

Appendix D

Earthworks



Turitea Wind Farm Earthwork Volumes - Summary

Notes:

It is important to note that due to the two layouts contained within the 126 turbine zones, presenting the earthwork volumes requires consideration of this issue.

However, for the purposes of assessing effects a total volume is provided which includes all earthworks for all roads and pads. In practical terms, once a turbine or layout is chosen, the earthworks volumes would be less than the combined total presented in this spreadsheet.

The figures in this spreadsheet must be read in conjunction with the attached diagrams.

The figures in this spreadsheet must also be qualified according to the various statements of evidence (EIC, rebuttal and supplementary) of experts appearing in support of Mighty River Power.

In addition, where relevant, a breakdown of figures for inside and outside the Reserve is provided. Cumulative figures are also provided as requested.

Spoil Sites

A separate spreadsheet on the potential volume of spoil to be disposed of at each identified spoil site is also attached. The total potential volume of these is show below:

	Total
Spoil sites (m3)	1,413,595
Spoil sites area (m2)	401,750

Summary Information - Combined

Parameter	Inside Reserve	Outside Reserve	Total
Area (m2)	483,720	543,680	1,027,400
Cut (m3)	702,236	898,300	1,600,536
Fill (m3)	-171,394	-357,110	-528,504
Topsoil (m3)	120,930	135,920	256,850
Disposal to Spoil Sites			1,072,032

TURITEA WIND FARM - SPOIL SITE CAPACITY

SPOIL SITE	AREA (m2)	NOMINAL FILL DEPTH (m)	CAPACITY (m3)
D001	7940	3.5	27790
D002	9400	3.5	32900
D003	3610	3.5	12635
D004	3930	3.5	13755
D005	17800	3.5	62300
D006	5410	3.5	18935
D007	8570	3.5	29995
D008	3830	3.5	13405
D009	3550	3.5	12425
D010	17200	3.5	60200
D011	3540	3.5	12390
D012	8610	3.5	30135
D013	4250	3.5	14875
D014	28630	3.5	100205
D015	11960	3.5	41860
D016	18040	3.5	63140
D017	6130	3.5	21455
D018	9270	3.5	32445
D019	15450	3.5	54075
D020	27500	3.5	96250
D021	9550	3.5	33425
D022	27690	3.5	96915
D023	26420	3.5	92470
D025	5390	3.5	18865
D026	25040	2	50080
D027	30020	5	150100
D028	8470	3.5	29645
D029	12430	3.5	43505
D030	21620	3.5	75670
D031	8020	3.5	28070
D032	6890	3.5	24115
D033	5590	3.5	19565
TOTAL	401750		1413595

ZONE No./ ROAD No	SEGMENT No	AREA	CUT	FILL	TOPSOIL	CUMULATIVE TOTALS			
						AREA m2	CUT m3	FILL m3	TOPSOIL m3
3mW Roads									
3mw Turbine Pad									
2.3mW Roads									
2.3mW Turbine Pad									

Zones Inside Reserve

0055	000	0	0	0	0				
0001	1	2000	2700	-440	500	2,000	2,700	-440	500
2000	2	3000	4070	-400	750	5,000	6,770	-840	1,250
2200	3	2320	1390	-1,050	580	7,320	8,160	-1,890	1,830
0002	4	1920	2410	-820	480	9,240	10,570	-2,710	2,310
2000	8	3760	3700	-360	940	13,000	14,270	-3,070	3,250
2000	11	1040	700	-960	260	14,040	14,970	-4,030	3,510
2500	12	5520	2300	-8,950	1,380	19,560	17,270	-12,980	4,890
0003	13	1800	1130	-360	450	21,360	18,400	-13,340	5,340
2000	14	1320	1710	-110	330	22,680	20,110	-13,450	5,670
2000	17	2760	120	-4,310	690	25,440	20,230	-17,760	6,360
0004	18	2720	2340	-1,710	680	28,160	22,570	-19,470	7,040
2000	19	3760	660	-1,290	940	31,920	23,230	-20,760	7,980
2000	22	1240	420	-420	310	33,160	23,650	-21,180	8,290
2700	23	4600	890	-1,830	1,150	37,760	24,540	-23,010	9,440
0005	24	1800	2300	-70	450	39,560	26,840	-23,080	9,890
2000	25	1560	280	-670	390	41,120	27,120	-23,750	10,280
2000	27	2680	1900	-1,800	670	43,800	29,020	-25,550	10,950
S067	28	2,800	7,240	-10	700	46,600	36,260	-25,560	11,650
0006	29	1,880	4,760	-120	470	48,480	41,020	-25,680	12,120
2000	30	2600	3010	-640	650	51,080	44,030	-26,320	12,770
2A00	31	400	180	-90	100	51,480	44,210	-26,410	12,870
0007	32	1560	300	-250	390	53,040	44,510	-26,660	13,260
2000	33	4480	1200	-2,270	1,120	57,520	45,710	-28,930	14,380
S069	34	2,200	350	-2,120	550	59,720	46,060	-31,050	14,930
0008	35	1,920	1,630	-170	480	61,640	47,690	-31,220	15,410
2000	36	480	350	-10	120	62,120	48,040	-31,230	15,530
2000	41	3760	850	-2,180	940	65,880	48,890	-33,410	16,470
0009	42	1880	1780	-250	470	67,760	50,670	-33,660	16,940
2000	43	4680	1050	-4,560	1,170	72,440	51,720	-38,220	18,110
0010	44	2000	450	-1,120	500	74,440	52,170	-39,340	18,610
2000	45	6240	1390	-5,170	1,560	80,680	53,560	-44,510	20,170
2900	46	880	1220	-10	220	81,560	54,780	-44,520	20,390
2910	47	3880	1450	-3,230	970	85,440	56,230	-47,750	21,360
0012	48	1760	930	-50	440	87,200	57,160	-47,800	21,800
2900	49	7120	1620	-5,480	1,780	94,320	58,780	-53,280	23,580
0013	50	1840	760	-250	460	96,160	59,540	-53,530	24,040
2900	51	3720	1050	-2,580	930	99,880	60,590	-56,110	24,970
0014	52	1880	3170	-100	470	101,760	63,760	-56,210	25,440
2000	53	1000	430	-360	250	102,760	64,190	-56,570	25,690
0011	54	1880	570	-340	470	104,640	64,760	-56,910	26,160

ZONE No./ ROAD No	SEGMENT No	AREA	CUT	FILL	TOPSOIL	CUMULATIVE TOTALS			
						AREA m2	CUT m3	FILL m3	TOPSOIL m3
3mW Roads									
3mw Turbine Pad									
2.3mW Roads									
2.3mW Turbine Pad									
2000	55	3720	470	-3,220	930	108,360	65,230	-60,130	27,090
2920	56	5200	2050	1,836	1,300	113,560	67,280	-58,294	28,390
0038	57	1796	1840	-80	449	115,356	69,120	-58,374	28,839
2000	58	760	10	-330	190	116,116	69,130	-58,704	29,029
0015	59	1800	130	-400	450	117,916	69,260	-59,104	29,479
3000	60	4600	200	3,320	1,150	122,516	69,460	-55,784	30,629
0016	61	1760	2480	-10	440	124,276	71,940	-55,794	31,069
3000	62	1720	340	-1,110	430	125,996	72,280	-56,904	31,499
3100	63	8240	6960	-2,870	2,060	134,236	79,240	-59,774	33,559
0039	64	1840	4460	-30	460	136,076	83,700	-59,804	34,019
3000	65	3600	801	-4,800	900	139,676	84,501	-64,604	34,919
0017	66	1,200	1,000	-150	300	140,876	85,501	-64,754	35,219
3000	67	1160	105	-300	290	142,036	85,606	-65,054	35,509
0018	68	1920	2140	-150	480	143,956	87,746	-65,204	35,989
3000	69	5160	260	-6,640	1,290	149,116	88,006	-71,844	37,279
3200	70	5640	7660	-2,000	1,410	154,756	95,666	-73,844	38,689
0040	71	1960	5690	-80	490	156,716	101,356	-73,924	39,179
0019	72	1800	2610	-70	450	158,516	103,966	-73,994	39,629
3000	73	3840	420	-2,290	960	162,356	104,386	-76,284	40,589
3300	74	7800	4040	-3,970	1,950	170,156	108,426	-80,254	42,539
0041	75	2400	1290	-650	600	172,556	109,716	-80,904	43,139
0020	76	2040	2760	-300	510	174,596	112,476	-81,204	43,649
3000	77	4800	880	-1,700	1,200	179,396	113,356	-82,904	44,849
0021	78	1760	1650	-10	440	181,156	115,006	-82,914	45,289
3000	79	3240	3930	-280	810	184,396	118,936	-83,194	46,099
0022	80	1920	4210	-80	480	186,316	123,146	-83,274	46,579
3000	81	2280	4260	-20	570	188,596	127,406	-83,294	47,149
3400	82	3080	3420	-1,590	770	191,676	130,826	-84,884	47,919
0042	83	1880	1450	-100	470	193,556	132,276	-84,984	48,389
3000	84	5400	5170	-160	1,350	198,956	137,446	-85,144	49,739
0023	85	1880	6080	-30	470	200,836	143,526	-85,174	50,209
3000	86	4240	7330	-350	1,060	205,076	150,856	-85,524	51,269
0024	87	1880	6770	-40	470	206,956	157,626	-85,564	51,739
3000	88	4840	6350	-520	1,210	211,796	163,976	-86,084	52,949
0025	89	2000	7250	-120	500	213,796	171,226	-86,204	53,449
3000	90	8760	18810	-3,160	2,190	222,556	190,036	-89,364	55,639
0026	91	2000	6350	-160	500	224,556	196,386	-89,524	56,139
3500	92	8520	19870	-1,520	2,130	233,076	216,256	-91,044	58,269
0043	93	1920	2040	-120	480	234,996	218,296	-91,164	58,749
3000	94	3400	11940	-10	850	238,396	230,236	-91,174	59,599
0027	95	1920	5240	-40	480	240,316	235,476	-91,214	60,079
3000	96	13720	30330	-6,290	3,430	254,036	265,806	-97,504	63,509
0028	97	1840	7040	-10	460	255,876	272,846	-97,514	63,969
3000	98	15520	27680	-1,420	3,880	271,396	300,526	-98,934	67,849
0029	99	1920	3200	-40	480	273,316	303,726	-98,974	68,329
3000	100	6360	6480	-3,380	1,590	279,676	310,206	-102,354	69,919

ZONE No./ ROAD No	SEGMENT No	AREA	CUT	FILL	TOPSOIL	CUMULATIVE TOTALS			
						AREA m2	CUT m3	FILL m3	TOPSOIL m3
3mW Roads									
3mw Turbine Pad									
2.3mW Roads									
2.3mW Turbine Pad									
0030	101	1960	6070	-270	490	281,636	316,276	-102,624	70,409
3000	102	5640	5700	-5,720	1,410	287,276	321,976	-108,344	71,819
0031	103	1880	4510	-60	470	289,156	326,486	-108,404	72,289
3000	104	3040	9310	-30	760	292,196	335,796	-108,434	73,049
0032	105	1840	1870	-70	460	294,036	337,666	-108,504	73,509
3000	106	12880	39570	-10,650	3,220	306,916	377,236	-119,154	76,729
0033	107	2280	10160	-60	570	309,196	387,396	-119,214	77,299
3000	108	3720	11190	-940	930	312,916	398,586	-120,154	78,229
0034	109	1800	4650	-10	450	314,716	403,236	-120,164	78,679
3000	110	6520	5620	-860	1,630	321,236	408,856	-121,024	80,309
0035	111	1800	4380	-10	450	323,036	413,236	-121,034	80,759
3000	112	5440	13080	-10	1,360	328,476	426,316	-121,044	82,119
0036	113	1880	6480	-30	470	330,356	432,796	-121,074	82,589
3000	114	1840	4100	-10	460	332,196	436,896	-121,084	83,049
3600	115	2400	7320	-80	600	334,596	444,216	-121,164	83,649
0044	116	1840	4560	-10	460	336,436	448,776	-121,174	84,109
3000	117	5760	3870	-2,280	1,440	342,196	452,646	-123,454	85,549
S105	118	1,400	2,960	-10	350	343,596	455,606	-123,464	85,899
0045	119	1,844	1,810	-190	461	345,440	457,416	-123,654	86,360
3000	120	1160	2990	-10	290	346,600	460,406	-123,664	86,650
0037	121	1840	2310	-120	460	348,440	462,716	-123,784	87,110
3000	122	5360	1120	-1,560	1,340	353,800	463,836	-125,344	88,450
3700	123	2040	540	-1,080	510	355,840	464,376	-126,424	88,960
0046	124	1840	2270	-70	460	357,680	466,646	-126,494	89,420
3000	125	1160	1360	-30	290	358,840	468,006	-126,524	89,710
3800	131	2160	6820	-10	540	361,000	474,826	-126,534	90,250
0047	132	1880	4820	-60	470	362,880	479,646	-126,594	90,720
3900	136	2640	3690	-320	660	365,520	483,336	-126,914	91,380
0048	137	1880	6040	-20	470	367,400	489,376	-126,934	91,850
5200	173	15520	14050	-7260	3880	382,920	503,426	-134,194	95,730
0054	174	1760	2940	-10	440	384,680	506,366	-134,204	96,170
6000	175	11080	24530	-1,010	2,770	395,760	530,896	-135,214	98,940
6000	197	10520	2600	-9,050	2,630	406,280	533,496	-144,264	101,570
0056	198	1800	4260	-10	450	408,080	537,756	-144,274	102,020
6000	199	3080	3050	-930	770	411,160	540,806	-145,204	102,790
6200	200	6040	5750	-660	1,510	417,200	546,556	-145,864	104,300
0057	201	1880	2650	-90	470	419,080	549,206	-145,954	104,770
6200	202	5240	10240	-460	1,310	424,320	559,446	-146,414	106,080
0058	203	1840	5020	-20	460	426,160	564,466	-146,434	106,540
6000	204	5280	2210	-5,680	1,320	431,440	566,676	-152,114	107,860
0059	205	1840	6780	-10	460	433,280	573,456	-152,124	108,320
6000	206	6280	7020	-7,750	1,570	439,560	580,476	-159,874	109,890
6300	207	1840	3890	-490	460	441,400	584,366	-160,364	110,350
0060	208	1920	10460	-10	480	443,320	594,826	-160,374	110,830
6300	209	5640	8390	-4,790	1,410	448,960	603,216	-165,164	112,240
0061	210	1800	1290	-70	450	450,760	604,506	-165,234	112,690

ZONE No./ ROAD No	SEGMENT No	AREA	CUT	FILL	TOPSOIL	CUMULATIVE TOTALS			
						AREA m2	CUT m3	FILL m3	TOPSOIL m3
3mW Roads									
3mw Turbine Pad									
2.3mW Roads									
2.3mW Turbine Pad									
6000	211	3840	6270	-480	960	454,600	610,776	-165,714	113,650
0062	212	1800	3010	-10	450	456,400	613,786	-165,724	114,100
6000	213	3560	3060	-1,630	890	459,960	616,846	-167,354	114,990
6400	214	960	2470	-200	240	460,920	619,316	-167,554	115,230
0063	215	1800	4840	-10	450	462,720	624,156	-167,564	115,680
6000	216	6440	35230	-540	1,610	469,160	659,386	-168,104	117,290
0064	217	2,040	8,790	-400	510	471,200	668,176	-168,504	117,800
6000	218	3400	24420	-10	850	474,600	692,596	-168,514	118,650
0065	219	1880	1690	-220	470	476,480	694,286	-168,734	119,120
6000	220	5480	5620	-2,650	1,370	481,960	699,906	-171,384	120,490
0066	221	1760	2330	-10	440	483,720	702,236	-171,394	120,930

Zones Outside Reserve

2000	5	2320	780	-120	580	2,320	780	-120	580
2300	6	3000	10780	-10	750	5,320	11,560	-130	1,330
0103	7	1800	2830	-10	450	7,120	14,390	-140	1,780
2400	9	3120	3050	-110	780	10,240	17,440	-250	2,560
0104	10	1840	2870	-60	460	12,080	20,310	-310	3,020
S078	15	2,400	6,460	-10	600	14,480	26,770	-320	3,620
0105	16	1,880	3,330	-200	470	16,360	30,100	-520	4,090
2600	20	1800	870	-40	450	18,160	30,970	-560	4,540
0106	21	1800	3320	-20	450	19,960	34,290	-580	4,990
0107	26	1920	440	-310	480	21,880	34,730	-890	5,470
2800	37	1120	2220	-10	280	23,000	36,950	-900	5,750
0108	38	1840	3300	-60	460	24,840	40,250	-960	6,210
2800	39	2,800	5,420	-2,600	700	27,640	45,670	-3,560	6,910
0109	40	1,960	3,620	-120	490	29,600	49,290	-3,680	7,400
3A00	126	10,080	17,940	-11,190	2,520	39,680	67,230	-14,870	9,920
0118	127	2120	5,110	-440	530	41,800	72,340	-15,310	10,450
3A00	128	6520	8,590	-4,290	1,630	48,320	80,930	-19,600	12,080
0117	129	1960	7,720	-50	490	50,280	88,650	-19,650	12,570
3000	130	480	480	-10	120	50,760	89,130	-19,660	12,690
3000	133	6440	11500	-4,020	1,610	57,200	100,630	-23,680	14,300
0110	134	1880	5300	-50	470	59,080	105,930	-23,730	14,770
3000	135	3160	3590	-630	790	62,240	109,520	-24,360	15,560
3000	138	4920	16240	-80	1,230	67,160	125,760	-24,440	16,790
0111	139	1960	7400	-50	490	69,120	133,160	-24,490	17,280
4000	140	4920	6490	-1,640	1,230	74,040	139,650	-26,130	18,510
0112	141	1880	1660	-260	470	75,920	141,310	-26,390	18,980
4000	142	5440	6110	-4,590	1,360	81,360	147,420	-30,980	20,340
0113	143	2080	7220	-80	520	83,440	154,640	-31,060	20,860
4000	144	4400	870	-5,930	1,100	87,840	155,510	-36,990	21,960
S094	145	0	11,310	-1,360		87,840	166,820	-38,350	21,960

ZONE No./ ROAD No	SEGMENT No	AREA	CUT	FILL	TOPSOIL	CUMULATIVE TOTALS			
						AREA m2	CUT m3	FILL m3	TOPSOIL m3
3mW Roads									
3mw Turbine Pad									
2.3mW Roads									
2.3mW Turbine Pad									
0119	146	0	5,770	-30		87,840	172,590	-38,380	21,960
4000	147	1040	10	-630	260	88,880	172,600	-39,010	22,220
0114	148	2000	4240	-140	500	90,880	176,840	-39,150	22,720
4000	149	9000	830	-12,150	2,250	99,880	177,670	-51,300	24,970
0115	150	1920	2590	-120	480	101,800	180,260	-51,420	25,450
4000	151	1800	2310	-1,120	450	103,600	182,570	-52,540	25,900
S096	152	1,400	4,510	-10	350	105,000	187,080	-52,550	26,250
0116	153	1,800	3,340	-10	450	106,800	190,420	-52,560	26,700
4000	154	6240	18660	-1,690	1,560	113,040	209,080	-54,250	28,260
0119	155	1840	6190	-10	460	114,880	215,270	-54,260	28,720
5000	156	5240	1440	-540	1310	120,120	216,710	-54,800	30,030
0120	157	1760	2260	-10	440	121,880	218,970	-54,810	30,470
5000	158	3560	4570	-1370	890	125,440	223,540	-56,180	31,360
0121	159	1840	4410	-40	460	127,280	227,950	-56,220	31,820
5000	160	3120	100	-4220	780	130,400	228,050	-60,440	32,600
0052	161	2,000	2,760	-500	500	132,400	230,810	-60,940	33,100
5000	162	2160	670	-230	540	134,560	231,480	-61,170	33,640
0122	163	1760	580	-90	440	136,320	232,060	-61,260	34,080
5000	164	2440	920	-740	610	138,760	232,980	-62,000	34,690
0123	165	2640	1800	-490	660	141,400	234,780	-62,490	35,350
5000	166	4160	480	-1190	1040	145,560	235,260	-63,680	36,390
5100	167	2120	620	-540	530	147,680	235,880	-64,220	36,920
0124	168	1960	2260	-90	490	149,640	238,140	-64,310	37,410
5000	169	3160	980	-1000	790	152,800	239,120	-65,310	38,200
5000	170	1480	460	-420	370	154,280	239,580	-65,730	38,570
5300	171	1880	2150	-140	470	156,160	241,730	-65,870	39,040
0125	172	1840	1520	-110	460	158,000	243,250	-65,980	39,500
6100	176	8320	38900	-7,890	2,080	166,320	282,150	-73,870	41,580
0134	177	1800	3390	-30	450	168,120	285,540	-73,900	42,030
6100	178	10440	10090	-17,780	2,610	178,560	295,630	-91,680	44,640
0135	179	2080	7300	-220	520	180,640	302,930	-91,900	45,160
6100	180	6680	10	-18,180	1,670	187,320	302,940	-110,080	46,830
0136	181	2840	4410	-640	710	190,160	307,350	-110,720	47,540
6100	182	3800	4050	-1,830	950	193,960	311,400	-112,550	48,490
6110	183	920	1370	-50	230	194,880	312,770	-112,600	48,720
0127	184	1840	3950	-40	460	196,720	316,720	-112,640	49,180
S116	185	2,800	4,230	-2,300	700	199,520	320,950	-114,940	49,880
0128	186	1,880	9,920	-10	470	201,400	330,870	-114,950	50,350
6100	187	8080	27640	-2,960	2,020	209,480	358,510	-117,910	52,370
0129	188	1760	2400	-30	440	211,240	360,910	-117,940	52,810
6100	189	3440	4490	-1,290	860	214,680	365,400	-119,230	53,670
0130	190	1800	3780	-30	450	216,480	369,180	-119,260	54,120
6100	191	9400	440	-21,800	2,350	225,880	369,620	-141,060	56,470
0131	192	1880	4730	-80	470	227,760	374,350	-141,140	56,940
6100	193	4760	4970	-3,990	1,190	232,520	379,320	-145,130	58,130
0132	194	2040	6160	-250	510	234,560	385,480	-145,380	58,640

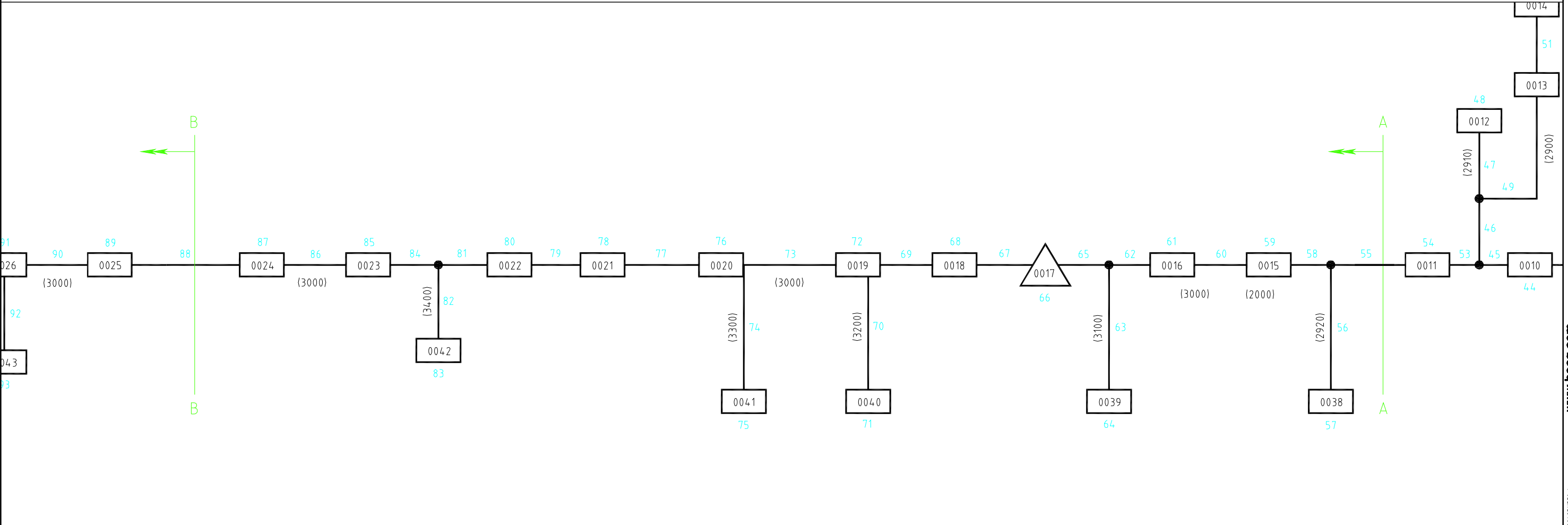
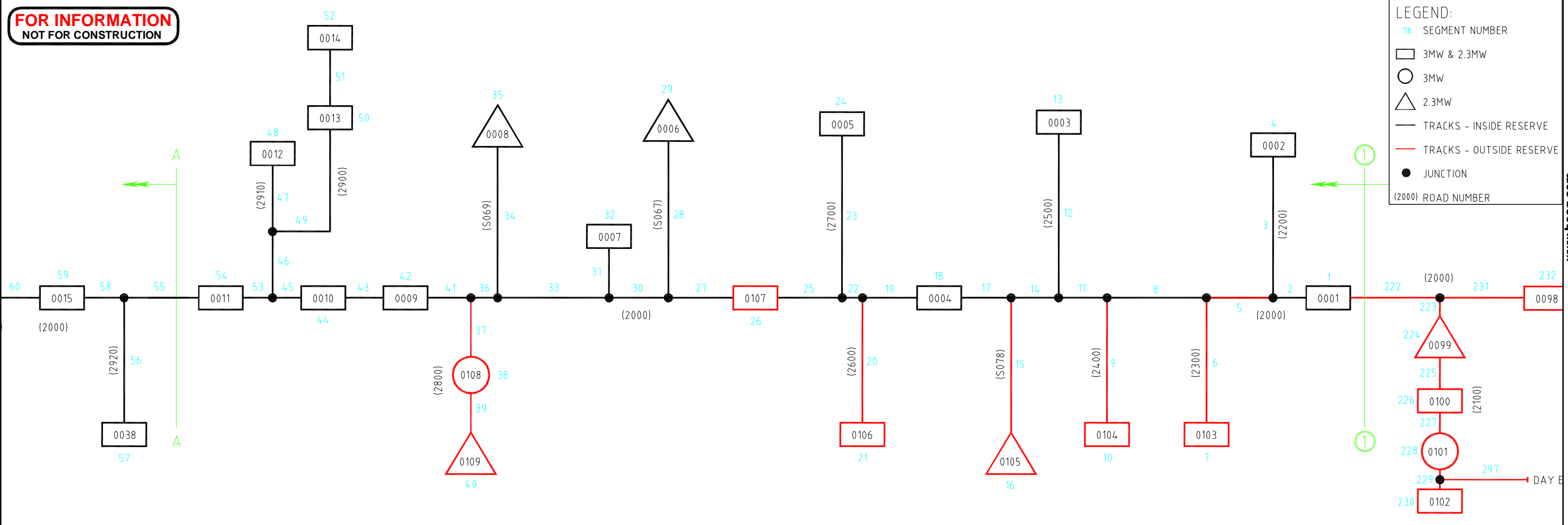
ZONE No./ ROAD No	SEGMENT No	AREA	CUT	FILL	TOPSOIL	CUMULATIVE TOTALS			
						AREA m2	CUT m3	FILL m3	TOPSOIL m3
3mW Roads									
3mw Turbine Pad									
2.3mW Roads									
2.3mW Turbine Pad									
6100	195	5800	4680	-7,340	1,450	240,360	390,160	-152,720	60,090
0133	196	1880	3160	-70	470	242,240	393,320	-152,790	60,560
2000	222	4520	220	-4,540	1,130	246,760	393,540	-157,330	61,690
2100	223	4040	1600	-3,210	1,010	250,800	395,140	-160,540	62,700
0099	224	1,840	3,200	-140	460	252,640	398,340	-160,680	63,160
2100	225	1720	3140	-10	430	254,360	401,480	-160,690	63,590
0100	226	1760	1870	-10	440	256,120	403,350	-160,700	64,030
2100	227	5200	20320	-20	1,300	261,320	423,670	-160,720	65,330
0101	228	1960	8760	-50	490	263,280	432,430	-160,770	65,820
2100	229	4760	9750	-1,770	1,190	268,040	442,180	-162,540	67,010
0102	230	1840	1870	-70	460	269,880	444,050	-162,610	67,470
2000	231	4520	2280	-4,550	1,130	274,400	446,330	-167,160	68,600
0098	232	1840	5440	-10	460	276,240	451,770	-167,170	69,060
2000	233	1880	3800	-1,470	470	278,120	455,570	-168,640	69,530
7100	234	680	1020	-10	170	278,800	456,590	-168,650	69,700
0097	235	1760	2430	-30	440	280,560	459,020	-168,680	70,140
1000	236	4000	3,660	-410	1,000	284,560	462,680	-169,090	71,140
S028	237	1,080	1,050	-1,930	270	285,640	463,730	-171,020	71,410
0096	238	1,880	4,850	-100	470	287,520	468,580	-171,120	71,880
1000	239	4200	3,700	-710	1,050	291,720	472,280	-171,830	72,930
0067	240	2000	7,050	-80	500	293,720	479,330	-171,910	73,430
1100	241	8400	4,400	-7,580	2,100	302,120	483,730	-179,490	75,530
0095	242	2480	2,180	-740	620	304,600	485,910	-180,230	76,150
1000	243	8800	3,400	-1,860	2,200	313,400	489,310	-182,090	78,350
0068	244	1760	1,430	-10	440	315,160	490,740	-182,100	78,790
1200	245	4160	2,100	-100	1,040	319,320	492,840	-182,200	79,830
0094	246	1800	2,770	-20	450	321,120	495,610	-182,220	80,280
1000	247	4640	2,570	-3,310	1,160	325,760	498,180	-185,530	81,440
0069	248	1840	4,740	-10	460	327,600	502,920	-185,540	81,900
1000	249	2000	3,140	-70	500	329,600	506,060	-185,610	82,400
0070	250	2,240	6,960	-210	560	331,840	513,020	-185,820	82,960
1000	251	18640	1,500	-87,120	4,660	350,480	514,520	-272,940	87,620
0071	252	1760	2,040	-10	440	352,240	516,560	-272,950	88,060
1000	253	10160	14,310	-5,280	2,540	362,400	530,870	-278,230	90,600
0072	254	1760	2,040	-10	440	364,160	532,910	-278,240	91,040
1000	255	1800	5,850	-200	450	365,960	538,760	-278,440	91,490
1300	256	4600	5,790	-1,380	1,150	370,560	544,550	-279,820	92,640
1310	257	2640	7,370	-400	660	373,200	551,920	-280,220	93,300
0091	258	1800	4,110	-10	450	375,000	556,030	-280,230	93,750
1300	259	14760	34,640	-12,880	3,690	389,760	590,670	-293,110	97,440
0092	260	1840	6,100	-10	460	391,600	596,770	-293,120	97,900
1000	261	3120	5,860	-300	780	394,720	602,630	-293,420	98,680
1400	262	1520	8,830	-10	380	396,240	611,460	-293,430	99,060
0073	263	1800	6,530	-10	450	398,040	617,990	-293,440	99,510
1000	264	11720	19,640	-3,700	2,930	409,760	637,630	-297,140	102,440
0074	265	1760	3,920	-10	440	411,520	641,550	-297,150	102,880

ZONE No./ ROAD No	SEGMENT No	AREA	CUT	FILL	TOPSOIL	CUMULATIVE TOTALS			
						AREA m2	CUT m3	FILL m3	TOPSOIL m3
3mW Roads									
3mw Turbine Pad									
2.3mW Roads									
2.3mW Turbine Pad									
1500	266	8160	10,970	-11,900	2,040	419,680	652,520	-309,050	104,920
0089	267	1840	7,960	-10	460	421,520	660,480	-309,060	105,380
1500	268	9160	17,490	-6,700	2,290	430,680	677,970	-315,760	107,670
0090	269	1760	2,870	-10	440	432,440	680,840	-315,770	108,110
1000	270	3960	5,470	-10	990	436,400	686,310	-315,780	109,100
1600	271	2680	1,010	-830	670	439,080	687,320	-316,610	109,770
0084	272	1,800	1,710	-70	450	440,880	689,030	-316,680	110,220
1600	273	3520	390	-2,850	880	444,400	689,420	-319,530	111,100
0085	274	1920	5,050	-60	480	446,320	694,470	-319,590	111,580
1600	275	3400	4,500	-1,530	850	449,720	698,970	-321,120	112,430
1610	276	7520	7,280	-9,430	1,880	457,240	706,250	-330,550	114,310
0082	277	1840	1,590	-70	460	459,080	707,840	-330,620	114,770
1610	278	6120	6,100	-3,580	1,530	465,200	713,940	-334,200	116,300
0083	279	1840	3,780	-20	460	467,040	717,720	-334,220	116,760
1600	280	1560	3,740	-40	390	468,600	721,460	-334,260	117,150
0086	281	2,080	8,850	-40	520	470,680	730,310	-334,300	117,670
1600	282	2480	19,030	-10	620	473,160	749,340	-334,310	118,290
0087	283	1920	9,780	-10	480	475,080	759,120	-334,320	118,770
1600	284	4800	19,890	-10	1,200	479,880	779,010	-334,330	119,970
0088	285	1840	5,520	-10	460	481,720	784,530	-334,340	120,430
1000	286	3120	8,790	-10	780	484,840	793,320	-334,350	121,210
0075	287	1880	7,300	-20	470	486,720	800,620	-334,370	121,680
1000	288	3040	9,890	-10	760	489,760	810,510	-334,380	122,440
0076	289	1960	11,400	-20	490	491,720	821,910	-334,400	122,930
1000	290	4160	22,690	-10	1,040	495,880	844,600	-334,410	123,970
0077	291	2040	6,180	-120	510	497,920	850,780	-334,530	124,480
1000	292	11720	18,830	-8,630	2,930	509,640	869,610	-343,160	127,410
0078	293	1920	2,770	-80	480	511,560	872,380	-343,240	127,890
7200	294	15400	15950	-1,700	3,850	526,960	888,330	-344,940	131,740
7300	295	7560	2640	-3,510	1,890	534,520	890,970	-348,450	133,630
7400	296	1200	1430	-20	300	535,720	892,400	-348,470	133,930
7000	297	7960	5900	-8,640	1,990	543,680	898,300	-357,110	135,920

**FOR INFORMATION
NOT FOR CONSTRUCTION**

LEGEND:

- 78 SEGMENT NUMBER
- 3MW & 2.3MW
- 3MW
- △ 2.3MW
- TRACKS - INSIDE RESERVE
- TRACKS - OUTSIDE RESERVE
- JUNCTION
- (2000) ROAD NUMBER

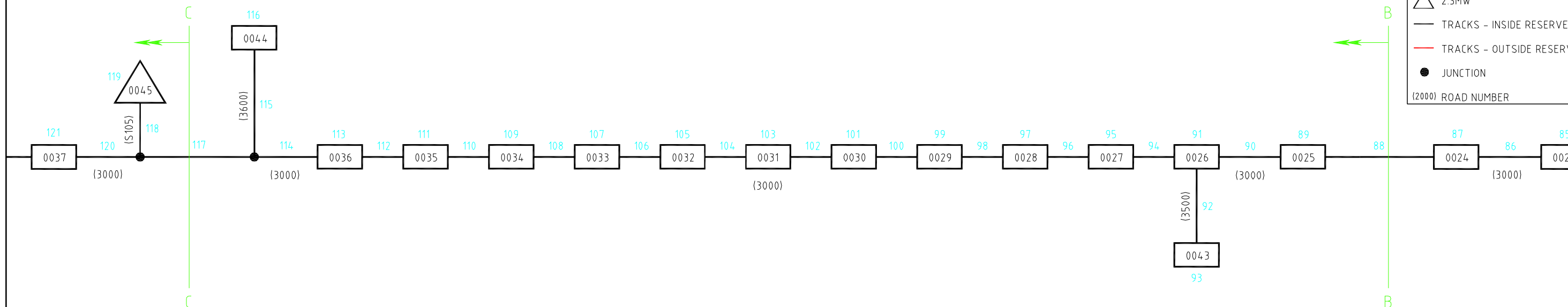


<p>Drawing Originator:</p>		<p>Original Scale (A1): N.T.S. Reduced Scale (A3): N.T.S.</p>		<p>Design Drawn: [] Dag Verifier: [] Dwg Check: []</p>		<p>Approved For Construction* [] Date: []</p>		<p>Client: </p>		<p>Project: TURITEA WIND FARM</p>		<p>Title: VOLUMES SCHEMATIC 1 OF 4</p>		<p>Discipline: GEOSPATIAL</p>	
<p>Revision: []</p>		<p>RXM CDJ SRW 16.07.09</p>		<p>By Chk Appd Date</p>		<p>* Refer to Revision 1 for Original Signature</p>		<p>Client: []</p>		<p>Project: []</p>		<p>Drawing No. 0848RK550</p>		<p>Rev. A</p>	

FOR INFORMATION
NOT FOR CONSTRUCTION

LEGEND:

- 78 SEGMENT NUMBER
- 3MW & 2.3MW
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- TRACKS - INSIDE RESERVE
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Drawing Originator:	Design	Drawn	Approved For Construction*
Original Scale (A1): N.T.S	Dag Verifier		Date
Reduced Scale (A3): N.T.S	Dwg Check		
	* Refer to Revision 1 for Original Signature		



Client: **TURITEA WIND FARM**

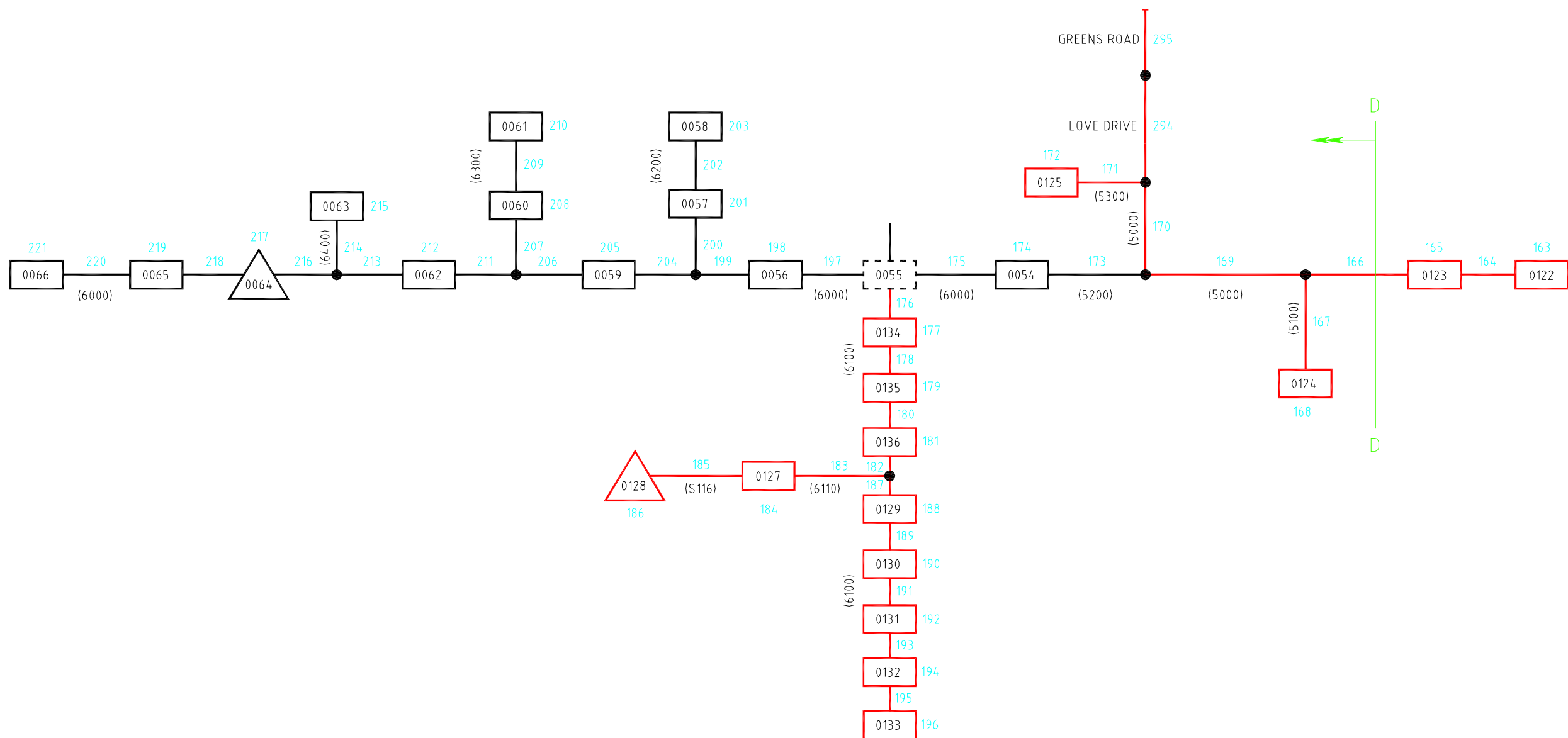
Title: **VOLUMES SCHEMATIC 2 OF 4**

Discipline: GEOSPATIAL	Rev. A
Drawing No. 0848RK551	

FOR INFORMATION
NOT FOR CONSTRUCTION

LEGEND:

- 78 SEGMENT NUMBER
- 3MW & 2.3MW
- 3MW
- △ 2.3MW
- TRACKS - INSIDE RESERVE
- TRACKS - OUTSIDE RESERVE
- JUNCTION
- (2000) ROAD NUMBER



A FOR INFORMATION		RXM	CDJ	SRW	16.07.09
No.	Revision	By	Chk	Appd	Date



Original Scale (A1) N.T.S	Design Drawn	Approved For Construction*
Reduced Scale (A3) N.T.S	Dwg Verifier	Date
	Dwg Check	
* Refer to Revision 1 for Original Signature		



Client: **TURITEA WIND FARM**

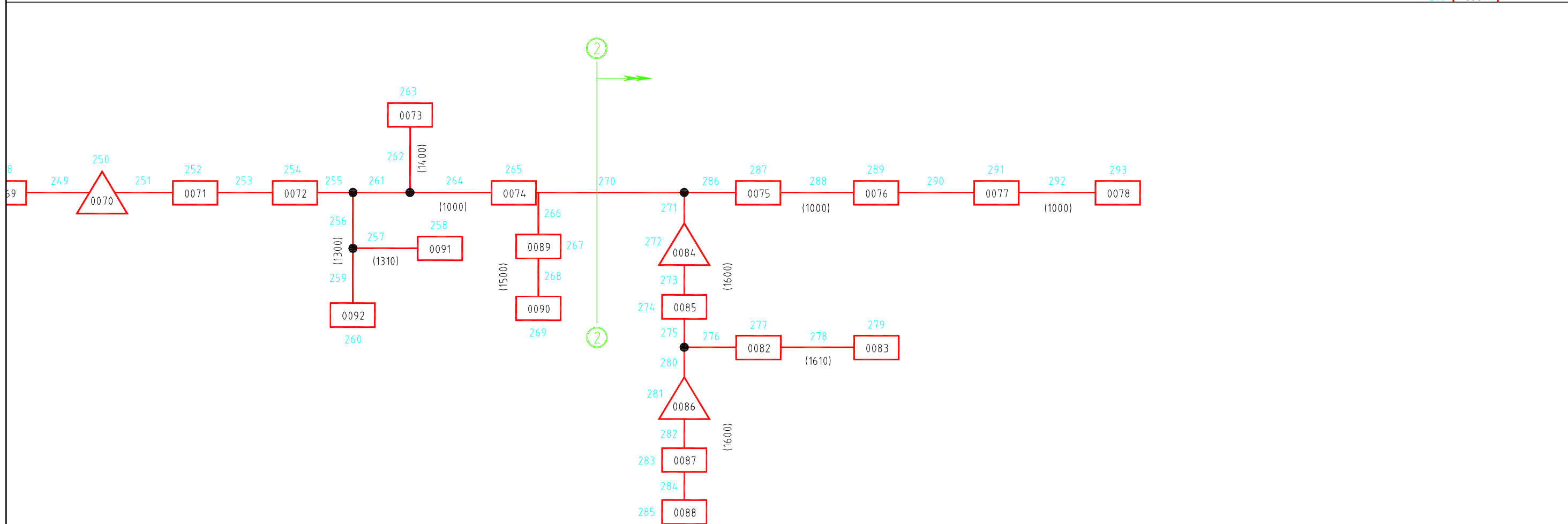
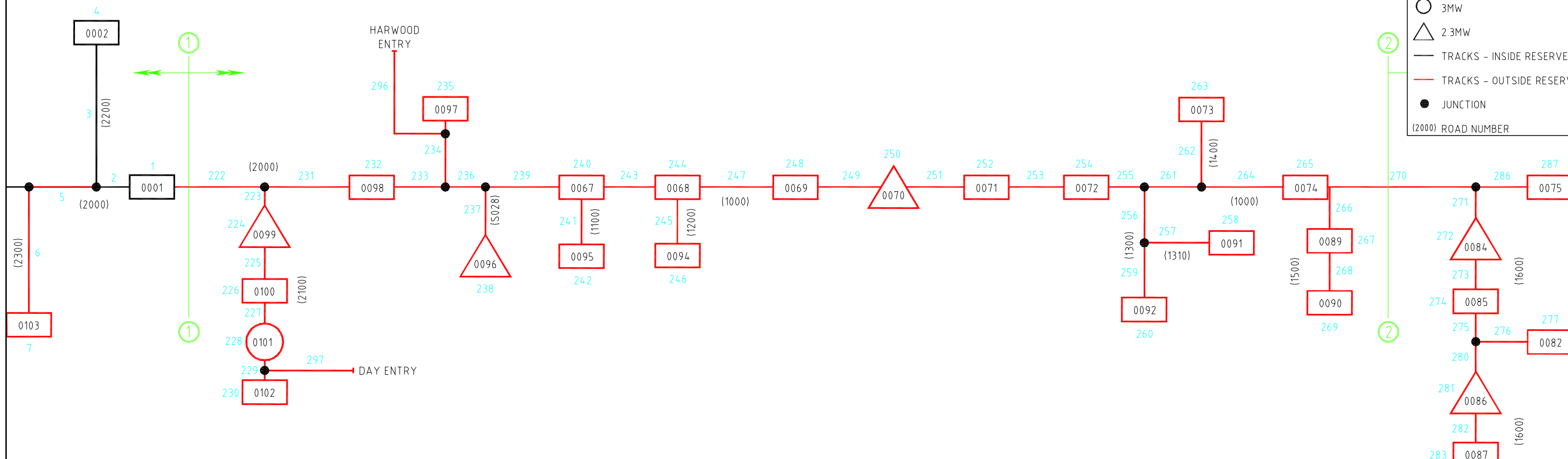
Title: **VOLUMES SCHEMATIC
3 OF 4**

Discipline	GEOSPATIAL
Drawing No.	0848RK552
Rev.	A

**FOR INFORMATION
NOT FOR CONSTRUCTION**

LEGEND:

- 78 SEGMENT NUMBER
- 3MW & 2.3MW
- 3MW
- △ 2.3MW
- TRACKS - INSIDE RESERVE
- TRACKS - OUTSIDE RESERVE
- JUNCTION
- (2000) ROAD NUMBER



A FOR INFORMATION		RXM	CDJ	SRW	16.07.09
No.	Revision	By	Chk	Appd	Date



Drawing Originator:	Original Scale (A1): N.T.S.	Design Drawn:	Approved For Construction:
	Reduced Scale (A3): N.T.S.	Dag Verifier:	Date:
		Dwg Check:	* Refer to Revision 1 for Original Signature



Client: **TURITEA WIND FARM**

Title: **VOLUMES SCHEMATIC
4 OF 4**

Discipline: GEOSPATIAL	Rev. A
Drawing No. 0848RK553	

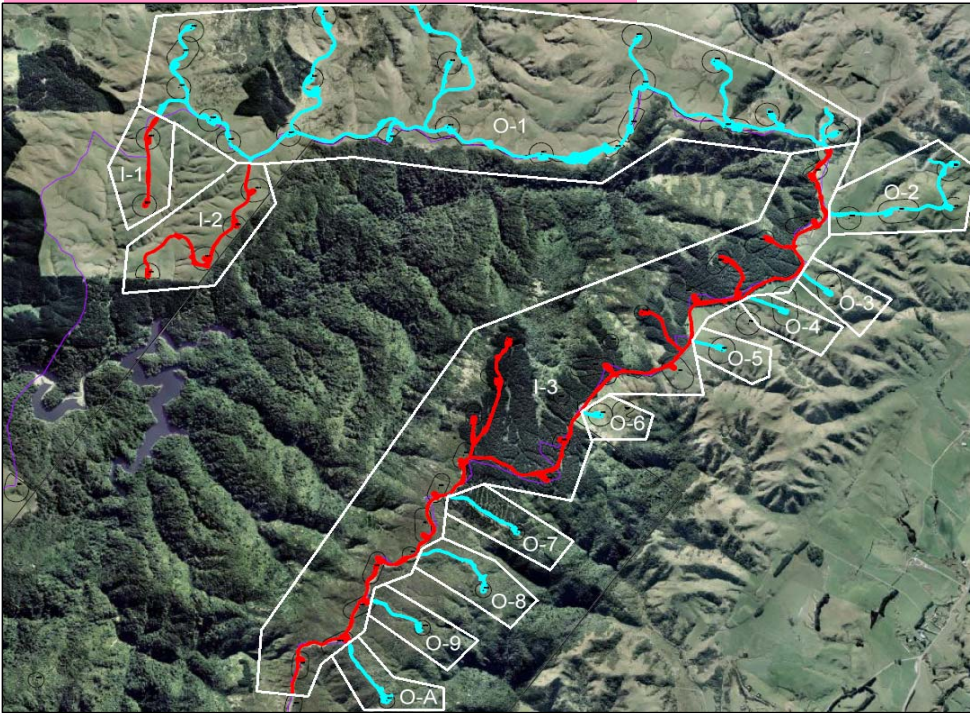
**TURITEA WIND FARM
SOIL VOLUMES**

Volumes calculated using the prismatic method. The TOTAL CUT volumes calculated includes topsoil. The topsoil volume in cut areas has been calculated by visually assessing the percentage of the earthworks footprint area in cut and an average depth of 0.25m.

The volume of CUT BELOW SOILS has been calculated using the prismatic method and by lowering the ground model surface by the average depth of soils assessed by Gavin Alexander for each area.

The volume of CUT IN SOILS has been calculated by subtracting the assessed topsoil volume and the CUT BELOW SOILS volume from the TOTAL CUT.

AREA A - ASSUMED AVERAGE DEPTH TO ROCK 2.0m



Roads/pads in cyan drain out of the PNCC water supply catchment

INSIDE CATCHMENT

SUB AREA	CUT AREA %	TOTAL TOPSOIL	TOPSOIL IN CUT AREAS	TOTAL CUT (Inc T/s)	CUT BELOW SOIL	CUT IN SOILS	% IN SOILS
I-1	80	3300	2640	14900	3900	8360	56
I-2	80	7300	5840	88000	46200	35960	41
I-3	80	40500	32400	118400	24300	61700	52
TOTALS	80	51100	40880	221300	74400	106020	48

OUTSIDE CATCHMENT

O-1	80	47800	38240	344000	144000	161760	47
O-2	80	5600	4480	52900	25300	23120	44
O-3	80	1100	880	13800	6300	6620	48
O-4	80	1200	960	6900	1400	4540	66
O-5	80	900	720	5200	700	3780	73
O-6	80	700	560	6100	2000	3540	58
O-7	80	2300	1840	5000	200	2960	59
O-8	80	2500	2000	13100	3300	7800	60
O-9	80	1800	1440	14200	5100	7660	54
O-A	80	2600	2080	5800	300	3420	59
TOTAL		66500	53200	467000	188600	225200	48

AREA TOTALS **117600** **94080** **688300** **263000** **331220** **48**

TOTAL AREA CHECK 80 117500 94000 688400 263000 331400 48
 Difference -100 -80 100 0

AREA B - ASSUMED AVERAGE DEPTH TO ROCK 0.25m



Roads/pads in cyan drain out of the PNCC water supply catchment

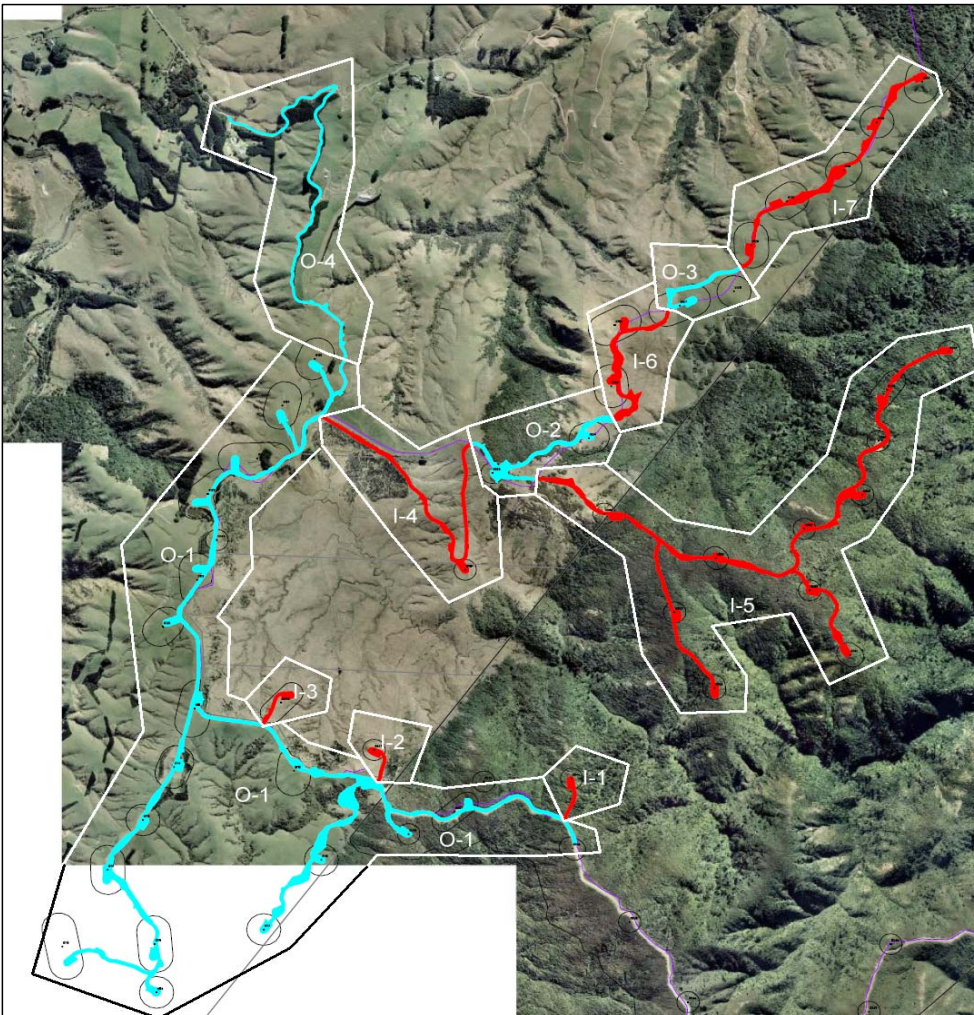
INSIDE CATCHMENT

SUB AREA	CUT AREA %	TOTAL TOPSOIL	TOPSOIL IN CUT AREAS	TOTAL CUT (Inc T/s)	CUT BELOW SOIL	CUT IN SOILS	% IN SOILS
1	95	500	475	3000	2500	25	1
2	95	800	760	7900	7100	40	1
3	95	1700	1615	20600	19100	-115	-1
4	95	600	570	5300	4700	30	1
5	0	900	0	200	200	0	0
6	95	1100	1045	13900	12800	55	0
7	90	800	720	5800	5200	-120	-2
8	70	1300	910	10100	9400	-210	-2
TOTALS	85	7700	6095	66800	61000	-295	0

OUTSIDE CATCHMENT

1	90	2200	1980	15400	13500	-80	-1
2	90	500	450	2100	1700	-50	-2
3	90	1800	1620	18800	17100	80	0
4	90	6200	5580	67700	62300	-180	0
5	90	1100	990	18700	17600	110	1
6	90	1400	1260	14700	13500	-60	0
7	90	3500	3150	23900	20800	-50	0
8	90	3600	3240	36000	33100	-340	-1
9	90	7000	6300	92500	85900	300	0
TOTAL		27300	24570	289800	265500	-270	0
AREA TOTALS		35000	30665	356600	326500	-565	0
TOTAL AREA CHECK	83	35100	29133	356600	326500	967	0
		100	-1532	0	0	1532	

WESTERN AREA - ASSUMED AVERAGE DEPTH TO ROCK 1.3m



Roads/pads in cyan drain out of the PNCC water supply catchment

INSIDE CATCHMENT							
SUB AREA	CUT AREA %	TOTAL TOPSOIL	TOPSOIL IN CUT AREAS	TOTAL CUT (Inc T/s)	CUT BELOW SOIL	CUT IN SOILS	
1	70	1000	700	12700	8000	4000	31
2	70	974	681.8	10670	6150	3838.2	36
3	70	1100	770	10900	6200	3930	36
4	70	6400	4480	43000	22200	16320	38
5	70	20600	14420	172000	107200	50380	29
6	70	5600	3920	26600	18100	4580	17
7	70	8500	5950	44300	23800	14550	33
TOTALS		44174	30921.8	320170	191650	97598.2	30
OUTSIDE CATCHMENT							
1	70	37610	26327	222477	120416	75734	34
2	70	5400	3780	60100	43900	12420	21
3	70	2400	1680	29000	19300	8020	28
4	70	5200	3640	23500	7400	12460	53
TOTAL		50610	35427	335077	191016	108634	
AREA TOTALS		94784	66348.8	655247	382666	206232.2	
TOTAL AREA check	70	94778	66344.6	654828	382188	206295.4	
		-6	-4.2	-419	-478	63.2	

SUMMARY

INSIDE CATCHMENT
OUTSIDE CATCHMENT

102974	77896.8	608270	327050	203323.2
144410	113197	1091877	645116	333564
247384	191093.8	1700147	972166	536887.2