

Appendix C

Northern Sewerage Works Summary - 2024

Northern Sewer Pump Stations												
Pump Station	STP	New or Upgrade SPS	Current Capacity	Required Capacity	M&E	Civil	Estimated Completion Date	M&E Cost	Civil Cost	Odour Dosing Unit	Cost \$2024/25	
BB01	BB	Upgrade	1050	1300	1		2036	\$ 2,634,431	\$ -	\$ -	\$ 2,634,431	
BB07	BB	Upgrade	27	63	1		2036	\$ 466,051	\$ -	\$ -	\$ 466,051	
BB11	BB	Upgrade	18	30	1		2029	\$ 305,247	\$ -	\$ -	\$ 305,247	
BB10	BB	Upgrade	54	75	1		2029	\$ 515,529	\$ -	\$ -	\$ 515,529	
BB19	BB	New SPS	0	30	1	1	2030	\$ 305,247	\$ 566,888	\$ 114,900	\$ 987,036	
CH12	CH	Upgrade	260	400	1		2028	\$ 1,443,240	\$ -	\$ -	\$ 1,443,240	
CH13	CH	Upgrade	400	860	1		2028	\$ 1,774,127	\$ -	\$ -	\$ 1,774,127	
CH21 (SPS 2 Darkinjung Wallarah) Stage 1	CH	New SPS	0	47	1	1	2028	\$ 394,858	\$ 733,307	\$ 114,900	\$ 1,243,064	
CH21 (SPS 2 Darkinjung Wallarah) Stage 2	CH	New SPS	47	87	1	1	2031	\$ 559,234	\$ 1,038,578	\$ 114,900	\$ 1,712,712	
CH27 (WWPS 3 WELOG)	CH	New SPS	0	93	1	1	2028	\$ 579,025	\$ 1,075,333	\$ 114,900	\$ 1,769,258	
CH28	CH	New SPS	0	50	1	1	2036	\$ 409,701	\$ 760,873	\$ 114,900	\$ 1,285,474	
CH30	CH	New SPS	0	250	1	1	2036	\$ 1,030,924	\$ 1,914,573	\$ 114,900	\$ 3,060,397	
CH31	CH	New SPS	0	25	1	1	2036	\$ 275,011	\$ 510,735	\$ 114,900	\$ 900,646	
CH33	CH	New SPS	0	35	1	1	2036	\$ 332,735	\$ 617,937	\$ 114,900	\$ 1,065,572	
CH37	CH	New SPS	0	10	1	1	2030	\$ 189,799	\$ 352,484	\$ 114,900	\$ 657,183	
CH39	CH	New SPS	0	85	1	1	2026	\$ 552,637	\$ 1,026,326	\$ 114,900	\$ 1,693,863	
CH27A WWPS 1 WELOG	CH	New SPS	0	30	1	1	2028	\$ 305,247	\$ 566,888	\$ 114,900	\$ 987,036	
CH27B WWPS 2 WELOG	CH	New SPS	0	13	1	1	2028	\$ 206,292	\$ 383,113	\$ 114,900	\$ 704,304	
CH22 SPS 1 Darkinjung Wallarah	CH	New SPS	0	43	1	1	2028	\$ 375,066	\$ 696,552	\$ 114,900	\$ 1,186,518	
GW11	GW	New SPS	0	110		1	2031	\$ -	\$ 1,176,920	\$ 114,900	\$ 1,291,820	
GW11	GW	New SPS	0	45	1		2031	\$ 384,962	\$ -	\$ -	\$ 384,962	
MP07	MP	Upgrade	25	45	1		2031	\$ 384,962	\$ -	\$ -	\$ 384,962	
MP17	MP	New SPS	0	15	1	1	2036	\$ 217,287	\$ 403,532	\$ 114,900	\$ 735,719	
MP18	MP	New SPS	0	40	1	1	2027	\$ 360,223	\$ 668,986	\$ 114,900	\$ 1,144,108	
WS07	WS	Upgrade	84	110	1	1	2029	\$ 633,726	\$ 1,176,920	\$ -	\$ 1,810,646	
WS09	WS	Upgrade	28	95	1	1	2031	\$ 585,623	\$ 1,087,585	\$ -	\$ 1,673,207	
Total:											\$	31,817,113

Sewer Rising Mains								
STP	SPS	Diameter (mm)	Length (m)	Flow (L/s)	Velocity (m/s)	Estimated Completion Year	Rate	Cost \$2024/25
BB	BB19	150	1150	31	1.75	2030	\$ 511	\$ 587,632
BB	BB05	250	1400	100	2.04	2036	\$ 620	\$ 867,586
BB	BB11	200	269	70	2.23	2029	\$ 554	\$ 149,153
BB	BB10	260		75	1.41	2029		\$ 861,750
CH	CH12	600	4400	140	0.50	2028	\$ 1,779	\$ 7,829,290
CH	CH13	600	5700	600	2.12	2028	\$ 1,779	\$ 10,142,489
CH	CH15	300	2900	140	1.98	2031	\$ 708	\$ 2,052,875
CH	CH22 SPS 1 Darkinjung Wallarah	250	1500	43	0.88	2026	\$ 620	\$ 929,556
CH	CH22 SPS 1 Darkinjung Wallarah	375	2500	87	0.79	2028	\$ 863	\$ 2,156,280
CH	CH28	200	1300	50	1.59	2036	\$ 554	\$ 720,814
CH	CH30	375	1800	250	2.26	2036	\$ 863	\$ 1,552,522
CH	CH31	150	700	23	1.30	2036	\$ 511	\$ 357,689
CH	WS16	300	1000	165	2.33	2029	\$ 586	\$ 585,964
CH	CH33	150	500	35	1.98	2036	\$ 511	\$ 255,492
CH	CH37	100	700	10	1.27	2030	\$ 445	\$ 311,181
CH	CH39	250	420	85	1.73	2026	\$ 620	\$ 260,276
CH	CH27A WWPS 1 WELOG	150	870	30	1.70	2028	\$ 511	\$ 444,556
CH	CH27B WWPS 2 WELOG	150	390	13	0.74	2028	\$ 511	\$ 199,284
CH	CH27 WWPS 3 WELOG	250	590	93	1.89	2028	\$ 620	\$ 365,625
GW	GW11	300	1200	110	1.56	2031	\$ 708	\$ 849,466
MP	MP07	200	410	45	1.43	2031	\$ 554	\$ 227,334
MP	MP17	100	900	15	1.91	2036	\$ 445	\$ 400,090
MP	MP18	200	3395	40	1.27	2027	\$ 554	\$ 1,882,432
WS	WS07	250	200	110	2.24	2027	\$ 620	\$ 123,941
Total:							\$	34,113,273

Northern Sewer Gravity Mains														
STP	SPS	Diameter (mm)	Length (m)	Top(m)	Bottom(m)	Ground Grade	Required Grade	Comment	Depth(m)	Depth(m)	Precinct/Suburb	Estimated Completion Date	Rate (\$/m)	Cost \$2024/25
CH	CH27A WWPS 1 WELOG	225	883	20	9	0.0125	0.0062		1.575	1.5-3	WELOG	2028	\$ 617	\$ 545,065
CH	CH27B WWPS 2 WELOG	225	437	7	2	0.0114	0.0062		1.575	1.5-3	WELOG	2028	\$ 617	\$ 269,755
CH	CH27 WWPS 3 WELOG	225	740	8	2	0.0081	0.0062		1.575	1.5-3	WELOG	2028	\$ 617	\$ 456,793
CH	CH27 WWPS 3 WELOG	300	475	20	4	0.0337	0.0042		1.650	1.5-3	WELOG	2028	\$ 779	\$ 370,101
CH	CH27 WWPS 3 WELOG	375	170	4	2	0.0118	0.0031		1.725	1.5-3	WELOG	2026	\$ 1,012	\$ 172,092
CH	CH21	600	300	2	2	0.0000	0.0017	New SPS	5.000	>4.5 m	Doyalson	2028	\$ 2,039	\$ 611,731
CH	CH21	225	1200	24	16	0.0067	0.0062	New SPS	1.575	1.5-3	Doyalson	2028	\$ 617	\$ 740,746
CH	CH21	450	800	4	2	0.0025	0.0025	New SPS	4.000	3-4.5	Doyalson	2028	\$ 1,416	\$ 1,132,621
CH	CH21	300	1500	12	2	0.0067	0.0042	New SPS	1.650	1.5-3	Doyalson	2028	\$ 779	\$ 1,168,740
CH	CH21	225	1900	10	2	0.0042	0.0062	New SPS	5.355	>4.5 m	Doyalson	2028	\$ 954	\$ 1,813,208
CH	CH21	300	700	10	2	0.0114	0.0042	New SPS	1.650	1.5-3	Doyalson	2028	\$ 779	\$ 545,412
CH	CH21	225	850	14	10	0.0047	0.0062	New SPS	2.845	1.5-3	Doyalson	2028	\$ 617	\$ 524,695
CH	CH21	225	1100	16	10	0.0055	0.0062	New SPS	2.395	1.5-3	Doyalson	2028	\$ 617	\$ 679,017
CH	CH21	375	1300	14	12	0.0015	0.0031	New SPS	3.755	3-4.5	Doyalson	2028	\$ 1,181	\$ 1,535,851
CH	CH21	225	400	10	4	0.0150	0.0062	New SPS	1.575	1.5-3	Doyalson	2028	\$ 617	\$ 246,915
MP	MP18	225	920	20	10	0.0109	0.0062		1.575	1.5-3	WELOG	2028	\$ 617	\$ 567,905
MP	MP18	225	230	11	10	0.0043	0.0062		2.001	1.5-3	WELOG	2028	\$ 617	\$ 141,976
BB	BB19	225	500	22	14	0.0160	0.0062		1.575	1.5-3	Bellevue Road	2030	\$ 617	\$ 308,644
CH	CH13	225	150	16	10	0.0400	0.0062		1.575	1.5-3	3A- Gorokan	2030	\$ 617	\$ 92,593
CH	CH13	225	150	16	12	0.0267	0.0062		1.575	1.5-3	3A- Gorokan	2030	\$ 617	\$ 92,593
CH	CH13	225	150	20	14	0.0400	0.0062		1.575	1.5-3	3A- Gorokan	2030	\$ 617	\$ 92,593
CH	CH13	225	200	22	14	0.0400	0.0062		1.575	1.5-3	3A- Gorokan	2030	\$ 617	\$ 123,458
CH	CH13	225	100	22	20	0.0200	0.0062		1.575	1.5-3	3A- Gorokan	2030	\$ 617	\$ 61,729
CH	CH15	375	550	10	7	0.0055	0.0031		3.500	3-4.5	6	2030	\$ 1,181	\$ 649,783
CH	CH15	300	450	10	10	0.0000	0.0042		3.540	3-4.5	6	2030	\$ 983	\$ 442,490
CH	CH15	225	700	14	10	0.0057	0.0062		1.915	1.5-3	6	2030	\$ 617	\$ 432,102
CH	CH15	300	1000	10	6	0.0040	0.0042		1.850	1.5-3	6	2030	\$ 779	\$ 779,160
CH	CH15	225	600	14	10	0.0067	0.0062		1.575	1.5-3	6	2030	\$ 617	\$ 370,373
CH	CH15	225	850	15	11	0.0047	0.0062		2.845	1.5-3	6	2030	\$ 617	\$ 524,695
CH	CH35	225	350	20	18	0.0057	0.0062	New SPS	1.745	1.5-3	9	2030	\$ 617	\$ 216,051
GW	GW01	225	350	4	2	0.0057	0.0062		1.745	1.5-3	Gwandalan Rosecorp	2030	\$ 617	\$ 216,051
GW	GW02	300	350	14	4	0.0286	0.0042		1.650	1.5-3	Gwandalan	2030	\$ 779	\$ 272,706
GW	GW02	375	130	4	2	0.0154	0.0031		1.725	1.5-3	Gwandalan	2030	\$ 1,012	\$ 131,600
TO	TO07	225	500	6	4	0.0040	0.0062	Follow existing	2.675	1.5-3	Noraville	2030	\$ 617	\$ 308,644
WS	WS08	300	400	12	8	0.0100	0.0042		1.650	1.5-3	Westfield Gateway	2030	\$ 779	\$ 311,664
WS	WS08	225	300	16	12	0.0133	0.0062		1.575	1.5-3	Westfield Gateway	2030	\$ 617	\$ 185,186
WS	WS08	225	250	18	8	0.0400	0.0062		1.575	1.5-3	Westfield Gateway	2030	\$ 617	\$ 154,322
WS	WS08	300	750	4	4	0.0000	0.0042		4.800	>4.5 m	Westfield Gateway	2030	\$ 1,138	\$ 853,452
CH	WS16	225	600	10	4	0.0100	0.0062		1.575	1.5-3	Wyong	2030	\$ 617	\$ 370,373
CH	WS16	225	500	10	6	0.0080	0.0062		1.575	1.5-3	Precinct 2A	2030	\$ 617	\$ 308,644
WS	WS20	225	600	8	2	0.0100	0.0062		1.575	1.5-3	R1 General Res	2030	\$ 617	\$ 370,373
GW	GW11	225	300	2	2	0.0000	0.0062	New SPS	3.435	3-4.5	21	2031	\$ 782	\$ 234,473
GW	GW11	225	700	18	14	0.0057	0.0062		1.915	1.5-3	21	2031	\$ 617	\$ 432,102
MP	MP05	450	350	4	2	0.0057	0.0025		1.800	1.5-3	Lake Munmorah	2031	\$ 1,230	\$ 430,410
MP	MP11	225	200	0	0	0.0000	0.0062		2.815	1.5-3	18- Lake Munmorah	2031	\$ 617	\$ 123,458
MP	MP12	300	950	4	0	0.0042	0.0042		1.650	1.5-3	16 N Lake Munmorah	2031	\$ 779	\$ 740,202
MP	MP12	225	1000	16	2	0.0140	0.0062		1.575	1.5-3	16 N Lake Munmorah	2031	\$ 617	\$ 617,288
MP	MP12	225	800	12	2	0.0125	0.0062		1.575	1.5-3	16 N Lake Munmorah	2031	\$ 617	\$ 493,830
MP	MP12	300	700	12	4	0.0114	0.0042		1.650	1.5-3	16 N Lake Munmorah	2031	\$ 779	\$ 545,412
MP	MP13	225	300	12	2	0.0333	0.0062		1.575	1.5-3	19	2031	\$ 617	\$ 185,186
MP	MP13	225	500	18	10	0.0160	0.0062		1.575	1.5-3	19	2031	\$ 617	\$ 308,644
MP	MP13	225	300	2	0	0.0067	0.0062		1.575	1.5-3	19	2031	\$ 617	\$ 185,186
MP	MP13	300	300	2	0	0.0067	0.0042		1.650	1.5-3	19	2031	\$ 779	\$ 233,748
MP	MP13	225	250	18	8	0.0400	0.0062		1.575	1.5-3	19	2035	\$ 617	\$ 154,322
CH	CH28	300	1100	18	10	0.0073	0.0042		1.650	1.5-3	6	2036	\$ 779	\$ 857,076
CH	CH28	225	300	22	14	0.0267	0.0062		1.575	1.5-3	6	2036	\$ 617	\$ 185,186
CH	CH28	225	300	24	18	0.0200	0.0062		1.575	1.5-3	6	2036	\$ 617	\$ 185,186
CH	CH28	225	800	30	24	0.0075	0.0062		1.575	1.5-3	6	2036	\$ 617	\$ 493,830
CH	CH30	600	330	8	2	0.0182	0.0017		1.950	1.5-3	8	2036	\$ 1,659	\$ 547,333
CH	CH30	225	800	22	12	0.0125	0.0062		1.575	1.5-3	6, 8	2036	\$ 617	\$ 493,830
CH	CH30	225	1000	32	16	0.0160	0.0062		1.575	1.5-3	6, 8	2036	\$ 617	\$ 617,288
CH	CH30	225	500	30	24	0.0120	0.0062		1.575	1.5-3	6, 8	2036	\$ 617	\$ 308,644
CH	CH30	375	1000	20	6	0.0140	0.0031		1.725	1.5-3	8	2036	\$ 1,012	\$ 1,012,304
CH	CH30	300	200	22	20	0.0100	0.0042		1.650	1.5-3	8	2036	\$ 779	\$ 155,832
CH	CH30	225	550	30	22	0.0145	0.0062		1.575	1.5-3	8 N, 6 ETC	2036	\$ 617	\$ 339,508
CH	CH30	225	350	32	24	0.0229	0.0062		1.575	1.5-3	6	2036	\$ 617	\$ 216,051
CH	CH30	375	800	16	6	0.0125	0.0031		1.725	1.5-3	8	2036	\$ 1,012	\$ 809,843
CH	CH30	300	800	24	16	0.0100	0.0042		1.650	1.5-3	8	2036	\$ 779	\$ 623,328
CH	CH30	225	300	22	16	0.0200	0.0062		1.575	1.5-3	8	2036	\$ 617	\$ 185,186
CH	CH30	225	700	14	4	0.0143	0.0062		1.575	1.5-3	8	2036	\$ 617	\$ 432,102
CH	CH31	225	600	8	2	0.0100	0.0062		1.575	1.5-3	9	2036	\$ 617	\$ 370,373
CH	CH33	225	450	8	2	0.0133	0.0062		1.575	1.5-3	3B	2036	\$ 617	\$ 277,780
													Total:	\$ 31,986,843.40

Sewage Treatment Plants

Charmhaven STP

Augmentation of the existing plant (Stage 1) is proposed in two or more future stages. Stage 2 comprises a conversion of the plant into an MLE process to achieve a 75,000 EP capacity. This would include a new inlet works, construction of new reactor and associated clarifier, conversion of a redundant aeration tank to aerobic digester, associated biosolids handling works and effluent pump station upgrades to increase the plants biological and hydraulic capacity. Stage 3 would involve the construction of an additional reactor and clarifier and an additional inlet works to resolve hydraulic capacity and biological capacity issues. Stage 3 is yet to be costed and its timing will be informed by the W&S Masterplan which is due to commence in mid 2024.

Stage	Commissioning Date	Cost	Comments
2	2027	\$ 60,748,412	Portion of upgrade cost estimate attributable to capacity upgrade based on concept design estimate (P50)

Details are available within the AECOM options and concept design reports

Bateau Bay STP

Capital upgrades are currently underway to allow the plant to remain operational up to a design horizon of 2036 to 2041. A capacity review undertaken by GHD has indicated that future loading on the plant will likely trigger a major augmentation of the plant. As the scope and scale of the future upgrade is not currently known, an allowance for the upgrade is based on the NSW Reference Rates Manual (Department of Industry), using the forecast load on the plant at that time.

Also noting that certain process units may or may not be able to be retained (subject to refurbishment) as part of the future upgrade, this DSP will only recover 50% of the estimated cost of the upgrade. The future upgrade pathway for BB STP will be informed by the W&S Masterplan which is due to commence in mid 2024.

Commissioning Date	Total Estimated Cost	Comments
2041	\$ 20,034,047	50% of cost estimate for 50,000EP plant.

Reference Rate	Index 2014 values to			
Element	2024/25	1.311		
	Preliminary	Sludge Lagoon		Contingency
Site Works	Treatment	(dewatering)*	IDEA Tanks	(30%)
\$ 1,910,000	\$ 3,700,000	\$ -	\$17,900,000	\$ 7,053,000
*No lagoons required and new dewatering plant already operating				

Details are available within the BECA H2O Capacity Assessment document

Gwandalan STP

Augmentation of the existing plant (Stage 1) is proposed in two additional stages. Stage 2 comprises a conversion of the plant into an MLE process including a new inlet works, conversion of an existing reactor and construction of a new clarifier, conversion of a redundant aeration tank to aerobic digester, associated biosolids handling works and effluent pump station upgrades to increase the plants biological and hydraulic capacity. Stage 3 would involve the construction of an additional reactor and clarifier and an additional inlet works to resolve hydraulic capacity and biological capacity issues. Stage 3 is yet to be costed and its timing will be informed by the W&S Masterplan which is due to commence in mid 2024.

Stage	Commissioning Date	Cost	Comments
2	2026	\$ 37,976,911	Portion of upgrade cost estimate attributable to capacity upgrade based on

Details are available within the AECOM options and concept design reports