

## ***Appendix 11-E***

*Murray River Project: Cumulative Loss from Past, Present, and Reasonably Foreseeable Future Projects within the CEA Boundary for Forested and BC CDC Listed Ecosystems*

MURRAY RIVER COAL PROJECT

**Application for an Environmental Assessment Certificate / Environmental Impact Statement**

Appendix 11-E. Murray River Project: Cumulative Loss from Past, Present and Reasonably Foreseeable Future Projects within the CEA Boundary for Forested and BC CDC Listed Ecosystems

Ecosystem Data						Past / Present Projects					
BEC	Site Series	Map Code	EcoUnit	Name	General Ecosystem Type	Wolverine (ha)	Tumbler Ridge (ha)	Trend (ha)	Sukunka (Bullmoose) (ha)	Quintette (ha)	Roads and all other Infrastructure (ha)
BWBSmw	0	BA	BA	Barren	Barren	0	10	1	0	4	4
	101	XA	101	Sw - Trailing raspberry - Step moss	Mesic Forest	0	128	49	0	590	590
	101\$	XG	101\$	At - Rose - Creamy peavine	Mesic Forest	0	27	6	0	27	27
	102	XB	102	Pl - Kinnikinnick - Lingonberry	Moderately Dry Forest	0	6	2	0	31	31
	102\$	XH	102\$	At - Soopolallie - Kinnikinnick	Moderately Dry Forest	0	3	1	0	3	3
	103	XC	103	SwPl - Soopolallie - Wildrye	Moderately Dry Forest	0	24	13	0	92	92
	103\$	XI	103\$	At - Rose - Fuzzy-spiked wildrye	Moderately Dry Forest	0	7	2	0	9	9
	103\$/102\$	XI/XH	103\$/102\$	At - Rose - Fuzzy-spiked wildrye/At - Soopolallie - Kinnikinnick	Moderately Dry Forest	0	2	0	0	2	2
	103/102	XC/XB	103/102	SwPl - Soopolallie - Wildrye/Pl - Kinnikinnick - Lingonberry	Moderately Dry Forest	0	10	2	0	8	8
	104	XD	104	Sb - Lingonberry - Step moss	Slightly Dry to Moist Forest	0	20	4	0	99	99
	104\$	XJ	104\$	At - Labrador tea - Lingonberry	Slightly Dry to Moist Forest	0	3	1	0	3	3
	110	XE	110	Sw - Oak fern - Sarsaparilla (blue listed)	Moist Forest	0	4	1	0	134	134
	110\$	XK	110\$	At - Highbush-cranberry - Oak fern	Moist Forest	0	1	0	0	1	1
	111	XF	111	Sw - Currant - Horsetail (blue listed)	Moist Forest	0	39	6	0	104	104
	111\$	XL	111\$	At - Cow-parsnip - Meadowrue	Moist Forest	0	2	0	0	2	2
	111\$/112	XL/XM	111\$/112	At - Cow-parsnip - Meadowrue/AcbSw - Mountain alder - Dogwood (blue listed-potentially)	Moist Forest/Mid Bench Floodplain	0	5	1	0	7	7
	F105	DB	F105	Drummond's willow-Bluejoint	Low Bench Floodplain	0	0	0	0	1	1
	Gb51	SB	Gb51	Saskatoon-Blue wildrye	Grassland Brushland	0	0	0	0	2	2
BWBSwk1	0	BA	BA	Barren	Barren	0	0	0	1	2	3
	101	YA	101	SwBl - Huckleberry - Feathermoss (blue listed)	Mesic Forest	0	0	0	39	208	248
	101\$	YG	101\$	At - Birch-leaved spiraea - Huckleberry	Mesic Forest	0	0	0	11	0	11
	102	YB	102	Pl - Lingonberry - Reindeer lichen	Moderately Dry Forest	0	0	0	5	15	20
	102\$	YH	102\$	At - Kinnikinnick - Fuzzy-spiked wildrye	Moderately Dry Forest	0	0	0	1	0	1
	103	YC	103	SwPl - Soopolallie - Showy aster (blue listed)	Moderately Dry Forest	0	0	0	1	66	66
	103\$	YI	103\$	At - Rose - Fuzzy-spiked wildrye	Moderately Dry Forest	0	0	0	0	0	0
	104	YD	104	Sb - Huckleberry - Lingonberry	Slightly Dry to Moist Forest	0	0	0	22	5	27
	104\$	YJ	104\$	At - Labrador tea - Lingonberry	Slightly Dry to Moist Forest	0	0	0	5	0	5
	110\$	YK	110\$	AcbAt - Cow-parsnip/At - Highbush-cranberry - Oak fern	Moist Forest	0	0	0	2	0	2
	110/111	YE/YF	110/111	Sw - Currant - Horsetail/Sb - Lingonberry - Horsetail (blue listed potentially)	Moist Forest	0	0	0	10	17	27
ESSFmv2	00	AH	AH	Alder-Hellebore avalanche track	Moist Shrub	0	0	0	0	5	5
	00	AW	AW	Entire-leaved white mountain avens-Netted willow	Dry Shrub	0	0	0	0	1	1
	00	CG	CG	Cryptogam-Altai fescue	Lichen - Gramminoid	0	0	0	0	0	0
	00	FB	FB	Subalpine fir-Mountain heather-Valerian	Slightly Dry to Mesic Forest	0	0	0	0	3	3
	00	FC	FC	Subalpine fir-Crowberry-Lichen	Dry Forest	0	0	0	0	0	0
	00	FK	FK	Subalpine fir krummholz	Krummholz	0	0	0	0	7	7
	00	FV	FV	Subalpine fir-Valerian	Moist to Wet Forest	0	0	0	0	22	22
	00	FW	FW	Altai fescue-Dwarf willow	Willow-Gramminoid	0	0	0	0	0	0
	00	HB	HB	Hellebore-Sedge-Bluejoint seepage meadow	Herb Meadow	0	0	0	0	0	0
	00	HW	HW	Netted willow-Four-angled mountain heather	Mesic Shrub	0	0	0	0	1	1
	00	JK	JK	Juniper-Kinnikinnick	Dry Shrub	0	0	0	0	4	4
	00	SS	SS	Scrub birch-Dwarf willow	Mesic to Dry Shrub	0	0	0	0	1	1
	00	BA	BA	Barren	Barren	4	0	0	0	27	27
	01/03/04	FR (BT/FO)	01/03/04	Bl - Rhododendron - Feathermoss (BlSb - Labrador tea/Bl - Oak fern - Knight's plume)	Slightly Dry to Moist Forest	28	0	53	0	168	168
	01	FR	01	Bl - Rhododendron - Feathermoss	Mesic Forest	98	0	55	0	637	637
	02	FL	02	Bl - Lingonberry	Moderately Dry Forest	10	0	2	0	82	82
	03	BT	03	BlSb - Labrador tea	Slightly Dry to Moist Forest	17	0	9	0	100	100
	04	FO	04	Bl - Oak fern - Knight's plume	Mesic Forest	6	0	6	0	48	48
	05	FD	05	Bl - Devil's club - Rhododendron	Moist Forest	35	0	27	0	212	212
	06	FH	06	Bl - Alder - Horsetail (Ws08 - Bl - Sitka valerian - Common horsetail)	Wet Forest	8	0	4	0	51	51
ESSFwc3	00	BA	BA	Barren	Barren	0	0	0	0	0	0
	01	WE	WE	TRIM Wetland	Wetland	0	0	0	0	0	0
	01	FR	01	Bl - Rhododendron - Oak fern	Mesic Forest	0	0	0	0	0	0
	02	FQ	02	Bl - Rhododendron - Queen's cup	Moderately Dry Forest	0	0	0	0	0	0
	03	FG	03	Bl - Globeflower - Horsetail (Ws08 - Bl - Sitka valerian - Common horsetail)	Moist Forest	0	0	0	0	0	0
ESSFwk2	00	BA	BA	Barren	Barren	0	0	0	0	0	0
	01/03	FO/FB	01/03	Bl - Oak fern - Knight's plume/Bl - Oak fern - Bluebells	Mesic Forest	0	0	0	0	0	0
	02	FS	02	Bl - Oak fern - Sarsaparilla	Moderately Dry Forest	0	0	0	0	0	0
	04	FD	04	Bl - Devil's club - Rhododendron	Moist Forest	0	0	0	0	0	0
	05	FR	05	Bl - Rhododendron - Lady fern	Moist Forest	0	0	0	0	0	0
	06	FH	06	Bl - Horsetail - Sphagnum	Wet Forest	0	0	0	0	0	0
SBSwk2	00	BA	BA	Barren	Barren	5	0	0	0	0	0
	01	SO	01	Sxw - Oak fern	Mesic Forest	262	0	0	0	4	4
	02	LH	02	Pl - Huckleberry - Cladina (blue listed)	Moderately Dry Forest	9	0	0	0	0	0
	03	SC	03	Sxw - Huckleberry - Highbush-cranberry	Moderately Dry Forest	187	0	0	0	3	3
	04	BF	04	SbPl - Feathermoss	Slightly Dry to Moist Forest	22	0	0	0	1	1
	05	SD	05	Sxw - Devil's club	Moist Forest	82	0	0	0	2	2
						773	291	245	96	2813	2909

Appendix 11-E. Murray River Project: Cumulative Loss from Past, Present and Reasonably Foreseeable Future Projects within the CEA Boundary for Forested and BC CDC Listed Ecosystems

Ecosystem Data				Future Projects								Total in RSA			
BEC	Site Series	Map Code	EcoUnit	Name	EB Pit Coal Mine (ha)	Hermann Mine (ha)	Horizon Mine (ha)	Northern Gateway Pipeline (ha)	Quintette Coal Mine (ha)	Roman Coal Mine (ha)	Murray River - MSAF (ha)	(ha)	Past / Present Loss (ha)	Future Loss (ha)	Total Loss (ha)
BWBSmw	0	BA	BA	Barren	0	0	0	3	19	0	4	433	72	25	97
	101	XA	101	Sw - Trailing raspberry - Step moss	0	0	0	30	380	0	219	13003	1649	629	2278
	101\$	XG	101\$	At - Rose - Creamy peavine	0	0	0	13	83	0	36	2792	163	132	294
	102	XB	102	Pl - Kinnikinnick - Lingonberry	0	0	0	1	22	0	12	829	67	35	102
	102\$	XH	102\$	At - Soopolallie - Kinnikinnick	0	0	0	2	8	0	7	312	24	17	41
	103	XC	103	SwPl - Soopolallie - Wildrye	0	0	0	13	43	0	35	2772	246	90	337
	103\$	XI	103\$	At - Rose - Fuzzy-spiked wildrye	0	0	0	8	9	0	4	961	57	21	77
	103\$/102\$	XI/XH	103\$/102\$	At - Rose - Fuzzy-spiked wildrye/At - Soopolallie - Kinnikinnick	0	0	0	3	3	0	14	208	14	21	35
	103/102	XC/XB	103/102	SwPl - Soopolallie - Wildrye/Pl - Kinnikinnick - Lingonberry	0	0	0	3	19	0	54	873	69	76	145
	104	XD	104	Sb - Lingonberry - Step moss	0	0	0	3	67	0	23	1658	213	93	306
	104\$	XJ	104\$	At - Labrador tea - Lingonberry	0	0	0	1	13	0	5	266	16	20	35
	110	XE	110	Sw - Oak fern - Sarsaparilla (blue listed)	0	0	0	1	30	0	3	672	161	34	195
	110\$	XK	110\$	At - Highbush-cranberry - Oak fern	0	0	0	1	7	0	1	139	8	9	17
	111	XF	111	Sw - Currant - Horsetail (blue listed)	0	0	0	8	98	0	35	2835	311	140	451
	111\$	XL	111\$	At - Cow-parsnip - Meadowrue	0	0	0	2	7	0	3	200	12	11	23
	111\$/112	XL/XM	111\$/112	At - Cow-parsnip - Meadowrue/AcbSw - Mountain alder - Dogwood (blue listed-potentially)	0	0	0	3	20	0	7	612	44	29	74
	F105	DB	F105	Drummond's willow-Bluejoint	0	0	0	0	0	0	0	1	1	0	1
	Gb51	SB	Gb51	Saskatoon-Blue wildrye	0	0	0	0	0	0	0	2	2	0	2
BWBSwk1	0	BA	BA	Barren	0	0	0	0	2	0	0	454	46	2	48
	101	YA	101	SwBl - Huckleberry - Feathermoss (blue listed)	0	0	0	3	205	0	0	22448	1065	208	1273
	101\$	YG	101\$	At - Birch-leaved spiraea - Huckleberry	0	0	0	1	26	0	0	5929	224	27	250
	102	YB	102	Pl - Lingonberry - Reindeer lichen	0	0	0	1	6	0	0	2624	106	6	113
	102\$	YH	102\$	At - Kinnikinnick - Fuzzy-spiked wildrye	0	0	0	0	1	0	0	571	26	1	26
	103	YC	103	SwPl - Soopolallie - Showy aster (blue listed)	0	0	0	0	1	0	0	435	68	1	69
	103\$	YI	103\$	At - Rose - Fuzzy-spiked wildrye	0	0	0	0	0	0	0	131	1	0	1
	104	YD	104	Sb - Huckleberry - Lingonberry	0	0	0	5	25	0	0	12572	485	30	516
	104\$	YJ	104\$	At - Labrador tea - Lingonberry	0	0	0	2	5	0	0	2679	108	7	115
	110\$	YK	110\$	AcbAt - Cow-parsnip/At - Highbush-cranberry - Oak fern	0	0	0	0	4	0	0	1136	47	4	51
	110/111	YE/YF	110/111	Sw - Currant - Horsetail/Sb - Lingonberry - Horsetail (blue listed potentially)	0	0	0	1	37	0	0	5639	239	38	277
ESSFmv2	00	AH	AH	Alder-Hellebore avalanche track	0	0	0	0	0	0	0	5	5	0	5
	00	AW	AW	Entire-leaved white mountain avens-Netted willow	0	0	0	0	0	0	0	1	1	0	1
	00	CG	CG	Cryptogam-Altai fescue	0	0	0	0	0	0	0	0	0	0	0
	00	FB	FB	Subalpine fir-Mountain heather-Valerian	0	0	0	0	0	0	0	3	3	0	3
	00	FC	FC	Subalpine fir-Crowberry-Lichen	0	0	0	0	0	0	0	0	0	0	0
	00	FK	FK	Subalpine fir krummholz	0	0	0	0	0	0	0	7	7	0	7
	00	FV	FV	Subalpine fir-Valerian	0	0	0	0	0	0	0	22	22	0	22
	00	FW	FW	Altai fescue-Dwarf willow	0	0	0	0	0	0	0	0	0	0	0
	00	HB	HB	Hellebore-Sedge-Bluejoint seepage meadow	0	0	0	0	0	0	0	0	0	0	0
	00	HW	HW	Netted willow-Four-angled mountain heather	0	0	0	0	0	0	0	1	1	0	1
	00	JK	JK	Juniper-Kinnikinnick	0	0	0	0	0	0	0	4	4	0	4
	00	SS	SS	Scrub birch-Dwarf willow	0	0	0	0	0	0	0	1	1	0	1
	00	BA	BA	Barren	1	8	24	0	41	8	0	1693	131	82	214
	01/03/04	FR (BT/FO)	01/03/04	Bl - Rhododendron - Feathermoss (BlSb - Labrador tea/Bl - Oak fern - Knight's plume)	30	105	109	0	334	50	0	11395	597	628	1225
	01	FR	01	Bl - Rhododendron - Feathermoss	78	376	569	0	483	171	1	39917	1471	1677	3148
	02	FL	02	Bl - Lingonberry	1	25	34	0	44	5	0	4004	138	108	246
	03	BT	03	BlSb - Labrador tea	7	18	18	0	119	10	0	6781	334	172	506
	04	FO	04	Bl - Oak fern - Knight's plume	3	13	19	0	53	5	0	2483	119	92	211
	05	FD	05	Bl - Devil's club - Rhododendron	58	128	149	0	514	64	0	14179	660	913	1574
	06	FH	06	Bl - Alder - Horsetail (Ws08 - Bl - Sitka valerian - Common horsetail)	10	33	49	0	57	12	0	3351	142	160	302
ESSFwc3	00	BA	BA	Barren	0	0	0	0	0	0	0	87	10	0	10
	01	WE	WE	TRIM Wetland	0	0	0	0	0	0	0	33	0	0	0
	01	FR	01	Bl - Rhododendron - Oak fern	0	0	0	0	0	0	0	2022	18	0	18
	02	FQ	02	Bl - Rhododendron - Queen's cup	0	0	0	0	0	0	0	472	0	0	0
	03	FG	03	Bl - Globeflower - Horsetail (Ws08 - Bl - Sitka valerian - Common horsetail)	0	0	0	0	0	0	0	841	6	0	6
ESSFwk2	00	BA	BA	Barren	0	0	0	0	0	0	0	35	4	0	4
	01/03	FO/FB	01/03	Bl - Oak fern - Knight's plume/Bl - Oak fern - Bluebells	0	0	0	0	0	0	0	2121	59	0	59
	02	FS	02	Bl - Oak fern - Sarsaparilla	0	0	0	0	0	0	0	79	2	0	2
	04	FD	04	Bl - Devil's club - Rhododendron	0	0	0	0	0	0	0	488	14	0	14
	05	FR	05	Bl - Rhododendron - Lady fern	0	0	0	0	0	0	0	587	33	0	33
	06	FH	06	Bl - Horsetail - Sphagnum	0	0	0	0	0	0	0	276	8	0	8
SBSwk2	00	BA	BA	Barren	0	0	0	2	1	0	0	345	25	2	28
	01	SO	01	Sxw - Oak fern	0	0	0	32	34	0	1	8106	564	67	631
	02	LH	02	Pl - Huckleberry - Cladina (blue listed)	0	0	0	3	2	0	0	487	22	5	27
	03	SC	03	Sxw - Huckleberry - Highbush-cranberry	0	0	0	32	27	0	1	5774	388	60	448
	04	BF	04	SbPl - Feathermoss	0	0	0	9	2	0	0	1305	75	11	86
	05	SD	05	Sxw - Devil's club	0	0	0	23	15	0	2	4266	314	40	353
					188	707	970	206	2865	325	466	194,326	10723	5726	16449