RF RADIATION HAZARD ANALYSIS
Exhibit #B

Antenna Diameter, (D) =	1.45	meters /	4.75745 Feet
Antenna Surface Area (Sa) =	1.6513	sq meters	
Subreflector Diameter (Ds) =	0.0000	centimeters	
Ku Wavelength at 14.250 GHz (LAMBDA) =	0.02103807	meters	
Power output of VPC Flange=	20.000	dB	
Path Loss to OMT (IL) =	0.6	dB	
Power at OMT, (P) =	87.10	Watts	
Antenna Gain at 14.250GHz (G) =	44.80	dBi (2 port antenna gain)	
Antenna Gain given in Power Ration, (Ges) =	3.02E+04		
Antenna Aperture Efficiency (N) =	0.650		

Region			**Radition Level**		**Hazard Assessment**
Far Field, (Rf) =	59.963 meters /	196.74 Feet	5.821	mW/cm sq	Potential Hazard
Near Field, (Wf) =	24.984 meters /	81.974 Feet	13.713	mW/cm sq	Potential Hazard
Transition Region (Rt) Ru<Rt<Rf			equal to or less than 13.713	mW/cm sq	Potential Hazard
Between Main Reflector and Subreflector (Ws)			N/A (no subreflector)		
Main Reflector Region (Wm)			10.549	mW/cm sq	Potential Hazard
Power Density Between Reflector and Ground			5.274	mW/cm sq	Potential Hazard
Far Field Off Axis (WF)			0.058	mW/cm sq	Meets ANSI Requirements
Near Field Off Axis (WN)			0.137	mW/cm sq	Meets ANSI Requirements

Conclusion: Based on the above analysis, harmful areas of Radiation do exist in the areas around the antenna and in the path of the antenna toward the satellite that it is pointed at. The Area occupied by the general public will not exceed the ANSI limit of 1mW cm sq. because the antenna is mounted on top of the truck, which is at least 8 feet above the ground, and safety increases with look angles used by the Satellites in the United States on Dom. Sat. arch. The areas on the ground and behind the antenna are 100 times less power (20dB) when at a min. of the dia. of the reflector. This is reflected in the Off Axis figures as seen above (WF) & (WN). The SNG will be marked with the standard radiation hazard warnings, and on the antenna itself. The warning signs will warn personnel to avoid the area around and in front of the reflector when the transmitter is operating. To ensure compliance with safety limits, the earth station transmitter will be turned off and marked to remain off whenever maintenance and repair personnel are required to work in the areas of potential hazard as defined in the above study. Additionally, the earth station personnel will be trained to ensure that the antenna path is clear at all times while the transmitter is in operation. The only access to the roof of the truck is a ladder that is not accessible by the general public.

Note: See Exhibit #Ba for how the above calculations were made.

Exhibit Ba Analysis on Non-Ionizing Radiation

Antenna Diameter, (D) =	D: = 1.45 meters	D*3.281 =	4.757	Feet
Antenna Surface Area, (Sa) =	Sa: = $\pi * \frac{D*D}{4}$	Sa =	1.651	sq meters
Subreflector Diameter, (Ds) =	Ds: = 0 cm	Ds*.3937	0.000	Inches
Area of Subreflector, (As) =	As: = $\pi * \frac{Ds*Ds}{4}$	As=	0.000	sq meters
Center Frequency, (Cf) =	Cf: = 14.250 GHz			
Wavelength at (Cf), (Lambda) =	Lambda = 0.0210380671 meters			
Tansmit Power at HPA or VPC Flange, (P1) =	P1= 100.00 watts			
	P2:=log(p1)*10	P2=	20.000	dB
Path Loss from HPA or VPC to OMT, (IL) =	Loss: = 0.6			
	P3:= P2-Loss	P3=	19.400	OMT Pwr in dB
	P:= $10^{\frac{P3}{10}}$	P=	87.096	OMT Pwr in watts
Antenna Gain at (Cf), (Gain) =	Gain: = 44.80 dBi			
Antenna Gain Converted to Power Ratio (Ges)=	Ges: = $10^{\frac{Gain}{10}}$	Ges =	3.02E+04	Ratio
Antenna Aperture Efficiency, (n) =	n: = 0.6500			

Far Field (Rf) =	Rf= $\frac{.60 * (D*D)}{Lambda}$	Rf =	59.963	meters
		Rf*3.281=	196.738	feet
Far Field Power Density (Wf) =	Wf= $4* \frac{Ges*P}{\pi * (Rf*Rf)}$ * .1	Wf =	5.821	mw sq cm
Near Field (Rn) =	Rn= $\frac{(D*D)}{4*Lambda}$	Rn=	24.984	meters
		Rf*3.281=	81.974	feet
Near Field Power Density (Wn) =	Wn= $\frac{16*n*P}{\pi * (D*D)}$ * .1	Wn =	13.713	mw sq cm
Transition Region (Rt) =	Rt = Wn*1	Rt=	13.713	mw sq cm (Equal to or less than)
Pwr Density at Sub Reflector (Ws) =	Ws= $\frac{2*P}{As}$ *1000	Ws =	N/A	
Main Reflector Region Pwr Density (Wm) =	Wm= $\frac{2*P}{Sa}$ *.1	Wm =	10.549	mw sq cm
Pwr Density between main reflector and ground (Wg) =	Wg= $\frac{P}{Sa}$ *.1	Wg =	5.274	mw sq cm
Far Field Off Axis (WF) =	WF:= Wf*.01	WF =	0.058	mw sq cm
Near Field Off Axis (WN) =	WN:= Wn*.01	WN =	0.137	mw sq cm

Form 312 Blocks Information

Project number:	4996
Customer:	WGAL
Customer Contact:	Christine Todlt
Date:	7/13/2018

Enter this information in the following FCC Form 312 Blocks			
Antenna Model		***Sat-Lite 1411***	
Amplifier Model		***TPB-KUB0500-HMS3***	
Nomenclature	Value	Unit of Measure	Form 312 Block
Power at OMT	87.096	watts	B5(g)
Total EIRP	64.20	dBw	B5(h)
Maximum EIRP Density toward the Horizon	-5.00	dBw/4KHz	B6(i)
Maximum EIRP per Carrier	62.15	dBw	B7(f)
Maximum EIRP Density per Carrier	22.60	dBw/4KHz	B7(g)

Variable Data

Project number:	4996
Customer:	WGAL
Customer Contact:	Christine Todlt
Date:	7/13/2018

Required Data			
Antenna Model		**Sat-Lite 1411**	
Amplifier Model		**TPB-KUB0500-HMS3**	
Antenna Diameter (D)	1.45	meters	
Subreflector Diameter (Ds)	0.00	cm	
Center Frequency (Cf)	14.25	GHz (14.250 GHz for Ku-Band)	
Transmit Power at HPA or VPC Flange (P1)	100.00	watts	
Path Loss from HPA or VPC to OMT (IL)	0.60	dB (0.6 for Hub Mount, 2.0 for Rack Mount and Hub Mouned 4 Port)	
Antenna Gain at (Cf) (Gain)	44.80	dBi	
Antenna Aperture Efficiency (n)	0.65		
Bandwidth of Transmission	6.00	MHz	