

VIR JAMES P. C.

TIMOTHY C. CUTFORTH P.E., DIRECTOR OF ENGINEERING
BROADCAST ENGINEERING CONSULTANTS
965 S. IRVING ST. · DENVER, CO · 80219
(303) 937-1900

DIRECTIONAL ANTENNAS
AM - FM - TV
APPLICATIONS
PROOFS
FIELD MEASUREMENTS
AUDIO AND RF ENGINEERING
EMERGENCY REPAIR

ENGINEERING STATEMENT

Concerning an amendment to a minor change application for new station at Fitzwilliam Depot, NH.

The FCC staff found in their studies that the proposed night power would contribute to the 50%RSS of accepted Canadian proposal at Pembroke, ON. This amendment changes the night pattern parameters and power to insure that the treaty obligations towards Pembroke are adequately met. Other exhibits requested are also supplied in this amendment.

The proposed night coverage encompasses 80% of the area of Fitzwilliam Depot as shown on the night coverage map exhibit. In the event that the FCC staff should find that a waiver of FCC rules is necessary for the proposed night operation such a waiver is hereby requested. The proposed 29.3 mV/m night limit is not the actual night limit existing. The largest contributor to the night limit is Pembroke, ON and Because the Canadian allocation is only a proposal and no application to use that allocation has been filed in Canada for over 20years it is unlikely that the Pembroke, ON 880kHz allocation will ever come on the air. Broadcasters in Canada have embraced the Eureka digital broadcasting system and have begun turning in AM broadcast licenses as part of that transition although international treaty obligations require applicants to protect that notification. Without an operating facility at Pembroke, ON the actual night limit is 16.5 mv/m and is also shown on the coverage map. The 16.5 mV/m contour completely encompasses the community of Fitzwilliam Depot. In addition, whereas much of New Hampshire is rocky, the proposed facility is located adjacent to a stream in lowlands and conductivity measurements would certainly show greater than M3 conductivities in the direction of Fitzwilliam Depot.

The array coordinates were changed slightly to exactly match the registered coordinates of the center tower to the tenth of a second. The prior coordinates were different only in that they are the result of rounding off to the nearest second. All exhibits except for the form 301 and the aerial photograph use the previous coordinates rounded to the nearest second. The change from rounding to the tenth of a second from rounding to

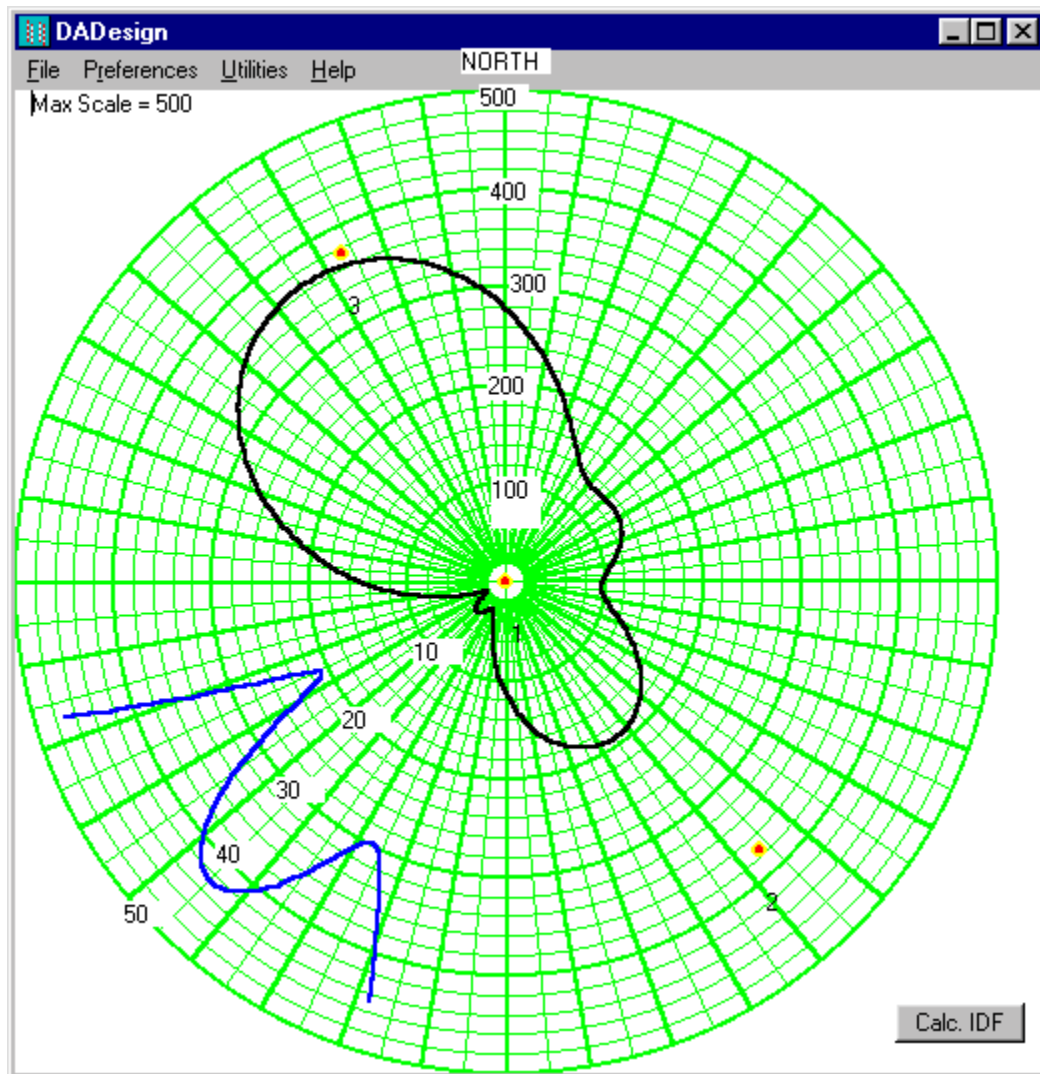
the even second has no effect on any allocations or coverage showing. The three tower registrations noted in the letter are necessary because the proposed Fitzwilliam Depot facility is proposed to share the site with WXNH and will share the southwest tower of the WXNH directional array.

Also included in this filing are the aerial photograph of the site with the 1V/m day and night contour superimposed on it, a ground system plot a vertical tower sketch, and a city grade coverage map showing both daytime and nighttime contours. The ground system will consist of 120 radials around each tower with 138 m long radials around the center tower and 84 m long radials around the two end towers except where shortened at a common strap where the radials would overlap.

Respectfully,

A handwritten signature in black ink, reading "Timothy C. Cutforth". The signature is written in a cursive, flowing style.

Timothy C. Cutforth
30 June 2006



FITZWILLIAM DEPOT-N 42-45-59 N	72-06-59 W	FCC RMS 1 OHM =	185.17 mV/m/km		
Frequency: 870 kHz	Class: B	Std RMS 1 OHM =	194.82 mV/m/km		
Nominal Power = 0.4000 kW		Antenna RSS =	467.98 mV/m/km		
RSS/RMS = 2.52726		STANDARD Q =	11.70 mV/m/km		
Twr.No.	Field	Phasing	Spacing	Azimuth	Height
1	1.020	+0.0	0.0	0.0	90.7
2	0.520	+175.0	75.0	136.5	50.0
3	0.580	-161.0	75.0	333.5	50.0

FITZWILLIAM DEPOT-N 42-45-59 N 72-06-59 W

Twr.No.	Field	Phasing	Spacing	Azimuth	Height
1	1.020	+0.0	0.0	0.0	90.7
2	0.520	+175.0	75.0	136.5	50.0
3	0.580	-161.0	75.0	333.5	50.0

Theo. RMS= 185.17 mV/m/km RSS= 467.98 Q= 11.70

STANDARD HORIZONTAL PLANE PATTERN

Azimuth	mV/m/km	Azimuth	mV/m/km
0	279.0	180	114.3
5	255.2	185	94.2
10	230.4	190	74.0
15	205.8	195	55.1
20	182.8	200	39.7
25	162.7	205	31.3
30	147.0	210	31.8
35	136.8	215	36.9
40	131.8	220	41.6
45	130.8	225	43.3
50	131.9	230	40.9
55	133.0	235	34.4
60	132.7	240	25.7
65	130.2	245	22.3
70	125.2	250	34.6
75	118.2	255	57.2
80	110.2	260	84.8
85	102.8	265	115.0
90	98.1	270	146.6
95	97.9	275	178.5
100	103.2	280	209.7
105	113.2	285	239.6
110	126.3	290	267.3
115	140.7	295	292.3
120	154.9	300	314.1
125	167.9	305	332.4
130	178.7	310	346.9
135	186.8	315	357.5
140	191.8	320	364.1
145	193.4	325	366.6
150	191.5	330	365.0
155	186.1	335	359.5
160	177.3	340	350.1
165	165.4	345	337.0
170	150.5	350	320.5
175	133.3	355	301.0

FITZWILLIAM DEPOT-N Standard Vertical Pattern
(mV/m at one kilometer)

Azimuth	VA= 5	VA= 10	VA= 15	VA= 20	VA= 25	VA= 30
0	275.8	266.3	251.0	230.8	206.7	179.8
5	252.2	243.5	229.5	211.0	188.9	164.4
10	227.7	219.9	207.2	190.6	170.7	148.8
15	203.5	196.5	185.3	170.6	153.1	133.9
20	180.7	174.6	165.0	152.2	137.2	120.7
25	160.9	155.8	147.5	136.7	124.0	110.1
30	145.6	141.2	134.3	125.3	114.7	103.1
35	135.5	131.9	126.1	118.5	109.6	99.8
40	130.7	127.6	122.6	116.0	108.2	99.6
45	129.8	127.0	122.5	116.5	109.4	101.4
50	131.0	128.3	124.1	118.4	111.6	104.0
55	132.1	129.6	125.5	120.1	113.5	106.0
60	131.9	129.5	125.5	120.3	113.9	106.7
65	129.4	127.1	123.4	118.4	112.4	105.5
70	124.5	122.4	118.9	114.3	108.7	102.4
75	117.6	115.6	112.4	108.1	103.1	97.4
80	109.6	107.6	104.6	100.6	96.0	90.9
85	102.1	100.1	96.9	92.8	88.3	83.5
90	97.2	94.8	91.0	86.3	81.3	76.3
95	96.8	93.6	88.8	82.8	76.4	70.3
100	101.8	97.6	91.3	83.4	74.8	66.7
105	111.4	106.3	98.3	88.3	77.2	66.3
110	124.2	118.2	108.7	96.6	82.9	69.0
115	138.4	131.5	120.7	106.7	90.7	74.1
120	152.4	144.8	132.9	117.3	99.4	80.4
125	165.1	157.0	144.1	127.3	107.7	86.8
130	175.8	167.2	153.5	135.7	114.8	92.4
135	183.8	174.9	160.6	142.0	120.3	96.7
140	188.7	179.5	165.0	145.9	123.5	99.3
145	190.2	181.0	166.3	147.0	124.4	99.8
150	188.4	179.2	164.5	145.3	122.7	98.2
155	183.0	174.0	159.6	140.7	118.5	94.3
160	174.3	165.6	151.6	133.3	111.7	88.4
165	162.5	154.1	140.7	123.2	102.7	80.4
170	147.8	139.9	127.4	110.9	91.6	70.7
175	130.8	123.5	111.8	96.6	78.8	59.6

FITZWILLIAM DEPOT-N Standard Vertical Pattern
(mV/m at one kilometer)

Azimuth	VA= 5	VA= 10	VA= 15	VA= 20	VA= 25	VA= 30
180	112.0	105.3	94.7	80.9	64.8	47.5
185	92.1	86.2	76.8	64.5	50.3	35.2
190	72.2	67.1	58.9	48.3	36.3	23.8
195	53.6	49.3	42.6	34.0	24.7	16.6
200	38.6	35.4	30.5	24.8	19.9	18.1
205	30.6	28.8	26.4	24.4	23.9	25.4
210	31.5	31.0	30.4	30.4	31.3	33.2
215	36.9	36.8	36.8	37.2	38.1	39.4
220	41.6	41.6	41.6	41.9	42.4	43.1
225	43.2	43.2	43.2	43.3	43.5	43.9
230	40.8	40.8	40.7	40.8	41.1	41.5
235	34.4	34.3	34.3	34.5	35.1	35.9
240	25.5	25.2	25.0	25.1	25.9	27.3
245	21.8	20.3	18.3	16.4	15.7	16.7
250	33.7	31.0	26.9	21.7	16.1	11.5
255	56.1	52.6	47.2	40.1	31.9	23.3
260	83.3	79.0	72.2	63.3	52.8	41.6
265	113.2	108.0	99.7	88.9	76.1	62.1
270	144.5	138.4	128.6	115.7	100.4	83.6
275	176.1	169.0	157.7	142.8	125.0	105.5
280	207.0	199.1	186.3	169.4	149.3	127.0
285	236.6	227.8	213.6	194.9	172.5	147.7
290	264.0	254.4	239.0	218.6	194.2	167.0
295	288.8	278.5	262.0	240.1	213.8	184.6
300	310.4	299.6	282.1	258.9	231.1	200.0
305	328.5	317.2	299.0	274.7	245.6	213.1
310	342.9	331.3	312.4	287.4	257.3	223.5
315	353.5	341.5	322.3	296.6	265.8	231.3
320	360.0	347.9	328.4	302.4	271.2	236.2
325	362.5	350.3	330.8	304.7	273.3	238.2
330	360.9	348.9	329.4	303.5	272.3	237.3
335	355.5	343.6	324.4	298.8	268.1	233.7
340	346.1	334.5	315.8	290.8	260.9	227.3
345	333.2	321.9	303.8	279.7	250.8	218.4
350	316.9	306.1	288.8	265.7	238.1	207.3
355	297.5	287.4	271.0	249.3	223.3	194.3

FITZWILLIAM DEPOT-N Standard Vertical Pattern
(mV/m at one kilometer)

Azimuth	VA= 35	VA= 40	VA= 45	VA= 50	VA= 55	VA= 60
0	151.6	123.6	97.0	73.2	53.4	38.5
5	138.8	113.4	89.6	68.4	51.0	38.1
10	126.0	103.5	82.6	64.2	49.2	38.1
15	114.0	94.5	76.5	60.9	48.2	38.7
20	103.7	87.2	72.0	58.9	48.2	39.8
25	95.9	82.1	69.5	58.4	49.2	41.5
30	91.2	79.7	69.0	59.4	50.9	43.5
35	89.7	79.7	70.2	61.4	53.3	45.7
40	90.6	81.5	72.6	64.0	55.8	47.9
45	93.0	84.3	75.5	66.9	58.4	50.0
50	95.7	87.1	78.3	69.4	60.6	51.8
55	97.8	89.3	80.4	71.4	62.3	53.2
60	98.7	90.3	81.6	72.6	63.5	54.2
65	98.0	89.9	81.5	72.8	63.8	54.7
70	95.4	88.0	80.2	72.0	63.5	54.6
75	91.2	84.5	77.5	70.2	62.3	54.1
80	85.4	79.8	73.8	67.4	60.5	53.0
85	78.7	74.0	69.1	63.8	58.0	51.5
90	71.7	67.6	63.7	59.6	55.0	49.6
95	65.1	61.1	57.9	55.0	51.7	47.3
100	60.0	55.2	52.1	50.1	48.0	44.9
105	57.0	50.4	46.8	45.2	44.2	42.3
110	56.6	47.3	42.2	40.5	40.4	39.7
115	58.6	46.1	38.6	36.3	36.7	37.1
120	62.1	46.6	36.2	32.5	33.3	34.7
125	66.2	48.0	34.9	29.3	30.1	32.3
130	70.1	49.8	34.2	26.6	27.2	30.2
135	73.1	51.2	33.7	24.4	24.7	28.4
140	74.8	51.9	33.0	22.3	22.5	26.9
145	74.9	51.5	31.8	20.3	20.7	25.8
150	73.3	49.8	29.9	18.2	19.4	25.1
155	69.9	46.7	27.2	16.0	18.5	24.8
160	64.7	42.3	23.5	13.9	18.3	24.9
165	57.9	36.7	19.2	12.4	18.9	25.5
170	49.6	30.0	14.5	12.2	20.2	26.5
175	40.3	22.6	10.3	13.8	22.2	27.8

FITZWILLIAM DEPOT-N Standard Vertical Pattern
(mV/m at one kilometer)

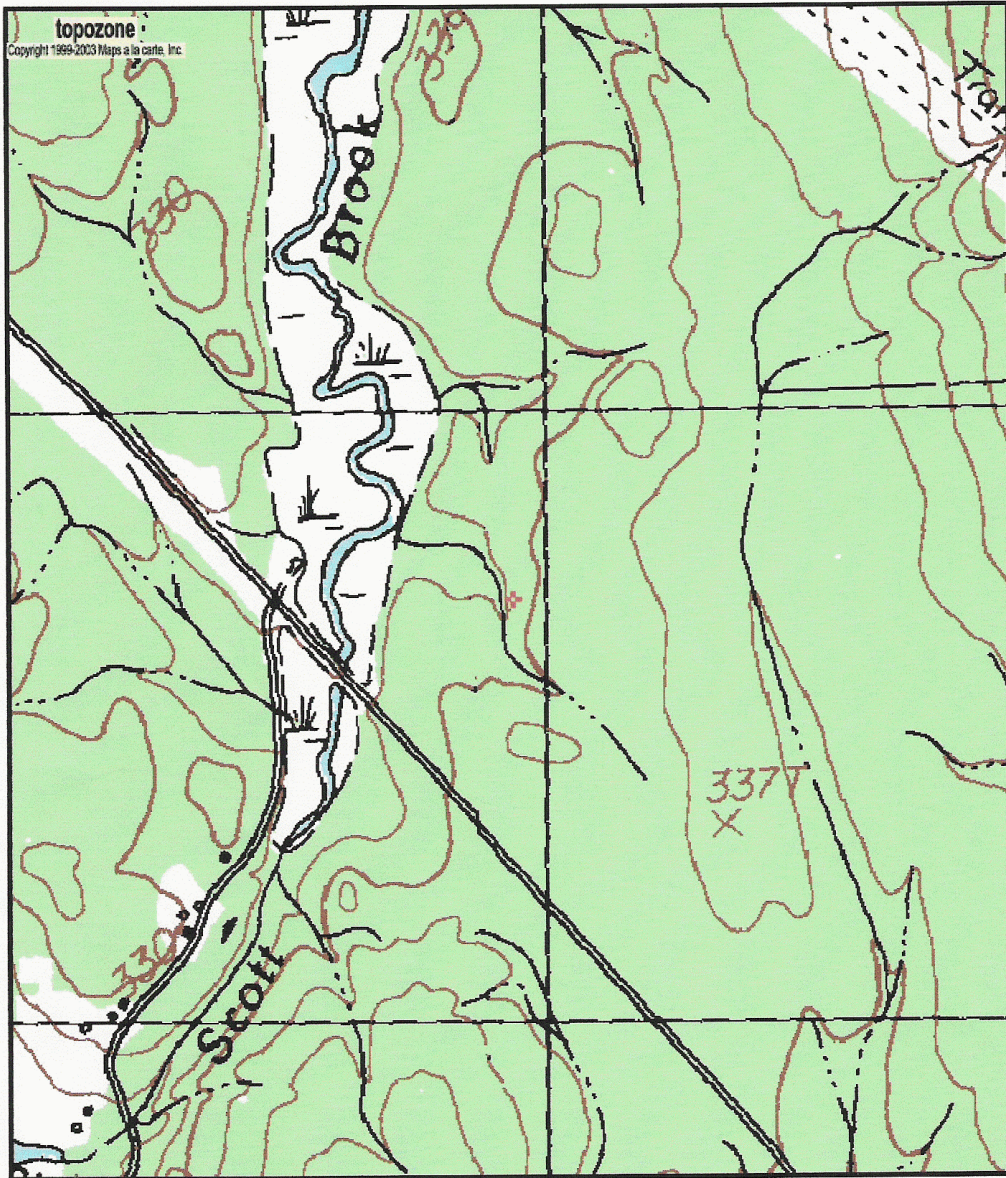
Azimuth	VA= 35	VA= 40	VA= 45	VA= 50	VA= 55	VA= 60
180	30.3	15.1	9.2	17.0	24.7	29.4
185	20.5	9.8	12.6	21.1	27.6	31.2
190	13.3	11.4	18.3	25.6	30.6	32.9
195	13.7	18.1	24.5	30.1	33.6	34.6
200	20.6	25.5	30.5	34.3	36.3	36.1
205	28.6	32.4	35.7	37.9	38.5	37.3
210	35.6	38.0	39.9	40.8	40.2	38.2
215	40.8	42.1	42.8	42.6	41.2	38.6
220	43.8	44.3	44.2	43.3	41.4	38.4
225	44.2	44.3	43.9	42.8	40.8	37.7
230	41.9	42.1	41.9	41.0	39.2	36.4
235	36.8	37.7	38.1	37.8	36.7	34.5
240	29.1	31.0	32.6	33.5	33.3	32.1
245	19.3	22.6	25.7	28.0	29.3	29.2
250	10.4	13.5	17.9	21.9	24.7	25.9
255	15.4	10.5	11.6	15.9	19.9	22.5
260	30.4	20.3	13.4	12.6	15.9	19.3
265	47.9	34.4	22.8	15.3	14.0	16.6
270	66.4	49.7	34.5	22.5	15.6	15.1
275	85.2	65.3	46.9	31.3	20.1	15.4
280	103.8	80.9	59.4	40.6	25.9	17.3
285	121.7	95.9	71.5	49.8	32.2	20.3
290	138.5	110.0	82.9	58.6	38.4	23.9
295	153.8	122.9	93.4	66.8	44.3	27.5
300	167.2	134.3	102.7	74.1	49.7	30.9
305	178.7	144.0	110.7	80.4	54.3	34.1
310	187.8	151.8	117.2	85.5	58.2	36.8
315	194.7	157.7	122.1	89.4	61.2	38.9
320	199.0	161.5	125.3	92.1	63.4	40.6
325	200.9	163.2	126.8	93.4	64.6	41.6
330	200.2	162.8	126.6	93.5	64.9	42.2
335	197.2	160.3	124.8	92.4	64.4	42.2
340	191.8	156.0	121.5	90.1	63.1	41.8
345	184.3	149.9	116.9	86.8	61.1	41.1
350	174.8	142.2	111.0	82.7	58.7	40.2
355	163.8	133.3	104.3	78.1	56.1	39.3

Proposed Night Limits

FITZWILLIAM DEPOT 870 kHz to Co-Channel Stations: WWL .5 mV/m 50% SKYWAVE

*** Facilities/Points with Proposed Limits less than .4 mV/m are NOT printed

Facility or Contour	Location	Dist km	Azim deg	Theta deg	Max IDF mV/m/km	Skywave uV/m	Limit mV/m	Required Protect
WWL-0	40-43-14N 90-07-55W	1508.8	267.5	2.0	5.6	130.0	15.5	0.402 0.500
WWL-5	40-41-29N 88-53-11W	1408.1	266.3	2.7	6.5	122.4	17.8	0.436 0.500
WWL-10	40-37-16N 87-38-10W	1308.4	264.8	3.3	7.4	112.8	20.7	0.466 0.500
WWL-15	40-29-52N 86-22-41W	1210.2	262.8	4.1	8.4	100.5	24.1	0.485 0.500
WWL-20	40-19-05N 85-06-38W	1113.8	260.3	4.9	9.6	85.0	28.4	0.483 0.500
WWL-25	40-03-09N 83-50-58W	1022.9	256.9	5.7	10.8	65.4	33.4	0.437 0.500
WWL-45	37-55-56N 79-20-04W	813.7	231.2	8.2	14.5	39.6	52.0	0.412 0.500
WWL-50	37-13-45N 78-17-31W	809.3	222.6	8.3	14.6	42.9	53.2	0.456 0.500
WHCU-L	42-21-49N 76-36-20W	370.3	264.6	20.4	32.0	85.8	152.2	2.612 4.048
WLVP-L	43-39-46N 70-29-41W	164.9	52.4	40.7	55.0	86.9	314.0	5.460 6.109
READING-C	40-16-29N 75-51-08W	416.5	229.7	18.1	28.9	41.7	135.1	1.127 4.243
BATHURS-P	47-33-00N 65-44-00W	729.7	41.1	13.1	13.1	123.3	95.2	2.348 6.190
SAULTST-P	46-31-00N 84-24-00W	1055.9	297.4	7.9	7.9	294.2	58.6	3.448 4.759
THUNDER-P	48-22-00N 89-24-30W	1478.6	300.8	4.0	4.0	314.7	27.5	1.731 4.941
QUEBEC-P	46-45-00N 71-15-00W	447.9	8.5	22.1	22.1	188.2	133.2	5.014 7.108
PEMBRO-P	45-45-00N 77-12-00W	523.2	311.0	18.9	18.9	295.3	121.1	7.208 7.280



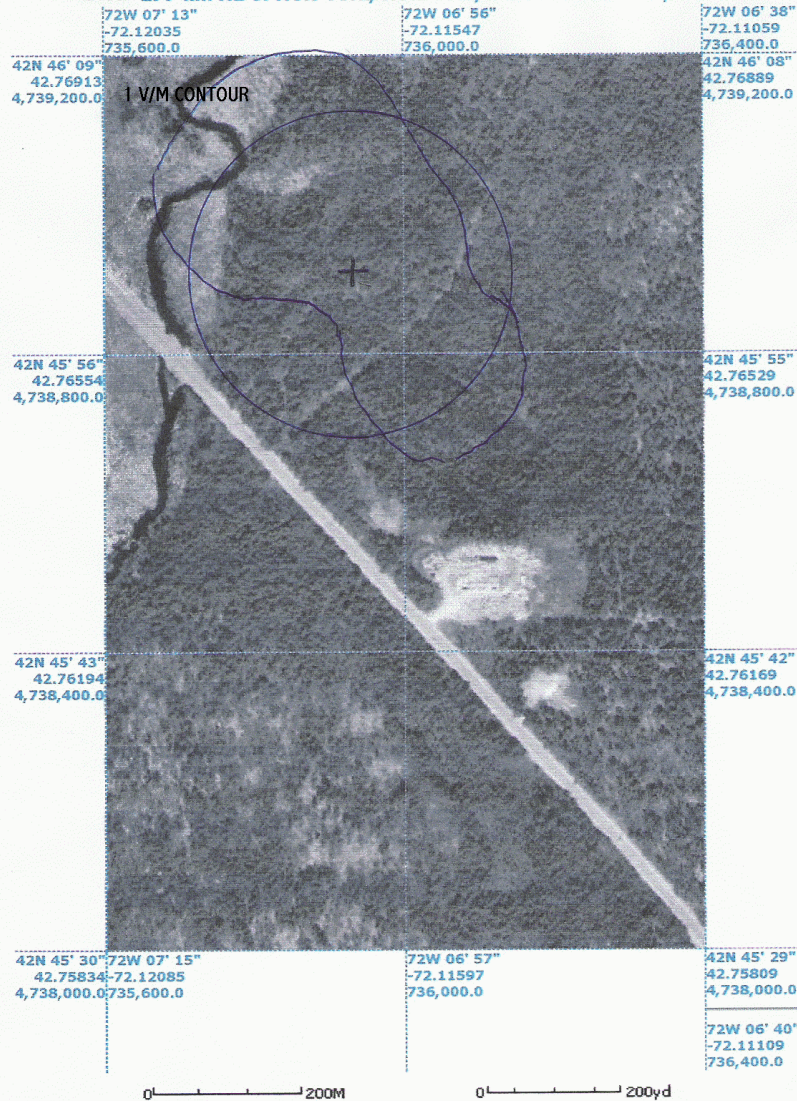
0 0.1 0.2 0.3 0.4 0.5 km
0 0.09 0.18 0.27 0.36 0.45 mi
Map center is 42° 45' 59"N, 72° 06' 59"W (NAD27)
Monadnock Mountain quadrangle
Projection is UTM Zone 18 NAD83 Datum

M
G
M=-15.232
G=1.96

<http://www.topozone.com/print.asp?z=18&n=4738691.51430878&e=735941.380408607&s=24&size=...> 3/20/06

[Send To Printer](#) [Back To TerraServer](#) [Change to 11x17 Print Size](#) [Remove Grid Lines](#) [Change to Landscape](#)

USGS 277 km NE of New York, New York, United States 13 Apr 1998



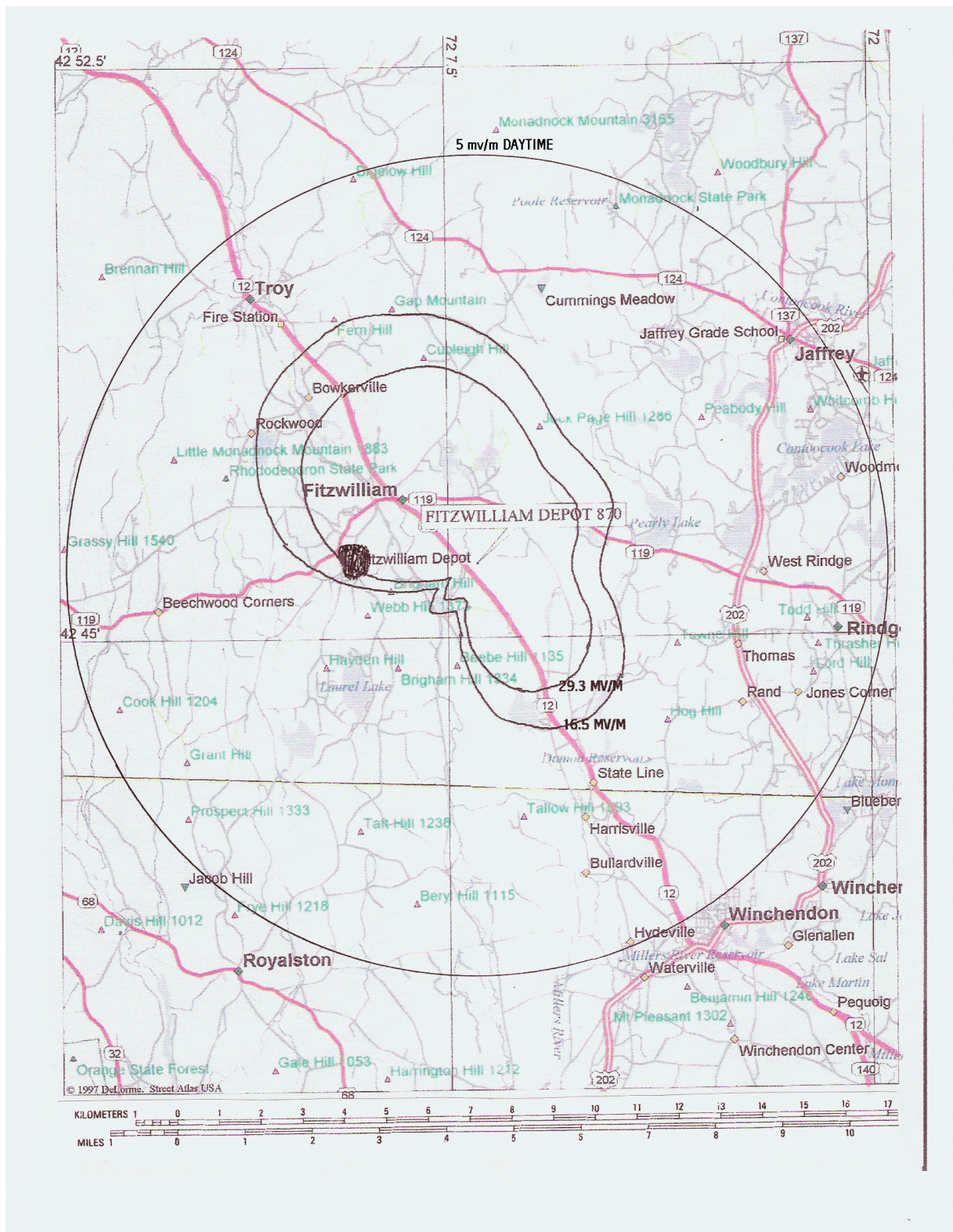
0 200M

0 200yd

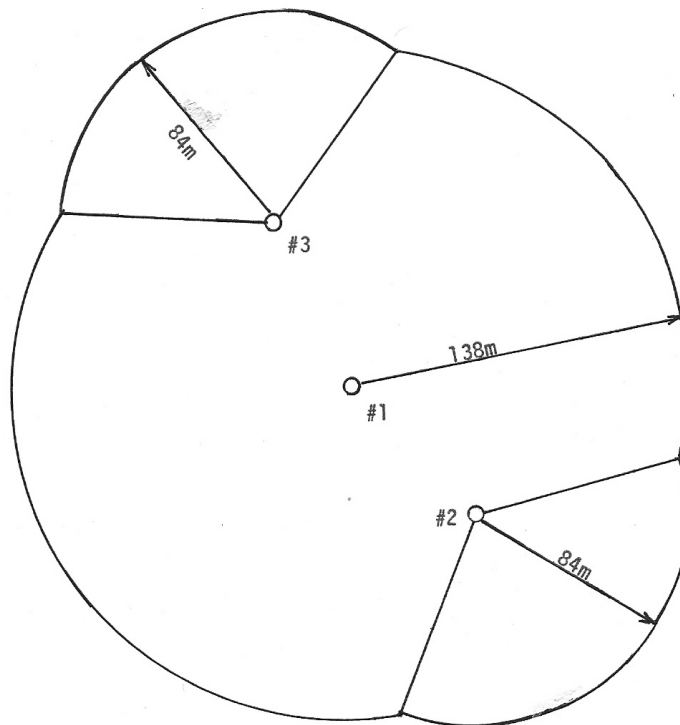
Image courtesy of the U.S. Geological Survey

© 2004 Microsoft Corporation. [Terms of Use](#) [Privacy Statement](#)

<http://terraserver.microsoft.com/printimage.aspx?T=1&S=11&X=1840&Y=11846&Z=18&P=277+km...> 3/20/06

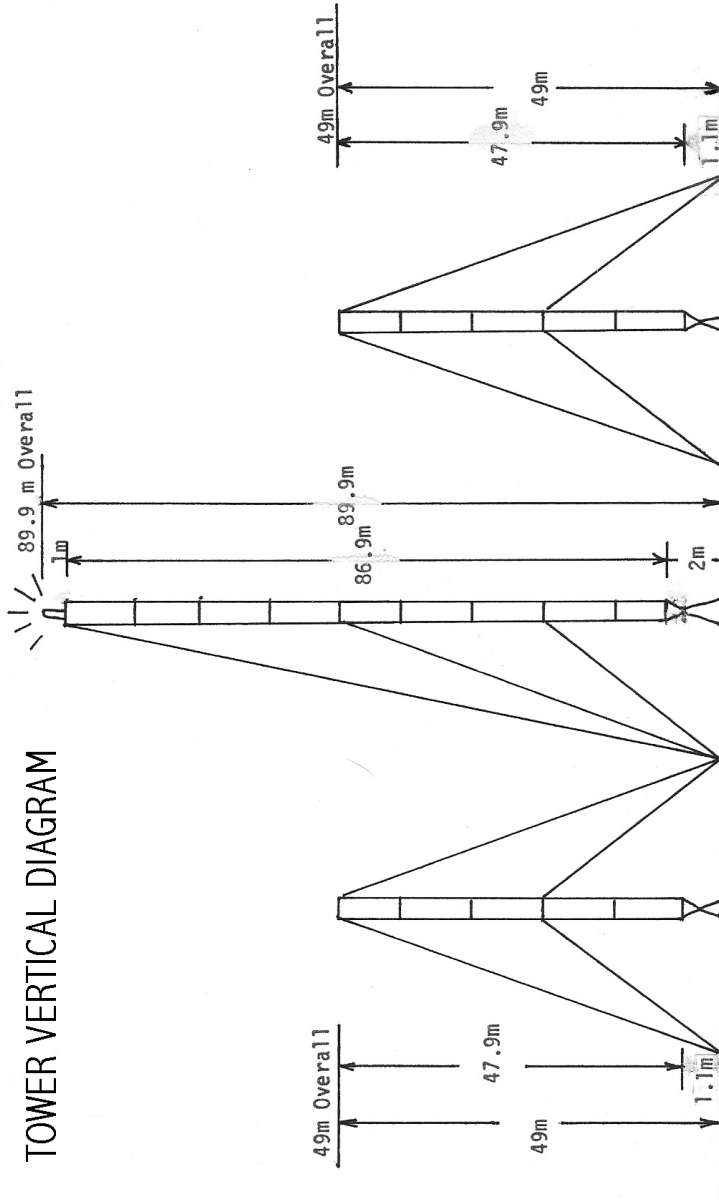


PLAT OF GROUND SYSTEM



VIR JAMES P. C.
TIMOTHY C. CUTFORTH P.E., DIRECTOR OF ENGINEERING
BROADCAST ENGINEERING CONSULTANTS
965 S. IRVING ST. • DENVER, CO 80219
(303) 937-1900

TOWER VERTICAL DIAGRAM



VIR JAMES P. C.
 TIMOTHY C. CUTPORTH P.E., DIRECTOR OF ENGINEERING
 BROADCAST ENGINEERING CONSULTANTS
 965 S. IRVING ST. • DENVER, CO 80219
 (303) 937-1900 •