Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio

# ENGINEERING EXHIBIT

## Application for Post-Transition Digital Television Station Construction Permit

prepared for

**KRCA License, LLC**
KPNZ-DT Ogden, UT
Facility ID 77512
Ch. 24 450 kW 1229 m

*KRCA License, LLC ("KLL")* is the licensee of television station KPNZ(TV), analog Channel 24, Ogden, UT. KPNZ was originally authorized after April 3, 1997 and therefore does not have a companion digital channel. *KLL* herein proposes construction of the KPNZ-DT post-transition digital facility on Channel 24 and intends to "flash cut" at the end of the transition. This channel was established in Appendix B of the Seventh Report and Order in MB Docket 87-278.

The instant proposal specifies an effective radiated power ("ERP") of 450 kW at 1229 meters antenna height above average terrain ("HAAT"), with a directional antenna. The proposal conforms exactly to the Appendix B site location and parameters of 450 kW ERP and 1229 meters HAAT.

The proposed digital Channel 24 operation will employ the existing shared directional antenna system licensed for KPNZ's analog Channel 24. The antenna is installed on an existing antenna supporting structure having FCC Antenna Structure Registration number 1062408. No change to the overall structure height and no tower work are required to carry out this proposal.

The proposed KPNZ-DT antenna system is a Dielectric model TUP-T3-12-1. The directional antenna's azimuthal pattern is depicted in **Figure 1**. **Figures 2** and **2A** provide the theoretical vertical plane (elevation) pattern[1].

[1] These patterns are supplied in terms of relative field. In recent years, FCC Staff have not required pattern data in dBk format however such patterns are available upon request.

A map is supplied as **Figure 3,** which depicts the standard predicted coverage contours. This map includes the boundaries of Ogden, KPNZ-DT's principal community. As demonstrated thereon, the proposed facility complies with §73.625(a)(1), as the entire principal community will be encompassed by the 48 dBμ contour.

The proposed KPNZ-DT facility will employ the same technical parameters as allotted in Appendix B, therefore realizing a 100.0 percent match of the Appendix B population. Since no extension in contour location beyond that of the allotment will result, interference analysis to other television facilities is not required.

The nearest FCC monitoring station is 897 km distant at Livermore, CA. This exceeds by a large margin the threshold minimum distance specified in §73.1030(c)(3) that would suggest consideration of the monitoring station. The site is not located within the areas requiring coordination with "quiet" zones specified in §73.1030(a) and (b). There are no AM stations within 3.2 kilometers of the site, based on information contained within the Commission's database. The site location is beyond the border areas requiring international coordination.

**Human Exposure to Radiofrequency Electromagnetic Field (Environmental)**

The proposal will involve use of an existing transmitting antenna. The use of existing transmitting locations has been characterized as being environmentally preferable by the Commission, according to Note 1 of §1.1306 of the FCC Rules. No tower construction or change in structure height is proposed. Therefore, it is believed that this application may be categorically excluded from environmental processing pursuant to §1.1306 of the Commission's rules.

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the Commission's OET Bulletin Number 65. The transmitting location is on Farnsworth Peak overlooking the Ogden and Salt Lake City region. There are numerous other transmitting facilities at this site area situated on various antenna supporting structures. According to the applicant, access to the entire site area is controlled by fencing, locked access gates, and the general remoteness of the site from publicly accessible areas. The applicant considers the site area

to be "controlled/occupational" for RF exposure evaluation. *KLL* participates in a radiofrequency ("RF") electromagnetic field exposure safety program, along with other broadcasters and FCC licensees that utilize the Farnsworth Peak site area. Based on OET-65 equation (10), and 13.2 percent antenna relative field in downward elevations (see **Figure 2**), the maximum calculated power density attributable to the proposed facility at locations near the transmitter site at a height of two meters above ground level is 77.8 $\mu W/cm^2$, which is 4.4 percent of the "controlled/occupational" maximum permissible exposure limit. This is below the five percent threshold limit described in §1.1307(b) regarding sites with multiple emitters, categorically excluding the applicant from responsibility for taking any corrective action regarding occupational exposure in the areas where the proposal's contribution is less than five percent.

For completeness, following construction of the proposed facility, RF exposure measurements (and/or detailed calculations) will be conducted to evaluate the level of RF exposure resulting from the KPNZ-DT facility. As necessary, based on these results and considering all emitters, appropriate exposure abatement procedures will be established and followed, in order to comply with the Commission's exposure limits. Such abatement procedures may involve the restriction of access to certain areas and/or facility modifications to reduce RF levels. It is expected that the RF levels attributable KPNZ-DT at the proposed 450 kW ERP on Channel 24 will be less than the current KPNZ analog Channel 24 1514 kW ERP operation which uses the same antenna and will cease operation.

Considering the post-construction measurement and an appropriate abatement program, the general public and workers will not be exposed to RF levels attributable to the proposal in excess of the Commission's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, authorized personnel will be trained and/or supervised as necessary for access to any "controlled" areas. *KLL* will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from RF electromagnetic field exposure in excess of FCC guidelines.

## Certification

The undersigned hereby certifies that the foregoing statement and associated attachments were prepared by him or under his direction, and that they are true and correct to the best of his knowledge and belief.

Joseph M. Davis, P.E.
May 1, 2008

**Chesapeake RF Consultants, LLC**
11993 Kahns Road
Manassas, VA 20112
703-650-9600

*List of Attachments*

| | |
|---|---|
| Figure 1 | Antenna Horizontal Plane Pattern |
| Figure 2, 2A | Antenna Vertical Plane (Elevation) Pattern |
| Figure 3 | Proposed Coverage Contours |
| Form 301 | Saved Version of Engineering Sections from FCC Form at Time of Upload |

*This material was entered May 1, 2008 for filing electronically. Since the FCC's electronic filing system may be accessed by anyone with the applicant's name and password, and electronic data may otherwise be altered in an unauthorized fashion, we cannot be responsible for changes made subsequent to our entry of this data and related attachments.*

**Figure 1**
**Antenna Horizontal Plane Pattern**
**KPNZ-DT Ogden, UT**
**Facility ID 77512**
**Ch. 24 450 kW 1229 m**

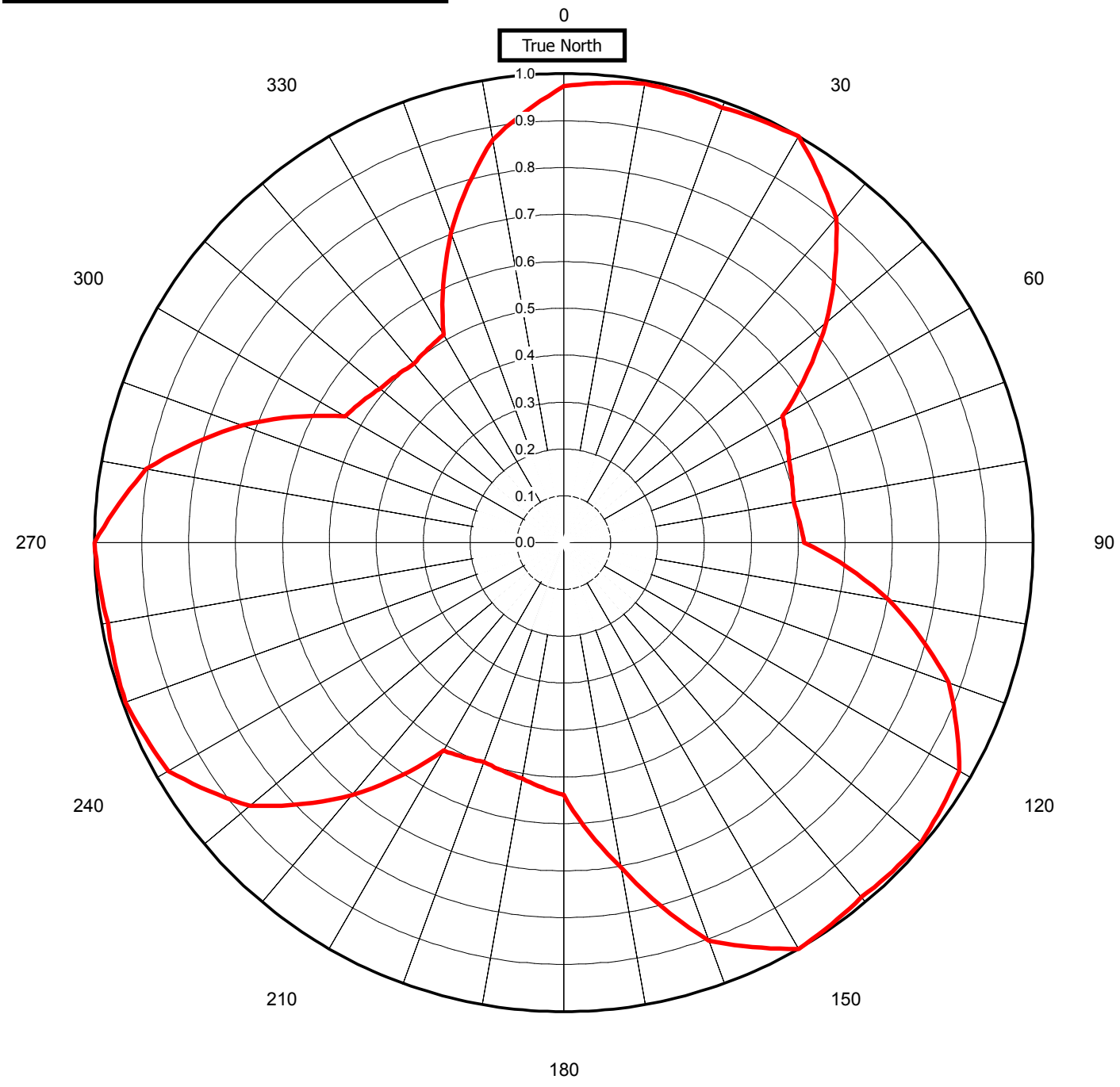
prepared for
**KRCA License, LLC**

May, 2008

| | | | |
|---|---|---|---|
| Date | **1-May-08** | | |
| Call Letters | **KPNZ-DT** | Channel | **24** |
| Location | **Ogden, UT** | | |
| Customer | | | |
| Antenna Type | **TUP-T3-12-1** | | |

## AZIMUTH PATTERN

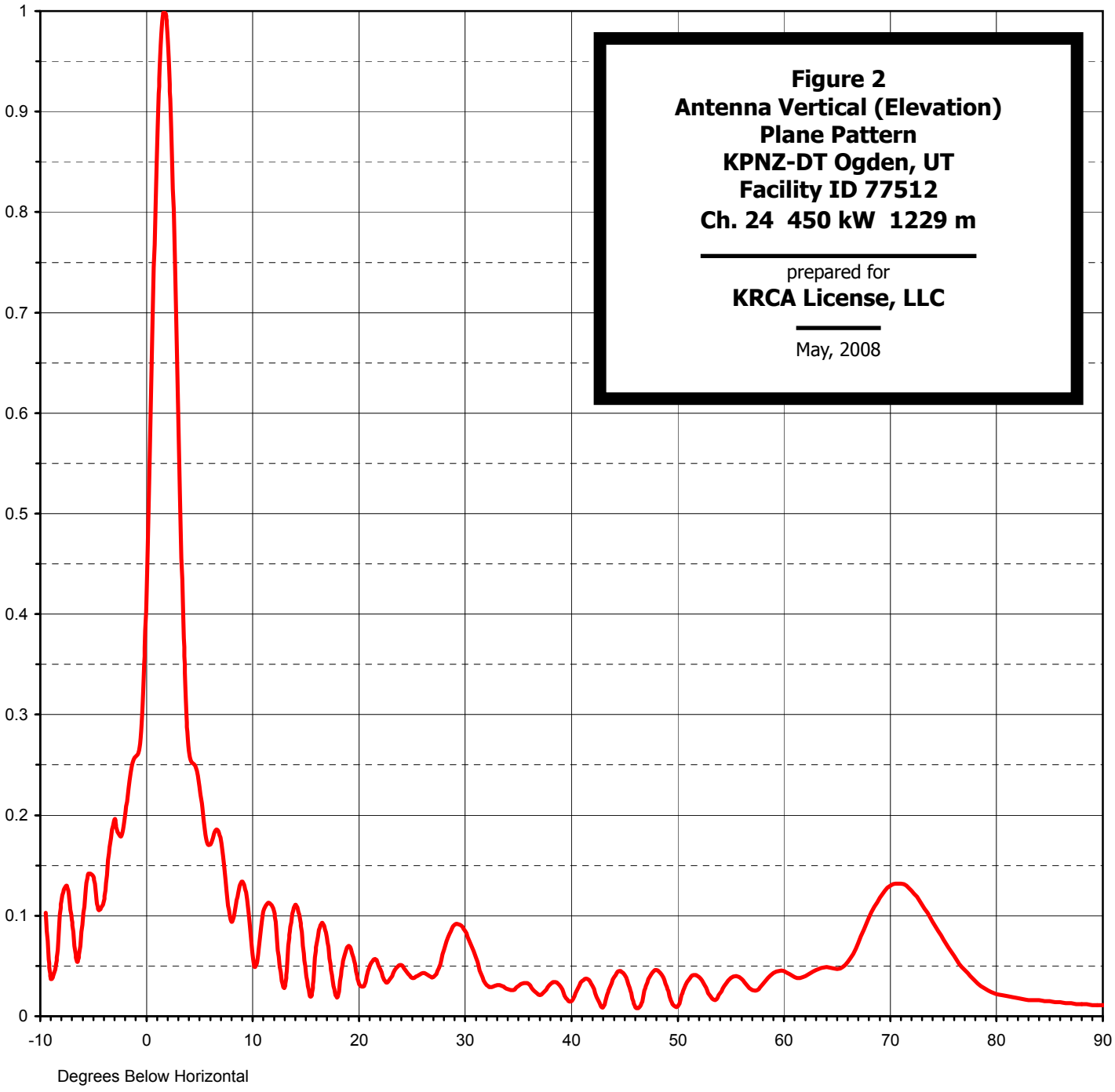
| | |
|---|---|
| Frequency | **533.00 MHz** |
| Drawing # | |



| | | | |
|---|---|---|---|
| Date | **1-May-08** | | |
| Call Letters | **KPNZ-DT** | Channel | **24** |
| Location | **Ogden, UT** | | |
| Customer | | | |
| Antenna Type | **TUP-T3-12-1** | | |

## ELEVATION PATTERN

| | | | |
|---|---|---|---|
| RMS Gain at Main Lobe | **21.70 ( 13.36 dB )** | Beam Tilt | **1.50 deg** |
| RMS Gain at Horizontal | **5.60 ( 7.48 dB )** | Frequency | **533.00 MHz** |
| Calculated / Measured | **Calculated** | Drawing # | **12U217015** |



| | | | |
|---|---|---|---|
| Date | **1-May-08** | | |
| Call Letters | **KPNZ-DT** | Channel | **24** |
| Location | **Ogden, UT** | | |
| Customer | | | |
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# ELEVATION PATTERN

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| RMS Gain at Horizontal | **5.60 ( 7.48 dB )** | Frequency | **533.00 MHz** |
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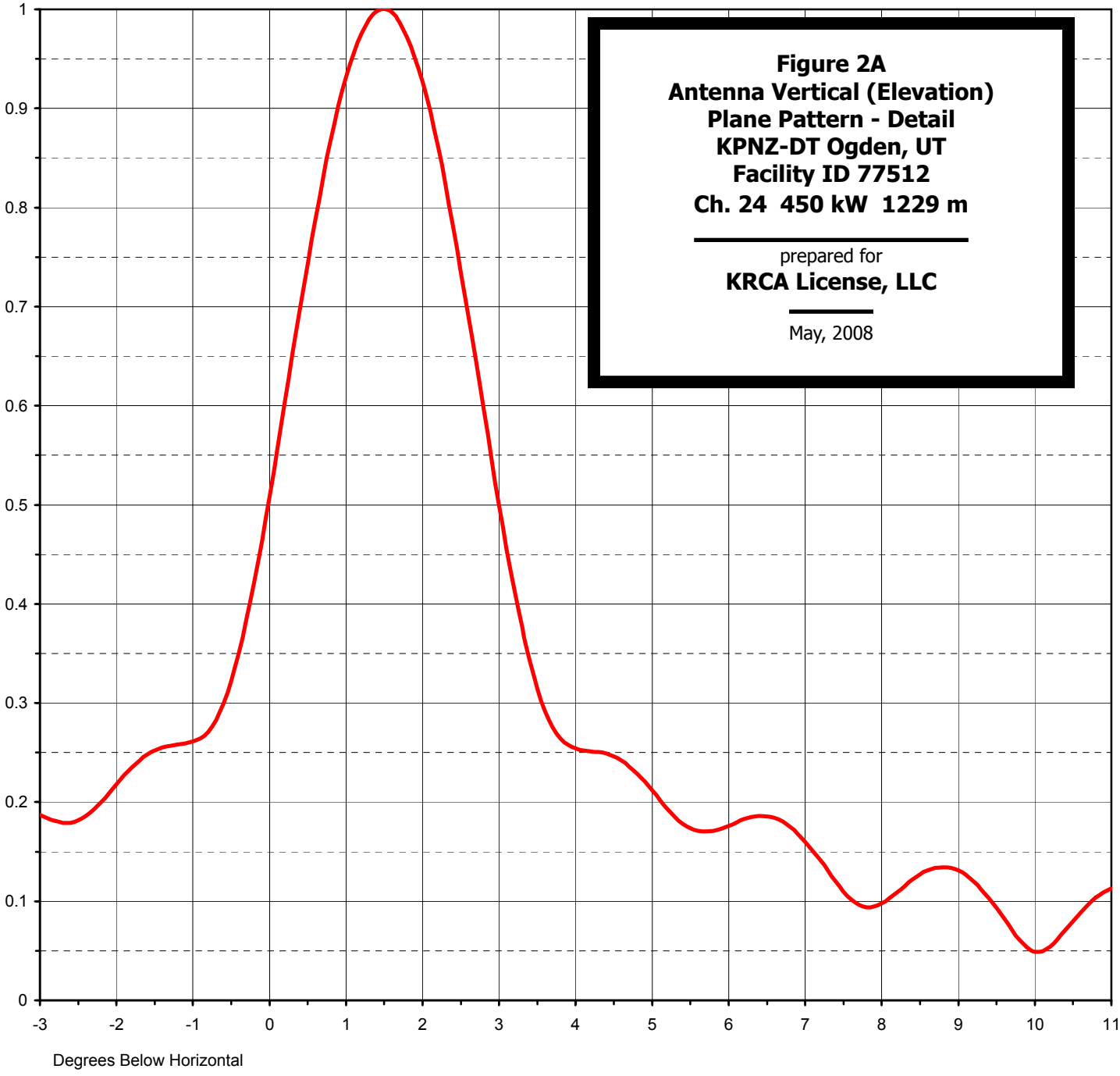

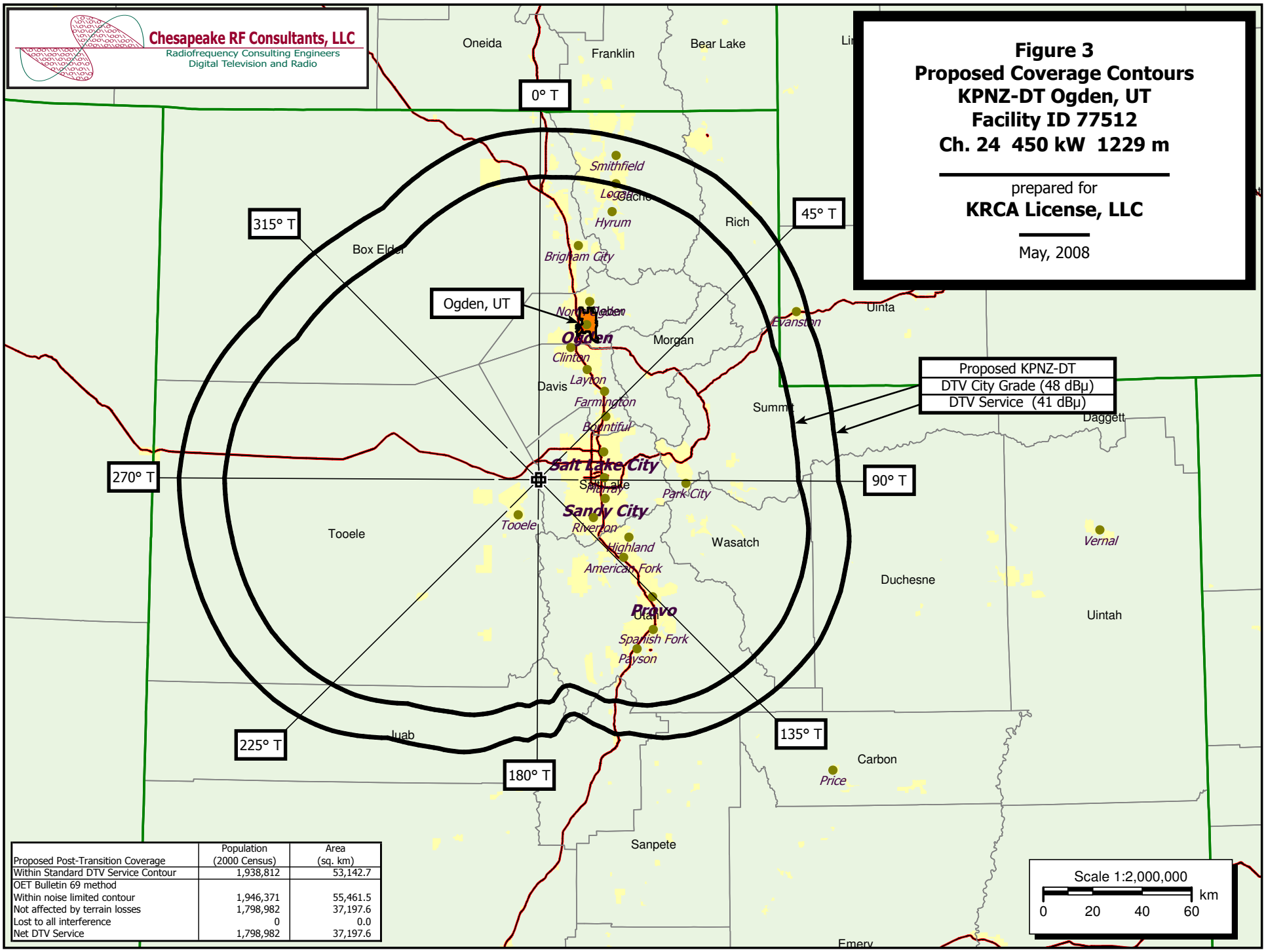


| Proposed Post-Transition Coverage | Population (2000 Census) | Area (sq. km) |
|---|---|---|
| Within Standard DTV Service Contour | 1,938,812 | 53,142.7 |
| OET Bulletin 69 method | | |
| Within noise limited contour | 1,946,371 | 55,461.5 |
| Not affected by terrain losses | 1,798,982 | 37,197.6 |
| Lost to all interference | 0 | 0.0 |
| Net DTV Service | 1,798,982 | 37,197.6 |

**SECTION III-D - DTV Engineering**

**Complete Questions 1-5, and provide all data and information for the proposed facility, as requested in Technical Specifications, Items 1-13.**

**Pre-Transition Certification Checklist:** An application concerning a pre-transition channel must complete questions 1(a)-(c), and 2-5. A correct answer of "Yes" to all of the questions will ensure an expeditious grant of a construction permit application to change pre-transition facilities. However, if the proposed facility is located within the Canadian or Mexican borders, coordination of the proposal under the appropriate treaties may be required prior to grant of the application. An answer of "No" will require additional evaluation of the applicable information in this form before a construction permit can be granted.

**Post-Transition Expedited Processing.** An application concerning a post-transition channel must complete questions 1(a), (d)-(e), and 2-5. A station applying for a construction permit to build its post-transition channel will receive expedited processing if its application (1) does not seek to expand the noise-limited service contour in any direction beyond that established by Appendix B of the Seventh Report and Order in MB Docket No. 87-268 establishing the new DTV Table of Allotments in 47 C.F.R. § 73.622(i) ("new DTV Table Appendix B"); (2) specifies facilities that match or closely approximate those defined in the new DTV Table Appendix B facilities; and (3) is filed within 45 days of the effective date of Section 73.616 of the rules adopted in the Report and Order in the Third DTV Periodic Review proceeding, MB Docket No. 07-91.

| | | | |
|---|---|---|---|
| 1. | The proposed DTV facility complies with 47 C.F.R. Section 73.622 in the following respects: | | |
| | (a) | It will operate on the DTV channel for this station as established in 47 C.F.R. Section 73.622. | (●) Yes ( ) No |
| | (b) | It will operate a pre-transition facility from a transmitting antenna located within 5.0 km (3.1 miles) of the DTV reference site for this station as established in 47 C.F.R. Section 73.622. | ( ) Yes ( ) No |
| | (c) | It will operate a pre-transition facility with an effective radiated power (ERP) and antenna height above average terrain (HAAT) that do not exceed the DTV reference ERP and HAAT for this station as established in 47 C.F.R. Section 73.622. | ( ) Yes ( ) No |
| | (d) | It will operate at post-transition facilities that do not expand the noise-limited service contour in any direction beyond that established by Appendix B of the Seventh Report and Order in MB Docket No. 87-268 establishing the new DTV Table of Allotments in 47 C.F.R. § 73.622(i) ("new DTV Table Appendix B"). | (●) Yes ( ) No ( ) N/A |
| | (e) | It will operate at post-transition facilities that match or reduce by no more than five percent with respect to predicted population from those defined in the new DTV Table Appendix B. | (●) Yes ( ) No ( ) N/A |
| 2. | The proposed facility will not have a significant environmental impact, including exposure of workers or the general public to levels of RF radiation exceeding the applicable health and safety guidelines, and therefore will not come within 47 C.F.R. Section 1.1307.<br>Applicant must **submit the Exhibit** called for in Item 13. | | (●) Yes ( ) No |
| 3. | Pursuant to 47 C.F.R. Section 73.625, the DTV coverage contour of the proposed facility will encompass the allotted principal community. | | (●) Yes ( ) No |
| 4. | The requirements of 47 C.F.R. Section 73.1030 regarding notification to radio astronomy installations, radio receiving installations and FCC monitoring stations have either been satisfied or are not applicable. | | (●) Yes ( ) No |
| 5. | The antenna structure to be used by this facility has been registered by the Commission and will not require registration to support the proposed antenna, OR the FAA has previously determined that the proposed structure will not adversely effect safety in air navigation and this structure qualifies for later registration under the Commission's phased registration plan, OR the proposed installation on this structure does not require notification to the FAA pursuant to 47 C.F.R. Section 17.7. | | (●) Yes ( ) No |

**SECTION III-D - DTV 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 Number:<br><br>DTV 24 Analog TV, if any 24 | |
| 2. | Zone:<br>( ) I (●) II ( ) III | |
| 3. | Antenna Location Coordinates: (NAD 27)<br>Latitude:<br>Degrees 40 Minutes 39 Seconds 33 (●) North ( ) South<br><br>Longitude:<br>Degrees 112 Minutes 12 Seconds 07 (●) West ( ) East | |
| 4. | Antenna Structure Registration Number: 1062408<br>☐ Not Applicable ☐ Notification filed with FAA | |
| 5. | Antenna Location Site Elevation Above Mean Sea Level: | 2754 meters |
| 6. | Overall Tower Height Above Ground Level: | 94 meters |
| 7. | Height of Radiation Center Above Ground Level: | 60 meters |
| 8. | Height of Radiation Center Above Average Terrain : | 1229 meters |

9. Maximum Effective Radiated Power (average power): 450 kW

10. Antenna Specifications:

a. Manufacturer DIE Model TUP-T3-12-1

b. Electrical Beam Tilt:
1.5 degrees ☐ Not Applicable

c. Mechanical Beam Tilt:
degrees toward azimuth
degrees True ☑ Not Applicable
Attach as an Exhibit all data specified in 47 C.F.R. Section 73.625(c). [Exhibit 42]

d. Polorization:
◉ Horizontal ○ Circular ○ Elliptical

e. Directional Antenna Relative Field Values: ☐ Not applicable (Nondirectional)

[For a composite directional (not off-the-shelf) antenna, press the following button to fill in the relative field values subform.]
[Relative Field Values]

**10e. Directional Antenna Relative Field Values**

[Fill in this subform for a composite directional (not off-the-shelf) antenna, only.]

e. Directional Antenna Relative Field Values:

Rotation (Degrees): ☑ No Rotation

| Degrees | Value | Degrees | Value | Degrees | Value | Degrees | Value | Degrees | Value | Degrees | Value |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0.973 | 10 | 0.994 | 20 | 0.987 | 30 | 1 | 40 | 0.903 | 50 | 0.73 |
| 60 | 0.538 | 70 | 0.511 | 80 | 0.497 | 90 | 0.512 | 100 | 0.703 | 110 | 0.873 |
| 120 | 0.973 | 130 | 0.994 | 140 | 0.987 | 150 | 1 | 160 | 0.903 | 170 | 0.73 |
| 180 | 0.538 | 190 | 0.511 | 200 | 0.497 | 210 | 0.512 | 220 | 0.703 | 230 | 0.873 |
| 240 | 0.973 | 250 | 0.994 | 260 | 0.987 | 270 | 1 | 280 | 0.903 | 290 | 0.73 |
| 300 | 0.538 | 310 | 0.511 | 320 | 0.497 | 330 | 0.512 | 340 | 0.703 | 350 | 0.873 |
| Additional Azimuths | | | | | | | | | | | |

Relative Field Polar Plot

If a directional antenna is proposed, the requirements of 47 C.F.R. Sections 73.625(c) must be satisfied. **Exhibit required.** [Exhibit 43]

11. Does the proposed facility satisfy the pre-transition interference protection provisions of 47 C.F.R. Section 73.623(a) (Applicable only if **Certification Checklist** Items 1(a), (b), or (c) are answered "No.") and/or the post-transition interference protection provisions of 47 C.F.R. Section 73.616? ◉ Yes ○ No [Exhibit 44]

If "No," attach as an Exhibit justification therefor, including a summary of any related previously granted waivers.

12. If the proposed facility will not satisfy the coverage requirement of 47 C.F.R. Section 73.625, attach as an Exhibit justification therefore. (Applicable only if **Certification Checklist** item 3 is answered "No.") [Exhibit 45]

13. **Environmental Protection Act. Submit in an Exhibit** the following: [Exhibit 46]

If **Certification Checklist** Item 2 is answered "Yes," a brief explanation of why an Environmental Assessment is not required. Also describe in the Exhibit the steps that will be taken to limit RF radiation exposure to the public and to persons authorized access to the tower site.

By checking "Yes" to **Certification Checklist** Item 2, 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.

If **Certification Checklist** Item 2 is answered "No," an Environmental Assessment as required by 47 C.F.R Section 1.1311.

**PREPARERS CERTIFICATION ON SECTION III 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<br>JOSEPH M. DAVIS, P.E. | Relationship to Applicant (e.g., Consulting Engineer)<br>CONSULTING ENGINEER | |
| Signature | Date<br>5/1/2008 | |
| Mailing Address<br>CHESAPEAKE RF CONSULTANTS, LLC<br>11993 KAHNS ROAD | | |
| City<br>MANASSAS | State or Country (if foreign address)<br>VA | Zip Code<br>20112 - |
| Telephone Number (include area code)<br>7036509600 | E-Mail Address (if available)<br>JOSEPH.DAVIS@RF-CONSULTANTS.COM | |

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).

Any specified rotation has already been applied to the plotted pattern.
Field strength values shown on a rotated pattern may differ from the listed values because intermediate azimuths are interpolated between entered azimuths.