

ENGINEERING REPORT

APPLICATION FOR FACILITIES CHANGES
WDRV(FM) CHANNEL 246B, 97.1 MHz
CHICAGO, IL

JUNE 2001

TABLE OF CONTENTS

1. Purpose of Application
2. Allocation Considerations
 - a. FM Channel Study
3. Facilities Proposed
 - a. NIER Study
 - b. Blanketing Contour
4. Exhibits per FCC Form 301, Section III-B
 - a. Exhibit 22 Proposed Coverage Contours
 - b. Exhibit 25A Directional Antenna Envelope Pattern Plot
 - c. Exhibit 25B Directional Antenna Statement
 - d. Exhibit 25C Short-Spacing Analysis
5. FCC Form 301, Section III-B
6. Statement of Engineer

1. Purpose of Application

This engineering report is part of an application for facilities changes for FM station WDRV at Chicago, Illinois. The proposed operation will be on FM Channel 246B (97.1 MHz) with a maximum lobe effective radiated power of 7.9 kw (8.98 dBk) at an antenna height above average terrain of 370 meters. The ERP specified is the maximum for Class B facilities at this height as calculated in accordance with the Commission's rules.

2. Allocation Considerations

During the preparation of this application, a careful examination of the USGS 7.5 minute "Chicago Loop" quadrangle (1997 revision) revealed that the historical licensed coordinates of WDRV, which date back over thirty years, are incorrect. The coordinates specified in this application differ from the licensed coordinates of WDRV by two seconds of latitude and three seconds of longitude. The change is due to a coordinate correction only, the actual location of WDRV is not being changed. Therefore there will be no change in the short spacing status of WDRV resulting from the grant of this application.

The attached spacing study shows that the proposed operation meets the co-channel and adjacent channel spacing requirements for Class B stations as prescribed in §73.207 of the Commission's Rules, with the exception of grandfathered short-spacings to stations WLLI Joliet, IL; WTNX Zion, IL; and WLTQ Milwaukee, WI.

WLLI 244A Joliet

WDRV will continue to be 16 km short-spaced to the licensed operation of WLLI, per the terms of §73.207. However, these two stations operate as "pre 1964" grandfathered short-spaced stations. Since WDRV and WLLI operate on second-adjacent channels, per §73.213(a)(4) there is no distance separation or interference protection requirement between these two stations.

WTNX 245B Zion

WLTQ 247B Milwaukee

WDRV operates as a "pre 1964" grandfathered short-spaced station with respect to WTNX and WLTQ. The proposed WDRV facility is at the same site as the licensed WDRV facility. Therefore, the existing short-spacings to WTNX and WLTQ will not be exacerbated. Furthermore, this application proposes operation with a directional antenna envelope pattern which will not cause any increased contour overlap with WTNX and WLTQ over land areas. Specifically, the table and maps included as Exhibit 25 demonstrate that the distances to the WDRV 54 dBu F(50,50) and 48 dBu F(50,10) contours will not be increased along the arc between 300 and 350 degrees True, which is the direction towards the existing overlap with WTNX and WLTQ.

[illegible]

FM Database Date: 010612

Page 3

Longitude: 87 37 18

Job Title: WDRV

44444 BEGINNING SEARCH OF SECONDARY DATABASE 44444

3. Facilities Proposed

The proposed operation will be on Channel 246B (97.1 MHz) with a maximum lobe effective radiated power of 7.9 kW. Operation is proposed with a 2-element circularly-polarized directional antenna. The antenna will be side-mounted on a pole atop the AON Center in downtown Chicago. While there are numerous communications facilities at this site, there are no other broadcast users.

Notice of the proposed height increase has been filed with the FAA on form 7460-1. Upon receipt of the FAA's determination of no hazard, FCC Antenna Structure Registration for the building will be filed on FCC form 854, and the resulting Antenna Structure Registration Number will be promptly supplied to the Audio Services Division.

a. NIER Calculations

A study of the area within 1000 meters of the proposed site reveals no likely sources of non-ionizing radiation, other than those cited above. Calculations are made only with regard to the levels from this proposal. As the proposed antenna is higher above the rooftop than the licensed antenna, and the ERP of the proposed facility is lower than that of the licensed facility, this proposal will have the effect of reducing the level of RF exposure on the rooftop. As it would be difficult to obtain enough accurate data on the various two-way and paging facilities located at this site, the applicant agrees to make measurements after construction to determine the level of RF exposure to persons working on the rooftop.

The power density calculations shown below were made using the techniques outlined in the EPA report titled: *An Engineering Assessment of the Potential Impact of Federal Radiation Protection Guidance on the AM, FM, and TV Broadcast Services* (Gailey & Tell, April, 1985). All calculations contained herein are based on the measured element patterns for the antenna, and follow the procedure shown in the Gailey and Tell report. The patterns were identified by applying the procedure outlined in the report to the measurement data contained in the report titled: *Element Pattern Measurements on FM Antennas* (EPA-520/ 6-85-107, June 1985).

"Rooftop level" calculations in this report have been made at a reference height of 2 meters

above the roof to provide a worst-case estimate of exposure for persons standing on the roof in the vicinity of the antenna. Equation #1, contained in the Gailey & Tell report and shown below, was used to calculate the rooftop level power density figures for the proposed facility antenna at incremental distances from the base of its supporting structure.

$$S(\mu\text{W}/\text{cm}^2) = \frac{(\text{Adjusted ERP in Watts}) \times 1.64 \times 2.56 \times 100}{4 \times \pi \times (\text{Distance})^2}$$

Where: Adjusted ERP in Watts is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

Distance = Distance in meters from the center of radiation to the calculation point.

Calculations of the power density produced by the WDRV antenna system assume a Type 3 element pattern, which is the appropriate element pattern for the ERI 2-bay antenna proposed for use by WDRV. Rooftop level power densities have been calculated for locations extending from the base of the tower to a distance of 1000 meters. Values past this point are increasingly negligible. As the rooftop is over 1000 feet above street level, it is assumed that the power level density on the street from this facility will be negligible.

The highest calculated rooftop level power density from WDRV occurs at a distance of 31 meters from the base of the antenna support structure. At this point the power density is calculated to be 208.6 $\mu\text{W}/\text{cm}^2$, 21% of 1000 $\mu\text{W}/\text{cm}^2$ (the ANSI standard for controlled environments such as the rooftop proposed).

Public access to the rooftop is restricted by a locked door. The access door to the rooftop is posted with warning signs. Pursuant to OST Bulletin No. 65, all station personnel and contractors are required to follow appropriate safety procedures before any work is commenced

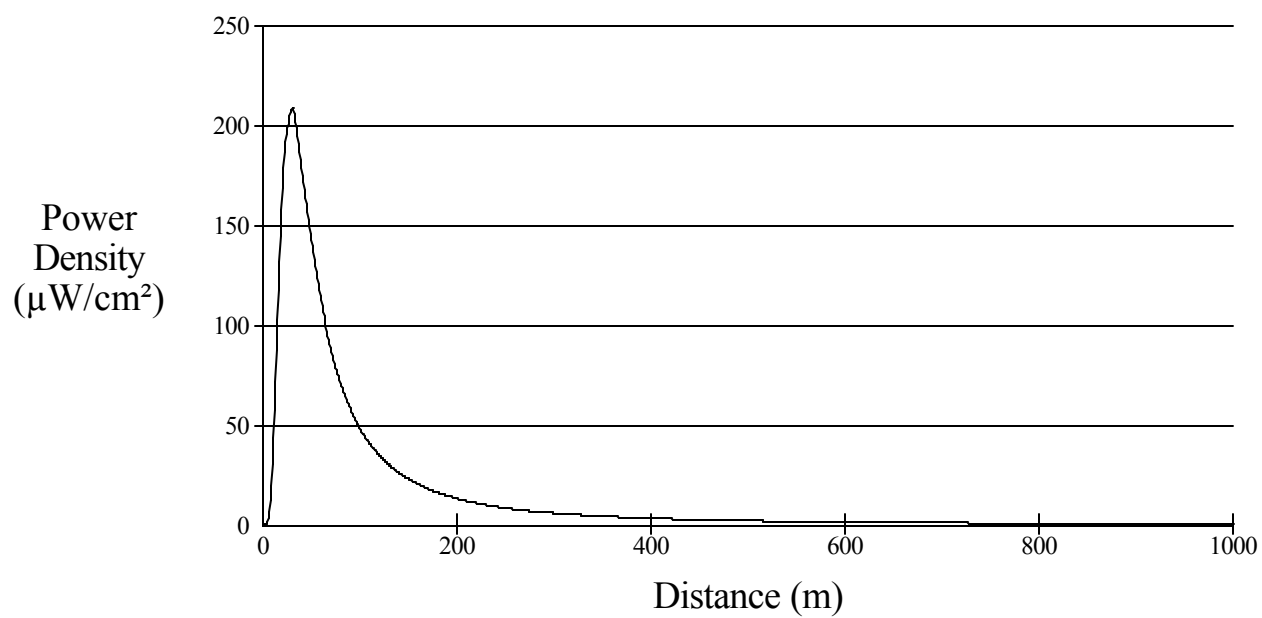
on or near the antenna, including reduction in power or discontinuance of operation before any maintenance work is undertaken.

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency radiation in excess of FCC guidelines.

b. Blanketing Contour

The 115 dBu contour for the proposed facility extends 1.1 kilometers from the site, based on the calculation methodology shown in §73.318 of the Commission's Rules. Most of the area within the blanketing area is populated. The height of the proposed antenna above ground, and its vertical radiation characteristics should mitigate any adverse effects to nearby residents of other communications facilities. If adverse effects occur, the applicant will be responsible for their amelioration as prescribed in §73.318, including receiver-induced intermodulation to facilities in existence or authorized, or receivers in use prior to the grant of this application.

Power Density vs Distance



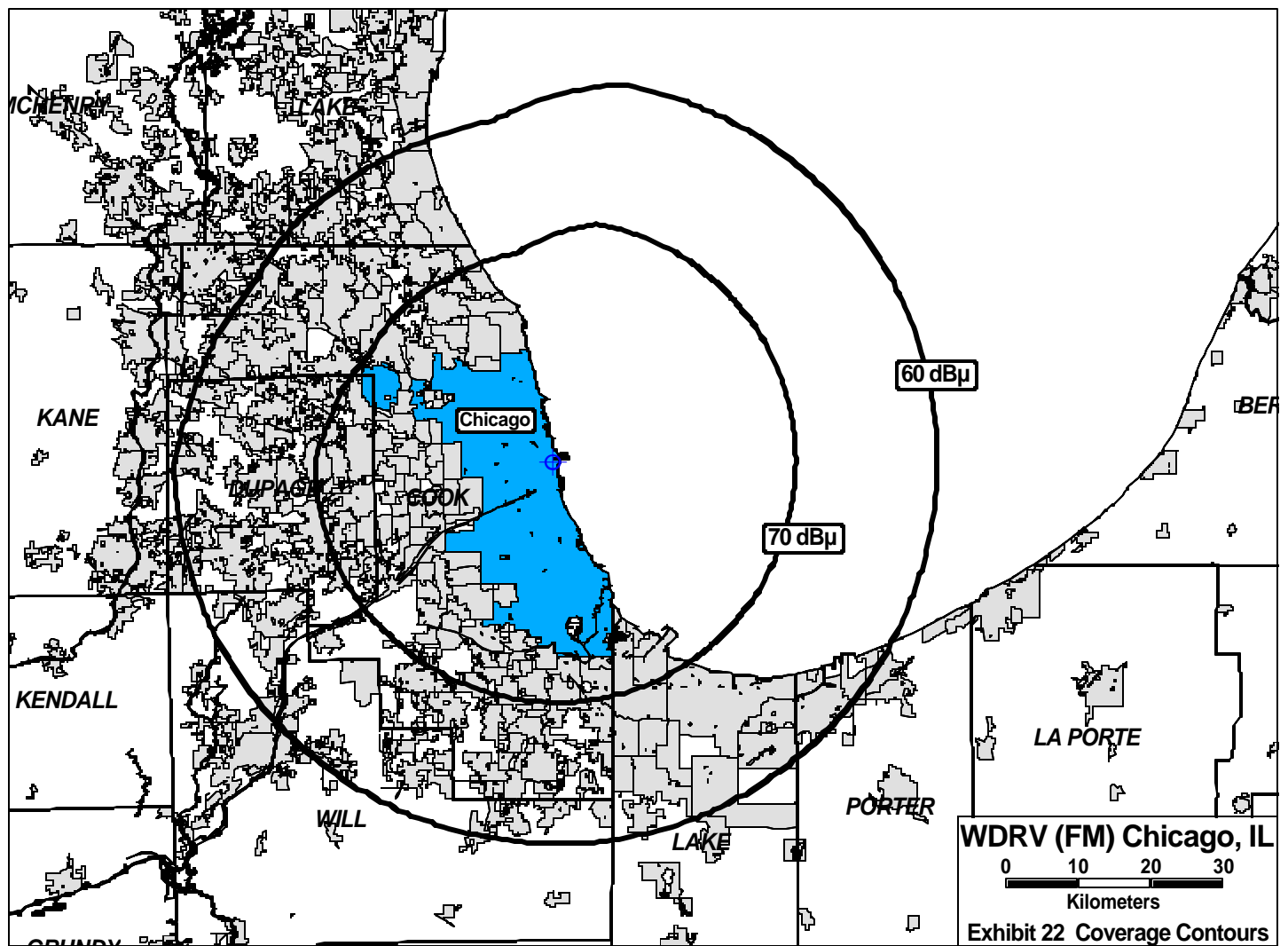
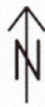


Exhibit 25
Distance to WDRV Contours Toward WTNX & WLTQ

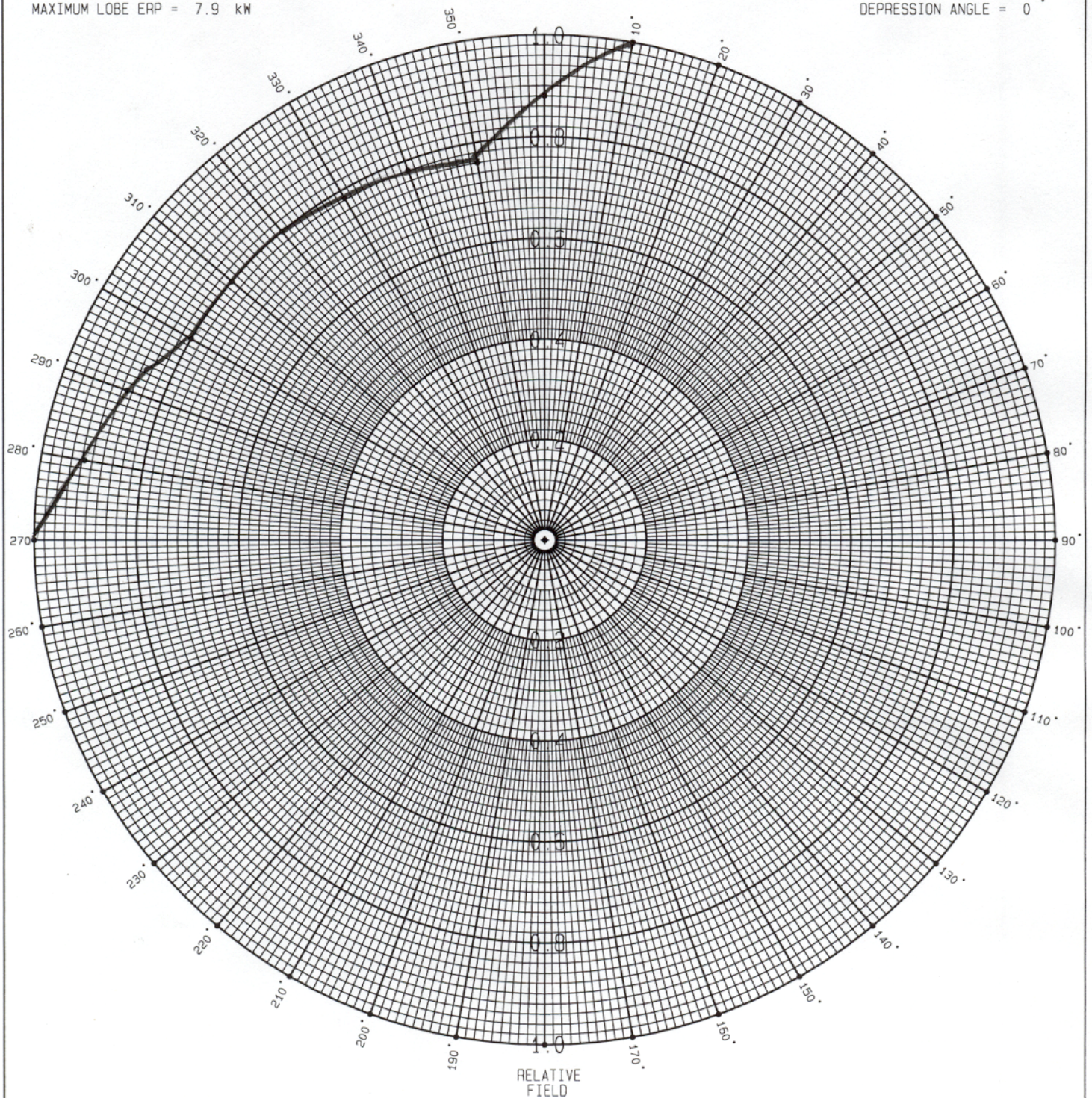
AZ Deg	54 dBμ(50, 50)		48 dBμ(50, 10)	
	Lic	Prop	Lic	Prop
280	63.5	63.5	92.8	92.7
281	63.4	63.4	92.6	92.6
282	63.3	63.2	92.5	92.4
283	63.2	63.1	92.3	92.3
284	63.1	63	92.1	92.1
285	63	62.9	92	92
286	62.8	62.8	91.8	91.8
287	62.7	62.7	91.7	91.6
288	62.6	62.6	91.5	91.5
289	62.5	62.5	91.4	91.3
290	62.4	62.4	91.2	91.2
291	62.3	62.2	91	91
292	62.1	62	90.8	90.7
293	61.9	61.9	90.6	90.5
294	61.8	61.7	90.3	90.3
295	61.6	61.6	90.1	90.1
296	61.5	61.4	89.9	89.9
297	61.3	61.3	89.7	89.7
298	61.2	61.1	89.5	89.5
299	61	61	89.3	89.2
300	60.9	60.8	89.1	89
301	60.9	60.8	89.1	89.1
302	60.9	60.8	89.1	89.1
303	60.9	60.9	89.2	89.1
304	61	60.9	89.2	89.2
305	61	60.9	89.2	89.2
306	61	60.9	89.2	89.2
307	61	60.9	89.3	89.2
308	61	61	89.3	89.3
309	61.1	61	89.4	89.3
310	61.1	61.1	89.4	89.4
311	61.2	61.1	89.5	89.5
312	61.2	61.1	89.5	89.5
313	61.2	61.1	89.6	89.5
314	61.2	61.1	89.5	89.5
315	61.1	61.1	89.5	89.4
316	61.1	61	89.4	89.4
317	61.1	61	89.4	89.3
318	61	61	89.3	89.3
319	61	60.9	89.2	89.2
320	61	60.9	89.2	89.2
321	60.9	60.9	89.1	89.1
322	60.8	60.8	89	89
323	60.8	60.8	89	89

324	60.8	60.7	88.9	88.9
325	60.7	60.7	88.9	88.9
326	60.7	60.7	88.9	88.8
327	60.7	60.6	88.8	88.8
328	60.7	60.6	88.8	88.8
329	60.6	60.6	88.8	88.7
330	60.6	60.5	88.7	88.7
331	60.6	60.5	88.7	88.7
332	60.6	60.5	88.7	88.6
333	60.5	60.5	88.6	88.6
334	60.5	60.4	88.6	88.5
335	60.5	60.4	88.5	88.5
336	60.5	60.4	88.5	88.5
337	60.5	60.4	88.5	88.5
338	60.4	60.4	88.5	88.5
339	60.5	60.4	88.5	88.5
340	60.5	60.4	88.5	88.5
341	60.5	60.4	88.5	88.5
342	60.5	60.4	88.6	88.5
343	60.5	60.4	88.6	88.5
344	60.5	60.4	88.6	88.6
345	60.5	60.5	88.7	88.6
346	60.6	60.5	88.7	88.7
347	60.6	60.5	88.8	88.7
348	60.6	60.5	88.8	88.7
349	60.6	60.5	88.7	88.7
350	60.5	60.4	88.6	88.6



MAXIMUM LOBE ERP = 7.9 kW

DEPRESSION ANGLE = 0°



HATFIELD & DAWSON
CONSULTING ENGINEERS

EXHIBIT 25A
Envelope Pattern Plot

WDRV

Chicago, IL

MAY 2001

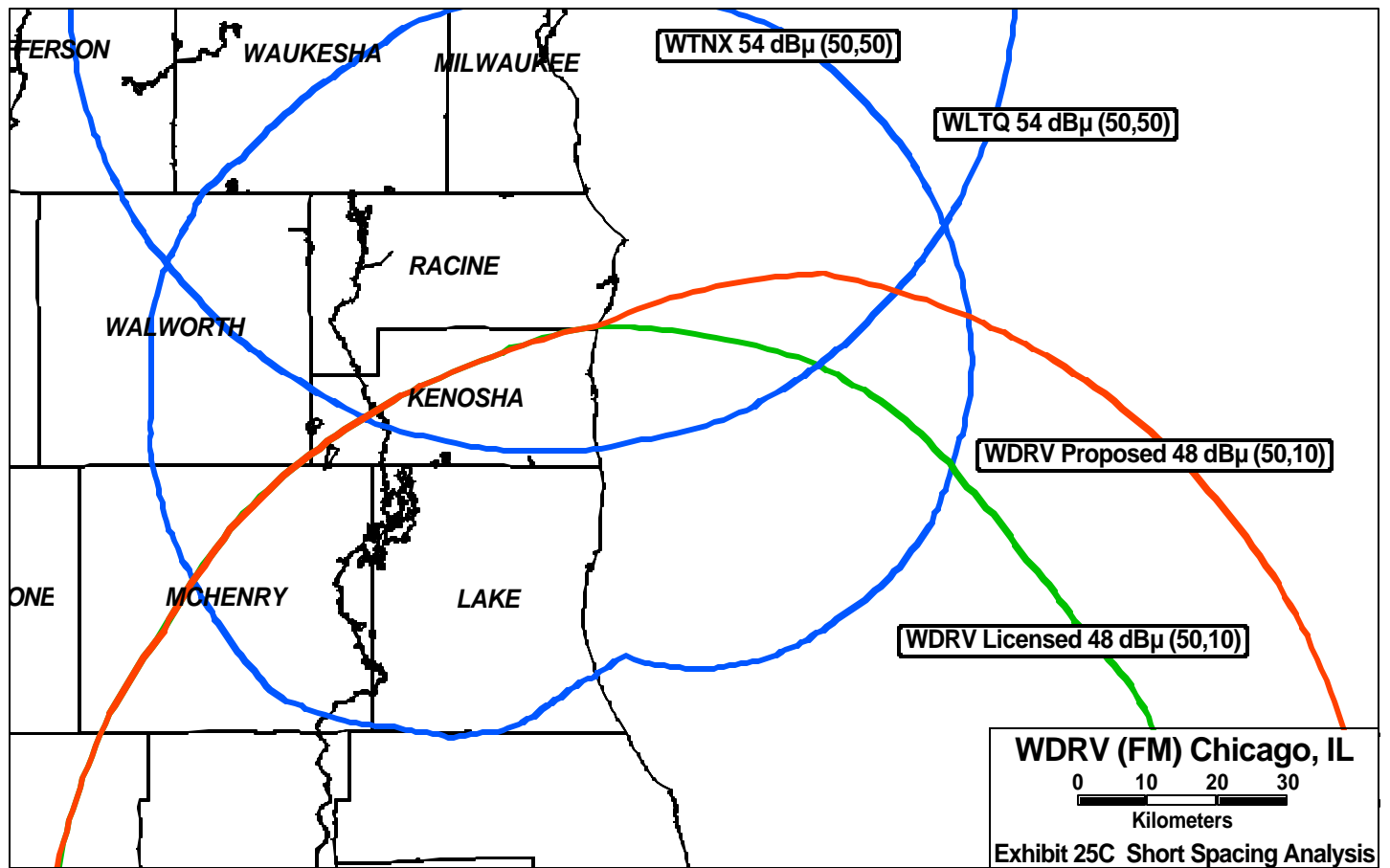
Exhibit 25B

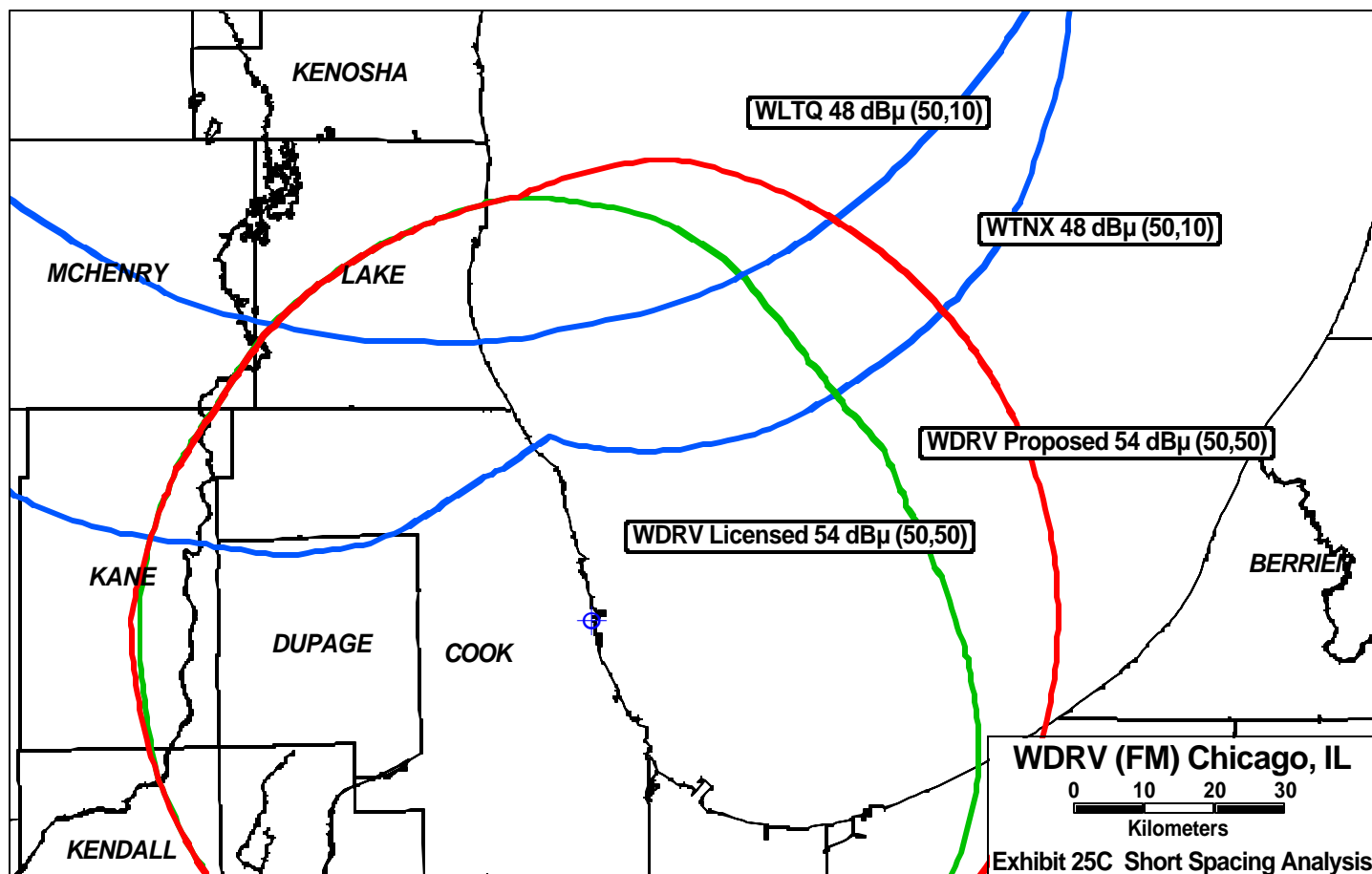
Directional Antenna Statement

The proposed antenna is a 2 bay, ERI "rototiller", which will be side mounted on a 3.5" steel pipe. The characteristics of the pole and intended orientation of the antenna will be specified by the manufacturer as a part of the design information submitted with the license application.

The proposed antenna will not be mounted at the top of a tower which contains a top-mounted platform, and no other antennas will be mounted with a horizontal or vertical proximity less than that specified by the manufacturer.

A certification of the mounting and orientation of the antenna from a licensed surveyor, or in states where permitted, a licensed engineer authorized to perform surveying work, will be provided with the license application.





SECTION III-B FM Engineering

TECHNICAL SPECIFICATIONS

Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.

TECH BOX

1. Channel: _____
2. Class: ☐ A ☐ B1 ☐ B ☐ C3 ☐ C2 ☐ C1 ☐ C ☐ D
3. Antenna Location Coordinates: (NAD 27)
 _____ ° _____ ' _____ " ☐ N ☐ S Latitude
 _____ ° _____ ' _____ " ☐ E ☐ W Longitude
4. One-Step Proposal Allotment Coordinates: (NAD 27) ☐ Not applicable
 _____ ° _____ ' _____ " ☐ N ☐ S Latitude
 _____ ° _____ ' _____ " ☐ E ☐ W Longitude
5. Antenna Structure Registration Number: _____
☐ Not applicable ☐ FAA Notification Filed with FAA
6. Antenna Location Site Elevation Above Mean Sea Level: _____ meters
7. Overall Tower Height Above Ground Level: _____ meters
8. Height of Radiation Center Above Ground Level: _____ meters (H) _____ meters (V)
9. Height of Radiation Center Above Average Terrain: _____ meters (H) _____ meters (V)
10. Effective Radiated Power: _____ kW (H) _____ kW (V)
11. Maximum Effective Radiated Power: ☐ Not applicable _____ kW (H) _____ kW (V)
 (Beam-Tilt Antenna ONLY)
12. Directional Antenna Relative Field Values: ☐ Not applicable (Nondirectional)
 Rotation: _____ ° ☐ No rotation

Degree	Value	Degree	Value	Degree	Value	Degree	Value	Degree	Value	Degree	Value
0		60		120		180		240		300	
10		70		130		190		250		310	
20		80		140		200		260		320	
30		90		150		210		270		330	
40		100		160		220		280		340	
50		110		170		230		290		350	
Additional Azimuths											

NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.

CERTIFICATION

**AUXILIARY ANTENNA APPLICANTS ARE NOT REQUIRED TO RESPOND TO ITEMS 13-16.
PROCEED TO ITEM 17.**

13. **Allotment.** The proposed facility complies with the allotment requirements of 47 C.F.R. Section 73.203. ☐ Yes ☐ No

See Explanation
in Exhibit No.
14. **Community Coverage.** The proposed facility complies with 47 C.F.R. Section 73.315. ☐ Yes ☐ No

See Explanation
in Exhibit No.
15. **Main Studio Location.** The proposed main studio location complies with 47 C.F.R. Section 73.1125. ☐ Yes ☐ No

See Explanation
in Exhibit No.
16. **Interference.** The proposed facility complies with all of the following applicable rule sections. Check all those that apply. ☐ Yes ☐ No

See Explanation
in Exhibit No.
- Separation Requirements.**
- a. ☐ 47 C.F.R. Section 73.207.
- Grandfathered Short-Spaced.**
- b. ☐ 47 C.F.R. Section 73.213(a) with respect to station(s): _____

Exhibit No.

Exhibit Required.
- c. ☐ 47 C.F.R. Section 73.213(b) with respect to station(s): _____

Exhibit No.

Exhibit Required.
- d. ☐ 47 C.F.R. Section 73.213(c) with respect to station(s): _____

Exhibit No.

Exhibit Required.
- Contour Protection.**
- e. ☐ 47 C.F.R. Section 73.215 with respect to station(s): _____

Exhibit No.

Exhibit Required.
17. **Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47 C.F.R. Section 1.1306 (*i.e.*, the facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine compliance through the use of the RF worksheets in Appendix A, an **Exhibit is required.** ☐ Yes ☐ No

See Explanation
in Exhibit No.

By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.

PREPARER'S CERTIFICATION ON PAGE 3 MUST BE COMPLETED AND SIGNED.

SECTION III PREPARER'S CERTIFICATION

I certify that I have prepared Section III (Engineering Data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

Name		Relationship to Applicant (e.g., Consulting Engineer)	
Signature		Date	
Mailing Address			
City		State or Country (if foreign address)	ZIP Code
Telephone Number (include area code)		E-Mail Address (if available)	

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT
(U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT
(U.S. CODE, TITLE 47, SECTION 312(a)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).

6. Statement of Engineer

This Engineering report, which is part of an application for facilities changes for station WDRV (FM) at Chicago, Illinois has been prepared under my direct supervision. All representations contained herein are true to the best of my knowledge. I am an experienced radio engineer whose qualifications are a matter of record with the Federal Communications Commission. I am a staff engineer in the firm of Hatfield & Dawson Consulting Engineers and am Registered as a Professional Engineer in the State of Washington.

Signed this 21st day of June, 2001



Thomas S. Gorton P.E.