RF RADIATION HAZARD ANALYSIS Exhibit #B

Antenna Diameter, (D) = 1.35 meters / 4.42935 Feet

Antenna Surface Area (Sa) = 1.4314 sq meters

Subreflector Diameter (Ds) = 0.0000 centimeters

Ku Wavelength at 14.250 GHz (LAMBDA) = 0.0211 meters

Power output of VPC Flange= 18.451 dB

Path Loss to OMT (IL) = 0.6 dB

Power at OMT, (P) = 60.97 Watts

Antenna Gain at 14.250GHz (G) = 44.30 dBi (2 port antenna gain)

Antenna Gain given in Power Ration, (Ges) = 2.69E+04 Antenna Aperture Efficiency (N) = 0.650

Region			Radition	Level	Hazard Assessment
Far Field, (Rf) =	51.825 meters /	170.04 Feet	4.862	mW/cm sq	Potential Hazard
Near Field, (Wf) =	21.594 meters /	70.849 Feet	11.074	mW/cm sq	Potential Hazard
Transition Region (Rt)			equal to	or less than	
Ru <rt<rf< td=""><td></td><td></td><td>11.074</td><td>mW/cm sq</td><td>Potential Hazard</td></rt<rf<>			11.074	mW/cm sq	Potential Hazard
Between Main Reflect	or		N/A (no	subreflector)	
and Subreflector (Ws)					
Main Reflector Region	(Wm)		8.519	mW/cm sq	Potential Hazard
Power Density Betwee	n Reflector		4.259	mW/cm sq	Potential Hazard
and Ground					
Far Field Off Axis (WF)			0.049	mW/cm sq	Meets ANSI Requirements
Near Field Off Axis (WI	N)		0.111	mW/cm sq	Potential Hazard

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. becuase 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 Starnetor. D = D = 1.35 meters D'3-281= 4425 Eest	mw sq cm	0.111	= NW		Wn*.01	WN:=	Near Field Off Axis (WN) =
na Diameter (, D) = D; = 1.35 meters D*3.281 = 4.429 Fracturace Area, (Sa) = Sa: = π* D*D Fracturace Area, (Sa) = Sa: = π* D*D Sa 1.431 sc ubrellector, (Ds) = Ds: = 0 cm Ds*.3937 0.000 In ubrellector, (As) = As: = π* D*Ds As = 0.000 sc Frequency, (Cf) = Cf: = 14.250 GHz VBC GHz V	mw sq cm	0.049	WF =		Wf*.01	WF:=	Far Field Off Axis (WF) =
D:= 1.35 meters D*3.281 = 4.429 Residence Sa:= π* D*D 4 5a = 1.431 5c DS:= 0 cm Ds*.3937 0.000 In As:= π* Ds*Ds* As= 0.0000 In As:= π* Ds*Ds*As As= 0.0000 In As:= π* Ds*.3937 0.000 In CF:= 14.250 GHz In As= 0.0000 sc CC:= 14.250 GHz In As= 0.0000 sc CB:= 10.940 kg-band=.0211 In In In Lambda = 0.0211 Ps:= 17.851 O O Ges:= 10 *(D*D) Rf = 51.825 In In Rf:= 1.6 *(D*D) Rf*3.281= 70.849 In	mw sq cm	4.259	Wg =	.* ' '	P Sa	Wg=	
D:= 1.35 meters D*3.281 = 4.429 FR Sa:= π* D*D 4 Sa = 1.431 sc DS:= 0 cm Ds*3.3937 0.000 In As:= π* Ds*Ds As 0.000 In As:= π* Ds*Ds As 0.000 In As:= π* Ds*3937 0.000 In As:= 0.0211 meters C-Band = .009 Ku-Band = .0211 Sc C-Band = .009 Ku-Band = .0211 P2= 18.451 Jack Jack Loss:= 0.6 P3= 70.00 watts P2= 18.451 Jack Jack Loss:= 0.6 P3= 17.851 D Jack D D D D Sc P3:= 10 10 P3 P3= 17.851 D O O D	mw sq cm	8.519	Wm =	.1	2*P Sa	Wm=	Main Reflector Region Pwr Density (Wm) =
D:= 1.35 meters D*3.281 = 4.429 Fe Sa:= π* D*D 4 Sa = 1.431 sc DS:= 0 cm Ds*.3937 0.0000 In As:= π* Ds*Ds As = 0.000 sc As:= π* Ds*Ds As = 0.000 sc As:= 0.0211 meters C-Band = 0.0211 sc C-Band = .049 Ku-Band = .0211 P2 = 18.451 dl Lambda = 0.0021 meters P2 = 18.451 dl C-Band = .049 Ku-Band = .0211 P2 = 18.451 dl Loss:= 0.6 P3 = 17.851 0 P2:= log(p1)*10 P3 = 17.851 0 Loss:= 0.6 P3 = 17.851 0 P:= 10		N/A	Ws =	*1000	2*P As	Ws=	Pwr Density at Sub Reflector (Ws) =
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	mw sq cm (Equal to or less than)	11.074	Rt=		Wn*1	Rt =	Transition Region (Rt) =
D: = 1.35 meters D*3.281 = 4.429 Sa: = π* D*D / 4 Sa = 1.431 Ds: = 0 cm Ds*.3937 0.000 As: = π* Ds*Ds / 4 As = 0.000 As: = π* Ds*Ds / 4 As = 0.000 Cf: = 14.250 GHz Lambda = 0.0211 meters C-Band = .049 Ku-Band = .0211 P1 = 70.00 watts P2: = log(p1)*10 P2 = 18.451 Loss: = 0.6 P3 = 17.851 P3: = P2-Loss P3 = 17.851 P3: = P2-Loss P3 = 17.851 P3: = 10 Gain Ges: = 10 Ges*D Lambda Rf = 51.825 Rf= .60 * (0*D) Lambda Rf*3.281= 170.037 Wf: 4* Ges*P Ges*D Rn= (D*D) A*Lambda Rn= 21.594 Rn= (D*D) Rn= 70.849	mw sq cm	11.074	Wn =	*.1	*		Near Field Power Density (Wn) =
D::= 1.35 meters D*3.281 = 4.429 Sa::= π* D*D Sa = 1.431 Ds::= 0 cm Ds*.3937 0.000 As::= π* Ds*Ds*Ds As = 0.000 As::= π* Ds*Ds*Ds As = 0.000 Cf::= 14.250 GHz As = 0.000 Lambda = 0.0211 meters Lambda = 0.0211 FP = 0.000 C-Band = .049 Ku-Band = .0211 P2 = 18.451 Loss::= 0.6 P3 = 17.851 P2:=log(p1)*10 P2 = 18.451 Loss::= 0.6 P3 = 17.851 P:= 10 P3 = 17.851 P:= 10 P3 = 60.967 Gain::= 0.6500 P3 = 2.69E+04 n::= 0.6500 Rf = 51.825 Rf= Lambda Rf*Rf* 170.037	meters feet	21.594 70.849	Rn= Rf*3.281=		(D*D) 4*Lambda	Rn= _	Near Field (Rn) =
D:= 1.35 meters D*3.281 = 4.429 Sa:= π* D*D Sa = 1.431 Ds:= 0 cm Ds*.3937 0.000 As:= π* Ds*Ds As = 0.000 As:= π* Ds*Ds As = 0.000 Cf:= 14.250 GHz Lambda = 0.0211 meters C-Band = .049 Ku-Band = .0211 P1 = 70.00 watts P2 = 18.451 Loss:= 0.6 P3 = 17.851 P3:=P2-Loss P3:=P2-Loss P3:= P2 = 10	mw sq cm	4.862	Wf =		Ges*P		Far Field Power Density (Wf) =
D:= 1.35 meters D*3.281 = 4.429 Sa:= π* Φ*D Sa = 1.431 Ds:= 0 cm Ds*.3937 0.000 As:= π* Ds*Ds*Ds*Ds*Ds*Ds*Ds*Ds*Ds*Ds*Ds*Ds*Ds*D	meters feet	51.825 170.037	Rf = Rf*3.281=		. <u>60 * (D*D)</u> Lambda	Rf=	Far Field (Rf) =
D:= 1.35 meters D*3.281 = 4.429 Sa:= π* D*D As:= π* D*D As:= π* Ds*Ds As:= π* Ds*Ds*Ds As:= π* Ds*Ds*Ds As:= π* Ds*Ds*Ds As:= 0.000 Cf:= 14.250 GHz Lambda = 0.0211 meters As= 0.000 C-Band = .049 Ku-Band = .0211 P2= 18.451 P2:=log(p1)*10 P2= 18.451 Loss:= 0.6 P3:= P2:-loss P3= 17.851 P:= 10 P3 P:= 10 P3 P:= 60.967 Gain:= 44.30 dBi Ges:= 10 Ges = 2.69E+04					0.6500	n: =	Antenna Aperture Efficiency, (n) =
D:= 1.35 meters D*3.281 = 4.429 Sa:= π* D*D Sa = 1.431 Ds:= 0 cm Ds*.3937 0.000 As:= π* Ds*Ds As = 0.000 Cf:= 14.250 GHz As = 0.000 Lambda = 0.0211 meters C-Band = .049 Ku-Band = .0211 C-Band = .049 Ku-Band = .0211 Fo.00 watts P2:=log(p1)*10 P2= 18.451 Loss: = 0.6 P3= 17.851 P3:= P2-Loss P3 = 17.851 P:= 10 P3	Ratio	2.69E+04	Ges =		<u>1</u>		Antenna Gain at (Cf), (Gain) = Antenna Gain Converted to Power Ratio (Ges)=
D:= 1.35 meters D*3.281 = 4.429 Sa:= π* D*D Ds:= 0 cm Ds*.3937 0.000 As:= π* Ds*Ds As:= π* Ds*Ds As:= π* Ds*Ds As:= π* Ds*Ds Cf:= 14.250 GHz Lambda = 0.0211 meters C-Band = .049 Ku-Band = .0211 P1= 70.00 watts P2:= log(p1)*10 P2= 18.451	OMT Pwr in dB OMT Pwr in watts	17.851 60.967	P3=		P P	Loss: = P3:= P2- P:=	Path Loss from HPA or VPC to OMT, (IL) =
D:= 1.35 meters D*3.281 = 4.429 Sa:= π*	dB	18.451	P2=	tts	70.00 wa p1)*10	P1= P2:=log(Tansmit Power at HPA or VPC Flange, (P1) =
D: = 1.35 meters D*3.281 = 4.429 Sa: = π* D*D / 4 Sa = 1.431 Ds: = 0 cm Ds*.3937 0.000 As: = π* Ds*Ds / 4 As = 0.000 Cf: = 14.250 GHz				eters = .0211	= 0.0211 me = .049 Ku-Band	Lambda C-Band :	Wavelength at (Cf), (Lambda) =
D:= 1.35 meters D*3.281 = 4.429 Sa:= π^* $\frac{D^*D}{4}$ Sa = 1.431 Ds:= 0 cm Ds*3.3937 0.000 As:= π^* $\frac{Ds^*Ds}{4}$ As = 0.000				Z	14.250 GH	Cf: =	Center Frequency, (Cf) =
D:= 1.35 meters D*3.281 = 4.429 Sa:= π* D*D 4 Sa = 1.431 Ds:= 0 cm Ds*.3937 0.000	sq meters	0.000	As=				Area of Subreflector, (As) =
D:= 1.35 meters D*3.281 = 4.429 Sa:= $\pi^* \frac{D^*D}{4}$ Sa = 1.431	Inches	0.000	Ds*.3937		0 cm	Ds: =	Subreflector Diameter, (Ds) =
D: = 1.35 meters D*3.281 = 4.429	sq meters	1.431	Sa =		lı I		Antenna Surface Area, (Sa) =
	Feet	4.429	D*3.281 =	ters	1.35 me	D: =	Antenna Diameter, (D) =