ELECTRONICS RESEARCH, INC. ERI®

Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610 Phone (812) 925-6000 Fax (812) 925-4030 http://www.eriinc.com/

Directional Antenna System for WJRK, Mina, New York

October 2, 2017

Electronics Research Inc. is providing a custom fabricated antenna system that is specially designed to meet the FCC requirements and the general needs of radio station WJRK.

The antenna is the ERI model LP-1E-DA configuration. The dual polarized system consists of one bay using one driven vertical dipole, two driven horizontal dipoles, one horizontal parasitic element placed one quarter wave above and below each bay and one vertical parasitic element. A power divider was used near the bottom of the antenna to feed the system. The antenna was mounted on the North 160 degrees East tower leg with bracketry to provide an antenna orientation of North 160 degrees East. The antenna was tested on a 30" face tower, which is the structure the station plans to use to support the array. All tests were performed on a frequency of 95.9 megahertz, which is the center of the FM broadcast channel assigned to WJRK.

Pattern measurements were made on a sixty-acre antenna pattern range that is owned and operated by Electronics Research, Inc. The tests were performed under the direction of Thomas B. Silliman, president of Electronics Research, Inc. Mr. Silliman has the Bachelor of Electrical Engineering and the Master of Electrical Engineering degrees from Cornell University and is a registered professional engineer in the states of Indiana, Maryland and Minnesota.

Directional Antenna System
For
WJRK, Mina, New York

(Continued)

DESCRIPTION OF THE TEST PROCEDURE

The test antenna consisted of the complete dual polarized system with the associated horizontal and vertical parasitic elements. The elements and brackets that were used in this test are electrically equivalent to those that will be supplied with the antenna. Sections of 1 5/8 inch o.d. rigid coaxial line were used to feed the test antenna and sections of 1 5/8 inch o.d. rigid outer conductor only were attached above the test antenna. The lines were properly grounded during all tests.

The power distribution and phase relationship to the antenna elements was adjusted in order to achieve the directional radiation patterns for both horizontal and vertical polarization components.

The proof-of-performance was accomplished using a 30" face tower with identical dimension and configuration including all braces, ladders, conduits, coaxial lines and other appurtenances that are included in the actual aperture at which the antenna will be installed. The structure was erected vertically on a turntable mounted on a non-metallic building with the antenna centered vertically on the structure, making the center of radiation of the test approximately 30 feet above ground. The turntable is equipped with a motor drive and a US Digital angle position indicator. The resolution of this angle position indicator is one-hundredth of a degree.

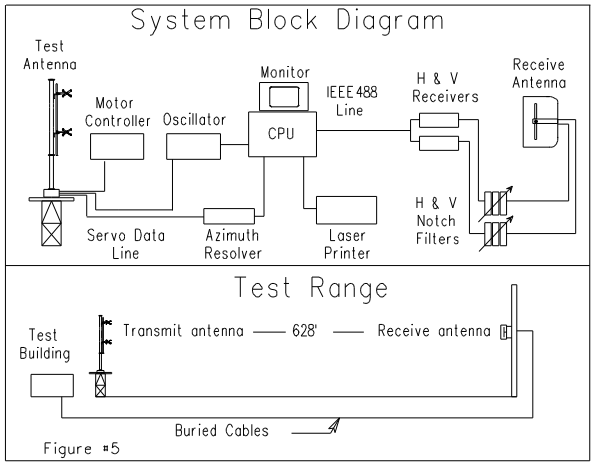


Figure #5

The antenna under test was operated in the transmitting mode and fed from a HP8657D signal generator. The frequency of the signal source was set at 95.9 MHz and was constantly monitored by a Rohde & Schwarz ESVD measuring receiver.

Directional Antenna System
For
WJRK, Mina, New York

(Continued)

A broadband horizontal and vertical dipole system, located approximately 628 feet from the test antenna, was used to receive the emitted test signals. The dipole system was mounted at the same height above terrain as the center of the antenna under test. The signals received by the dipole system were fed to the test building by way of two buried Heliax cables to a Rohde & Schwarz measuring receiver. This data was interfaced to a laser jet printer by means of a computer system. Relative field strength was plotted as a function of azimuth.

The measurements were performed by rotating the test antenna in a counter-clockwise direction and plotting the received signal on polar co-ordinated graph paper in a clockwise direction. Both horizontal and vertical components were recorded separately.

CONCLUSIONS

The dual polarized system consists of one bay using one driven vertical dipole, two driven horizontal dipoles, one horizontal parasitic element placed one quarter wave above and below each bay and one vertical parasitic element. A power divider was used near the bottom of the antenna to feed the system.

The power distribution and phase relationship will be fixed when the antenna is manufactured. Proper maintenance of the elements should be all that is required to maintain the pattern in adjustment.

The LP-1E-DA array is to be mounted on the North 160 degrees East tower leg of the 30" face tower at a bearing of North 160 degrees East. Blue prints provided with the antenna will show the proper antenna orientation alignment. The antenna alignment procedure should be directed by a licensed surveyor as prescribed by the FCC.

Figure #1 represents the measured individual horizontal and vertical components, the composite maximum of either the horizontal or vertical component at any azimuth and the FCC filed envelope pattern. The horizontal plane relative field list for the composite pattern and the individual H & V components are shown as Figure #1 & 1A respectively. The actual measured pattern does not exceed the authorized FCC composite pattern at any azimuth. A calculated vertical plane relative field pattern for the vertically polarized component is shown on Figure #3 attached.

Directional Antenna System
For
WJRK, Mina, New York

(Continued)

A calculated vertical plane relative field pattern for the horizontally polarized component is shown on Figure #3 attached. The power in the maximum will reach .820 kilowatts (-0.862 dBk).

The power at North 300 degrees East does not exceed 0.026 kilowatts (-15.85 dBk).

The RMS of the vertically polarized horizontal plane component does not exceed the RMS of the horizontally polarized horizontal plane component.

The composite horizontal and vertical maximum relative field pattern obtained from the measured data as shown on Figure #1 has an RMS that is greater that 85% of the filed composite pattern.

The clear vertical length of the structure required to support the antenna is 20 feet.

The directional antenna should not be mounted on the top of an antenna tower that includes a top-mounted platform larger than the cross-sectional area of the tower in the horizontal plane. No obstructions other than those that are specified by the blue prints supplied with the antenna are to be mounted within 75 ft. horizontally of the system. The vertical distance to the nearest obstruction should be a minimum of 10 ft. from the directional antenna. Metallic guy wires should be a minimum distance of forty feet horizontally from the antenna.

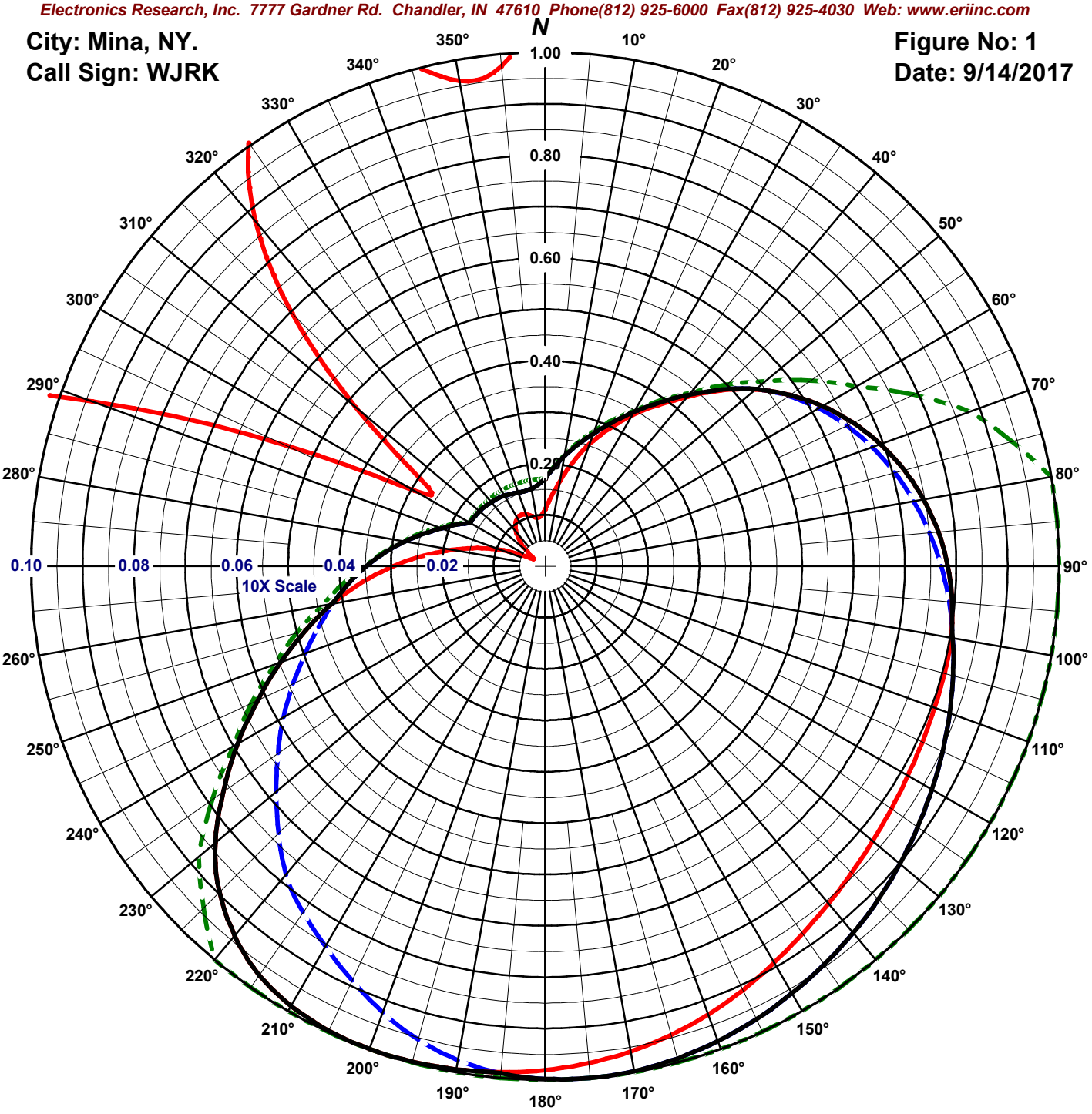
ELECTRONICS RESEARCH, INC.

ERI® Horizontal Plane Relative Field Pattern

Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610 Phone(812) 925-6000 Fax(812) 925-4030 Web: www.eriinc.com

City: Mina, NY.
Call Sign: WJRK

Figure No: 1
Date: 9/14/2017



Antenna Orientation: 160° True

Frequency: 95.9 MHz
Antenna Type: LP-1E-DA

Antenna Mounting: Custom
Tower Type: 30" Tower

HORIZONTAL	VERTICAL	COMPOSITE	FCC ENVELOPE
RMS: .653	RMS: .649	RMS: .674	RMS: .731
Maximum: 1 @ 200°	Maximum: 1 @ 175°	Maximum: 1 @ 175°	Maximum: 1 @ 80°
Minimum: .026 @ 302°	Minimum: .151 @ 345°	Minimum: .151 @ 345°	Minimum: .17 @ 0°

Measured patterns of the horizontal and vertical components. The composite pattern shows the maximum of either the H or V azimuth values. This patterns is greater than 85% of the FCC filed composite pattern BNPH-20130724ABK.

ERI® Horizontal Plane Relative Field Pattern

Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610 Phone(812) 925-6000 Fax(812) 925-4030 Web: www.eriinc.com

Figure# 1 **Date: 9/14/2017**
Station: WJRK **Antenna: LP-1E-DA**
Location: Mina, NY. **Antenna Orientation: 160° True**
Frequency: 95.9 MHz **Number of Bays: 1**

Azimuth	Envelope			Polarization	Azimuth	Envelope			Polarization
	Field	kW	dBk	Maximum		Field	kW	dBk	Maximum
0°	0.170	0.024	-16.266	Vertical	180°	0.998	0.817	-0.879	Vertical
5°	0.193	0.030	-15.172	Vertical	185°	0.991	0.805	-0.942	Vertical
10°	0.218	0.039	-14.077	Vertical	190°	0.995	0.811	-0.908	Horizontal
15°	0.245	0.049	-13.086	Vertical	195°	0.998	0.817	-0.876	Horizontal
20°	0.274	0.062	-12.095	Vertical	200°	1.000	0.820	-0.862	Horizontal
25°	0.309	0.078	-11.073	Vertical	205°	0.997	0.816	-0.885	Horizontal
30°	0.347	0.099	-10.054	Vertical	210°	0.988	0.801	-0.966	Horizontal
35°	0.389	0.124	-9.060	Vertical	215°	0.971	0.773	-1.120	Horizontal
40°	0.435	0.155	-8.083	Vertical	220°	0.939	0.723	-1.406	Horizontal
45°	0.486	0.194	-7.126	Vertical	225°	0.896	0.659	-1.814	Horizontal
50°	0.536	0.236	-6.273	Vertical	230°	0.837	0.575	-2.403	Horizontal
55°	0.581	0.277	-5.577	Horizontal	235°	0.764	0.479	-3.199	Horizontal
60°	0.623	0.318	-4.969	Horizontal	240°	0.691	0.391	-4.075	Horizontal
65°	0.661	0.358	-4.459	Horizontal	245°	0.617	0.312	-5.059	Horizontal
70°	0.694	0.395	-4.032	Horizontal	250°	0.548	0.246	-6.082	Horizontal
75°	0.723	0.429	-3.677	Horizontal	255°	0.482	0.191	-7.200	Horizontal
80°	0.748	0.458	-3.387	Horizontal	260°	0.421	0.145	-8.378	Horizontal
85°	0.768	0.484	-3.156	Horizontal	265°	0.384	0.121	-9.180	Vertical
90°	0.784	0.504	-2.979	Horizontal	270°	0.348	0.099	-10.036	Vertical
95°	0.795	0.518	-2.854	Horizontal	275°	0.312	0.080	-10.984	Vertical
100°	0.806	0.532	-2.739	Vertical	280°	0.277	0.063	-12.016	Vertical
105°	0.822	0.554	-2.567	Vertical	285°	0.244	0.049	-13.107	Vertical
110°	0.837	0.575	-2.402	Vertical	290°	0.215	0.038	-14.198	Vertical
115°	0.853	0.597	-2.239	Vertical	295°	0.190	0.030	-15.266	Vertical
120°	0.869	0.619	-2.081	Vertical	300°	0.168	0.023	-16.333	Vertical
125°	0.885	0.642	-1.923	Vertical	305°	0.168	0.023	-16.377	Vertical
130°	0.901	0.666	-1.766	Vertical	310°	0.167	0.023	-16.420	Vertical
135°	0.917	0.690	-1.614	Vertical	315°	0.165	0.022	-16.532	Vertical
140°	0.932	0.712	-1.473	Vertical	320°	0.163	0.022	-16.642	Vertical
145°	0.946	0.734	-1.340	Vertical	325°	0.161	0.021	-16.732	Vertical
150°	0.960	0.756	-1.215	Vertical	330°	0.158	0.021	-16.865	Vertical
155°	0.973	0.776	-1.102	Vertical	335°	0.155	0.020	-17.044	Vertical
160°	0.984	0.793	-1.006	Vertical	340°	0.152	0.019	-17.197	Vertical
165°	0.992	0.807	-0.930	Vertical	345°	0.151	0.019	-17.267	Vertical
170°	0.998	0.817	-0.879	Vertical	350°	0.153	0.019	-17.162	Vertical
175°	1.000	0.820	-0.862	Vertical	355°	0.159	0.021	-16.821	Vertical

Horizontal Polarization:
Maximum: 1.034 (0.145 dB)
Horizontal Plane: 1.034 (0.145 dB)
Maximum ERP: 0.820 kW

Vertical Polarization:
Maximum: 1.034 (0.145 dB)
Horizontal Plane: 1.034 (0.145 dB)
Maximum ERP: 0.820 kW

Total Input Power: 0.793 kW
Reference: WJRK1M.FIG
This list shows the the maximum azimuth values of either the horizontal or vertical components.

ERI® Horizontal Plane Relative Field Pattern

Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610 Phone(812) 925-6000 Fax(812) 925-4030 Web: www.eriinc.com

Figure# 1A **Date: 9/14/2017**
Station: WJRK **Antenna: LP-1E-DA**
Location: Mina, NY. **Antenna Orientation: 160° True**
Frequency: 95.9 MHz **Number of Bays: 1**

Azimuth	Horizontal			Vertical			Azimuth	Horizontal			Vertical		
	Field	kW	dBk	Field	kW	dBk		Field	kW	dBk	Field	kW	dBk
0°	0.110	0.010	-20.007	0.170	0.024	-16.266	180°	0.981	0.789	-1.029	0.998	0.817	-0.879
5°	0.135	0.015	-18.254	0.193	0.030	-15.172	185°	0.989	0.802	-0.959	0.991	0.805	-0.942
10°	0.169	0.023	-16.298	0.218	0.039	-14.077	190°	0.995	0.811	-0.908	0.976	0.781	-1.071
15°	0.210	0.036	-14.419	0.245	0.049	-13.086	195°	0.998	0.817	-0.876	0.954	0.746	-1.272
20°	0.254	0.053	-12.778	0.274	0.062	-12.095	200°	1.000	0.820	-0.862	0.924	0.700	-1.548
25°	0.295	0.071	-11.465	0.309	0.078	-11.073	205°	0.997	0.816	-0.885	0.889	0.649	-1.879
30°	0.340	0.095	-10.242	0.347	0.099	-10.054	210°	0.988	0.801	-0.966	0.855	0.599	-2.224
35°	0.383	0.120	-9.208	0.389	0.124	-9.060	215°	0.971	0.773	-1.120	0.822	0.553	-2.569
40°	0.430	0.152	-8.187	0.435	0.155	-8.083	220°	0.939	0.723	-1.406	0.784	0.504	-2.976
45°	0.484	0.192	-7.167	0.486	0.194	-7.126	225°	0.896	0.659	-1.814	0.734	0.442	-3.550
50°	0.535	0.234	-6.301	0.536	0.236	-6.273	230°	0.837	0.575	-2.403	0.683	0.382	-4.177
55°	0.581	0.277	-5.577	0.578	0.274	-5.622	235°	0.764	0.479	-3.199	0.634	0.330	-4.816
60°	0.623	0.318	-4.969	0.615	0.310	-5.091	240°	0.691	0.391	-4.075	0.588	0.283	-5.479
65°	0.661	0.358	-4.459	0.647	0.344	-4.638	245°	0.617	0.312	-5.059	0.541	0.240	-6.200
70°	0.694	0.395	-4.032	0.677	0.376	-4.248	250°	0.548	0.246	-6.082	0.497	0.202	-6.939
75°	0.723	0.429	-3.677	0.704	0.406	-3.910	255°	0.482	0.191	-7.200	0.456	0.171	-7.680
80°	0.748	0.458	-3.387	0.728	0.435	-3.616	260°	0.421	0.145	-8.378	0.419	0.144	-8.416
85°	0.768	0.484	-3.156	0.751	0.462	-3.354	265°	0.356	0.104	-9.823	0.384	0.121	-9.180
90°	0.784	0.504	-2.979	0.771	0.488	-3.120	270°	0.295	0.071	-11.458	0.348	0.099	-10.036
95°	0.795	0.518	-2.854	0.789	0.511	-2.920	275°	0.237	0.046	-13.363	0.312	0.080	-10.984
100°	0.802	0.528	-2.778	0.806	0.532	-2.739	280°	0.184	0.028	-15.562	0.277	0.063	-12.016
105°	0.805	0.531	-2.748	0.822	0.554	-2.567	285°	0.137	0.015	-18.151	0.244	0.049	-13.107
110°	0.806	0.533	-2.730	0.837	0.575	-2.402	290°	0.094	0.007	-21.421	0.215	0.038	-14.198
115°	0.810	0.538	-2.694	0.853	0.597	-2.239	295°	0.056	0.003	-25.941	0.190	0.030	-15.266
120°	0.815	0.545	-2.637	0.869	0.619	-2.081	300°	0.029	0.001	-31.488	0.168	0.023	-16.333
125°	0.823	0.555	-2.557	0.885	0.642	-1.923	305°	0.030	0.001	-31.434	0.168	0.023	-16.377
130°	0.832	0.568	-2.457	0.901	0.666	-1.766	310°	0.048	0.002	-27.216	0.167	0.023	-16.420
135°	0.844	0.584	-2.337	0.917	0.690	-1.614	315°	0.070	0.004	-24.007	0.165	0.022	-16.532
140°	0.858	0.603	-2.197	0.932	0.712	-1.473	320°	0.088	0.006	-22.004	0.163	0.022	-16.642
145°	0.873	0.625	-2.039	0.946	0.734	-1.340	325°	0.101	0.008	-20.816	0.161	0.021	-16.732
150°	0.891	0.651	-1.863	0.960	0.756	-1.215	330°	0.108	0.010	-20.181	0.158	0.021	-16.865
155°	0.910	0.680	-1.676	0.973	0.776	-1.102	335°	0.110	0.010	-20.019	0.155	0.020	-17.044
160°	0.929	0.707	-1.505	0.984	0.793	-1.006	340°	0.107	0.009	-20.266	0.152	0.019	-17.197
165°	0.945	0.732	-1.354	0.992	0.807	-0.930	345°	0.101	0.008	-20.775	0.151	0.019	-17.267
170°	0.959	0.754	-1.226	0.998	0.817	-0.879	350°	0.096	0.008	-21.225	0.153	0.019	-17.162
175°	0.971	0.773	-1.117	1.000	0.820	-0.862	355°	0.098	0.008	-21.066	0.159	0.021	-16.821

Horizontal Polarization:
Maximum: 1.034 (0.145 dB)
Horizontal Plane: 1.034 (0.145 dB)
Maximum ERP: 0.820 kW

Vertical Polarization:
Maximum: 1.034 (0.145 dB)
Horizontal Plane: 1.034 (0.145 dB)
Maximum ERP: 0.820 kW

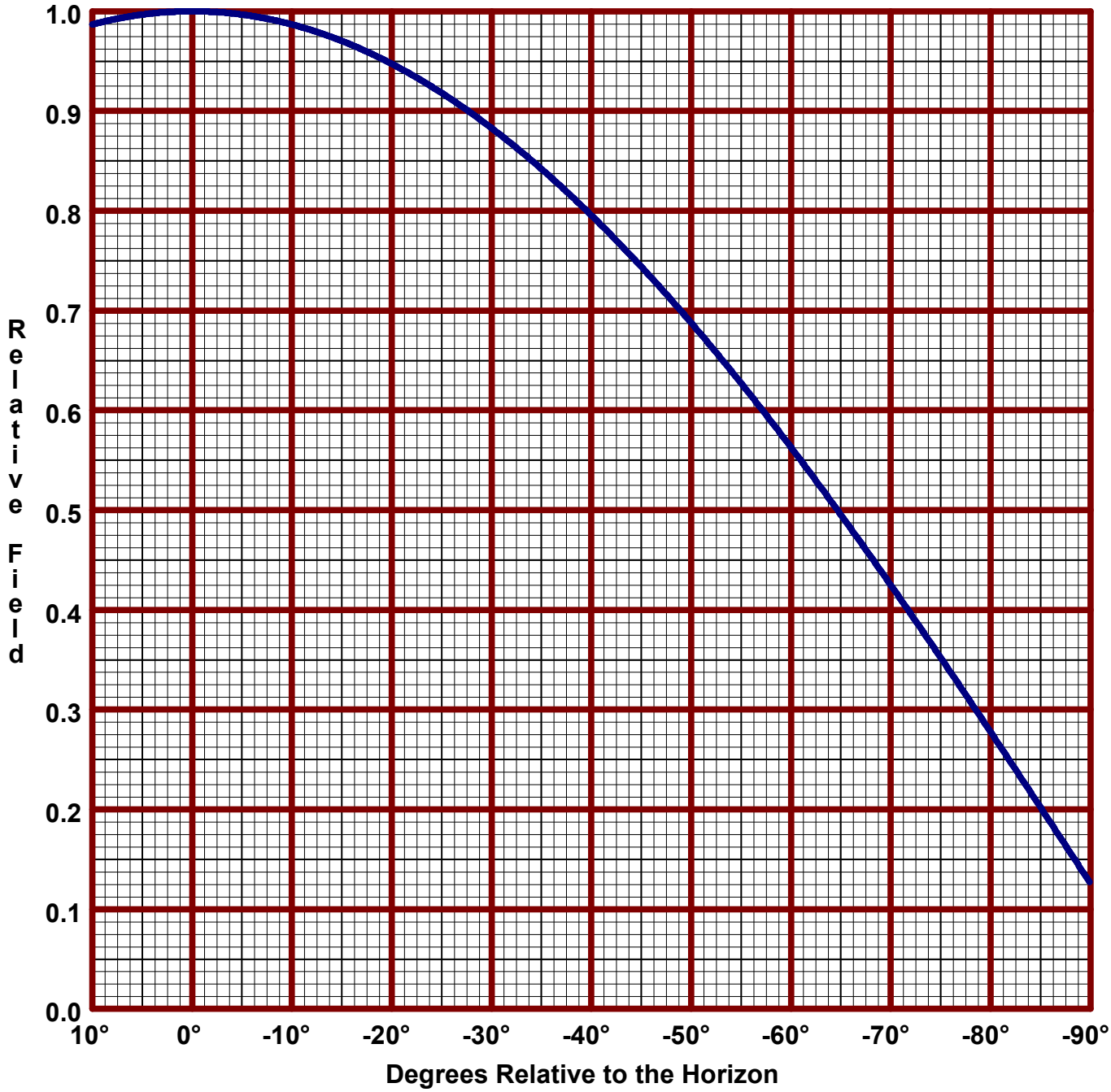
Total Input Power: 0.793 kW
Reference: WJRK1M.FIG
This list shows the azimuth values for the horizontal and vertical components.

Vertical Plane Relative Field Pattern

Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610 Phone(812) 925-6000 Fax(812) 925-4030 Web: www.eriinc.com

Figure No: 3
Call Sign: WJRK
Location: Mina, NY.
Frequency: 95.9 MHz
Antenna: 1 bay LP-1E-DA

Date: 9/14/2017
H/V Power Ratio: 1
1 Wave-length Spacing
0° Beam Tilt
0% First Null Fill



Horizontal Polarization:
Maximum: 1.034 (0.145 dB)
Horizontal Plane: 1.034 (0.145 dB)
Maximum ERP: 0.820 kW

Vertical Polarization:
Maximum: 1.034 (0.145 dB)
Horizontal Plane: 1.034 (0.145 dB)
Maximum ERP: 0.820 kW

Directional Antenna System
for
WJRK, Mina, New York

(Continued)

ANTENNA SPECIFICATIONS

Antenna Type:	LP-1E-DA
Frequency:	95.9 MHz
Number of Bays:	One

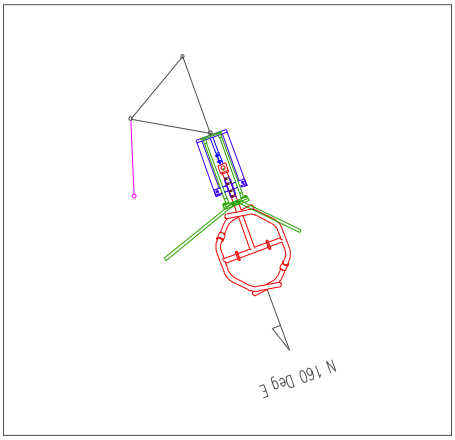
MECHANICAL SPECIFICATIONS

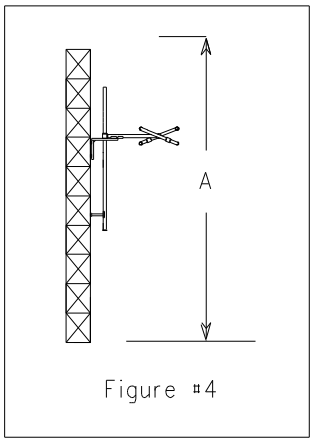
Mounting:	Standard
System length:	8 ft 8 in
Aperture length required:	20 ft
Orientation:	160° true

Input flange to the antenna 1 5/8" female.

ELECTRICAL SPECIFICATIONS
(For directional use)

Maximum horizontal ERP:	0.820 kW (-0.862 dBk)
Horizontal maximum power gain:	1.034 (0.145 dB)
Maximum vertical ERP:	0.820 kW (-0.862 dBk)
Vertical maximum power gain:	1.034 (0.145 dB)
Total input power:	0.793 kW (1.008 dBk)





Daniel L. Barry Land Surveyor LLC
Licensed In New York and Pennsylvania
92 Baxter Avenue
Lakewood, NY 14750
716-763-1254
Facsimile 716-763-0915
www.danbarrysurveyor.com

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*Member of the **N**ational **S**ociety of **P**rofessional **S**urveyors*

Daniel L. Barry, PLS, NY & PA
E-mail dan@danbarrysurveyor.com

Scott R. Johnson, PLS, NY & PA
E-mail scott@danbarrysurveyor.com

October 18, 2017

Connoisseur Media
One Boston Store Place
Erie, Pa. 16501

FAA TOWER CERTIFICATION

Tower located off of the NE Sherman Road, County Route 6, Town of Ripley, Chautauqua County, NY, tax parcel 290.00-1-8 on land titled in the name of CTI Towers Assets II, LLC, by a deed recorded as instrument number DE2017004339 on 7/17/2017. The tower is an existing, guyed tower.

I hereby certify that the following Latitude and Longitude values for the center of the above-referenced tower are accurate to within +/- 15 feet horizontally; and that the following tower site elevation is accurate to within +/- 3 feet vertically.

NAD_83(2011)(Epoch: 2010.0000) From GNSS observations post processed with OPUS software, paired with conventional total station measurements.
Latitude: 42° 11' 52.181" N.
Longitude: 79° 45' 10.996" W.

Ground Elevation at Base of Tower: 1520.37 Feet NAVD, 1988, Geoid 12B

On October 18, 2017, the new Mina NY CP antenna, at a proposed height of 91 meters above ground per construction drawings provided to me, was, under my direct supervision, oriented to a Grid North Azimuth of 160 Degrees.

Daniel L Barry

Daniel L. Barry, PLS

SECOND OPINION COMMUNICATIONS, INC.

Gregory Dahl CPBE
Broadcast Engineer
8009 Living Woods Drive
Rockford, Illinois 61109
Direct: 815.222.3556
gregorydahl@secondopinioncomm.com

Connoisseur Media Licenses, LLC
180 Post Road East
Suite 201
Westport, CT 06880
(203)227-1978

WJRK CP Construction Affidavit

The WJRK CP has been built to specifications as directed by the construction permit, the directional antenna is manufactured by ERI and certified in accordance of the construction permit and height and azimuth is verified by a licensed surveyor in the state of New York. The transmitter is a Nautel VS2.5 with a TPO of 0.919kW operating on a frequency of 95.9MHz.

Best Regards,

COMPLIANCE WITH CONDITION #5

COMMUNITY COVERAGE SUPPLEMENTAL SHOWING
USING AN ALTERNATIVE CONTOUR PREDICTION METHOD
COMMUNITY COVERAGE SUPPLEMENTAL SHOWING
USING AN ALTERNATIVE CONTOUR PREDICTION METHOD
FM STATION WJRK
MINA, NEW YORK
CH 240A 0.82 KW (DA) 200 M

This technical exhibit demonstrates that the measured directional antenna pattern complies with the community coverage provisions of Section 73.315 pursuant to Condition #5 of WJRK's construction permit (CP, BNPH-20130724ABK).

Attached as Figure 2A is a map showing portions of the FCC predicted 70 dBu and 60 dBu coverage contours. As indicated, the FCC predicted 70 dBu contour does not encompass 80% of the principal community of Mina. However, using a terrain sensitive propagation model, the 70 dBu based on the measured directional antenna pattern is predicted to encompass 100% of Mina.

Acceptability of Supplemental Showing

A supplemental showing was submitted with WJRK's CP and accepted by the FCC. Therefore, as this license application is to cover the facilities authorized in WJRK's CP, it is considered appropriate to use a supplemental showing in the context of compliance with coverage of the community of license (Section 73.315).[1] Specifically, as indicated below, there is at least a 23 percent difference in the distance to the 70 dBu contour based on the supplemental method as compared to the distance provided by the standard prediction method. As such, the terrain along propagation paths from the proposed transmitter site towards the Mina city limits "departs widely" from the 50 meter delta standard, thus satisfying the

[1] See *Amendments of Parts 73 and 74 of the Commission Rules to Permit Certain Minor Changes in Broadcast Facilities Without a Construction Permit*, Report and Order, 12 FCC Rcd 12371, 12401-03 (1997)(the "*Minor Changes R&O*"); *KNTV Licensee, 19 FCC Rcd 15479 (2004); Letter to Christopher Sova, Esq. re KFME(FM) from Peter H. Doyle, Chief, Audio Division, Media Bureau (March 5, 2004)("KFME"), affirmed sub nom. CMP Houston-KC, LLC*, Memorandum Opinion and Order, 23 FCC Rcd 10565 (2008*)("KFME MO&O"*); and *Skytower Communications – 94.3, LLC, Request for Determination of Compliance with the Main Studio Location Rule, 47 CFR 73.1125*, Memorandum Opinion and Order and Notice of Apparent Liability for Forfeiture, Facility ID No. 25799, NaL/Acct. No. MB 201041410015, FRN: 0001790724, DA 10-1760.

requirements in the *Minor Changes R&O* that the 70 dBu contour as predicted by the supplemental method be at least 10% larger than the distance based on the standard prediction method.

Longley-Rice Coverage Analysis

The Longley-Rice propagation model[2] was used as more precise alternative to the Commission's standard prediction method to determine the location of the proposed 70 dBu contour. The Mina town limits are located across the arc of azimuths from 106° clockwise to 183° true from the proposed WKRH transmitter site. Therefore, for the Longley-Rice analysis terrain profiles were prepared for the following radials: 106°, 110°, 120°, 130°, 140°, 150°, 160°, 170°, 180° and 183° true. Figure 1A, Sheets 1 thru 10, depicts the 106°, 110°, 120°, 130°, 140°, 150°, 160°, 170°, 180° and 183° true terrain profiles, respectively. The terrain data was derived from the NGDC 3-second terrain database. Using these terrain elevations, calculations of the field strength were made at 0.1-km intervals along each radial using the Longley-Rice propagation model. The following parameters were employed in the calculations:

Model	Point-to-point irregular
Location Variability	50%
Time Variability	50%
Situation Variability	50%
Frequency	95.9 MHz
Polarization	Horizontal
Conductivity	0.005 S/m
Dielectric Constant	15.0
Transmitter Antenna Height AMSL	556 m
Transmitting Antenna	Measured Composite Directional
Maximum Effective Radiated Power	820 W
Receive Antenna Height	9.1 m
Clutter Factor	3 db

[2] Rice, P.L., A.G. Longley, K.A. Norton, and A.P. Barsis, "Transmission Loss Predictions for Tropospheric Communication Circuits," Technical Note 101 (Issued May 7, 1965, Revised January 1, 1967) National Bureau of Standards, Boulder, Colorado.

See also Longley, A.G., and P.L. Rice, "Prediction of Tropospheric Radio transmission Loss Over Irregular Terrain: A Computer Method-1969,"" ESSA Technical Report ERL-ITS 67, Institute for Telecommunications Sciences, Boulder, Colorado, July 1968.

As indicated above, a 3 dB clutter factor was used to take into account field strength variations due to local clutter (e.g. trees, buildings).[3] The results of the study are illustrated graphically on Figure 1A. The field strength data along each radial was analyzed to determine the "median" values using polynomial curve fitting (based on the method of least squares).[4] The location of the "median" 70 dBu field strength level is indicated on each radial based on this analysis.

The 70 dBu contour based on the alternate terrain method (Longley-Rice) has been depicted on Figure 2A. Also shown are the legal boundaries of Mina based on the 2010 Census, the proposed transmitter site and the protected 60 dBu contour based on the FCC's standard prediction method [F(50,50)]. It has been determined that the Longley-Rice 70 dBu encompasses 94.5% of the total land area and 96% of the total 2010 Census population within the Mina town limits.[5]

Compliance with 70 dBu Contour 10% Extension Criteria

The following tabulates the distance to the 70 dBu contour along each radial based on the FCC's standard prediction method [F(50,50)] and the Longley-Rice alternate terrain method, the difference and percent change:

Radial	70 dBu Field Strength (km)		Difference	
	FCC F(50,50)	Longley-Rice	Km	Percent
106°T	8.7	11.5	2.8	+32.2
110°T	8.7	12.2	3.5	+40.2
120°T	8.9	13.2	4.3	+48.3
130°T	9.0	13.7	4.7	+52.2
140°T	8.7	14.0	5.3	+60.9

[3] Use of a 3 dB clutter factor appears "conservative" for the propagation paths considered here. For instance, a 2 dB clutter factor was used by the FCC to establish that KALF-FM at Red Bluff, California encompassed its main studio location - see Memorandum from William Daniel, Chief, Propagation Analysis Bureau, OET, to Dennis Williams, Chief, FM Branch, MMB, dated Oct. 6, 1992 concerning the supplemental showing of 3.16 mV/m contour of KALF-FM, Red Bluff, CA, File BLH-851125KH. In addition, Bullington indicated that the average loss from surrounding trees for horizontal polarization may be 2 to 3 dB (see Kenneth Bullington, "Radio Propagation at Frequencies Above 30 Megacycles, Proc IRE, October, 1947).

[4] The polynomial equation used for the analysis is shown on each graph as a dashed line along with the R-squared value, which helps determine the line of best fit.

[5] It is noted that the 60 dBu, F(50,50) contour based on the FCC's standard prediction method encompasses 100% of the Mina town limits.

150°T	9.0	12.8	3.8	+42.2
160°T	9.0	13.8	4.8	+53.3
170°T	10.2	22.4	12.2	+119.6
180°T	9.3	12.2	2.9	+31.2
183°T	9.5	11.7	2.2	+23.2

The difference between the distances to the 70 dBu contours exceeds 10 percent.

Sample Calculation

The following provides a sample Longley-Rice calculation along the 150° true radial.

Free Space Field (0.82 kW @ 14.0 km)	82.7 dBu
Additional estimated transmission loss	6.6 dB
Clutter Loss	3 dB
Net received field	73.1 dBu

Conclusion

As demonstrated above, the WJRK measured directional antenna pattern complies with the community of license coverage requirements of Section 73.315 based on the supplemental showing.

W. Jeffrey Reynolds

du Treil, Lundin & Rackley, Inc.
3135 Southgate Circle
Sarasota, Florida 34239-5515
(941) 329-6000
JEFF@DLR.COM

November 2, 2017

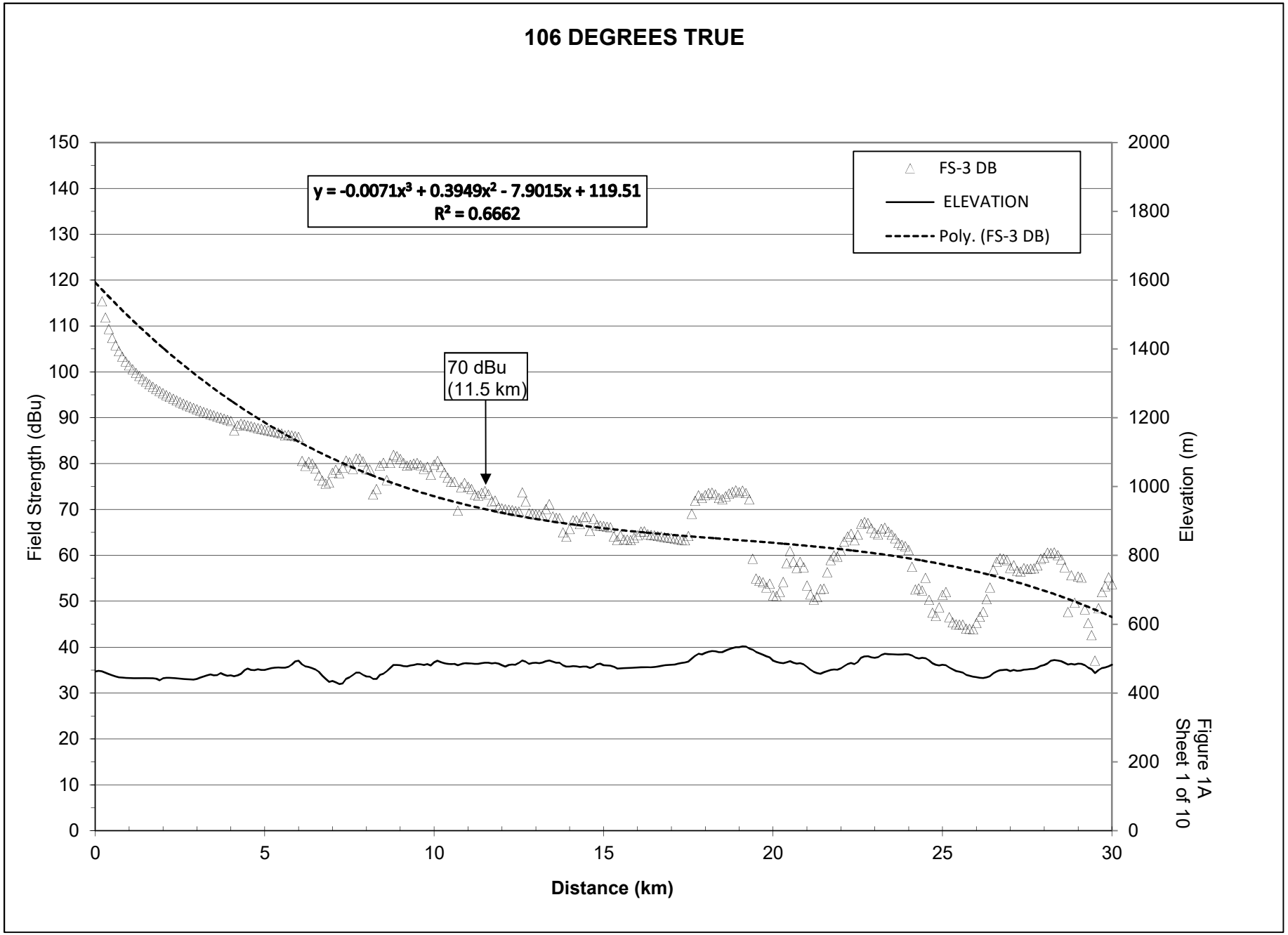


Figure 1A
Sheet 1 of 10

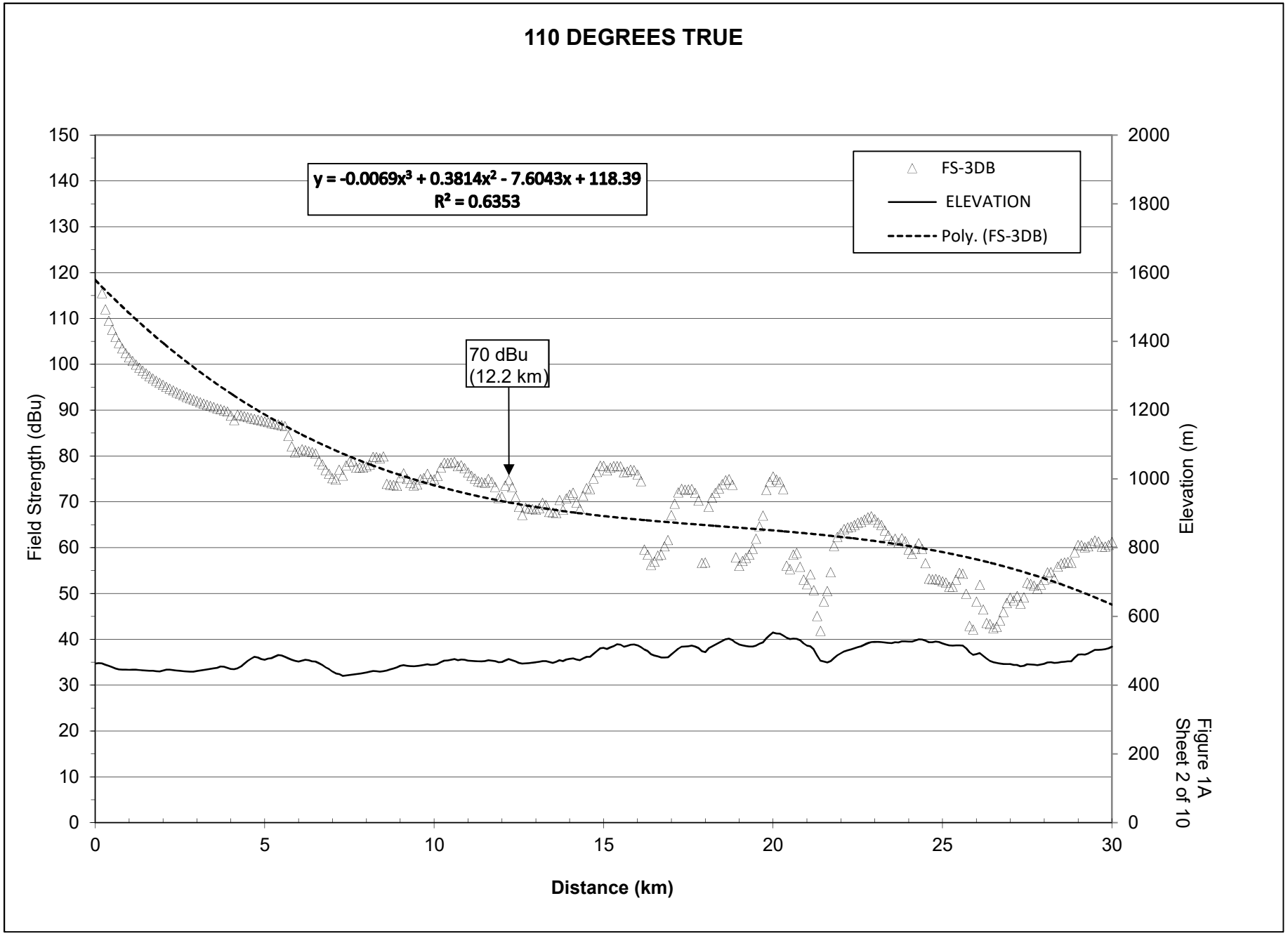


Figure 1A
Sheet 2 of 10

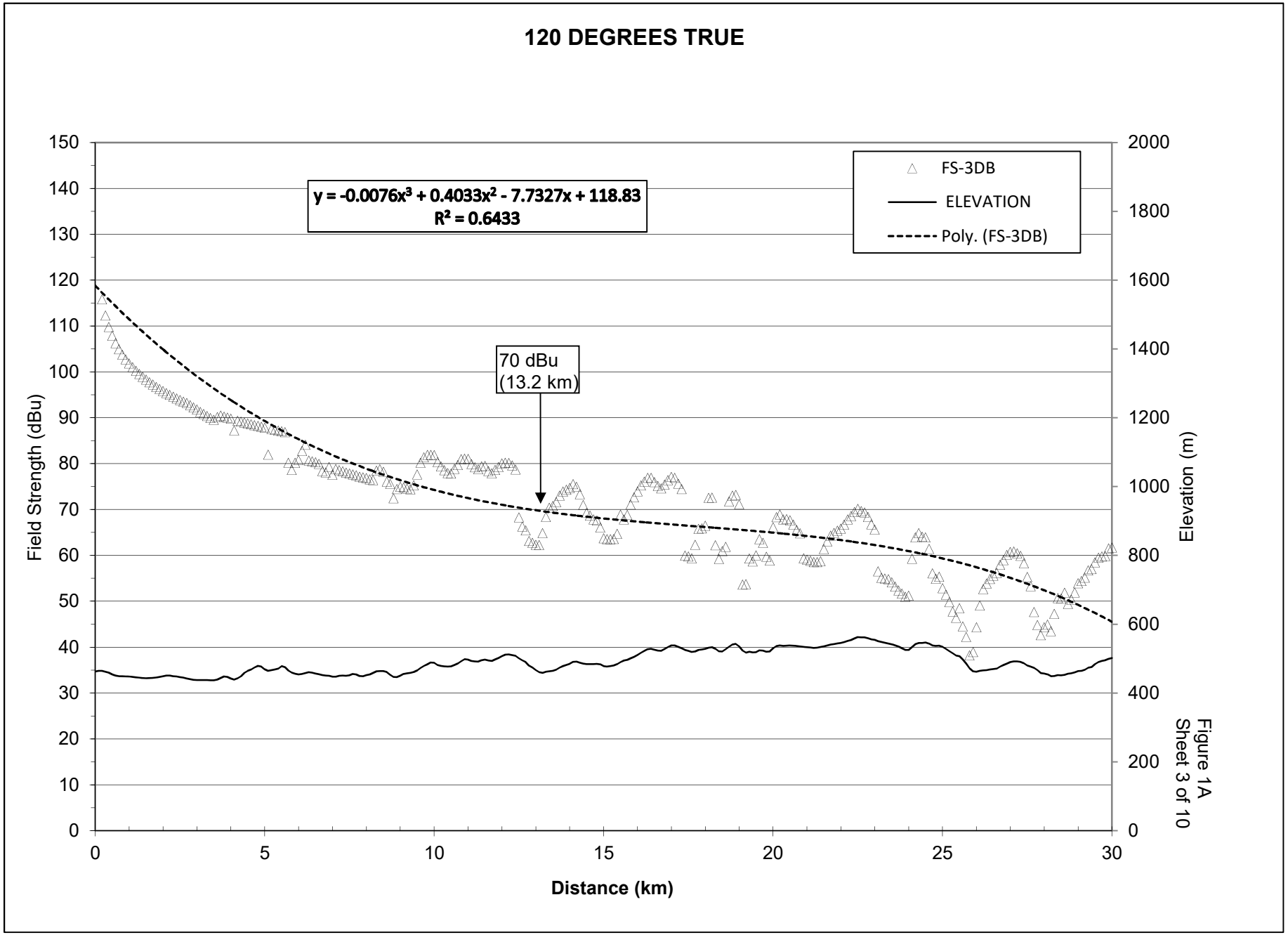


Figure 1A
Sheet 3 of 10

130 DEGREES TRUE

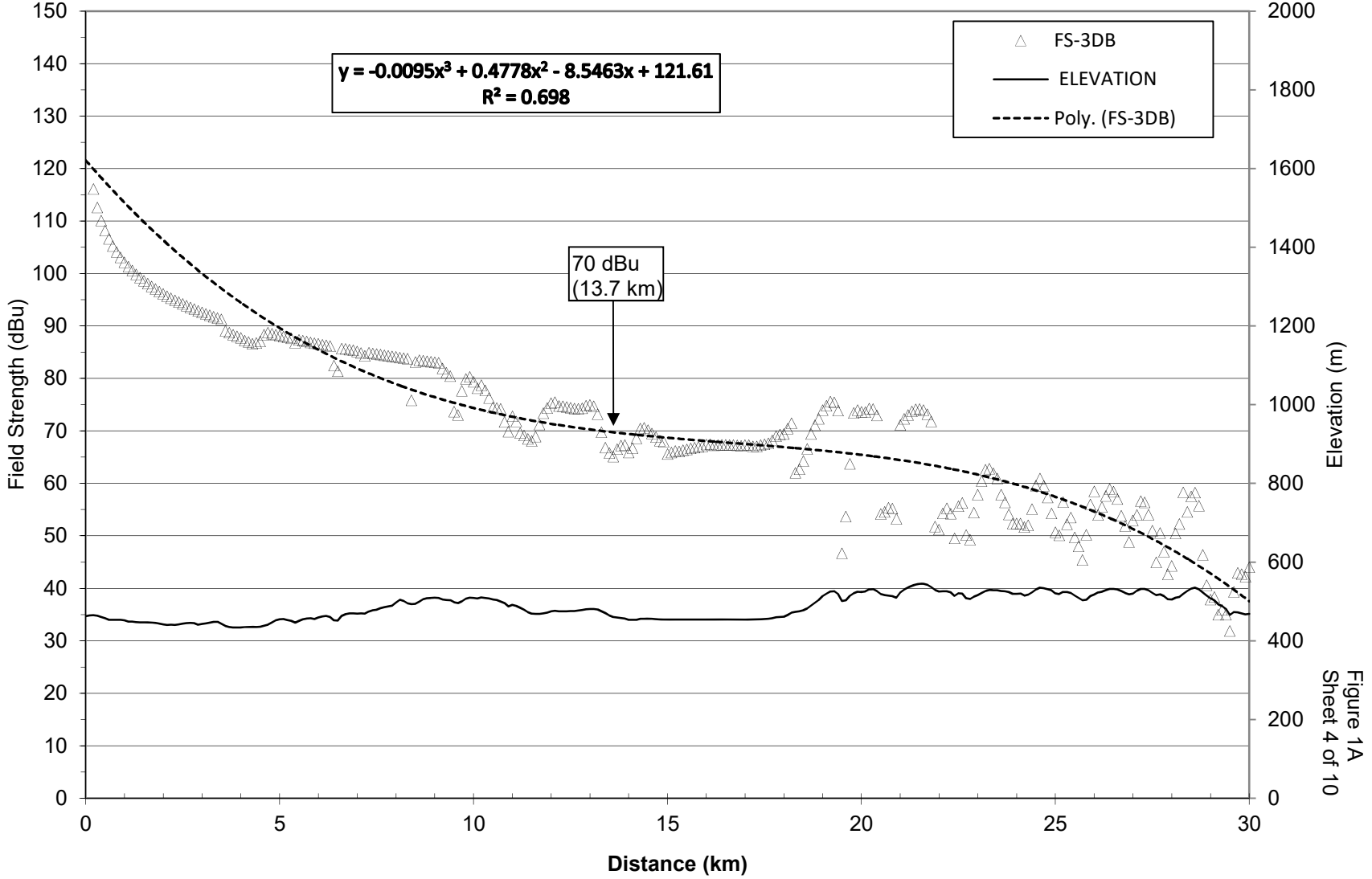


Figure 1A
Sheet 4 of 10

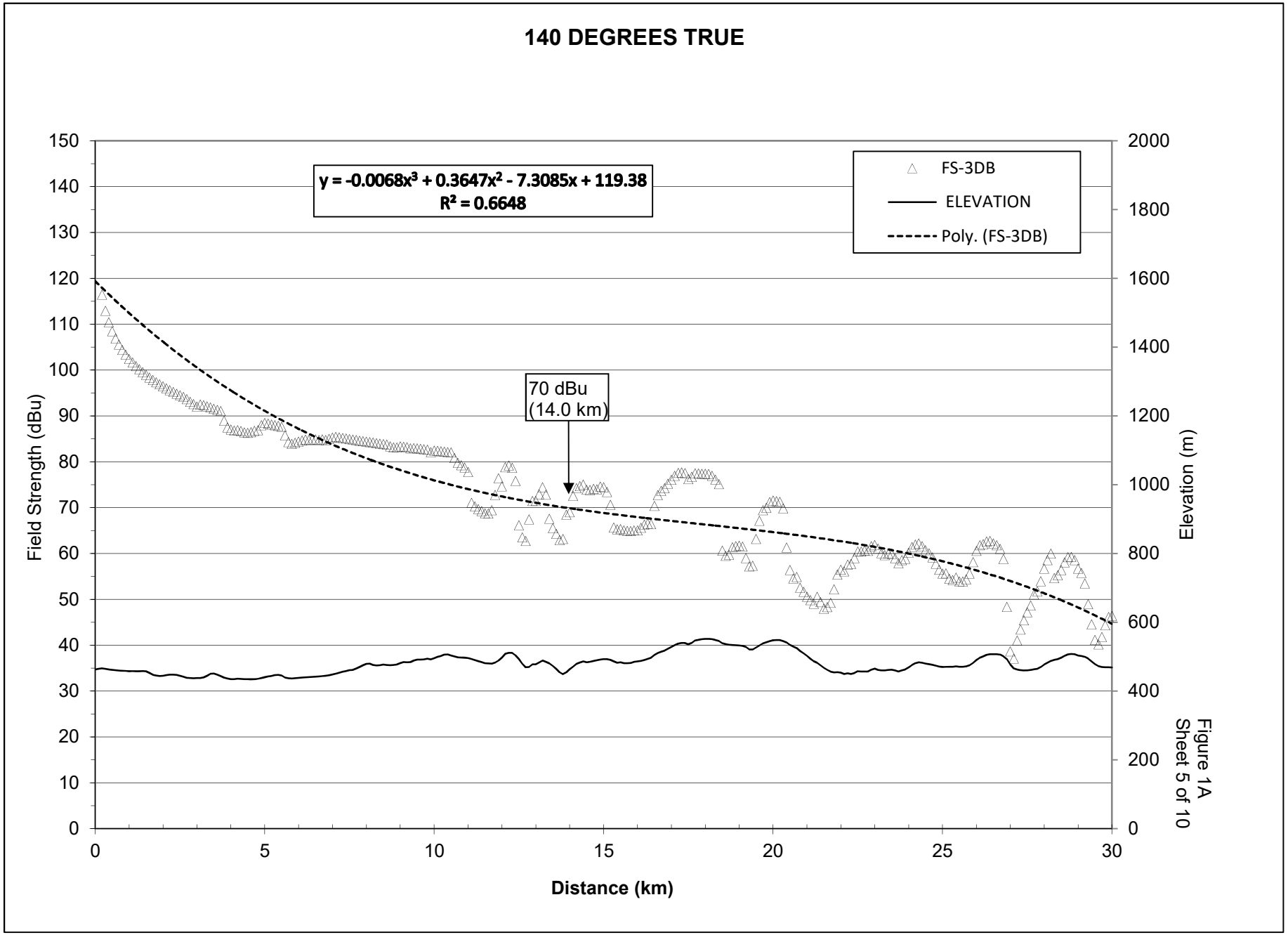


Figure 1A
Sheet 5 of 10

150 DEGREES TRUE

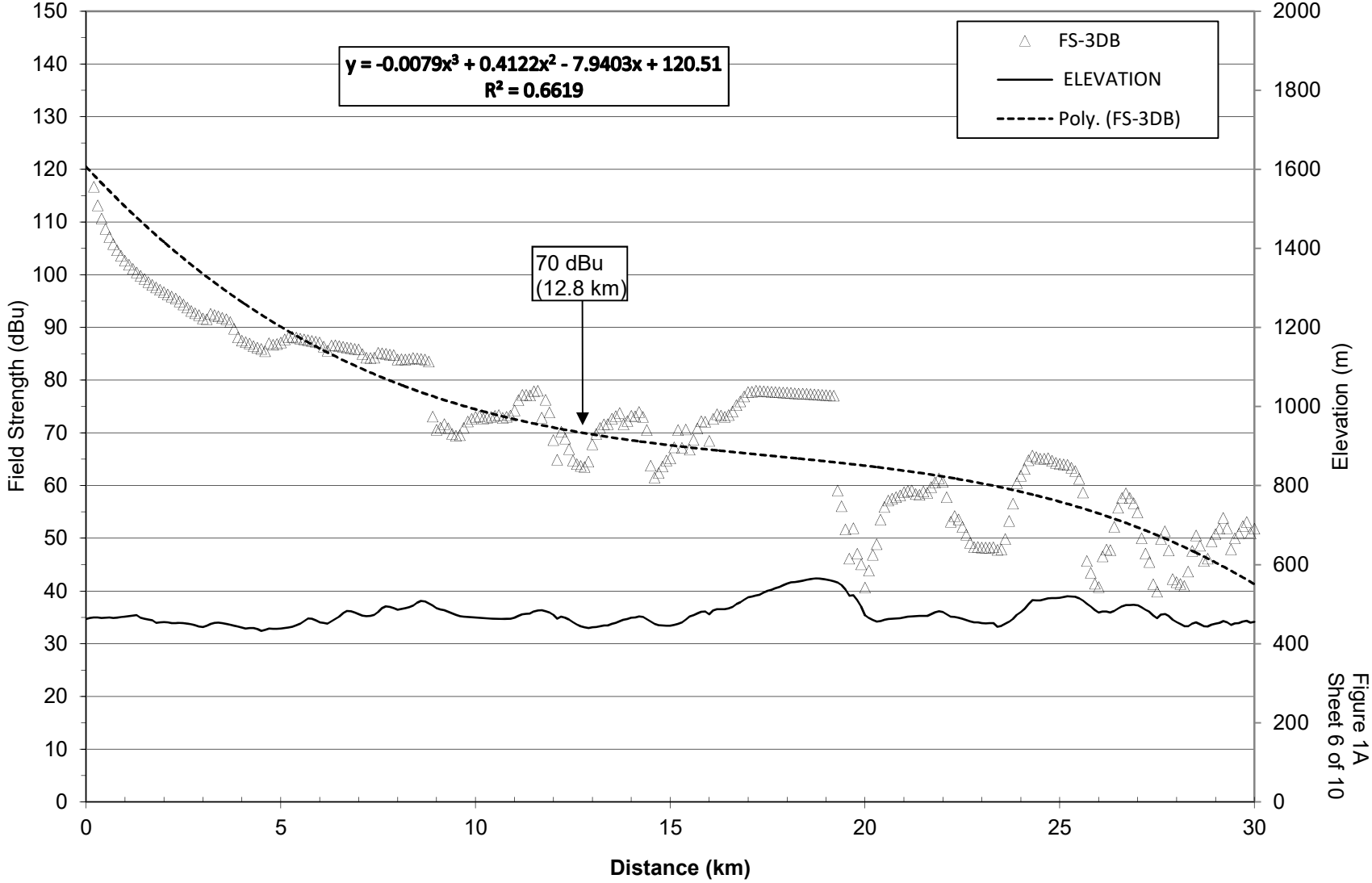


Figure 1A
Sheet 6 of 10

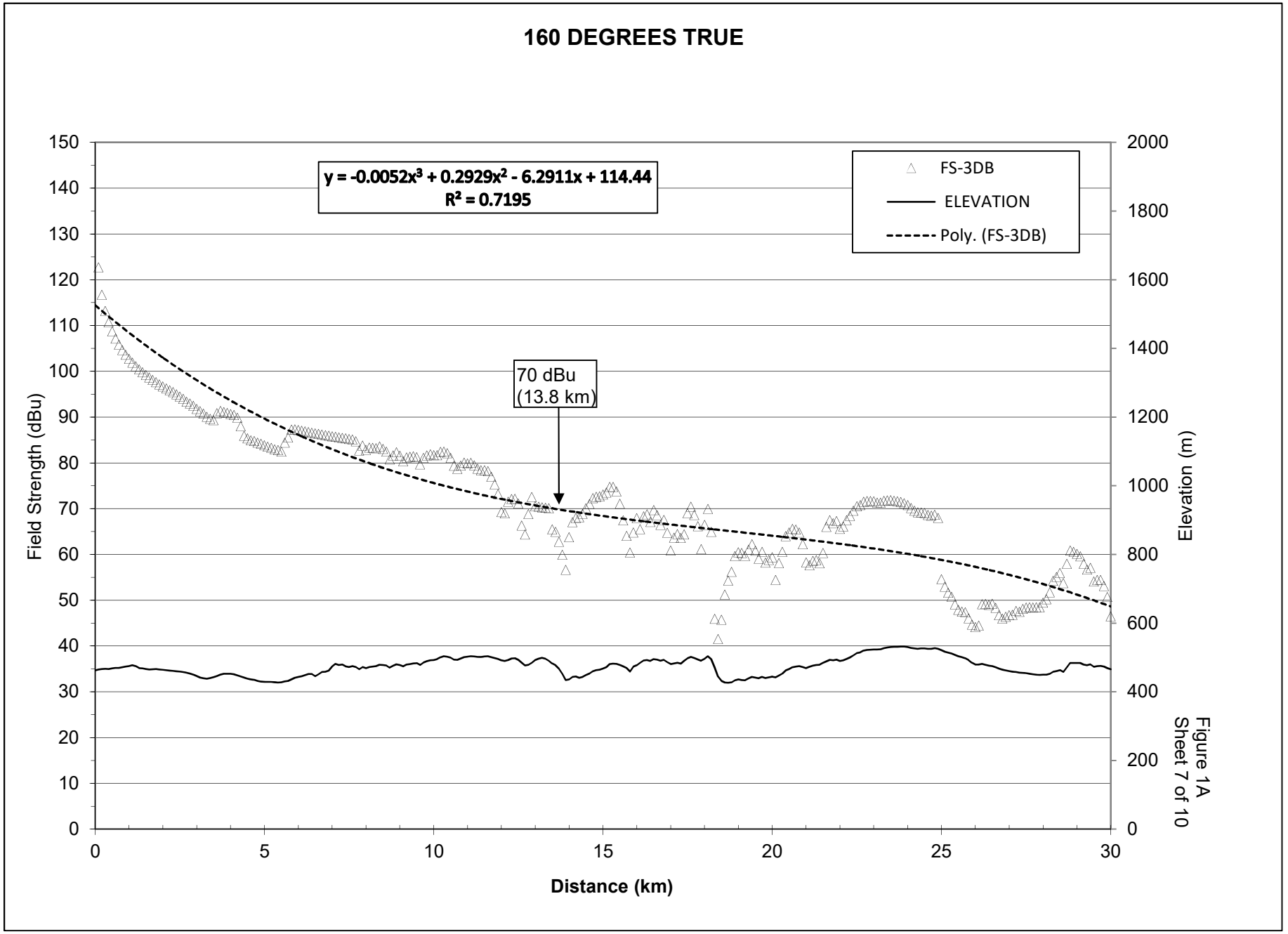


Figure 1A
Sheet 7 of 10

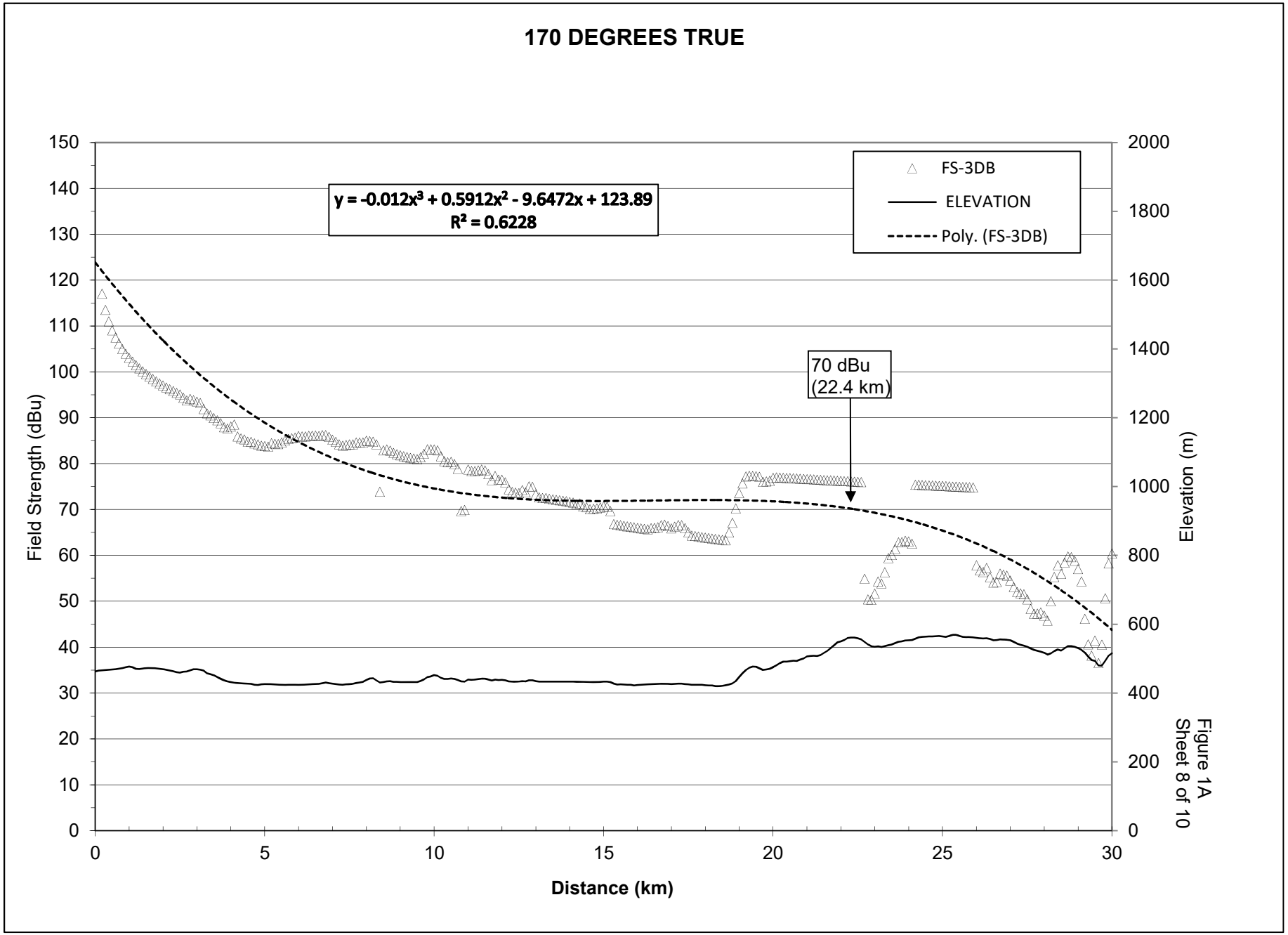


Figure 1A
Sheet 8 of 10

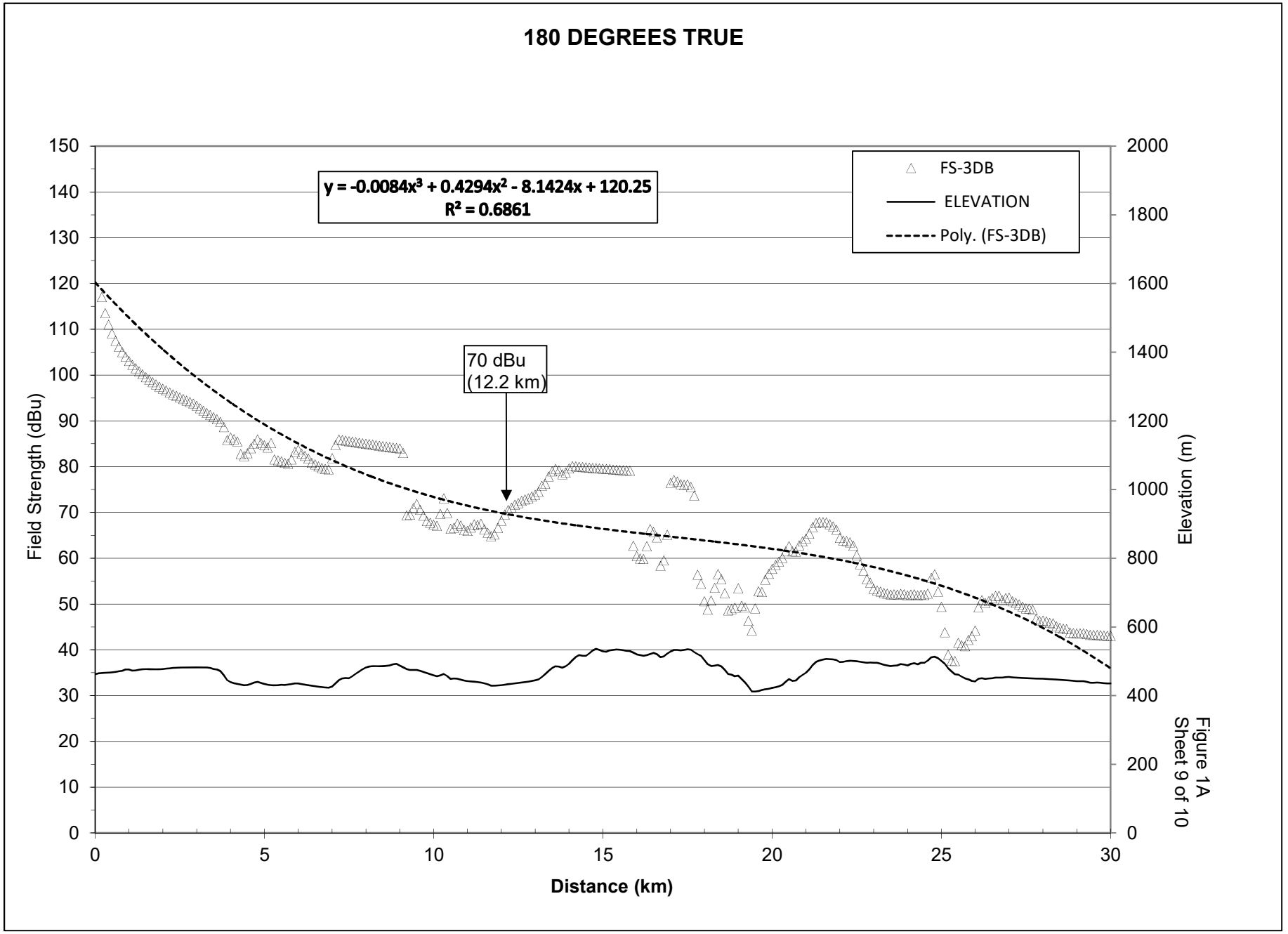


Figure 1A
Sheet 9 of 10

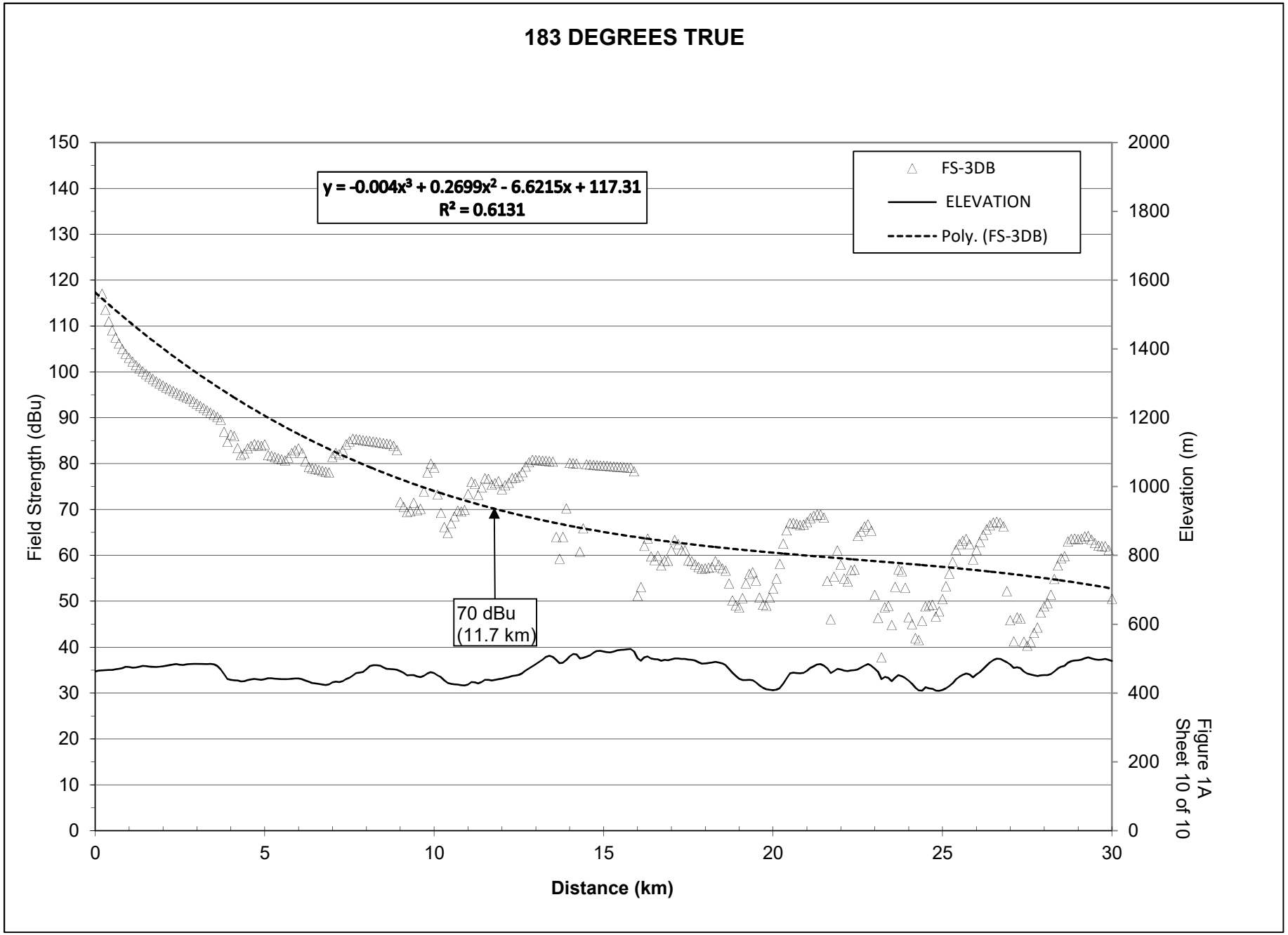
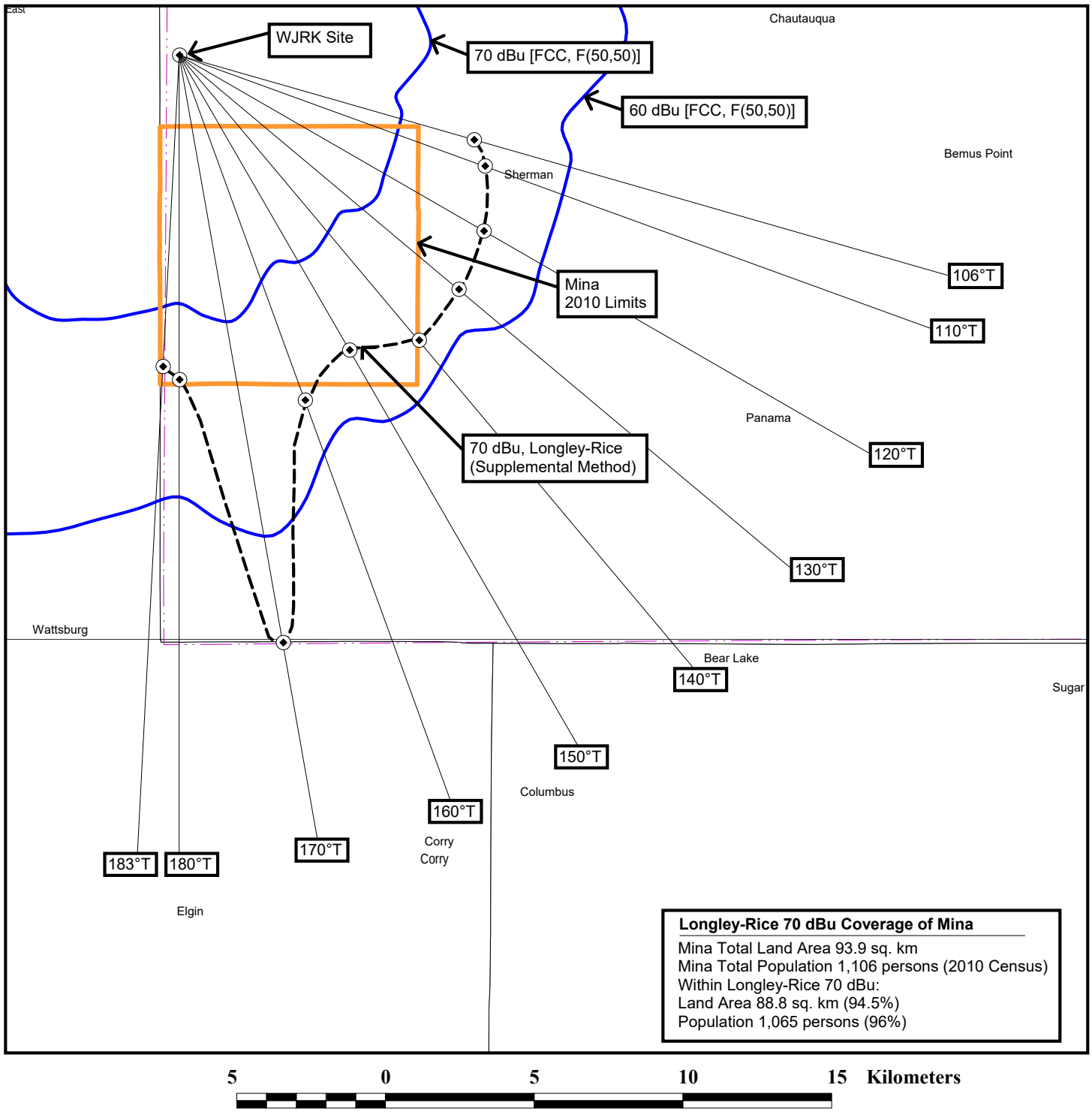


Figure 1A
Sheet 10 of 10

Figure 2A



70 DBU - SUPPLEMENTAL SHOWING

STATION WJRK
MINA, NEW YORK
CH 240A (95.9 MHZ) 0.82 KW (DA) 200 M

du Treil, Lundin & Rackley, Inc. Sarasota, Florida