

# Sewerage Drainage Strategy

## PEPPERTREE ESTATE SCONE

LOT 2 IN DP1169320



MM Hyndes Bailey November 2017

## 1 Proposal

It is proposed to develop residential lots to the east of Scone on the Gundy Road. The land abuts the age care facility Strathearn. The location is shown in Figure 1 below.



Location Plan  
**Figure 1**

The area is proposed for development of 423 residential lots.

Urbanisation of this area will require installation of suitable sewer reticulation system and this report and the accompanying plans will demonstrate the broad strategy sewerage drainage for all lots within the proposed development. This report is limited to the site reticulation system only. RGH Engineers have been engaged to undertake comprehensive assessment of the exiting sewerage system external to the site to determine the downstream connection point for the development and assess if any upgrades to the external network are required to service this development.

Plans of the proposed layout are included with and form part of this report and are numbered SEW001 SEW002 SEW003 AND SEW004.

## 2 Topography

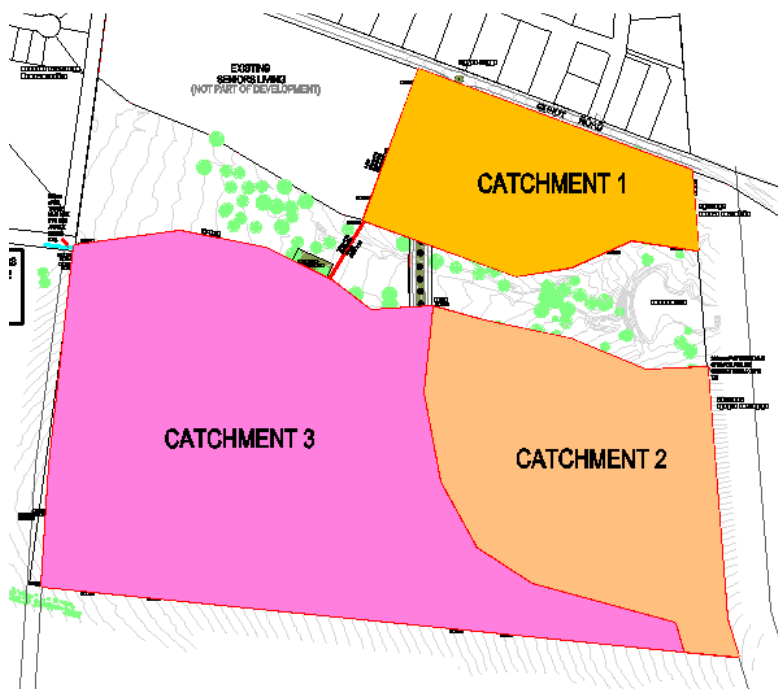
The site comprises approximately 57 Has of gently sloping grassland. With a waterway which traverses through the site.

The grades of the site are well suited to residential development and provide ideal grades for the drainage of sewerage system.

## 3 Subdivision Proposal

It is proposed to develop a quality fully serviced 423 urban residential development with all lots having easy access to a gravity sewer junction within each lot boundary. The sewerage system strategy has been developed in accordance with the Sewerage Code of Australia WSA 002.

The subdivision will generate 423 Equivalent Tenements (ET's) comprised in 3 distinct catchment areas within the subdivision.



It is anticipated that up to 10% of lots may be developed into duplex sites and as such all proposed sewerage lines have been checked for capacity to 110% of the actual subdivision being 465 ET's in total.

Capacity of sewer lines has been determined using  
Appendix B

### GRAVITY SEWER CAPACITIES, PIPE SIZING AND GRADING TABLES – WSA002

**TABLE HW B1**  
**GRAVITY SEWER CAPACITIES, PIPE SIZING AND GRADING TABLES**

	150				225				
Grade (%)	Flow (L/sec)		Tenements		Flow (L/sec)		Tenements		Grade (%)
	Qsc	Qf	Min	Max	Qsc	Qf	Min	Max	
1.400	0.260	21.00	1	235					1.400
1.250	0.318	19.84	1	221					1.250
1.100	0.393	18.59	4	208					1.100
1.000	0.462	17.72	6	196	0.585	51.9	11	610	1.000
0.950	0.505	17.26	8	191	0.634	50.6	13	593	0.950
0.900	0.556	16.79	10	185	0.690	49.2	16	576	0.900
0.850	0.617	16.31	12	180	0.756	47.8	19	559	0.850
0.800	0.690	15.82	16	174	0.833	46.4	22	542	0.800
0.750	0.799	15.31	20	168	0.927	44.9	27	523	0.750
0.700	0.890	14.78	25	162	1.040	43.3	32	504	0.700
0.650	1.033	14.24	32	155	1.181	41.7	38	485	0.650
0.600	1.221	13.67	39	149	1.359	40.1	44	465	0.600
0.550	1.481	13.08	49	142	1.589	38.3	54	444	0.550
0.500	1.866	12.46	65	135	1.896	36.5	66	422	0.500
0.450					2.326	34.6	85	399	0.450
0.400					2.962	32.6	113	374	0.400
0.350					4.001	30.5	161	348	0.350
0.333					4.526	29.7	187	339	0.333
	300				375				
Grade (%)	Flow (L/sec)		Tenements		Flow (L/sec)		Tenements		Grade (%)
	Qsc	Qf	Min	Max	Qsc	Qf	Min	Max	
0.850	0.915	102.20	26	1238	0.940	184.1	28	2279	0.850
0.800	1.001	99.10	31	1199	1.030	178.5	32	2207	0.800
0.750	1.104	96.00	35	1159	1.130	172.8	35	2135	0.750
0.700	1.228	92.70	39	1118	1.250	166.9	40	2059	0.700
0.650	1.380	89.30	45	1076	1.390	160.8	46	1981	0.650
0.600	1.569	85.70	53	1030	1.570	154.4	53	1900	0.600
0.550	1.810	82.00	63	984	1.800	147.8	62	1815	0.550
0.500	2.124	78.20	76	936	2.100	140.8	75	1726	0.500
0.450	2.550	74.10	94	885	2.500	133.5	92	1634	0.450
0.400	3.151	69.80	121	832	3.050	125.8	117	1536	0.400
0.350	4.053	65.20	164	775	3.860	117.6	154	1432	0.350
0.333	4.470	63.60	184	755	4.220	114.6	172	1395	0.333
0.300	5.537	60.30	237	714	5.120	108.7	217	1320	0.300
0.280	6.437	58.20	283	688	5.850	105.0	253	1273	0.280
0.250	8.422	55.00	389	648	7.350	99.1	332	1199	0.250
0.220					9.710	92.9	460	1121	0.220
0.200					12.220	88.5	602	1066	0.200

Qsc = Self Cleansing Flow

Qf = Capacity

## 4 Trunk Main Sewer Pump Station

### 4.1 TRUNK MAIN (SEE PLAN SEW001)

It is proposed to include a spinal trunk main to service the three (3) catchment areas and provide additional capacity for further growth of the Scone township in the future.

We investigated the use of 225mm trunk main pipe however with the anticipated ET load of 465 with addition of duplex sites within the development, this would only have provided a maximum 145 additional ET's assuming pipe grade was above 1%.

Therefore; a 300mm trunk main was adopted providing up to an additional 773 ET's external to this development.

### 4.2 SEWER PUMP STATION

The whole the site can be serviced by gravity sewer and NO sewer pump station is required to service any lots within the development area.

## 5 Pipe Sizing, Access Chambers

The site will use 300mm, 225mm and 1500mm pipe sizes.

All pipes sizes have been selected to accommodate ET flows and all pipes have capacity significantly above capacity requirements of the development with the majority of the development being serviced by standard 150mm mains.

Maintenance access chambers will be placed at all bends, at spacing not exceeding 120m and not more than 40m from the end of dead end line

## 6 Self-Cleansing Flows

The whole development was checked for minimum grades for self-cleansing flows.

It is noted a number of the proposed mains will service a low number of ET's. The site generally provides grades that will naturally produce grades above that required for self-cleansing flows.

As the development will likely have single dwellings on some low volume lines as the subdivision is taken up for period of time, it will be important to have the whole of the lines servicing area with low lot numbers at grades above 1.4% not just the last section. Lines that we consider may experience such issues have been noted on the plan with MIN GRADE 1.4% note.

## 7 Easements

In accordance with Upper Hunter Shire Council policy, "Easement to Drain Sewer" will be created over all sewer mains within private property in favour of Upper Hunter Shire Council.

## 8 Sewer Main Depth

The strategy has adopted a general invert depth of pipe of 1-1.5m which we believe is the optimum depth for installation of gravity sewers providing flexibility cut and fill for site floor levels.

There is only one section that will require a deeper installation of about 4.5m to invert to traverse a low ridgeline that runs east west across the southern section of the site. This section is at the rear of lot 1325 and will only be approximately 150m in length. This is considered a very minor issue and should poses no construction issues.

## 9 Conclusion

The sewer proposal outlined in this report and in the accompanying plans clearly demonstrates the site can be adequately serviced by gravity sewer. With velocities and grades being suitable for self-cleansing flows in all lines, no Sewer Pump Station being required to service any lots in the development and capacity is provided for future growth of the Scone township.

Your faithfully,

Michael Cole  
Registered Surveyor  
MM Hyndes Bailey & Co.

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## **Annex 'A'**

**Drawings –  
SEW001  
SEW002  
SEW003  
SEW004**