

Appendix E
Sewerage Capital Works Summary

Sewerage Capital Works Summary
Sewage Treatment Plants

Charmhaven STP

Augmentation of the existing plant (Stage 1) is proposed in two future stages. Stage 2 comprises an aeration upgrade and biosolids handling works to increase the plants biological capacity. Stage 3 will involve the construction of a third tank and new inlet works to resolve hydraulic capacity and biological capacity issues.

Stage	Commissioning Date	Cost	Comments
2	2023	\$ 5,075,000	50% of cost attributable to capacity upgrade
3	2030	\$ 13,975,000	Construction of third IDEA tank and inlet works.

Details are available within the GHD Capacity Assessment document

Bateau Bay STP

Capital upgrades are currently underway to allow the plant to remain operational up to a design horizon of 2031. 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.

Commissioning Date	Total Estimated Cost	Comments
2031	\$ 16,036,313	50% of cost estimate for 50,000EP plant.

Reference Rate Element	Index 2014 values	1.075		
		Sludge Lagoon		Contingency
		(dewatering)	IDEA Tanks	(30%)
\$	1,350,000	\$ 3,700,000	\$ -	\$ 17,900,000
				\$ 6,885,000
No lagoons required and new dewatering plant already operating				

Details are available within the GHD Capacity Assessment document

Sewerage Capital Works Summary Pumping Stations
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Pump Station	STP	Notes	Current Capacity	Required Capacity	M&E	Civil	Year	Capacity (L/s)	M&E Cost	Civil Cost	dour Dosing Ur	Cost
BB01	BB		1050	1300	1		2036	1300	\$2,073,023	\$0	\$0	\$2,073,023
BB07	BB		27	63	1		2036	63	\$366,734	\$0	\$0	\$366,734
BB11	BB		18	70	1		2020	70	\$389,445	\$0	\$0	\$389,445
BB19	BB	New SPS	0	30	1	1	2036	30	\$240,198	\$446,082	\$100,000	\$786,280
CH12	CH		260	400	1		2041	400	\$1,135,680	\$0	\$0	\$1,135,680
CH13	CH		400	860	1	1	2023	860	\$1,614,766	\$2,998,852	\$0	\$4,613,618
CH21 (SPS 2 Darkinjung Wallarah) Stage 1	CH	New SPS	0	47	1	1	2026	47	\$310,712	\$577,036	\$100,000	\$987,748
CH21 (SPS 2 Darkinjung Wallarah) Stage 2	CH	New SPS	47	87	1		2031	87	\$440,059	\$0	\$100,000	\$540,059
CH27 (WWPS 3 WELOG)	CH	New SPS	0	93	1	1	2026	93	\$455,633	\$846,175	\$100,000	\$1,401,808
CH28	CH	New SPS	0	25	1		2036	25	\$216,405	\$0	\$100,000	\$316,405
CH28	CH	New SPS	0	50		1	2036	50	\$0	\$598,728	\$0	\$598,728
CH30	CH	New SPS	0	250		1	2036	250	\$0	\$1,506,570	\$100,000	\$1,606,570
CH30	CH	New SPS	0	170	1		2036	170	\$638,190	\$0	\$0	\$638,190
CH30	CH		170	250	1		2036	250	\$811,230	\$0	\$0	\$811,230
CH31	CH	New SPS	0	25	1	1	2036	25	\$216,405	\$401,895	\$100,000	\$718,300
CH32	CH	New SPS	0	90	1	1	2036	90	\$447,846	\$831,714	\$100,000	\$1,379,560
CH33	CH	New SPS	0	35	1	1	2036	35	\$261,828	\$486,252	\$100,000	\$848,080
CH35	CH	New SPS	0	20	1	1	2036	20	\$192,612	\$357,708	\$100,000	\$650,320
CH36	CH	New SPS	0	5	1	1	2036	10	\$149,352	\$277,368	\$100,000	\$526,720
GW09	GW	New SPS	0	46	1	1	2023	46	\$306,818	\$569,806	\$100,000	\$976,624
GW10	GW	New SPS	0	15	1	1	2026	15	\$170,982	\$317,538	\$100,000	\$588,520
GW11	GW	New SPS	0	50	1	1	2036	50	\$322,392	\$598,728	\$100,000	\$1,021,120
MP07	MP		28	50	1		2023	50	\$322,392	\$0	\$0	\$322,392
MP07	MP		50	65	1	1	2031	65	\$373,223	\$693,128	\$0	\$1,066,350
MP17	MP	New SPS	0	15	1	1	2036	15	\$170,982	\$317,538	\$100,000	\$588,520
WS07	WS		84	110	1	1	2020	110	\$498,677	\$926,114	\$0	\$1,424,790
WS09	WS		28	95	1	1	2031	95	\$460,824	\$855,816	\$0	\$1,316,640
WWPS 1 WELOG	CH	New SPS	0	30	1		2026	30	\$240,198	\$0	\$100,000	\$340,198
WWPS 2 WELOG	CH	New SPS	0	13	1	1	2026	13	\$162,330	\$301,470	\$100,000	\$563,800
SPS Darkinjung Lake Munmorah (Option 2D)	MP	New SPS	0	40	1		2021	40	\$283,458	\$0	\$100,000	\$383,458
SPS 1 Darkinjung Wallarah	CH	New SPS	0	43	1	1	2026	43	\$295,138	\$548,114	\$100,000	\$943,252
WS47	WS	New SPS	0	20	1	1	2020	30	\$240,198	\$446,082	\$100,000	\$786,280
TOTAL												\$30,710,442

Sewerage Capital Works Summary Sewer Rising Mains									
STP	SPS	Dia(mm)	Length(m)	Flow (L/s)	Velocity (m/s)	Precinct	Year	Rate	Cost
BB	BB07	200	1500	63	2.01		2036	459	\$688,008
BB	BB11	200	269	70	2.23		2020	459	\$123,383
CH	CH12	600	4400	140	0.50		2041	1473	\$6,480,320
CH	CH13	600	5700	600	2.12		2023	1473	\$8,394,960
CH	CH15	300	2900	140	1.98		2025	586	\$1,699,296
CH	CH21 (SPS 2 Darkinjung Wallarah)	375	2500	87	0.79		2026	714	\$1,785,770
CH	CH28	200	1300	50	1.59	6	2036	459	\$596,274
CH	CH30	375	800	170	1.54	VARIOUS	2036	714	\$571,446
CH	CH31	150	700	23	1.30	9	2036	423	\$296,033
CH	CH32	250	700	90	1.83		2036	513	\$359,363
CH	CH33	150	500	35	1.98		2036	423	\$211,452
CH	CH35	150	1700	20	1.13		2036	423	\$718,937
CH	CH36	100	700	5	0.64		2036	368	\$257,740
CH	WWPS1	150	870	30	1.70		2026	423	\$367,926
CH	WWPS2	150	390	13	0.74		2026	423	\$164,933
CH	WWPS3	250	590	93	1.89		2026	513	\$302,892
GW	GW09	225	1100	46	1.16	20	2023	479	\$526,900
GW	GW10	100	550	15	1.91	20	2026	368	\$202,510
GW	GW11	200	1200	51	1.62	21	2036	459	\$550,406
MP	MP07	200	3650	65	2.07		2031	459	\$1,674,153
MP	MP17	100	900	14	1.78	16 - N San Remo	2036	368	\$331,380
MP	SPS Darkinjung Lake Munmorah	200	3395	40	1.27		2021	459	\$1,557,191
WS	WS07	250	200	55	1.12		2020	513	\$102,675
WS	WS09	250	1100	95	1.94		2031	513	\$564,714
WS	WS47	225	740	30	0.75	Glenning Valley	2020	479	\$354,460
								TOTAL	\$28,195,113

Sewerage Capital Works Summary											Min Depth 1.35					
Gravity Mains																
Ground Level																
STP	SPS	Line	Dia(mm)	Length(m)	Top(m)	Bottom(m)	Ground Grade	Required Grade	Comment	Depth(m)	Depth(m)	Precinct/Suburb	Year	Rate (\$/m)	Cost	
BB	BB01	1	525	300	8	6	0.67%	0.21%		1.88	1.5-3	Killarney Vale	2020	1091	\$327,277	
BB	BB04	1	300	750	6	2	0.53%	0.42%		1.65	1.5-3	Killarney Vale	2020	645	\$483,657	
BB	BB04	2	225	400	6	2	1.00%	0.62%		1.58	1.5-3	Killarney Vale	2022	511	\$204,509	
BB	BB11	1	225	200	2	2	0.00%	0.62%	Follow existing nearby sewer grade	2.82	1.5-3	The Entrance North	2022	511	\$102,254	
BB	BB19	1	225	500	22	14	1.60%	0.62%		1.58	1.5-3	Bellevue Road	2036	511	\$255,636	
CH	CH07	1	225	150	10	10	0.00%	0.62%		2.51	1.5-3	Doyalson	2030	511	\$76,691	
CH	CH07	2	225	600	10	6	0.67%	0.62%		1.58	1.5-3	Doyalson	2030	511	\$306,763	
CH	CH12	1a, b, c, d	225	1000	22	8	1.40%	0.62%		1.58	1.5-3	Warnervale TC	2020	511	\$511,272	
CH	CH12	2	300	1000	20	8	1.20%	0.42%		1.65	1.5-3	Warnervale TC	2020	645	\$644,876	
CH	CH13	1	300	600	40	18	3.67%	0.42%		1.65	1.5-3	Warnervale TC	2021	645	\$386,926	
CH	CH13	2a, b, c, d	225	600	30	22	1.33%	0.62%		1.58	1.5-3	Warnervale TC	2021	511	\$306,763	
CH	CH13	3	225	400	16	14	0.50%	0.62%		2.06	1.5-3	7	2020	511	\$204,509	
CH	CH13	4a	225	300	8	6	0.67%	0.62%		1.58	1.5-3	7	2020	511	\$153,382	
CH	CH13	4b	225	200	10	8	1.00%	0.62%		1.58	1.5-3	7	2020	511	\$102,254	
CH	CH13	4c	225	200	8	8	0.00%	0.62%	existing sewer depth 2.63m	2.82	1.5-3	7	2020	511	\$102,254	
CH	CH13	5a	225	150	16	10	4.00%	0.62%		1.58	1.5-3	3A- Gorokan	2020	511	\$76,691	
CH	CH13	5b	225	150	16	12	2.67%	0.62%		1.58	1.5-3	3A- Gorokan	2020	511	\$76,691	
CH	CH13	5c	225	150	20	14	4.00%	0.62%		1.58	1.5-3	3A- Gorokan	2020	511	\$76,691	
CH	CH13	5d	225	200	22	14	4.00%	0.62%		1.58	1.5-3	3A- Gorokan	2020	511	\$102,254	
CH	CH13	5e	225	100	22	20	2.00%	0.62%		1.58	1.5-3	3A- Gorokan	2020	511	\$51,127	
CH	CH13	6	225	400	20	12	2.00%	0.62%		1.58	1.5-3	2B - Wadalba	2020	511	\$204,509	
CH	CH15	1	375	550	10	7	0.55%	0.31%		3.50	3-4.5	6	2020	978	\$538,098	
CH	CH15	2	300	450	10	10	0.00%	0.42%		3.54	3-4.5	6	2020	814	\$366,412	
CH	CH15	3	225	700	14	10	0.57%	0.62%		1.92	1.5-3	6	2020	511	\$357,890	
CH	CH15	4	300	1000	10	6	0.40%	0.42%		1.85	1.5-3	6	2020	645	\$644,876	
CH	CH15	5	225	600	14	10	0.67%	0.62%		1.58	1.5-3	6	2020	511	\$306,763	
CH	CH15	6	225	850	15	11	0.47%	0.62%		2.85	1.5-3	6	2020	511	\$434,581	
CH	CH20	1	225	500	24	18	1.20%	0.62%		1.58	1.5-3	5, 6	2020	511	\$255,636	
CH	CH21	1	600	300	2	2	0.00%	0.17%	New SPS	5.00	> 4.5 m	Doyalson	2026	1688	\$506,538	
CH	CH21	10	225	1200	24	16	0.67%	0.62%	New SPS	1.58	1.5-3	Doyalson	2026	511	\$613,526	
CH	CH21	2	450	800	4	2	0.25%	0.25%	New SPS	4.00	3-4.5	Doyalson	2026	1172	\$937,542	
CH	CH21	3	300	1500	12	2	0.67%	0.42%	New SPS	1.65	1.5-3	Doyalson	2026	645	\$967,314	
CH	CH21	4	225	1900	10	2	0.42%	0.62%	New SPS	5.36	> 4.5 m	Doyalson	2026	790	\$1,501,099	
CH	CH21	5	300	700	10	2	1.14%	0.42%	New SPS	1.65	1.5-3	Doyalson	2026	645	\$451,413	
CH	CH21	6	225	850	14	10	0.47%	0.62%	New SPS	2.85	1.5-3	Doyalson	2026	511	\$434,581	
CH	CH21	7	225	1100	16	10	0.55%	0.62%	New SPS	2.40	1.5-3	Doyalson	2026	511	\$562,399	
CH	CH21	8	375	1300	14	12	0.15%	0.31%	New SPS	3.76	3-4.5	Doyalson	2026	978	\$1,271,868	
CH	CH21	9	225	400	10	4	1.50%	0.62%	New SPS	1.58	1.5-3	Doyalson	2026	511	\$204,509	
CH	CH28	1	300	1100	18	10	0.73%	0.42%		1.65	1.5-3	6	2027	645	\$709,364	
CH	CH28	2	225	300	22	14	2.67%	0.62%		1.58	1.5-3	6	2035	511	\$153,382	
CH	CH28	3	225	300	24	18	2.00%	0.62%		1.58	1.5-3	6	2027	511	\$153,382	
CH	CH28	4	225	800	30	24	0.75%	0.62%		1.58	1.5-3	6	2031	511	\$409,018	
CH	CH30	1	600	1000	8	2	0.60%	0.17%		1.95	1.5-3	8	2036	1373	\$1,372,860	
CH	CH30	10a, b	225	800	22	12	1.25%	0.62%		1.58	1.5-3	6, 8	2036	511	\$409,018	
CH	CH30	11a, b, c, d	225	1000	32	16	1.60%	0.62%		1.58	1.5-3	6, 8	2036	511	\$511,272	
CH	CH30	12a, b	225	500	30	24	1.20%	0.62%		1.58	1.5-3	6, 8	2036	511	\$255,636	
CH	CH30	2	375	1000	20	6	1.40%	0.31%		1.73	1.5-3	8	2036	838	\$838,444	
CH	CH30	3	300	200	22	20	1.00%	0.42%		1.65	1.5-3	8	2036	645	\$128,975	
CH	CH30	4	225	550	30	22	1.45%	0.62%		1.58	1.5-3	8 N, 6 ETC	2036	511	\$281,200	
CH	CH30	5	225	350	32	24	2.29%	0.62%		1.58	1.5-3	6	2036	511	\$178,945	
CH	CH30	6	375	800	16	6	1.25%	0.31%		1.73	1.5-3	8	2036	838	\$670,755	
CH	CH30	7	300	800	24	16	1.00%	0.42%		1.65	1.5-3	8	2036	645	\$515,901	
CH	CH30	8	225	300	22	16	2.00%	0.62%		1.58	1.5-3	8	2036	511	\$153,382	
CH	CH30	9	225	700	14	4	1.43%	0.62%		1.58	1.5-3	8	2036	511	\$357,890	
CH	CH31	1	225	600	8	2	1.00%	0.62%		1.58	1.5-3	9	2036	511	\$306,763	
CH	CH32	1	300	500	6	4	0.40%	0.42%	New SPS	1.75	1.5-3	7	2036	645	\$322,438	
CH	CH32	2a	225	200	8	8	0.00%	0.62%	New SPS	2.82	1.5-3	7	2036	511	\$102,254	

CH	CH32	2b	225	200	8	8	0.00%	0.62%	New SPS	2.82	1.5-3	7	2036	511	\$102,254
CH	CH32	3	225	200	8	8	0.00%	0.62%	Clearance under rail	4.40	3-4.5	7	2036	647	\$129,396
CH	CH33	1	225	450	8	2	1.33%	0.62%		1.58	1.5-3	3B	2036	511	\$230,072
CH	CH34	1	225	250	10	8	0.80%	0.62%	New SPS	1.58	1.5-3	9	2021	511	\$127,818
CH	CH35	1	225	350	20	18	0.57%	0.62%	New SPS	1.75	1.5-3	9	2036	511	\$178,945
GW	GW01	1a	225	350	4	2	0.57%	0.62%		1.75	1.5-3	Gwandalan Rosecorp	2020	511	\$178,945
GW	GW02	1a	300	350	14	4	2.86%	0.42%		1.65	1.5-3	Gwandalan	2030	645	\$225,707
GW	GW02	2	375	130	4	2	1.54%	0.31%		1.73	1.5-3	Gwandalan	2030	838	\$108,998
GW	GW09	1	225	400	14	2	3.00%	0.62%		1.58	1.5-3	20	2023	511	\$204,509
GW	GW09	2a	225	200	12	4	4.00%	0.62%		1.58	1.5-3	20	2023	511	\$102,254
GW	GW09	2b	225	200	4	2	1.00%	0.62%		1.58	1.5-3	20	2023	511	\$102,254
GW	GW10	1	225	200	10	2	4.00%	0.62%		1.58	1.5-3	20	2026	511	\$102,254
GW	GW11	1	225	300	2	2	0.00%	0.62%	New SPS	3.44	3-4.5	21	2036	647	\$194,094
GW	GW11	2	225	700	18	14	0.57%	0.62%		1.92	1.5-3	21	2036	511	\$357,890
MP	MP05	1	450	350	4	2	0.57%	0.25%		1.80	1.5-3	Lake Munmorah	2028	1018	\$356,418
MP	MP11	1	225	200	0	0	0.00%	0.62%	sps av depth 4m	2.82	1.5-3	18- Lake Munmorah	2026	511	\$102,254
MP	MP12	1	300	950	4	0	0.42%	0.42%		1.65	1.5-3	16 N Lake Munmorah	2026	645	\$612,632
MP	MP12	2	225	1000	16	2	1.40%	0.62%		1.58	1.5-3	16 N Lake Munmorah	2026	511	\$511,272
MP	MP12	3	225	800	12	2	1.25%	0.62%		1.58	1.5-3	16 N Lake Munmorah	2031	511	\$409,018
MP	MP12	4	300	700	12	4	1.14%	0.42%		1.65	1.5-3	16 N Lake Munmorah	2031	645	\$451,413
MP	MP13	1	225	300	12	2	3.33%	0.62%		1.58	1.5-3	19	2025	511	\$153,382
MP	MP13	2	225	250	18	8	4.00%	0.62%		1.58	1.5-3	19	2035	511	\$127,818
MP	MP13	3	225	500	18	10	1.60%	0.62%		1.58	1.5-3	19	2031	511	\$255,636
MP	MP13	4	225	300	2	0	0.67%	0.62%		1.58	1.5-3	19	2025	511	\$153,382
MP	MP13	5	300	300	2	0	0.67%	0.42%		1.65	1.5-3	19	2031	645	\$193,463
TO	TO07	1	225	500	6	4	0.40%	0.62%	Follow existing sewer grade	2.68	1.5-3	Noraville	2020	511	\$255,636
WS	WS08	1	300	400	12	8	1.00%	0.42%		1.65	1.5-3	Westfield Gateway	2020	645	\$257,950
WS	WS08	2a	225	300	16	12	1.33%	0.62%		1.58	1.5-3	Westfield Gateway	2020	511	\$153,382
WS	WS08	2b	225	250	18	8	4.00%	0.62%		1.58	1.5-3	Westfield Gateway	2020	511	\$127,818
WS	WS08	3	300	750	4	4	0.00%	0.42%		4.80	> 4.5 m	Westfield Gateway	2020	942	\$706,155
WS	WS11	1	450	950	12	4	0.84%	0.25%		1.80	1.5-3	Watanobbi	2040	1018	\$967,419