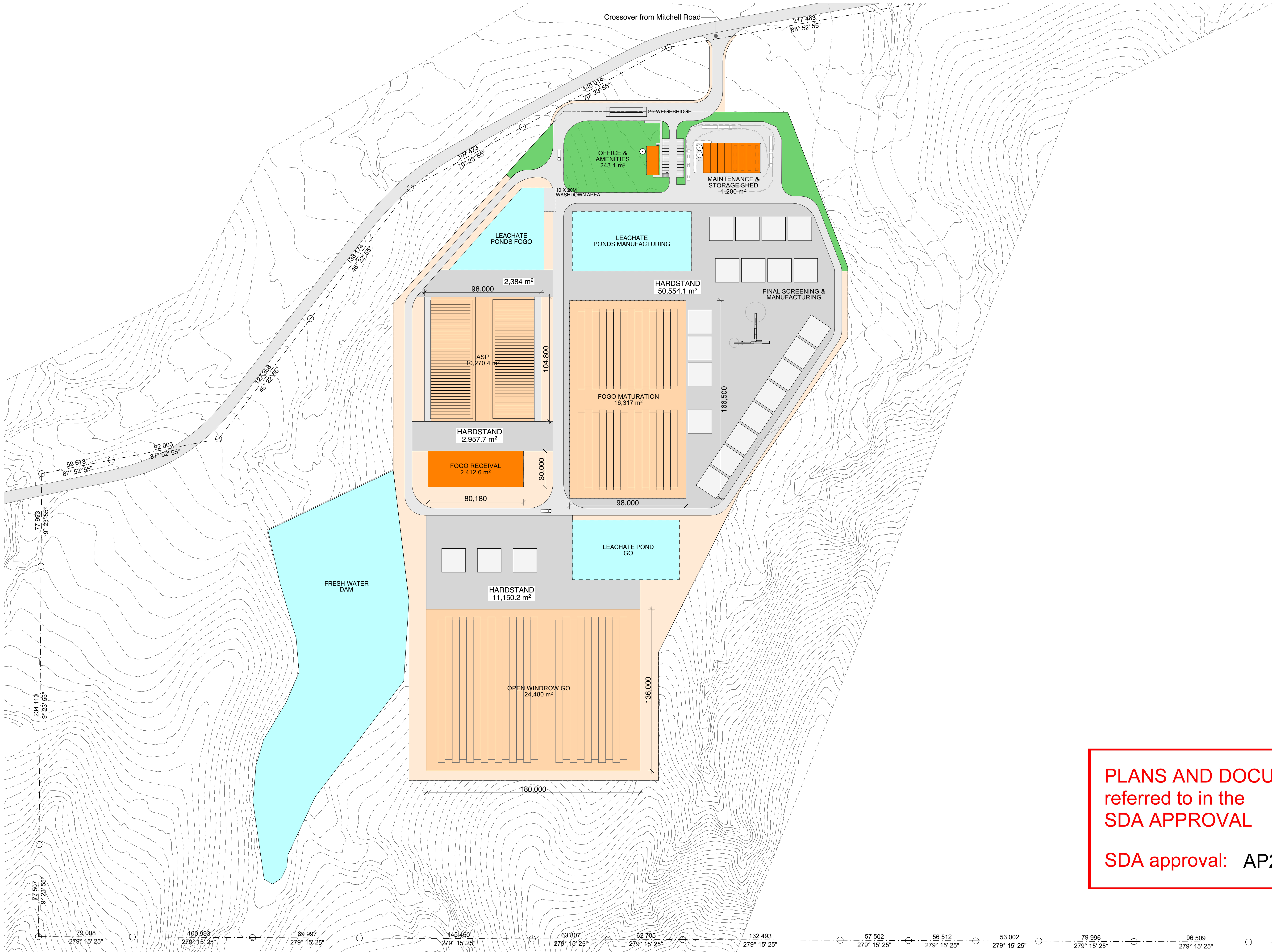


APPENDIX A – Development Plans



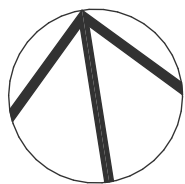
PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL

SDA approval: AP2024/011


Queensland
Government

DA

NOT FOR CONSTRUCTION



APPENDIX B – Pavement Impact Assessment Calculations

Annual Average Daily Traffic data for segments of select roads

Road Name	SECTION ID	Direction	TDIST_START	TDIST_END	AADT	AADT_YEAR	GROWTH_PC_SYR	% NOHV	% HV	AADT_NOHV	AADT_HV	Existing SAR
BEAUDESERT - NERANG ROAD	202	A	0	1.485	3684	2023	4.43	88.78	11.22	3271	413	1321.6
BEAUDESERT - NERANG ROAD	202	G	0	1.485	3786	2023	4.96	80.66	19.34	3054	732	2342.4
BEAUDESERT - NERANG ROAD	202	A	1.485	1.755	3684	2023	4.43	88.78	11.22	3271	413	1321.6
BEAUDESERT - NERANG ROAD	202	G	1.485	1.755	3786	2023	4.96	80.66	19.34	3054	732	2342.4
BEAUDESERT - NERANG ROAD	202	A	1.755	7.64	3684	2023	4.43	88.78	11.22	3271	413	1321.6
BEAUDESERT - NERANG ROAD	202	G	1.755	7.64	3786	2023	4.96	80.66	19.34	3054	732	2342.4
BEAUDESERT - NERANG ROAD	202	A	7.64	16.19	221	2023	1.46	67.81	32.19	150	71	227.2
BEAUDESERT - NERANG ROAD	202	G	7.64	16.19	236	2023	3.38	81.88	18.12	193	43	137.6
BEAUDESERT - NERANG ROAD	202	A	17.56	20.33	221	2023	1.46	67.81	32.19	150	71	227.2
BEAUDESERT - NERANG ROAD	202	G	17.56	20.33	236	2023	3.38	81.88	18.12	193	43	137.6
BEAUDESERT - NERANG ROAD	202	A	20.33	26.965	4300	2023	4.15	84.17	15.83	3619	681	2179.2
BEAUDESERT - NERANG ROAD	202	G	20.33	26.965	4670	2023	5.22	91.57	8.43	4276	394	1280.8
BEAUDESERT - NERANG ROAD	202	A	26.965	37.885	4274	2023	4.3	90.44	9.56	3865	409	1308.8
BEAUDESERT - NERANG ROAD	202	G	26.965	37.885	4623	2023	5.22	90.03	9.97	4162	461	1475.2
BEAUDESERT - NERANG ROAD	202	A	37.885	47.932	4087	2023	1.63	85.33	14.67	3487	600	1920
BEAUDESERT - NERANG ROAD	202	G	37.885	47.932	4900	2023	2.56	89.41	10.59	4381	519	1660.8
BEAUDESERT - NERANG ROAD	202	A	47.932	48	4087	2023	1.63	85.33	14.67	3487	600	1920
BEAUDESERT - NERANG ROAD	202	G	47.932	48	4900	2023	2.56	89.41	10.59	4381	519	1660.8
BEAUDESERT - NERANG ROAD	202	A	48	48.145	6466	2023	1.93	87.99	12.01	5689	777	2486.4
BEAUDESERT - NERANG ROAD	202	G	48	48.145	7938	2023	3.51	87.84	12.16	6973	965	3088
BEAUDESERT - NERANG ROAD	202	A	48.145	48.277	6466	2023	1.93	87.99	12.01	5689	777	2486.4
BEAUDESERT - NERANG ROAD	202	G	48.145	48.277	7938	2023	3.51	87.84	12.16	6973	965	3088
BEAUDESERT - NERANG ROAD	202	A	48.277	48.635	6466	2023	1.93	87.99	12.01	5689	777	2486.4
BEAUDESERT - NERANG ROAD	202	G	48.277	48.635	7938	2023	3.51	87.84	12.16	6973	965	3088
BEAUDESERT - NERANG ROAD	202	A	48.635	51.05	6466	2023	1.93	87.99	12.01	5689	777	2486.4
BEAUDESERT - NERANG ROAD	202	G	48.635	51.05	7938	2023	3.51	87.84	12.16	6973	965	3088
BEAUDESERT - NERANG ROAD	202	A	51.05	51.26	6466	2023	1.93	87.99	12.01	5689	777	2486.4
BEAUDESERT - NERANG ROAD	202	G	51.05	51.26	7938	2023	3.51	87.84	12.16	6973	965	3088
BEAUDESERT - NERANG ROAD	202	A	51.26	52.11	12276	2023	1.88	94.06	5.94	11547	729	2332.8
BEAUDESERT - NERANG ROAD	202	G	51.26	52.11	13410	2023	2.25	92.3	7.7	12377	1033	3305.6
IPSWICH - BOONAH ROAD	211	A	0	0.33	3995	2023	4.08	85.29	14.71	3407	588	1881.6
IPSWICH - BOONAH ROAD	211	G	0	0.33	3861	2023	3.86	88.61	11.39	3421	440	1408
IPSWICH - BOONAH ROAD	211	A	0.33	11.385	3995	2023	4.08	85.29	14.71	3407	588	1881.6
IPSWICH - BOONAH ROAD	211	G	0.33	11.385	3861	2023	3.86	88.61	11.39	3421	440	1408
IPSWICH - BOONAH ROAD	211	A	11.385	13.615	3317	2023	15.78	82.39	17.61	2733	584	1868.8
IPSWICH - BOONAH ROAD	211	G	11.385	13.615	3224	2023	14.33	85.19	14.81	2747	477	1526.4
IPSWICH - BOONAH ROAD	211	A	13.615	34.31	1798	2023	1.43	80.44	19.56	1446	352	1126.4
IPSWICH - BOONAH ROAD	211	G	13.615	34.31	1850	2023	1.25	82.36	17.64	1524	326	1043.2
IPSWICH - BOONAH ROAD	211	A	34.31	34.385	1798	2023	1.43	80.44	19.56	1446	352	1126.4
IPSWICH - BOONAH ROAD	211	G	34.31	34.385	1850	2023	1.25	82.36	17.64	1524	326	1043.2
BEAUDESERT - BOONAH ROAD	212	A	0	0.37	1964	2023	3.25	81.53	18.47	1601	363	1161.6
BEAUDESERT - BOONAH ROAD	212	G	0	0.37	1895	2023	2.92	80.99	19.01	1535	360	1152
BEAUDESERT - BOONAH ROAD	212	A	0.37	0.6	1964	2023	3.25	81.53	18.47	1601	363	1161.6
BEAUDESERT - BOONAH ROAD	212	G	0.37	0.6	1895	2023	2.92	80.99	19.01	1535	360	1152
BEAUDESERT - BOONAH ROAD	212	A	0.6	31.63	1964	2023	3.25	81.53	18.47	1601	363	1161.6
BEAUDESERT - BOONAH ROAD	212	G	0.6	31.63	1895	2023	2.92	80.99	19.01	1535	360	1152
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	0	2.39	28804	2023	3.56	71.61	28.39	20627	8177	26166.4
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	0	2.39	28839	2023	1.81	86.95	13.05	25076	3763	12041.6
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	2.39	5.27	20320	2023	-0.47	87.05	12.95	17689	2631	8419.2
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	2.39	5.27	19186	2023	-2.98	85.8	14.2	16462	2724	8716.8
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	5.27	12.2	14863	2023	6.11	89.01	10.99	13230	1633	5225.6
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	5.27	12.2	15559	2023	3.65	89.32	10.68	13897	1662	5318.4
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	12.2	13.175	10984	2023	1.55	89.53	10.47	9834	1150	3680
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	12.2	13.175	10980	2023	-3.3	89.8	10.2	9860	1120	3584
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	13.175	18.91	10984	2023	1.55	89.53	10.47	9834	1150	3680
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	13.175	18.91	10980	2023	-3.3	89.8	10.2	9860	1120	3584
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	18.91	19	10984	2023	1.55	89.53	10.47	9834	1150	3680
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	18.91	19	10980	2023	-3.3	89.8	10.2	9860	1120	3584
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	19	20.095	12040	2023	5.59	82.45	17.55	9927	2113	6761.6
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	19	20.095	12038	2023	0.61	88.42	11.58	10644	1394	4460.8
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	20.095	22.62	12040	2023	5.59	82.45	17.55	9927	2113	6761.6
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	20.095	22.62	12038	2023	0.61	88.42	11.58	10644	1394	4460.8
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	22.62	28.86	6649	2023	-9.22	86.49	13.51	5751	898	2873.6
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	22.62	28.86	6593	2023	-13.69	84.53	15.47	5573	1020	3264
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	28.86	38.63	5080	2023	-2.34	69.62	30.38	3537	1543	4937.6
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	28.86	38.63	5038	2023	-3.23	79.11	20.89	3986	1052	3366.4
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	38.63	40.25	6556	2023	0.68	84.65	15.35	5550	1006	3219.2
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	38.63	40.25	6508	2023	0.48	85.09	14.91	5538	970	3104
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	40.25	40.435	6556	2023	0.68	84.65	15.35	5550	1006	3219.2
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	40.25	40.435	6508	2023	0.48	85.09	14.91	5538	970	3104
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	40.435	40.66	1293	2023	3.89	73.97	26.03	956	337	1078.4
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	40.435	40.66	1345	2023	3.41	72.94	27.06	981	364	1164.8
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	40.66	41.6	1293	2023	3.89	73.97	26.03	956	337	1078.4
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	40.66	41.6	1345	2023	3.41	72.94	27.06	981	364	1164.8
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	A	41.6	41.85	1293	2023	3.89	73.97	26.03	956	337	1078.4
MOUNT LINDESAY HIGHWAY (BRISBANE - BEAUDESERT)	25A	G	41.6	41.85	1345	2023	3.41	72.94	27.06	981	364	1164.8

Background SAR4 per day

Road Name		Direction	TDIST_START	TDIST_END	AADT	Growth Rate	% HV	AADT_HV	Directionality	SAR4_PER_HV	SAR4_PER_DAY 2023		SAR4_PER_DAY 2024		2026		2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
											2023	2023	2024	2024	2026	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
BEAUDESERT - NERANG ROAD	A		0	1.485	3684	4.43	11.22	413	1	3.2	1,322	1,322	482.384	503.754	526.070	549.575	573.712	599.128	625.669	653.386	682.331	712.558	744.125	777.089	811.514	847.464	885.007	924.213	965.156	1,007.912	1,052.653	1,099.191	1,147.885	1,198.737	1,251.841
BEAUDESERT - NERANG ROAD	G		0	1.485	3786	4.46	19.34	732	1	3.2	2,342	2,342	854.976	897.383	941.893	988.611	1,037.646	1,089.113	1,143.133	1,199.633	1,259.344	1,321.086	1,387.370	1,456.183	1,526.410	1,600.219	1,683.788	1,767.304	1,854.962	1,948.968	2,043.528	2,144.897	2,251.284	2,362.948	2,480.150
BEAUDESERT - NERANG ROAD	A		1.485	1.755	3684	4.43	11.22	413	1	3.2	2,342	2,342	854.976	897.383	941.893	988.611	1,037.646	1,089.113	1,143.133	1,199.633	1,259.344	1,321.086	1,387.370	1,456.183	1,526.410	1,600.219	1,683.788	1,767.304	1,854.962	1,948.968	2,043.528	2,144.897	2,251.284	2,362.948	2,480.150
BEAUDESERT - NERANG ROAD	G		1.755	7.64	3684	4.43	11.22	413	1	3.2	1,322	1,322	482.384	503.754	526.070	549.575	573.712	599.128	625.669	653.386	682.331	712.558	744.125	777.089	811.514	847.464	885.007	924.213	965.156	1,007.912	1,052.653	1,099.191	1,147.885	1,198.737	1,251.841
BEAUDESERT - NERANG ROAD	A		1.755	7.64	3786	4.46	19.34	732	1	3.2	2,342	2,342	854.976	897.383	941.893	988.611	1,037.646	1,089.113	1,143.133	1,199.633	1,259.344	1,321.086	1,387.370	1,456.183	1,526.410	1,600.219	1,683.788	1,767.304	1,854.962	1,948.968	2,043.528	2,144.897	2,251.284	2,362.948	2,480.150
BEAUDESERT - NERANG ROAD	G		7.64	16.19	221	1.46	32.19	71	1	3.2	138	138	50.224	51.922	53.677	55.491	57.396	59.505	61.310	63.382	65.524	67.739	70.029	72.366	74.843	77.372	79.988	82.691	85.486	88.376	91.363	94.451	97.643	100.944	104.355
BEAUDESERT - NERANG ROAD	A		17.56	20.33	221	1.46	32.19	71	1	3.2	227	227	82.928	84.139	85.367	86.614	87.878	89.161	90.463	91.784	93.124	94.483	95.863	97.262	98.682	100.123	101.585	103.068	104.573	106.107	107.649	109.220	110.815	112.433	114.074
BEAUDESERT - NERANG ROAD	G		17.56	20.33	226	1.38	18.12	43	1	3.2	138	138	50.224	51.922	53.677	55.491	57.396	59.505	61.310	63.382	65.524	67.739	70.029	72.366	74.843	77.372	79.988	82.691	85.486	88.376	91.363	94.451	97.643	100.944	104.355
BEAUDESERT - NERANG ROAD	A		20.33	26.965	4400	4.15	15.83	681	1	3.2	1,179	1,179	406.192	826.417	888.003	945.895	974.724	1,015.186	1,057.116	1,101.186	1,148.864	1,194.490	1,244.862	1,296.090	1,349.462	1,405.464	1,463.791	1,524.538	1,587.807	1,651.701	1,722.209	1,793.890	1,868.249	1,945.781	
BEAUDESERT - NERANG ROAD	G		20.33	26.965	4670	5	8.43	394	1	3.2	1,261	1,261	460.192	483.202	506.362	532.730	559.366	585.178	612.704	639.813	667.348	694.804	721.684	748.904	776.584	804.611	832.984	861.761	890.944	919.544	948.584	977.584	1,006.544	1,035.484	
BEAUDESERT - NERANG ROAD	A		26.965	37.885	4274	4.3	9.56	409	1	3.2	1,309	1,309	477.712	498.254	519.679	542.025	565.332	589.641	614.996	641.440	668.022	694.790	722.795	752.090	781.731	812.776	844.584	880.119	916.947	954.987	1,019.257	1,063.085	1,108.798	1,156.478	1,205.204
BEAUDESERT - NERANG ROAD	G		26.965	37.885	4274	5	9.57	403	1	3.2	1,475	1,475	538.640	565.576	593.639	623.921	654.487	687.211	721.572	757.650	795.533	835.510	877.705	923.029	968.975	1,015.524	1,066.080	1,118.395	1,175.384	1,234.133	1,295.639	1,360.681	1,428.663	1,500.096	1,576.076
BEAUDESERT - NERANG ROAD	A		37.885	47.932	4807	1.63	14.67	600	1	3.2	1,920	1,920	700.800	712.223	723.832	735.631	747.622	759.898	772.193	784.779	797.571	810.572	823.784	837.212	850.858	864.727	878.822	893.147	907.705	922.501	937.538	952.820	968.351	984.135	1,000.176
BEAUDESERT - NERANG ROAD	G		37.885	47.932	4800	2.56	10.59	519	1	3.2	1,661	1,661	606.192	621.711	637.628	653.650	669.681	687.889	705.470	723.530	742.052	761.048	780.531	800.513	821.006	842.024	863.580	885.687	908.361	931.615	955.464	979.624	1,005.010	1,030.738	1,057.125
BEAUDESERT - NERANG ROAD	A		48	48.145	6466	1.93	12.01	717	1	3.2	2,486	2,486	907.536	925.051	942.905	961.103	979.652	999.560	1,017.832	1,037.478	1,057.499	1,077.869	1,098.713	1,119.938	1,141.532	1,163.564	1,186.021	1,208.911	1,232.243	1,256.025	1,280.266	1,304.975	1,330.161	1,355.834	1,382.001
BEAUDESERT - NERANG ROAD	G		48	48.145	7938	3.51	12.16	965	1	3.2	3,088	3,088	1,127.120	1,166.682	1,207.632	1,250.026	1,299.886	1,339.312	1,386.321	1,434.982	1,485.349	1,537.485	1,591.451	1,647.311	1,705.131	1,764.982	1,826.952	1,891.058	1,957.434	2,026.140	2,097.257	2,170.871	2,247.069	2,325.841	2,407.481
BEAUDESERT - NERANG ROAD	A		48.145	48.277	6466	1.93	12.01	717	1	3.2	2,486	2,486	907.536	925.051	942.905	961.103	979.652	999.560	1,017.832	1,037.478	1,057.499	1,077.869	1,098.713	1,119.938	1,141.532	1,163.564	1,186.021	1,208.911	1,232.243	1,256.025	1,280.266	1,304.975	1,330.161	1,355.834	1,382.001
BEAUDESERT - NERANG ROAD	G		48.277	48.635	6466	1.93	12.01	717	1	3.2	2,486	2,486	907.536	925.051	942.905	961.103	979.652	999.560	1,017.832	1,037.478	1,057.499	1,077.869	1,098.713	1,119.938	1,141.532	1,163.564	1,186.021	1,208.911	1,232.243	1,256.025	1,280.266	1,304.975	1,330.161	1,355.834	1,382.001
BEAUDESERT - NERANG ROAD	A		48.277	48.635	7938	3.51	12.16	965	1	3.2	3,088	3,088	1,127.120	1,166.682	1,207.632	1,250.026	1,299.886	1,339.312	1,386.321	1,434.982	1,485.349	1,537.485	1,591.451	1,647.311	1,705.131	1,764.982	1,826.952	1,891.058	1,957.434	2,026.140	2,097.257	2,170.871	2,247.069	2,325.841	2,407.481
BEAUDESERT - NERANG ROAD	G		48.635	51.05	6466	1.93	12.16	965	1	3.2	2,486	2,486	907.536	925.051	942.905	961.103	979.652	999.560	1,017.832	1,037.478	1,057.499	1,077.869	1,098.713	1,119.938	1,141.532	1,163.564	1,186.021	1,208.911	1,232.243	1,256.025	1,280.266	1,304.975	1,330.161	1,355.834	1,382.001
BEAUDESERT - NERANG ROAD	A		51.05	51.26	6466	1.93	12.01	617	1	3.2	3,088	3,088	1,127.120	1,166.682	1,207.632	1,250.026	1,299.886	1,339.312	1,386.321	1,434.982	1,485.349	1,537.485	1,591.451	1,647.311	1,705.131	1,764.982	1,826.952	1,891.058	1,957.434	2,026.140	2,097.257	2,170.871	2,247.069	2,325.841	2,407.481
BEAUDESERT - NERANG ROAD	G		51.26	52.11	12276	1.88	5.94	729	1	3.2	2,333	2,333	851.472	867.480	883.788	900.404	917.231	934.577	952.147	970.047	988.284	1,006.884	1,025.793	1,045.078	1,064.725	1,084.742	1,105.135	1,125.912	1,147.079	1,168.644	1,190.615	1,212.998	1,235.803	1,259.036	1,282.706
BEAUDESERT - NERANG ROAD	A		52.12	53.95	13415	2.25	7.7	1033	1	3.2	3,126	3,126	1,026.544	1,057.236	1,081.449	1,109.622	1,134.927	1,161.989	1,189.484	1,214.616	1,241.057	1,267.219	1,293.151	1,318.979	1,344.748	1,370.498	1,397.281	1,424.138	1,451.016	1,477.968	1,504.948	1,531.999	1,559.181	1,586.484	
IPSWICH - BOONAH ROAD	A		0	0.33	3995	4.08	14.71	588	1	3.2	1,882	1,882	686.784	714.805	734.969	774.323	855.795	838.795	873.019	869.939	865.745	722.654	750.548	778.029	809.609	840.880	873.317	907.027	942.038	978.401	1,016.167	1,055.391	1,096.130	1,138.440	1,182.384
IPSWICH - BOONAH ROAD	G		0.33	11.385	3995	4.08	14.71	588	1	3.2	1,882	1,882	686.784	714.805	734.969	774.323	855.795	838.795	873.019	869.939	865.745	722.654	750.548	778.029	809.609	840.880	873.317	907.027	942.038	978.401	1,016.167	1,055.391	1,096.130	1,138.440	1,182.384
IPSWICH - BOONAH ROAD	A		0.33	11.385	3995	4.08	14.71	588	1	3.2	1,882	1,882	686.784	714.805	734.969	774.323	855.795	838.795	873.019	869.939	865.745	722.654	750.548	778.029	809.609	840.880	873.317	907.027	942.038	978.401	1,016.167	1,055.391	1,096.130	1,138.440	1,182.384
IPSWICH - BOONAH ROAD	G		11.385	13.615	3317	5	17.61	584	1	3.2	1,869	1,869	682.112	716.218	752.028	789.630	829.111	870.567	914.095	959.800	1,007.790	1,058.180	1,111.089	1,168.643	1,224.975	1,286.224	1,350.535	1,418.062	1,488.958	1,563.413	1,641.584	1,723.663	1,809.846	1,900.390	1,996.355
IPSWICH - BOONAH ROAD	A		11.385	13.615	3324	5	14.81	477	1	3.2	1,526	1,526	586.912	584.993	616.242	644.855	677.021	710.062	748.586	823.144	864.301	907.516	952.882	1,000.536	1,050.563	1,103.091	1,158.246	1,216.518	1,276.966	1,340.814	1,407.855	1,476.240	1,552.160	1,628.768	
IPSWICH - BOONAH ROAD	G		13.615	34.31</																															

Vehicles In/ Day				
Truck Type	No of Trucks In	Notes	Notes	Loaded / Unloaded
Waste Collection Truck	10	Local GO & FOGO Deliveries - Councils etc	Class 5 - Medium 4 Axle	Loaded
Walking Floor	5	Long Haul Transfer Contracts	Class 7 - 4 axle articulated	Loaded
High Volume Side Tipper	10	Long Haul Transfer Contracts	Class 10 - B-double	Loaded
Rigid Truck & Dog	15	Manufacturing Drop Off	Class 8 - 5 Axle	Loaded
Unloading floor	15	Extr Vehicle- Material in - short haul	Class 7 - 4 axle articulated	Loaded
Rigid Truck & Dog	15	Extr Vehicle- Material in - long haul	Class 8 - 5 Axle	Loaded
Stuff Vehicles		Cars	Class 1	Loaded

Truck Type	No of Trucks out	Notes	Notes	Loaded / Unloaded
Waste Collection Truck	10	Trucks leave site empty	Class 5 - Medium 4 Axle	Unloaded
Walking Floor	5	Walking floors in transport end product out	Class 7 - 4 axle articulated	Loaded
High Volume Side Tipper	19	Side Tipper Leave Site Empty	Class 20 - 8 double	Unloaded
Rigid Truck & Dog	36	Manufactured out	Class 6 - 5 Axle	loaded
Rigid Truck & Dog	5	Contamination out	Class 6 - 5 Axle	loaded
Staff Vehicles	10	Cars	Class 1	

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40%				Unloaded										
Type	Vehicle Class	Direction	Daily Demand	SARS_PER_VEHICLE	SARA_DAY	SARA_YEAR	Type	Vehicle Class	Direction	Daily Demand	SARS_PER_VEHICLE	SARA_DAY	SARA_YEAR	TOTAL YEAR
Waste Collection	Class 9	IN	4	4.89	19.01437	5,438	Waste Collection	Class 9	IN	3.888419273	0.37	1.4387151	.411	5,850
Walking Floor - In	Class 7	IN	2	5.73	12.532861	3,584	High Vol Side Tipper	Class 10	OUT	7.776838546	0.42	3.2662722	934	4,519
Walking Floor - In Extra	Class 7	IN	5	5.73	26.785	8,522								
Walking Floor - Out	Class 7	OUT	2	5.73	12.532861	3,584								3,584
Rigid TSD - In Manu	Class 8	IN	6	6.58	38.378698	10,976								10,976
Rigid TSD - In Extra	Class 8	IN	5	6.58	34.216	9,785								9,785
Rigid TSD - Out Manu	Class 8	OUT	14	6.58	94.757008	27,101								27,101
Rigid TSD - Out Cont	Class 8	OUT	2	6.58	12.653846	3,619								3,619
High Vol Side Tipper	Class 10	OUT	8	7.09	55.137785	15,769								15,769
Total						88,300								88,300
													1,346	
														89,725

75%		Loaded				Unloaded				TOTAL YEAR			
Type	Vehicle Class	Direction	Daily Demand	SARA_PER VEHICLE	SARA_DAY	SARA_YEAR	Type	Vehicle Class	Direction		Daily Demand	SARA_PER VEHICLE	SARA_DAY
Waste Collection	Class 5	IN	7	4.89	35.51944	10,196	Waste Collection	Class 5	OUT	7	2.99796137	772	10,968
Walking Floor - IN	Class 7	IN	4	5.73	23.499115	6,721	High Vol Side Tipper	Class 10	OUT	14.58157227	0.42	6.1242604	1,752
Walking Floor - IN Extra	Class 7	IN	10	5.73	56.8575	15,978							
Walking Floor - Out	Class 7	OUT	4	5.73	23.499115	6,721							
Rigid TMD - In Manu	Class 8	IN	11	6.58	71.900599	20,581							
Rigid TMD - IN Extra	Class 8	IN	10	6.58	64.1515	18,248							
Rigid TMD - Out Manu	Class 8	OUT	27	6.58	177.6995	50,813							
Rigid TMD - Out Cont	Class 8	OUT	4	6.58	23.725962	6,786							
High Vol Side Tipper	Class 10	IN	15	7.09	103.38335	29,568							
Total						165,712						2,523	168,235

100%		Loaded					Unloaded								
Type	Vehicle Class	Direction	Daily Demand	SARA_PER_VEHICLE	SARA_DAY	SARA_YEAR	Type	Vehicle Class	Direction	Daily Demand	SARA_PER_VEHICLE	SARA_DAY	SARA_YEAR	TOTAL_YEAR	
Waste Collection	Class 5	IN	10	4.89	47.535926	13,595	Waste Collection	Class 5	OUT	9.721048183	0.46	4.4716922	1,279	14,874	
Walking floor - IN	Class 7	IN	5	5.73	31.322153	8,961	High Vol Side Tipper	Class 10	OUT	19.44209637	0.42	8.1656805	2,335	11,296	
Walking floor - IN Extra	Class 7	IN	5	5.73	76.49	1,304									21,304
Walking floor - OUT	Class 7	OUT	5	5.73	31.322153	8,961									8,961
Rigid TMD - IN Manu	Class 8	IN	15	6.58	95.946746	27,441								27,441	
Rigid TMD - IN Extra	Class 8	IN	13	6.58	85.54	2,464								24,644	
Rigid TMD - Out Manu	Class 8	OUT	36	6.58	236.859267	67,751								67,751	
Rigid TMD - Out Cont	Class 8	OUT	5	6.58	31.634615	9,048								9,048	
High Vol Side Tipper	Class 10	IN	19	7.09	97.384446	29,424								29,424	
Total					220,849							3,614		244,563	

Vehicles In/ Day

Vehicles Out/ Day

Operational Days Per year	286
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16-20 years														
100%														
Loaded							Unloaded							
Type	Vehicle Class	Direction	Daily Demand	SAR12_PER_VEHICLE	SAR4_DAY	SAR4_YEAR	Type	Vehicle Class	Direction	Daily Demand	SAR12_PER_VEHICLE	SAR4_DAY	SAR4_YEAR	TOTAL_YEAR
Waste Collection	Class 5	IN	10	17.07	165.9363	47,458	Waste Collection	Class 5	OUT	9.721048183	0.09	0.874894	250	47,709
Walking Floor - In	Class 7	IN	5	15.13	82.7322	23,661	High Vol Side Tipper	Class 10	OUT	19.44209637	0.11	2.138631	612	24,273
Walking Floor - In Extra	Class 7	IN	13	15.13	196.69	56,253								56,253
Walking Floor - Out	Class 7	OUT	15	15.13	82.7322	23,661								23,661
Rigid T&O - In Manu	Class 8	IN	15	20.61	300.5262	85,950								85,950
Rigid T&O - In Extra	Class 8	IN	13	20.61	267.93	76,628								76,628
Rigid T&O - Out Manu	Class 8	OUT	36	20.61	741.9997	212,212								212,212
Rigid T&O - Out Cont	Class 8	OUT	9	20.61	99.8668	28,339								28,339
High Vol Side Tipper	Class 10	IN	19	17.17	333.8208	95,473								95,473
Total					649,636							862		650,498

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Marginal Cost Calculations for Selected Roads

Impact ID	Total Costs (\$)
1A	\$ 73,812
1G	\$ 34,974
2A	\$ 26,996
2G	\$ 12,939
3A	\$ -
3G	\$ 95,235
4A	\$ -
4G	\$ 418
5A	\$ 23,045
5G	\$ 9,800
6A	\$ 20,358
6G	\$ 8,657
7A	\$ 1,058,237
7G	\$ 449,446
8A	\$ 100,993
8G	\$ -
9A	\$ 24,503
9G	\$ -
10A	\$ 3,076
10G	\$ -
11A	\$ 9,655
11G	\$ 4,156
12A	\$ 37,556
12G	\$ 16,167
13A	\$ 5,875
13G	\$ 2,529
Total	\$ 2,018,427



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9 July 2024

J002474-001-L-Rev0

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**SLOPE STABILITY ASSESSMENT
PROPOSED COMMERCIAL DEVELOPMENT
MITCHELL ROAD BROMELTON**

**PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL**



SDA approval: AP2024/011

INTRODUCTION

At the request of SOILCO Pty Ltd (the Client), Core Consultants Pty Ltd (Core) has undertaken a landslide stability assessment for the proposed development at the above site. Our assessment was based on a review of available published geological information (Council maps and published geological mapping), a walk-over survey by a Core geotechnical engineer, and review of a previous geotechnical investigation report performed at this site (East Coast Geotechnical, dated 27th July 2021).

This report presents the results of our desktop study and site observations, together with our slope stability assessment. The landslide hazard assessment report has been prepared using the national AGS landslide guidelines methods.

SITE DESCRIPTION

The proposed development site is located on Lot 4 on RP85497 and covers an area of about 27,000 m². The subject site is west of Beaudesert-Boonah Road and to the south of Mitchell Road.

The site is occupied by grassed paddocks with sparse to medium dense tree cover and has grass cover with shrubs and tree cover consisting of medium to large trees, the site has an undulating topography which is gently to steeply sloping. An overview of the site is provided in Image 1 below. Site conditions at the time of the walk-over are shown in Photographs 1 to 6 below.



Image 1: Aerial view of site – Nearmaps (approximate site boundary annotated by Core)



Photograph 1: From western side of the site, looking east towards the centre of site



Photograph 2: From western side of the site, looking east towards the centre of site



Photograph 3: From northern side of the site, looking south towards the centre of site



Photograph 4: From northern side of the site, looking east, also showing creek with scour erosion



Photograph 5: Creek at north of the site, showing evidence of erosion



Photograph 6: Creek at north of the site, showing evidence of erosion

PROPOSED DEVELOPMENT

The proposed commercial development is to consist of a compost manufacturing facility, with associated access driveways, the development will involve cut to fill earthworks of approximately 10 m maximum depth of cut and fill. Fill slopes will not exceed 1V:2H and cut slopes will not exceed 1V:2H in soil and 1V:1H in rock. The development layout is shown in Image 2.

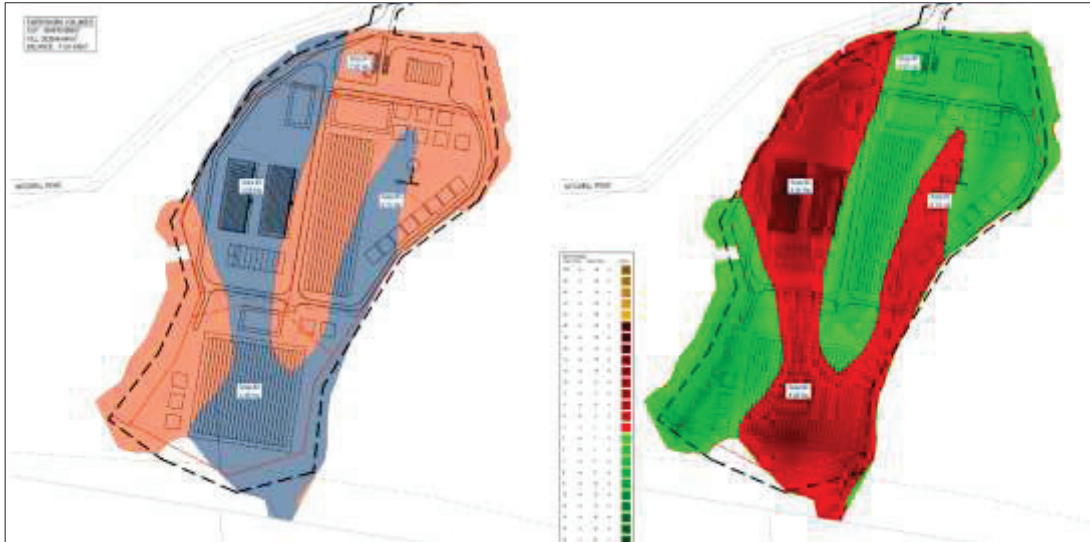


Image 2: Layout and cut-fill plan of proposed development (provided by Client)

METHOD OF INVESTIGATION

As part of our slope stability assessment, a desktop study was carried out comprising a review of the published geological maps of the area and the previous geotechnical investigation report at the site (East Coast Geotechnical, dated 27th July 2021), and the Scenic Rim Council (SRRC) planning scheme interactive map.

A walkover survey was conducted by a geotechnical engineer on 8th July 2024 to make an appraisal of the general site conditions, including assessment of the site conditions, topography, drainage, vegetation cover, geology, erosion, and slope stability.

RESULTS OF INVESTIGATION

Regional Geology

The Queensland Geotechnical Database (QGD) indicates that approximately half of the site is underlain by the Middle Jurassic aged Heifer Creek Sandstone Member (**Jbmkh**) comprising “*Sublabile to quartzose sandstone, siltstone, shale*”. The other half of the site is underlain by Early Jurassic – Middle Jurassic aged (**Jbmk**) comprising “*Lithofeldspathic labile and sublabile to quartzose sandstone, siltstone, shale, minor coal, ferruginous oolite marker*.” An extract from the geology map is shown below in Image 3.

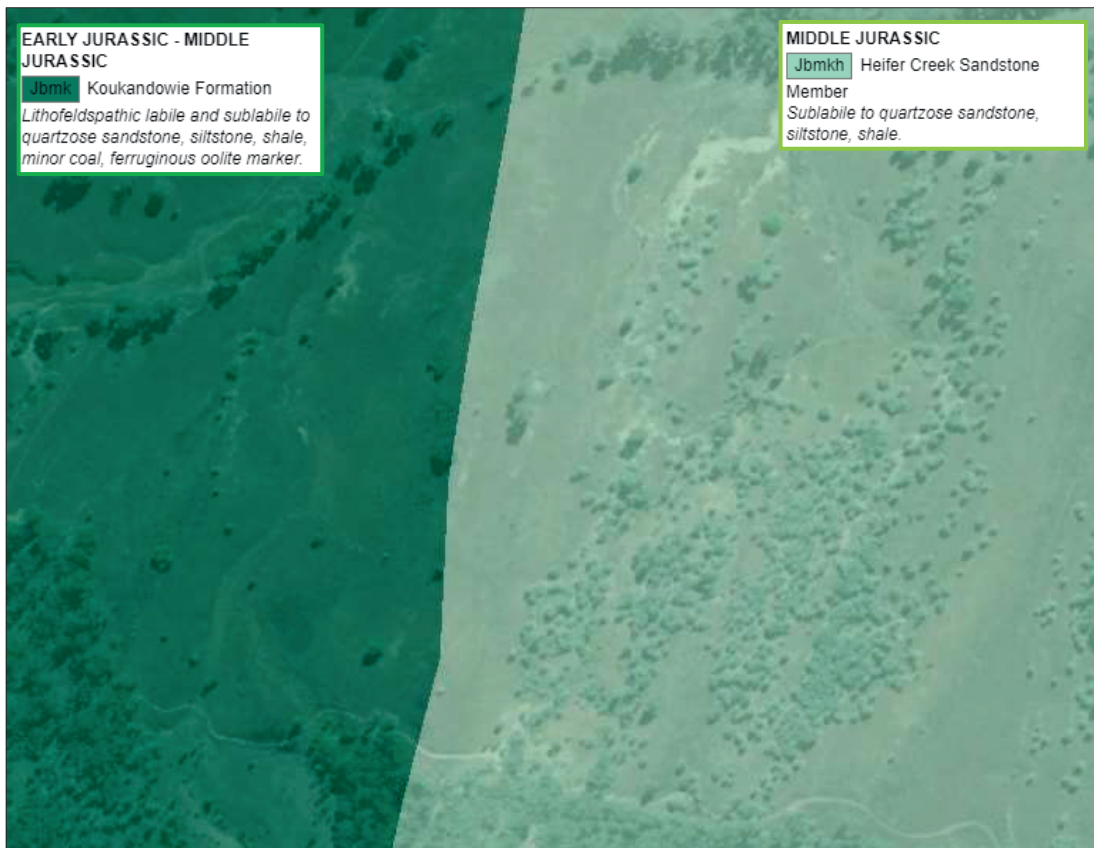


Image 3: Extract from the QGD

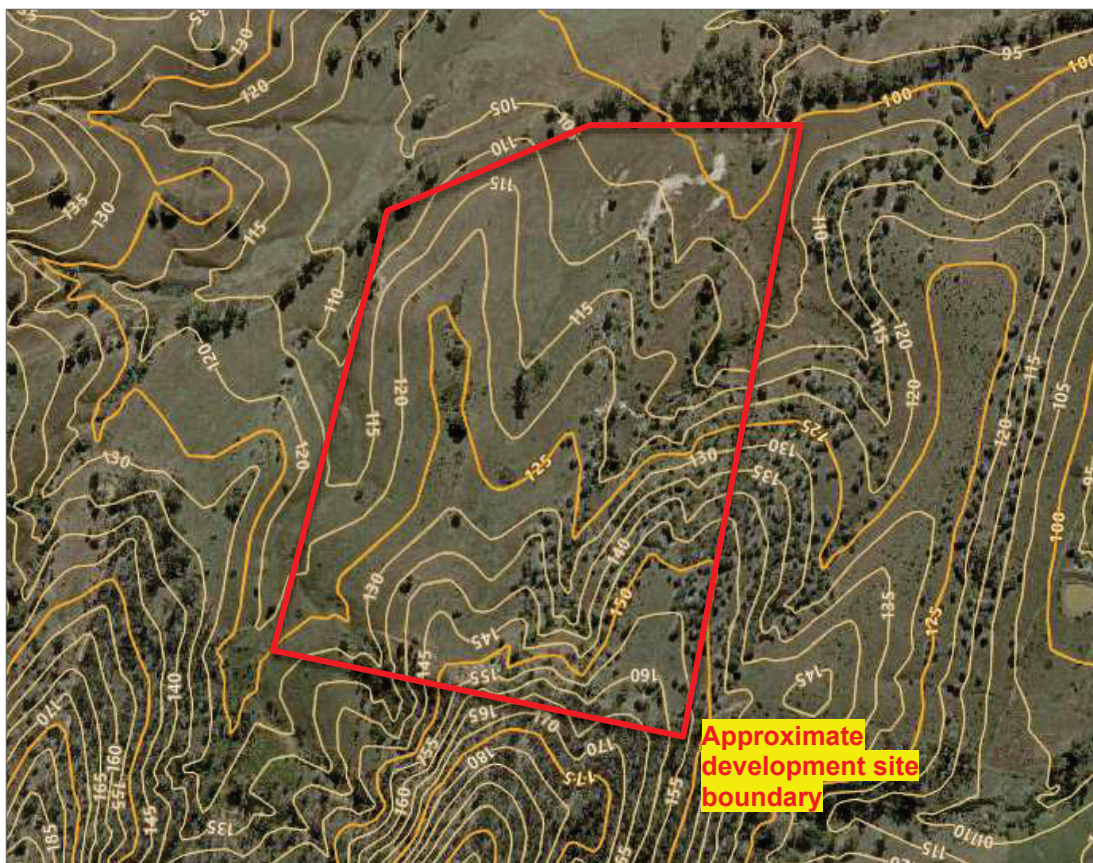


Image 4: Topographic setting (Georesglobe)

Previous geotechnical investigation

The previously performed geotechnical investigation (East Coast Geotechnical, dated 27th July 2021) is attached in Appendix C.

Based on the information provided in the previous geotechnical investigation report, the subsurface profile at the investigation site is likely to consist of natural silty clays and sand, with weathered rock encountered at 0.9 to 5.5 m below ground level (bgl). No signs of groundwater or seepage were recorded in the previous investigation's boreholes; local surface might be experienced in near surface sandy layers during or after periods of wet weather.

Site walkover

Observations made during the walk-over indicate that the site drainage is generally poor to fair. Erosion was noted around the creek located to the north of the site (draining to the north, but mostly dry at the time of inspection). The sites natural topography is undulating, with slight to steep slopes. The maximum slope fall is approximately 25 - 30%. Aside from the previously noted creek bed, there were no signs of water ponding noted at the site. There were no signs of instability noted during the site walkover.

COMMENTS AND RECOMMENDATIONS

Existing Conditions

The site is covered by the SRRC Landslide (susceptibility) Hazard Overlay which indicates areas of *Slope Hazard over 25%* (refer Image 5). These areas mainly appear the ridges at the south-east corner of the site.

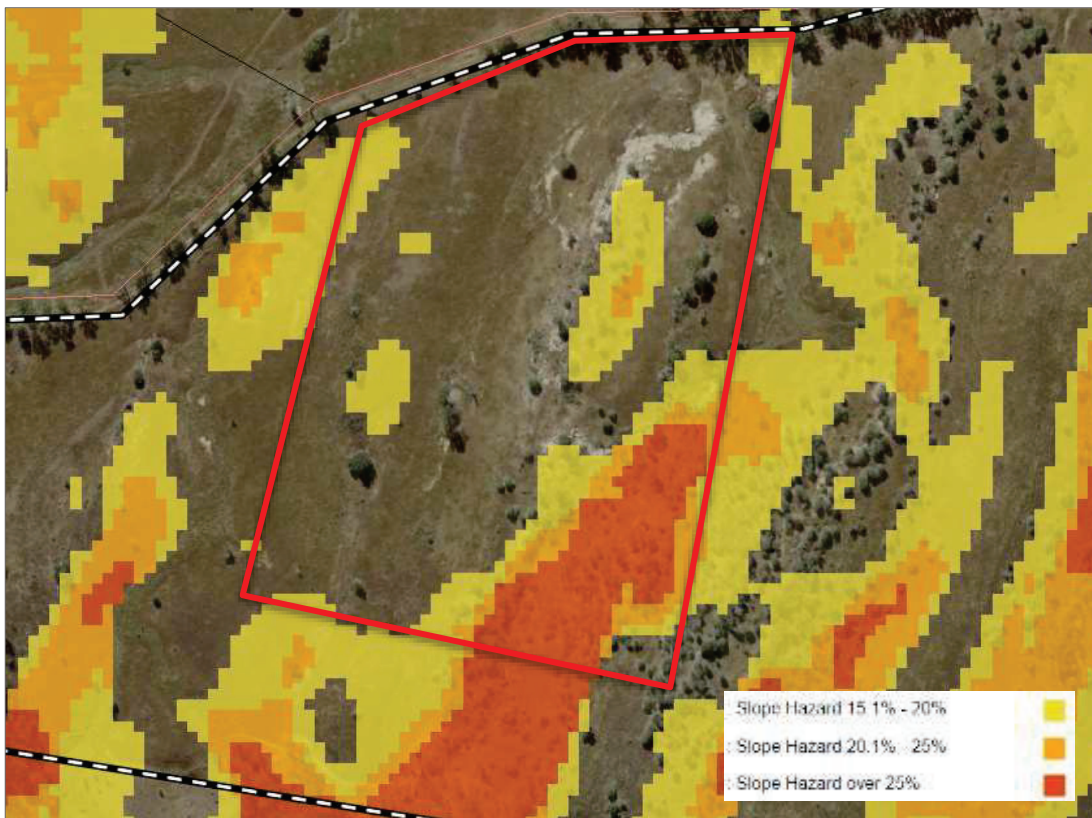


Image 5: Extract from SRRC Landslide hazard overlay

Following bulk earthworks (Image 2), the site will be level apart from perimeter cut and fill slopes. Fill slopes will not exceed 1V:2H and cut slopes will not exceed 1V:2H in soil and 1V:1H in rock. These slopes, and if any retaining walls are to be adopted, are checked by a geotechnical engineer to achieve a safety factor of not less than 1.5 for global instability.

Landslide Susceptibility Analysis

Using the Australian Geomechanics Society Landslide Risk Management methods (refer Appendix A) the likelihood of a failure of the existing site and the proposed development slopes provided all slope and retraining walls are checked by a geotechnical engineer to achieve a safety factor of not less than 1.5 for

global instability, is Unlikely and the consequence Minor, and the assessed risk is **Low** and acceptable. The creek banks and areas of cut to fill should also be checked by a geotechnical engineer at time of construction to verify stability.

A landslide susceptibility analysis was also carried out using the method of MacGregor and Taylor and is attached in Appendix B; this method indicates that the site has a **Low** susceptibility rating (i.e. less than 0.6) with no special treatment for stability being required.

Relative levels of risk and their implications are given in Table 1 below taken from 'Qualitative Terminology for Use in Assessing Risk to Property'.

Table 1: Stability Risk Levels

Risk Level		Example Implications
VH	VERY HIGH RISK	Unacceptable without treatment. Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to Low; may be too expensive and not practical. Work likely to cost more than value of property.
H	HIGH RISK	Unacceptable without treatment. Detailed investigation, planning and implementation of treatment options required to reduce risk to Low. Work would cost a substantial sum in relation to the value of the property.
M	MODERATE RISK	May be tolerated in certain circumstances (subject to regulators' approval) but requires investigation, planning and implementation of treatment options to reduce risk to Low. Treatment options to reduce to Low risk should be implemented as soon as practicable.
L	LOW RISK	Usually acceptable to regulators. Where treatment has been required to reduce the risk to this level, ongoing maintenance required.
VL	VERY LOW RISK	Acceptable. Manage by normal slope maintenance procedures.
Note: 1) The implications for a particular situation are to be determined by all parties to the risk assessment and may depend on the nature of the property at risk; these are only given as a general guide.		

LIMITATIONS

Your attention is drawn to the document Limitations, which is also attached in Appendix D.

Please contact the undersigned should you wish to discuss any of the above matters.

Yours sincerely,

CORE CONSULTANTS PTY LTD



Matthew Addis
BEng(Civil) MIEAust
Geotechnical Engineer



Andrew Middleton
BE(Civil) FIEAust EngExec CPEng NER RPEQ 4366
Senior Principal Geotechnical Engineer

MA/AM/am

Attachments: Appendix A – AGS Qualitative Terminology for use in Assessing Risk to Property
Appendix B – Landslide Susceptibility Assessment
Appendix C – Limitations

Appendix A

AGS Qualitative Terminology for use in Assessing Risk to Property

PRACTICE NOTE GUIDELINES FOR LANDSLIDE RISK MANAGEMENT 2007

APPENDIX C: LANDSLIDE RISK ASSESSMENT

QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY

QUALITATIVE MEASURES OF LIKELIHOOD

Approximate Annual Probability		Implied Indicative Landslide Recurrence Interval	Description	Descriptor	Level
Indicative Value	Notional Boundary				
10 ⁻¹	5x10 ⁻²	10 years	The event is expected to occur over the design life.	ALMOST CERTAIN	A
10 ⁻²		100 years	The event will probably occur under adverse conditions over the design life.	LIKELY	B
10 ⁻³		1000 years	The event could occur under adverse conditions over the design life.	POSSIBLE	C
10 ⁻⁴		10,000 years	The event might occur under very adverse circumstances over the design life.	UNLIKELY	D
10 ⁻⁵	5x10 ⁻⁵	100,000 years	The event is conceivable but only under exceptional circumstances over the design life.	RARE	E
10 ⁻⁶		1,000,000 years	The event is inconceivable or fanciful over the design life.	BARELY CREDIBLE	F

Note: (1) The table should be used from left to right; use Approximate Annual Probability or Description to assign Descriptor, not *vice versa*.

QUALITATIVE MEASURES OF CONSEQUENCES TO PROPERTY

Approximate Cost of Damage		Description	Descriptor	Level
Indicative Value	Notional Boundary			
200%	100%	Structure(s) completely destroyed and/or large scale damage requiring major engineering works for stabilisation. Could cause at least one adjacent property major consequence damage.	CATASTROPHIC	1
60%		Extensive damage to most of structure, and/or extending beyond site boundaries requiring significant stabilisation works. Could cause at least one adjacent property medium consequence damage.	MAJOR	2
20%	40%	Moderate damage to some of structure, and/or significant part of site requiring large stabilisation works. Could cause at least one adjacent property minor consequence damage.	MEDIUM	3
5%		Limited damage to part of structure, and/or part of site requiring some reinstatement stabilisation works.	MINOR	4
0.5%	1%	Little damage. (Note for high probability event (Almost Certain), this category may be subdivided at a notional boundary of 0.1%. See Risk Matrix.)	INSIGNIFICANT	5

- Notes:**
- (2) The Approximate Cost of Damage is expressed as a percentage of market value, being the cost of the improved value of the unaffected property which includes the land plus the unaffected structures.
 - (3) The Approximate Cost is to be an estimate of the direct cost of the damage, such as the cost of reinstatement of the damaged portion of the property (land plus structures), stabilisation works required to render the site to tolerable risk level for the landslide which has occurred and professional design fees, and consequential costs such as legal fees, temporary accommodation. It does not include additional stabilisation works to address other landslides which may affect the property.
 - (4) The table should be used from left to right; use Approximate Cost of Damage or Description to assign Descriptor, not *vice versa*

PRACTICE NOTE GUIDELINES FOR LANDSLIDE RISK MANAGEMENT 2007
APPENDIX C: – QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY (CONTINUED)

QUALITATIVE RISK ANALYSIS MATRIX – LEVEL OF RISK TO PROPERTY

LIKELIHOOD		CONSEQUENCES TO PROPERTY (With Indicative Approximate Cost of Damage)				
	Indicative Value of Approximate Annual Probability	1: CATASTROPHIC 200%	2: MAJOR 60%	3: MEDIUM 20%	4: MINOR 5%	5: INSIGNIFICANT 0.5%
A – ALMOST CERTAIN	10 ⁻¹	VH	VH	VH	H	M or L (5)
B – LIKELY	10 ⁻²	VH	VH	H	M	L
C – POSSIBLE	10 ⁻³	VH	H	M	M	VL
D – UNLIKELY	10 ⁻⁴	H	M	L	L	VL
E – RARE	10 ⁻⁵	M	L	L	VL	VL
F – BARELY CREDIBLE	10 ⁻⁶	L	VL	VL	VL	VL

Notes: (5) For Cell A5, may be subdivided such that a consequence of less than 0.1% is Low Risk.
(6) When considering a risk assessment it must be clearly stated whether it is for existing conditions or with risk control measures which may not be implemented at the current time.

RISK LEVEL IMPLICATIONS

Risk Level		Example Implications (7)
VH	VERY HIGH RISK	Unacceptable without treatment. Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to Low; may be too expensive and not practical. Work likely to cost more than value of the property.
H	HIGH RISK	Unacceptable without treatment. Detailed investigation, planning and implementation of treatment options required to reduce risk to Low. Work would cost a substantial sum in relation to the value of the property.
M	MODERATE RISK	May be tolerated in certain circumstances (subject to regulator's approval) but requires investigation, planning and implementation of treatment options to reduce the risk to Low. Treatment options to reduce to Low risk should be implemented as soon as practicable.
L	LOW RISK	Usually acceptable to regulators. Where treatment has been required to reduce the risk to this level, ongoing maintenance is required.
VL	VERY LOW RISK	Acceptable. Manage by normal slope maintenance procedures.

Note: (7) The implications for a particular situation are to be determined by all parties to the risk assessment and may depend on the nature of the property at risk; these are only given as a general guide.

Appendix B

Landslide Susceptibility Assessment

LANDSLIDE FREQUENCY ANALYSIS

Analysis No.:

NATURAL SHALLOW LANDSLIDES

LOCATION: Mitchell Rd Bromelton

Site No.

Site name: J002474

1 Basic Frequency

6 Concentration of surface water

2 Slope Angle

Site	Level	Factor
Less than 5 degrees	L	0.1
Between 5 and 15 degrees	M	0.5
Between 15 and 30 degrees	M	0.8
Between 30 and 45 degrees	H	1.2
More than 45 degrees	M	0.8

Site	Level	Factor
Ridge	L	0.7
Crest	M	0.8
Upper slope	M	0.9
Mid slope	H	1.2
Lower slope	H	1.5

3 Slope Shape

Site	Level	Factor
Crest or ridge	L	0.7
Planar	M	0.9
Convex	M	0.9
Concave	H	1.5

Site	Level	Factor
None apparent	L	0.7
Minor moistness	M	0.9
Generally wet	H	1.5
Surface springs	VH	3

8 Evidence of instability

4 Site geology

Site	Level	Factor
Volcanic rock	H	1.1
Sedimentary rock	M	1
Low grade metamorphic rock	M	1
High grade metamorphic rock	L	0.9
Granitic rock	M	1

Site	Level	Factor
No sign of instability	L	0.5
Trees bent	H	1.5
Minor irregularity	VH	2
Major irregularity	VH	5
Scarps	VH	10

Summary

5 Material strength

Site	Level	Factor
Rock at surface	VL	0.1
Residual soil < 1 m deep	L	0.5
Residual soil 1-3 m deep	M	0.9
Residual soil >3 m deep	H	1.5
Colluvial soil < 1 m deep	H	1.5
Colluvial soil 1-3 m deep	VH	2
Colluvial soil > 3 m deep	VH	4
Fill (slope regrading)	VH	5

2 Slope Angle	Factor
3 Slope Shape	0.7
4 Site geology	1.0
5 Material strength	1.5
6 Concentration of surface water	1.2
7 Evidence of groundwater	0.7
8 Evidence of instability	0.5

9 Relative Frequency (2x3x4x5x6x7x8)

0.35

Site Frequency (1 x 9)

0.35

Appendix C

Limitations

LIMITATIONS

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In addition, it is recognised that the passage of time affects the information and assessment provided in this Document. Core's opinions are based upon information that existed at the time of the production of the Document. It is understood that the Services provided allowed Core to form no more than an opinion of the actual conditions of the site at the time the site was visited and cannot be used to assess the effect of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.

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CONSULTING ENGINEERS

ELECTRICAL
LIGHTING
MECHANICAL
SECURITY
COMMUNICATIONS
AUDIO VISUAL

28th June 2024

SMEC
832 Southport-Nerang Road
NERANG QLD 4211

Attention: Robert Nutt

Email: Robert.Nutt@smec.com

**BROMELTON COMPOST MANUFACTURING FACILITY - ENERGY CONCEPT REPORT
DESIGN CONSULTANCY - ELECTRICAL & LIGHTING SERVICES**

Dear Robert,

The following report has been produced to investigate the proposed infrastructure for the Bromelton Compost Manufacturing Facility and produce commentary on the proposed upgrades required for the project.

The site is located on lot 4/RP85497 which is adjacent to Mitchell Road, Bromelton. Based on Energex online mapping there is an existing LV supply provided near the intersection of Mitchell Road / Beaudesert-Boonah Road.

An application has been placed with Energex for the supply of the site (Reference CX24BEA1117829Q) which is placed on hold until the DA conditions (and additional details) can be provided.

Based on the information provided, the scope of works is as follows:

- New sitewide point of supply
- New office building and parking facilities
- New internal roadway lighting
- Electrical supply to manufacturing equipment
 - Specific location and loads to be provided by the client
- External distribution boards with consideration for future connected electrical plant equipment

**PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL**



SDA approval: AP2024/011

R868A-E-LTR-001[A]

1 of 2

WEBB AUSTRALIA GROUP (QLD) PTY LIMITED ABN 30 010 733 561
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BRISBANE CANBERRA GOLD COAST MELBOURNE NEWCASTLE SUNSHINE COAST SYDNEY NEW ZEALAND
DIRECTORS GARRY LOWE MARK WILTON IAN FOY MARC PIROZZI
ASSOCIATES ALASTAIR CARR BILL HARDING CRAIG COLLINS CRAIG LITTLETON JAMES WALDEN KEN DOUGLAS KURT WILTON
ROBERT HAMILTON ROBERT SMITH SIMON CHIU STEVEN LAM

The following is an estimated maximum demand for the site based on the equipment list provided from the client:

Equipment No.	Equipment Type	PROPOSED 3Ø LOAD
CV-01A	Conveyor 1 - Infeed Hopper A	4A
CV-01B	Conveyor 1 - Infeed Hopper b	2A
CV-02	Conveyor 2 - Incline Conveyor	4A
SC-01	Trommer Screen	15A ¹
CV-03	Conveyor 3 - Overs/Sort Conveyor	4A ²
MA-01	Overbelt Magnet	2A ³
LS-01	Lights Recovery Separator	23A
CV-04	Shredder Feed Conveyor	4A
SH-01	Shredder - E50 or Similar	413A
CV-05	Fines Transfer Conveyor 1	4A
CV-06	Fines transfer Conveyor 2	4A
CV-07	Shredder Unders Conveyor	4A
FA-01	ASP Fan 1	61A
FA-02	ASP Fan 2	41A
Office Fit-out & Carpark Lighting	-	25A
Internal Roadway Lighting	-	10A
TOTAL		620A

The loads mentioned above would be further confirmed throughout a detailed design phase of the project.

Based on the maximum demand, a Padmount substation will be required. Refer to attached sketch for indicative location and Energex standard details around for sizing. Confirmation would be required from Energex regarding the earthing arrangement, for now a separate earthed substation is proposed. To further assist with location and sizing, the following information should be provided:

- Any Q100 flood levels of the site
- Hydrant locations to ensure minimum 10m separation in accordance with Energex standards
- Major electrical connections through the site
 - Potential const savings could be achieved by moving the substation internal of the site
- Any know future electrical plant that would be proposed for the site
 - Including indicative locations due to the size of the site

Yours faithfully
Webb Australia Group (Qld) Pty Ltd



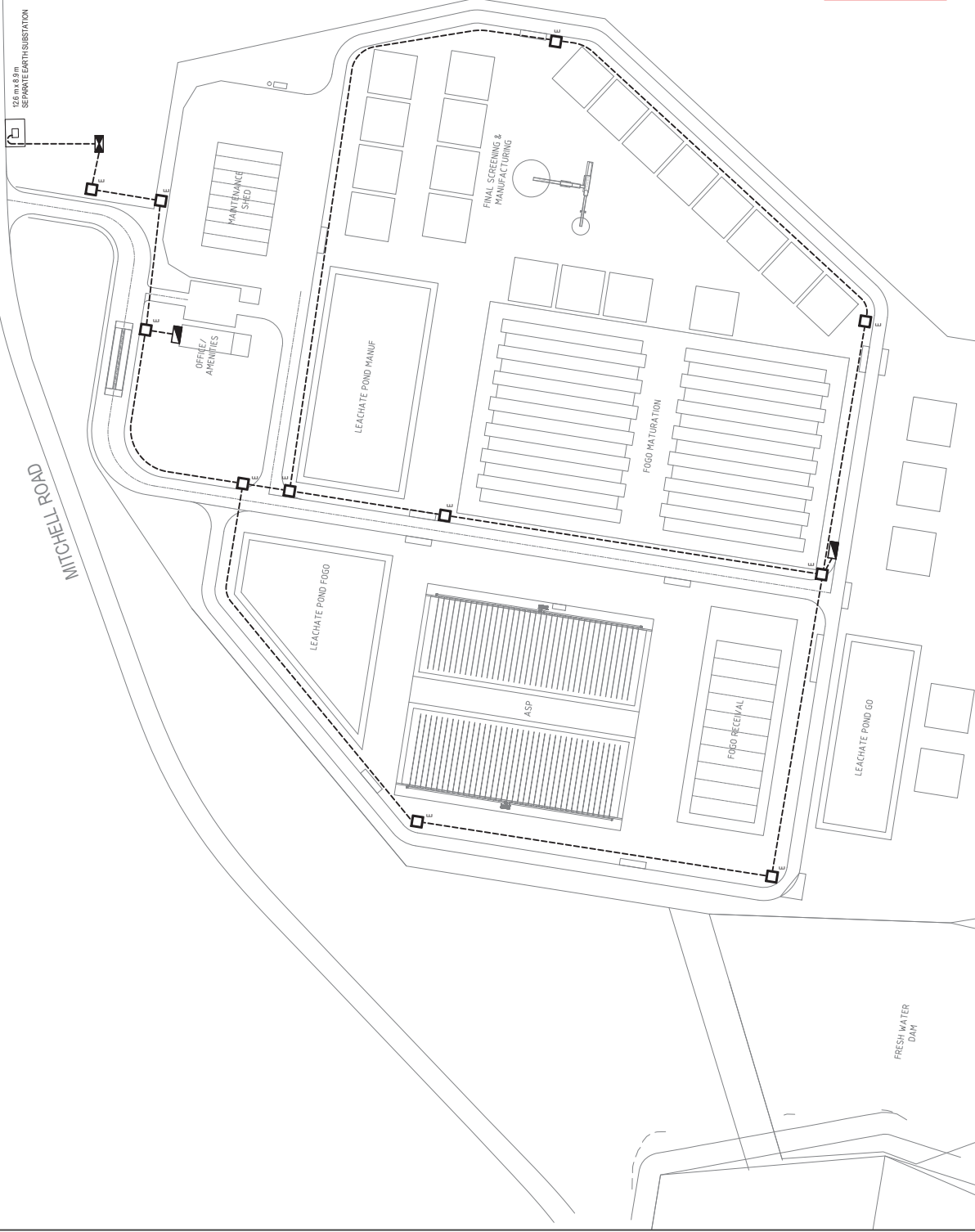
per Nic Stack

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AMENDMENTS

[illegible]

MITCHELL ROAD



PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL

SDA approval: AP2024/01

SDA approval: AP2024/011

DRAWINGS INCLUDE COLOUR INFORMATION. A BLACK AND WHITE COPY MAY NOT HAVE ALL THE INFORMATION. THIS BACKGROUND IS COLOURED BLUE



STAKEHOLDER ENGAGEMENT REPORT

BROMELTON COMPOST MANUFACTURING FACILITY

260 MITCHELL ROAD, BROMELTON, QLD 4285

Lot 4 RP85497



PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: AP2024/011

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Executive Summary

SOILCO propose to establish and operate a Compost Manufacturing Facility (CMF) on Lot 4 RP85497, 260 Mitchell Road, Bromelton, QLD 4285. The development site is a 24-hectare greenfield site located within the Bromelton State Development Area (SDA) and Scenic Rim Regional Council Area.

The site is located approximately 8km west of the township of Beaudesert. The population of Beaudesert, as per the 2021 Australian Bureau of Statistics Census, is 6,752. Bromelton and Josephville, two areas which comprise the Bromelton SDA, have a population of 129 and 172 respectively. These areas were considered relevant and included in the community consultation efforts.

Relevant stakeholder groups engaged with include State Government Departments, Local Government Council, Business Associations, Local Community, Traditional Owners and Neighbouring Landholders

As the proposed development is still in the application stage, implementation of the stakeholder engagement plan is ongoing. Some engagement activities are yet to be undertaken.

The following engagement activities have been, or will be, undertaken by SOILCO as part of the engagement plan:

- Stakeholder meetings
- Email liaison
- Presentation of the proposed project at Beaudesert Chamber of Commerce
- Membership with the Beaudesert Chamber of Commerce
- Membership with the Bromelton Business Group
- Newspaper advertisements in local Scenic Rim media outlets (i.e. Beaudesert Bulletin, Fassifern Guardian)
- Open day at the SOILCO Stott's Creek Organics Processing Facility (OPF) in Northern NSW
- Social media posts and other online media
- Consultation with traditional Mununjali elders for a Walk on Country
- Hosting of an onsite community field day at the Bromelton site (to be undertaken as part of the public notification period)

Throughout the design and assessment phase of the project, there has been general support for the proposed SOILCO Bromelton CMF and the overall direction of this development.

Regular monitoring, reviewing and adaptation of the community stakeholder engagement plan will ensure it remains effective and encourages community participation.

1.0 Project Description

SOILCO Pty Ltd is a family-founded business that designs, builds and operates innovative organics recycling facilities across New South Wales and Queensland. The head office is located in Kembla Grange, NSW.

SOILCO propose to establish a Compost Manufacturing Facility (CMF) on Lot 4 RP85497, a 24-hectare greenfield site located within the Bromelton State Development Area (SDA). The site is located approximately 8km west of the township of Beaudesert and is to be accessed via Mitchell Road, a currently unformed road that will be constructed as part of the development. Mitchell Road extends off the state-controlled Beaudesert-Boonah Road; Mitchell and Beaudesert-Boonah Rd intersection upgrades are also proposed as part of the development.

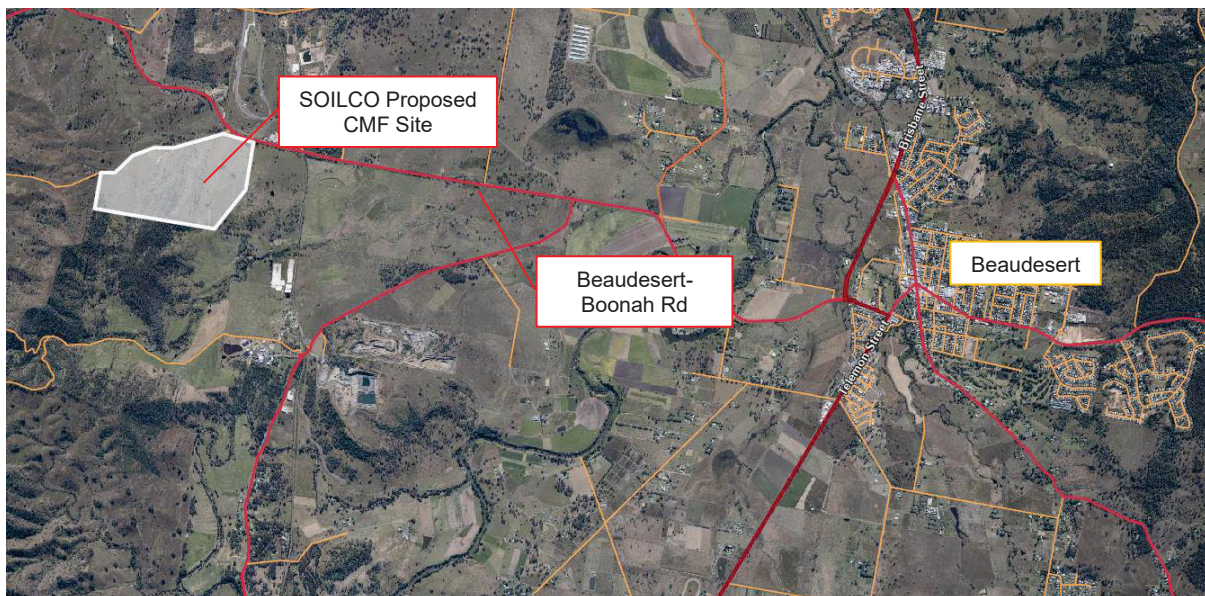


Figure 1: Proposed CMF Site Location

The proposal seeks to manufacture, store, and distribute soil, compost and mulch products that meet Australian Standards AS4454:2012 and AS4419 for sale direct to market. The proposed CMF will consist of three areas—receival, decontamination and composting—for the processing of:

- 150,000 tpa of organic waste using an Aerated Static Pile (ASP) method; and
- 100,000 tpa of organic waste using a Passive Open Windrow (OW) method.

The proposed facility will also undertake receipt, processing, storage and blending of up to 150,000 tpa of sand and soil products for the manufacturing of soil blends to cater for the landscape, agricultural and urban amenity markets.

Odour and leachate management strategies will be implemented as per the QLD Department of Environment, Science and Innovation *Best Practice Environmental Management ERA 53(a) Organic Material Processing by Composting* (2024). Associated infrastructure such as offices, car parks and amenities blocks will be built to support the development and operation of the proposed CMF.

Operational hours of the CMF would be as follows:

- Monday to Friday from 6am to 6pm.
- Saturday from 6am to 4pm; and
- Sundays and Public Holidays from 9am to 4pm.

2.0 Consultation

The Bromelton SDA is located within the Scenic Rim Regional Council, approximately 8km west of Beaudesert and 75km south-west of Brisbane. The Bromelton SDA is an area designated for high impact, difficult to locate and rail dependent (due to access of the Sydney-Brisbane rail corridor) industries. It includes much of the areas of Bromelton and Josephville, population 129 and 172 respectively (Australian Bureau of Statistics, 2021 Census data). The township of Beaudesert, population 6,752, is also considered as relevant and was thus included in the consultation.

Initial agency consultation (with the Queensland Office of the Co-Ordinator General) commenced in mid-2022.

Stakeholder engagement began in the pre-lodgment phase of the proposal and has been conducted in accordance with the QLD Department of State Development, Infrastructure, Local Government and Planning Social Impact Assessment Guideline (2018).

The following stakeholders were, or will be, contacted by SOILCO as part of the engagement plan:

- State Government Departments:
 - Department of Transport and Main Roads (TMR)
 - Department of Environment, Science and Innovation (DESI)
 - Department of Agriculture and Fisheries (DAF)
 - Department of Regional Development and Water (Water Services)
 - Seqwater
 - Office of the Coordinator-General (OCG)
- Scenic Rim Regional Council (SRRC)
- Business Associations:
 - Bromelton Business Group
 - Beaudesert Chamber of Commerce
- Local community
- Traditional owners
- Neighbouring Landholders

Table 1 contains further information on the above stakeholders who have been engaged with during consultation, as well as those intended to be engaged with in future.

The following engagement activities have been undertaken by SOILCO as part of the engagement plan to date:

- Stakeholder meetings
- Email liaison
- Presentation of the proposed project at Beaudesert Chamber of Commerce and membership of the Beaudesert Chamber of Commerce

- Membership with the Bromelton Business Group
- Newspaper advertisements in local Scenic Rim media outlets (ie. Beaudesert Bulletin, Fassifern Guardian)
- Open day at the Stott's Creek OMF facility in Northern NSW

Table 1 also outlines the engagement activities undertaken during consultation. While these actions are minimal to date, SOILCO intends to engage more with community stakeholders about the progress, performance and compliance of the project, and continue its open and frequent communication with statutory bodies. Regular monitoring, reviewing and adaptation of the stakeholder engagement plan will ensure it remains effective and encourages ongoing open communication with all stakeholders.

The following future engagement activities are planned to be undertaken by SOILCO as part of the engagement plan:

- Further newspaper advertisements in local Scenic Rim media outlets.
- Social media posts and other online media.
- Consultation with traditional Mununjali elders for a Walk on Country.
- As part of the public notification period, hosting of an onsite community field day at the Bromelton site.

Overall, there is general support for the proposed SOILCO Bromelton CMF and the direction of this development throughout the design and assessment phase of the project.



Figure 2: Joel Coulton (SOILCO business manager) receiving his Beaudesert Chamber of Commerce membership certificate from President John Powell (Beaudesert Bulletin, Oct 2023)

2.1 Values and Objectives

SOILCO has undertaken its stakeholder engagement process in a sequenced, strategic approach t, to provide fair opportunities for communities and stakeholders to participate in the project's development and delivery.

A focus on best practice public participation has been undertaken to enhance the project's reputation and build SOILCO's social licence to operate in the local community.

The strategic approach considers five elements:

1.	A strong narrative	Developing a narrative that is clear and promotes the benefits of the CMF for Beaudesert, the Scenic Rim and South-East Queensland.
2.	Sequenced briefings	Ensuring correct sequencing of stakeholder briefings such that right stakeholders are informed at the right time.
3.	Agreed messaging	Communication should be adapted to suit different audiences and used consistently for communication materials and engagement activities. Emphasis on plain, English language for community engagement is important to ensure inclusivity.
4.	Robust engagement schedule and reporting cycle	A Communication Action Plan will be used to track upcoming activities, internal roles and responsibilities. A regular reporting cycle will ensure lessons learned are captured and changes to the engagement approach can be adopted for better outcomes if necessary.
5.	Effective issues management	A risk mitigation and issues management plan will be required to minimise engagement risks and protect reputation in the event of negative community and stakeholder feedback.

2.2 Stakeholder Engagement

Table 1: Stakeholder Engagement and Activities

Date	Stakeholder/s	Project Team Involved	Engagement Purpose/Method	Notes
Stakeholder/Community Engagement undertaken to date				
05/06/2024	Scenic Rim Regional Council (SRRC)	SRRC – Mayor, CEO, General Managers, Economic Development Team SOILCO – Charlie Emery (<i>Managing Director</i>), Jason Gaff (<i>General Manager Infrastructure Delivery</i>) ACS Engineers – Angela Harlen (<i>Director</i>), Susan Shay (<i>Director/Principal Civil and Environmental Engineer</i>)	Meeting - Overview of the project Pre-lodgement meeting to seek advice regarding development applications.	SOILCO presented a project summary at SRRC Workshop. The project was well received. SRRC have endorsed the development in the Bromelton SDA. They have also given approval for the construction of Mitchell Road to access the development site.
Ongoing discussions since late 2023	Department of Transport and Main Roads (TMR)	SOILCO – Jason Gaff ACS Engineers – Nicholas Falvey (<i>Senior Designer</i>), Angela Harlen, Susan Shay	Meeting - Overview of the project Discussion regarding Mitchell Road intersection.	Several meetings have been held to discuss safe access to the SOILCO site from Beaudesert Boonah Road. The application for approval is currently under review by the TMR South Coast Team.
05/06/2024	Office of the Coordinator General (OCG) and Department of Environment, Science and Innovation (DESI)	OCG – Amanda Koenig, Marcus Peck, Rachael Leeson SOILCO – Jason Gaff, Duncan Le Good (<i>Executive General Manager, Products, Sales and Innovation</i>), Roslyn Florie-George (<i>Executive General Manager, Business Growth and Sustainability</i>), Dave Schumacher (<i>General Manager, Quality, Environment and Planning</i>) ACS Engineers – Susan Shay, Angela Harlen GHD – Sarah Wilson, Adrienne Harvey, Prasanna Wijesinghe DESI – Madeleine Lewis, Jasmine Corica, Scott Blanchard	Meeting – Pre-lodgement meeting to seek advice regarding development applications.	A pre-referral meeting was held with the OCG to discuss the following: - Project Overview. - Approvals process. - Technical reports/matters. - Water and groundwater. - Waste receivals. - Odour. - Program timeline. - Koala mapping. - Next steps.

Date	Stakeholder/s	Project Team Involved	Engagement Purpose/Method	Notes
14/06/2024	DESI	GHD - Lauren Rolfe	Email Meeting – Pre-lodgement advice regarding development applications.	The following information was sent to DESI by email: - Leachate management. - Facility design. - Odour Assessment. - GHG Emissions.
01/07/2024	Department of Agriculture and Fisheries		Email Meeting – Pre-lodgement advice regarding development applications.	The following information was sent to DAF by email: - Brief overview of the project. - A map with the two low risk waterways traversing the facility location. - A request to declassify the mentioned waterways, based on the aquatic assessment report. - A question regarding the setback distances the compost facility should have from existing moderate risk waterways.
01/07/2024	Department of Regional Development and Water (Water Services) (DRDMW)		Email Meeting – Pre-lodgement advice regarding progress of the SDA MCU development application.	The following information was sent to DRDMW by email: - Brief overview of the project. - A map with the facility location. - A request for unmapped water features to be classified as drainage features, based on the aquatic assessment report. - A query regarding the need of a water licence or an approval under the Water Plan (Logan Basin) 2007 to construct a freshwater dam with overflow spillway to store uncontaminated water run-off on the site.
04/07/2024	Seqwater	Seqwater – Leah Snerling, Medina Handley GHD – Sarah Wilson, Prasanna Wijesinghe, Rod Towner SOILCO – Jason Gaff, David Schumacher ACS Engineers - Angela Harlen, Susan Shay	Meeting – Pre-lodgement advice regarding progress of the SDA MCU development application.	A pre-lodgement meeting was held with the Seqwater team for the Bromelton SDA to discuss the following: - Stormwater quality and potential impact on receiving waters to Seqwater's treatment plants. - How SOILCO intends to address the critical performance outcomes in the Seqwater Development Guidelines for the Project. - Whether any additional technical studies were required other than those identified in the soil presentation.

Date	Stakeholder/s	Project Team Involved	Engagement Purpose/Method	Notes
26/10/2023	Local Community	SOILCO – Duncan Le Good, Joel Coulton (<i>Business Manager, Industry & Government</i>)	Meeting	- Whether Seqwater has any concerns about the design that is being proposed for the facility. - Any other documents/policies that will need to be considered for the project. In October 2023, SOILCO became members of the Beaudesert Chamber of Commerce. SOILCO presented the project to the Beaudesert Chamber of Commerce on the 26/10/23 to share with the community the goals of the compost manufacturing facility. A newspaper article was published in the Beaudesert Bulletin, detailing this presentation. The benefits to the environment and the community were explained, including how this project will: - Reduce the amount of waste sent to landfill - Generate compost for agricultural use, and - Create local job opportunities.
Quarterly from 03/2023	Neighbouring Landholders			In March 2023, SOILCO became members of the Bromelton Business Group. All Bromelton SDA landholders are members of the Bromelton Business Group – this includes SOILCO. The Bromelton Business Group meet quarterly to discuss topics concerning the Bromelton SDA, which has allowed SOILCO to make surrounding businesses and neighbouring landholders aware of the proposed CMF. <i>The location of neighbouring landowners is shown in Figure 3 and Table 2 below.</i>
26/06/2024	DESI, Neighbouring Landholders	SOILCO – Joel Coulton	Open day	An open day was held at the Stott's Creek Organics Processing Facility in Tweed Heads, NSW. An informative 2-hour tour was given of the site and its operations.

Date	Stakeholder/s	Project Team Involved	Engagement Purpose/Method	Notes
Stakeholder/Community Engagement still to be undertaken				
TBC	Traditional Owners			SOILCO has engaged Redleaf Group to undertake Cultural Heritage assessments and assist with engaging with indigenous leaders and custodial landowners of the project site.
	Local Community			Regular engagement with the local community is intended to be maintained as the project progresses, through communication actions such as: - Regular social media posts. - Advertisement and advertorials in local Scenic Rim media outlets. - Onsite community field day at the Bromelton site.
	OCG, SRRC & DESI			Following the success of the open facility at Stott's Creek, SOILCO will host an open field day at the Bromelton CMF for all stakeholders to view the facility and its operation.
				Future open facility days at Stotts Creek are also planned.

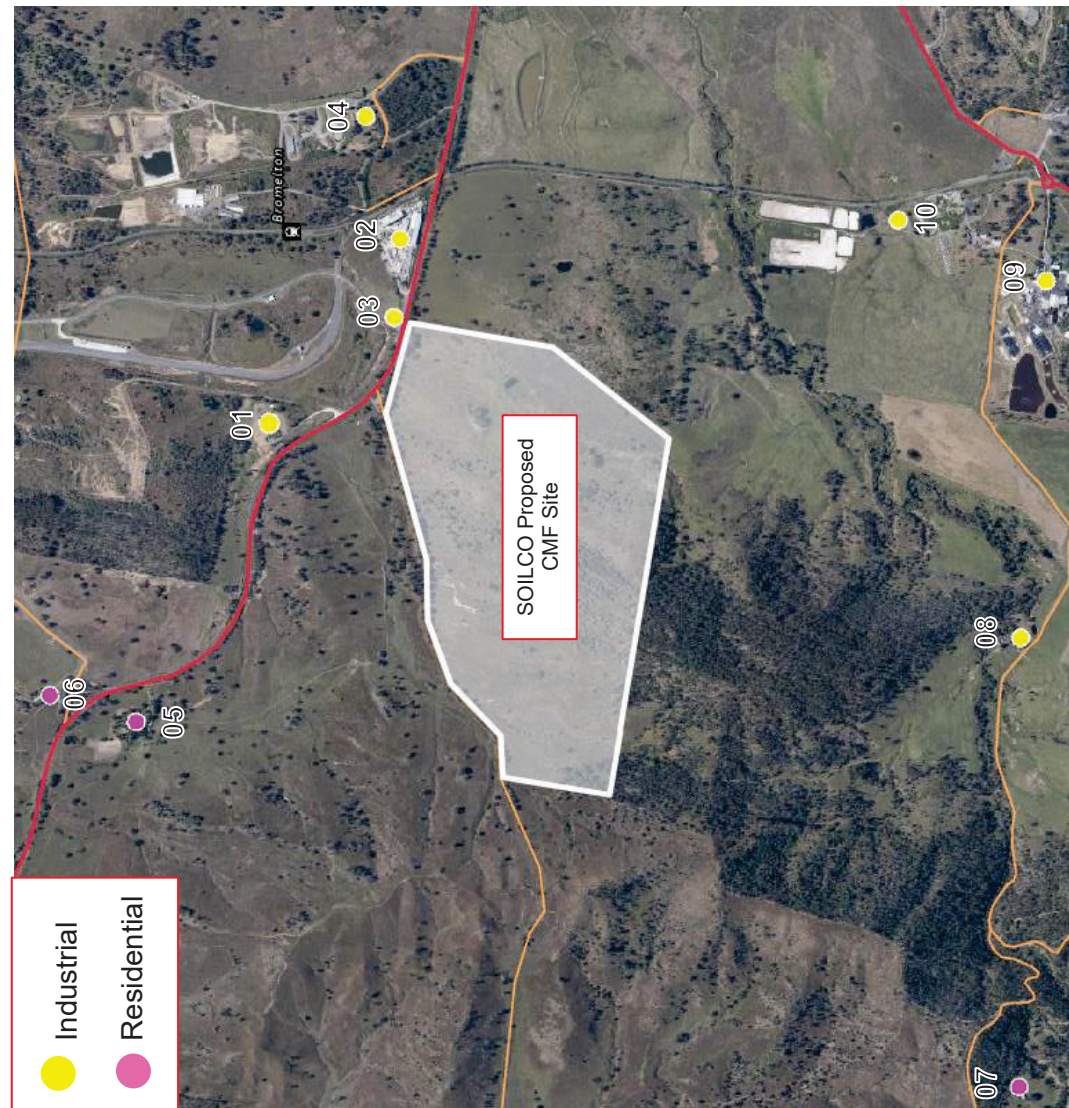


Figure 3: Location of Neighbouring Landowners (within 2km of SOILCO Bromelton CMF).

Table 2: Neighbouring Landholders

ID	Receptor Type	Address	Distance from Project
01	Industrial	Beaudesert Saleyards 2563 Beaudesert Boonah Road	863m Northeast
02	Industrial	Quickcell Technology Products Pty Ltd Lot 3 Beaudesert Boonah Road	1150m Northeast
03	Industrial	SCT Logistics 2603 Beaudesert Boonah Road	1000m Northeast
04	Industrial	SRRC Waste Facility Waste Facility Road	1700m Northeast
05	Residential	2572 Beaudesert Boonah Boonah Road	1100m Northwest
06	Residential	15 Tilley Road	1466m North
07	Residential	388 Swan Gully Road	2000m Southwest
08	Industrial	194 Swan Gully Road	1400m South
09	Industrial	Bush's Proteins QLD (A J Bush & Sons) 358 Sandy Creek Road	1800m Southeast
10	Industrial	28 Swan Gully Road	1700m Southeast

2.3 Concerns and Issues

All concerns or issues raised by stakeholders during consultation are contained in table 3 below. This table is intended to be a live document which will be amended and added to as stakeholder feedback is received by SOILCO over the course of the project.

Table 3: Stakeholder Concerns and Issues

Contributor	Concern	Comments	Way forward

2.4 Next Steps

Stakeholder engagement is a process that will be continually undertaken throughout the approval, construction and operation of the Bromelton CMF.

During the approval stage, further community engagement and liaison with relevant statutory bodies is anticipated. Engagement with the following stakeholders is planned or intended, as mentioned in Table 1:

- Traditional Owners – walk on country or similar meeting.
- Local Community – further and continual engagement through distribution of information brochures, and social media/other online media updates.
- OCG & SRRC – through an onsite open field day.

During the construction of the CMF, stakeholder engagement, particularly with surrounding landholders, is important to ensure construction activities are not disruptive or cause any actionable nuisances.

Once the CMF is operational, regular and ongoing engagement with the local community and neighbouring landholders will be necessary to ensure the development is still meeting community expectations.

SOILCO is proactively facilitating engagement through its membership in the local Beaudesert Chamber of Commerce and Bromelton Business Group. Additionally, SOILCO will be active members of the wider community and plans to invest and sponsor local events and clubs in the future.

Any issues or concerns raised will be received and a Response to Submission Report will be prepared by SOILCO and documented in Table 3 as part of the Stakeholder Engagement Plan.

Regular monitoring, reviewing and adaptation of the community stakeholder engagement plan will ensure it remains effective and encourages community participation.

Bromelton Compost Manufacturing Facility

Surface Water Impact Assessment

SOILCO Pty Ltd

28 August 2024

→ The Power of Commitment

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: AP2024/011

Project name		Bromelton Compost Manufacturing Facility					
Document title		Bromelton Compost Manufacturing Facility Surface Water Impact Assessment					
Project number		12626213					
File name		12626213-REP_Bromelton_Compost_Manufacturing_Facility-SWIA.docx					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S3	A	A Harvey	R Towner	DRAFT	E. Rothwell	DRAFT	09/08/24
S4	0	A Harvey	R Towner	On File	E. Rothwell	<i>Emma Rothwell</i>	28/08/24
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Executive Summary

Background

SOILCO Developments Pty Ltd (SOILCO) is a producer of organic soil improvers, manufacturing a range of soil, compost, and mulch products and specialising in the processing of organic waste through composting facilities and organics processing facilities. SOILCO currently has four approved and licensed facilities in New South Wales and is proposing to develop and operate a Compost Manufacturing Facility (CMF) in Southeast Queensland, approximately 80 km south-west of Brisbane and 62 km west of the Gold Coast (the Project).

SOILCO engaged GHD to undertake a Surface Water Impact Assessment for the Project, comprising this report. This report also includes a conceptual surface water management plan. This has been developed in collaboration with the design process for the Project, to develop in-built mitigation measures which seek to manage water-related aspects of the Project in accordance with the relevant legislation and design criteria.

Existing conditions

The regional topography in the vicinity of the Project site includes foothills and valleys extending from an unnamed ridge, which is located 6km south of the Project site. The Project site is undulating and slopes relatively steeply towards the north. The grade of west-east undulations at the Project site are up to 24%.

The Project site is situated within the regional catchment of the Logan River, a coastal draining watercourse some 11 km downstream of the Project site. Major regional hydrological features include Wyaralong Dam, located 4.6 km to the northwest, which impounds Teviot Brook, a direct tributary of the Logan River downstream of the Project site. Bromelton Off Stream Storage, an off-stream storage located adjacent the Logan River, is also located 4.2 km north east of the Project site, however is currently not in commission.

Two first order drainage lines of Allan Creek intersect the Project site, which drain north to adjoin a third order, north easterly flowing tributary of Allan Creek. Allan Creek is a fourth order tributary of the Logan River at the confluence of these waterways. There are farm dams located within the lot boundary, including approximately 650 to 700 m east of the Project site. The hydrological features in the vicinity of the project site are shown in Figure 3.3.

The existing flood conditions at the site were characterised through development of a hydraulic flood model in TUFLOW. In the upper tributaries across the southern extent of the Project lot, for the 1% AEP storm, the lateral flood extents are shown to be topographically constrained, with minimal bank storage of flood waters. Peak flood depths in these areas were modelled up to 1.18 m within the tributary and generally less than 0.4 m in the bank areas. The topography flattens slightly in the northern portion of the Project lot. In the 1% AEP flood event, the lateral extent of the flood waters in this area extend from the north and occur out of stream bank areas, with flood depths predominantly less than 0.2 m to 0.4 m. Outside of the Project lot, at the confluence of the tributaries across the site, in stream peak flood depths of up to 1.5 m were modelled.

Water quality sampling undertaken indicates that existing surface water quality across the site was reasonably poor in relation to guideline values.

Proposed conditions

Based on the review of the relevant regulatory context applicable to the Project and the existing conditions at the Project site, a requirement for mitigation measures to be in-built into the Project was identified. This has been undertaken through the development of the Surface Water Management Plan in Section 4, described herein, which has been developed collaboratively with (and informed) the Project design development undertaken by SMEC.

The potential impacts of the Project were assessed with relation to surface water, including the in-built management measures. The water related risks were found to be generally acceptably managed based on the following:

- Appropriate separation of water types in accordance with best-practice for composting sites and the ERA53(s) Model Operating Conditions (MOC) produced by the Queensland Government.
- Provision of in excess of 30 ML of leachate storage sized in exceedance of the 24-hour event supported by the MOC, with reuse in the early stage of composting. No proposed active release of leachate and no overflow up to a design standard rainfall of 900 mm falling within a 6 month period.
- Separation of stormwater from contamination and management through provision of a stormwater treatment train in accordance with South East Queensland Water (SEQW) guidelines.
- Estimation of water demands by SOILCO and confirmation that during dry periods they can be sourced via appropriately licensed external sources. Provision of a 30ML harvesting storage to minimise reliance on imported water.
- Location of the operational site outside the 1% AEP flood impact for the identified flow paths adjacent to the site in accordance with SEQW guidelines and the Scenic Rim Hazard Overlay Code.
- Separation distances from identified flow paths consistent with the understood intent of the SEQW guidelines.
- Provision of an erosion and sediment control plan, based on relevant regulatory requirements, to be updated and confirmed during detailed design.

Risk reduction was anticipated as the Project water management measures were developed through the process outlined in this assessment, in consideration of potential impacts and in accordance with regulatory requirements. However, it was noted that whilst appropriate measures are specified to the degree that they can realistically be at this stage, there are some additional mitigations required, that can only be fully defined and implemented through the operational phase of the project. These additional mitigations consist of:

- Preparation and regular update of an Operational Management Plan.
- Adjustment of leachate catchment area when full processing rate is not occurring.
- Preparation of a detailed water balance model based on actual site operational data and provide emergency containment bunding if required.

With inclusion of the in-built measures, as well as the additional measures, the project is expected to appropriately manage risks with relation to surface water.

Limitations

This report is subject to, and must be read in conjunction with, the limitations, assumptions and qualifications contained throughout the Report.

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1. Introduction

The Bromelton Compost Manufacturing Facility (the Bromelton CMF Project) is an organics facility located along Mitchell Road in Bromelton, in South East Queensland. The Bromelton CMF Project will involve the construction and operation of a facility for the receipt, processing, composting, and storage of the following materials: garden, food, wood wastes, manures and soil for the sale and distribution of finished compost, mulch and soil products. SOILCO Pty Ltd (referred to as SOILCO) will design, construct and operate the Bromelton CMF Project.

SOILCO are seeking the following approvals for the Project:

- A State Development Area (SDA) Material Change of Use approval for works within the Bromelton SDA under the *State Development and Public Works Organisation Act 1971*.
- An Environmental Authority (EA) Approval for Environmentally Relevant Activities (ERAs) ERA:
 - ERA 33(1): Crushing, milling, grinding or screening more than 5,000t of material in a year.
 - ERA 53(a): Organic material processing - processing more than 200 t of organic material in a year by composting
 - ERA 54(2)(c): Mechanical waste reprocessing - operating a facility for receiving and mechanically reprocessing more than 10,000 t a year of general waste

SOILCO engaged GHD to undertake a Surface Water Impact Assessment for the Project, comprising this report. This Surface Water Impact Assessment has been prepared to support the application for an Environmental Authority (EA) for the above ERAs. The surface water assessment in the context of this report considers, flooding, drainage, surface water quality, wastewater, flooding and water sourcing.

This report also includes a conceptual surface water management plan. This has been developed in collaboration with the design process for the Project, to develop in-built mitigation measures which seek to manage water-related aspects of the Project in accordance with the relevant legislation and design criteria.

1.1 Project overview

The Bromelton CMF Project aligns with objectives in the Queensland Government Queensland Organics Strategy 2022–2032 by reducing the amount of organic waste going to landfill and it will offer economic and social benefits through employment and local business opportunities in South East Queensland.

SOILCO commenced composting operations in 1985 in Australia and has a strong distribution network in agricultural and urban markets in Australia. SOILCO are a manufacturer of quality assured compost, mulch and soil blends and specialise in the design, construction and operation of innovative organics recycling facilities in Australia. SOILCO's mission is to transform organic resources into the world's best products to regenerate and enhance the health and productivity of soil and to maximise our contribution to clean energy and sustainable communities. SOILCO successfully operates a state-of-the-art network of licensed organics processing facilities across Eastern Australia. SOILCO's infrastructure experience spans different technology solutions, including:

- Open Windrow (OW)
- In-Vessel Composting (IVC) tunnels
- Aerated Static Piles/ Covered Aerated Static Piles (ASP/CASP)

For the Bromelton CMF Project, SOILCO will utilise ASP & OW technologies..

Table 1.1 and Figure 1.1 summarise and depict the key Bromelton CMF Project components.

Table 1.1 *Project components*

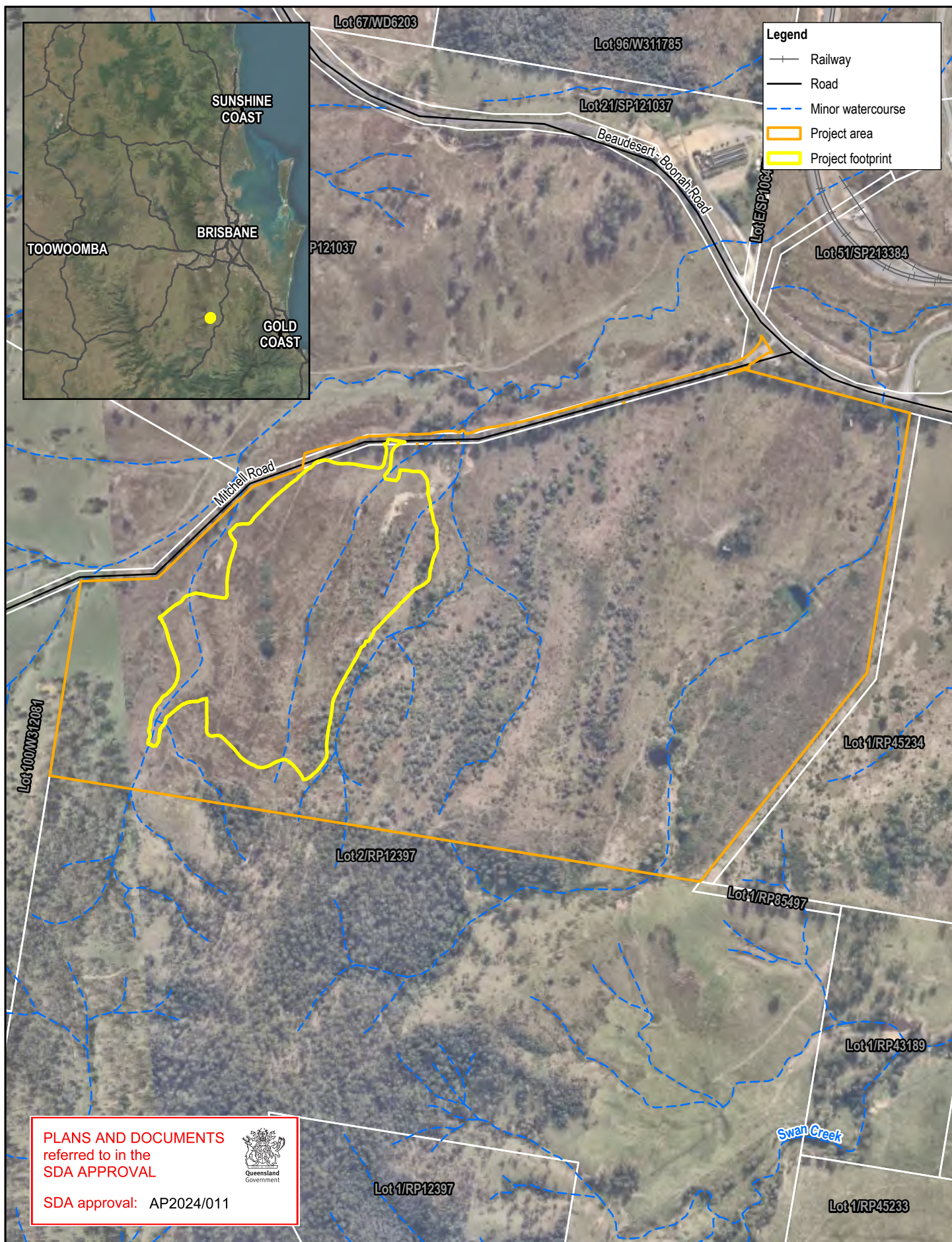
Project Component	Details
Lot on Plan	Lot 4 on Plan RP85497 and Mitchell Road (Local government road parcel)
Summary of proposed works	Construct and operate a Compost Manufacturing Facility (CMF) at 260 Mitchell Road, Bromelton for the sale and distribution of finished compost, mulch & soil products

Project Component	Details
	The site will be split into 3 different processing areas: Receival, decontamination and composting utilizing Forced Aeration Pad system (ASP).
Construction disturbance area within Lot 4 RP85497	21 hectares
Operational footprint within Lot 4 RP85497	18.5 hectares
Proposed output of the compost facility and type of material to be received and processed	Receipt, processing, composting, and storage of up to 250,000 tpa of the following materials: Garden, Food and Wood wastes and manure. Receipt, processing, storage and blending of up to 150,000 tpa of sand and soil products for manufacturing (Virgin Excavated Natural Materials or VENM).
Technology used	Two composting technologies will be utilised to handle different feedstocks: 100,000 tpa of garden organics (GO) composted by Passive Open Windrow (OW) method. 150,000 tpa of Food Organics and Garden Organics (FOGO) is to be processed on a Forced Aeration Pad system (ASP). Wood wastes and manure will make up a small portion of the composting feedstocks and will be blended with the GO & FOGO based on onsite capacity. VENM will be received and stored as required based on demand of finished products. Due to the seasonal nature of feedstock generation, up to 15% of the total annual waste may be received in any one month. This would typically occur around spring and autumn.
Key infrastructure and structures	Access from Mitchell Road Weigh bridges Internal road network Maintenance and storage shed Final screening and manufacturing area Water tanks Aeration Pad system Office, carparking and amenities FOGO receival area 3 x leachate ponds, lined with either HDPE or 300 mm thick clay with permeability of no more than 1×10^{-9} m/s 1 x freshwater dam Open windrows pad FOGO maturation pad Hardstand areas Retaining wall Upgrade of Mitchell Road
Hours of Operation	Monday – Friday 6am to 6pm Saturday – 6am to 4pm Sunday and public holidays 9am - 4pm
Operational Staff	22 employees
Access arrangements	Mitchell Road will connect the Bromelton CMF Project to the road network. Mitchell Road will be upgraded to accommodate the traffic from the Bromelton CMF Project.

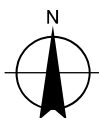
Project Component	Details
Timeframe	Construction and Commissioning 7th April 2025 – 30th January 2026

Based on review of the proposed project the following key considerations with relation to surface water are noted:

- Water sourcing
- Water quality (construction and operational phase, including wastewater)
- Flooding
- Stormwater quantity (non-flooding)
- Waterways and separation distances



Paper Size ISO A4
0 50 100 150 200
Metres



Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56



SOILCO Pty Ltd
Bromelton Compost Manufacturing Facility

Project No. 12626213
Revision No. A
Date 8/08/2024

Project area and locality

FIGURE 1-1

1.2 Purpose of this report

The purpose of this report is to document the outcomes of the Surface Water Impact Assessment undertaken by GHD to support SOILCO's application for the EA. This report also summarises the proposed conceptual surface water management plan developed through the assessment and design process.

1.3 Scope and limitations

The scope of this report is to summarise the surface water impact assessment considering potential surface water related impacts arising from the Project, including flooding, drainage, surface water quality, wastewater, flooding and water sourcing. The scope of this report also includes the development of a conceptual stormwater management plan.

This report has been prepared by GHD for SOILCO Pty Ltd and may only be used and relied on by SOILCO Pty Ltd for the purpose agreed between GHD and SOILCO Pty Ltd as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than SOILCO Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

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 *throughout this* report. GHD disclaims liability arising from any of the assumptions being incorrect.

1.4 Structure of this report

This report is structured as follows:

- Section 2 – summarises the key governing legislation and policy to inform the design and management requirements of the Project with relation to surface water
- Section 3 – describes the existing environment at the Project site relevant to surface water
- Section 4 – describes the Surface Water Management Plan in-built into the proposal development/design. This includes the basis for its development, with reference to the requirements of Section 2.
- Section 5 – provides an assessment of the impacts on surface water due to the project, with the inclusion of the measures outlined in Section 4, and where required, outlines additional mitigation measures required.
- Section 6 – concludes the report.

2. Regulatory context

This section outlines a review of the relevant legislation and regulations that was undertaken to contextualise the Project within the QLD planning system. It should be noted that Sections 4 and 5 further review and synthesise these requirements into specific objectives for the Project that were then adopted into the development of the Surface Water Management Plan and impact assessment/mitigation process.

The relevant legislation, guidelines and performance criteria were reviewed with regard to integrating appropriate measures with relation to the following key issues:

- Water sourcing and licensing (Section 2.2)
- Operational phase water quality management (Section 2.3)
- Construction phase water quality management (Section 2.4)
- Flooding (Section 2.5) Waterways and separation distances (Section 2.6)
- Stormwater quantity (non-flooding) (Section 2.7)

2.1 Legislation, regulations and codes

2.1.1 Environmental Protection Act 1994

The *Environmental Protection Act 1994* aims to protect Queensland's environment to maintain ecological processes, while allowing for development that improves current and future quality of life. It also defines environmental values and environmental harm and states the general environmental duty which requires that a person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm.

Environmental values relevant to the Project under the *Environmental Protection Act 1994* include natural and physical resources including surface water, groundwater and ecological habitats. Consideration of ecologically sustainable development principles is established in environmental licensing and a number of other legislative frameworks, relevant to the project as described below.

2.1.2 Environmental Protection Regulation 2019

Environmentally Relevant Activities (ERAs) describe activities which are generally industrial or intensive industries with the potential to release emissions which impact on the environment and surrounding land uses. Schedule 2 of the Environmental Protection Regulation 2019 lists all prescribed ERAs regulated by the Department of Environment, Science and Innovation (DESI). The Project is most closely aligned with the prescribed ERA 53 - Organic material processing. The organic material processing ERA is a listed concurrence ERA within Schedule 2 of the *Environmental Protection Regulation 2019*.

A Development Assessment (DA) is required for assessment of a prescribed concurrence ERA. An Environmental Authority (EA) is required to undertake an ERA; however, a DA application is also an application for an Environmental Authority (EA), under Section 115 (2) of the *Environmental Protection Act 1994*. Where a concurrence ERA is a Material Change of Use (MCU), the development application is referred to the state for assessment under Schedule 8 of the *Planning Regulation 2017* in accordance with State Code 22: Environmentally Relevant Activities and the Guideline.

2.1.3 State Code 22: Environmentally Relevant Activities

State Code 22 provides assessment benchmarks which identify overall performance outcomes (PO) to achieve the purpose statement and acceptable outcomes (AO) which identify one way to achieve the relevant performance outcome. Assessments must demonstrate compliance with either the PO or AO of the code. If the development does not meet the relevant AO or PO, SARA may determine on balance that the overall purpose statement is complied with. The provisions under State Code 22 for the Project relevant to surface water are addressed in the Environmental Assessment Report (GHD 2024).

2.1.4 Environmental Protection (Water and Wetland Biodiversity) Policy 2019

The *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* (EPP Water 2019) is nested within the *Environmental Protection Act 1994* and exists to protect the quality of all waters and wetlands in Queensland while also supporting ecologically sustainable development. Part 2 of the Policy outlines how it aims to achieve its purpose:

- Identifying environmental values for waters and wetlands to be enhanced or protected.
- Identifying management goals for waters.
- Stating water quality objectives and water quality guidelines for enhancing or protecting the environmental values of waters.
- Providing a framework for making consistent, equitable and informed decisions about waters.
- Monitoring and reporting on the condition of waters.

Schedule 1 of the Policy refers to documents published by the department which contain prescribed environmental values and water quality objectives for waters in Queensland. The water quality objectives for the Logan river are described in Section 3.4.

Logan River Environmental Values and Water Quality Objectives

The Logan River Environmental Values and Water Quality Objectives contains Environmental Values (EVs) and Water Quality Objectives (WQOs) for surface fresh and estuarine waters in the Logan River Basin and is listed under schedule 1 of the EPP (2019). Review of the WQ1454 Logan River Map DES (2022) indicates the Project is located within the Western Logan River Fresh Waters environmental value zone boundary. The environmental values (EVs) for the catchment are shown in Figure 2.1 and outlined in Table 2.1.

LOGAN RIVER BASIN (Refer plan WQ1454)	Environmental values ¹⁻⁵											
	Aquatic ecosystem	Irrigation	Farm supply/use	Stock water	Aquaculture	Human consumer ⁵	Primary recreation ⁵	Secondary recreation ⁵	Visual recreation ⁵	Drinking water ³	Industrial use	Cultural and spiritual values
Environmental Value Zone (listed alphabetically)												
Western Logan River Fresh Waters	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓

Figure 2.1 Environmental Values – Western Logan River Fresh Water catchment (EPP Water 2019 – Logan River Basin)

Table 2.1 Environmental Values – Western Logan River Fresh Water catchment

Environmental value zone	Description
Aquatic ecosystem	The aquatic ecosystem EV is a default applying to all Queensland waters, and therefore the WQOs for aquatic ecosystems form the minimum WQOs for all waters. The WQOs applicable to watercourses within the Project lot are described in Section 3.4.
Irrigation	The management goal for irrigation water is that the quality of water, when used in accordance with the best irrigation and crop management practices and principles of ecologically sustainable development, does not result in crop yield loss or soil degradation (noting that water quality requirements may differ by crop type).
Farm supply use	The management goal for farm supply use is that the quality of water is suitable for produce preparation and domestic uses other than drinking.
Stock water	The management goal for stock watering is that the quality of water provided to stock does not cause deterioration in stock health or condition (noting that water quality requirements may differ by stock type).

Environmental value zone	Description
Human consumption	The management goal is that the water quality is suitable for producing or taking aquatic foods that are safe and suitable for human consumption.
Primary recreation	The management goal for recreational water quality is to achieve a low risk to human health from water quality threats posed by exposure through ingestion, inhalation or contact during recreational use of water resources.
Secondary recreation	
Visual recreation	
Drinking water	The management goal is to: — minimise the risk that the quality of raw water taken for treatment for human consumption results in adverse human health effects — maintain the palatability rating of water taken for treatment for human consumption at the level of 'good' as set out in the Australian Drinking Water Guidelines — minimise the risk that the quality of raw water taken for treatment for human consumption results in the odour of drinking water being offensive to consumers.
Industrial use	The management goal for industrial use is that the quality of water provided to industry is, with an appropriate level of treatment, suitable for industrial use. Industries usually treat water supplies to meet their specific needs, accordingly no WQOs are specified
Cultural and spiritual values	The management goal is that water is suitable to support identified cultural and spiritual values of waters, including those of Aboriginal people or Torres Strait Islanders. Management goals and objectives specified for aquatic ecosystems and other human water uses (including recreation, human consumption of aquatic foods, and drinking water) will assist in supporting some aspects of cultural and spiritual values of water.

2.1.5 Water Act 2000

The *Water Act 2000* is the governing legislation for the sustainable management of Queensland's water resources. The main purposes of the *Water Act 2000* are to provide a framework for water security in terms of planning, management of supply and demand, management of impacts on underground water caused by the exercise of underground water rights by the resource sector and the effective operation of water authorities.

The *Water Act 2000* details the framework for licenses or permits to take water. However, these licenses do not authorise the construction of groundwater related works, which is dealt with in the *Planning Act 2016*. The *Water Regulation 2016* administers the provisions of the *Water Act 2000* with respect to administrative and operational matters. The QLD Government also prepares and implements water plans and water use plans and administers these plans under the *Water Act 2000*. The Project is located within the Water Plan (Logan Basin) 2007 plan area (refer to Section 2.1.4).

2.1.5.1 Water Regulation 2016

The *Water Regulation 2016* intends to prescribe the administrative and operational matters of the *Water Act 2000*. Relevant sections of the *Water Regulation 2016* include water licencing and water allocations, water rights and planning, authorisations to take or interfere with water, and water supply and demand management.

A **water licence** is an authority granted under the *Water Act 2000* to either take water, interfere with water or both interfere with and take water where these two activities are inextricably linked. A water licence is required for taking or interfering with water in a watercourse for stock and domestic use on lands, irrigation, industrial and commercial use, storage of water behind a weir, impounding water behind a storage structure, or storing water in excavations that are within or connected to a watercourse.

Water sourcing and licensing requirements for the Project are described in Section 2.2.

2.1.6 Planning Act 2016

The purpose of the *Planning Act 2016* is to establish a system for land use planning, development assessment and related matters which facilitates ecological sustainability.

2.1.6.1 State Planning Policy 2017

The State Planning Policy (SPP) outlines the Queensland Government's interests in, and policies for, a range of land use planning matters. It provides a policy framework for planning outcomes across Queensland by requiring that these state interests are delivered through local government planning schemes and regional plans. The SPP contains guiding principles to ensure plan-making and development assessment systems are outcome focused, integrated, efficient and accountable.

Scenic Rim Regional Council Planning Scheme (refer below) has developed an integrated development scheme as per Part 2 State Planning Provisions.

2.1.6.2 Scenic Rim Planning Scheme 2020

SRRC developed the Scenic Rim Planning Scheme which commenced in 2020, which is a framework for managing development in accordance with the Planning Act 2016 and the SPP (2017). The Scenic Rim Planning Scheme contains overlay areas which identify areas relevant to state and local interests that may have sensitivity, land use constraints, valuable resources or development opportunities. The overlays which traverse through the project site include:

- OM4E Environmental significance – Local Watercourses (watercourse buffer area A)
- OM7A Landslide Hazard Steep Slope – Steep Slope
- Bromelton State Development Area Industrial Precincts

Where an overlay traverses a proposed assessable development lot boundary, the planning scheme outlines performance criteria and related acceptable outcomes to be achieved by the project, which are outlined within overlay codes. The overlay codes relevant to this assessment include:

- Environmental significance overlay code
- Landslide Hazard Steep Slope – Steep Slope overlay code

These overlay code performance outcomes relevant to the Project are discussed in Section 2.3 to Section 2.6.

2.1.6.3 Development Guidelines for Water Quality Management in Drinking Water Catchments 2017 (Seqwater 2017)

The Seqwater Development Guidelines for Water Quality Management in Drinking Water Catchments (Seqwater 2017) provide an assessment framework to manage the risk of development activities in the drinking water catchments in South East Queensland (SEQ), in accordance with the State Planning Policy (2017) and the South East Queensland Regional Plan (2017). Seqwater (2017) catchment overlay code applies to developments within a water resource catchment, Water Supply Buffer area or aquifer recharge area. The Project is located in a water resource area and within the water supply buffer area, as identified within Figure 1 of Seqwater (2017).

As the Project is considered to be a high impact industry, the development is considered to be 'Assessable' with the Assessment Benchmarks for Assessable Development. The benchmarks for assessable developments relevant to this report include:

- Separation distances
- Stormwater quality and hydrology
- Wastewater

2.2 Water sourcing and water licence

Water security and water licencing in Queensland are primarily governed by the *Water Act 2000* (Section 2.1.2) and administered by the *Water Regulation 2016* (Section 2.1.5.1). Water take within the Project site would be subject to the conditions set out by the *Water Plan (Logan Basin) 2007* (Section 2.2.1) for water resources. Water is required to be sourced from local water resources to support the construction and operation of the Project.

2.2.1 Water Plan (Logan Basin) 2007

A water plan is a plan that applies to a part of the State and advances the sustainable management of Queensland's water. Water plans may apply to rivers, lakes and springs, overland flow and underground water.

The Project is located within the Logan Basin water plan area. Water availability and supply is therefore regulated under the *Water Plan (Logan Basin) 2007* (the Water Plan). In accordance with Part 2 of the Water Plan, this area includes water in a watercourse or lake, and water in springs not connected to water which the *Water Plan (Great Artesian Basin and Other Regional Aquifers) 2017* applies. Review of the *Great Artesian Basin and Other Regional Aquifers) 2017* plan map indicates the Project is not located within this area.

The Water Plan also sets environmental flow objectives for performance indicators for sub catchments within the Plan area. As shown in Figure 2.2, the Project site is located south of Allan Creek, within sub catchment area 3, the largest sub catchment within the Plan. The use of these flow objectives within this assessment have been excluded, on the basis that impacts at the sub catchment outlet node G will not be measurable, given the relative size of the catchment area to be excised for the Project compared to the overall sub catchment area.

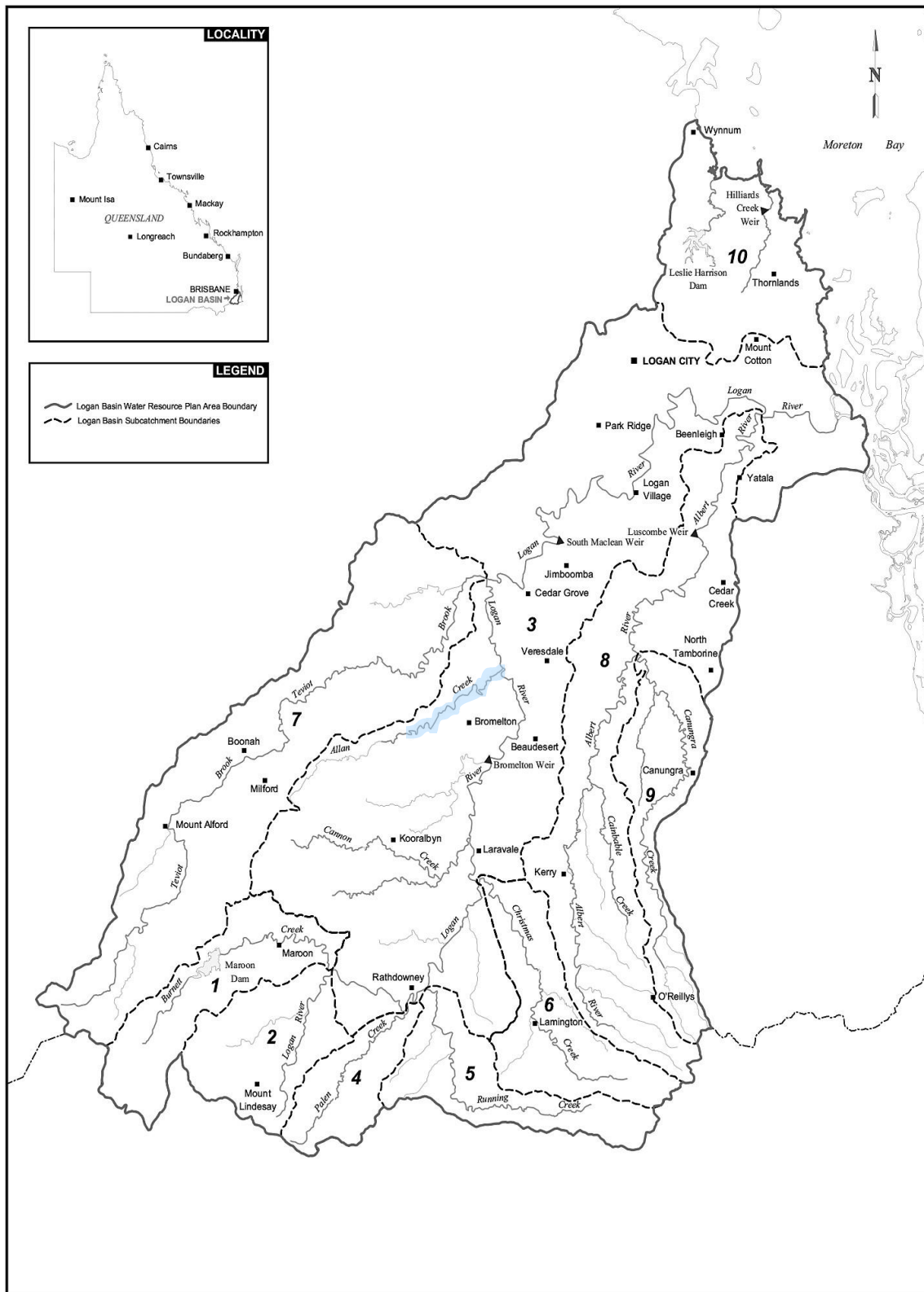


Figure 2.2 Logan Basin sub-catchments for the Water Plan (Logan Basin) 2007

Note: highlighted blue section of Allan Creek is downstream of the Project.

2.3 Operational phase water quality management

A critical component of operational water quality management for the Project is providing for the separation of water quality streams, in particular, the separation of stormwater (unimpacted by organics activities at the site) from impacted water.

The Model Operating Conditions (MOC) for ERA 53 were identified as the most specific guideline to inform the framework for the management of operational phase water quality. The MOC as relevant to this assessment are included in Section 2.3.1. Consideration of the Seqwater guidelines is also undertaken, noting they are not specific to composting sites.

2.3.1 ERA 53 (a) Model operating conditions

The MOC for ERA 53 (a) Organic material processing by composting document is relevant to the proposed development. The model operating conditions provide a non-mandatory framework of conditions that apply to site specific applications for an environmental authority to undertake ERA 53 (a) in QLD

The MOC outline specific conditions related to protecting water values, which may form part of the EA for the proposed development. As the EA would permit the site to undertake an ERA, the Project seeks to meet the MOC in addition to other relevant requirements.

Review of the operating conditions suggest that leachate means a liquid that has passed through or emerged from or is likely to have passed through or emerged from, a material that contains soluble, suspended or miscible contaminants. This is key for interpretation of the guidelines, however elsewhere in this report and in the design of the site, leachate is used to define any water potentially contaminated by organics handling or composting activities, whether infiltrated water or surface water runoff.

The conditions define disturbed areas as areas that are susceptible to erosion and/or have been contaminated by the activity, and/or upon which stockpiles of soil or other materials are located.

Table 2.2 Model operating conditions – ERA 53

Condition	Description
WT1	Other than as permitted within this environmental authority, contaminants must not be released to waters
WT2	Any stormwater which filters through composting piles or stored feedstock must be managed as leachate.
WT3	Stormwater Stormwater must be managed to: a) prevent stormwater from being contaminated by the activity; or b) direct stormwater that is contaminated by the activity to stormwater treatment and retention measures.
WT4	Stormwater treatment and retention measures must have capacity to retain stormwater runoff from disturbed areas generated by a rainfall event up to and including a 24-hour rainfall event with an Annual Exceedance Probability (AEP) of [insert site-specific AEP]
WT5	Stormwater may only be released to waters where: (a) beneficial reuse of contained stormwater runoff on site is not viable; and (b) the release is necessary to maintain stormwater retention capacity required by condition WT4; and (c) there are no contaminants present that will, or that are capable of causing environmental harm.
WT6	Leachate must be collected and stored in: (a) Aerated ponds that maintain aerobic conditions; or (b) An enclosed leachate tank.
WT7	Leachate collection and storage must be designed, installed, operated and maintained by an appropriately qualified person to: (a) Prevent ponding of leachate in any area other than the designated leachate collection and/or storage areas; and (b) Prevent the leachate directly entering a stormwater basin; and (c) Drain leachate away from composting material; and

Condition	Description
	(d) Drain leachate to a collection drain; and (e) Ensure the structural integrity of the impervious barrier is maintained.

2.3.2 Development Guidelines for Water Quality Management in Drinking Water Catchments 2017 (Seqwater 2017)

The Seqwater Development Guidelines for Water Quality Management in Drinking Water Catchments (SEQ Water 2017) include performance outcomes for stormwater management during operational stages to protect drinking water supply environmental values.

Table 2.3 Stormwater quality performance outcomes under Seqwater (2017) development guidelines

Performance outcomes	Acceptable outcomes
PO5 Wastewater treatment systems are designed, constructed and managed in ways that do not compromise the drinking water supply environmental values.	AO5.1 Development does not involve an on-site wastewater facility. OR AO5.2 Where the combined total peak design capacity of wastewater treatment is less than 21 Equivalent Persons (EP), the design of the system achieves a Low or Medium Risk classification in accordance with Seqwater's Land Use Risk Tool for on-site sewage facilities. OR AO5.3 Where the combined total peak design capacity of wastewater treatment is 21EP or greater, the system is located and designed in the following manner: a. achieves a minimum secondary treatment standard with nutrient removal and disinfection; b. on land at or above the 0.5% AEP flood event; c. the hydraulic capacity of the system is five times the average dry weather flow (ADWF); d. no direct discharge of sewage to a waterway or water supply source occurs, unless during a bypass event that exceeds peak hydraulic capacity and sewage is screened and disinfected before release; e. where treated effluent will be used in irrigation, application is: i. confined to a dedicated area of land suitably located and sized, and using irrigation practices that will not adversely affect groundwater and surface water quality; and ii. located on land at or above the 0.5% AEP flood event; and f. where the combined total peak design capacity of wastewater treatment is 1500EP or greater, and direct discharge to a waterway is the only reasonably practical disposal option, the contribution of flow from the system must be modelled over the range of reasonably expected flow events. If the proportion of flow is: i. <10% of the total flow, 3-log reduction bacteria and virus, and 4-log reduction protozoa, minimum pathogen log-reduction values apply; or ii. >10% of the total flow, it must demonstrate compliance with the Australian guidelines for water recycling (Phase 2): Augmentation of drinking water supply (to be undertaken in consultation with Seqwater).
PO8 Manage stormwater during operational (postconstruction) stages to protect drinking water supply environmental values	AO8.1 Development does not involve an impervious area greater than 1,000m ² .

Performance outcomes	Acceptable outcomes
and facilitate the achievement of water quality objectives for receiving waters. Note: Drinking water supply environmental values are referenced within Schedule 1 of the Environmental Protection Policy (Water) 2009.	OR AO8.2 Development is for reconfiguring a lot that; a. will not create more than two additional lots; or b. involves a land area less than 1000m². OR AO8.3 Stormwater run-off generated during operation (post-construction) demonstrates a minimum reduction in mean annual load from unmitigated development that achieves the following stormwater management design objectives: • 85% reduction in total suspended solids; • 65% reduction in total phosphorus; • 45% reduction in total nitrogen; and • 95% reduction in gross pollutants. OR AO8.4 Stormwater run-off generated during operation is captured and transferred off-site or captured and treated to any applicable re-use standards and reused on-site. Note: A Site Stormwater Quality Management Plan is to be prepared by a suitably qualified individual such as a Civil Engineer or an Environmental Professional and is to be certified by a Registered Professional Engineer (RPEQ) (Civil or Environmental) to demonstrate compliance with the stormwater design objectives.

2.3.3 Scenic Rim Planning Scheme (SRRC 2020)

The SRRC (2020) Landslide Hazard Steep Slope Overlay traverses the Project site. The relevant performance objectives from the overlay code with respect to stormwater drainage are presented in Table 2.4.

Table 2.4 Landslide hazard steep slope overlay

Performance objective	Acceptable outcome
PO6 Development ensures that stormwater runoff does not: increase the susceptibility of the site to landslide; and does not cause detriment to the natural environment or to any other lots.	AO6 Stormwater drainage (including roof guttering and rainwater tank overflows) is managed to avoid an increase in on-site groundwater, ponding of water and water concentration into slopes and discharges to a lawful point of discharge

2.4 Construction phase water quality

In addition to the operational phase water quality guidelines, the scale of construction phase activities also requires consideration of particular controls to restrict impacts to water quality. These include consideration of the Seqwater (2017) guidelines, the SPP (2017), and best practice erosion and sediment control guidelines (IECA 2008), as described below.

2.4.1 Seqwater Development Guidelines – Water quality management in drinking water catchments

Seqwater (2017) provides performance outcomes for the management of surface water runoff during the construction phase. The Seqwater performance outcomes are outlined in Table 2.5. The acceptable outcomes of the Seqwater (2017) guidelines make reference to Appendix 2, Table A of the SPP for the development of stormwater management design objectives. These design objectives are outlined in Section 2.4.2.

Table 2.5 Seqwater (2017) stormwater quality and hydrology

Performance outcome	Acceptable outcomes
PO7 Manage stormwater at the construction phase to protect drinking water supply environmental values and facilitate the achievement of water quality objectives for receiving waters.	AO7.1 At the construction stage, an erosion and sediment control program (ESCP) demonstrates that stormwater achieves the design objectives listed in Table A of the SPP (appendix 2): Construction Phase – Stormwater management design objectives (all parts). OR AO7.2 An ESCP demonstrates how stormwater quality will be managed at the construction stage in accordance with an acceptable regional or local guideline so that target contaminants are treated to a design objective at least equivalent to Table A of the SPP (all parts). OR AO7.3 Stormwater run-off generated during construction is captured and transferred off-site or captured and treated to any applicable re-use standards and reused on-site.

2.4.2 State Planning Policy (2017) – Appendix 2 – Stormwater management design objectives

The stormwater management design objectives as described by the SPP (2017) are presented in Table 2.6. The SPP (2017) makes reference to construction areas greater than 2500m² requiring a minimum of 80% of average annual runoff volumes of the contributing catchment to be treated to 50 mg/L TSS or less and pH in the range of 6.5 – 8.5 pH units. It is noted these requirements are implemented within the *Procedural guide, Releases to waters from land development sites and construction sites 2500 m² and greater* (the Procedural Guide; DES 2019) in accordance with IECA (2008 and 2018). These guidelines are described in Section 2.4.3 and Section 2.4.4 respectively.

Table 2.6 State Planning Policy – Appendix 2 - Stormwater management design objectives

Issue	Desired outcomes
Sediment control	1. Direct runoff from exposed site soils to sediment controls that are appropriate to the extent of disturbance and level of erosion risk. 2. All exposed areas greater than 2500 m ² must be provided with sediment controls which are designed, implemented and maintained to a standard which would achieve at least 80% of the average annual runoff volume of the contributing catchment treated (i.e. 80% hydrological effectiveness) to 50mg/L Total Suspended Solids (TSS) or less, and pH in the range (6.5–8.5).
Drainage control	1. Manage stormwater flows around or through areas of exposed soil to avoid contamination. 2. Manage sheet flows in order to avoid or minimise the generation of rill or gully erosion. 3. Provide stable concentrated flow paths to achieve the construction phase stormwater management design objectives for temporary drainage works (part 2). 4. Provide emergency spillways for sediment basins to achieve the construction phase stormwater management design objectives for emergency spillways on temporary sediment basins (part 3).
Erosion control	1. Stage clearing and construction works to minimise the area of exposed soil at any one time. 2. Effectively cover or stabilise exposed soils prior to predicted rainfall. 3. Prior to completion of works for the development, and prior to removal of sediment controls, all site surfaces must be effectively stabilised using methods which will achieve effective short-term stabilisation.
Litter, hydrocarbons and other contaminants	1. Remove gross pollutants and litter. 2. Avoid the release of oil or visible sheen to released waters. 3. Dispose of waste containing contaminants at authorised facilities.
Waterway stability and flood flow management	1. Where measures are required to meet post-construction waterway stability objectives (specified in table B), these are either installed prior to land disturbance and are integrated with erosion and sediment controls, or equivalent alternative measures are implemented during construction. 2. Earthworks and the implementation of erosion and sediment controls are undertaken in ways which ensure flooding characteristics (including stormwater quantity characteristics) external to

Issue	Desired outcomes
	the development site are not worsened during construction for all events up to and including the 1 in 100 year ARI (1% AEP).

2.4.3 Procedural guide, releases to waters from land development sites and construction sites 2500 m² and greater (DES 2019)

The Procedural guide provides a framework for achievement of the water quality provisions of the EP Act. The Procedural Guide applies to all Queensland construction sites greater than 2500 m². While the Procedural guide provides assessment criteria for actual and potential water contamination, it also provides assessment criteria for depositing prescribed water contaminants or release of stormwater runoff. The general provisions of the document include:

- Requirements for development of erosion and sediment control plans
- Prevention, reduction and treatment of contaminants
- Erosion control, including:
 - *the extent of clearing is restricted to that necessary for access to, and safe construction of the approved works i.e. vegetation remains intact or is protected in all other areas of the site the duration of exposure is minimised by undertaking works so that:*
 - *clearing of vegetation is only undertaken immediately prior to an area being actively worked*
 - *the work is staged to minimise the area of soil exposed at any one time*
 - *if clearing is undertaken in areas which are not intended to be immediately worked, such areas are effectively stabilised immediately following clearing*
 - *areas at finished level are effectively stabilised*
 - *steep areas, such as stockpiles, batters and embankments, which are not being actively worked, are effectively stabilised.*
- Drainage control, including the criteria provided in Section 2.4.5
- Sediment control, including:
 - *all site sub-catchments with greater than 2500m² of exposed soil drain to an appropriate sediment control device (e.g. sediment basins and including associated drainage controls), which is designed, implemented and maintained to a standard which would achieve at least 80 per cent of the average annual run-off volume of the contributing catchment treated to 50mg/L Total Suspended Solids (TSS) or less*
 - *the sediment control have the capacity to store two months' sediment from the receiving catchment, as determined using the Revised Universal Soil Loss Equation (RUSLE)*
- Risk management
- Disturbances in waterways
- Monitoring and adaptive management.

It should be noted that the sediment control standard has been developed in response to the low effectiveness of traditional batch sediment basins which were implemented in accordance with the previous standard. The above revised standard was incorporated in an update to IECA (2008) - Appendix B (IECA 2018) to incorporate design procedures for more effective continuous-flow (or high efficiency) sediment basins capable of meeting this standard.

2.4.4 Best Practice Erosion and Sediment Control (IECA 2008 and 2018)

IECA has published a suite of Erosion and Sediment Control guidelines which intends to provide guidance in the planning, design installation and maintenance of erosion and sediment control measures on building and construction sites, with the intent to facilitate the minimisation of environmental harm. The general principles from

IECA (2008) will be applied the development of erosion and sediment controls for the project, where local or state guidelines and codes are non-specific.

The design and implementation of sediment basins are outlined in the updated Appendix (IECA 2018) is relevant to the management of construction phase water quality.

Table 2.7 *Basin type and performance criteria*

Basin type	Soil and/or catchment conditions	Features
Type A	The duration of the soil disturbance within a given drainage catchment, exceeds 12 months 1,2,3	- Type A basins are considered the most effective sediment traps for clayey soils. - Pond size is governed by both minimum volume and minimum surface area requirements. - Operation of the sediment basin relies on the installation of an automatic chemical dosing system. - A floating decant system collects water from the top of the water column during the storm event. - In most circumstances, the settling pond is required to be de-watered to the nominated static level prior to a rain event that is likely to produce runoff. - Temporary basins are typically sized for the 1 year ARI, 24 hour storm event.
Type B	The duration of the soil disturbance within a given drainage catchment, does not exceed 12 months 1,2,3	- Pond size is primarily governed by a minimum required surface area. - These basins are typically larger in volume and surface area than Type A basins. - Operation of the sediment basin relies on the installation of an automatic chemical dosing system. - Ideally the settling pond should be de-watered prior to a rain event that is likely to produce runoff; however, during dry conditions water may be retained in the pond as a source of water for usage on the construction site. - Temporary basins are typically sized for a discharge of 0.5 times the peak 1 in 1 year ARI critical duration storm.
Type C	Less than 33% of soil finer than 0.02 mm (i.e. $d_{33} > 0.02$ mm) and no more than 10% of soil dispersive	- Type C basins are limited to works within non-dispersive, low-clay, sandy soils. - Pond size is governed by a minimum required surface area. - These basins are free-draining, which means they are normally 'empty' at the start of rainfall; however, under certain conditions water may be retained in the pond as supply a source of water for usage on the site. - Temporary basins are typically sized for a discharge of 0.5 times the peak 1 in 1 year ARI critical duration storm
Type D	An alternative to type A or B basin where it can be demonstrated that automatic chemical flocculation is not reasonable or practical 3,	- Pond size is governed by a minimum required volume. - Operation of the sediment basin normally relies on chemical dosing, using either an automatic or manual chemical dosing system. - The settling pond is required to be de-watered to the bottom of the settling zone prior to a rain event that is likely to produce runoff. - Temporary basins are typically sized for an 80%ile, 5-day rainfall depth, depending on catchment conditions and risk.

Note:

1. Duration of soil disturbance include periods when there is likely to be less than 70% of groundcover
2. Reasonableness and practicality comes down to whether effective automated dosing can be implemented – i.e. multiple inflow locations
3. Type D basins may be implemented in lieu of type A or B basins where shown to achieve a commensurate performance outcome. Alternative designed should demonstrate through long-term water balance modelling:
 - a. The equivalent water quality outcomes of existing type A basins in the local area
 - b. If local data on the performance of type A basins is not available, as least 80% of the annual average runoff volume can achieve the specified WQO

2.4.5 Scenic Rim Planning Scheme

The Environmental Significance Overlay Code for local waterways applies to the Project. PO11/AO11 of this code requires that a site-based stormwater quality management plan be prepared in accordance with the design objectives identified in Table 8.2.4.3.2 of the Planning Scheme. These design objectives are replicated in Table 2.8. It is noted that the requirements contained in Table 2.8 generally reflect those described in IECA (2008), DES (2019) and SPP (2017), given the Scenic Rim Planning Scheme is the regional framework for managing development in accordance with the *Planning Act 2016* and the SPP (2017). However, it is noted that the requirements outlined for sediment control are equivalent to the requirements of DES (2019), as outlined for Type D sediment basins described in the updated appendix (IECA 2018) to Best Practice Erosion and Sediment Control, IECA (2008).

Table 2.8 *SRRC Planning Scheme - Stormwater management design objectives*

Element	Measure	Criteria
Drainage control	Temporary drainage works	1. Design life and design storm for temporary drainage works:
		a. Disturbed area open for <12 months—1 in 2-year ARI event
		b. Disturbed area open for 12–24 months—1 in 5-year ARI event
		c. Disturbed area open for > 24 months—1 in 10-year ARI event
		2. Design capacity excludes minimum 150 mm freeboard
		3. Temporary culvert crossing—minimum 1 in 1-year ARI hydraulic capacity
Erosion control	Erosion control measures	1. Minimise exposure of disturbed soils at any time 2. Divert water run-off from undisturbed areas around disturbed areas 3. Determine the erosion risk rating using local rainfall erosivity, rainfall depth, soil-loss rate or other acceptable methods 4. Implement erosion control methods corresponding to identified erosion risk rating
Sediment control	1. Sediment control measures 2. Design storm for sediment control basins 3. Sediment basin dewatering	1. Determine appropriate sediment control measures using: a. potential soil loss rate, or b. monthly erosivity, or c. average monthly rainfall
		2. Collect and drain stormwater from disturbed soils to sediment basin for design storm event: a. design storm for sediment basin sizing is 80th% five-day event or similar
		3. Site discharge during sediment basin dewatering: a. TSS < 50 mg/L TSS, and b. Turbidity not >10% receiving waters turbidity, and c. pH 6.5–8.5
Water quality	Litter and other waste, hydrocarbons and other contaminants	1. Avoid wind-blown litter; remove gross pollutants
		2. Ensure there is no visible oil or grease sheen on released waters

Element	Measure	Criteria
		3. Dispose of waste containing contaminants at authorised facilities
Waterway stability and flood flow management	Changes to the natural waterway hydraulics and hydrology	1. For peak flow for the 1-year and 100-year ARI event, use constructed sediment basins to attenuate the discharge rate of stormwater from the site

2.5 Flooding

2.5.1 Australian Rainfall and Runoff (ARR, 2019)

Australian Rainfall and Runoff (ARR 2019) is the primary technical publication for stormwater and hydrological estimates and design considerations. The publication was the result of several years' of updates to the previous version of Australian Rainfall and Runoff (Engineers Australia 1987). The technical analysis and development of the hydrologic and hydraulic models, including the management and flooding at the site would need to consider this guideline.

2.5.2 Scenic Rim Planning Scheme (2020) - Flood Hazard Overlay Code

SRRC (2020) has published a flood overlay code which provides overarching performance outcomes and acceptance criteria for assessable developments. The purpose of the Flood Hazard Overlay Code is to ensure that development in a flood hazard area is compatible with the risk of the flood hazard and protects life and property. While the flood hazard overlay does not traverse the site, the minimum flood immunity standards for infrastructure have been adopted.

The defined minimum flood immunity standards for infrastructure, such as waste management facilities (refer to Table 8.2.6.3.2 of Scenic Rim Planning scheme) are replicated in Table 2.9.

Table 2.9 Scenic Rim Planning scheme – Minimum flood immunity standards for infrastructure

Infrastructure type	Settlement context	Floodplain Context	Minimum immunity
Cemetery and crematorium Sporting facility, community centre, meeting hall (where not used as an evacuation or recovery facility) Waste management facilities Storage and works depots and similar facilities, including administrative facilities associated with the provision or maintenance of the community infrastructure mentioned in this part.	All	High hazard or limited warning (e.g. less than 24 hours)	Locate outside 1% AEP.
		High hazard and longer warning	Locate outside 1% AEP. OR Building floor levels above 1%AEP plus freeboard.
		Lower hazard and longer warning	

2.6 Waterways and separation distances

2.6.1 Seqwater (2017) guidelines

The Seqwater (2017) guidelines note the following assessment benchmarks for separation distances for assessable developments, outlined in Table 2.10. Table 5 of Seqwater (2017) are replicated in Figure 2.3.

Table 2.10 Assessment benchmarks for separation distances Seqwater (2017)

Performance outcome	Acceptable outcome
PO1 Development maintains an adequate separation distance and avoids areas of potential flood inundation to protect waterways or water supply sources.	AO1.1 Development complies with the separation distances and other locational criteria specified in Table 5. Note: Where another setback distance or locational criteria is identified within this code, the higher standard applies.

Development type and activities	Stream Order 1 To 3	Stream Order 4 or greater	Full supply level of a dam, lake or reservoir or watercourse that serves as a potable water supply	Flood immunity
Intensive animal industry	50m	100m	800m	AEP 1%
Aquaculture	Case-by-case basis	Case-by-case basis	Case-by-case basis	N/A
All other agricultural or forestry land uses	50m	100m	400m	Buildings – AEP 1% Other areas – AEP 20%
Extractive industry	50m	100m	400m	AEP 1%
All other industry uses	100m	100m	800m	
Motor sport facility	50m	100m	400m	Buildings – AEP 1% Other infrastructure (e.g. trails) – AEP 20%
Outdoor sport and recreation				
Major sport, recreation and entertainment facility				
Service station	50m	100m	800m	AEP 1%
All other development types	50m	100m	400m	AEP 1%

Figure 2.3 Table 5 of Seqwater (2017)

The Seqwater (2017) guidelines also provide assessment benchmarks for excavation and filling activities on development sites. These benchmarks would apply to construction phase earthworks and design of developments near waterways for assessable developments. These benchmarks are outlined in Table 2.11.

Table 2.11 Assessment benchmarks for excavation and filling Seqwater (2017)

Performance outcome	Acceptable outcome
PO13 The siting and design of earthworks minimises impacts on the natural landform that may cause contamination or interfere with the flow of a waterway or water supply source.	AO13.1 Earthworks comply with the following locational criteria: a. 25m setback to a stream order 1–3; b. 50m setback to a stream order 4 or greater; c. 200m setback to a full supply level of a dam, lake or reservoir or watercourse which serves as a potable water supply; d. is not undertaken on land at or below the 1% AEP; and e. is not undertaken on a slope greater than 15%.

2.6.2 Scenic Rim Planning Scheme (2020) – Environmental Significance Overlay Code

SRRC (2020) Environmental Significance Overlay Code performance outcome (PO10) requires developments within a watercourse buffer area shown on the Environmental Significance Overlay Map – Local watercourse OM-04-E. The requirements are outlined in Table 2.12.

Table 2.12 Performance outcomes for watercourse offsets – Scenic Rim Planning Scheme

Performance outcome	Acceptable outcome
PO10 Development within a Watercourse Buffer Area (A, B or C) shown on environmental Significance Overlay Map – Local Watercourse OM-04-E has no adverse impact on: – Native vegetation – Terrestrial and aquatic habitat – Ecological functions – Native conservation functions	AO10 The development footprint is not located within: – 10 m from the high or outer bank of the watercourse located in Watercourse buffer area A – 25 m from the high or outer bank of the watercourse located in Watercourse buffer area B – 50 m from the high or outer bank of the watercourse located in watercourse buffer area C

2.7 Stormwater quantity (non flooding)

2.7.1 Seqwater (2017) guidelines

The Seqwater (2017) guidelines note the following assessment benchmarks for surface water flows for assessable developments, outlined in Table 2.10.

Table 2.13 Performance outcomes for stormwater quantity Seqwater (2017)

Performance outcomes	Acceptable outcomes
PO10 Development avoids and minimises changes to the existing surface water natural hydrological regime so that: - there is no change to the reference high-flow and low-flow duration frequency curves, lowflow spells frequency curve and mean annual flow to and from waterways as a result of the development; - any relevant flows into waterways comply with the relevant flow objectives of the applicable water plan for the area; and - the collection and re-use of stormwater occurs so there is no increase to the velocity or volume of stormwater flows entering a waterway.	No Acceptable outcome is nominated

3. Existing environment

This section outlines the existing environment of the project site and surrounds with particular relation to surface water.

3.1 Climate

Daily rainfall data were obtained from the Scientific Information for Land Owners (SILO) database operated by the Queensland Government - Department of Environment and Science (DES 2024). SILO patched point data are based on historical data from a particular Bureau of Meteorology (BOM) station with missing data interpolated from nearby stations. For this assessment, SILO data were obtained for grid point -28.00, 152.90, which is located within proximity to the Project site. The patched point annual rainfall depth totals between 1970 and 2023 inclusive are shown in Figure 3.1.

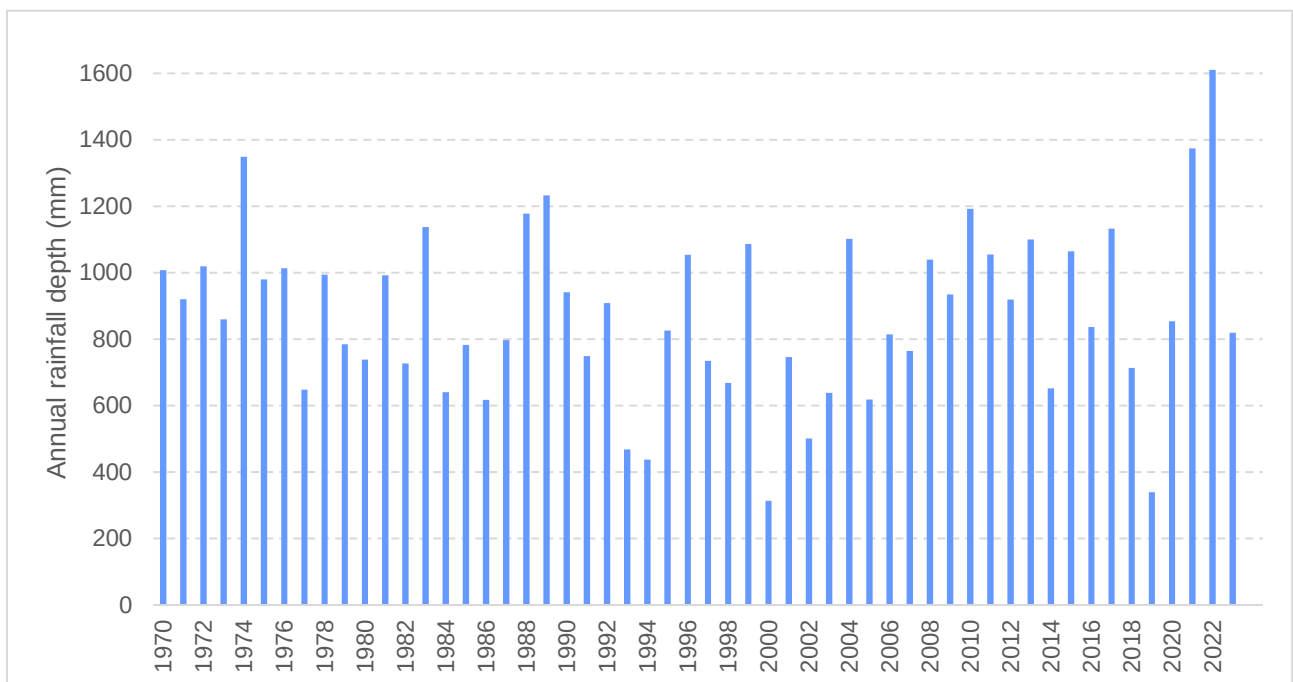


Figure 3.1 Annual rainfall depth totals

The annual rainfall statistics associated with the Project area are:

- Minimum annual rainfall total – 313.4 mm in 2000
- Median annual rainfall of 856.1 mm
- Average annual rainfall of 888.0 mm
- Maximum rainfall total – 1610.2 mm in 2022

Average monthly rainfall and evaporation depths have been reviewed as shown in Figure 3.2.

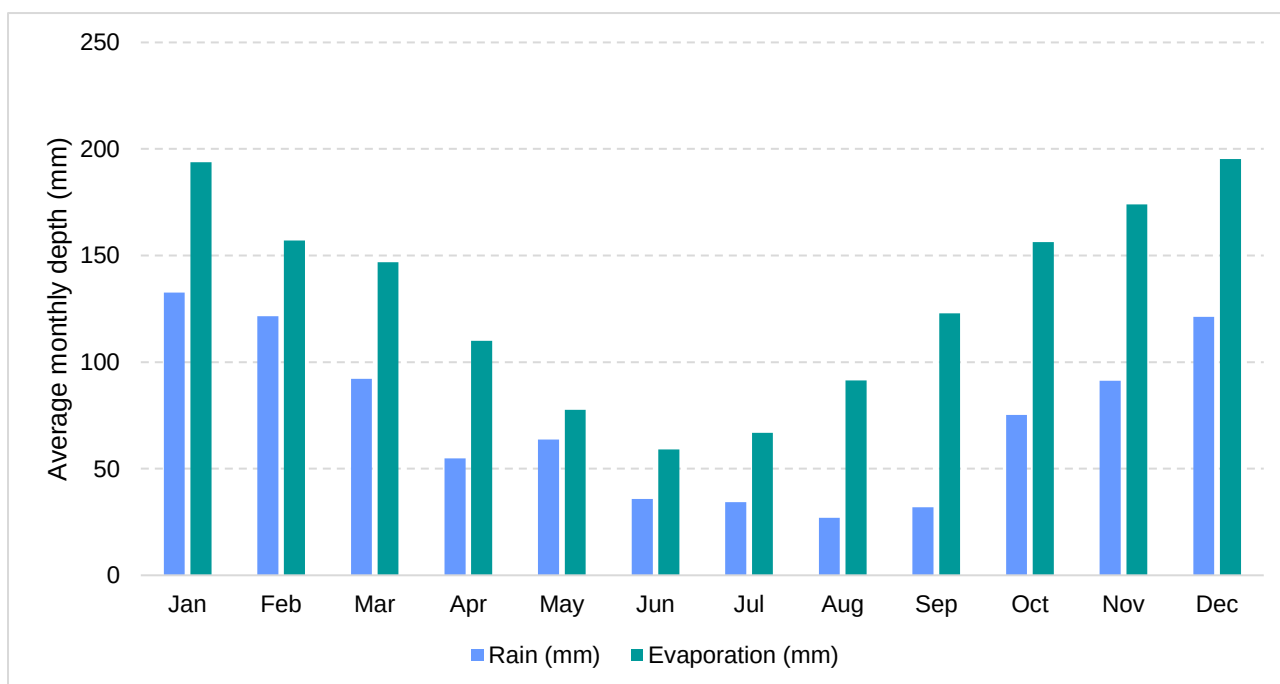


Figure 3.2 Average monthly rainfall and evaporation depths

As shown in Figure 3.2, rainfall and evaporation are seasonal, with higher rainfall and evaporation totals occurring in October to March, and the lowest totals occurring in April to September. Review of the average monthly rainfall and evaporation depths indicates a monthly rainfall deficit in each month throughout the year, though occurring more strongly during September to April. The annual average rainfall deficit from 1970 to 2023 is 673 mm.

3.2 Topography and hydrology

The regional topography in the vicinity of the project site includes foothills and valleys extending from an unnamed ridge, which is located 6km south of the Project site. The Project site is undulating and slopes relatively steeply towards the north, with site elevations ranging from 155 m AHD at the southern boundary of the Project site to 100 m AHD at the northern boundary. The grade of west-east undulations at the Project site are up to 24%.

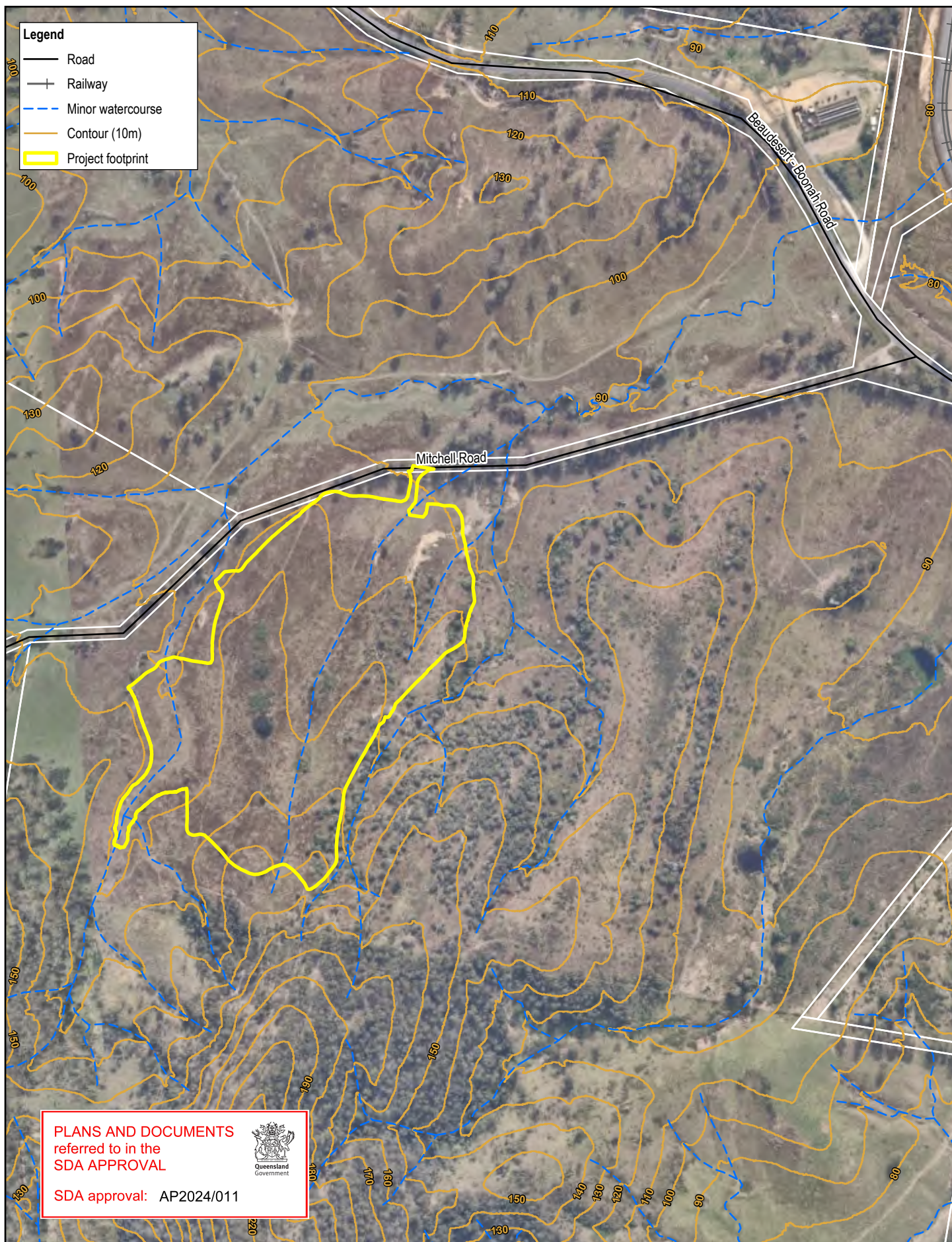
The Project site is situated within the regional catchment of the Logan River, a coastal draining watercourse some 4.8 km downstream of the Project site. Major regional hydrological features include Wyaralong Dam, located 4.6 km to the northwest, which impounds Teviot Brook, a direct tributary of the Logan River downstream of the Project site. Bromelton Off Stream Storage, an off-stream storage located adjacent the Logan River, is also located 4.2 km north east of the Project site, however is currently not in commission.

According to Queensland Globe mapping, two mapped “drainage features” of Allan Creek intersect the Project site.

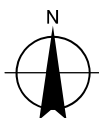
For the purposes of the definitions of waterways under the *Water Act 2000*, the waterways within the Project lot are considered to be “drainage features”. However, several of the first order tributaries are also mapped as “unmapped” features. Liaison with DRDMW has informed the following outcome:

- The unmapped features traversing Lot 4 RP85497 have been determined as drainage for the purpose of the *Water Act 2000*, and Queensland Globe will be updated to reflect this. Therefore, the department has no requirements for an authorisation to undertake any proposed works.

These unmapped features therefore drain north to adjoin a third order, north easterly flowing tributary of Allan Creek. Allan Creek is a fourth order tributary of the Logan River at the confluence of these waterways. There are farm dams located within the lot boundary, including approximately 650 to 700 m east of the Project site. The hydrological features in the vicinity of the Project site are shown in Figure 3.3.



Paper Size ISO A4
0 50 100 150 200
Metres



Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56



SoilCo Pty Limited
Bromelton Compost Manufacturing Facility
Stormwater Impact Assessment

Project No. **12626213**
Revision No. **A**
Date **9/08/2024**

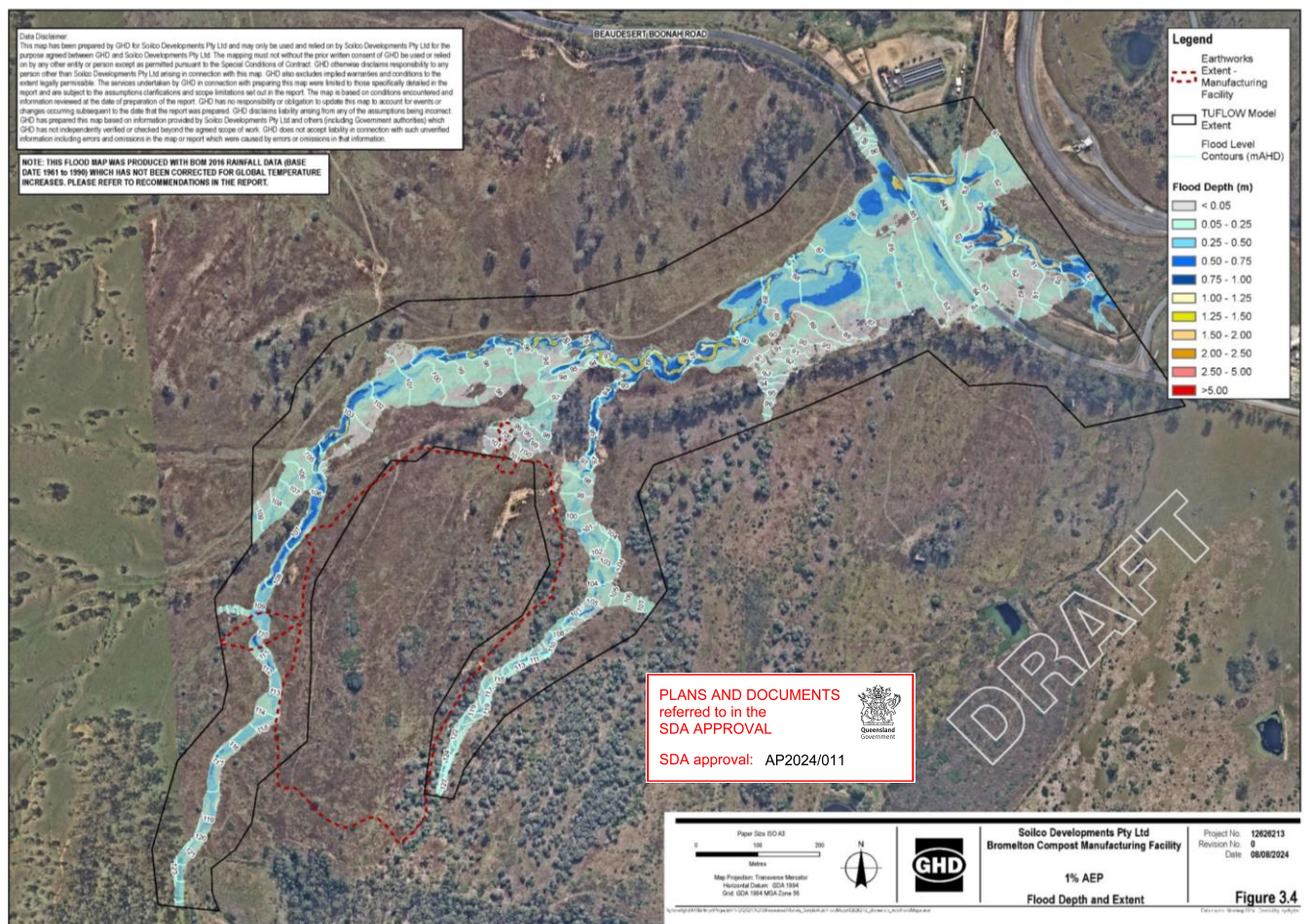
Topography and hydrology

FIGURE 3.3

3.3 Flooding

The existing flood conditions at the site were characterised through development of a hydraulic flood model in TUFLOW as outlined in Appendix B, with peak flows for the critical durations of the waterways developed using a Watershed Bounded Network Model (WBNM) used as inputs to the TUFLOW model. The model was simulated for the 63.2%, 50%, 20%, 10%, 2%, 1% and 0.2% AEP storm events in accordance with the procedures of Australian Rainfall and Runoff (Section 2.5.1). The 0.2% AEP storm event has been presented as a proxy for the future climate change 1% AEP storm event. The full modelling methodology and results are included in Appendix B, however key results have been summarised to characterise the baseline flood conditions under a range of storm events.

As shown in Figure 3.4, in the upper tributaries across the southern extent of the Project lot, for the 1% AEP storm, the lateral flood extents are topographically constrained, with minimal bank storage of flood waters. Peak flood depths upstream of Mitchell Road were modelled up to approximately 0.8 m in the western tributary, 1.2 m in the eastern tributary and generally less than 0.4 m in the bank areas. The topography flattens slightly in the northern portion of the Project lot. In the 1% AEP flood event, the lateral extent of the flood waters in this area extend from the north and occur out of stream bank areas, with flood depths predominantly less than 0.2 m to 0.4 m. Outside of the Project lot, at the confluence of the tributaries across the site, in stream peak flood depths of up to approximately 1.9 m were modelled.



3.4 Surface water quality

A field survey was conducted on 5 April 2024 and 10 April 2024 by GHD for the purpose of the Aquatic Ecology Assessment GHD (2024). During the survey, opportunistic *in-situ* water quality sampling was undertaken. A total of five monitoring locations were sampled, across each tributary of Allan Creek within the site and per the methodology described in GHD (2024). Sampling locations are shown in Figure 3.5 and included:

- ACT1 located in the south-west extent of the Project area
- ACT2 located in the Project area
- ACT3 is located slightly east and outside of the Project area but within the Lot boundary
- ACT4 is located far east and outside of the Project area but within the Lot boundary
- ACT5 is outside of the Lot at the confluence of tributaries ACT1 to 3

The results of the *in-situ* water quality sampling are shown in Table 3.1.

As described in Section 2.1.4, the aquatic ecosystem WQOs applicable to the Project site under EPP (2019) are the Western Logan River Freshwaters –Moderately Disturbed waters (Low Flow) (DES 2022). The surface water quality data has been compared against the guidelines (DES 2022) as shown in Table 3.1. There are no water quality guidelines for water temperature; however, water temperatures were within normal ranges expected for the sampling season.

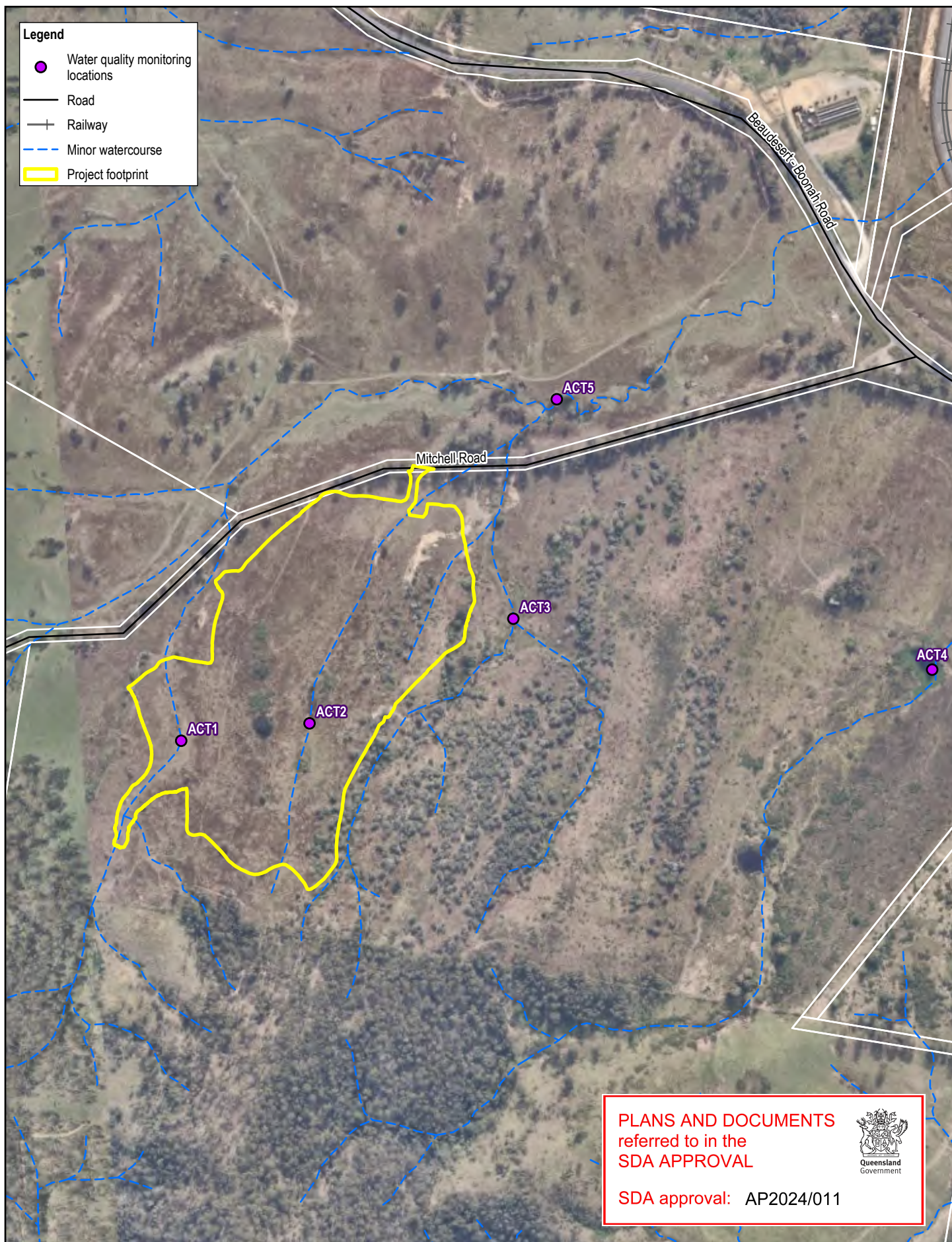
Table 3.1 *In-situ water quality results*

Sample Location ID	Date	Temp.	pH	Electrical conductivity	Dissolved oxygen	Dissolved oxygen	Turbidity
Units	DD/MM/YY	°C	pH unit	µS/cm	mg/L	% sat.	NTU
Guideline *	-	–	6.5-8.2	350	–	85 – 110%	11
ACT1	05/04/24	27.5	7.5	371	5.9	51.2	78.15
ACT2	05/04/24	27.2	7.0	365	5.8	50.6	64.12
ACT3	05/04/24	26.9	6.9	357	6.2	58.6	74.72
ACT4	10/04/24	21.8	7.3	346	6.4	65.8	42.11
ACT5	10/04/24	22.1	7.9	361	6.8	84.1	73.85

* *Environmental Protection (Water and Wetland Biodiversity) Policy 2019*, Logan River Environmental Values and Water Quality Objectives Basin No. 145 (part) – Western Logan River Freshwaters – Upland Freshwaters – Upland Moderately Disturbed waters (Low Flow)

Orange cells note exceedances compared against water quality guidelines

As shown in Table 3.1, exceedances were recorded at all five sites for dissolved oxygen and turbidity. Dissolved oxygen ranged from 50.6% (ACT2) to 84.1% (ACT5) whilst turbidity ranged from 42.11 NTU (ACT4) to 78.15 NTU (ACT1). Exceedances for electrical conductivity were also recorded at all sites, except for site ACT4 (346 µS/cm). The pH was within the water quality guideline range at each site. These results indicate the overall water quality across site was reasonably poor in relation to the guideline values.

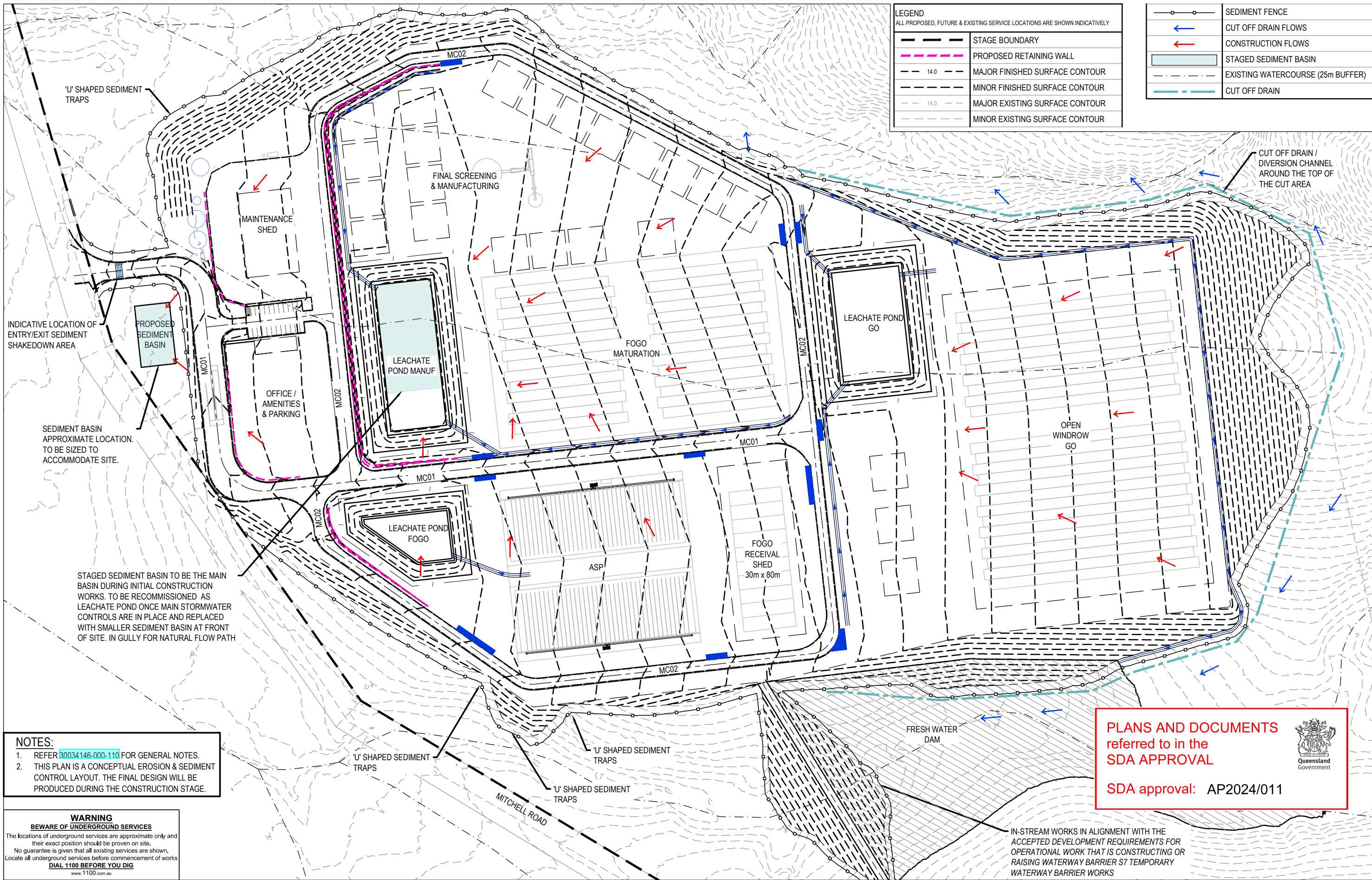


4. Surface water management plan

Based on the review of the relevant regulatory context applicable to the Project (refer Section 2) and the existing conditions at the Project site (refer Section 3), a requirement for mitigation measures to be in-built into the Project was identified. This has been undertaken through the development of this Surface Water Management Plan, described herein, which has been developed collaboratively with (and informed) the Project design development undertaken by SMEC.

Figure 4.1 outlines the SMEC design, inclusive of surface water management measures during operation and Figure 4.2 also providing a construction phase Erosion and Sediment Control Plan.

Table 4.1 outlines the in-built water management measures, consistent with the SMEC design and with additional detail where applicable. The table also includes the basis of the measures, developed in consideration of the regulatory context outlined in Section 2.



REV	DATE	AMENDMENT / REVISION DESCRIPTION	DRAFT	DESIGN	WVR No.	STATUS	 an  company	 	CLIENT 	PROJECT NAME PROPOSED DEVELOPMENT SOILCO PTY LTD BOONAH ROAD, BEAUDESERT SCENIC RIM REGIONAL COUNCIL	DRAWING TITLE EROSION & SEDIMENT CONTROL LAYOUT	
01	06.08.2024	ISSUED FOR APPROVAL	KM	KM	0001	SUBJECT TO APPROVAL						
02	07.08.2024	ISSUED FOR APPROVAL	KM	MH	0002							
						APPROVED	RPEQ:					
							DATE					

Table 4.1 Surface Water Management Plan in-built water management measures

Category	Phase	Description	In-built control measures	Basis of measures
Separation of water types	Operation	Composting sites generate differing water types distinguished by their respective water quality. This has impacts on both risk to downstream environments but on the ability to use in the composting process. They consist of leachate that has been in contact with organic material, stormwater which has not, roofwater, and runoff from areas external to the operational site. It should be noted that at times 'leachate' is used to refer specifically to water that has seeped from organic piles but for this assessment the term refers to any water in significant contact with organics. Leachate can only be reused in early phase stage of the process, whereas other water types can be used throughout the full process. Due to the different water quality risks and reuse opportunities, these types of water must be appropriately separated.	• Diversion of upstream run-on around the facility • Designation of respective leachate and stormwater catchments within the operational site, with separate stormwater conveyance systems. With leachate catchments those with realistic probability of generating runoff quality impacted by the presence of organic material.	The <i>Model Operating Conditions (MOC) ERA53(a) Organic Material Processing by Composting</i> (Section 2.3.1) form the most specific authoritative guideline that considers the specific requirements of composting sites with relation to their need to separate and manage different water types differently. This is reflected in Condition WT3 requiring prevention of stormwater being contaminated by the activity or direction of water that is contaminated to treatment and retention measures.
Leachate management	Operation	Runoff that has come into significant contact with organic material is generally not suitable for regular, untreated discharge and must therefore be contained up to a design standard rainfall.	Provision of in excess of 30 ML of contact water storage with disposal via reuse in the early phase of the process. No proposed active release of leachate and no overflow up to a design standard rainfall of 900 mm falling within a 6 month period.	The MOC (Section 2.3.1) nominate (WT3) that leachate needs to be directed to stormwater treatment and retention measures and that these measures must have the capacity to retain runoff for a 24-hour rainfall event up to an unspecified site-specific Annual Exceedance Probability (AEP). It is noted that there is precedent for other sites for an Average Recurrence Interval (ARI) of 10 years and that this is consistent with the NSW guideline <i>Environmental Guidelines, Composting and Related Organics Processing Facilities, NSW DEC 2003</i>. Therefore containment of the 10-year 24 hour event (152 mm) was taken as the initial minimum sizing and identified to be approximately 17 ML assuming 100% runoff. However, it was identified based on preliminary water balance of the site that the site would be most sensitive to longer durations of regular rainfall rather than a shorter intense storm. Therefore, approximately twice (i.e. 30ML) the volume of the minimum sizing

Category	Phase	Description	In-built control measures	Basis of measures
				was adopted. This, based on water balance calculations considering a 6 month period in which 900 mm of rainfall occurs. This rainfall was selected as approximately the depth within a 6 month period that is exceeded once every 10 years on average based on historical rainfall records. The water balance calculations indicated that this period could be managed with disposal via early phase reuse. The required disposal estimated approximately on average 150% of the typical conditions average demand/disposal rates supplied by SOILCO. In consultation with SOILCO this was considered to be achievable on the basis that the typical operational demand estimates are based on water demands during average and dryer times, not volumes that can be disposed of during periods of excess water. There are a number of operational actions that SOILCO could implement including increasing fan speeds of the ASP and increasing frequency of windrow turning. The preliminary water balance calculations are shown in Appendix C.
Stormwater management	Operation	Runoff from impervious site areas not impacted by organic material includes a water quality risk consistent with typical urban stormwater, requiring consideration accordingly.	Provision of a typical urban stormwater treatment train including 500 m ² of bio-retention filter area and a Gross Pollutant Trap.	The MOC (Section 2.3.1) note that runoff to be conveyed to the stormwater treatment and retention measures consists of water contaminated by the activity (WT3) and runoff from “disturbed areas”. Disturbed areas are defined to include areas susceptible to erosion, contaminated by the activity or upon which stockpiles are located. Being an engineered surface, free of organics storage the stormwater catchment is not considered to be classified as a disturbed area and not subject to the treatment and retention measures under the MOC. Notwithstanding this, typical urban stormwater quality risks still exist and as such the <i>Development Guidelines Water Quality Management in Drinking Water Catchments (SEQW Guidelines)</i> (Section 2.3.2) were considered the most applicable and specify pollutant reduction targets in outcome AO 8.3. MUSIC modelling was developed for the stormwater catchment in accordance with <i>Water By Design MUSIC Modelling Guidelines Nov 2018</i> demonstrating compliance with these targets. This modelling is summarised in Appendix A demonstrating the derivation of the proposed stormwater treatment train.
Wastewater	Operation	Management of wastewater generated in the amenities building is required	Provision of advanced secondary 10EP wastewater treatment plant and land application area adjacent to amenities building	AO5.2 of the Seqwater (2017) guidelines require developments with wastewater treatment system designed for less than 21EP achieve a low or medium risk classification in accordance with the Land Use Risk Tool (LURT) for on site sewage facilities. A site soil and evaluation report (Stav’s Hydraulic Services 2024, refer to Appendix D) was undertaken for the proposed effluent

Category	Phase	Description	In-built control measures	Basis of measures
				disposal from the proposed on-site waste water treatment facility. Based on the evaluation report and proposal, a LURT assessment has been undertaken for the Project site, as included in Appendix D. The outcomes of the LURT determined a “very low risk” for subsurface irrigation of effluent and therefore meets AO5.2 of Seqwater (2017).
Water sourcing	Operation	Water is required for the composting process, including in the early phase and later phase processes, with leachate only able to be used in the early phase process.	Provision of a 30 ML harvesting storage to the west of the operational area. Water to be sourced externally from appropriately licensed source for delivery during dry periods to meet water supply needs.	Demand estimate for water use was provided by SOILCO equalling approximately 700,000 L/week. SOILCO has confirmed the ability to provide this demand during dry periods (if required) via appropriately licensed, externally sourced water imported to site. Reliance on externally sourced water has been reduced through provision of the harvesting storage. The storage was sized based water balance optimisation considering the catchment available for the storage and evaporation from the dam. With respect to the Logan Water Plan (Section 2.2.1), the drainage line of the harvesting storage is not mapped as a watercourse under the plan and is therefore not subject to surface water licensing requirements. Groundwater is not to be utilised to contribute to site water requirements.
Impact from flooding	Operation	Avoidance of impact from external floodwaters is required both with respect to minimising impact on operations and also water quality risks associated with site inundation.	As shown in Appendix B, the operational site is located outside the 1% AEP flood impact for the identified flow paths adjacent to the site, other than for two minor locations where through detailed design extents would be altered as required to locate outside the flood extent. This would also be undertaken in consideration of waterway separation distance requirements (refer later in this table). ACS Engineers has prepared design documentation for the upgrade of Mitchell Road including provision of appropriate flood protection and flow conveyance.	<i>SEQW Guidelines (Section 2.3.2)</i> and the <i>Scenic Rim Hazard Overlay Code (Section 2.3.3)</i> require flood immunity in the 1% AEP event.

Category	Phase	Description	In-built control measures	Basis of measures
Impact on flooding	Operation	Increasing impervious areas associated with the site has the potential to increase the peak rate of runoff and impact downstream flooding conditions.	Leachate storages	As outlined in Appendix B, critical storm durations of receiving waterways for flooding are up to 4.5 hours. The 1% AEP 4.5 hour event corresponds to approximately 130 mm of rainfall which is less than half of the runoff depth associated with filling the leachate storages from empty. Therefore, as the leachate catchment is sensitive to longer duration events and is to be maintained relatively empty, it is anticipated that for storm events critical for flooding the leachate catchment would typically be contained. As this comprises the majority of the impervious catchment it is anticipated to offset the impact of increasing imperviousness at the site. This would be confirmed hydrologic modelling undertaken during detailed design.
Separation distances from existing flow paths	Construction and Operation	Government authorities	25 m setback from flow paths, other than the harvesting storage Location of site operational activities above the 1% AEP.	With respect to water quality impacts from the operations: providing an equivalent outcome of the separation distances, by locating outside of the 1% AEP flood extent requirement of the SEQ Guidelines (Section 2.6.1). This in turn meets the intended outcomes of the separation distances specified in Table 5 of the guideline. With respect to vegetation clearing and earthworks: maintaining the 25m specified in the guideline. Achieved in most locations in current design with detailed design to set toe of batter based on 25m setback based on detailed survey.
Erosion and sediment control	Construction	During construction, substantial ground disturbance activities will be undertaken with the potential to generate sediment discharged to the downstream environment.	Construction phase erosion and sediment control plan (Figure 4.1) prepared as a component of the facility design. Including provision of sediment basins. During detailed design these would be sized in accordance with management of at least 80% of the annual average runoff to 50 mg/L of TSS. Erosion and drainage controls to be included as required in Section 2.4. Staging of the works is also to be considered during detailed design, and in particular the provision of early stage temporary sediment basin(s) before final pad levels are reached and leachate basins	As outlined in Section 2.4 IECA Appendix B provides design guidance for sediment basins to achieve management of at least 80% of average annual runoff to 50 mg/L of Total Suspended Solids. This guidance has been adopted in specifying the sediment basin sizing and also in specifying general drainage and erosion controls.

Category	Phase	Description	In-built control measures	Basis of measures
			cannot be used as temporary sediment basins.	

5. Impact assessment and mitigation

The potential impacts of the Project were assessed with relation to surface water, including the in-built management measures outlined in Section 4. The water related risks were found to be generally acceptably managed based on the following:

- Appropriate separation of water types in accordance with best-practice for composting sites and the ERA53(s) Model Operating Conditions (MOC).
- Provision of in excess of 30 ML of leachate storage sized in exceedance of the 24-hour event supported by the MOC, with reuse in the early phase of composting. No proposed active release of leachate and no overflow up to a design standard rainfall of 900 mm falling within a 6 month period.
- Provision of a wastewater treatment system for amenities wastewater in accordance with the Seqwater (2017) guidelines.
- Separation of stormwater from contamination and management through provision of a stormwater treatment train in accordance with SEQWater (2017) guidelines.
- Potential changes to general hydrological (not during times of flood) regimes were considered alongside water quality requirements for the proposal. It is noted that to manage water quality risks containment of flows for a large portion of the site is required. As such, maintenance of existing flow regimes is not possible. As this impacts only the direct area of the manufacturing pad, which is a small portion of the overall receiving catchment, it is not anticipated to result in measurable hydrologic change to the overall downstream system.
- Estimation of water demands by SOILCO and confirmation that during dry periods they can be sourced via appropriately licensed external sources. Provision of a 30ML harvesting storage to minimise reliance on imported water.
- Location of the operational site outside the 1% AEP flood impact for the identified flow paths adjacent to the site in accordance with Seqwater (2017) guidelines and the Scenic Rim Hazard Overlay Code (refer to 2.5.2).
- Containment of the leachate catchment offsetting the impact of increasing imperviousness on peak discharge rates.
- Separation distances from identified flow paths consistent with the understood intent of the Seqwater (2017) guidelines.
- Provision of an erosion and sediment control plan, based on relevant regulatory requirements, to be updated and confirmed during detailed design.

Risk reduction was expected as the Project water management measures were developed through the process outlined in this assessment, in consideration of potential impacts and in accordance with regulatory requirements. However, it was noted that whilst appropriate measures are specified to the degree that they can realistically be at this stage, there are some additional mitigations required, that can only be fully defined and implemented through the operational phase of the Project. These are outlined in Table 5.1, as well as the basis for why they are required.

With inclusion of the in-built measures outlined in Section 4, as well as the additional measures outlined in Table 5.1, the Project is expected to appropriately manage risks with relation to surface water.

Table 5.1 *Additional Mitigation Required*

Relevant Category (of Table 4.1)	Additional Mitigation	Basis
Separation of water types	Preparation and regular update of a Operational Management Plan	The critical nature of separation of waters was identified, and that a lack of separation could potentially occur due to operational factors. Therefore, preparation and annual updating of a management plan is required, stipulating in particular maintenance and observation requirements for the stormwater catchment to confirm it is not contaminated by organic material. At a minimum this plan is to include daily inspection of the stormwater catchment, demonstrating the appropriate isolation of the catchment from contamination. Water quality monitoring requirements are to be included with quarterly sampling undertaken. In addition, sampling is to be undertaken prior to, during and after any overflow from leachate storages. Analytes are to include suite of analytes potentially impacted by composting, including those specified in the NSW EPA Composting Guidelines as a minimum. Locations are to include the leachate dams and discharge from the stormwater catchment before and after the stormwater treatment train. As stormwater discharge is only periodic at least one sample per year is to be obtained during a rainfall event when the stormwater catchment is discharging.
Leachate management	Adjustment of leachate catchment area when full processing rate is not occurring	It was identified that leachate disposal is via reuse in the early phase process and that at site commencement the full processing rate and therefore full disposal rate will not be available. The water balance calculations (Appendix C) were undertaken based on the full rate. Therefore, prior to that rate being achieved only partial areas of the leachate catchment are to be used for organics storage or processing to reduce rainfall into the system. The drainage system is to be designed so that the site can be actively portioned, and part of the leachate catchment operates as part of the stormwater catchment during early periods of site operation.
Leachate management and water sourcing	Preparation of a detailed water balance model based on actual site operational data and provide emergency containment bunding if required	Highly accurate quantification of wet period water disposal/reuse ability through the early phase process cannot be achieved until data on the actual site operations. A reasonable estimate based on available data has been undertaken, suggesting that disposal for the design standard 6 month period is feasible, and is in excess of the 24-hour duration specified in the MOC. However, after 24 months of site operation a detailed water balance is to be prepared based on daily observations (via automated telemetry) collected on water application rates, withdrawals from the dams, leachate dam levels and harvesting storage levels. If the updated water balance predicts that the design standards adopted herein are not satisfied then operational controls are to be implemented, potentially including road tankering leachate offsite to an appropriately licenced facility, as well as bunding of part of the leachate catchment to provide temporary storage over select working areas up to that required for the design standard. That is, in the unexpected event that the leachate system is not performing as predicted in this assessment, the risks are transferred from environmental discharge to operational factors. The water balance would also include a more accurate representation of the harvesting storage, allowing for optimising of external water sourcing procedures. Further, SOILCO may consider a first-flush system for part of the stormwater catchment where initial runoff is conveyed to leachate system with subsequent runoff conveyed to the stormwater system. If implemented, this would be assessed in the detailed water balance to demonstrate it does not compromise the performance of the leachate system.

6. Conclusions

The potential impacts of the Project were assessed with relation to surface water, including the in-built management measures incorporated into the design and the Surface Water Management Plan developed herein. The water related risks were found to be generally acceptably managed which is to be expected as they were developed through the process outlined in this assessment, in consideration of potential impacts and in accordance with regulatory requirements. However, it was noted that whilst appropriate measures are specified to the degree that they can realistically be at this stage, there are some additional mitigations required and stipulated herein, that can only be fully defined and implemented through the operational phase of the project.

With inclusion of the in-built measures, as well as the additional measures, the project is expected to appropriately manage risks with relation to surface water.

7. References

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- DES (2019) Procedural guide, releases to waters from land development sites and construction sites 2500 m² and greater
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- South East Queensland Regional Plan (2017).

Appendices

Appendix A

MUSIC Modelling Summary

Introduction

Conceptual MUSIC modelling was undertaken to inform the concept development for management of the stormwater (non leachate) catchment. Being an engineered surface, free of organics storage, the stormwater catchment is not considered to be classified as a disturbed area and not subject to the treatment and retention measures required for the leachate catchment.

Notwithstanding this, typical urban stormwater quality risks still exist and as such the Development Guidelines Water Quality Management in Drinking Water Catchments (Seqwater 2017) were considered the most applicable and specify pollutant reduction targets in outcome AO 8.3 (refer to Section 2.3)

Methodology

The MUSIC modelling was undertaken for the stormwater catchment in accordance with the requirements specified in Water By Design MUSIC Modelling Guidelines Nov 2018 (Water By Design 2018). The inputs and configuration of the modelling undertaken are summarised in this section. The stormwater quality treatment train included a gross pollutant trap (GPT) and a bioretention basin. The model configuration is shown in Figure 7.2. Key parameters input to the modelling were as follows:

Rainfall and PET

Rainfall and potential evapotranspiration (PET) data input requirements are stipulated within Appendix A of Water By Design (2018). The nearest listed gauging station to the Project is the Beaudesert Cryna (40014). The required climate period input to the model ranges 1 January 1968 to 31 December 1977. Rainfall data was sourced from the Pluviograph Rainfall Data Tool, accessed from the eWater toolkit. The monthly average PET data (mm) as defined in the Water by Design (2018) guidelines was input into the model. These were input into the model at 6 minute time intervals.

Catchment parameters

The stormwater catchments are conceptually split into roofed areas and ground areas.

The catchment area for the ground level stormwater catchments is approximately 4.25 ha, which are considered to be 100% impervious. The catchment area for the roofed areas within the stormwater catchment total 0.41 ha, which were also classified as 100% impervious.

Pollutant generation parameters

The stormwater catchment includes typical urban pollutants generated from runoff over distinct roofed areas and the ground surface. Therefore, the pollutant generation parameters input into the model for industrial split catchment land uses for roofs and ground surfaces, as outlined in Table 3.8 of Water By Design (2018). A summary of the pollutant generation parameters is included in Table 7.1.

Table 7.1 Industrial pollutant generation parameters – Water By Design (2018)

Land use	Flow type	Total suspended solids Log ¹⁰ Values		Total phosphorus Log ¹⁰ Values		Total Nitrogen Log ¹⁰ Values	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Roof	Baseflow	0	0	0	0	0	0
	Stormflow	1.3	0.44	-0.89	0.36	0.25	0.32
Ground level	Baseflow	0.78	0.45	-1.11	0.48	0.14	0.20
	Stormflow	1.92	0.44	-0.59	0.36	0.25	0.32

For the ground level, as the catchment areas are 100% impervious, the baseflow parameters are not applied.

GPT parameters

The efficiency of the Gross Pollutant Trap (GPT) treatment system was assumed to be equivalent to the OceanSave GPT, which were input into the model. The predicted removal efficiency of the OceanSave GPT is summarised in Figure 7.1. The high flow bypass was input as 0.8 m³/s.

Table 3-1 OceanSave® Treatment Performance Accepted by Majority of Councils within Australia

Pollutant	Predicted removal efficiency (%) ¹	References ²
Gross pollutants	100%	Based on Allison et al (1998), Walker et al (1999) and high rates of sediment removal observed in other studies.
Total suspended solids	70%	Based on Walker et al (1999), noting MUSIC modelling guidelines (Water by Design 2010, BMT WBM 2015, eWater 2016) recommend applying a storm event mean concentration of 269 to 270mg/L.
Total phosphorus	30%	Based on Walker et al (1999)
Total nitrogen	0%	Based on Walker et al (1999) and Birch et al (2009)

¹: Removal up to design flow rate (refer to Technical Design Guide in Appendix B). All flows greater than this flow rate are assumed to receive zero pollutant removal.

Figure 7.1 OceanSave GPT treatment efficiency

Bioretention parameters

The conceptual bioretention system configuration within the model included the following parameters:

Storage properties of the basin include a filter area of 500 m², an extended detention depth of 0.3 m and top of extended detention surface area of 750 m². The treatment filter media properties consisted to of a media depth of 0.5 m and a saturated hydraulic conductivity of 200 mm/h. The filter area and surface area of the basin were iterated until achievement of the pollutant reduction targets specified by Seqwater (2017). A high flow bypass of 0.8 m³/s was input as the threshold for inflows to the system. The overall design of the treatment train would be refined during detailed design.

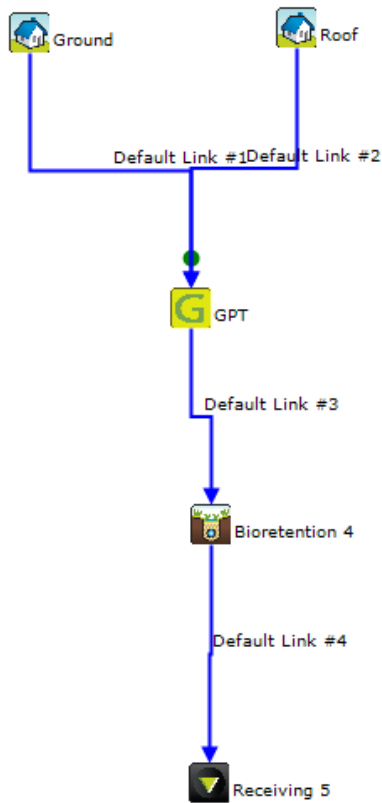


Figure 7.2 MUSIC model structure

Results

The results of the stormwater quality treatment train effectiveness (as output by the model) are presented in Table 7.2. The results are taken from the bioretention node.

Table 7.2 Target pollutant reduction target

Seqwater (2017) target pollutant reduction	MUSIC model result output			
		Sources	Residual Load	% Reduction
85% reduction in total suspended solids; 65% reduction in total phosphorus; 45% reduction in total nitrogen; and 95% reduction in gross pollutants.	Flow (ML/yr)	34.86	33.72	3.277
	Total Suspended Solids (kg/yr)	4426	348.5	92.13
	Total Phosphorus (kg/yr)	11.74	2.344	80.04
	Total Nitrogen (kg/yr)	82.48	39.09	52.61
	Gross Pollutants (kg/yr)	909.6	2.942	99.68

As shown in Table 7.2, the pollutant reduction targets for the stormwater catchment areas were achieved through the inclusion of a GPT and bioretention system. The stormwater treatment train would be refined and updated through the detailed design process.

Appendix B

Flood Assessment

Introduction

Flood modelling was undertaken to inform the understanding of flooding conditions, which in turn was used to inform the planning and design of the proposed works.

Methodology

The catchment for the site was delineated as shown in the figure overleaf using publicly available LiDAR data from the Elevation and Depth – Foundation Spatial Data (ELVIS) portal. A Watershed Bounded Network Model (WBNM) hydrological model was compiled using *Australian Rainfall and Runoff: A guide to flood estimation* (Ball et al. 2019) (ARR 2019) methodologies and 10 rainfall distributions. Inputs to the WBNM model were:

- Rainfall was downloaded from the BOM Design Rainfall Data System (2016) for the site, and hydrological parameters were downloaded from the ARR data hub (issued 22 March 2024 for Latitude, -27.9774, Longitude, 152.9099). However, it must be noted that the BOM (2016) design rainfall data (base date 1961 to 1990) is not corrected for global temperatures increases to 2024. This is an emerging science matter currently being investigated, which may in the near term replace the ARR2019 climate change chapter. The BOM rainfall data for this assessment has been applied without any climate change adjustment other than considering the 0.2% AEP as a climate change sensitivity.
- Catchment and impervious areas: The catchment area (approximately 176 ha) is mostly pervious. To account for roads and other less pervious areas, an approximate 5% impervious fraction was adopted.
- Initial and continuing losses: Initial and continuing losses were adopted according to ARR 2019 (Ball et al 2019). The initial losses were corrected for pre-burst, while the continuing losses had a 0.4 factor applied.
- A WBNM lag parameter of 1.6 was adopted, after validating against other methods (see below).

Model simulations were undertaken for the 63.2%, 50%, 20%, 10%, 2%, 1% and 0.2% AEP storm events. In doing so, 10 storm rainfall patterns were simulated for a range of durations. For each duration the median flood peak was identified from the 10 storm patterns. This was adopted as the design flood peak for that duration, whereafter the design flood peaks were enveloped across all durations, to identify the critical duration and corresponding design flood peak. This is an approach acceptable under ARR 2019, however does not preclude a design flood peak greater than the critical flood peak being adopted.

Since no concurrent pluviographic rainfall and runoff data was available, calibration of the model was not possible. Validation was thus undertaken using three separate methods, namely:

- a separate RORB model.
- the Regional Flood Frequency Estimate (RFFE).
- an inhouse GHD flood peak relationship.

The results in the table below show favourable agreement between the WBNM model, the RORB model and the inhouse GHD flood peak relationship. The RFFE produced a higher suggested peak flow. However, this can be explained by the fact that all 15 gauged catchments used in the RFFE were larger than the 176 ha catchment for the site. Based on this outcome, the WBNM model simulations have been adopted.

Table: Peak Flow Comparison

Method	1% AEP Flood Peak (m ³ /s)
WBNM	25 (1.5-hour duration)
RORB	24 (1.5-hour duration)
RFFE (WMA, 2021)	40 (suggested, range 12-125)
GHD Inhouse Graph	25

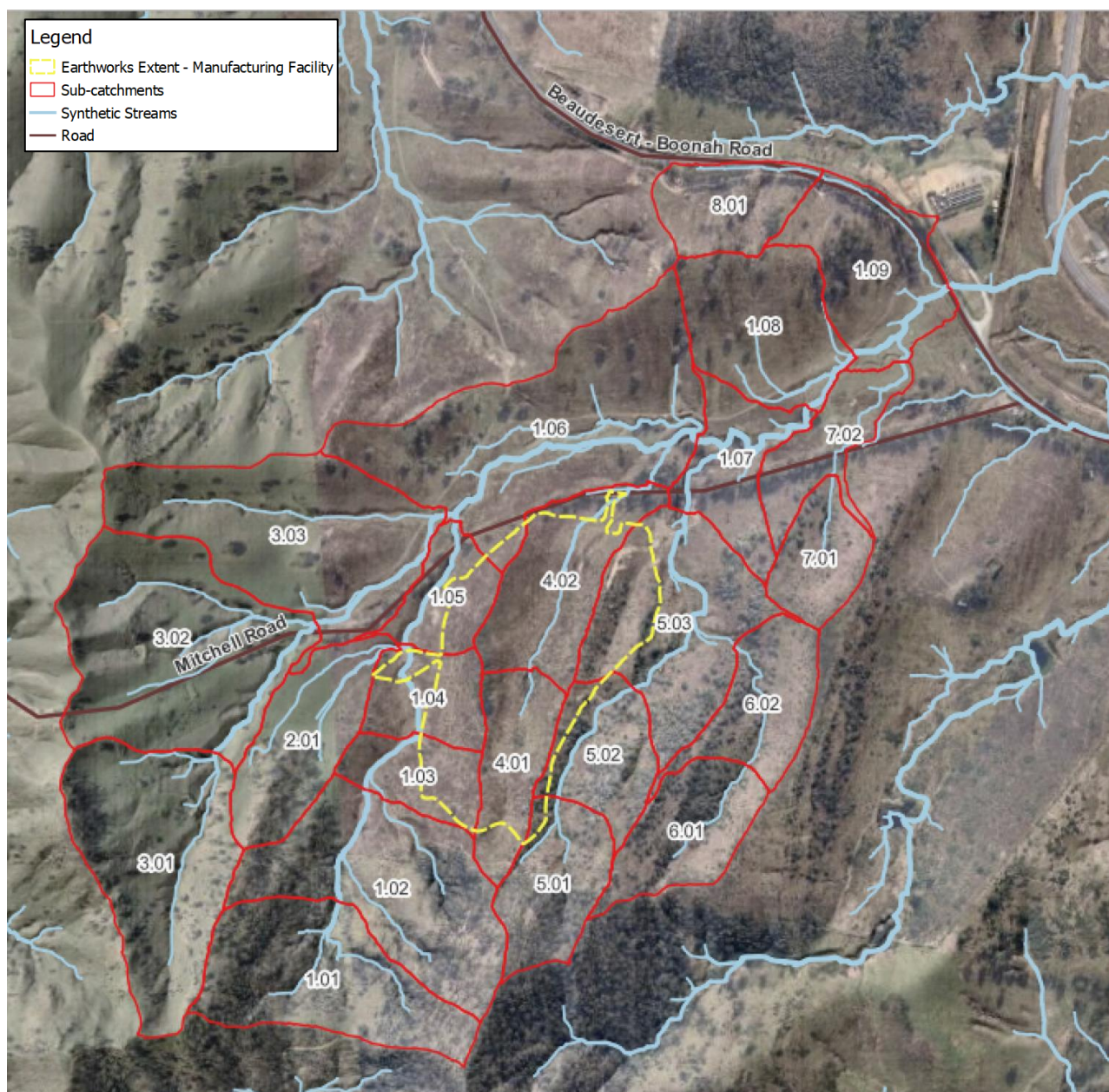


Figure: Catchment Delineation

The WBNM model was simulated to determine the flood hydrographs at the upstream boundaries of the proposal site. The flood peaks at the catchment outlet near Beaudesert Boonah Road are listed in the table below.

Table: Peak Flow Estimate

Event (AEP)	Critical Duration	Median Flood Peak Flow (m ³ /s)	Ensemble Number
63.2%	4.50 hours	3.7	TP6
50%	4.50 hours	4.8	TP6
20%	4.50 hours	8.9	TP7
10%	3 hours	12.6	TP6
2%	1.50 hour	20.5	TP5
1%	1.50 hour	25.4	TP3
0.2%	1.50 hour	34.7	TP3

A TUFLOW hydraulic model was compiled for the purpose of calculating the flood inundation at the location of the proposed site, as follows:

- The model covered the site area to the extent shown in the attached flood mapping results, ending approximately 1km downstream of the site. Flooding modelling was limited to waterways of Horton's Stream Order 3 and above.
- Topographic data was sourced from LiDAR data (1 m grid) obtained from the ELVIS data portal.
- A 1m cell size was adopted for the model domain.
- A Manning's "n" roughness value of 0.06 was adopted for the majority of the model domain, and 0.025 was applied for Beaudesert Boonah Road.
- Hydrographs from the WBNM hydrology model described above were input as boundary inflows and normal depth was assumed at the downstream boundary.
- The three main culverts under Beaudesert Boonah Road were configured in the model based on the dimensions obtained from GHD's site inspection. Invert levels and lengths were estimated from LiDAR data and aerial imagery.
- Upgrades to Mitchell Road were not represented and flood impacts with relation to these aspects of the proposed works have been considered and included in the concept development for the road prepared by ACS Engineers.

Results

The model was simulated for the 63.2%, 50%, 20%, 10%, 2%, 1% and 0.2% AEP flood events and the flood data was enveloped to produce a series of flood maps which are attached to this appendix. The flood simulations showed that in the upper tributaries across the southern extent of the Project lot, for the 1% AEP storm, the lateral flood extents are topographically constrained, with minimal bank storage of flood waters. Peak flood depths upstream of Mitchell Road were modelled up to approximately 0.8 m in the western tributary, 1.2 m in the eastern tributary and generally less than 0.4 m in the bank areas.

The topography flattens slightly in the northern portion of the Project lot. In the 1% AEP flood event, the lateral extent of the flood waters in this area extend from the north and occur out of stream bank areas, with flood depths predominantly less than 0.2 m to 0.4 m. Outside of the Project lot, at the confluence of the tributaries across the site, in stream peak flood depths of up to approximately 1.9 m were modelled.

Peak flood velocities in the 1% AEP event upstream of Mitchell Road were simulated up to approximately 1.8 m/s in the western tributary, and 2.3 m/s in the eastern tributary. At the confluence of the tributaries, velocities are typically in the range of 1.2 to 2 m/s.

Flood hazard in the 1% AEP event ranges from H1 (generally safe for vehicles, people and buildings) to H5 (unsafe for vehicles and people, all buildings vulnerable to structural damage with some less robust buildings subject to failure). Refer to the attached flood maps for further detail on the flood hazard categories. It is noted that in the 1% AEP, areas with higher flood hazard categories are mainly reflecting in-channel flow. Flood hazard in bank areas and towards the outer edges of the floodplain are mostly H1 (generally safe for vehicles, people and buildings) to H2 (unsafe for small vehicles).

A key outcome of the assessment is that inundation of the proposed facility pad earthworks extent in the 1% AEP does not occur other than two localised areas at the west of the extent. During detailed design minor earthworks alterations would be undertaken to avoid this, also in consideration of minor alterations required to achieve a 25 metre separation distance as outlined in this assessment with relation to waterway requirements.

This assessment has not directly considered future climate flood levels, which would be expected to be higher than the flood levels simulated as part of the current study and can be assessed as part of more detailed investigations. However, the 0.2% AEP flood events are at times used as a proxy for the future climate 1% AEP event, and the flood maps of the 0.2% event have been provided. They confirm that inundation of the facility pad earthworks extent does not occur other than the two localised areas described above.

Attachment: Flood Mapping

Data Disclaimer:
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NOTE: THIS FLOOD MAP WAS PRODUCED WITH BOM 2016 RAINFALL DATA (BASE DATE 1961 to 1990) WHICH HAS NOT BEEN CORRECTED FOR GLOBAL TEMPERATURE INCREASES. PLEASE REFER TO RECOMMENDATIONS IN THE REPORT.

BEAUDESERT BOONAH ROAD

Legend

Earthworks

Extent -

Manufacturing

Facility

TUFLOW Model

Extent

Flood Level

Contours (mAHD)

Flood Depth (m)

< 0.05

0.05 - 0.25

0.25 - 0.50

0.50 - 0.75

0.75 - 1.00

1.00 - 1.25

1.25 - 1.50

1.50 - 2.00

2.00 - 2.50

2.50 - 5.00

>5.00

DRAFT

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Queensland
Government

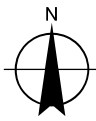
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Paper Size ISO A3

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56





Soilco Developments Pty Ltd
Bromelton Compost Manufacturing Facility

63.2% AEP
Flood Depth and Extent

Project No. 12626213
Revision No. 0
Date 08/08/2024

Figure 1

Data source: Nearmap 2024. Created by: sydhidro

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BEAUDESERT BOONAH ROAD

Legend

Earthworks

Extent -

Manufacturing Facility

TUFLOW Model

Extent

Flood Level

Contours (mAHD)

Flood Depth (m)

< 0.05

0.05 - 0.25

0.25 - 0.50

0.50 - 0.75

0.75 - 1.00

1.00 - 1.25

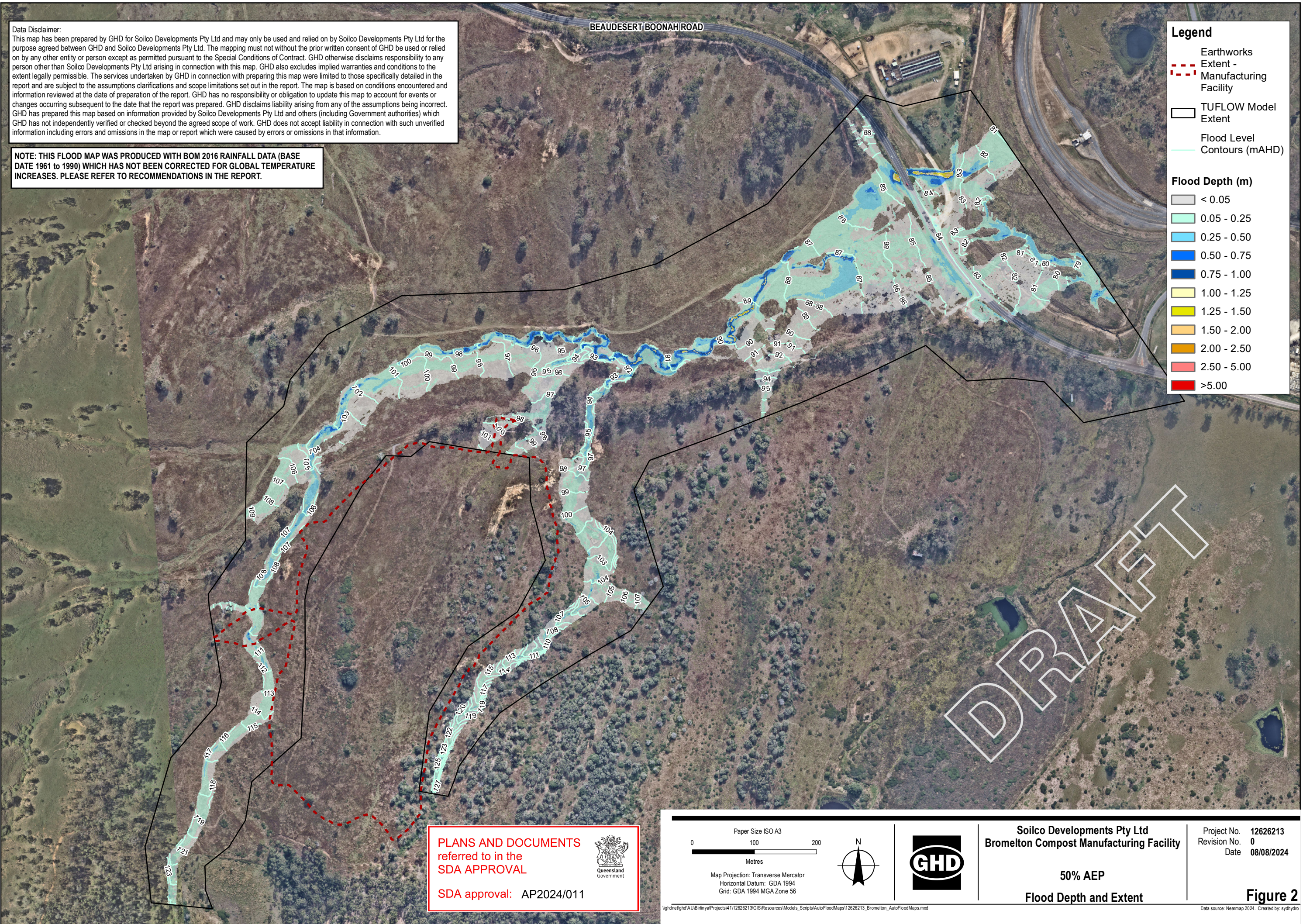
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SDA APPROVAL

SDA approval: AP2024/011

0100200

Paper Size ISO A3

Metres

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Soilco Developments Pty Ltd
Bromelton Compost Manufacturing Facility

50% AEP
Flood Depth and Extent

Project No. 12626213
Revision No. 0
Date 08/08/2024

Figure 2

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

12626213_Bromelton_AutoFloodMaps.mxd

Data source: Nearmap 2024. Created by: sydhidro

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BEAUDESERT BOONAH ROAD

Legend

Earthworks

Extent -

Manufacturing Facility

TUFLOW Model

Extent

Flood Level

Contours (mAHD)

Flood Depth (m)

< 0.05

0.05 - 0.25

0.25 - 0.50

0.50 - 0.75

0.75 - 1.00

1.00 - 1.25

1.25 - 1.50

1.50 - 2.00

2.00 - 2.50

2.50 - 5.00

>5.00

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SDA approval: AP2024/011



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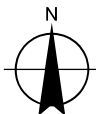
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Metres

Map Projection: Transverse Mercator

Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 56



Soilco Developments Pty Ltd

Bromelton Compost Manufacturing Facility

20% AEP

Flood Depth and Extent

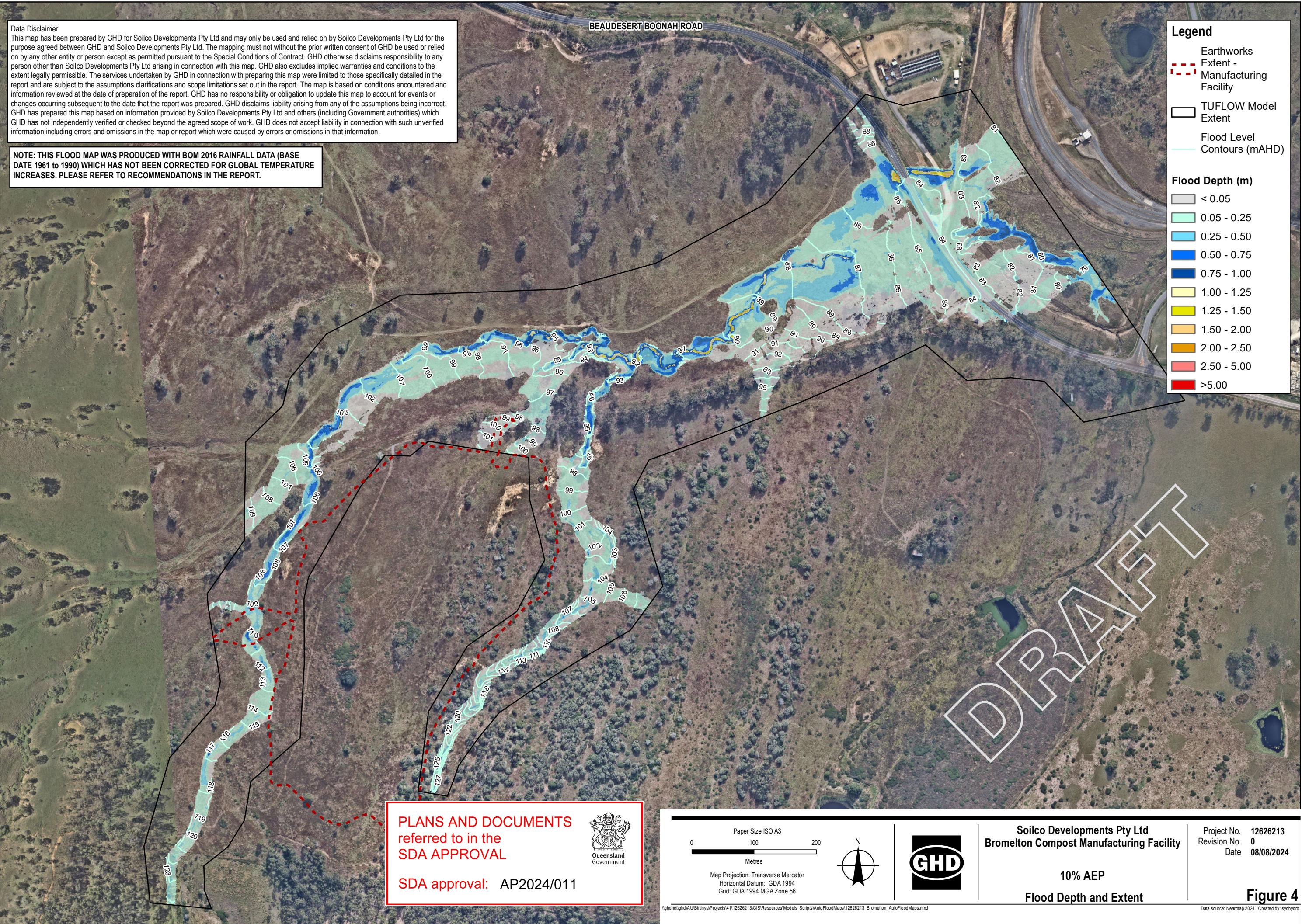
Project No. 12626213
Revision No. 0
Date 08/08/2024

Figure 3

Data source: Nearmap 2024. Created by: sydhidro

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BEAUDESERT BOONAH ROAD

Legend

Earthworks

Extent -

Manufacturing Facility

TUFLOW Model Extent

Flood Level

Contours (mAHD)

Flood Depth (m)

< 0.05

0.05 - 0.25

0.25 - 0.50

0.50 - 0.75

0.75 - 1.00

1.00 - 1.25

1.25 - 1.50

1.50 - 2.00

2.00 - 2.50

2.50 - 5.00

>5.00

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL

SDA approval: AP2024/011

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Soilco Developments Pty Ltd
Bromelton Compost Manufacturing Facility

1% AEP

Flood Depth and Extent

Project No. 12626213
Revision No. 0
Date 08/08/2024

Figure 6

Data source: Nearmap 2024. Created by: sydhidro

Data Disclaimer:
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NOTE: THIS FLOOD MAP WAS PRODUCED WITH BOM 2016 RAINFALL DATA (BASE DATE 1961 to 1990) WHICH HAS NOT BEEN CORRECTED FOR GLOBAL TEMPERATURE INCREASES. PLEASE REFER TO RECOMMENDATIONS IN THE REPORT.

BEAUDESERT BOONAH ROAD

Legend

- Earthworks
- Extent - Manufacturing Facility
- TUFLOW Model Extent
- Flood Level Contours (mAHD)

Flood Depth (m)

< 0.05
0.05 - 0.25
0.25 - 0.50
0.50 - 0.75
0.75 - 1.00
1.00 - 1.25
1.25 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 5.00
>5.00

DRAFT

PLANS AND DOCUMENTS referred to in the SDA APPROVAL

SDA approval: AP2024/011

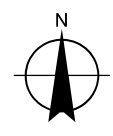


Queensland Government

Paper Size ISO A3

0 100 200 Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56





Soilco Developments Pty Ltd
Bromelton Compost Manufacturing Facility

2% AEP
Flood Depth and Extent

Project No. 12626213
Revision No. 0
Date 08/08/2024

Figure 5

Data source: Nearmap 2024. Created by: sydhidro

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BEAUDESERT BOONAH ROAD

Legend

Earthworks

Extent -

Manufacturing Facility

TUFLOW Model

Extent

Flood Level

Contours (mAHD)

Flood Depth (m)

< 0.05

0.05 - 0.25

0.25 - 0.50

0.50 - 0.75

0.75 - 1.00

1.00 - 1.25

1.25 - 1.50

1.50 - 2.00

2.00 - 2.50

2.50 - 5.00

>5.00

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL

SDA approval: AP2024/011



0100200

Paper Size ISO A3

Metres

Map Projection: Transverse Mercator

Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 56

N

GHD

Soilco Developments Pty Ltd

Bromelton Compost Manufacturing Facility

0.2% AEP

Flood Depth and Extent

Project No. 12626213

Revision No. 0

Date 08/08/2024

Figure 7

Data source: Nearmap 2024. Created by: sydhidro

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BEAUDESERT BOONAH ROAD

Legend

Earthworks

Extent - Manufacturing Facility

TUFLOW Model Extent

Peak Flood Velocity (m/s)

0.00 - 0.25

0.25 - 0.50

0.50 - 0.75

0.75 - 1.00

1.00 - 1.50

1.50 - 2.00

2.00 - 5.00

>5.00

DRAFT

PLANS AND DOCUMENTS referred to in the SDA APPROVAL

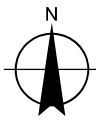
SDA approval: AP2024/011



0100200Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N





Soilco Developments Pty Ltd
Bromelton Compost Manufacturing Facility

63.2% AEP
Peak Flood Velocity

Project No. 12626213
Revision No. 0
Date 08/08/2024

Figure 8

Data source: Nearmap 2024. Created by: sydhidro