

Comprehensive Engineering Statement

prepared for

Lutheran Church-Missouri Synod

New(FM) Troy, Missouri

Facility ID 767850

Channel 209C3 11 kW 72 m HAAT

Lutheran Church-Missouri Synod (“*Lutheran Church*”), herein is filing an application in response to the FCC’s filing notice for a new NCE filing window.¹ The instant application is being filed as a Short Form application for a new Channel 209C3 FM facility for Troy, Missouri. In particular, *Lutheran Church* proposes to use an existing registered tower (ASR Number 1250297) at 38° 58’ 44.8”N Latitude, and 91° 00’ 17.2”W Longitude (NAD 83). The proposed antenna will be directional, circularly polarized and mounted at 45.7 meters AGL. An ERP of 11 kW is being specified.

The FCC has specified 25 kW with an antenna Height Above Average Terrain (“HAAT”) of 100 meters as the maximum operating parameters for a Class C3. Per §73.210(b)(3)(i) of the Rules, a Class a facility has a contour distance of not greater than 39 km. The proposed 209C3 facility is to be installed with a site elevation of 206.7 meters and a Center of Radiation of 252.4 meters AMSL. The standard 8-radial HAAT calculation for the proposal at this site is 72 meters per the procedure in §73.313(d).² It is believed that the proposal is within the parameters for a Class C3 facility.

Lutheran Church proposes to utilize an existing antenna support structure. Since no change in overall height is required for the proposal, no change in structure lighting or painting will be required. The site and FCC 60 dBμ contour locations are depicted in the attached **Figure 1**. The principal community of Troy, Missouri, shown by green shading, is predicted to be completely encompassed by the 60 dBμ contour of the proposed facility, thus satisfying §73.515 of the Rules.

Allocation and Other Considerations

A study of the pertinent surrounding FM facilities in regard to prohibited overlap under §73.509 of the Commission’s Rules suggests the following facilities require further study. The

¹ Public Notice MEDIA BUREAU ANNOUNCES NCE FM NEW STATION FILING PROCEDURES AND REQUIREMENTS FOR NOVEMBER 2 - 9, 2021, WINDOW, Released July 23, 2021, DA 21-885.

² Details of the HAAT calculation procedure will be made available upon request.

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attached **Table I** identifies the nearest co-channel, first adjacent, and second and third adjacent facilities that may require additional study.

The nearest full service Channel 209 facilities are KGNX(FM) (Ch 209A, Baldwin, MO), WCBW-FM (Ch 209A, East St. Louis, MO), WLUI(FM) (Ch 209B1, Springfield, IL), KNLP(FM) (Ch 209A, Potosi, MO), KMNR(FM) (Ch 209A, Rolla, MO) and WBMV(FM) (Ch 209B1, Mount Vernon, IL). **Figure 2** depicts the pertinent co-channel protected and interfering contours of the proposed facility, as well as the protected and interfering contour of each listed facility. As shown, the proposal causes no prohibited contour overlap. The nearest second or third adjacent facilities are KGNV(FM) (Ch 210A, Washington, MO), WLCA(FM) (Ch 210A, Ch 210A, Godfrey, IL), KCFV(FM) (Ch 208A, Ferguson, MO), KOPN(FM) (Ch 208C2, Columbia, MO), KGNA-FM (Ch 210A, Arnold, MO) and KNLH(FM) (Ch 208A, 208A, Cedar Hill, MO). **Figure 2A (Detail)** is provided to show a closer view of the KGNX(FM) contours and the proposal. As demonstrated in **Figure 3** and **Figure 3A (Detail)**, the 54 dB μ F(50,10) interfering contours of each facility will not overlap the 60 dB μ contour of the proposal. The nearest second and third adjacent facilities to the proposal are KCLC(FM) (Ch 206C2, St. Charles, MO) and WIPA(FM) (Ch 207B, Pittsfield, MO). As demonstrated in **Figure 4**, there is no prohibited contour overlap with nearby second or third adjacent facilities. The nearest IF relationship channel station (53 or 54 channels removed) is KATZ-FM at 63.2 km from the proposed site. The nearest Standard AM broadcast facility is KYRO(AM) (1,280 kHz, Troy, MO) at 8.3 km distant. §1.30002 of the Rules states that proponents of construction within one wavelength of non-directional AM facilities require further attention. One wavelength at 1,280 kHz is 234.2 meters. Since the proposal is more than ten wavelengths from KYRO(AM), no notice or studies are required with respect to it. There are no directional AM broadcast stations within 25 km of the proposed facility.

Television Channel 6 Protection

§73.525(a) specifies that proposals for new Channel 209 NCE facilities must demonstrate protection to existing Channel 6 stations if they are within 196 km of the station. There are no full service Channel 6 facilities within 196 km of the proposal. Therefore, there is no prohibited contour overlap between the instant proposal and nearby full service Channel 6 facilities.

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International and Other Considerations

The proposed site is located 745.4 km from the Canadian border, and 1,399.3 km from the Mexican border. Therefore, International Coordination should not be required with respect to the instant proposal. The nearest FCC monitoring station is 586.3 km distant at Allegan, MI and the facility is 909 km from the Green Bank Quiet Zone. These distances exceed the threshold minimum distance specified in §73.1030 that would suggest consideration.

It is therefore believed that the proposed facility satisfies all of the pertinent Commission Rules and Policies now in effect regarding allocation matters.

Site Assurance

Site assurance for the proposed tower (ASR 1250297) has been obtained. The contact name that provided assurance was Joe Meleski, phone number (812) 430 – 3551. Mr. Meleski is the authorized representative of the tower owner.

Environmental Considerations

The proposed facility will operate with a circularly-polarized ERP of 11 kW with a 3-bay, 0.75 wavelength spaced omni-directional antenna at 45.7 meters AGL on the registered tower with ASRN 1250297. 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. Because no change in structure height is proposed, no change in current structure marking and lighting requirements is anticipated. Therefore, it is believed that this application may be categorically excluded from environmental processing pursuant to §1.1306 of the Commission's rules.

Human Exposure to Radiofrequency Radiation

The proposed operation was evaluated for human exposure to radiofrequency energy using the procedures outlined in the Commission's OET Bulletin No. 65 ("OET 65"). OET 65 describes a means of determining whether a proposed facility meets the radiofrequency exposure guidelines adopted in §1.1310. Under present Commission policy, a facility may be presumed to comply with

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the limits specified in §1.1310 if it satisfies the exposure criteria set forth in OET 65. Based upon that methodology, and as demonstrated in the following, the proposed transmitting system will comply with the cited adopted guidelines.

The general population/uncontrolled maximum permitted exposure (“MPE”) limit specified in §1.1310 for the entire FM broadcast band is $200 \mu\text{W}/\text{cm}^2$. For the purpose of this study, “public access” will be considered at the base of the tower at locations two-meters above ground. Using the FCC’s FM Model program and a worst-case EPA Type 1 antenna it was determined that the proposed facility would contribute a worst-case RF power density of $21.8 \mu\text{W}/\text{cm}^2$ at two meters above ground level near the antenna support structure, or 10.9 percent of the general population/uncontrolled limit.

The nearest FM broadcast facility is KFNS(FM) (Ch 264A, Troy, TX) at 8.2 km distant. At 8.2 km, the worst case RF exposure levels are well below one percent of the general population/uncontrolled limit. Accordingly, it is believed that the impact of the proposed operation should not be considered to be a factor at ground level as defined under §1.1307(b).

Safety of Tower Workers and the General Public

As demonstrated herein, excessive levels of RF energy will not be caused by the proposal at publicly accessible areas at ground level near the antenna supporting structure. Consequently, members of the general public will not be exposed to RF levels in excess of the Commission's guidelines. Nevertheless, tower access will continue to be restricted and controlled through the use of a locked gate. According to information provided by the applicant, appropriate RF exposure warning signs will be posted. In the event that maintenance or other workers gain access to the tower, power output of the translator will be decreased or shut off to protect workers.

With respect to worker safety, it is believed that based on the preceding analysis, excessive exposure would not occur in areas at ground level. A site exposure policy will be employed protecting maintenance workers from excessive exposure when work must be performed on the tower in areas where high RF levels may be present. Such protective measures may include, but will not be limited to, restriction of access to areas where levels in excess of the guidelines may be expected, power reduction, or the complete shutdown of facilities when work or inspections must be

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performed in areas where the exposure guidelines would otherwise be exceeded. On-site RF exposure measurements may also be undertaken to establish the bounds of safe working areas. The applicant will coordinate exposure procedures with all pertinent stations.

Conclusion

It is therefore believed that the proposed facility satisfies all of the pertinent Commission Rules and Policies now in effect.

FIGURE 1
PROPOSED COVERAGE CONTOUR

prepared November 2021 for

Lutheran Church-Missouri Synod
New(FM) Troy, MO
Facility ID 767850
Ch. 209C3 11 kW 72 m HAAT

Cavell, Mertz & Associates, Inc.
Manassas, Virginia

New(FM) Proposed
Ch 209C3 11 kW 72 m
60 dB μ F(50,50)

Troy, MO

Lincoln

Pike

Calhoun

Jersey

Montgomery

Warren

Saint Peters

St. Charles

Saint Charles

Florissant

Maryland Heights

Chesterfield

University C

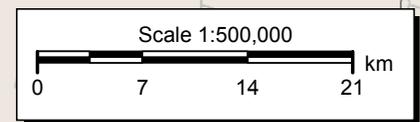


Table I
SPACING SUMMARY
 prepared for
Lutheran Church-Missouri Synod
 New(FM) Troy, MO
 Facility ID 767850
 Ch. 209C3 11 kW 72 m

REFERENCE				CLASS = C3		DISPLAY DATES		
38 58 44.80 N.							DATA	11-08-21
91 00 17.20 W.							SEARCH	11-08-21
----- Channel 209 - 89.7 MHz -----								
Call	Channel	Location		Azi	Dist	FCC	Margin	
KGXN	LIC 209A	Ballwin		MO 134.0	56.89	141.5	-84.6	
WCBW-FM	LIC 209A	East St. Louis		IL 118.4	81.06	141.5	-60.4	
KGNV	LIC 210A	Washington		MO 191.6	43.30	88.5	-45.2	
WLWJ	LIC-D 209B1	Springfield		IL 51.7	150.34	174.5	-24.2	
KNLP	LIC 209A	Potosi		MO 169.9	118.46	141.5	-23.0	
KCFV	LIC-D 208A	Ferguson		MO 110.4	66.45	88.5	-22.1	
WLCA	LIC-D 210A	Godfrey		IL 92.5	70.13	88.5	-18.4	
KOPN	LIC 208C2	Columbia		MO 271.5	103.30	116.5	-13.2	
KMNR	LIC 209A	Rolla		MO 210.7	131.45	141.5	-10.1	
KNLH	LIC-D 208A	Cedar Hill		MO 149.9	79.26	88.5	-9.2	
KGNA-FM	LIC-D 210A	Arnold		MO 138.3	80.47	88.5	-8.0	
KCLC	LIC-D 206C2	St. Charles		MO 116.2	48.09	55.5	-7.4	
WIPA	LIC-D 207B	Pittsfield		IL 18.2	87.10	70.5	16.6	
WBMV	LIC 209B1	Mount Vernon		IL 109.9	193.39	174.5	18.9	

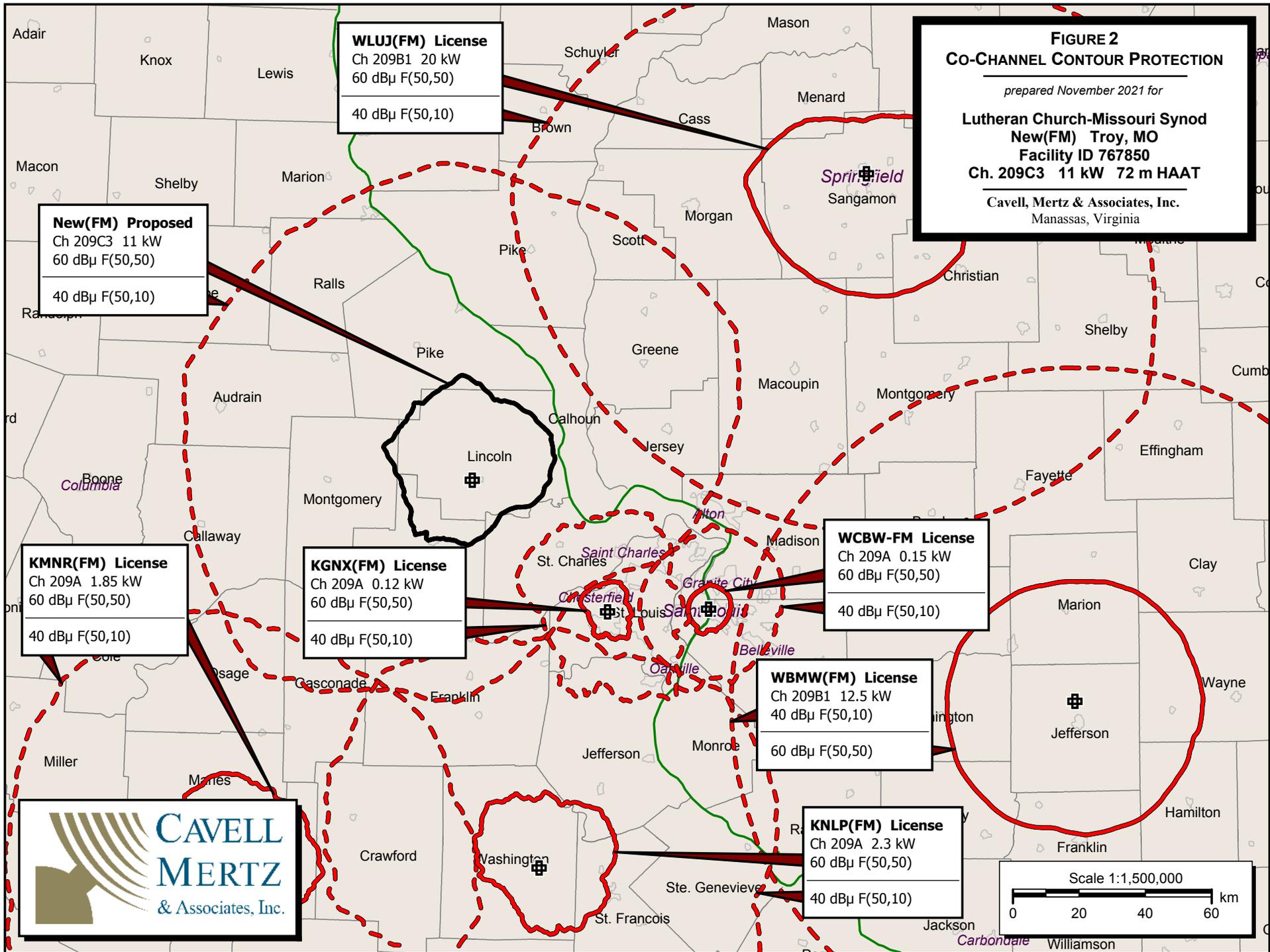


FIGURE 2
CO-CHANNEL CONTOUR PROTECTION

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Ch. 209C3 11 kW 72 m HAAT

Cavell, Mertz & Associates, Inc.
 Manassas, Virginia

WLUJ(FM) License
 Ch 209B1 20 kW
 60 dBμ F(50,50)
 40 dBμ F(50,10)

New(FM) Proposed
 Ch 209C3 11 kW
 60 dBμ F(50,50)
 40 dBμ F(50,10)

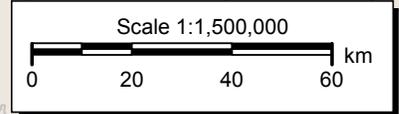
KMNR(FM) License
 Ch 209A 1.85 kW
 60 dBμ F(50,50)
 40 dBμ F(50,10)

KGNX(FM) License
 Ch 209A 0.12 kW
 60 dBμ F(50,50)
 40 dBμ F(50,10)

WCBW-FM License
 Ch 209A 0.15 kW
 60 dBμ F(50,50)
 40 dBμ F(50,10)

WBMW(FM) License
 Ch 209B1 12.5 kW
 40 dBμ F(50,10)
 60 dBμ F(50,50)

KNLP(FM) License
 Ch 209A 2.3 kW
 60 dBμ F(50,50)
 40 dBμ F(50,10)



**FIGURE 2 (DETAIL)
CO-CHANNEL CONTOUR PROTECTION**

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New(FM) Troy, MO
Facility ID 767850
Ch. 209C3 11 kW 72 m HAAT**

**Cavell, Mertz & Associates, Inc.
Manassas, Virginia**

New(FM) Proposed

Ch 209C3 11 kW
60 dB μ F(50,50)

40 dB μ F(50,10)

KGX(FM) License

Ch 209A 0.12 kW
60 dB μ F(50,50)

40 dB μ F(50,10)

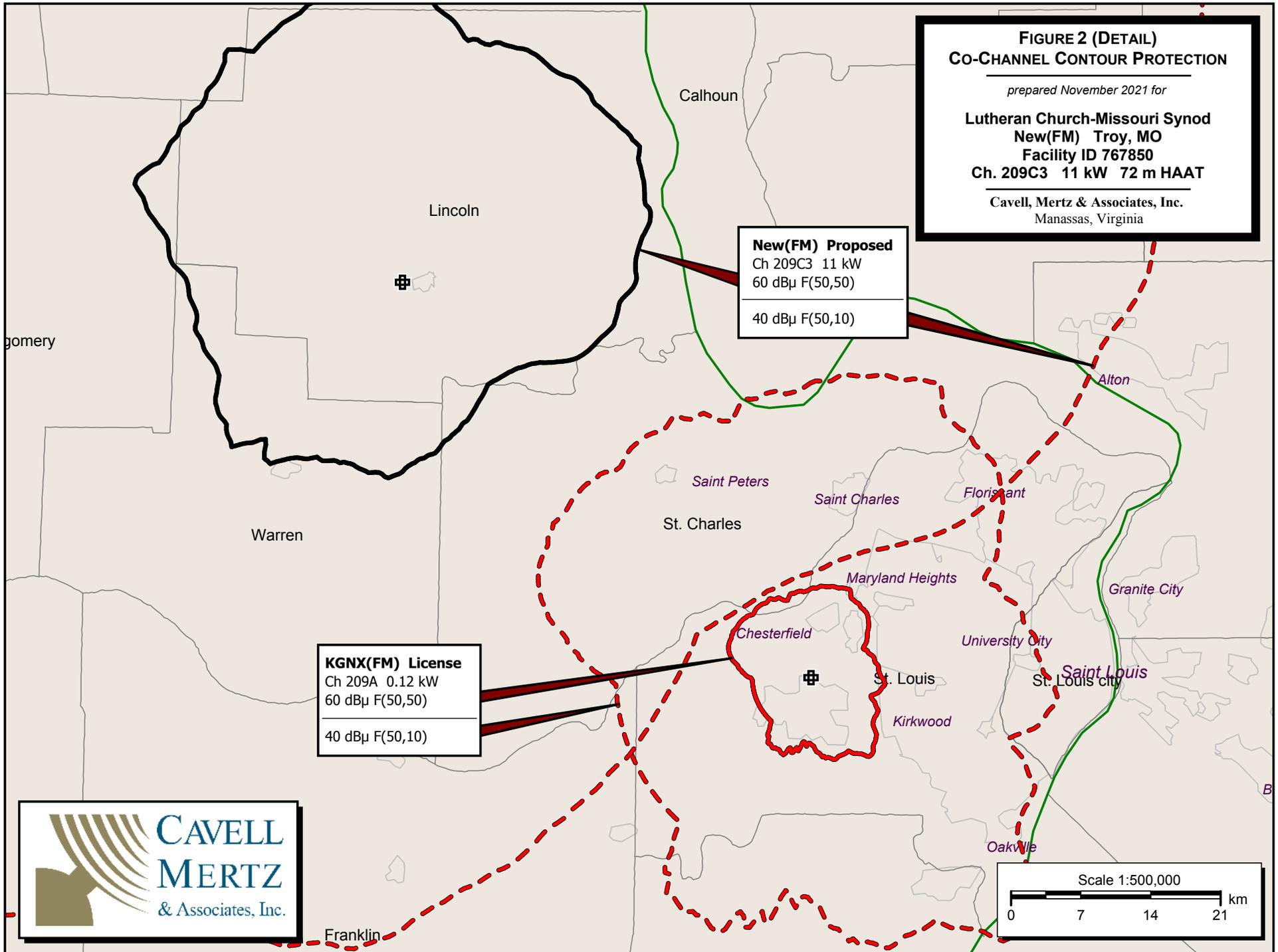
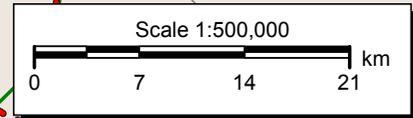
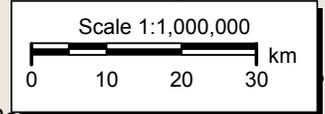
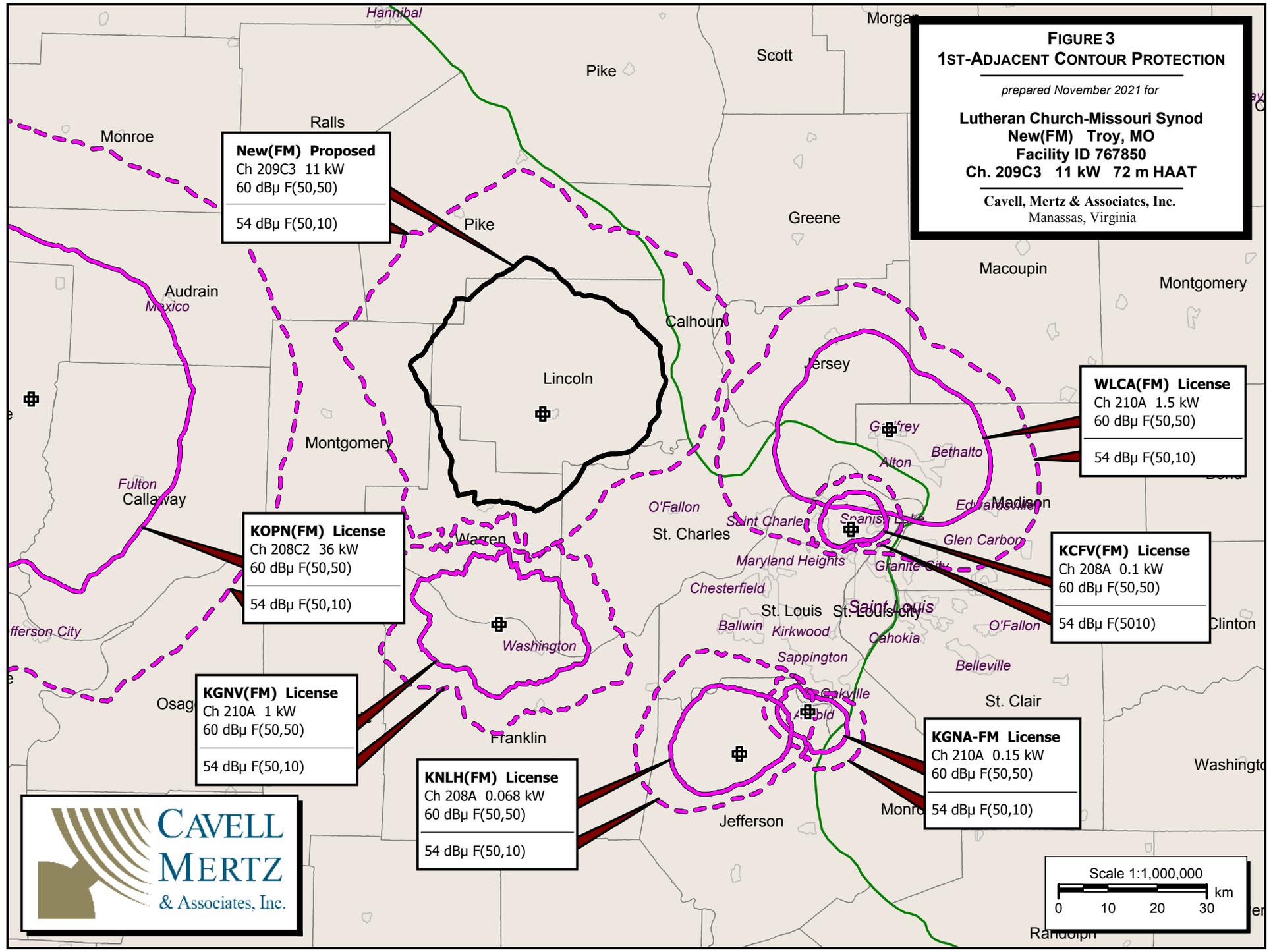


FIGURE 3
1ST-ADJACENT CONTOUR PROTECTION

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Cavell, Mertz & Associates, Inc.
 Manassas, Virginia



**FIGURE 3 (DETAIL)
1ST-ADJACENT CONTOUR PROTECTION**

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Ch. 209C3 11 kW 72 m HAAT**

**Cavell, Mertz & Associates, Inc.
Manassas, Virginia**

New(FM) Proposed
Ch 209C3 11 kW
60 dBμ F(50,50)
54 dBμ F(50,10)

KGNV(FM) License
Ch 210A 1 kW
60 dBμ F(50,50)
54 dBμ F(50,10)

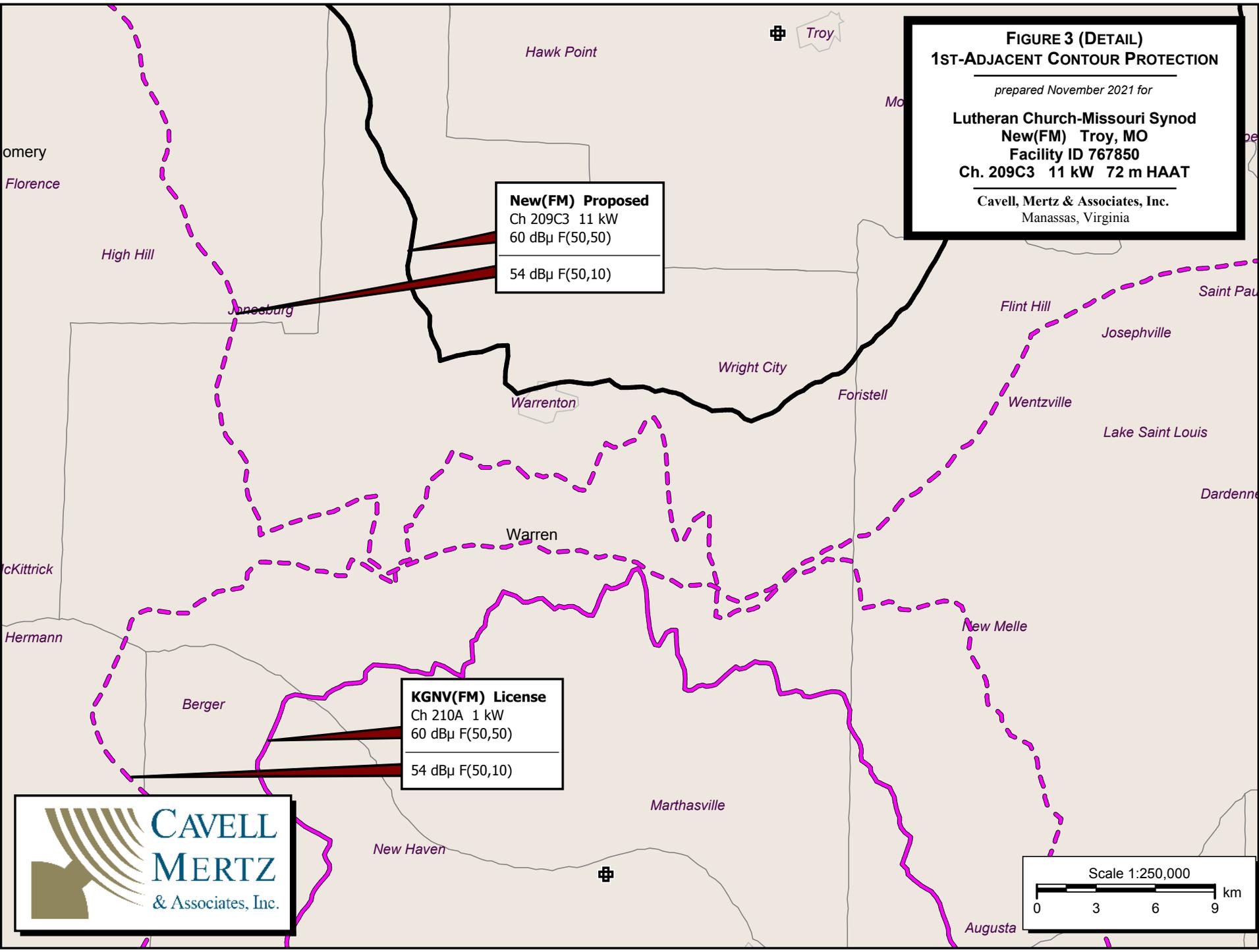
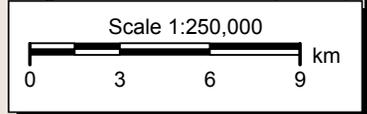


FIGURE 4
2ND & 3RD ADJACENT PROTECTION

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 Manassas, Virginia

