

## Appendix E-2 Waterhole and Dawson River Water and Sediment Quality Summary Statistics 2015 to 2022

# APPENDIX E-2

**Santos Fairview Water Release Scheme  
Preliminary Documentation**

**Summary Water Quality Statistics - July 2015 to 2021 - HCS04 DWB Pond, Waterhole and Dawson River**

	Units	LOR	State EA CL S4	sub-regional WQO / DGV 95% Spp. Prot.	State EA CL HCS04 DWB Pond	HCS04 Desalinated Water Balance Pond (HCS04DWB1) - 2015-2021									WLMP1-2015-2022								
						Number of data	No. > LoR	% detection	Minimum	20th Percentile	Median	80th Percentile	95th Percentile	Maximum	Number of data	No. > LoR	% detection	Minimum	20th Percentile	Median	80th Percentile	95th Percentile	Maximum
<b>Physicochemical Parameters</b>																							
Dissolved Oxygen - Field	mg/L	-	NL	7.0-9.0	6.4-16.4	156	156	100	5.6	7.7	8.4	9.4	10.6	13.4	68	68	100	0.5	6.9	8.3	9.7	11.0	11.6
Electrical Conductivity - Field	µS/cm	-	NL	370 (base flow) 210 (high flow)	370 (75%ile)	157	157	100	33	63	91	129	217	376	68	68	100	83	133	165	206	275	350
pH - Field	pH units	-	NL	6.5 - 8.5	6.5-8.5	156	156	100	6.3	7.7	8.2	8.6	9.0	9.8	67	67	100	5.0	7.4	7.8	8.3	8.7	9.3
Suspended Solids	mg/L	5	NL	< 30	NL	157	13	8	NC	NC	NC	NC	NC	28	46	36	78	5	5	11	16	33	152
Turbidity - Field	NTU	-	NL	50	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	11	11	100	3	10	18	23	30	36
<b>Cations</b>																							
Calcium (dissolved)	mg/L	1	Minimum 1	No WQO	Minimum 1	157	149	95	1	1	3	5	6	10	27	27	100	9	13	16	21	28	13
Magnesium (dissolved)	mg/L	1	0.5	No WQO	NL	157	0	0	NC	NC	NC	NC	NC	NC	27	25	93	1	2	4	6	7	3
Sodium (dissolved)	mg/L	1	NL	No WQO	115	157	156	99	1	8	12	18	34	40	26	26	100	10	13	16	21	23	13
Potassium (dissolved)	mg/L	1	NL	No WQO	NL	157	1	1	NC	NC	NC	NC	NC	4	26	26	100	2	4	7	13	16	5
<b>Anions</b>																							
Chloride	mg/L	1	NL	No WQO	175	155	155	100	5.00	10.00	13.00	20.20	29.30	36.00	7	7	100	10	11	12	21.6	30	34
Fluoride	mg/L	0.1	1.5	No WQO	1.0	159	3	2	NC	NC	NC	NC	NC	NC	7	5	71	0.1	0.1	0.2	0.6	0.8	0.2
Sulfate as SO4 2-	mg/L	1	NL	< 5	5	157	14	9	NC	NC	NC	NC	NC	4	7	0	0	NC	NC	NC	NC	NC	NC
<b>Metals and Metalloids</b>																							
Aluminium (dissolved)	mg/L	0.01	0.20	0.055	0.055	157	83	53	0.01	0.01	0.01	0.02	0.03	0.05	7	7	100	0.01	0.01	0.02	0.04	0.15	0.20
Arsenic (dissolved)	mg/L	0.001	0.010	0.013	NL	160	0	0	NC	NC	NC	NC	NC	< 0.001	7	6	86	0.001	0.001	0.001	0.003	0.004	0.004
Boron (dissolved)	mg/L	0.05	4.0	0.94	2.9 @ 18 ML/day <sup>2</sup> 2.5 @ 13.5 ML/day	158	158	100	0.22	0.58	0.83	1.17	1.81	2.05	71	68	96	0.05	0.42	0.59	0.87	1.14	1.47
Cadmium (dissolved)	mg/L	0.0001	0.002	0.0002	0.0002	158	1	1	NC	NC	NC	NC	NC	NC	7	0	0	NC	NC	NC	NC	NC	< 0.0001
Chromium (dissolved)	mg/L	0.001	0.050	0.001	0.001	158	8	5	NC	NC	NC	NC	NC	0.003	7	0	0	NC	NC	NC	NC	NC	< 0.001
Cobalt (dissolved)	mg/L	0.001	NL	0.001	NL	3	0	0	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	mg/L	0.001	2.0	0.0014	0.0014	158	6	4	NC	NC	NC	NC	NC	0.003	7	1	14	NC	NC	NC	NC	NC	0.004
Lead (dissolved)	mg/L	0.001	0.01	0.0034	0.0034	158	4	3	NC	NC	NC	NC	NC	0.004	7	1	14	NC	NC	NC	NC	NC	0.002
Manganese (dissolved)	mg/L	0.001	0.5	1.900	1.9	136	14	10	NC	NC	NC	NC	NC	0.059	7	7	100	0.002	0.010	0.042	0.155	0.250	0.283
Mercury (dissolved)	mg/L	0.0001	0.001	0.0006	0.0006	157	0	0	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	mg/L	0.001	0.02	0.011	0.011	158	3	2	NC	NC	NC	NC	NC	0.007	7	1	14	NC	NC	NC	NC	NC	0.001
Selenium (dissolved)	mg/L	0.01	0.01	0.011	0.011	158	0	0	NC	NC	NC	NC	NC	NC	7	0	0	NC	NC	NC	NC	NC	NC
Zinc (dissolved)	mg/L	0.005	3.0	0.008	0.008	158	21	13	NC	NC	NC	NC	NC	0.142	37	2	5	NC	NC	NC	NC	NC	0.013
<b>Nutrients</b>																							
Ammonia as N	mg/L	0.01	0.50	0.02	0.9	159	145	91	0.01	0.03	0.07	0.14	0.26	0.34	46	34	74	0.01	0.01	0.03	0.08	0.12	0.35
Nitrate as N	mg/L	0.01	NL	No WQO	NL	5	1	20	NC	NC	NC	NC	NC	0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrite + Nitrate as N	mg/L	0.01	NL	0.06	NL	157	48	31	0.01	0.01	0.01	0.01	0.02	0.05	46	13	28	0.01	0.01	0.01	0.01	0.04	0.13
Total Nitrogen as N	mg/L	0.1	NL	0.62	0.62	157	117	75	0.1	0.1	0.2	0.3	0.4	0.6	46	46	100	0.2	0.4	0.6	1.0	1.3	4.8
Total Phosphorus as P	mg/L	0.01	NL	0.07	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

**Table Notes**

Green highlighting is to provide visual guidance for the applicable statistic to be referenced against the State EA CL or WQO

LoR = Limit of Reporting of analytical method

NA = Not Analysed

NC = Insufficient detections to calculate summary statistics - maximum value provided only

sub-regional WQO = sub-regional Water Quality Objective

DGV = Default Guideline Value (ANZG, 2018) for 95% species protection level (Spp. Prot.)

NL = No State EA Contaminant Limit

Percent (%) detection values that are underlined indicate the number of detections are too low to calculate a reliable summary statistic

Bold values denote a dissolved phase value in outside or above the sub-regional WQO as follows:

- for physico-chemical parameters the median value are compared against the sub-regional WQO

- for nutrients, toxicants, metals and metalloids the 95<sup>th</sup> percentile is compared against the sub-regional WQO

Values shaded orange = the median (physico-chemical parameters) or 95<sup>th</sup> percentile are above the respective State EA CL triggering a review/investigation of trend or cause

- State EA Contaminant Limits (CL) are derive from EPPG00928713

- Physico-Chemical and Nutrient sub-regional WQO derived from the Environmental Protection (Water and Wetland Biodiversity) Policy 2019 - Schedule 1 document for the Upper Dawson River:

Environmental Protection (Water) Policy 2009 Dawson River Sub-basin Environmental Values and Water Quality Objectives Basin No. 130 (part), including all waters of the Dawson River Sub-basin except the Callide Creek Catchment September 2011.

- Toxicant/parameters WQO derived from Australia and New Zealand Guidelines for Fresh and Marine Water Quality (2019) Default Guideline Value (DGV) for 95% species protection level (moderately disturbed) for filtered/dissolved chemicals.

\* - Site specific water quality guideline (SSWQG) used for Boron as developed in AECOM, 2019

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**Summary Water Quality Statistics - July 2015 to 2021 - HCS04 DWB Pond, Waterhole and Dawson River**

	Units	LOR	State EA CL S4	sub-regional WQO / DGV 95% Spp. Prot.	State EA CL HCS04 DWB Pond	WLMP4-2015-2022									WLMP5-2015-2022								
						Number of data	No. > LoR	% detection	Minimum	20th Percentile	Median	80th Percentile	95th Percentile	Maximum	Number of data	No. > LoR	% detection	Minimum	20th Percentile	Median	80th Percentile	95th Percentile	Maximum
<b>Physicochemical Parameters</b>																							
Dissolved Oxygen - Field	mg/L	-	NL	7.0-9.0	6.4-16.4	30	30	100	3.6	6.5	8.1	9.3	10.3	11.0	44	44	100	2.4	6.6	7.5	9.1	11.7	12.6
Electrical Conductivity - Field	µS/cm	-	NL	370 (base flow) 210 (high flow)	370 (75%ile)	30	30	100	121	266	298	378	499	524	44	44	100	108	136	160	214	254	310
pH - Field	pH units	-	NL	6.5 - 8.5	6.5-8.5	29	29	100	6.1	7.4	7.8	8.0	8.6	8.8	43	43	100	7.1	7.5	7.7	7.9	8.2	9.8
Suspended Solids	mg/L	5	NL	< 30	NL	16	14	88	5	5	10	24	137	174	30	23	77	5	5	8	16	53	155
Turbidity - Field	NTU	-	NL	50	50	11	11	100	5	6	12	17	30	31	10	10	100	4	11	14	32	223	353
<b>Cations</b>																							
Calcium (dissolved)	mg/L	1	Minimum 1	No WQO	Minimum 1	13	13	100	13	23	27	38	43	44	29	29	100	7	10	13	18	22	28
Magnesium (dissolved)	mg/L	1	0.5	No WQO	NL	13	13	100	4	4	6	12	12	13	29	27	93	1	1	2	4	7	7
Sodium (dissolved)	mg/L	1	NL	No WQO	115	12	12	100	14	22	24	26	28	30	28	28	100	8	10	12	16	21	22
Potassium (dissolved)	mg/L	1	NL	No WQO	NL	12	12	100	5	6	9	24	27	29	28	28	100	1	2	5	8	15	16
<b>Anions</b>																							
Chloride	mg/L	1	NL	No WQO	175	7	7	100	22	24	28	34.4	37	38	8	8	100	10	10	12	20	29	33
Fluoride	mg/L	0.1	1.5	No WQO	1.0	7.0	7.0	100.0	0.1	0.1	0.1	0.2	0.2	0.2	8	8	100	0.1	0.1	0.1	0.2	0.2	0.2
Sulfate as SO4 2-	mg/L	1	NL	< 5	5	7	0	0	NC	NC	NC	NC	NC	NC	8	0	0	NC	NC	NC	NC	NC	NC
<b>Metals and Metalloids</b>																							
Aluminium (dissolved)	mg/L	0.01	0.20	0.055	0.055	7	4	57	0.01	0.01	0.02	0.02	0.03	0.04	8	8	100	0.01	0.02	0.03	0.04	0.19	0.27
Arsenic (dissolved)	mg/L	0.001	0.010	0.013	NL	7	6	86	0.001	0.001	0.002	0.002	0.003	0.004	8	6	75	0.001	0.001	0.001	0.002	0.003	0.003
Boron (dissolved)	mg/L	0.05	4.0	0.94	2.9 @ 18 ML/day <sup>a</sup> 2.5 @ 13.5 ML/day	30	27	90	0.05	0.14	0.75	1.09	1.35	1.77	46	42	91	0.05	0.26	0.60	0.90	1.23	1.49
Cadmium (dissolved)	mg/L	0.0001	0.002	0.0002	0.0002	7	0	0	NC	NC	NC	NC	NC	NC	8	0	0	NC	NC	NC	NC	NC	NC
Chromium (dissolved)	mg/L	0.001	0.050	0.001	0.001	7	0	0	NC	NC	NC	NC	NC	NC	8	0	0	NC	NC	NC	NC	NC	NC
Cobalt (dissolved)	mg/L	0.001	NL	0.001	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	mg/L	0.001	2.0	0.0014	0.0014	7	0	0	NC	NC	NC	NC	NC	NC	8	1	13	NC	NC	NC	NC	NC	0.004
Lead (dissolved)	mg/L	0.001	0.01	0.0034	0.0034	7	0	0	NC	NC	NC	NC	NC	NC	8	1	13	NC	NC	NC	NC	NC	0.002
Manganese (dissolved)	mg/L	0.001	0.5	1.900	1.9	7	7	100	0.014	0.022	0.037	0.139	0.192	0.211	8	7	88	0.001	0.005	0.023	0.057	0.215	0.291
Mercury (dissolved)	mg/L	0.0001	0.001	0.0006	0.0006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	mg/L	0.001	0.02	0.011	0.011	7	4	57	0.001	0.001	0.002	0.002	0.002	0.002	8	1	13	NC	NC	NC	NC	NC	0.001
Selenium (dissolved)	mg/L	0.01	0.01	0.011	0.011	7	0	0	NC	NC	NC	NC	NC	NC	8	0	0	NC	NC	NC	NC	NC	NC
Zinc (dissolved)	mg/L	0.005	3.0	0.008	0.008	26	1	4	NC	NC	NC	NC	NC	0.005	29	3	10	NC	NC	NC	NC	NC	0.011
<b>Nutrients</b>																							
Ammonia as N	mg/L	0.01	0.50	0.02	0.9	16	11	69	0.01	0.01	0.03	0.06	0.15	0.25	30	22	73	0.01	0.01	0.02	0.07	0.16	0.42
Nitrate as N	mg/L	0.01	NL	No WQO	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrite + Nitrate as N	mg/L	0.01	NL	0.06	NL	16	3	19	NC	NC	NC	NC	NC	0.35	30	9	30	NC	NC	NC	NC	NC	0.14
Total Nitrogen as N	mg/L	0.1	NL	0.62	0.62	16	16	100	0.4	0.6	1.0	1.5	1.9	2.1	30	30	100	0.3	0.5	0.7	1.0	1.5	3.5
Total Phosphorus as P	mg/L	0.01	NL	0.07	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

**Table Notes**

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sub-regional WQO = sub-regional Water Quality Objective

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Percent (%) detection values that are underlined indicate the number of detections are too low to calculate a reliable summary statistic

Bold values denote a dissolved phase value in outside or above the sub-regional WQO as follows:

- for physico-chemical parameters the median value are compared against the sub-regional WQO

- for nutrients, toxicants, metals and metalloids the 95<sup>th</sup> percentile is compared against the sub-regional WQO

Values shaded orange = the median (physico-chemical parameters) or 95<sup>th</sup> percentile are above the respective State EA CL triggering a review/investigation of trend or cause

- State EA Contaminant Limits (CL) are derive from EPPG00928713

- Physico-Chemical and Nutrient sub-regional WQO derived from the Environmental Protection (Water and Wetland Biodiversity) Policy 2019 - Schedule 1 document for the Upper Dawson River:

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	Units	LOR	State EA CL S4	sub-regional WQO / DGV 95% Spp. Prot.	State EA CL HCS04 DWB Pond	DRR1-2015-2022									DRMP1 2015-2022								
						Number of data	No. > LoR	% detection	Minimum	20th Percentile	Median	80th Percentile	95th Percentile	Maximum	Number of data	No. > LoR	% detection	Minimum	20th Percentile	Median	80th Percentile	95th Percentile	Maximum
<b>Physicochemical Parameters</b>																							
Dissolved Oxygen - Field	mg/L	-	NL	7.0-9.0	6.4-16.4	25	25	100	3.6	5.2	6.3	7.1	7.6	7.8	58	58	100	3.4	6.2	7.1	8.9	9.6	11.6
Electrical Conductivity - Field	µS/cm	-	NL	370 (base flow) 210 (high flow)	370 (75%ile)	25	25	100	82	241	273	290	307	312	58	58	100	102	222	275	303	335	602
pH - Field	pH units	-	NL	6.5 - 8.5	6.5-8.5	25	25	100	6.7	7.1	7.4	7.5	7.6	7.9	56	56	100	5.9	7.2	7.4	7.7	7.9	8.1
Suspended Solids	mg/L	5	NL	< 30	NL	26	20	77	5	5	12	42	277	711	25	21	84	5	6	12	36	153	174
Turbidity - Field	NTU	-	NL	50	50	11	11	100	11	13	20	21	520	1000	10	10	100	12	13	17	27	34	39
<b>Cations</b>																							
Calcium (dissolved)	mg/L	1	Minimum 1	No WQO	Minimum 1	24	24	100	5	14	16	18	20	21	26	26	100	6	14	16	19	22	23
Magnesium (dissolved)	mg/L	1	0.5	No WQO	NL	24	24	100	1	6	7	7	8	9	26	26	100	2	6	6	7	8	10
Sodium (dissolved)	mg/L	1	NL	No WQO	115	9	9	100	8	23	28	31	32	19	25	25	100	8	26	29	31	34	37
Potassium (dissolved)	mg/L	1	NL	No WQO	NL	23	23	100	3	3	4	4	5	6	25	25	100	3	4	4	5	6	4
<b>Anions</b>																							
Chloride	mg/L	1	NL	No WQO	175	9	9	100	4	18	21	24	26	26	8	8	100	16	21	22	24	25	25
Fluoride	mg/L	0.1	1.5	No WQO	1.0	9	8	89	0.1	0.1	0.1	0.1	0.2	0.2	8	8	100	0.1	0.1	0.1	0.2	0.3	0.4
Sulfate as SO4 2-	mg/L	1	NL	< 5	5	9	4	44	NC	NC	NC	NC	NC	2	8	5	63	1	1	1	2	4	4
<b>Metals and Metalloids</b>																							
Aluminium (dissolved)	mg/L	0.01	0.20	0.055	0.055	9	9	100	0.01	0.01	0.02	0.12	0.26	0.30	8	8	100	0.01	0.02	0.03	0.06	0.13	0.15
Arsenic (dissolved)	mg/L	0.001	0.010	0.013	NL	9	1	11	NC	NC	NC	NC	NC	0.001	8	1	13	NC	NC	NC	NC	NC	0.001
Boron (dissolved)	mg/L	0.05	4.0	0.94	2.9 @ 18 ML/day <sup>a</sup> 2.5 @ 13.5 ML/day	26	0	0	NC	NC	NC	NC	NC	NC	60	26	43	NC	NC	NC	NC	NC	0.28
Cadmium (dissolved)	mg/L	0.0001	0.002	0.0002	0.0002	9	0	0	NC	NC	NC	NC	NC	NC	8	0	0	NC	NC	NC	NC	NC	NC
Chromium (dissolved)	mg/L	0.001	0.050	0.001	0.001	9	0	0	NC	NC	NC	NC	NC	NC	8	0	0	NC	NC	NC	NC	NC	NC
Cobalt (dissolved)	mg/L	0.001	NL	0.001	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	mg/L	0.001	2.0	0.0014	0.0014	9	2	22	NC	NC	NC	NC	NC	0.005	8	1	13	NC	NC	NC	NC	NC	0.0020
Lead (dissolved)	mg/L	0.001	0.01	0.0034	0.0034	9	0	0	NC	NC	NC	NC	NC	NC	8	0	0	NC	NC	NC	NC	NC	NC
Manganese (dissolved)	mg/L	0.001	0.5	1.900	1.9	9	9	100	0.003	0.076	0.148	0.206	0.221	0.227	8	8	100	0.061	0.095	0.156	0.201	0.208	0.211
Mercury (dissolved)	mg/L	0.0001	0.001	0.0006	0.0006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	mg/L	0.001	0.02	0.011	0.011	9	0	0	NC	NC	NC	NC	NC	NC	8	1	13	NC	NC	NC	NC	NC	0.001
Selenium (dissolved)	mg/L	0.01	0.01	0.011	0.011	9	0	0	NC	NC	NC	NC	NC	NC	8	0	0	NC	NC	NC	NC	NC	NC
Zinc (dissolved)	mg/L	0.005	3.0	0.008	0.008	26	2	8	NC	NC	NC	NC	NC	0.011	60	6	10	NC	NC	NC	NC	NC	0.008
<b>Nutrients</b>																							
Ammonia as N	mg/L	0.01	0.50	0.02	0.9	26	21	81	0.01	0.01	0.04	0.06	0.10	0.15	25	25	100	0.01	0.02	0.05	0.07	0.08	0.13
Nitrate as N	mg/L	0.01	NL	No WQO	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrite + Nitrate as N	mg/L	0.01	NL	0.06	NL	26	19	73	0.01	0.01	0.04	0.10	0.45	0.83	25	22	88	0.01	0.01	0.04	0.08	0.74	0.87
Total Nitrogen as N	mg/L	0.1	NL	0.62	0.62	26	19	73	0.1	0.1	0.2	0.5	2.0	2.1	25	21	84	0.1	0.1	0.2	0.5	1.7	1.8
Total Phosphorus as P	mg/L	0.01	NL	0.07	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

**Table Notes**

Green highlighting is to provide visual guidance for the applicable statistic to be referenced against the State EA CL or WQO

LoR = Limit of Reporting of analytical method

NA = Not Analysed

NC = Insufficient detections to calculate summary statistics - maximum value provided only

sub regional WQO = sub regional Water Quality Objective

DGV = Default Guideline Value (ANZG, 2018) for 95% species protection level (Spp. Prot.)

NL = No State EA Contaminant Limit

Percent (%) detection values that are underlined indicate the number of detections are too low to calculate a reliable summary statistic

Bold values denote a dissolved phase value in outside or above the sub regional WQO as follows:

- for physico-chemical parameters the median value are compared against the sub-regional WQO

- for nutrients, toxicants, metals and metalloids the 95<sup>th</sup> percentile is compared against the sub-regional WQO

Values shaded orange = the median (physico-chemical parameters) or 95<sup>th</sup> percentile are above the respective State EA CL triggering a review/investigation of trend or cause

- State EA Contaminant Limits (CL) are derived from LPPG00928713

- Physico-Chemical and Nutrient sub-regional WQO derived from the Environmental Protection (Water and Wetland Biodiversity) Policy 2019 - Schedule 1 document for the Upper Dawson River;

- Environmental Protection (Water) Policy 2009 Dawson River Sub-basin Environmental Values and Water Quality Objectives Basin No. 130 (part), including all waters of the Dawson River Sub-basin except the Callide Creek Catchment September 2011

- Toxicant/parameters WQO derived from Australia and New Zealand Guidelines for Fresh and Marine Water Quality (2019) Default Guideline Value (DGV) for 95% species protection level (moderately disturbed) for filtered/dissolved chemicals.

\* Site specific water quality guideline (SSWQG) used for Boron as developed in AECOM, 2019

## APPENDIX E-2

**Santos Fairview Water Release Scheme  
Preliminary Documentation**

**Summary Water Quality Statistics - July 2015 to 2021 - HCS04 DWB Pond, Waterhole and Dawson River**

	Units	LOR	State EA CL S4	sub-regional WQO / DGV 95% Spp. Prot.	State EA CL HCS04 DWB Pond	S4 2015-2022								
						Number of data	No. > LoR	% detection	Minimum	20th Percentile	Median	80th Percentile	95th Percentile	Maximum
<b>Physicochemical Parameters</b>														
Dissolved Oxygen - Field	mg/L	-	NL	7.0-9.0	6.4-16.4	58	58	100	5.6	6.4	7.3	8.9	10.2	13.0
Electrical Conductivity - Field	µS/cm	-	NL	370 (base flow) 210 (high flow)	370 (75%ile)	58	58	100	111	214	273	306	338	393
pH - Field	pH units	-	NL	6.5 - 8.5	6.5-8.5	57	57	100	6.6	7.4	7.6	7.9	8.5	9.5
Suspended Solids	mg/L	5	NL	< 30	NL	17	10	59	5	5	16	144	555	650
Turbidity - Field	NTU	-	NL	50	50	9	9	100	6	16	20	30	37	40
<b>Cations</b>														
Calcium (dissolved)	mg/L	1	Minimum 1	No WQO	Minimum 1	10	10	100	13	15	17	18	22	25
Magnesium (dissolved)	mg/L	1	0.5	No WQO	NL	10	10	100	6	6	7	7	8	8
Sodium (dissolved)	mg/L	1	NL	No WQO	115	10	10	100	25	29	31	34	35	36
Potassium (dissolved)	mg/L	1	NL	No WQO	NL	10	10	100	3	3	4	4	4	4
<b>Anions</b>														
Chloride	mg/L	1	NL	No WQO	175	7	7	100	21	22	23	25	27	28
Fluoride	mg/L	0.1	1.5	No WQO	1.0	35	33	94	0.1	0.1	0.1	0.1	0.2	0.2
Sulfate as SO4 2-	mg/L	1	NL	< 5	5	7	4	57	NC	NC	NC	NC	NC	2
<b>Metals and Metalloids</b>														
Aluminium (dissolved)	mg/L	0.01	0.20	0.055	0.055	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic (dissolved)	mg/L	0.001	0.010	0.013	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron (dissolved)	mg/L	0.05	4.0	0.94	2.9 @ 18 ML/day <sup>a</sup> 2.5 @ 13.5 ML/day	17	2	12	NC	NC	NC	NC	NC	0.24
Cadmium (dissolved)	mg/L	0.0001	0.002	0.0002	0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	mg/L	0.001	0.050	0.001	0.001	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt (dissolved)	mg/L	0.001	NL	0.001	NL	1	0	0	NC	NC	NC	NC	NC	< 0.001
Copper (dissolved)	mg/L	0.001	2.0	0.0014	0.0014	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	mg/L	0.001	0.01	0.0034	0.0034	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (dissolved)	mg/L	0.001	0.5	1.900	1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury (dissolved)	mg/L	0.0001	0.001	0.0006	0.0006	24	0	0	NC	NC	NC	NC	NC	NC
Nickel (dissolved)	mg/L	0.001	0.02	0.011	0.011	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium (dissolved)	mg/L	0.01	0.01	0.011	0.011	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (dissolved)	mg/L	0.005	3.0	0.008	0.008	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Nutrients</b>														
Ammonia as N	mg/L	0.01	0.50	0.02	0.9	46	38	83	0.01	0.01	0.04	0.06	0.10	0.18
Nitrate as N	mg/L	0.01	NL	No WQO	NL	1	1	100	NC	NC	NC	NC	NC	0.02
Nitrite + Nitrate as N	mg/L	0.01	NL	0.06	NL	24	18	75	0.01	0.01	0.02	0.18	0.38	0.57
Total Nitrogen as N	mg/L	0.1	NL	0.62	0.62	24	23	96	0.1	0.1	0.2	1.4	1.9	3.2
Total Phosphorus as P	mg/L	0.01	NL	0.07	NL	7	7	100	0.01	0.02	0.02	0.05	0.07	0.08

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<sup>a</sup> Site specific water quality guideline (SSWQG) used for Boron as developed in AECOM, 2019