	m ²
Net/Gross Lot Area	70%	
Sewer below water table	70%	
Soil aspect	0.80	= S _{aspect}
Network defects aspect	0.50	= N _{aspect}
Leakage Severity C	1.30	= S _{aspect} + N _{aspect}
Ave Lot Density	6	Lots/ha
I _{1,2}	21.1	mm/hr
ARI	5	years
τ _{av}	1.60	Pa
g	9.81	m/s ²
ν	1.01E-06	m ² /s

Q _{sc}	= Self cleansing flow	L/s
Q _{df}	= Design flow	L/s

Grade		DN150					
		Flow (L/s)		Equiv. Tenements		Equiv. Population	
		Q _{sc}	Q _f	Min	Max	Min	Max
1 in 300	0.33%						
1 in 250	0.40%						
1 in 200	0.50%						
1 in 175	0.57%	2.30	11.68	112	148	291	384
1 in 150	0.67%	1.71	12.62	75	162	195	421
1 in 140	0.71%	1.51	13.07	64	168	166	438
1 in 130	0.77%	1.32	13.56	53	176	137	457
1 in 125	0.80%	1.23	13.83	48	180	124	468
1 in 120	0.83%	1.14	14.12	43	184	111	479
1 in 110	0.91%	0.99	14.75	36	194	93	504
1 in 105	0.95%	0.92	15.10	32	199	83	518
1 in 100	1.00%	0.84	15.48	29	205	75	533
1 in 90	1.11%	0.70	16.32	22	218	57	567
1 in 80	1.25%	0.58	17.31	17	233	44	607
1 in 70	1.43%	0.47	18.52	13	252	33	656
1 in 60	1.67%	0.36	20.01	9	276	23	717
1 in 50	2.00%	0.27	21.93	6	307	15	797
1 in 40	2.50%	0.19	24.53	3	349	7	907

Grade		DN225					
		Flow (L/s)		Equiv. Tenements		Equiv. Population	
		Q _{sc}	Q _f	Min	Max	Min	Max
1 in 300	0.33%						
1 in 250	0.40%	5.03	28.79	310	420	806	1091
1 in 200	0.50%	3.33	32.21	182	477	473	1241
1 in 175	0.57%	2.61	34.45	132	516	343	1340
1 in 150	0.67%	2.03	37.23	95	563	247	1465
1 in 140	0.71%	1.81	38.54	81	586	210	1524
1 in 130	0.77%	1.60	40.00	69	612	179	1591
1 in 125	0.80%	1.50	40.80	63	626	163	1627
1 in 120	0.83%	1.39	41.64	57	641	148	1666
1 in 110	0.91%	1.21	43.51	47	673	122	1751
1 in 105	0.95%	1.12	44.53	42	692	109	1798
1 in 100	1.00%	1.04	45.64	38	711	98	1849
1 in 90	1.11%	0.86	48.12	29	756	75	1964
1 in 80	1.25%	0.71	51.05	23	808	59	2102
1 in 70	1.43%	0.58	54.59	17	872	44	2268
1 in 60	1.67%	0.45	58.98	12	953	31	2477
1 in 50	2.00%	0.33	64.63	8	1057	20	2749
1 in 40	2.50%	0.23	72.28	5	1201	13	3122

Grade		DN300					
		Flow (L/s)		Equiv. Tenements		Equiv. Population	
		Q _{sc}	Q _f	Min	Max	Min	Max
1 in 300	0.33%	7.65	56.44	526	906	1367	2356
1 in 250	0.40%	5.51	61.86	348	1006	904	2616
1 in 200	0.50%	3.77	69.21	214	1143	556	2971
1 in 175	0.57%	3.03	74.01	161	1233	418	3206
1 in 150	0.67%	2.33	79.97	114	1346	296	3501
1 in 140	0.71%	2.08	82.79	98	1400	254	3641
1 in 130	0.77%	1.85	85.93	83	1461	215	3798
1 in 125	0.80%	1.72	87.64	76	1494	197	3883
1 in 120	0.83%	1.60	89.46	69	1529	179	3975
1 in 110	0.91%	1.39	93.45	57	1606	148	4176
1 in 105	0.95%	1.30	95.66	52	1649	135	4288
1 in 100	1.00%	1.21	98.03	47	1695	122	4408
1 in 90	1.11%	1.02	103.35	37	1800	96	4680
1 in 80	1.25%	0.84	109.65	29	1924	75	5003
1 in 70	1.43%	0.67	117.24	21	2075	54	5395
1 in 60	1.67%	0.53	126.67	15	2264	39	5887
1 in 50	2.00%	0.39	138.79	10	2510	26	6525
1 in 40	2.50%	0.28	155.22	6	2846	15	7399

Grade		DN375					
		Flow (L/s)		Equiv. Tenements		Equiv. Population	
		Q _{sc}	Q _f	Min	Max	Min	Max
1 in 300	0.33%	8.24	102.02	577	1774	1500	4611
1 in 250	0.40%	6.09	111.81	395	1967	1027	5114
1 in 200	0.50%	4.18	125.08	244	2232	634	5803
1 in 175	0.57%	3.37	133.75	185	2407	481	6259
1 in 150	0.67%	2.58	144.52	130	2626	338	6828
1 in 140	0.71%	2.32	149.61	113	2731	293	7100
1 in 130	0.77%	2.06	155.28	97	2847	252	7403
1 in 125	0.80%	1.96	158.37	90	2911	234	7568
1 in 120	0.83%	1.82	161.64	82	2979	213	7745
1 in 110	0.91%	1.59	168.86	68	3128	176	8134
1 in 105	0.95%	1.46	172.85	61	3211	158	8350
1 in 100	1.00%	1.36	177.13	55	3301	143	8582
1 in 90	1.11%	1.15	186.74	44	3502	114	9106
1 in 80	1.25%	0.95	198.10	34	3742	88	9729
1 in 70	1.43%	0.76	211.82	25	4034	65	10487
1 in 60	1.67%	0.58	228.84	17	4398	44	11434
1 in 50	2.00%	0.45	250.74	12	4871	31	12664
1 in 40	2.50%	0.31	280.41	7	5519	18	14348

Grade		DN450					
		Flow (L/s)		Equiv. Tenements		Equiv. Population	
		Q _{sc}	Q _f	Min	Max	Min	Max
1 in 300	0.33%	9.01	165.33	643	3055	1671	7943
1 in 250	0.40%	6.66	181.19	442	3386	1149	8803
1 in 200	0.50%	4.60	202.67	276	3839	717	9981
1 in 175	0.57%	3.64	216.73	205	4138	533	10759
1 in 150	0.67%	2.89	234.16	151	4512	392	11732
1 in 140	0.71%	2.59	242.41	131	4690	340	12195
1 in 130	0.77%	2.30	251.59	112	4889	291	12712
1 in 125	0.80%	2.15	256.59	102	4998	265	12995
1 in 120	0.83%	2.01	261.90	94	5114	244	13295
1 in 110	0.91%	1.74	273.58	77	5369	200	13959
1 in 105	0.95%	1.61	280.04	69	5510	179	14327
1 in 100	1.00%	1.48	286.97	62	5663	161	14724
1 in 90	1.11%	1.27	302.54	51	6007	132	15617
1 in 80	1.25%	1.04	320.95	38	6415	98	16680
1 in 70	1.43%	0.83	343.16	28	6912	72	17970
1 in 60	1.67%	0.66	370.73	20	7532	52	19584
1 in 50	2.00%	0.48	406.19	13	8337	33	21677
1 in 40	2.50%	0.32	454.24	7	9439	18	24542