

Appendix C Equipment and Technical Information

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Part 1: Equipment Available During an Emergency

Appendix C1: Earthworks Equipment, Helicopters, Boats and Cranes

Earthworks Equipment

All emergency equipment hire is to be arranged through TCC RPA service preapproved supplier services.

Note: In addition to the further resources can be accessed through Local, District, and State Disaster Management framework, if and when each Local Disaster Management Group is activated. See relevant pages in communication lists for contact details.

Part 2: Technical Information - Gate Openings, Spillway and Tailwater Data

Appendix C2: Ross River Dam–Flood Rules

The operation of the gates on Ross River Dam is directly related to the water level in the reservoir.

Table C1: Critical Levels

Item	EL (m AHD)
Spillway Crest Level	34.65
Full Supply Level	38.55
Gate Trigger Level	38.65
Top of Spillway Gate (Closed)	39.05
Limit of Hydrostatic Load	40.05 ⁵
Limit of D/S Channel Capacity (Under normal operating conditions)	42.50
Dam Crest Level	48.00

Note: The data presented in the following Appendices is taken from DOMM-004, Detailed Operating and Maintenance Procedure for Supervisory Control and Data Acquisition System. The Limit of Hydrostatic Load EL 40.05m at Ross River Dam is related to the design hydrostatic load limit that the gates can withstand if they fail to open as designed.

This level is only relevant if one or more of the spillway gates fails to open when required. It is equivalent to 1.0m of water overtopping the gates when closed.

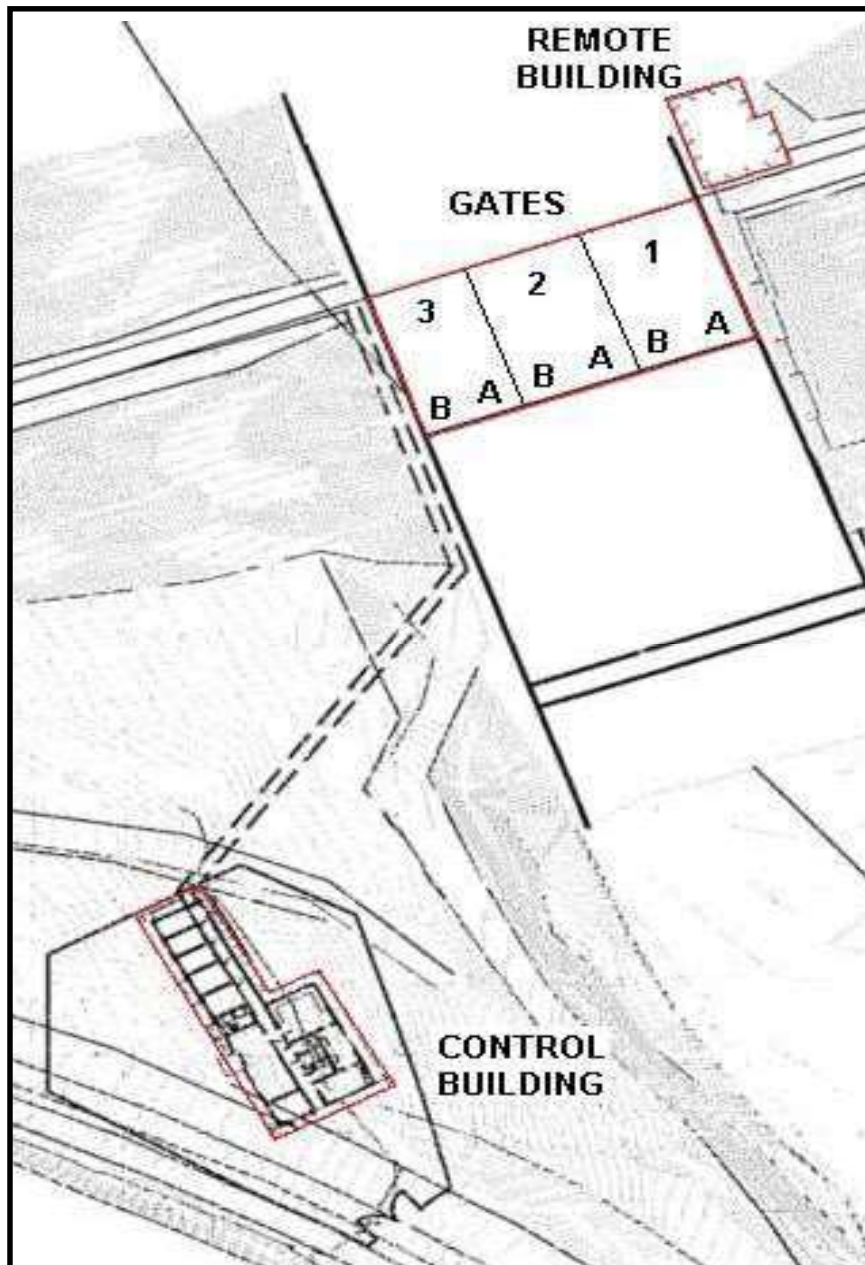
⁵ Stage 2 to 5, Spillway and Stilling Basin Design Report (September 2005, GHD)

Appendix C2: Flood Rules

Flood discharges are controlled by the 3 spillway gates, shown in Figure C1, for lake levels less than EL 43.00 m. Gates 1, 2 & 3 may also be referred to as Left, Centre and Right respectively.

For lake levels equal to and above EL 43.00 m, the spillway gates are to be fully open with free discharge over the crest of the spillway.

Figure C1: Ross River Dam Layout





Appendix C3: Ross River Dam Gate Openings

Gate opening (G_o) is defined as the distance between the bottom of the gate skin plate and the dam crest tangent line at the elevation of the gate seating position as shown below.

Figure C2: Ross River Dam Gate Opening Definition

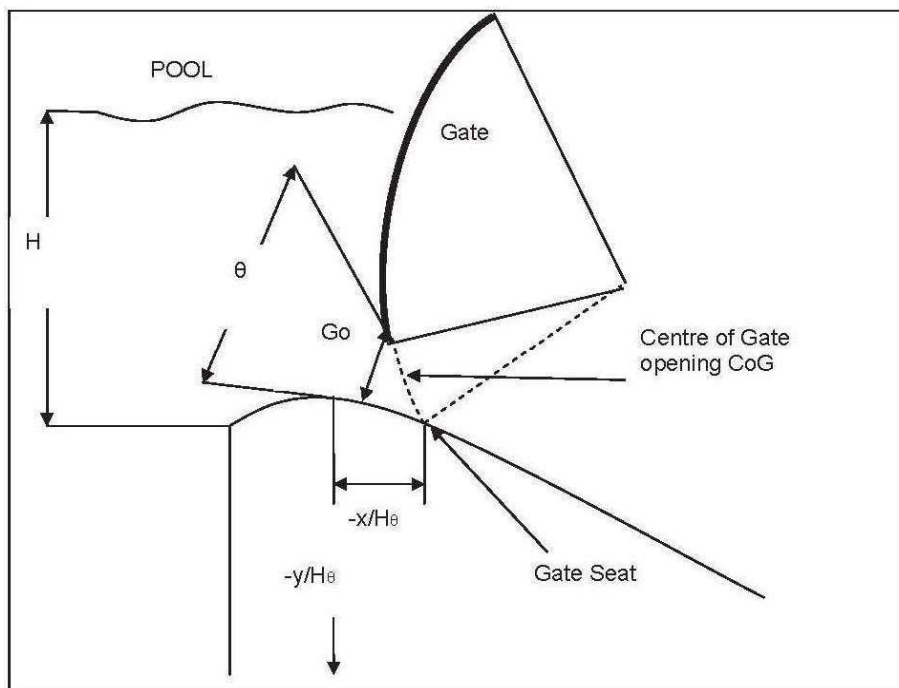


Table C2 below presents the relationships between gate opening and the change of gate arm angle.

Table C2: Gate Opening Relationship - 2012

Gate Opening G_o (m)	Gate Arm Angle Change (Degrees)
0.00	0.000
0.25	2.170
0.50	4.170
0.75	6.050
1.00	7.830
1.25	9.530
1.50	11.170
1.75	12.760
2.00	14.310
2.25	15.810
2.50	17.290
2.75	18.740
3.00	20.170
3.25	21.580
3.50	22.970
3.75	24.330
4.00	25.656
4.25	26.981
4.50	28.305
4.75	29.630
5.00	30.954
5.25	32.278
5.50	33.603
5.75	34.927
6.00	36.252
6.25	37.576
6.50	38.900
6.75	40.225
7.00	41.549
7.25	42.874
7.50	44.198
11.50	65.388

Appendix C4: Ross River Dam Gate Discharges

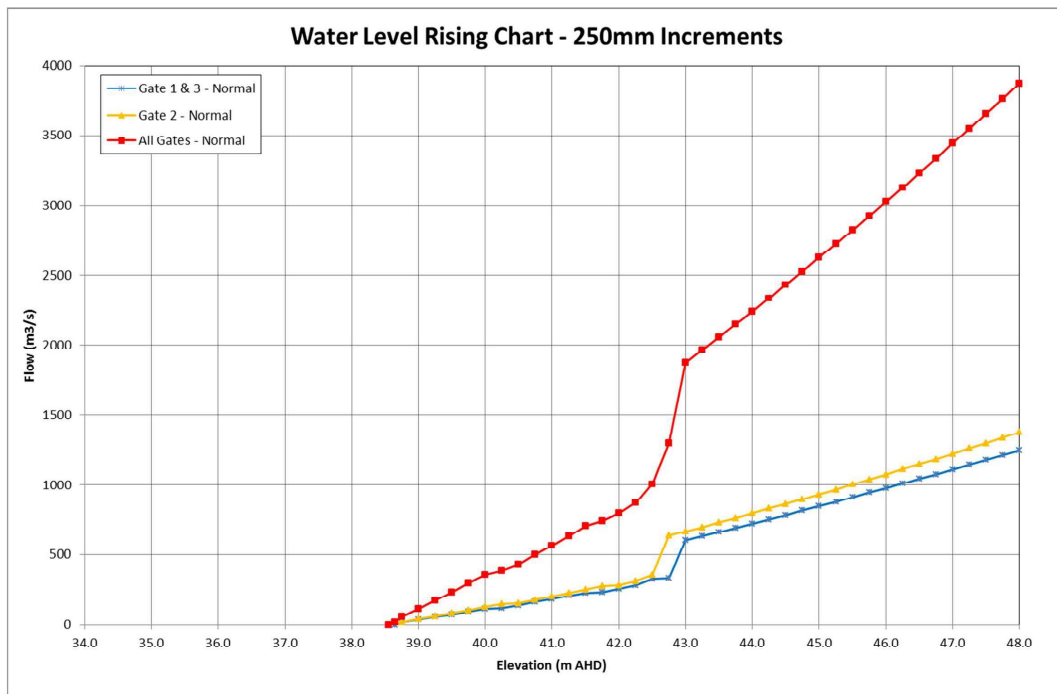
Discharge values and the corresponding gate openings are shown in Table C3 and Table C4.

Table C3: Gate openings & discharges–water level rising 250mm increments – 2016

Headwater Level 2012 (m AHD)	Headwater Level (m above FSL)	Headwater Level (m above Spillway)	Gate Opening G _o (m)			2016 Discharge (m ³ /s)			
			Left	Centre	Right	Left	Centre	Right	Total
			1	2	3	1	2	3	
38.55	0	3.89	0	0	0	0	0	0	0
38.65	0.1	3.99	0	0.25	0	0	20	0	20
38.75	0.2	4.09	0.25	0.25	0.25	18	20	18	57
39	0.45	4.34	0.5	0.5	0.5	37	41	37	114
39.25	0.7	4.59	0.75	0.75	0.75	56	61	56	173
39.5	0.95	4.84	1	1	1	75	83	75	232
39.75	1.2	5.09	1.25	1.25	1.25	95	104	95	293
40	1.45	5.34	1.5	1.5	1.5	115	126	115	356
40.25	1.7	5.59	1.5	1.75	1.5	118	149	118	385
40.5	1.95	5.84	1.75	1.75	1.75	139	153	139	431
40.75	2.2	6.09	2	2	2	160	177	160	497
41	2.45	6.34	2.25	2.25	2.25	182	201	182	565
41.25	2.7	6.59	2.5	2.5	2.5	205	225	205	635
41.5	2.95	6.84	2.75	2.75	2.75	228	251	228	706
41.75	3.2	7.09	2.75	3	2.75	233	276	233	742
42	3.45	7.34	3	3	3	256	282	256	795
42.25	3.7	7.59	3.25	3.25	3.25	281	309	281	870
42.5	3.95	7.84	3.75	3.75	3.75	324	356	324	1003
42.75	4.2	8.09	3.75	11.5	3.75	330	636	330	1296
43	4.45	8.34	11.5	11.5	11.5	605	667	605	1877
43.25	4.7	8.59	11.5	11.5	11.5	634	698	634	1966
43.5	4.95	8.84	11.5	11.5	11.5	663	730	663	2056
43.75	5.2	9.09	11.5	11.5	11.5	692	763	692	2148
44	5.45	9.34	11.5	11.5	11.5	722	796	722	2241
44.25	5.7	9.59	11.5	11.5	11.5	753	829	753	2335
44.5	5.95	9.84	11.5	11.5	11.5	784	863	784	2430
44.75	6.2	10.09	11.5	11.5	11.5	815	898	815	2527
45	6.45	10.34	11.5	11.5	11.5	846	932	846	2625
45.25	6.7	10.59	11.5	11.5	11.5	878	967	878	2724
45.5	6.95	10.84	11.5	11.5	11.5	910	1003	910	2823
45.75	7.2	11.09	11.5	11.5	11.5	943	1039	943	2924
46	7.45	11.34	11.5	11.5	11.5	976	1075	976	3026
46.25	7.7	11.59	11.5	11.5	11.5	1009	1111	1009	3129
46.5	7.95	11.84	11.5	11.5	11.5	1042	1148	104	3233
46.75	8.2	12.09	11.5	11.5	11.5	1076	1185	107	3337
47	8.45	12.34	11.5	11.5	11.5	1110	1223	111	3442
47.25	8.7	12.59	11.5	11.5	11.5	1144	1260	114	3548
47.5	8.95	12.84	11.5	11.5	11.5	1178	1298	117	3655
47.75	9.2	13.09	11.5	11.5	11.5	1213	1336	121	3763
48	9.45	13.34	11.5	11.5	11.5	1248	1375	124	3871



Figure C3: Spillway Discharge - Water Level Rising 2016



As the lake level falls the total discharge shall be progressively reduced so that at any given level the discharge does not exceed the value for the next higher lake level range. There is less risk of the gates “hunting” if gate openings on the falling limb of a flood remain at the highest lake level setting for the first fall in lake level. The gate openings are set for the next higher lake level reached given in Table C3 as the lake continues to fall.

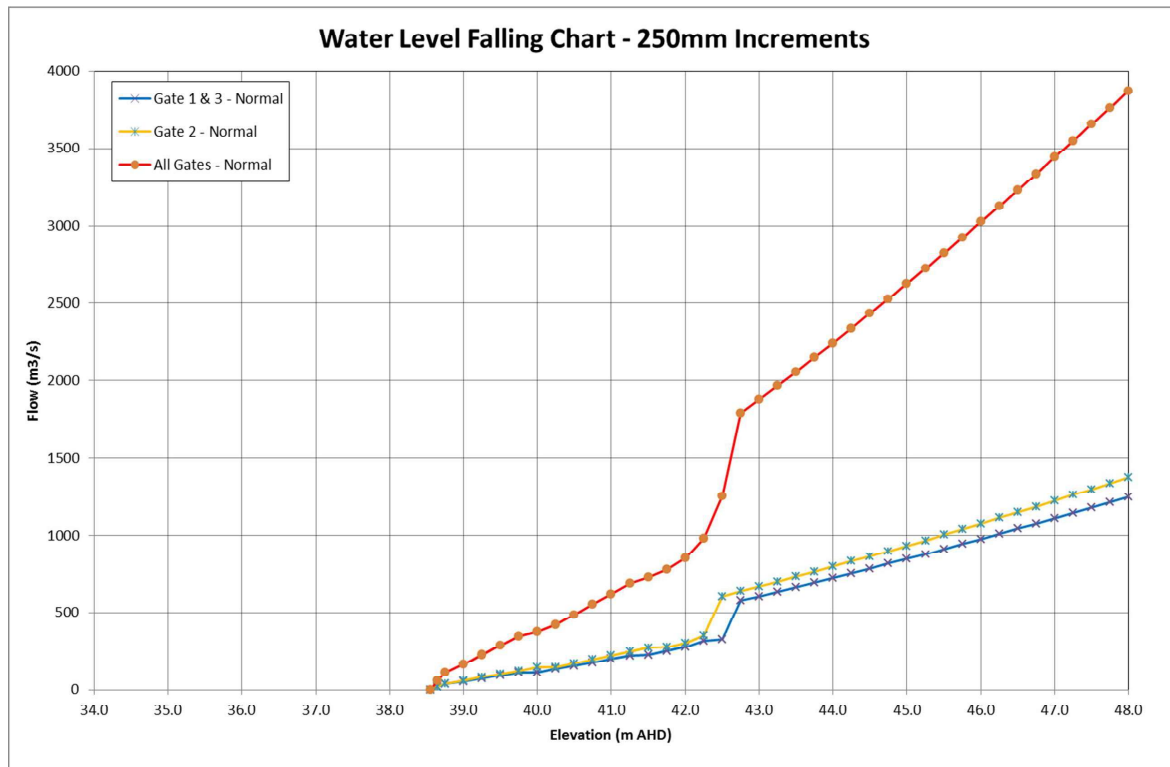
Table C4: Gate Openings & Discharges – Water Level Falling 250mm Increments

Headwater Level 2012 (m AHD)	Headwater Level (m above FSL)	Headwater Level (m above Spillway)	Gate Opening G _o (m)			2016 Discharge (m ³ /s)			
			Left	Centre	Right	Left	Centre	Right	Total
			1	2	3	1	2	3	Total
38.55	0	3.89	0	0	0	0	0	0	0
38.65	0.1	3.99	0.25	0.25	0.25	18	20	18	56
38.75	0.2	4.09	0.5	0.5	0.5	36	39	36	111
39	0.45	4.34	0.75	0.75	0.75	54	60	54	168
39.25	0.7	4.59	1	1	1	73	80	73	226
39.5	0.95	4.84	1.25	1.25	1.25	92	101	92	285
39.75	1.2	5.09	1.5	1.5	1.5	112	123	112	346
40	1.45	5.34	1.5	1.75	1.5	115	145	115	375
40.25	1.7	5.59	1.75	1.75	1.75	135	149	135	420
40.5	1.95	5.84	2	2	2	156	172	156	485
40.75	2.2	6.09	2.25	2.25	2.25	178	196	178	552
41	2.45	6.34	2.5	2.5	2.5	200	220	200	620
41.25	2.7	6.59	2.75	2.75	2.75	222	245	222	690
41.5	2.95	6.84	2.75	3	2.75	228	270	228	725
41.75	3.2	7.09	3	3	3	251	276	251	778
42	3.45	7.34	3.25	3.25	3.25	275	303	275	852
42.25	3.7	7.59	3.75	3.75	3.75	317	349	317	982
42.5	3.95	7.84	3.75	11.5	3.75	324	605	324	1252
42.75	4.2	8.09	11.5	11.5	11.5	577	636	577	1789
43	4.45	8.34	11.5	11.5	11.5	605	667	605	1877
43.25	4.7	8.59	11.5	11.5	11.5	634	698	634	1966
43.5	4.95	8.84	11.5	11.5	11.5	663	730	663	2056
43.75	5.2	9.09	11.5	11.5	11.5	692	763	692	2148
44	5.45	9.34	11.5	11.5	11.5	722	796	722	2241
44.25	5.7	9.59	11.5	11.5	11.5	753	829	753	2335
44.5	5.95	9.84	11.5	11.5	11.5	784	863	784	2430
44.75	6.2	10.09	11.5	11.5	11.5	815	898	815	2527
45	6.45	10.34	11.5	11.5	11.5	846	932	846	2625
45.25	6.7	10.59	11.5	11.5	11.5	878	967	878	2724
45.5	6.95	10.84	11.5	11.5	11.5	910	1003	910	2823
45.75	7.2	11.09	11.5	11.5	11.5	943	1039	943	2924
46	7.45	11.34	11.5	11.5	11.5	976	1075	976	3026
46.25	7.7	11.59	11.5	11.5	11.5	1009	1111	1009	3129
46.5	7.95	11.84	11.5	11.5	11.5	1042	1148	1042	3233
46.75	8.2	12.09	11.5	11.5	11.5	1076	1185	1076	3337
47	8.45	12.34	11.5	11.5	11.5	1110	1223	1110	3442
47.25	8.7	12.59	11.5	11.5	11.5	1144	1260	1144	3548
47.5	8.95	12.84	11.5	11.5	11.5	1178	1298	1178	3655
47.75	9.2	13.09	11.5	11.5	11.5	1213	1336	1213	3763
48	9.45	13.34	11.5	11.5	11.5	1248	1375	1248	3871



Townsville City Council
RD0032 Ross River Dam Emergency Action Plan

Figure C4: Spillway Discharge – Water Level Falling – 2016



Appendix C5: Ross River Dam Free Overflow Discharges

Table C5 shows the flow over the spillway which would result if the gates were fully opened at the commencement of spill.

Table C5: Free overflow discharges – 2016

Headwater Level (m AHD)	Headwater Level (m above Spillway)	Discharge (m ³ /s)			
		Left	Centre	Right	Total
34.656	0	0	0	0	0
34.75	0.09	1	1	1	2
35	0.34	4	5	4	14
35.5	0.84	17	19	17	54
35.75	1.09	26	28	26	80
36	1.34	35	39	35	109
36.25	1.59	46	50	46	142
36.5	1.84	57	63	57	177
36.75	2.09	69	77	69	215
37	2.34	83	91	83	257
37.25	2.59	97	107	97	300
37.5	2.84	112	123	112	346
37.75	3.09	127	140	127	395
38	3.34	144	158	144	446
38.25	3.59	161	177	161	499
38.5	3.84	179	197	179	554
38.75	4.09	197	217	197	612
39	4.34	216	238	216	671
39.25	4.59	236	260	236	733
39.5	4.84	257	283	257	797
39.75	5.09	278	306	278	863
40	5.34	300	330	300	930
40.25	5.59	322	355	322	1000
40.5	5.84	345	380	345	1071
40.75	6.09	369	406	369	1144
41	6.34	393	433	393	1219
41.25	6.59	418	460	418	1296
41.5	6.84	443	488	443	1374
41.75	7.09	469	516	469	1454
42	7.34	495	545	495	1535
42.25	7.59	522	575	522	1618
42.5	7.84	549	605	549	1703
42.75	8.09	577	636	577	1789
43	8.34	605	667	605	1877
43.25	8.59	634	698	634	1966
43.5	8.84	663	730	663	2056
43.75	9.09	692	763	692	2148
44	9.34	722	796	722	2241
44.25	9.59	753	829	753	2335
44.5	9.84	784	863	784	2430
44.75	10	815	898	815	2527
45	10.3	846	932	846	2625
45.25	10.5	878	967	878	2724
45.5	10.8	910	1003	910	2823
45.75	11	943	1039	943	2924
46	11.3	976	1075	976	3026
46.25	11.5	1009	1111	1009	3129
46.5	11.8	1042	1148	1042	3233
46.75	12	1076	1185	1076	3337
47	12.3	1110	1223	1110	3442
47.25	12.5	1144	1260	1144	3548
47.5	12.8	1178	1298	1178	3655
47.75	13	1213	1336	1213	3763
48	13.3	1248	1375	1248	3871



Authorised by: General Manager WRR N00636

Townsville City Council

RD0032 Ross River Dam Emergency Action Plan

Effective Date: 3/11/2023

Table C6: Discharge for Central Gate only (m3/s) – 2016

Lake Level	Gate Opening (m)																													
	0 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25 2.50 2.75 3.00																													
	Elevation on centre of gate opening (m)																													
	Elevation at Top of Gate (m)																													
	34.252	34.46	34.65	34.82	34.99	35.15	35.30	35.45	35.59	35.73	35.87	36.00	36.13	36.26	36.39	36.52	36.65	36.77	36.90	37.03	37.15	37.40	37.65	37.90	38.15	38.40	40.389			
39.03	39.44	39.82	40.18	40.52	40.85	41.16	41.47	41.76	42.05	42.33	42.61	42.88	43.15	43.41	43.67	43.93	44.17	44.42	44.60	44.90	45.37	45.82	46.27	46.71	47.13	50.11				
48.00	584	589	588	589	592	597	603	610	618	627	637	647	658	669	681	693	705	719	733	751	790	821	853	886	921	1375				
47.75	569	565	564	565	568	573	580	587	595	604	614	624	635	646	658	671	683	697	711	739	769	800	833	866	902	1336				
47.50	545	541	540	542	545	550	556	564	572	581	591	601	612	624	636	649	661	675	689	718	748	780	813	847	884	1298				
47.25	521	517	517	518	522	527	534	541	550	559	569	579	591	602	615	627	640	654	668	697	728	760	794	829	868	1260				
47.00	497	494	493	495	499	505	511	519	527	537	547	556	569	581	593	606	619	633	647	677	708	741	776	813	855	1223				
46.75	474	471	471	473	477	483	489	497	506	515	526	537	548	560	573	586	599	613	628	658	690	723	759	798	842	1185				
46.50	451	448	448	451	455	461	468	476	485	494	505	516	528	540	552	566	579	594	608	639	671	706	743	786	829	1148				
46.25	429	426	427	429	434	440	447	455	464	474	484	496	507	520	533	546	560	575	590	621	654	690	730	774	817	1111				
46.00	407	404	405	408	412	419	426	434	444	454	464	476	488	501	514	528	541	556	572	604	638	675	719	762	803	1075				
45.75	385	383	384	387	392	398	406	414	424	434	445	457	469	482	495	509	523	539	554	587	623	664	708	750	790	1039				
45.50	364	362	363	367	372	378	386	395	404	415	426	438	451	464	477	492	508	522	538	572	609	653	698	737	777	1003				
45.25	343	341	343	346	352	359	367	376	386	396	408	420	433	446	460	475	489	506	522	558	599	643	685	725	763	967				
45.00	322	321	323	327	333	340	348	357	367	378	390	402	415	429	443	458	474	490	508	545	589	632	673	712	749	932				
44.75	302	302	304	308	314	321	330	339	349	361	373	385	398	413	428	443	459	476	494	536	579	621	661	699	734	898				
44.50	283	282	285	289	295	303	312	321	332	344	356	369	383	397	412	429	445	463	483	527	569	610	649	685	720	863				
44.25	264	264	268	271	277	285	294	304	315	327	340	353	368	383	398	415	433	452	474	518	559	599	636	672	705	829				
44.00	245	245	249	253	260	268	278	288	299	312	325	339	353	369	385	403	422	444	466	508	549	587	624	659	690	796				
43.75	227	227	231	236	243	252	262	272	284	297	310	324	340	358	373	392	414	436	458	499	539	576	611	644	674	763				
43.50	209	210	214	220	227	236	246	257	269	282	296	311	327	344	363	385	407	428	449	490	528	564	598	629	658	730				
43.25	192	193	197	204	211	221	231	243	255	269	283	299	316	335	356	378	399	420	441	480	517	552	584	614	642	698				
43.00	175	177	181	188	196	206	217	229	242	256	272	288	306	325	346	368	391	412	432	470	506	539	570	599	625	667				
42.75	159	161	166	173	182	192	203	216	230	245	261	279	300	322	343	364	384	404	425	460	494	526	556	583	608	636				
42.50	143	146	151	159	168	179	191	204	218	234	252	273	294	315	336	356	376	395	414	449	483	513	542	567	590	605				
42.25	128	131	137	145	155	166	179	193	208	225	246	267	288	309	329	349	368	387	404	439	471	500	527	551	572	575				
42.00	113	117	124	132	143	155	168	183	199	219	241	262	282	303	322	341	359	378	395	428	458	486	511	534	545	545				
41.75	99	104	111	120	131	144	158	174	193	215	236	260	276	296	316	333	351	369	385	417	446	472	495	516	516	516				
41.50	86	91	99	109	121	134	150	168	189	210	231	251	270	289	307	325	342	359	375	405	433	457	479	498	498	498				
41.25	73	79	88	98	111	126	143	164	185	205	225	245	264	282	300	317	333	349	365	393	419	442	460	460	460	460				
41.00	61	68	77	89	103	119	139	160	181	201	220	239	257	275	292	308	324	340	354	381	405	427	433	433	433	433				
40.75	50	58	68	80	96	116	136	157	177	196	215	233	251	268	284	300	315	329	343	369	391	406	406	406	406	406				
40.50	39	48	59	73	91	112	133	153	172	191	209	227	244	260	276	291	305	319	332	355	376	389	389	389	389	389				
40.25	30	39	52	68	89	110	130	149	168	186	203	220	237	252	267	281	295	308	320	342	355	355	355	355	355	355				
40.00	21	32	47	66	87	107	126	145	163	181	198	214	229	244	258	272	284	297	308	328	339	339	339	339	339	339				
39.75	14	26	44	65	85	104	123	141	159	175	192	207	222	236	249	262	274	285	295	306	306	306	306	306	306	306				
39.50	7	22	43	63	83	101	120	137	154	170	185	200	214	227	240	252	262	273	282	283	283	283	283	283	283	283				
39.25	2	21	42	61	80	98	116	133	149	164	179	193	208	218	230	241	251	260	260	260	260	260	260	260	260	260				
39.00	0	21	41	60	78	95	112	128	144	158	172	185	197	209	220	230	238	238	238	238	238	238	238	238	238	238				
38.75	0	20	39	58	75	92	108	124	138	152	165	177	189	199	209	217	217	217	217	217	217	217	217	217	217	217				
38.50	0	20	38	56	73	89	104	119	133	146	158	169	179	189	197	197	197	197	197	197	197	197	197	197	197	197				
38.25	0	19	37	54	70	86	100	114	127	139	150	160	170	177	177	177	177	177	177	177	177	177	177	177	177	177				
38.00	0	18	36	52	67	82	96	109	121	132	142	151	158	158	158	158	158	158	158	158	158	158	158	158	158	158				
37.75	0	18	34	50	65	78	91	103	114	124	133	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140				
37.50	0	17	33	48	63	75	87	97	107	116	123	129	133	133	133	133	133	133	133	133	133	133	133	133	133	133				
37.25	0	16	31	45	58	70	81	91	100	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107				
37.00	0	15	30	43	55	66	76	85	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91				
36.75	0	15	28	40	52	61	70	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77				
36.50	0	14	26	38	49	58	67	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73				
36.25	0	13	25	35	44	50	56	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59				
36.00	0	12	23	32	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39				
35.75	0	11	20	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28				
35.50	0	10	18	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25				
35.25	0	9	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11				
35.00	0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5				
34.75	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
L = 11.1metres Cost = 34.65metres 50 Denotes Over Topping and Drifts Flow Condition 50 Denotes Drifts Flow Condition 50 Denotes Free Flow Condition																														
Gate Orifice Coef = 0.675 1.0 for over topping of gates																														

Townsville City Council
RD0032 Ross River Dam Emergency Action Plan

Effective Date: 3/11/2023

Table C7: Discharge for singles Outer Gate (1 or 3) only (m3/s) - 2016

[illegible]



Authorised by: General Manager WRR N00636

Townsville City Council

RD0032 Ross River Dam Emergency Action Plan

Effective Date: 3/11/2023

Table C8: Discharge for all Gates (m3/s) – 2016

Lake Level	Gate Opening (m)																			
	0	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	Discharge (m ³ /s) at gate opening (m)							
	34.212	34.46	34.65	34.82	34.99	35.15	35.30	35.45	35.59	35.73	35.87	36.00	36.13	36.26	36.39	36.52	36.65	36.77	36.90	37.15
Elevation at Top of Gate (m)																				
	39.03	39.44	39.82	40.18	40.52	40.85	41.16	41.47	41.76	42.05	42.33	42.61	42.88	43.15	43.41	43.67	43.93	44.17	44.42	44.90
	45.00	1672	1659	1656	1659	1668	1681	1698	1718	1740	1765	1792	1821	1851	1883	1917	1952	1986	2025	2062
	47.75	1602	1590	1587	1591	1600	1614	1632	1652	1675	1700	1727	1756	1787	1820	1853	1889	1923	1962	2000
	47.50	1534	1523	1520	1525	1534	1549	1566	1587	1610	1636	1664	1693	1724	1757	1791	1827	1861	1901	1940
	47.25	1466	1456	1454	1459	1469	1484	1502	1523	1547	1573	1601	1631	1663	1696	1730	1766	1801	1842	1881
	47.00	1400	1390	1389	1395	1406	1421	1439	1461	1485	1511	1540	1570	1602	1636	1671	1707	1743	1783	1823
	46.75	1335	1326	1325	1331	1343	1359	1378	1400	1424	1451	1480	1511	1543	1577	1612	1649	1686	1727	1767
	46.50	1270	1262	1263	1269	1281	1297	1317	1339	1364	1392	1421	1452	1485	1520	1555	1593	1630	1672	1712
	46.25	1207	1200	1201	1208	1221	1237	1256	1281	1306	1334	1364	1395	1429	1464	1500	1538	1576	1616	1660
	46.00	1143	1138	1140	1148	1161	1179	1199	1223	1249	1277	1308	1340	1374	1409	1446	1485	1524	1567	1609
	45.75	1084	1078	1081	1089	1103	1121	1142	1166	1193	1222	1253	1286	1320	1357	1394	1434	1473	1517	1560
	45.50	1024	1019	1023	1032	1046	1065	1087	1111	1138	1168	1200	1233	1268	1305	1344	1384	1424	1469	1514
	45.25	965	961	965	976	991	1010	1032	1058	1085	1116	1148	1182	1218	1256	1296	1336	1376	1424	1470
	45.00	908	905	910	920	936	956	979	1005	1034	1065	1098	1133	1169	1208	1248	1291	1334	1381	1429
	44.75	851	849	855	867	883	904	928	954	984	1015	1049	1085	1123	1162	1204	1247	1292	1341	1391
	44.50	796	795	802	814	831	853	878	905	935	968	1002	1039	1078	1118	1161	1207	1253	1305	1359
	44.25	742	742	750	763	781	803	829	857	888	922	957	995	1035	1077	1121	1169	1218	1273	1335
	44.00	689	689	699	713	732	755	782	811	843	877	914	953	994	1036	1084	1134	1188	1250	1312
	43.75	638	640	650	665	685	709	736	767	799	835	873	913	956	1002	1051	1105	1166	1228	1288
	43.50	588	591	602	618	639	664	693	724	758	795	834	876	921	970	1023	1084	1145	1206	1265
	43.25	539	544	556	573	595	621	651	683	719	757	798	842	890	942	1003	1065	1124	1184	1241
	43.00	492	498	511	529	553	580	611	645	681	721	765	811	863	923	984	1045	1103	1160	1216
	42.75	448	453	468	488	512	541	573	608	647	689	735	785	845	908	968	1024	1081	1137	1191
	42.50	402	411	426	447	473	503	537	574	615	659	709	767	826	888	946	1003	1058	1113	1165
	42.25	360	369	387	409	436	468	503	543	586	634	691	752	810	870	927	982	1036	1088	1139
	42.00	318	330	348	373	402	435	473	515	561	617	678	737	795	853	907	961	1012	1063	1112
	41.75	279	292	313	339	369	405	445	490	543	604	664	722	778	833	886	938	988	1037	1084
	41.50	242	257	279	307	340	378	421	472	532	592	649	708	761	814	865	916	964	1011	1056
	41.25	206	223	247	277	313	354	402	461	521	579	635	690	743	794	844	892	938	984	1027
	41.00	172	191	218	260	289	335	382	451	509	565	620	673	724	774	822	869	913	956	997
	40.75	140	161	227	269	324	383	441	497	552	605	656	705	753	799	844	886	927	966	1003
	40.50	111	135	167	207	257	315	374	431	485	538	589	638	686	732	776	819	860	898	934
	40.25	84	111	147	192	251	309	365	420	473	524	573	620	666	710	752	792	830	867	901
	40.00	59	90	131	187	245	301	356	409	460	509	556	602	646	687	727	765	801	835	866
	39.75	38	74	124	162	219	283	346	397	446	494	539	583	624	664	702	737	770	802	831
	39.50	20	62	121	177	232	285	336	386	433	478	522	563	602	640	676	708	738	768	797
	39.25	6	50	117	173	226	277	328	374	419	462	503	543	580	615	647	678	705	732	753
	39.00	0	59	114	169	219	266	316	361	404	445	484	521	556	588	618	646	671	691	711
	38.75	0	57	111	163	212	260	305	348	389	428	465	499	531	561	588	612	632	652	671
	38.50	0	55	107	157	205	250	294	335	373	410	444	476	505	532	554	584	614	644	674
	38.25	0	53	104	152	198	241	282	321	357	391	422	451	478	499	518	545	574	604	634
	38.00	0	51	100	146	190	231	270	306	340	371	400	426	448	465	480	498	514	530	546
	37.75	0	50	96	140	182	221	257	291	322	350	376	395	395	395	395	395	395	395	395
	37.50	0	48	92	134	173	210	244	274	303	328	348	366	348	348	348	348	348	348	348
	37.25	0	46	88	128	164	198	229	257	282	300	300	300	300	300	300	300	300	300	300
	37.00	0	44	84	121	155	186	214	239	267	287	287	287	287	287	287	287	287	287	287
	36.75	0	41	79	114	145	173	199	215	215	215	215	215	215	215	215	215	215	215	215
	36.50	0	39	74	106	134	159	177	177	177	177	177	177	177	177	177	177	177	177	177
	36.25	0	37	69	96	123	142	142	142	142	142	142	142	142	142	142	142	142	142	142
	36.00	0	34	64	89	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109
	35.75	0	31	57	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
	35.50	0	28	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54
	35.25	0	24	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	35.00	0	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
	34.75	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

L = metres Crest = metres
For over topping of gates

Note: Discharge rates do not include flow over the closed gate. If a gate is closed or inoperable, assuming the gate has not partially opened, the gate will be overtopped for EL greater than 39.05m. For all situations where a gate is inoperable when closed, refer to Section 10 for Emergency Actions.



Authorised by: General Manager WRR N00636

Townsville City Council
RD0032 Ross River Dam Emergency Action Plan

Effective Date: 3/11/2023

Table C9: Minimum Gate Settings - Water Level RISING 50mm increments

Headwater	Headwater	Gate Opening G ₀			All Gates Operational				Gate 1 closed or Inoperable (m)				Q (m ³ /s)	Gate 2 closed or Inoperable (m)				Q (m ³ /s)	Gate 3 closed or Inoperable (m)				Q (m ³ /s)	2016 Discharge				
Level	Level	(m)			Gate Opening (m)																			(m ³ /s)				
(m AHD)	(m above FSL)	Left	Centre	Right	Left	Centre	Right		Left	Centre	Right			Left	Centre	Right			Left	Centre	Right			Left	Centre	Right	Total	
		1	2	3	1	2	3	Q (m ³ /s)	1	2	3		1	2	3		1	2	3		1	2	3	(m ³ /s)				
38.55	0.00	0.00	0.00	0.00	closed	closed	closed	0	closed	closed	closed	0	closed	closed	closed	0	closed	closed	closed	0	0.0	0.0	0.0	0.0				
38.60	0.05	0.00	0.00	0.00	closed	closed	closed	0	closed	closed	closed	0	closed	closed	closed	0	closed	closed	closed	0	0.0	0.0	0.0	0.0				
38.65	0.10	0.00	0.25	0.00	closed	0.25	closed	20	closed	0.25	closed	20	closed	closed	closed	0	closed	0.25	closed	20	0.0	19.9	0.0	19.9				
38.70	0.15	0.00	0.25	0.00	closed	0.25	closed	20	closed	0.25	closed	20	closed	closed	closed	0	closed	0.25	closed	20	0.0	20.0	0.0	20.0				
38.75	0.20	0.25	0.25	0.25	0.25	0.25	0.25	57	closed	0.50	0.50	75	0.50	closed	0.50	71	0.50	0.50	closed	75	18.3	20.1	18.3	56.7				
38.80	0.25	0.25	0.25	0.25	0.25	0.25	0.25	57	closed	0.50	0.50	76	0.50	closed	0.50	72	0.50	0.50	closed	76	18.4	20.2	18.4	57.0				
38.85	0.30	0.25	0.25	0.25	0.25	0.25	0.25	57	closed	0.50	0.50	76	0.50	closed	0.50	72	0.50	0.50	closed	76	18.5	20.4	18.5	57.3				
38.90	0.35	0.25	0.25	0.25	0.25	0.25	0.25	58	closed	0.50	0.50	76	0.50	closed	0.50	73	0.50	0.50	closed	76	18.6	20.5	18.6	57.6				
38.95	0.40	0.25	0.25	0.25	0.25	0.25	0.25	58	closed	0.50	0.50	77	0.50	closed	0.50	73	0.50	0.50	closed	77	18.7	20.6	18.7	58.0				
39.00	0.45	0.50	0.50	0.50	0.50	0.50	0.50	114	closed	0.75	0.75	114	1.00	closed	1.00	141	0.75	0.75	closed	114	36.8	40.5	36.8	114.1				
39.05	0.50	0.50	0.50	0.50	0.50	0.50	0.50	115	closed	0.75	0.75	114	1.00	closed	1.00	142	0.75	0.75	closed	114	37.0	40.8	37.0	114.8				
39.10	0.55	0.50	0.50	0.50	0.50	0.50	0.50	115	closed	0.75	0.75	115	1.00	closed	1.00	143	0.75	0.75	closed	115	37.2	41.0	37.2	115.4				
39.15	0.60	0.50	0.50	0.50	0.50	0.50	0.50	116	closed	0.75	0.75	116	1.00	closed	1.00	144	0.75	0.75	closed	116	37.4	41.2	37.4	116.1				
39.20	0.65	0.50	0.50	0.50	0.50	0.50	0.50	117	closed	0.75	0.75	116	1.00	closed	1.00	145	0.75	0.75	closed	116	37.6	41.5	37.6	116.7				
39.25	0.70	0.75	0.75	0.75	0.75	0.75	0.75	173	closed	1.25	1.25	188	1.25	closed	1.25	179	1.25	1.25	closed	188	55.7	61.3	55.7	172.7				
39.30	0.75	0.75	0.75	0.75	0.75	0.75	0.75	174	closed	1.25	1.25	189	1.25	closed	1.25	180	1.25	1.25	closed	189	56.0	61.7	56.0	173.6				
39.35	0.80	0.75	0.75	0.75	0.75	0.75	0.75	175	closed	1.25	1.25	190	1.25	closed	1.25	181	1.25	1.25	closed	190	56.3	62.0	56.3	174.6				
39.40	0.85	0.75	0.75	0.75	0.75	0.75	0.75	176	closed	1.25	1.25	191	1.25	closed	1.25	182	1.25	1.25	closed	191	56.6	62.4	56.6	175.6				
39.45	0.90	0.75	0.75	0.75	0.75	0.75	0.75	177	closed	1.25	1.25	192	1.25	closed	1.25	183	1.25	1.25	closed	192	56.9	62.7	56.9	176.5				
39.50	0.95	1.00	1.00	1.00	1.00	1.00	1.00	232	closed	1.50	1.50	228	1.75	closed	1.75	249	1.50	1.50	closed	228	74.9	82.5	74.9	232.4				
39.55	1.00	1.00	1.00	1.00	1.00	1.00	1.00	234	closed	1.50	1.50	229	1.75	closed	1.75	250	1.50	1.50	closed	229	75.3	83.0	75.3	233.7				
39.60	1.05	1.00	1.00	1.00	1.00	1.00	1.00	235	closed	1.50	1.50	231	1.75	closed	1.75	252	1.50	1.50	closed	231	75.7	83.4	75.7	234.9				
39.65	1.10	1.00	1.00	1.00	1.00	1.00	1.00	236	closed	1.50	1.50	232	1.75	closed	1.75	253	1.50	1.50	closed	232	76.2	83.9	76.2	236.2				
39.70	1.15	1.00	1.00	1.00	1.00	1.00	1.00	237	closed	1.50	1.50	233	1.75	closed	1.75	255	1.50	1.50	closed	233	76.6	84.3	76.6	237.5				
39.75	1.20	1.25	1.25	1.25	1.25	1.25	1.25	293	closed	2.00	2.00	303	2.00	closed	2.00	288	2.00	2.00	closed	303	94.6	104.2	94.6	293.4				
39.80	1.25	1.25	1.25	1.25	1.25	1.25	1.25	295	closed	2.00	2.00	304	2.00	closed	2.00	290	2.00	2.00	closed	304	95.1	104.8	95.1	295.0				
39.85	1.30	1.25	1.25	1.25	1.25	1.25	1.25	297	closed	2.00	2.00	306	2.00	closed	2.00	291	2.00	2.00	closed	306	95.6	105.4	95.6	296.6				
39.90	1.35	1.25	1.25	1.25	1.25	1.25	1.25	298	closed	2.00	2.00	308	2.00	closed	2.00	293	2.00	2.00	closed	308	96.1	105.9	96.1	298.2				
39.95	1.40	1.25	1.25	1.25	1.25	1.25	1.25	300	closed	2.00	2.00	310	2.00	closed	2.00	295	2.00	2.00	closed	310	96.6	106.5	96.6	299.7				
40.00	1.45	1.50	1.50	1.50	1.50	1.50	1.50	356	closed	2.25	2.25	345	2.50	closed	2.50	359	2.25	2.25	closed	345	114.7	126.4	114.7	355.9				
40.05	1.50	1.50	1.50	1.50	1.50	1.50	1.50	358	closed	2.25	2.25	347	2.50	closed	2.50	361	2.25	2.25	closed	347	115.4	127.1	115.4	357.8				
40.10	1.55	1.50	1.50	1.50	1.50	1.50	1.50	360	closed	2.25	2.25	349	2.50	closed	2.50	363	2.25	2.25	closed	349	116.0	127.8	116.0	359.7				
40.15	1.60	1.50	1.50	1.50	1.50	1.50	1.50	362	closed	2.25	2.25	351	2.50	closed	2.50	365	2.25	2.25	closed	351	116.6	128.4	116.6	361.5				
40.20	1.65	1.50	1.50	1.50	1.50	1.50	1.50	363	closed	2.25	2.25	353	2.50	closed	2.50	367	2.25	2.25	closed	353	117.2	129.1	117.2	363.4				
40.25	1.70	1.50	1.75	1.50	1.50	1.75	1.50	385	closed	2.50	2.25	372	2.50	closed	2.50	369	2.25	2.50	closed	372	117.8	149.1	117.8	384.6				
40.30	1.75	1.50	1.75	1.50	1.50	1.75	1.50	387	closed	2.50	2.25	374	2.50	closed	2.50	371	2.25	2.50	closed	374	118.4	149.9	118.4	386.6				
40.35	1.80	1.50	1.75	1.50	1.50	1.75	1.50	389	closed	2.50	2.25	376	2.50	closed	2.50	374	2.25	2.50	closed	376	119.0	150.6	119.0	390.5				
40.40	1.85	1.50	1.75	1.50	1.50	1.75	1.50	390	closed	2.50	2.25	379	2.50	closed	2.50	376	2.25	2.50	closed	379	119.5	151.4	119.5	390.5				
40.45	1.90	1.50	1.75	1.50	1.50	1.75	1.50	392	closed	2.50	2.25	381	2.50	closed	2.50	378	2.25	2.50	closed	381	120.1	152.2	120.1	392.4				
40.50	1.95	1.75	1.75	1.75	1.75	1.75	1.75	431	closed	2.75	2.75	433	2.75	closed	2.75	412	2.75	2.75	closed	433	138.8	152.9	138.8	430.5				

Table C9 (continued): Minimum Gate Settings–Water Level RISING 50mm increments



City of
Townsville

Authorised by: General Manager WRR N00632

Townsville City Council

RD0032 Ross River Dam Emergency Action Plan

Effective Date: 3/11/2023

Headwater	Headwater	Gate Opening G ₀			All Gates Operational				Gate 1 closed or			Q	Gate 2 closed or			Q	Gate 3 closed or			Q	2016 Discharge			
Level	Level	(m)			Gate Opening (m)				Inoperable (m)			(m ³ /s)	Inoperable (m)			(m ³ /s)	Inoperable (m)			(m ³ /s)	(m ³ /s)			
(m AHD)	(m above FSL)	Left	Centre	Right	Left	Centre	Right	Q	Left	Centre	Right		Left	Centre	Right		Left	Centre	Right		Left	Centre	Right	Total
40.55	2.00	1.75	1.75	1.75	1.75	1.75	1.75	433	closed	2.75	2.75	435	2.75	closed	2.75	414	2.75	2.75	closed	435	139.5	153.7	139.5	432.6
40.60	2.05	1.75	1.75	1.75	1.75	1.75	1.75	435	closed	2.75	2.75	437	2.75	closed	2.75	416	2.75	2.75	closed	437	140.2	154.4	140.2	434.8
40.65	2.10	1.75	1.75	1.75	1.75	1.75	1.75	437	closed	2.75	2.75	440	2.75	closed	2.75	418	2.75	2.75	closed	440	140.8	155.2	140.8	436.9
40.70	2.15	1.75	1.75	1.75	1.75	1.75	1.75	439	closed	2.75	2.75	442	2.75	closed	2.75	421	2.75	2.75	closed	442	141.5	155.9	141.5	439.0
40.75	2.20	2.00	2.00	2.00	2.00	2.00	2.00	497	closed	3.00	3.00	478	3.25	closed	3.25	486	3.25	3.00	closed	493	160.3	176.6	160.3	497.2
40.80	2.25	2.00	2.00	2.00	2.00	2.00	2.00	500	closed	3.00	3.00	481	3.25	closed	3.25	488	3.25	3.00	closed	496	161.1	177.5	161.1	499.6
40.85	2.30	2.00	2.00	2.00	2.00	2.00	2.00	502	closed	3.00	3.00	483	3.25	closed	3.25	491	3.25	3.00	closed	499	161.8	178.3	161.8	502.0
40.90	2.35	2.00	2.00	2.00	2.00	2.00	2.00	504	closed	3.00	3.00	486	3.25	closed	3.25	494	3.25	3.00	closed	501	162.6	179.1	162.6	504.4
40.95	2.40	2.00	2.00	2.00	2.00	2.00	2.00	507	closed	3.00	3.00	488	3.25	closed	3.25	496	3.25	3.00	closed	504	163.4	180.0	163.4	506.7
41.00	2.45	2.25	2.25	2.25	2.25	2.25	2.25	565	closed	3.50	3.50	557	3.50	closed	3.50	530	3.50	3.50	closed	557	182.3	200.8	182.3	565.3
41.05	2.50	2.25	2.25	2.25	2.25	2.25	2.25	568	closed	3.50	3.50	560	3.50	closed	3.50	533	3.50	3.50	closed	560	183.1	201.7	183.1	566.0
41.10	2.55	2.25	2.25	2.25	2.25	2.25	2.25	571	closed	3.50	3.50	563	3.50	closed	3.50	536	3.50	3.50	closed	563	184.0	202.7	184.0	570.6
41.15	2.60	2.25	2.25	2.25	2.25	2.25	2.25	573	closed	3.50	3.50	566	3.50	closed	3.50	539	3.50	3.50	closed	566	184.8	203.6	184.8	573.3
41.20	2.65	2.25	2.25	2.25	2.25	2.25	2.25	576	closed	3.50	3.50	569	3.50	closed	3.50	541	3.50	3.50	closed	569	185.7	204.6	185.7	575.9
41.25	2.70	2.50	2.50	2.50	2.50	2.50	2.50	635	closed	3.75	3.75	605	11.50	closed	11.50	835	3.75	3.75	closed	605	204.7	225.5	204.7	634.8
41.30	2.75	2.50	2.50	2.50	2.50	2.50	2.50	638	closed	3.75	3.75	608	11.50	closed	11.50	845	3.75	3.75	closed	608	205.6	226.5	205.6	637.8
41.35	2.80	2.50	2.50	2.50	2.50	2.50	2.50	641	closed	3.75	3.75	611	11.50	closed	11.50	855	3.75	3.75	closed	611	206.6	227.6	206.6	640.7
41.40	2.85	2.50	2.50	2.50	2.50	2.50	2.50	644	closed	3.75	3.75	614	11.50	closed	11.50	866	3.75	3.75	closed	614	207.5	228.6	207.5	643.6
41.45	2.90	2.50	2.50	2.50	2.50	2.50	2.50	647	closed	3.75	3.75	617	11.50	closed	11.50	876	3.75	3.75	closed	617	208.4	229.6	208.4	646.5
41.50	2.95	2.75	2.75	2.75	2.75	2.75	2.75	706	closed	11.50	11.50	931	11.50	closed	11.50	886	11.50	11.50	closed	931	227.5	250.7	227.5	705.7
41.55	3.00	2.75	2.75	2.75	2.75	2.75	2.75	709	closed	11.50	11.50	942	11.50	closed	11.50	896	11.50	11.50	closed	942	228.6	251.8	228.6	708.9
41.60	3.05	2.75	2.75	2.75	2.75	2.75	2.75	712	closed	11.50	11.50	952	11.50	closed	11.50	906	11.50	11.50	closed	952	229.6	252.0	229.6	712.1
41.65	3.10	2.75	2.75	2.75	2.75	2.75	2.75	715	closed	11.50	11.50	963	11.50	closed	11.50	917	11.50	11.50	closed	963	230.6	254.1	230.6	715.3
41.70	3.15	2.75	2.75	2.75	2.75	2.75	2.75	718	closed	11.50	11.50	974	11.50	closed	11.50	927	11.50	11.50	closed	974	231.6	255.2	231.6	718.5
41.75	3.20	2.75	3.00	2.75	2.75	3.00	2.75	742	closed	11.50	11.50	985	11.50	closed	11.50	937	11.50	11.50	closed	985	232.6	276.4	232.6	741.7
41.80	3.25	2.75	3.00	2.75	2.75	3.00	2.75	745	closed	11.50	11.50	996	11.50	closed	11.50	948	11.50	11.50	closed	996	233.7	277.6	233.7	744.9
41.85	3.30	2.75	3.00	2.75	2.75	3.00	2.75	748	closed	11.50	11.50	1007	11.50	closed	11.50	958	11.50	11.50	closed	1007	234.7	278.8	234.7	748.1
41.90	3.35	2.75	3.00	2.75	2.75	3.00	2.75	751	closed	11.50	11.50	1018	11.50	closed	11.50	969	11.50	11.50	closed	1018	235.7	280.0	235.7	751.4
41.95	3.40	2.75	3.00	2.75	2.75	3.00	2.75	755	closed	11.50	11.50	1029	11.50	closed	11.50	979	11.50	11.50	closed	1029	236.7	281.2	236.7	754.6
42.00	3.45	3.00	3.00	3.00	3.00	3.00	3.00	795	closed	11.50	11.50	1040	11.50	closed	11.50	990	11.50	11.50	closed	1040	256.4	282.5	256.4	795.2
42.05	3.50	3.00	3.00	3.00	3.00	3.00	3.00	799	closed	11.50	11.50	1052	11.50	closed	11.50	1001	11.50	11.50	closed	1052	257.5	283.7	257.5	798.6
42.10	3.55	3.00	3.00	3.00	3.00	3.00	3.00	802	closed	11.50	11.50	1063	11.50	closed	11.50	1011	11.50	11.50	closed	1063	258.6	284.8	258.6	802.0
42.15	3.60	3.00	3.00	3.00	3.00	3.00	3.00	805	closed	11.50	11.50	1074	11.50	closed	11.50	1022	11.50	11.50	closed	1074	259.6	286.0	259.6	805.3
42.20	3.65	3.00	3.00	3.00	3.00	3.00	3.00	809	closed	11.50	11.50	1085	11.50	closed	11.50	1033	11.50	11.50	closed	1085	260.7	287.2	260.7	808.6
42.25	3.70	3.25	3.25	3.25	3.25	3.25	3.25	870	closed	11.50	11.50	1097	11.50	closed	11.50	1044	11.50	11.50	closed	1097	280.5	309.1	280.5	870.1
42.30	3.75	3.25	3.25	3.25	3.25	3.25	3.25	874	closed	11.50	11.50	1108	11.50	closed	11.50	1054	11.50	11.50	closed	1108	281.7	310.4	281.7	873.8
42.35	3.80	3.25	3.25	3.25	3.25	3.25	3.25	877	closed	11.50	11.50	1120	11.50	closed	11.50	1065	11.50	11.50	closed	1120	282.9	311.6	282.9	877.4
42.40	3.85	3.25	3.25	3.25	3.25	3.25	3.25	881	closed	11.50	11.50	1131	11.50	closed	11.50	1076	11.50	11.50	closed	1131	284.0	312.9	284.0	881.0
42.45	3.90	3.25	3.25	3.25	3.25	3.25	3.25	885	closed	11.50	11.50	1142	11.50	closed	11.50	1087	11.50	11.50	closed	1142	285.2	314.2	285.2	884.6
42.50	3.95	3.75	3.75	3.75	3.75	3.75	3.75	1003	closed	11.50	11.50	1154	11.50	closed	11.50	1098	11.50	11.50	closed	1154	323.5	356.4	323.5	1003.5



Authorised by: General Manager WRR N00636

Townsville City Council

RD0032 Ross River Dam Emergency Action Plan

Effective Date: 3/11/2023

Table C9 (continued): Minimum Gate Settings–Water Level RISING 50mm increments

Headwater	Headwater	Gate Opening G ₀			All Gates Operational				Gate 1 closed or Inoperable (m)				Gate 2 closed or Inoperable (m)				Gate 3 closed or Inoperable (m)				2016 Discharge			
Level	Level	(m)			Gate Opening (m)				(m ³ /s)				(m ³ /s)				(m ³ /s)				(m ³ /s)			
(m AHD)	(m above FSL)	Left	Centre	Right	Left	Centre	Right	Q	Left	Centre	Right	Q	Left	Centre	Right	Q	Left	Centre	Right	Q	Left	Centre	Right	Total
42.55	4.00	3.75	3.75	3.75	3.75	3.75	3.75	1008	closed	11.50	11.50	1166	11.50	closed	11.50	1109	11.50	11.50	closed	1166	324.9	357.9	324.9	1007.6
42.60	4.05	3.75	3.75	3.75	3.75	3.75	3.75	1012	closed	11.50	11.50	1177	11.50	closed	11.50	1120	11.50	11.50	closed	1177	326.2	359.4	326.2	1011.8
42.65	4.10	3.75	3.75	3.75	3.75	3.75	3.75	1016	closed	11.50	11.50	1189	11.50	closed	11.50	1131	11.50	11.50	closed	1189	327.6	360.9	327.6	1016.0
42.70	4.15	3.75	3.75	3.75	3.75	3.75	3.75	1020	closed	11.50	11.50	1201	11.50	closed	11.50	1143	11.50	11.50	closed	1201	328.9	362.3	328.9	1020.1
42.75	4.20	3.75	11.50	3.75	3.75	11.50	3.75	1296	closed	11.50	11.50	1212	11.50	closed	11.50	1154	11.50	11.50	closed	1212	330.2	635.5	330.2	1296.0
42.80	4.25	3.75	11.50	3.75	3.75	11.50	3.75	1305	closed	11.50	11.50	1224	11.50	closed	11.50	1165	11.50	11.50	closed	1224	331.5	641.7	331.5	1304.8
42.85	4.30	3.75	11.50	3.75	3.75	11.50	3.75	1314	closed	11.50	11.50	1236	11.50	closed	11.50	1176	11.50	11.50	closed	1236	332.9	647.9	332.9	1313.6
42.90	4.35	3.75	11.50	3.75	3.75	11.50	3.75	1322	closed	11.50	11.50	1248	11.50	closed	11.50	1187	11.50	11.50	closed	1248	334.2	654.1	334.2	1322.5
42.95	4.40	3.75	11.50	3.75	3.75	11.50	3.75	1331	closed	11.50	11.50	1260	11.50	closed	11.50	1199	11.50	11.50	closed	1260	335.5	660.4	335.5	1331.3
43.00	4.45	11.50	11.50	11.50	11.50	11.50	11.50	1877	closed	11.50	11.50	1272	11.50	closed	11.50	1210	11.50	11.50	closed	1272	605.1	666.6	605.1	1876.8
43.05	4.50	11.50	11.50	11.50	11.50	11.50	11.50	1895	closed	11.50	11.50	1284	11.50	closed	11.50	1222	11.50	11.50	closed	1284	610.8	672.9	610.8	1894.5
43.10	4.55	11.50	11.50	11.50	11.50	11.50	11.50	1912	closed	11.50	11.50	1296	11.50	closed	11.50	1233	11.50	11.50	closed	1296	616.5	679.2	616.5	1912.2
43.15	4.60	11.50	11.50	11.50	11.50	11.50	11.50	1930	closed	11.50	11.50	1308	11.50	closed	11.50	1245	11.50	11.50	closed	1308	622.3	685.5	622.3	1930.0
43.20	4.65	11.50	11.50	11.50	11.50	11.50	11.50	1948	closed	11.50	11.50	1320	11.50	closed	11.50	1256	11.50	11.50	closed	1320	628.0	691.9	628.0	1947.9
43.25	4.70	11.50	11.50	11.50	11.50	11.50	11.50	1966	closed	11.50	11.50	1332	11.50	closed	11.50	1268	11.50	11.50	closed	1332	633.8	698.2	633.8	1965.8
43.30	4.75	11.50	11.50	11.50	11.50	11.50	11.50	1984	closed	11.50	11.50	1344	11.50	closed	11.50	1279	11.50	11.50	closed	1344	639.6	704.6	639.6	1983.8
43.35	4.80	11.50	11.50	11.50	11.50	11.50	11.50	2002	closed	11.50	11.50	1356	11.50	closed	11.50	1291	11.50	11.50	closed	1356	645.4	711.0	645.4	2001.8
43.40	4.85	11.50	11.50	11.50	11.50	11.50	11.50	2020	closed	11.50	11.50	1369	11.50	closed	11.50	1302	11.50	11.50	closed	1369	651.2	717.4	651.2	2019.8
43.45	4.90	11.50	11.50	11.50	11.50	11.50	11.50	2038	closed	11.50	11.50	1381	11.50	closed	11.50	1314	11.50	11.50	closed	1381	657.0	723.9	657.0	2038.0
43.50	4.95	11.50	11.50	11.50	11.50	11.50	11.50	2056	closed	11.50	11.50	1393	11.50	closed	11.50	1326	11.50	11.50	closed	1393	662.9	730.3	662.9	2056.1
43.55	5.00	11.50	11.50	11.50	11.50	11.50	11.50	2074	closed	11.50	11.50	1406	11.50	closed	11.50	1338	11.50	11.50	closed	1406	668.8	736.8	668.8	2074.4
43.60	5.05	11.50	11.50	11.50	11.50	11.50	11.50	2093	closed	11.50	11.50	1410	11.50	closed	11.50	1349	11.50	11.50	closed	1410	674.7	743.3	674.7	2092.7
43.65	5.10	11.50	11.50	11.50	11.50	11.50	11.50	2111	closed	11.50	11.50	1430	11.50	closed	11.50	1361	11.50	11.50	closed	1430	680.6	749.8	680.6	2111.0
43.70	5.15	11.50	11.50	11.50	11.50	11.50	11.50	2129	closed	11.50	11.50	1443	11.50	closed	11.50	1373	11.50	11.50	closed	1443	686.5	756.3	686.5	2129.4
43.75	5.20	11.50	11.50	11.50	11.50	11.50	11.50	2148	closed	11.50	11.50	1455	11.50	closed	11.50	1385	11.50	11.50	closed	1455	692.5	762.9	692.5	2147.8
43.80	5.25	11.50	11.50	11.50	11.50	11.50	11.50	2166	closed	11.50	11.50	1468	11.50	closed	11.50	1397	11.50	11.50	closed	1468	698.4	769.5	698.4	2166.3
43.85	5.30	11.50	11.50	11.50	11.50	11.50	11.50	2185	closed	11.50	11.50	1480	11.50	closed	11.50	1409	11.50	11.50	closed	1480	704.4	776.0	704.4	2184.9
43.90	5.35	11.50	11.50	11.50	11.50	11.50	11.50	2203	closed	11.50	11.50	1493	11.50	closed	11.50	1421	11.50	11.50	closed	1493	710.4	782.6	710.4	2203.4
43.95	5.40	11.50	11.50	11.50	11.50	11.50	11.50	2222	closed	11.50	11.50	1506	11.50	closed	11.50	1433	11.50	11.50	closed	1506	716.4	789.3	716.4	2222.1
44.00	5.45	11.50	11.50	11.50	11.50	11.50	11.50	2241	closed	11.50	11.50	1518	11.50	closed	11.50	1445	11.50	11.50	closed	1518	722.4	795.9	722.4	2240.8
44.05	5.50	11.50	11.50	11.50	11.50	11.50	11.50	2260	closed	11.50	11.50	1531	11.50	closed	11.50	1457	11.50	11.50	closed	1531	728.5	802.6	728.5	2259.5
44.10	5.55	11.50	11.50	11.50	11.50	11.50	11.50	2278	closed	11.50	11.50	1544	11.50	closed	11.50	1469	11.50	11.50	closed	1544	734.5	809.2	734.5	2278.3
44.15	5.60	11.50	11.50	11.50	11.50	11.50	11.50	2297	closed	11.50	11.50	1557	11.50	closed	11.50	1481	11.50	11.50	closed	1557	740.6	815.9	740.6	2297.2
44.20	5.65	11.50	11.50	11.50	11.50	11.50	11.50	2316	closed	11.50	11.50	1569	11.50	closed	11.50	1493	11.50	11.50	closed	1569	746.7	822.6	746.7	2316.1
44.25	5.70	11.50	11.50	11.50	11.50	11.50	11.50	2335	closed	11.50	11.50	1582	11.50	closed	11.50	1506	11.50	11.50	closed	1582	752.8	829.4	752.8	2335.0
44.30	5.75	11.50	11.50	11.50	11.50	11.50	11.50	2354	closed	11.50	11.50	1595	11.50	closed	11.50	1518	11.50	11.50	closed	1595	758.9	836.1	758.9	2354.0
44.35	5.80	11.50	11.50	11.50	11.50	11.50	11.50	2373	closed	11.50	11.50	1600	11.50	closed	11.50	1530	11.50	11.50	closed	1600	765.1	842.9	765.1	2373.0
44.40	5.85	11.50	11.50	11.50	11.50	11.50	11.50	2392	closed	11.50	11.50	1621	11.50	closed	11.50	1542	11.50	11.50	closed	1621	771.2	849.7	771.2	2392.1
44.45	5.90	11.50	11.50	11.50	11.50	11.50	11.50	2411	closed	11.50	11.50	1634	11.50	closed	11.50	1555	11.50	11.50	closed	1634	777.4	856.5	777.4	2411.3
44.50	5.95	11.50	11.50	11.50	11.50	11.50	11.50	2430	closed	11.50	11.50	1647	11.50	closed	11.50	1567	11.50	11.50	closed	1647	783.6	863.3	783.6	2430.4



Authorised by: General Manager WRR N00636

Townsville City Council
RD0032 Ross River Dam Emergency Action Plan

Effective Date: 3/11/2023

Table C9 (continued): Minimum Gate Settings–Water Level RISING 50mm increments

Headwater	Headwater	Gate Opening G ₀			All Gates Operational				Gate 1 closed or Inoperable (m)			Q	Gate 2 closed or Inoperable (m)			Q	Gate 3 closed or Inoperable (m)			Q	2016 Discharge			
Level	Level	Gate Opening (m)			Gate Opening (m)				Gate 1 closed or Inoperable (m)			Q	Gate 2 closed or Inoperable (m)			Q	Gate 3 closed or Inoperable (m)			Q	2016 Discharge			
(m AHD)	(m above FSL)	Left	Centre	Right	Left	Centre	Right	Q (m ³ /s)	Left	Centre	Right	(m ³ /s)	Left	Centre	Right	(m ³ /s)	Left	Centre	Right	(m ³ /s)	Left	Centre	Right	Total (m ³ /s)
44.55	6.00	11.50	11.50	11.50	11.50	11.50	11.50	2450	closed	11.50	11.50	1660	11.50	closed	11.50	1580	11.50	11.50	closed	1660	789.8	870.1	789.8	2449.7
44.60	6.05	11.50	11.50	11.50	11.50	11.50	11.50	2469	closed	11.50	11.50	1673	11.50	closed	11.50	1592	11.50	11.50	closed	1673	796.0	876.9	796.0	2468.9
44.65	6.10	11.50	11.50	11.50	11.50	11.50	11.50	2488	closed	11.50	11.50	1686	11.50	closed	11.50	1604	11.50	11.50	closed	1686	802.2	883.8	802.2	2488.3
44.70	6.15	11.50	11.50	11.50	11.50	11.50	11.50	2508	closed	11.50	11.50	1699	11.50	closed	11.50	1617	11.50	11.50	closed	1699	808.5	890.7	808.5	2507.6
44.75	6.20	11.50	11.50	11.50	11.50	11.50	11.50	2527	closed	11.50	11.50	1712	11.50	closed	11.50	1629	11.50	11.50	closed	1712	814.7	897.6	814.7	2527.0
44.80	6.25	11.50	11.50	11.50	11.50	11.50	11.50	2546	closed	11.50	11.50	1725	11.50	closed	11.50	1642	11.50	11.50	closed	1725	821.0	904.5	821.0	2546.5
44.85	6.30	11.50	11.50	11.50	11.50	11.50	11.50	2566	closed	11.50	11.50	1739	11.50	closed	11.50	1655	11.50	11.50	closed	1739	827.3	911.4	827.3	2566.0
44.90	6.35	11.50	11.50	11.50	11.50	11.50	11.50	2586	closed	11.50	11.50	1752	11.50	closed	11.50	1667	11.50	11.50	closed	1752	833.6	918.4	833.6	2585.6
44.95	6.40	11.50	11.50	11.50	11.50	11.50	11.50	2605	closed	11.50	11.50	1765	11.50	closed	11.50	1680	11.50	11.50	closed	1765	839.9	925.3	839.9	2605.1
45.00	6.45	11.50	11.50	11.50	11.50	11.50	11.50	2625	closed	11.50	11.50	1779	11.50	closed	11.50	1692	11.50	11.50	closed	1779	846.2	932.3	846.2	2624.8
45.05	6.50	11.50	11.50	11.50	11.50	11.50	11.50	2644	closed	11.50	11.50	1792	11.50	closed	11.50	1705	11.50	11.50	closed	1792	852.6	939.3	852.6	2644.5
45.10	6.55	11.50	11.50	11.50	11.50	11.50	11.50	2664	closed	11.50	11.50	1805	11.50	closed	11.50	1718	11.50	11.50	closed	1805	858.9	946.3	858.9	2664.2
45.15	6.60	11.50	11.50	11.50	11.50	11.50	11.50	2684	closed	11.50	11.50	1819	11.50	closed	11.50	1731	11.50	11.50	closed	1819	865.3	953.3	865.3	2683.9
45.20	6.65	11.50	11.50	11.50	11.50	11.50	11.50	2704	closed	11.50	11.50	1832	11.50	closed	11.50	1743	11.50	11.50	closed	1832	871.7	960.3	871.7	2703.8
45.25	6.70	11.50	11.50	11.50	11.50	11.50	11.50	2724	closed	11.50	11.50	1846	11.50	closed	11.50	1756	11.50	11.50	closed	1846	878.1	967.4	878.1	2723.6
45.30	6.75	11.50	11.50	11.50	11.50	11.50	11.50	2743	closed	11.50	11.50	1859	11.50	closed	11.50	1769	11.50	11.50	closed	1859	884.5	974.5	884.5	2743.5
45.35	6.80	11.50	11.50	11.50	11.50	11.50	11.50	2763	closed	11.50	11.50	1872	11.50	closed	11.50	1782	11.50	11.50	closed	1872	890.9	981.5	890.9	2763.4
45.40	6.85	11.50	11.50	11.50	11.50	11.50	11.50	2783	closed	11.50	11.50	1886	11.50	closed	11.50	1795	11.50	11.50	closed	1886	897.4	988.6	897.4	2783.4
45.45	6.90	11.50	11.50	11.50	11.50	11.50	11.50	2803	closed	11.50	11.50	1900	11.50	closed	11.50	1808	11.50	11.50	closed	1900	903.8	995.8	903.8	2803.4
45.50	6.95	11.50	11.50	11.50	11.50	11.50	11.50	2823	closed	11.50	11.50	1913	11.50	closed	11.50	1821	11.50	11.50	closed	1913	910.3	1002.9	910.3	2823.5
45.55	7.00	11.50	11.50	11.50	11.50	11.50	11.50	2844	closed	11.50	11.50	1927	11.50	closed	11.50	1834	11.50	11.50	closed	1927	916.8	1010.0	916.8	2843.6
45.60	7.05	11.50	11.50	11.50	11.50	11.50	11.50	2864	closed	11.50	11.50	1940	11.50	closed	11.50	1847	11.50	11.50	closed	1940	923.3	1017.2	923.3	2863.7
45.65	7.10	11.50	11.50	11.50	11.50	11.50	11.50	2884	closed	11.50	11.50	1954	11.50	closed	11.50	1860	11.50	11.50	closed	1954	929.8	1024.3	929.8	2883.9
45.70	7.15	11.50	11.50	11.50	11.50	11.50	11.50	2904	closed	11.50	11.50	1968	11.50	closed	11.50	1873	11.50	11.50	closed	1968	936.3	1031.5	936.3	2904.1
45.75	7.20	11.50	11.50	11.50	11.50	11.50	11.50	2924	closed	11.50	11.50	1982	11.50	closed	11.50	1886	11.50	11.50	closed	1982	942.8	1038.7	942.8	2924.4
45.80	7.25	11.50	11.50	11.50	11.50	11.50	11.50	2945	closed	11.50	11.50	1995	11.50	closed	11.50	1899	11.50	11.50	closed	1995	949.4	1045.9	949.4	2944.7
45.85	7.30	11.50	11.50	11.50	11.50	11.50	11.50	2965	closed	11.50	11.50	2009	11.50	closed	11.50	1912	11.50	11.50	closed	2009	955.9	1053.1	955.9	2965.0
45.90	7.35	11.50	11.50	11.50	11.50	11.50	11.50	2985	closed	11.50	11.50	2023	11.50	closed	11.50	1925	11.50	11.50	closed	2023	962.5	1060.4	962.5	2985.4
45.95	7.40	11.50	11.50	11.50	11.50	11.50	11.50	3006	closed	11.50	11.50	2037	11.50	closed	11.50	1938	11.50	11.50	closed	2037	969.1	1067.6	969.1	3005.8
46.00	7.45	11.50	11.50	11.50	11.50	11.50	11.50	3026	closed	11.50	11.50	2051	11.50	closed	11.50	1951	11.50	11.50	closed	2051	975.7	1074.9	975.7	3026.2
46.05	7.50	11.50	11.50	11.50	11.50	11.50	11.50	3047	closed	11.50	11.50	2064	11.50	closed	11.50	1965	11.50	11.50	closed	2064	982.3	1082.2	982.3	3046.7
46.10	7.55	11.50	11.50	11.50	11.50	11.50	11.50	3067	closed	11.50	11.50	2078	11.50	closed	11.50	1978	11.50	11.50	closed	2078	988.9	1089.4	988.9	3067.2
46.15	7.60	11.50	11.50	11.50	11.50	11.50	11.50	3088	closed	11.50	11.50	2092	11.50	closed	11.50	1991	11.50	11.50	closed	2092	995.5	1096.7	995.5	3087.8
46.20	7.65	11.50	11.50	11.50	11.50	11.50	11.50	3108	closed	11.50	11.50	2106	11.50	closed	11.50	2004	11.50	11.50	closed	2106	1002.1	1104.1	1002.1	3108.4
46.25	7.70	11.50	11.50	11.50	11.50	11.50	11.50	3129	closed	11.50	11.50	2120	11.50	closed	11.50	2018	11.50	11.50	closed	2120	1008.8	1111.4	1008.8	3129.0
46.30	7.75	11.50	11.50	11.50	11.50	11.50	11.50	3150	closed	11.50	11.50	2134	11.50	closed	11.50	2031	11.50	11.50	closed	2134	1016.5	1118.7	1016.5	3149.6
46.35	7.80	11.50	11.50	11.50	11.50	11.50	11.50	3170	closed	11.50	11.50	2148	11.50	closed	11.50	2044	11.50	11.50	closed	2148	1022.1	1126.1	1022.1	3170.3
46.40	7.85	11.50	11.50	11.50	11.50	11.50	11.50	3191	closed	11.50	11.50	2162	11.50	closed	11.50	2058	11.50	11.50	closed	2162	1028.8	1133.4	1028.8	3191.1
46.45	7.90	11.50	11.50	11.50	11.50	11.50	11.50	3212	closed	11.50	11.50	2176	11.50	closed	11.50	2071	11.50	11.50	closed	2176	1035.5	1140.8	1035.5	3211.8

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Townsville City Council

RD0032 Ross River Dam Emergency Action Plan

Effective Date: 3/11/2023

Table C9 (continued): Minimum Gate Settings–Water Level RISING 50mm increments

Headwater	Headwater	Gate Opening G ₀			All Gates Operational				Gate 1 closed or Inoperable (m)			Q	Gate 2 closed or Inoperable (m)			Q	Gate 3 closed or Inoperable (m)			Q	2016 Discharge			
Level	Level	(m)			Gate Opening (m)				(m)			(m ³ /s)	(m)			(m ³ /s)	(m)			(m ³ /s)	(m ³ /s)			
(m AHD)	(m above FSL)	Left	Centre	Right	Left	Centre	Right	Q	Left	Centre	Right		Left	Centre	Right		Left	Centre	Right		Left	Centre	Right	Total
		1	2	3	1	2	3	(m ³ /s)	1	2	3		1	2	3		1	2	3		1	2	3	(m ³ /s)
46.50	7.95	11.50	11.50	11.50	11.50	11.50	11.50	3233	closed	11.50	11.50	2190	11.50	closed	11.50	2084	11.50	11.50	closed	2190	1042.2	1148.2	1042.2	3232.6
46.55	8.00	11.50	11.50	11.50	11.50	11.50	11.50	3253	closed	11.50	11.50	2205	11.50	closed	11.50	2098	11.50	11.50	closed	2205	1048.9	1155.6	1048.9	3253.5
46.60	8.05	11.50	11.50	11.50	11.50	11.50	11.50	3274	closed	11.50	11.50	2219	11.50	closed	11.50	2111	11.50	11.50	closed	2219	1055.7	1163.0	1055.7	3274.3
46.65	8.10	11.50	11.50	11.50	11.50	11.50	11.50	3295	closed	11.50	11.50	2233	11.50	closed	11.50	2125	11.50	11.50	closed	2233	1062.4	1170.4	1062.4	3295.2
46.70	8.15	11.50	11.50	11.50	11.50	11.50	11.50	3316	closed	11.50	11.50	2247	11.50	closed	11.50	2138	11.50	11.50	closed	2247	1069.1	1177.9	1069.1	3316.2
46.75	8.20	11.50	11.50	11.50	11.50	11.50	11.50	3337	closed	11.50	11.50	2261	11.50	closed	11.50	2152	11.50	11.50	closed	2261	1075.9	1185.3	1075.9	3337.1
46.80	8.25	11.50	11.50	11.50	11.50	11.50	11.50	3358	closed	11.50	11.50	2275	11.50	closed	11.50	2165	11.50	11.50	closed	2275	1082.7	1192.8	1082.7	3358.1
46.85	8.30	11.50	11.50	11.50	11.50	11.50	11.50	3379	closed	11.50	11.50	2290	11.50	closed	11.50	2179	11.50	11.50	closed	2290	1089.5	1200.2	1089.5	3379.2
46.90	8.35	11.50	11.50	11.50	11.50	11.50	11.50	3400	closed	11.50	11.50	2304	11.50	closed	11.50	2192	11.50	11.50	closed	2304	1096.2	1207.7	1096.2	3400.2
46.95	8.40	11.50	11.50	11.50	11.50	11.50	11.50	3421	closed	11.50	11.50	2318	11.50	closed	11.50	2206	11.50	11.50	closed	2318	1103.0	1215.2	1103.0	3421.3
47.00	8.45	11.50	11.50	11.50	11.50	11.50	11.50	3442	closed	11.50	11.50	2333	11.50	closed	11.50	2220	11.50	11.50	closed	2333	1109.9	1222.7	1109.9	3442.4
47.05	8.50	11.50	11.50	11.50	11.50	11.50	11.50	3464	closed	11.50	11.50	2347	11.50	closed	11.50	2233	11.50	11.50	closed	2347	1116.7	1230.2	1116.7	3463.6
47.10	8.55	11.50	11.50	11.50	11.50	11.50	11.50	3485	closed	11.50	11.50	2361	11.50	closed	11.50	2247	11.50	11.50	closed	2361	1123.5	1237.8	1123.5	3484.7
47.15	8.60	11.50	11.50	11.50	11.50	11.50	11.50	3506	closed	11.50	11.50	2376	11.50	closed	11.50	2261	11.50	11.50	closed	2376	1130.3	1245.3	1130.3	3506.0
47.20	8.65	11.50	11.50	11.50	11.50	11.50	11.50	3527	closed	11.50	11.50	2390	11.50	closed	11.50	2274	11.50	11.50	closed	2390	1137.2	1252.8	1137.2	3527.2
47.25	8.70	11.50	11.50	11.50	11.50	11.50	11.50	3548	closed	11.50	11.50	2404	11.50	closed	11.50	2288	11.50	11.50	closed	2404	1144.0	1260.4	1144.0	3548.5
47.30	8.75	11.50	11.50	11.50	11.50	11.50	11.50	3570	closed	11.50	11.50	2419	11.50	closed	11.50	2302	11.50	11.50	closed	2419	1150.9	1267.9	1150.9	3569.8
47.35	8.80	11.50	11.50	11.50	11.50	11.50	11.50	3591	closed	11.50	11.50	2433	11.50	closed	11.50	2316	11.50	11.50	closed	2433	1157.8	1275.5	1157.8	3591.1
47.40	8.85	11.50	11.50	11.50	11.50	11.50	11.50	3612	closed	11.50	11.50	2448	11.50	closed	11.50	2329	11.50	11.50	closed	2448	1164.7	1283.1	1164.7	3612.4
47.45	8.90	11.50	11.50	11.50	11.50	11.50	11.50	3634	closed	11.50	11.50	2462	11.50	closed	11.50	2343	11.50	11.50	closed	2462	1171.6	1290.7	1171.6	3633.8
47.50	8.95	11.50	11.50	11.50	11.50	11.50	11.50	3655	closed	11.50	11.50	2477	11.50	closed	11.50	2357	11.50	11.50	closed	2477	1178.5	1298.3	1178.5	3655.2
47.55	9.00	11.50	11.50	11.50	11.50	11.50	11.50	3677	closed	11.50	11.50	2491	11.50	closed	11.50	2371	11.50	11.50	closed	2491	1185.4	1305.9	1185.4	3676.6
47.60	9.05	11.50	11.50	11.50	11.50	11.50	11.50	3698	closed	11.50	11.50	2506	11.50	closed	11.50	2385	11.50	11.50	closed	2506	1192.3	1313.5	1192.3	3698.1
47.65	9.10	11.50	11.50	11.50	11.50	11.50	11.50	3720	closed	11.50	11.50	2520	11.50	closed	11.50	2398	11.50	11.50	closed	2520	1199.2	1321.2	1199.2	3719.6
47.70	9.15	11.50	11.50	11.50	11.50	11.50	11.50	3741	closed	11.50	11.50	2535	11.50	closed	11.50	2412	11.50	11.50	closed	2535	1206.1	1328.8	1206.1	3741.1
47.75	9.20	11.50	11.50	11.50	11.50	11.50	11.50	3763	closed	11.50	11.50	2550	11.50	closed	11.50	2426	11.50	11.50	closed	2550	1213.1	1336.5	1213.1	3762.6
47.80	9.25	11.50	11.50	11.50	11.50	11.50	11.50	3784	closed	11.50	11.50	2564	11.50	closed	11.50	2440	11.50	11.50	closed	2564	1220.0	1344.1	1220.0	3784.2
47.85	9.30	11.50	11.50	11.50	11.50	11.50	11.50	3806	closed	11.50	11.50	2579	11.50	closed	11.50	2454	11.50	11.50	closed	2579	1227.0	1351.8	1227.0	3805.8
47.90	9.35	11.50	11.50	11.50	11.50	11.50	11.50	3827	closed	11.50	11.50	2593	11.50	closed	11.50	2468	11.50	11.50	closed	2593	1234.0	1359.4	1234.0	3827.4
47.95	9.40	11.50	11.50	11.50	11.50	11.50	11.50	3849	closed	11.50	11.50	2608	11.50	closed	11.50	2482	11.50	11.50	closed	2608	1240.9	1367.1	1240.9	3849.0
48.00	9.45	11.50	11.50	11.50	11.50	11.50	11.50	3871	closed	11.50	11.50	2623	11.50	closed	11.50	2496	11.50	11.50	closed	2623	1247.9	1374.8	1247.9	3870.7

Note: Discharge rate does not include flow over the closed gate

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Townsville City Council

RD0032 Ross River Dam Emergency Action Plan

Effective Date: 3/11/2023

Table C10: Minimum Gate Settings–Water Level FALLING Table 50mm increments

Headwater Level (m AHD)	Headwater Level (m)	Gate Opening G ₀ (m)			All Gates Operational				Gate 1 closed or Inoperable				Q	Gate 2 closed or Inoperable				Q	Gate 3 closed or Inoperable				Q
					(m)			Q (m³/s)	(m)			Q (m³/s)		(m)			Q (m³/s)		(m)			Q (m³/s)	
		Left	Centre	Right	Left	Centre	Right		Left	Centre	Right		Left	Centre	Right	Left		Centre	Right				
		1	2	3	1	2	3		1	2	3		1	2	3	1		2	3				
38.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	closed	closed	closed	0	closed	closed	closed	0	closed	closed	closed	0			
38.60	0.05	0.25	0.25	0.25	0.25	0.25	0.25	56	closed	0.50	0.50	74	0.5	closed	0.5	70	0.50	0.50	closed	74			
38.65	0.10	0.25	0.25	0.25	0.25	0.25	0.25	56	closed	0.50	0.50	74	0.5	closed	0.5	71	0.50	0.50	closed	74			
38.70	0.15	0.50	0.50	0.50	0.50	0.50	0.50	110	closed	0.75	0.75	109	1.0	closed	1.0	136	0.75	0.75	closed	109			
38.75	0.20	0.50	0.50	0.50	0.50	0.50	0.50	111	closed	0.75	0.75	110	1.00	closed	1.00	137	0.75	0.75	closed	110			
38.80	0.25	0.75	0.75	0.75	0.75	0.75	0.75	164	closed	1.25	1.25	177	1.25	closed	1.25	169	1.25	1.25	closed	177			
38.85	0.30	0.75	0.75	0.75	0.75	0.75	0.75	165	closed	1.25	1.25	178	1.25	closed	1.25	170	1.25	1.25	closed	178			
38.90	0.35	0.75	0.75	0.75	0.75	0.75	0.75	166	closed	1.25	1.25	180	1.25	closed	1.25	171	1.25	1.25	closed	180			
38.95	0.40	0.75	0.75	0.75	0.75	0.75	0.75	167	closed	1.25	1.25	181	1.25	closed	1.25	172	1.25	1.25	closed	181			
39.00	0.45	1.00	1.00	1.00	1.00	1.00	1.00	219	closed	1.50	1.50	214	1.75	closed	1.75	233	1.50	1.50	closed	214			
39.05	0.50	1.00	1.00	1.00	1.00	1.00	1.00	220	closed	1.50	1.50	215	1.75	closed	1.75	234	1.50	1.50	closed	215			
39.10	0.55	1.00	1.00	1.00	1.00	1.00	1.00	222	closed	1.50	1.50	217	1.75	closed	1.75	236	1.50	1.50	closed	217			
39.15	0.60	1.00	1.00	1.00	1.00	1.00	1.00	223	closed	1.50	1.50	218	1.75	closed	1.75	238	1.50	1.50	closed	218			
39.20	0.65	1.00	1.00	1.00	1.00	1.00	1.00	225	closed	1.50	1.50	220	1.75	closed	1.75	239	1.50	1.50	closed	220			
39.25	0.70	1.25	1.25	1.25	1.25	1.25	1.25	277	closed	2.00	2.00	284	2.00	closed	2.00	270	2.00	2.00	closed	284			
39.30	0.75	1.25	1.25	1.25	1.25	1.25	1.25	279	closed	2.00	2.00	286	2.00	closed	2.00	272	2.00	2.00	closed	286			
39.35	0.80	1.25	1.25	1.25	1.25	1.25	1.25	280	closed	2.00	2.00	288	2.00	closed	2.00	274	2.00	2.00	closed	288			
39.40	0.85	1.25	1.25	1.25	1.25	1.25	1.25	282	closed	2.00	2.00	290	2.00	closed	2.00	275	2.00	2.00	closed	290			
39.45	0.90	1.25	1.25	1.25	1.25	1.25	1.25	284	closed	2.00	2.00	291	2.00	closed	2.00	277	2.00	2.00	closed	291			
39.50	0.95	1.50	1.50	1.50	1.50	1.50	1.50	336	closed	2.25	2.25	324	2.50	closed	2.50	336	2.25	2.25	closed	324			
39.55	1.00	1.50	1.50	1.50	1.50	1.50	1.50	338	closed	2.25	2.25	326	2.50	closed	2.50	339	2.25	2.25	closed	326			
39.60	1.05	1.50	1.50	1.50	1.50	1.50	1.50	340	closed	2.25	2.25	328	2.50	closed	2.50	341	2.25	2.25	closed	328			
39.65	1.10	1.50	1.50	1.50	1.50	1.50	1.50	342	closed	2.25	2.25	330	2.50	closed	2.50	343	2.25	2.25	closed	330			
39.70	1.15	1.50	1.50	1.50	1.50	1.50	1.50	344	closed	2.25	2.25	332	2.50	closed	2.50	345	2.25	2.25	closed	332			
39.75	1.20	1.50	1.50	1.50	1.50	1.50	1.50	346	closed	2.25	2.25	335	2.50	closed	2.50	348	2.25	2.25	closed	335			
39.80	1.25	1.50	1.75	1.50	1.50	1.75	1.50	366	closed	2.50	2.25	353	2.50	closed	2.50	350	2.25	2.50	closed	353			
39.85	1.30	1.50	1.75	1.50	1.50	1.75	1.50	369	closed	2.50	2.25	355	2.50	closed	2.50	352	2.25	2.50	closed	355			
39.90	1.35	1.50	1.75	1.50	1.50	1.75	1.50	371	closed	2.50	2.25	357	2.50	closed	2.50	354	2.25	2.50	closed	357			
39.95	1.40	1.50	1.75	1.50	1.50	1.75	1.50	373	closed	2.50	2.25	359	2.50	closed	2.50	357	2.25	2.50	closed	359			
40.00	1.45	1.50	1.75	1.50	1.50	1.75	1.50	375	closed	2.50	2.25	362	2.50	closed	2.50	359	2.25	2.50	closed	362			
40.05	1.50	1.75	1.75	1.75	1.75	1.75	1.75	411	closed	2.75	2.75	410	2.75	closed	2.75	391	2.75	2.75	closed	410			



Authorised by: General Manager WRR N00636

Townsville City Council
RD0032 Ross River Dam Emergency Action Plan

Effective Date: 3/11/2023

Table C10 (continued): Minimum Gate Settings–Water Level FALLING Table 50mm increments

Headwater Level (m AHD)	Headwater Level (m)	Gate Opening G ₃ (m)			All Gates Operational (m)			Q (m ³ /s)	Gate 1 closed or Inoperable (m)			Q (m ³ /s)	Gate 2 closed or Inoperable (m)			Q (m ³ /s)	Gate 3 closed or Inoperable (m)			Q (m ³ /s)
		Left	Centre	Right	Left	Centre	Right		Left	Centre	Right		Left	Centre	Right		Left	Centre	Right	
		1	2	3	1	2	3		1	2	3		1	2	3		1	2	3	
40.10	1.55	1.75	1.75	1.75	1.75	1.75	1.75	413	closed	2.75	2.75	413	2.75	closed	2.75	393	2.75	2.75	closed	413
40.15	1.60	1.75	1.75	1.75	1.75	1.75	1.75	415	closed	2.75	2.75	415	2.75	closed	2.75	395	2.75	2.75	closed	415
40.20	1.65	1.75	1.75	1.75	1.75	1.75	1.75	418	closed	2.75	2.75	418	2.75	closed	2.75	398	2.75	2.75	closed	418
40.25	1.70	1.75	1.75	1.75	1.75	1.75	1.75	420	closed	2.75	2.75	420	2.75	closed	2.75	400	2.75	2.75	closed	420
40.30	1.75	2.00	2.00	2.00	2.00	2.00	2.00	475	closed	3.00	3.00	454	3.25	closed	3.25	461	3.00	3.00	closed	454
40.35	1.80	2.00	2.00	2.00	2.00	2.00	2.00	478	closed	3.00	3.00	457	3.25	closed	3.25	464	3.00	3.00	closed	457
40.40	1.85	2.00	2.00	2.00	2.00	2.00	2.00	480	closed	3.00	3.00	460	3.25	closed	3.25	466	3.00	3.00	closed	460
40.45	1.90	2.00	2.00	2.00	2.00	2.00	2.00	483	closed	3.00	3.00	462	3.25	closed	3.25	469	3.00	3.00	closed	462
40.50	1.95	2.00	2.00	2.00	2.00	2.00	2.00	485	closed	3.00	3.00	465	3.25	closed	3.25	472	3.00	3.00	closed	465
40.55	2.00	2.25	2.25	2.25	2.25	2.25	2.25	541	closed	3.50	3.50	529	3.50	closed	3.50	503	3.50	3.50	closed	529
40.60	2.05	2.25	2.25	2.25	2.25	2.25	2.25	543	closed	3.50	3.50	532	3.50	closed	3.50	506	3.50	3.50	closed	532
40.65	2.10	2.25	2.25	2.25	2.25	2.25	2.25	546	closed	3.50	3.50	535	3.50	closed	3.50	509	3.50	3.50	closed	535
40.70	2.15	2.25	2.25	2.25	2.25	2.25	2.25	549	closed	3.50	3.50	538	3.50	closed	3.50	512	3.50	3.50	closed	538
40.75	2.20	2.25	2.25	2.25	2.25	2.25	2.25	552	closed	3.50	3.50	542	3.50	closed	3.50	515	3.50	3.50	closed	542
40.80	2.25	2.50	2.50	2.50	2.50	2.50	2.50	608	closed	3.75	3.75	575	11.50	closed	11.50	747	3.75	3.75	closed	575
40.85	2.30	2.50	2.50	2.50	2.50	2.50	2.50	611	closed	3.75	3.75	579	11.50	closed	11.50	757	3.75	3.75	closed	579
40.90	2.35	2.50	2.50	2.50	2.50	2.50	2.50	614	closed	3.75	3.75	582	11.50	closed	11.50	767	3.75	3.75	closed	582
40.95	2.40	2.50	2.50	2.50	2.50	2.50	2.50	617	closed	3.75	3.75	585	11.50	closed	11.50	776	3.75	3.75	closed	585
41.00	2.45	2.50	2.50	2.50	2.50	2.50	2.50	620	closed	3.75	3.75	589	11.50	closed	11.50	786	3.75	3.75	closed	589
41.05	2.50	2.75	2.75	2.75	2.75	2.75	2.75	676	closed	11.50	11.50	836	11.50	closed	11.50	796	11.50	11.50	closed	836
41.10	2.55	2.75	2.75	2.75	2.75	2.75	2.75	680	closed	11.50	11.50	847	11.50	closed	11.50	806	11.50	11.50	closed	847
41.15	2.60	2.75	2.75	2.75	2.75	2.75	2.75	683	closed	11.50	11.50	857	11.50	closed	11.50	816	11.50	11.50	closed	857
41.20	2.65	2.75	2.75	2.75	2.75	2.75	2.75	686	closed	11.50	11.50	867	11.50	closed	11.50	825	11.50	11.50	closed	867
41.25	2.70	2.75	2.75	2.75	2.75	2.75	2.75	690	closed	11.50	11.50	878	11.50	closed	11.50	835	11.50	11.50	closed	878
41.30	2.75	2.75	3.00	2.75	2.75	3.00	2.75	712	closed	11.50	11.50	888	11.50	closed	11.50	845	11.50	11.50	closed	888
41.35	2.80	2.75	3.00	2.75	2.75	3.00	2.75	715	closed	11.50	11.50	899	11.50	closed	11.50	855	11.50	11.50	closed	899
41.40	2.85	2.75	3.00	2.75	2.75	3.00	2.75	719	closed	11.50	11.50	910	11.50	closed	11.50	866	11.50	11.50	closed	910
41.45	2.90	2.75	3.00	2.75	2.75	3.00	2.75	722	closed	11.50	11.50	920	11.50	closed	11.50	876	11.50	11.50	closed	920
41.50	2.95	2.75	3.00	2.75	2.75	3.00	2.75	725	closed	11.50	11.50	931	11.50	closed	11.50	886	11.50	11.50	closed	931
41.55	3.00	3.00	3.00	3.00	3.00	3.00	3.00	764	closed	11.50	11.50	942	11.50	closed	11.50	896	11.50	11.50	closed	942
41.60	3.05	3.00	3.00	3.00	3.00	3.00	3.00	768	closed	11.50	11.50	952	11.50	closed	11.50	906	11.50	11.50	closed	952



Authorised by: General Manager WRR N00636

Townsville City Council

RD0032 Ross River Dam Emergency Action Plan

Effective Date: 3/11/2023

Table C10 (continued): Minimum Gate Settings–Water Level FALLING Table 50mm increments

Headwater Level (m AHD)	Headwater Level (m)	Gate Opening G ₀ (m)			All Gates Operational				Gate 1 closed or Inoperable			Q (m ³ /s)	Gate 2 closed or Inoperable			Q (m ³ /s)	Gate 3 closed or Inoperable			Q (m ³ /s)	
					(m)			Q (m ³ /s)	(m)				(m)								
		Left	Centre	Right	Left	Centre	Right		Left	Centre	Right	Left	Centre	Right							
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3		
41.65	3.10	3.00	3.00	3.00	3.00	3.00	3.00	3.00	771	closed	11.50	11.50	963	11.50	closed	11.50	917	11.50	11.50	closed	963
41.70	3.15	3.00	3.00	3.00	3.00	3.00	3.00	3.00	775	closed	11.50	11.50	974	11.50	closed	11.50	927	11.50	11.50	closed	974
41.75	3.20	3.00	3.00	3.00	3.00	3.00	3.00	3.00	778	closed	11.50	11.50	985	11.50	closed	11.50	937	11.50	11.50	closed	985
41.80	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	837	closed	11.50	11.50	996	11.50	closed	11.50	948	11.50	11.50	closed	996
41.85	3.30	3.25	3.25	3.25	3.25	3.25	3.25	3.25	841	closed	11.50	11.50	1007	11.50	closed	11.50	958	11.50	11.50	closed	1007
41.90	3.35	3.25	3.25	3.25	3.25	3.25	3.25	3.25	844	closed	11.50	11.50	1018	11.50	closed	11.50	969	11.50	11.50	closed	1018
41.95	3.40	3.25	3.25	3.25	3.25	3.25	3.25	3.25	848	closed	11.50	11.50	1029	11.50	closed	11.50	979	11.50	11.50	closed	1029
42.00	3.45	3.25	3.25	3.25	3.25	3.25	3.25	3.25	852	closed	11.50	11.50	1040	11.50	closed	11.50	990	11.50	11.50	closed	1040
42.05	3.50	3.75	3.75	3.75	3.75	3.75	3.75	3.75	965	closed	11.50	11.50	1052	11.50	closed	11.50	1001	11.50	11.50	closed	1052
42.10	3.55	3.75	3.75	3.75	3.75	3.75	3.75	3.75	969	closed	11.50	11.50	1063	11.50	closed	11.50	1011	11.50	11.50	closed	1063
42.15	3.60	3.75	3.75	3.75	3.75	3.75	3.75	3.75	974	closed	11.50	11.50	1074	11.50	closed	11.50	1022	11.50	11.50	closed	1074
42.20	3.65	3.75	3.75	3.75	3.75	3.75	3.75	3.75	978	closed	11.50	11.50	1085	11.50	closed	11.50	1033	11.50	11.50	closed	1085
42.25	3.70	3.75	3.75	3.75	3.75	3.75	3.75	3.75	982	closed	11.50	11.50	1097	11.50	closed	11.50	1044	11.50	11.50	closed	1097
42.30	3.75	3.75	11.50	3.75	3.75	11.50	3.75	3.75	1217	closed	11.50	11.50	1108	11.50	closed	11.50	1054	11.50	11.50	closed	1108
42.35	3.80	3.75	11.50	3.75	3.75	11.50	3.75	3.75	1226	closed	11.50	11.50	1120	11.50	closed	11.50	1065	11.50	11.50	closed	1120
42.40	3.85	3.75	11.50	3.75	3.75	11.50	3.75	3.75	1234	closed	11.50	11.50	1131	11.50	closed	11.50	1076	11.50	11.50	closed	1131
42.45	3.90	3.75	11.50	3.75	3.75	11.50	3.75	3.75	1243	closed	11.50	11.50	1142	11.50	closed	11.50	1087	11.50	11.50	closed	1142
42.50	3.95	3.75	11.50	3.75	3.75	11.50	3.75	3.75	1252	closed	11.50	11.50	1154	11.50	closed	11.50	1098	11.50	11.50	closed	1154
42.55	4.00	11.50	11.50	11.50	11.50	11.50	11.50	11.50	1720	closed	11.50	11.50	1166	11.50	closed	11.50	1109	11.50	11.50	closed	1166
42.60	4.05	11.50	11.50	11.50	11.50	11.50	11.50	11.50	1737	closed	11.50	11.50	1177	11.50	closed	11.50	1120	11.50	11.50	closed	1177
42.65	4.10	11.50	11.50	11.50	11.50	11.50	11.50	11.50	1755	closed	11.50	11.50	1189	11.50	closed	11.50	1131	11.50	11.50	closed	1189
42.70	4.15	11.50	11.50	11.50	11.50	11.50	11.50	11.50	1772	closed	11.50	11.50	1201	11.50	closed	11.50	1143	11.50	11.50	closed	1201
42.75	4.20	11.50	11.50	11.50	11.50	11.50	11.50	11.50	1789	closed	11.50	11.50	1212	11.50	closed	11.50	1154	11.50	11.50	closed	1212
42.80	4.25	11.50	11.50	11.50	11.50	11.50	11.50	11.50	1807	closed	11.50	11.50	1224	11.50	closed	11.50	1165	11.50	11.50	closed	1224
42.85	4.30	11.50	11.50	11.50	11.50	11.50	11.50	11.50	1824	closed	11.50	11.50	1236	11.50	closed	11.50	1176	11.50	11.50	closed	1236
42.90	4.35	11.50	11.50	11.50	11.50	11.50	11.50	11.50	1842	closed	11.50	11.50	1248	11.50	closed	11.50	1187	11.50	11.50	closed	1248
42.95	4.40	11.50	11.50	11.50	11.50	11.50	11.50	11.50	1859	closed	11.50	11.50	1260	11.50	closed	11.50	1199	11.50	11.50	closed	1260
43.00	4.45	11.50	11.50	11.50	11.50	11.50	11.50	11.50	1877	closed	11.50	11.50	1272	11.50	closed	11.50	1210	11.50	11.50	closed	1272
43.05	4.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	1895	closed	11.50	11.50	1284	11.50	closed	11.50	1222	11.50	11.50	closed	1284
43.10	4.55	11.50	11.50	11.50	11.50	11.50	11.50	11.50	1912	closed	11.50	11.50	1296	11.50	closed	11.50	1233	11.50	11.50	closed	1296

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Townsville City Council

RD0032 Ross River Dam Emergency Action Plan

Effective Date: 3/11/2023

Table C10 (continued): Minimum Gate Settings–Water Level FALLING Table 50mm increments

Headwater Level (m AHD)	Headwater Level (m)	Gate Opening G ₁ (m)			All Gates Operational (m)				Gate 1 closed or Inoperable (m)				Gate 2 closed or Inoperable (m)				Gate 3 closed or Inoperable (m)			
		Left	Centre	Right	Left	Centre	Right	Q (m ³ /s)	Left	Centre	Right	Q (m ³ /s)	Left	Centre	Right	Q (m ³ /s)	Left	Centre	Right	Q (m ³ /s)
43.20	4.65	11.50	11.50	11.50	11.50	11.50	11.50	1948	closed	11.50	11.50	1320	11.50	closed	11.50	1256	11.50	11.50	closed	1320
43.25	4.70	11.50	11.50	11.50	11.50	11.50	11.50	1966	closed	11.50	11.50	1332	11.50	closed	11.50	1268	11.50	11.50	closed	1332
43.30	4.75	11.50	11.50	11.50	11.50	11.50	11.50	1984	closed	11.50	11.50	1344	11.50	closed	11.50	1279	11.50	11.50	closed	1344
43.35	4.80	11.50	11.50	11.50	11.50	11.50	11.50	2002	closed	11.50	11.50	1356	11.50	closed	11.50	1291	11.50	11.50	closed	1356
43.40	4.85	11.50	11.50	11.50	11.50	11.50	11.50	2020	closed	11.50	11.50	1369	11.50	closed	11.50	1302	11.50	11.50	closed	1369
43.45	4.90	11.50	11.50	11.50	11.50	11.50	11.50	2038	closed	11.50	11.50	1381	11.50	closed	11.50	1314	11.50	11.50	closed	1381
43.50	4.95	11.50	11.50	11.50	11.50	11.50	11.50	2056	closed	11.50	11.50	1393	11.50	closed	11.50	1326	11.50	11.50	closed	1393
43.55	5.00	11.50	11.50	11.50	11.50	11.50	11.50	2074	closed	11.50	11.50	1406	11.50	closed	11.50	1338	11.50	11.50	closed	1406
43.60	5.05	11.50	11.50	11.50	11.50	11.50	11.50	2093	closed	11.50	11.50	1418	11.50	closed	11.50	1349	11.50	11.50	closed	1418
43.65	5.10	11.50	11.50	11.50	11.50	11.50	11.50	2111	closed	11.50	11.50	1430	11.50	closed	11.50	1361	11.50	11.50	closed	1430
43.70	5.15	11.50	11.50	11.50	11.50	11.50	11.50	2129	closed	11.50	11.50	1443	11.50	closed	11.50	1373	11.50	11.50	closed	1443
43.75	5.20	11.50	11.50	11.50	11.50	11.50	11.50	2148	closed	11.50	11.50	1455	11.50	closed	11.50	1385	11.50	11.50	closed	1455
43.80	5.25	11.50	11.50	11.50	11.50	11.50	11.50	2166	closed	11.50	11.50	1468	11.50	closed	11.50	1397	11.50	11.50	closed	1468
43.85	5.30	11.50	11.50	11.50	11.50	11.50	11.50	2185	closed	11.50	11.50	1480	11.50	closed	11.50	1409	11.50	11.50	closed	1480
43.90	5.35	11.50	11.50	11.50	11.50	11.50	11.50	2203	closed	11.50	11.50	1493	11.50	closed	11.50	1421	11.50	11.50	closed	1493
43.95	5.40	11.50	11.50	11.50	11.50	11.50	11.50	2222	closed	11.50	11.50	1506	11.50	closed	11.50	1433	11.50	11.50	closed	1506
44.00	5.45	11.50	11.50	11.50	11.50	11.50	11.50	2241	closed	11.50	11.50	1518	11.50	closed	11.50	1445	11.50	11.50	closed	1518
44.05	5.50	11.50	11.50	11.50	11.50	11.50	11.50	2260	closed	11.50	11.50	1531	11.50	closed	11.50	1457	11.50	11.50	closed	1531
44.10	5.55	11.50	11.50	11.50	11.50	11.50	11.50	2278	closed	11.50	11.50	1544	11.50	closed	11.50	1469	11.50	11.50	closed	1544
44.15	5.60	11.50	11.50	11.50	11.50	11.50	11.50	2297	closed	11.50	11.50	1557	11.50	closed	11.50	1481	11.50	11.50	closed	1557
44.20	5.65	11.50	11.50	11.50	11.50	11.50	11.50	2316	closed	11.50	11.50	1569	11.50	closed	11.50	1493	11.50	11.50	closed	1569
44.25	5.70	11.50	11.50	11.50	11.50	11.50	11.50	2335	closed	11.50	11.50	1582	11.50	closed	11.50	1506	11.50	11.50	closed	1582
44.30	5.75	11.50	11.50	11.50	11.50	11.50	11.50	2354	closed	11.50	11.50	1595	11.50	closed	11.50	1518	11.50	11.50	closed	1595
44.35	5.80	11.50	11.50	11.50	11.50	11.50	11.50	2373	closed	11.50	11.50	1608	11.50	closed	11.50	1530	11.50	11.50	closed	1608
44.40	5.85	11.50	11.50	11.50	11.50	11.50	11.50	2392	closed	11.50	11.50	1621	11.50	closed	11.50	1542	11.50	11.50	closed	1621
44.45	5.90	11.50	11.50	11.50	11.50	11.50	11.50	2411	closed	11.50	11.50	1634	11.50	closed	11.50	1555	11.50	11.50	closed	1634
44.50	5.95	11.50	11.50	11.50	11.50	11.50	11.50	2430	closed	11.50	11.50	1647	11.50	closed	11.50	1567	11.50	11.50	closed	1647
44.55	6.00	11.50	11.50	11.50	11.50	11.50	11.50	2450	closed	11.50	11.50	1660	11.50	closed	11.50	1580	11.50	11.50	closed	1660
44.60	6.05	11.50	11.50	11.50	11.50	11.50	11.50	2469	closed	11.50	11.50	1673	11.50	closed	11.50	1592	11.50	11.50	closed	1673
44.65	6.10	11.50	11.50	11.50	11.50	11.50	11.50	2488	closed	11.50	11.50	1686	11.50	closed	11.50	1604	11.50	11.50	closed	1686
44.70	6.15	11.50	11.50	11.50	11.50	11.50	11.50	2508	closed	11.50	11.50	1699	11.50	closed	11.50	1617	11.50	11.50	closed	1699
44.75	6.20	11.50	11.50	11.50	11.50	11.50	11.50	2527	closed	11.50	11.50	1712	11.50	closed	11.50	1629	11.50	11.50	closed	1712



City of
Townsville

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Townsville City Council

RD0032 Ross River Dam Emergency Action Plan

Effective Date: 3/11/2023

Table C10 (continued): Minimum Gate Settings–Water Level FALLING Table 50mm increments

Headwater Level (m AHD)	Headwater Level (m)	Gate Opening G ₀ (m)			All Gates Operational				Gate 1 closed or Inoperable			Q (m ³ /s)	Gate 2 closed or Inoperable			Q (m ³ /s)	Gate 3 closed or Inoperable			Q (m ³ /s)	
					(m)			(m)			(m)			(m)							
		Left	Centre	Right	Left	Centre	Right	Left	Centre	Right	Left	Centre	Right	Left	Centre	Right					
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3					
44.80	6.25	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2546	closed	11.50	11.50	1725	11.50	closed	11.50	1642	11.50	11.50	closed	1725
44.85	6.30	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2566	closed	11.50	11.50	1739	11.50	closed	11.50	1655	11.50	11.50	closed	1739
44.90	6.35	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2586	closed	11.50	11.50	1752	11.50	closed	11.50	1667	11.50	11.50	closed	1752
44.95	6.40	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2605	closed	11.50	11.50	1765	11.50	closed	11.50	1680	11.50	11.50	closed	1765
45.00	6.45	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2625	closed	11.50	11.50	1779	11.50	closed	11.50	1692	11.50	11.50	closed	1779
45.05	6.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2644	closed	11.50	11.50	1792	11.50	closed	11.50	1705	11.50	11.50	closed	1792
45.10	6.55	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2664	closed	11.50	11.50	1805	11.50	closed	11.50	1718	11.50	11.50	closed	1805
45.15	6.60	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2684	closed	11.50	11.50	1819	11.50	closed	11.50	1731	11.50	11.50	closed	1819
45.20	6.65	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2704	closed	11.50	11.50	1832	11.50	closed	11.50	1743	11.50	11.50	closed	1832
45.25	6.70	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2724	closed	11.50	11.50	1846	11.50	closed	11.50	1756	11.50	11.50	closed	1846
45.30	6.75	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2743	closed	11.50	11.50	1859	11.50	closed	11.50	1769	11.50	11.50	closed	1859
45.35	6.80	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2763	closed	11.50	11.50	1872	11.50	closed	11.50	1782	11.50	11.50	closed	1872
45.40	6.85	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2783	closed	11.50	11.50	1886	11.50	closed	11.50	1795	11.50	11.50	closed	1886
45.45	6.90	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2803	closed	11.50	11.50	1900	11.50	closed	11.50	1808	11.50	11.50	closed	1900
45.50	6.95	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2823	closed	11.50	11.50	1913	11.50	closed	11.50	1821	11.50	11.50	closed	1913
45.55	7.00	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2844	closed	11.50	11.50	1927	11.50	closed	11.50	1834	11.50	11.50	closed	1927
45.60	7.05	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2864	closed	11.50	11.50	1940	11.50	closed	11.50	1847	11.50	11.50	closed	1940
45.65	7.10	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2884	closed	11.50	11.50	1954	11.50	closed	11.50	1860	11.50	11.50	closed	1954
45.70	7.15	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2904	closed	11.50	11.50	1968	11.50	closed	11.50	1873	11.50	11.50	closed	1968
45.75	7.20	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2924	closed	11.50	11.50	1982	11.50	closed	11.50	1886	11.50	11.50	closed	1982
45.80	7.25	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2945	closed	11.50	11.50	1995	11.50	closed	11.50	1899	11.50	11.50	closed	1995
45.85	7.30	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2965	closed	11.50	11.50	2009	11.50	closed	11.50	1912	11.50	11.50	closed	2009
45.90	7.35	11.50	11.50	11.50	11.50	11.50	11.50	11.50	2985	closed	11.50	11.50	2023	11.50	closed	11.50	1925	11.50	11.50	closed	2023
45.95	7.40	11.50	11.50	11.50	11.50	11.50	11.50	11.50	3006	closed	11.50	11.50	2037	11.50	closed	11.50	1938	11.50	11.50	closed	2037
46.00	7.45	11.50	11.50	11.50	11.50	11.50	11.50	11.50	3026	closed	11.50	11.50	2051	11.50	closed	11.50	1951	11.50	11.50	closed	2051
46.05	7.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	3047	closed	11.50	11.50	2064	11.50	closed	11.50	1965	11.50	11.50	closed	2064
46.10	7.55	11.50	11.50	11.50	11.50	11.50	11.50	11.50	3067	closed	11.50	11.50	2078	11.50	closed	11.50	1978	11.50	11.50	closed	2078
46.15	7.60	11.50	11.50	11.50	11.50	11.50	11.50	11.50	3088	closed	11.50	11.50	2092	11.50	closed	11.50	1991	11.50	11.50	closed	2092
46.20	7.65	11.50	11.50	11.50	11.50	11.50	11.50	11.50	3108	closed	11.50	11.50	2106	11.50	closed	11.50	2004	11.50	11.50	closed	2106
46.25	7.70	11.50	11.50	11.50	11.50	11.50	11.50	11.50	3129	closed	11.50	11.50	2120	11.50	closed	11.50	2018	11.50	11.50	closed	2120
46.30	7.75	11.50	11.50	11.50	11.50	11.50	11.50	11.50	3150	closed	11.50	11.50	2134	11.50	closed	11.50	2031	11.50	11.50	closed	2134



Authorised by: General Manager WRR N00636

Townsville City Council
RD0032 Ross River Dam Emergency Action Plan

Effective Date: 3/11/2023

Table C10 (continued): Minimum Gate Settings–Water Level FALLING Table 50mm increments

Headwater Level (m AHD)	Headwater Level (m)	Gate Opening G ₃ (m)			All Gates Operational (m)			Q (m ³ /s)	Gate 1 closed or Inoperable (m)			Q (m ³ /s)	Gate 2 closed or Inoperable (m)			Q (m ³ /s)	Gate 3 closed or Inoperable (m)			Q (m ³ /s)
		Left	Centre	Right	Left	Centre	Right		Left	Centre	Right		Left	Centre	Right		Left	Centre	Right	
		1	2	3	1	2	3		1	2	3		1	2	3		1	2	3	
46.35	7.80	11.50	11.50	11.50	11.50	11.50	11.50	3170	closed	11.50	11.50	2148	11.50	closed	11.50	2044	11.50	11.50	closed	2148
46.40	7.85	11.50	11.50	11.50	11.50	11.50	11.50	3191	closed	11.50	11.50	2162	11.50	closed	11.50	2058	11.50	11.50	closed	2162
46.45	7.90	11.50	11.50	11.50	11.50	11.50	11.50	3212	closed	11.50	11.50	2176	11.50	closed	11.50	2071	11.50	11.50	closed	2176
46.50	7.95	11.50	11.50	11.50	11.50	11.50	11.50	3233	closed	11.50	11.50	2190	11.50	closed	11.50	2084	11.50	11.50	closed	2190
46.55	8.00	11.50	11.50	11.50	11.50	11.50	11.50	3253	closed	11.50	11.50	2205	11.50	closed	11.50	2098	11.50	11.50	closed	2205
46.60	8.05	11.50	11.50	11.50	11.50	11.50	11.50	3274	closed	11.50	11.50	2219	11.50	closed	11.50	2111	11.50	11.50	closed	2219
46.65	8.10	11.50	11.50	11.50	11.50	11.50	11.50	3295	closed	11.50	11.50	2233	11.50	closed	11.50	2125	11.50	11.50	closed	2233
46.70	8.15	11.50	11.50	11.50	11.50	11.50	11.50	3316	closed	11.50	11.50	2247	11.50	closed	11.50	2138	11.50	11.50	closed	2247
46.75	8.20	11.50	11.50	11.50	11.50	11.50	11.50	3337	closed	11.50	11.50	2261	11.50	closed	11.50	2152	11.50	11.50	closed	2261
46.80	8.25	11.50	11.50	11.50	11.50	11.50	11.50	3358	closed	11.50	11.50	2275	11.50	closed	11.50	2165	11.50	11.50	closed	2275
46.85	8.30	11.50	11.50	11.50	11.50	11.50	11.50	3379	closed	11.50	11.50	2290	11.50	closed	11.50	2179	11.50	11.50	closed	2290
46.90	8.35	11.50	11.50	11.50	11.50	11.50	11.50	3400	closed	11.50	11.50	2304	11.50	closed	11.50	2192	11.50	11.50	closed	2304
46.95	8.40	11.50	11.50	11.50	11.50	11.50	11.50	3421	closed	11.50	11.50	2318	11.50	closed	11.50	2206	11.50	11.50	closed	2318
47.00	8.45	11.50	11.50	11.50	11.50	11.50	11.50	3442	closed	11.50	11.50	2333	11.50	closed	11.50	2220	11.50	11.50	closed	2333
47.05	8.50	11.50	11.50	11.50	11.50	11.50	11.50	3464	closed	11.50	11.50	2347	11.50	closed	11.50	2233	11.50	11.50	closed	2347
47.10	8.55	11.50	11.50	11.50	11.50	11.50	11.50	3485	closed	11.50	11.50	2361	11.50	closed	11.50	2247	11.50	11.50	closed	2361
47.15	8.60	11.50	11.50	11.50	11.50	11.50	11.50	3506	closed	11.50	11.50	2376	11.50	closed	11.50	2261	11.50	11.50	closed	2376
47.20	8.65	11.50	11.50	11.50	11.50	11.50	11.50	3527	closed	11.50	11.50	2390	11.50	closed	11.50	2274	11.50	11.50	closed	2390
47.25	8.70	11.50	11.50	11.50	11.50	11.50	11.50	3548	closed	11.50	11.50	2404	11.50	closed	11.50	2288	11.50	11.50	closed	2404
47.30	8.75	11.50	11.50	11.50	11.50	11.50	11.50	3570	closed	11.50	11.50	2419	11.50	closed	11.50	2302	11.50	11.50	closed	2419
47.35	8.80	11.50	11.50	11.50	11.50	11.50	11.50	3591	closed	11.50	11.50	2433	11.50	closed	11.50	2316	11.50	11.50	closed	2433
47.40	8.85	11.50	11.50	11.50	11.50	11.50	11.50	3612	closed	11.50	11.50	2448	11.50	closed	11.50	2329	11.50	11.50	closed	2448
47.45	8.90	11.50	11.50	11.50	11.50	11.50	11.50	3634	closed	11.50	11.50	2462	11.50	closed	11.50	2343	11.50	11.50	closed	2462
47.50	8.95	11.50	11.50	11.50	11.50	11.50	11.50	3655	closed	11.50	11.50	2477	11.50	closed	11.50	2357	11.50	11.50	closed	2477
47.55	9.00	11.50	11.50	11.50	11.50	11.50	11.50	3677	closed	11.50	11.50	2491	11.50	closed	11.50	2371	11.50	11.50	closed	2491
47.60	9.05	11.50	11.50	11.50	11.50	11.50	11.50	3698	closed	11.50	11.50	2506	11.50	closed	11.50	2385	11.50	11.50	closed	2506
47.65	9.10	11.50	11.50	11.50	11.50	11.50	11.50	3720	closed	11.50	11.50	2520	11.50	closed	11.50	2398	11.50	11.50	closed	2520
47.70	9.15	11.50	11.50	11.50	11.50	11.50	11.50	3741	closed	11.50	11.50	2535	11.50	closed	11.50	2412	11.50	11.50	closed	2535
47.75	9.20	11.50	11.50	11.50	11.50	11.50	11.50	3763	closed	11.50	11.50	2550	11.50	closed	11.50	2426	11.50	11.50	closed	2550
47.80	9.25	11.50	11.50	11.50	11.50	11.50	11.50	3784	closed	11.50	11.50	2564	11.50	closed	11.50	2440	11.50	11.50	closed	2564
47.85	9.30	11.50	11.50	11.50	11.50	11.50	11.50	3806	closed	11.50	11.50	2579	11.50	closed	11.50	2454	11.50	11.50	closed	2579
47.90	9.35	11.50	11.50	11.50	11.50	11.50	11.50	3827	closed	11.50	11.50	2593	11.50	closed	11.50	2468	11.50	11.50	closed	2593
47.95	9.40	11.50	11.50	11.50	11.50	11.50	11.50	3849	closed	11.50	11.50	2608	11.50	closed	11.50	2482	11.50	11.50	closed	2608
48.00	9.45	11.50	11.50	11.50	11.50	11.50	11.50	3871	closed	11.50	11.50	2623	11.50	closed	11.50	2496	11.50	11.50	closed	2623

Note: Discharge rate does not include flow over the closed gate

Note: Discharge rate does not include flow over the closed gate



Appendix C6 – Ross River Dam Storage Curve

Figure C5: Ross River Dam Storage Curve

