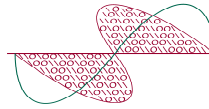


Radiofrequency Electromagnetic Field Hazard Study

prepared for

Gray Television Licensee, LLC E010214

Fixed Satellite Service - Temporary Earth Station



Chesapeake RF Consultants, LLC

Radiofrequency Consulting Engineers
Digital Television and Radio

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Proposed Earth Station Parameters

Center Frequency of Operation (F)	14.25	GHz		
Wavelength at Center Frequency (λ)	0.02105	meters		
Power At OMT (P)	120.00	Watts		
Antenna Diameter (D)	1.20	meters	3.94	feet
Antenna Gain (G)	43.50	dBi		
Antenna Aperture Efficiency (η)	0.698			

Radiofrequency Electromagnetic Field Maximum Permissible Exposure (MPE) Limits for 1500-100,000 MHz

General Population / Uncontrolled	1.00	mW/cm ²
Occupational / Controlled	5.00	mW/cm ²

Calculation Results - Maximum RF Power Density

Near Field On-Axis:				
R _{nf} Ends	17.10	meters	56.1	feet
S _{nf} Maximum Power Density	60.79	mW/cm ²	Exceeds Uncontrolled MPE Exceeds Controlled MPE	
Far Field On-Axis:				
R _{ff} Begins	41.04	meters	134.7	feet
S _{ff} Maximum Power Density	12.69	mW/cm ²	Exceeds Uncontrolled MPE Exceeds Controlled MPE	
Transition Region On-Axis:				
R _{nf} Transition Begins	17.10	meters	56.1	feet
R _{ff} Transition Ends	41.04	meters	134.7	feet
S _t Maximum Power Density	60.79	mW/cm ²	Exceeds Uncontrolled MPE Exceeds Controlled MPE	
Off-Axis Near Field:				
S _{nf(oa)} Maximum Power Density (at one antenna diameter)	0.61	mW/cm ²	Satisfies Uncontrolled MPE Satisfies Controlled MPE	
Off-Axis Far Field:				
S _{ff(oa)} Maximum Power Density (at 7° off-axis)	0.127	mW/cm ²	Satisfies Uncontrolled MPE Satisfies Controlled MPE	

Compliance Statement: The dish antenna is mounted on the top of a commercial-grade truck. On-axis locations exceed the FCC MPE limit and will be well elevated above ground and not accessible by the general public. Off-axis, the maximum power density does not exceed the general population / uncontrolled MPE.

The licensee has established procedures for the operational personnel to verify that the antenna is not pointing in the direction of populated areas, and that access to any hazardous areas are restricted while the unit is in operation. The only access to the roof of the truck is a ladder that is not accessible by the general public. Operational personnel shall choose transmitting locations such that no buildings, other obstacles, or human access will be situated in the areas that exceed the MPE limits. The earth station personnel are trained to ensure that the antenna path is clear at all times while the transmitter is in operation.

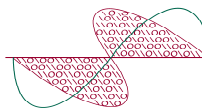
To assure the compliance with safety limits, all emissions shall cease whenever personnel must access the area in front of the antenna or any other locations that may exceed the occupational / controlled MPE limit. The mobile unit will be marked with warning signs to advise personnel to avoid the area around and in front of the reflector when the transmitter is operating.

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Power Density Calculation Detail

Distance to Far Field (R_{ff})	$R_{ff} =$	$0.6 * D^2 / \lambda$	$R_{ff} =$	41.04	meters
Far Field Power Density (S_{ff})	$S_{ff} =$	$(P_G) / (4 \pi R^2)$	$S_{ff} =$	12.69	mW/cm ²
Near Field Distance (R_{nf})	$R_{nf} =$	$D^2 / 4\lambda$	$R_{nf} =$	17.10	meters
Near Field Power Density (S_{nf})	$S_{nf} =$	$(16 P) / (\eta \pi D^2)$	$S_{nf} =$	60.79	mW/cm ²

Transition Region (R_t) Begins at End of Near Field:		$R_{nf} =$	17.10	meters
Transition Region (R_t) Ends at Beginning of Far Field:		$R_{ff} =$	41.04	meters
Transition Power Density (S_t)	$S_t =$	$S_{nf} R_{nf} / R_t$		
S_t will not exceed near field density (S_{nf})			$S_t \leq$	60.79 mW/cm ²

Off-Axis Near Field Power Density $S_{nf(oa)}$	$S_{nf(oa)} =$	$S_{nf} / 100$	$S_{nf(oa)} =$	0.61	mW/cm ²
Off-Axis Far Field Power Density $S_{ff(oa)}$	$S_{ff(oa)} =$	$S_{ff} / 100$	$S_{ff(oa)} =$	0.127	mW/cm ²

Note: Calculations made pursuant to FCC OET Bulletin No. 65 Edition 97-01 (1997) except that near field power density computed using updated formula as derived by FCC Staff from IEEE Std. C95.3-2021, Section D.4.4.

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August 19, 2026
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