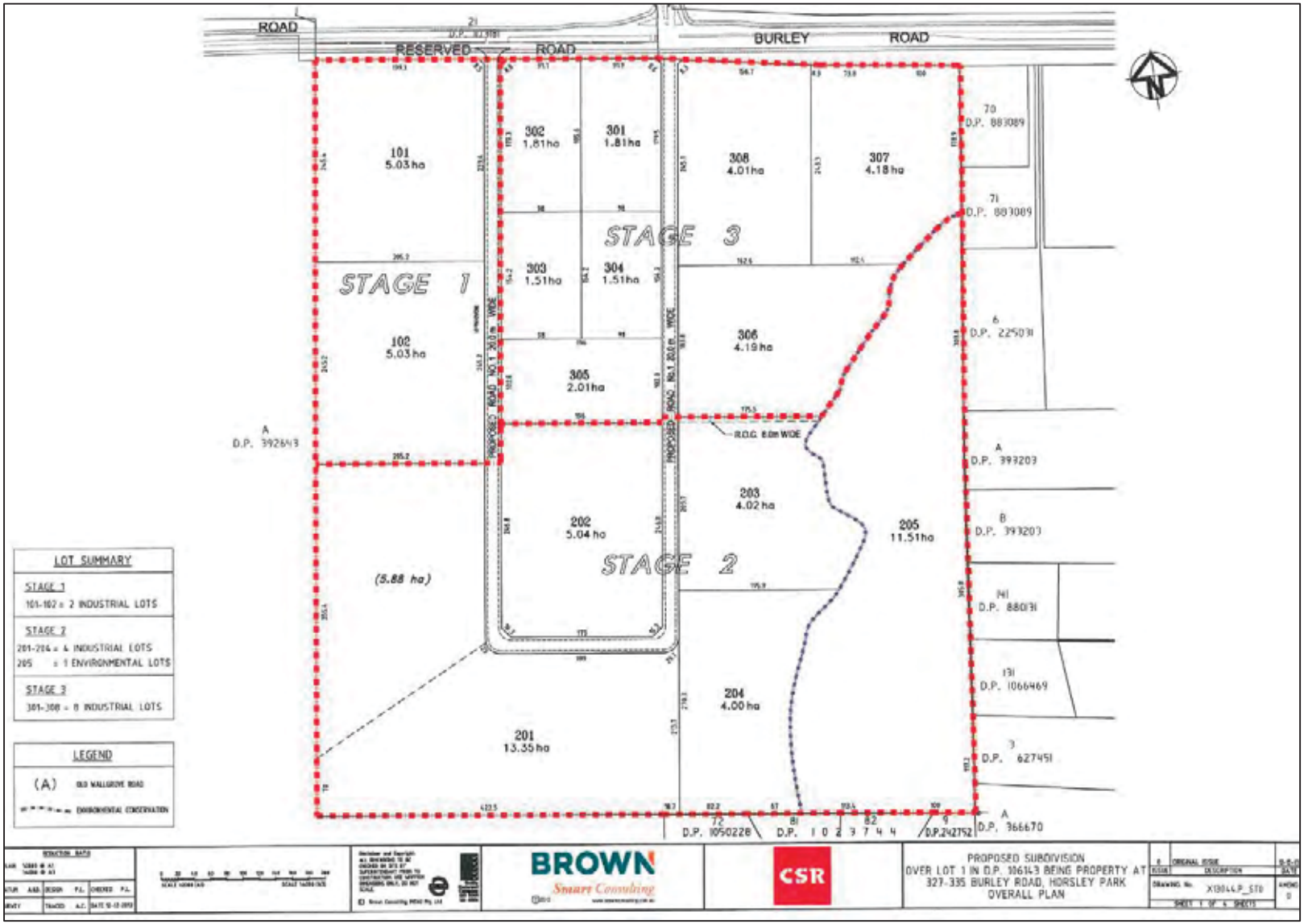


Figure 12 Proposed Subdivision of CSR Site

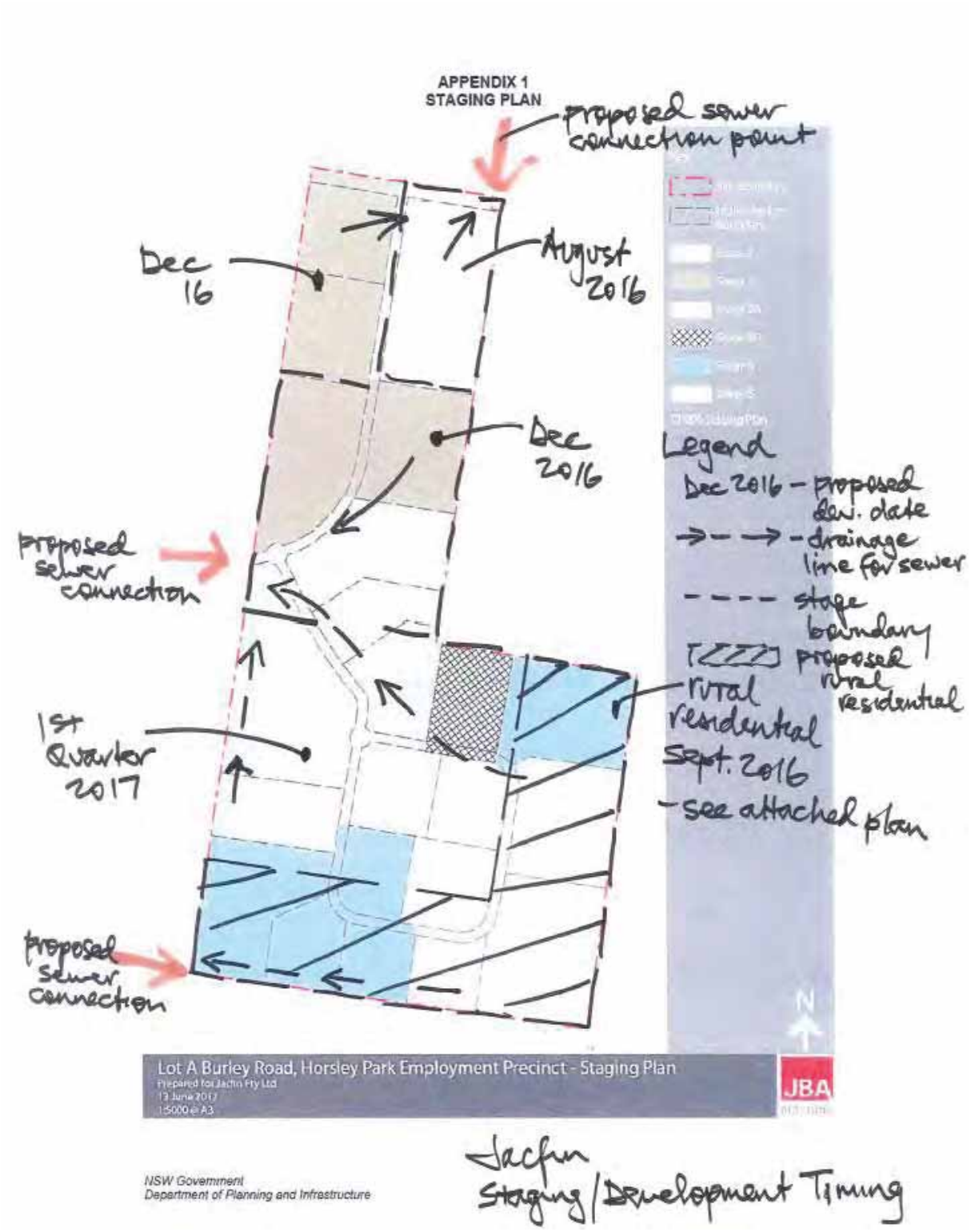


Figure 13 Proposed Development Plan for Jacfin Site

Appendix C – Wastewater Modelling Run Codes

The run codes used for the base and the updated models (2020 and 2036 scenarios) are presented in the following Table.

Planning Year	Base Model	Updated with Oakdale Industrial Development
2036	SMJA	SMJD
2020	SMJD	SMJE

Appendix D – Dry Weather System Performance

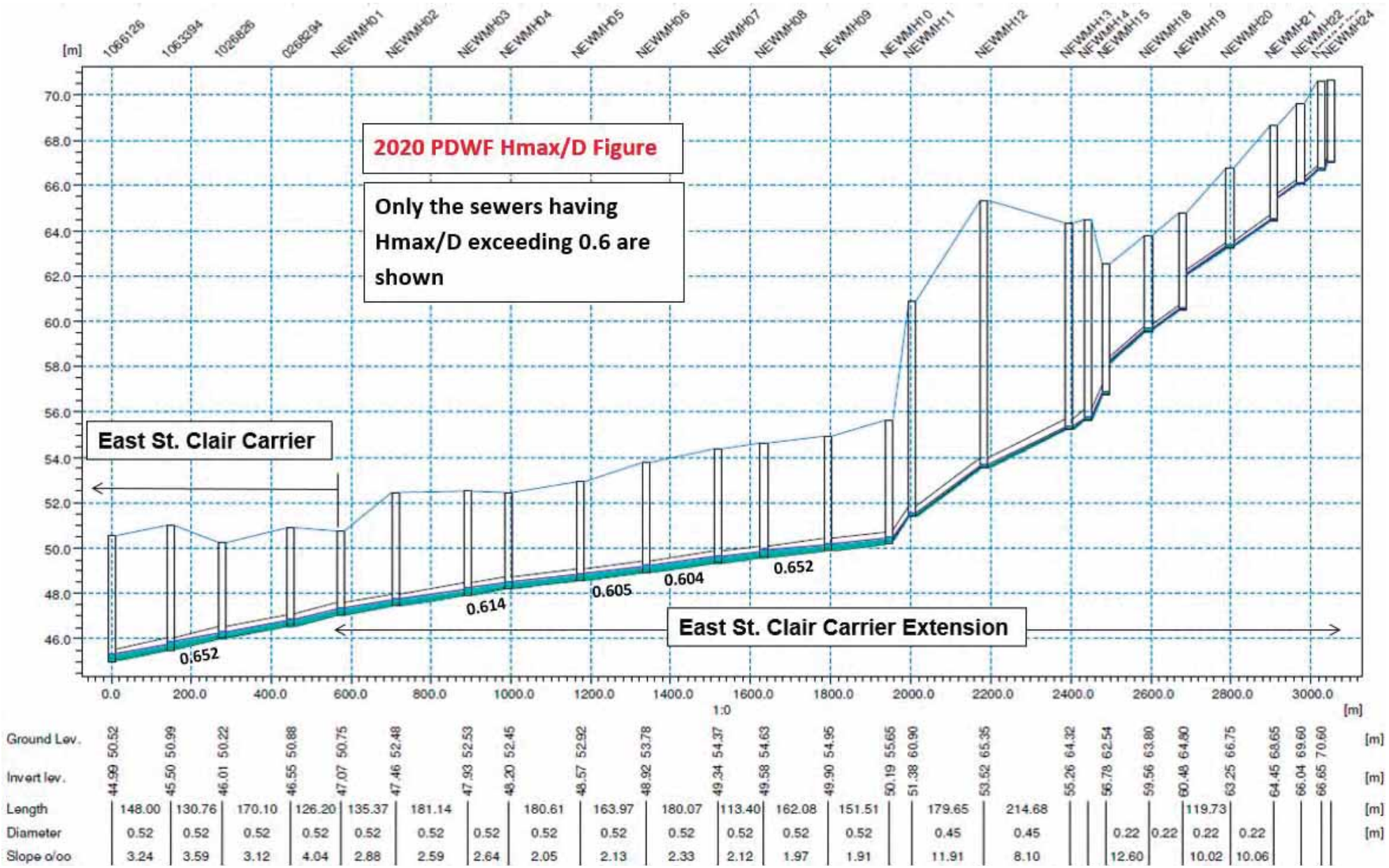
U/s Node	D/s Node	Pipe Dia (mm)	Slope (%)	2020 (Runcode: SMJE)			2036 (Runcode: SMJE)		
				PDWF (l/s)	Hmax/ D	Max Velocity (m/s)	PDWF (l/s)	Hmax/ D	Max Velocity (m/s)
East St. Clair Carrier Extension									
NEWMH24	NEWMH23	225	1.02	5	0.212	0.8	5	0.212	0.8
NEWMH23	NEWMH22	225	1.02	5	0.212	0.8	5	0.212	0.8
NEWMH22	NEWMH21	225	0.95	5	0.216	0.78	5	0.216	0.78
NEWMH21	NEWMH20	225	1.01	5	0.213	0.8	5	0.213	0.8
NEWMH20	NEWMH19	225	1.00	9	0.296	0.96	9	0.296	0.96
NEWMH19	NEWMH18	225	1.01	9	0.295	0.96	9	0.295	0.96
NEWMH18	NEWMH15	225	1.26	9	0.279	1.04	9	0.279	1.04
NEWMH15	NEWMH14	450	2.58	23	0.339	0.77	55	0.531	0.99
NEWMH14	NEWMH13	450	0.83	23	0.297	0.75	55	0.458	0.97
NEWMH13	NEWMH12	450	0.81	24	0.386	0.62	55	0.573	0.83
NEWMH12	NEWMH11	450	1.19	29	0.36	0.79	60	0.524	1
NEWMH11	NEWMH10	450	1.81	29	0.374	1.14	60	0.499	1.41
NEWMH10	NEWMH09	525	0.19	81	0.531	0.77	113	0.643	0.84
NEWMH09	NEWMH08	525	0.20	81	0.652	0.65	113	0.756	0.74
NEWMH08	NEWMH07	525	0.21	112	0.596	0.89	143	0.693	0.95
NEWMH07	NEWMH06	525	0.23	112	0.604	0.9	143	0.704	0.96
NEWMH06	NEWMH05	525	0.21	112	0.605	0.89	143	0.705	0.94
NEWMH05	NEWMH04	525	0.20	112	0.594	0.89	143	0.691	0.95
NEWMH04	NEWMH03	525	0.26	112	0.614	0.89	143	0.71	0.96
NEWMH03	NEWMH02	525	0.26	112	0.587	0.94	143	0.679	1
NEWMH02	NEWMH01	525	0.29	112	0.578	0.96	143	0.664	1.03
Oakdale Central									
NEWMH24	NEWMH23	225	1.02	5	0.212	0.8	5	0.212	0.8
NEWMH23	NEWMH22	225	1.02	5	0.212	0.8	5	0.212	0.8
NEWMH22	NEWMH21	225	0.95	5	0.216	0.78	5	0.216	0.78
NEWMH21	NEWMH20	225	1.01	5	0.213	0.8	5	0.213	0.8
NEWMH20	NEWMH19	225	1.00	9	0.296	0.96	9	0.296	0.96
NEWMH19	NEWMH18	225	1.01	9	0.295	0.96	9	0.295	0.96
NEWMH18	NEWMH15	225	1.26	9	0.279	1.04	9	0.279	1.04
Oakdale East									
NEWMH38	NEWMH37	375	0.51	-	-	-	32	0.377	0.96
NEWMH37	NEWMH36	375	0.51	-	-	-	32	0.553	0.68
NEWMH36	NEWMH35	375	0.50	-	-	-	32	0.489	0.75
NEWMH35	NEWMH34	375	0.50	-	-	-	32	0.328	1.01
NEWMH34	NEWMH33	375	0.83	7	0.139	0.76	39	0.324	1.25
NEWMH33	NEWMH68	375	2.10	10	0.14	1.12	42	0.279	1.68
NEWMH68	NEWMH69	375	2.13	12	0.141	1.23	43	0.27	1.81

U/s Node	D/s Node	Pipe Dia (mm)	Slope (%)	2020 (Runcode: SMJE)			2036 (Runcode: SMJE)		
				PDWF (l/s)	Hmax/ D	Max Velocity (m/s)	PDWF (l/s)	Hmax/ D	Max Velocity (m/s)
NEWMH69	NEWMH32	375	2.65	12	0.134	1.33	43	0.255	1.95
NEWMH32	NEWMH15	375	0.99	14	0.184	0.97	45	0.339	1.38
Oakdale West									
NEWMH85	NEWMH84	375	0.49	4	0.15	0.42	4	0.15	0.42
NEWMH84	NEWMH83	375	0.50	4	0.251	0.26	4	0.251	0.26
NEWMH83	NEWMH82	375	0.50	10	0.256	0.54	10	0.256	0.54
NEWMH82	NEWMH81	375	0.50	10	0.258	0.54	10	0.258	0.54
NEWMH81	NEWMH80	375	0.50	10	0.361	0.4	10	0.361	0.4
NEWMH80	NEWMH79	375	0.50	13	0.295	0.61	13	0.295	0.61
NEWMH79	NEWMH78	375	0.50	13	0.294	0.61	13	0.294	0.61
NEWMH78	NEWMH76	375	0.50	13	0.417	0.45	13	0.417	0.45
NEWMH76	NEWMH25	375	0.46	21	0.47	0.55	21	0.47	0.55
NEWMH25	NEWMH08	375	0.54	30	0.334	0.93	30	0.338	0.93
NEWMH77	NEWMH30	225	1.31	7	0.452	0.59	7	0.452	0.59
NEWMH30	NEWMH31	225	1.18	7	0.439	0.6	7	0.439	0.6
NEWMH31	NEWMH76	225	0.96	7	0.262	0.88	7	0.262	0.88
NEWMH75	NEWMH74	300	1.21	8	0.32	0.56	8	0.32	0.56
NEWMH74	NEWMH73	300	1.20	8	0.318	0.56	8	0.318	0.56
NEWMH73	NEWMH72	300	1.21	8	0.347	0.52	8	0.347	0.52
NEWMH72	NEWMH71	300	1.20	8	0.345	0.52	8	0.345	0.52
NEWMH71	NEWMH26	300	1.21	8	0.359	0.5	8	0.359	0.5
NEWMH26	NEWMH25	300	1.18	10	0.587	0.38	10	0.587	0.38
Oakdale South									
NEWMH45	NEWMH44	375	1.50	2	0.184	0.27	2	0.184	0.27
NEWMH44	NEWMH50	375	0.48	4	0.198	0.4	4	0.198	0.4
NEWMH50	NEWMH43	375	1.09	5	0.176	0.58	5	0.176	0.58
NEWMH43	NEWMH42	375	0.59	5	0.164	0.54	5	0.164	0.54
NEWMH42	NEWMH55	375	0.53	5	0.303	0.36	5	0.303	0.36
NEWMH55	NEWMH41	375	0.51	11	0.502	0.65	11	0.502	0.65
NEWMH41	NEWMH40	450	0.51	45	0.394	0.9	45	0.394	0.9
NEWMH40	NEWMH67	450	0.51	47	0.505	0.75	47	0.505	0.75
NEWMH67	NEWMH39	450	0.48	53	0.397	1	53	0.397	1
NEWMH39	NEWMH10	450	0.53	53	0.327	1.17	53	0.327	1.17
Oakdale South									
NEWMH49	NEWMH48	300	2.86	26	0.262	1.78	26	0.262	1.78
NEWMH48	NEWMH56	300	1.23	26	0.327	1.31	26	0.327	1.31
NEWMH56	NEWMH47	300	4.12	26	0.236	2.06	26	0.236	2.06
NEWMH47	NEWMH46	300	1.29	34	0.384	1.37	34	0.384	1.37
NEWMH46	NEWMH41	300	2.03	34	0.351	1.54	34	0.351	1.54
NEWMH59	NEWMH58	225	0.29	5	0.551	0.28	5	0.551	0.28

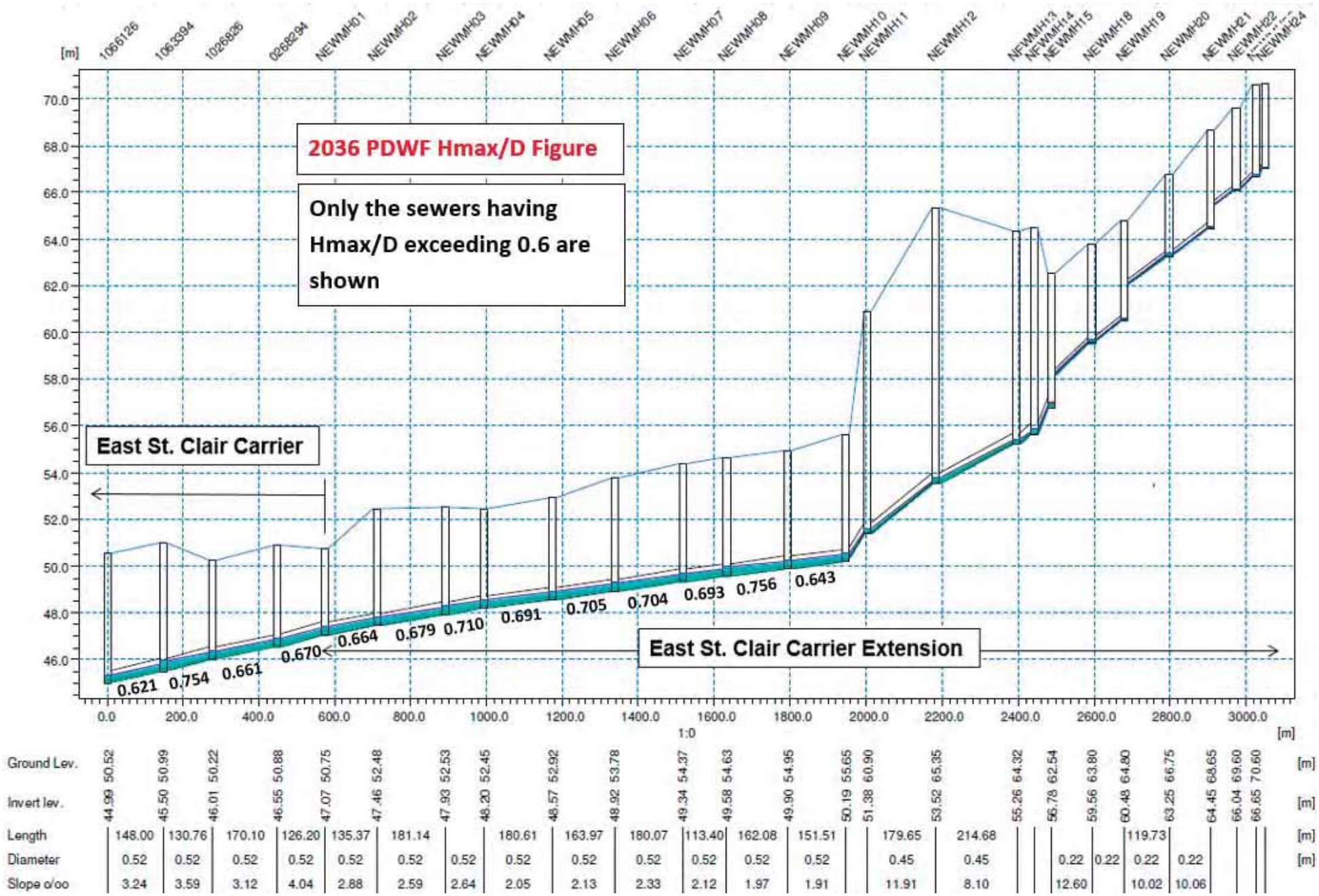
U/s Node	D/s Node	Pipe Dia (mm)	Slope (%)	2020 (Runcode: SMJE)			2036 (Runcode: SMJE)		
				PDWF (l/s)	Hmax/ D	Max Velocity (m/s)	PDWF (l/s)	Hmax/ D	Max Velocity (m/s)
NEWMH57	NEWMH58	225	1.16	3	0.166	0.74	3	0.166	0.74
NEWMH58	NEWMH60	225	0.67	8	0.447	0.58	8	0.447	0.58
NEWMH60	NEWMH61	225	2.17	8	0.52	0.59	8	0.52	0.59
NEWMH61	NEWMH47	225	0.51	8	0.321	0.72	8	0.321	0.72
NEWMH51	NEWMH52	225	1.40	6	0.249	0.81	6	0.249	0.81
NEWMH52	NEWMH53	225	0.63	6	0.265	0.66	6	0.265	0.66
NEWMH53	NEWMH54	225	0.62	6	0.37	0.5	6	0.37	0.5
NEWMH54	NEWMH55	225	0.66	6	0.263	0.67	6	0.263	0.67
NEWMH62	NEWMH63	225	0.70	1	0.238	0.29	1	0.238	0.29
NEWMH63	NEWMH40	225	0.70	1	0.129	0.49	1	0.129	0.49
NEWMH64	NEWMH65	225	3.79	6	0.465	0.58	6	0.465	0.58
NEWMH65	NEWMH66	225	1.24	6	0.456	0.52	6	0.456	0.52
NEWMH66	NEWMH67	225	1.25	6	0.228	0.93	6	0.228	0.93
Jacfin Extension									
NEWMH89	NEWMH90	225	5.55	3	0.327	0.47	3	0.327	0.47
NEWMH90	NEWMH88	225	1.41	4	0.349	0.47	4	0.349	0.47
NEWMH88	NEWMH91	225	0.41	4	0.569	0.35	4	0.569	0.35
NEWMH91	NEWMH86	225	1.04	11	0.425	0.98	11	0.425	0.98
NEWMH86	NEWMH49	300	0.65	26	0.59	1.05	26	0.59	1.05
NEWMH87	NEWMH86	225	2.63	4	0.425	0.84	4	0.425	0.84
Downstream East St. Clair Carrier									
NEWMH01	268294	525	0.40	111	0.58	1.01	143	0.67	1.08
268294	1026826	525	0.31	112	0.571	0.99	143	0.661	1.05
1026826	1063394	525	0.36	112	0.652	0.9	143	0.754	0.96
1063394	1066126	525	0.32	112	0.536	1.04	144	0.621	1.11
1066126	1394278	525	0.32	113	0.453	1.2	145	0.533	1.25
1394278	1394282	600	0.19	114	0.456	0.94	146	0.526	1
1394282	1394286	600	0.32	115	0.421	1.03	146	0.493	1.09
1394286	1063358	600	0.27	115	0.506	0.9	146	0.579	0.96
1063358	1063366	600	0.25	115	0.472	0.93	146	0.542	0.99
1063366	1066102	600	0.26	117	0.479	0.96	147	0.548	1.01
1066102	1063374	600	0.27	118	0.469	0.99	149	0.535	1.06
1063374	1066110	600	0.26	119	0.398	1.19	149	0.45	1.28
1066110	1065994	600	0.15	120	0.467	0.96	150	0.533	1.01
1065994	1063274	750	0.15	120	0.369	0.84	151	0.423	0.88
1063274	1063286	750	0.15	120	0.387	0.78	151	0.441	0.82
1063286	1066022	750	0.18	120	0.425	0.72	151	0.476	0.78
1066022	1394274	750	0.24	125	0.368	0.88	156	0.416	0.93
1394274	1394290	800	0.20	125	0.322	0.91	156	0.36	0.97
1394290	1394294	800	0.20	125	0.29	1.1	156	0.324	1.18

U/s Node	D/s Node	Pipe Dia (mm)	Slope (%)	2020 (Runcode: SMJE)			2036 (Runcode: SMJE)		
				PDWF (l/s)	Hmax/ D	Max Velocity (m/s)	PDWF (l/s)	Hmax/ D	Max Velocity (m/s)
1394294	1394298	1200	0.24	125	0.165	1.05	156	0.183	1.12
1394298	1063298	900	0.28	125	0.306	0.89	156	0.342	0.95
1063298	1066026	900	0.28	125	0.327	0.82	156	0.366	0.87
1066026	1225433	900	0.28	125	0.303	0.89	156	0.338	0.95
1225433	1225013	900	0.28	125	0.3	0.9	156	0.335	0.96
1225013	1227493	900	0.28	125	0.298	0.91	156	0.333	0.97
1227493	1224765	900	0.28	125	0.232	1.13	156	0.259	1.2
1224765	1227497	900	0.18	125	0.252	1.04	156	0.283	1.08
1227497	1278268	1200	0.13	127	0.225	0.73	158	0.249	0.78
1278268	1281000	1200	0.15	131	0.224	0.75	160	0.248	0.8
1281000	1277995	1200	0.15	131	0.225	0.75	160	0.249	0.79
1277995	1280483	1200	0.15	131	0.233	0.73	160	0.258	0.77
1280483	1280111	1200	0.13	131	0.217	0.74	160	0.239	0.78
1280111	1280115	1200	0.32	131	0.227	0.82	160	0.251	0.86
1280115	1608413	1050	0.31	132	0.265	0.82	161	0.293	0.87
1608413	1279791	1050	0.30	132	0.255	0.87	161	0.281	0.92
1279791	1282311	1050	0.30	132	0.256	0.87	161	0.283	0.92
1282311	1279583	1050	0.30	132	0.254	0.87	161	0.28	0.92
1279583	1279371	1050	0.30	132	0.202	1.09	161	0.223	1.15
1279371	1279103	1050	0.32	133	0.279	0.81	162	0.308	0.86
1279103	1281835	1050	0.30	136	0.204	1.1	164	0.225	1.16
1281835	1279107	1500	0.15	194	0.226	0.71	243	0.253	0.75
1279107	1281839	1500	0.10	194	0.224	0.69	243	0.25	0.74
1281839	1281603	1500	0.10	194	0.224	0.69	243	0.251	0.74
1281603	1281199	1500	0.10	194	0.24	0.66	243	0.269	0.7
1281199	1278471	1050	0.13	194	0.316	0.84	243	0.353	0.9
1278471	1280983	1050	0.45	194	0.344	0.96	243	0.384	1.02
1280983	1280786	1050	0.15	215	0.284	1.17	267	0.317	1.24
1280786	1277646	1200	0.11	223	0.324	0.77	277	0.364	0.82
1277646	1280378	1200	0.09	223	0.318	0.75	277	0.356	0.79
1280378	1280086	1200	0.09	223	0.3	0.79	277	0.334	0.84
1280086	1280090	1200	0.10	223	0.267	0.93	277	0.298	0.99
1280090	1279614	1200	0.11	223	0.265	0.93	277	0.295	1
1279614	1282026	1200	0.10	236	0.265	1.12	291	0.294	1.19
1282026	1282022	1200	0.50	236	0.184	1.65	291	0.204	1.75
1282022	1279294	1200	0.50	236	0.477	0.56	291	0.516	0.59
1279294	1281374	1350	0.09	405	0.393	0.84	471	0.427	0.85
1281374	1275321	1350	0.12	403	0.368	0.9	468	0.397	0.94
1275321	1276981	1350	0.11	403	0.341	0.95	468	0.366	1
1276981	1276849	1350	0.11	404	0.303	1.26	466	0.325	1.32

U/s Node	D/s Node	Pipe Dia (mm)	Slope (%)	2020 (Runcode: SMJE)			2036 (Runcode: SMJE)		
				PDWF (l/s)	Hmax/ D	Max Velocity (m/s)	PDWF (l/s)	Hmax/ D	Max Velocity (m/s)
1276849	1273977	1350	0.13	411	0.366	0.99	468	0.391	1.04
1273977	1276705	1350	0.15	411	0.296	1.3	468	0.315	1.35
1276705	1404019	1350	2.36	502	0.223	2.36	542	0.236	2.36
1404019	SPS0204	1350	13.55	502	0.554	8.99	542	0.559	6.07
RMTND01	RMTND03	2000	0.20	501	0.186	1.81	542	0.196	1.78
RMTND03	OUTLET1	3000	0.20	810	0.124	1.61	904	0.131	1.66

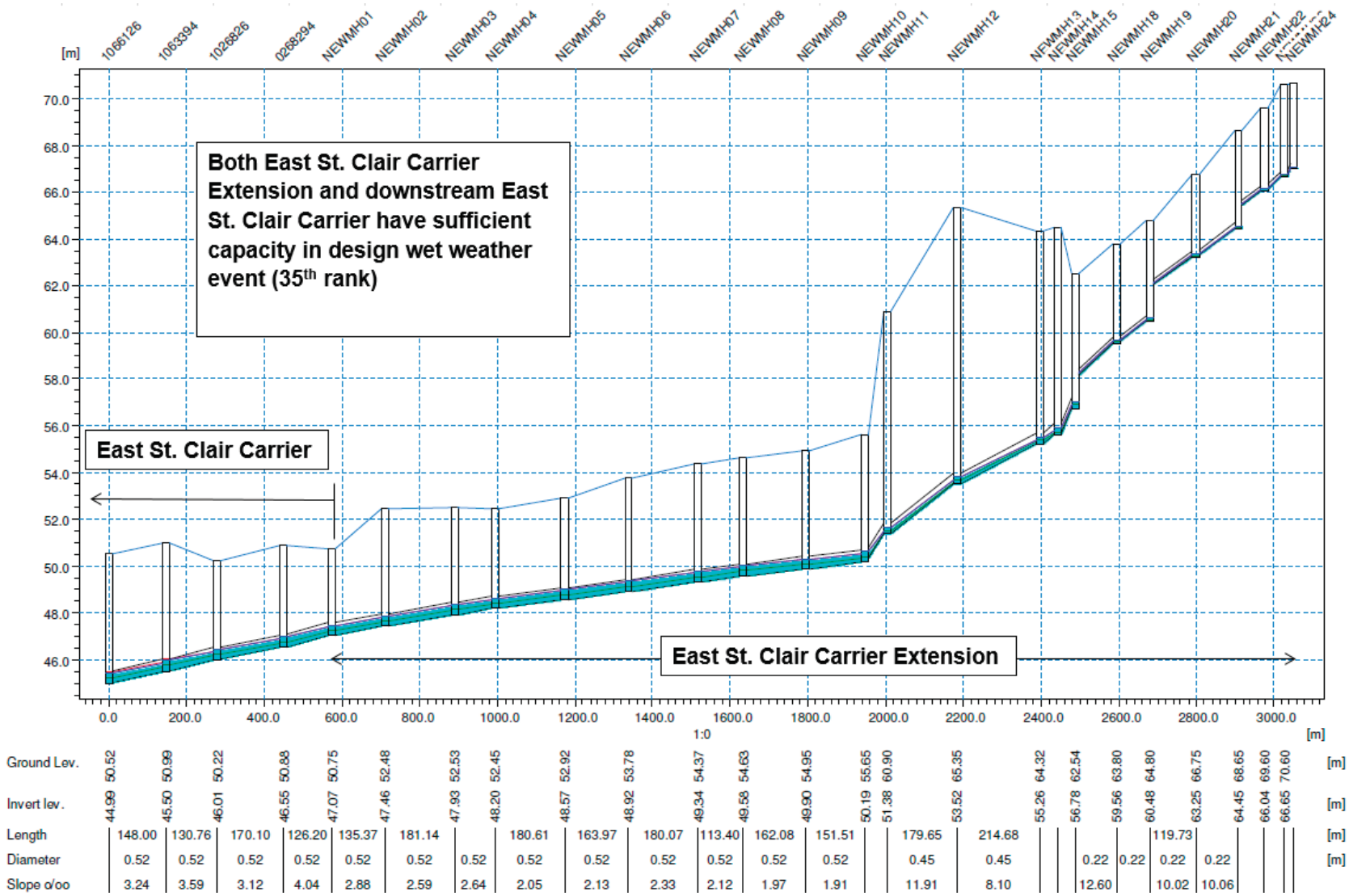


HGL along East St. Clair Carrier Extension and downstream East St. Clair Carrier in 2020 PDWF



HGL along East St. Clair Carrier Extension and downstream East St. Clair Carrier in 2036 PDWF

Appendix E – Wet Weather (Design Event) System Performance (2036)



HGL along East St. Clair Carrier Extension and downstream East St. Clair Carrier in 2036 Design Wet Weather Event (35th rank)

Appendix F – Cost Estimates

Sydney WATER

COST ESTIMATOR

Job Name: Oakdale Central

Estimator: Amir Rashidi

Estimate Date: **05/05/2016**

Print Date/Time: **26/05/2016 15:36**

Ver 09-2015.11

ITEM	H#	DESCRIPTION		PARAMETER	UNIT	QUANTITY	RATE	TOTAL
		DIRECT COSTS						
	H1	**Option 1**						
1		Gravity Sewer Greenfield PVC 1.5m deep		225 dia	m	0	228	0
2		Gravity Sewer Greenfield PVC 1.5m deep		300 dia	m	0	275	0
3		Gravity Sewer Greenfield PVC 1.5m deep		375 dia	m	750	386	289,828
4		Gravity Sewer Greenfield PP 2.0m deep		450 dia	m	0	621	0
5		EO Rock Excav Trench Std Dpth - 250 Dia (1%RK-100%RK)	%RK-->	30	m	0	18	0
6		EO Rock Excav Trench Std Dpth - 300 Dia (1%RK-100%RK)	%RK-->	30	m	0	21	0
7		EO Rock Excav Trench Std Dpth - 375 Dia (1%RK-100%RK)	%RK-->	30	m	750	25	18,621
8		EO Rock Excav Trench Std Dpth - 450 Dia (1%RK-100%RK)	%RK-->	30	m	0	10	0
9		EO Road Restoration Trench Std Depth		250 dia	m	0	434	0
10		EO Road Restoration Trench Std Depth		300 dia	m	0	485	0
11		EO Road Restoration Trench Std Depth		375 dia	m	188	513	96,163
12		EO Road Restoration Trench Std Depth		450 dia	m	0	579	0
	H1	**Scope Contingency**						
13		Urban Detailed Planning		75	%	404,612	0.75	303,459
		Sub Total Direct Costs						**708,072**
		INDIRECT COSTS				**%**		
14		Contractor Design Costs (% of Direct Costs)				10.00%		70,807
15		Contractor Indirect Costs (% of Direct Costs)				20.00%		141,614
16		Contractor Margin (% of DC+Indirect Costs)				15.00%		138,074
17		Risk Contingency (% of (Direct Costs+Indirect Costs+Margin))				35.00%		370,498
		Total Construction Cost						**1,429,065**
		SWC CLIENT COSTS				**% of ConstC**		
18		SWC Costs to Date	Current as at:					
19		SWC Design Costs (% of Construction Costs)				1.00%		14,291
20		SWC Tender Costs (% of Construction Costs)				0.50%	Adj. to Min Limit>>	50,000

Sydney WATER **COST ESTIMATOR**

Job Name:	Oakdale Central	Estimate Date:	**05/05/2016**
Estimator:	Amir Rashidi	Print Date/Time:	**26/05/2016 15:36**
			Ver 09-2015.11

ITEM	H#	DESCRIPTION	PARAMETER	UNIT	QUANTITY	RATE	TOTAL
21		SWC Planning Costs (% of Construction Costs)			5.00%		71,453
22		SWC Project Management Costs (% of Construction Costs)			5.00%		71,453
23		SWC Insurances & Financing Costs (% of Construction Costs)			0.55%		7,860
24		SWC Land Acquisition/Easement Costs					
25		SWC Risk Contingency (% of the SWC Client Future Costs only)				**of Client Costs**	
		TOTAL PROJECT BUDGET REQUIREMENT					**1,644,122**

Sydney WATER

COST ESTIMATOR

Job Name: Oakdale East

Estimator: Amir Rashidi

Estimate Date: **05/05/2016**

Print Date/Time: **26/05/2016 15:39**

Ver 09-2015.11

ITEM	H#	DESCRIPTION		PARAMETER	UNIT	QUANTITY	RATE	TOTAL
		DIRECT COSTS						
	H1	**Option 1**						
1		Gravity Sewer Greenfield PVC 1.5m deep		225 dia	m	0	228	0
2		Gravity Sewer Greenfield PVC 1.5m deep		300 dia	m	0	275	0
3		Gravity Sewer Greenfield PVC 1.5m deep		375 dia	m	1,020	386	394,166
4		Gravity Sewer Greenfield PP 2.0m deep		450 dia	m	0	621	0
5		EO Rock Excav Trench Std Dpth - 250 Dia (1%RK-100%RK)	%RK-->	30	m	0	18	0
6		EO Rock Excav Trench Std Dpth - 300 Dia (1%RK-100%RK)	%RK-->	30	m	0	21	0
7		EO Rock Excav Trench Std Dpth - 375 Dia (1%RK-100%RK)	%RK-->	30	m	1,020	25	25,325
8		EO Rock Excav Trench Std Dpth - 450 Dia (1%RK-100%RK)	%RK-->	30	m	0	10	0
9		EO Road Restoration Trench Std Depth		250 dia	m	0	434	0
10		EO Road Restoration Trench Std Depth		300 dia	m	0	485	0
11		EO Road Restoration Trench Std Depth		375 dia	m	255	513	130,782
12		EO Road Restoration Trench Std Depth		450 dia	m	0	579	0
	H1	**Scope Contingency**						
13		Urban Detailed Planning		75	%	550,273	0.75	412,705
		Sub Total Direct Costs						**962,977**
		INDIRECT COSTS				**%**		
14		Contractor Design Costs (% of Direct Costs)				10.00%		96,298
15		Contractor Indirect Costs (% of Direct Costs)				20.00%		192,595
16		Contractor Margin (% of DC+Indirect Costs)				15.00%		187,781
17		Risk Contingency (% of (Direct Costs+Indirect Costs+Margin))				35.00%		503,878
		Total Construction Cost						**1,943,529**
		SWC CLIENT COSTS				**% of ConstC**		
18		SWC Costs to Date	Current as at:					
19		SWC Design Costs (% of Construction Costs)				1.00%		19,435
20		SWC Tender Costs (% of Construction Costs)				0.50%	Adj. to Min Limit>>	50,000

Sydney WATER **COST ESTIMATOR**

Job Name:	Oakdale East	Estimate Date:	**05/05/2016**
Estimator:	Amir Rashidi	Print Date/Time:	**26/05/2016 15:39**
			Ver 09-2015.11

ITEM	H#	DESCRIPTION	PARAMETER	UNIT	QUANTITY	RATE	TOTAL
21		SWC Planning Costs (% of Construction Costs)			5.00%		97,176
22		SWC Project Management Costs (% of Construction Costs)			5.00%		97,176
23		SWC Insurances & Financing Costs (% of Construction Costs)			0.55%		10,689
24		SWC Land Acquisition/Easement Costs					
25		SWC Risk Contingency (% of the SWC Client Future Costs only)				**of Client Costs**	
		TOTAL PROJECT BUDGET REQUIREMENT					**2,218,005**

Sydney WATER

COST ESTIMATOR

Job Name: Oakdale West

Estimator: Amir Rashidi

Estimate Date: **05/05/2016**

Print Date/Time: **26/05/2016 15:40**

Ver 09-2015.11

ITEM	H#	DESCRIPTION		PARAMETER	UNIT	QUANTITY	RATE	TOTAL
		DIRECT COSTS						
	H1	**Option 1**						
1		Gravity Sewer Greenfield PVC 1.5m deep		225 dia	m	250	228	57,075
2		Gravity Sewer Greenfield PVC 1.5m deep		300 dia	m	1,500	275	413,142
3		Gravity Sewer Greenfield PVC 1.5m deep		375 dia	m	2,320	386	896,533
4		Gravity Sewer Greenfield PP 2.0m deep		450 dia	m	0	621	0
5		EO Rock Excav Trench Std Dpth - 250 Dia (1%RK-100%RK)	%RK-->	30	m	250	18	4,421
6		EO Rock Excav Trench Std Dpth - 300 Dia (1%RK-100%RK)	%RK-->	30	m	1,500	21	32,141
7		EO Rock Excav Trench Std Dpth - 375 Dia (1%RK-100%RK)	%RK-->	30	m	2,320	25	57,602
8		EO Rock Excav Trench Std Dpth - 450 Dia (1%RK-100%RK)	%RK-->	30	m	0	10	0
9		EO Road Restoration Trench Std Depth		250 dia	m	63	434	27,128
10		EO Road Restoration Trench Std Depth		300 dia	m	375	485	181,800
11		EO Road Restoration Trench Std Depth		375 dia	m	580	513	297,466
12		EO Road Restoration Trench Std Depth		450 dia	m	0	579	0
	H1	**Scope Contingency**						
13		Urban Detailed Planning		75	%	1,967,308	0.75	1,475,481
		Sub Total Direct Costs						**3,442,789**
		INDIRECT COSTS				**%**		
14		Contractor Design Costs (% of Direct Costs)				10.00%		344,279
15		Contractor Indirect Costs (% of Direct Costs)				20.00%		688,558
16		Contractor Margin (% of DC+Indirect Costs)				15.00%		671,344
17		Risk Contingency (% of (Direct Costs+Indirect Costs+Margin))				35.00%		1,801,440
		Total Construction Cost						**6,948,410**
		SWC CLIENT COSTS				**% of ConstC**		
18		SWC Costs to Date	Current as at:					
19		SWC Design Costs (% of Construction Costs)				1.00%		69,484
20		SWC Tender Costs (% of Construction Costs)				0.50%	Adj. to Min Limit>>	50,000

Sydney WATER

COST ESTIMATOR

Job Name: Oakdale West

Estimator: Amir Rashidi

Estimate Date: **05/05/2016**

Print Date/Time: **26/05/2016 15:40**

Ver 09-2015.11

ITEM	H#	DESCRIPTION	PARAMETER	UNIT	QUANTITY	RATE	TOTAL
21		SWC Planning Costs (% of Construction Costs)			5.00%		347,421
22		SWC Project Management Costs (% of Construction Costs)			5.00%		347,421
23		SWC Insurances & Financing Costs (% of Construction Costs)			0.55%		38,216
24		SWC Land Acquisition/Easement Costs					
25		SWC Risk Contingency (% of the SWC Client Future Costs only)				of Client Costs	
		TOTAL PROJECT BUDGET REQUIREMENT					**7,800,952**

Sydney WATER **COST ESTIMATOR**

Job Name:	Oakdale South	Estimate Date:	**05/05/2016**
Estimator:	Amir Rashidi	Print Date/Time:	**26/05/2016 15:39**
			Ver 09-2015.11

ITEM	H#	DESCRIPTION		PARAMETER	UNIT	QUANTITY	RATE	TOTAL
		DIRECT COSTS						
	H1	**Option 1**						
1		Gravity Sewer Greenfield PVC 1.5m deep		225 dia	m	1,280	228	292,226
2		Gravity Sewer Greenfield PVC 1.5m deep		300 dia	m	450	275	123,943
3		Gravity Sewer Greenfield PVC 1.5m deep		375 dia	m	1,250	386	483,046
4		Gravity Sewer Greenfield PP 2.0m deep		450 dia	m	720	621	447,136
5		EO Rock Excav Trench Std Dpth - 250 Dia (1%RK-100%RK)	%RK-->	30	m	1,280	18	22,638
6		EO Rock Excav Trench Std Dpth - 300 Dia (1%RK-100%RK)	%RK-->	30	m	450	21	9,642
7		EO Rock Excav Trench Std Dpth - 375 Dia (1%RK-100%RK)	%RK-->	30	m	1,250	25	31,035
8		EO Rock Excav Trench Std Dpth - 450 Dia (1%RK-100%RK)	%RK-->	30	m	720	10	7,102
9		EO Road Restoration Trench Std Depth		250 dia	m	320	434	138,896
10		EO Road Restoration Trench Std Depth		300 dia	m	113	485	54,540
11		EO Road Restoration Trench Std Depth		375 dia	m	313	513	160,272
12		EO Road Restoration Trench Std Depth		450 dia	m	180	579	104,172
	H1	**Scope Contingency**						
13		Urban Detailed Planning		75	%	1,874,649	0.75	1,405,986
		Sub Total Direct Costs						**3,280,635**
		INDIRECT COSTS				**%**		
14		Contractor Design Costs (% of Direct Costs)				10.00%		328,063
15		Contractor Indirect Costs (% of Direct Costs)				20.00%		656,127
16		Contractor Margin (% of DC+Indirect Costs)				15.00%		639,724
17		Risk Contingency (% of (Direct Costs+Indirect Costs+Margin))				35.00%		1,716,592
		Total Construction Cost						**6,621,141**
		SWC CLIENT COSTS				**% of ConstC**		
18		SWC Costs to Date	Current as at:					
19		SWC Design Costs (% of Construction Costs)				1.00%		66,211
20		SWC Tender Costs (% of Construction Costs)				0.50%	Adj. to Min Limit>>	50,000

Sydney WATER

COST ESTIMATOR

Job Name: Oakdale South

Estimator: Amir Rashidi

Estimate Date: **05/05/2016**

Print Date/Time: **26/05/2016 15:39**

Ver 09-2015.11

ITEM	H#	DESCRIPTION	PARAMETER	UNIT	QUANTITY	RATE	TOTAL
21		SWC Planning Costs (% of Construction Costs)			5.00%		331,057
22		SWC Project Management Costs (% of Construction Costs)			5.00%		331,057
23		SWC Insurances & Financing Costs (% of Construction Costs)			0.55%		36,416
24		SWC Land Acquisition/Easement Costs					
25		SWC Risk Contingency (% of the SWC Client Future Costs only)				**of Client Costs**	
		TOTAL PROJECT BUDGET REQUIREMENT					**7,435,882**

Sydney WATER

COST ESTIMATOR

Job Name: Jacfin

Estimator: Amir Rashidi

Estimate Date: **05/05/2016**

Print Date/Time: **26/05/2016 15:38**

Ver 09-2015.11

ITEM	H#	DESCRIPTION		PARAMETER	UNIT	QUANTITY	RATE	TOTAL
		DIRECT COSTS						
	H1	**Option 1**						
1		Gravity Sewer Greenfield PVC 1.5m deep		225 dia	m	1,250	228	285,377
2		Gravity Sewer Greenfield PVC 1.5m deep		300 dia	m	170	275	46,823
3		Gravity Sewer Greenfield PVC 1.5m deep		375 dia	m	0	386	0
4		Gravity Sewer Greenfield PP 2.0m deep		450 dia	m	0	621	0
5		EO Rock Excav Trench Std Dpth - 250 Dia (1%RK-100%RK)	%RK-->	30	m	1,250	18	22,107
6		EO Rock Excav Trench Std Dpth - 300 Dia (1%RK-100%RK)	%RK-->	30	m	170	21	3,643
7		EO Rock Excav Trench Std Dpth - 375 Dia (1%RK-100%RK)	%RK-->	30	m	0	25	0
8		EO Rock Excav Trench Std Dpth - 450 Dia (1%RK-100%RK)	%RK-->	30	m	0	10	0
9		EO Road Restoration Trench Std Depth		250 dia	m	313	434	135,641
10		EO Road Restoration Trench Std Depth		300 dia	m	43	485	20,604
11		EO Road Restoration Trench Std Depth		375 dia	m	0	513	0
12		EO Road Restoration Trench Std Depth		450 dia	m	0	579	0
	H1	**Scope Contingency**						
13		Urban Detailed Planning		75	%	514,195	0.75	385,646
		Sub Total Direct Costs						**899,841**
		INDIRECT COSTS				**%**		
14		Contractor Design Costs (% of Direct Costs)				10.00%		89,984
15		Contractor Indirect Costs (% of Direct Costs)				20.00%		179,968
16		Contractor Margin (% of DC+Indirect Costs)				15.00%		175,469
17		Risk Contingency (% of (Direct Costs+Indirect Costs+Margin))				35.00%		470,842
		Total Construction Cost						**1,816,104**
		SWC CLIENT COSTS				**% of ConstC**		
18		SWC Costs to Date	Current as at:					
19		SWC Design Costs (% of Construction Costs)				1.00%		18,161
20		SWC Tender Costs (% of Construction Costs)				0.50%	Adj. to Min Limit>>	50,000

Sydney WATER

COST ESTIMATOR

Job Name: Jacfin

Estimator: Amir Rashidi

Estimate Date: **05/05/2016**

Print Date/Time: **26/05/2016 15:38**

Ver 09-2015.11

ITEM	H#	DESCRIPTION	PARAMETER	UNIT	QUANTITY	RATE	TOTAL
21		SWC Planning Costs (% of Construction Costs)			5.00%		90,805
22		SWC Project Management Costs (% of Construction Costs)			5.00%		90,805
23		SWC Insurances & Financing Costs (% of Construction Costs)			0.55%		9,989
24		SWC Land Acquisition/Easement Costs					
25		SWC Risk Contingency (% of the SWC Client Future Costs only)				**of Client Costs**	
		TOTAL PROJECT BUDGET REQUIREMENT					**2,075,864**

Sydney WATER **COST ESTIMATOR**

Job Name: Jacfin

Estimator: Amir Rashidi

Estimate Date: **05/05/2016**

Print Date/Time: **26/05/2016 15:36**

Ver 09-2015.11

ITEM	H#	DESCRIPTION		PARAMETER	UNIT	QUANTITY	RATE	TOTAL
		DIRECT COSTS						
	H1	**Option 1**						
1		Gravity Sewer Greenfield PVC 1.5m deep		225 dia	m	1,250	228	285,377
2		Gravity Sewer Greenfield PVC 1.5m deep		300 dia	m	170	275	46,823
3		Gravity Sewer Greenfield PVC 1.5m deep		375 dia	m	0	386	0
4		Gravity Sewer Greenfield PP 2.0m deep		450 dia	m	0	621	0
5		EO Rock Excav Trench Std Dpth - 250 Dia (1%RK-100%RK)	%RK-->	30	m	1,250	18	22,107
6		EO Rock Excav Trench Std Dpth - 300 Dia (1%RK-100%RK)	%RK-->	30	m	170	21	3,643
7		EO Rock Excav Trench Std Dpth - 375 Dia (1%RK-100%RK)	%RK-->	30	m	0	25	0
8		EO Rock Excav Trench Std Dpth - 450 Dia (1%RK-100%RK)	%RK-->	30	m	0	10	0
9		EO Road Restoration Trench Std Depth		250 dia	m	313	434	135,641
10		EO Road Restoration Trench Std Depth		300 dia	m	43	485	20,604
11		EO Road Restoration Trench Std Depth		375 dia	m	0	513	0
12		EO Road Restoration Trench Std Depth		450 dia	m	0	579	0
	H1	**Scope Contingency**						
13		Urban Detailed Planning		75	%	514,195	0.75	385,646
		Sub Total Direct Costs						**899,841**
		INDIRECT COSTS				**%**		
14		Contractor Design Costs (% of Direct Costs)				10.00%		89,984
15		Contractor Indirect Costs (% of Direct Costs)				20.00%		179,968
16		Contractor Margin (% of DC+Indirect Costs)				15.00%		175,469
17		Risk Contingency (% of (Direct Costs+Indirect Costs+Margin))				35.00%		470,842
		Total Construction Cost						**1,816,104**
		SWC CLIENT COSTS				**% of ConstC**		
18		SWC Costs to Date	Current as at:					
19		SWC Design Costs (% of Construction Costs)				1.00%		18,161
20		SWC Tender Costs (% of Construction Costs)				0.50%	Adj. to Min Limit>>	50,000

Sydney WATER

COST ESTIMATOR

Job Name: Jacfin

Estimator: Amir Rashidi

Estimate Date: **05/05/2016**

Print Date/Time: **26/05/2016 15:36**

Ver 09-2015.11

ITEM	H#	DESCRIPTION	PARAMETER	UNIT	QUANTITY	RATE	TOTAL
21		SWC Planning Costs (% of Construction Costs)			5.00%		90,805
22		SWC Project Management Costs (% of Construction Costs)			5.00%		90,805
23		SWC Insurances & Financing Costs (% of Construction Costs)			0.55%		9,989
24		SWC Land Acquisition/Easement Costs					
25		SWC Risk Contingency (% of the SWC Client Future Costs only)				**of Client Costs**	
		TOTAL PROJECT BUDGET REQUIREMENT					**2,075,864**

www.ghd.com

Oakdale Industrial Development - Planning of Water Related Services

Final Report - Water

July 2016

Commercial in Confidence

GHD Disclaimer

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The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in Basis of Planning report (i.e. TM-01). GHD disclaims liability arising from any of the assumptions being incorrect.

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GHD has prepared preliminary Cost Estimates in this report. Actual prices, costs and other variables may be different to those used to prepare the Cost Estimate and may change. Unless as otherwise specified in this report, no detailed quotation has been obtained for actions identified in this report. GHD does not represent, warrant or guarantee that the works can or will be undertaken at a cost which is the same or less than the Cost Estimate.

GHD

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Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Rev. 01	A Rashidi	M Healey		M Healey		15/06/16
Rev. 02	A Rashidi	M Healey		M Healey		5/07/16
Final	A Rashidi	M Healey, Sydney Water, Goodmans		M Healey		28/07/2016

Document Status

Oakdale Industrial Development - Planning of Water Related Services July 2016

This report has been prepared by GHD

Approved for issue

Signature	Date	Signature	Date	Signature	Date
	29/07/16		29/07/16.		
Kym Dracopoulos		Russell Hogan		Amir Rashidi	
Manager, Technical		Project Manager		Project Manager	
Goodman Property Services (AUST) Pty Ltd		AT&L Associates		GHD	

Endorsed

I confirm that impacted parties within my business have been consulted, their inputs have been considered and the decisions have been communicated to relevant parties.

Signature	Date	Signature	Date
Suhanti Thirunavukarasu		Richard Schuil	
Principal Planner		Engineering & Planning Manager	
Engineering & Environmental Services		Growth Centres	
Sydney Water		Sydney Water	

Approved

Signature	Date
Jim Price	
Development Services Officer	
Liveable City Solutions	
Sydney Water	

Executive Summary

The Oakdale industrial site is part of the existing Western Sydney Employment Area (WSEA 8 – Area South of Pipeline Precinct), located approximately 40 kms west of the Sydney CBD, adjacent to the M7 and M4 intersection. The site was rezoned in September 2009 through the WSEA SEPP 2009, and Goodman is the lead developer of the precinct. An overview of study area is presented in Figure 1.

The initial water servicing plan scheme was to supply Oakdale from existing DN450 lead-in main within Cecil Park supply system.

This Local Area Servicing Plan (LASP) for potable water has been prepared at the request of Sydney Water to provide a servicing strategy for the existing WSEA Precinct No. 8–Area South of Pipeline, including Goodman's Oakdale development. This servicing strategy identifies the Sydney Water infrastructure required to service the Oakdale Precinct, anticipated costs, sizing, preliminary alignments and trigger points (i.e. development timing and staging) for the delivery of potable water infrastructure required to service the Oakdale Precinct.

Growth and water demand projections

Oakdale Estate is an ongoing industrial development with approximately 452 nett hectares of developable area. This includes Goodman, CSR and Jacfin lands. Their lands are predominately zoned IN1 'General Industrial' under the State Environmental Planning Policy (Western Sydney Employment Area) 2009. The site spans two local government areas of Penrith and Fairfield.

The growth projections listed for this study are supplied by AT&L in conjunction with Jacfin, CSR and Goodman. The list of the growth projection within the Oakdale Industrial Development is summarised in Table 1.

Table 1 Growth Projections

Development site	Nett Development (ha)	Development type	Connection (1)
Oakdale Central	45.2	IN1- General Industrial (2)	2016- 2017
Jacfin	87.8	IN1- General Industrial/ Residential	2016- 2017
Oakdale South	70.2	IN1- General Industrial	2017- 2019
CSR	63.4	IN1- General Industrial	2017-2020
Oakdale West	90.5	IN1- General Industrial	2019- 2021
Oakdale East	95.0	IN1- General Industrial	2022- 2024
Total	**452**		

Note 1: The proposed timing of connection is subject to change

Note 2: water demand assessed based on Light industrial / warehouse

An evidence based approach to forecasting future demands in the study area, based on observed demands in an adjacent water supply system, was adopted as per the "Water System Planning Guidelines 2014". Table 2 below summarises the projected water demands for the Oakdale Industrial Development. Total projected max day demand in the Oakdale Precinct is 7.5 ML/d.

Table 2 Summary of Water Demand - Oakdale Industrial Development

Development site	Timing	Average Day Demand (ML/d)	Max Day Demand (ML/d)
Oakdale Central	2016-2017	0.42	0.7
Jacfin	2016-2017	1.04	2.12
Oakdale South	2017-2019	0.65	1.0
CSR	2017-2020	0.58	0.93
Oakdale West	2019-2021	0.83	1.3
Oakdale East	2022-2024	0.87	1.4
Total		**4.4**	**7.5**

The key opportunities and constraints associated with water servicing of the Oakdale Industrial Development is summarised below.

Opportunities

- Based on the supplied Oakdale growth projections, Cecil Park reservoir and Prospect Creek pumping station WP0184B have sufficient capacity to supply the entire Cecil Park zone including Oakdale Development for the 2020 demand scenario.
- A DN450 lead-in water main has been constructed as part of previous site works and has sufficient capacity to supply the entire Oakdale Development.
- Minchinbury Elevated supply zone has 2.5 ML/d transferable capacity to provide supply contingency to Oakdale Industrial.
- The Growth Servicing Strategy (GSS) proposed augmentations are adequate to supply the entire Cecil Park zone including Oakdale Development for the post 2031 demand scenario.

Constraints

- Cecil Park reservoir and pumping station WP0184 has insufficient capacity to supply the entire Cecil Park zone including Oakdale Development post 2020 demand scenario, when Austral and Leppington North will be rezoned to Cecil Park supply system. Sydney Water will address growth servicing requirements in the broader region.
- Erskine Park Elevated supply system has insufficient head to supply Oakdale Industrial system.

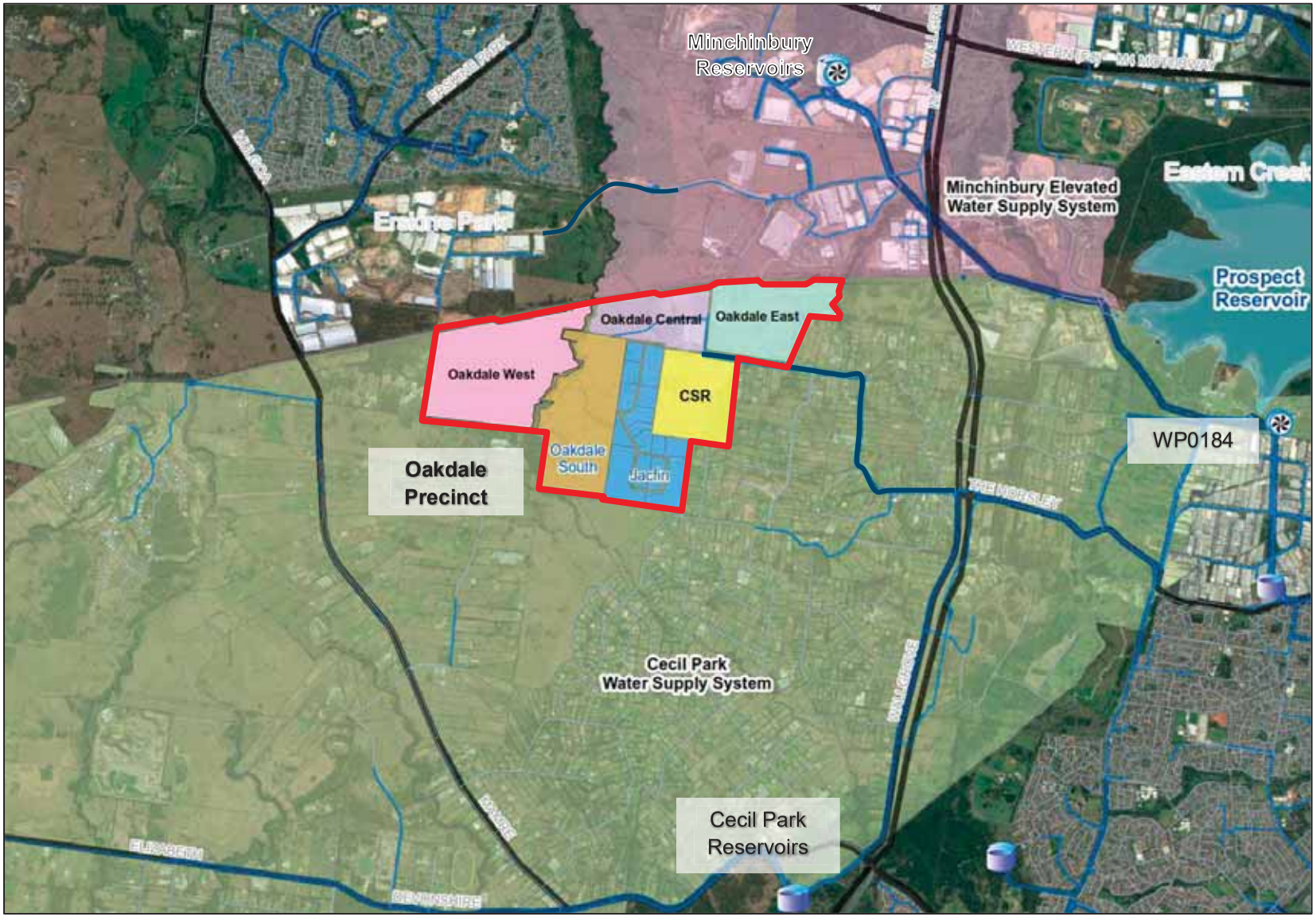

Figure 1 Oakdale Industrial Development Overview

The Oakdale Servicing Strategy is made up of the following:

Oakdale Central

Oakdale Central is currently supplied from the existing DN250 potable water main within Millner Avenue (refer section 3-4 on figure 2) which is supplied from the Cecil Park Supply System. To improve system reliability, it is proposed to supply Oakdale Central from the Minchinbury Elevated supply system via a proposed DN300 connection (refer section 4-7 on Fig. 2) between the existing DN250 potable water main within Millner Avenue (refer section 3-4 on Fig. 2) to the proposed DN300 within Oakdale West (refer section 7-8 on Fig. 2) which ultimately connects to the existing DN300 within Erskine Park Link Road (EPLR). The proposed DN300 is proposed to be delivered at the same time as the Oakdale West development.

Oakdale South

Oakdale South will be supplied via extension (refer section 4-6 on Fig. 2) of the existing DN250 potable water main (Refer Section 3-4 on Fig. 2) within Millner Avenue which is supplied from the Cecil Park Supply System.

Oakdale West

Oakdale West will be supplied via a proposed DN300 (refer section 8-9 on Fig. 2) connection to the existing DN300 within Erskine Park Link Road (EPLR). This proposed DN300 will be supplied from the Minchinbury Elevated Supply System. As mentioned above, a DN300 cross connection (refer section 4-7 on Fig. 2) to Oakdale Central will be delivered at the same time as the Oakdale West development to supply Oakdale Central from the Minchinbury Elevated Supply System which will improve the system reliability.

Oakdale East

Oakdale East will be supplied off the existing DN450 within Burley Road which is supplied from the Cecil Park Supply System.

CSR

CSR lands will be supplied via a proposed DN300 connected to the existing DN450 within Burley Road which is supplied from the Cecil Park Supply System.

Jacfin

Jacfin lands will be supplied via a proposed DN300 connected to the existing DN450 within Burley Road which is supplied from the Cecil Park Supply System. Jacfin internal reticulation will be via a proposed DN250 which will be connected to the proposed DN250 within Oakdale South to improve the system reliability.

The preliminary capital cost estimates associated with Oakdale Industrial water servicing is presented in Table 3. The Oakdale servicing plan overview is presented in Figure 2.

Table 3 Preliminary capital cost estimates

Section	Description	Delivery Date	Capital Cost ($M)
2-4	1.2 km DN300	2016-2017	$2.21 M
4-5	0.9 km DN250	2016-2017	$1.34 M
5-6	0.85 km DN200	2016-2017	$1.08 M
4-7	0.7 km DN300	2017-2018	$ 1.31 M
7-8	1.2 km DN300	2018-2019	$2.21 M
8-9	1.6 km DN300	2018-2019	$2.93 M

Section	Description	Delivery Date	Capital Cost ($M)
1-2	4.0 km DN450	Constructed	NA
2-3	0.35 km DN250	Constructed	NA
3-4	1.2 km DN250	Constructed	NA
2-4	1.2 km DN300	2016-2017	$2.21 M
4-5	0.9 km DN250	2016-2017	$1.34 M
5-6	0.85 km DN200	2016-2017	$1.08 M
4-7	0.7 km DN300	2017-2018	$ 1.31 M
7-8	1.2 km DN300	2018-2019	$2.21 M
8-9	1.6 km DN300	2018-2019	$2.93 M

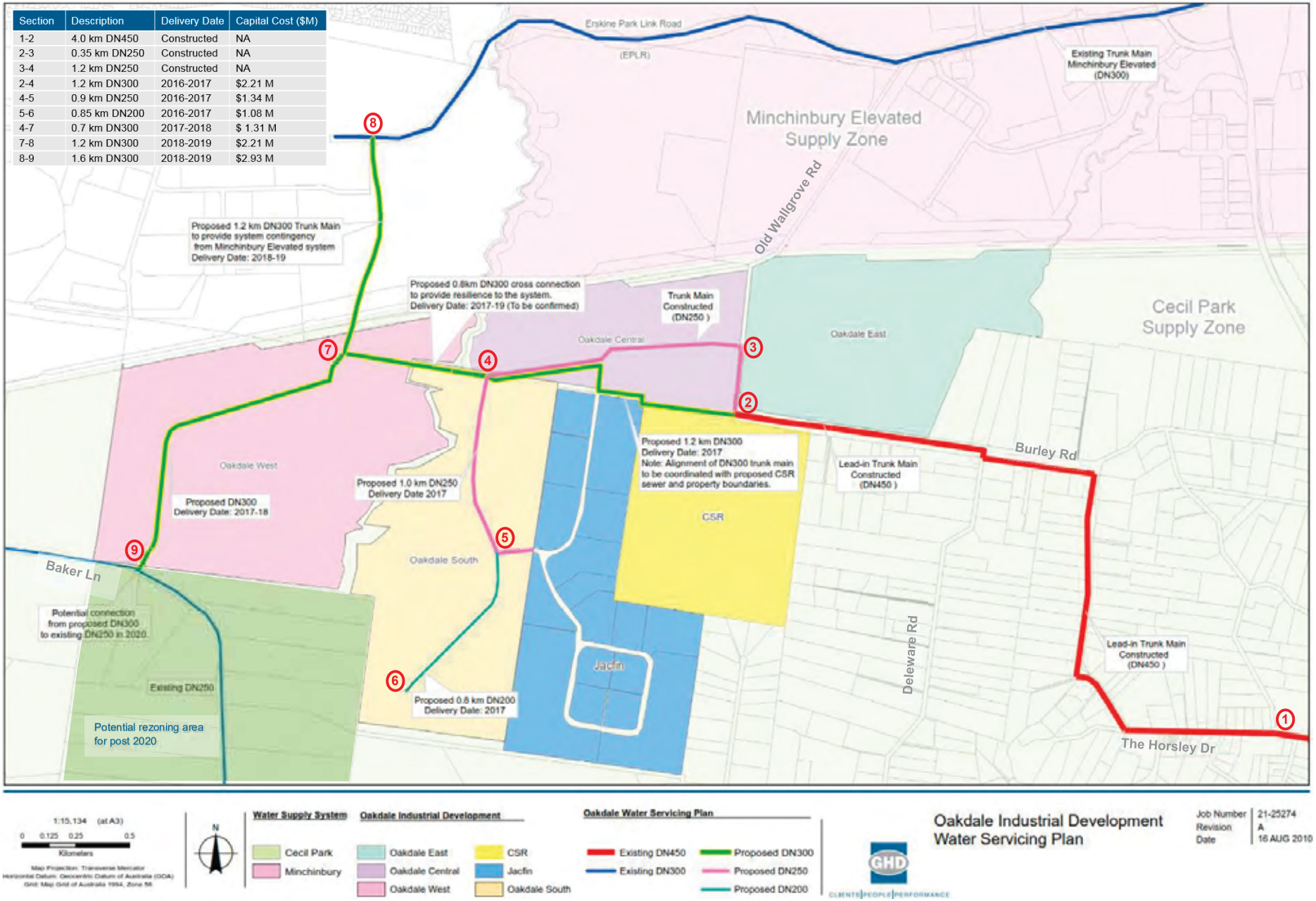

Figure 2- Oakdale Industrial Water Servicing Plan

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Appendix B – Detailed Cost Estimation

Appendix C – Growth Servicing Strategy (GSS) augmentations

1. Introduction

1.1 Background

The Oakdale industrial site is part of the existing Western Sydney Employment Area (WSEA 8 – Area South of Pipeline Precinct), located approximately 40 kms west of the Sydney CBD, adjacent to the M7 and M4 intersection. The site was rezoned in September 2009 through the WSEA SEPP 2009, and Goodman is the lead developer of the precinct. An overview of study area is presented in Figure 1.

The initial water servicing plan scheme was to supply Oakdale from existing DN450 lead-in main within Cecil Park supply system. Minchinbury Elevated supply system also will provide connection to Oakdale from the existing DN300 within Erskine Park Link Road (EPLR).

Assets required to service proposed Goodman, Jacfin and CSR developments within Oakdale precinct are to be staged to meet development timeframes, with lead-in infrastructure funded up front and delivered by the lead developer and to be reimbursed by Sydney Water in accordance with its policy on Funding Infrastructure to Service Growth.

1.2 Purpose of this report

The purpose of this report is to document the:

- Revised growth and water demand forecasts,
- Key opportunities and constraints,
- Outcomes of the assessment work undertaken, and
- Water servicing plan for the Oakdale Industrial Development.

This Local Area Servicing Plan (LASP) for potable water has been prepared at the request of Sydney Water to provide a servicing strategy for the existing WSEA Precinct No. 8–Area South of Pipeline, including Goodman's Oakdale development. This servicing strategy identifies the Sydney Water infrastructure required to service the Oakdale Precinct, anticipated costs, sizing, preliminary alignments and trigger points (i.e. development timing and staging) for the delivery of potable water infrastructure required to service the Oakdale Precinct.

2. Growth Projections

This section provides details of growth and water demand projections within the study area including the expected timing, and scale of growth.

2.1 Summary of Growth

Growth forecasts are a key input into the planning process and provide an insight into future infrastructure needs as well as future capital investment needs.

Oakdale Estate is an ongoing industrial development with approximately 452 nett hectares of development area. This includes Goodman, CSR and Jacfin lands. There lands are predominately zoned IN1 'General Industrial' under the State Environmental Planning Policy (Western Sydney Employment Area) 2009 The site spans two local government areas of Penrith and Fairfield.

The growth projections listed for this study are supplied by AT&L in conjunction with Jacfin, CSR and Goodman. The list of the growth projection within the Oakdale Industrial Development is summarised in Table 4.

Table 4 Growth Projections

Development site	Precinct	Nett Development (ha)	Development type	Connection
Oakdale South	1	18.8	IN1- General Industrial (5)	2017-2018
	2	4.4		2018
	3	16.5		2017-2019
	4	9.5		2019
	5	14.0		2017
	6	7.0		2019
	Total	**70.2**		
Oakdale East	1	95.0 (3)	IN1- General Industrial	2022-2024 (1)
Oakdale West	1	21.7		2019
	2	21.6		2019-2020
	3	18.5		2020
	4	22.6		2020-2021
	5	6.1		2020
	Total	**90.5**		
Oakdale Central	1A	4.1	IN1- General Industrial	Built
	1B	5.9		Built
	1C	4.6		Q1-2016
	2A	7.5		Built

Development site	Precinct	Nett Development (ha)	Development type	Connection
	2B	6.0		Q1-2016
	3A	1.6		2017
	3B	5.8		Q4-2016
	3C	5.6		2017
	3D	1.9		2017
	Lot 4	2.2		2017
	Total	**45.2**		
Jacfin	1	3.6	IN1- General Industrial	2016
	2	17.4		2016
	3	21.6		2017
	4	25.7	Residential low density (2)	2016
	5	19.5		2016
	Total	**87.8**		
CSR	1	10.1	IN1- General Industrial	2017
	2	20.8		2018
		11.5		
	3	21.0		2020 (1)
	Total	**63.4**		
Grand Total		**452**		

Note 1: The proposed timing of infrastructure proposed is subject to change

Note 2: Rural Residential

Note 3: Further growth listed for this study is in addition to current East Oakdale development plan

Note 4: The above growth projections have been provided be the following:

Developer	Contact(s) – Role	Received	Date received
CSR	Wayne Pasalich – CSR Senior Development Manager	Via Email	1st March 2016
Jacfin	Emma Sunderland – Calibre Consulting on behalf of Jacfin	Via Email	29th Feb 2016
Goodman	Richard Seddon – Goodman Development Manager	Via Email	29th Feb 2016

Note 5: Water demand assessed based on Light industrial / warehouse

2.2 Water Demand Projections

An evidence based approach to forecasting future demands in the study area, based on observed demands in an adjacent water supply system, was adopted as per the "Water System Planning Guidelines 2014". The Growth Servicing Strategy (GSS) demand estimation revised based on the following updated growth data:

- The proposed Oakdale Industrial demand within GSS model (i.e. 0.2 ML/d) will be replaced with evidence based industrial demand assumptions. i.e. 9.2 ML/d. the proposed demand previously calculated for this development removed from the model.
- Additional forecast growth within the Parkbridge Estate i.e. 264 dwellings
- Defer rezoning from Austral to Cecil Park supply system to post 2020 i.e. 450 dwellings. The 2020 sensitivity analysis with Austral demand will be developed.
- Potable top-up transfers into the Hoxton Park recycled water scheme reduced from 1.2 ML/d to 1.1 ML/d

The revised future demand projections for the Cecil Park supply system are presented in Table 5.

Table 5 Summary of revised future water demand- Cecil Park Supply System

Demand Category	2016 MDD ML/d	2020 MDD ML/d	2031 MDD ML/d	2036 MDD ML/d
Residential (LD)	6.2	10.2	31.7	47.7
Residential (HD)	0.03	4.9	5.3	5.4
Dual Retic Res (LD)	0.2	1.1	1.2	1.4
Dual Retic Res (HD)	0.03	0.1	0.1	0.1
Industrial	1.6	1.8	4.1	7.7
Commercial	8.6	13.8	24.7	40.6
Other	2.1	2.1	5.6	5.64
Oakdale Industrial	0.0	5.8	7.5	7.5
Total	**18.8**	**39.8**	**80.3**	**116.0**

The detailed methodology for projecting average day and maximum day demands is described in Tech Memo 1 (Appendix A).

Table 6 summarises the projected water demands for the Oakdale Industrial Development. Total projected max day demand in the Oakdale Precinct is 7.5 ML/d.

Table 6 Summary of Water Demand - Oakdale Industrial Development

Development site	Timing	Average Day Demand (ML/d)	Max Day Demand (ML/d)
Oakdale South	2017-2019	0.65	1.0
Oakdale West	2019-2021	0.83	1.3
Oakdale East	2022-2024	0.87	1.4
Oakdale Central	2016-2017	0.42	0.7
Jacfin	2016-2017	1.04	2.12
CSR	2017-2020	0.58	0.93
Total		**4.4**	**7.5**

3. Opportunities and constraints

The following is a summary of the key opportunities and constraints associated with water servicing of the Oakdale Industrial Development.

3.1 Opportunities

- Based on the supplied Oakdale growth projections, Cecil Park reservoir and Prospect Creek pumping station WP0184B have sufficient capacity to supply the entire Cecil Park zone including Oakdale Development for the 2020 demand scenario.
- A DN450 lead-in water main has been constructed as part of previous site works and has sufficient capacity to supply the entire Oakdale Development.
- Minchinbury Elevated supply zone has 2.5 ML/d transferable capacity to provide supply contingency to Oakdale Industrial. Extensions off Sydney Water's existing DN300 trunk main will need to be built. i.e. approx. 1.2 Km.
- The Growth Servicing Strategy (GSS) proposed augmentations are adequate to supply the entire Cecil Park zone including Oakdale Development for the post 2031 demand scenario. Additional augmentations as a result of the GSS study include 30 ML new reservoir will provide system reliability.
- Customers along Aldington Rd that experiencing low pressure under current maximum day demand could be rezoned to Oakdale development. i.e. 1.0 ML/d

3.2 Constraints

- Cecil Park reservoir and pumping station WP0184 has insufficient capacity to supply the entire Cecil Park zone including Oakdale Development post 2020 demand scenario, when Austral and Leppington North will be rezoned to Cecil Park supply system. The GSS system augmentations (i.e. Prospect Creek pumping station WP0184B and raising main upgrade) proposed for 2031 demand scenario will address the long term system capacity issues within Cecil Park supply system.
- Erskine Park Elevated supply system has insufficient head to supply Oakdale Industrial system.

The opportunities and constraints identified in Oakdale Industrial water servicing plan is presented in Figure 3.

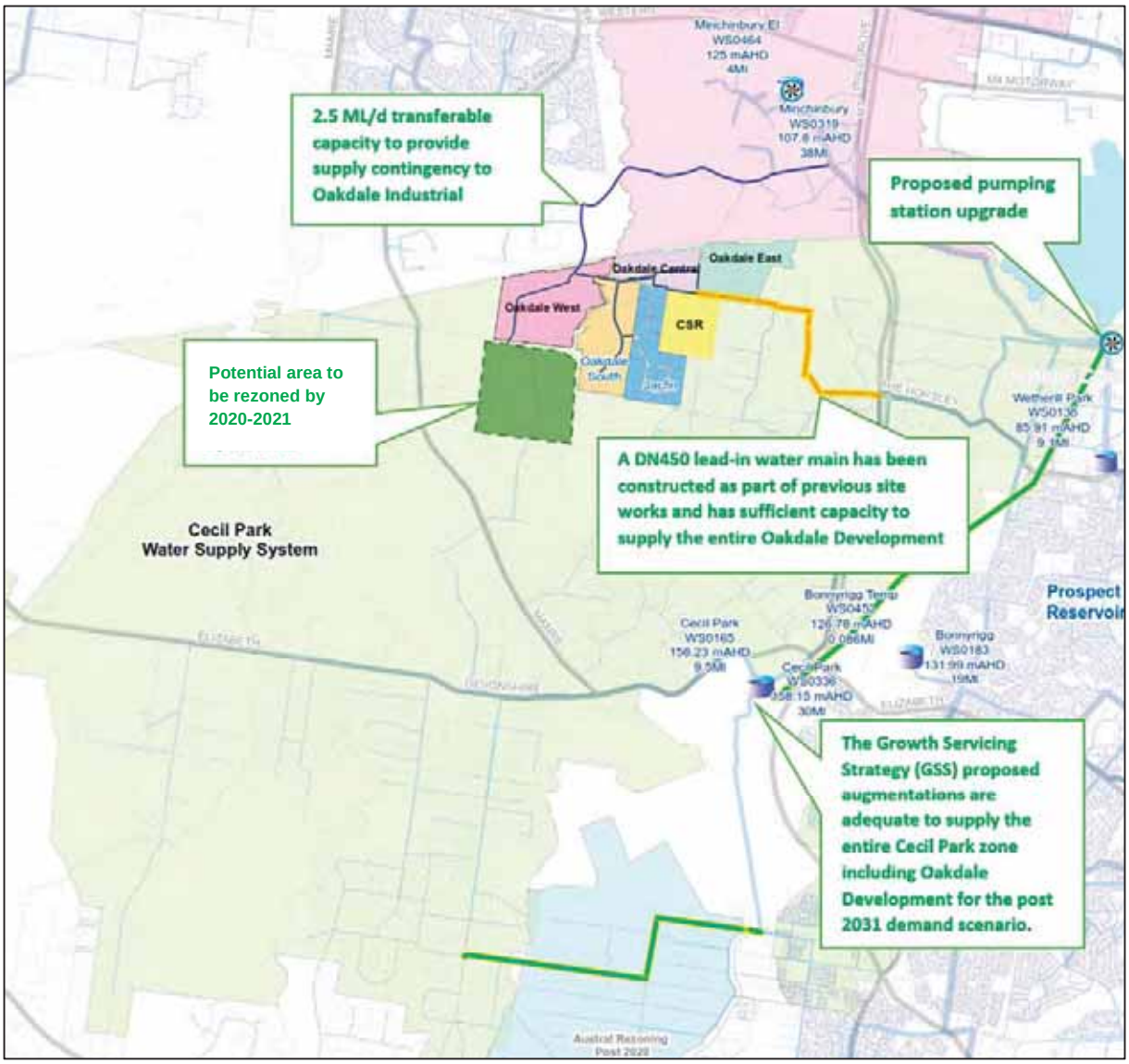

Figure 3 Opportunities and constraints

4. Water servicing

4.1 Oakdale Industrial water servicing

4.1.1 Oakdale Central

Oakdale Central is currently supplied from the existing DN250 potable water main within Millner Avenue (refer section 3-4 on figure 4) which is supplied from the Cecil Park Supply System. To improve system reliability, it is proposed to supply Oakdale Central from the Minchinbury Elevated supply system via a proposed DN300 connection (refer section 4-7 on Fig. 4) between the existing DN250 potable water main within Millner Avenue (refer section 3-4 on Fig. 4) to the proposed DN300 within Oakdale West (refer section 7-8 on Fig. 4) which ultimately connects to the existing DN300 within Erskine Park Link Road (EPLR). The proposed DN300 is proposed to be delivered at the same time as the Oakdale West development.

4.1.2 Oakdale South

Oakdale South will be supplied via extension (refer section 4-6 on Fig. 4) of the existing DN250 potable water main (Refer Section 3-4 on Fig. 4) within Millner Avenue which is supplied from the Cecil Park Supply System.

4.1.3 Oakdale West

Oakdale West will be supplied via a proposed DN300 (refer section 8-9 on Fig. 2) connection to the existing DN300 within Erskine Park Link Road (EPLR). This proposed DN300 will be supplied from the Minchinbury Elevated Supply System. As mentioned above, a DN300 cross connection (refer section 4-7 on Fig. 2) to Oakdale Central will be delivered at the same time as the Oakdale West development to supply Oakdale Central from the Minchinbury Elevated Supply System which will improve the system reliability.

4.1.4 Oakdale East

Oakdale East will be supplied off the existing DN450 within Burley Road which is supplied from the Cecil Park Supply System.

4.1.5 CSR

CSR lands will be supplied via a proposed DN300 connected to the existing DN450 within Burley Road which is supplied from the Cecil Park Supply System.

4.1.6 Jacfin

Jacfin lands will be supplied via a proposed DN300 connected to the existing DN450 within Burley Road which is supplied from the Cecil Park Supply System. Jacfin internal reticulation will be via a proposed DN250 which will be connected to the proposed DN250 within Oakdale South to improve the system reliability.

4.2 Short-term servicing plan (Current- 2020)

Under this short-term supply configuration, Oakdale development will be supplied from Cecil Park supply system using existing DN450 lead-in main. The proposed internal pipework within Oakdale South need to be completed. i.e. 850 m DN250 and 850 m DN200.

Cecil Park reservoirs have sufficient capacity to supply the Cecil Park zone for the current max day scenario including proposed 2020 growth in the Oakdale Development as summarised below:

- Oakdale South, (i.e. 2020 MDD: 1.0 ML/d)
- Oakdale Central, (i.e. 2020 MDD: 0.7 ML/d)
- Oakdale West, (i.e. 2020 MDD: 1.0 ML/d)
- Jacfin, (i.e. 2020 MDD: 2.1 ML/d) and
- CSR. (i.e. 2020 MDD: 0.9 ML/d)

4.3 Mid-term servicing plan (2020- 2031)

Cecil Park reservoirs and transfer system have capacity to supply Cecil Park zone for the 2020 max day scenario including proposed 2020 growth in the Oakdale Development.

Between 2020 and 2024 the following actions are proposed:

- Rezoning to occur @ 2020 of Austral onto Cecil park (MDD: 2.8 ML/d @ 2020 and through to MDD: 4.8 ML/d @ 2024-25) (South West Priority Land Release Area "SWPLRA"; May 2016)
- Further growth within the Oakdale Development 1.7 ML/d (Oakdale Industrial will be fully developed at 2024)

The above contribute to significant capacity deficiencies within the system. i.e. WP0184 and Cecil Park reservoirs cannot keep up with a max week demand. By rezoning Oakdale West and Central on to Minchinbury Elevated relieves demand of 1.6 ML/d provides sufficient capacity relief to accommodate the forecasted demand and rezoning up to 2024.

Therefore, under mid-term servicing plan, Oakdale West and Oakdale Central will be supplied from Minchinbury Elevated supply zone using existing DN300 trunk main (i.e. gravity supply from elevated reservoir). Extensions off Sydney Water's existing DN300 trunk main will need to be built. i.e. approx. 1.2 Km. Customers along Aldington Rd (i.e. approx. 28 customers) that experiencing low pressure under current maximum day demand could also be rezoned to Minchinbury Elevated supply zone using the proposed DN300 trunk main within Oakdale West.

The Oakdale Industrial remainder including Jacfin and CSR would be supplied from Cecil Park using existing DN450 and proposed DN300 lead-in main.

From 2024 through to 2030 there is insufficient capacity within both the Minchinbury Elevated and Cecil Park supply systems to accommodate growth within the Oakdale Industrial area. Between 2024 and 2030 the following actions are proposed:

- Further growth in the Austral rezoned area now being fed from Cecil Park
- Rezoning to occur @ 2024 of Leppington North onto Cecil Park (7.3 ML/d @ 2024) (South West Priority Land Release Area "SWPLRA"; May 2016)

Accordingly, further investigation into the proposed rezoning and or required amplification of the system prior to this date is required.

4.4 Long-term servicing plan (Post 2030)

The Oakdale Industrial development will be supplied from Cecil Park and Minchinbury Elevated supply systems. Cecil Park reservoirs (i.e. including any proposed new reservoir) and upgraded Prospect Creek pumping station WP0184B have sufficient capacity to supply the Cecil Park zone for the 2036 max day scenario including ultimate growth within the Oakdale Development. This is based on an indicative scheme included in the GSS but subject to detailed planning before finalisation of preferred option.

The Oakdale servicing plan overview is presented in Figure 4.

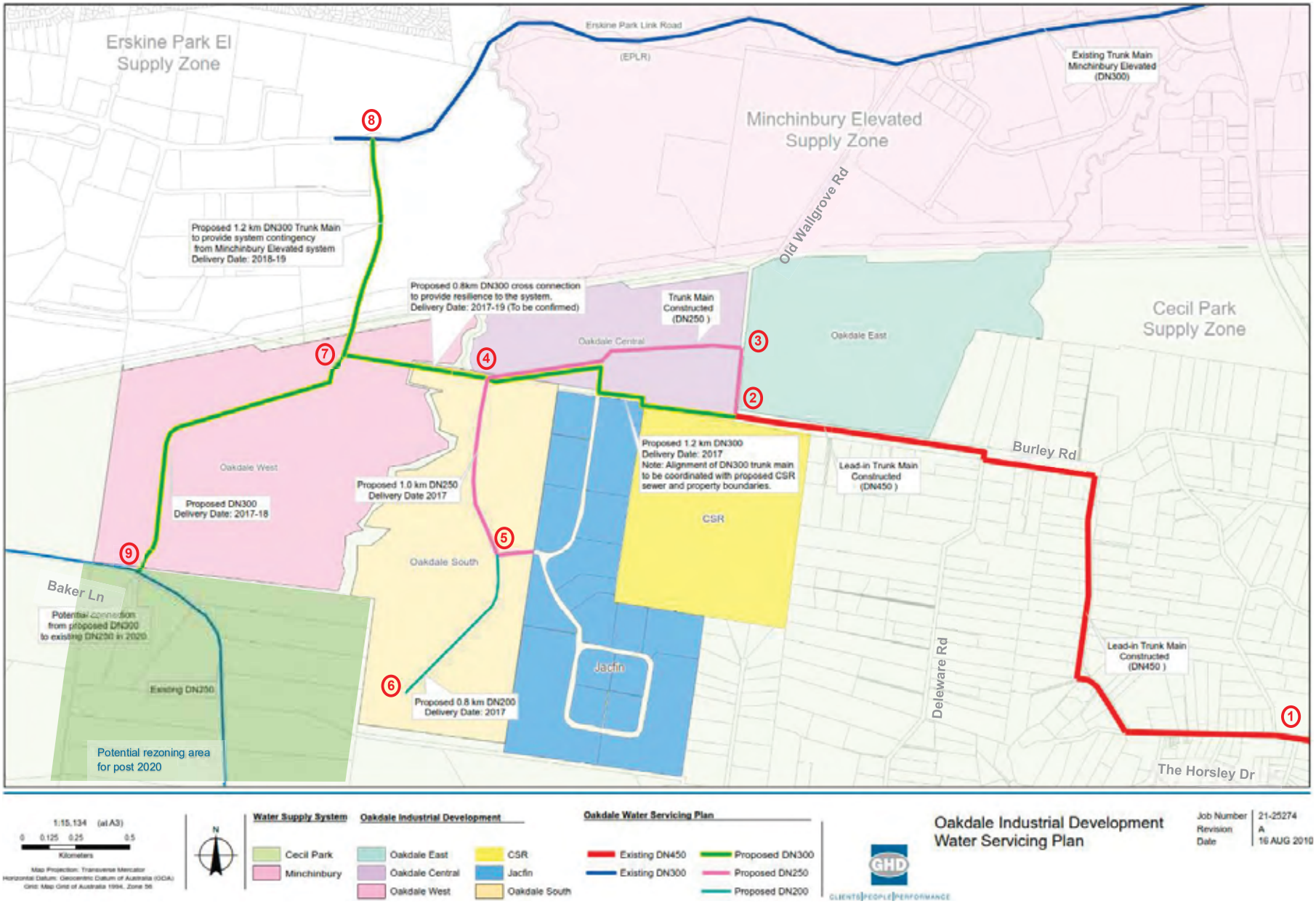

Figure 4- Oakdale Industrial Water Servicing Plan

4.5 Preliminary capital cost assessment

Preliminary capital cost estimates were developed for Oakdale Development. The water mains indirect and total delivery costs were estimated using the Sydney Water Cost Estimator tool (version 09-2015.11). The following assumptions were adopted for preliminary cost estimation:

- 75% scope contingency was adopted for all options as per advice from Sydney Water
- An allowance was made for rock excavation for 30% of the length of the water mains
- 25% Road restoration was allowed for all pipework

A summary of the preliminary capital cost estimates associated with Oakdale Industrial water servicing is presented in Table 7. Detailed cost estimates are provided in Appendix B.

Table 7 Preliminary capital cost estimates

Section	Description	Delivery Date	Capital Cost ($M)
1-2	4.0 km DN450	Constructed	NA
2-3	0.35 km DN250	Constructed	NA
3-4	1.2 km DN250	Constructed	NA
2-4	1.2 km DN300	2016-17	$2.21 M
4-5	0.9 km DN250	2016-17	$1.34 M
5-6	0.85 km DN200	2016-2017	$1.08 M
4-7	0.7 km DN300	2017-2018	$ 1.31 M
7-8	1.2 km DN300	2018-2019	$2.21 M
8-9	1.6 km DN300	2018-2019	$2.93 M

5. Conclusions and Recommendations

This study investigated the assets required to service the proposed Goodman, Jacfin and CSR developments within the Oakdale Precinct to meet development timeframes. The water servicing plan for the Oakdale Industrial Development is made up of the following:

Oakdale Central

Oakdale Central is currently supplied from the existing DN250 potable water main within Millner Avenue which is supplied from the Cecil Park Supply System. To improve system reliability, it is proposed to supply Oakdale Central from the Minchinbury Elevated supply system via a proposed DN300 connection between the existing DN250 potable water main within Millner Avenue to the proposed DN300 within Oakdale West which ultimately connects to the existing DN300 within Erskine Park Link Road (EPLR). The proposed DN300 is proposed to be delivered at the same time as the Oakdale West development.

Oakdale South

Oakdale South will be supplied via extension of the existing DN250 potable water main within Millner Avenue which is supplied from the Cecil Park Supply System.

Oakdale West

Oakdale West will be supplied via a proposed DN300 connection to the existing DN300 within Erskine Park Link Road (EPLR). This proposed DN300 will be supplied from the Minchinbury Elevated Supply System. As mentioned above, a DN300 cross connection to Oakdale Central will be delivered at the same time as the Oakdale West development to supply Oakdale Central from the Minchinbury Elevated Supply System which will improve the system reliability.

Oakdale East

Oakdale East will be supplied off the existing DN450 within Burley Road which is supplied from the Cecil Park Supply System.

CSR

CSR lands will be supplied via a proposed DN300 connected to the existing DN450 within Burley Road which is supplied from the Cecil Park Supply System.

Jacfin

Jacfin lands will be supplied via a proposed DN300 connected to the existing DN450 within Burley Road which is supplied from the Cecil Park Supply System. Jacfin internal reticulation will be via a proposed DN250 which will be connected to the proposed DN250 within Oakdale South to improve the system reliability.

Appendices

Appendix A –Revised Basis of Water Planning

Memorandum

25 May 2016

To	Amir Rashidi		
Copy to	Russell Hogan, Suhanti Thirunavukarasu, Suganthini Niranjan		
From	Amir Rashidi	Tel	02 92397010
Subject	Oakdale Industrial- Revised Basis of Water Planning	Job no.	21/25274

1. Introduction

1.1 Purpose of this memorandum

The purpose of this memorandum is to document and seek endorsement from Sydney Water on the design and system performance criteria to be adopted for the investigation associated with the water system within the Oakdale Industrial development. It is important that Sydney Water agrees to these criteria prior to substantial commencement of the planning tasks.

1.2 Background

The Oakdale industrial site is part of the existing Western Sydney Employment Area (WSEA 8 – Area South of Pipeline Precinct), located approximately 40 kms west of the Sydney CBD, adjacent to the M7 and M4 intersection, adjacent south to the Eastern Creek Precinct and Warragamba Water Pipeline at Horsley Park. The site was rezoned in September 2009 through the WSEA SEPP 2009, and Goodman is the lead developer of the precinct. An overview of study area is presented in Figure 1.

Water: The initial scheme was to supply the site from Cecil Park; however, there is an alternative option to supply Oakdale through a combination of the Minchinbury and Cecil Park supply zones. Extensions off Sydney Water's existing system will need to be built to provide the full site with drinking water services.

Assets required to service proposed Goodman development at Oakdale are to be staged to meet development timeframes, with lead-in infrastructure funded up front and delivered by the lead developer and to be reimbursed by Sydney Water in accordance with its policy on Funding Infrastructure to Service Growth.

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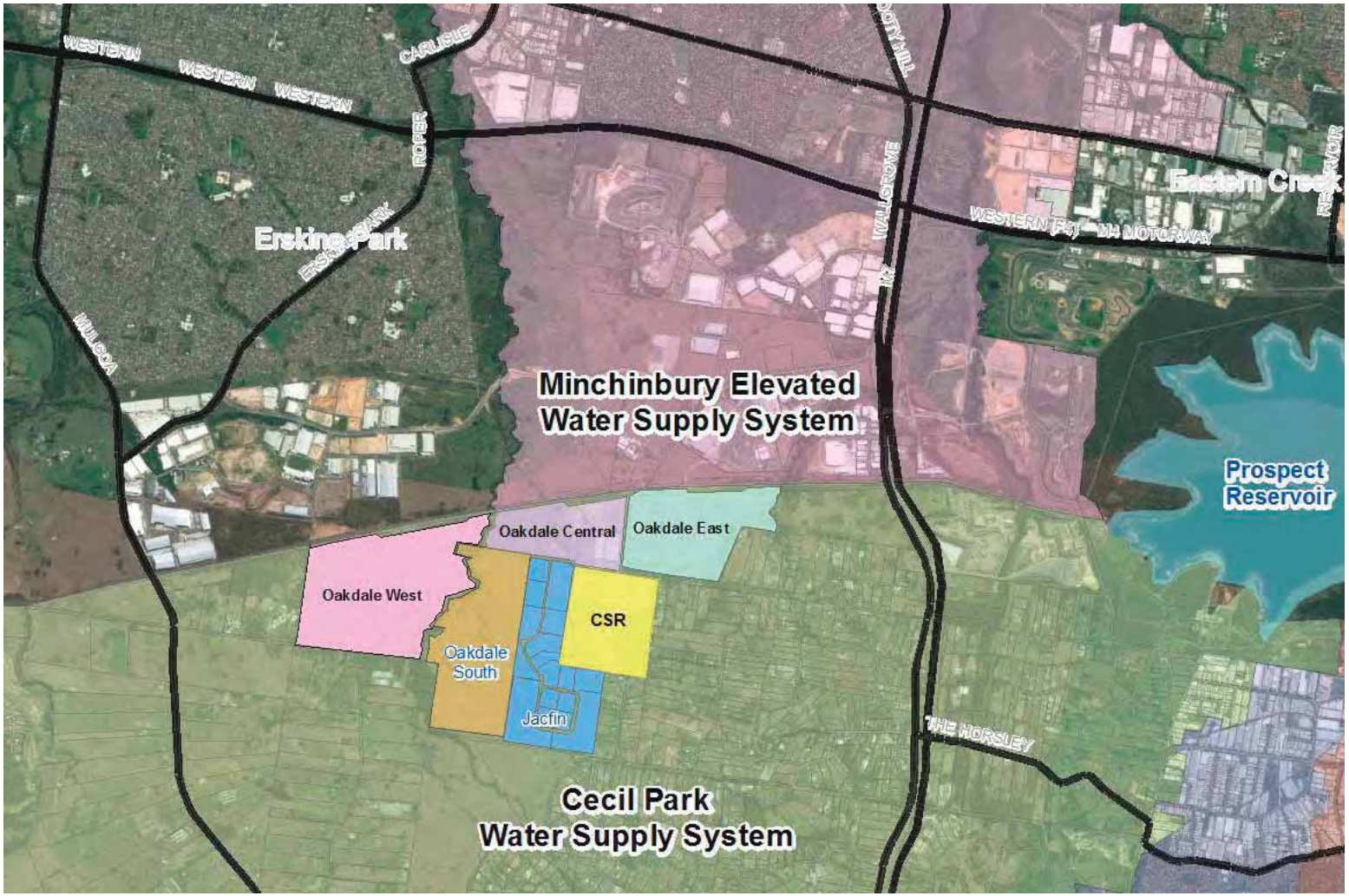

Figure 1 Oakdale Industrial Development Overview

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2. Summary of Growth

This section provides details of growth projections within the study area including the expected timing, and scale of growth.

2.1 Growth

Population growth forecasts are a key input into the planning process and provide an insight into future infrastructure needs as well as future capital investment needs.

Oakdale Estate is a future industrial development with approximately 300 nett hectares of development lots anticipated in the ultimate stage. The site spans two local government areas of Penrith and Fairfield.

The growth projections listed for this study are supplied by AT&L in conjunction with Jacfin, CSR and Goodman. The list of the growth projection within the Oakdale Industrial Development is summarised in Table 1. Detailed figures for each of the developments are included in Appendix A.

Table 1 Growth projections

Development site	Precinct	Nett Development (ha)	Development type	Timing
Oakdale South	1	18.8	Light industrial/warehouse	2017-2018
	2	4.4		2018
	3	16.5		2017-2019
	4	9.5		2019
	5	14.0		2017
	6	7.0		2019
	Total	**70.2**		
Oakdale East	**1**	**95.0** [(3)]	Light industrial/warehouse	2022-2024 [(1)]
Oakdale West	1	21.7	Light industrial/warehouse	2019
	2	21.6		2019-2020
	3	18.5		2020
	4	22.6		2020-2021
	5	6.1		2020
	Total	**90.5**		

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Development site	Precinct	Nett Development (ha)	Development type	Timing
Oakdale Central	1A	4.1	Light industrial/warehouse	Built
	1B	5.9		Built
	1C	4.6		Q1-2016
	2A	7.5		Built
	2B	6.0		Q1-2016
	3A	1.6		2017
	3B	5.8		Q4-2016
	3C	5.6		2017
	3D	1.9		2017
	Lot 4	2.2		2017
	Total	**45.2**		
Jacfin	1	3.6	Light industrial/warehouse	2016
	2	17.4		2016
	3	21.6		2017
	4	25.7	Residential low density [2]	2016
	5	19.5		2016
	Total	**87.8**		
CSR	1	10.1	Light industrial/warehouse	2017
	2	32.3		2018
		11.5	Environmental /Open Space	
	3	21.0	Light industrial/warehouse	2020 [1]
	Total	**74.9**		
Grand Total		**463.6**		

Note 1: The timeframes are subject to change

Note 2: Rural Residential

Note 3: Further growth listed for this study is in addition to current East Oakdale development plan

Note 4: The above growth projections have been provided be the following:

Developer	Contact(s) - Role	Received	Date received
CSR	Wayne Pasalich – CSR Senior Development Manager	Via Email	1st March 2016
Jacfin	Emma Sunderland – Calibre Consulting on behalf of Jacfin	Via Email	29th Feb 2016
Goodman	Richard Seddon – Goodman Development Manager Russell Hogan – AT&L on behalf of Goodman	Via Email	29th Feb 2016

3. Planning criteria

3.1 Water planning criteria

This section details the water planning criteria relevant to this investigation. We request Sydney Water's endorsement of the design criteria as a hold point for the project prior to commencement of the system performance assessment.

3.2 Water planning references

The following documents, referenced in Table 2, were consulted in developing the planning criteria:

1. Water and Recycled Water System Growth Servicing Strategy – Criteria and Guidelines 2012
2. Water System Planning Guideline (ver. 1- September 2014)
3. Water Supply Code of Australia (WSA 03-2011-3.1 - Sydney Water Edition 2012)
4. Recommendation – Water-main renewal program interim sizing rules to address fire-fighting needs
5. Precinct Structure Plan

Table 2 Water Planning Criteria

Item	Design Criteria	Units	Water	Reference
System Demands (existing areas)				
Max Day Demand (MDD)	Max Day Demand /Average Day Demand (MDD/ADD) Factor	NA	An analysis of the last ten consecutive financial years of IICATS data to select the day with the highest demand over 24 hours. The peaking factor will be derived from calculated MDD and ADD. (i.e. peaking factor: MDD/ADD) • Cecil Park Supply System peaking factor: 2.8 • Cecil Park maximum day demand : 18.75 ML/d • Minchinbury Supply System peaking factor: 1.6 • Minchinbury maximum day demand : 5.2 ML/d	Reference 2 See Appendix C
Max Hour Demand	Max Hour Demand /Max Day Demand Factor	NA	An analysis of the last ten years of 15 minutes of IICATS data to select the maximum hour event. If the results are inconsistent then the default WMS maximum day demand diagram will be adopted	Reference 2
Performance Requirements				
Trunk Mains	Minimum Pressure	Meter	Trunk mains (no customer connections) will maintain 3 m at all times under max day demand condition	Reference 1

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Item	Design Criteria	Units	Water	Reference
Reticulation Mains	Minimum Pressure	m	Maintain at the property boundary: >25 m residual pressure (desirable) (2)	
	Maximum Pressure	m	The long-term aim is to reduce to 60 m or less where financially viable	Reference 2
	Maximum headloss	km/ hr.	Maximum headloss of 5 m/km for ≤ DN150 and 3 m/km for ≥ DN200. (secondary criteria)	Reference 3
	Maximum Velocity	m/s	>2 m/s (i.e. The optimum velocity is in the range 0.8 m/s to 1.4 m/s.)	
Critical water-mains (Fire flow criteria)	Fire-Fighting Enquiries	L/s	High density residential, major special uses and heavy commercial and industrial : Not less than 10 m residual head with assume flow of 25 L/s (at 95th percentile domestic demand)	Reference 4
Minimum Pipe Size	Flow rates & residual pressure	mm	Industrial and Commercial: Cast iron outside diameter series: 150; Steel and Polyethylene pipes: 180	Reference 3
WMS model for water planning purposes (1)				
Minchinbury			***Current MDD***: > Potable Retic>04. Prospect South>4.1 Minchinbury>Minchinbury-Minchinbury Elevated>20 Projects>GSS 2013-14>HP2 System Performance>Max Day>GSS - Current Max Day Run 1.1 ***2031 MDD Model Run:*** >Potable Retic>04. Prospect South>4.1 Minchinbury>Minchinbury-Minchinbury Elevated>20 Projects>GSS 2013-14>HP2 System Performance>Max Day>GSS - 2031 Max Day Run 1.1 ***2036 MDD Model Run:*** >Potable Retic>04. Prospect South>4.1 Minchinbury>Minchinbury-Minchinbury Elevated>20 Projects>GSS 2013-14>HP2 System Performance>Max Day>GSS - 2036 Max Day Run 1.1	
Cecil Park			***Current MDD :*** >Potable Retic>04. Prospect South>4.4 Cecil Park>Cecil Park>20 Projects>WSEA - Structure Plan Update>GSS Run Group>Current Max Day ***2031 MDD Model Run :*** >Potable Retic>04. Prospect South>4.4 Cecil Park>Cecil Park>20 Projects>GSS>Run Group>2031 Max week GSS_Solutions ***2036 MDD Model Run*** : >Potable Retic>04. Prospect South>4.4 Cecil Park>Cecil Park>20 Projects>GSS>Run Group>2036 Max week_Solutions_N	

Note 1: The GSS model for Minchinbury was used as this was the latest study in the local area and included an update of key assets and system demands. This will be validated and forecast demands updated as part of this project. The GSS model for Cecil Park was referenced in the recent SWPLRA / SWGC 2nd release precincts detailed planning investigation and is the latest version of the Cecil Park model available. This will be validated and forecast demands updated to reflect latest data. This has been discussed and confirmed with Sydney Water.

Note 2: The minimum pressure specified in the Operating Licence is 15 metres, however, some exceedances of this limit are permitted. Refer to Sydney Water Operating Licence. A lower minimum service pressure may be provided based on financial and risk considerations, and is subject to Sydney Water approval.

4. Water demand assessment

A baseline maximum day demand of 40 kL/Nha/day for light industrial new development was employed from Water System Planning Guideline to estimate the Oakdale Industrial water demand. During this assessment, it was observed that new development that anticipated occurring in Oakdale industrial will be typically warehouses with commercial / office land use. Consequently, Sydney Water advice to reassess the Oakdale industrial future demand based upon the Moorebank and Wetherill Park industrial areas that exhibit a similar type of development. The evidence based average day water demand summarised in Table 3. Figure 2 also shows the location of the Moorebank and Wetherill Park industrial areas in relation to the Oakdale Industrial precinct. .

Table 3 Evidence based average day water demand for comparable Industrial Areas (1)

Average Day Demand	Units	Moorebank	Wetherill Park	Weighted Average
Area demand (average)	kL/day	1,324	4,520	-
Area	Hectares	182	456	-
Demand per net hectare	kL/net ha/day	7.3	9.9	9.2

Note 1: The evidence based industrial demand employed from Broader WSEA Water Services Study (Nov 2013)

4.1 Summary of Oakdale Industrial water demand forecasts

The following outline of potable water demand provides predicted average day (ADD), maximum day (MDD) and maximum hour demand (MHD) based on projected development yield.

The calculations are based on the forecast development yield (i.e. Table 1) and evidence base design demands (Table 3). Detailed calculations for MDD and MHD demand are provided in Appendix B. The Oakdale Industrial demand forecast summarised in Table 4.

Table 4 Summary of revised water demand- Oakdale Industrial fully developed

Development site	Demand Scenario (ML/d)		
	ADD	**MDD**	**MHD**
Oakdale South	0.65	1.0	1.65
Oakdale West	0.83	1.3	2.13
Oakdale East	0.87	1.4	2.24
Oakdale Central	0.42	0.7	1.08
Jacfin	1.04	2.12	4.1
CSR	0.58	0.93	1.49
Total	**4.4**	**7.5**	**12.7**

Note 1: the maximum demand was estimated based on Industrial peaking factor of 1.6 (i.e. MDD/ADD)

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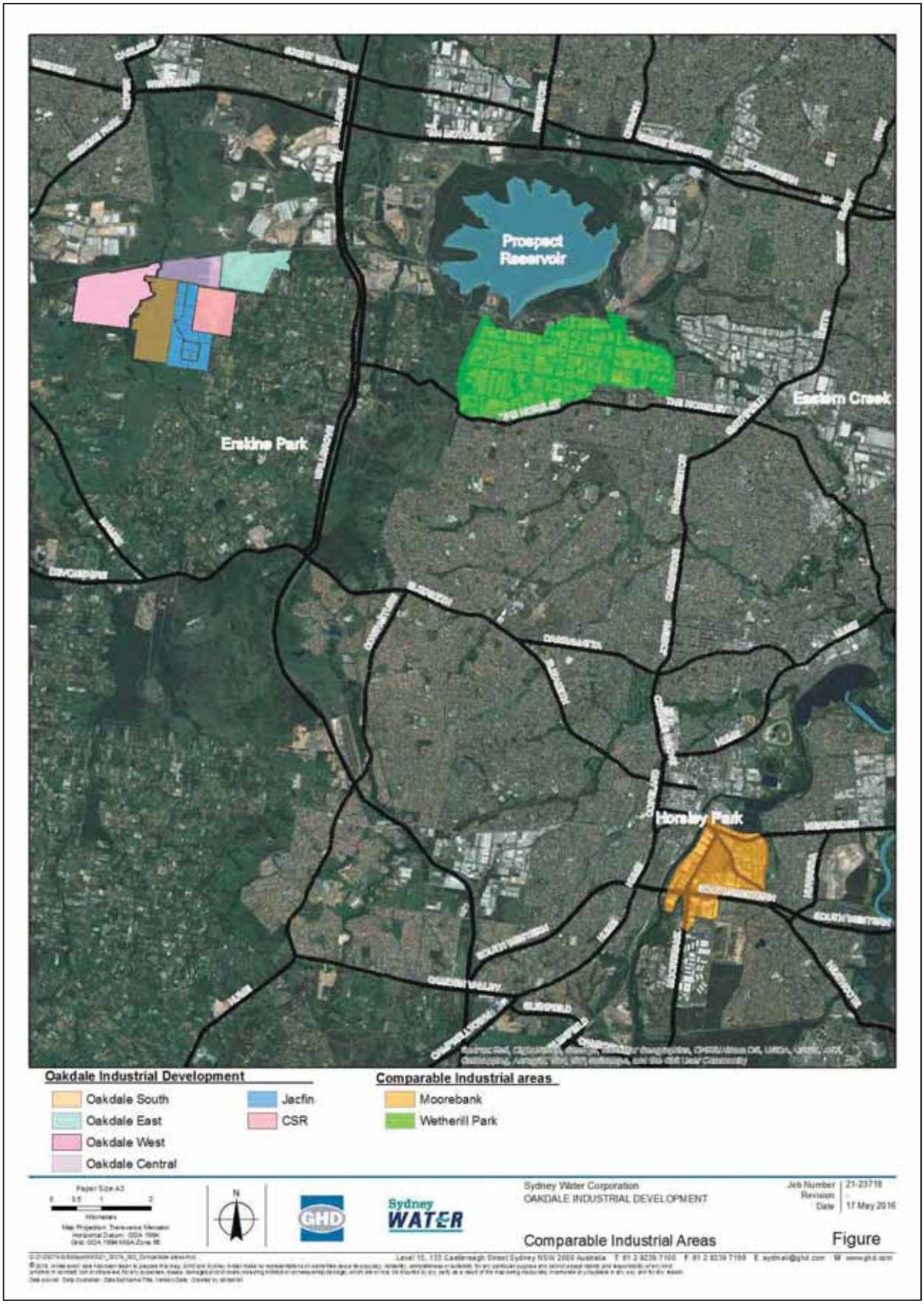

Figure 2- Comparable Industrial Areas

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4.2 Future Max Day Demand Projections

The Growth Servicing Strategy (GSS) demand estimation revised based on the following updated growth data:

- Additional forecast growth within the Parkbridge Estate i.e. 264 dwellings
- Defer rezoning from Austral to Cecil Park supply system to post 2020 i.e. 450 dwellings. The 2020 sensitivity analysis with Austral demand will be developed.
- Potable top-up transfer into the Hoxton Park recycled water scheme reduced from 1.2 ML/d to 1.1 ML/d (i.e. The Hoxton Park Recycled Water top-up water demand pattern will be employed)
- The proposed Oakdale Industrial demand within GSS model (i.e. 0.2 ML/d) will be replaced with revised demand assumptions (Table 4)

The revised future demand projections are presented in Table 5. The residential growth sites details are provided in Appendix D.

Table 5 Summary of revised future water demand- Cecil Park Supply System

Demand Category	2016 MDD ML/d	2020 MDD ML/d	2031 MDD ML/d	2036 MDD ML/d
Residential (LD)	6.2	10.2	31.7	47.7
Residential (HD)	0.03	4.9	5.3	5.4
Dual Retic Res (LD)	0.2	1.1	1.2	1.4
Dual Retic Res (HD)	0.03	0.1	0.1	0.1
Industrial	1.6	1.8	4.1	7.7
Commercial	8.6	13.8	24.7	40.6
Other	2.1	2.1	5.6	5.64
Oakdale Industrial	0.0	5.8	7.5	7.5
Total	**18.8**	**39.8**	**80.3**	**116.0**

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Appendix A- Oakdale Industrial Detailed Development

GHD
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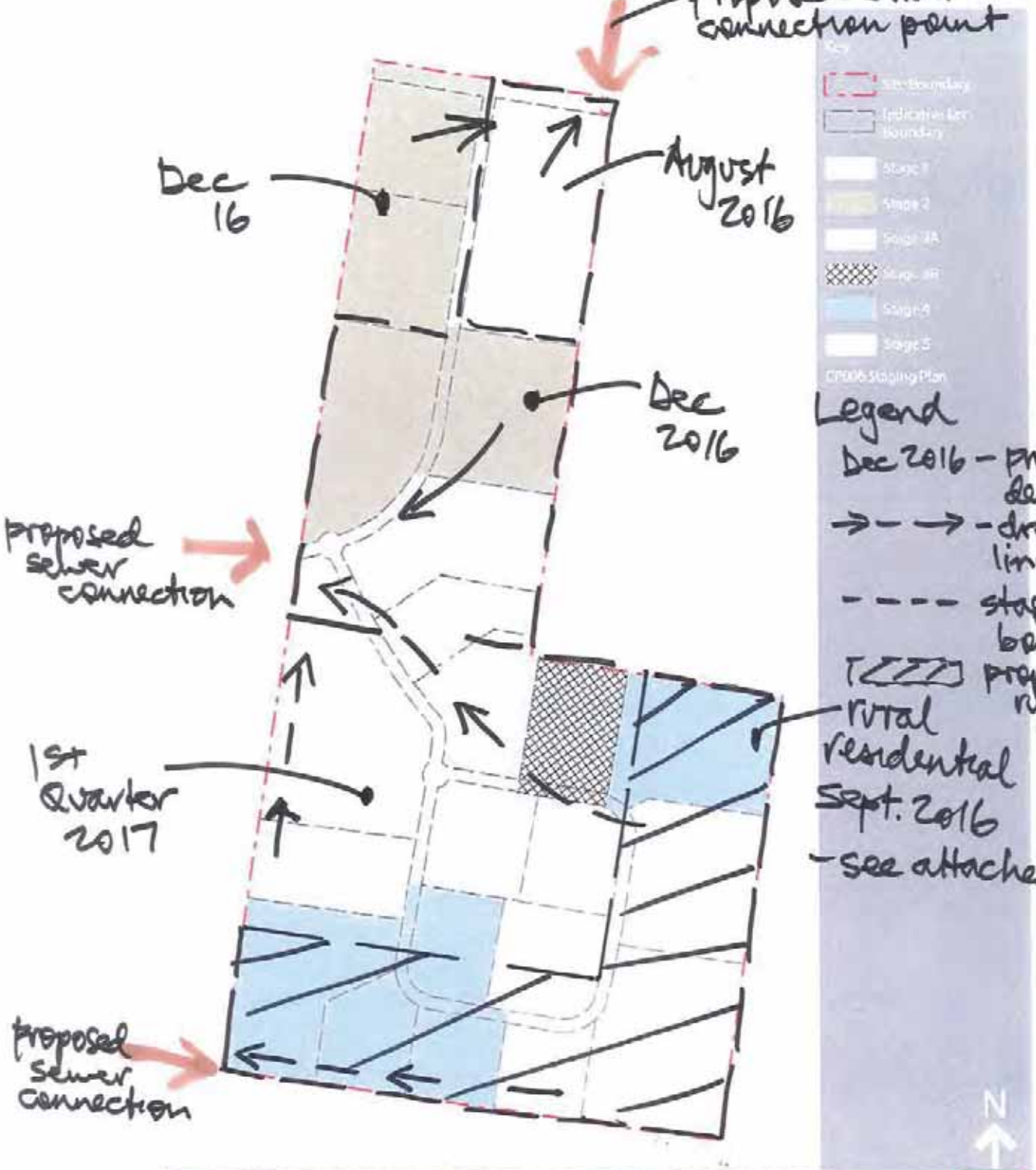
CENTRAL Area Schedule

TOTAL LAND AREA		612,065 sqm
Lot	**Site Area**	**Building Area**
Lot 1A	41,368 sqm	20,220 sqm
Lot 1B	58,760 sqm	31,745 sqm*
Lot 1C	46,417 sqm	27,145 sqm*
Lot 2A	74,693 sqm	36,570 sqm
Lot 2B	60,010 sqm	31,080 sqm*
Lot 3A	16,016 sqm	7,283 sqm*
Lot 3B	58,493 sqm	36,965 sqm*
Lot 3C	55,622 sqm	33,426 sqm*
Lot 3D	18,795 sqm	8,275 sqm*
SUB TOTAL	414,158 sqm	232,709 sqm*
Lot 4	21,615 sqm	0 sqm*
CENTRAL TOTAL	435,773 sqm	232,709 sqm*
Services Lot	10,000 sqm	
Biodiversity Lot A	18,367 sqm	
Biodiversity Lot B	40,812 sqm	
Biodiversity Lot C	41,533 sqm	
Road Widening Lots	4,572 sqm	

* Areas subject to Survey.

APPENDIX 1
STAGING PLAN



Lot A Burley Road, Horsley Park Employment Precinct - Staging Plan
Prepared for Jacfin Pty Ltd
13 June 2012
1:5000 @ A3

JBA planning

NSW Government
Department of Planning and Infrastructure

Jacfin
Staging / Development Timing


ROAD = DC DATE
Site Area Schedule
Total Site Area 117.00 ha
Less:
Non Developable Land 35.85 ha
Easements 3.73 ha
Regional Roads 1.74 ha
Services Lot 1.66 ha
Estate Roads 5.38 ha
48.36 ha
Development Areas
Precinct 1 18.81 ha
Precinct 2 4.38 ha
Precinct 3 16.53 ha
Precinct 4 9.45 ha
Precinct 5 14.01 ha
Precinct 6 7.09 ha
Total Developable 70.28 ha
Total Warehouse 376,295 sqm
Total Office 19,585 sqm
Total Facility 395,880 sqm
OAKDALE WEST
LOT 1
DP 120679
Proposed Western North South Link Road
Proposed Southern Link Road
Transmission Easement
Goodman
BRICKWORKS
PRECINCT 6
2019
6A
6B
3C
2019
3B
2017
PRECINCT 3
3A
2017
Site Access
Transmission Easement
10m Riparian Setback
15m Riparian Setback
30m Riparian Setback
Future Elevated Regional Road Min 4.5m Clearance at Millner Ave
Approved Millner extension and roundabout refer SSD 6088
OAKDALE CENTRAL
30m Wide Road Reserve
Estate Road 04
Estate Road 05
Estate Road 01
Estate Road 02
Estate Road 03
5A
PRECINCT 5
2017
4B
4C
PRECINCT 4
2019
4A
Services Lot
2A
PRECINCT 2
2018
2B
1C
2018
PRECINCT 1
1D
2017
1A
2017
1B
2017
SBA ARCHITECTS
Oakdale South Estate
Horsley Park
SSDA Masterplan
1:2500 @ A1
1:5000 @ A2
04 Sept 2015
OAK MP 02 (K)

Goodman

BRICKWORKS

OAKDALE WEST
- ESTIMATED TABLE UP FOR SERVICING

SEE DRAWING OAK MP03 FOR CONTINUATION

Site Area Schedule

Total Site Area	154.10 ha
Less:	
Non Developable Land	32.01 ha
Easements	22.55 ha
Regional Roads	6.43 ha
Estate Roads	8.74 ha
	69.73 ha
Development Areas	
Precinct 1	21.72 ha
Precinct 2	21.61 ha
Precinct 3	18.51 ha
Precinct 4	22.56 ha
Precinct 5	6.05 ha
Total Developable	90.45 ha
Total Warehouse	455,233 sqm
Total Office	22,685 sqm
Total Facility	477,918 sqm

PRELIMINARY

SBA ARCHITECTS

Oakdale West Estate
Horsley Park

SSDA Estate Masterplan

1:2500 @ A1
1:5000 @ A3
03 Feb 2016

OAK MP 02 (G)

Russell Hogan

From: Russell Hogan
Sent: Wednesday, March 2, 2016 3:11 PM
To: Mahmood Hossain (Mahmood.Hossain@ghd.com); 'Amir Rashidi (Amir.Rashidi@ghd.com)'
Subject: RE: Oakdale LASP update
Attachments: Appendix 2 Subdivision Development Application Plans.pdf

Gents,

Please see below staging horizons for CSR land.

Goodman information to follow shortly.

Also please see attached CSR proposed staging plan.

Regards,

Russell Hogan
Civil Project Manager

at&l

Level 7, 153 Walker Street
North Sydney NSW 2060

P 02 9439 1777
M 0424 441 231
F 02 9923 1055
russell@atl.net.au
www.atl.net.au

From: Pasalich, Wayne [mailto:WPASALICH@csr.com.au]
Sent: Tuesday, March 1, 2016 5:52 PM
To: Russell Hogan <Russell@atl.net.au>; Claire Kollaras <Claire.Kollaras@calibreconsulting.co>
Cc: Rachel Owen <Rachel.Owen@calibreconsulting.co>; Stuart Green <Stuart.Green@calibreconsulting.co>; Inbox <inbox1@atl.net.au>
Subject: RE: Oakdale LASP update

Russell

Claire is away on leave currently so I can address any queries you have. The current anticipated deliver program is as follows;

Stage	Registration Date	Notes
1	Q2 2017	Earlier connection would be beneficial as we have sold the property and the new owners are looking to make an early start on the works
2	Q1 2018	
3	TBA	No fixed date for this stage as the business does not currently have any plans to shut down the factory in the short term

LOT SUMMARY
STAGE 1 101-102 = 2 INDUSTRIAL LOTS
STAGE 2 201-204 = 4 INDUSTRIAL LOTS 205 = 1 ENVIRONMENTAL LOTS
STAGE 3 301-308 = 8 INDUSTRIAL LOTS

LEGEND	
(A)	OLD WALLGROVE ROAD
- - - - - -	ENVIRONMENTAL CONSERVATION

BROWN
Smart Consulting

CSR

PROPOSED SUBDIVISION
OVER LOT 1 IN D.P. 106143 BEING PROPERTY AT
327-335 BURLEY ROAD, HORSLEY PARK
OVERALL PLAN

ISSUE	DESCRIPTION	DATE
A	ORIGINAL ISSUE	9-5-19

DRAWING No. X13044.P_ST0
SHEET 1 OF 4 SHEETS
AMEND B

Appendix B- Detail Water Demand Calculations

Industrial- Max Day Demand	15	kL/Nha/day
Residential- Max Day Demand	2.2	kL/dwelling/day

Development site	Precinct	Area (ha)	Development type	Timing	Average Day Demand (Ml/d)	Maximum Day Demand (Ml/d)	Maximum Hour Demand (Ml/d)
Oakdale South	1	18.8	Light industrial/warehouse	2017-2018	0.17	0.28	0.44
	2	4.4	Light industrial/warehouse	2018	0.04	0.06	0.10
	3	16.5	Light industrial/warehouse	2017-2019	0.15	0.24	0.39
	4	9.5	Light industrial/warehouse	2019	0.09	0.14	0.22
	5	14	Light industrial/warehouse	2017	0.13	0.21	0.33
	6	7	Light industrial/warehouse	2019	0.06	0.10	0.16
Oakdale East	1	95	Light industrial/warehouse	2022-2024	0.87	1.40	2.24
Oakdale West	*1*	21.7	Light industrial/warehouse	2019	0.20	0.32	0.51
	2	21.6	Light industrial/warehouse	2019-2020	0.20	0.32	0.51
	3	18.5	Light industrial/warehouse	2020	0.17	0.27	0.44
	4	22.6	Light industrial/warehouse	2021-2020	0.21	0.33	0.53
	5	6.1	Light industrial/warehouse	2020	0.06	0.09	0.14
Oakdale Central	*1A*	4.1	Light industrial/warehouse	Built	0.04	0.06	0.10
	1B	5.9	Light industrial/warehouse	Built	0.05	0.09	0.14
	1C	4.6	Light industrial/warehouse	Q1-2016	0.04	0.07	0.11
	2A	7.5	Light industrial/warehouse	Built	0.07	0.11	0.18
	2B	6.0	Light industrial/warehouse	Q1-2016	0.06	0.09	0.14
	3A	1.6	Light industrial/warehouse	2017	0.01	0.02	0.04
	3B	5.8	Light industrial/warehouse	Q4-2016	0.05	0.09	0.14
	3C	5.6	Light industrial/warehouse	2017	0.05	0.08	0.13
	3D	1.9	Light industrial/warehouse	2017	0.02	0.03	0.04
	Lot 4	2.2	Commercial/café /light industrial	2017	0.02	0.03	0.05
Jacfin	1	3.6	Light industrial/warehouse	2016	0.03	0.05	0.08
	2	17.4	Light industrial/warehouse	2016	0.16	0.26	0.41
	3	21.6	Light industrial/warehouse	2017	0.20	0.32	0.51
	4	25.7	Residential low density (R4 Rural Residential)	2016	0.37	0.85	1.75
	5	19.5	Residential low density (R4 Rural Residential)	2016	0.28	0.64	1.33
CSR	1	10.1	Light industrial/warehouse	2017	0.09	0.15	0.24
	2	32.34	Light industrial	2018	0.30	0.48	0.76
		11.5	Environmental conservation area (Open Space)		0.00	0.00	0.00
	3	21	Light industrial	2020	0.19	0.31	0.49
Grand Total		**463.6**			**4.39**	**7.48**	**12.7**

Note 1: Timeframes are subject to change

Note 2: No water demand assumed for environmental conservation area within the CSR

Note 3: Additional development within Oakdale East

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Appendix C- Existing system demands assessment

Cecil Park supply system current demand

Historical system demand in the last 10 years was assessed to calculate the average day demand and to identify a suitable maximum day demand (MDD) event. Data from flow meter WF0557 downstream of Prospect Creek Pumping Station WP0184 and the reservoir level trends of Cecil Park Reservoirs were considered for the mass balance (i.e. flow data were not available from 2006 to 2009). The mass balance carried out for the above period indicated the highest max day value in November 2015 (i.e. 21.8 Ml/d).

However, this event is not acceptable due to an open DV between Cecil Park and Liverpool system. Sydney Water advice to adopt the GSS peaking factor (i.e. MDD/ADD: 2.80).

Minchinbury supply system current demand

Analysis of historical Minchinbury system demand in IICATS (i.e. past 10-year data) revealed the highest max day value in 15 January 2015. Details of selected peak demand event is provided in Table 6.

Table 6 Historical demand assessment (Ml/d)

	Cecil Park Supply System	Minchinbury Supply System	Notes
Average day demand (ADD)	6.7	32.1	# Cecil Park: 20 Nov 2015 # Minchinbury: 15 Jan 2014
Maximum day demand (MDD)	21.8	50.2	
MDD/ ADD ratio	**2.80**	**1.56**	

The Table 7 below outlines the calculated MDD per demand category in Cecil Park and Minchinbury models. The individual demand category max day factors were based on the guideline factors applied to the actual MDD/ADD.

Table 7 Current maximum day demand breakdown

Demand Category	Cecil Park Water Supply System			Minchinbury Water Supply System		
	ADD (Ml/d)	MDD factor	MDD (Ml/d)	ADD (Ml/d)	MDD factor	MDD (Ml/d)
Residential (LD)	2.07	3.24	6.40	19.7	1.74	34.4
Residential (HD)	0.02	3.19	0.03	1.9	1.44	2.8
Commercial	3.38	3.05	7.49	1.7	1.52	2.6
Industrial	0.51	3.70	1.58	2.4	1.21	2.9
Other	0.23	1.89	2.54	2.2	1.52	3.3
UFW	0.7	1.0	0.7	4.2	1.0	4.2
Total	**6.87**	**2.80**	**18.75**	**32.1**	**1.56**	**50.2**

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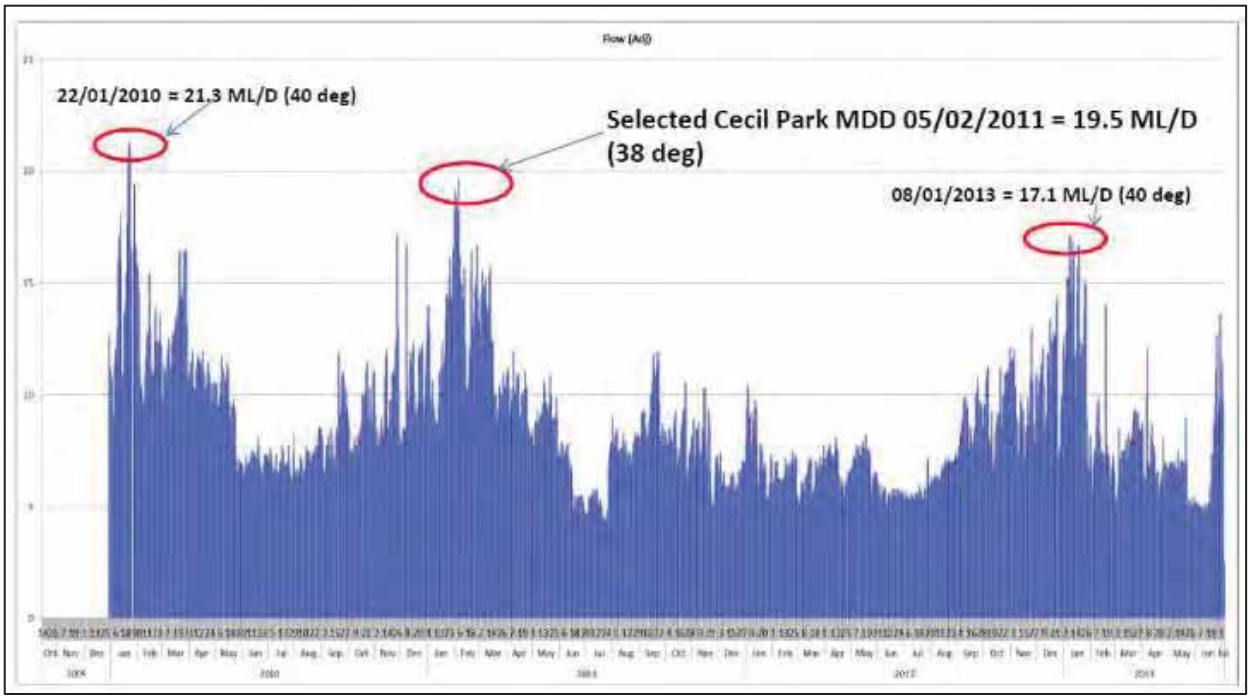
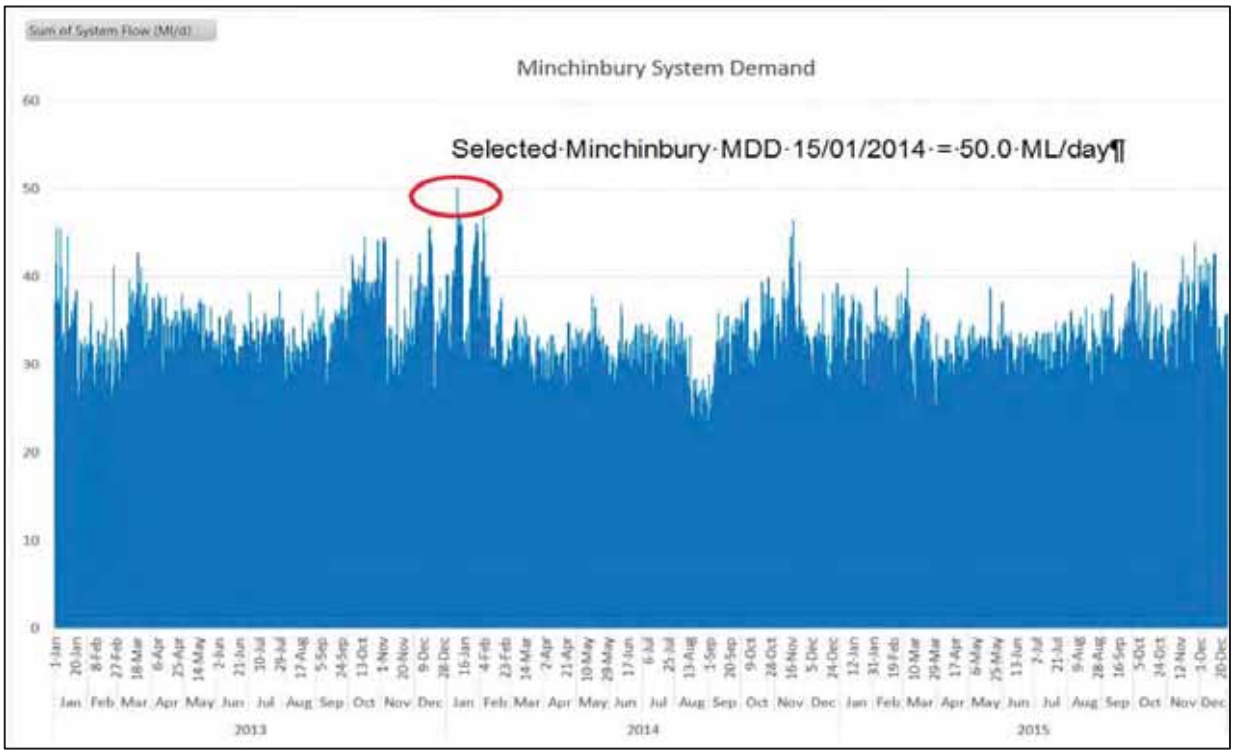
Cecil Park historical system demand analysis within the last 10 years demonstrated in figure below.



IICATS	Average (ML/d)	Maximum (ML/d)	MDD/ADD
Cecil Park	7.9	19.5 (1)	2.46

Note 1: Include 0.7 ML/day recycled water component that is potable water and should be subtracted from IICATS data. Hence, current max day of Cecil Park = 18.8 ML/day

Minchinbury historical system demand analysis demonstrated in figure below.



Appendix D- Residential growth sites

Residential Growth Sites – Dwellings (Cumulative)

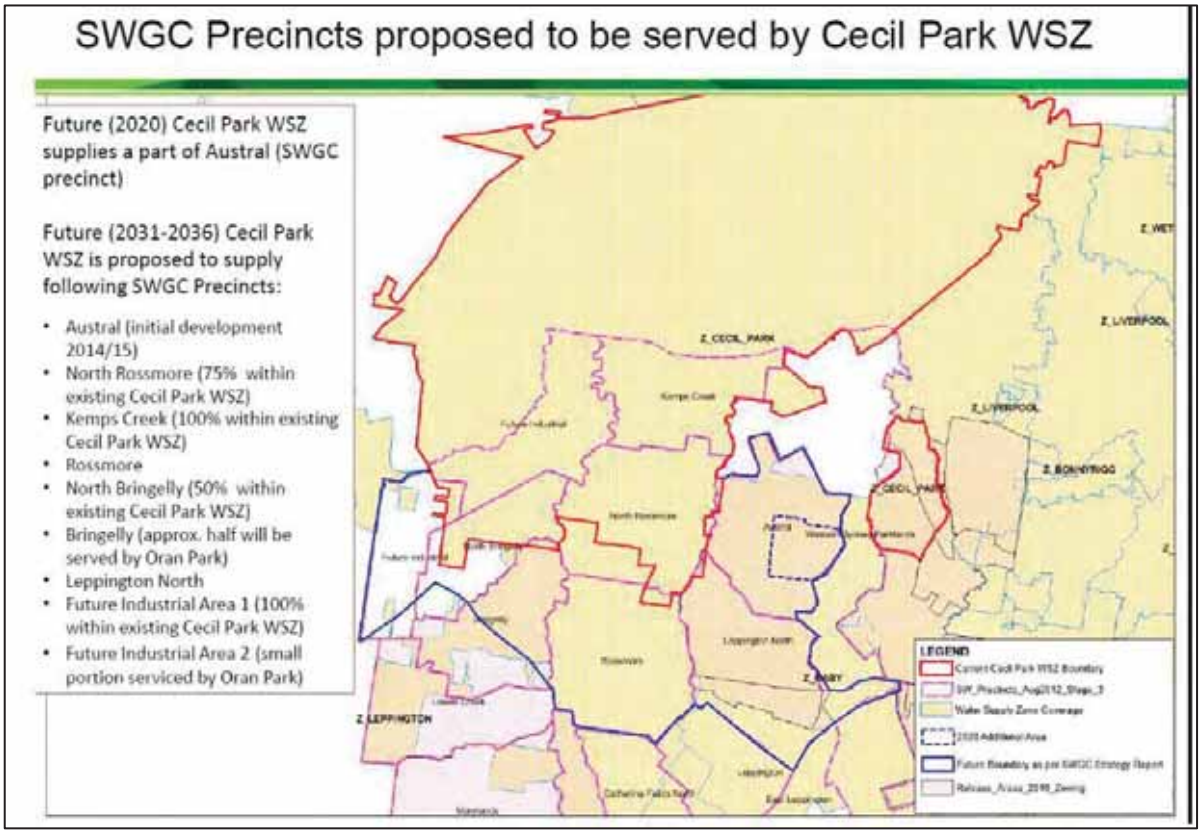
Precincts site names	Short (2011-2015)	Medium (2016-2020)	Comment
MDP Sites and Release Areas*			
Twin Creeks, Luddenham	244	326	-
Capitol Hill Drive, Mt Vernon	0	102	-
Aerodrome	500	850	-
South Hoxton Park	1,115	2,230	Hoxton Park Recycled Water Scheme
SWGC Precincts supplied via Cecil Park WSZ in future***			

Precincts site names	2020	2031	2036	Comment
North Bringelly	0	242	3,434	100% Cecil Park
North Rossmore	0	2272	5,464	100% Cecil Park
Rossmore	0	329	2,882	100% Cecil Park
Austral		3,650	5,200	100% Cecil Park
Bringelly	0	0	1,267	50% Cecil Park and 50% Oran Park (future)
Kemps Creek	0	0	1,132	100% Cecil Park
Leppington North	0**	4,400	5,600	100% Cecil Park

*Growth provided by the Department of Planning and Environment in a form of Housing Supply Forecast Model (HSFM) table which contains an incremental growth per property for 2015 and 2020 planning horizons

** There are 700 dwellings forecast for Leppington North by 2020 however the initial servicing (up to 2020) for Leppington North is from Carnes Hill water supply zone as per the SWGC Servicing Strategy

*** These SWGC precincts are located outside of the existing Cecil Park zone boundary however the Cecil Park zone boundary will be extended in the future to enable supply from Cecil Park Reservoirs to these precincts



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Appendix B – Detailed Cost Estimation

Sydney WATER

COST ESTIMATOR

Job Name: Oakdale Central -2-3-

Estimator: Amir Rashidi

Estimate Date: **10/06/2016**

Print Date/Time: **10/06/2016 18:32**

Ver 09-2015.11

ITEM	H#	DESCRIPTION		PARAMETER	UNIT	QUANTITY	RATE	TOTAL
		DIRECT COSTS						
	H1	**Option 1**						
1		Water Main Greenfield PVC		200 dia	m		191	0
2		Water Main Greenfield PVC		250 dia	m	350	238	83,204
3		Water Main Greenfield PVC		300 dia	m		314	0
4		Water Main Greenfield PVC		375 dia	m		407	0
5		Water Main Greenfield DICL		450 dia	m		569	0
6		EO Rock Excav Trench Std Dpth - 200 Dia (1%RK-100%RK)	%RK-->	30	m	0	15	0
7		EO Rock Excav Trench Std Dpth - 250 Dia (1%RK-100%RK)	%RK-->	30	m	350	18	6,190
8		EO Rock Excav Trench Std Dpth - 300 Dia (1%RK-100%RK)	%RK-->	30	m	0	21	0
9		EO Rock Excav Trench Std Dpth - 375 Dia (1%RK-100%RK)	%RK-->	30	m	0	25	0
10		EO Rock Excav Trench Std Dpth - 450 Dia (1%RK-100%RK)	%RK-->	30	m	0	10	0
11		EO Road Restoration Trench Std Depth		250 dia	m	88	434	37,980
12		EO Road Restoration Trench Std Depth		300 dia	m	0	485	0
13		EO Road Restoration Trench Std Depth		375 dia	m	0	513	0
14		EO Road Restoration Trench Std Depth		450 dia	m	0	579	0
15		EO Road Restoration Trench Std Depth		200 dia	m	0	409	0
	H1	**Scope Contingency**						
16		Urban Detailed Planning		75	%	127,374	0.75	95,530
		Sub Total Direct Costs						**222,904**
		INDIRECT COSTS				**%**		
17		Contractor Design Costs (% of Direct Costs)				10.00%		22,290
18		Contractor Indirect Costs (% of Direct Costs)				20.00%		44,581
19		Contractor Margin (% of DC+Indirect Costs)				15.00%		43,466
20		Risk Contingency (% of (Direct Costs+Indirect Costs+Margin))				35.00%		116,634
		Total Construction Cost						**449,875**
		SWC CLIENT COSTS				**% of ConstC**		
21		SWC Costs to Date	Current as at:					
22		SWC Design Costs (% of Construction Costs)				1.00%		4,499
23		SWC Tender Costs (% of Construction Costs)				0.50%	Adj. to Min Limit>>	50,000

Sydney WATER

COST ESTIMATOR

Job Name: Oakdale Central -2-3-

Estimator: Amir Rashidi

Estimate Date: **10/06/2016**

Print Date/Time: **10/06/2016 18:32**

Ver 09-2015.11

ITEM	H#	DESCRIPTION	PARAMETER	UNIT	QUANTITY	RATE	TOTAL
24		SWC Planning Costs (% of Construction Costs)			5.00%		22,494
25		SWC Project Management Costs (% of Construction Costs)			5.00%		22,494
26		SWC Insurances & Financing Costs (% of Construction Costs)			0.55%		2,474
27		SWC Land Acquisition/Easement Costs					
28		SWC Risk Contingency (% of the SWC Client Future Costs only)				**of Client Costs**	
		TOTAL PROJECT BUDGET REQUIREMENT					**551,836**

Sydney WATER

COST ESTIMATOR

Job Name: Oakdale Central- 2-4-

Estimator: Amir Rashidi

Estimate Date: **10/06/2016**

Print Date/Time: **04/07/2016 11:29**

Ver 09-2015.11

ITEM	H#	DESCRIPTION		PARAMETER	UNIT	QUANTITY	RATE	TOTAL
		DIRECT COSTS						
	H1	**Option 1**						
1		Water Main Greenfield PVC		200 dia	m		191	0
2		Water Main Greenfield PVC		250 dia	m		238	0
3		Water Main Greenfield PVC		300 dia	m	1,200	314	377,012
4		Water Main Greenfield PVC		375 dia	m		407	0
5		Water Main Greenfield DICL		450 dia	m	0	569	0
6		EO Rock Excav Trench Std Dpth - 200 Dia (1%RK-100%RK)	%RK-->	30	m	0	15	0
7		EO Rock Excav Trench Std Dpth - 250 Dia (1%RK-100%RK)	%RK-->	30	m	0	18	0
8		EO Rock Excav Trench Std Dpth - 300 Dia (1%RK-100%RK)	%RK-->	30	m	1,200	21	25,713
9		EO Rock Excav Trench Std Dpth - 375 Dia (1%RK-100%RK)	%RK-->	30	m	0	25	0
10		EO Rock Excav Trench Std Dpth - 450 Dia (1%RK-100%RK)	%RK-->	30	m	0	10	0
11		EO Road Restoration Trench Std Depth		250 dia	m	0	434	0
12		EO Road Restoration Trench Std Depth		300 dia	m	300	485	145,440
13		EO Road Restoration Trench Std Depth		375 dia	m	0	513	0
14		EO Road Restoration Trench Std Depth		450 dia	m	0	579	0
15		EO Road Restoration Trench Std Depth		200 dia	m	0	409	0
	H1	**Scope Contingency**						
16		Urban Detailed Planning		75	%	548,164	0.75	411,123
		Sub Total Direct Costs						**959,287**
		INDIRECT COSTS				**%**		
17		Contractor Design Costs (% of Direct Costs)				10.00%		95,929
18		Contractor Indirect Costs (% of Direct Costs)				20.00%		191,857
19		Contractor Margin (% of DC+Indirect Costs)				15.00%		187,061
20		Risk Contingency (% of (Direct Costs+Indirect Costs+Margin))				35.00%		501,947
		Total Construction Cost						**1,936,081**
		SWC CLIENT COSTS				**% of ConstC**		
21		SWC Costs to Date	Current as at:					
22		SWC Design Costs (% of Construction Costs)				1.00%		19,361
23		SWC Tender Costs (% of Construction Costs)				0.50%	Adj. to Min Limit>>	50,000

Sydney WATER **COST ESTIMATOR**

Job Name:	Oakdale Central- 2-4-	Estimate Date:	10/06/2016
Estimator:	Amir Rashidi	Print Date/Time:	04/07/2016 11:29
			Ver 09-2015.11

ITEM	H#	DESCRIPTION	PARAMETER	UNIT	QUANTITY	RATE	TOTAL
24		SWC Planning Costs (% of Construction Costs)			5.00%		96,804
25		SWC Project Management Costs (% of Construction Costs)			5.00%		96,804
26		SWC Insurances & Financing Costs (% of Construction Costs)			0.55%		10,648
27		SWC Land Acquisition/Easement Costs					
28		SWC Risk Contingency (% of the SWC Client Future Costs only)				**of Client Costs**	
		TOTAL PROJECT BUDGET REQUIREMENT					**2,209,698**

Sydney WATER

COST ESTIMATOR

Job Name: Oakdale Central -4-5-

Estimator: Amir Rashidi

Estimate Date: **10/06/2016**

Print Date/Time: **10/06/2016 18:46**

Ver 09-2015.11

ITEM	H#	DESCRIPTION		PARAMETER	UNIT	QUANTITY	RATE	TOTAL
		DIRECT COSTS						
	H1	**Option 1**						
1		Water Main Greenfield PVC		200 dia	m		191	0
2		Water Main Greenfield PVC		250 dia	m	900	238	213,954
3		Water Main Greenfield PVC		300 dia	m		314	0
4		Water Main Greenfield PVC		375 dia	m		407	0
5		Water Main Greenfield DICL		450 dia	m		569	0
6		EO Rock Excav Trench Std Dpth - 200 Dia (1%RK-100%RK)	%RK-->	30	m	0	15	0
7		EO Rock Excav Trench Std Dpth - 250 Dia (1%RK-100%RK)	%RK-->	30	m	900	18	15,917
8		EO Rock Excav Trench Std Dpth - 300 Dia (1%RK-100%RK)	%RK-->	30	m	0	21	0
9		EO Rock Excav Trench Std Dpth - 375 Dia (1%RK-100%RK)	%RK-->	30	m	0	25	0
10		EO Rock Excav Trench Std Dpth - 450 Dia (1%RK-100%RK)	%RK-->	30	m	0	10	0
11		EO Road Restoration Trench Std Depth		250 dia	m	225	434	97,662
12		EO Road Restoration Trench Std Depth		300 dia	m	0	485	0
13		EO Road Restoration Trench Std Depth		375 dia	m	0	513	0
14		EO Road Restoration Trench Std Depth		450 dia	m	0	579	0
15		EO Road Restoration Trench Std Depth		200 dia	m	0	409	0
	H1	**Scope Contingency**						
16		Urban Detailed Planning		75	%	327,533	0.75	245,650
		Sub Total Direct Costs						**573,183**
		INDIRECT COSTS				**%**		
17		Contractor Design Costs (% of Direct Costs)				10.00%		57,318
18		Contractor Indirect Costs (% of Direct Costs)				20.00%		114,637
19		Contractor Margin (% of DC+Indirect Costs)				15.00%		111,771
20		Risk Contingency (% of (Direct Costs+Indirect Costs+Margin))				35.00%		299,918
		Total Construction Cost						**1,156,827**
		SWC CLIENT COSTS				**% of ConstC**		
21		SWC Costs to Date	Current as at:					
22		SWC Design Costs (% of Construction Costs)				1.00%		11,568
23		SWC Tender Costs (% of Construction Costs)				0.50%	Adj. to Min Limit>>	50,000

Sydney WATER **COST ESTIMATOR**

Job Name:	Oakdale Central -4-5-	Estimate Date:	**10/06/2016**
Estimator:	Amir Rashidi	Print Date/Time:	**10/06/2016 18:46**
			Ver 09-2015.11

ITEM	H#	DESCRIPTION	PARAMETER	UNIT	QUANTITY	RATE	TOTAL
24		SWC Planning Costs (% of Construction Costs)			5.00%		57,841
25		SWC Project Management Costs (% of Construction Costs)			5.00%		57,841
26		SWC Insurances & Financing Costs (% of Construction Costs)			0.55%		6,363
27		SWC Land Acquisition/Easement Costs					
28		SWC Risk Contingency (% of the SWC Client Future Costs only)				**of Client Costs**	
		TOTAL PROJECT BUDGET REQUIREMENT					**1,340,440**

Sydney WATER

COST ESTIMATOR

Job Name: Oakdale Central -4-7

Estimator: Amir Rashidi

Estimate Date: **10/06/2016**

Print Date/Time: **04/07/2016 11:30**

Ver 09-2015.11

ITEM	H#	DESCRIPTION		PARAMETER	UNIT	QUANTITY	RATE	TOTAL
		DIRECT COSTS						
	H1	**Option 1**						
1		Water Main Greenfield PVC		200 dia	m		191	0
2		Water Main Greenfield PVC		250 dia	m		238	0
3		Water Main Greenfield PVC		300 dia	m	700	314	219,923
4		Water Main Greenfield PVC		375 dia	m	0	407	0
5		Water Main Greenfield DICL		450 dia	m		569	0
6		EO Rock Excav Trench Std Dpth - 200 Dia (1%RK-100%RK)	%RK-->	30	m	0	15	0
7		EO Rock Excav Trench Std Dpth - 250 Dia (1%RK-100%RK)	%RK-->	30	m	0	18	0
8		EO Rock Excav Trench Std Dpth - 300 Dia (1%RK-100%RK)	%RK-->	30	m	700	21	14,999
9		EO Rock Excav Trench Std Dpth - 375 Dia (1%RK-100%RK)	%RK-->	30	m	0	25	0
10		EO Rock Excav Trench Std Dpth - 450 Dia (1%RK-100%RK)	%RK-->	30	m	0	10	0
11		EO Road Restoration Trench Std Depth		250 dia	m	0	434	0
12		EO Road Restoration Trench Std Depth		300 dia	m	175	485	84,840
13		EO Road Restoration Trench Std Depth		375 dia	m	0	513	0
14		EO Road Restoration Trench Std Depth		450 dia	m	0	579	0
15		EO Road Restoration Trench Std Depth		200 dia	m	0	409	0
	H1	**Scope Contingency**						
16		Urban Detailed Planning		75	%	319,762	0.75	239,822
		Sub Total Direct Costs						**559,584**
		INDIRECT COSTS				**%**		
17		Contractor Design Costs (% of Direct Costs)				10.00%		55,958
18		Contractor Indirect Costs (% of Direct Costs)				20.00%		111,917
19		Contractor Margin (% of DC+Indirect Costs)				15.00%		109,119
20		Risk Contingency (% of (Direct Costs+Indirect Costs+Margin))				35.00%		292,802
		Total Construction Cost						**1,129,380**
		SWC CLIENT COSTS				**% of ConstC**		
21		SWC Costs to Date	Current as at:					
22		SWC Design Costs (% of Construction Costs)				1.00%		11,294
23		SWC Tender Costs (% of Construction Costs)				0.50%	Adj. to Min Limit>>	50,000

Sydney WATER

COST ESTIMATOR

Job Name:	Oakdale Central -4-7	Estimate Date:	**10/06/2016**
Estimator:	Amir Rashidi	Print Date/Time:	**04/07/2016 11:30**
			Ver 09-2015.11

ITEM	H#	DESCRIPTION	PARAMETER	UNIT	QUANTITY	RATE	TOTAL
24		SWC Planning Costs (% of Construction Costs)			5.00%		56,469
25		SWC Project Management Costs (% of Construction Costs)			5.00%		56,469
26		SWC Insurances & Financing Costs (% of Construction Costs)			0.55%		6,212
27		SWC Land Acquisition/Easement Costs					
28		SWC Risk Contingency (% of the SWC Client Future Costs only)				**of Client Costs**	
		TOTAL PROJECT BUDGET REQUIREMENT					**1,309,824**

Sydney WATER

COST ESTIMATOR

Job Name: Oakdale Central -5-6-

Estimator: Amir Rashidi

Estimate Date: **10/06/2016**

Print Date/Time: **10/06/2016 18:47**

Ver 09-2015.11

ITEM	H#	DESCRIPTION		PARAMETER	UNIT	QUANTITY	RATE	TOTAL
		DIRECT COSTS						
	H1	**Option 1**						
1		Water Main Greenfield PVC		200 dia	m	850	191	162,010
2		Water Main Greenfield PVC		250 dia	m		238	0
3		Water Main Greenfield PVC		300 dia	m		314	0
4		Water Main Greenfield PVC		375 dia	m		407	0
5		Water Main Greenfield DICL		450 dia	m		569	0
6		EO Rock Excav Trench Std Dpth - 200 Dia (1%RK-100%RK)	%RK-->	30	m	850	15	12,431
7		EO Rock Excav Trench Std Dpth - 250 Dia (1%RK-100%RK)	%RK-->	30	m	0	18	0
8		EO Rock Excav Trench Std Dpth - 300 Dia (1%RK-100%RK)	%RK-->	30	m	0	21	0
9		EO Rock Excav Trench Std Dpth - 375 Dia (1%RK-100%RK)	%RK-->	30	m	0	25	0
10		EO Rock Excav Trench Std Dpth - 450 Dia (1%RK-100%RK)	%RK-->	30	m	0	10	0
11		EO Road Restoration Trench Std Depth		250 dia	m	0	434	0
12		EO Road Restoration Trench Std Depth		300 dia	m	0	485	0
13		EO Road Restoration Trench Std Depth		375 dia	m	0	513	0
14		EO Road Restoration Trench Std Depth		450 dia	m	0	579	0
15		EO Road Restoration Trench Std Depth		200 dia	m	213	409	86,959
	H1	**Scope Contingency**						
16		Urban Detailed Planning		75	%	261,400	0.75	196,050
		Sub Total Direct Costs						**457,450**
		INDIRECT COSTS				**%**		
17		Contractor Design Costs (% of Direct Costs)				10.00%		45,745
18		Contractor Indirect Costs (% of Direct Costs)				20.00%		91,490
19		Contractor Margin (% of DC+Indirect Costs)				15.00%		89,203
20		Risk Contingency (% of (Direct Costs+Indirect Costs+Margin))				35.00%		239,361
		Total Construction Cost						**923,249**
		SWC CLIENT COSTS				**% of ConstC**		
21		SWC Costs to Date	Current as at:					
22		SWC Design Costs (% of Construction Costs)				1.00%		9,232
23		SWC Tender Costs (% of Construction Costs)				0.50%	Adj. to Min Limit>>	50,000

Sydney WATER

COST ESTIMATOR

Job Name: Oakdale Central -5-6-

Estimator: Amir Rashidi

Estimate Date: **10/06/2016**

Print Date/Time: **10/06/2016 18:47**

Ver 09-2015.11

ITEM	H#	DESCRIPTION	PARAMETER	UNIT	QUANTITY	RATE	TOTAL
24		SWC Planning Costs (% of Construction Costs)			5.00%		46,162
25		SWC Project Management Costs (% of Construction Costs)			5.00%		46,162
26		SWC Insurances & Financing Costs (% of Construction Costs)			0.55%		5,078
27		SWC Land Acquisition/Easement Costs					
28		SWC Risk Contingency (% of the SWC Client Future Costs only)				of Client Costs	
		TOTAL PROJECT BUDGET REQUIREMENT					**1,079,883**

Sydney WATER

COST ESTIMATOR

Job Name: Oakdale Central -7-8-

Estimator: Amir Rashidi

Estimate Date: **10/06/2016**

Print Date/Time: **10/06/2016 18:47**

Ver 09-2015.11

ITEM	H#	DESCRIPTION		PARAMETER	UNIT	QUANTITY	RATE	TOTAL
		DIRECT COSTS						
	H1	**Option 1**						
1		Water Main Greenfield PVC		200 dia	m		191	0
2		Water Main Greenfield PVC		250 dia	m		238	0
3		Water Main Greenfield PVC		300 dia	m	1,200	314	377,012
4		Water Main Greenfield PVC		375 dia	m		407	0
5		Water Main Greenfield DICL		450 dia	m		569	0
6		EO Rock Excav Trench Std Dpth - 200 Dia (1%RK-100%RK)	%RK-->	30	m	0	15	0
7		EO Rock Excav Trench Std Dpth - 250 Dia (1%RK-100%RK)	%RK-->	30	m	0	18	0
8		EO Rock Excav Trench Std Dpth - 300 Dia (1%RK-100%RK)	%RK-->	30	m	1,200	21	25,713
9		EO Rock Excav Trench Std Dpth - 375 Dia (1%RK-100%RK)	%RK-->	30	m	0	25	0
10		EO Rock Excav Trench Std Dpth - 450 Dia (1%RK-100%RK)	%RK-->	30	m	0	10	0
11		EO Road Restoration Trench Std Depth		250 dia	m	0	434	0
12		EO Road Restoration Trench Std Depth		300 dia	m	300	485	145,440
13		EO Road Restoration Trench Std Depth		375 dia	m	0	513	0
14		EO Road Restoration Trench Std Depth		450 dia	m	0	579	0
15		EO Road Restoration Trench Std Depth		200 dia	m	0	409	0
	H1	**Scope Contingency**						
16		Urban Detailed Planning		75	%	548,164	0.75	411,123
		Sub Total Direct Costs						**959,287**
		INDIRECT COSTS				%		
17		Contractor Design Costs (% of Direct Costs)				10.00%		95,929
18		Contractor Indirect Costs (% of Direct Costs)				20.00%		191,857
19		Contractor Margin (% of DC+Indirect Costs)				15.00%		187,061
20		Risk Contingency (% of (Direct Costs+Indirect Costs+Margin))				35.00%		501,947
		Total Construction Cost						**1,936,081**
		SWC CLIENT COSTS				**% of ConstC**		
21		SWC Costs to Date	Current as at:					
22		SWC Design Costs (% of Construction Costs)				1.00%		19,361
23		SWC Tender Costs (% of Construction Costs)				0.50%	Adj. to Min Limit>>	50,000

Sydney WATER **COST ESTIMATOR**

Job Name:	Oakdale Central -7-8-	Estimate Date:	**10/06/2016**
Estimator:	Amir Rashidi	Print Date/Time:	**10/06/2016 18:47**
			Ver 09-2015.11

ITEM	H#	DESCRIPTION	PARAMETER	UNIT	QUANTITY	RATE	TOTAL
24		SWC Planning Costs (% of Construction Costs)			5.00%		96,804
25		SWC Project Management Costs (% of Construction Costs)			5.00%		96,804
26		SWC Insurances & Financing Costs (% of Construction Costs)			0.55%		10,648
27		SWC Land Acquisition/Easement Costs					
28		SWC Risk Contingency (% of the SWC Client Future Costs only)				**of Client Costs**	
		TOTAL PROJECT BUDGET REQUIREMENT					**2,209,698**

Sydney WATER

COST ESTIMATOR

Job Name: Oakdale Central -7-9-

Estimator: Amir Rashidi

Estimate Date: **10/06/2016**

Print Date/Time: **10/06/2016 18:48**

Ver 09-2015.11

ITEM	H#	DESCRIPTION		PARAMETER	UNIT	QUANTITY	RATE	TOTAL
		DIRECT COSTS						
	H1	**Option 1**						
1		Water Main Greenfield PVC		200 dia	m		191	0
2		Water Main Greenfield PVC		250 dia	m		238	0
3		Water Main Greenfield PVC		300 dia	m	1,600	314	502,682
4		Water Main Greenfield PVC		375 dia	m		407	0
5		Water Main Greenfield DICL		450 dia	m		569	0
6		EO Rock Excav Trench Std Dpth - 200 Dia (1%RK-100%RK)	%RK-->	30	m	0	15	0
7		EO Rock Excav Trench Std Dpth - 250 Dia (1%RK-100%RK)	%RK-->	30	m	0	18	0
8		EO Rock Excav Trench Std Dpth - 300 Dia (1%RK-100%RK)	%RK-->	30	m	1,600	21	34,284
9		EO Rock Excav Trench Std Dpth - 375 Dia (1%RK-100%RK)	%RK-->	30	m	0	25	0
10		EO Rock Excav Trench Std Dpth - 450 Dia (1%RK-100%RK)	%RK-->	30	m	0	10	0
11		EO Road Restoration Trench Std Depth		250 dia	m	0	434	0
12		EO Road Restoration Trench Std Depth		300 dia	m	400	485	193,920
13		EO Road Restoration Trench Std Depth		375 dia	m	0	513	0
14		EO Road Restoration Trench Std Depth		450 dia	m	0	579	0
15		EO Road Restoration Trench Std Depth		200 dia	m	0	409	0
	H1	**Scope Contingency**						
16		Urban Detailed Planning		75	%	730,885	0.75	548,164
		Sub Total Direct Costs						**1,279,049**
		INDIRECT COSTS				**%**		
17		Contractor Design Costs (% of Direct Costs)				10.00%		127,905
18		Contractor Indirect Costs (% of Direct Costs)				20.00%		255,810
19		Contractor Margin (% of DC+Indirect Costs)				15.00%		249,415
20		Risk Contingency (% of (Direct Costs+Indirect Costs+Margin))				35.00%		669,263
		Total Construction Cost						**2,581,442**
		SWC CLIENT COSTS				**% of ConstC**		
21		SWC Costs to Date	Current as at:					
22		SWC Design Costs (% of Construction Costs)				1.00%		25,814
23		SWC Tender Costs (% of Construction Costs)				0.50%	Adj. to Min Limit>>	50,000

Sydney WATER **COST ESTIMATOR**

Job Name:	Oakdale Central -7-9-	Estimate Date:	**10/06/2016**
Estimator:	Amir Rashidi	Print Date/Time:	**10/06/2016 18:48**
			Ver 09-2015.11

ITEM	H#	DESCRIPTION	PARAMETER	UNIT	QUANTITY	RATE	TOTAL
24		SWC Planning Costs (% of Construction Costs)			5.00%		129,072
25		SWC Project Management Costs (% of Construction Costs)			5.00%		129,072
26		SWC Insurances & Financing Costs (% of Construction Costs)			0.55%		14,198
27		SWC Land Acquisition/Easement Costs					
28		SWC Risk Contingency (% of the SWC Client Future Costs only)				**of Client Costs**	
		TOTAL PROJECT BUDGET REQUIREMENT					**2,929,598**

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