

**APPENDIX D - PHOTOSIMULATION
MAP**

ISABELLE
SUBSTATION

NE County Line Road

Evans Street

Main Street



**APPENDIX D - PHOTOSIMULATION
EXISTING CONDITION**



**APPENDIX D - PHOTOSIMULATION
PROPOSED MONOPOLE**





ISABELLE
SUBSTATION

NE County Line Road



Evans Street

Main Street

Existing

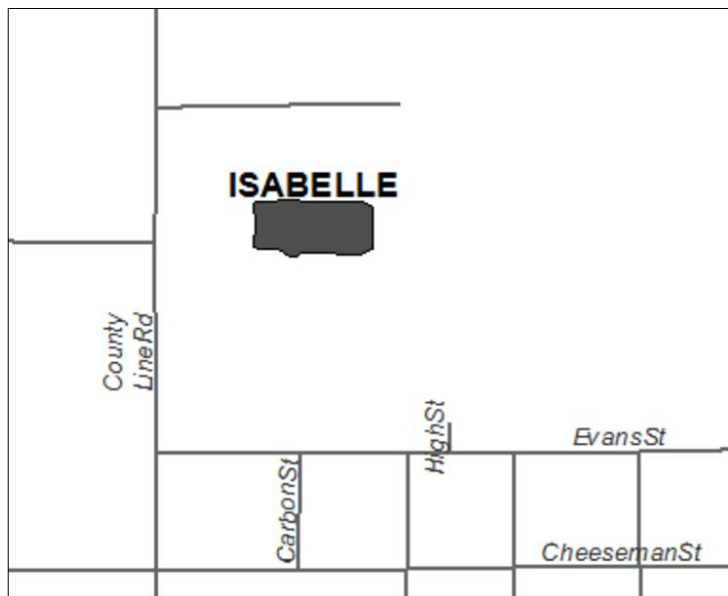


Proposed

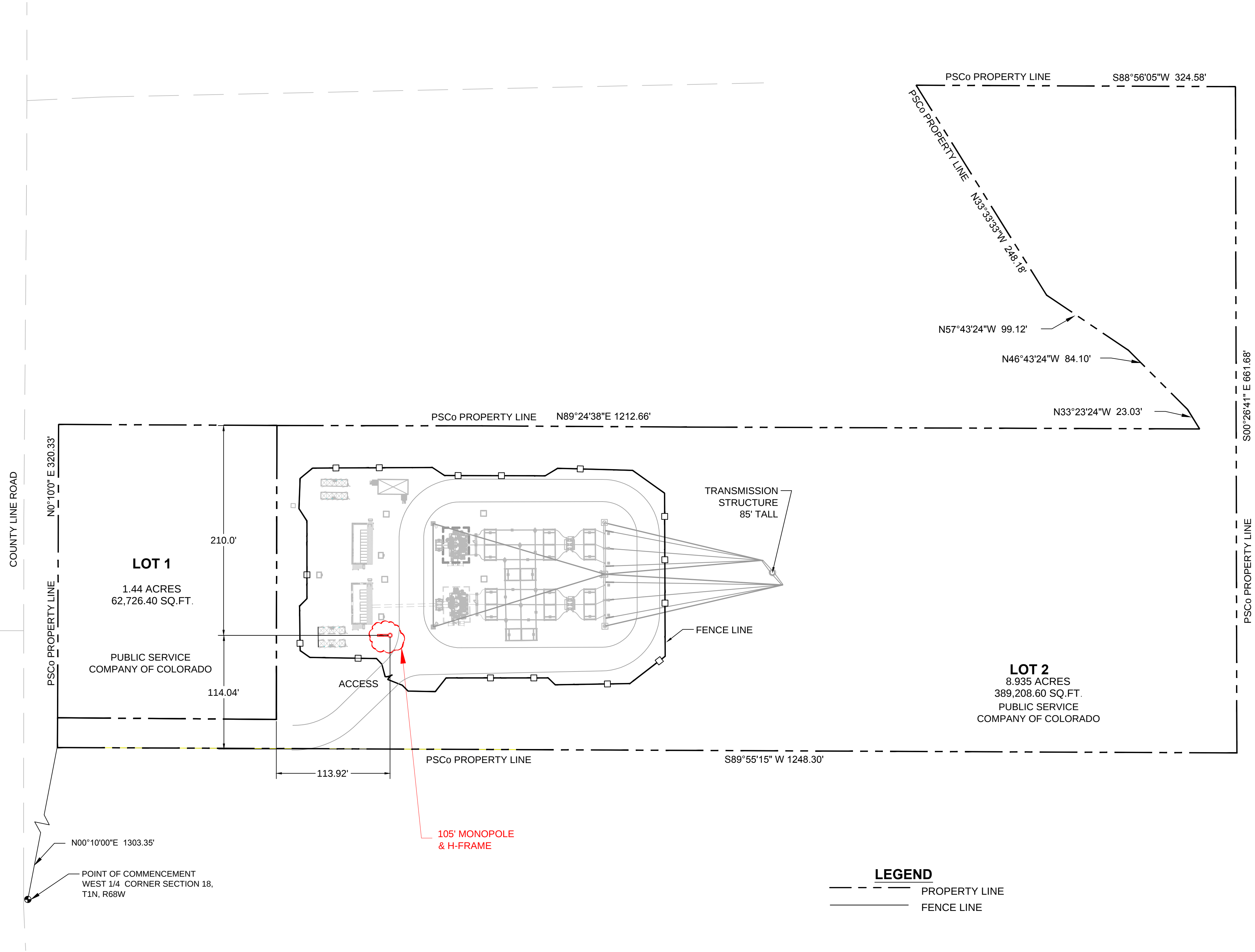


PUBLIC SERVICE COMPANY OF COLORADO
ISABELLE SUBSTATION
FAN PROJECT

LOCATED IN LOT 2 OF SECTION 18, T1N, R68W
WELD COUNTY, STATE OF COLORADO
SPECIAL REVIEW PERMIT PLAN MAP



VICINITY MAP
NOT TO SCALE

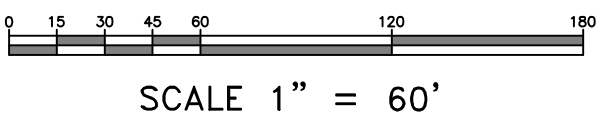


NOTE: THE INFORMATION CONVEYED BY THESE DRAWINGS
IS FOR REFERENCE PURPOSES ONLY
AND DOES NOT CONSTITUTE A LAND SURVEY.

ISABELLE SUBSTATION
905 County Line Road, Erie CO 80516

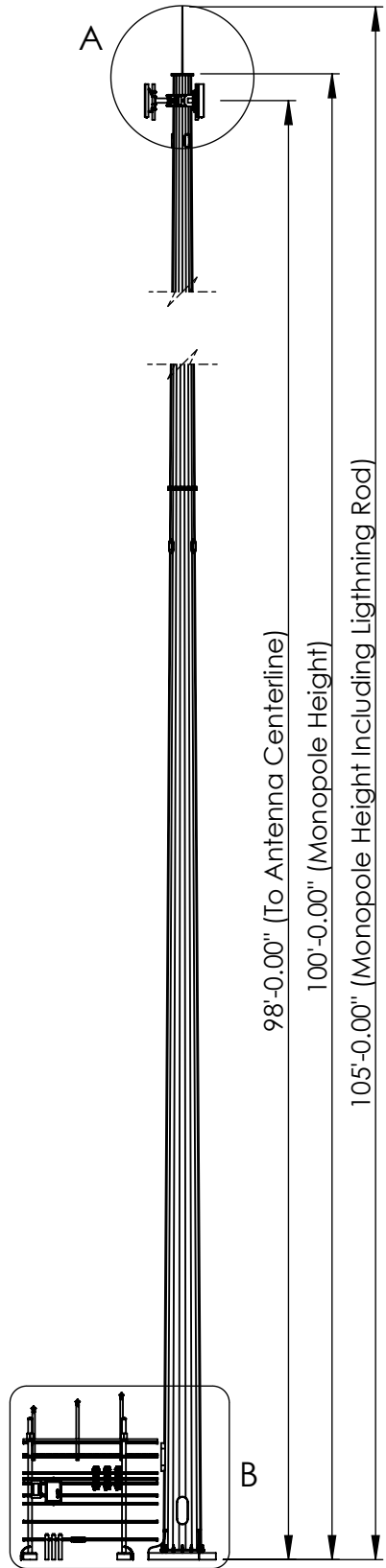


PUBLIC SERVICE COMPANY OF
COLORADO SITING AND LAND RIGHTS
1800 LARIMER STREET, SUITE 400
DENVER, COLORADO 80202
(303) 571-7799



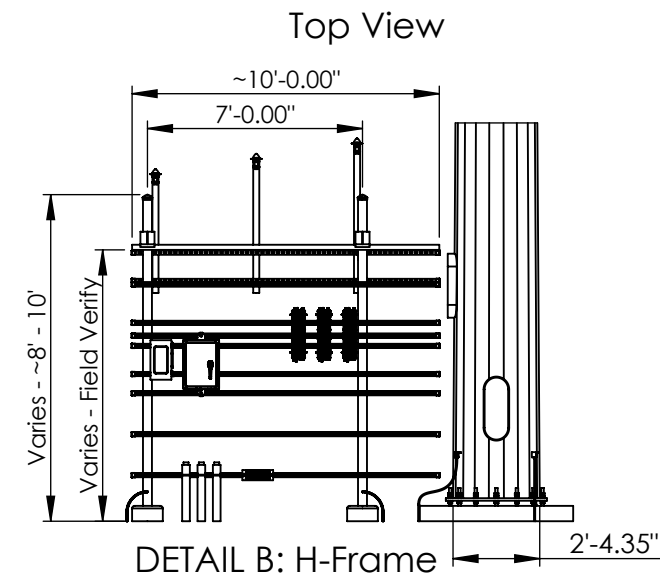
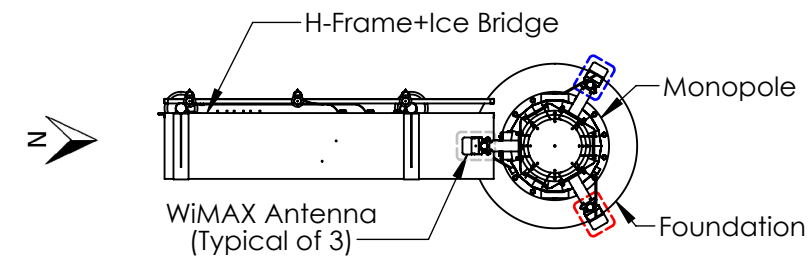
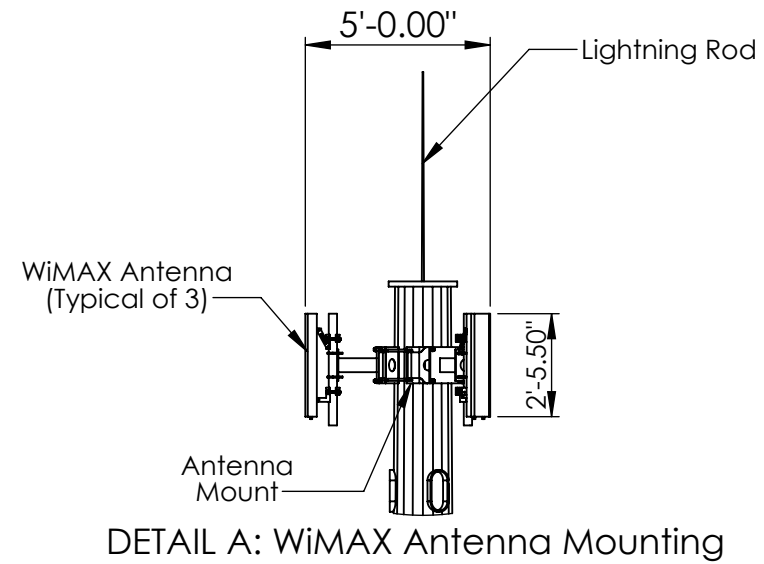
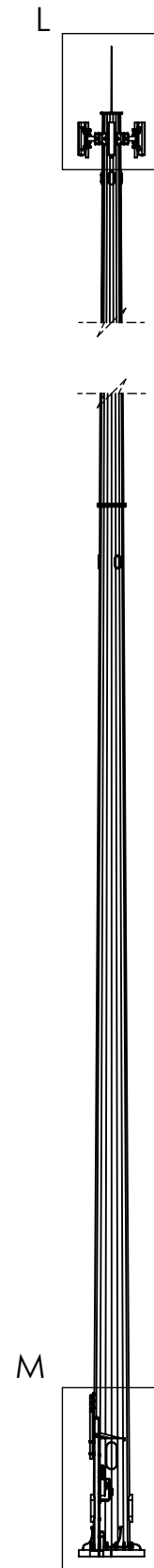
ORIG. DWG.:
REV. BY: I. FRIDMAN
DATE: 3/8/19
APPROVED: L. CLAXTON
DATE: 3/8/19

REVISION	DATE
SHEET	1 of 1



Notes:

- Preliminary schematic design only - not for construction.
- Dimensions are approximate and subject to field verification.
- Drawing not to scale.

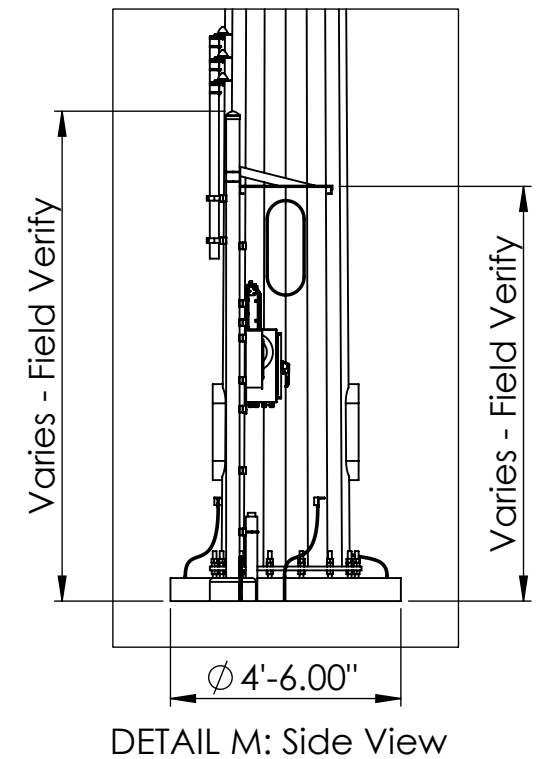
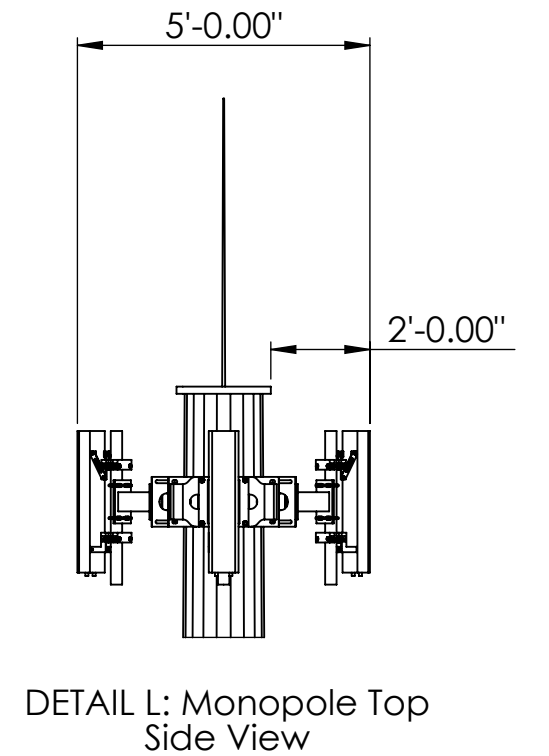


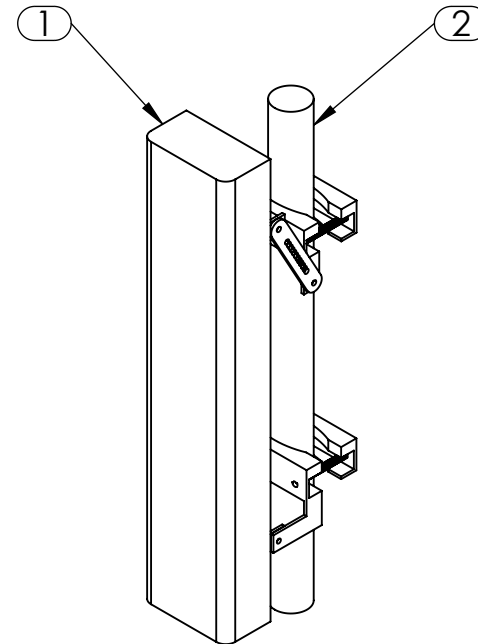
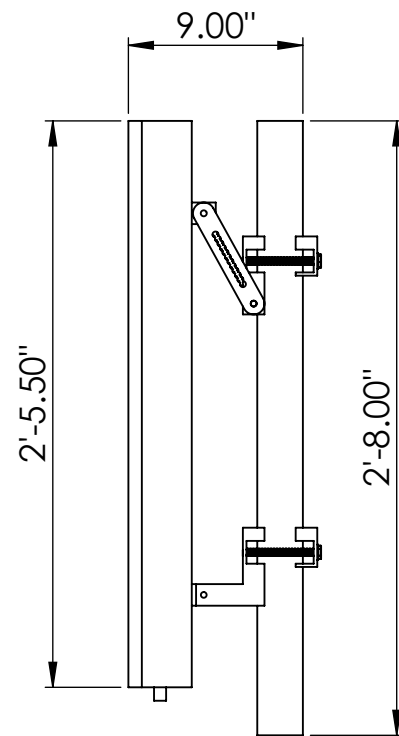
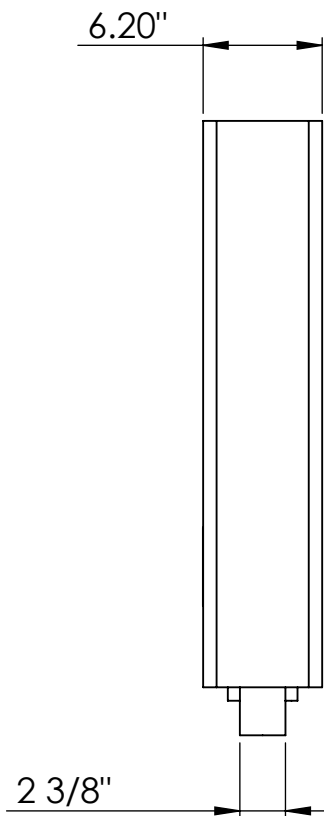
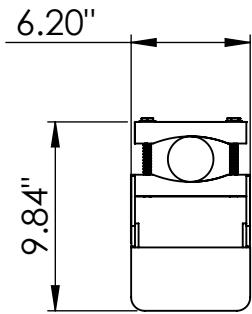
Notes:

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APPENDIX B - MONOPOLE STRUCTURE DRAWING

PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF COUNCIL ROCK. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF COUNCIL ROCK IS PROHIBITED.	 Xcel Energy[®] RESPONSIBLE BY NATURE[®]	SIZE	Isabelle		REV
	COUNCILROCK Smart Private Networks	B	Installation Overview		0.1
		Date: 11-07-18		SHEET 1 OF 4	





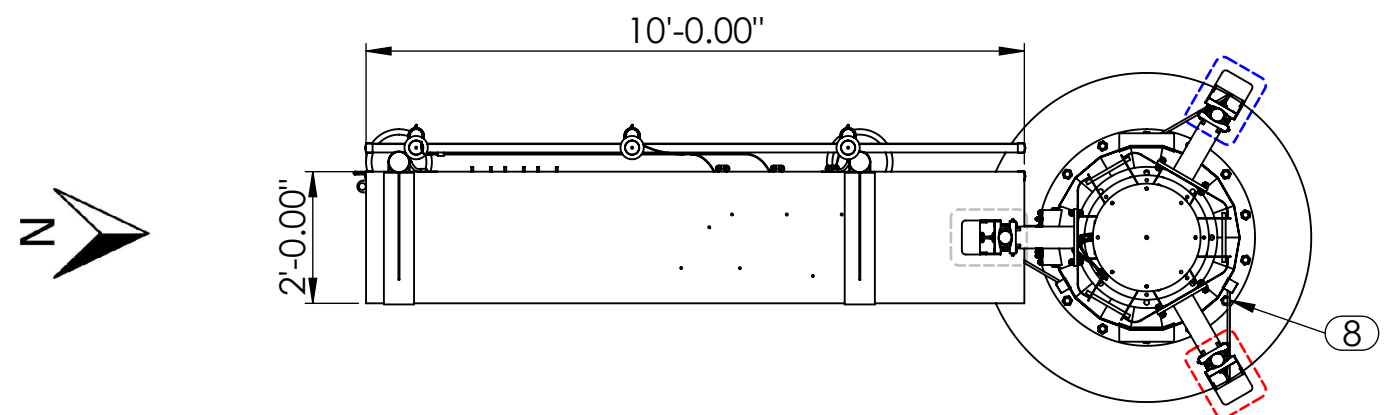
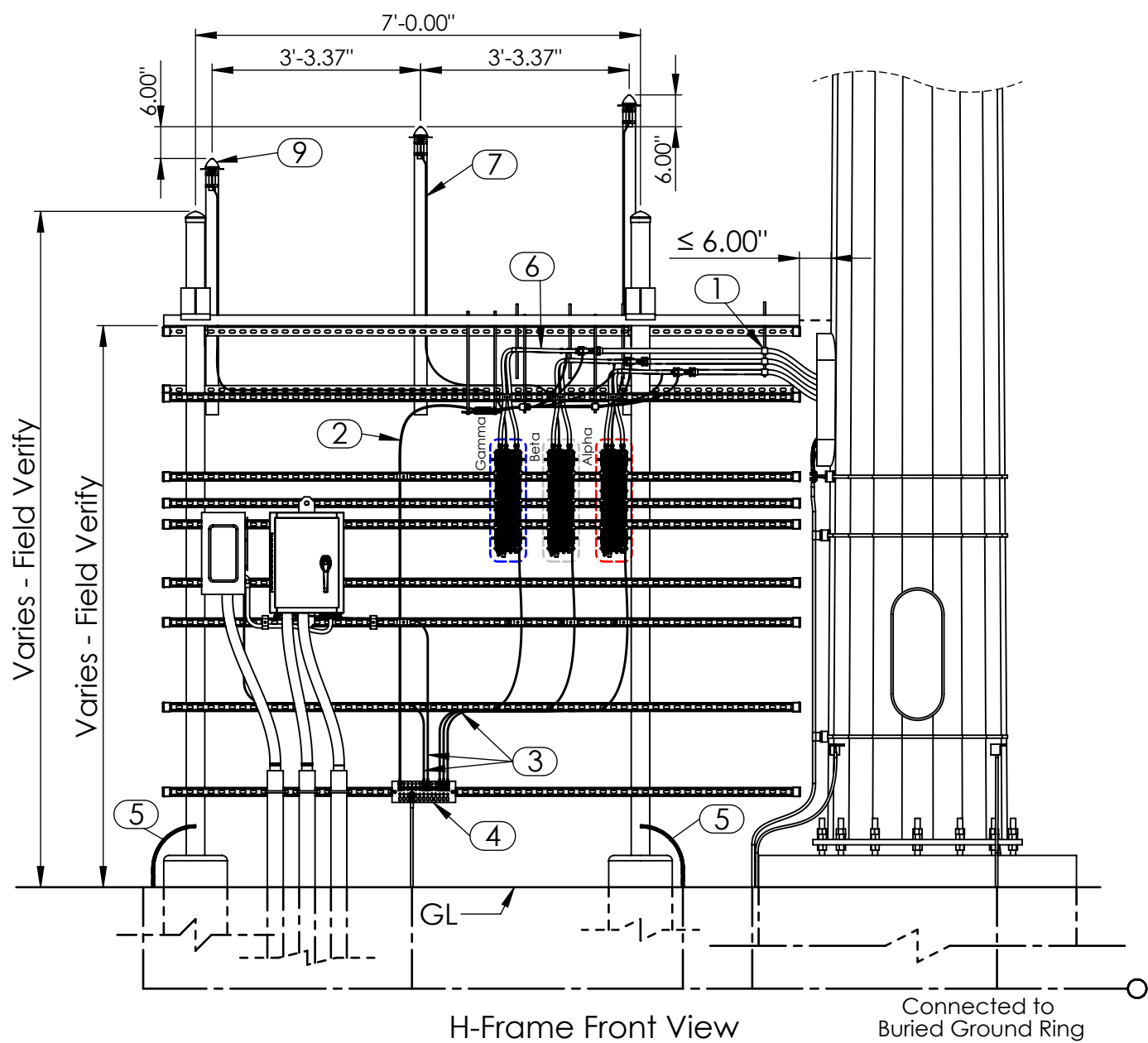
Keyed notes

- ① WiMAX Antenna
- ② 2'-8.00" L x 2 3/8" OD Antenna Pipe

- Notes:
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			Date: 11-07-18	SHEET 2 OF 4



Keyed Items

- | | |
|--|--|
| ① 7/8" Cable Support Blocks (3) | ⑥ Coax Jumpers (6) |
| ② #2 AWG Insulated (GRN) | ⑦ GPS Cables (3) |
| ③ #6 AWG Insulated (GRN) | ⑧ 4/0 Bare Grounding Lead
Connected to Monopole
Grounding Tabs (3) |
| ④ Only Bus Bar w/isolators
(ANSI T1 313-2003) | ⑨ GPS Antennas (3) |
| ⑤ 4/0 AWG Exothermic Welded
GND Jumper | |

Notes:

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- Drawing not to scale.

APPENDIX B - MONOPOLE STRUCTURE DRAWING

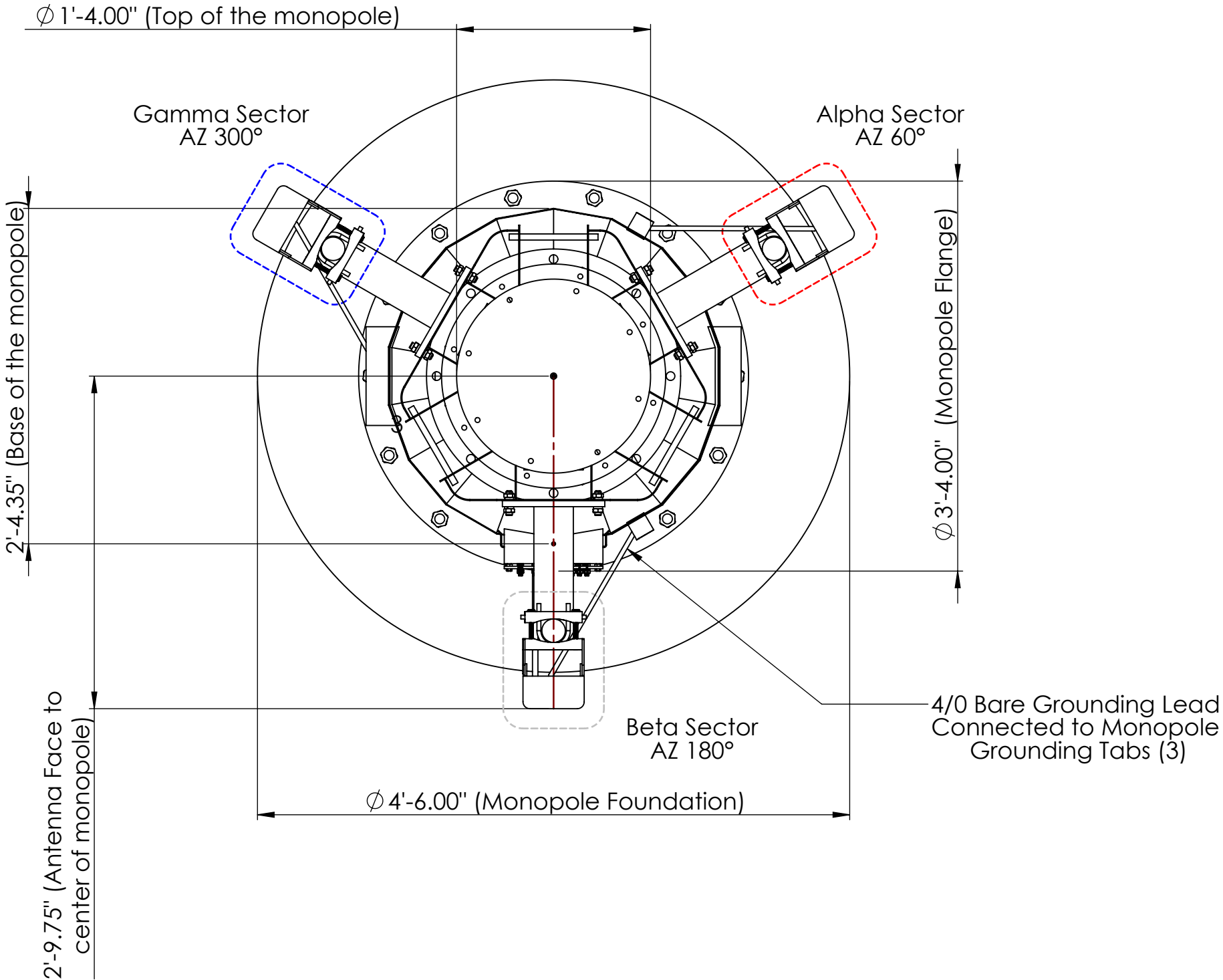
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF COUNCIL ROCK. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF COUNCIL ROCK IS PROHIBITED.	 Xcel Energy[®] RESPONSIBLE BY NATURE[®]	SIZE	Isabelle - H-Frame Installation Detail		REV 0.1
	B				
	 COUNCIL ROCK Smart Private Networks	Date: 11-07-18		SHEET 3 OF 4	

4

3

2

1



- Notes:
- Preliminary schematic design only - not for construction.
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 - Drawing not to scale.

APPENDIX B - MONOPOLE STRUCTURE DRAWING

PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS
DRAWING IS THE SOLE PROPERTY OF
COUNCIL ROCK. ANY REPRODUCTION IN
PART OR AS A WHOLE WITHOUT THE
WRITTEN PERMISSION OF COUNCIL
ROCK IS PROHIBITED.



SIZE
B

Isabelle
Monopole Top View

REV
0.1

Date: 11-07-18

SHEET 4 OF 4

4

3

2

1

3300-3800MHz Sector Antenna

(Dual Port, 65° Beamwidth, +/-45° Polarisation, Fixed Tilt)

*The parameters in this specification follow the definitions and recommendations per NGMN P-Basta, Release 9.6

RF Specifications

Frequency Range per Input	MHz	3300 - 3800
Polarisation:	NA	+/-45° Slant Linear
Gain		
Over all Tilts	dBi	18
Azimuth Beamwidth	Degree	65
Azimuth Beam Squint	Degree <	3
Elevation Beamwidth	Degree	7
Electrical Downtilt:	Degree	T0° or T4°
Electrical Downtilt Deviation	Degree <	1
Impedance	Ohms	50
VSWR	NA <	1.4
Return Loss:	dB >	15
Isolation	dB >	28
Front to Back Ratio: Total Power +/-30°	dB >	30
Upper Sidelobe Suppression, Peak to 20°	dB >	18
Cross Polar Discrimination at Sector	dB >	16
Maximum Effective Power Per Port	W	100



Mechanical Specifications

Dimensions (LxWxD) mm (in) (inc RET)	mm (in)	750 (29.5) x 160 (6.2) x 85 (3.3)
Packing Size (LxWxD)	mm (in)	823(32.4) x 240(9.4) x 178(7)
Net Weight (antenna)	kg (lb)	4.3 (9.4)
Net Weight (mount)	kg (lb)	1.43 (3.1)
Shipping Weight	kg (lb)	5.7 (12.5)
Connector Quantity	NA	2 x N Type Female
Connector Position	NA	Bottom
Windload calculation	km/h	$F=1/2 \cdot \rho \cdot (C_{dp} \cdot \lambda) \cdot v^2 \cdot A$
Windload Frontal	N	240
Windload Lateral	N	130
Survival Wind Speed	km/h	200 (125)
Radome Material	NA	UV-Stabilised PVC
Radome Colour	RAL	7035
Product Compliance Environmental	NA	RoHS
Lightening Protection	NA	DC Grounded
Cold Temperature Survival	Celsius	-40
Hot Temperature Survival	Celsius	+ 70

Ordering Information:

* T0 (Electrical Tilt 0)

** T4 (Electrical Tilt 4)

PROJECT MONOPOLE GALVANIZED EXTERIOR TREATMENT COLOR SAMPLES



This is a picture of an existing FAN monopole located at PSC's Argo Substation. Prior to its installation, the monopole was stored on its side for approximately one year. The grey color on the right side of the monopole was on top during storage and subjected to weathering. The silver color on the left side of the monopole is the original color. It was on the bottom during storage and protected from the elements.



This is a picture of an electric transmission monopole located across Inca Street from PSCo's Argo Substation. This galvanized monopole has been in place for several years. The Project monopole will fade to a similar color following several years of weathering.



Picture of Argo FAN Tower (looking NW)



Picture of Broomfield FAN Monopole with Full Sunlight

Xcel Energy – PSCO

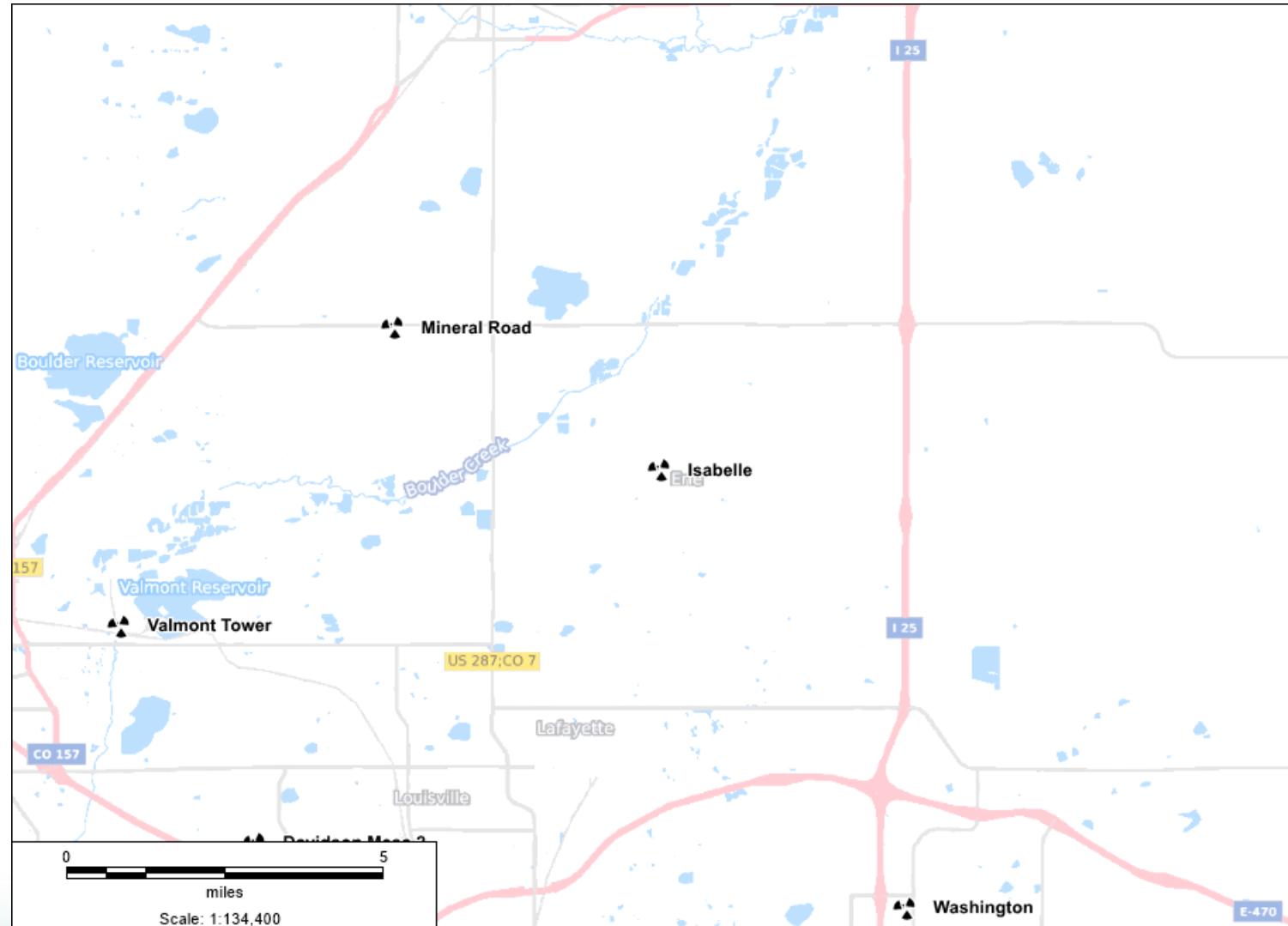
Feasibility studies: Isabelle

Analysis of 100ft / 75ft



Overview Map

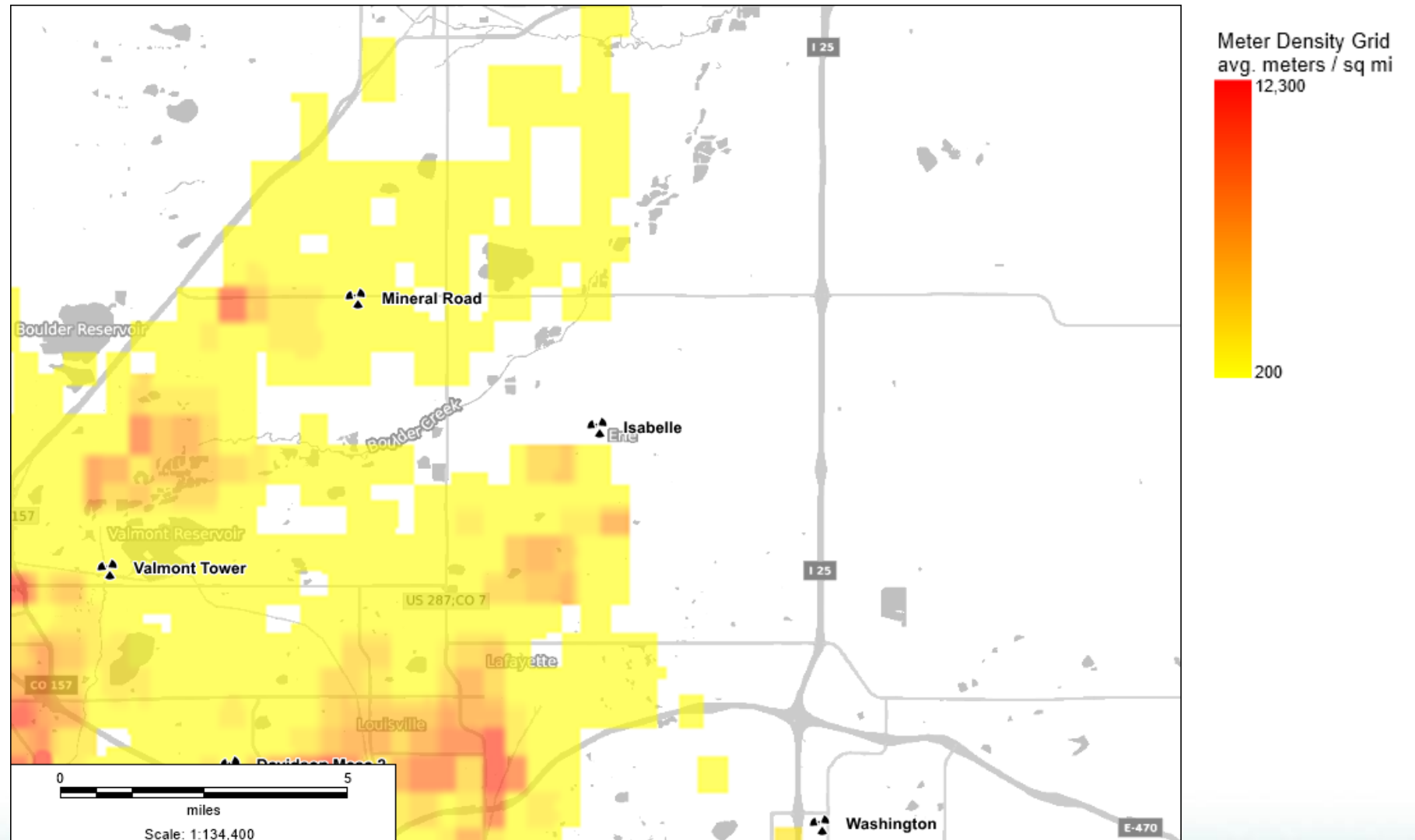
Isabelle is North of Denver, East of Boulder. Nearest neighboring base stations are Mineral Road and Washington.



Service Area: Electric

Isabelle is just Northeast of pockets of dense meters near Nine Mile Corner.

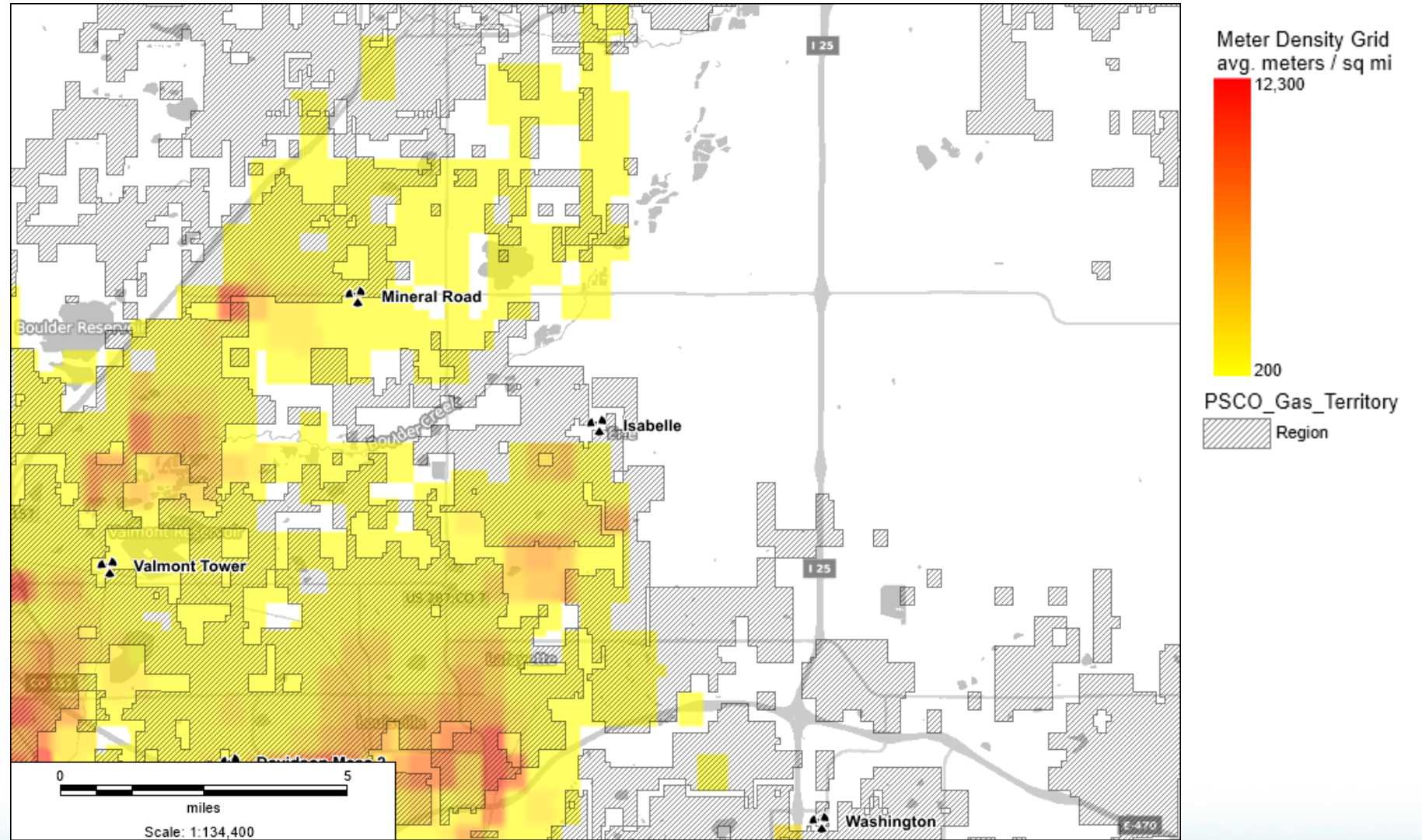
Meter density data is from the XCEL map:
"PSCo Electric Meter Density.pdf" dated 6/2/16



Service Area: Electric and Gas

Isabelle is within the Gas Territory.

Gas area is from XCEL map:
“PSCo Gas and Electric Service Territories.pdf”, dated 6/9/16



RF Propagation Modeling

System Inputs

Inputs:

- Location information [**XLSX**]
"BaseStationListsPSCo20180108.xlsx"
- Base Station Locations per XLSX.
- Base Station Heights: per XLSX.
- CPE Heights: 40ft
- Sectorization: 3 sectors 60/180/300 deg azimuth except as noted in XLSX

Propagation Model Info:

- Model: CRC Predict v4.8
- Frequency: 3650 MHz
- Geodata:
Infovista Cityscape 30m, 2005/2012/2013 vintage

Radio Info:

- Base - Airspan Airsynergy
 - (3) Sectors of 18dBi, 65 degree antennas
 - 40dBm Max EIRP
- CPE - Airspan MiMAX
 - 15dBi integrated 28 degree antenna
 - 40dBm Max EIRP

RF Propagation Maps

coverage concepts

- **Best Server**
- **Predicted Coverage**
- **Predicted Signal**
- **Footprint**

Signal is simulated with an untuned propagation model.

All planned Base Stations are included in the simulation.

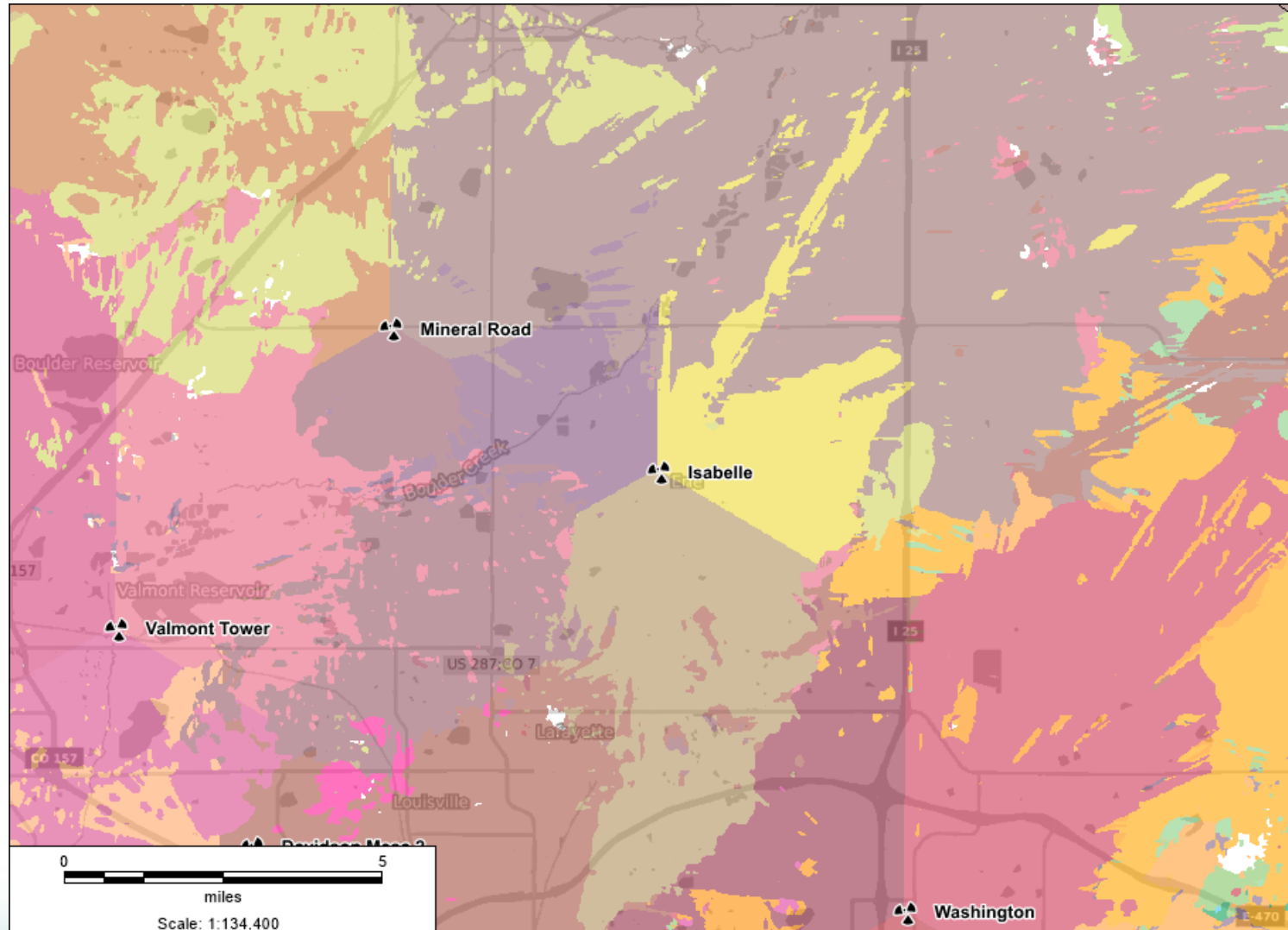
Areas are colored by Base Station Sector.

One color = One Sector

Coverage: -96dBm - the lowest signal level for a usable link between Base and CPE (from field testing).

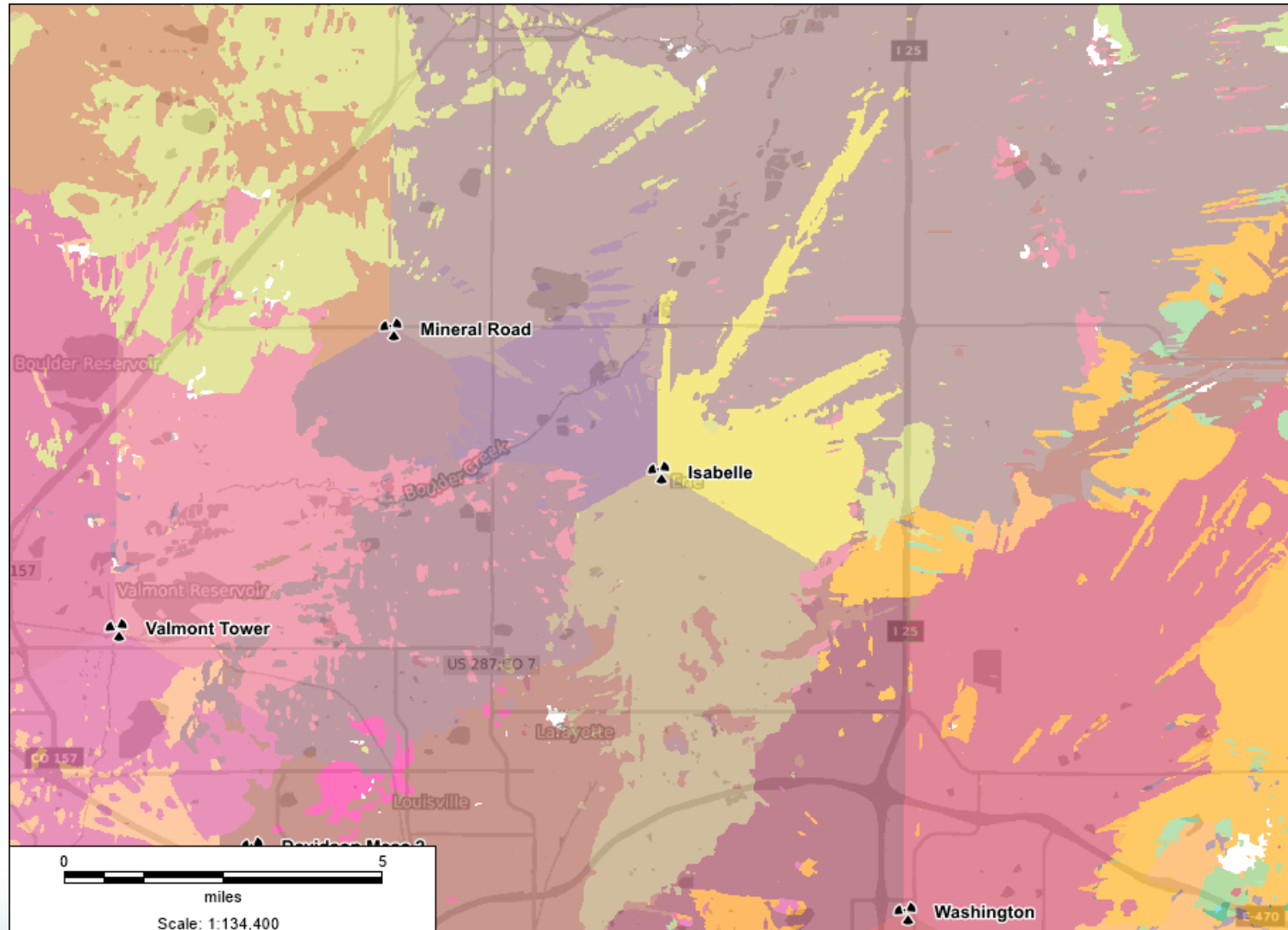
Best Server: Isabelle 100ft

Areas Shown:
predicted signal to -96dBm



Best Server: Isabelle 75ft

Areas Shown:
predicted signal to -96dBm



RF Propagation Maps

coverage concepts

- **Best Server**
- **Predicted Coverage**
- **Predicted Signal**
- **Footprint**

Signal is simulated with an untuned propagation model.

All planned Base Stations are included in the simulation.
Results are filtered for the Base Station being analyzed.

Areas are colored by Sector.
One color = One Sector

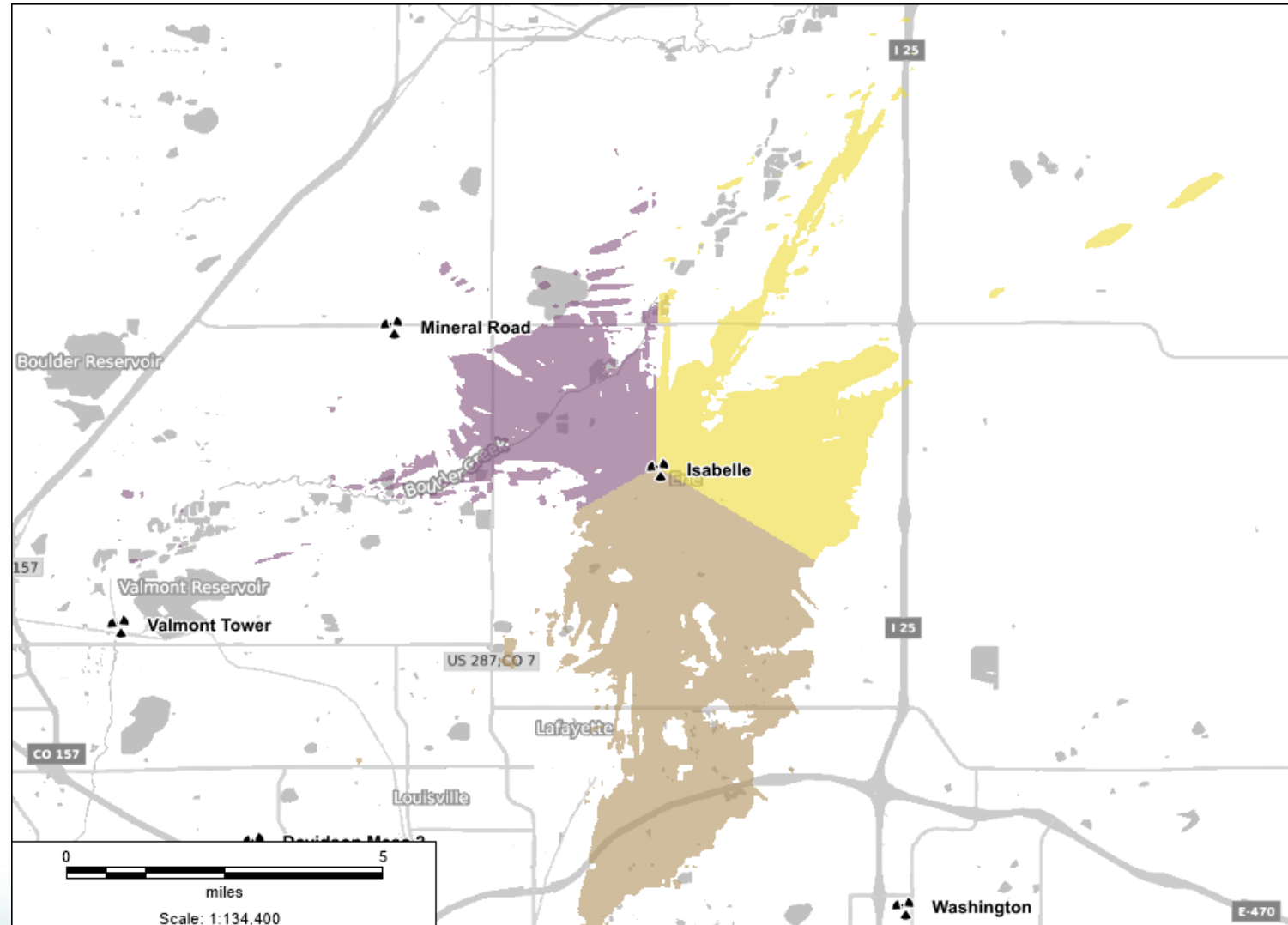
Coverage: -85dBm - the design criteria signal level.

Predicted Coverage: Isabelle 100ft

Predicted Coverage:
-85dBm or better

	Area (sq mi)	Meters
sector1	11.66	37
sector2	16.71	3,687
sector3	8.18	1,045
Total	36.55	4,769

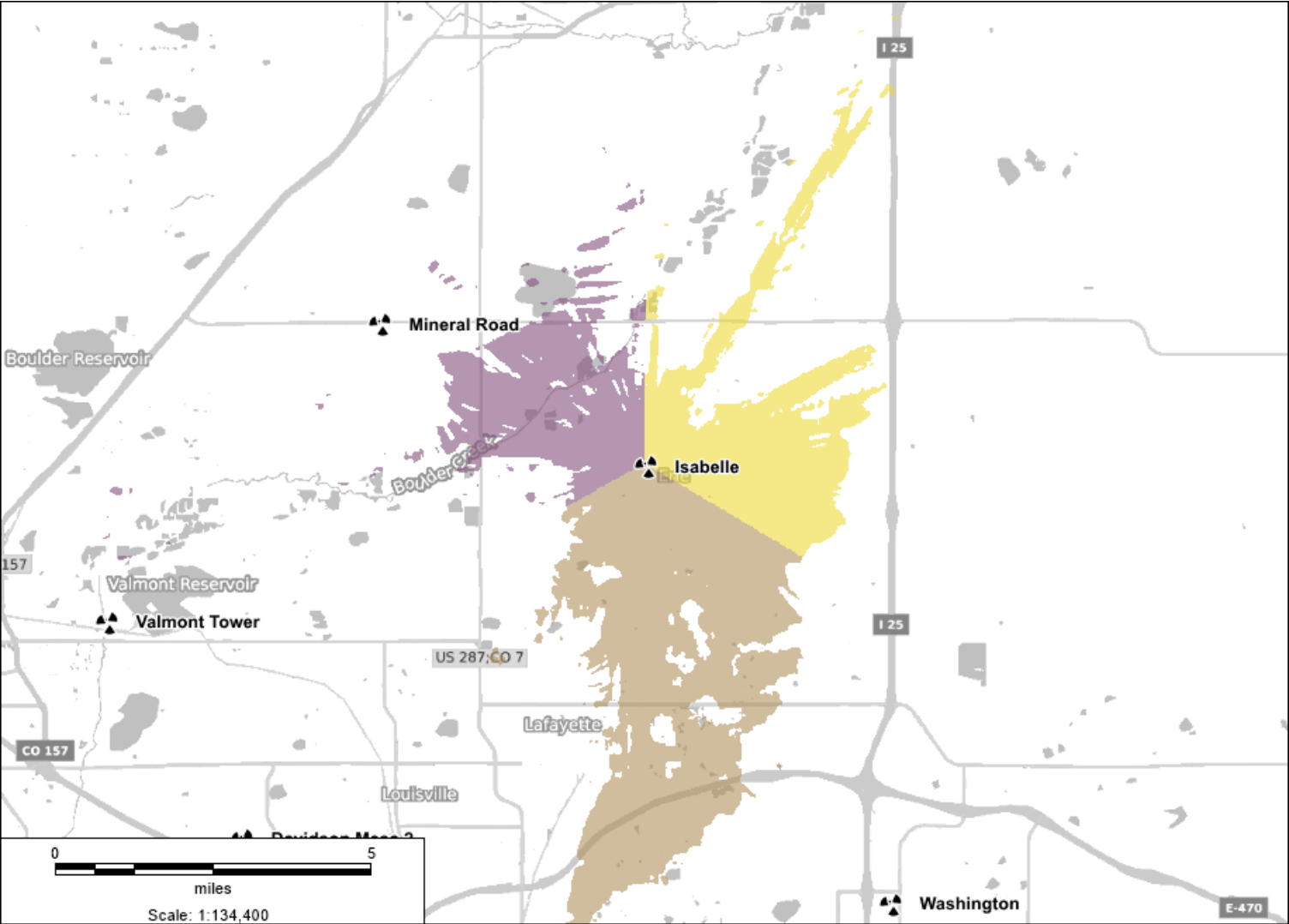
Meter Counts are derived from electric meter densities inside the coverage areas shown. They are not provided as a design metric, but as a means of estimating changes to coverage in the Electric Service Area.



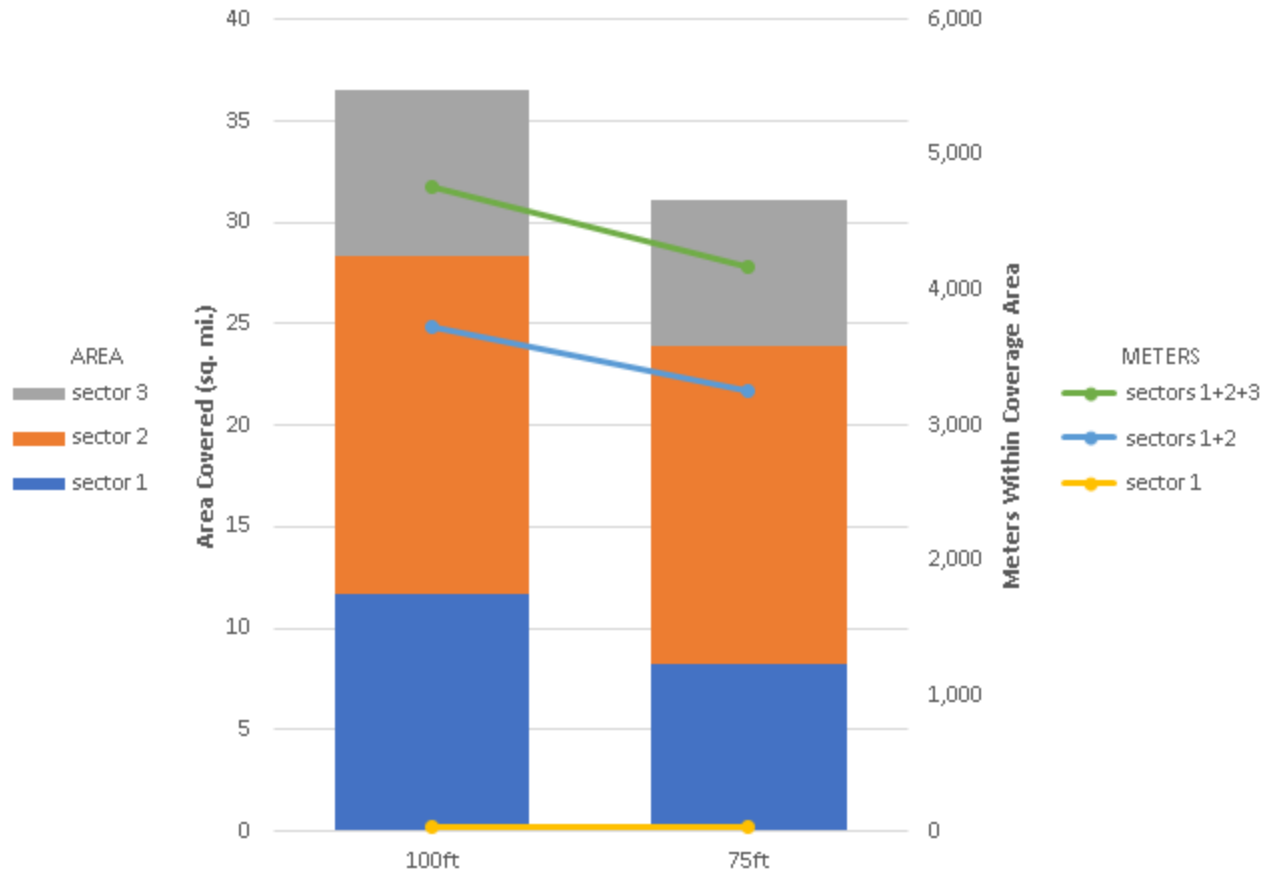
Predicted Coverage: Isabelle 75ft

Predicted Coverage:
-85dBm or better

	Area (sq mi)	Meters
sector1	8.22	37
sector2	15.73	3,213
sector3	7.14	926
Total	31.09	4,176



Coverage Modeling: Isabelle



Predicted Coverage Lost:
(vs 100ft)

	AREA (sq mi)	METERS
75ft	-5.45	-593

Percent Change:

75ft	-14.9%	-12.4%
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RF Propagation Maps

coverage concepts

- **Best Server**
- **Predicted Coverage**
- **Predicted Signal**
- **Footprint**

Signal is simulated with an untuned propagation model.

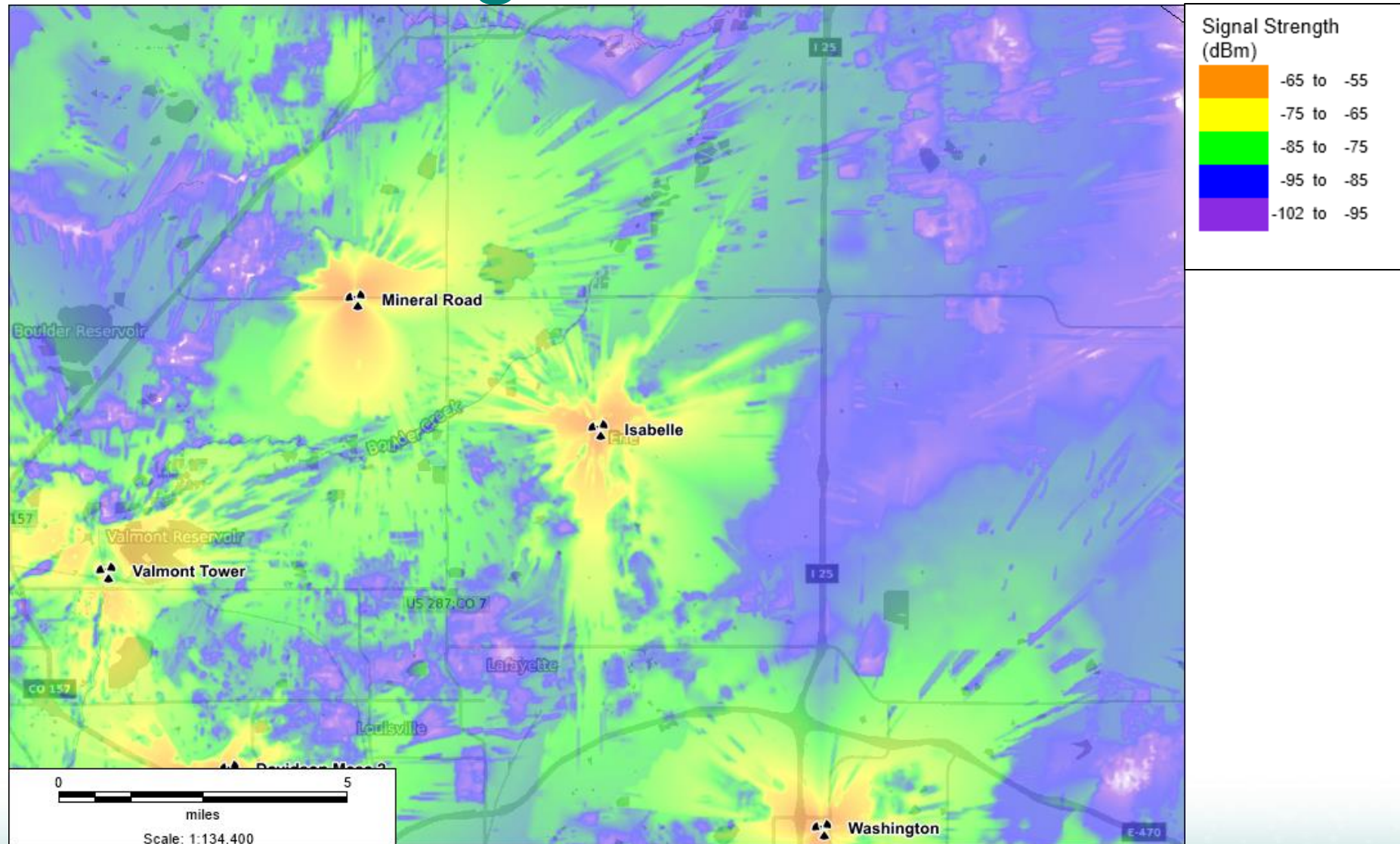
All planned Base Stations are included in the simulation.

Areas are a spectral heat map of predicted signal level.

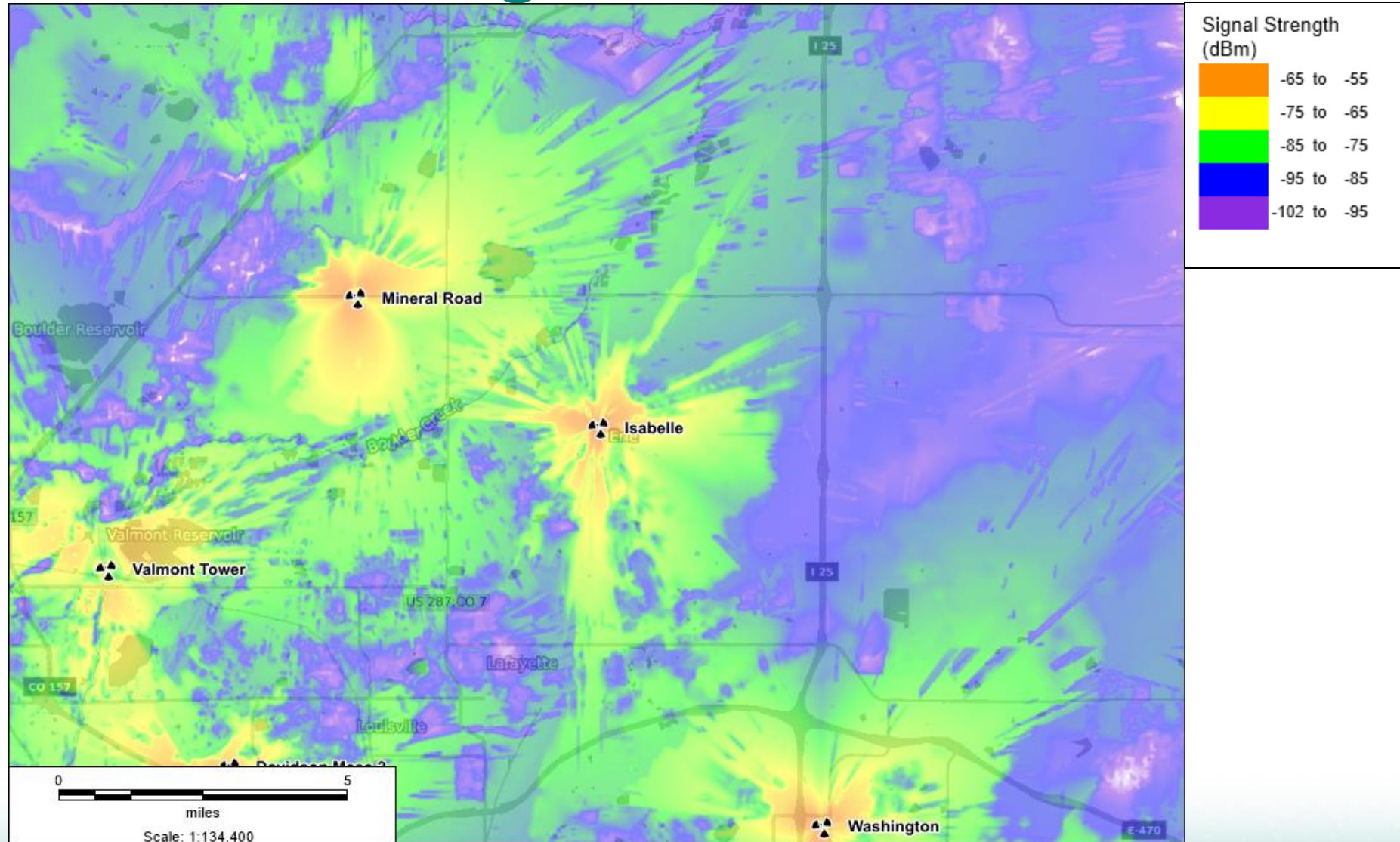
Red: hot <— — —> Purple: cool

Coverage: -102dBm - the radio receive threshold.

Predicted Signal: Isabelle 100ft



Predicted Signal: Isabelle 75ft



RF Propagation Maps

coverage concepts

- **Best Server**
- **Predicted Coverage**
- **Predicted Signal**
- **Footprint**

Signal is simulated with an untuned propagation model.

All planned Base Stations are included in the simulation.

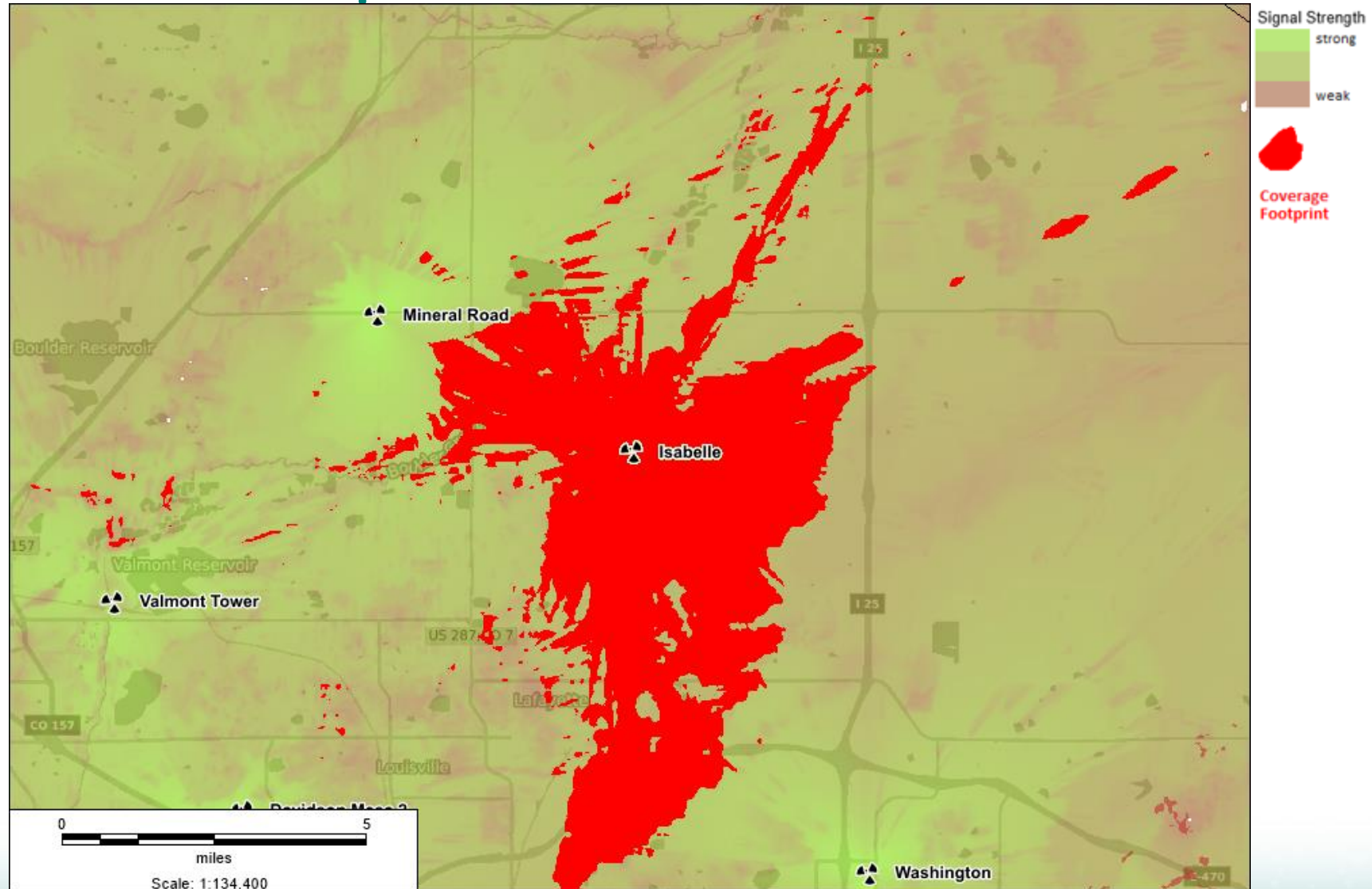
Radio Footprint of the Base Station being analyzed is shown in Red.

Background map: simplified signal prediction in green.

Footprint Coverage: -96dBm - the lowest signal level for a usable link between Base and CPE (from field testing).

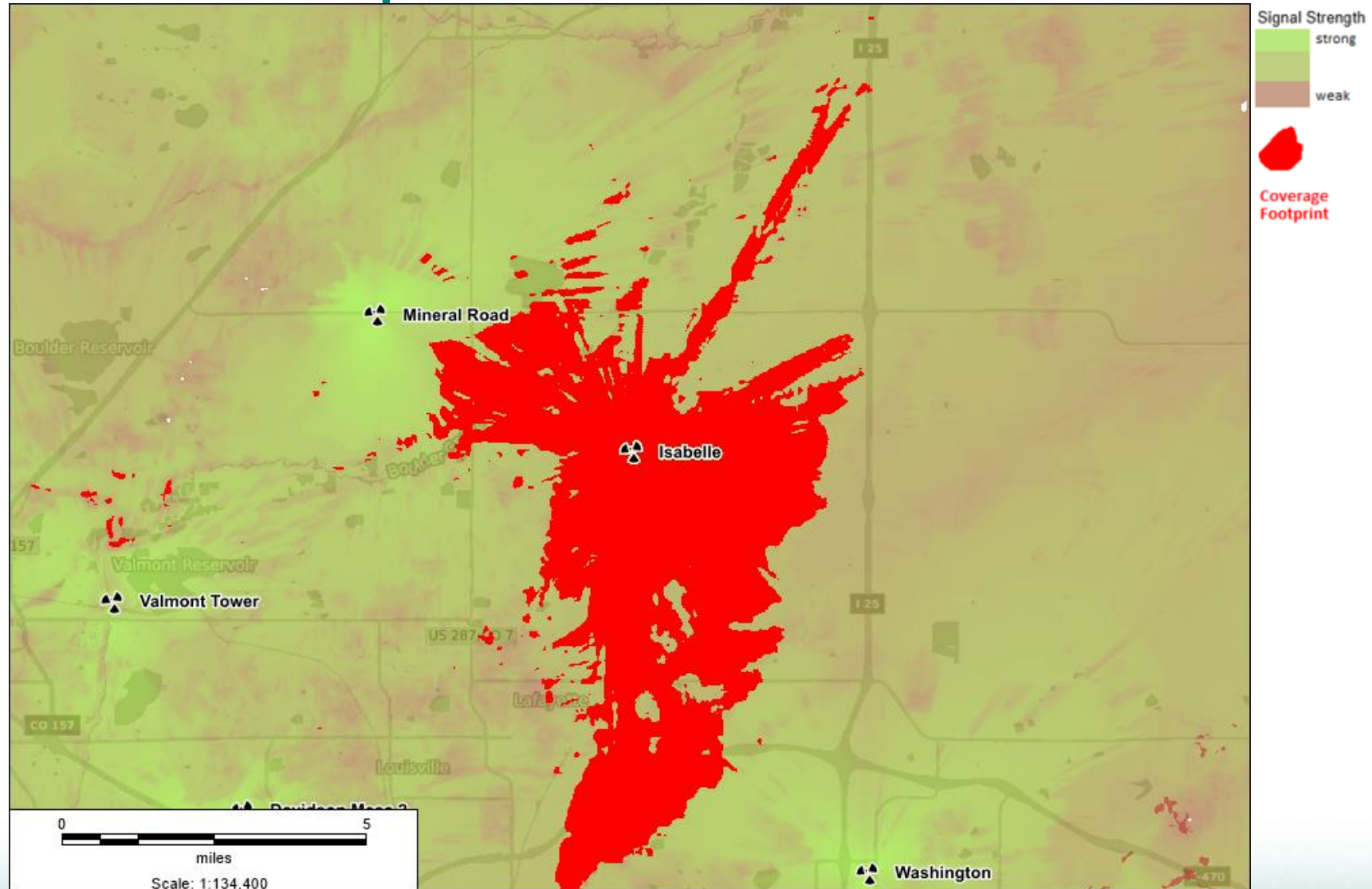
Footprint: Isabelle 100ft

Area Shown:
predicted signal to -96dBm



Footprint: Isabelle 75ft

Area Shown:
predicted signal to -96dBm



Disclaimer

Preliminary coverage maps are based on customer supplied information and predictive Radio Frequency modeling. Results are for system planning purposes and are not intended to represent final radio coverage.

Coverage areas contain unpredictable elements affecting coverage predictions, including but not limited to vegetation and buildings. Council Rock recommends field testing for system characterization and propagation model tuning as part of a complete system plan.

SPECIAL WARRANTY DEED

The "Grantors", John Sosa and Patricia J. Sosa, with an address of 3800 Weld County Road 1, Erie, Colorado 80516, for the consideration of Ten Dollars (\$10.00), in hand paid, hereby sell and convey to Public Service Company of Colorado, a Colorado corporation, the "Grantee," with an address of 550 15th Street, Suite 700, Denver, Colorado 80202-4256, the following real property in the County of Weld and State of Colorado (the "Premises"), to wit:

Lot B, Corrected Recorded Exemption No. 1467-18-2 RE-4161, being a replat of Lot B, RE-128, recorded August 4, 2006 at Reception No. 3409328 in the Weld County Clerk and Recorder's Office, State of Colorado, located in part of the Northwest Quarter of Section 18, Township 1 North, Range 68 West of the 6th P.M., County of Weld, State of Colorado.

Containing 10.817 acres (gross), more or less.

with all its appurtenances, and warrants the title against all persons claiming under the Grantors, except for the matters listed on Exhibit A, attached hereto and incorporated by reference.

RESERVING, HOWEVER, unto Grantors, the following:

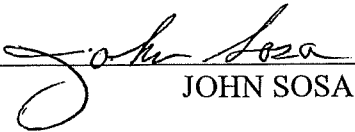
1. All of their right, title and interest, if any, in and to the coal, oil, gas, and all other minerals (including any and all royalty interests) lying under the Premises, provided however, Grantors waive and relinquish all rights to enter upon and use the surface of said property for all purposes, as is more fully set out in the Relinquishment and Quit Claim of Surface Rights executed by Grantors and Grantee contemporaneously herewith.

2. A perpetual non-exclusive easement over the portion of the Premises described on Exhibit B, attached hereto and incorporated by reference (the "Easement Area"), for the construction, maintenance and use of underground utility lines to serve the adjacent property described on Exhibit C attached hereto and made a part hereof. Grantors shall not construct any buildings or other improvements above the surface of the Easement Area. Grantee shall have all use of the Easement Area that is not inconsistent with the rights reserved to Grantors herein, including without limitation, the installation and maintenance of fencing, landscaping and related irrigation facilities. The work of installing and maintaining utility lines and fixtures shall be done with care, and following any such work, Grantors shall restore the surface along the



Easement Area substantially to its original level and condition, including the replacement of grass and other landscaping disturbed by the work.

Signed this 30th day of April, 2007.


JOHN SOSA

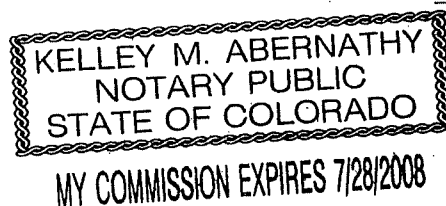

PATRICIA J. SOSA

STATE OF COLORADO)
COUNTY OF Boulder) ss.

The foregoing instrument was acknowledged before me this 30th day of April, 2007, by John Sosa and Patricia J. Sosa.

Witness my hand and official seal.

My commission expires: July 28, 2008



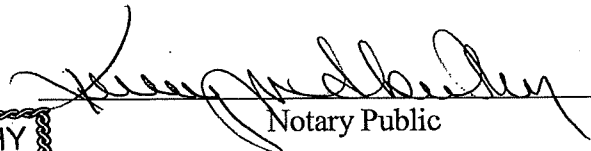

Notary Public



Exhibit A

1. Taxes and assessments for the year 2007, which are a lien not yet due and payable.
2. Right of way for the lower Boulder Extension Ditch as evidenced on ALTA/ACSM Land Title Survey dated January 11, 2007 by Jeffrey Scott Rhoten, Job No. WO#501-06-1047.
3. Right of way for pipeline purposes as granted to Vessels Oil & Gas Company by instrument recorded May 13, 1985 in Book 1069 at Reception No. 2009374, said right of way being along the southerly line of subject property.
4. Easement for sanitary sewer line purposes as granted to the Town of Erie by instrument recorded June 30, 1997 in Book 1613 at Reception no. 2555590.
5. Easement for water line purposes as granted to the Town of Erie by instrument recorded June 30, 1997 in Book 1613 at Reception no. 2555591.
6. Reservation of all oil, gas and other minerals therein or thereunder as reserved in instrument from Weld County to Evert W. Young recorded December 7, 1961 in Book 1601 at Page 440, and re-recorded December 14, 1961 in Book 1602 at Page 55.
7. Oil and gas lease from John Sosa and Patricia J. Sosa to The Vessels Company, recorded April 3, 1981 in Book 932 at Reception No. 1854115 and any interests therein, assignments or conveyances thereof. Said lease extended by production affidavit recorded May 4, 1987 in Book 1155 at Reception No. 2098337.
8. Terms, conditions, provisions, obligations and agreements as contained in Request for Notification of Surface Development recorded April 21, 2006 at Reception No. 3381085.
9. Notes and easements as shown on Recorded Exemption maps recorded July 17, 2006 as Reception No. 3403727 and August 4, 2006 at Reception No. 3409328.

EXHIBIT B



7800 Miller Drive, Unit C,
Frederick, CO 80504
Tel: (303) 702-1617
Fax: (303) 702-1488
TOLL FREE (800) 824-2550
www.powersurveying.com

April 26, 2007

UTILITY EASEMENT

A TRACT OF LAND LOCATED IN THE NORTHWEST 1/4 OF SECTION 18, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6th PRINCIPAL MERIDIAN, BEING PART OF LOT B CORRECTED RECORDED EXEMPTION No. 1467-18-2 RE-4161 RECORDED AUGUST 4, 2006 AS RECEPTION No. 3409238 IN THE WELD COUNTY CLERK AND RECORDER'S OFFICE, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF SAID LOT B; THENCE N89°24'38"E, ALONG THE NORTH LINE OF SAID LOT B, A DISTANCE OF 1244.86 FEET TO A POINT ON THE EAST LINE OF SAID LOT B; THENCE S00°26'41"E, ALONG SAID EAST LINE, A DISTANCE OF 30.00 FEET; THENCE S89°24'38"W, 30 FEET SOUTH OF AND PARALLEL TO THE NORTH LINE OF SAID LOT B, A DISTANCE OF 1245.18 FEET TO A POINT ON THE WEST LINE OF SAID LOT B; THENCE N00°10'00"E, ALONG SAID WEST LINE A DISTANCE OF 30.00 FEET TO THE **POINT OF BEGINNING**.

CONTAINING 37,351 SQUARE FEET OR 0.857 ACRES MORE OR LESS.

Jeffrey S. Rhoten, PLS
Colorado PLS 37910



JS
PGR



EXHIBIT B

BASIS OF BEARINGS

(SECTION LINE) N00°10'00"E 2652.54' (M)

NORTHWEST CORNER
SECTION 18, T1N, R68W
FOUND 3-1/4" AC PLS 11372

WEST QUARTER CORNER
SECTION 18, T1N, R68W
FOUND 3-1/4" AC (ILLEGIBLE)

NORTHEAST COUNTY LINE ROAD

POINT OF
BEGINNING

N00°10'00"E
30.00'

LOT A
CORRECTED RECORDED EXEMPTION
No. 1467-18-2 RE-4161

LOT B
CORRECTED RECORDED EXEMPTION
No. 1467-18-2 RE-4161

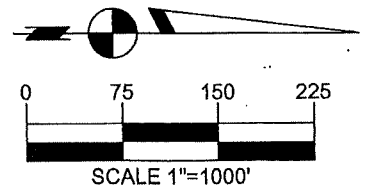
S89°24'38"W 1245.18'

UTILITY EASEMENT

N89°24'38"E 1244.86'

LOT A
RE No. 1467-18-2 RE-128

S00°26'41"E
30.00'



POWERTM
Surveying Company, Inc.
Established 1948

7800 MILLER DRIVE, UNIT "C"
FREDERICK, COLORADO 80504
(303) 702-1617
FAX: (303) 702-1488

WO#: 501-06-1047
DATE OF COMPLETION: 4-26-07

Exhibit C

Parcel 1:

Lot A, Corrected Recorded Exception No. 1467-18-2 RE-4161, being a replat of Lot B, RE-128, located in part of the Northwest Quarter of Section 18, Township 1 North, Range 68 West of the 6th P.M., County of Weld, State of Colorado.

Parcel 2:

Lot A, Recorded Exemption No. 1467-18-2-RE-128, recorded May 8, 1974, in Book 714 as Reception No. 1636089, Weld County Records, being part of the NW1/4 of Section 18, T1N, R68W of the 6th P.M., Weld County, Colorado.

Parcel 3:

A Parcel of Land in the NW 1/4 of Section 18, Township 1 North, Range 68 West of the 6th PM, in the County of Weld, State of Colorado, described as follows:

Commencing at the W 1/4 Corner of Section 18, Township 1 North, Range 68 west of the 6th PM, thence N 0 degrees 10' E 1977.01 feet along the West line of said Section 18; Thence S 89 degrees 42' E 653.87 feet the True Point Of Beginning;

Thence S 0 degrees 30' W 343.90 feet;

Thence N 89 Degrees 20' E 561.00 feet to the approximate centerline of the Lower Boulder Ditch;

Thence N 33 degrees 30' W 23.00 feet along the approximate centerline of said Lower Boulder Ditch;

Thence N 46 degrees 50' W 84.00 feet along the approximate centerline of said Lower Boulder Ditch;

Thence N 57 degrees 50' W 99.00 feet along the approximate centerline of said Lower Boulder Ditch;

Thence N 33 degrees 40' W 247.89 feet along the approximate centerline of said Lower Boulder Ditch;

Thence N 88 degrees 58' W 25.29 feet;

Thence N 89 degrees 42' W 237.49 feet to the True Point of Beginning.