ENGINEERING BRIEF REGARDING THE APPLICATION FOR A NEW FM BROADCAST STATION UNDERTAKING IN HALIFAX, NOVA SCOTIA

CHXU-FM

(proposed)

CHANNEL 295 – 106.9 MHz CLASS A

Version 1.0

SUBMITTED ON BEHALF OF

UMCC HALIFAX GROUP

2510 St Matthias St,

Halifax, NS,
B3L 0A9

YRH

424 Guy Street
suite 102
Montreal (Qc)
Canada, H3J 1S6

telephone: 514 934 3024

fax: 514 934 2245

web: www.YRH.com
e-mail: Telecom@YRH.com

Prayers Connect
Mosques & Time Discovery

June 2023
O/Ref.: P-2022289

TABLE OF CONTENT

Page

A – SYSTEM DESCRIPTION - SUMMARY SHEET

Applicant	UMCC HALIFAX GROUP
Address	2510 St Matthias St, Halifax, NS, B3L 0A9
Location	Halifax
Call Sign	CHXU-FM (proposed)
Channel	295
Class	A
Frequency	106.9 MHz
Site Coordinates: *(NAD 83)*	Latitude : 44° 39' 02'' N Longitude : 63° 35' 51'' W
Transmitter Power	1473 W
Feed System Efficiency	0.66 dB
Antenna Power Gain	Max : 5 dBd Ave : 3.11 dBd
Antenna polarisation	Vertical
Effective Radiated Power (ERP)	Max : 4000 W Ave : 2587 W
Effective Height Above Average Terrain (EHAAT)	44.7 m
Overall Height of Tower Structure above Ground Level	23.5 m
Radiating Centre Above Mean Sea Level	78.0 m
Ground Level Above Mean Sea Level	56.0 m
Modes	**Stereo ( ), Unattended**

B – SERVICE CONTOURS

Call Sign	CHXU-FM (proposed)
Location	Halifax
Site Coordinates: *(NAD 83)*	Latitude : 44° 39' 02'' N Longitude : 63° 35' 51'' W
ERP *(Effective Radiated Power)*	Max : 4000 W Ave : 2587 W
Channel	295
Class	A
Frequency	106.9 MHz

Proposed service contours:

Radial No.	**Azimuth (°)**	**HAAT (m)**	**ERP (Watts)**	Distance to **3 mV/m** Contour (km)	Distance to **0.5 mV/m** Contour (km)
1	0	55.5	2898	10.2	24.5
2	45	53.2	1127	7.9	19.1
3	90	56.6	895	7.7	18.6
4	135	55.1	1127	8.0	19.4
5	180	42.0	2898	8.8	21.3
6	225	28.6*	3864	8.2	19.9
7	270	14.9*	4000	8.2	20.0
8	315	52.1	3864	10.6	25.4

EHAAT: 44.7 m (based upon 8 standard radials)
(*) an HAAT of 30 m value was considerate for calculation purposes

ENGINEERING BRIEF REGARDING THE APPLICATION FOR A NEW FM BROADCAST STATION UNDERTAKING IN HALIFAX, NOVA SCOTIA

CHXU-FM
(proposed)

CHANNEL 295 – 106.9 MHz

Version 1.0

1 INTRODUCTION

The applicant has retained the services of *YRH Inc.* , Broadcast and Telecommunications Consultants, to prepare an engineering brief in support of the application for modification of operational parameters for the broadcast station VF3002 undertaking in Halifax, Nova Scotia.

This brief is presented in conformance with the Application Procedures and Rules for FM Broadcasting Undertakings Part III (BPR 3), dated February 2016 and published by Innovation, Science and Economic Development Canada (ISED-ISDE).

2 OBJECTIVE

In order to offer quality FM broadcasting services to the population of Halifax and its surrounding municipalities in Nova Scotia, the applicant requests permission to operate from the proposed location a new FM broadcasting transmitting station on channel 295 (at a frequency band of 106.9 MHz)

To achieve this, it is proposed the installation of a new antenna and a new transmitter on existing V003 LP site.

The proposed parameters of 4000 W maximal ERP and an EHAAT of 44.7 m are within the class A equivalent parameters.

Details of the proposed antenna location are provided in Transport Canada form 26 0427. A copy of this form is included at the end of this brief. Map 1 shows the site location on a topographical map of 1:50000 scale.

The service contours considered are of 3.0 mV/m and 0.5 mV/m, and are calculated using the curves F(50,50), as stated in Section C-3 of BPR Part III. These contours are shown on Map 2 of this technical brief. We can predict satisfactory service to the target centre of Halifax and its surroundings according to the article C-1.1.18 of the BPR 3.

The programming feed as well as the remote control and monitoring of the equipment will be subject to a study following approval of this project.

3 ASSUMPTIONS AND SOURCES OF INFORMATION

This Engineering Brief complies with the rules for FM Broadcast Undertakings stated in the ISDE/ISED Canada Broadcast Procedures and Rules, Parts 1 and 3, issued and maintained by ISDE/ISED Canada. Topographic data were obtained from digital elevation database, DTED-CDED, available on Canadian web site:

https://www.nrcan.gc.ca/science-and-data/science-and-research/earth-sciences/geography/topographic-information/10785

The reference system is NAD 83.

The table of allotments and assignments for FM broadcasting channels in Canada used, was revised in June 2023, and is available at the following Internet address:

http://www.ic.gc.ca/engineering/BC_DBF_FILES/baserad.zip

All antennas gains are expressed in dBd (referenced to a dipole).

4 LOCATION

It is proposed to use a building rooftop, the existing location of V003 in Halifax. There will be no significant change to the height of the structure (approximative 3 m, less 25%). Therefore, the applicant is exempt from the public consultation procedure and is not required to inform the local land use authority for the installation of this new antenna. This exemption is detailed in the CPC-2-0-03 published by Industry Canada. However, it is important to note that the exemption doesn't exclude the applicant's responsibility with respect to the following:

- Meeting the requirements detailed in Safety Code 6;
- RF immunity as detailed by EMCAB-2;
- Notification to short-spaced broadcasting stations;
- Environmental considerations;
- Transport/NAV Canada requirements.

Finally, the location choice will be conditional of project acceptance by the CRTC and ISED/ISDE.

5 CHANNEL SELECTION

An analysis was performed to determine the distances separating the proposed site and other allotments and assignments operating on co-channel and adjacent frequencies in order to find the optimal available frequencies. Consequently, channel 295, corresponding to the FM frequency of 106.9 MHz, is proposed.

5.1 Short spaced distance

Based on the selected channel and class (295 A) there are two (2) short-spaced allotments that do not comply with ISED-ISDE Canada's minimum required spacing rules.

Table 1 – Short spaced station/allotment list

Latitude :			44° 39' 02'' N					
Longitude :			63° 35' 51'' W					
Channel 295 cross-checking:			From 201 to 300					
Survey radius :			350 km					
Channel	**Lim**	**Station**	**Station Location**	**Class**	**Status**	**Azimuth (deg)**	**Distance (km)**	**Required Distance (km)**
296		CBC 430-FM	Truro	B	AL	18	83.7	137.0
295	#	SHELBURNE 40	Shelburne	B	AL	235	169.5	209.0

The interference analyses for each of these allotments are presented in the following pages.

5.2 Detail of CBC 430-FM - Truro, Short-Spaced with proposed CHXU-FM in Halifax

The class B allotment CBC 430-FM reserved for Truro, is 83.7 km from the proposed station. The proposed CHXU-FM is in a short space situation with the CBC 430-FM since the separation distance between them is less than the required 137 km. This minimal distance is specified in BPR part 3 for a class B and A stations operating on channels separated by 200 kHz. The following calculations show the potential interference between the two stations.

Potential of interference on CBC 430-FM

Maximum permitted interfering contour on CBC 430-FM 54 dBµV/m contour (1st adjacent) 54 dBµV/m -6 dB = 48 dBµV/m	48	dBµV/m
Distance to the interference free contour of CBC 430-FM (B class allotment) towards new FM at 198º ,	50.0	km
Distance to the 54 dBµV/m contour of CBC 430-FM using maximal parameters towards proposed FM using F(50,50) curves	65.0	km
Distance from proposed CHXU-FM station to its 48 dBµV/m interfering contour calculated at 18º (2069 W and 30 m HAAT) using F(50,10) curves	25.6	km
Margin between interference free contour of CBC 430-FM and the 48 dBµV/m interfering contour of the proposed station (83.7 – 50.0 – 25.6 = -6.2 km)	8.1	km
Margin between the 54 dBµV/m contour of CBC 430-FM at its maximal parameters and the 48 dBµV/m interfering contour of the proposed station (83.7 – 65 – 25.6 = -6.9 km)	-6.9	km

Potential interference to proposed CHXU-FM station

Maximum permitted interfering contour on proposed FM 54 dBµV/m contour (1st adjacent) 54 dBµV/m -6 dB = 48 dBµV/m	48	dBµV/m
Distance from proposed CHXU-FM station to its 54 dBµV/m coverage contour calculated at 18º (2069 W and 30 m HAAT) using F(50,50) curves	17.0	km
Distance to CBC 430-FM 48 dBµV/m maximal class B interfering contour at 198º calculated with F(50,10) curves	99.2	km
Margin between the proposed 54 dBµV/m contour and the 48 dBµV/m interfering contour of CBC 430-FM station at its maximal parameters (83.7 – 17 – 99.2 = -32.5 km)	-32.5	km

The analysis shows that the maximum class B contour of the CBC 430-FM allotment could receive interference from the proposed station. The interference zone is identified on the maps. No interference is calculated within the protected contour of the CBC allotment.

The proposed CHXU-FM station will receive interference from a station operating from Truro at maximum class B parameters according to this site to site in line calculations. The interference zone is identified on the maps.

This interference case is shown on Map 2 and Map 4.

5.3 Detail of SHELBURNE 40 - Shelburne, Short-Spaced with proposed CHXU-FM in Halifax

The class B allotment SHELBURNE 40 reserved for Shelburne, is 169.5 km from the proposed station. Proposed CHXU-FM is in a short space situation with the SHELBURNE 40 since the separation distance between them is less than the required 209 km. This minimal distance is specified in BPR part 3 for a class B and A stations operating on the same channel. The following calculations show the potential interference between the two stations.

Potential of interference on SHELBURNE 40

Maximum permitted interfering contour on SHELBURNE 40 54 dBµV/m contour (co-channel) 54 dBµV/m -20 dB = 34 dBµV/m	34 dBµV/m
Distance to the interference free contour of SHELBURNE 40 (B class allotment) towards proposed FM at 55º	50 km
Distance to the 54 dBµV/m contour of SHELBURNE 40 using its maximal parameters towards Proposed FM using F(50,50) curves	65.0 km
Distance from proposed Proposed FM station to its 34 dBµV/m interfering contour calculated at 235º (3954 W and 30 m HAAT) using F(50,10) curves	89.1 km
Margin between the 54 dBµV/m contour of SHELBURNE 40 at its maximal parameters and the 34 dBµV/m interfering contour of the proposed station (169.5 – 65 – 89.1 = 15.4 km)	15.4 km

Potential interference to proposed CHXU-FM station

Maximum permitted interfering contour on proposed Proposed FM 54 dBµV/m contour (co-channel) 54 dBµV/m -20 dB = 34 dBµV/m	34 dBµV/m
Distance from proposed CHXU-FM station to its 54 dBµV/m coverage contour calculated at 235º (3954 W and 30 m HAAT) using F(50,50) curves	20.0 km
Distance to SHELBURNE 40 34 dBµV/m maximal class B interfering contour at 55º calculated with F(50,10) curves	171.6 km
Margin between the proposed 54 dBµV/m contour and the 34 dBµV/m interfering contour of SHELBURNE 40 station at its maximal parameters (169.5 – 20 – 171.6 = -22.1 km)	-22.1 km

The analysis shows that maximum class B contour of SHELBURNE 40 allotment will not be affected by interference from the proposed station.

The proposed CHXU-FM station will receive interference from a station operating from Shelburne maximum class B parameters according to this site to site in line calculations. The interference zone is identified on the maps.

This interference case is shown on Map 2 and Map 3.

6 DISTORSION ANALYSIS OF THE RADIATION PATTERNS OF AM STATIONS

There are no operational AM stations within 2 km of the proposed station. Therefore, no further analysis is necessary.

7 INTERFERENCE AND INTERMODULATION ANALYSIS

7.1 Potential Harmonics Interference

Channel: f_1: 106.9 MHz

Harmonics: $2f_1$: 213.8 MHz

The second harmonic of the proposed station is included within the television channel VHF 13 (210 - 216 MHz).

There are no TV stations operating on channel 13 within 100 km of the proposed station. Therefore, we do not anticipate any problem of this type arising from the operation of the proposed station.

7.2 Interference to TV channel 6

The proposed station will transmit on channel 295, which is outside the band of frequencies relative to TV broadcasting channels 201-220.

Therefore, no interference of this kind is expected.

7.3 Third and fourth adjacent channels

The actual channel 298 used by applicant on LP class it finds to be in a third adjacent.
However, it is proposed a channel change for this location.

Channel	Station	Station Location	Class	Status	Azimuth (deg)	Distance (km)
298	VF3002	Halifax	LP	OP	0	0.0

There are no other third or fourth adjacent channel in a short space situation to the proposed station; therefore, no further analysis is necessary.

7.4 Intermodulation

Table below shows the stations for which frequencies are in use or potentially in use and where their protected 54 dBµV/m overlaps the 115 dBµV/m contour of the proposed station.

Call Sign	Location	Channel	Class	Status	Azimuth (deg)	Distance (km)
CHXU-FM	Halifax	295	A	PC	270	0.0
CKRH-FM	Halifax	253	A	TO	56	2.9
CIRP-FM	Spryfield	234	LP	OP	199	3.9
CKDU-FM	Halifax	201	A	OP	270	4.7
CBAF-FM-5	Halifax	222	C	OP	270	4.7
CBH-FM	Halifax	274	C	OP	270	4.7
CHFX-FM	Halifax	270	C	OP	270	4.7
CFLT-FM	Dartmouth	225	C1	OP	270	4.7
CBAX-FM	Halifax	218	C1	OP	270	4.7
CHNS-FM	Halifax	210	C1	OP	270	4.7
CJNI-FM	Halifax	239	C1	OP	270	4.7
CKRH-FM	Halifax	253	B1	OP	270	4.7
CHHU-FM	Halifax	256	A	OP	270	4.7
CBHA-FM	Halifax	213	C	OP	270	4.7
CFEP-FM	Halifax	290	A	OP	270	4.7
CKHY-FM	Halifax	286	C	OP	265	5.0
CKHZ-FM	Halifax	278	C	OP	265	5.0
CFRQ-FM	Dartmouth	282	C	OP	265	5.0
CKUL-FM	Halifax	243	C1	OP	265	5.0
CIOO-FM	Halifax	261	C	OP	265	5.0
CJCH-FM	Halifax	267	C1	OP	265	5.0
CJLU-FM	Dartmouth	230	A	OP	60	7.9

Intermodulation is expected to arise between the above-mentioned stations. The intermodulation analysis shows that there could be up to 669 second and third order possible combinations using the stations listed in the overhead table including the new proposed channel. As these stations are all within a low order of magnitude in power, it is not anticipated that there will be any prejudicial intermodulation products generated. However, if problems arise, the applicant will take appropriate measures to remedy the situation at the applicants own expense.

We also note that none of these stations are in proximity to the proposed transmission site.

8 EQUIPMENT

Figure 6 shows the block diagram of the equipment proposed used for this project. A complete list of the equipment will be made available at the time of the certification procedure prior to on-air operation.

8.1 Transmitter

MANUFACTURER:	*NAUTEL* (or equivalent)
MODEL:	VX1.5 (or equivalent)
NOMINAL POWER:	1500 W
OPERATING POWER:	1473 W

8.2 Antenna

MANUFACTURER:	Power Antenna (or equivalent)
TYPE:	vertical dipole (or equivalent)
MODEL NUMBER:	PAFM-VDP (or equivalent)
NUMBER OF BAYS:	2 bays
PATTERN:	directional
GAIN (max):	5 dBd
GAIN (ave):	3.11 dBd
POLARISATION:	Vertical

8.3 Transmission Line

MANUFACTURER:	CommScope (Andrew) (or equivalent)
MODEL:	AVA5-50 (7/8” air dielectric)
LENGTH:	30 m
ATTENUATION:	1.202 dB /100m
LOSS:	0.36 dB

8.4 Miscellaneous losses

Other material used between the transmitter and the antenna (transmission line inside the building, elbows, connectors, Wattmeter line section, etc.) will attenuate the signal. This insertion loss is estimated at 0.3 dB.

9 SERVICE CONTOUR CALCULATIONS

9.1 Calculation of operating parameters

Operating Transmitter Power = 1473 W ≈ 31.68 dBW

ERP (max.)	=	Operating Transmitter Power		-	Transmission Loss		+	Miscellaneous losses		+	Antenna Gain (max)	
	=	31.7	dBW	-	0.36	dB	-	0.3	dB	+	5	dBd
	=	36.02	dBW	≈	4000	W						

ERP (ave.)	=	Operating Transmitter Power		-	Transmission Loss		+	Miscellaneous losses		+	Antenna Gain (ave.)	
	=	31.7	dBW	-	0.36	dB	-	0.3	dB	+	3.11	dBd
	=	34.13	dBW	≈	2587	W						

9.2 Terrain profile parameters

The following values were used for different calculations:

- Radiation Center Height: 22.0 m AGL;
- Ground: 56.0 m ASL;
- AET: 33.3 m (calculated with 8 azimuths);
- EHAAT result: 44.7 m (calculated with 8 azimuths);
- The profiles of the 8 standard radials are shown on Figures 2, 3, 4 and 5;
- FCC(50,50) and FCC(50,10) curves for interference calculations.

Table 2 – Service Contours

Radial No.	**Azimuth (°)**	**HAAT (m)**	**ERP (Watts)**	Distance to **3 mV/m** Contour (km)	Distance to **0.5 mV/m** Contour (km)
1	0	55.5	2898	10.2	24.5
2	10	38.8	2410	8.1	19.7
3	20	38.7	1982	7.7	18.7
4	30	37.0	1574	7.1	17.4
5	40	42.6	1236	7.2	17.5
6	45	53.2	1127	7.9	19.1
7	50	52.6	1052	7.7	18.7
8	60	53.1	971	7.6	18.4
9	70	50.4	916	7.2	17.7
10	80	54.8	895	7.5	18.3
11	90	56.6	895	7.7	18.6
12	100	57.9	895	7.8	18.9
13	110	56.7	916	7.7	18.8
14	120	57.6	971	7.9	19.2
15	130	56.0	1052	7.9	19.3
16	135	55.1	1127	8.0	19.4
17	140	50.8	1236	7.9	19.1
18	150	50.0	1574	8.3	20.1
19	160	43.2	1982	8.1	19.7
20	170	42.1	2410	8.5	20.4
21	180	42.0	2898	8.8	21.3
22	190	42.6	3266	9.2	22.1
23	200	34.6	3524	8.5	20.6
24	210	27.6*	3690	8.1	19.6
25	220	26.5*	3820	8.1	19.8
26	225	28.6*	3864	8.2	19.9
27	230	29.4*	3909	8.2	19.9
28	240	28.2*	4000	8.2	20.0
29	250	24.7*	4000	8.2	20.0
30	260	14.4*	4000	8.2	20.0
31	270	14.9*	4000	8.2	20.0
32	280	23.3*	4000	8.2	20.0
33	290	31.0	4000	8.3	20.3
34	300	47.9	4000	10.3	24.6
35	310	54.0	3909	10.9	26.0
36	315	52.1	3864	10.6	25.4
37	320	48.9	3820	10.3	24.6
38	330	42.9	3690	9.5	22.8
39	340	49.2	3524	10.1	24.2
40	350	51.9	3266	10.2	24.4

EHAAT: 44.7 m (based upon 8 standard radials)
(*) an HAAT of 30 m value was considerate for calculation purposes

10 HIGH FIELD STRENGTH CONTOUR

The operation of the proposed station with a maximum ERP of 4000 W will cause high field contours at ground level. The calculations of the high field contours give a 100 dBμV/m contour extending to a maximum of 2.15 km. The 115 dBμV/m contour is extending to a maximum of 750 m.

Map 1, in appendix, shows the high field contours of the proposed station.

11 POPULATION ESTIMATES

According to our evaluation, the total population contained within the service contours is as follows:

Table 3 – Population Count for the proposed station CHXU-FM

Field Strength	English	French	Bilingual	Other	TOTAL	Dwelling
115 dBμV/m	6 514	4	1 520	40	**8 078**	**4 006**
100 dBμV/m	30 512	14	6 649	247	**37 422**	**19 483**
70 dBμV/m (3.0 mV/m)	183 512	96	27 643	1 859	**213 110**	**107 697**
54 dBμV/m (0.5 mV/m)	336 039	141	48 547	2 346	**387 073**	**176 863**

Table 3 – Population Count for VF3002

Field Strength	English	French	Bilingual	Other	TOTAL	Dwelling
70 dBμV/m (3.0 mV/m)	71 024	18	13 738	585	**85 365**	**47 311**
54 dBμV/m (0.5 mV/m)	203 501	106	30 391	1 909	**235 907**	**116 767**

Source: Statistics Canada (Population Census 2021)

12 INTERFERENCE CAUSED TO LOW POWER AND VERY LOW POWER STATIONS

There are not low power stations in a short space situation to the proposed station; therefore, no analysis is necessary.

13 RF EXPOSURE ANALYSIS

A study was undertaken to predict radiation levels on the rooftop. The Hifield program version 5.6. from Industry Canada has been used to evaluate the RF energy exposure.

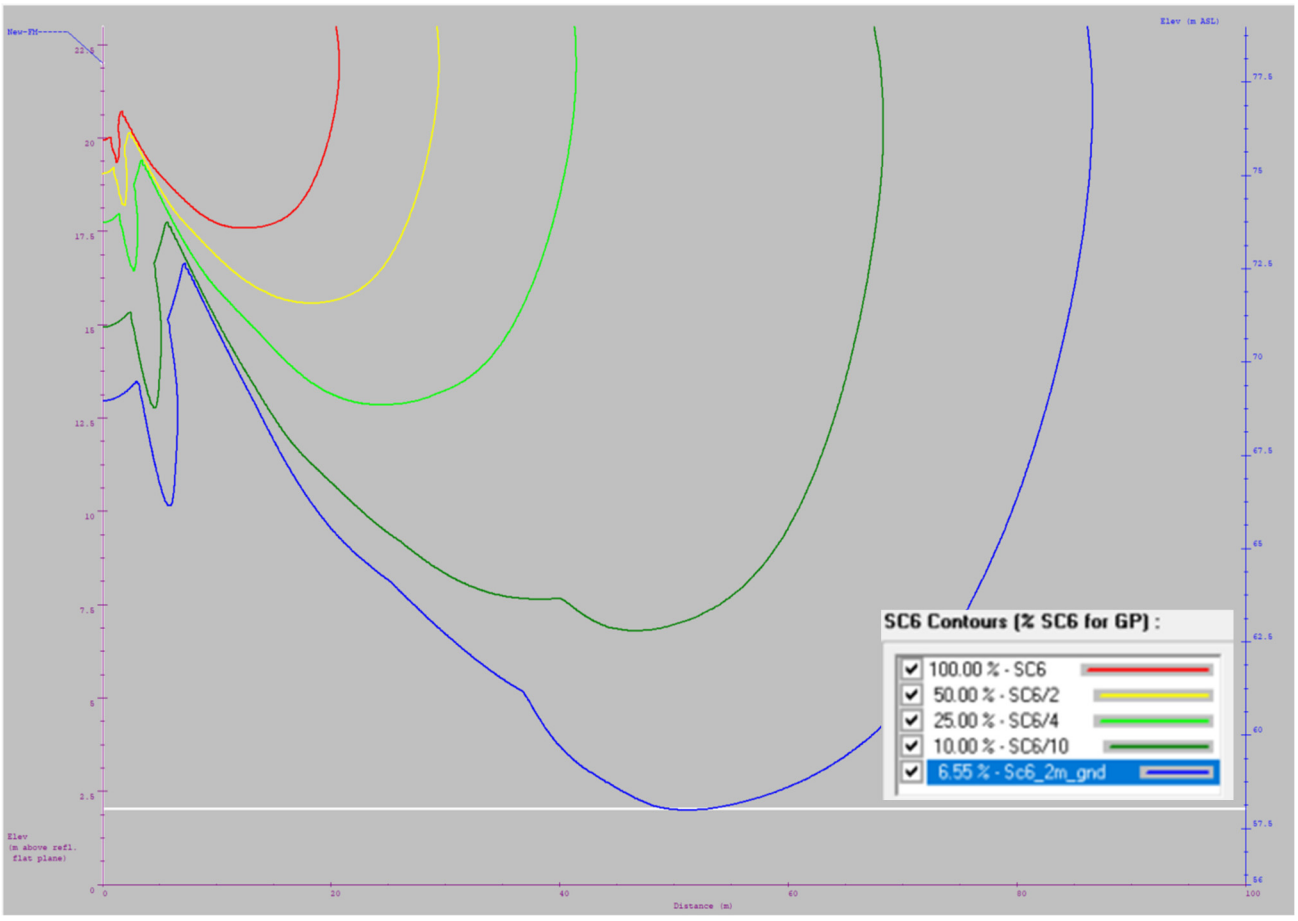
Nearby Stations List

44° 39' 02.0" N - 63° 35' 51.0" W

Broadcast Stations Listing (1 stations) :

Id	Type	Rec. Stat.	Call Sign	Ban.	City	Prov.	Chan.	Frequency (MHz)	Max ERP (W)	Ground Level (m AMSL)	Rad. Center (m AMSL)	Rad. Center (m AGL)	Dist. (m)	Bear. (deg)
2	FM	ADD	CHXU-FM	PC	Halifax	NS	295	106.9	4,000.0	56.0	78.0	22.0	0.0	0.0

HiField – Safety Code 6 Report
Vertical Plane at Azimuth 270deg (max)



The maximum value at 2m from the ground level is less than 7% of the uncontrolled environment Safety Code 6 limit.

14 BROADCASTER'S RESPONSIBILITIES

The broadcaster is aware of the responsibilities associated with operating such a station, and is aware that all appropriate corrective actions that may be required must be implemented at his own expense to allow normal operation of this FM station in accordance with the requirements of the Radio Legislation.

Since potential high field problems exist related to receivers of poor quality, the broadcaster is completely aware of the commitment made by him to Industry Canada.

15 EXPIRATION DATE

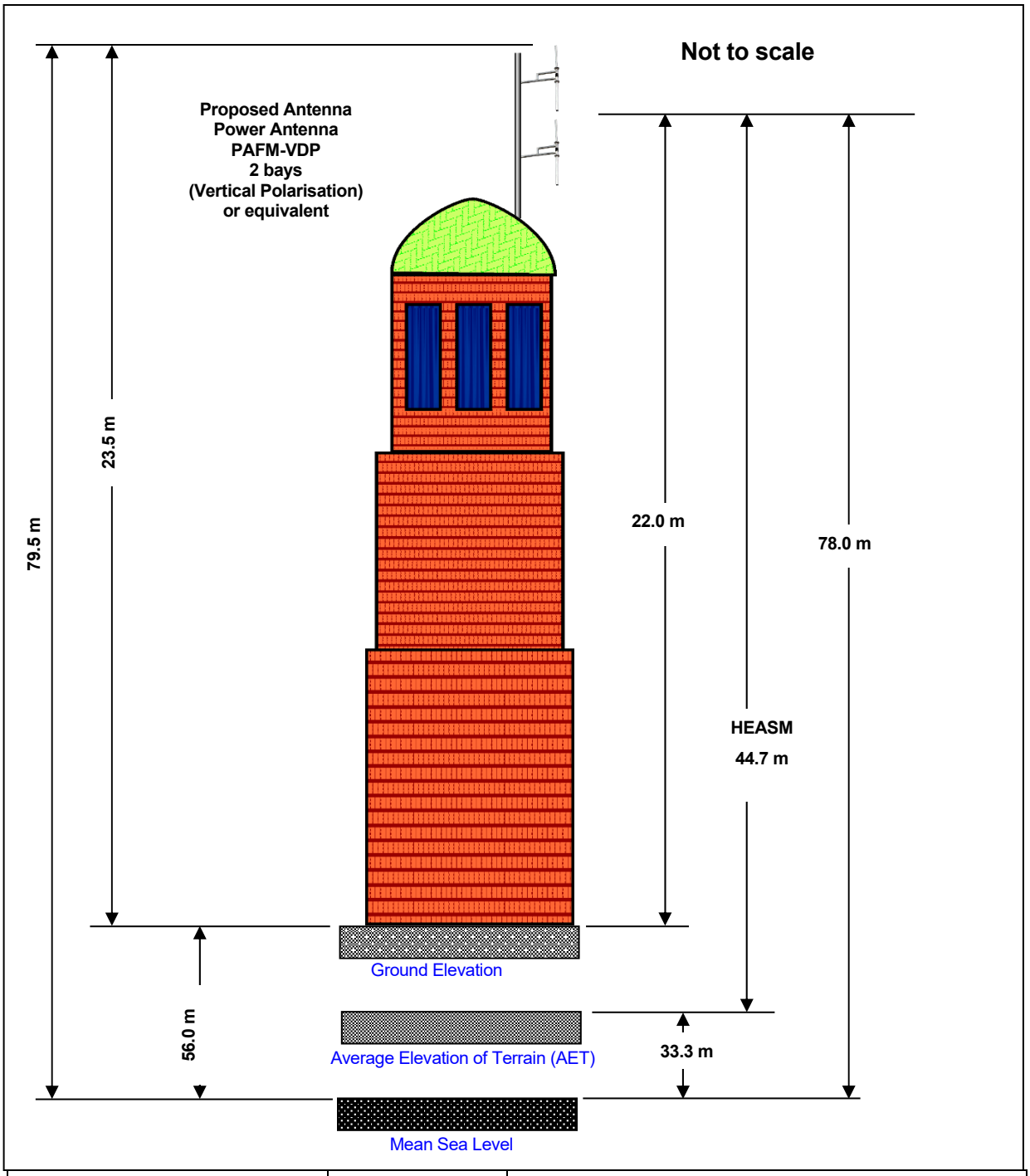
Should this technical brief not be submitted to Industry Canada in the three (3) months following the date of its preparation, a revision by the engineer responsible for its preparation will be required.

16 QUALIFICATION AND SIGNATURE

The consulting engineer responsible for the preparation of this technical brief is a member of the *l'Ordre des Ingénieurs du Québec* and the *Canadian Association of Broadcast Consultants*.

Prepared by:

Tudor Rosu, Eng.
(OIQ #147095 – 08-06-2023)
YRH Inc.

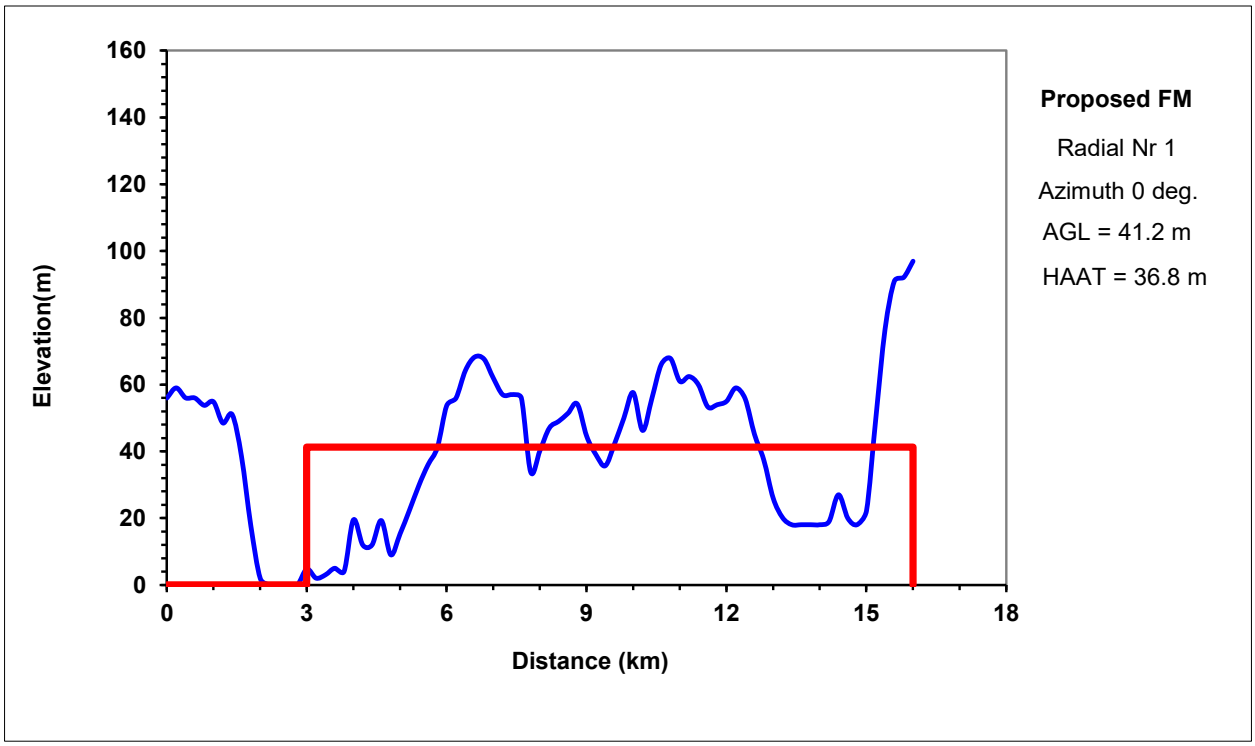


File:	Drawn by: Tudor Rosu
Version: 01	Approved by: J.S.
YRH Inc. Broadcast and Telecommunication Consultants	

FIGURE 1
ELEVATION DIAGRAM OF TOWER
CHXU-FM
(proposed)
Halifax

Channel: 295 Frequency: 106.9 MHz
ERP max: 4000 W EHAAT : 44.7 m
ERP Ave: 2587 W

Figure 2 - Terrain Profiles 1 and 2



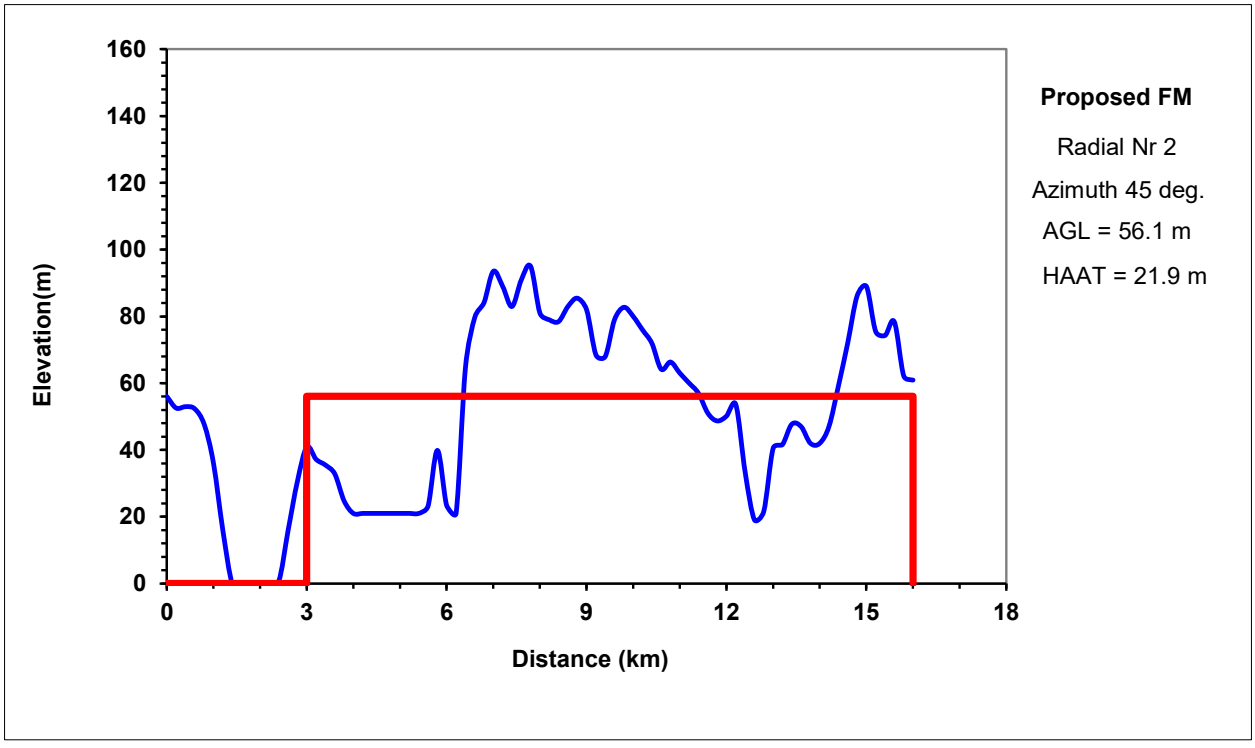
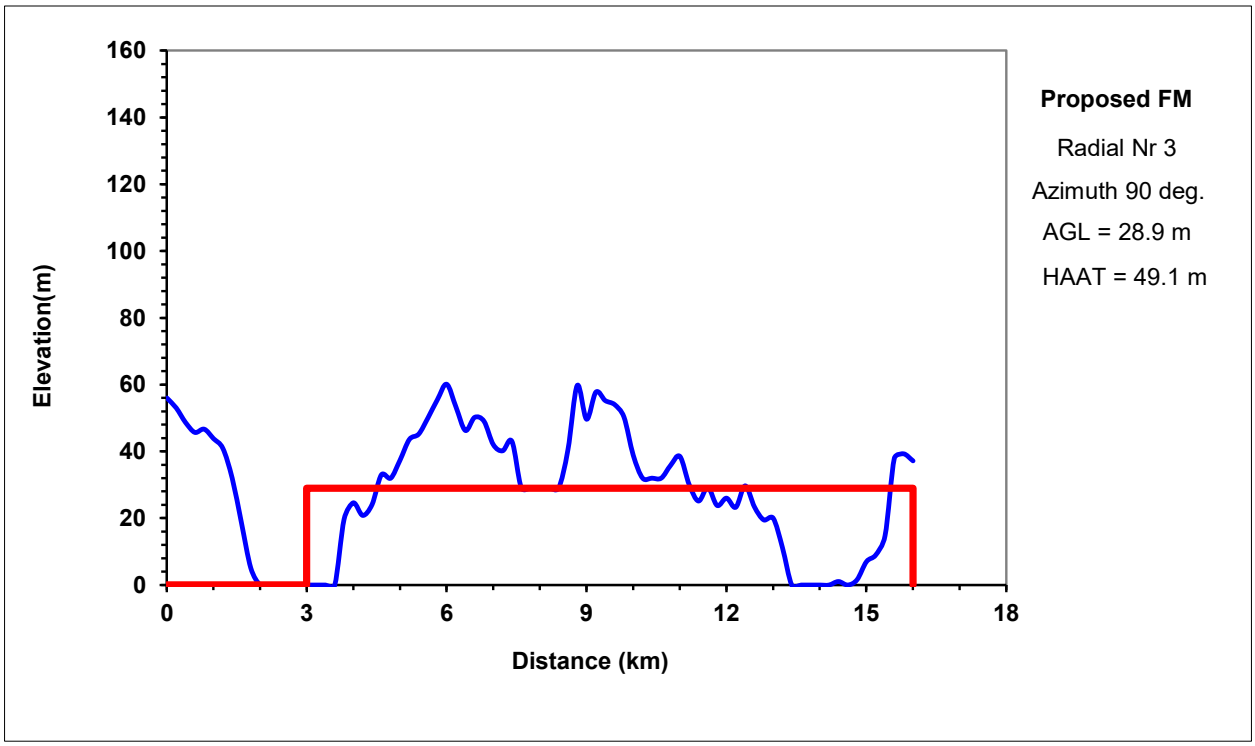


Figure 3 - Terrain Profiles 3 and 4



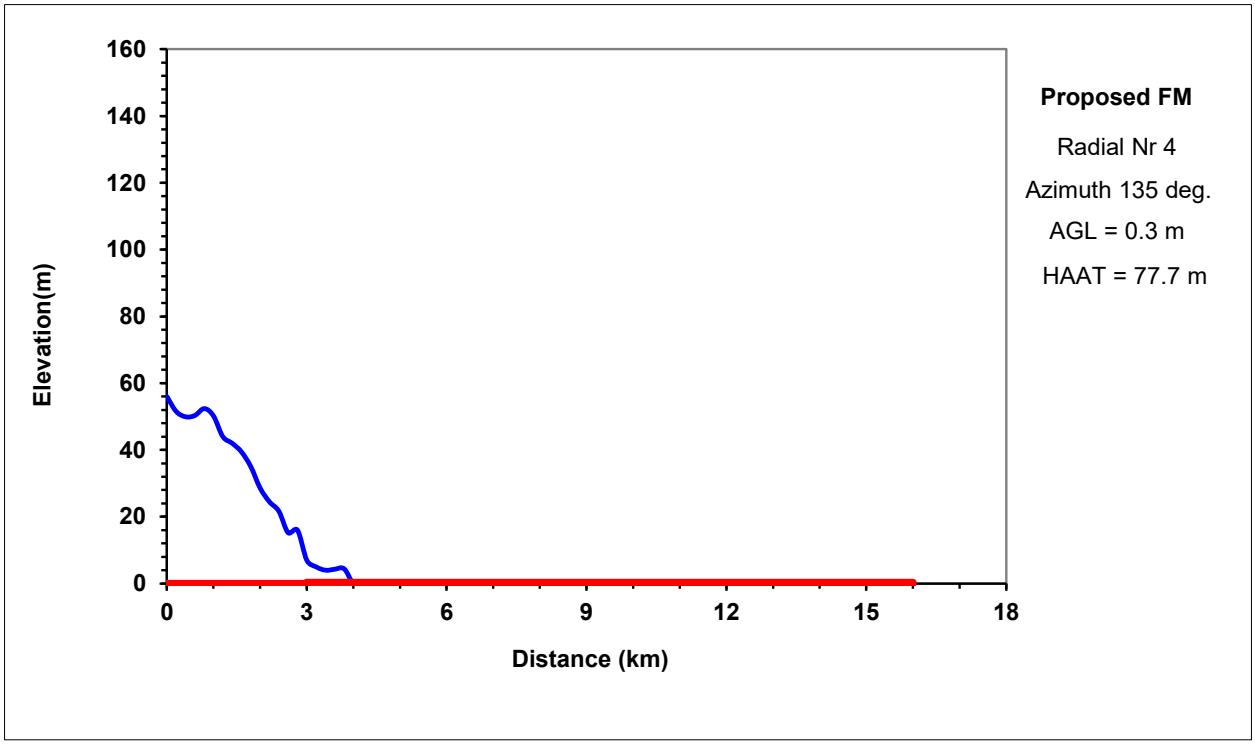
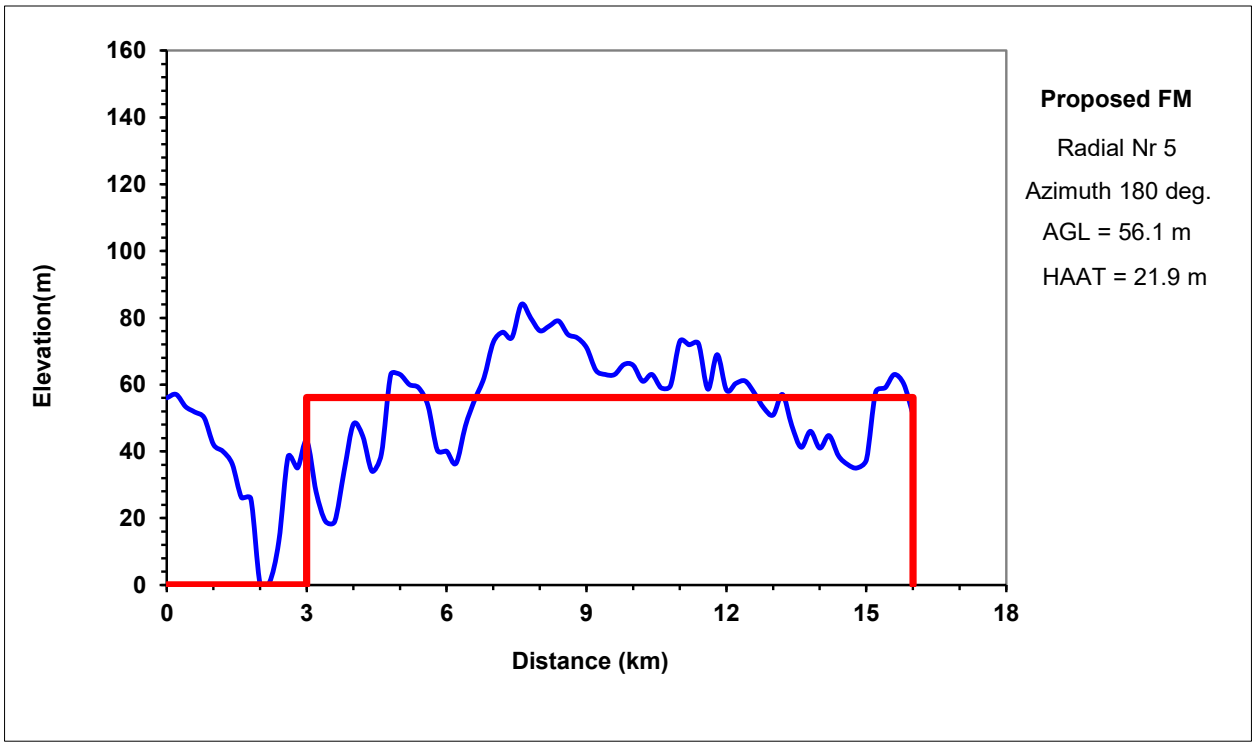


Figure 4 - Terrain Profiles 5 and 6



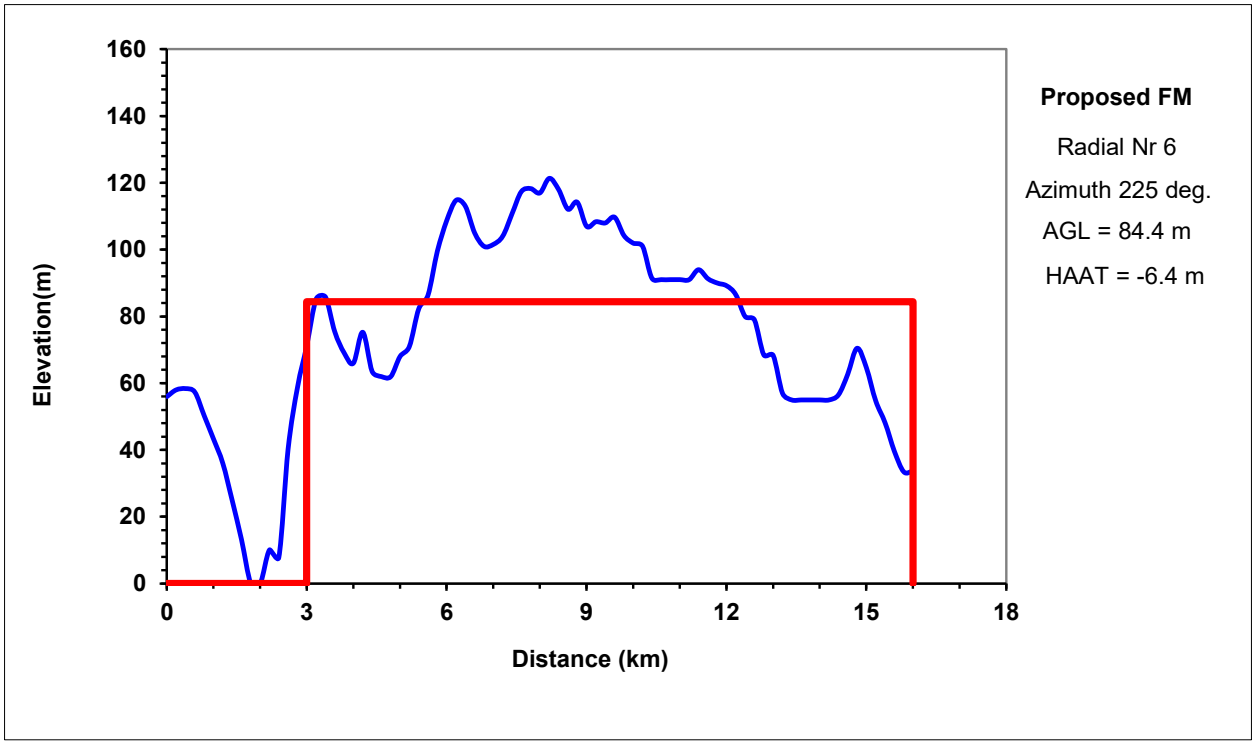
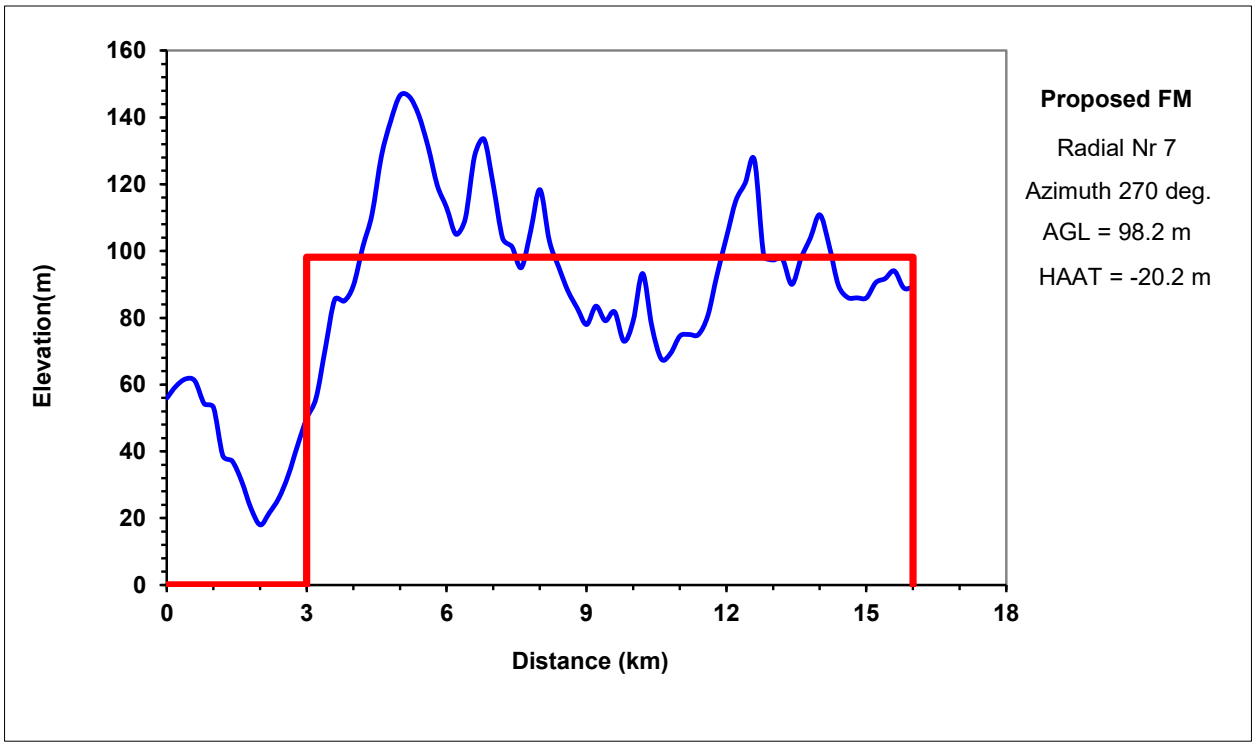
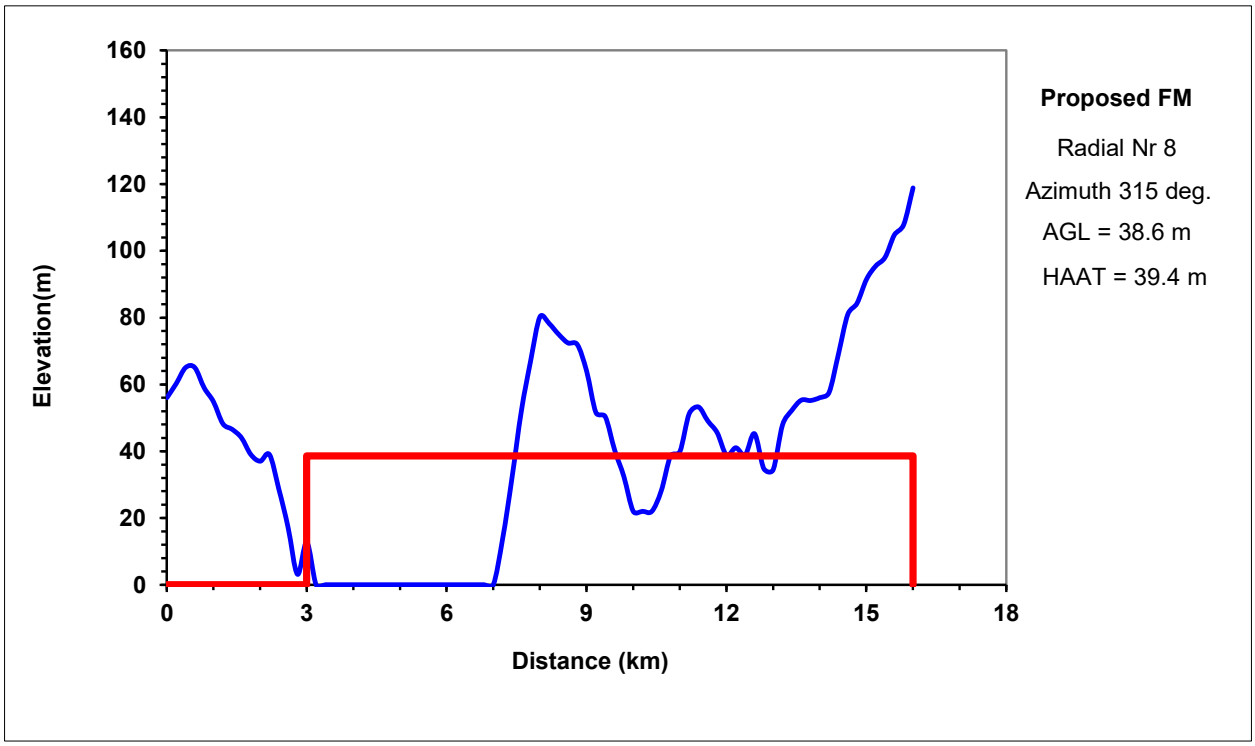
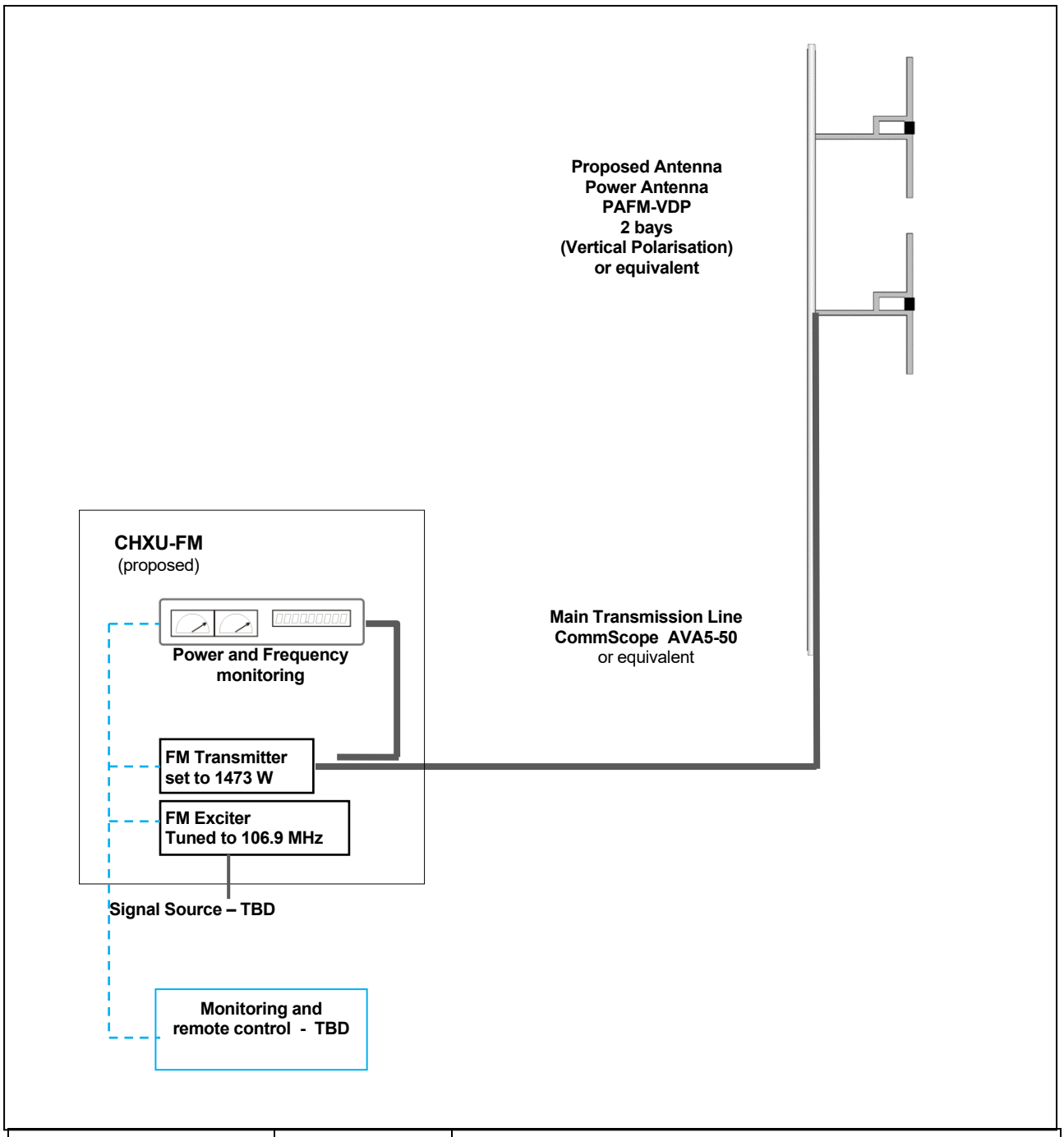


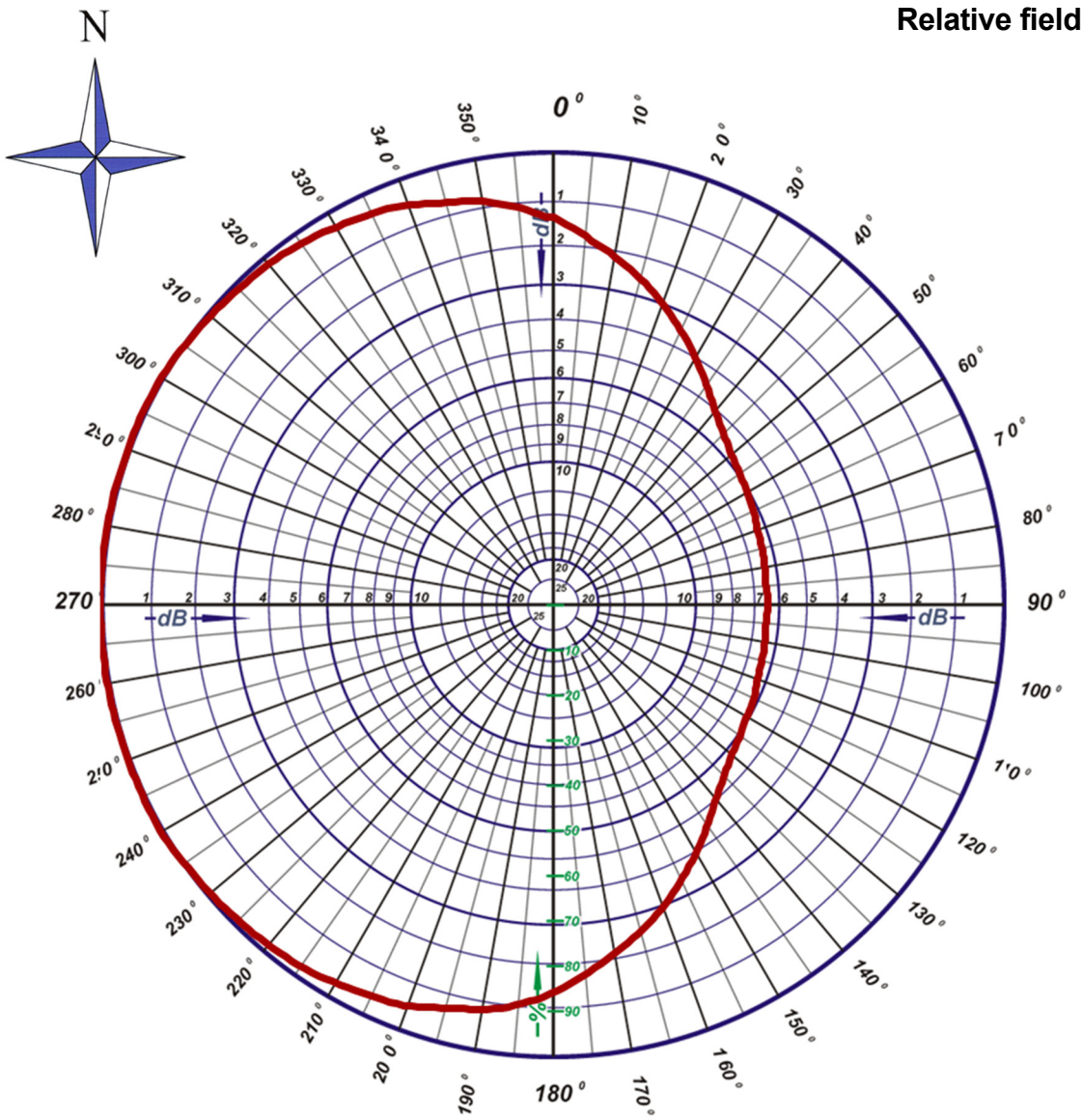
Figure 5 - Terrain Profiles 7 and 8





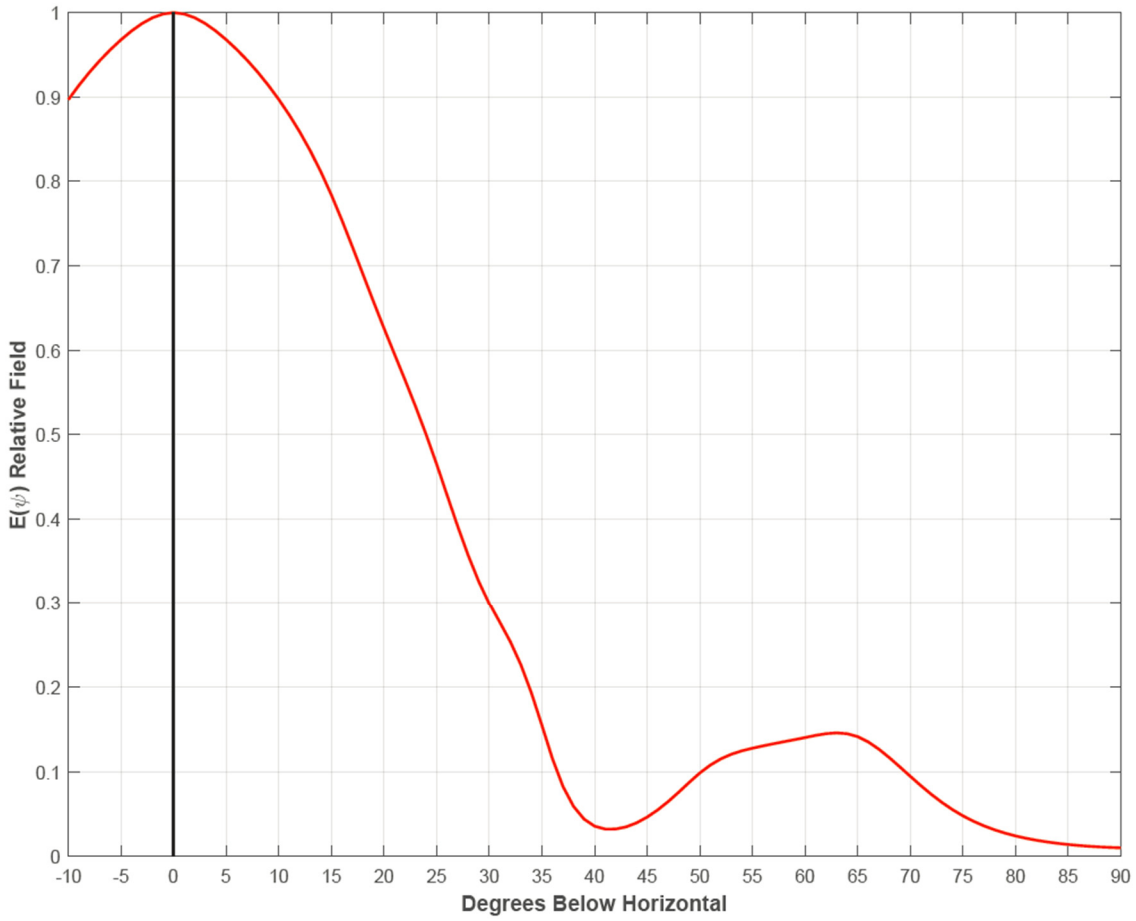


File:	Drawn by: Tudor Rosu	**FIGURE 6** EQUIPMENT SCHEMATIC CHXU-FM (proposed) Halifax
Version: 01	Approved by: J.S.	
YRH Inc. Broadcast and Telecommunication Consultants		Channel: 295 Frequency: 106.9 MHz ERP max: 4000 W EHAAT : 44.7 m ERP Ave: 2587 W



File:	Drawn by: Tudor Rosu	**FIGURE Nº 7** HORIZONTAL RADIATION PATTERN (V polarisation) CHXU-FM (proposed) Halifax
Version: 01	Approved by: J.S.	
YRH Inc. Broadcast and Telecommunication Consultants		Channel: 295 Frequency: 106.9 MHz ERP max: 4000 W EHAAT : 44.7 m ERP Ave: 2587 W

Relative field



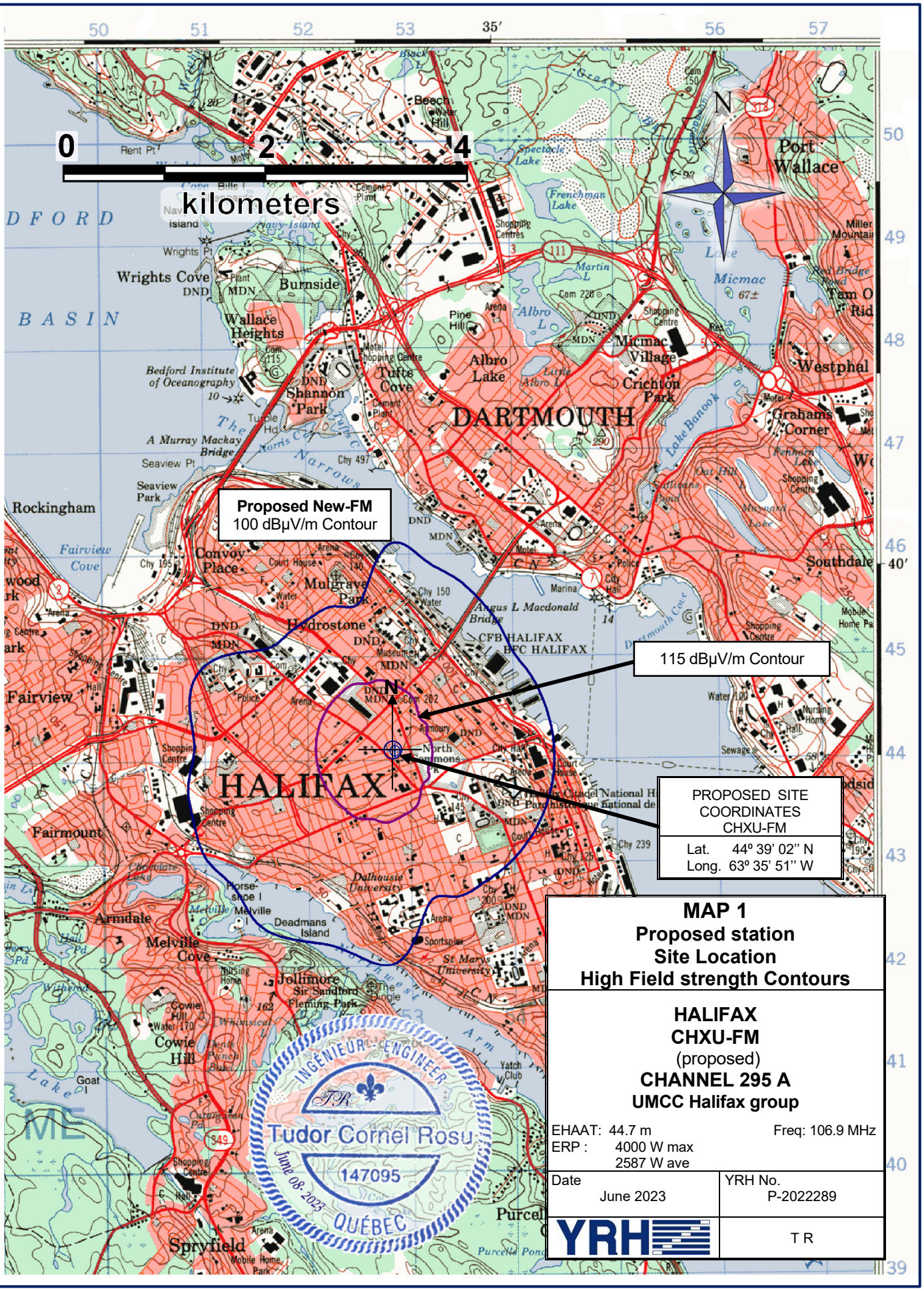
File:	Drawn by: Tudor Rosu	**FIGURE Nº 8** VERTICAL RADIATION PATTERN (V polarisation) CHXU-FM (proposed) Halifax
Version: 01	Approved by: J.S.	
YRH Inc. Broadcast and Telecommunication Consultants		Channel: 295 Frequency: 106.9 MHz ERP max: 4000 W EHAAT : 44.7 m ERP Ave: 2587 W

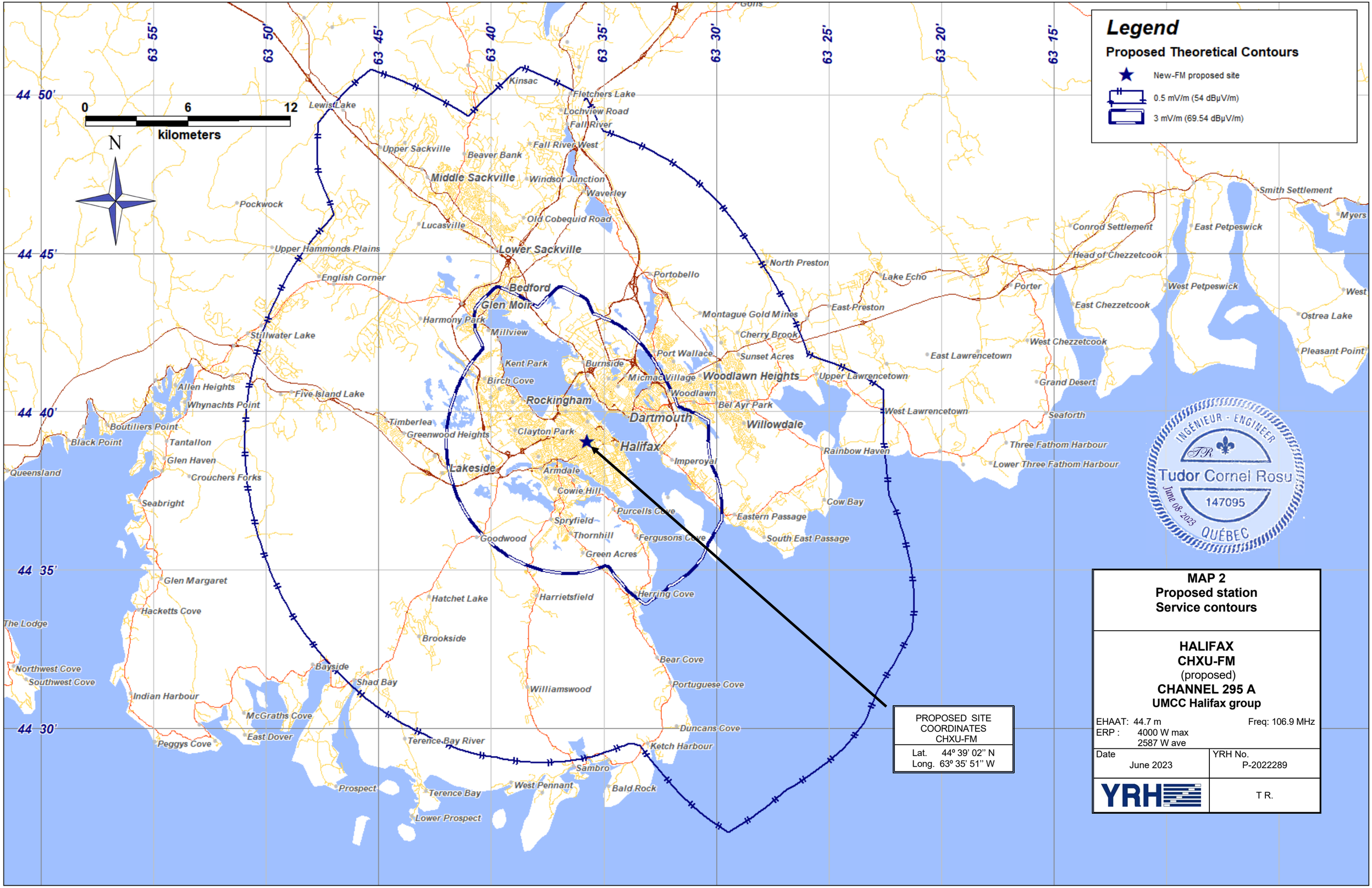
Table 5 – Tabulated Values
Horizontal Pattern

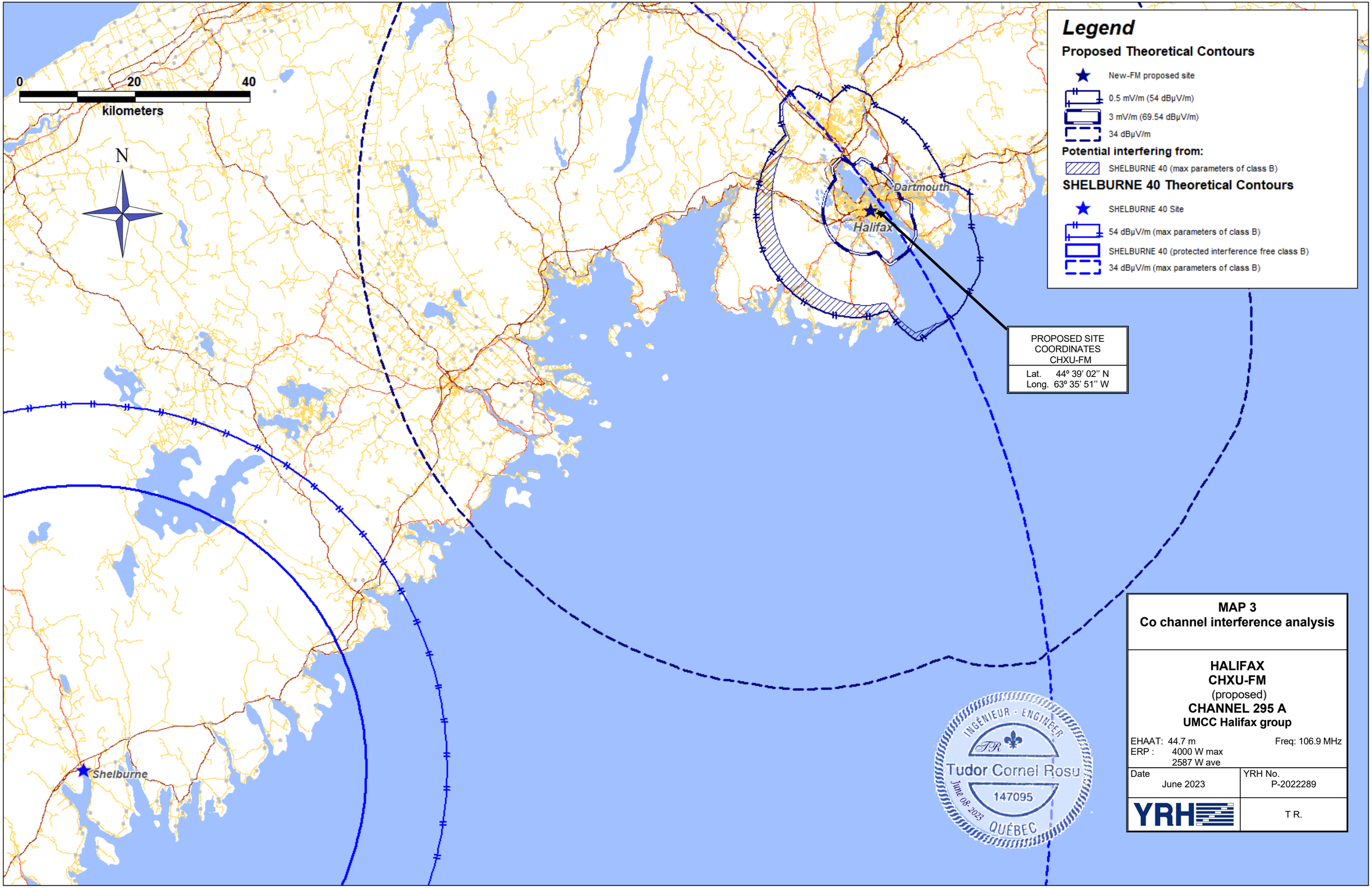
Azimuth (°)	*Field (relative)*	*Azimuth (°)*	*Field (relative)*
0	0.851	**180**	0.851
5	0.813	**185**	0.881
10	0.776	**190**	0.904
15	0.741	**195**	0.917
20	0.704	**200**	0.939
25	0.665	**205**	0.950
30	0.627	**210**	0.961
35	0.589	**215**	0.972
40	0.556	**220**	0.977
45	0.531	**225**	0.983
50	0.513	**230**	0.989
55	0.501	**235**	0.994
60	0.493	**240**	1.000
65	0.487	**245**	1.000
70	0.479	**250**	1.000
75	0.476	**255**	1.000
80	0.473	**260**	1.000
85	0.470	**265**	1.000
90	0.473	**270**	1.000
95	0.470	**275**	1.000
100	0.473	**280**	1.000
105	0.476	**285**	1.000
110	0.479	**290**	1.000
115	0.487	**295**	1.000
120	0.493	**300**	1.000
125	0.501	**305**	0.994
130	0.513	**310**	0.989
135	0.531	**315**	0.983
140	0.556	**320**	0.977
145	0.589	**325**	0.972
150	0.627	**330**	0.961
155	0.665	**335**	0.950
160	0.704	**340**	0.939
165	1.000	**345**	0.917
170	0.776	**350**	0.904
175	0.813	**355**	0.881

Table 6– Tabulated Values
Vertical Pattern

Azimuth (°)	*Field (relative)*	*Azimuth (°)*	*Field (relative)*	*Azimuth (°)*	*Field (relative)*
0	1.000	**24**	0.500	**58**	0.135
0.5	0.999	**25**	0.465	**59**	0.138
1	0.998	**26**	0.428	**60**	0.140
1.5	0.996	**27**	0.391	**61**	0.143
2	0.994	**28**	0.356	**62**	0.145
2.5	0.991	**29**	0.326	**63**	0.146
3	0.987	**30**	0.299	**64**	0.145
3.5	0.983	**31**	0.276	**65**	0.141
4	0.978	**32**	0.253	**66**	0.135
4.5	0.973	**33**	0.226	**67**	0.127
5	0.968	**34**	0.193	**68**	0.116
5.5	0.962	**35**	0.154	**69**	0.106
6	0.956	**36**	0.115	**70**	0.094
6.5	0.950	**37**	0.082	**71**	0.083
7	0.943	**38**	0.059	**72**	0.073
7.5	0.936	**39**	0.044	**73**	0.064
8	0.929	**40**	0.036	**74**	0.055
8.5	0.922	**41**	0.032	**75**	0.048
9	0.914	**42**	0.032	**76**	0.041
9.5	0.905	**43**	0.035	**77**	0.036
10	0.897	**44**	0.040	**78**	0.031
11	0.878	**45**	0.046	**79**	0.027
12	0.858	**46**	0.055	**80**	0.024
13	0.836	**47**	0.065	**81**	0.021
14	0.811	**48**	0.076	**82**	0.019
15	0.784	**49**	0.087	**83**	0.017
16	0.754	**50**	0.098	**84**	0.015
17	0.722	**51**	0.108	**85**	0.014
18	0.690	**52**	0.115	**86**	0.013
19	0.657	**53**	0.120	**87**	0.012
20	0.626	**54**	0.124	**88**	0.011
21	0.595	**55**	0.128	**89**	0.010
22	0.564	**56**	0.130	**90**	0.010
23	0.533	**57**	0.133		


0
2
4
kilometers
Proposed New-FM
100 dBµV/m Contour
115 dBµV/m Contour
PROPOSED SITE COORDINATES CHXU-FM
Lat. 44° 39' 02" N
Long. 63° 35' 51" W
MAP 1
Proposed station
Site Location
High Field strength Contours
HALIFAX
CHXU-FM
(proposed)
CHANNEL 295 A
UMCC Halifax group
EHAAT: 44.7 m
ERP : 4000 W max
2587 W ave
Freq: 106.9 MHz
Date
June 2023
YRH No.
P-2022289
T R
INGÉNIEUR - ENGINEER
Tudor Cornel Rosu
147095
June 08 2023
QUÉBEC
DARTMOUTH
HALIFAX
Bedford Institute of Oceanography
A Murray Mackay Bridge
CFB HALIFAX
BFC HALIFAX
Dalhousie University
St Mary's University
Port Wallace
Westphal
Micmac Village
Albro Lake
Burnside
Wrights Cove
Wallace Heights
Tufts Cove
Shannon Park
Crichton Park
Grahams Corner
Southdale
Rockingham
Fairview
Fairmount
Armdale
Melville Cove
Jollimore
Spryfield
Mulgrave Park
Hydrostone
Convoy Place
Seaview Park
Seaview Pt
Wrights Pt
Rent Pt
Beech Hill
Pine Hill
Micmac
Frenchman Lake
Spectacle Lake
Martin L
Albro L
Little Albro L
Lake Banook
Oat Hill
Deadmans Island
Horse-shoe I
Cowie Hill
Goat I
Purcell
Purcells Pond


Legend
Proposed Theoretical Contours
New-FM proposed site
0.5 mV/m (54 dBµV/m)
3 mV/m (69.54 dBµV/m)
0
6
12
kilometers
N
63 55'
63 50'
63 45'
63 40'
63 35'
63 30'
63 25'
63 20'
63 15'
44 50'
44 45'
44 40'
44 35'
44 30'
Kinsac
Fletchers Lake
Lochview Road
Fall River
Lewist Lake
Upper Sackville
Beaver Bank
Fall River West
Middle Sackville
Windsor Junction
Waverley
Pockwock
Lucasville
Old Cobequid Road
Upper Hammonds Plains
Lower Sackville
English Corner
Bedford
Glen Moir
Portobello
North Preston
Lake Echo
Porter
Smith Settlement
Myers
Conrod Settlement
East Petpeswick
Head of Chezzetcook
West Petpeswick
East Chezzetcook
West
Ostrea Lake
Pleasant Point
Harmony Park
Millview
Stillwater Lake
Montague Gold Mines
East Preston
Cherry Brook
Port Wallace
Sunset Acres
Kent Park
Burnside
Micmac Village
Woodlawn Heights
Upper Lawrencetown
East Lawrencetown
West Chezzetcook
Grand Desert
Allen Heights
Whynachts Point
Five Island Lake
Birch Cove
Rockingham
Woodlawn
Bel Ayr Park
Dartmouth
Willowdale
West Lawrencetown
Seaforth
Timberlea
Greenwood Heights
Clayton Park
Halifax
Imperoyal
Rainbow Haven
Three Fathom Harbour
Lower Three Fathom Harbour
Boutiliers Point
Black Point
Tantallon
Glen Haven
Queensland
Crouchers Forks
Lakeside
Armdale
Cowie Hill
Purcells Cove
Cow Bay
Eastern Passage
South East Passage
Seabright
Spryfield
Thornhill
Fergusons Cove
Goodwood
Green Acres
Glen Margaret
Hatchet Lake
Harrietsfield
Herring Cove
Hacketts Cove
The Lodge
Brookside
Bear Cove
Northwest Cove
Southwest Cove
Bayside
Shad Bay
Williamswood
Portuguese Cove
Indian Harbour
McGraths Cove
East Dover
Peggys Cove
Terence Bay River
Duncans Cove
Ketch Harbour
Sambro
Prospect
Terence Bay
West Pennant
Bald Rock
Lower Prospect
PROPOSED SITE COORDINATES CHXU-FM
Lat. 44º 39' 02'' N
Long. 63º 35' 51'' W
MAP 2
Proposed station
Service contours
HALIFAX
CHXU-FM
(proposed)
CHANNEL 295 A
UMCC Halifax group
EHAAT: 44.7 m
ERP : 4000 W max
2587 W ave
Freq: 106.9 MHz
Date
June 2023
YRH No.
P-2022289
YRH
T R.
INGÉNIEUR - ENGINEER
TR
Tudor Cornel Rosu
147095
June 08-2023
QUÉBEC



MAP 3
Co channel interference analysis

HALIFAX
CHXU-FM
(proposed)
CHANNEL 295 A
UMCC Halifax group

EHAAT: 44.7 m
ERP : 4000 W max
2587 W ave
Freq: 106.9 MHz

Date	YRH No.
June 2023	P-2022289
YRH	T R.

0 20 40
kilometers

N

Truro

Dartmouth

Halifax

Legend

Proposed Theoretical Contours

- New-FM proposed site
- 0.5 mV/m (54 dBµV/m)
- 3 mV/m (69.54 dBµV/m)
- 48 dBµV/m

Potential interfering from:

- CBC 430-FM (max parameters of class B)

CBC 430-FM Theoretical Contours

- CBC 430-FM Site
- 54 dBµV/m (max parameters of class B)
- CBC 430-FM (protected interference free class B)
- 48 dBµV/m (max parameters of class B)

Potential interfering from

- New proposed station on the max class B contour

PROPOSED SITE COORDINATES CHXU-FM
Lat. 44º 39' 02'' N Long. 63º 35' 51'' W

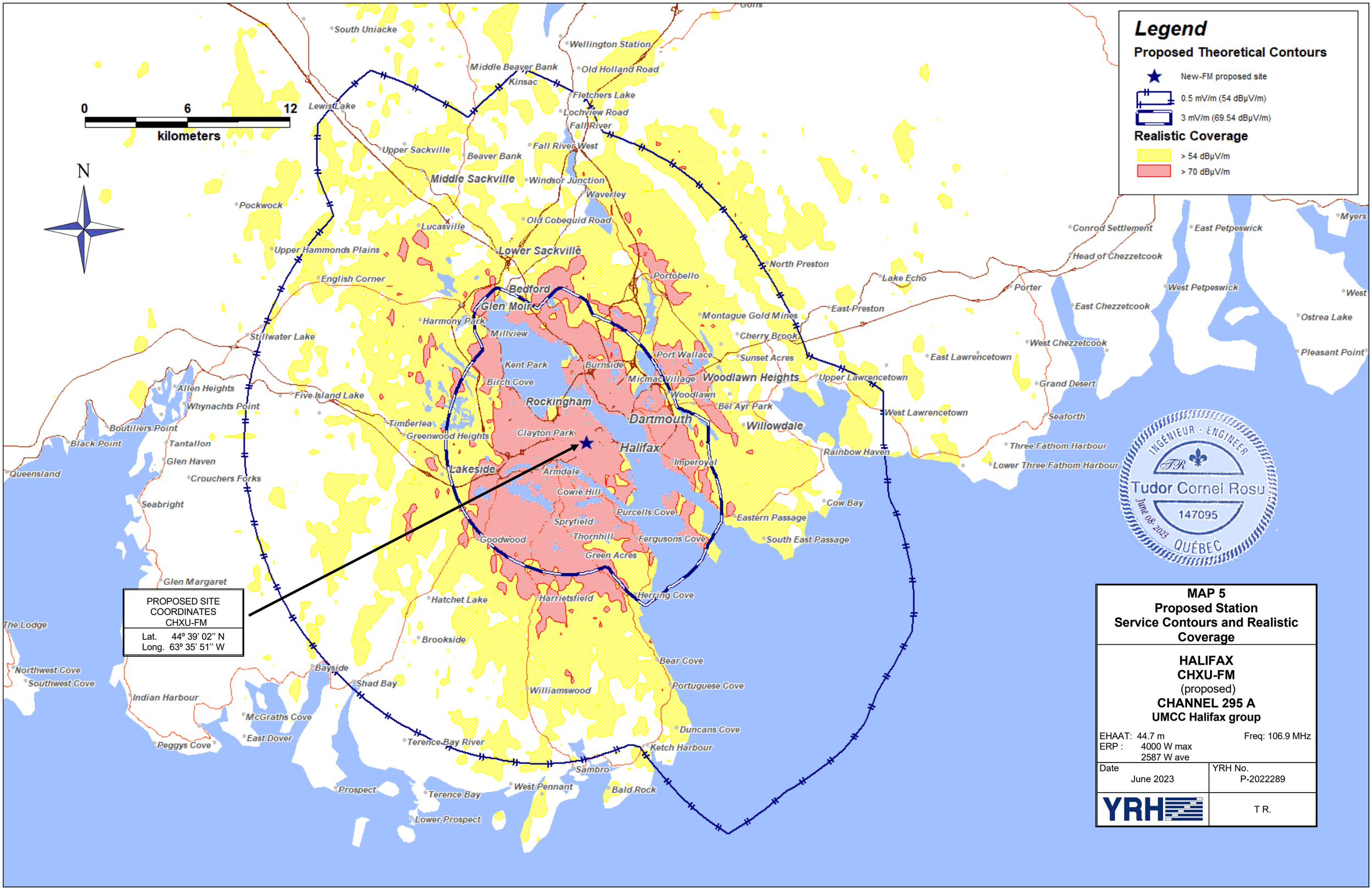
INGÉNIEUR - ENGINEER
TR
Tudor Cornel Rosu
147095
June 08 - 2023
QUÉBEC

MAP 4
First adjacent interference analysis

HALIFAX
CHXU-FM
(proposed)
CHANNEL 295 A
UMCC Halifax group

EHAAT: 44.7 m
ERP : 4000 W max
2587 W ave
Freq: 106.9 MHz

Date	YRH No.
June 2023	P-2022289
YRH	T R.


Legend
Proposed Theoretical Contours
New-FM proposed site
0.5 mV/m (54 dBµV/m)
3 mV/m (69.54 dBµV/m)
Realistic Coverage
> 54 dBµV/m
> 70 dBµV/m
0
6
12
kilometers
N
PROPOSED SITE COORDINATES CHXU-FM
Lat. 44º 39' 02" N
Long. 63º 35' 51" W
South Uniacke
Wellington Station
Middle Beaver Bank
Old Holland Road
Kinsac
Fletchers Lake
Lewis Lake
Lochview Road
Fall River
Upper Sackville
Beaver Bank
Fall River West
Middle Sackville
Windsor Junction
Waverley
Pockwock
Old Cobequid Road
Lucasville
Upper Hammonds Plains
Lower Sackville
North Preston
English Corner
Portobello
Bedford
Glen Moir
Harmony Park
Millview
Stillwater Lake
Kent Park
Burnside
Port Wallace
Micmac Village
Woodlawn Heights
Birch Cove
Woodlawn
Allen Heights
Five Island Lake
Whynachts Point
Rockingham
Bel Ayr Park
Timberlea
Dartmouth
Willowdale
Boutiliers Point
Clayton Park
Greenwood Heights
Black Point
Tantallon
Halifax
Glen Haven
Queensland
Crouchers Forks
Lakeside
Armdale
Imperoyal
Cowie Hill
Seabright
Purcells Cove
Eastern Passage
Cow Bay
Spryfield
Thornhill
Fergusons Cove
Goodwood
South East Passage
Green Acres
Glen Margaret
Hatchet Lake
Harrietsfield
Herring Cove
The Lodge
Brookside
Northwest Cove
Bayside
Bear Cove
Southwest Cove
Shad Bay
Portuguese Cove
Williamswood
Indian Harbour
McGraths Cove
Duncans Cove
East Dover
Peggys Cove
Terence Bay River
Ketch Harbour
Sambro
Prospect
West Pennant
Terence Bay
Bald Rock
Lower Prospect
Conrod Settlement
East Petpeswick
Myers
Head of Chezzetcook
Lake Echo
Porter
West Petpeswick
West
East Chezzetcook
Ostrea Lake
East-Preston
Montague Gold Mines
Cherry Brook
West Chezzetcook
Pleasant Point
Sunset Acres
East Lawrencetown
Upper Lawrencetown
Grand Desert
West Lawrencetown
Seaforth
Three Fathom Harbour
Rainbow Haven
Lower Three Fathom Harbour
Tudor Cornel Rosu
INGÉNIEUR - ENGINEER
147095
June 08-2023
QUÉBEC
MAP 5
Proposed Station
Service Contours and Realistic Coverage
HALIFAX
CHXU-FM
(proposed)
CHANNEL 295 A
UMCC Halifax group
EHAAT: 44.7 m
ERP : 4000 W max
2587 W ave
Freq: 106.9 MHz
Date
June 2023
YRH No.
P-2022289
YRH
T R.

ISED CANADA FORMS

Industry Canada Industrie Canada

APPLICATION FOR A BROADCASTING CERTIFICATE FOR A REGULAR POWER UNDERTAKING

INSTRUCTIONS

(a) This form is to be used, pursuant to the *Radiocommunication Act* and regulations made thereunder, in applying for a broadcasting certificate for a radio apparatus that forms part of a new broadcasting undertaking or modification to an existing broadcasting undertaking.

(b) A completed application form and required documentation may be filed electronically in pdf format to ic.broadcasting-radiodiffusion.ic@canada.ca. The completed application form and documentation may be filed by mail to the Director, Broadcast, Coordination and Planning, Innovation, Science and Economic Development Canada, 235 Queen Street, Ottawa, Ontario, K1A 0H5. If required, an application should also be filed with the Canadian Radio-Television and Telecommunications Commission (CRTC).

(c) If the submission is found to be missing information, incomplete or incorrect, the applicant and/or agent will be so notified and the CRTC will be advised accordingly. If the necessary information is not supplied within a period of time specified by the Department, the application will be considered closed.

(d) Applicants who choose to retain an agent must complete the section *Notice of retention of an agent*.

(e) The Agent is responsible for ensuring that all documents submitted with respect to this application have the necessary signatures in accordance with the *Broadcasting Procedures and Rules*.

(f) The applicant is required to submit a completed *Radiocommunication and Broadcasting Antenna Systems Attestation* (IC-2430) and, if applicable, a copy of the Letter of Intent to the CRTC regarding their commitment to conduct any required consultations after receiving CRTC approval (refer to BPR-1 Part 1: General Rules).

APPLICANT INFORMATION

Name of Applicant		Telephone Number
UMCC Halifax group		(902) 407-1411
Street Address	**Email Address**	
2510 St Matthias St	info@umcc.ca	
City	**Province**	**Postal Code**
Halifax	Nova Scotia	B3L 0A9
Contact Name	**Title**	
Emam Abdallah Yousri or David Bannerman(TA.)	Technical Assistant & Representative	
Telephone Number / **Facsimile Number**	**Email Address**	
(902) 253-2048 / (514) 368-0565	david@mediavoice.ca	
Language of Correspondence ◉ English ○ French	**Account Number (if applicable)**	

NOTICE OF RETENTION OF AN AGENT

☑ The following person has been retained as my agent to prepare the necessary documentation for this application.

☐ The following person has been retained as my agent to certify for this application that the installation of the facilities is in accordance with the technical requirements of Innovation, Science and Economic Development Canada.

☐ The following person has been retained as my agent to correspond with the Department on my behalf for all matters relating to this application.

Name	Company Name
Tudor Rosu, engineer	Yves R. Hamel et Associés inc. (YRH)
Street Address	**City**
424 Guy, suite 102	Montreal
Province	**Postal Code**
Quebec	H3J 1S6
Telephone Number / **Facsimile Number**	**Email Address**
(514) 934-3024 / (514) 934-2245	trosu@yrh.com
Language of Correspondence ◉ English ○ French	**Effective Date of Retention** (YYYY-MM-DD) 2022-11-08

SERVICE

Specify which type of undertaking this application refers to:

○ AM ○ TV ○ Multipoint Distribution System (MDS)
◉ FM ○ Digital Television (DTV) ○ Satellite Digital Audio Radio Service (SDARS)

Specify if this application is for a new undertaking or a modification to an existing undertaking:

◉ NEW
○ MODIFICATION

ISED-ISDE3050E (2016/01), Page 1 of 2

Canada

a. This application is for a new undertaking for:

- [x] regular term
- [ ] developmental service

  Please provide the start and end dates

  Start Date (YYYY-MM-DD) _____ End Date (YYYY-MM-DD) _____
- [ ] Temporary operation

b. Desired call-sign CHUX-FM

c. Service objective:

Principal City Halifax Province Nova Scotia

d. Is a CRTC licence required?

- (•) YES - Note that if no CRTC application is received within 30 days, the technical application will be returned to the applicant. This does not apply to terrestrial SDARS or to applications meeting CRTC exemption criteria.
- ( ) NO - CRTC exemption number _____

ATTACHMENTS

The following documents have been attached to this application.

- [x] Engineering brief
- [x] Contour coverage maps
- [x] Electronic contours
- [x] Vertical and horizontal antenna radiation patterns in graphical and tabulated format.
- [x] IC-2430: *Radiocommunication and Broadcasting Antenna Systems Attestation*
- [ ] Copy of the Letter of Intent regarding antenna system
- [ ] Other (please specify) _____

CERTIFICATION

I certify that the statements made in this application and related documentation are complete and correct to the best of my knowledge, that the radio equipment used is type approved or technically acceptable for use in Canada and that the station will be used only for the purposes authorized by the Minister of Innovation, Science and Economic Development and the Regulations made under the *Radiocommunication Act*.

I understand that Industry Canada reserves the right to ask for additional information.

Abdallah Yousri		2023-03-08
Name	Applicant's Signature	Date (YYYY-MM-DD)

ISED-ISDE3050E (2016/01), Page 2 of 2

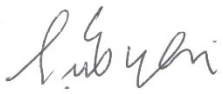
Innovation, Science and Economic Development Canada | Innovation, Sciences et Développement économique Canada

RADIOCOMMUNICATION AND BROADCASTING ANTENNA SYSTEMS ATTESTATION

I acknowledge my responsibility to comply with Innovation, Science and Economic Development Canada's (ISED) Client Procedures Circular CPC-2-0-03, *Radiocommunication and Broadcasting Antenna Systems*, current issue (www.ic.gc.ca/antenna).

1. **Use of Existing Infrastructure (Sharing)**
   I am proposing to share an existing mast, tower or other antenna supporting structure. ◉Yes ○No
   If I have selected 'No', I am attaching a detailed explanation of why sharing is not possible.
2. **Exclusion from Public and Land-Use Consultation**
   My proposed antenna system is explicitly excluded from public and land-use authority consultation either under ISED's CPC-2-0-03 exclusion criteria or under the land-use authority's local process. ◉Yes ○No
   If 'Yes', proceed to #5 below.
3. **Land-Use Authority Consultation**
   I consulted with the land-use authority. ○Yes ◉No
   I have successfully completed my land-use authority consultation responsibilities in compliance with the requirements set out in CPC-2-0-03. ○Yes ◉No
4. **Public Consultation**
   I consulted with the local public. ○Yes ◉No
   If 'Yes' either by:
   ○ following the local land-use authority's established and documented public consultation process for the siting of antenna systems; or
   ○ following ISED's Default Public Consultation process set out in CPC-2-0-03.
   I have successfully completed my public consultation responsibilities in compliance with the requirements set out in CPC-2-0-03. ○Yes ○No

   If I have selected 'No' in any of the boxes in questions 3 or 4 above, I am attaching a written explanation supporting why I have: (i) not consulted and/or, (ii) was unable to successfully complete consultation.
5. **General Requirements**
   I meet **all** of the general requirements described in Section 7 of CPC-2-0-03, *Radiocommunication and Broadcasting Antenna Systems*, current issue and understand that certain responsibilities are ongoing. ◉Yes ○No
   If 'No', I am providing details.
6. **Aboriginal Land and/or Land Claim**
   My proposed radio apparatus could impact upon a claim involving Aboriginal rights, treaty rights or title to Crown land. ○Yes ◉No
   If 'Yes', or if additional information is required, contact the local ISED office for guidance on consultation requirements. Office locations can be found on the Department's website (www.ic.gc.ca/epic/site/smt-gst.nsf/en/sf01742e.html).

I understand that if I have not successfully concluded both land-use authority and public consultation, unless specifically excluded from this requirement, I must not proceed with the proposed installation and may petition ISED to initiate its Dispute Resolution Process as set out in CPC-2-0-03.	
Proponent's Signature 	2023-03-08 Date (YYYY-MM-DD)

ISED-ISDE2430E (2017/12), Page 1 of 1

Canada