

**MERA NEXT GENERATION RADIO
COMMUNICATION SYSTEM**

**DRAFT SUBSEQUENT
ENVIRONMENTAL IMPACT REPORT**

SCH #99092073

VOLUME 2 OF 2

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COMMENT LETTERS

SEPTEMBER 2019

MARIN EMERGENCY RADIO AUTHORITY (MERA)

APPENDIX A

ACCURACY OF VISUAL SIMULATIONS

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ACCURACY OF VISUAL SIMULATIONS

The aesthetics analysis of impacts depends on visual simulations to accurately depict conditions after installation of the project. This brief document describes the process used to generate and maintain accuracy in visual simulations.

A. Site Photography

Photo locations are selected to represent typical near and distant views, especially from public lands when available.

B. CAD Modeling

Three-dimensional computer aided design (CAD) models of the towers and all existing and proposed equipment are incorporated into the CAD models. Sun position at the time of the original photograph are matched and shadows, which reveal considerable detail, are incorporated.

C. Perspective Matching

CAD models can be viewed from any perspective; above, below, near and distant perspectives. GPS is used to record the coordinates of the original photo locations. The location of the model is geo-referenced to real-world spatial coordinates, thus the selected view of the model can be matched to the original perspective in the photograph. Photos of the model are taken within the CAD environment and the digitally overlaid onto the existing photograph. Existing equipment in the photograph and the model are matched to insure the perspective is accurate and alignments are correct.

C. Simulation Production and Rendering

Colors and textures are added to the CAD models depending to the materials specified.

APPENDIX B

SPECIAL-STATUS SPECIES LISTS

APPENDIX B

SPECIAL-STATUS SPECIES LISTS

The tables contained in this appendix were developed to support the Biological Resources Assessment (BRA) completed by WRA, Inc. (2018), which is incorporated into Section IV.C (Environmental Impact Analysis, Biological Resources). The evaluation of biological resources included literature reviews and desktop database reviews for all 18 sites, as well as field visits to the nine sites found to have potential impacts to sensitive biological resources. The three tables below were used to support the impact conclusions contained in the SEIR. Tables 1 and 2 summarize the lists of special-status plants and wildlife species with at least a moderate to high potential to occur at each site. The more general Table 3 includes any species with potential to occur in the Study Area, including those that are less likely to be present. It was used as the initial filter to determine the potential for presence of special-status species at each site.

- 1. Special-status Plants with Moderate/High Potential to Occur near the Study Area**
- 2. Special-status Wildlife with Moderate/High Potential to Occur near the Study Area**
- 3. Potential for Special-Status Plant and Wildlife Species to Occur in the Study Area**

Table 1. Special-status Plants with Moderate/High Potential to Occur near the Study Area

Species / Status	D. Mt. Tamalpais	F. Point Reyes	K. Stewart Point	L. Tomaes	M. Coyote Peak	N. Skyview Terrace	O. Muir Beach	R. Mill Valley
Blasdale's bent grass (<i>Agrostis blasdalei</i>) CNPS Rank 1B.2		X	X					
Napa false indigo (<i>Amorpha californica</i> var. <i>napensis</i>) CNPS Rank 1B.2	X							
bent-flowered fiddleneck (<i>Amsinckia lunaris</i>) CNPS Rank 1B.2				X	X	X		X
Marin manzanita (<i>Arctostaphylos</i> <i>virgata</i>) CNPS Rank 1B.2		X	X					
Brewer's calandrinia (<i>Calandrinia breweri</i>) CNPS Rank 4.2	X	X	X					
Oakland star-tulip (<i>Calochortus</i> <i>umbellatus</i>) CNPS Rank 4.2	X							X
Coastal bluff morning-glory (<i>Calystegia purpurata</i> ssp. <i>saxicola</i>) CNPS Rank 1B.2		X	X					
Point Reyes ceanothus (<i>Ceanothus gloriosus</i> var. <i>gloriosus</i>) CNPS Rank 4.3		X						
Mt. Vision ceanothus (<i>Ceanothus gloriosus</i> var. <i>porrectus</i>) CNPS Rank 1B.3		X						

Species / Status	D. Mt. Tamalpais	F. Point Reyes	K. Stewart Point	L. Tomaes	M. Coyote Peak	N. Skyview Terrace	O. Muir Beach	R. Mill Valley
Baker's larkspur (<i>Delphinium bakeri</i>) FE, SE, CNPS Rank 1B.1					X			
Western leatherwood (<i>Dirca occidentalis</i>) CNPS Rank 1B.2		X						
California bottle- brush grass (<i>Elymus californicus</i>) CNPS Rank 4.3			X					
Marin checker lily (<i>Fritillaria lanceolata</i> var. <i>tristulis</i>) CNPS Rank 1B.1		X	X					
fragrant fritillary (<i>Fritillaria liliacea</i>) CNPS Rank 1B.2				X	X			
congested-headed hayfield tarplant (<i>Hemizonia congesta</i> ssp. <i>congesta</i>) CNPS Rank 1B.2				X	X	X		X
Point Reyes horkelia (<i>Horkelia</i> <i>marinensis</i>). CNPS Rank 1B.2		X					X	
thin-lobed horkelia (<i>Horkelia tenuiloba</i>) CNPS Rank 1B.2	X							
small groundcone (<i>Kopsiopsis hookeri</i>) CNPS Rank 2B.3	X							
Baker's goldfields (<i>Lasthenia californica</i> ssp. <i>bakeri</i>) CNPS Rank 1B.2		X	X					

Species / Status	D. Mt. Tamalpais	F. Point Reyes	K. Stewart Point	L. Tomaes	M. Coyote Peak	N. Skyview Terrace	O. Muir Beach	R. Mill Valley
perennial goldfields (<i>Lasthenia californica</i> ssp. <i>macrantha</i>) CNPS Rank 1B.2		X						
bristly leptosiphon (<i>Leptosiphon</i> <i>acicularis</i>) CNPS Rank 4.2				X		x		
large-flowered leptosiphon (<i>Leptosiphon</i> <i>grandiflorus</i>) CNPS Rank 4.2		X		X				
Mt. Diablo cottonweed (<i>Micropus</i> <i>amphibolus</i>) CNPS Rank 3.2	X							
marsh Microseris (<i>Microseris paludosa</i>) CNPS Rank 1B.2		X	X	X		X		
Michael's rein orchid (<i>Piperia michaelii</i>) CNPS Rank 4.2		X	X					
Tamalpais oak (<i>Quercus parvula</i> var. <i>tamalpaisensis</i>) CNPS Rank 1B.3	X							
two-fork clover (<i>Trifolium amoenum</i>) FE, CNPS Rank 1B.1				X				
San Francisco owl's clover (<i>Triphysaria</i> <i>floribunda</i>) CNPS Rank 1B.2		X						

Species / Status	D. Mt. Tamalpais	F. Point Reyes	K. Stewart Point	L. Tomaes	M. Coyote Peak	N. Skyview Terrace	O. Muir Beach	R. Mill Valley
coastal triquetrella (<i>Triquetrella californica</i>) CNPS Rank 1B.1		X	X					

Table 2. Special-status Wildlife with Moderate/High Potential to Occur near the Study Area

Species/ Status	D. Mt. Tamalpais	F. Point Reyes	I. Mt. Tiburon	K. Stewart Point	L. Tomaes	M. Coyote Peak	N. Skyview Terrace	O. Muir Beach	R. Mill Valley
American badger (<i>Taxidea taxus</i>)	X	X		X	X	X			
burrowing owl (<i>Athene cunicularia</i>)					X				
nesting birds (including special-status)	X	X	X	X	X	X	X	X	X
northern spotted owl (<i>Strix occidentalis caurina</i>)				X					X
California red-legged frog (<i>Rana draytonii</i>)					X	X			

Table 3. Potential for Special-Status Plant/Wildlife Species to Occur in the Study Area

Special-status plant and wildlife species table with the potential to occur within the vicinity of the Project Area (Valley Ford, Point Reyes NE, Inverness, Novato, Bolinas, San Rafael, San Quentin, and Point Bonita USGS 7.5' topographic quadrangles). Results include database searches of California Native Plant Society (CNPS) Rare and Endangered Plant Inventory, California Natural Diversity Database (CNDDB, CDFW), Information Planning and Conservation (IPaC) as well as U.S. Fish and Wildlife Service Threatened and Endangered Species Lists.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
pink sand-verbena <i>Abronia umbellata</i> var. <i>breviflora</i>	Rank 1B.1	Coastal dunes. Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms Jun-Oct.	No Potential. The Study Area lacks coastal dunes necessary to support this species.	No further actions are recommended.
Blasdale's bent grass <i>Agrostis blasdalei</i>	Rank 1B.2	Coastal bluff scrub, coastal dunes, coastal prairie. Elevation ranges from 0 to 490 feet (0 to 150 meters). Blooms May-Jul.	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having a moderate potential to occur at the Stewart Point, and Point Reyes Hill sites due to the presence of potentially suitable coastal scrub habitat within the Study Area. However, this species was not observed during protocol-level rare plant surveys conducted	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
			during the species' documented bloom period.	
Sonoma alopecurus <i>Alopecurus aequalis</i> var. <i>sonomensis</i>	FE, Rank 1B.1	Marshes and swamps (freshwater), riparian scrub. Elevation ranges from 15 to 1200 feet (5 to 365 meters). Blooms May-Jul.	No Potential. The Study Area lacks large, intact freshwater marshes known to support this species.	No further actions are recommended.
Napa false indigo <i>Amorpha californica</i> var. <i>napensis</i>	Rank 1B.2	Broad-leafed upland forest (openings), chaparral, cismontane woodland. Elevation ranges from 390 to 6560 feet (120 to 2000 meters). Blooms Apr-Jul.	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having a moderate potential to occur at the Mt. Tamalpais site due to the presence of potentially suitable woodland and chaparral habitat within the Study Area, and proximity to a documented occurrence. However, this species was not observed during protocol-level rare plant surveys conducted during	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
			the species' documented bloom period.	
bent-flowered fiddleneck <i>Amsinckia lunaris</i>	Rank 1B.2	Coastal bluff scrub, cismontane woodland, valley and foothill grassland. Elevation ranges from 5 to 1640 feet (3 to 500 meters). Blooms Mar-Jun.	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having a moderate potential to occur at the Tomales, Coyote Peak, Skyview Terrace, and Mill Valley Water Tank sites due to the presence of potentially suitable grassland and woodland habitat within the Study Area. This species was observed at a documented reference site along Highway 1 in Tomales during the March 30, 2018 survey. However, this species was not observed during protocol-level rare plant surveys conducted during the species' documented bloom period.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
coast rockcress <i>Arabis blepharophylla</i>	Rank 4.3	Broad-leaved upland forest, coastal bluff scrub, coastal prairie, coastal scrub. Elevation ranges from 5 to 3610 feet (3 to 1100 meters). Blooms Feb-May.	Unlikely. The Study Area lacks rock outcrop habitat within coastal scrub most often associated with this species. This species was observed at a documented reference site along Highway 1 in Tomales during the March 30, 2018 survey. However, this species was not observed during protocol-level rare plant surveys conducted during the species' documented bloom period.	No further actions are recommended.
Mt. Tamalpais manzanita <i>Arctostaphylos montana ssp. montana</i>	Rank 1B.3	Chaparral, valley and foothill grassland; serpentine. Elevation ranges from 520 to 2495 feet (160 to 760 meters). Blooms Feb-Apr.	No Potential. The Study Area lacks serpentine substrates necessary to support this species.	No further actions are recommended.
Marin manzanita <i>Arctostaphylos virgata</i>	Rank 1B.2	Broad-leaved upland forest, closed-cone coniferous forest, chaparral, north coast coniferous forest. Elevation ranges from 195	Present (at Stewart Point Study Area; initially assessed: High Potential). This species was initially determined to have a high potential to occur at the Point Reyes Hill and Stewart	See Section 4.1 for recommendations for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
		to 2295 feet (60 to 700 meters). Blooms Jan-Mar.	Point sites due to the presence of potentially suitable scrub and woodland habitats directly adjacent to the Study Area and proximity to documented occurrences. This species was not observed at the Point Reyes hill site despite observing one individual of this species at a documented reference site on Mount Vision Road the day of the site visits. One individual of this species was observed in the Stewart Point Study Area, but outside of the Project Area during the March 30, and June 20, 2018 site visits.	
Carlotta Hall's lace fern <i>Aspidotis carlotta-halliae</i>	Rank 4.2	Chaparral, cismontane woodland; serpentine. Elevation ranges from 325 to 4595 feet (100 to 1400 meters). Blooms Jan-Dec.	No Potential. The Study Area lacks serpentine substrate known to support this species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
Brewer's milk-vetch <i>Astragalus breweri</i>	Rank 4.2	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland (open, often gravelly, usually on serpentine). Elevation ranges from 295 to 2395 feet (90 to 730 meters). Blooms Apr-Jun.	Unlikely. The Study Area lacks serpentine substrates most often associated with this species.	No further actions are recommended.
ocean bluff milk-vetch <i>Astragalus nuttallii</i> var. <i>nuttallii</i>	Rank 4.2	Coastal bluff scrub, coastal dunes. Elevation ranges from 5 to 395 feet (3 to 120 meters). Blooms Jan-Nov.	No Potential. The Study Area lacks coastal bluff scrub and coastal dunes known to support this species.	No further actions are recommended.
coastal marsh milk-vetch <i>Astragalus pycnostachyus</i> var. <i>pycnostachyus</i>	Rank 1B.2	Coastal dunes (mesic), coastal scrub, marshes and swamps (coastal salt, stream sides). Elevation ranges from 0 to 100 feet (0 to 30 meters). Blooms (Apr)Jun-Oct.	No Potential. The Study Area lacks salt marsh, and mesic coastal scrub habitat known to support this species.	No further actions are recommended.
Bolander's reed grass <i>Calamagrostis bolanderi</i>	Rank 4.2	Bogs and fens, broad-leaved upland forest, closed-cone coniferous forest, coastal scrub, meadows and seeps (mesic), marshes and	Unlikely. The Study Area lacks freshwater marshes and wet meadows known to support this species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
		swamps (freshwater), north coast coniferous forest. Elevation ranges from 0 to 1495 feet (0 to 455 meters). Blooms May-Aug.		
Thurber's reed grass <i>Calamagrostis crassiglumis</i>	Rank 2B.1	Coastal scrub (mesic), marshes and swamps (freshwater). Elevation ranges from 30 to 195 feet (10 to 60 meters). Blooms May-Aug.	Unlikely. The Study Area lacks freshwater marsh habitat known to support this species.	No further actions are recommended.
serpentine reed grass <i>Calamagrostis ophitidis</i>	Rank 4.3	Chaparral (open, often north-facing slopes), lower montane coniferous forest, meadows and seeps, valley and foothill grassland; serpentine. Elevation ranges from 295 to 3495 feet (90 to 1065 meters). Blooms Apr-Jul.	No Potential. The Study Area lacks serpentine habitat known to support this species.	No further actions are recommended.
Brewer's calandrinia <i>Calandrinia breweri</i>	Rank 4.2	Chaparral, coastal scrub. Elevation ranges from 30 to 4005 feet (10 to 1220 meters). Blooms (Jan) Mar-Jun.	Not Observed (initially assessed: Moderate Potential). This species was initially determined to have a moderate potential to occur at the Point Reyes	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
			Hill, Stewart Point, and Mt. Tamalpais sites due to the presence of potentially suitable scrub and chaparral habitat within the Study Area. However, this species was not observed during the site visits conducted during the species' documented bloom period.	
Tiburon mariposa lily <i>Calochortus tiburonensis</i>	FT, ST, Rank 1B.1	Valley and foothill grassland (serpentine). Elevation ranges from 160 to 490 feet (50 to 150 meters). Blooms Mar-Jun.	No Potential. The Study Area lacks serpentine outcrops necessary to support this species. This species is only known to be present in the Ring Mountain Open Space Preserve.	No further actions are recommended.
Oakland star-tulip <i>Calochortus umbellatus</i>	Rank 4.2	Broad-leaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 325 to 2295 feet (100 to 700 meters). Blooms Mar-May.	Present (at Stewart Point Study Area; initially assessed: Moderate Potential). This species was initially assessed as having a moderate potential to occur at the Mt. Tamalpais, and Mill Valley Water Tank sites due to the	See Section 4.2 for recommendations for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
			presences of potentially suitable grassland, chaparral, and forest habitat within or directly adjacent to the Study Area. This species was not observed at the Mt. Tamalpais site. However, approximately 15 individuals were observed in the Mill Valley Water Tank Study Area, but outside of the Project Area during the May 8, 2018 site visit.	
coastal bluff morning-glory <i>Calystegia purpurata ssp. saxicola</i>	Rank 1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, north coast coniferous forest. Elevation ranges from 0 to 345 feet (0 to 105 meters). Blooms (Mar) Apr-Sep.	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having a moderate potential to occur at the Stewart Point, and Point Reyes Hill sites due to the presence of potentially suitable coastal scrub within the Study Area and proximity to documented occurrences. However, this species was not observed during	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
			protocol-level rare plant surveys conducted during the species' documented bloom period.	
swamp harebell <i>Campanula californica</i>	Rank 1B.2	Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows and seeps, marshes and swamps (freshwater), north coast coniferous forest. Elevation ranges from 0 to 1330 feet (1 to 405 meters). Blooms Jun-Oct.	No Potential. The Study Area lacks freshwater marsh and wet meadow necessary to support this species.	No further actions are recommended.
Lyngbye's sedge <i>Carex lyngbyei</i>	Rank 2B.2	Marshes and swamps (brackish or freshwater). Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms Apr-Aug.	No Potential. The Study Area lacks freshwater marsh habitat necessary to support this species.	No further actions are recommended.
Tiburon paintbrush <i>Castilleja affinis</i> var. <i>neglecta</i>	FE, ST, Rank 1B.2	Valley and foothill grassland (serpentine). Elevation ranges from 195 to 1310 feet (60 to 400 meters). Blooms Apr-Jun.	No Potential. Despite the location of a documented occurrence in close proximity to the Mt. Tiburon site, the Mt. Tiburon site is previously developed, and lacks serpentine substrate necessary to support this	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
			species. This species was observed in full bloom at a documented reference site on Gilmartin Drive, approximately 0.3 mile west of the Study Area. However, this species was not observed within the Study Area.	
johnny-nip <i>Castilleja ambigua</i> var. <i>ambigua</i>	Rank 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pools margins (mesic). Elevation ranges from 0 to 1425 feet (0 to 435 meters). Blooms Mar-Aug.	Unlikely. The Study Area lacks mesic coastal grassland and seasonal wetland habitats known to support this species.	No further actions are recommended.
Humboldt Bay owl's-clover <i>Castilleja ambigua</i> var. <i>humboldtiensis</i>	Rank 1B.2	Marshes and swamps (coastal salt). Elevation ranges from 0 to 10 feet (0 to 3 meters). Blooms Apr-Aug.	No Potential. The Study Area lacks wetland habitat necessary to support this species.	No further actions are recommended.
glory brush <i>Ceanothus gloriosus</i> var. <i>exaltatus</i>	Rank 4.3	Chaparral. Elevation ranges from 95 to 2000 feet (30 to 610 meters). Blooms Mar-Jun (Aug).	Unlikely. The Study Area lacks chaparral habitat known to support this species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
Point Reyes ceanothus <i>Ceanothus gloriosus var. gloriosus</i>	Rank 4.3	Coastal bluff scrub, closed-cone coniferous forest, coastal dunes, coastal scrub. Elevation ranges from 15 to 1705 feet (5 to 520 meters). Blooms Mar-May.	Not Observed (initially assessed: High Potential). This species was initially determined to have a high potential to occur at the Point Reyes Hill site due to the presence of potentially suitable Bishop pine forest and coastal scrub habitats within the Study Area, and proximity to documented occurrences. However, this species was not observed during protocol-level rare plant surveys conducted during the species' documented bloom period.	No further actions are recommended.
Mt. Vision ceanothus <i>Ceanothus gloriosus var. porrectus</i>	Rank 1B.3	Closed-cone coniferous forest, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 80 to 1000 feet (25 to 305 meters). Blooms Feb-May.	Not Observed (initially assessed: High Potential). This species was initially assessed as having potential to occur at the Point Reyes Hill site as identified in the Project's EIR (EDAW Inc 2000) due to the presence of potentially suitable Bishop	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
			<p>pine forest and coastal scrub habitats within the Study Area, and proximity to documented occurrences. WRA conducted a survey for this species at the Point Reyes Hill site in compliance with Mitigation Measure – Point Reyes Hill Site BIO-3. This species was observed in bud and in bloom at a documented reference site on Point Reyes on May 6, 2018, indicating that it would have been identifiable during the site visit. However, this species was not observed in the Study Area during the protocol-level rare plant survey conducted on March 30, 2018</p>	
Mason's ceanothus <i>Ceanothus masonii</i>	SR, Rank 1B.2	Chaparral (openings, rocky, serpentine). Elevation ranges from 750 to 1640 feet (230 to 500 meters). Blooms Mar-Apr.	Unlikely. The Study Area lacks chaparral and serpentine substrates known to support this species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
Point Reyes bird's-beak <i>Chloropyron maritimum ssp. palustre</i>	Rank 1B.2	Marshes and swamps (coastal salt). Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms Jun-Oct.	No Potential. The Study Area lacks salt marsh habitat necessary to support this species.	No further actions are recommended.
San Francisco Bay spineflower <i>Chorizanthe cuspidata var. cuspidata</i>	Rank 1B.2	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub (sandy). Elevation ranges from 5 to 705 feet (3 to 215 meters). Blooms Apr-Jul (Aug).	No Potential. The Study Area lacks sandy soils and coastal dunes known to support this species.	No further actions are recommended.
woolly-headed spineflower <i>Chorizanthe cuspidata var. villosa</i>	Rank 1B.2	Coastal dunes, coastal prairie, coastal scrub (sandy). Elevation ranges from 5 to 195 feet (3 to 60 meters). Blooms May-Jul (Aug).	No Potential. The Study Area lacks sandy soils and coastal dunes known to support this species.	No further actions are recommended.
Sonoma spineflower <i>Chorizanthe valida</i>	FE, SE, Rank 1B.1	Coastal prairie (sandy). Elevation ranges from 30 to 1000 feet (10 to 305 meters). Blooms Jun-Aug.	No Potential. The Study Area lacks coastal prairie underlain by sandy soils necessary to support this species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
Bolander's water-hemlock <i>Cicuta maculata</i> var. <i>bolanderi</i>	Rank 2B.1	Marshes and swamps coastal, fresh or brackish water. Elevation ranges from 0 to 655 feet (0 to 200 meters). Blooms Jul-Sep.	No Potential. The Study Area lacks salt marsh habitat necessary to support this species.	No further actions are recommended.
Franciscan thistle <i>Cirsium andrewsii</i>	Rank 1B.2	Broad-leafed upland forest, coastal bluff scrub, coastal prairie, coastal scrub; bluffs, ravines, seeps (sometimes serpentine). Elevation ranges from 0 to 490 feet (0 to 150 meters). Blooms Mar-Jul.	Unlikely. The Study Area lacks seeps, ravines, and serpentine substrates most often associated with this species.	No further actions are recommended.
Mt. Tamalpais thistle <i>Cirsium hydrophilum</i> var. <i>vaseyi</i>	Rank 1B.2	Broad-leafed upland forest, chaparral, meadows and seeps (serpentine). Elevation ranges from 785 to 2035 feet (240 to 620 meters). Blooms May-Aug.	No Potential. The Study Area lacks serpentine seeps and streams necessary to support this species.	No further actions are recommended.
round-headed Chinese-houses <i>Collinsia corymbosa</i>	Rank 1B.2	Coastal dunes. Elevation ranges from 0 to 65 feet (0 to 20 meters). Blooms Apr-Jun.	No Potential. The Study Area lacks coastal dunes necessary to support this species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
California lady's-slipper <i>Cypripedium californicum</i>	Rank 4.2	Bogs and fens, lower montane coniferous forest. Elevation ranges from 95 to 9020 feet (30 to 2750 meters). Blooms Apr-Aug (Sep).	No Potential. The Study Area lacks wetland habitat necessary to support this species.	No further actions are recommended.
Baker's larkspur <i>Delphinium bakeri</i>	FE, SE, Rank 1B.1	Broad-leaved upland forest, coastal scrub, valley and foothill grassland. Elevation ranges from 260 to 1000 feet (80 to 305 meters). Blooms Mar-May.	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having moderate potential to occur at the Coyote Peak site due to the presence of potentially suitable coastal scrub and grassland habitat within the Study Area, and its close proximity to the only documented extant occurrence of this species along Marshall-Petaluma Road, approximately 3.5 miles southeast of the Study Area. This species was observed at the documented occurrence on May 9, 2018, the same date of the survey. However, this species was	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
			not observed in the Study Area.	
golden larkspur <i>Delphinium luteum</i>	FE, SR, Rank 1B.1	Chaparral, coastal prairie, coastal scrub. Elevation ranges from 0 to 330 feet (0 to 100 meters). Blooms Mar-May.	Unlikely. The Study Area lacks rock outcrops known to support this species. This species was observed at a documented reference site along Highway 1 in Tomales during the March 30, 2018 survey. However, this species was not observed during protocol-level rare plant surveys conducted during the species' documented bloom period.	No further actions are recommended.
western leatherwood <i>Dirca occidentalis</i>	Rank 1B.2	Broad-leaved upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, north coast coniferous forest, riparian forest, riparian woodland. Elevation ranges from 80 to 1395 feet (25 to	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having potential to occur at the Point Reyes Hill site as identified in the Project's EIR (EDAW Inc. 2000). WRA conducted a survey for this species at the Point	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
		425 meters). Blooms Jan-Mar (Apr).	Reyes Hill site during the documented bloom period on March 30, 2018, in compliance with Mitigation Measure – Point Reyes Hill Site BIO-3. However, this species was not observed in the Study Area.	
California bottle-brush grass <i>Elymus californicus</i>	Rank 4.3	Broad-leafed upland forest, cismontane woodland, north coast coniferous forest, riparian woodland. Elevation ranges from 45 to 1540 feet (15 to 470 meters). Blooms May-Aug (Nov).	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having moderate potential to occur at the Stewart Point site due to the presence of potentially suitable coniferous forest directly adjacent to the Study Area. However, this species was not observed in the Study Area during the surveys conducted during the species' documented bloom period.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
Tiburon buckwheat <i>Eriogonum luteolum</i> var. <i>caninum</i>	Rank 1B.2	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland (serpentine). Elevation ranges from 0 to 2295 feet (0 to 700 meters). Blooms May-Sep.	Unlikely. There is a documented occurrence within close proximity to the Mt. Tiburon site. However, the Mt. Tiburon site lacks serpentine substrate necessary to support this species. This species was observed in full bloom at a documented reference site on Gilmartin Drive, approximately 0.3 mile west of the Study Area. However, this species was not observed within the Study Area.	No further actions are recommended.
bluff wallflower <i>Erysimum concinnum</i>	Rank 1B.2	Coastal bluff scrub, coastal dunes, coastal prairie. Elevation ranges from 0 to 605 feet (0 to 185 meters). Blooms Feb-Jul.	No Potential. The Study Area lacks coastal dunes, and sandy coastal bluff scrub and prairie habitats known to support this species.	No further actions are recommended.
San Francisco wallflower <i>Erysimum franciscanum</i>	Rank 4.2	Chaparral, coastal dunes, coastal scrub, valley and foothill grassland. Elevation ranges from 0 to 1805 feet	No Potential. The Study Area lacks coastal dunes and sandy coastal scrub and	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
		(0 to 550 meters). Blooms Mar-Jun.	grassland habitats known to support this species.	
minute pocket moss <i>Fissidens pauperculus</i>	Rank 1B.2	North coast coniferous forest (damp coastal soil). Elevation ranges from 30 to 3360 feet (10 to 1024 meters).	No Potential. Despite the presence of coniferous forest at the Stewart Point site, the site lacks sufficiently wet soil necessary to support this species.	No further actions are recommended.
Marin checker lily <i>Fritillaria lanceolata</i> var. <i>tristulis</i>	Rank 1B.1	Coastal bluff scrub, coastal prairie, coastal scrub. Elevation ranges from 45 to 490 feet (15 to 150 meters). Blooms Feb-May.	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having a moderate potential to occur at the Point Reyes Hill, Stewart Point, and Muir Beach sites due to the presence of potentially suitable coastal scrub habitat directly adjacent to the Study Area. However, this species was not observed in the Study Area during the surveys conducted during the	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
			species' documented bloom period.	
fragrant fritillary <i>Fritillaria liliacéa</i>	Rank 1B.2	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 5 to 1345 feet (3 to 410 meters). Blooms Feb-Apr.	Not Observed (originally assessed: Moderate Potential). This species was initially assessed as having a moderate potential to occur at the Tomales and Coyote Peak sites due to the presence of potentially suitable grassland habitat within and directly adjacent to the Study Area. However, this species was not observed in the Study Area during the surveys conducted during the species' documented bloom period.	No further actions are recommended.
blue coast gilia <i>Gilia capitata ssp. chamissonis</i>	Rank 1B.1	Coastal dunes, coastal scrub (sandy). Elevation ranges from 5 to 655 feet (2 to 200 meters). Blooms Apr-Jul.	Unlikely. The Study Area lacks coastal dune habitat, and sandy coastal scrub necessary to support this species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
woolly-headed gilia <i>Gilia capitata ssp. tomentosa</i>	Rank 1B.1	Coastal bluff scrub, valley and foothill grassland (serpentine). Elevation ranges from 30 to 720 feet (10 to 220 meters). Blooms May-Jul.	No Potential. The Study Area lacks serpentine substrate necessary to support this species.	No further actions are recommended.
dark-eyed gilia <i>Gilia millefoliata</i>	Rank 1B.2	Coastal dunes. Elevation ranges from 5 to 100 feet (2 to 30 meters). Blooms Apr-Jul.	No Potential. The Study Area coastal dunes necessary to support this species.	No further actions are recommended.
San Francisco gumplant <i>Grindelia hirsutula var. maritima</i>	Rank 3.2	Coastal bluff scrub, coastal scrub, valley and foothill grassland (serpentine). Elevation ranges from 45 to 1310 feet (15 to 400 meters). Blooms Jun-Sep.	No Potential. The Study Area lacks serpentine substrate necessary to support this species.	No further actions are recommended.
Diablo helianthella <i>Helianthella castanea</i>	Rank 1B.2	Broad-leafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. Elevation ranges from 195 to 4265 feet (60 to 1300 meters). Blooms Mar-Jun.	Unlikely. Although several sites within the Study Area contain potentially suitable grassland habitat which could support this species, CNPS (2018) considers this species 'presumed extirpated' from Marin County. This species is currently known to be	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
			present in Alameda, Contra Costa, and San Mateo counties.	
congested-headed hayfield tarplant <i>Hemizonia congesta</i> ssp. <i>congesta</i>	Rank 1B.2	Valley and foothill grassland. Elevation ranges from 65 to 1835 feet (20 to 560 meters). Blooms Apr-Nov.	Not Observed (initially assessed: High Potential). This species was initially assessed as having a high potential to occur at the Tomales, Coyote Peak, Mill Valley Water Tank, and Skyview Terrace sites due to the presence of potentially suitable grassland habitat within and directly adjacent to the Study Area. This species was observed in full bloom at a documented reference site on Bodega Avenue, Petaluma on June 19, 2018. However, this species was not observed in the Study Area during the surveys conducted during the species' documented bloom period.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
short-leaved evax <i>Hesperevax sparsiflora</i> var. <i>brevifolia</i>	Rank 1B.2	Coastal bluff scrub (sandy), coastal dunes, coastal prairie. Elevation ranges from 0 to 705 feet (0 to 215 meters). Blooms Mar-Jun.	Unlikely. The Study Area lacks coastal dunes and sandy coastal scrub and grassland habitat necessary to support this species.	No further actions are recommended.
Marin western flax <i>Hesperolinon congestum</i>	FT, ST, Rank 1B.1	Chaparral, valley and foothill grassland (serpentine). Elevation ranges from 15 to 1215 feet (5 to 370 meters). Blooms Apr-Jul.	No Potential. The Study Area lacks serpentine substrate necessary to support this species.	No further actions are recommended.
water star-grass <i>Heteranthera dubia</i>	Rank 2B.2	Marshes and swamps (alkaline, still or slow-moving water). Elevation ranges from 95 to 4905 feet (30 to 1495 meters). Blooms Jul-Oct.	No Potential. The Study Area lacks marshes and swamps necessary to support this species.	No further actions are recommended.
Santa Cruz tarplant <i>Holocarpha macradenia</i>	FT, SE, Rank 1B.1	Coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 30 to 720 feet (10 to 220 meters). Blooms Jun-Oct.	Unlikely. The Study Area lacks grassland underlain by clay soils necessary to support this species (Jepson eFlora, 2018).	No further actions are recommended.
Kellogg's horkelia <i>Horkelia cuneata</i> var. <i>sericea</i>	Rank 1B.1	Closed-cone coniferous forest, chaparral (maritime), coastal dunes, coastal	Unlikely. The Study Area lacks closed-cone coniferous forest, maritime	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
		scrub. Elevation ranges from 30 to 655 feet (10 to 200 meters). Blooms Apr-Sep.	chaparral, and coastal dunes. CNPS (2018) considers this species 'presumed extirpated' from Marin County.	
Point Reyes horkelia <i>Horkelia marinensis</i>	Rank 1B.2	Coastal dunes, coastal prairie, coastal scrub. Elevation ranges from 15 to 2475 feet (5 to 755 meters). Blooms May-Sep.	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having high potential to occur at the Point Reyes Hill and Muir Beach sites due to the presence of potentially suitable coastal scrub and grassland within the Study Area, and proximity to documented occurrences. habitat. However, this species was not observed in the Study Area during the surveys conducted during the species' documented bloom period.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
thin-lobed horkelia <i>Horkelia tenuiloba</i>	Rank 1B.2	Broad-leafed upland forest, chaparral, valley and foothill grassland. Elevation ranges from 160 to 1640 feet (50 to 500 meters). Blooms May-Jul (Aug).	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having moderate potential to occur at the Mt. Tamalpais site due to the presence of potentially suitable chaparral habitat within the Study Area, and proximity to a documented occurrence. However, this species was not observed in the Study Area during the April 30 survey when this species would have been identifiable vegetatively conducted during the species' documented bloom period.	No further actions are recommended.
harlequin lotus <i>Hosackia gracilis</i>	Rank 4.2	Broad-leafed upland forest, coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal prairie, coastal scrub, meadows and seeps, marshes and swamps, north coast coniferous forest,	Unlikely. The Study Area lacks sufficiently mesic habitat necessary to support this hydrophytic species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
		valley and foothill grassland. Elevation ranges from 0 to 2295 feet (0 to 700 meters). Blooms Mar-Jul.		
small groundcone <i>Kopsiopsis hookeri</i>	Rank 2B.3	North coast coniferous forest. Elevation ranges from 295 to 2905 feet (90 to 885 meters). Blooms Apr-Aug.	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having a moderate potential to occur at Mt. Tamalpais sites due to the presence of potentially suitable coniferous forest and proximity to documented occurrences. However, this species was not observed in the Study Area during the surveys conducted during the species' documented bloom period.	No further actions are recommended.
Baker's goldfields <i>Lasthenia californica ssp. bakeri</i>	Rank 1B.2	Closed-cone coniferous forest (openings), coastal scrub, meadows and seeps, marshes and swamps. Elevation ranges from 195	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having a moderate potential to occur at Point Reyes Hill, and Stewart Point sites due	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
		to 1705 feet (60 to 520 meters). Blooms Apr-Oct.	to the presence of potentially suitable coniferous forest, and costal scrub habitat, and proximity to documented occurrences. However, this species was not observed in the Study Area during the surveys conducted during the species' documented bloom period.	
perennial goldfields <i>Lasthenia californica</i> ssp. <i>macrantha</i>	Rank 1B.2	Coastal bluff scrub, coastal dunes, coastal scrub. Elevation ranges from 15 to 1705 feet (5 to 520 meters). Blooms Jan-Nov.	Not Observed (initially assessed: Moderate Potential) This species was initially assessed as having a high potential to occur at the Point Reyes Hill site due to the presence of potentially suitable coastal scrub, and proximity to documented occurrences. However, this species was not observed in the Study Area during the surveys conducted during the species' documented bloom period.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
Contra Costa goldfields <i>Lasthenia conjugens</i>	FE, Rank 1B.1	Cismontane woodland, playas (alkaline), valley and foothill grassland, vernal pools. Elevation ranges from 0 to 1540 feet (0 to 470 meters). Blooms Mar-Jun.	No Potential. The Study Area lacks vernal pools necessary to support this species.	No further actions are recommended.
beach layia <i>Layia carnosa</i>	FE, SE, Rank 1B.1	Coastal dunes, coastal scrub (sandy). Elevation ranges from 0 to 195 feet (0 to 60 meters). Blooms Mar-Jul.	No Potential. The Study Area lacks coastal dunes and sandy coastal scrub necessary to support this species.	No further actions are recommended.
bristly leptosiphon <i>Leptosiphon acicularis</i>	Rank 4.2	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland. Elevation ranges from 180 to 4920 feet (55 to 1500 meters). Blooms Apr-Jul.	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having a moderate potential to occur at the Tomales and Skyview Terrace sites due to the presence of potentially suitable grassland habitat. However, this species was not observed in the Study Area during the surveys conducted during the	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
			species' documented bloom period.	
coast yellow leptosiphon <i>Leptosiphon croceus</i>	SS, Rank 1B.1	Coastal bluff scrub, coastal prairie. Elevation ranges from 30 to 490 feet (10 to 150 meters). Blooms Apr-Jun.	Unlikely. The Study Area lacks coastal bluff scrub, and coastal prairie habitat associated with this species.	No further actions are recommended.
large-flowered leptosiphon <i>Leptosiphon grandiflorus</i>	Rank 4.2	Coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 15 to 4005 feet (5 to 1220 meters). Blooms Apr-Aug.	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having a moderate potential to occur at the Tomales site due to the presence of potentially suitable grassland habitat, and proximity to documented occurrences. However, this species was not observed in the Study Area during the surveys conducted during the species' documented bloom period.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
rose leptosiphon <i>Leptosiphon rosaceus</i>	Rank 1B.1	Coastal bluff scrub. Elevation ranges from 0 to 330 feet (0 to 100 meters). Blooms Apr-Jul.	Unlikely. The Study Area lacks coastal bluff scrub habitat known to support this species.	No further actions are recommended.
woolly-headed lessingia <i>Lessingia hololeuca</i>	Rank 3	Broad-leafed upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland (serpentine). Elevation ranges from 45 to 1000 feet (15 to 305 meters). Blooms Jun-Oct.	No Potential. The Study Area lacks serpentine substrate necessary to support this species.	No further actions are recommended.
Tamalpais lessingia <i>Lessingia micradenia</i> var. <i>micradenia</i>	Rank 1B.2	Chaparral, valley and foothill grassland (serpentine). Elevation ranges from 325 to 1640 feet (100 to 500 meters). Blooms (Jun)Jul-Oct.	No Potential. The Study Area lacks serpentine substrate necessary to support this species.	No further actions are recommended.
Mason's lilaeopsis <i>Lilaeopsis masonii</i>	SR, Rank 1B.1	Marshes and swamps (brackish or freshwater), riparian scrub. Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms Apr-Nov.	No Potential. The Study Area lacks marshes and swamps known to support this species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
coast lily <i>Lilium maritimum</i>	Rank 1B.1	Broad-leafed upland forest, closed-cone coniferous forest, coastal prairie, coastal scrub, marshes and swamps (freshwater), north coast coniferous forest. Elevation ranges from 15 to 1560 feet (5 to 475 meters). Blooms May-Aug.	Unlikely. The Study Area lacks wetland habitat necessary to support this species.	No further actions are recommended.
Mt. Diablo cottonweed <i>Micropus amphibolus</i>	Rank 3.2	On slopes, or ridges, underlain by shallow soils, of sedimentary or volcanic origin in broad-leafed upland forest, chaparral, cismontane woodland, valley and foothill grassland (thin soils). Elevation ranges from 145 to 2705 feet (45 to 825 meters). Blooms Mar-May.	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having a moderate potential to occur at the Mt. Tamalpais site due to the presence of potentially suitable thin, rocky soils in chaparral and forest habitat. However, this species was not observed in the Study Area during the surveys conducted during the species' documented bloom period.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
marsh microseris <i>Microseris paludosa</i>	Rank 1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. Elevation ranges from 15 to 1165 feet (5 to 355 meters). Blooms Apr-Jun (Jul).	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having a moderate potential to occur at the Tomales Point Reyes Hill, Stewart Point, and Skyview Terrace sites due to the presence of potentially suitable coastal scrub and grassland habitat, and proximity to documented occurrences. However, this species was not observed in the Study Area during the surveys conducted during the species' documented bloom period.	No further actions are recommended.
elongate copper moss <i>Mielichhoferia elongata</i>	Rank 4.3	Broad-leafed upland forest, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, subalpine coniferous forest; growing on very acidic, metamorphic rock. Elevation	No Potential. The Study Area lacks acidic, metamorphic rock necessary to support this species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
		ranges from 0 to 6430 feet (0 to 1960 meters).		
northern curly-leaved monardella <i>Monardella sinuata</i> ssp. <i>nigrescens</i>	Rank 1B.2	Chaparral (scr co.), coastal dunes, coastal scrub, lower montane coniferous forest (scr co., ponderosa pine sandhills). Elevation ranges from 0 to 985 feet (0 to 300 meters). Blooms (Apr) May-Jul (Aug-Sep).	No Potential. The Study Area lacks coastal dunes and sandy substrates within chaparral, coastal scrub, and ponderosa pine forest habitats known to support this species.	No further actions are recommended.
Baker's navarretia <i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	Rank 1B.1	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 15 to 5710 feet (5 to 1740 meters). Blooms Apr-Jul.	No Potential. The Study Area lacks vernal pool habitat necessary to support this species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
Marin County navarretia <i>Navarretia rosulata</i>	Rank 1B.2	Closed-cone coniferous forest, chaparral (serpentine). Elevation ranges from 655 to 2085 feet (200 to 635 meters). Blooms May-Jul.	No Potential. The Study Area lacks serpentine habitat necessary to support this species.	No further actions are recommended.
white-rayed pentachaeta <i>Pentachaeta bellidiflora</i>	FE, SE, Rank 1B.1	Cismontane woodland, valley and foothill grassland (often serpentine). Elevation ranges from 110 to 2035 feet (35 to 620 meters). Blooms Mar-May.	No Potential. The Study Area lacks serpentine habitat most often associated with this species.	No further actions are recommended.
Gairdner's yampah <i>Perideridia gairdneri</i> ssp. <i>gairdneri</i>	Rank 4.2	Broad-leafed upland forest, chaparral, coastal prairie, valley and foothill grassland, vernal pools. Elevation ranges from 0 to 2000 feet (0 to 610 meters). Blooms Jun-Oct.	Unlikely. The Study Area lacks wetland habitat and vernal pools known to support this species/	No further actions are recommended.
North Coast phacelia <i>Phacelia insularis</i> var. <i>continentis</i>	Rank 1B.2	Coastal bluff scrub, coastal dunes. Elevation ranges from 30 to 560 feet (10 to 170 meters). Blooms Mar-May.	No Potential. The Study Area lacks coastal dunes and sandy substrates within coastal bluff scrub known to support this species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
Michael's rein orchid <i>Piperia michaelii</i>	Rank 4.2	Coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest. Elevation ranges from 5 to 3000 feet (3 to 915 meters). Blooms Apr-Aug.	Not Observed (initially assessed: Moderate Potential). This species was initially assessed as having a moderate potential to occur at the Point Reyes Hill, and Stewart Point sites due to the presence of potentially suitable coastal scrub habitat, and proximity to a documented occurrence. However, this species was not observed in the Study Area during the surveys conducted during the species' documented bloom period.	No further actions are recommended.
hairless popcornflower <i>Plagiobothrys glaber</i>	Rank 1A	Meadows and seeps (alkaline), marshes and swamps (coastal salt). Elevation ranges from 45 to 590 feet (15 to 180 meters). Blooms Mar-May.	No Potential. The Study Area lacks coastal salt marshes and alkaline meadows known to historically support this species. This species is presumed extinct.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
North Coast semaphore grass <i>Pleuropogon hooverianus</i>	ST, Rank 1B.1	Broad-leaved upland forest, meadows and seeps, north coast coniferous forest. Elevation ranges from 30 to 2200 feet (10 to 671 meters). Blooms Apr-Jun.	No Potential. The Study Area lacks sufficiently mesic habitat necessary to support this species.	No further actions are recommended.
nodding semaphore grass <i>Pleuropogon refractus</i>	Rank 4.2	Lower montane coniferous forest, meadows and seeps, north coast coniferous forest, riparian forest. Elevation ranges from 0 to 5250 feet (0 to 1600 meters). Blooms (Mar) Apr-Aug.	No Potential. The Study Area lacks sufficiently mesic habitat necessary to support this species.	No further actions are recommended.
Oregon polemonium <i>Polemonium carneum</i>	Rank 2B.2	Coastal prairie, coastal scrub, lower montane coniferous forest. Elevation ranges from 0 to 6005 feet (0 to 1830 meters). Blooms Apr-Sep.	Unlikely. The Study Area lacks coastal prairie and lower montane coniferous forest, and sufficiently mesic coastal scrub habitat associated with this species. This species has not been observed in Marin or Sonoma counties since 1939 (CCH 2018).	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
Marin knotweed <i>Polygonum marinense</i>	Rank 3.1	Marshes and swamps (coastal salt or brackish). Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms (Apr)May-Aug(Oct).	No Potential. The Study Area lacks coastal salt marshes known to support this species.	No further actions are recommended.
Tamalpais oak <i>Quercus parvula</i> var. <i>tamalpaisensis</i>	Rank 1B.3	Lower montane coniferous forest. Elevation ranges from 325 to 2460 feet (100 to 750 meters). Blooms Mar-Apr.	Moderate Potential (Not Observed). This species was initially assessed as having a moderate potential to occur at the Mt. Tamalpais site due to the proximity to several documented occurrences. However, this species was not observed during protocol-level rare plant surveys conducted during the species' documented bloom period.	No further actions are recommended.
Lobb's aquatic buttercup <i>Ranunculus lobbii</i>	Rank 4.2	Cismontane woodland, north coast coniferous forest, valley and foothill grassland, vernal pools. Elevation ranges from 45 to 1540 feet (15 to 470 meters). Blooms Feb-May.	No Potential. The Study Area lacks seasonally ponded water of 6 inches or deeper necessary to support this species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
Victor's gooseberry <i>Ribes victoris</i>	Rank 4.3	Broad-leafed upland forest, chaparral. Elevation ranges from 325 to 2460 feet (100 to 750 meters). Blooms Mar-Apr.	Unlikely. The Study Area lacks broad-leafed upland forest and chaparral known to support this species.	No further actions are recommended.
Sanford's arrowhead <i>Sagittaria sanfordii</i>	Rank 1B.2	Marshes and swamps (assorted shallow freshwater). Elevation ranges from 0 to 2135 feet (0 to 650 meters). Blooms May-Oct (Nov).	No Potential. The Study Area lacks perennially ponded water necessary to support this species.	No further actions are recommended.
Point Reyes checkerbloom <i>Sidalcea calycosa ssp. rhizomata</i>	Rank 1B.2	Marshes and swamps (freshwater, near coast). Elevation ranges from 5 to 245 feet (3 to 75 meters). Blooms Apr-Sep.	No Potential. The Study Area lacks freshwater marshes known to support this species.	No further actions are recommended.
Marin checkerbloom <i>Sidalcea hickmanii ssp. viridis</i>	Rank 1B.1	Chaparral (serpentine). Elevation ranges from 160 to 1410 feet (50 to 430 meters). Blooms May-Jun.	No Potential. The Study Area lacks serpentine chaparral habitat known to support this species.	No further actions are recommended.
purple-stemmed checkerbloom <i>Sidalcea malviflora ssp. purpurea</i>	Rank 1B.2	Broad-leafed upland forest, coastal prairie. Elevation ranges from 45 to 280 feet	Unlikely. The Study Area lacks broadleaf upland forest and coastal prairie	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
		(15 to 85 meters). Blooms May-Jun.	habitat associated with this species.	
Santa Cruz microseris <i>Stebbinsoseris decipiens</i>	Rank 1B.2	Open, sandy, shaly, or serpentine sites, in coastal broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 30 to 1640 feet (10 to 500 meters). Blooms Apr-May.	Unlikely. The Study Area lacks open sandy, shaly or serpentine sites known to support this species.	No further actions are recommended.
Tamalpais jewelflower <i>Streptanthus batrachopus</i>	Rank 1B.3	Closed-cone coniferous forest, chaparral. Elevation ranges from 1000 to 2135 feet (305 to 650 meters). Blooms Apr-Jul.	No Potential. The Study Area lacks serpentine substrates necessary to support this species.	No further actions are recommended.
Tiburon jewelflower <i>Streptanthus glandulosus ssp. niger</i>	FE, SE, Rank 1B.1	Valley and foothill grassland (serpentine). Elevation ranges from 95 to 490 feet (30 to 150 meters). Blooms May-Jun.	No Potential. Despite the location of a documented occurrence in close proximity to the Mt. Tiburon site, the Mt. Tiburon site is previously developed, and lacks serpentine substrate necessary to support this	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
			species. This species was observed in full bloom at a documented reference site on Gilmartin Drive, approximately 0.3 mile west of the Study Area. However, this species was not observed within the Study Area.	
Mt. Tamalpais bristly jewelflower <i>Streptanthus glandulosus</i> ssp. <i>pulchellus</i>	Rank 1B.2	Chaparral, valley and foothill grassland. Elevation ranges from 490 to 2625 feet (150 to 800 meters). Blooms May-Jul (Aug).	No Potential. The Study Area lacks serpentine substrates necessary to support this species.	No further actions are recommended.
Suisun Marsh aster <i>Symphyotrichum lentum</i>	Rank 1B.2	Marshes and swamps (brackish and freshwater). Elevation ranges from 0 to 10 feet (0 to 3 meters). Blooms (Apr) May-Nov.	No Potential. The Study Area lacks marshes and swamps necessary to support this species.	No further actions are recommended.
whiteworm lichen <i>Thamnolia vermicularis</i>	Rank 2B.1	On rocks derived from sandstone in chaparral, valley and foothill grassland. Elevation ranges from 295 to 295 feet (90 to 90 meters).	Unlikely. The Study Area lacks rocky outcrops of sandstone rock known to support this species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
two-fork clover <i>Trifolium amoenum</i>	FE, Rank 1B.1	Coastal bluff scrub, valley and foothill grassland (sometimes serpentine). Elevation ranges from 15 to 1360 feet (5 to 415 meters). Blooms Apr-Jun.	Moderate Potential (Not Observed). This species was initially assessed as having moderate potential to occur at the Tomales site due to the presence of potentially suitable grassland habitat and proximity to the only documented extant occurrence near Dillon Beach (CDFW 2018). However, this species was not observed during protocol-level rare plant surveys conducted during the species' documented bloom period.	No further actions are recommended.
saline clover <i>Trifolium hydrophilum</i>	Rank 1B.2	Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools. Elevation ranges from 0 to 985 feet (0 to 300 meters). Blooms Apr-Jun.	No Potential. The Study Area lacks marshes and swamps, vernal pools, and alkaline wetlands necessary to support this species.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
San Francisco owl's-clover <i>Triphysaria floribunda</i>	Rank 1B.2	Coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 30 to 525 feet (10 to 160 meters). Blooms Apr-Jun.	High Potential (Not Observed). This species was initially assessed as having high potential to occur at the Point Reyes Hill site due to the presence of potentially suitable coastal scrub habitat and proximity to documented occurrences. However, this species was not observed during protocol-level rare plant surveys conducted during the species' documented bloom period.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS***
Plants				
coastal triquetrella <i>Triquetrella californica</i>	Rank 1B.2	Coastal bluff scrub, coastal scrub. Elevation ranges from 30 to 330 feet (10 to 100 meters).	Moderate Potential (Not Observed). This species was initially assessed as having moderate potential to occur at the Point Reyes Hill and Stewart Point sites due to the presence of potentially suitable coastal scrub habitat and proximity to documented occurrences. However, this species was not observed during protocol-level rare plant surveys conducted during the species' documented bloom period.	No further actions are recommended.

APPENDIX C

LAND USE POLICIES

APPENDIX C

LAND USE POLICIES

A. INTRODUCTION

Since the previous CEQA analysis of 19 existing sites occurred in 2000, the regulatory requirements for land use consistency determinations under the jurisdiction of a JPA have been clarified.¹ Under Government Code Section 6509, a joint exercise of powers agreement must designate a member agency to which the JPA will look for the restrictions upon its exercise of power. The designated agency in MERA's joint exercise of powers agreement is the County of Marin. Intergovernmental immunity exempts MERA from compliance with the local codes and ordinances of cities, towns, counties, and special districts in which its facilities are located, except where its immunity has been expressly waived by the State Legislature. Accordingly, MERA is only required to comply with the following state and federal land use regulations.

- Marin County Local Coastal Program (LCP) - Units 1 and 2
- California Streets and Highways Code Section 660 *et seq.*
- Federal Aviation Administration (FAA) Height Requirements
- Golden Gate National Recreation Area (GGNRA) General Management Plan (GMP)
- Point Reyes National Seashore GMP
- Olompali State Historic Park (OSHP) General Plan

Of these, only the Marin County Local Coastal Program has specific, relevant policies other than the summaries written in Chapter IV.D. Land Use Consistency. These policies are outlined below.

B. CALIFORNIA COASTAL MANAGEMENT PROGRAM

MERA must comply with the California Coastal Management Program (CCMP), which is administered by the County of Marin through the Local Coastal Program, Units I and II. The relevant policies have been extracted below from those management plans.

¹ Zack v. Marin Emergency Radio Authority (2004) 118 Cal. App. 4th 617.

Marin County Local Coastal Program (LCP) Unit I*Habitat Protection*

23. Development adjacent to wildlife nesting and roosting areas shall be set back a sufficient distance to minimize impacts on the habitat areas. Such development activities shall be timed so that disturbance to nesting and breeding wildlife is minimized and shall, to the extent practical, use native vegetation for landscaping.
25. Fences, roads, and structures which significantly inhibit wildlife movement, particularly access to water, shall be avoided.
26. Upland grassland feeding areas shall be protected against any significant disruption of habitat values.

Shoreline Protection and Hazard Areas

1. New structures shall be set back from the Bolinas and [Muir] Beach bluffs a sufficient distance to ensure with reasonable certainty that they are not threatened from cliff retreat within their economic life expectancies. Adequate setback distances will be determined from information contained in required geologic reports and the setback formula established below. These setbacks will be of sufficient distance to eliminate the need for shoreline protective works. In view of the fact that the retreat rate varies markedly along the cliffs, and that the life expectancy of different kinds of structures varies greatly, the following formula will be used to determine setbacks from the bluff for new structures: $\text{Setback (meters)} = \text{structure life (years)} \times \text{retreat rate (meters/year)}$. In areas where vigorous sliding is taking place, an additional 15 meters should be added as a safety factor. The retreat rate will be determined by a complete geotechnical investigation which will be required if one or both of the following conditions are met: The building or proposed development site is within 150 feet of the bluff top, or the site is located in stability zones 2, 3, or 4 as indicated on the Slope Stability of the Bolinas Peninsula Study Area map which accompanies Wagner's 1977 report, "Geology for Planning, Western Marin County". This report and accompanying maps is incorporated by reference as part of the LCP.
2. Development shall continue to be required to meet the seismic safety standards of the Alquist-Priolo Act as it has been implemented by the County.

New Development and Land Use

15. In order to protect the unique qualities and character of coastal communities in the Unit 1 coastal zone, historic structures shall be preserved and restored. The following means shall be used to protect and preserve historic structures: a. "Historic areas" shall be established in Stinson Beach and Bolinas. The boundaries of these areas are described and mapped in Appendix F of the Unit 1 LCP. Within these historic area boundaries, all new construction shall conform in scale, design, materials and texture with the surrounding community character...

19. Prior to the approval of any proposed development within an area of known or probable archaeological significance, a limited field survey by a qualified professional at the applicant's expense shall be required to determine the extent of the archaeological resources on the site. Results of such field survey shall be transmitted to the State Historical Preservation officer or his/her designee for comment.
21. Existing development standards and the design review ordinance shall continue to be enforced. The following explicit standards shall apply to selected areas and projects: All new construction in Bolinas, Stinson Beach, and Muir Beach shall be limited to a maximum height of twenty-five (25) feet. To the maximum extent feasible, new development shall not impair or obstruct an existing view of the ocean, Bolinas Lagoon, or the national or State parklands from Highway 1 or Panoramic Highway.
25. For necessary grading operations, the smallest practicable area of land shall be exposed at any one time during development and the length of exposure shall be kept to the shortest practicable time. The clearing of land shall be discouraged during the winter rainy season and stabilizing slopes shall be in place before the beginning of rainy season.
26. Development plans shall include sediment, erosion, runoff controls, and revegetation measures. The following measures shall be included in all cases; additional conditions as required pursuant to Section 23.08.090 of Marin County Code shall also be included where appropriate. Sediment basins... shall be installed at the beginning of grading operations and maintained throughout the development process to remove sediment from runoff waters. All sediment shall be retained on site. The extent of impervious surfaces shall be minimized to the greatest degree possible. Water runoff beyond natural levels shall be retained on-site whenever possible to facilitate maximum groundwater recharge. In order to prevent onsite gullyng and downstream erosion of existing stream channels, the velocity of runoff on and off the site shall be dissipated through the application of appropriate drainage controls so that the runoff rate does not exceed the storm water runoff from the area in its natural or undeveloped state for all intensities and durations of rainfall. Grassed waterways are preferred to concrete storm drains for runoff conveyance. Temporary vegetation, seeding, mulching, or other suitable stabilization methods shall be used to protect soils which have been exposed during grading or development. Cut and fill slopes shall be permanently stabilized as soon as possible with native plants or other suitable landscaping techniques. Where topsoil is removed by grading operations, it shall be stockpiled for reuse and shall be protected from compaction and wind or erosion during stockpiling. All debris shall be removed from the site upon the completion of the project. Permit applications for grading which involve cut slopes in excess of 8 feet or fill in excess of 5 feet shall include a report from a registered soils or civil engineer.

County of Marin Local Coastal Program (LCP) Unit II*Agriculture*

4. All land divisions and developments in the APZ shall require an approved master plan showing how the proposed division or development would affect the subject property. In reviewing a proposed master plan and determining the density of permitted units, the County shall make all of the following findings: a. The development would protect and enhance continued agricultural use and contribute to agricultural viability. b. The development is necessary because agricultural use of the property is no longer feasible. The purpose of this standard is to permit agricultural landowners who face economic hardship to demonstrate how development on a portion of their land would ease this hardship and enhance agricultural operations on the remainder of the property. c. The land division or development would not conflict with the continuation of agriculture on that portion of the property which is not developed, on adjacent parcels, or those within one mile of the perimeter of the proposed development. d. Adequate water supply, sewage disposal, road access and capacity and other public services are available to service the proposed development after provision has been made for existing and continued agricultural operations. Water diversions or use for a proposed development shall not adversely impact stream habitats or significantly reduce freshwater inflows to Tomales Bay, either individually or cumulatively. e. Appropriate public agencies are able to provide necessary services (fire protection, police protection, schools, etc.) to serve the proposed development. f. The proposed land division and/or development will have no significant adverse impacts on environmental quality or natural habitats, including stream or riparian habitats and scenic resources. In all cases, LCP policies on streams and natural resources shall be met. g. Development consists of permitted and conditional uses as authorized in the APZ.
5. As part of the approval of a master plan, the following conditions shall be required: a. All development shall be clustered to retain the maximum amount of land in agricultural production or available for agricultural use development, including all land converted from agricultural use such as roads and residential support facilities, shall be clustered on no more than five percent of the gross acreage, to the extent feasible, with the remaining acreage to be left in agricultural production and/or open space. Development shall be located close to existing roads and shall be sited to minimize impacts on scenic resources, wildlife habitat and streams, and adjacent agricultural operations. b. Permanent conservation easements over that portion of the property not used for physical development or services shall be required to promote the long-term preservation of these lands. Only agricultural uses shall be allowed under the easements. In addition, the County shall require the execution of a covenant not to divide for the parcels created under this division so that they are retained as a single unit and are not further subdivided. c. The creation of a homeowner's or other organization and/or the submission of agricultural management plans may be required

to provide for the proper utilization of agricultural lands and their availability on a lease basis or for the maintenance of community roads or mutual water systems.

6. The definition of agricultural uses in the APZ is given below, along with permitted and conditional uses...
 - b. Permitted uses include the following:
 - g. Agricultural uses [such as livestock and poultry; livestock and poultry products; field, fruit, nut, and vegetable crops; and nursery products].
 - h. One single-family dwelling per parcel. "Parcel" is defined as all contiguous assessor's parcels under common ownership.
 - i. Accessory structures or uses appurtenant and necessary to the operation of agricultural uses, other than dwelling units of any kind, but including barns, fences, stables, corrals, coops and pens, and utility facilities.
 - c. Conditional uses include the following:
 - j. Land divisions,
 - k. Farmworker housing,
 - l. Mobile homes so long as they are used exclusively for employees of the owner who are actively and directly engaged in the agricultural use of the land,
 - m. Hog ranch,
 - n. veterinary facilities,
 - o. Fish hatcheries and rearing ponds,
 - p. Stabling of more than five horses on ranches where horses are the primary or only animals raised,
 - q. Raising of other food and fiber producing animals not listed under (a) above,
 - r. Planting, raising, or harvesting of trees for timber, field, or Christmas tree production,
 - s. Facilities for processing or retail sale of agricultural products,
 - t. Greenhouses,
 - u. Commercial storage and sale of garden supply products,
 - v. Water conservation dams and ponds,
 - w. Mineral resource production,
 - x. Game or nature preserve or refuge,
 - y. Public or private recreational activities, such as hunting, fishing, and camping,
 - z. Bed and breakfast operations in existing structures up to a maximum of 5 rooms,
 - aa. Construction, alteration, or maintenance of gas, electric, water, communication, or flood control facilities, unrelated to an agricultural use, as approved by the appropriate governmental agencies.
 - bb. Dump.

New Development and Land Use

- 3a. The height, scale, and design of new structures shall be compatible with the character of the surrounding natural or built environment. Structures shall be designed to follow the natural contours of the landscape and sited so as not to obstruct significant views as seen from public viewing places.
 - b. Development shall be screened with appropriate landscaping; however, such landscaping shall not, when mature, interfere with public views to and along the coast. The use of native plant material is encouraged.
 - c. Signs shall be of a size, location, and appearance so as not to detract from scenic areas or views from public roads and other viewing points and shall conform to the County's sign ordinance.
 - d. Distribution utility lines shall be placed underground in new developments to protect scenic resources except where the cost of undergrounding would be so high as to deny service.
5. An applicant for development in an area potentially subject to geologic or other hazards as mapped by the County, including Alquist-Priolo earthquake hazards zones, areas subject to tsunami runup, landslides, liquefaction, beach or bluff erosion, steep slopes averaging greater than 35%, or flood hazard areas, shall be required to

demonstrate that the area of construction is stable for development, the development will not create a hazard or diminish the stability of the area, and the development will not require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs. The applicant may be required to file a report by a qualified professional evaluating the geologic conditions of the site and the effect of the development. In addition, as a condition of coastal permit approval, the applicant shall be required to sign a waiver of liability exempting the County from liability for any personal or property damage caused by natural hazards on such properties. b. In coastal bluff areas, new structures shall be set back a sufficient distance from the bluff edge to ensure with reasonable certainty that they are not threatened by bluff retreat within their expected economic lifespans (50 years). The County shall determine the required setback based on information submitted by the applicant, staff investigation, and a geologic report which may be required. The setbacks will be of sufficient distance to eliminate the need for shoreline protective works. c. Development of any kind beyond the required bluff-top setback shall be constructed to ensure that all surface and subsurface drainage shall not contribute to the erosion of the bluff face or the stability of the bluff itself. Surface water shall be directed away from the top of the bluff or handled in a manner which prevents damage to the bluff by surface and percolating water. d. New development shall be sited and designed so that no protective shoreline structures (e.g. seawalls, groins, breakwaters) are or will be necessary to protect the building from erosion or storm damage during its expected economic lifespan (50 years). The applicant may be required to submit a professional geologic report demonstrating that the project conforms to this policy. e. The County encourages PG&E to utilize materials for overhead utility lines which minimize fire hazards to surrounding areas.

APPENDIX D

SITESAFE REPORT



Attn: Ernest Klock, Operations Officer
Marin Emergency Radio Authority
c/o Marin County Department of Public Works
3501 Civic Center Dr
San Rafael, CA 94913

Date: April 22, 2019

Subject: Radio Frequency Exposure Report for MERA Next Generation Project

Dear Mr. Klock:

SiteSafe is pleased to submit the attached radio frequency (RF) exposure report for the 18 communication sites that comprise the proposed MERA Next Generation Project.

As explained in the report, our determination of exposure level impacts is made in relation to the Federal Communications Commission (FCC) Rules and Regulations for RF exposure found in 47 CFR § 1.1310, which were established in 1996. The Rules and Regulations were created after considering various industry standards that had been previously developed by medical researchers, engineers, and industry representatives.

Guidelines for human exposure to RF energy are based on the Specific Absorption Rate (SAR), a measure of the rate of energy absorbed by and dissipated in biological tissue. The SAR is usually expressed in watts per kilogram (W/kg). The FCC has adopted a human exposure SAR threshold level of "4 watts per kilogram (4 W/kg), as averaged over the entire mass of the body, above which expert organizations have determined that potentially hazardous exposures may occur" (OET Bulletin 65).

The FCC regulations also define two primary RF-exposure environments, "controlled/ occupational" and "uncontrolled/general public", each with its own exposure threshold. The exposure threshold within occupational environments was established at one-tenth of the SAR threshold described above (0.4 W/kg), and the exposure threshold within general public environments was established at one-fiftieth of the threshold above (0.08 W/kg).

In order to ensure human exposure to RF energy remains within a safe Specific Absorption Rate, the FCC Rules and Regulations impose Maximum Permissible Exposure (MPE) limits, which are derived from the SAR's described above. These MPE limits are defined in terms of the power density (expressed in milliwatts per centimeter squared, mW/cm²) that is emitted from transmitting antennas. The limits vary depending on frequency, since the human body absorbs RF energy differently at varying frequencies.

SiteSafe has made reasonable assumptions where information was not readily available for use in this analysis, and these assumptions are outlined in Appendix B of the report. Under these assumptions, each site has been modeled to show its maximum potential RF power density. Consequently, SiteSafe believes this to be a "worst-case" analysis of RF exposure levels, based on the best available data.

Again, we are grateful that MERA has placed its confidence in SiteSafe to perform this investigation. If you have any questions regarding this report or RF safety and regulatory compliance, please do not hesitate to contact SiteSafe's Customer Support Department at (703) 276-1100.

Sincerely,

Michael McGuire H2DC PLLC
Professional Engineer
Site Safe, LLC



sealed 22apr2019



8618 Westwood Center Drive, Suite 315, Vienna, VA 22182
703.276.1100 • 703.276.1169 fax
info@sitesafe.com • www.sitesafe.com

Marin Emergency Radio Authority Assessment Purpose – Radio System Upgrade Site Name – Multiple Sites Site Compliance Report

Site visit dates: August 21, 2018 through August 24, 2018
Sites surveyed by: Jeff Desira

Report generated date: March 28, 2019
Report by: Sam Cosgrove
Customer Contact: David Mortimer

Site Addresses:

Site ID 1: 1600 Los Gamos Dr. San Rafael, CA 94903
Site ID 2: 3501 Civic Center Dr. San Rafael, CA 94903
Site ID 3: 325 H Ranch Rd. San Rafael, CA 94947
Site ID 4: 2001 Ridgecrest Blvd. Mill Valley CA 94941
Site ID 5: 1 Barnabe Peak Ave. Lagunitas, CA 94938
Site ID 8: 3 Mt. Vision Rd. Inverness, CA 94937
Site ID 10: Robert Dollar Dr. San Rafael, CA 94945
Site ID 11: 3000 Bayhills Dr. San Rafael, CA 94903
Site ID 14: 99 1/2 Mt. Tiburon Rd Tiburon, CA 94920
Site ID 18: Near 2430 Sonoma Mt. Rd. Petaluma, CA 94954
Site ID 19: 315 Paradise Valley Rd Bolinas, CA 94924
Site ID 20: 28775 Shoreline Hwy Tomales, CA 94971
Site ID 21: Near 1700 Marshall Petaluma Rd Petaluma, CA 94954
Site ID 22: Near 70 Skyview Terrace San Rafael, CA 94903
Site ID 23: Muir Beach Overlook Muir Beach, CA 94965
Site ID 24: 200 Sundial Rd Sausalito, CA 94965
Site ID 25: Mt. Burdell Novato, CA 94945
Site ID 26: Mill Valley Reservoir Mill Valley, CA 94941

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1 Executive Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions on the sites listed below in relation to the Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

In 1996, the Federal Communications Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields, Edition 97-01, published August 1997. As detailed in OET 65, the standards are based on research from various standards and health organizations and include a 10 to 1 safety factor for occupational workers and a 50 to 1 safety factor for the general public. The safety factors are based on research showing that a Specific Absorption Rate (SAR) of 4 W/kg could be harmful to humans and factors in environmental factors and the condition of the test subject. The FCC divided this number by 10 to use 0.4 W/kg as the basis for the occupational safety level. The maximum level for the public cuts the occupational level by 5, resulting in a 50:1 safety factor over the 4W/kg basis for the standard. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate. The most up to date OET-65 form can be found at on the FCC's website in the following link: <https://www.fcc.gov/general/oet-bulletins-line>

Sitesafe's field personnel visited 12 sites from August 21, 2018 through August 24, 2018. An assessment for these 12 sites is included in this report. In addition, SiteSafe performed predicted MPE simulations (theoretical calculations) for 6 other sites and an assessment for each of these sites has been included in this report. This report contains an RF emissions analysis on the proposed configurations for the Next Generation radio communications sites.

This report contains a detailed summary of the RF environment at the sites including:

- Site compliance determination;
- Photographs of the site (at sites physically visited by Sitesafe's field tech);
- Diagram of the site;
- Inventory of the make / model of all transmitting antennas found on the site (where possible);
- Record of any Maximum Permissible Exposure ("MPE") measurements taken on the site, as applicable; and
- Theoretical MPE based on modeling.



The theoretical modeling diagrams for each site represent worst case MPE levels based on the assumption(s) detailed in each section, the measurement data is a snapshot of MPE levels at the time of our visit, and dependent on transmitter duty cycle, system implementation and emissions from other RF sources at nearby antenna sites.

Theoretical simulations for each site were run with up to three different configurations:

- "Existing Antennas Only On Air" – This configuration includes all antennas currently on site. This configuration shows the theoretical simulation of the RF environment before the proposed antennas are on air.
- "All Antennas On Air" – This configuration includes all antennas currently on site along with the proposed antennas. This is a theoretical simulation of the transition period when all antennas will be on air.
- "Proposed Configuration On Air" – This configuration includes the antennas that will be on air when the project is complete. This is a theoretical simulation of the RF environment that the proposed configuration will create.

This report addresses exposure to radio frequency electromagnetic fields in accordance with the FCC Rules and Regulations for all individuals, classified in two groups, "Occupational or Controlled" and "General Public or Uncontrolled." Five of the sites studied require mitigation to be within acceptable safety standards. Of the sites requiring action, three are the responsibility of the County of Marin.

During our field visits, Sitesafe documented the presence and location of signs and barriers. This document specifically addresses compliance of Marin Emergency Radio Authority's transmitting facilities independently and in relation to all colocated transmitting facilities, which together constitute the RF environment at the site.

Access to all sites was arranged through David Mortimer with Federal Engineering.

If you have any questions regarding RF safety and regulatory compliance, please do not hesitate to contact Sitesafe's Customer Support Department at (703) 276-1100.

2 Regulatory Basis

2.1 FCC Rules and Regulations

In 1996, the Federal Communications Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to accessible areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

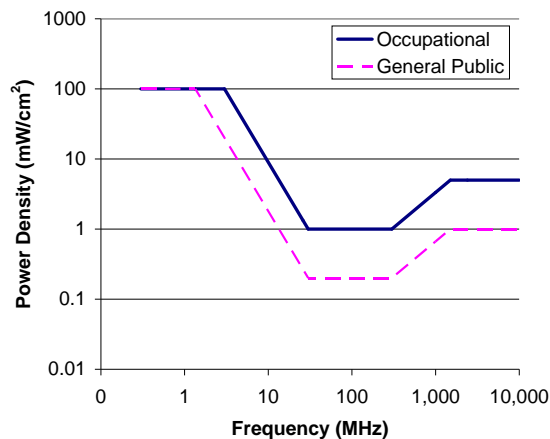
Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:

FCC Limits for Maximum Permissible Exposure (MPE)
Plane-wave Equivalent Power Density



Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz

*Plane-wave equivalent power density

3 EOF Prime Site



Marin Emergency Radio Authority Site Name – EOF Prime Site Site ID: 1 Site Compliance Report

**1600 Los Gamos Dr.
San Rafael, CA 94903**

Site visit date: August 21, 2018
Site visit time: 12:58 PM
Site survey by: Jeff Desira

Latitude: N38-1-09.00
Longitude: W122-32-29.50
Structure Type: Rooftop

Report generated date: March 28, 2019
Report by: Sam Cosgrove
Customer Contact: David Mortimer

The site will be compliant upon completion of the remediation identified in Section 3.2.2.



3.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at the proposed communications site, 1 - EOF Prime Site, located at 1600 Los Gamos Dr., San Rafael, CA, in relation to Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

Sitesafe's field personnel visited 1 - EOF Prime Site on August 21, 2018. This section contains a detailed summary of the RF environment at the site including:

- Site compliance determination;
- Photographs of the site;
- Diagram of the site;
- Inventory of the make / model of all transmitting antennas found on the site (where possible);
- Record of any Maximum Permissible Exposure ("MPE") measurements taken on the site, as applicable; and
- Theoretical MPE based on modeling.

RF emissions levels exceed 100% MPE in the northeast corner of PH 2 due to the height from rooftop level, powers used, and amount of antennas being proposed. Signage should be posted in areas where it will be clearly visible to anyone approaching the antenna mount structure.



3.2 Site Compliance

3.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, and a thorough review of site access procedures, RF hazard signage and visible antenna locations, Sitesafe has determined that:

The site will be compliant with the FCC rules and regulations, as described in OET Bulletin 65 **upon implementation of the proposed remediation.** The corrective actions needed to make this site compliant are located in Section 3.2.2.

The compliance determination is based on General Public MPE levels due to theoretical modeling and/or physical measurements, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant. Measurements have also been performed to validate the assumptions used in our theoretical modeling of this site.

Modeling is used for determining compliance and the percentage of MPE contribution. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results.

3.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on existing measurements and theoretical analysis of MPE levels. Sitesafe has documented the locations of any RF signs and barriers that are required for compliance. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

The site will be made compliant if the following changes are implemented:

Antenna Mount Location

Install a Notice sign.

3.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the rooftop to be:

Maximum Cumulative Theoretical General Public MPE level (Existing Antennas) : 553.6%
Maximum Cumulative Theoretical General Public MPE level (All Antennas): 577.1%
Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 553.2%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

Grey areas in the diagrams are <5% of the General Public threshold and are not predicted to pose any danger to anyone accessing these areas.

Green areas in the diagrams are between 5% and 100% of the General Public threshold and are not predicted to pose any danger to anyone accessing these areas.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

Average from 20 feet above to 26 feet above origin



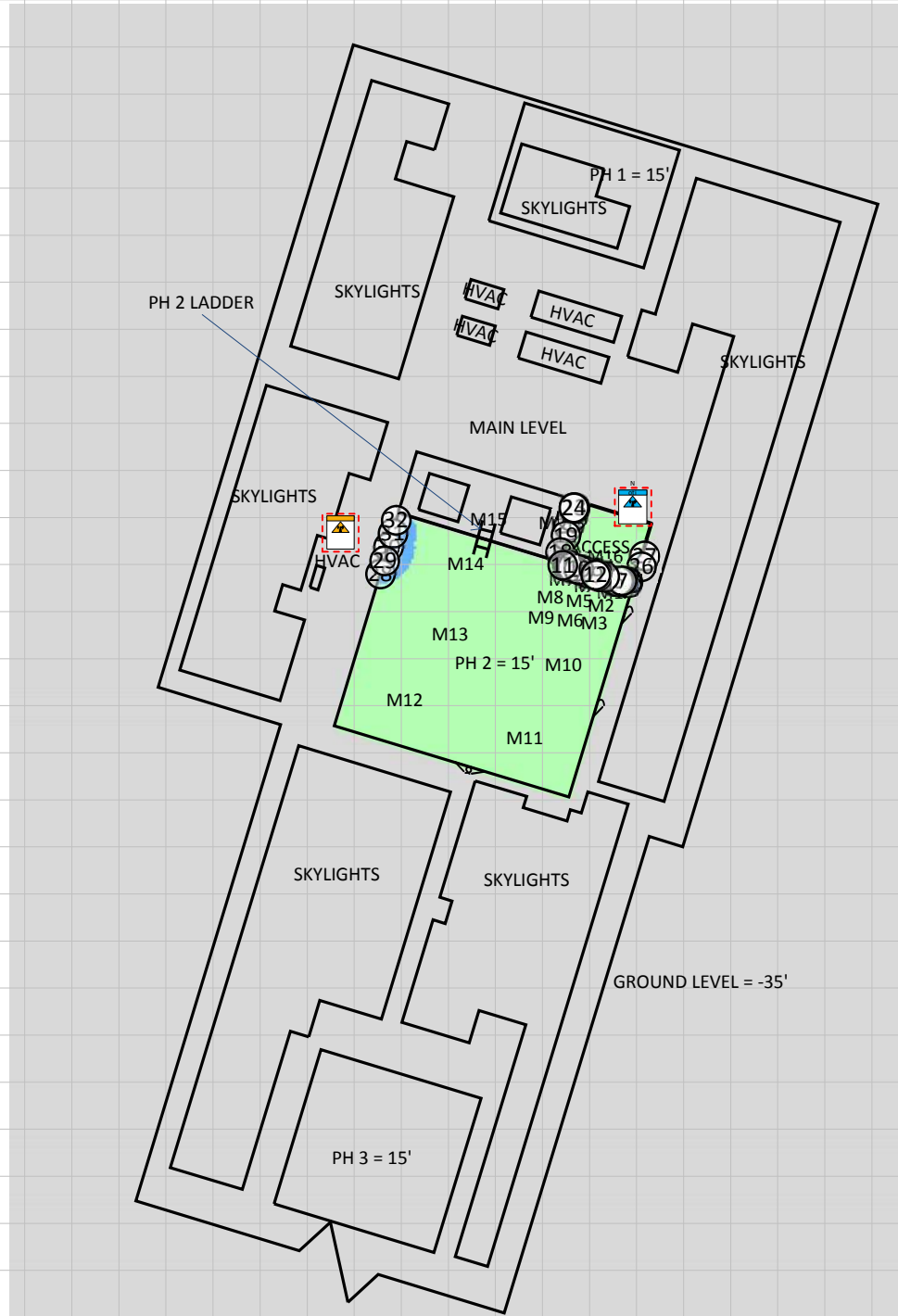
The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

Abbreviations used in the RF Emissions Diagrams

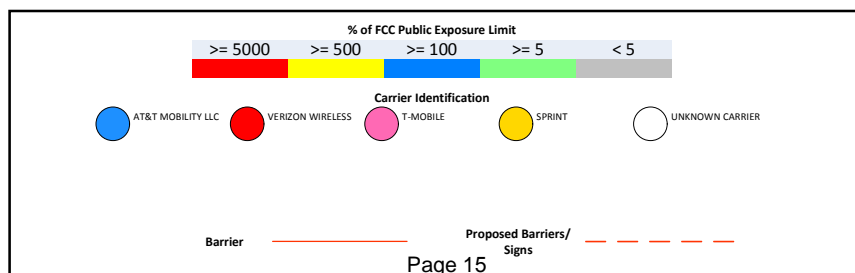
PH=##'	Penthouse at ## feet above main roof
M##	Measurement ## taken during a site visit

As discussed in Section 3.4, site measurement locations for spatial average measurements collected at the time of Sitesafe's visit have been added to the RF emissions diagram. While the theoretical modeling represents worst case MPE levels based on the assumption(s) detailed above, the measurement data is a snapshot of MPE levels at the time of our visit, and dependent on transmitter duty cycle, system implementation and emissions from other RF sources at nearby antenna sites.

RF Exposure Simulation For: EOF Prime Site Existing Antennas Only On Air



% of FCC Public Exposure Limit
Spatial average 0' - 6'



(Feet)
0 37.7 75.3
www.sitesafe.com
Site Name: EOF Prime Site
8/29/2018 8:49:45 AM

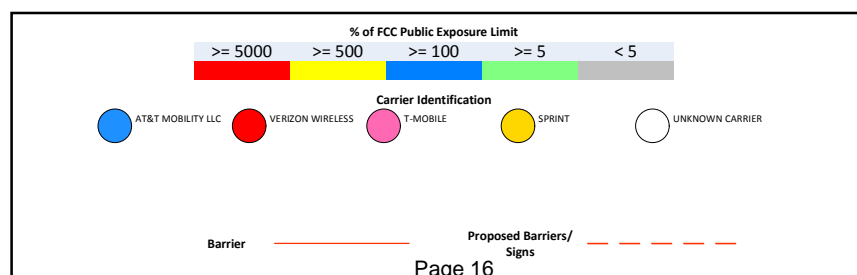
Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: EOF Prime Site Existing Antennas Only On Air – Detail View



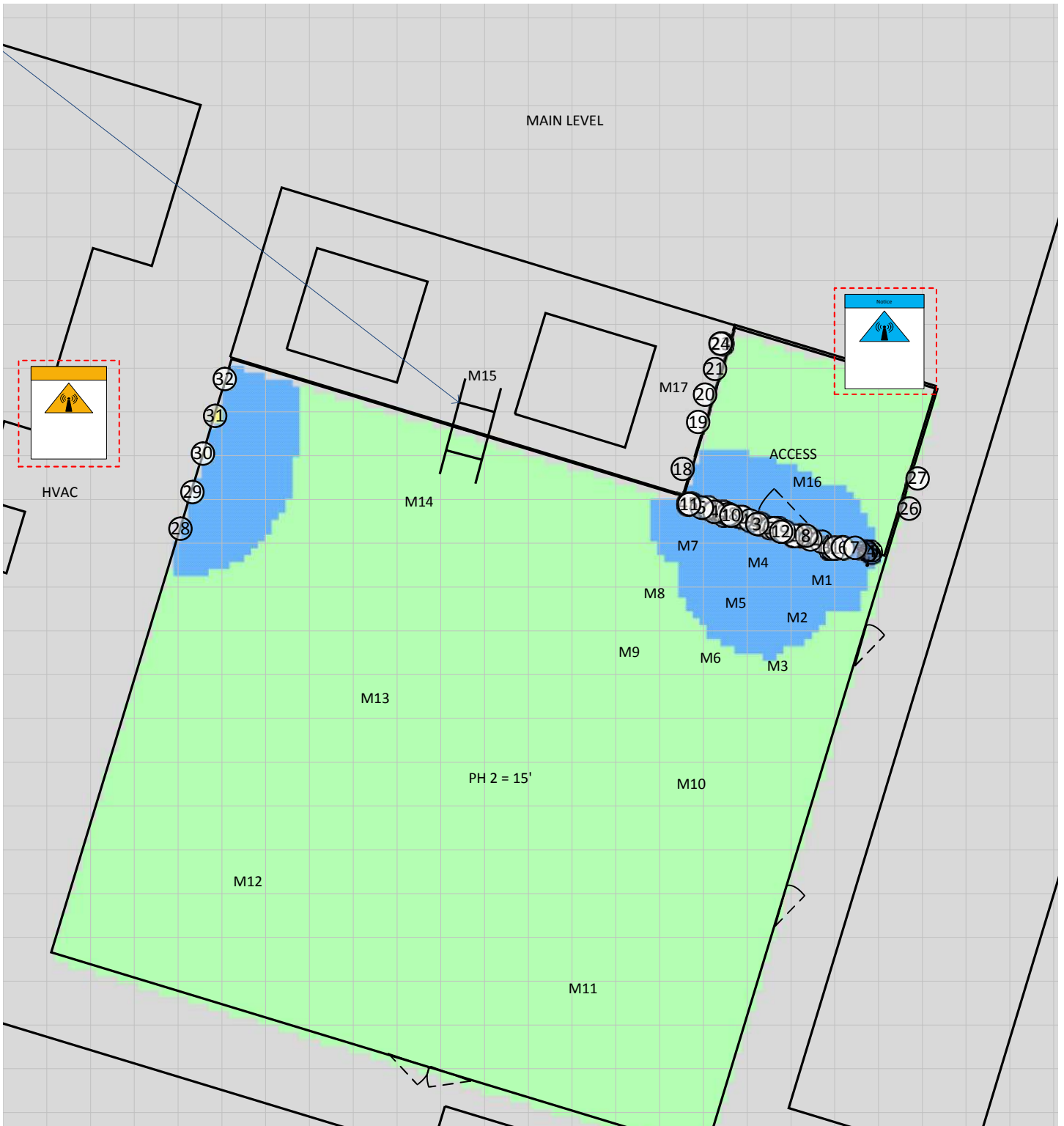
% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)
0 7.7 15.4
www.sitesafe.com
Site Name: EOF Prime Site
8/28/2018 9:42:05 AM



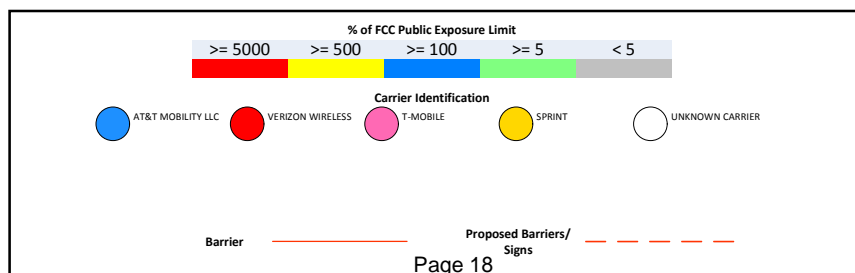
Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: EOF Prime Site All Antennas On Air – Detail View



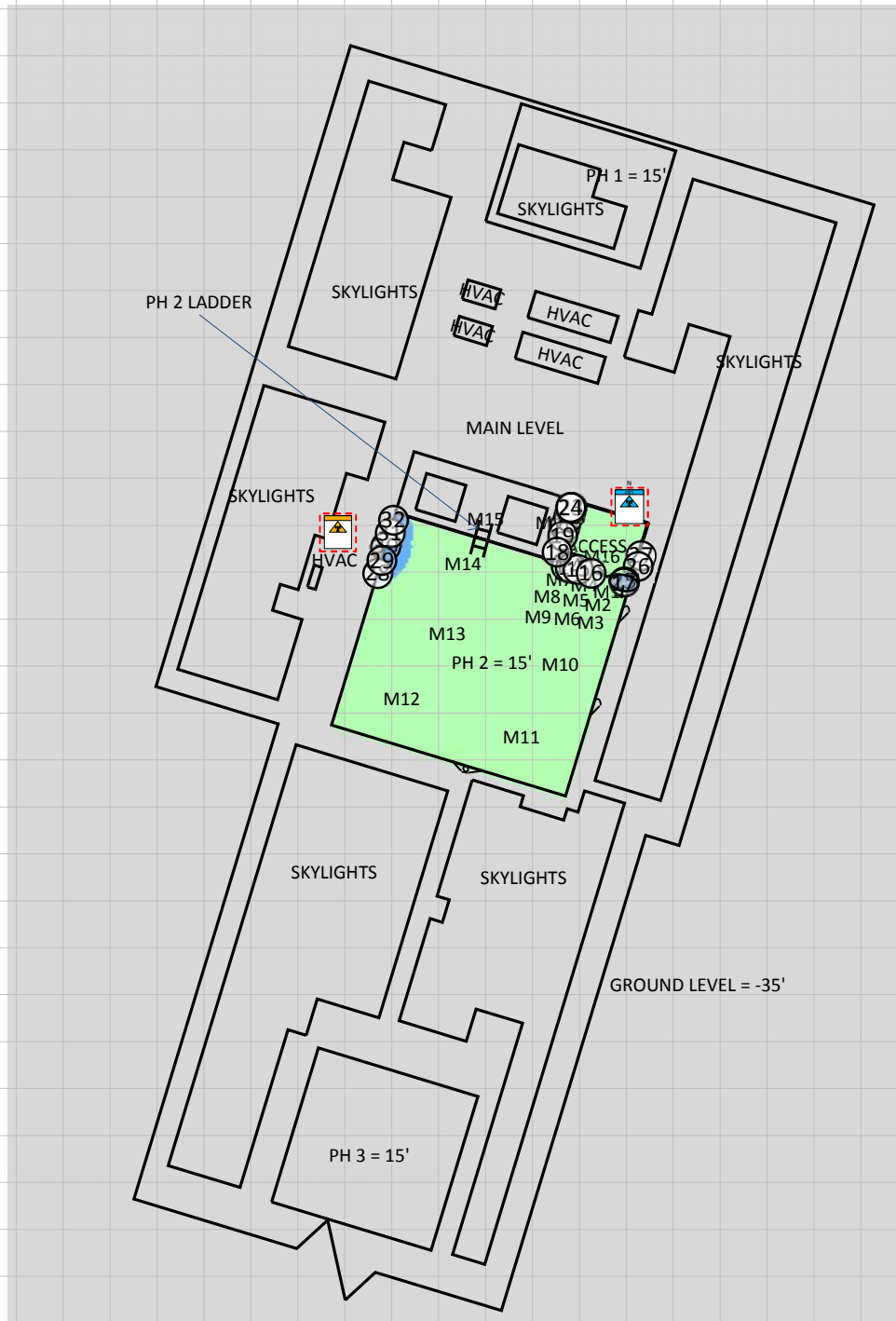
% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)
0 10 20.1
www.sitesafe.com
Site Name: EOF Prime Site
8/29/2018 8:46:58 AM

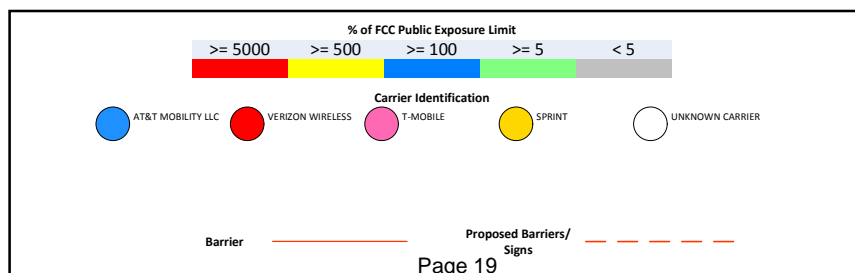


Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: EOF Prime Site Proposed Antennas Only On Air



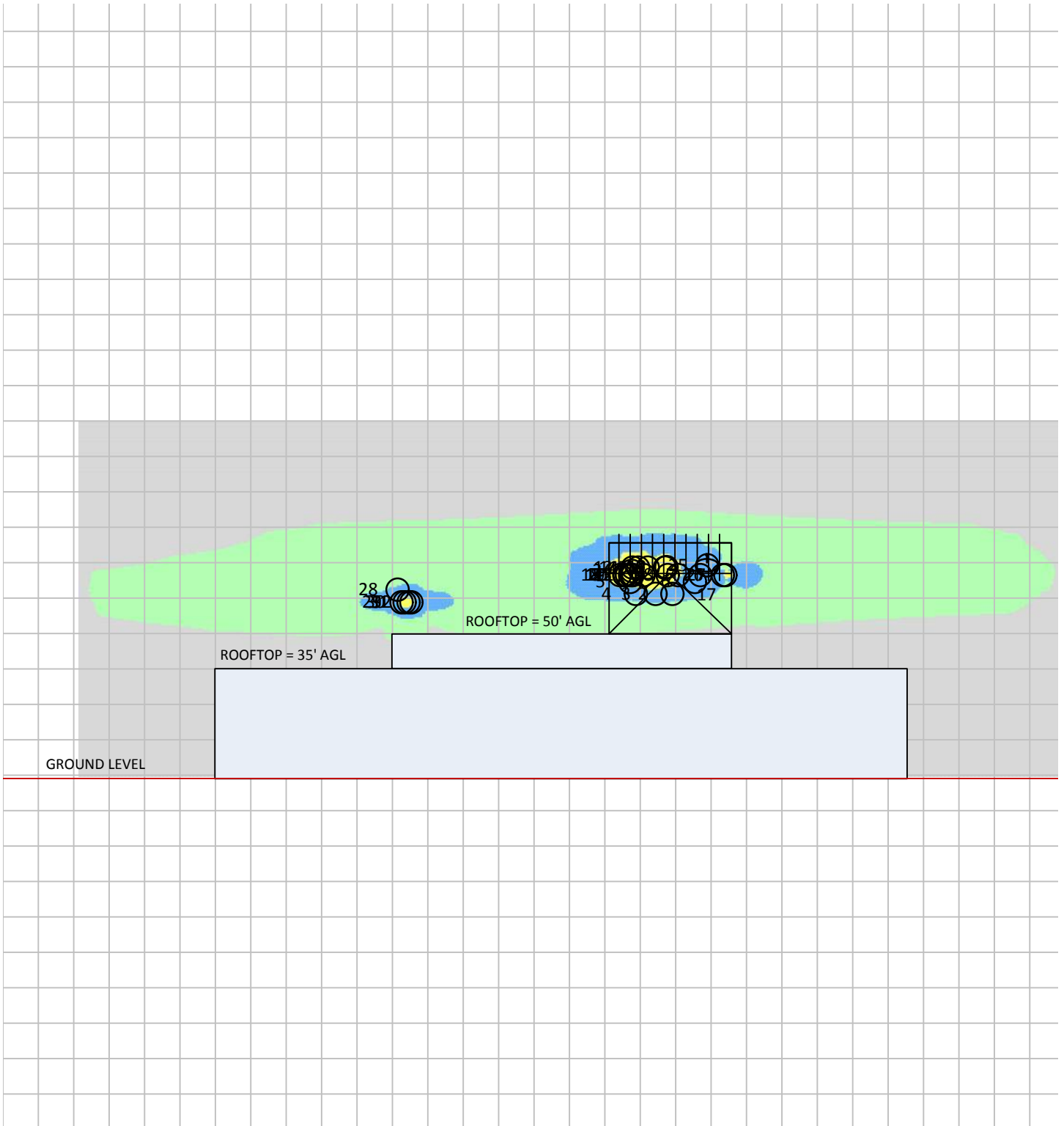
% of FCC Public Exposure Limit
Spatial average 0' - 6'



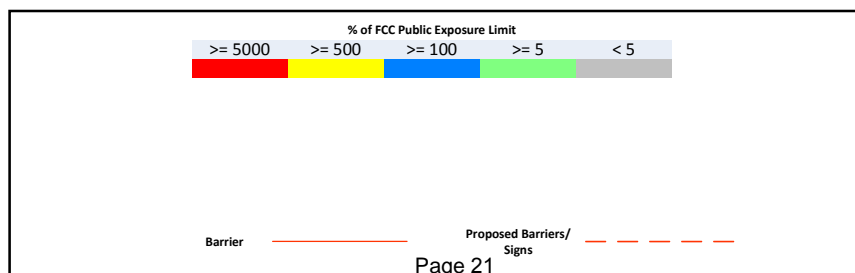
(Feet)
0 38 75.9
www.sitesafe.com
Site Name: EOF Prime Site
8/29/2018 8:52:38 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

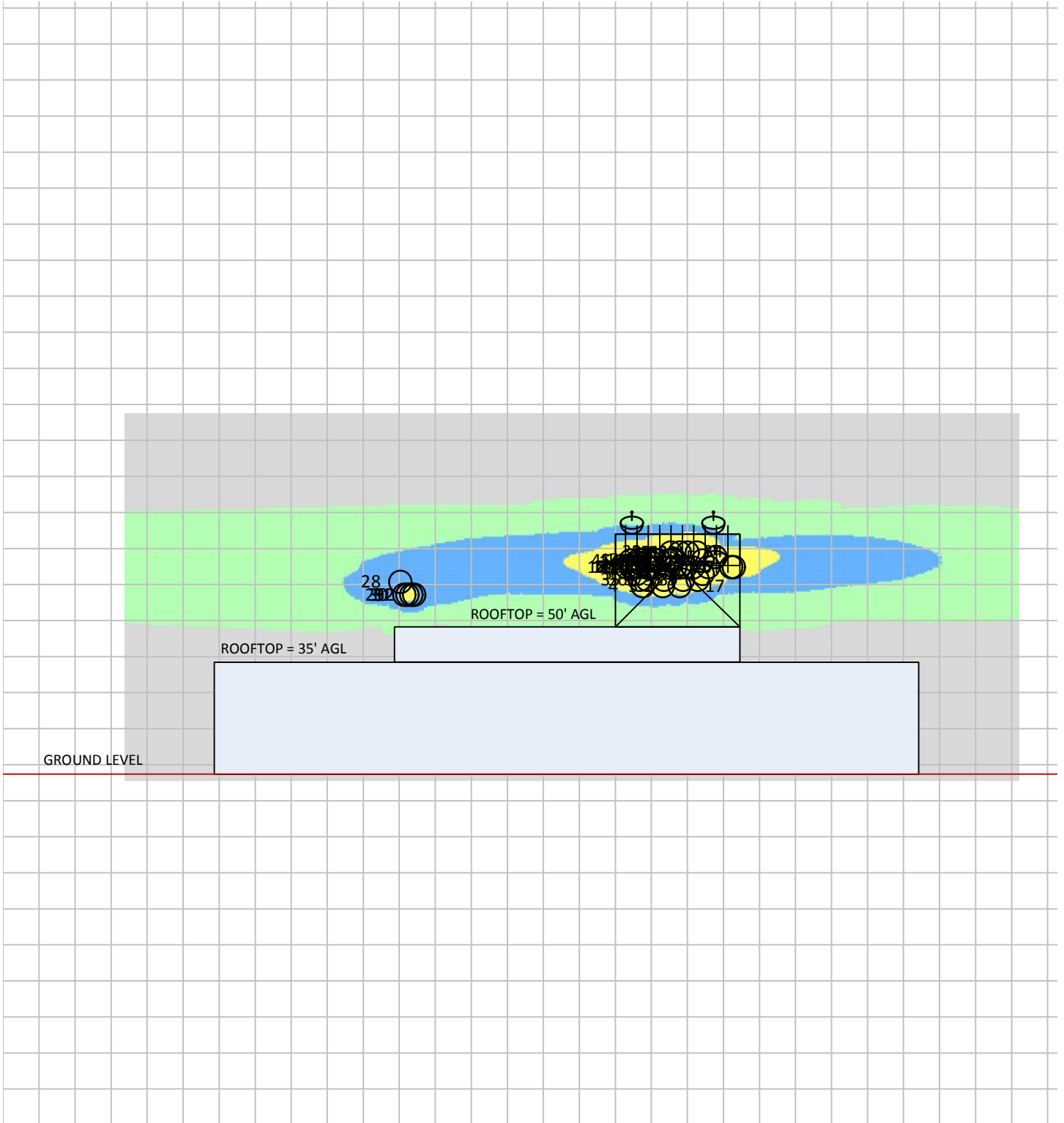
RF Exposure Simulation For: EOF Prime Site Elevation View – Existing Configuration



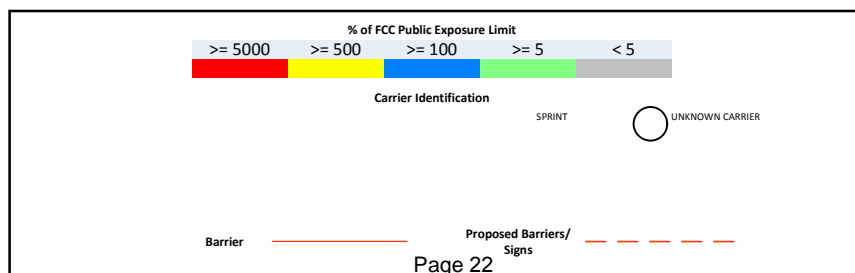
% of FCC Public Exposure Limit



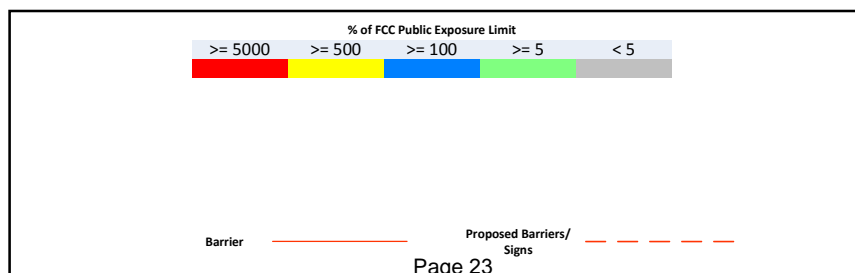
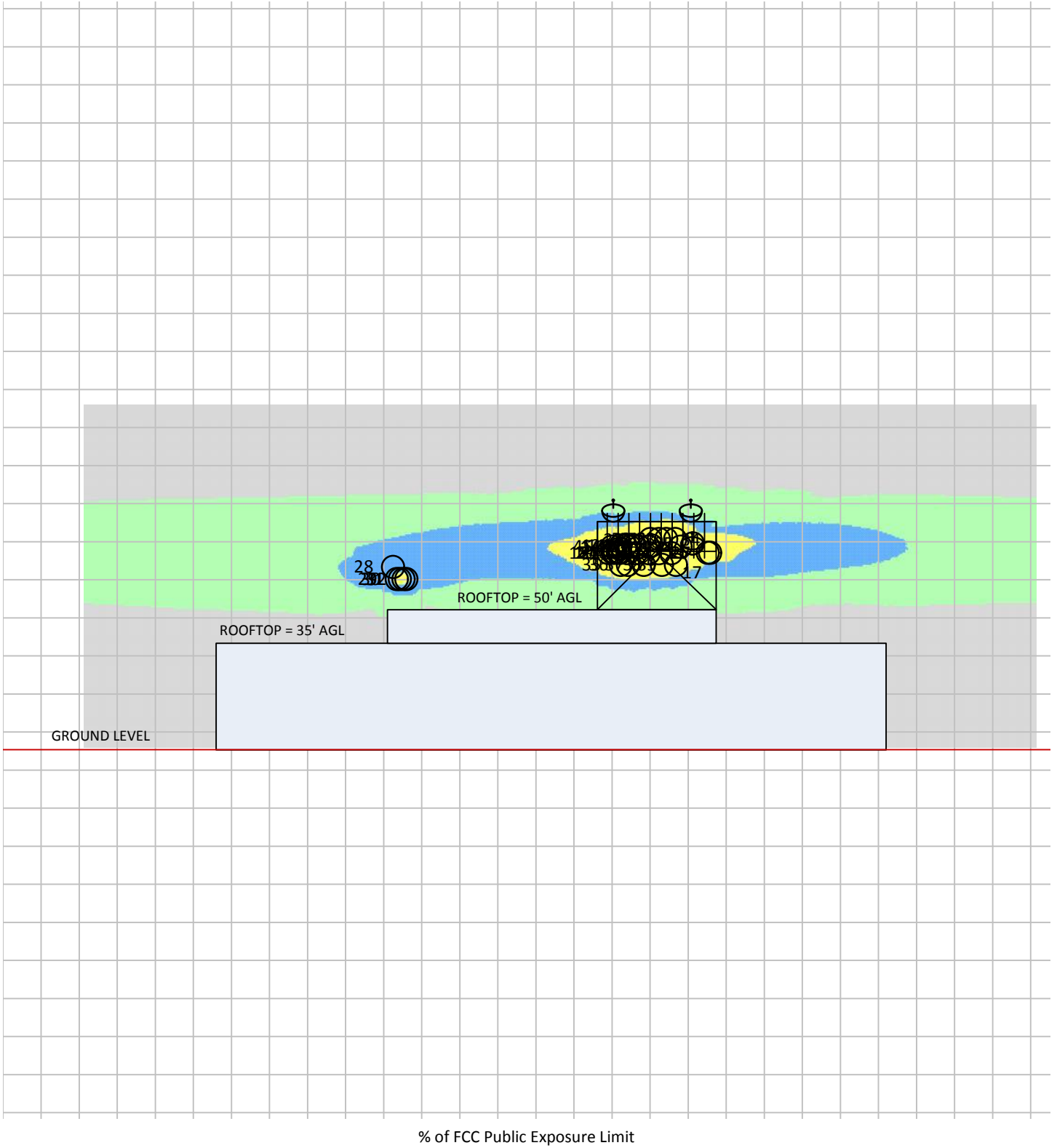
RF Exposure Simulation For: EOF Prime Site Elevation View – All Antennas On Air



% of FCC Public Exposure Limit



RF Exposure Simulation For: EOF Prime Site Elevation View – Final Configuration



3.4 Site Measurements

This section provides a summary of the measurements collected at the site. Actual measurements locations at which these data points were collected are included in the RF emission diagram provided in Section 3.3 of this report. Two types of measurements were collected at each measurement location: maximum (peak) and spatial average. The spatial average measurement consists of a collection of ten (10) measurements within a ten (10) second time interval taken from zero (0) to six (6) feet in height. The purpose of this measurement technique is to identify the average power density over the dimensions of a typical human body.

Table 1 below contains all the measurements collected from accessible areas located at the site at the time of Sitesafe's visit. Whenever possible, measurements are taken in front of the antenna in the transmitting direction. However, because of the antenna configuration at this site, specific emissions could not be discerned from nearby facilities, and no attempt was made to determine power density levels from a specific transmitting antenna.

Highest Measured Occupational Level: <1%

This value is equal to:

Highest General Public Level: <5%.

Table 1: Spatial Average and Maximum Occupational Measurements					
Measurements Points	Spatial Average	Maximum	Measurements Points	Spatial Average	Maximum
M1	<1 %	<1 %	M11	<1 %	<1 %
M2	<1 %	<1 %	M12	<1 %	<1 %
M3	<1 %	<1 %	M13	<1 %	<1 %
M4	<1 %	<1 %	M14	<1 %	<1 %
M5	<1 %	<1 %	M15	<1 %	<1 %
M6	<1 %	<1 %	M16	<1 %	<1 %
M7	<1 %	<1 %	M17	<1 %	<1 %
M8	<1 %	<1 %	M18	<1 %	<1 %
M9	<1 %	<1 %	M19	<1 %	<1 %
M10	<1 %	<1 %	M20	<1 %	<1 %

RF meters and probes have been calibrated and used according to the manufacturer's specifications. Measurements provide a view of the MPE percentage levels at the site at the time of Sitesafe's site visit and are used to validate modeling results. Theoretical modeling is used for determining compliance and the percentage of MPE contributions.

An RF Emission diagram has been included in section 3.3 of this document. All measurement locations are identified in this diagram. The locations of measurements in the RF Emission diagram can be cross referenced with Table 1 (above) to determine the actual spatial average and maximum measurement value per location.

3.5 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was verified on site, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 1 - EOF Prime Site. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory and representative photographs were obtained or verified during the site visit and were utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	E1	Generic	Yagi	1.2	450	190	9.97	60	100	ERP	Watt	1	100	23.7	0	0
2	E2	Generic	Yagi	1.2	450	190	9.97	60	100	ERP	Watt	1	100	23.7	0	0
3	E3	Generic	Yagi	1.2	450	190	9.97	60	100	ERP	Watt	1	100	23.7	0	0
4	E4	Generic	Yagi	1.2	450	190	9.97	60	100	ERP	Watt	1	100	23.7	0	0
5	E5	Generic	Yagi	1.2	450	190	9.97	60	100	ERP	Watt	1	100	27.5	0	0
6	E6	Generic	Yagi	1.2	450	190	9.97	60	100	ERP	Watt	1	100	27.5	0	0
7	E7	Generic	Yagi	1.2	450	190	9.97	60	100	ERP	Watt	1	100	29.7	0	0
8	E8	Generic	Yagi	1.2	450	190	9.97	60	100	ERP	Watt	1	100	29.7	0	0
9	E9	Generic	Yagi	1.2	450	190	9.97	60	100	ERP	Watt	1	100	29.7	0	0
10	E10	Generic	Yagi	1.2	450	190	9.97	60	100	ERP	Watt	1	100	29.7	0	0
11	E11	Generic	Yagi	1.2	450	190	9.97	60	100	ERP	Watt	1	100	29.7	0	0
12	E12	Generic	Yagi	1.2	450	190	9.97	60	100	ERP	Watt	1	100	32.2	0	0
13	E13	Generic	Omni	1.5	850	0	0.01	360	1000	ERP	Watt	1	1000	32	0	0
14	E14	Generic	Omni	2	2400	0	9.51	360	4	ERP	Watt	1	4	32	0	0
15	E16	Generic	Omni	20	450	0	10.81	360	100	ERP	Watt	1	100	32	0	0
16	E17	Generic	Omni	1.5	850	0	0.01	360	1000	ERP	Watt	1	1000	32	0	0
17	E18	Generic	Aperture	0	11000	190	37.66	0	0.01	TPO	Watt	1	58.3	32.8	0	0
18	UNKNOWN OPERATOR	Generic	Omni	3	450	0	0	360	100	ERP	Watt	1	100	29.7	0	0
19	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	290	9.97	60	100	ERP	Watt	1	100	29.7	0	0
20	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	290	9.97	60	100	ERP	Watt	1	100	29.7	0	0
21	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	290	9.97	60	100	ERP	Watt	1	100	29.7	0	0
22	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	290	9.97	60	100	ERP	Watt	1	100	29.7	0	0
23	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	290	9.97	60	100	ERP	Watt	1	100	29.7	0	0
24	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	100	ERP	Watt	1	100	31	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
25	UNKNOWN OPERATOR	Generic	Omni	20	450	0	10.81	360	100	ERP	Watt	1	100	32.8	0	0
26	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	110	9.97	60	100	ERP	Watt	1	100	29.7	0	0
27	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	110	9.97	60	100	ERP	Watt	1	100	29.7	0	0
28	UNKNOWN OPERATOR	Generic	Omni	12.5	150	0	2.87	360	100	ERP	Watt	1	100	25	0	0
29	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	21	0	0
30	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	21	0	0
31	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	21	0	0
32	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	21	0	0
33	P1	Generic	Aperture	6	6000	201.7	36.36	2	0.01	TPO	Watt	1	43.3	43.5	0	0
34	P2	Generic	Aperture	4	11000	230.7	37.66	2	0.01	TPO	Watt	1	58.3	43.5	0	0
35	P3	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	25.7	0	0
36	P4	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	25.7	0	0
37	P5	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	25.7	0	0
38	P6	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	25.7	0	0
39	P7	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	25.7	0	0
40	P8	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	29.5	0	0
41	P9	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	29.5	0	0
42	P10	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	29.5	0	0
43	P11	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	29.5	0	0
44	P12	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	29.5	0	0
45	P13	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	31.7	0	0
46	P14	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	31.7	0	0
47	P15	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	31.7	0	0
48	P16	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	31.7	0	0
49	P17	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	31.7	0	0
50	P18	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	34.2	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
51	P19	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	34.2	0	0
52	P20	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	34.2	0	0
53	P21	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	TPO	Watt	1	4036.5	34.2	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

3.6 Site Pictures



Figure 1: Antenna Structure Facing East



Figure 2: Antenna Structure Facing North



Figure 3: Antennas 28 through 32

4 Civic Center



Marin Emergency Radio Authority Site Name – Civic Center Site ID: 2 Site Compliance Report

**3501 Civic Center Dr.
San Rafael, CA 94903**

Site visit date: August 21, 2018
Site visit time: 8:12 PM
Site survey by: Jeff Desira

Latitude: N37-59-56.60
Longitude: W122-31-52.70
Structure Type: Rooftop

Report generated date: March 28, 2019
Report by: Sam Cosgrove
Customer Contact: David Mortimer

**This site will be compliant upon
completion of the remediation identified
in Section 4.2.2.**

4.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at the communications site, 2 - Civic Center, located at 3501 Civic Center Dr., San Rafael, CA, in relation to Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

Sitesafe's field personnel visited 2 - Civic Center on August 21, 2018. This section contains a detailed summary of the RF environment at the site including:

- Site compliance determination;
- Photographs of the site;
- Diagram of the site;
- Inventory of the make / model of all transmitting antennas found on the site (where possible);
- Record of any Maximum Permissible Exposure ("MPE") measurements taken on the site, as applicable; and
- Theoretical MPE based on modeling.

RF emissions exceed MPE limits near the areas that the omni directional antennas area installed. The RF emissions exceed the limits in the center of the roof, the west side, and the east side due to the height of the antennas from the rooftop, the powers used, and the amount of antennas existing and proposed. Signage should be posted in areas where it will be clearly visible to anyone approaching the antenna mount structures.



4.2 Site Compliance

4.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, and a thorough review of site access procedures, RF hazard signage and visible antenna locations, Sitesafe has determined that:

The site is compliant with the FCC rules and regulations, as described in OET Bulletin 65, and will remain compliant upon implementation of the proposed changes. The site has compliance issues that are not the result of, and therefore not the responsibility of, Marin Emergency Radio Authority.

The compliance determination is based on General Public MPE levels due to theoretical modeling and/or physical measurements, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant. Measurements have also been performed to validate the assumptions used in our theoretical modeling of this site.

Modeling is used for determining compliance and the percentage of MPE contribution. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results.

4.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on existing measurements and theoretical analysis of MPE levels. Sitesafe has documented the locations of any RF signs and barriers that are required for compliance. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

This site will be compliant with the FCC rules and regulations.

Remediation needed on site:

Install a Notice sign at antennas 31-35.

Install a Caution sign at antennas 18-30 and 8-12.

NOTE: The area that exceeds MPE limits near antennas 18-30 is a sloped roof. The Area that exceeds Occupational limits near antennas 8-12 is less than 2'x2'. Barriers are not required in these areas.

4.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the rooftop to be:

Maximum Cumulative Theoretical General Public MPE level (Existing Antennas) : 2,677.3%
Maximum Cumulative Theoretical General Public MPE level (All Antennas): 2,677.3%
Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 2,677.3%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

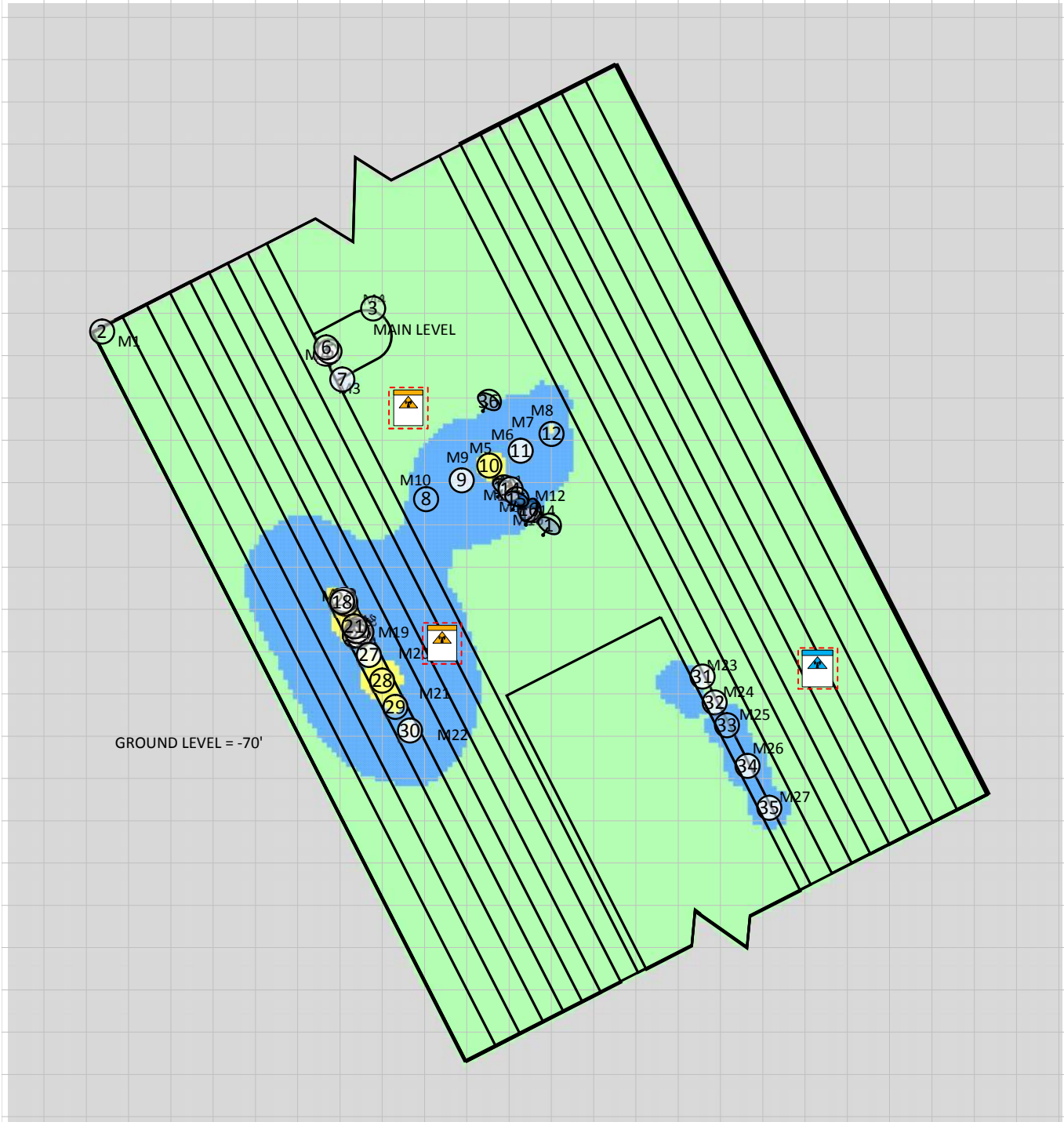


Abbreviations used in the RF Emissions Diagrams

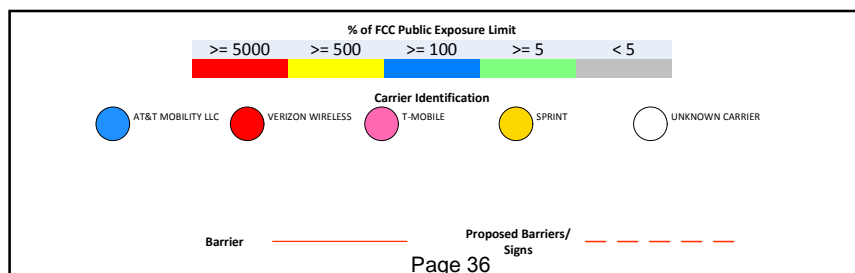
PH=##'	Penthouse at ## feet above main roof
M##	Measurement ## taken during a site visit

As discussed in Section 4.4, site measurement locations for spatial average measurements collected at the time of Sitesafe's visit have been added to the RF emissions diagram. While the theoretical modeling represents worst case MPE levels based on the assumption(s) detailed above, the measurement data is a snapshot of MPE levels at the time of our visit, and dependent on transmitter duty cycle, system implementation and emissions from other RF sources at nearby antenna sites.

RF Exposure Simulation For: Civic Center Existing Antennas Only On Air



% of FCC Public Exposure Limit
Spatial average 0' - 6'



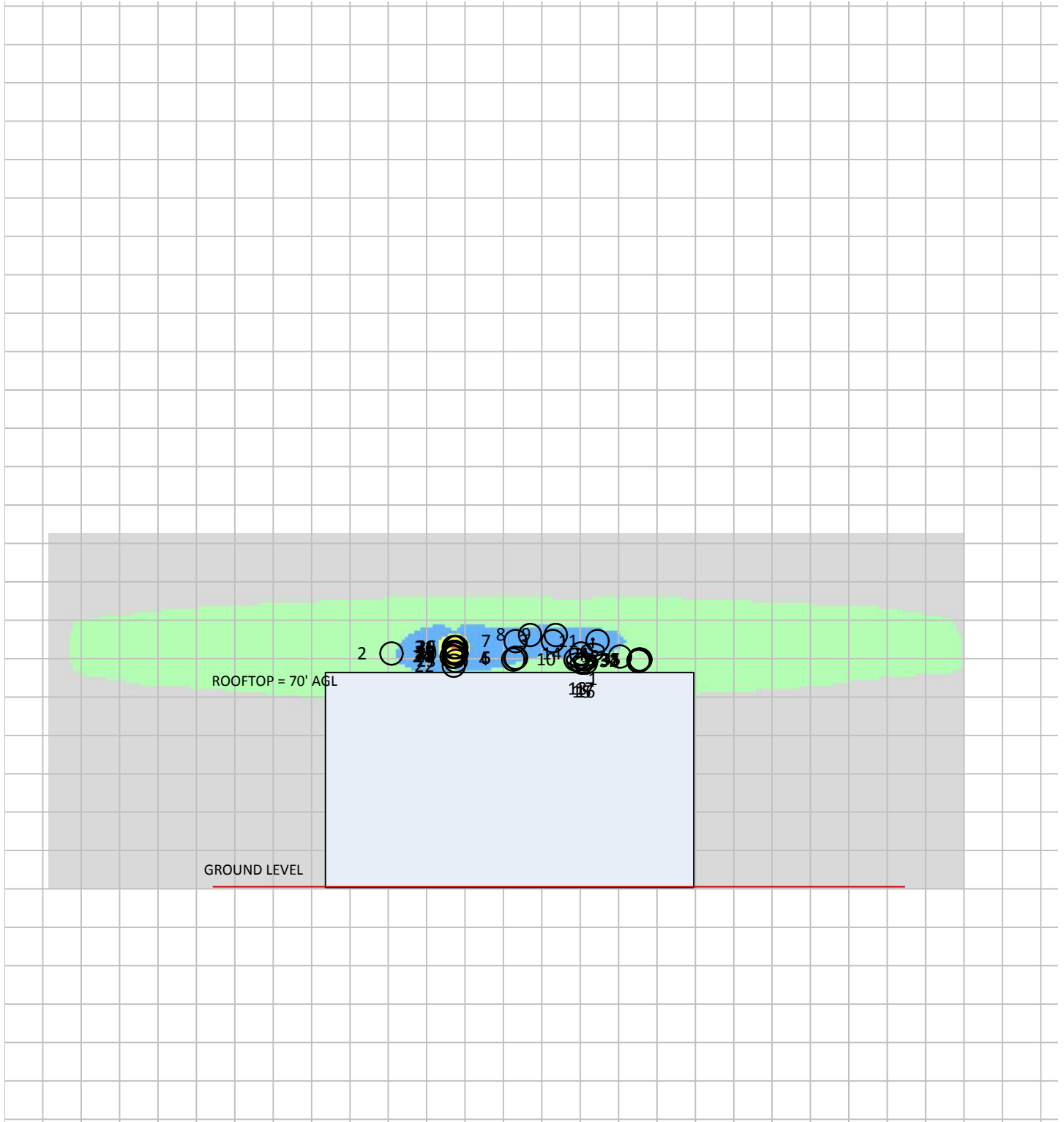
(Feet)

0 16.6 33.1

www.sitesafe.com
Site Name: Civic Center
8/28/2018 8:59:02 AM

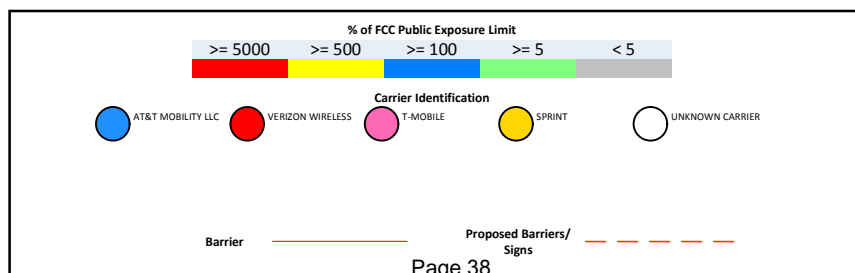
Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Civic Center Elevation View – Existing Configuration



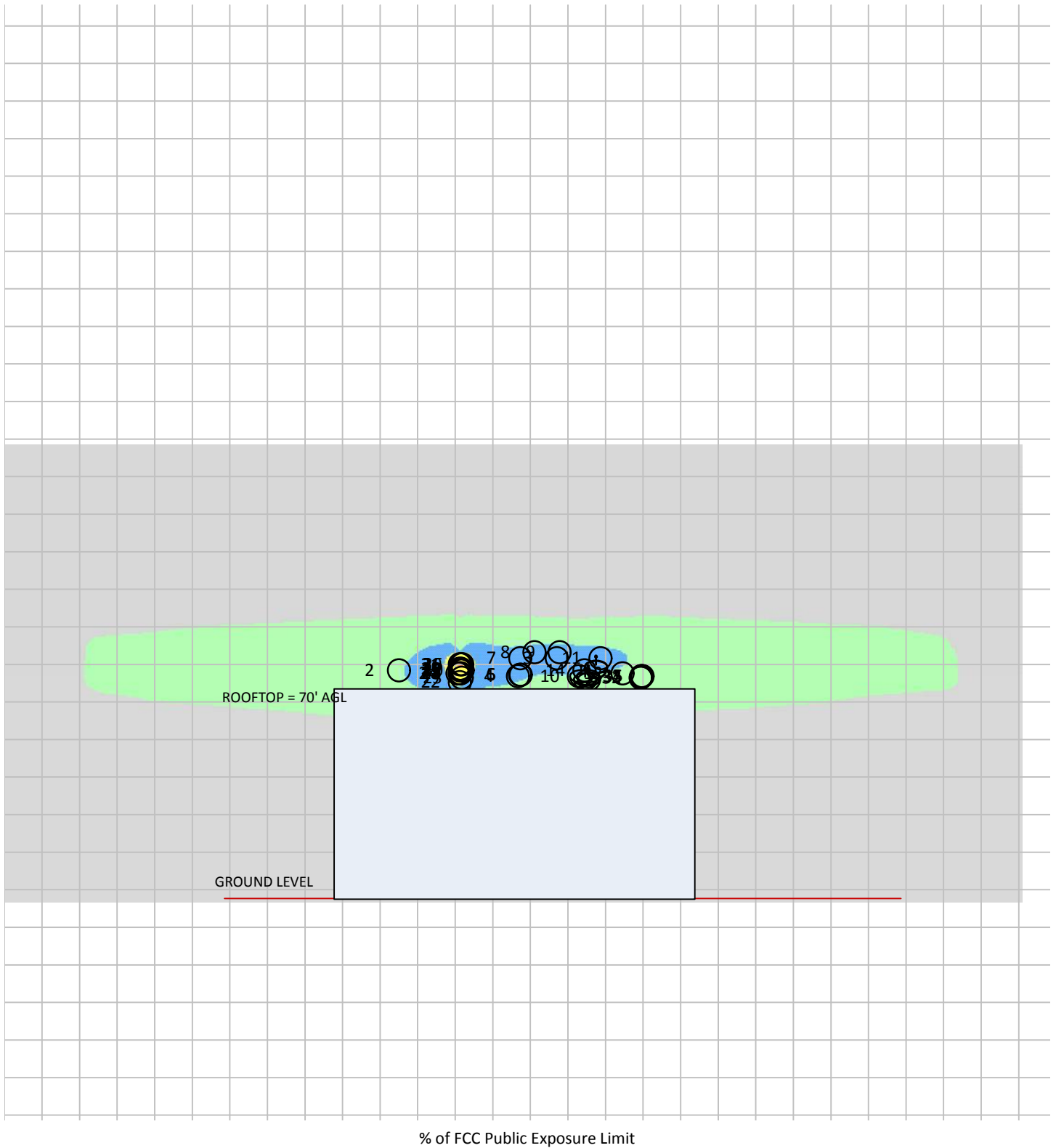
% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)
0 22.9 45.8
www.sitesafe.com
Site Name: Civic Center
11/5/2018 8:51:04 AM

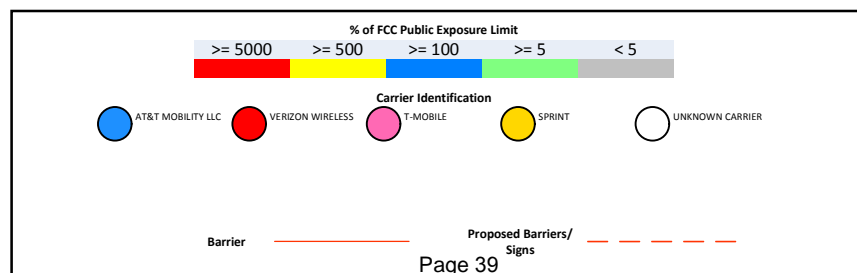


Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Single Level (0)

RF Exposure Simulation For: Civic Center Elevation View – All Antennas On Air



% of FCC Public Exposure Limit



4.4 Site Measurements

This section provides a summary of the measurements collected at the site. Actual measurements locations at which these data points were collected are included in the RF emission diagram provided in Section 4.3 of this report. Two types of measurements were collected at each measurement location: maximum (peak) and spatial average. The spatial average measurement consists of a collection of ten (10) measurements within a ten (10) second time interval taken from zero (0) to six (6) feet in height. The purpose of this measurement technique is to identify the average power density over the dimensions of a typical human body.

Table 1 below contains all the measurements collected from accessible areas located at the site at the time of Sitesafe's visit. Whenever possible, measurements are taken in front of the antenna in the transmitting direction. However, because of the antenna configuration at this site, specific emissions could not be discerned from nearby facilities, and no attempt was made to determine power density levels from a specific transmitting antenna.

Highest Measured Occupational Level: 1%

This value is equal to:

Highest General Public Level: 5%.

Table 1: Spatial Average and Maximum Occupational Measurements					
Measurements Points	Spatial Average	Maximum	Measurements Points	Spatial Average	Maximum
M1	<1 %	<1 %	M19	<1 %	<1 %
M2	<1 %	<1 %	M20	<1 %	<1 %
M3	<1 %	<1 %	M21	<1 %	<1 %
M4	<1 %	<1 %	M22	<1 %	<1 %
M5	<1 %	1 %	M23	<1 %	<1 %
M6	<1 %	<1 %	M24	<1 %	<1 %
M7	<1 %	<1 %	M25	<1 %	<1 %
M8	<1 %	<1 %	M26	<1 %	<1 %
M9	<1 %	<1 %	M27	<1 %	<1 %
M10	<1 %	<1 %	M28	<1 %	<1 %
M11	<1 %	1 %	M29	<1 %	<1 %
M12	<1 %	<1 %	M30	<1 %	<1 %
M13	<1 %	<1 %	M31	<1 %	<1 %
M14	1 %	1 %	M32	<1 %	<1 %
M15	<1 %	<1 %	M33	<1 %	<1 %
M16	<1 %	<1 %	M34	<1 %	<1 %
M17	<1 %	<1 %	M35	<1 %	<1 %
M18	<1 %	<1 %			



RF meters and probes have been calibrated and used according to the manufacturer's specifications. Measurements provide a view of the MPE percentage levels at the site at the time of Sitesafe's site visit and are used to validate modeling results. Theoretical modeling is used for determining compliance and the percentage of MPE contributions.

An RF Emission diagram has been included in section 4.3 of this document. All measurement locations are identified in this diagram. The locations of measurements in the RF Emission diagram can be cross referenced with Table 1 (above) to determine the actual spatial average and maximum measurement value per location.

4.5 Antenna Inventory

The following antenna inventory and representative photographs were obtained or verified during the site visit and were utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	Marin Emergency Radio Authority	Generic	Aperture	4	11000	212.2	37.66	2	61.4	EIRP	dBmW	1	841.5	7.2	0	0
2	UNKNOWN OPERATOR	Generic	Yagi	0.5	2400	0	13.37	27.5	4	ERP	Watt	1	4	6	0	0
3	UNKNOWN OPERATOR	Generic	Omni	8	154	0	2.61	360	82	ERP	Watt	1	82	10	0	0
4	UNKNOWN OPERATOR	Generic	Yagi	0.5	2400	0	13.37	27.5	4	ERP	Watt	1	4	4	0	0
5	UNKNOWN OPERATOR	Generic	Aperture	3	5800	0	29.06	2	20	ERP	Watt	1	20	4.5	0	0
6	UNKNOWN OPERATOR	Generic	Panel	3	450	0	15.51	32	4	ERP	Watt	1	4	4.5	0	0
7	CALIFORNIA, STATE OF	Generic	Omni	8	159	0	2.61	360	100	ERP	Watt	1	100	10	0	0
8	CALIFORNIA, STATE OF	Generic	Omni	12.5	159	0	2.87	360	100	ERP	Watt	1	100	12	0	0
9	CALIFORNIA, STATE OF	Generic	Omni	8	153	0	2.61	360	94	ERP	Watt	1	94	12	0	0
10	UNKNOWN OPERATOR	Generic	Omni	3	155	0	0	360	47	ERP	Watt	1	47	4	0	0
11	CALIFORNIA, STATE OF	Generic	Omni	8	153	0	2.61	360	330	ERP	Watt	1	330	10	0	0
12	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	0	9.97	60	100	ERP	Watt	1	100	5	0	0
13	MARIN, COUNTY OF	Generic	Aperture	4	11545	212	37.66	2	58.1	ERP	Watt	1	58.1	4	0	0
14	MARIN, COUNTY OF	Generic	Omni	3	458	0	0	360	47	ERP	Watt	1	47	6	0	0
15	MARIN, COUNTY OF	Generic	Aperture	4	11305	200	37.66	2	58.1	ERP	Watt	1	58.1	3	0	0
16	MARIN, COUNTY OF	Generic	Aperture	4	11215	300	37.66	2	56.6	ERP	Watt	1	56.6	3	0	0
17	UNKNOWN OPERATOR	Generic	Aperture	3	5800	200	29.06	2	20	ERP	Watt	1	20	4	0	0
18	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	310	9.97	60	100	ERP	Watt	1	100	5	0	0
19	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	310	9.97	60	100	ERP	Watt	1	100	6.5	0	0
20	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	300	9.97	60	100	ERP	Watt	1	100	8	0	0
21	MARIN, COUNTY OF	Generic	Omni	3	159	0	0	360	120	ERP	Watt	1	120	8	0	0
22	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	270	9.97	60	100	ERP	Watt	1	100	2	0	0
23	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	310	9.97	60	100	ERP	Watt	1	100	3.5	0	0
24	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	310	9.97	60	100	ERP	Watt	1	100	5	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
25	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	310	9.97	60	100	ERP	Watt	1	100	6.5	0	0
26	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	310	9.97	60	100	ERP	Watt	1	100	8	0	0
27	MARIN, COUNTY OF	Generic	Omni	8	155	0	2.61	360	110	ERP	Watt	1	110	6	0	0
28	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	100	ERP	Watt	1	100	5	0	0
29	MARIN, COUNTY OF	Generic	Omni	8	155	0	2.61	360	110	ERP	Watt	1	110	6	0	0
30	MARIN, COUNTY OF	Generic	Omni	8	155	0	2.61	360	110	ERP	Watt	1	110	6	0	0
31	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	270	9.97	60	100	ERP	Watt	1	100	3.5	0	0
32	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	270	9.97	60	100	ERP	Watt	1	100	3.5	0	0
33	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	4	0	0
34	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	4	0	0
35	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	4	0	0
36	P1	Generic	Aperture	4	11000	212.2	37.66	2	61.4	EIRP	dBmW	1	841.5	7	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

4.6 Site Pictures



Figure 4: Antenna 2



Figure 5: Antennas 3 through 7



Figure 6: Antennas 8 through 12



Figure 7: Antennas 1 and 13 through 17

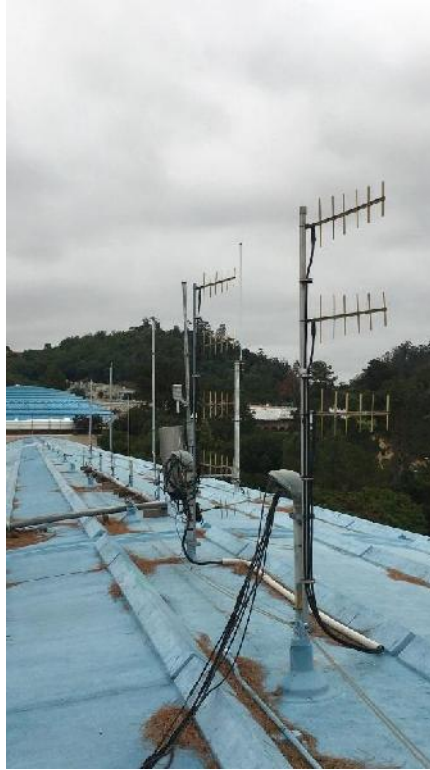


Figure 8: Antennas 18 through 30



Figure 9: Antennas 31 through 35

5 Big Rock



Marin Emergency Radio Authority

Site Name – Big Rock

Site ID: 3

Site Compliance Report

325 H Ranch Rd.
San Rafael, CA 94947

Site visit date: August 22, 2018
Site visit time: 2:00 PM
Site survey by: Jeff Desira

Latitude: N38-3-33.10
Longitude: W122-36-15.30
Structure Type: Self-Support

Report generated date: March 28, 2019
Report by: Sam Cosgrove
Customer Contact: David Mortimer

This site is compliant and will remain complaint upon implementation of the proposed changes.



5.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at communications site, Big Rock, located at 325 H Ranch Rd., San Rafael, CA, in relation to Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

Sitesafe's field personnel visited 3 - Big Rock on August 22, 2018. This section contains a detailed summary of the RF environment at the site including:

- Site compliance determination;
- Photographs of the site;
- Diagram of the site;
- Inventory of the make / model of all transmitting antennas found on the site (where possible);
- Record of any Maximum Permissible Exposure ("MPE") measurements taken on the site, as applicable; and
- Theoretical MPE based on modeling.

RF emissions exceed MPE limits on the inaccessible rooftops on this site. Since these areas are not accessible to the general public, signage is not required. RF emissions levels on the ground level are less than 100% and do not pose a danger to workers in these areas.



5.2 Site Compliance

5.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, and a thorough review of site access procedures, RF hazard signage and visible antenna locations, Sitesafe has determined that:

Marin Emergency Radio Authority is compliant with the FCC rules and regulations, as described in OET Bulletin 65, and will remain compliant upon implementation of the proposed changes.

The compliance determination is based on General Public MPE levels due to theoretical modeling and/or physical measurements, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant. Measurements have also been performed to validate the assumptions used in our theoretical modeling of this site.

Modeling is used for determining compliance and the percentage of MPE contribution. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results.

5.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on existing measurements and theoretical analysis of MPE levels. Sitesafe has documented the locations of any RF signs and barriers that are required for compliance. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

This site is compliant with the FCC rules and regulations.

5.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the Rooftop to be:

Maximum Cumulative Theoretical General Public MPE level (Existing Antennas): 786.21%
Maximum Cumulative Theoretical General Public MPE level (All Antennas): 786.21%
Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 786.21%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

Average from 20 feet above to 26 feet above origin



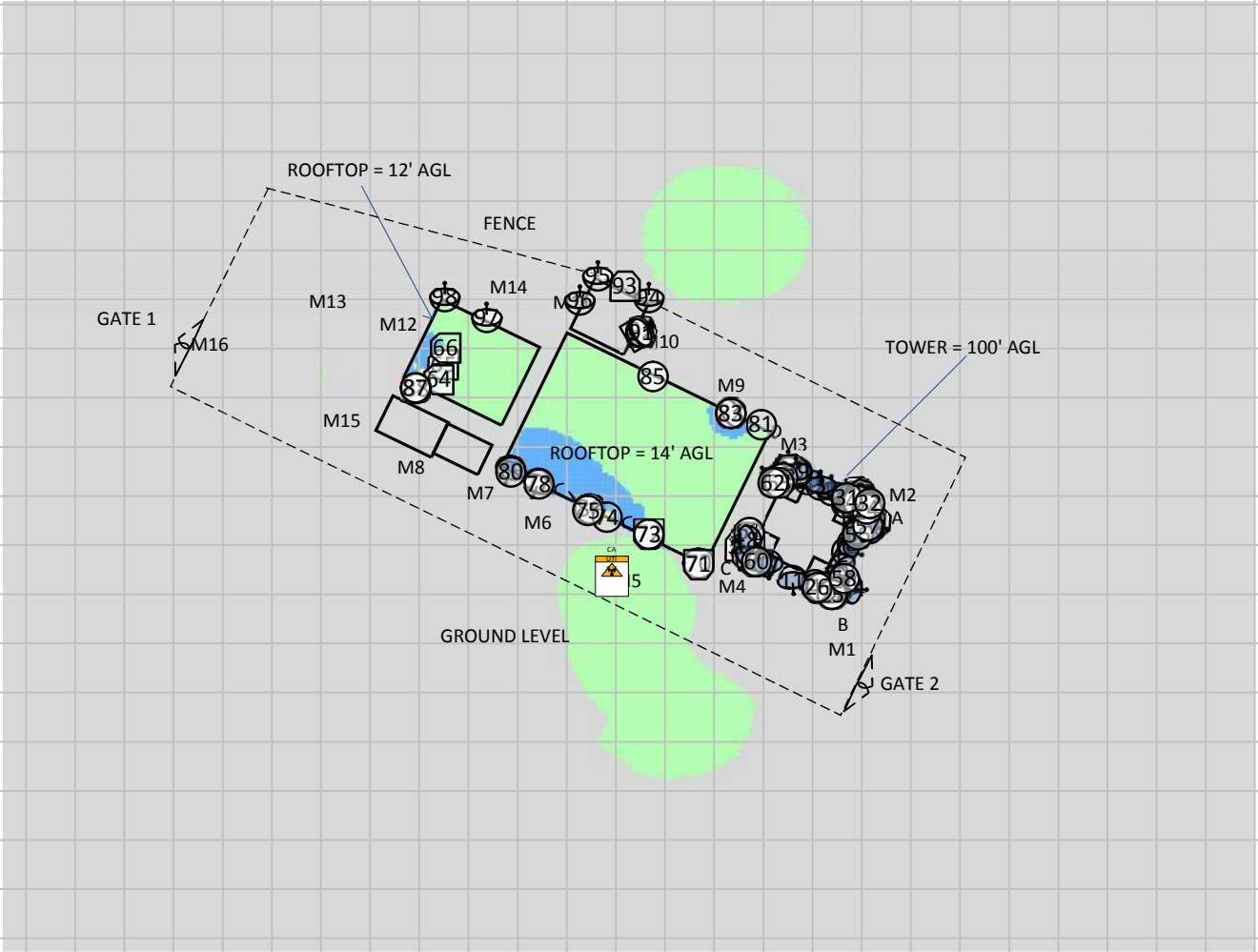
The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

Abbreviations used in the RF Emissions Diagrams

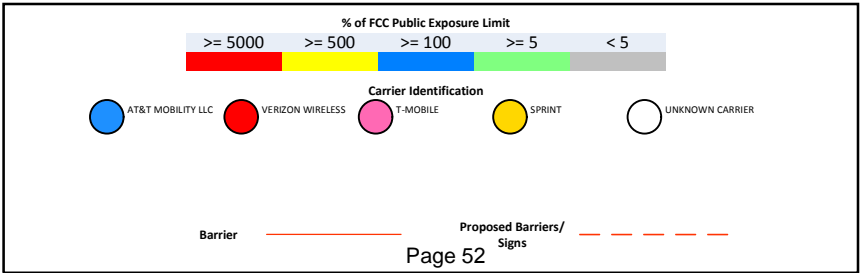
PH=##'	Penthouse at ## feet above main roof
M##	Measurement ## taken during a site visit

As discussed in Section 5.4, site measurement locations for spatial average measurements collected at the time of Sitesafe's visit have been added to the RF emissions diagram. While the theoretical modeling represents worst case MPE levels based on the assumption(s) detailed above, the measurement data is a snapshot of MPE levels at the time of our visit, and dependent on transmitter duty cycle, system implementation and emissions from other RF sources at nearby antenna sites.

RF Exposure Simulation For: Big Rock
Existing Configuration



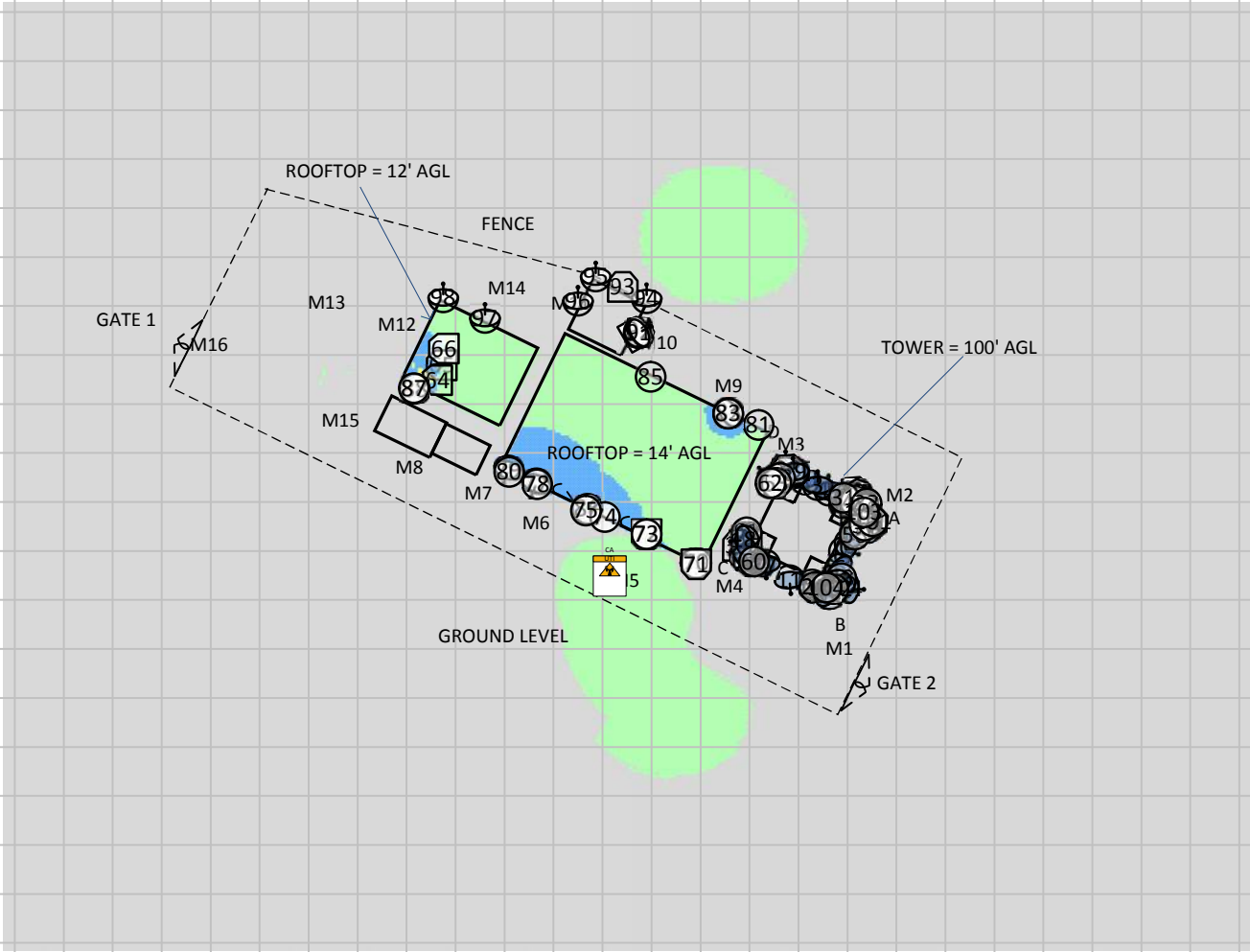
% of FCC Public Exposure Limit
Spatial average 0' - 6'



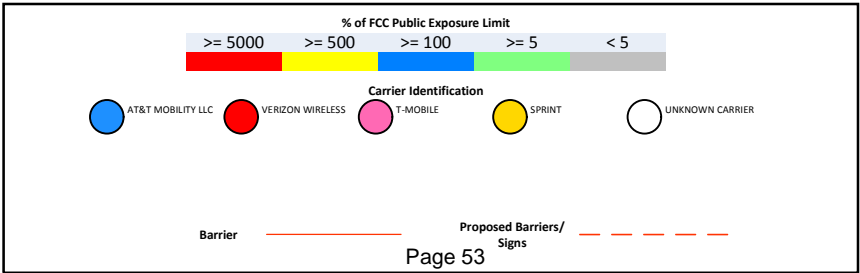
(Feet)
0 16.3 32.6
www.sitesafe.com
Site Name: Big Rock
11/5/2018 9:10:54 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Big Rock
All Antennas On Air



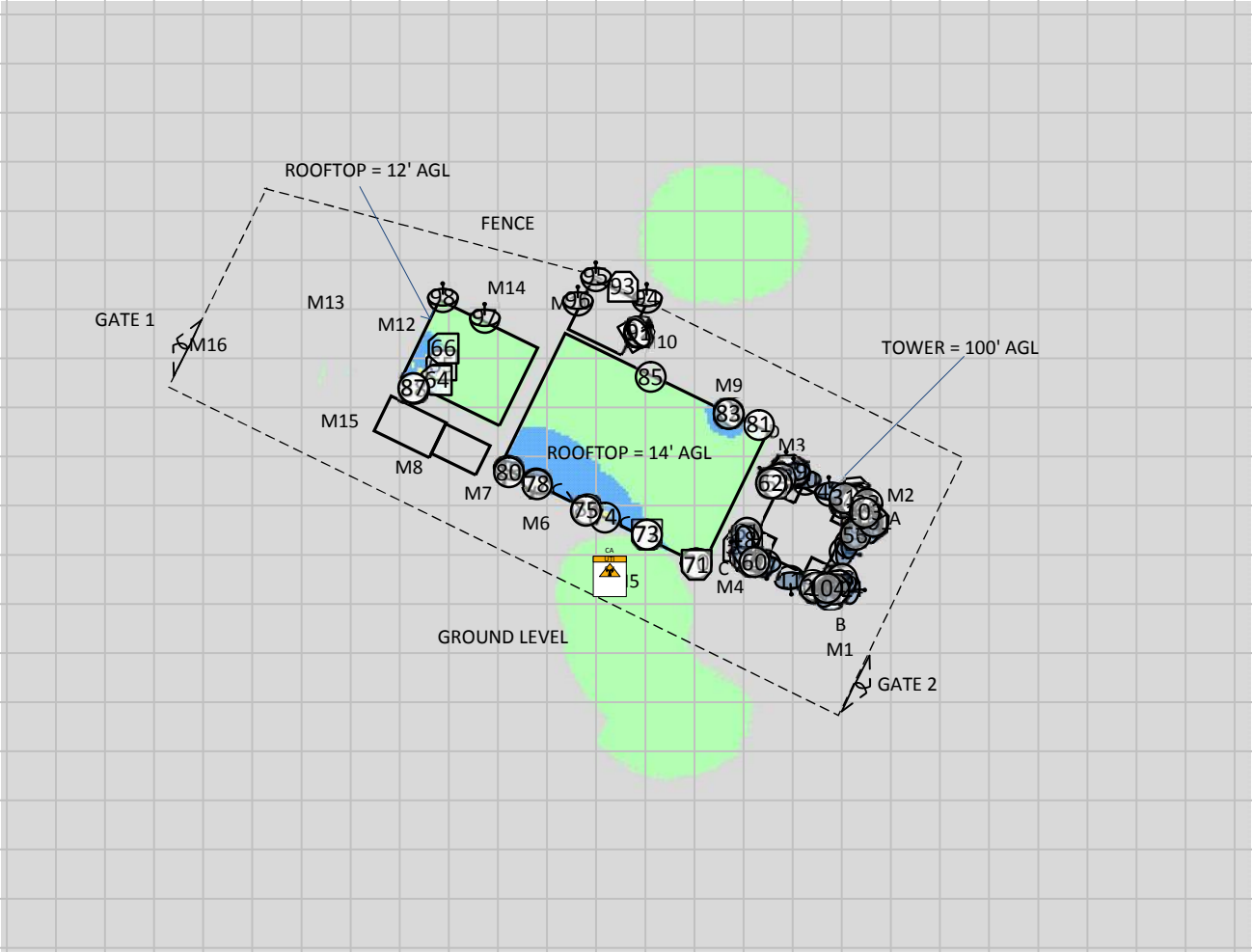
% of FCC Public Exposure Limit
Spatial average 0' - 6'



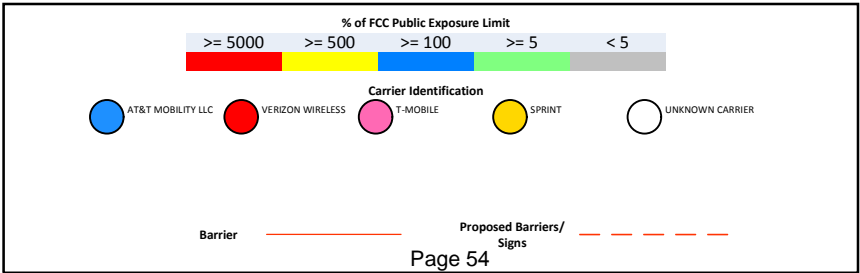
(Feet)
0 16.4 32.9
www.sitesafe.com
Site Name: Big Rock
11/5/2018 9:16:02 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Big Rock
Final Configuration



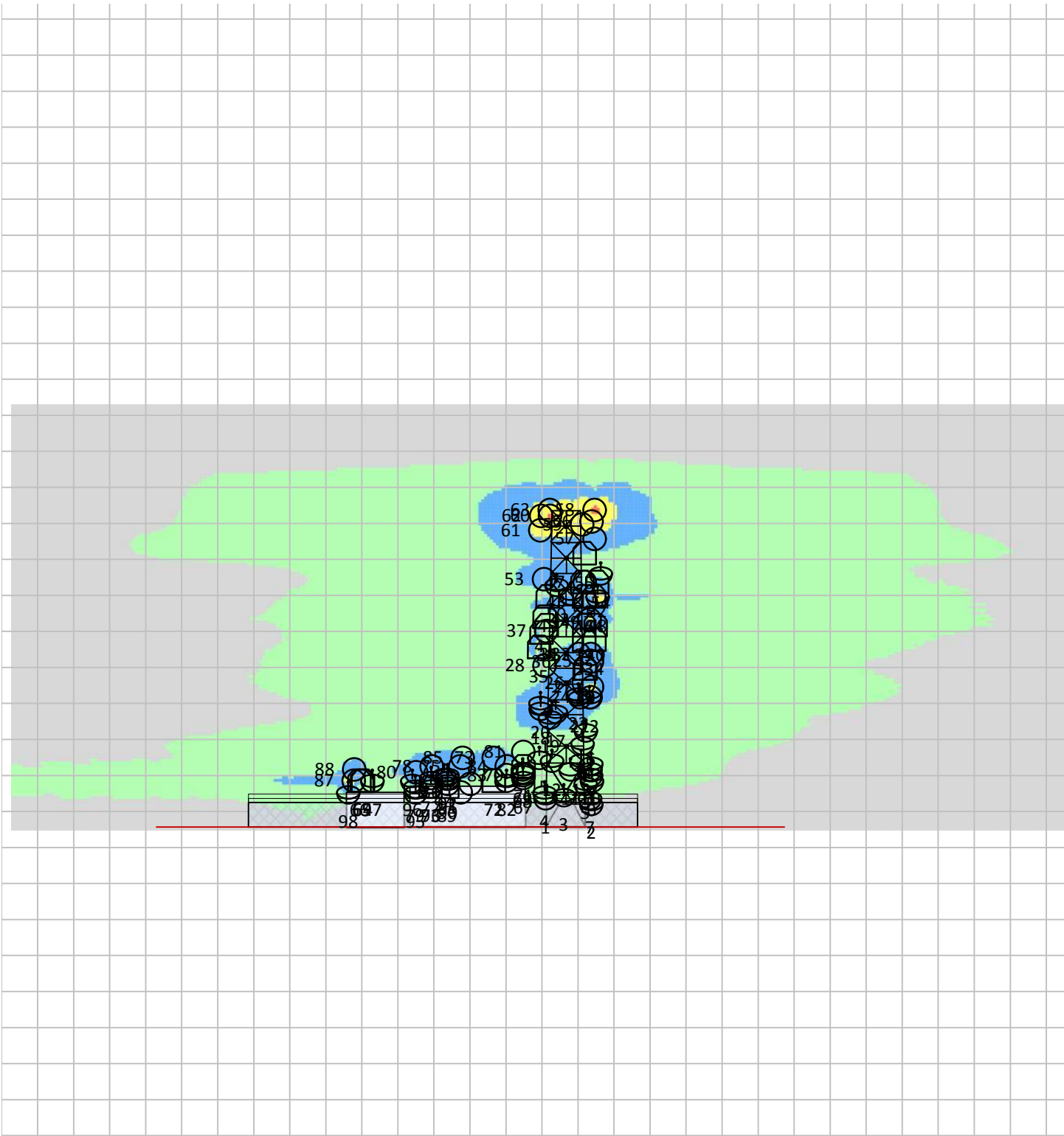
% of FCC Public Exposure Limit
Spatial average 0' - 6'



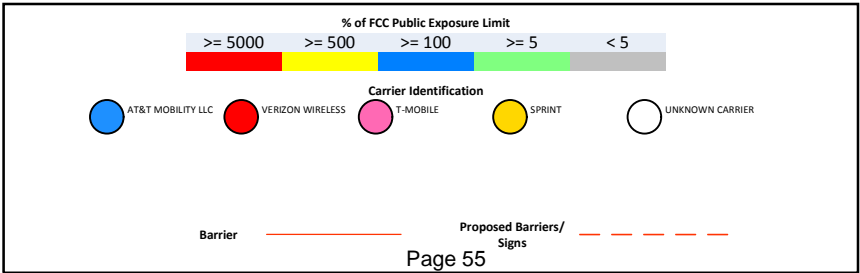
(Feet)
0 16.5 33
www.sitesafe.com
Site Name: Big Rock
11/5/2018 9:19:41 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Big Rock
Elevation View – Existing Configuration

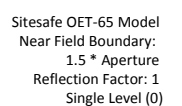
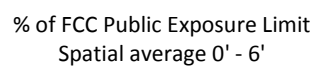


% of FCC Public Exposure Limit
Spatial average 0' - 6'



(Feet)
0 24.6 49.2
www.sitesafe.com
Site Name: Big Rock
11/5/2018 9:36:40 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Single Level (0)



5.4 Site Measurements

This section provides a summary of the measurements collected at the site. Actual measurements locations at which these data points were collected are included in the RF emission diagram provided in Section 5.3 of this report. Two types of measurements were collected at each measurement location: maximum (peak) and spatial average. The spatial average measurement consists of a collection of ten (10) measurements within a ten (10) second time interval taken from zero (0) to six (6) feet in height. The purpose of this measurement technique is to identify the average power density over the dimensions of a typical human body.

Table 1 below contains all the measurements collected from accessible areas located at the site at the time of Sitesafe's visit. Whenever possible, measurements are taken in front of the antenna in the transmitting direction. However, because of the antenna configuration at this site, specific emissions could not be discerned from nearby facilities, and no attempt was made to determine power density levels from a specific transmitting antenna.

Highest Measured Occupational Level: 1.00%

This value is equal to:

Highest General Public Level: 5.00%.

Table 1: Spatial Average and Maximum Occupational Measurements					
Measurements Points	Spatial Average	Maximum	Measurements Points	Spatial Average	Maximum
M1	<1 %	<1 %	M14	1 %	1 %
M2	<1 %	<1 %	M15	<1 %	<1 %
M3	<1 %	<1 %	M16	<1 %	<1 %
M4	<1 %	<1 %	M17	<1 %	<1 %
M5	1 %	1 %	M18	<1 %	<1 %
M6	1 %	1 %	M19	<1 %	<1 %
M7	1 %	1 %	M20	<1 %	<1 %
M8	1 %	1 %	M21	<1 %	<1 %
M9	<1 %	<1 %	M22	<1 %	<1 %
M10	<1 %	1 %	M23	<1 %	<1 %
M11	1 %	1 %	M24	<1 %	<1 %
M12	1 %	1 %	M25	<1 %	<1 %
M13	1 %	1 %			

RF meters and probes have been calibrated and used according to the manufacturer's specifications. Measurements provide a view of the MPE percentage levels at the site at the time of Sitesafe's site visit and are used to validate modeling results. Theoretical modeling is used for determining compliance and the percentage of MPE contributions.

An RF Emission diagram has been included in section 5.3 of this document. All measurement locations are identified in this diagram. The locations of measurements in the RF Emission diagram can be cross referenced with Table 1 (above) to determine the actual spatial average and maximum measurement value per location.

5.5 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was verified on site, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 3 - Big Rock. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory and representative photographs were obtained or verified during the site visit and were utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	E1	Generic	Aperture	0	11000	220	37.66	0	64.7	EIRP	dBmW	1	1799.4	10	0	0
2	E2	Generic	Aperture	0	11000	100	31.16	0	64.7	EIRP	dBmW	1	1799.4	8	0	0
3	E3	Generic	Aperture	0	11000	0	37.66	0	64.7	EIRP	dBmW	1	1799.4	11	0	0
4	E4	Generic	Aperture	0	6000	0	36.36	0	72.3	EIRP	dBmW	1	10354.9	12	0	0
5	E5	Generic	Aperture	0	11000	5	37.66	0	64.7	EIRP	dBmW	1	1799.4	15	0	0
6	E6	Generic	Aperture	0	11000	130	37.66	0	64.7	EIRP	dBmW	1	1799.4	16	0	0
7	E7	Generic	Aperture	0	6000	100	39.06	0	72.3	EIRP	dBmW	1	10354.9	10	0	0
8	E8	Generic	Aperture	0	6000	100	32.86	0	72.3	EIRP	dBmW	1	10354.9	18	0	0
9	E9	Generic	Aperture	0	6000	100	32.86	0	72.3	EIRP	dBmW	1	10354.9	22	0	0
10	E10	Generic	Aperture	0	18000	40	37.66	0	65.3	EIRP	dBmW	1	2065.9	20	0	0
11	E11	Generic	Aperture	0	6000	175	36.36	0	72.3	EIRP	dBmW	1	10354.9	20	0	0
12	E12	Generic	Aperture	0	11000	220	37.66	0	64.7	EIRP	dBmW	1	1799.4	23	0	0
13	E13	Generic	Aperture	0	11000	40	37.66	0	64.7	EIRP	dBmW	1	1799.4	23	0	0
14	E14	Generic	Aperture	0	5800	40	29.06	0	20	ERP	Watt	1	20	29	0	0
15	E15	Generic	Aperture	0	11000	310	37.66	0	64.7	EIRP	dBmW	1	1799.4	24	0	0
16	E16	Generic	Aperture	0	11000	130	37.66	0	64.7	EIRP	dBmW	1	1799.4	33.5	0	0
17	E17	Generic	Omni	10	450	175	0	360	100	ERP	Watt	1	100	40	0	0
18	E18	Generic	Omni	12.5	150	265	2.87	360	100	ERP	Watt	1	193.6	41	0	0
19	E19	Generic	Omni	4.7	450	355	2.97	360	100	ERP	Watt	1	198.2	38	0	0
20	E20	Generic	Aperture	0	6000	310	36.36	0	72.3	EIRP	dBmW	1	10354.9	43	0	0
21	E21	Generic	Panel	4.6	1900	355	15.43	65	60	TPO	Watt	1	2094.8	45	0	0
22	E22	Generic	Panel	4.6	1900	95	15.43	65	60	TPO	Watt	1	2094.8	45	0	0
23	E23	Generic	Panel	2	1900	355	8.6	65	60	TPO	Watt	1	434.7	46	0	0
24	E24	Generic	Omni	8	150	95	2.61	360	100	ERP	Watt	1	100	45	0	0
25	E25	Generic	Omni	12.5	150	95	2.87	360	100	ERP	Watt	1	100	57.5	0	0
26	E26	Generic	Omni	8	150	175	2.61	360	100	ERP	Watt	1	100	50	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
27	E27	Generic	Omni	1.5	850	175	0.01	360	60	TPO	Watt	1	60.1	48.6	0	0
28	E28	Generic	Omni	12.5	150	355	2.87	360	100	ERP	Watt	1	100	56	0	0
29	E29	Generic	Panel	4.6	1900	330	15.43	65	60	TPO	Watt	1	2094.8	55	0	0
30	E30	Generic	Panel	4.6	1900	330	15.43	65	60	TPO	Watt	1	2094.8	55	0	0
31	E31	Generic	Omni	4.7	450	355	2.97	360	100	ERP	Watt	1	100	60	0	0
32	E32	Generic	Omni	4.7	450	95	2.97	360	100	ERP	Watt	1	100	60	0	0
33	E33	Generic	Panel	4.6	1900	355	15.43	65	60	TPO	Watt	1	2094.8	65	0	0
34	E34	Generic	Panel	4.6	1900	95	15.43	65	60	TPO	Watt	1	2094.8	65	0	0
35	E35	Generic	Panel	4.6	1900	0	15.43	65	60	TPO	Watt	1	2094.8	62.5	0	0
36	E36	Generic	Panel	4.6	1900	0	15.43	65	60	TPO	Watt	1	2094.8	67.5	0	0
37	E37	Generic	Omni	4.7	450	355	2.97	360	100	ERP	Watt	1	100	68	0	0
38	E38	Generic	Omni	10	150	355	0	360	100	ERP	Watt	1	100	70	0	0
39	E39	Generic	Panel	4.6	1900	355	15.43	65	60	TPO	Watt	1	2094.8	70	0	0
40	E40	Generic	Panel	4.6	1900	95	15.43	65	60	TPO	Watt	1	2094.8	70	0	0
41	E41	Generic	Panel	4.6	1900	220	15.43	65	60	TPO	Watt	1	2094.8	73	0	0
42	E42	Generic	Omni	4.7	450	95	2.97	360	100	ERP	Watt	1	100	72	0	0
43	E43	Generic	Omni	4.7	450	95	2.97	360	100	ERP	Watt	1	100	78	0	0
44	E44	Generic	Panel	4.6	1900	130	15.43	65	60	TPO	Watt	1	2094.8	80	0	0
45	E45	Generic	Panel	4.6	1900	220	15.43	65	60	TPO	Watt	1	2094.8	80	0	0
46	E46	Generic	Panel	4.6	1900	355	15.43	65	60	TPO	Watt	1	2094.8	80	0	0
47	E47	Generic	Omni	10	150	95	0	360	100	ERP	Watt	1	100	85	0	0
48	E48	Generic	Aperture	0	23000	95	32.66	0	63.8	EIRP	dBmW	1	1462.2	80	0	0
49	E49	Generic	Aperture	0	18000	355	37.66	0	60.9	EIRP	dBmW	1	750	81	0	0
50	E50	Generic	Aperture	0	23000	355	32.66	0	63.8	EIRP	dBmW	1	1462.2	84	0	0
51	E51	Generic	Panel	4.6	1900	355	15.43	65	60	TPO	Watt	1	2094.8	85	0	0
52	E52	Generic	Panel	4.6	1900	95	15.43	65	60	TPO	Watt	1	2094.8	85	0	0
53	E53	Generic	Omni	1.5	850	355	0.01	360	1000	ERP	Watt	1	1000	86	0	0
54	E54	Generic	Aperture	0	18000	95	37.66	0	60.9	EIRP	dBmW	1	750	88	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
55	E55	Generic	Panel	4.6	1900	355	15.43	65	60	TPO	Watt	1	2094.8	95	0	0
56	E56	Generic	Omni	12.5	150	355	2.87	360	100	ERP	Watt	1	100	106	0	0
57	E57 (Rx)	Generic	Omni	12.5	150	95	2.87	360	0	ERP	Watt	1	0	100	0	0
58	E58	Generic	Omni	1.5	850	95	0.01	360	1000	ERP	Watt	1	1000	110	0	0
59	E59	Generic	Omni	10	150	175	0	360	100	ERP	Watt	1	100	105	0	0
60	E60	Generic	Omni	1.5	850	175	0.01	360	1000	ERP	Watt	1	1000	108	0	0
61	E61	Generic	Omni	4.7	450	265	2.97	360	100	ERP	Watt	1	100	103	0	0
62	E62	Generic	Omni	1.5	850	265	0.01	360	1000	ERP	Watt	1	1000	108	0	0
63	E63	Generic	Omni	10	150	355	0	360	100	ERP	Watt	1	100	110	0	0
64	UNKNOWN OPERATOR	Generic	Panel	6.3	1900	270	16.26	65	60	TPO	Watt	1	2536	16	0	0
65	UNKNOWN OPERATOR	Generic	Panel	6.3	1900	270	16.26	65	60	TPO	Watt	1	2536	16	0	0
66	UNKNOWN OPERATOR	Generic	Panel	6.3	1900	270	16.26	65	60	TPO	Watt	1	2536	16	0	0
67	UNKNOWN OPERATOR	Generic	Aperture	0	5800	180	29.06	0	20	ERP	Watt	1	20	17	0	0
68	UNKNOWN OPERATOR	Generic	Aperture	0	5800	180	29.06	0	20	ERP	Watt	1	20	19	0	0
69	UNKNOWN OPERATOR	Generic	Aperture	0	5800	180	29.06	0	20	ERP	Watt	1	20	20	0	0
70	UNKNOWN OPERATOR	Generic	Aperture	0	5800	180	29.06	0	20	ERP	Watt	1	20	18	0	0
71	UNKNOWN OPERATOR	Generic	Yagi	0.5	850	180	9.97	60	1000	ERP	Watt	1	1000	21	0	0
72	UNKNOWN OPERATOR	Generic	Panel	4.6	1900	180	15.43	65	60	TPO	Watt	1	2094.8	16	0	0
73	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	24	0	0
74	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	15	0	0
75	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	21	0	0
76	UNKNOWN OPERATOR	Generic	Aperture	0	6000	200	32.86	0	72.3	EIRP	dBmW	1	10354.9	14	0	0
77	UNKNOWN OPERATOR	Generic	Aperture	0	2400	200	22.96	0	4	ERP	Watt	1	4	17	0	0
78	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	21	0	0
79	UNKNOWN OPERATOR	Generic	Aperture	0	6000	200	36.36	0	72.3	EIRP	dBmW	1	10354.9	14	0	0
80	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	19	0	0
81	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	26	0	0
82	UNKNOWN OPERATOR	Generic	Aperture	0	2400	60	22.96	0	4	ERP	Watt	1	4	16	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
83	UNKNOWN OPERATOR	Generic	Yagi	0.5	850	0	9.97	60	1000	ERP	Watt	1	1000	18	0	0
84	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	21	0	0
85	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	24	0	0
86	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	160	9.97	60	100	ERP	Watt	1	100	12	0	0
87	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	270	9.97	60	100	ERP	Watt	1	100	16	0	0
88	UNKNOWN OPERATOR	Generic	Omni	3	450	0	0	360	25	ERP	Watt	1	25	20	0	0
89	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	60	10.01	90	4	ERP	Watt	1	4	14	0	0
90	UNKNOWN OPERATOR	Generic	Aperture	0	5800	40	29.06	0	20	ERP	Watt	1	20	15	0	0
91	UNKNOWN OPERATOR	Generic	Aperture	0	18000	60	30.96	0	60.9	EIRP	dBmW	1	750	17	0	0
92	UNKNOWN OPERATOR	Generic	Aperture	0	18000	70	30.96	0	60.9	EIRP	dBmW	1	750	18	0	0
93	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	0	10.01	90	4	ERP	Watt	1	4	14	0	0
94	UNKNOWN OPERATOR	Generic	Aperture	0	6000	0	39.06	0	72.3	EIRP	dBmW	1	10354.9	18	0	0
95	UNKNOWN OPERATOR	Generic	Aperture	0	5800	0	29.06	0	20	ERP	Watt	1	20	12	0	0
96	UNKNOWN OPERATOR	Generic	Aperture	0	23000	0	32.66	0	63.8	EIRP	dBmW	1	1462.2	16	0	0
97	UNKNOWN OPERATOR	Generic	Aperture	0	6000	0	39.06	0	72.3	EIRP	dBmW	1	10354.9	16	0	0
98	UNKNOWN OPERATOR	Generic	Aperture	0	18000	0	30.96	0	60.9	EIRP	dBmW	1	750	12	0	0
99	P1	Generic	Aperture	0	11000	132.5	37.66	0	64.7	EIRP	dBmW	1	1799.4	21	0	0
100	P2	Generic	Aperture	4.6	11000	146.8	41.86	61	64.7	EIRP	dBmW	1	1799.4	15.8	0	0
101	P3	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	58.5	0	0
102	P4	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	58.5	0	0
103	P5 (Rx)	Sinclair SC479-HF1LDF(D06)	Omni	14.5	700	0	9.5	360	0	TPO	Watt	1	0	102.3	0	0
104	P6 (Rx)	Sinclair SC479-HF1LDF(D06)	Omni	14.5	700	0	9.5	360	0	TPO	Watt	1	0	102.3	0	0
105	7P	Generic	Aperture	0	6000	5.5	36.36	0	72.3	EIRP	dBmW	1	10354.9	16	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

5.6 Site Pictures



Figure 10: Site Overview – East Facing



Figure 11: Tower Overview West Facing



Figure 12: Tower Overview South Facing



Figure 13: Tower Overview Southwest Facing



Figure 14: Tower Overview Northeast Facing



Figure 15: Tower Base Overview



Figure 16: North Tower Overview



Figure 17: Overview Facing South



Figure 18: Overview Facing North

6 Mt. Tamalpais



Marin Emergency Radio Authority

Site Name – Mt. Tamalpais

Site ID: 4

Site Compliance Report

**2001 Ridgecrest Blvd.
Mill Valley, CA 94941**

Site visit date: August 24, 2018

Site visit time: 1:00 PM

Site survey by: Jeff Desira

Latitude: N37-55-44.42

Longitude: W122-35-13.50

Structure Type: Self-Support

Report generated date: March 28, 2019

Report by: Sam Cosgrove

Customer Contact: David Mortimer

Marin Emergency Radio Authority is compliant and will remain complaint upon implementation of the proposed changes. The site has compliance issues that are not the result of, and therefore not the responsibility of, Marin Emergency Radio Authority.

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6.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at communications site, 4 - Mt. Tamalpais, located at 2001 Ridgecrest Blvd., Mill Valley, CA, in relation to Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

Sitesafe's field personnel visited 4 - Mt. Tamalpais on August 24, 2018. This section contains a detailed summary of the RF environment at the site including:

- Site compliance determination;
- Photographs of the site;
- Diagram of the site;
- Inventory of the make / model of all transmitting antennas found on the site (where possible);
- Record of any Maximum Permissible Exposure ("MPE") measurements taken on the site, as applicable; and
- Theoretical MPE based on modeling.

RF emissions exceed MPE limits in the areas near antennas 104/105 and 114-117 (as shown in the diagram below). These areas should be reviewed by the unknown operator and mitigation should be put in place in the form of signage or an RF safety plan. The areas that exceed MPE limits are not regularly accessed by the general public since the site is gated and locked. The proposed antenna configuration does not create any significant change to the RF emissions in the area. The emissions on the ground level near the monopoles does not pose any danger to workers in the area.

6.2 Site Compliance

6.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, and a thorough review of site access procedures, RF hazard signage and visible antenna locations, Sitesafe has determined that:

Marin Emergency Radio Authority is compliant with the FCC rules and regulations, as described in OET Bulletin 65, and will remain compliant upon implementation of the proposed changes. The site has compliance issues that are not the result of, and therefore not the responsibility of, Marin Emergency Radio Authority.

The compliance determination is based on General Public MPE levels due to theoretical modeling and/or physical measurements, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant. Measurements have also been performed to validate the assumptions used in our theoretical modeling of this site.

Modeling is used for determining compliance and the percentage of MPE contribution. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results.

6.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on existing measurements and theoretical analysis of MPE levels. Sitesafe has documented the locations of any RF signs and barriers that are required for compliance. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

This site will be compliant with the FCC rules and regulations.

Remediation for other operators (Marin Emergency Radio Authority is not responsible for the actions below):

Operator #1

The carriers at antennas 104-105 & 114-117 should review their antennas and raise centerlines or lower the power of the antennas.

6.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the ground to be:

Maximum Cumulative Theoretical General Public MPE level (Existing Antennas) : 2,418.3%
Maximum Cumulative Theoretical General Public MPE level (All Antennas): 2,418.3%
Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 2,418.3%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

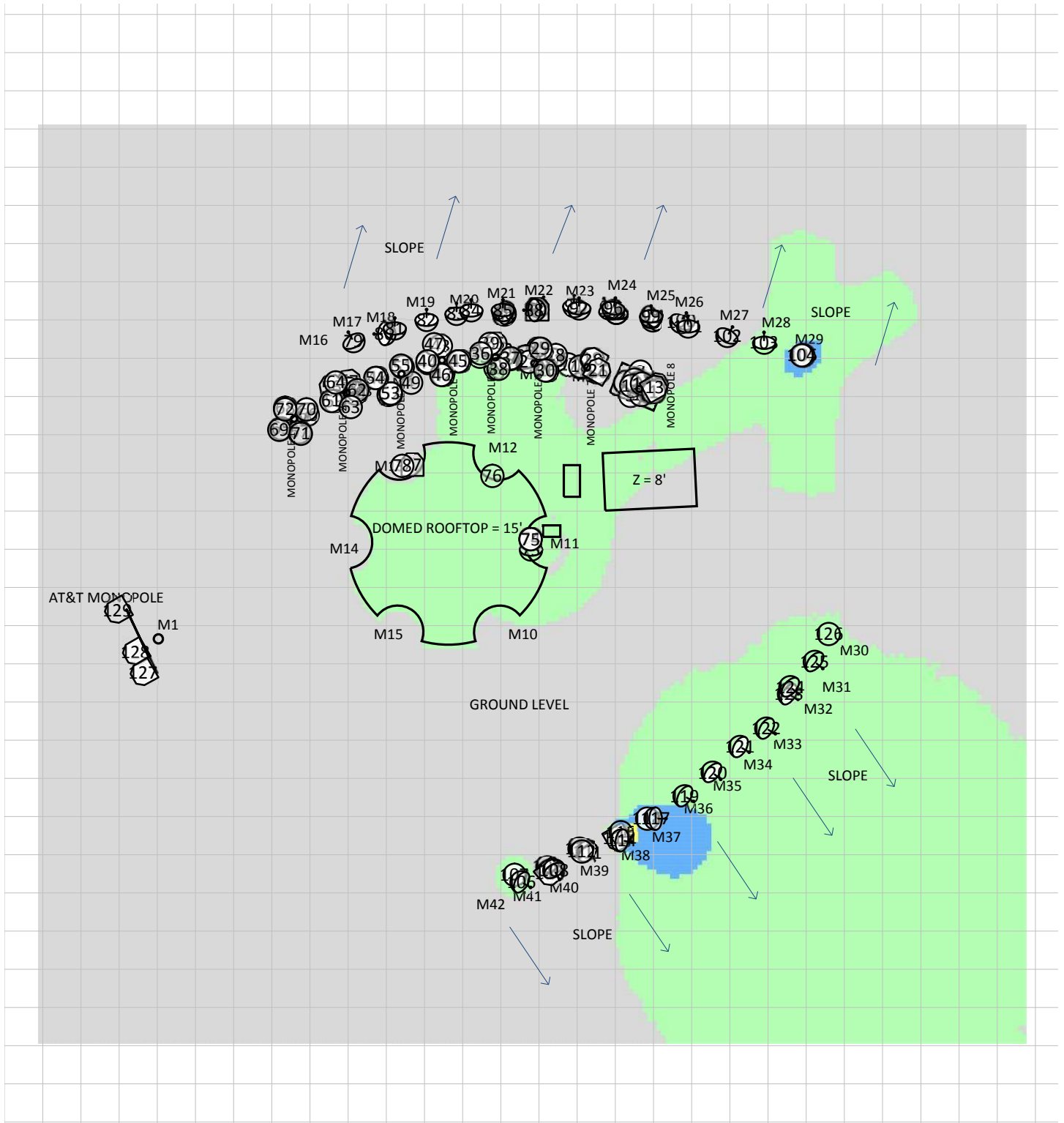


Abbreviations used in the RF Emissions Diagrams

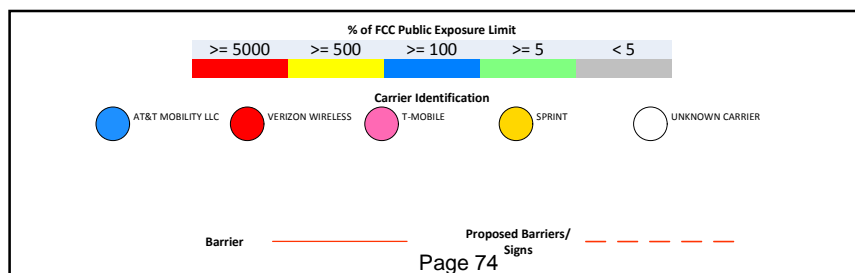
PH=##'	Penthouse at ## feet above main roof
M##	Measurement ## taken during a site visit

As discussed in Section 6.4, site measurement locations for spatial average measurements collected at the time of Sitesafe's visit have been added to the RF emissions diagram. While the theoretical modeling represents worst case MPE levels based on the assumption(s) detailed above, the measurement data is a snapshot of MPE levels at the time of our visit, and dependent on transmitter duty cycle, system implementation and emissions from other RF sources at nearby antenna sites.

RF Exposure Simulation For: Mt. Tamalpais Existing Antennas Only On Air



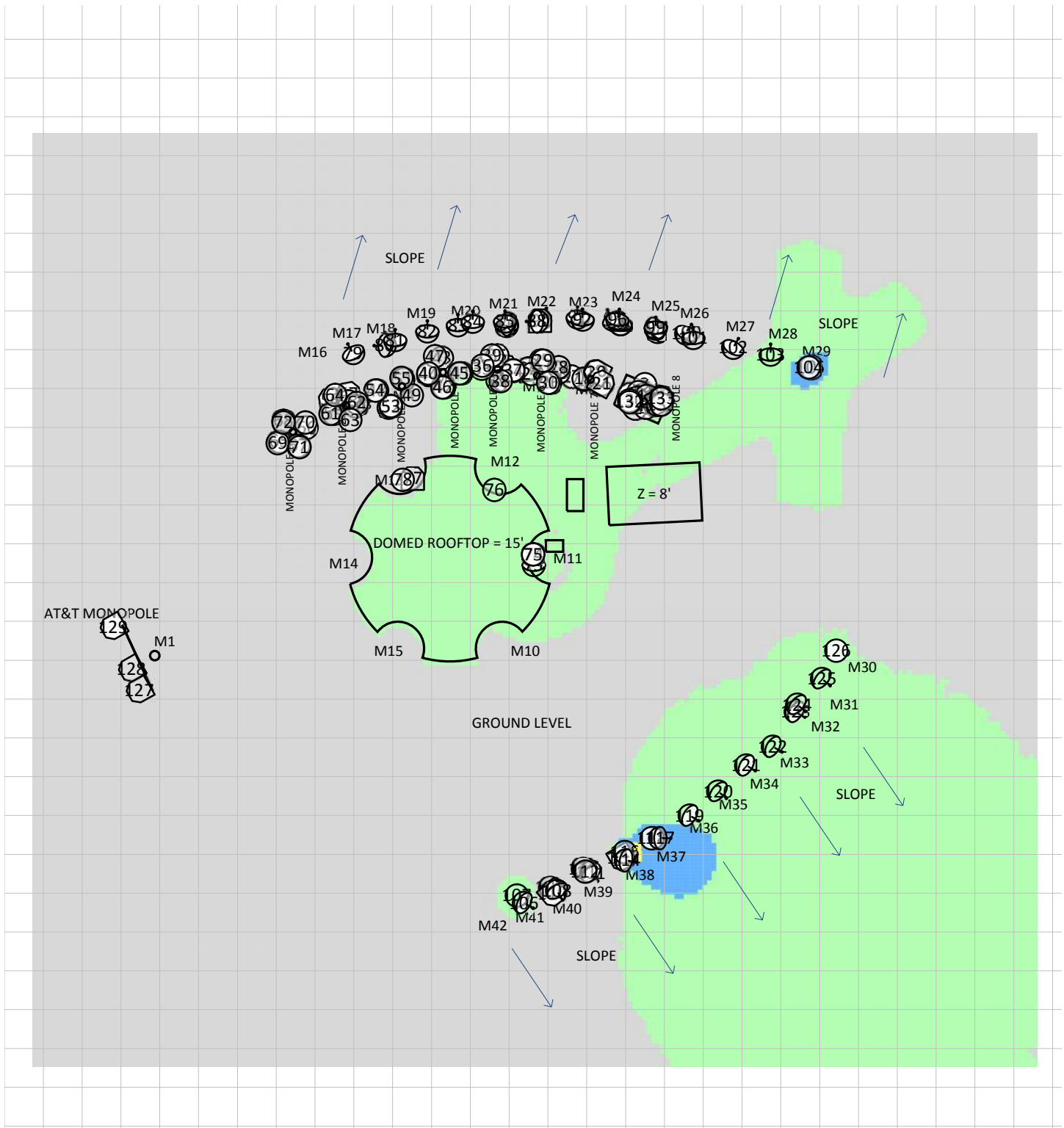
% of FCC Public Exposure Limit
Spatial average 0' - 6'



(Feet)
0 23 46
www.sitesafe.com
Site Name: Mt. Tamalpais
8/28/2018 11:09:58 AM

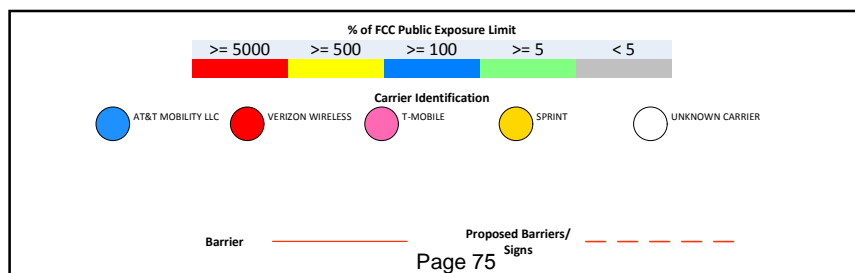
Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Mt. Tamalpais All Antennas On Air



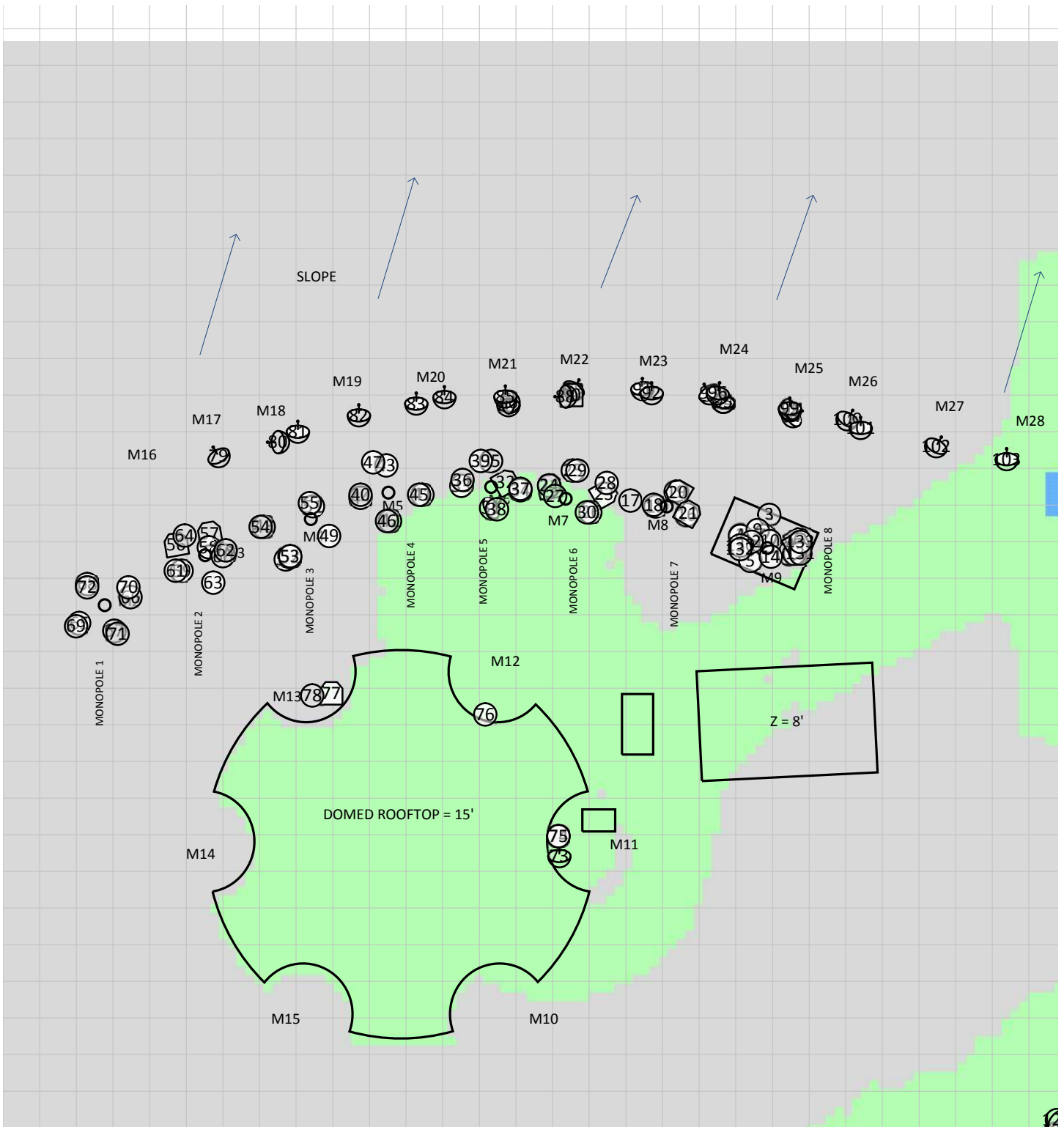
% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)
0 22.7 45.4
www.sitesafe.com
Site Name: Mt. Tamalpais
8/28/2018 11:06:55 AM

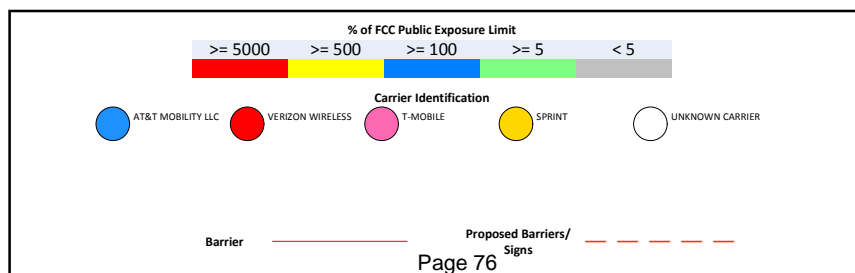


Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Mt. Tamalpais All Antennas On Air – Monopoles Detail View



% of FCC Public Exposure Limit
Spatial average 0' - 6'



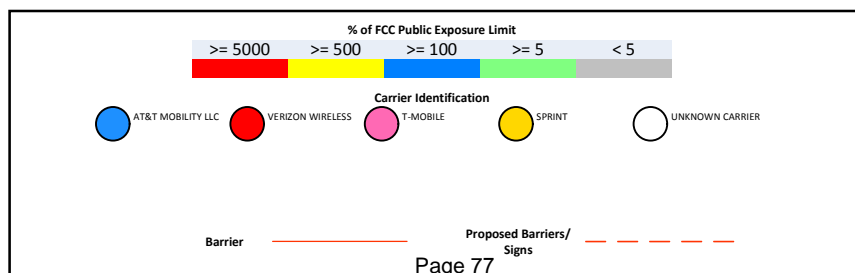
(Feet)
0 12 24
www.sitesafe.com
Site Name: Mt. Tamalpais
8/28/2018 11:07:27 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Mt. Tamalpais Proposed Configuration On Air



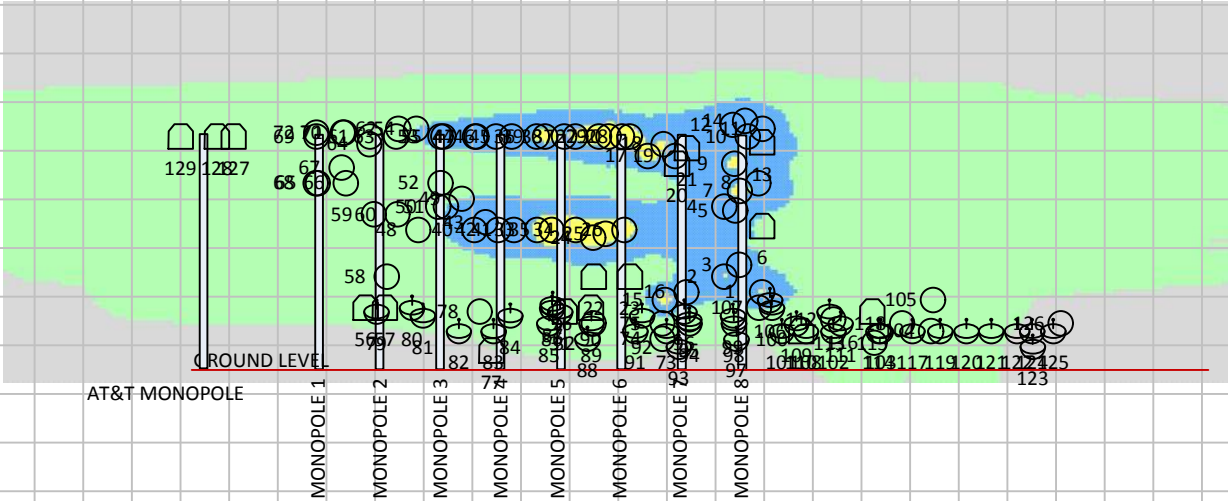
% of FCC Public Exposure Limit
Spatial average 0' - 6'



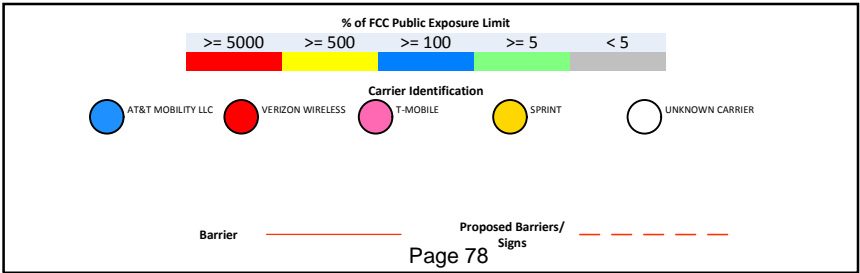
(Feet)
0 23.6 47.2
www.sitesafe.com
Site Name: Mt. Tamalpais
8/28/2018 11:27:54 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

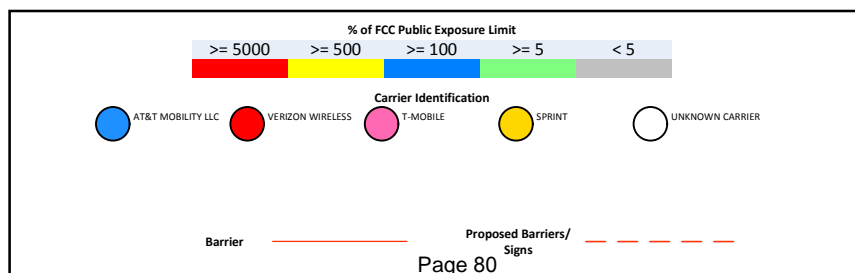
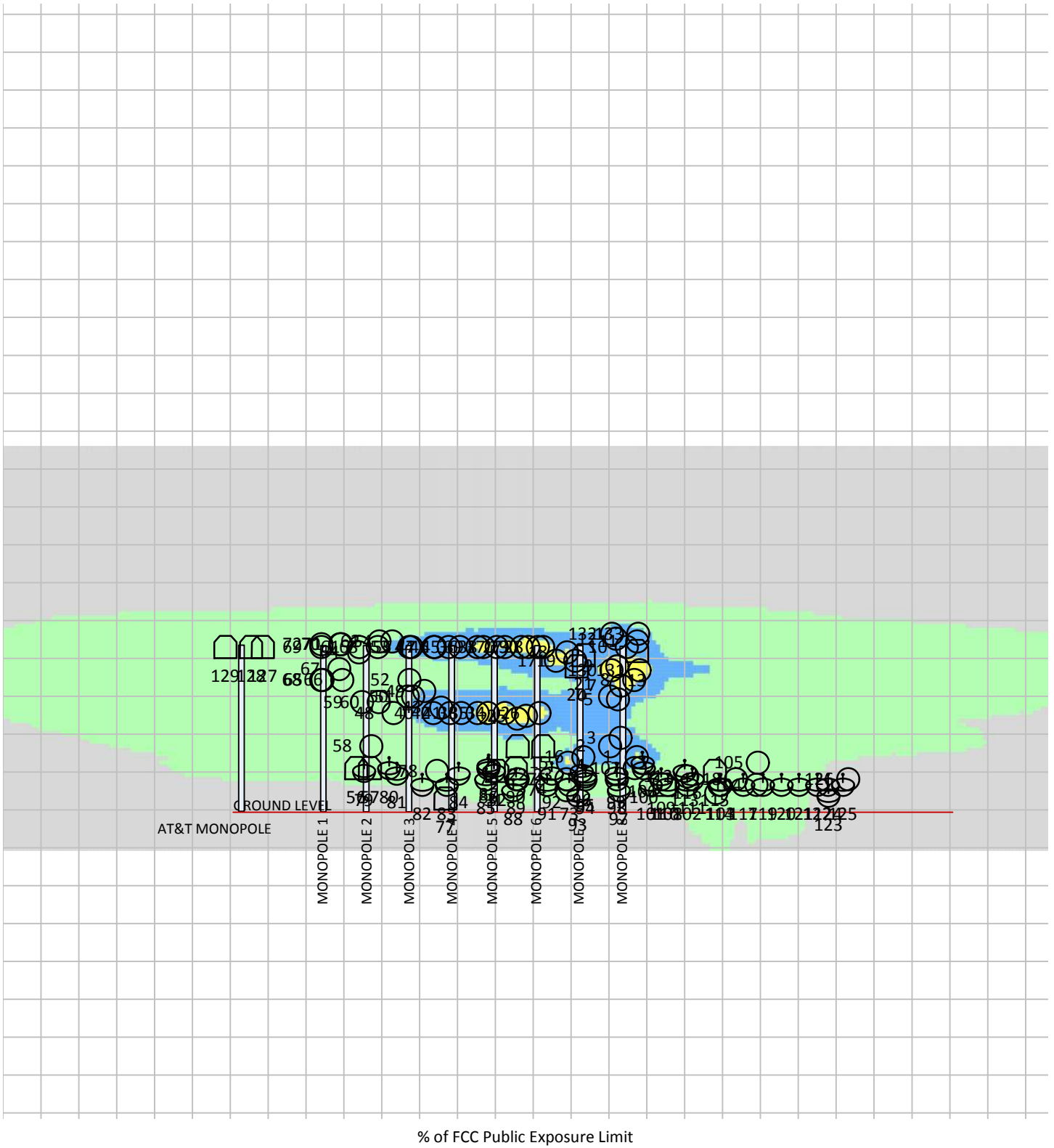
RF Exposure Simulation For: Mt. Tamalpais
Existing Antennas Only On Air – Elevation View



% of FCC Public Exposure Limit



RF Exposure Simulation For: Mt. Tamalpais Elevation View – Final Configuration



6.4 Site Measurements

This section provides a summary of the measurements collected at the site. Actual measurements locations at which these data points were collected are included in the RF emission diagram provided in Section 6.3 of this report. Two types of measurements were collected at each measurement location: maximum (peak) and spatial average. The spatial average measurement consists of a collection of ten (10) measurements within a ten (10) second time interval taken from zero (0) to six (6) feet in height. The purpose of this measurement technique is to identify the average power density over the dimensions of a typical human body.

Table 1 below contains all the measurements collected from accessible areas located at the site at the time of Sitesafe's visit. Whenever possible, measurements are taken in front of the antenna in the transmitting direction. However, because of the antenna configuration at this site, specific emissions could not be discerned from nearby facilities, and no attempt was made to determine power density levels from a specific transmitting antenna.

Highest Measured Occupational Level: 17.00%

This value is equal to:

Highest General Public Level: 85.00%.

Measurements Points	Spatial Average	Maximum	Measurements Points	Spatial Average	Maximum
M1	<1 %	<1 %	M23	1 %	1 %
M2	1 %	1 %	M24	1 %	1 %
M3	1 %	1 %	M25	2 %	2 %
M4	1 %	1 %	M26	2 %	2 %
M5	1 %	3 %	M27	3 %	4 %
M6	1 %	2 %	M28	4 %	5 %
M7	1 %	1 %	M29	17 %	23 %
M8	1 %	1 %	M30	1 %	1 %
M9	2 %	2 %	M31	1 %	1 %
M10	<1 %	<1 %	M32	<1 %	<1 %
M11	<1 %	<1 %	M33	<1 %	<1 %
M12	<1 %	<1 %	M34	<1 %	<1 %
M13	<1 %	1 %	M35	<1 %	<1 %
M14	<1 %	<1 %	M36	<1 %	<1 %
M15	<1 %	<1 %	M37	<1 %	<1 %
M16	2 %	2 %	M38	<1 %	<1 %
M17	1 %	1 %	M39	<1 %	<1 %
M18	1 %	1 %	M40	<1 %	<1 %
M19	1 %	1 %	M41	<1 %	1 %
M20	1 %	1 %	M42	<1 %	<1 %
M21	1 %	1 %	M43	<1 %	<1 %
M22	1 %	1 %			



RF meters and probes have been calibrated and used according to the manufacturer's specifications. Measurements provide a view of the MPE percentage levels at the site at the time of Sitesafe's site visit and are used to validate modeling results. Theoretical modeling is used for determining compliance and the percentage of MPE contributions.

An RF Emission diagram has been included in section 6.3 of this document. All measurement locations are identified in this diagram. The locations of measurements in the RF Emission diagram can be cross referenced with Table 1 (above) to determine the actual spatial average and maximum measurement value per location.

6.5 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was verified on site, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 4 - Mt. Tamalpais. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory and representative photographs were obtained or verified during the site visit and were utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	E1	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	20	0	0
2	E2	Generic	Omni	12.5	150	90	2.87	360	100	ERP	Watt	1	100	24	0	0
3	E3	Generic	Omni	14	850	270	9.97	360	1000	ERP	Watt	1	1000	27	0	0
4	E4	Generic	Omni	14	850	60	9.97	360	1000	ERP	Watt	1	1000	42	0	0
5	E5	Generic	Omni	14	850	60	9.97	360	1000	ERP	Watt	1	1000	41	0	0
6	E6	Generic	Panel	1.1	2400	60	10.01	90	4	ERP	Watt	1	4	37	0	0
7	E7	Generic	Omni	3	150	60	0	360	25	ERP	Watt	1	25	46	0	0
8	E8	Generic	Omni	12.5	150	240	2.87	360	100	ERP	Watt	1	100	48	0	0
9	E9	Generic	Omni	3	150	60	0	360	25	ERP	Watt	1	25	53	0	0
10	E10	Generic	Omni	9.5	450	240	5.97	360	100	ERP	Watt	1	100	60	0	0
11	E11	Generic	Omni	14	850	240	9.97	360	1000	ERP	Watt	1	1000	62	0	0
12	E12	Generic	Omni	14	850	60	9.97	360	1000	ERP	Watt	1	1000	63	0	0
13	E13	Generic	Panel	1.1	2400	60	10.01	90	4	ERP	Watt	1	4	58.5	0	0
14	E14	Generic	Omni	9.5	450	60	5.97	360	100	ERP	Watt	1	100	64	0	0
15	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	18	0	0
16	UNKNOWN OPERATOR	Generic	Omni	9.5	450	0	5.97	360	100	ERP	Watt	1	100	20	0	0
17	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	55	0	0
18	UNKNOWN OPERATOR	Generic	Omni	14	850	0	9.97	360	1000	ERP	Watt	1	1000	58	0	0
19	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	55	0	0
20	UNKNOWN OPERATOR	Generic	Panel	1.7	2400	300	12.01	90	4	ERP	Watt	1	4	53	0	0
21	UNKNOWN OPERATOR	Generic	Panel	3.3	2400	30	15.01	90	4	ERP	Watt	1	4	57	0	0
22	UNKNOWN OPERATOR	Generic	Panel	1.7	2400	350	12.01	90	4	ERP	Watt	1	4	24	0	0
23	UNKNOWN OPERATOR	Generic	Panel	1.7	2400	60	12.01	90	4	ERP	Watt	1	4	24	0	0
24	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	34	0	0
25	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	35	0	0
26	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	100	ERP	Watt	1	100	36	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
27	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	60	0	0
28	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	60	0	0
29	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	60	0	0
30	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	60	0	0
31	UNKNOWN OPERATOR	Generic	Aperture	3	5800	60	29.06	2	20	ERP	Watt	1	20	15	0	0
32	UNKNOWN OPERATOR	Generic	Panel	2.2	5800	60	16.01	90	20	ERP	Watt	1	20	15	0	0
33	UNKNOWN OPERATOR	Generic	Omni	14	850	0	9.97	360	1000	ERP	Watt	1	1000	36	0	0
34	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	36	0	0
35	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	100	ERP	Watt	1	100	36	0	0
36	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	60	0	0
37	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	60	0	0
38	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	60	0	0
39	UNKNOWN OPERATOR	Generic	Omni	3	450	0	0	360	25	ERP	Watt	1	25	60	0	0
40	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	36	0	0
41	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	36	0	0
42	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	36	0	0
43	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	38	0	0
44	UNKNOWN OPERATOR	Generic	Omni	3	450	0	0	360	25	ERP	Watt	1	25	60	0	0
45	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	60	0	0
46	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	60	0	0
47	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	60	0	0
48	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	36	0	0
49	UNKNOWN OPERATOR	Generic	Omni	14	850	0	9.97	360	25	ERP	Watt	1	25	44	0	0
50	UNKNOWN OPERATOR	Generic	Omni	14	850	0	9.97	360	25	ERP	Watt	1	25	42	0	0
51	UNKNOWN OPERATOR	Generic	Omni	14	850	0	9.97	360	25	ERP	Watt	1	25	42	0	0
52	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	48	0	0
53	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	60	0	0
54	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	62	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
55	UNKNOWN OPERATOR	Generic	Omni	3	450	0	0	360	25	ERP	Watt	1	25	60	0	0
56	UNKNOWN OPERATOR	Generic	Panel	4.6	1900	350	15.43	65	60	TPO	Watt	1	2094.8	16	0	0
57	UNKNOWN OPERATOR	Generic	Panel	4.6	1900	350	15.43	65	60	TPO	Watt	1	2094.8	16	0	0
58	UNKNOWN OPERATOR	Generic	Omni	12.5	150	0	2.87	360	100	ERP	Watt	1	100	24	0	0
59	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	40	0	0
60	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	40	0	0
61	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	60	0	0
62	UNKNOWN OPERATOR	Generic	Omni	9.5	450	0	5.97	360	100	ERP	Watt	1	100	62	0	0
63	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	60	0	0
64	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	58	0	0
65	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	48	0	0
66	UNKNOWN OPERATOR	Generic	Omni	3	450	0	0	360	25	ERP	Watt	1	25	48	0	0
67	UNKNOWN OPERATOR	Generic	Omni	9.5	450	0	5.97	360	100	ERP	Watt	1	100	52	0	0
68	UNKNOWN OPERATOR	Generic	Omni	3	450	0	0	360	25	ERP	Watt	1	25	48	0	0
69	UNKNOWN OPERATOR	Generic	Omni	3	450	0	0	360	25	ERP	Watt	1	25	60	0	0
70	UNKNOWN OPERATOR	Generic	Omni	3	450	0	0	360	25	ERP	Watt	1	25	61	0	0
71	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	61	0	0
72	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	61	0	0
73	UNKNOWN OPERATOR	Generic	Aperture	3	5800	0	29.06	2	20	ERP	Watt	1	20	10	0	0
74	UNKNOWN OPERATOR	Generic	Yagi	0.5	850	0	9.97	60	1	TPO	Watt	1	9.9	8	0	0
75	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	12	0	0
76	UNKNOWN OPERATOR	Generic	Yagi	3	150	0	9.11	76	100	ERP	Watt	1	100	12	0	0
77	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	0	10.01	90	4	ERP	Watt	1	4	5	0	0
78	UNKNOWN OPERATOR	Generic	Omni	2	2400	0	9.51	360	4	ERP	Watt	1	4	15	0	0
79	UNKNOWN OPERATOR	Generic	Aperture	2	11000	330	31.16	2	64.5	EIRP	dBmW	1	1718.3	15	0	0
80	UNKNOWN OPERATOR	Generic	Aperture	1	18000	270	30.96	2	56.4	EIRP	dBmW	1	265.9	16	0	0
81	UNKNOWN OPERATOR	Generic	Aperture	1	18000	0	30.96	2	56.4	EIRP	dBmW	1	265.9	14	0	0
82	UNKNOWN OPERATOR	Generic	Aperture	4.6	11000	0	41.86	61	64.5	EIRP	dBmW	1	1718.3	10	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
83	UNKNOWN OPERATOR	Generic	Aperture	4	2400	0	22.96	2	4	TPO	Watt	1	790.8	10	0	0
84	UNKNOWN OPERATOR	Generic	Aperture	3	5800	0	29.06	2	20	TPO	Watt	1	16107.6	14	0	0
85	UNKNOWN OPERATOR	Generic	Aperture	6	6000	0	36.36	2	65	EIRP	dBmW	1	1928	12	0	0
86	UNKNOWN OPERATOR	Generic	Aperture	3	5800	270	29.06	2	20	TPO	Watt	1	16107.6	16	0	0
87	UNKNOWN OPERATOR	Generic	Aperture	3	5800	0	29.06	2	20	TPO	Watt	1	16107.6	17	0	0
88	UNKNOWN OPERATOR	Generic	Aperture	4	6000	270	32.86	2	65	EIRP	dBmW	1	1928	8	0	0
89	UNKNOWN OPERATOR	Generic	Aperture	4	2400	30	22.96	2	4	TPO	Watt	1	790.8	12	0	0
90	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	0	10.01	90	4	TPO	Watt	1	40.1	16	0	0
91	UNKNOWN OPERATOR	Generic	Aperture	4	11000	0	37.66	2	64.5	EIRP	dBmW	1	1718.3	10	0	0
92	UNKNOWN OPERATOR	Generic	Aperture	4	11000	0	37.66	2	64.5	EIRP	dBmW	1	1718.3	14	0	0
93	UNKNOWN OPERATOR	Generic	Aperture	4	6000	330	32.86	2	65	EIRP	dBmW	1	1928	6	0	0
94	UNKNOWN OPERATOR	Generic	Aperture	3	5800	10	29.06	2	20	TPO	Watt	1	16107.6	12	0	0
95	UNKNOWN OPERATOR	Generic	Aperture	3	5800	10	29.06	2	20	TPO	Watt	1	16107.6	13	0	0
96	UNKNOWN OPERATOR	Generic	Aperture	4	11000	10	37.66	2	64.5	EIRP	dBmW	1	1718.3	15	0	0
97	UNKNOWN OPERATOR	Generic	Aperture	4	11000	60	37.66	2	64.5	EIRP	dBmW	1	1718.3	8	0	0
98	UNKNOWN OPERATOR	Generic	Aperture	6	6000	60	36.36	2	65	EIRP	dBmW	1	1928	12	0	0
99	UNKNOWN OPERATOR	Generic	Aperture	4	11000	0	37.66	2	64.5	EIRP	dBmW	1	1718.3	14	0	0
100	UNKNOWN OPERATOR	Generic	Aperture	6	6000	30	36.36	2	65	EIRP	dBmW	1	1928	16	0	0
101	UNKNOWN OPERATOR	Generic	Aperture	2	18000	0	37.66	2	56.4	EIRP	dBmW	1	265.9	10	0	0
102	UNKNOWN OPERATOR	Generic	Aperture	4.6	11000	30	41.86	61	64.5	EIRP	dBmW	1	1718.3	10	0	0
103	UNKNOWN OPERATOR	Generic	Aperture	0	6000	0	39.06	2	65	EIRP	dBmW	1	1928	10	0	0
104	UNKNOWN OPERATOR	Generic	Omni	3	150	60	0	360	100	ERP	Watt	1	100	10	0	0
105	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	100	ERP	Watt	1	100	18	0	0
106	UNKNOWN OPERATOR	Generic	Aperture	4	11000	120	37.66	2	64.5	EIRP	dBmW	1	1718.3	18	0	0
107	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	TPO	Watt	1	182.4	16	0	0
108	UNKNOWN OPERATOR	Generic	Aperture	4	6000	150	32.86	2	65	EIRP	dBmW	1	1928	10	0	0
109	UNKNOWN OPERATOR	Generic	Aperture	3	5800	150	29.06	2	20	TPO	Watt	1	16107.6	12	0	0
110	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	140	10.01	90	4	TPO	Watt	1	40.1	10	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
111	UNKNOWN OPERATOR	Generic	Aperture	4.6	2400	140	19.16	61	4	TPO	Watt	1	329.7	12	0	0
112	UNKNOWN OPERATOR	Generic	Yagi	0.5	850	150	9.97	60	1	TPO	Watt	1	9.9	13	0	0
113	UNKNOWN OPERATOR	Generic	Aperture	3	5800	160	29.06	2	20	TPO	Watt	1	16107.6	15	0	0
114	UNKNOWN OPERATOR	Generic	Aperture	6	6000	100	36.36	2	65	EIRP	dBmW	1	1928	10	0	0
115	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	150	10.01	90	4	TPO	Watt	1	40.1	15	0	0
116	UNKNOWN OPERATOR	Generic	Yagi	3	150	90	9.11	76	100	TPO	Watt	1	814.7	7	0	0
117	UNKNOWN OPERATOR	Generic	Aperture	8	6000	90	39.06	2	65	EIRP	dBmW	1	1928	10	0	0
118	UNKNOWN OPERATOR	Generic	Yagi	3	150	120	9.11	76	100	TPO	Watt	1	814.7	12	0	0
119	UNKNOWN OPERATOR	Generic	Aperture	6	6000	120	36.36	2	65	EIRP	dBmW	1	1928	10	0	0
120	UNKNOWN OPERATOR	Generic	Aperture	6	6000	130	36.36	2	65	EIRP	dBmW	1	1928	10	0	0
121	UNKNOWN OPERATOR	Generic	Aperture	8	11000	120	44.96	2	64.5	EIRP	dBmW	1	1718.3	10	0	0
122	UNKNOWN OPERATOR	Generic	Aperture	8	11000	120	44.96	2	64.5	EIRP	dBmW	1	1718.3	10	0	0
123	UNKNOWN OPERATOR	Generic	Aperture	3	5800	120	29.06	2	20	TPO	Watt	1	16107.6	6	0	0
124	UNKNOWN OPERATOR	Generic	Aperture	3	5800	130	29.06	2	20	TPO	Watt	1	16107.6	10	0	0
125	UNKNOWN OPERATOR	Generic	Aperture	8	6000	130	39.06	2	65	EIRP	dBmW	1	1928	10	0	0
126	UNKNOWN OPERATOR	Generic	Yagi	0.5	2400	140	13.37	27.5	4	TPO	Watt	1	86.9	12	0	0
127	UNKNOWN OPERATOR	Generic	Panel	4.6	1900	240	15.43	65	60	TPO	Watt	1	2094.8	60	0	0
128	UNKNOWN OPERATOR	Generic	Panel	4.6	1900	240	15.43	65	60	TPO	Watt	1	2094.8	60	0	0
129	UNKNOWN OPERATOR	Generic	Panel	4.6	1900	240	15.43	65	60	TPO	Watt	1	2094.8	60	0	0
130	P1	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	51.5	0	0
131	P2	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	51.5	0	0
132	P3 (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	64.8	0	0
133	P4 (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	64.8	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other carriers at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to carrier, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

6.6 Site Pictures



Figure 19: Monopoles 1 & 2



Figure 20: Monopoles 3 & 4



Figure 21: Monopoles 5 & 6



Figure 22: Monopoles 7 & 8



Figure 23: Monopoles Overview



Figure 24: Northwestern Microwaves



Figure 25: Northern Microwaves



Figure 26: Northeastern Microwaves



Figure 27: Antennas 104 & 105



Figure 28: Southwestern Microwaves



Figure 29: Southern Microwaves



Figure 30: Southeastern Microwaves (1)



Figure 31: Southeastern Microwaves (2)



Figure 32: Dome Overview Facing West



Figure 33: Dome Overview Facing South



Figure 34: Dome Overview Facing Southwest



Figure 35: AT&T Monopole

7 Mt. Barnabe



Marin Emergency Radio Authority

Site Name – Mt. Barnabe

Site ID: 5

Site Compliance Report

**1 Barnabe Peak Ave.
Lagunitas, CA 94938**

Site visit date: August 23, 2018
Site visit time: 11:23 PM
Site survey by: Jeff Desira

Latitude: N38-1-36.30
Longitude: W122-42-58.76
Structure Type: Self-Support

Report generated date: March 28, 2019
Report by: Sam Cosgrove
Customer Contact: David Mortimer

Marin Emergency Radio Authority is compliant and will remain compliant upon implementation of the proposed changes. The site has compliance issues that are not the result of, and therefore not the responsibility of, Marin Emergency Radio Authority.

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7.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at the communications site, 5 - Mt. Barnabe, located at 1 Barnabe Peak Ave., Lagunitas, CA, in relation to Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

Sitesafe's field personnel visited 5 - Mt. Barnabe on August 23, 2018. This section contains a detailed summary of the RF environment at the site including:

- Site compliance determination;
- Photographs of the site;
- Diagram of the site;
- Inventory of the make / model of all transmitting antennas found on the site (where possible);
- Record of any Maximum Permissible Exposure ("MPE") measurements taken on the site, as applicable; and
- Theoretical MPE based on modeling.

RF emissions on the rooftop and outside walkway of the fire lookout tower exceed MPE limits. The unknown operators in this area should review their antennas and make changes to the configuration accordingly. These areas are regularly accessed by fire lookout personnel, so signage or RF safety plans would not be sufficient. The RF emissions on the ground level do not pose a danger to anyone accessing the area. The proposed antennas do not change the RF emissions on the ground or rooftop levels significantly.

7.2 Site Compliance

7.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, and a thorough review of site access procedures, RF hazard signage and visible antenna locations, Sitesafe has determined that:

Marin Emergency Radio Authority is compliant with the FCC rules and regulations, as described in OET Bulletin 65, and will remain compliant upon implementation of the proposed changes. The site has compliance issues that are not the result of, and therefore not the responsibility of, Marin Emergency Radio Authority.

The compliance determination is based on General Public MPE levels due to theoretical modeling and/or physical measurements, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant. Measurements have also been performed to validate the assumptions used in our theoretical modeling of this site.

Modeling is used for determining compliance and the percentage of MPE contribution. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results.

7.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on existing measurements and theoretical analysis of MPE levels. Sitesafe has documented the locations of any RF signs and barriers that are required for compliance. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

This site will be compliant with the FCC rules and regulations.

Remediation for other operators (Marin Emergency Radio Authority is not responsible for the actions below):

Operators #1

The antennas on the Lookout Tower Rooftop, Lookout Tower Deck, and lower area of the tower should be relocated or an RF Safety Plan should be implemented for the site.

NOTE: The areas that are predicted to have emissions above MPE limits are in public areas accessed by site personnel.

7.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the rooftop to be:

Maximum Cumulative Theoretical General Public MPE level (Existing Antennas) : 889.7%
Maximum Cumulative Theoretical General Public MPE level (All Antennas): 967.6%
Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 967.6%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

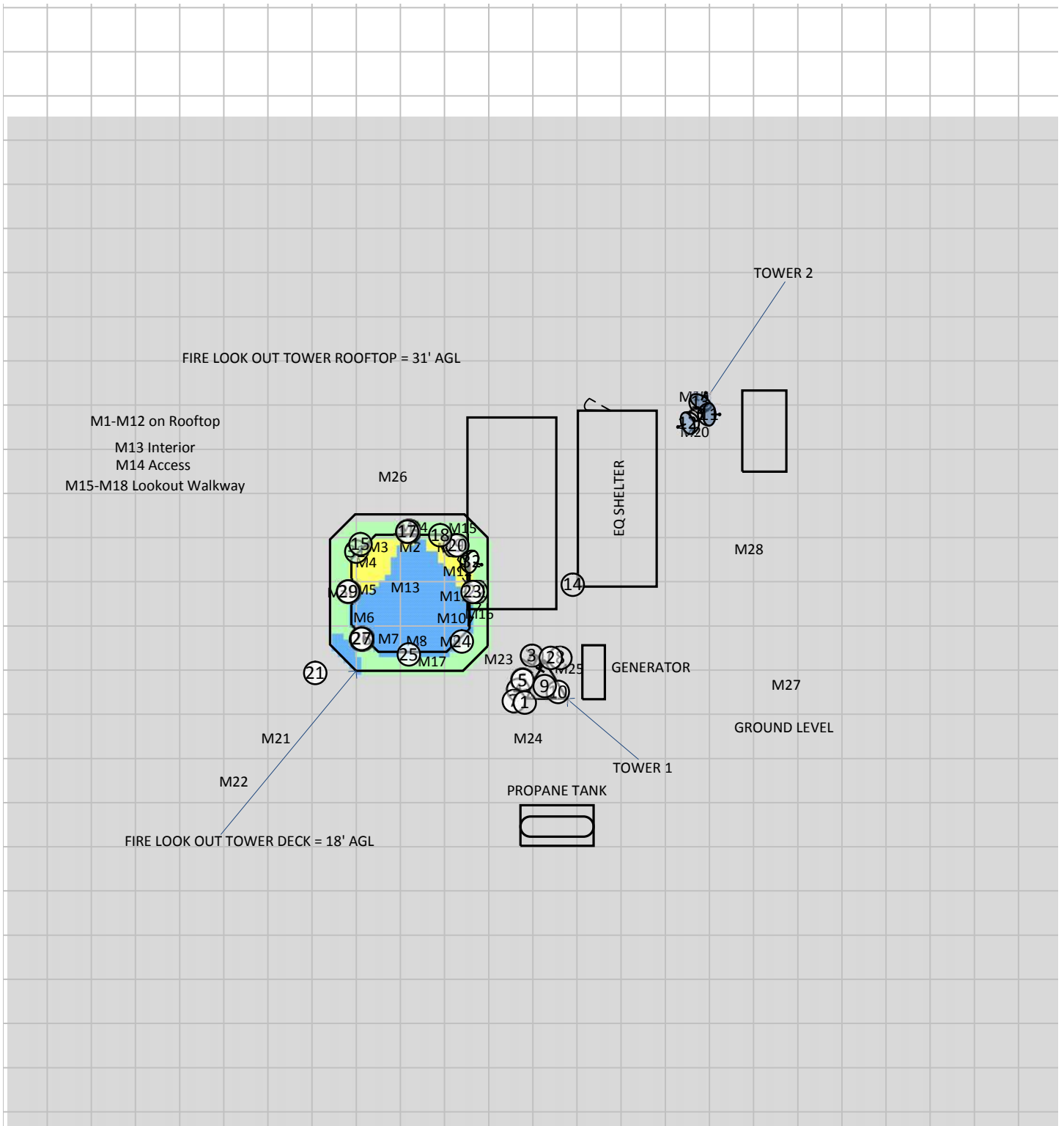


Abbreviations used in the RF Emissions Diagrams

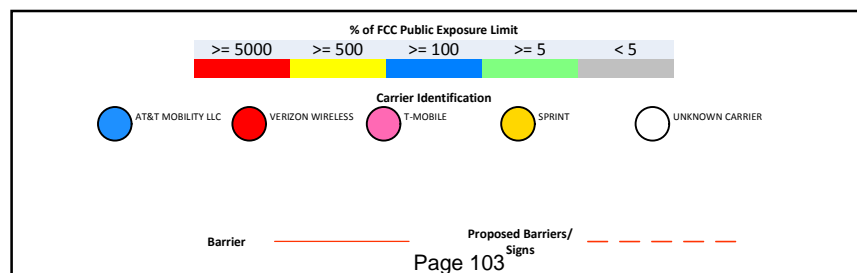
PH=##'	Penthouse at ## feet above main roof
M##	Measurement ## taken during a site visit

As discussed in Section 7.4, site measurement locations for spatial average measurements collected at the time of Sitesafe's visit have been added to the RF emissions diagram. While the theoretical modeling represents worst case MPE levels based on the assumption(s) detailed above, the measurement data is a snapshot of MPE levels at the time of our visit, and dependent on transmitter duty cycle, system implementation and emissions from other RF sources at nearby antenna sites.

RF Exposure Simulation For: Mt. Barnabe Existing Configuration



% of FCC Public Exposure Limit
Spatial average 0' - 6'



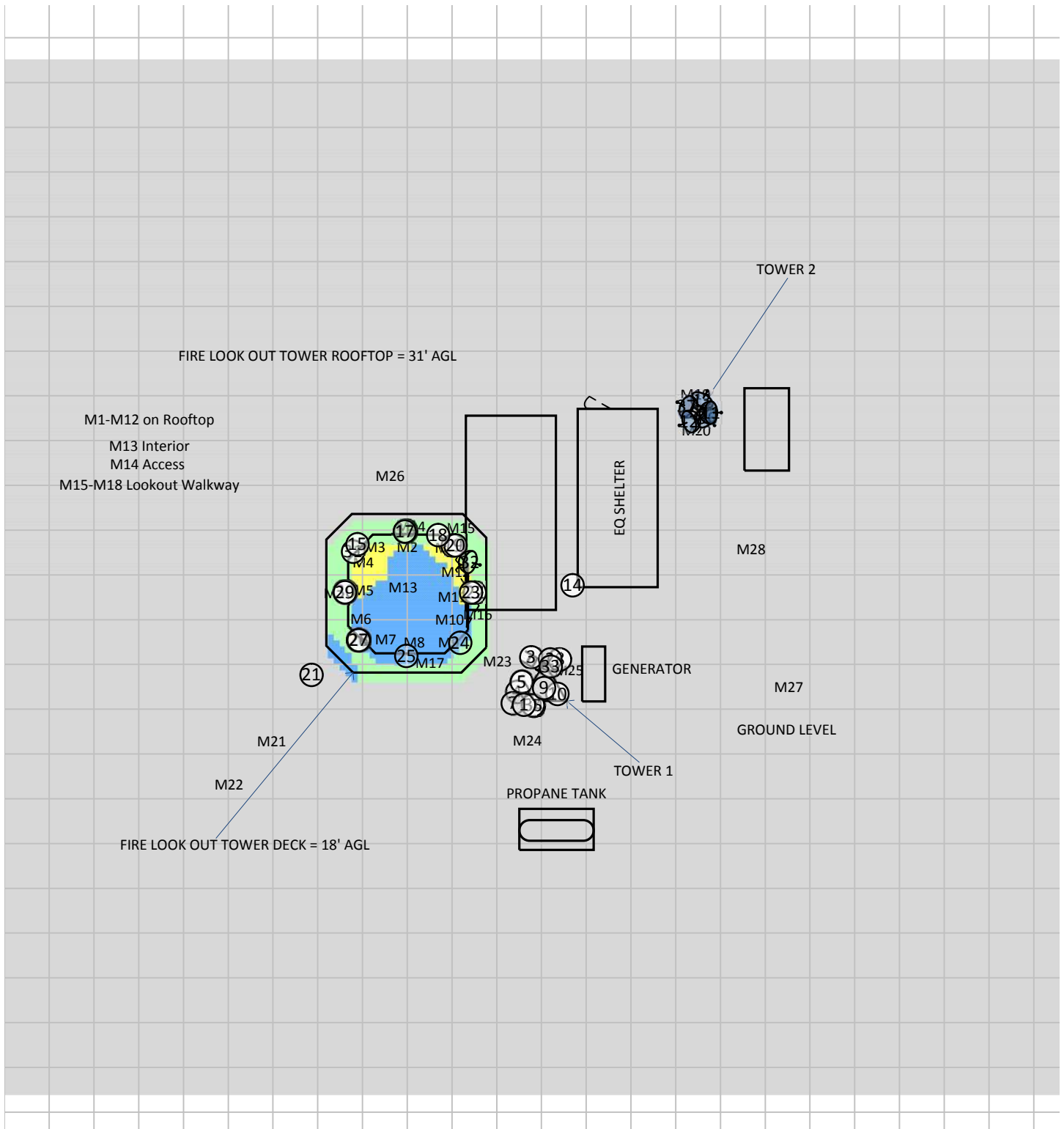
(Feet)

0 6 12

www.sitesafe.com
Site Name: Mt. Barnabe
11/5/2018 9:57:44 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Mt. Barnabe All Antennas On Air

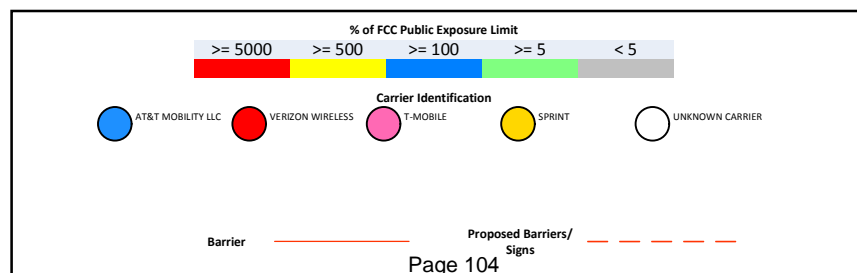


% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)

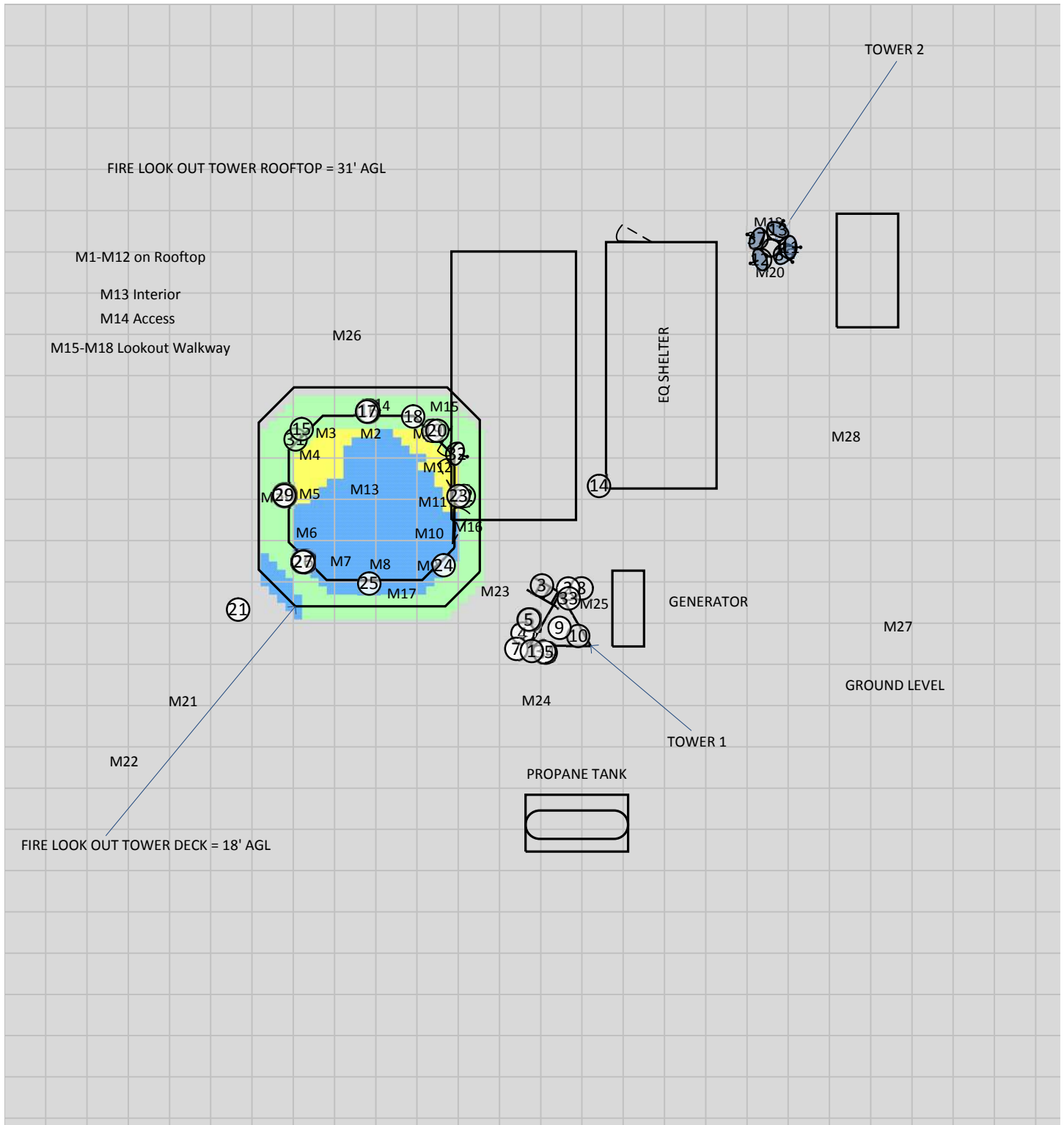
0 5.9 11.8

www.sitesafe.com
Site Name: Mt. Barnabe
11/5/2018 9:54:01 AM

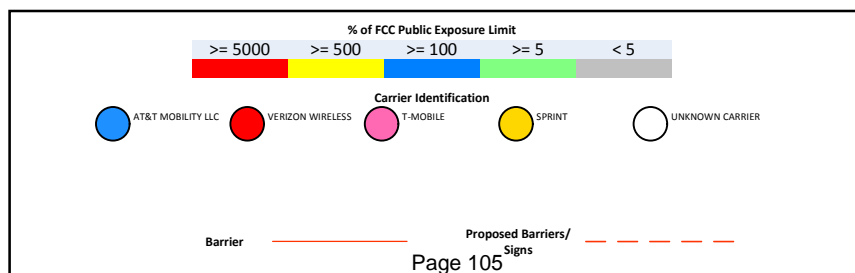


Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Mt. Barnabe All Antennas On Air – Detail View



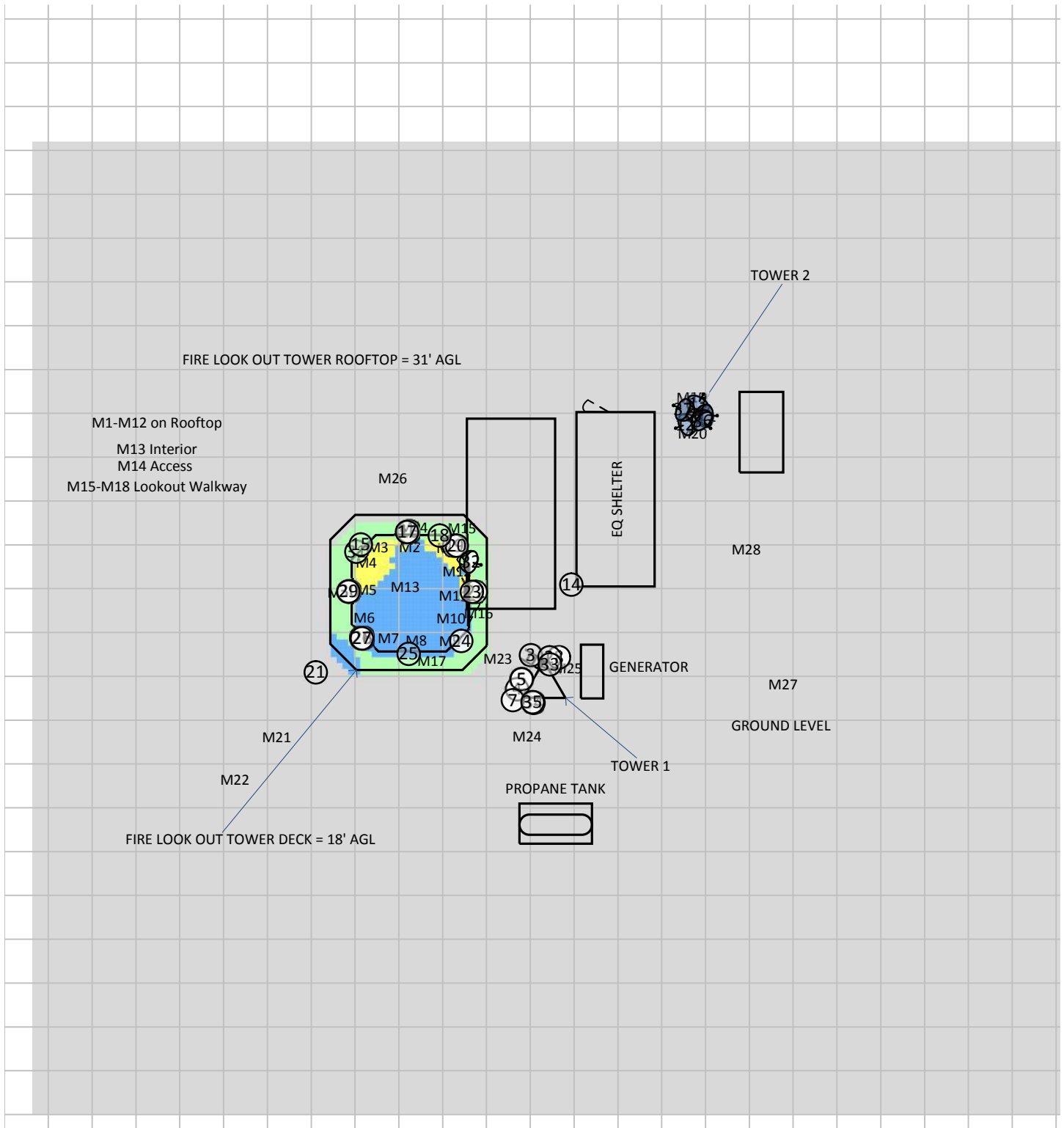
% of FCC Public Exposure Limit
Spatial average 0' - 6'



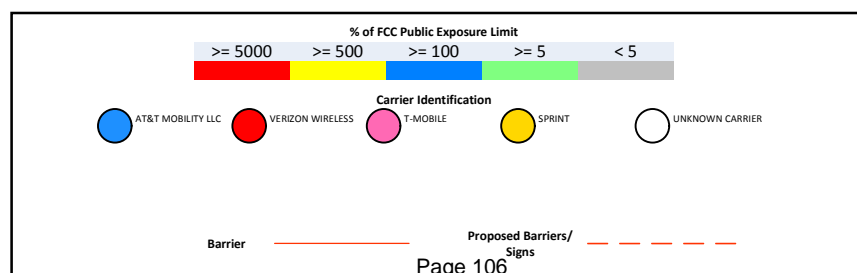
(Feet)
0 4.3 8.5
www.sitesafe.com
Site Name: Mt. Barnabe
11/5/2018 9:56:15 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Mt. Barnabe Final Configuration



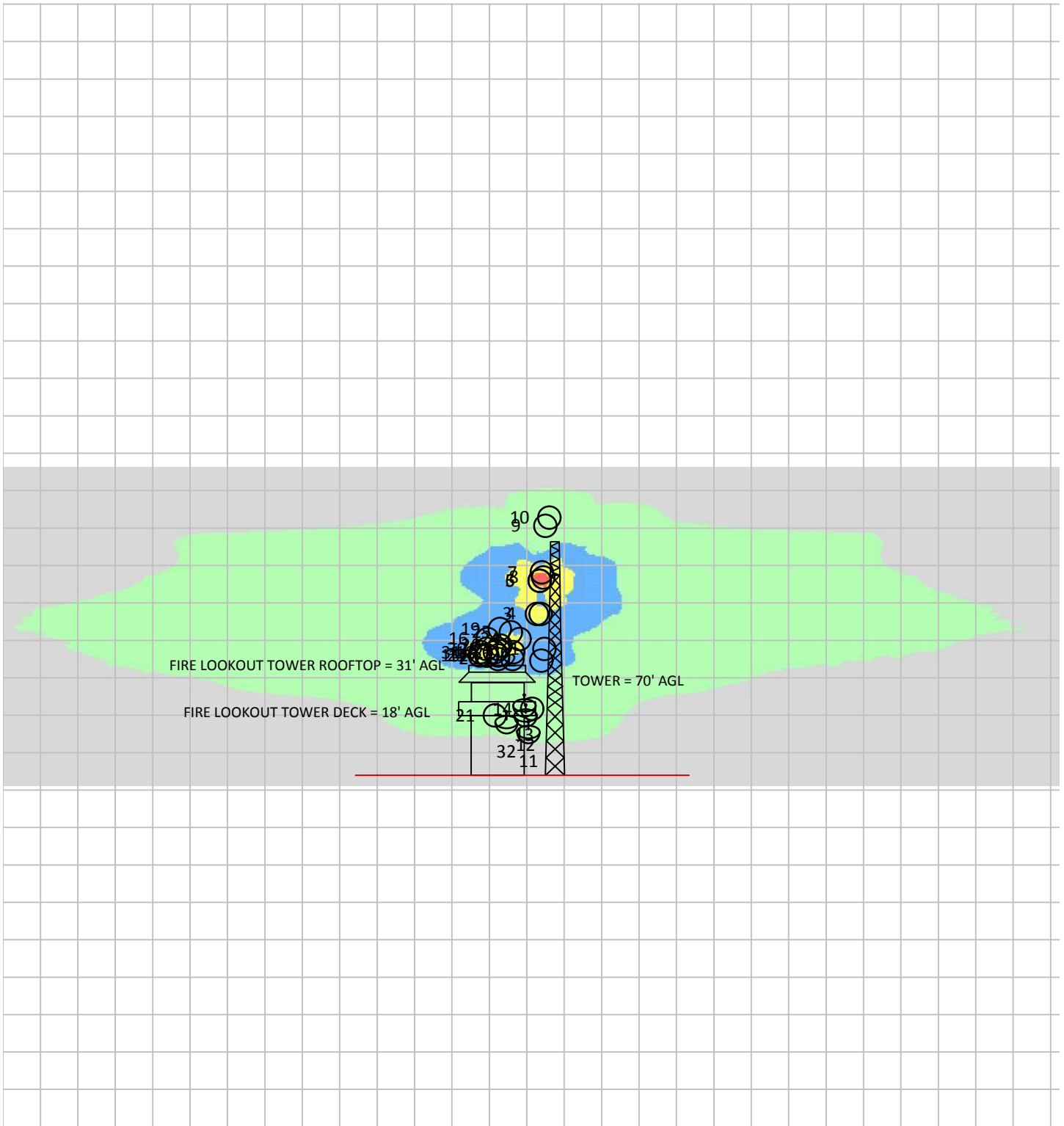
% of FCC Public Exposure Limit
Spatial average 0' - 6'



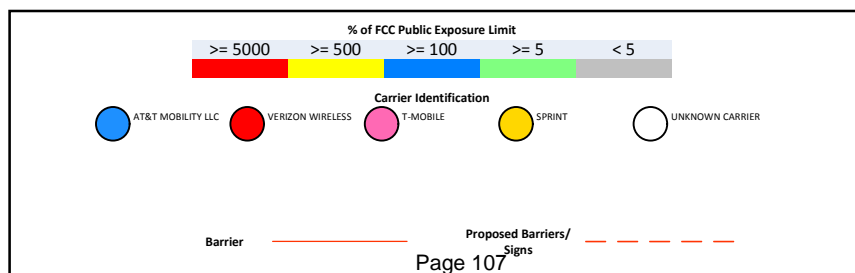
(Feet)
0 6 12
www.sitesafe.com
Site Name: Mt. Barnabe
11/5/2018 9:59:19 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

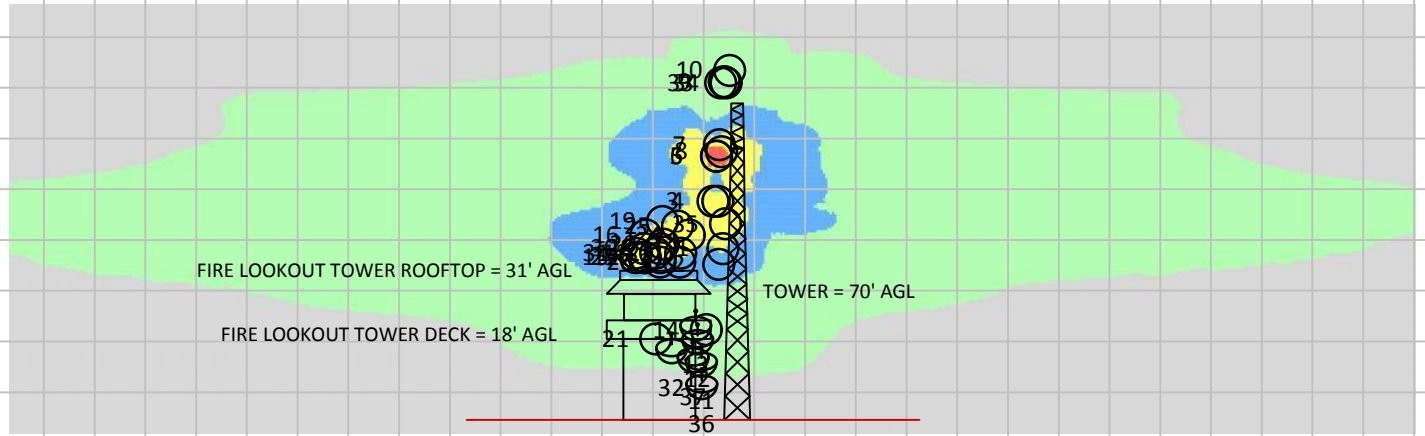
RF Exposure Simulation For: Mt. Barnabe Elevation View – Existing Configuration



% of FCC Public Exposure Limit
Spatial average 0' - 6'



RF Exposure Simulation For: Mt. Barnabe Elevation View – All Antennas On Air



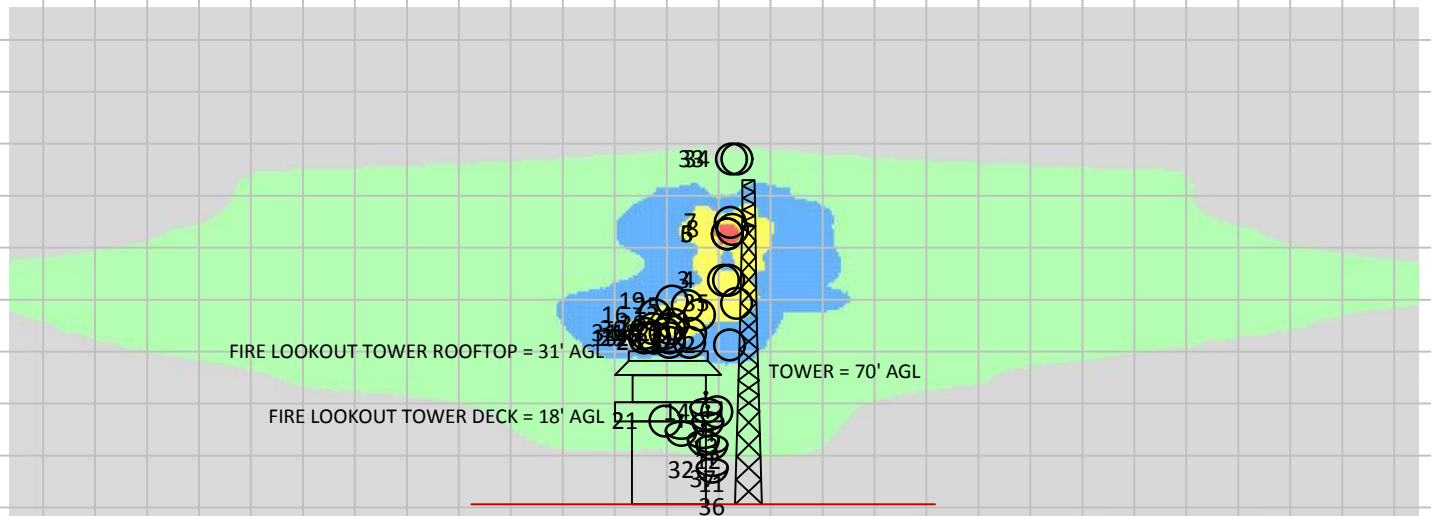
% of FCC Public Exposure Limit



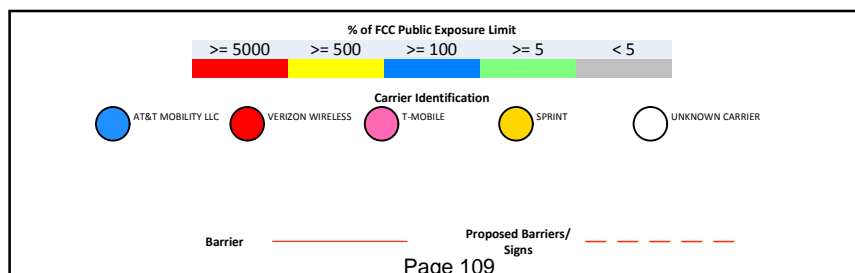
Barrier

Proposed Barriers/
Signs

RF Exposure Simulation For: Mt. Barnabe Elevation View – Final Configuration



% of FCC Public Exposure Limit



7.4 Site Measurements

This section provides a summary of the measurements collected at the site. Actual measurements locations at which these data points were collected are included in the RF emission diagram provided in Section 7.3 of this report. Two types of measurements were collected at each measurement location: maximum (peak) and spatial average. The spatial average measurement consists of a collection of ten (10) measurements within a ten (10) second time interval taken from zero (0) to six (6) feet in height. The purpose of this measurement technique is to identify the average power density over the dimensions of a typical human body.

Table 1 below contains all the measurements collected from accessible areas located at the site at the time of Sitesafe's visit. Whenever possible, measurements are taken in front of the antenna in the transmitting direction. However, because of the antenna configuration at this site, specific emissions could not be discerned from nearby facilities, and no attempt was made to determine power density levels from a specific transmitting antenna.

Highest Measured Occupational Level: 11.00%

This value is equal to:

Highest General Public Level: 55.00%.

Measurements Points	Spatial Average	Maximum	Measurements Points	Spatial Average	Maximum
M1	2 %	3 %	M16	1 %	2 %
M2	1 %	2 %	M17	<1 %	2 %
M3	1 %	1 %	M18	<1 %	1 %
M4	1 %	1 %	M19	<1 %	1 %
M5	1 %	1 %	M20	<1 %	<1 %
M6	1 %	2 %	M21	<1 %	<1 %
M7	3 %	7 %	M22	<1 %	<1 %
M8	1 %	2 %	M23	1 %	1 %
M9	3 %	6 %	M24	<1 %	<1 %
M10	11 %	15 %	M25	<1 %	<1 %
M11	9 %	12 %	M26	<1 %	1 %
M12	5 %	6 %	M27	<1 %	<1 %
M13	<1 %	1 %	M28	<1 %	<1 %
M14	<1 %	<1 %	M29	<1 %	<1 %
M15	<1 %	<1 %	M30	<1 %	<1 %

RF meters and probes have been calibrated and used according to the manufacturer's specifications. Measurements provide a view of the MPE percentage levels at the site at the time of Sitesafe's site visit and are used to validate modeling results. Theoretical modeling is used for determining compliance and the percentage of MPE contributions.

An RF Emission diagram has been included in section 7.3 of this document. All measurement locations are identified in this diagram. The locations of measurements in the RF Emission diagram can be cross referenced with Table 1 (above) to determine the actual spatial average and maximum measurement value per location.

7.5 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was verified on site, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 5 - Mt. Barnabe. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory and representative photographs were obtained or verified during the site visit and were utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	E1	Generic	Omni	14	850	144	9.97	360	1000	ERP	Watt	1	1000	38	0	0
2	E2	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	34.5	0	0
3	E3	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	48.5	0	0
4	E4	Generic	Omni	8	150	204	2.61	360	100	ERP	Watt	1	100	48.5	0	0
5	E5	Generic	Omni	1.5	850	204	0.01	360	1000	ERP	Watt	1	1000	58.5	0	0
6	E6	Generic	Omni	1.5	850	204	0.01	360	1000	ERP	Watt	1	1000	58.5	0	0
7	E7	Generic	Omni	8	150	124	2.61	360	100	ERP	Watt	1	100	61	0	0
8	E8	Generic	Omni	4.7	450	84	2.97	360	100	ERP	Watt	1	100	59.5	0	0
9	E9 (Rx)	Generic	Omni	9.5	450	144	5.97	360	0	ERP	Watt	1	0	75	0	0
10	E10	Generic	Omni	9.5	450	264	5.97	360	100	ERP	Watt	1	100	77.5	0	0
11	E11	Generic	Aperture	4	11435	90	37.66	2	64.7	EIRP	dBmW	1	1799.4	13	0	0
12	E12	Generic	Aperture	4	11415	250	37.66	2	64.7	EIRP	dBmW	1	1799.4	18	0	0
13	E13	Generic	Aperture	4	11693	30	37.66	2	64.7	EIRP	dBmW	1	1799.4	21	0	0
14	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	20	0	0
15	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	36	0	0
16	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	41	0	0
17	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	300	9.97	60	100	ERP	Watt	1	100	36	0	0
18	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	37	0	0
19	UNKNOWN OPERATOR	Generic	Omni	12.5	150	0	2.87	360	0	TPO	Watt	1	0	44	0	0
20	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	39	0	0
21	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	18	0	0
22	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	37	0	0
23	UNKNOWN OPERATOR	Generic	Omni	9	92	90	0	360	10	TPO	Watt	1	10	35	0	0
24	UNKNOWN OPERATOR	Generic	Omni	9.5	450	0	5.97	360	100	ERP	Watt	1	100	41	0	0
25	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	43	0	0
26	UNKNOWN OPERATOR	Generic	Panel	3	450	210	15.51	32	100	ERP	Watt	1	100	35	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
27	UNKNOWN OPERATOR	Generic	Yagi	1.2	450	260	9.97	60	100	ERP	Watt	1	100	36	0	0
28	UNKNOWN OPERATOR	Generic	Panel	3	450	270	15.51	32	100	ERP	Watt	1	100	38	0	0
29	UNKNOWN OPERATOR	Generic	Yagi	3	150	300	9.11	76	100	ERP	Watt	1	100	36	0	0
30	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	38	0	0
31	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	37	0	0
32	UNKNOWN OPERATOR	Generic	Aperture	0	6635	105.9	39.06	0	66.3	EIRP	dBmW	1	2600.6	16	0	0
33	P1 (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	74.8	0	0
34	P2 (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	74.8	0	0
35	P3	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	43.5	0	0
36	P4	Generic	Aperture	4	11000	133.8	37.66	2	64.7	EIRP	dBmW	1	1799.4	8	0	0
37	P5	Generic	Aperture	4	11000	294	37.66	2	64.7	EIRP	dBmW	1	1799.4	14	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

7.6 Site Pictures



Figure 36: Overview Facing South



Figure 37: Overview Facing Southwest



Figure 38: Overview Facing Northwest



Figure 39: Ground Level Overview



Figure 40: Tower Overview Facing South



Figure 41: Lower Tower Overview Facing Southeast



Figure 42: Upper Tower Overview Facing Southeast

8 Point Reyes



Marin Emergency Radio Authority

Site Name – Point Reyes

Site ID: 8

Site Compliance Report

**3 Mt. Vision Rd.
Inverness, CA 94937**

Site visit date: August 23, 2018
Site visit time: 3:48 PM
Site survey by: Jeff Desira

Latitude: N38-4-47.24
Longitude: W122-52-00.70
Structure Type: Self-Support

Report generated date: March 28, 2019
Report by: Sam Cosgrove
Customer Contact: David Mortimer

The site is compliant and will remain complaint upon implementation of the proposed changes.

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8.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at the communications site, 8 - Point Reyes, located at 3 Mt. Vision Rd., Inverness, CA, in relation to Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

Sitesafe's field personnel visited 8 - Point Reyes on August 23, 2018. This section contains a detailed summary of the RF environment at the site including:

- Site compliance determination;
- Photographs of the site;
- Diagram of the site;
- Inventory of the make / model of all transmitting antennas found on the site (where possible);
- Record of any Maximum Permissible Exposure ("MPE") measurements taken on the site, as applicable; and
- Theoretical MPE based on modeling.

The RF emissions on site do not exceed MPE limits. The levels measured on site and the theoretical predictions come close to the MPE limit, but do not exceed. The RF emissions shown are mainly due to the FM transmitter on site (antenna #2).



8.2 Site Compliance

8.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, and a thorough review of site access procedures, RF hazard signage and visible antenna locations, Sitesafe has determined that:

The site is compliant with the FCC rules and regulations, as described in OET Bulletin 65, and will remain compliant upon implementation of the proposed changes.

The compliance determination is based on General Public MPE levels due to theoretical modeling and/or physical measurements, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant. Measurements have also been performed to validate the assumptions used in our theoretical modeling of this site.

Modeling is used for determining compliance and the percentage of MPE contribution. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results.

8.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on existing measurements and theoretical analysis of MPE levels. Sitesafe has documented the locations of any RF signs and barriers that are required for compliance. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

This site will be compliant with the FCC rules and regulations.

8.3 Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the ground to be:

Maximum Cumulative Theoretical General Public MPE level (Existing Antennas): 21.3%
Maximum Cumulative Theoretical General Public MPE level (All Antennas): 21.5%
Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 16.2%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

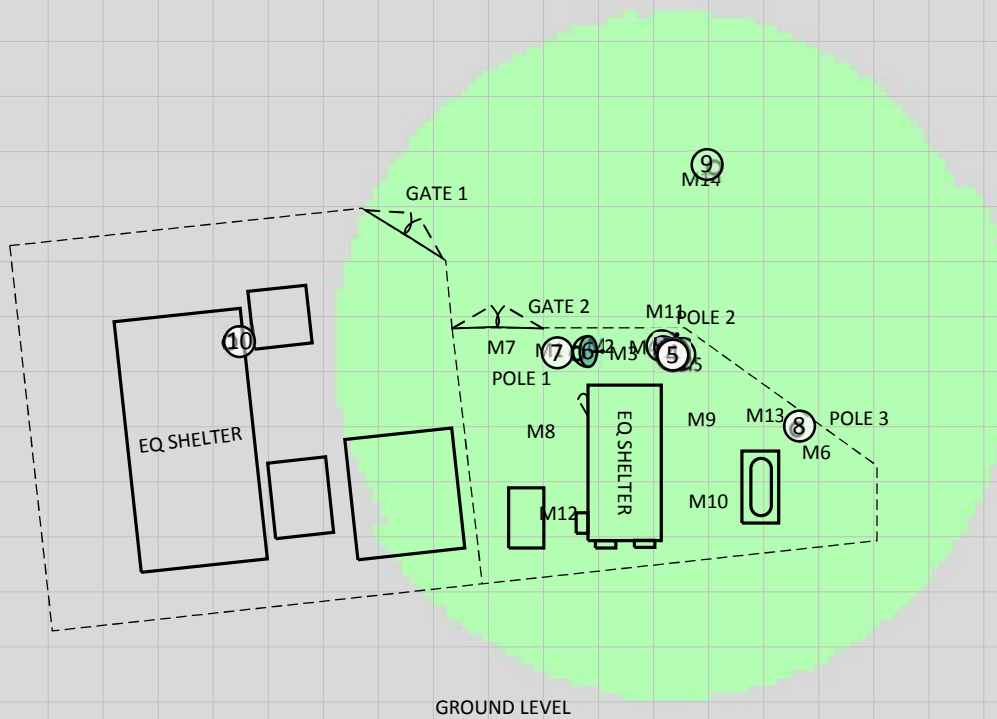


Abbreviations used in the RF Emissions Diagrams

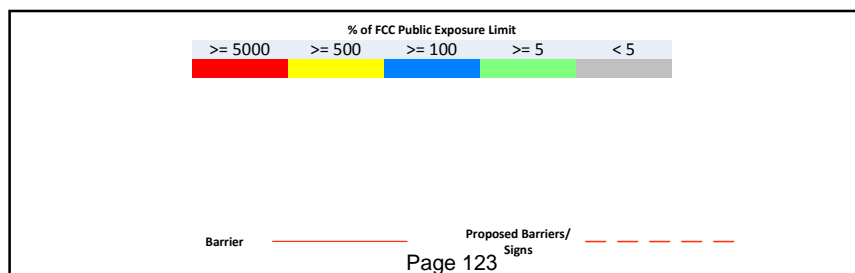
PH=##'	Penthouse at ## feet above main roof
M##	Measurement ## taken during a site visit

As discussed in Section 8.4, site measurement locations for spatial average measurements collected at the time of Sitesafe's visit have been added to the RF emissions diagram. While the theoretical modeling represents worst case MPE levels based on the assumption(s) detailed above, the measurement data is a snapshot of MPE levels at the time of our visit, and dependent on transmitter duty cycle, system implementation and emissions from other RF sources at nearby antenna sites.

RF Exposure Simulation For: Point Reyes Existing Configuration



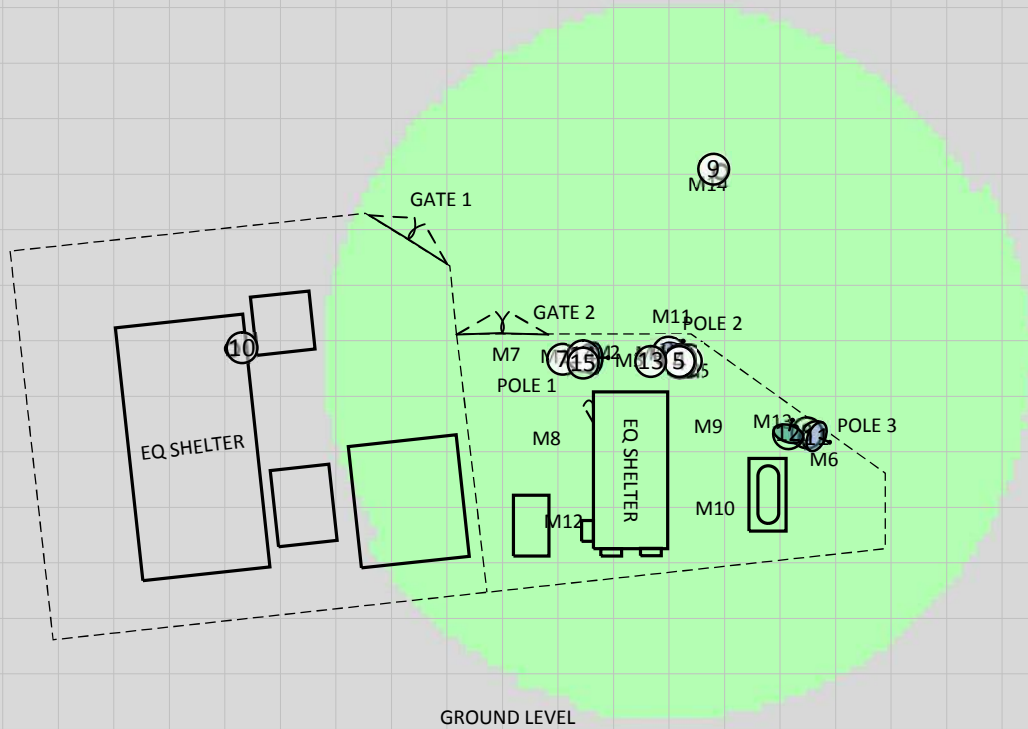
% of FCC Public Exposure Limit
Spatial average 0' - 6'



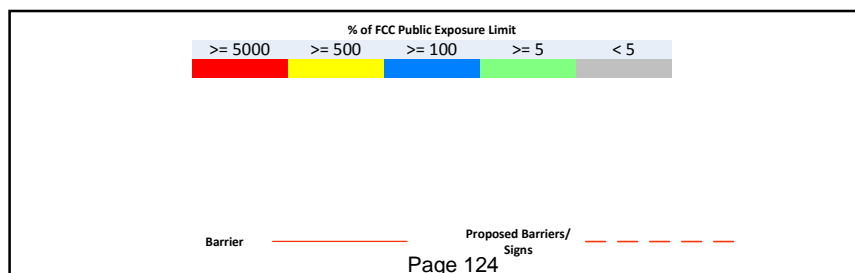
(Feet)
0 13.1 26.2
www.sitesafe.com
Site Name: Point Reyes
11/5/2018 10:19:46 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Point Reyes All Antennas On Air



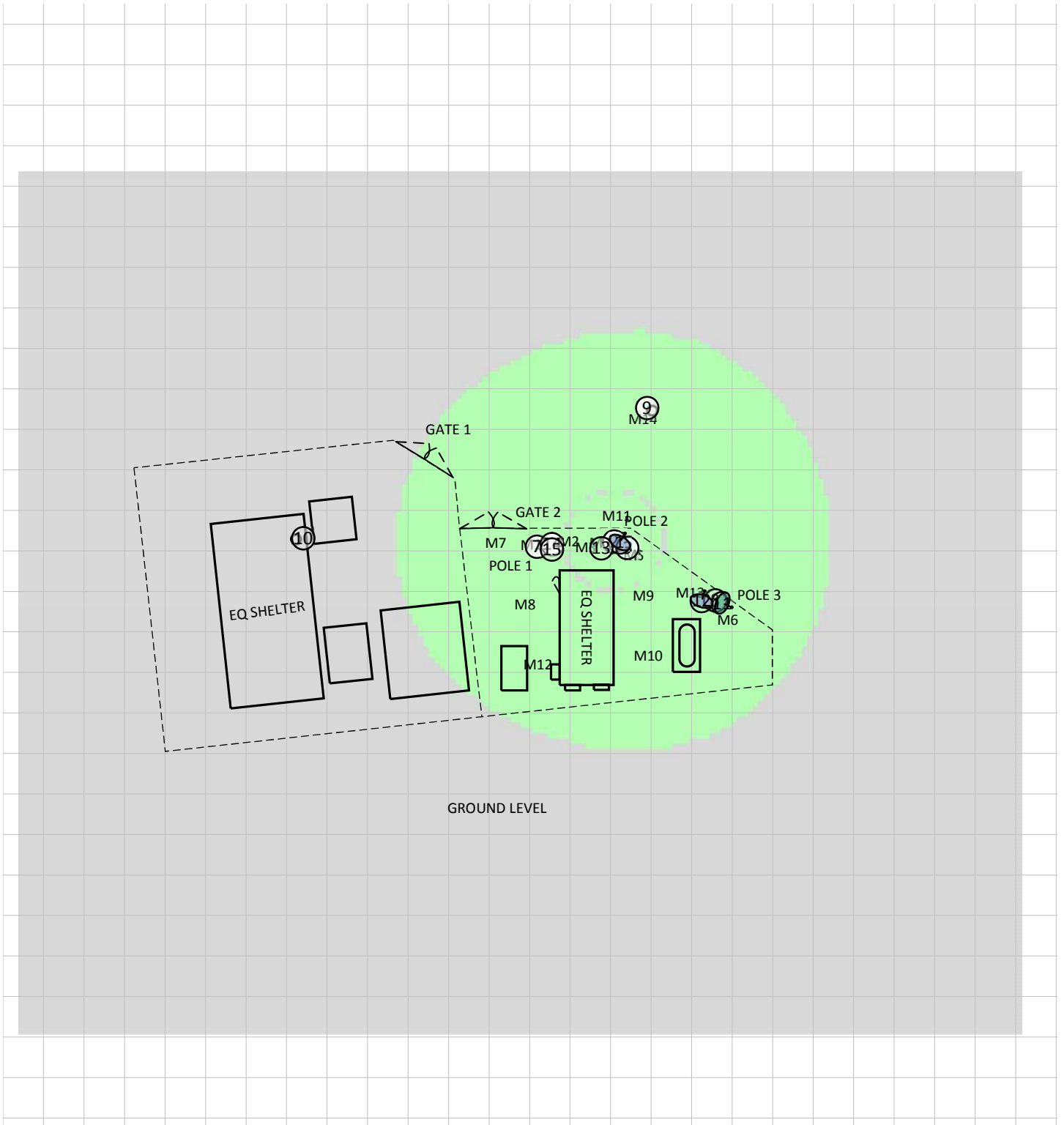
% of FCC Public Exposure Limit
Spatial average 0' - 6'



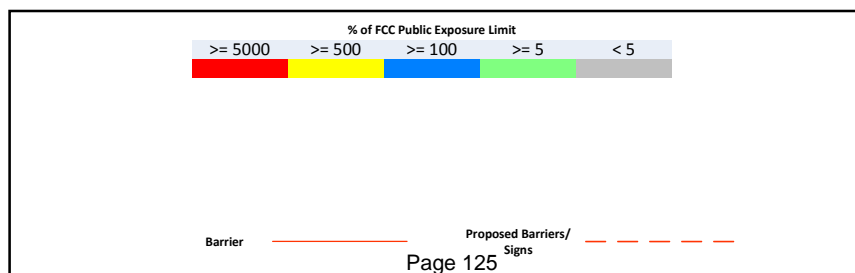
(Feet)
0 13 25.9
www.sitesafe.com
Site Name: Point Reyes
11/5/2018 10:16:46 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Point Reyes Final Configuration



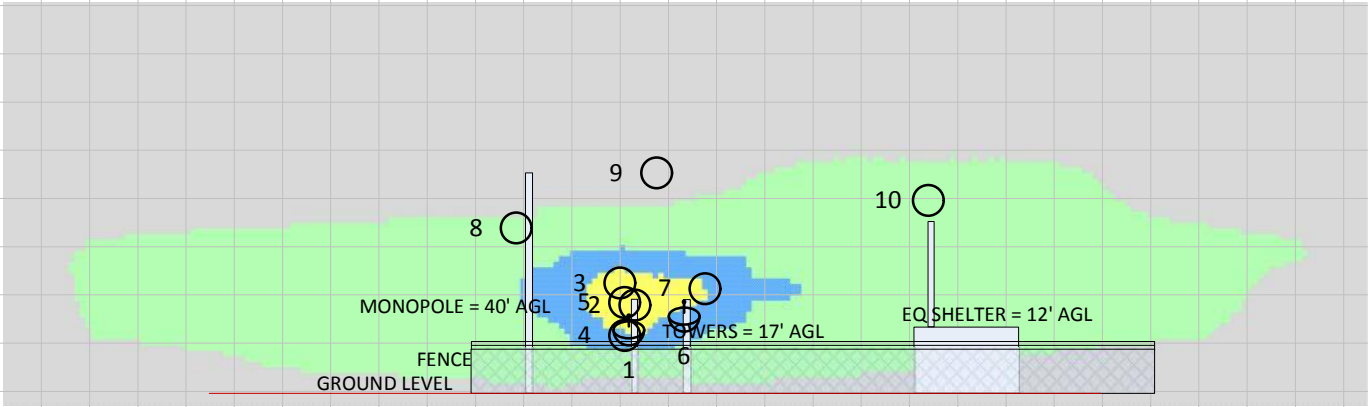
% of FCC Public Exposure Limit
Spatial average 0' - 6'



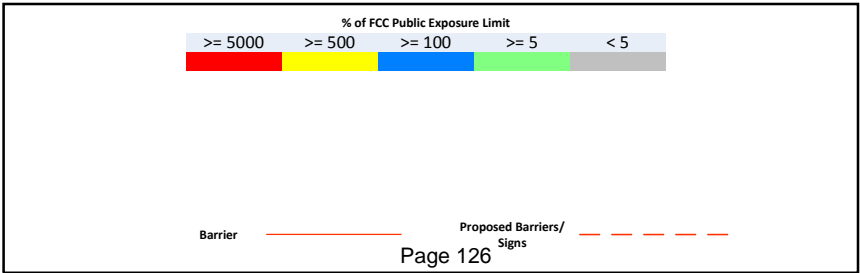
(Feet)
0 13 26
www.sitesafe.com
Site Name: Point Reyes
11/5/2018 10:18:31 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

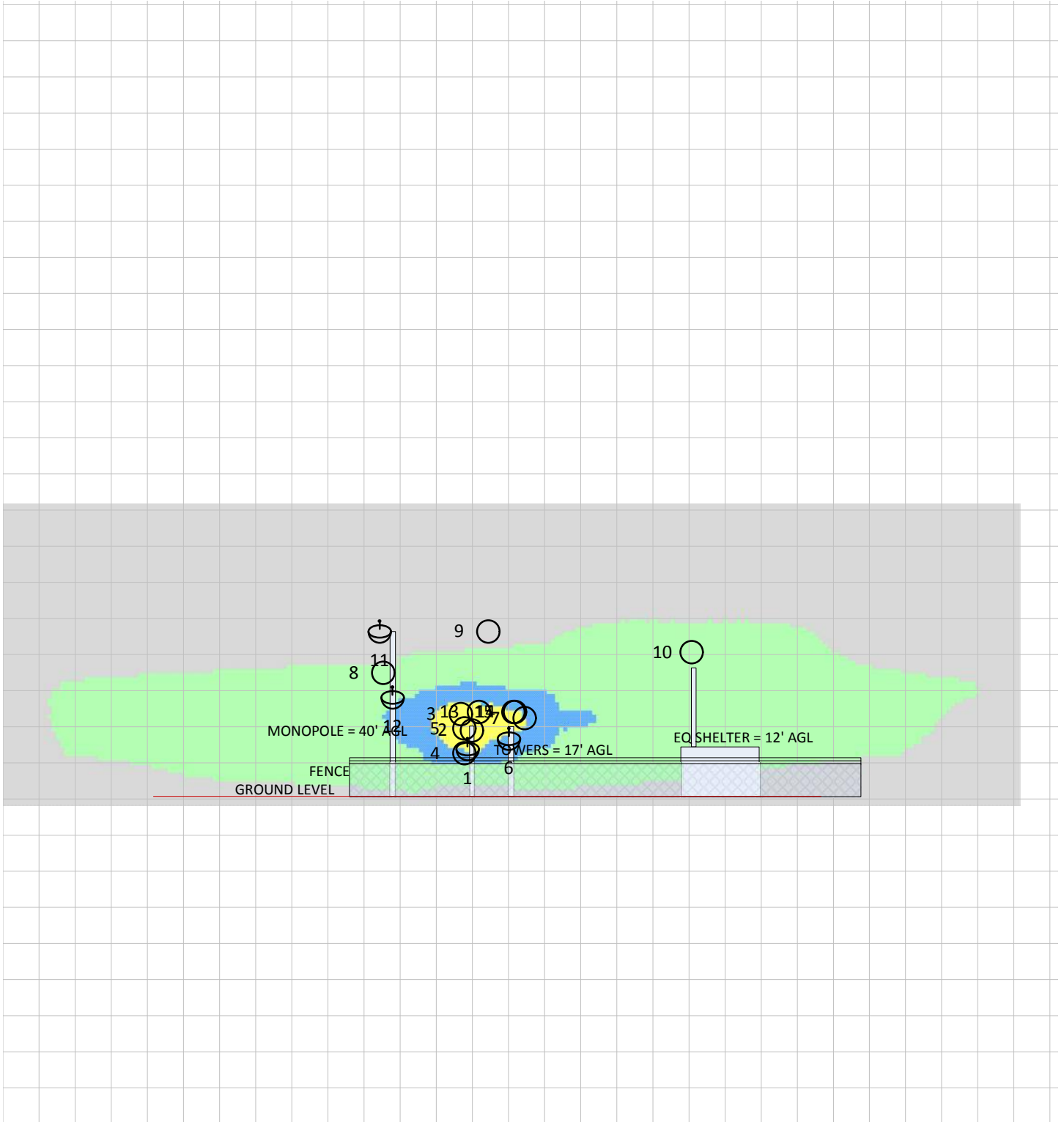
RF Exposure Simulation For: Point Reyes Elevation View – Existing Configuration



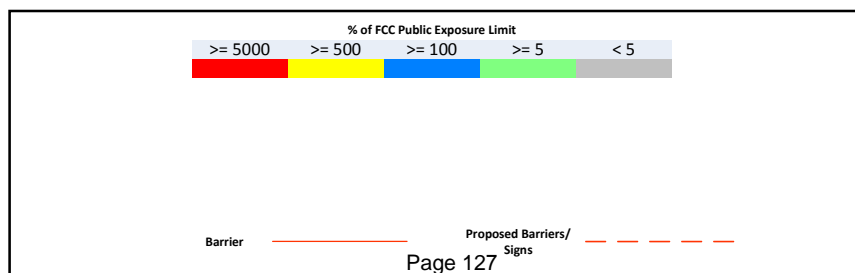
% of FCC Public Exposure Limit



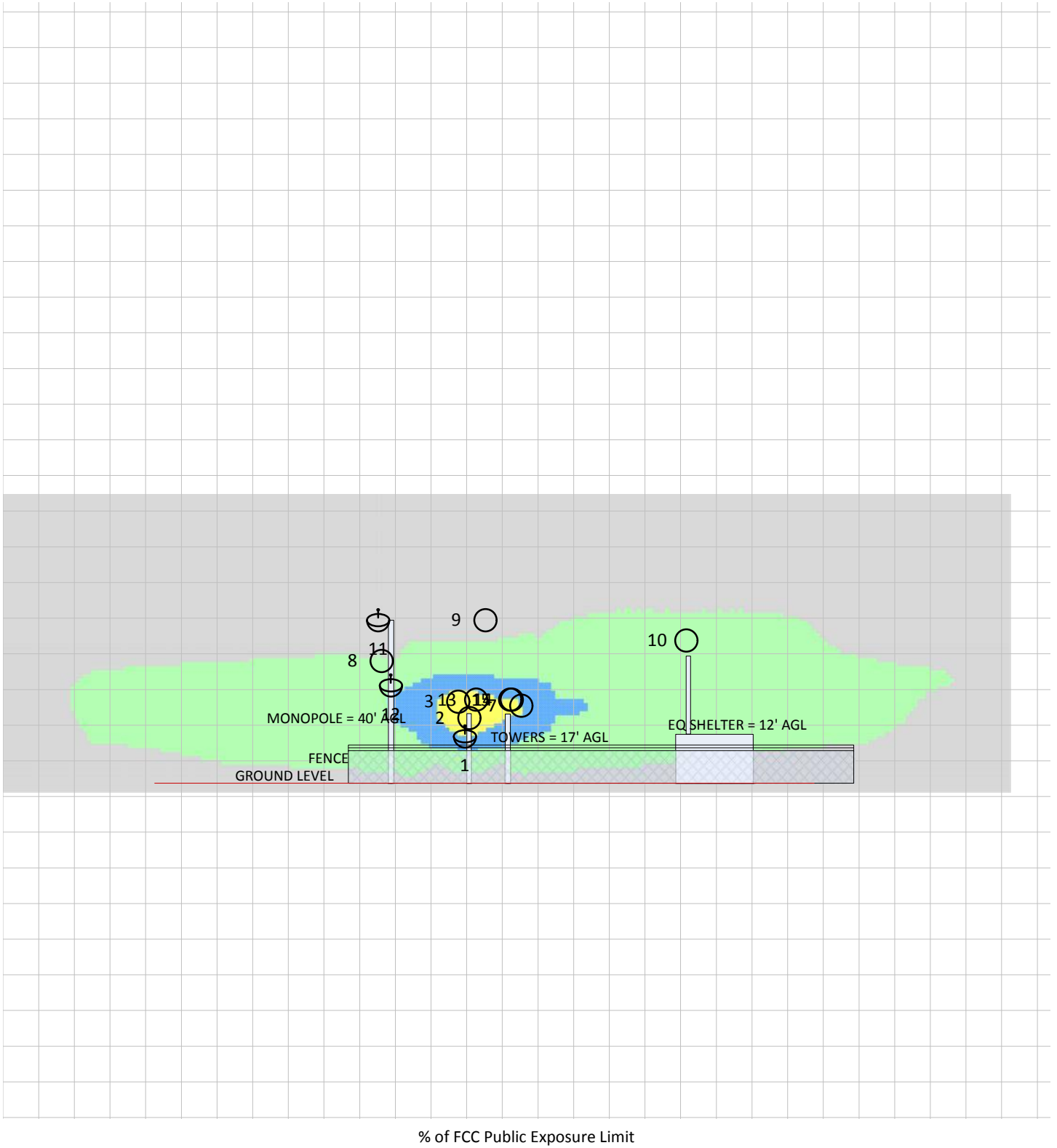
RF Exposure Simulation For: Point Reyes Elevation View – All Antennas On Air



% of FCC Public Exposure Limit



RF Exposure Simulation For: Point Reyes Elevation View – Final Configuration



8.4 Site Measurements

This section provides a summary of the measurements collected at the site. Actual measurements locations at which these data points were collected are included in the RF emission diagram provided in Section 8.3 of this report. Two types of measurements were collected at each measurement location: maximum (peak) and spatial average. The spatial average measurement consists of a collection of ten (10) measurements within a ten (10) second time interval taken from zero (0) to six (6) feet in height. The purpose of this measurement technique is to identify the average power density over the dimensions of a typical human body.

Table 1 below contains all the measurements collected from accessible areas located at the site at the time of Sitesafe's visit. Whenever possible, measurements are taken in front of the antenna in the transmitting direction. However, because of the antenna configuration at this site, specific emissions could not be discerned from nearby facilities, and no attempt was made to determine power density levels from a specific transmitting antenna.

Highest Measured Occupational Level: 7.00%

This value is equal to:

Highest General Public Level: 35.00%.

Measurements Points	Spatial Average	Maximum	Measurements Points	Spatial Average	Maximum
M1	1 %	2 %	M14	7 %	8 %
M2	6 %	17 %	M15	<1 %	<1 %
M3	4 %	9 %	M16	<1 %	<1 %
M4	6 %	12 %	M17	<1 %	<1 %
M5	4 %	7 %	M18	<1 %	<1 %
M6	2 %	2 %	M19	<1 %	<1 %
M7	1 %	2 %	M20	<1 %	<1 %
M8	<1 %	1 %	M21	<1 %	<1 %
M9	2 %	4 %	M22	<1 %	<1 %
M10	1 %	1 %	M23	<1 %	<1 %
M11	3 %	7 %	M24	<1 %	<1 %
M12	<1 %	<1 %	M25	<1 %	<1 %
M13	2 %	2 %	M26	<1 %	<1 %

RF meters and probes have been calibrated and used according to the manufacturer's specifications. Measurements provide a view of the MPE percentage levels at the site at the time of Sitesafe's site visit and are used to validate modeling results. Theoretical modeling is used for determining compliance and the percentage of MPE contributions.

An RF Emission diagram has been included in section 8.3 of this document. All measurement locations are identified in this diagram. The locations of measurements in the RF Emission diagram can be cross referenced with Table 1 (above) to determine the actual spatial average and maximum measurement value per location.

8.5 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was verified on site, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 8 - Point Reyes. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory and representative photographs were obtained or verified during the site visit and were utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	E1	Generic	Aperture	0	2400	30	22.96	0	4	ERP	Watt	1	4	11.5	0	0
2	E2	Generic	Omni	9	90	30	0	360	235	TPO	Watt	1	235	16	0	0
3	E3	Generic	Omni	8	150	30	2.61	360	100	TPO	Watt	1	182.4	20	0	0
4	E4 (Rx)	Generic	Omni	1.5	850	150	0.01	360	0	ERP	Watt	1	0	10.5	0	0
5	E5	Generic	Omni	1.5	850	150	0.01	360	230	ERP	Watt	1	230	16.5	0	0
6	E6	Generic	Aperture	4	11000	90	37.66	2	64.9	EIRP	dBmW	1	1884.1	14	0	0
7	E7	Antel BCD-7506-EDIN-X-25	Omni	6.6	770	270	5.4	360	230	TPO	Watt	1	797.5	19	0	0
8	UNKNOWN OPERATOR	Generic	Yagi	0.5	2400	270	13.37	27.5	4	ERP	Watt	1	4	30	0	0
9	UNKNOWN OPERATOR	Generic	Yagi	0.5	850	300	9.97	60	1	TPO	Watt	1	9.9	40	0	0
10	UNKNOWN OPERATOR	Generic	Omni	12.5	150	0	2.87	360	100	ERP	Watt	1	100	35	0	0
11	P1	Generic	Aperture	4	11000	114	37.66	2	64.9	EIRP	dBmW	1	1884.1	31	0	0
12	P2	Generic	Aperture	4	11000	17	37.66	2	64.9	EIRP	dBmW	1	1884.1	24	0	0
13	P3	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	20.5	0	0
14	P5 (Rx)	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	0	ERP	Watt	1	0	20.5	0	0
15	P6 (Rx)	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	0	ERP	Watt	1	0	20.5	0	0

8.6 Site Pictures



Figure 43: Pole 1 Overview



Figure 44: Pole 2 Overview



Figure 45: Pole 3 Overview



Figure 46: Antenna 9



Figure 47: Antenna 10



Figure 48: Overview Facing West

9 Dollar Hill



Marin Emergency Radio Authority

Site Name – Dollar Hill

Site ID: 10

Site Compliance Report

**Robert Dollar Dr.
San Rafael, CA 94945**

Site visit date: August 21, 2018

Site visit time: 1:39 PM

Site survey by: Jeff Desira

Latitude: N37-58-48.94

Longitude: W122-31-45.67

Structure Type: Self-Support

Report generated date: March 28, 2019

Report by: Sam Cosgrove

Customer Contact: David Mortimer

The site is compliant and will remain compliant upon implementation of the proposed changes.

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9.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at the communications site, 10 - Dollar Hill, located at Robert Dollar Dr., San Rafael, CA, in relation to Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

Sitesafe's field personnel visited 10 - Dollar Hill on August 21, 2018. This section contains a detailed summary of the RF environment at the site including:

- Site compliance determination;
- Photographs of the site;
- Diagram of the site;
- Inventory of the make / model of all transmitting antennas found on the site (where possible);
- Record of any Maximum Permissible Exposure ("MPE") measurements taken on the site, as applicable; and
- Theoretical MPE based on modeling.

RF emissions do not exceed MPE limits on this site. The levels measured and predicted on site do not pose a danger to personnel working in the area. The emissions predicted on the ground level are due to the antennas with the lowest height from ground level.



9.2 Site Compliance

9.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, and a thorough review of site access procedures, RF hazard signage and visible antenna locations, Sitesafe has determined that:

The site is compliant with the FCC rules and regulations, as described in OET Bulletin 65, and will remain compliant upon implementation of the proposed changes.

The compliance determination is based on General Public MPE levels due to theoretical modeling and/or physical measurements, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant. Measurements have also been performed to validate the assumptions used in our theoretical modeling of this site.

Modeling is used for determining compliance and the percentage of MPE contribution. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results.

9.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on existing measurements and theoretical analysis of MPE levels. Sitesafe has documented the locations of any RF signs and barriers that are required for compliance. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

This site is compliant with the FCC rules and regulations.

9.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the ground to be:

Maximum Cumulative Theoretical General Public MPE level (Existing Antennas) : 71.7%

Maximum Cumulative Theoretical General Public MPE level (All Antennas): 73.7%

Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 73.7%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

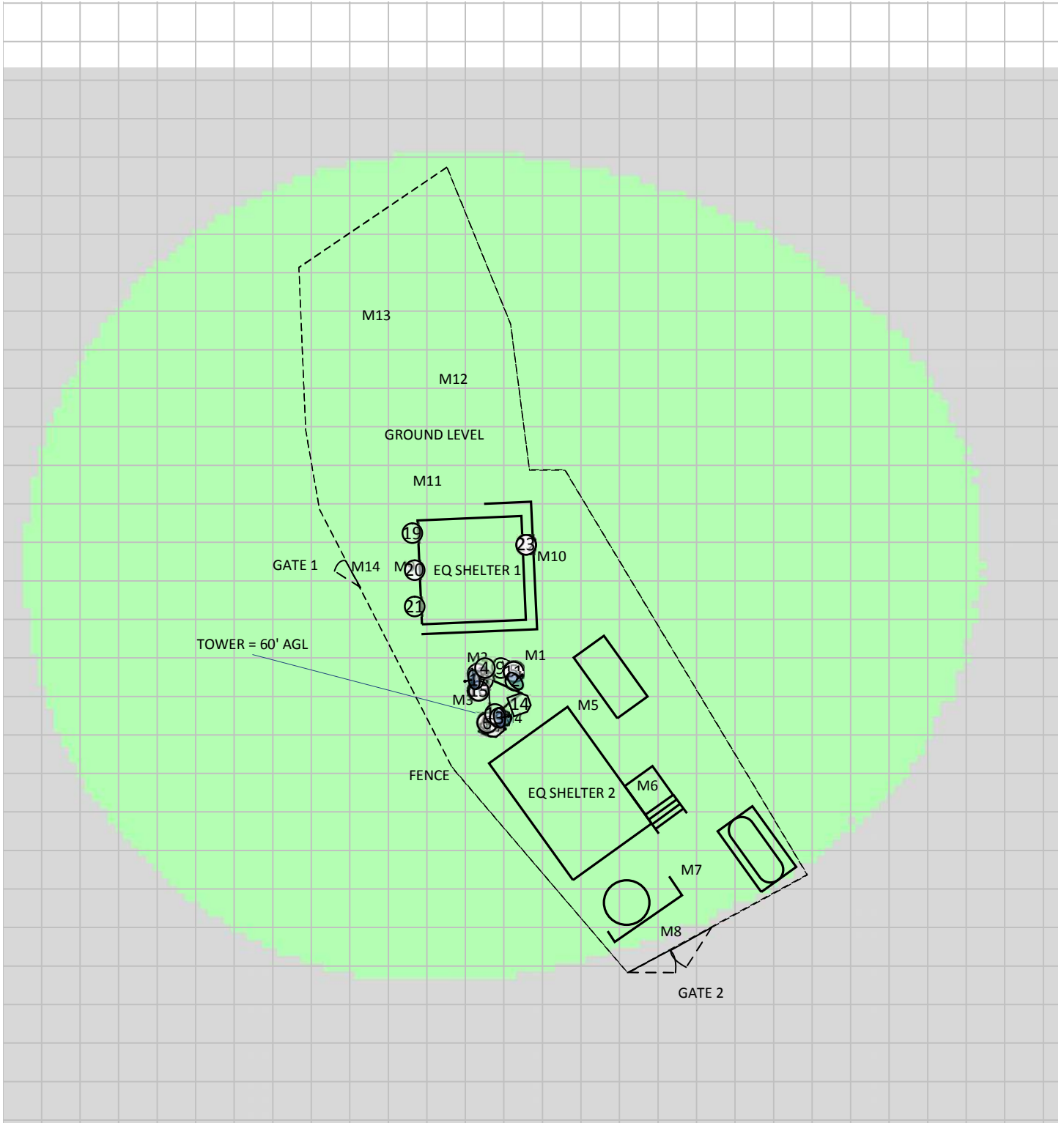


Abbreviations used in the RF Emissions Diagrams

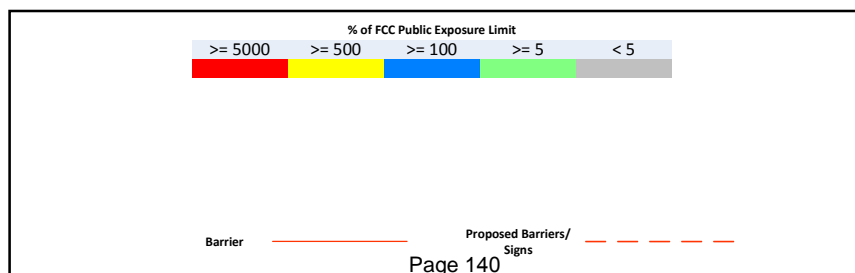
PH=##'	Penthouse at ## feet above main roof
M##	Measurement ## taken during a site visit

As discussed in Section 9.4, site measurement locations for spatial average measurements collected at the time of Sitesafe's visit have been added to the RF emissions diagram. While the theoretical modeling represents worst case MPE levels based on the assumption(s) detailed above, the measurement data is a snapshot of MPE levels at the time of our visit, and dependent on transmitter duty cycle, system implementation and emissions from other RF sources at nearby antenna sites.

RF Exposure Simulation For: Dollar Hill Existing Antennas On Air



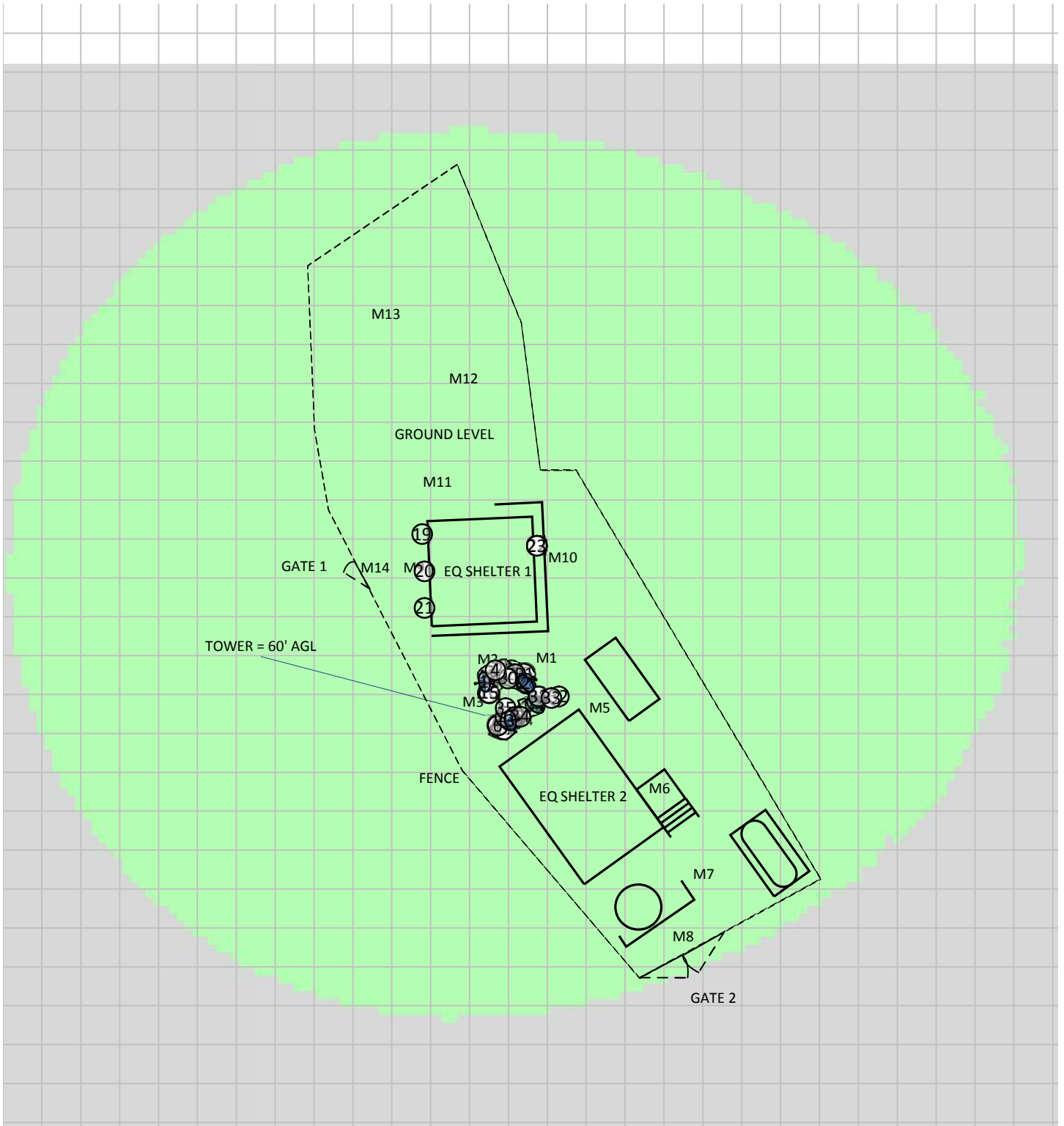
% of FCC Public Exposure Limit
Spatial average 0' - 6'



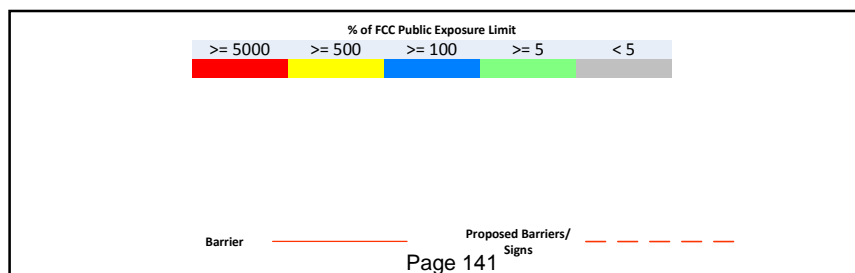
(Feet)
0 9.7 19.4
www.sitesafe.com
Site Name: Dollar Hill
3/27/2019 2:16:30 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Dollar Hill All Antennas On Air



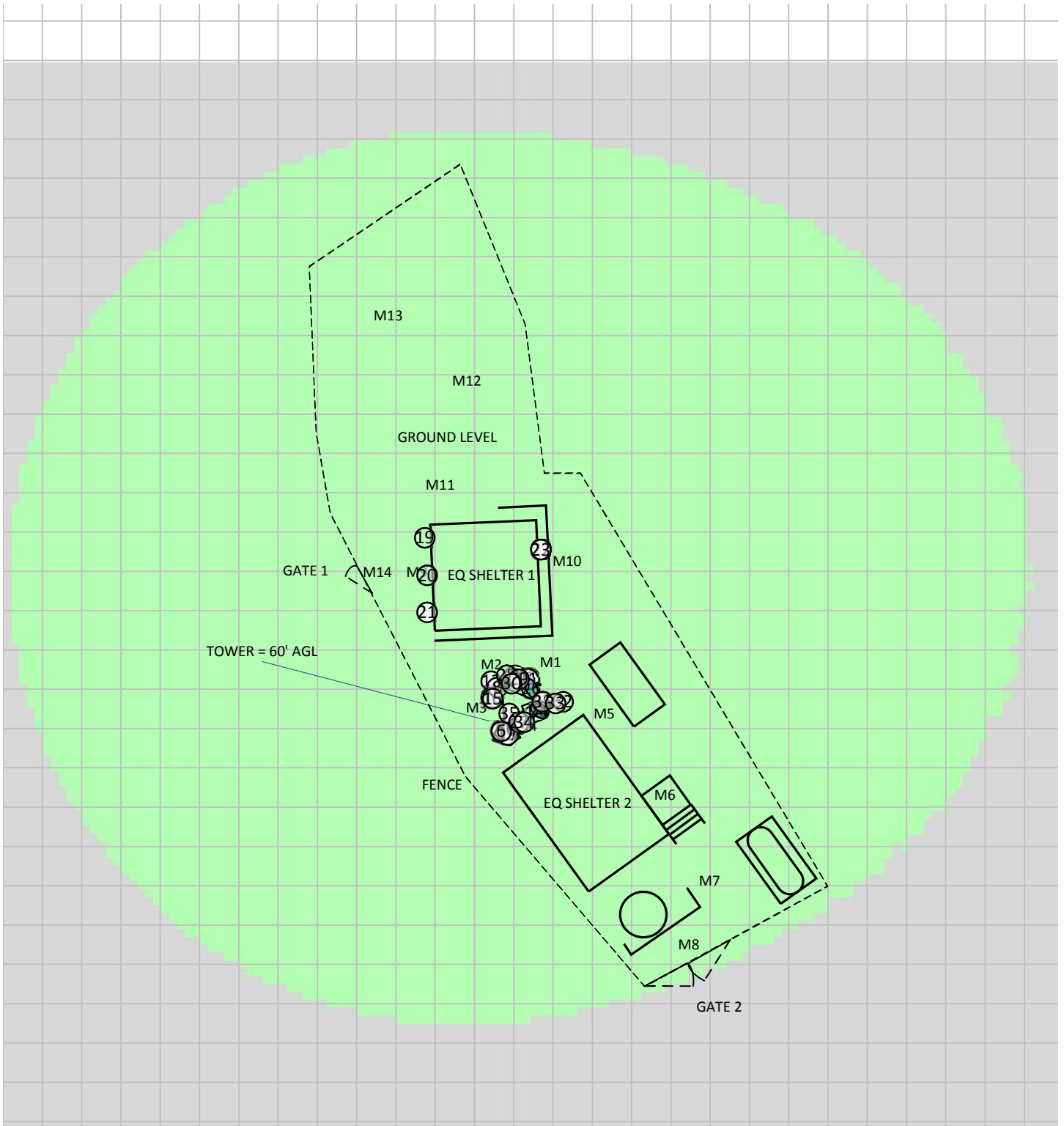
% of FCC Public Exposure Limit
Spatial average 0' - 6'



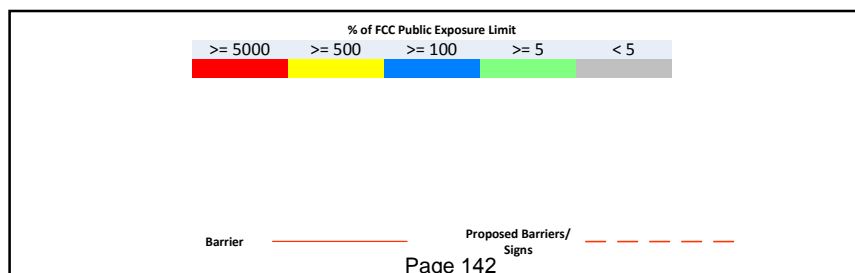
(Feet)
0 9.6 19.2
www.sitesafe.com
Site Name: Dollar Hill
3/27/2019 2:14:42 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Dollar Hill Final Configuration



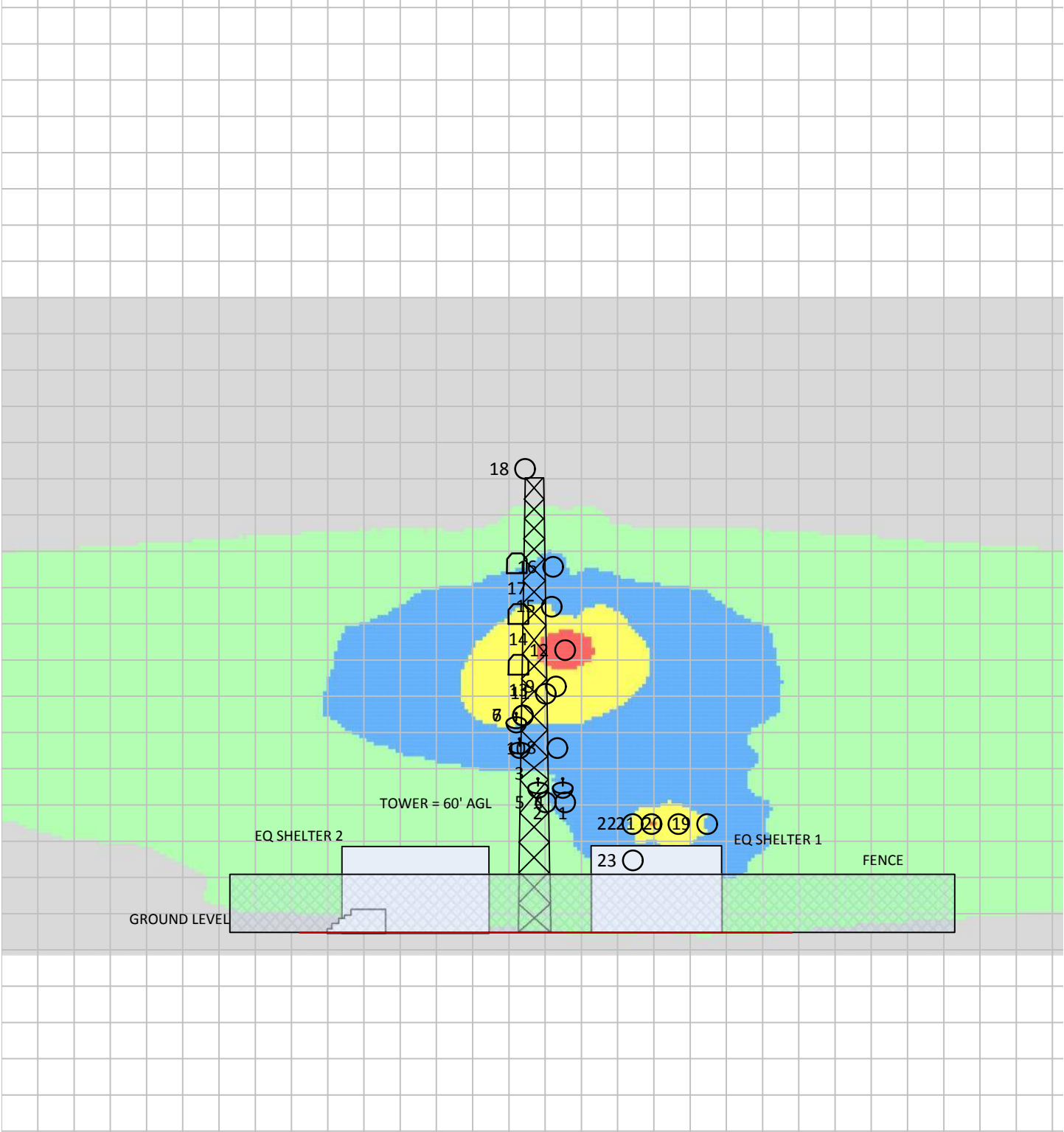
% of FCC Public Exposure Limit
Spatial average 0' - 6'



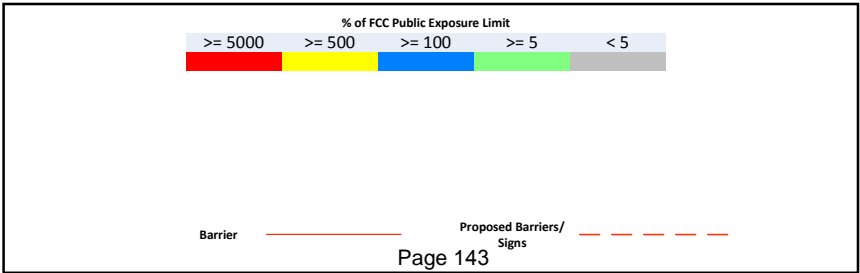
(Feet)
0 9.5 19
www.sitesafe.com
Site Name: Dollar Hill
3/27/2019 2:11:16 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

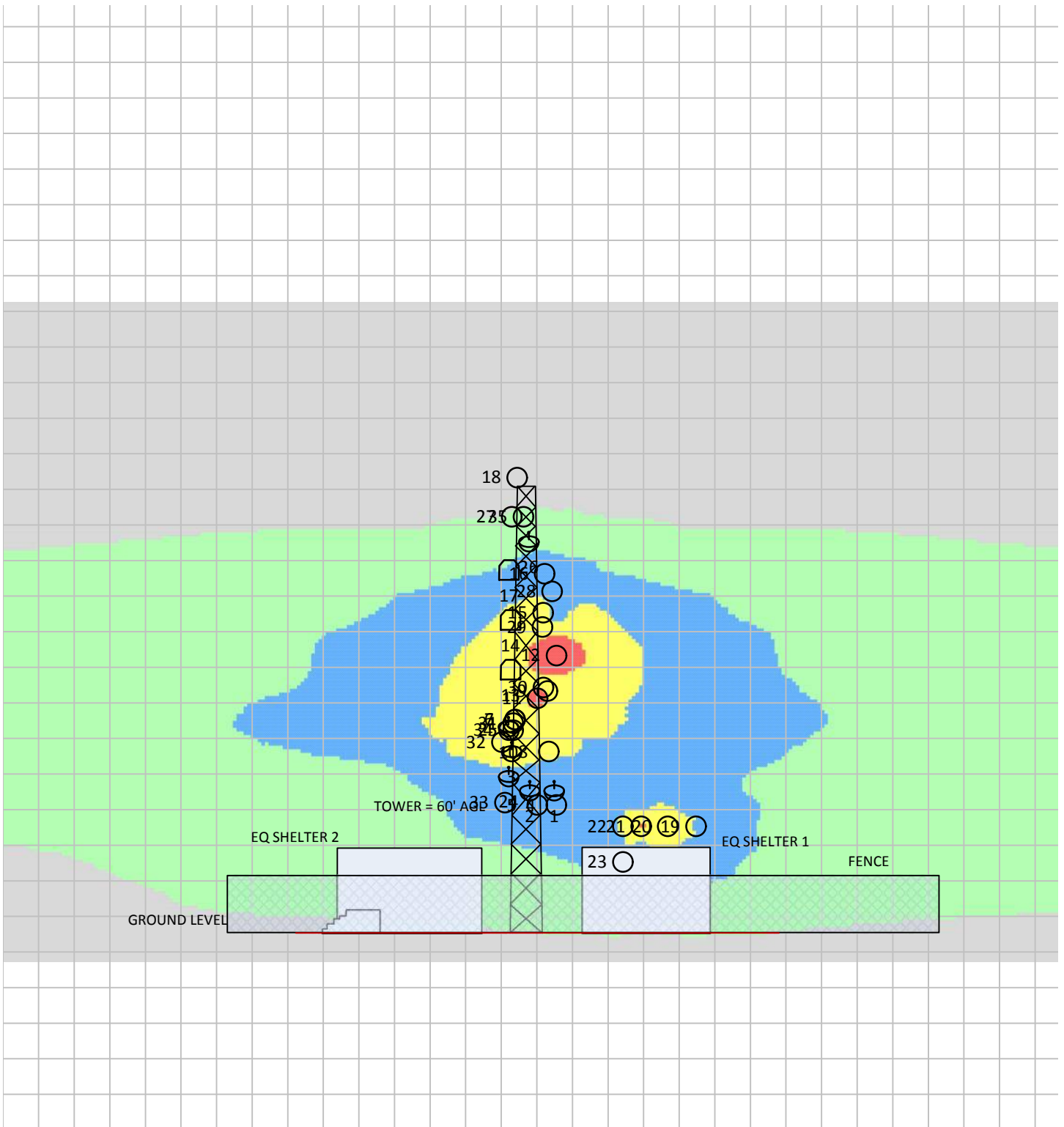
RF Exposure Simulation For: Dollar Hill
Elevation View – Existing Antennas On Air



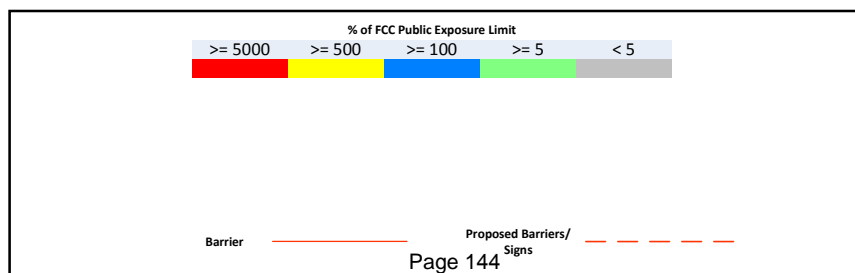
% of FCC Public Exposure Limit



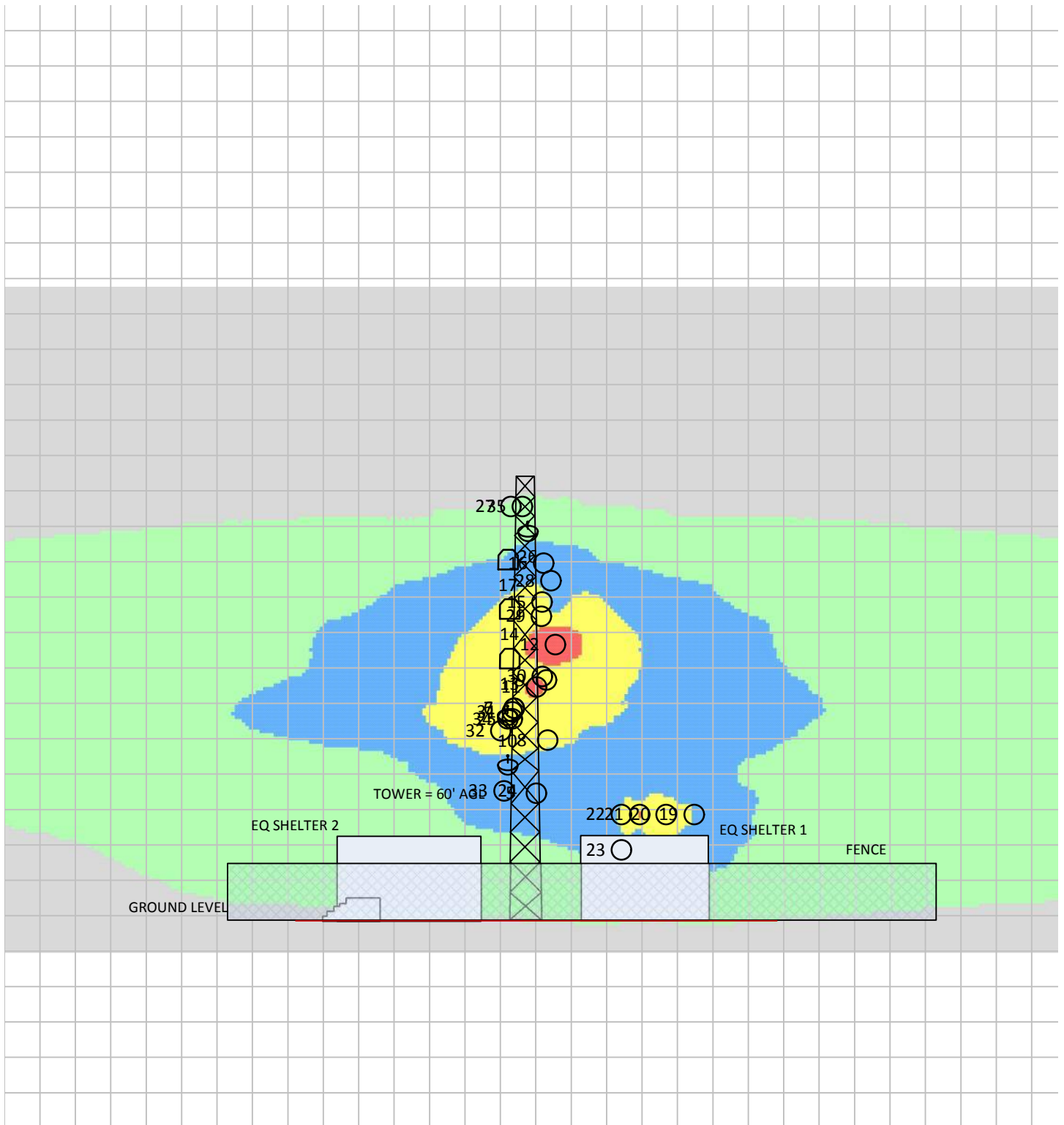
RF Exposure Simulation For: Dollar Hill Elevation View – All Antennas On Air



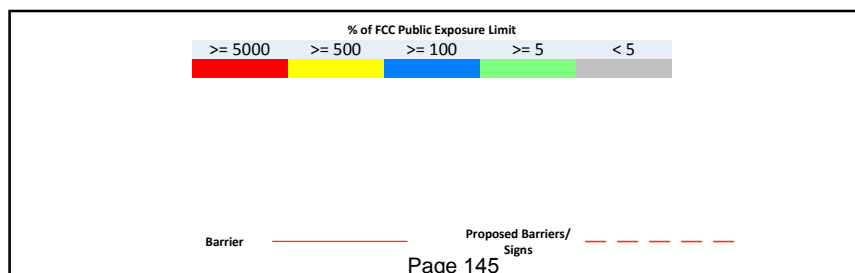
% of FCC Public Exposure Limit



RF Exposure Simulation For: Dollar Hill Elevation View – Final Configuration



% of FCC Public Exposure Limit



9.4 Site Measurements

This section provides a summary of the measurements collected at the site. Actual measurements locations at which these data points were collected are included in the RF emission diagram provided in Section 9.3 of this report. Two types of measurements were collected at each measurement location: maximum (peak) and spatial average. The spatial average measurement consists of a collection of ten (10) measurements within a ten (10) second time interval taken from zero (0) to six (6) feet in height. The purpose of this measurement technique is to identify the average power density over the dimensions of a typical human body.

Table 1 below contains all the measurements collected from accessible areas located at the site at the time of Sitesafe's visit. Whenever possible, measurements are taken in front of the antenna in the transmitting direction. However, because of the antenna configuration at this site, specific emissions could not be discerned from nearby facilities, and no attempt was made to determine power density levels from a specific transmitting antenna.

Highest Measured Occupational Level: 2.00%

This value is equal to:

Highest General Public Level: 10.00%.

Table 1: Spatial Average and Maximum Occupational Measurements					
Measurements Points	Spatial Average	Maximum	Measurements Points	Spatial Average	Maximum
M1	<1 %	<1 %	M10	1 %	2 %
M2	1 %	1 %	M11	<1 %	<1 %
M3	1 %	1 %	M12	<1 %	<1 %
M4	<1 %	1 %	M13	<1 %	<1 %
M5	2 %	3 %	M14	2 %	2 %
M6	<1 %	<1 %	M15	<1 %	<1 %
M7	1 %	2 %	M16	<1 %	<1 %
M8	<1 %	<1 %	M17	<1 %	<1 %
M9	1 %	2 %			

RF meters and probes have been calibrated and used according to the manufacturer's specifications. Measurements provide a view of the MPE percentage levels at the site at the time of Sitesafe's site visit and are used to validate modeling results. Theoretical modeling is used for determining compliance and the percentage of MPE contributions.

An RF Emission diagram has been included in section 9.3 of this document. All measurement locations are identified in this diagram. The locations of measurements in the RF Emission diagram can be cross referenced with Table 1 (above) to determine the actual spatial average and maximum measurement value per location.

9.5 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was verified on site, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 10 - Dollar Hill. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory and representative photographs were obtained or verified during the site visit and were utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	E1	Generic	Aperture	4	11000	260	37.66	2	55.3	EIRP	dBmW	1	206.1	20	0	0
2	E2	Generic	Aperture	4	11000	50	37.66	2	50.3	EIRP	dBmW	1	65.2	20	0	0
3	E3	Generic	Aperture	1	22075	80	32.66	2	57.2	EIRP	dBmW	1	319.5	25.5	0	0
4	E4	Generic	Omni	20	482	200	10.81	360	200	ERP	Watt	1	200	18	0	0
5	E5	Generic	Omni	20	482	30	10.81	360	200	ERP	Watt	1	200	18	0	0
6	E6	Generic	Omni	9.5	483	110	5.97	360	200	ERP	Watt	1	200	30	0	0
7	E7	Generic	Yagi	0.5	850	110	9.97	60	200	ERP	Watt	1	200	30	0	0
8	E8	Generic	Omni	20	488	280	10.81	360	200	ERP	Watt	1	200	25.5	0	0
9	E9	Generic	Omni	4.7	489	280	2.97	360	200	ERP	Watt	1	200	34	0	0
10	E10	Generic	Aperture	1	22125	160	32.66	2	57.2	EIRP	dBmW	1	319.5	29	0	0
11	E11	Generic	Omni	3	484	320	0	360	1000	ERP	Watt	1	1000	33	0	0
12	E12	Generic	Omni	3	490	80	0	360	1000	ERP	Watt	1	1000	39	0	0
13	E13	Generic	Panel	2.2	5800	110	16.01	90	20	ERP	Watt	1	20	37	0	0
14	E14	Generic	Panel	1.7	2400	70	12.01	90	4	ERP	Watt	1	4	44	0	0
15	E15	Antel BCD-7506-EDIN-X-25	Omni	6.6	769	310	5.4	360	118	ERP	Watt	1	118	45	0	0
16	E16	Antel BCD-7506-EDIN-X-25	Omni	6.6	770	310	5.4	360	118	ERP	Watt	1	118	50.5	0	0
17	E17	Generic	Panel	2.2	5800	140	16.01	90	20	ERP	Watt	1	20	51	0	0
18	E18 (Rx)	Generic	Omni	9.5	489	80	5.97	360	0	ERP	Watt	1	0	64	0	0
19	UNKNOWN OPERATOR	Generic	Omni	1.5	850	0	0.01	360	200	ERP	Watt	1	200	15	0	0
20	UNKNOWN OPERATOR	Generic	Omni	1.5	850	0	0.01	360	200	ERP	Watt	1	200	15	0	0
21	UNKNOWN OPERATOR	Generic	Omni	1.5	850	0	0.01	360	200	ERP	Watt	1	200	15	0	0
22	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	100	ERP	Watt	1	100	15	0	0
23	UNKNOWN OPERATOR	Generic	Yagi	3	150	90	9.11	76	100	ERP	Watt	1	100	10	0	0
24	P1	Generic	Aperture	6	6000	221	36.36	2	0.01	TPO	Watt	1	43.3	22	0	0
25	P2	Sinclair SC476-HF1LDF	Omni	7	800	0	6.06	360	1000	ERP	Watt	1	1000	28.5	0	0
26	P3	Generic	Aperture	6	6000	67	36.36	2	0.01	TPO	Watt	1	43.3	55	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
27	P4 (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	58.5	0	0
28	P5	Andrew DB404	Omni	5	450	0	3.81	360	100	ERP	Watt	1	100	48	0	0
29	P6	Generic	Omni	10	450	0	0	360	100	ERP	Watt	1	100	43	0	0
30	P7	Andrew DB404	Omni	5	450	0	3.81	360	100	ERP	Watt	1	100	34.5	0	0
31	P8	Generic	Omni	10	450	0	0	360	100	ERP	Watt	1	100	29.5	0	0
32	P9	Andrew DB404	Omni	5	450	0	3.81	360	100	ERP	Watt	1	100	26.8	0	0
33	P10	Generic	Omni	10	450	0	0	360	100	ERP	Watt	1	100	18.3	0	0
34	P11	Sinclair SC476-HF1LDF	Omni	7	800	0	6.06	360	1000	ERP	Watt	1	1000	28.5	0	0
35	P12 (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	58.5	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

9.6 Site Pictures



Figure 49: Site Overview Facing South



Figure 50: Site Overview Facing Southeast



Figure 51: Tower Overview Facing West



Figure 52: Tower Overview Facing South



Figure 53: Tower Overview Facing Southeast



Figure 54: Equipment Shelter Overview

10 San Pedro



Marin Emergency Radio Authority

Site Name – San Pedro

Site ID: 11

Site Compliance Report

3000 Bayhills Dr.

San Rafael, CA 94903

Site visit date: August 21, 2018

Site visit time: 11:01 PM

Site survey by: Jeff Desira

Latitude: N37-59-24.74

Longitude: W122-30-00.50

Structure Type: Self-Support

Report generated date: March 28, 2019

Report by: Sam Cosgrove

Customer Contact: David Mortimer

The site is compliant and will remain complaint upon implementation of the proposed changes.

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10.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at the communications site, 11 - San Pedro, located at 3000 Bayhills Dr., San Rafael, CA, in relation to Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

Sitesafe's field personnel visited 11 - San Pedro on August 21, 2018. This section contains a detailed summary of the RF environment at the site including:

- Site compliance determination;
- Photographs of the site;
- Diagram of the site;
- Inventory of the make / model of all transmitting antennas found on the site (where possible);
- Record of any Maximum Permissible Exposure ("MPE") measurements taken on the site, as applicable; and
- Theoretical MPE based on modeling.

RF emissions do not exceed MPE limits on the ground level. The area that does exceed MPE limits is located on an inaccessible rooftop and does not require signage.



10.2 Site Compliance

10.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, and a thorough review of site access procedures, RF hazard signage and visible antenna locations, Sitesafe has determined that:

The site is compliant with the FCC rules and regulations, as described in OET Bulletin 65, and will remain compliant upon implementation of the proposed changes.

The compliance determination is based on General Public MPE levels due to theoretical modeling and/or physical measurements, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant. Measurements have also been performed to validate the assumptions used in our theoretical modeling of this site.

Modeling is used for determining compliance and the percentage of MPE contribution. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results.

10.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on existing measurements and theoretical analysis of MPE levels. Sitesafe has documented the locations of any RF signs and barriers that are required for compliance. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

This site will be compliant with the FCC rules and regulations.

10.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the rooftop to be:

Maximum Cumulative Theoretical General Public MPE level (Existing Antennas) : 192.9%
Maximum Cumulative Theoretical General Public MPE level (All Antennas): 192.9%
Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 192.9%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

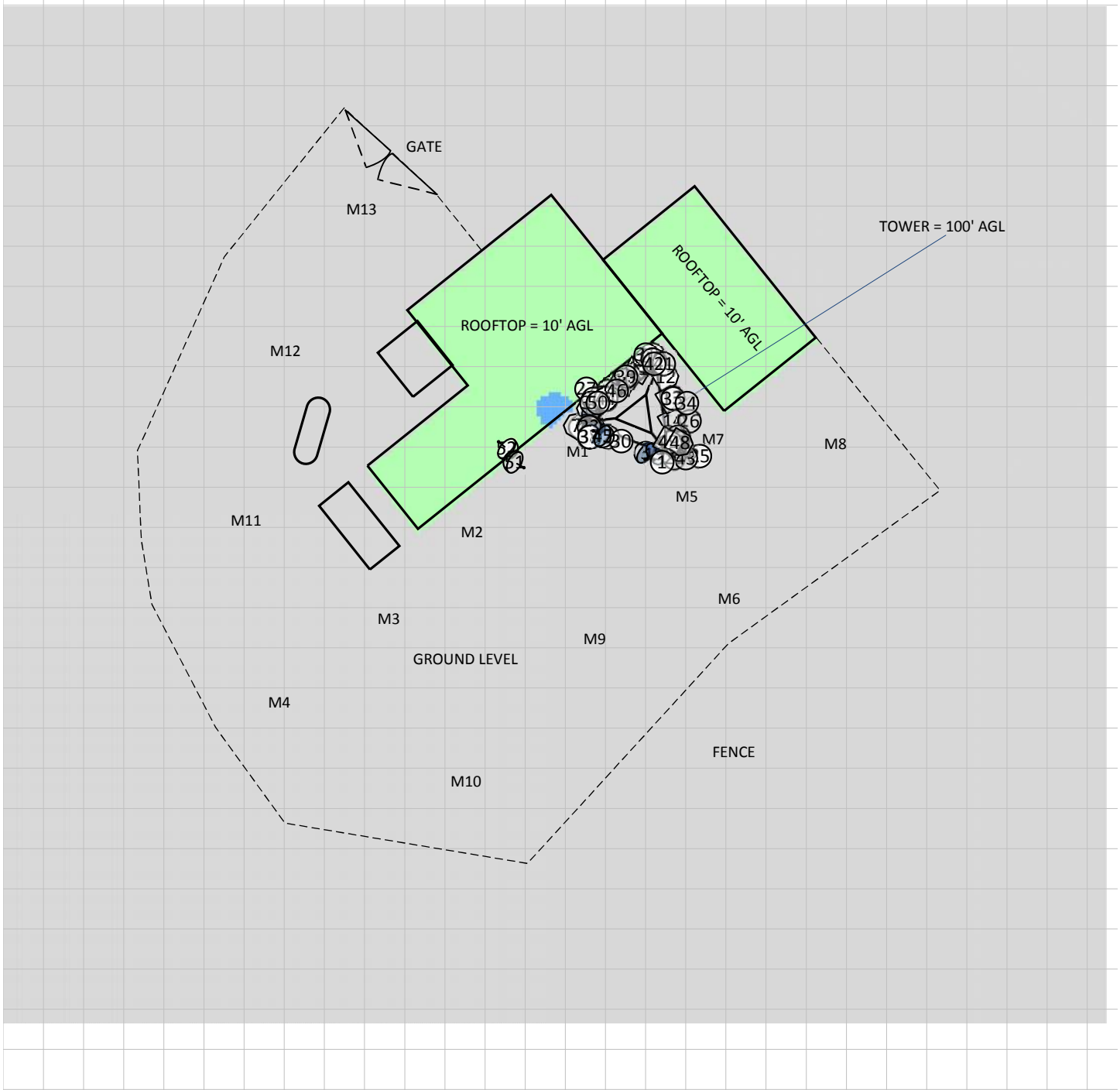


Abbreviations used in the RF Emissions Diagrams

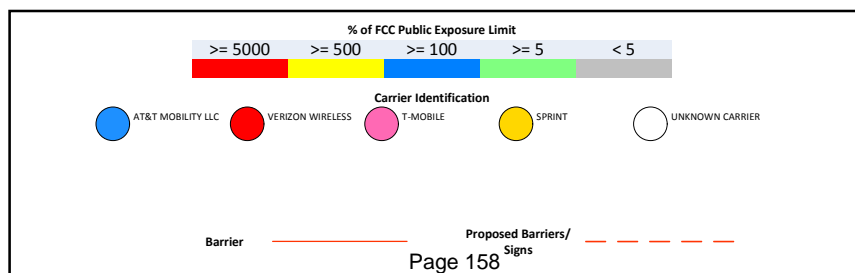
PH=##'	Penthouse at ## feet above main roof
M##	Measurement ## taken during a site visit

As discussed in Section 10.4, site measurement locations for spatial average measurements collected at the time of Sitesafe's visit have been added to the RF emissions diagram. While the theoretical modeling represents worst case MPE levels based on the assumption(s) detailed above, the measurement data is a snapshot of MPE levels at the time of our visit, and dependent on transmitter duty cycle, system implementation and emissions from other RF sources at nearby antenna sites.

RF Exposure Simulation For: San Pedro Existing Antennas Only On Air



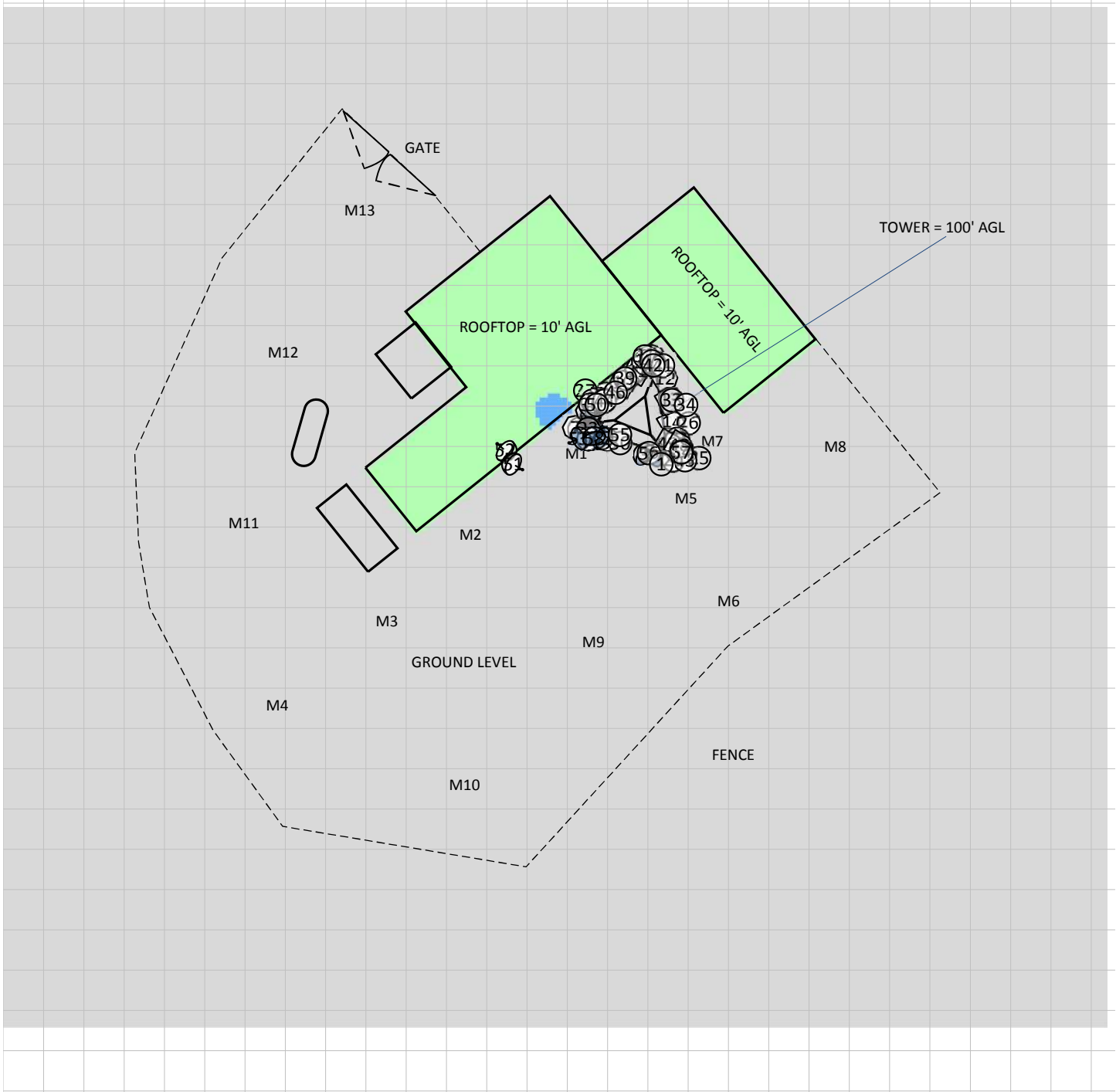
% of FCC Public Exposure Limit
Spatial average 0' - 6'



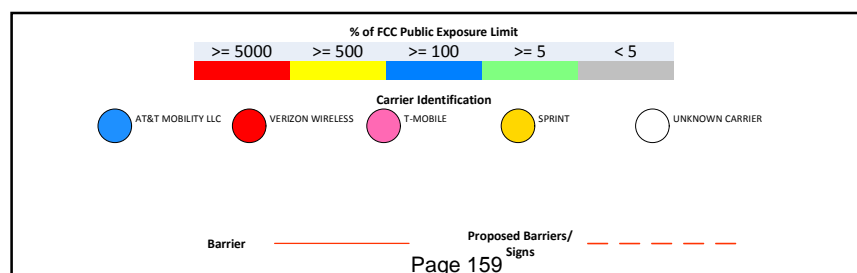
(Feet)
0 9.3 18.5
www.sitesafe.com
Site Name: San Pedro
8/28/2018 12:45:46 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: San Pedro All Antennas On Air



% of FCC Public Exposure Limit
Spatial average 0' - 6'



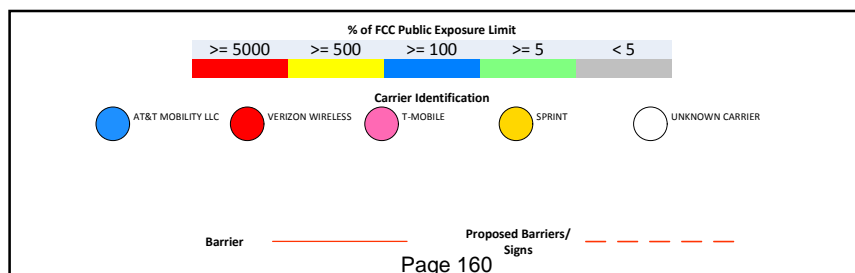
(Feet)
0 9.2 18.4
www.sitesafe.com
Site Name: San Pedro
8/28/2018 12:43:51 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: San Pedro Final Configuration On Air



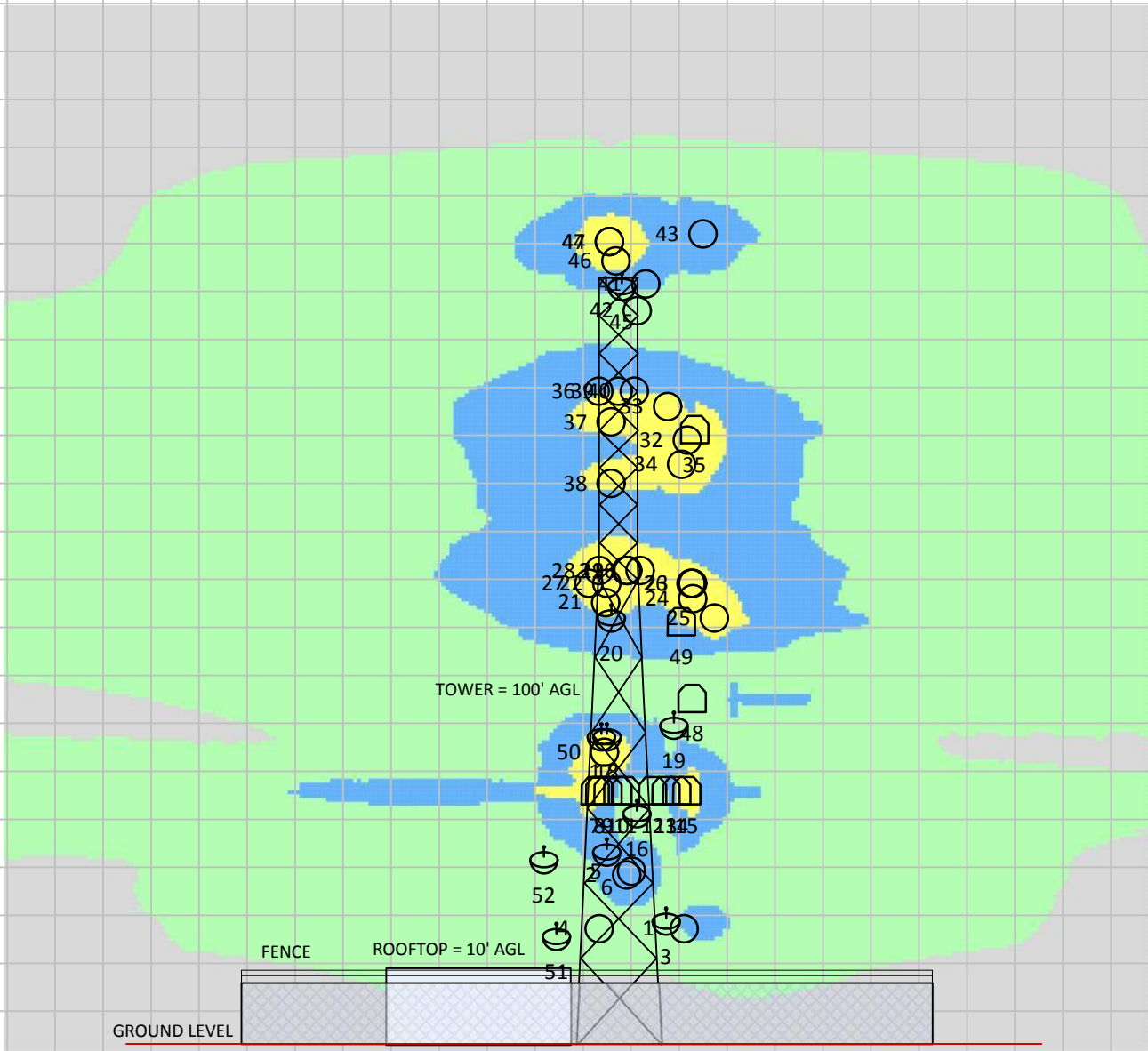
% of FCC Public Exposure Limit
Spatial average 0' - 6'



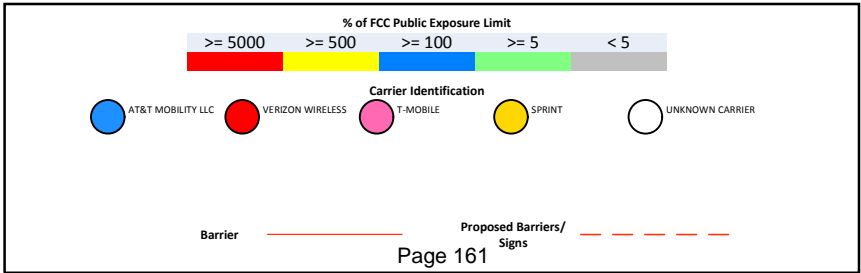
(Feet)
0 9.4 18.7
www.sitesafe.com
Site Name: San Pedro
8/28/2018 12:48:27 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

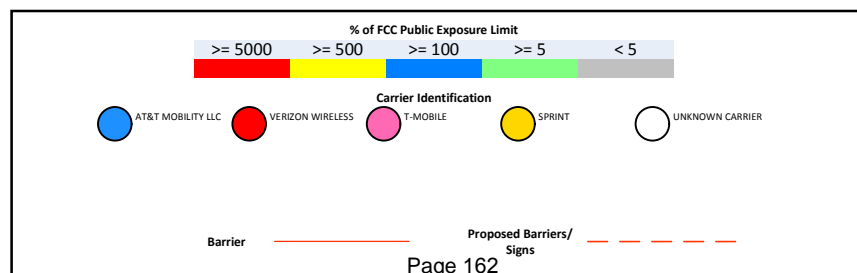
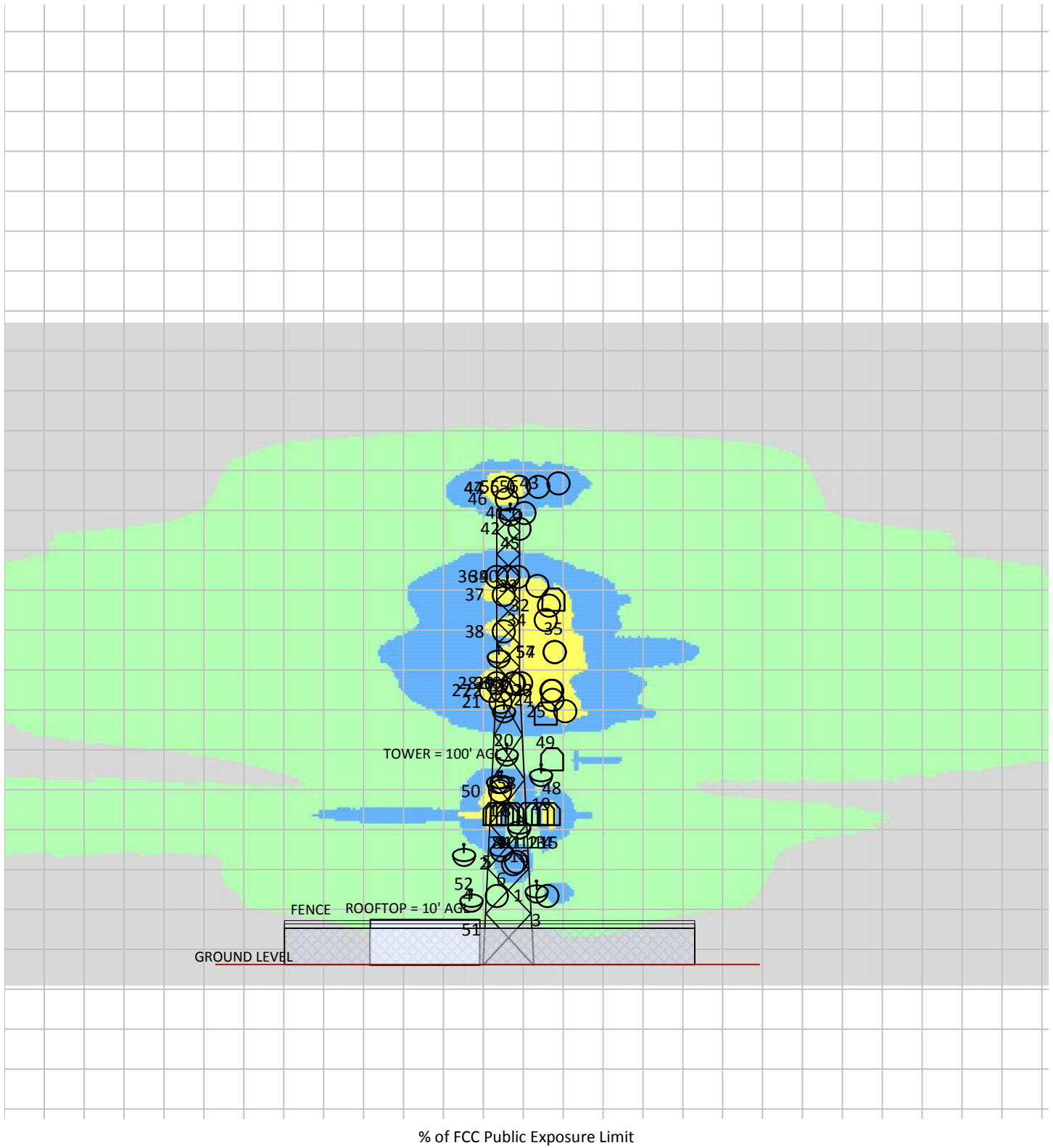
RF Exposure Simulation For: San Pedro Existing Antennas Only On Air – Elevation View



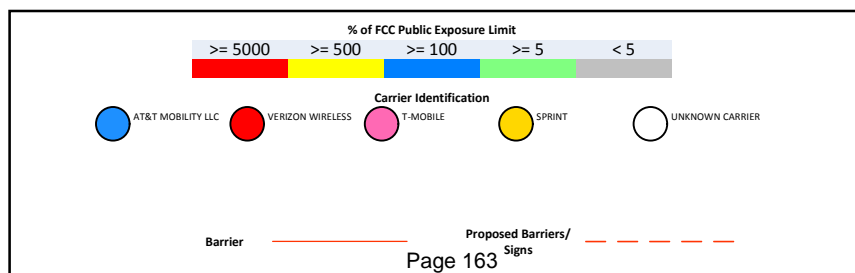
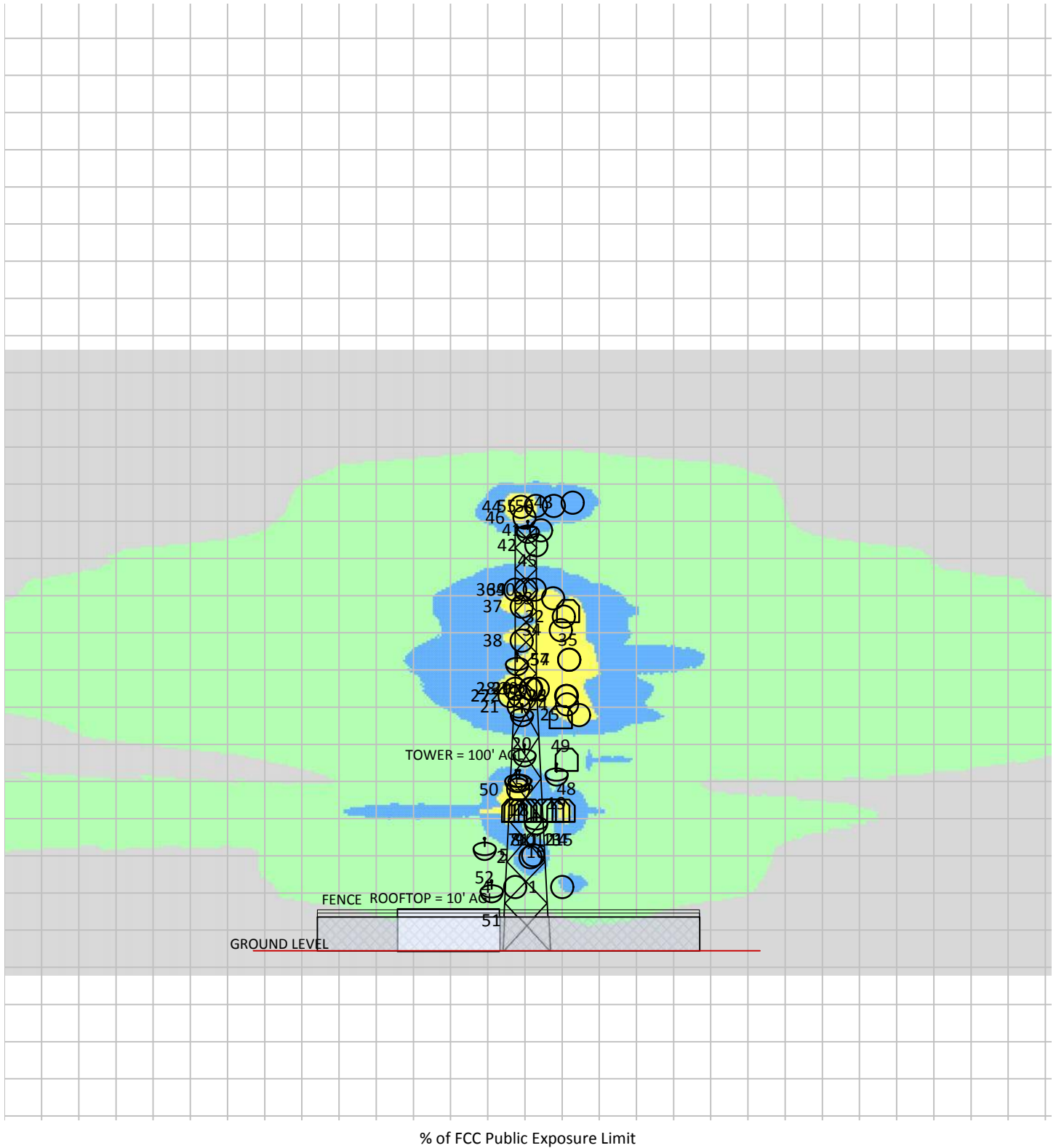
% of FCC Public Exposure Limit



RF Exposure Simulation For: San Pedro Elevation View – All Antennas on Air



RF Exposure Simulation For: San Pedro Elevation View – Final Configuration



10.4 Site Measurements

This section provides a summary of the measurements collected at the site. Actual measurements locations at which these data points were collected are included in the RF emission diagram provided in Section 10.3 of this report. Two types of measurements were collected at each measurement location: maximum (peak) and spatial average. The spatial average measurement consists of a collection of ten (10) measurements within a ten (10) second time interval taken from zero (0) to six (6) feet in height. The purpose of this measurement technique is to identify the average power density over the dimensions of a typical human body.

Table 1 below contains all the measurements collected from accessible areas located at the site at the time of Sitesafe's visit. Whenever possible, measurements are taken in front of the antenna in the transmitting direction. However, because of the antenna configuration at this site, specific emissions could not be discerned from nearby facilities, and no attempt was made to determine power density levels from a specific transmitting antenna.

Highest Measured Occupational Level: <1%

This value is equal to:

Highest General Public Level: <5%.

Measurements Points	Spatial Average	Maximum	Measurements Points	Spatial Average	Maximum
M1	<1 %	<1 %	M12	<1 %	<1 %
M2	<1 %	<1 %	M13	<1 %	<1 %
M3	<1 %	<1 %	M14	<1 %	<1 %
M4	<1 %	<1 %	M15	<1 %	<1 %
M5	<1 %	<1 %	M16	<1 %	<1 %
M6	<1 %	<1 %	M17	<1 %	<1 %
M7	<1 %	<1 %	M18	<1 %	<1 %
M8	<1 %	<1 %	M19	<1 %	<1 %
M9	<1 %	<1 %	M20	<1 %	<1 %
M10	<1 %	<1 %	M21	<1 %	<1 %
M11	<1 %	<1 %	M22	<1 %	<1 %

RF meters and probes have been calibrated and used according to the manufacturer's specifications. Measurements provide a view of the MPE percentage levels at the site at the time of Sitesafe's site visit and are used to validate modeling results. Theoretical modeling is used for determining compliance and the percentage of MPE contributions.

An RF Emission diagram has been included in section 10.3 of this document. All measurement locations are identified in this diagram. The locations of measurements in the RF Emission diagram can be cross referenced with Table 1 (above) to determine the actual spatial average and maximum measurement value per location.

10.5 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was verified on site, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 11 - San Pedro. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory and representative photographs were obtained or verified during the site visit and were utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	E1	Generic	Yagi	1.2	450	60	9.97	60	100	ERP	Watt	1	100	15	0	0
2	E2	Generic	Omni	12.5	150	60	2.87	360	100	ERP	Watt	1	100	22	0	0
3	E3	Generic	Aperture	3	5800	130	29.06	2	20	ERP	Watt	1	20	16	0	0
4	E4	Generic	Yagi	1.2	450	300	9.97	60	100	ERP	Watt	1	100	15	0	0
5	E5	Generic	Omni	12.5	150	300	2.87	360	100	ERP	Watt	1	100	22.5	0	0
6	E6	Generic	Aperture	4	11000	180	37.66	2	0.01	TPO	Watt	1	58.3	25	0	0
7	E7	Generic	Panel	6.3	1900	300	16.26	65	60	TPO	Watt	1	2536	33	0	0
8	E8	Generic	Panel	4.6	1900	300	15.43	65	60	TPO	Watt	1	2094.8	33	0	0
9	E9	Generic	Panel	6.3	1900	300	16.26	65	60	TPO	Watt	1	2536	33	0	0
10	E10	Generic	Panel	6.3	1900	300	16.26	65	60	TPO	Watt	1	2536	33	0	0
11	E11	Generic	Panel	4.6	1900	300	15.43	65	60	TPO	Watt	1	2094.8	33	0	0
12	E12	Generic	Panel	6.3	1900	60	16.26	65	60	TPO	Watt	1	2536	33	0	0
13	E13	Generic	Panel	4.6	1900	60	15.43	65	60	TPO	Watt	1	2094.8	33	0	0
14	E14	Generic	Panel	6.3	1900	60	16.26	65	60	TPO	Watt	1	2536	33	0	0
15	E15	Generic	Panel	4.6	1900	60	15.43	65	60	TPO	Watt	1	2094.8	33	0	0
16	E16	Generic	Aperture	4	2400	300	22.96	2	4	ERP	Watt	1	4	30	0	0
17	E17	Generic	Aperture	2	18000	320	37.66	2	0.01	TPO	Watt	1	58.3	40	0	0
18	E18	Generic	Aperture	4	11000	170	37.66	2	0.01	TPO	Watt	1	58.3	40	0	0
19	E19	Generic	Aperture	4	11000	240	37.66	2	0.01	TPO	Watt	1	58.3	41.5	0	0
20	E20	Generic	Aperture	4	11000	180	37.66	2	0.01	TPO	Watt	1	58.3	55.5	0	0
21	E21	Generic	Omni	8	150	60	2.61	360	100	ERP	Watt	1	100	57.5	0	0
22	E22	Generic	Omni	9.5	450	60	5.97	360	100	ERP	Watt	1	100	60	0	0
23	E23	Generic	Omni	9.5	450	60	5.97	360	100	ERP	Watt	1	100	60	0	0
24	E24	Generic	Yagi	1.2	450	60	9.97	60	100	ERP	Watt	1	100	58	0	0
25	E25	Generic	Omni	3	150	60	0	360	100	ERP	Watt	1	100	55.5	0	0
26	E26	Generic	Omni	10	450	60	0	360	100	ERP	Watt	1	100	60	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
27	E27	Generic	Omni	12.5	150	300	2.87	360	100	ERP	Watt	1	100	60	0	0
28	E28	Generic	Omni	4.7	450	300	2.97	360	100	ERP	Watt	1	100	61.7	0	0
29	E29	Generic	Omni	4.7	450	300	2.97	360	100	ERP	Watt	1	100	61.7	0	0
30	E30	Generic	Omni	12.5	150	300	2.87	360	100	ERP	Watt	1	100	61.7	0	0
31	E31	Generic	Omni	12.5	150	300	2.87	360	100	ERP	Watt	1	100	61.7	0	0
32	E32	Generic	Yagi	1.2	450	60	9.97	60	100	ERP	Watt	1	100	78.7	0	0
33	E33	Generic	Omni	4.7	450	60	2.97	360	100	ERP	Watt	1	100	83	0	0
34	E34	Generic	Omni	3	150	60	0	360	100	ERP	Watt	1	100	75.5	0	0
35	E35	Generic	Panel	6.3	1900	60	16.26	65	60	TPO	Watt	1	2536	80	0	0
36	E36	Generic	Omni	4.7	450	180	2.97	360	100	ERP	Watt	1	100	85	0	0
37	E37	Generic	Omni	1.5	850	180	0.01	360	1000	ERP	Watt	1	1000	81	0	0
38	E38	Generic	Omni	1.5	850	180	0.01	360	1000	ERP	Watt	1	1000	73	0	0
39	E39	Generic	Omni	20	450	300	10.81	360	100	ERP	Watt	1	100	85	0	0
40	E40	Generic	Omni	20	450	300	10.81	360	100	ERP	Watt	1	100	85	0	0
41	E41	Generic	Yagi	1.2	450	60	9.97	60	100	ERP	Watt	1	100	99	0	0
42	E42	Generic	Yagi	1.2	450	60	9.97	60	100	ERP	Watt	1	100	95.5	0	0
43	E43	Generic	Omni	4.7	450	60	2.97	360	100	ERP	Watt	1	100	105.5	0	0
44	E44	Generic	Omni	3	150	300	0	360	100	ERP	Watt	1	100	104.5	0	0
45	E45	Generic	Aperture	4	2400	300	22.96	2	4	ERP	Watt	1	4	98.7	0	0
46	E46	Generic	Omni	4.7	450	300	2.97	360	100	ERP	Watt	1	100	102	0	0
47	E47	Generic	Omni	4.7	450	180	2.97	360	100	ERP	Watt	1	100	104.5	0	0
48	UNKNOWN OPERATOR	Generic	Panel	4.6	1900	120	15.43	65	60	TPO	Watt	1	2094.8	45	0	0
49	UNKNOWN OPERATOR	Generic	Panel	4.6	1900	120	15.43	65	60	TPO	Watt	1	2094.8	55	0	0
50	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	100	ERP	Watt	1	100	38	0	0
51	UNKNOWN OPERATOR	Generic	Aperture	8	6000	120	39.06	2	0.01	TPO	Watt	1	80.5	14	0	0
52	UNKNOWN OPERATOR	Generic	Aperture	3	5800	310	29.06	2	20	TPO	Watt	1	16107.6	24	0	0
53	P1	Generic	Aperture	6	6000	246.8	36.36	2	0.01	TPO	Watt	1	43.3	67.5	0	0
54	P2	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	68.5	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
55	P3 (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	104.8	0	0
56	P4 (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	104.8	0	0
57	P5	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	68.5	0	0
58	P6	Generic	Aperture	4	11000	164.3	37.66	2	0.01	TPO	Watt	1	58.3	46	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

10.6 Site Pictures



Figure 55: Ground Level Overview Facing North



Figure 56: Tower Overview North



Figure 57: Tower Overview South



Figure 58: Tower Overview West



Figure 59: Tower Overview East

11 Tiburon



Marin Emergency Radio Authority Site Name – Tiburon Site ID: 14 Site Compliance Report

**99 1/2 Mt. Tiburon Rd
Tiburon, CA 94920**

Latitude: N37-53-25.58
Longitude: W122-27-53.27
Structure Type: Monopole

Report generated date: March 28, 2019
Report by: Sam Cosgrove
Customer Contact: David Mortimer

**This site will be compliant upon
completion of the remediation
identified in Section 11.2.2.**

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11.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at the proposed communications site, 14 - Tiburon, located at 99 1/2 Mt. Tiburon Rd, Tiburon, CA, is in compliance with Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

This section contains a detailed summary of the RF environment at the site including:

- Diagram of the site
- Inventory of the make / model of all antennas
- Theoretical MPE based on modeling

RF emissions exceed MPE limits on this top of the water tank located near the monopole. The ground level is predicted have less than 5% of MPE limits. RF alerting signage should be installed at the access of the water tank.



11.2 Site Compliance

11.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, and a thorough review of site access procedures, RF hazard signage and visible antenna locations, Sitesafe has determined that:

The site will be compliant with the FCC rules and regulations, as described in OET Bulletin 65 upon implementation of the proposed remediation. The corrective actions needed to make this site compliant are located in Section 11.2.2.

The compliance determination is based on General Public MPE levels due to theoretical modeling and/or physical measurements, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant. Measurements have also been performed to validate the assumptions used in our theoretical modeling of this site.

Modeling is used for determining compliance and the percentage of MPE contribution. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results.

11.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on existing measurements and theoretical analysis of MPE levels. Sitesafe has documented the locations of any RF signs and barriers that are required for compliance. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

The site will be made compliant if the following changes are implemented:

Water Tank Access

Install a Notice sign.

11.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the water tank to be:

Maximum Cumulative Theoretical General Public MPE level (Existing Antennas): 9.28%
 Maximum Cumulative Theoretical General Public MPE level (All Antennas): 10.07%
 Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 2.15%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

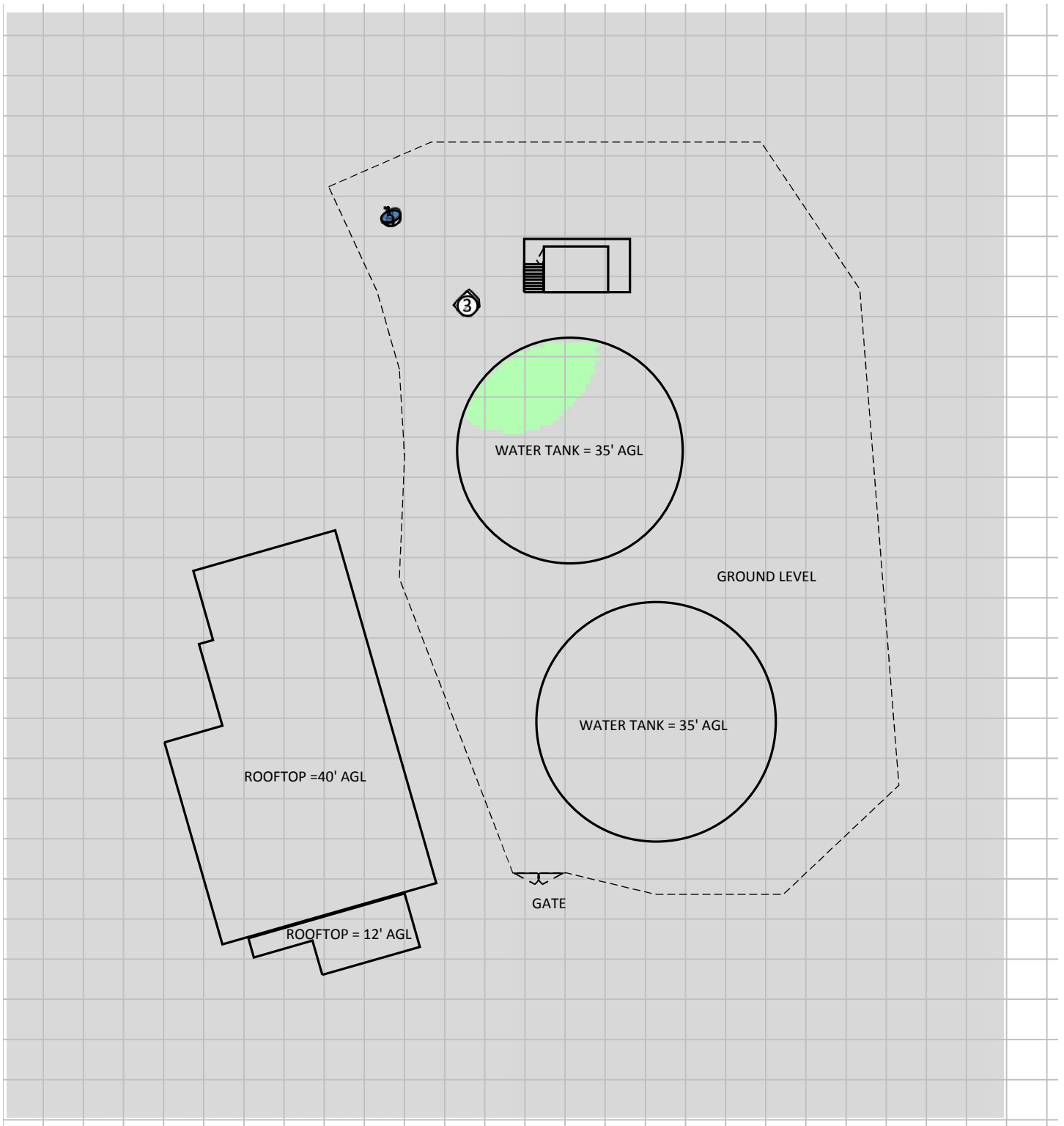
Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

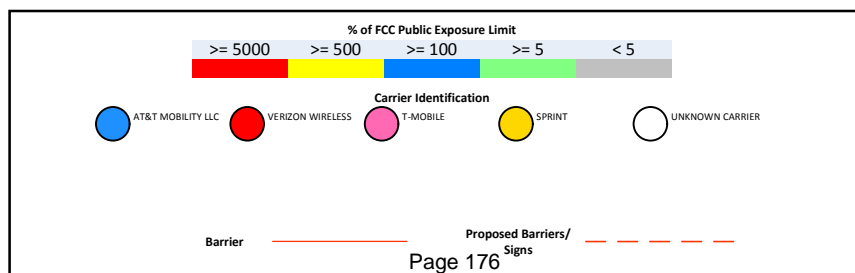
Abbreviations used in the RF Emissions Diagrams

PH=# #'	Penthouse at ## feet above main roof
---------	--------------------------------------

RF Exposure Simulation For: Tiburon Existing Antennas On Air



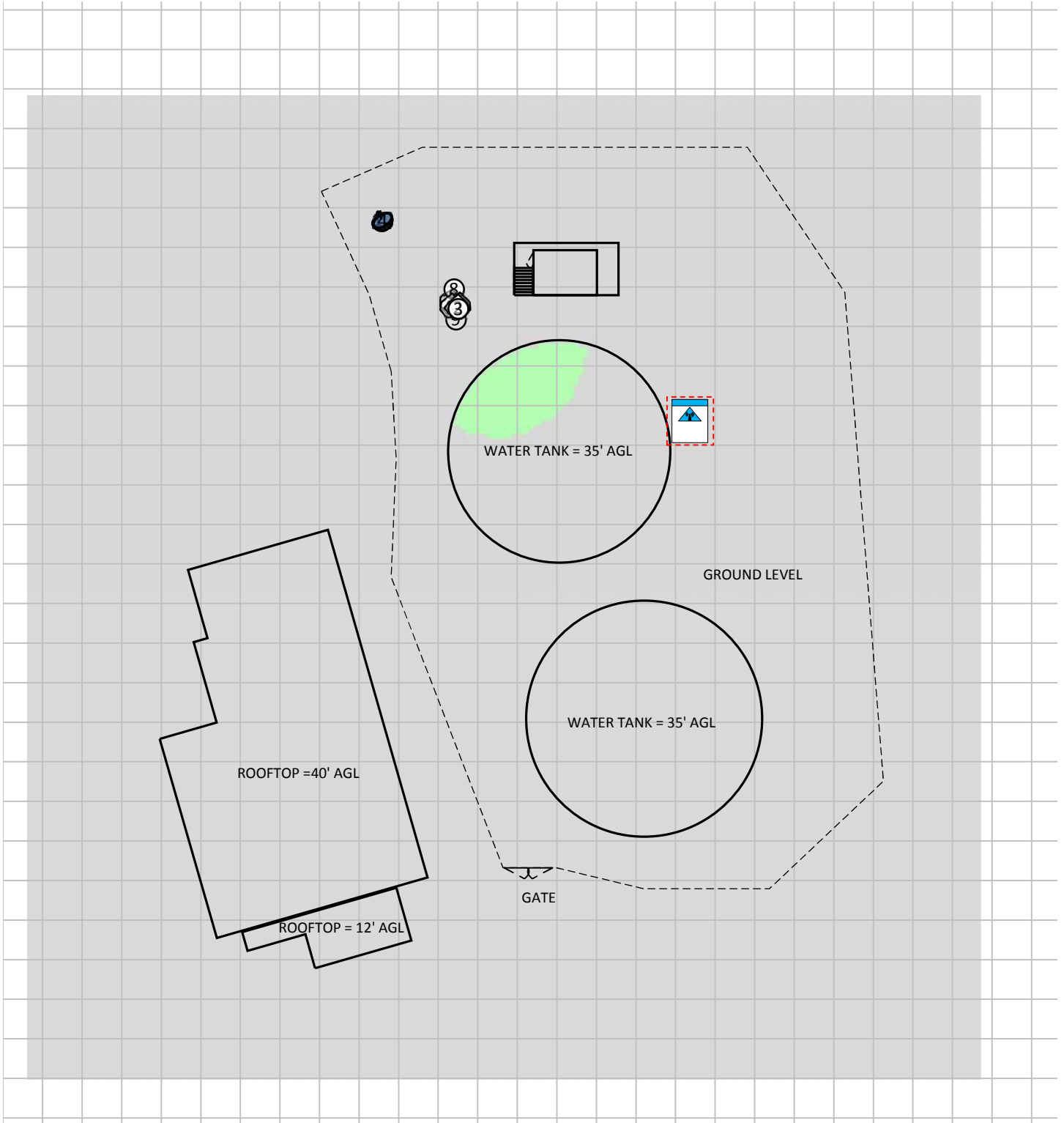
% of FCC Public Exposure Limit
Spatial average 0' - 6'



(Feet)
0 16.3 32.6
www.sitesafe.com
Site Name: Tiburon
3/27/2019 3:01:20 PM

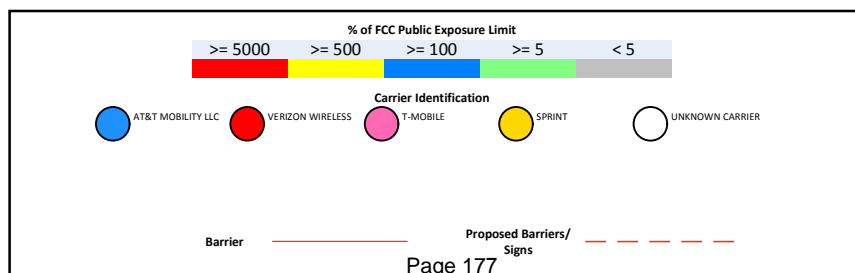
Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Tiburon All Antennas On Air



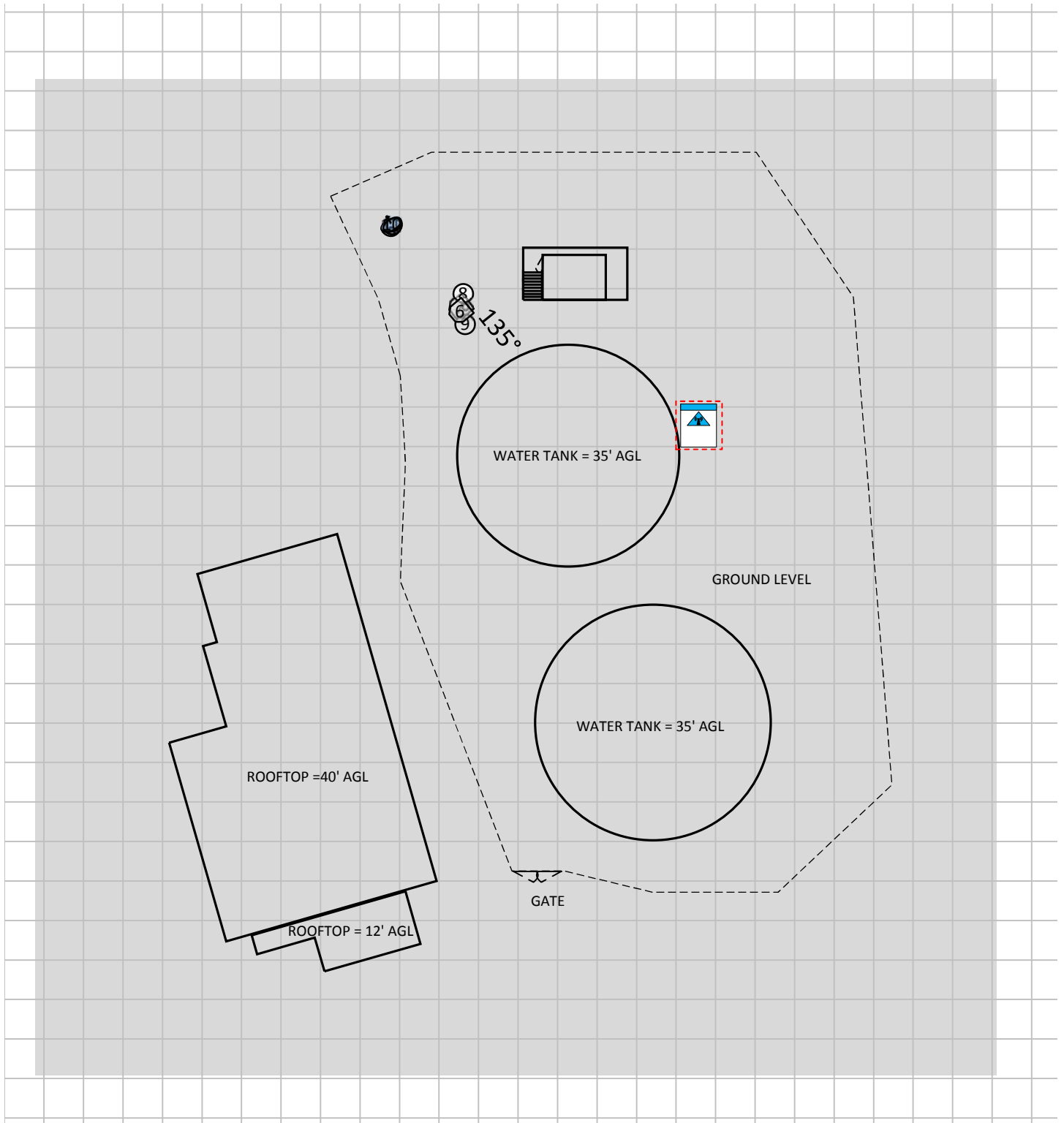
% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)
0 16.5 33
www.sitesafe.com
Site Name:Tiburon
3/28/2019 9:33:49 AM



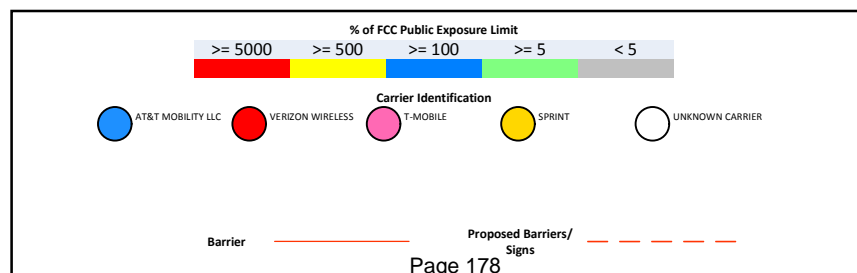
Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Tiburon Final Configuration



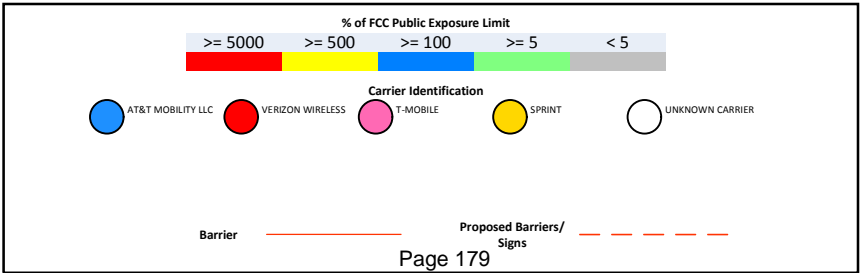
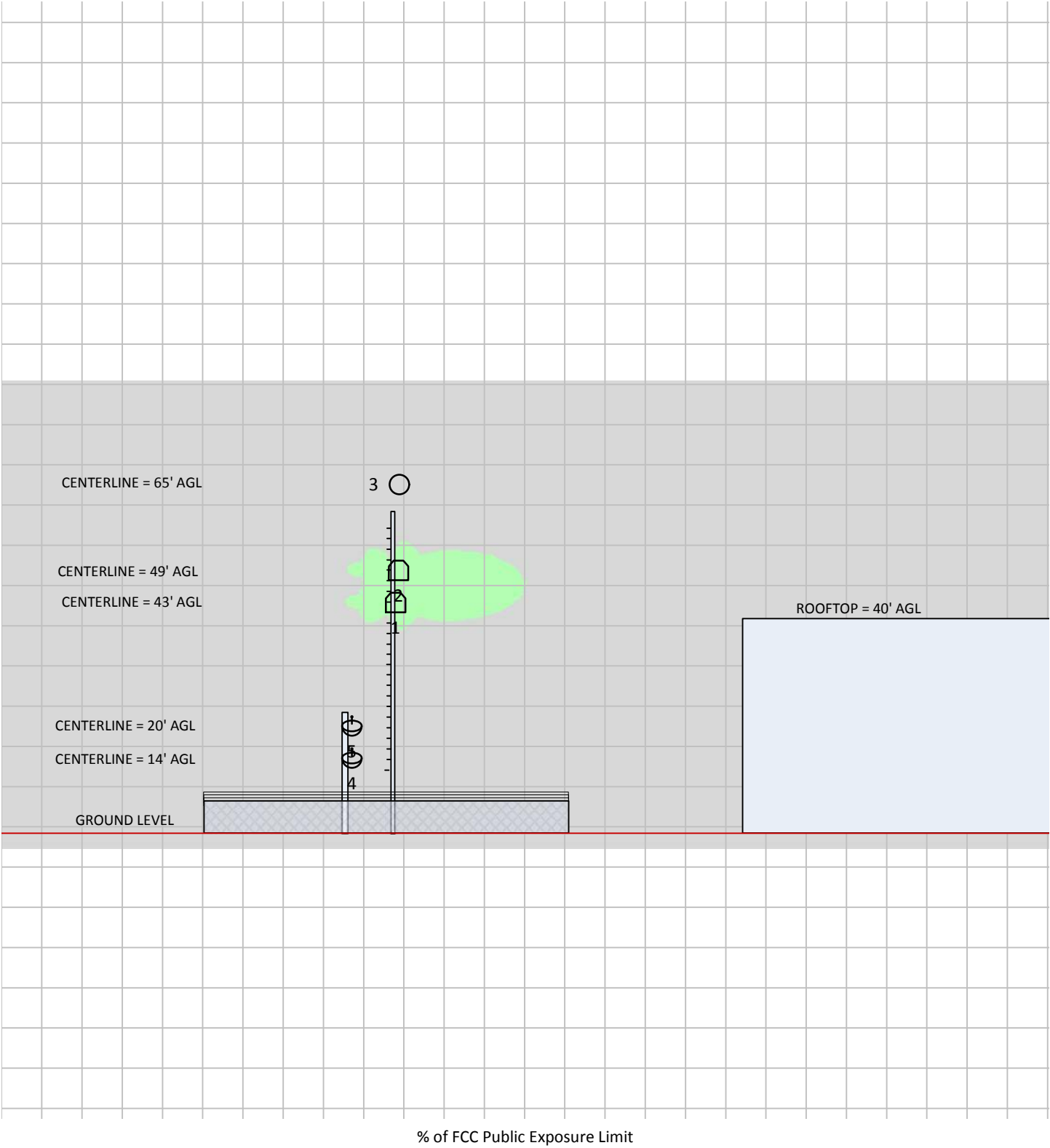
% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)
0 16.5 33
www.sitesafe.com
Site Name: Tiburon
3/28/2019 9:29:35 AM



Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Tiburon
Elevation View – Existing Antennas On Air



RF Exposure Simulation For: Tiburon
Elevation View – All Antennas On Air

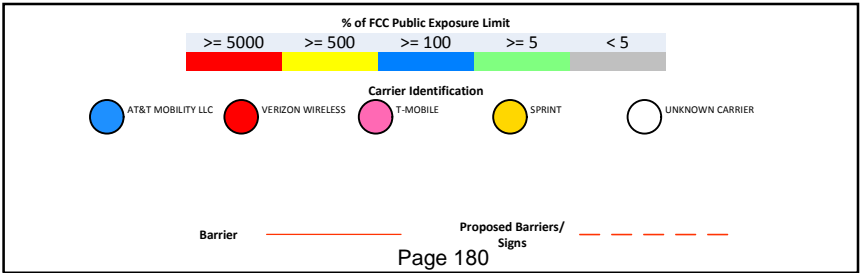
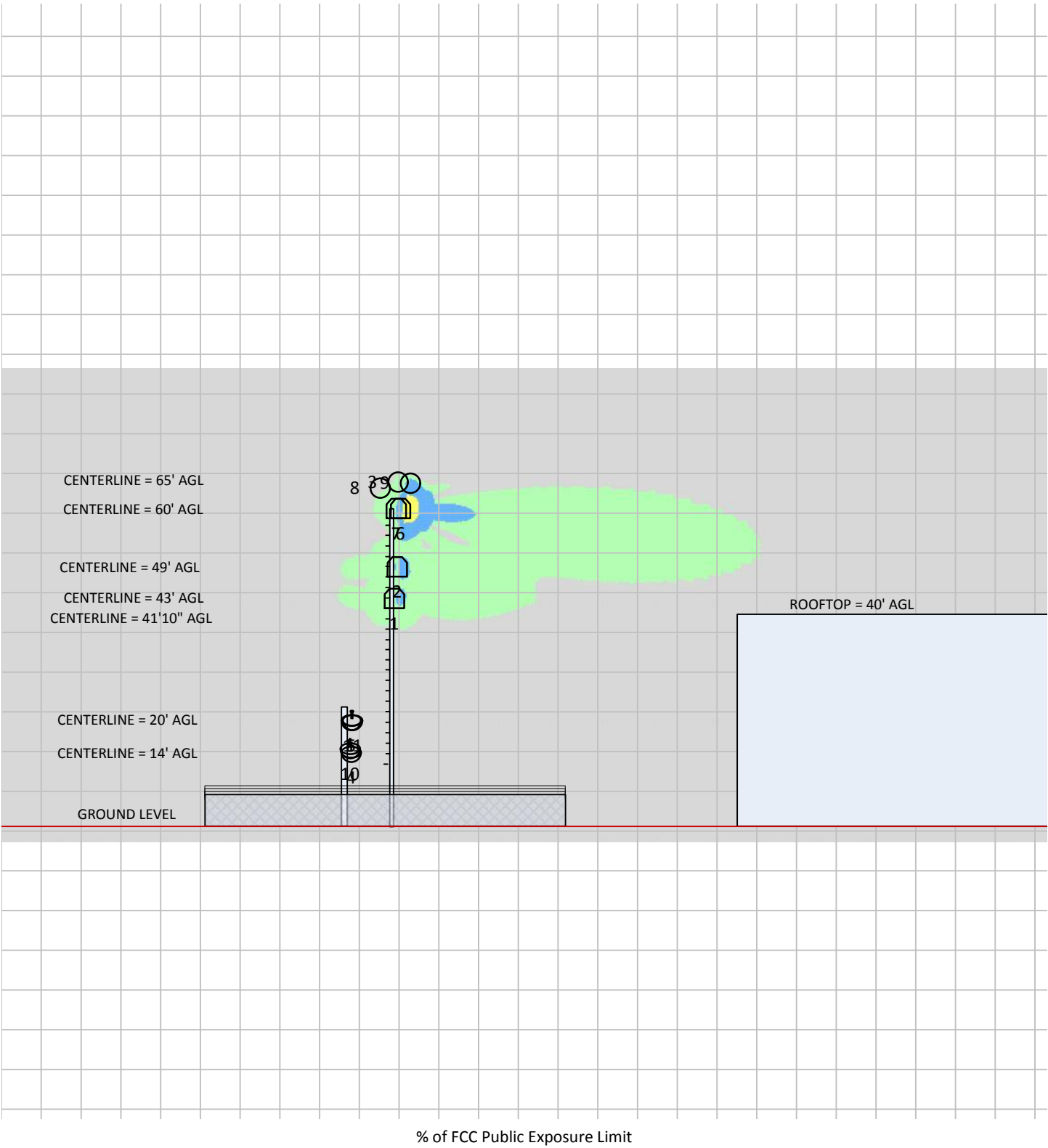


Diagram illustrating a cross-section of a building and its rooftop, showing a plume or smoke release.

Key features and labels:

- Centerline = 65' AGL**: The height of the building's centerline above ground level.
- Centerline = 60' AGL**: The height of the building's centerline above ground level.
- Centerline = 20' AGL**: The height of the building's centerline above ground level.
- Centerline = 14' AGL**: The height of the building's centerline above ground level.
- GROUND LEVEL**: The base of the building.
- ROOFTOP = 40' AGL**: The height of the rooftop above ground level.
- Plume/Smoke Release**: A green plume is shown emanating from the rooftop area, extending horizontally.
- Building Structure**: A cross-section of the building is shown, including the rooftop and the main structure.
- Scale**: A vertical scale is present on the left side of the diagram, marked with numbers 8, 9, 10, and 11.

% of FCC Public Exposure Limit

Carrier	% of FCC Public Exposure Limit
AT&T MOBILITY LLC	>= 5000
VERIZON WIRELESS	>= 500
T-MOBILE	>= 100
SPRINT	>= 5
UNKNOWN CARRIER	< 5

Barrier

Proposed Barriers/
Signs

Page 181

11.4 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was provided by the customer, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 14 - Tiburon. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory was provided by the customer and was utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Len (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	POWER	POWER TYPE	POWER UNITS	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	E1	Andrew DB682H120-AD	Panel	4	450	180	8.01	120	100	ERP	Watt	1	100	43	0	0
2	E2	Andrew DB682H120-AD	Panel	4	450	180	8.01	120	100	ERP	Watt	1	100	49	0	0
3	E3	Generic (Rx)	Omni	10	450	225	0	360	0	ERP	Watt	1	0	65	0	0
4	E1	Generic	Aperture	4	18000	0	42.46	2	64.7	EIRP	dBmW	1	1799.4	14	0	0
5	E2	Generic	Aperture	4	18000	15	42.46	2	65.2	EIRP	dBmW	1	2018.9	20	0	0
6	P1	Sinclair SE414-SWBPALDF(D00) A=160	Panel	4.4	746	180	8.06	160	375	ERP	Watt	1	1000	41.8	0	0
7	P2	Sinclair SE414-SWBPALDF(D00) A=160	Panel	4.4	746	180	8.06	160	375	ERP	Watt	1	1000	41.8	0	0
8	P3	Rfi CC807-08 (Rx)	Omni	9.5	800	225	8	360	0	ERP	Watt	1	0	63.8	0	0
9	P4	Rfi CC807-08 (Rx)	Omni	9.5	800	45	8	360	0	ERP	Watt	1	0	64.8	0	0
10	P1	Generic	Aperture	4	11000	326.8	37.66	2	64.3	EIRP	dBmW	1	1640.9	14.7	0	0
11	P2	Generic	Aperture	4	11000	344.3	37.66	2	68.7	EIRP	dBmW	1	4520.1	20	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

12 Sonoma Mountain



Marin Emergency Radio Authority

Site Name – Sonoma Mountain

Site ID: 18

Site Compliance Report

**Near 2430 Sonoma Mt. Rd
Petaluma, CA 94954**

Site visit date: August 21, 2018

Site visit time: 4:20 PM

Site survey by: Jeff Desira

Latitude: N38-20-54.40

Longitude: W122-34-41.40

Structure Type: Self-Support

Report generated date: March 28, 2019

Report by: Sam Cosgrove

Customer Contact: David Mortimer

The site is compliant and will remain compliant upon implementation of the proposed changes.

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12.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at the proposed communications site, 18 - Sonoma Mountain, located at Near 2430 Sonoma Mt. Rd, Petaluma, CA, is in compliance with Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

Sitesafe's field personnel visited 18 - Sonoma Mountain on August 21, 2018. This section contains a detailed summary of the RF environment at the site including:

- Site compliance determination;
- Photographs of the site;
- Diagram of the site;
- Inventory of the make / model of all transmitting antennas found on the site (where possible);
- Record of any Maximum Permissible Exposure ("MPE") measurements taken on the site, as applicable; and
- Theoretical MPE based on modeling.

RF emissions on the ground level do not exceed MPE limits. The area on the rooftop that does exceed MPE limits is in an inaccessible area. The emissions in that area are due to the height of the antennas (#37-#46) from the rooftop, the power levels used, and the amount of antennas. Since the area is not accessible to the general public, signage is not required. The RF emissions levels on the ground do not pose a danger to personnel in the area.



12.2 Site Compliance

12.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, and a thorough review of site access procedures, RF hazard signage and visible antenna locations, Sitesafe has determined that:

The site is compliant with the FCC rules and regulations, as described in OET Bulletin 65, and will remain compliant upon implementation of the proposed changes.

The compliance determination is based on General Public MPE levels due to theoretical modeling and/or physical measurements, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant. Measurements have also been performed to validate the assumptions used in our theoretical modeling of this site.

Modeling is used for determining compliance and the percentage of MPE contribution. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results.

12.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on existing measurements and theoretical analysis of MPE levels. Sitesafe has documented the locations of any RF signs and barriers that are required for compliance. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

This site will be compliant with the FCC rules and regulations.

12.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the rooftop to be:

Maximum Cumulative Theoretical General Public MPE level (Existing Antennas) : 9,765.9%
Maximum Cumulative Theoretical General Public MPE level (All Antennas): 9,765.9%
Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 9,765.9%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

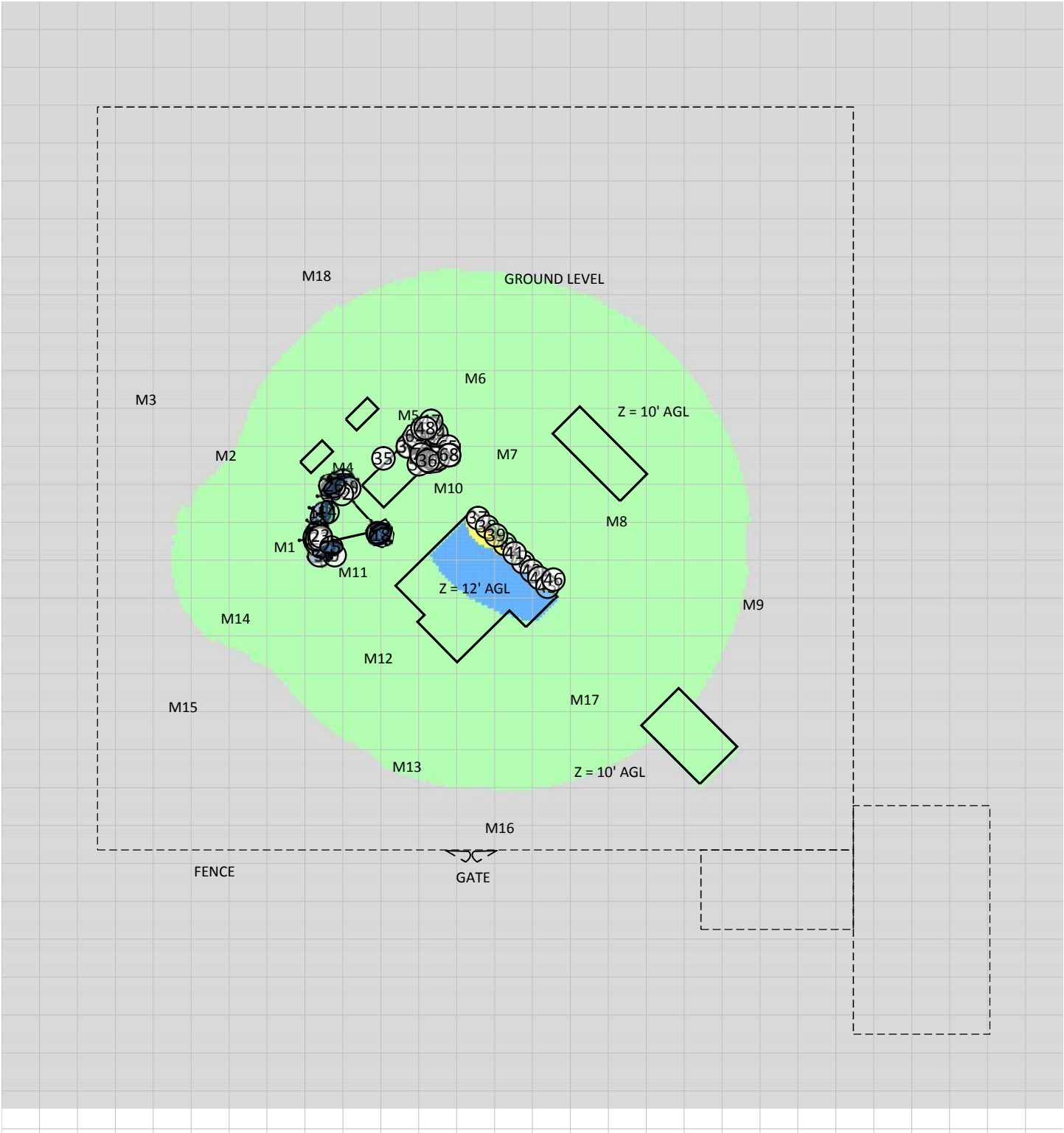


Abbreviations used in the RF Emissions Diagrams

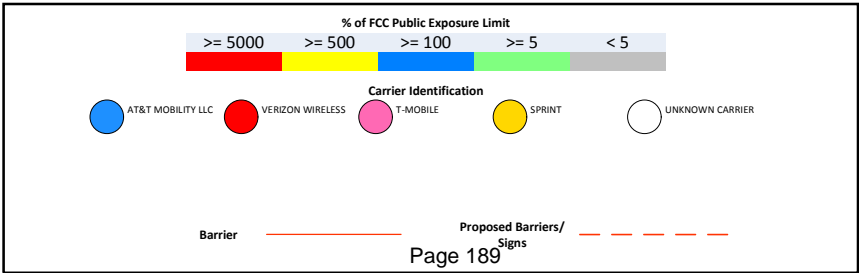
PH=##'	Penthouse at ## feet above main roof
M##	Measurement ## taken during a site visit

As discussed in Section 12.4, site measurement locations for spatial average measurements collected at the time of Sitesafe's visit have been added to the RF emissions diagram. While the theoretical modeling represents worst case MPE levels based on the assumption(s) detailed above, the measurement data is a snapshot of MPE levels at the time of our visit, and dependent on transmitter duty cycle, system implementation and emissions from other RF sources at nearby antenna sites.

RF Exposure Simulation For: Sonoma Mountain
Existing Antennas Only On Air



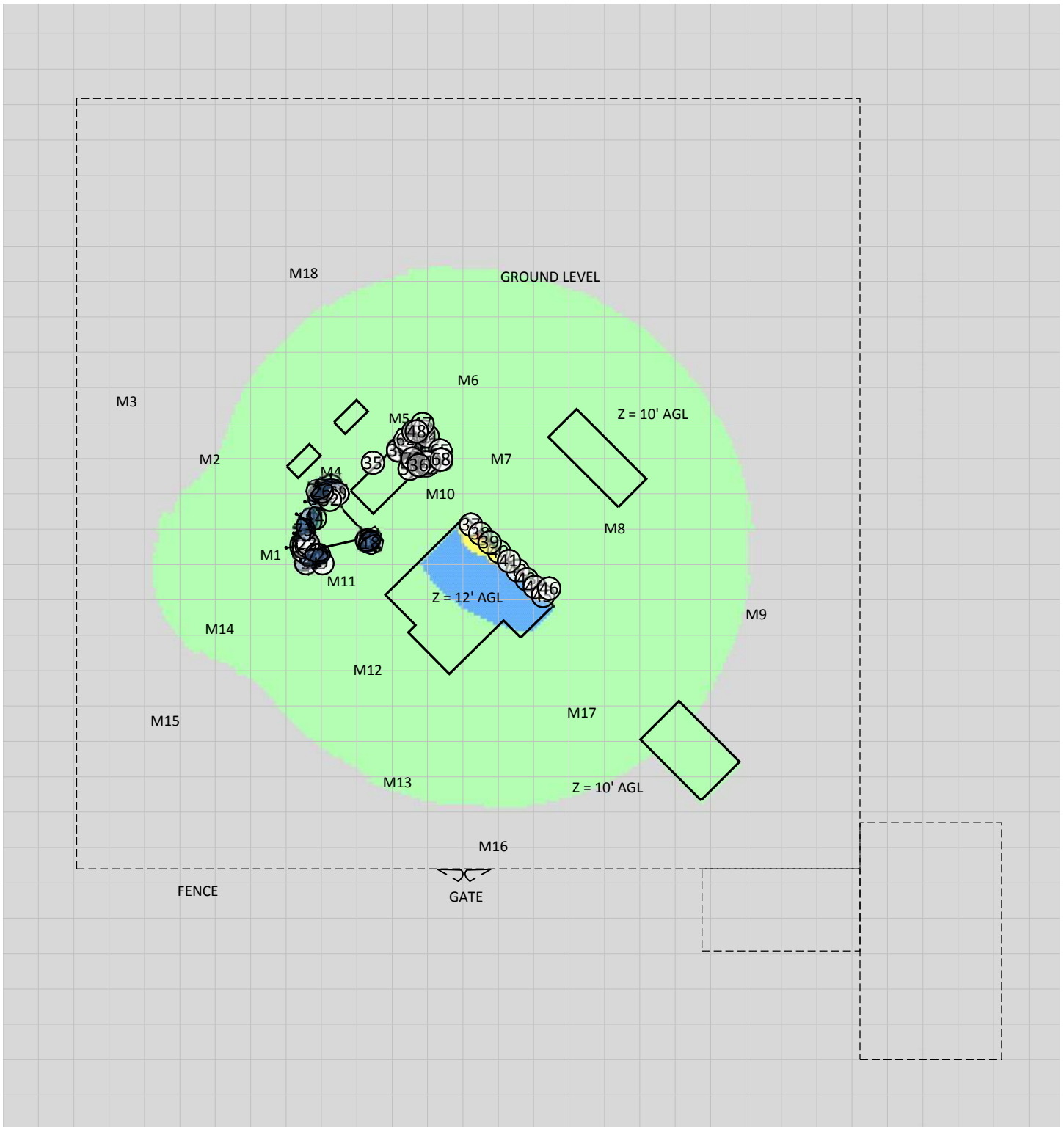
% of FCC Public Exposure Limit
Spatial average 0' - 6'



(Feet)
0 24.8 49.6
www.sitesafe.com
Site Name: Sonoma Mountain
8/28/2018 1:20:27 PM

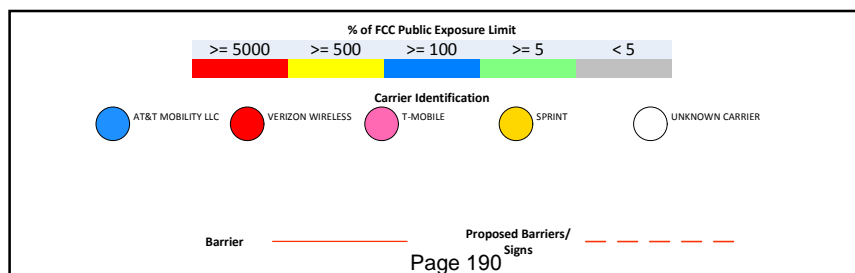
Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Sonoma Mountain All Antennas On Air



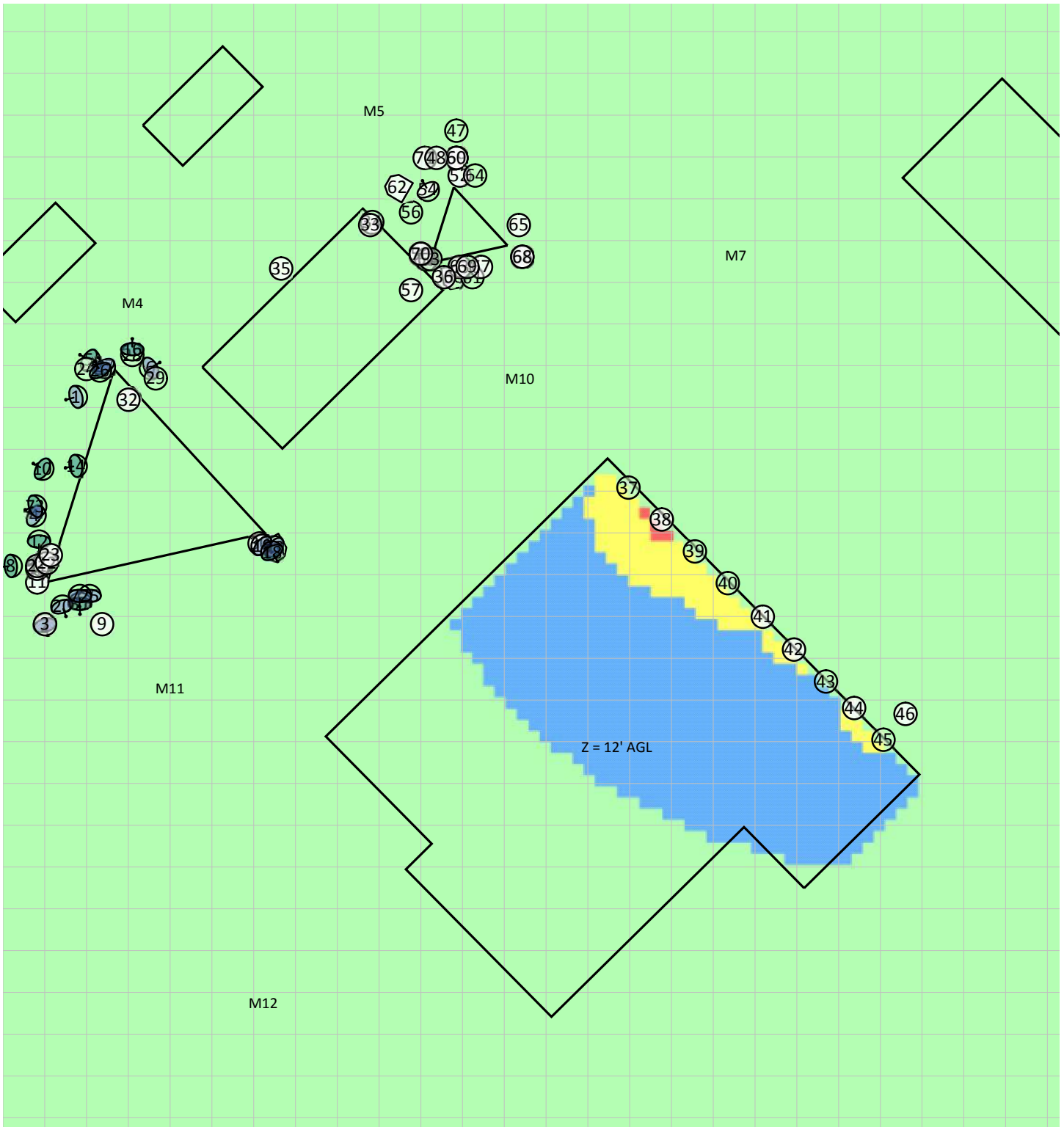
% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)
0 23.8 47.6
www.sitesafe.com
Site Name: Sonoma Mountain
8/28/2018 1:16:44 PM



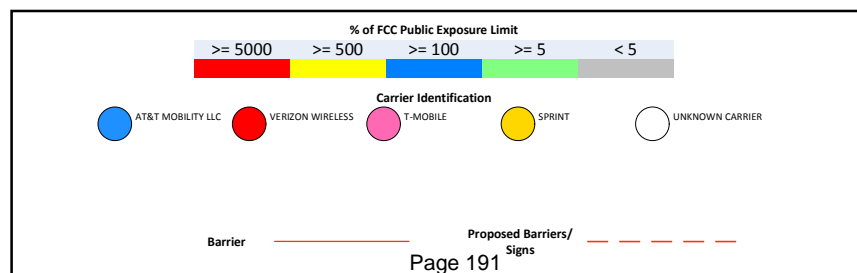
Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Sonoma Mountain All Antennas On Air – Detail View



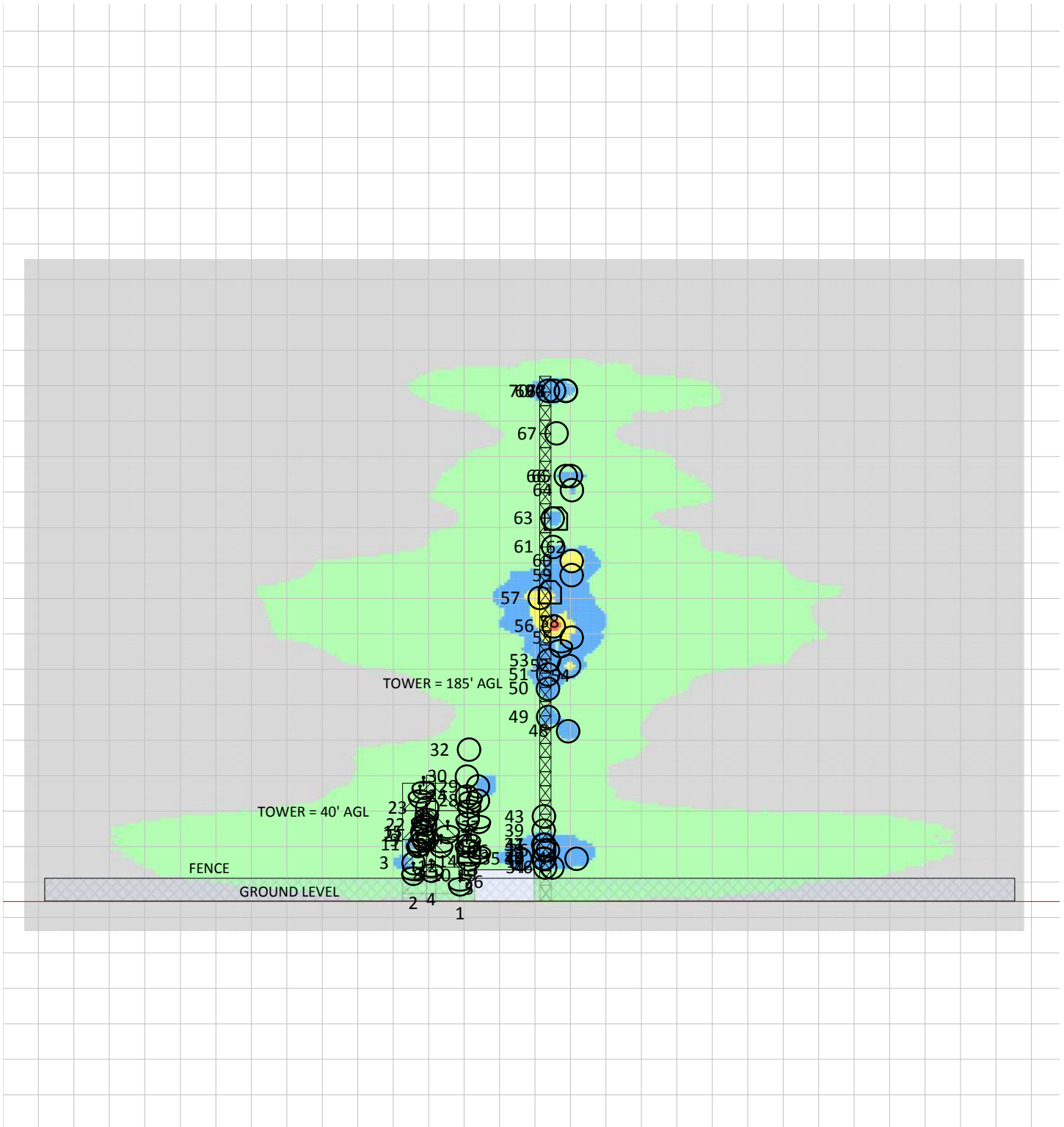
% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)
0 6.7 13.4
www.sitesafe.com
Site Name: Sonoma Mountain
8/28/2018 1:17:24 PM

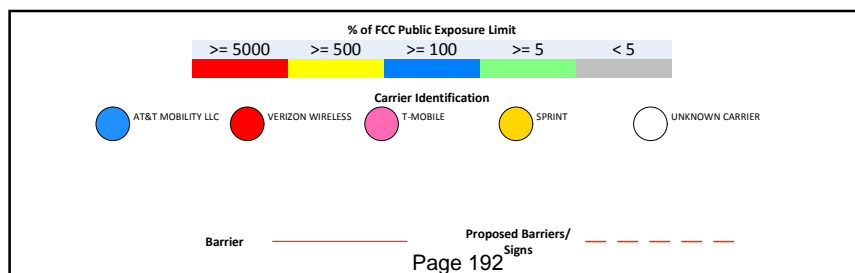


Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

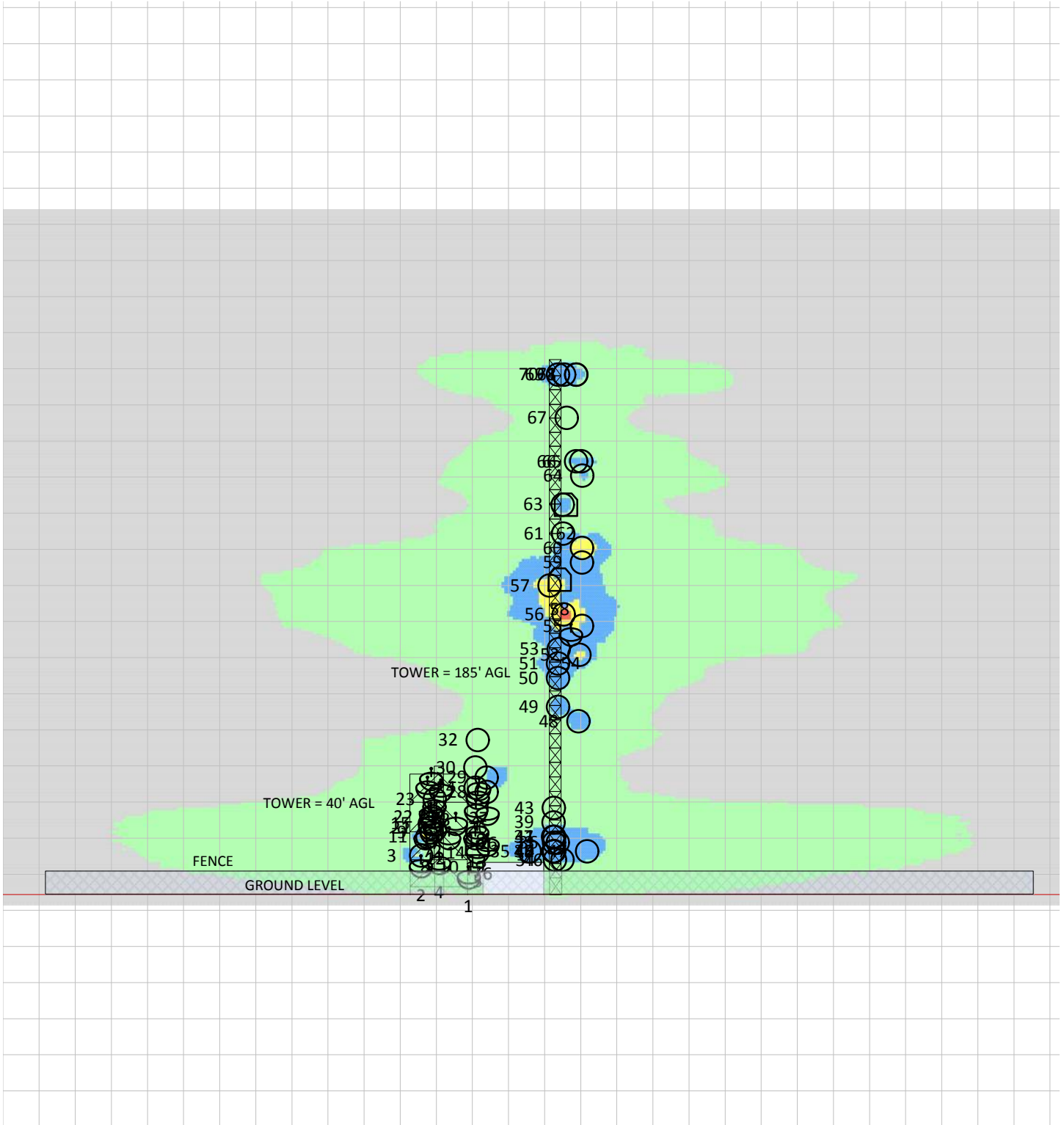
RF Exposure Simulation For: Sonoma Mountain Existing Antennas Only On Air



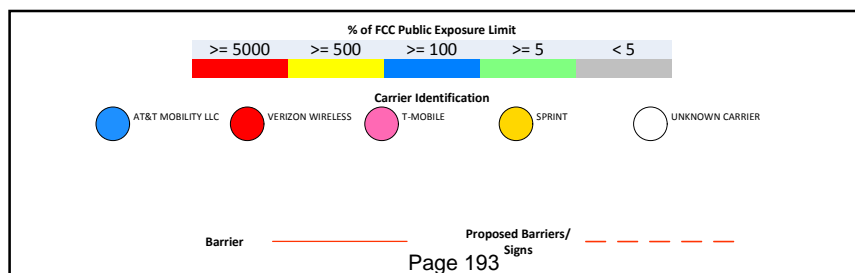
% of FCC Public Exposure Limit



RF Exposure Simulation For: Sonoma Mountain All Antennas On Air – Elevation View



% of FCC Public Exposure Limit



12.4 Site Measurements

This section provides a summary of the measurements collected at the site. Actual measurements locations at which these data points were collected are included in the RF emission diagram provided in Section 12.3 of this report. Two types of measurements were collected at each measurement location: maximum (peak) and spatial average. The spatial average measurement consists of a collection of ten (10) measurements within a ten (10) second time interval taken from zero (0) to six (6) feet in height. The purpose of this measurement technique is to identify the average power density over the dimensions of a typical human body.

Table 1 below contains all the measurements collected from accessible areas located at the site at the time of Sitesafe's visit. Whenever possible, measurements are taken in front of the antenna in the transmitting direction. However, because of the antenna configuration at this site, specific emissions could not be discerned from nearby facilities, and no attempt was made to determine power density levels from a specific transmitting antenna.

Highest Measured Occupational Level: <1%

This value is equal to:

Highest General Public Level: <5%.

Measurements Points	Spatial Average	Maximum	Measurements Points	Spatial Average	Maximum
M1	<1 %	<1 %	M14	<1 %	<1 %
M2	<1 %	<1 %	M15	<1 %	<1 %
M3	<1 %	<1 %	M16	<1 %	<1 %
M4	<1 %	<1 %	M17	<1 %	<1 %
M5	<1 %	<1 %	M18	<1 %	<1 %
M6	<1 %	<1 %	M19	<1 %	<1 %
M7	<1 %	<1 %	M20	<1 %	<1 %
M8	<1 %	<1 %	M21	<1 %	<1 %
M9	<1 %	<1 %	M22	<1 %	<1 %
M10	<1 %	<1 %	M23	<1 %	<1 %
M11	<1 %	<1 %	M24	<1 %	<1 %
M12	<1 %	<1 %	M25	<1 %	<1 %
M13	<1 %	<1 %	M26	<1 %	<1 %

RF meters and probes have been calibrated and used according to the manufacturer's specifications. Measurements provide a view of the MPE percentage levels at the site at the time of Sitesafe's site visit and are used to validate modeling results. Theoretical modeling is used for determining compliance and the percentage of MPE contributions.

An RF Emission diagram has been included in section 12.3 of this document. All measurement locations are identified in this diagram. The locations of measurements in the RF Emission diagram can be cross referenced with Table 1 (above) to determine the actual spatial average and maximum measurement value per location.

12.5 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was verified on site, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 18 - Sonoma Mountain. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory and representative photographs were obtained or verified during the site visit and were utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBi)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	E1	Generic	Aperture	6	6615	255	36.36	2	71.1	EIRP	dBmW	1	7854.9	6	0	0
2	E2	Generic	Aperture	6	6585	165	36.36	2	62.3	EIRP	dBmW	1	1035.4	9.8	0	0
3	E3	Generic	Yagi	1.2	450	260	9.97	60	100	ERP	Watt	1	100	13.5	0	0
4	E4	Generic	Aperture	6	6675	300	36.36	2	71.3	EIRP	dBmW	1	8225	10.8	0	0
5	E5	Generic	Aperture	6	6655	300	36.36	2	58	EIRP	dBmW	1	384.1	14.8	0	0
6	E6	Generic	Aperture	6	6550	60	36.36	2	61	EIRP	dBmW	1	767.1	17.3	0	0
7	E7	Generic	Panel	2.2	5800	150	16.01	90	20	ERP	Watt	1	20	17.6	0	0
8	E8	Generic	Aperture	6	6645	265	36.36	2	61.3	EIRP	dBmW	1	822	19.5	0	0
9	E9	Generic	Yagi	1.2	450	140	9.97	60	100	ERP	Watt	1	100	21.5	0	0
10	E10	Generic	Aperture	8	6550	300	39.06	2	61	EIRP	dBmW	1	767.1	19.5	0	0
11	E11	Generic	Yagi	1.2	450	180	9.97	60	100	ERP	Watt	1	100	20	0	0
12	E12	Generic	Aperture	2	10705	180	31.16	2	56.9	EIRP	dBmW	1	298.2	22.5	0	0
13	E13	Generic	Aperture	6	6655	130	36.36	2	58	EIRP	dBmW	1	384.1	21.5	0	0
14	E14	Generic	Aperture	4	2400	260	22.96	2	4	ERP	Watt	1	4	24.5	0	0
15	E15	Generic	Yagi	1.2	450	0	9.97	60	100	ERP	Watt	1	100	24.5	0	0
16	E16	Generic	Aperture	4	11000	0	37.66	2	0.01	TPO	Watt	1	58.3	28	0	0
17	E17	Generic	Aperture	4	2400	270	22.96	2	4	ERP	Watt	1	4	28	0	0
18	E18	Generic	Aperture	6	6550	150	36.36	2	61	EIRP	dBmW	1	767.1	29	0	0
19	E19	Generic	Aperture	4	6655	130	32.86	2	58	EIRP	dBmW	1	384.1	19.5	0	0
20	E20	Generic	Aperture	4	6695	160	32.86	2	54.3	EIRP	dBmW	1	164	37	0	0
21	E21	Generic	Yagi	1.2	450	270	9.97	60	100	ERP	Watt	1	100	23	0	0
22	E22	Generic	Yagi	1.2	450	270	9.97	60	100	ERP	Watt	1	100	27	0	0
23	E23	Generic	Yagi	1.2	450	270	9.97	60	100	ERP	Watt	1	100	33	0	0
24	E24	Generic	Yagi	1.2	450	270	9.97	60	100	ERP	Watt	1	100	37	0	0
25	E25	Generic	Aperture	6	6034	180	32.86	2	65.9	EIRP	dBmW	1	2372	30.5	0	0
26	E26	Generic	Aperture	6	6063	330	36.36	2	65.8	EIRP	dBmW	1	2317.7	33.5	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
27	E27	Generic	Aperture	6	6034	330	36.36	2	64.5	EIRP	dBmW	1	1718.3	36.5	0	0
28	E28	Generic	Yagi	1.2	450	90	9.97	60	100	ERP	Watt	1	100	35.5	0	0
29	E29	Generic	Yagi	1.2	450	90	9.97	60	100	ERP	Watt	1	100	40.5	0	0
30	E30	Generic	Omni	10	150	90	0	360	100	ERP	Watt	1	100	44	0	0
31	E31	Generic	Aperture	6	6063	180	36.36	2	64.5	EIRP	dBmW	1	1718.3	40	0	0
32	E32	Generic	Omni	20	450	330	10.81	360	100	ERP	Watt	1	100	53.5	0	0
33	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	18	0	0
34	UNKNOWN OPERATOR	Generic	Yagi	0.5	850	90	9.97	60	1	TPO	Watt	1	9.9	12	0	0
35	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	15	0	0
36	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	18	0	0
37	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	20	0	0
38	UNKNOWN OPERATOR	Generic	Omni	1.5	850	0	0.01	360	1000	ERP	Watt	1	1000	15	0	0
39	UNKNOWN OPERATOR	Generic	Omni	14	850	0	9.97	360	1000	ERP	Watt	1	1000	25	0	0
40	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	15	0	0
41	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	20	0	0
42	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	15	0	0
43	UNKNOWN OPERATOR	Generic	Omni	24	850	0	11.97	360	1000	ERP	Watt	1	1000	30	0	0
44	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	15	0	0
45	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	15	0	0
46	UNKNOWN OPERATOR	Generic	Yagi	0.5	850	0	9.97	60	1	TPO	Watt	1	9.9	12	0	0
47	UNKNOWN OPERATOR	Generic	Omni	14	850	0	9.97	360	1000	ERP	Watt	1	1000	15	0	0
48	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	60	0	0
49	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	65	0	0
50	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	75	0	0
51	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	80	0	0
52	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	83	0	0
53	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	85	0	0
54	UNKNOWN OPERATOR	Generic	Aperture	3	5800	330	29.06	2	20	ERP	Watt	1	20	90	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
55	UNKNOWN OPERATOR	Generic	Omni	9.5	450	0	5.97	360	100	ERP	Watt	1	100	93	0	0
56	UNKNOWN OPERATOR	Generic	Omni	1.5	850	0	0.01	360	1000	ERP	Watt	1	1000	97	0	0
57	UNKNOWN OPERATOR	Generic	Omni	1.5	850	0	0.01	360	1000	ERP	Watt	1	1000	107	0	0
58	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	170	10.01	90	4	ERP	Watt	1	4	109	0	0
59	UNKNOWN OPERATOR	Generic	Omni	9.5	450	0	5.97	360	100	ERP	Watt	1	100	115	0	0
60	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	100	ERP	Watt	1	100	120	0	0
61	UNKNOWN OPERATOR	Generic	Yagi	0.5	850	160	9.97	60	1	TPO	Watt	1	9.9	125	0	0
62	UNKNOWN OPERATOR	Generic	Panel	1.7	2400	300	12.01	90	4	ERP	Watt	1	4	135	0	0
63	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	135	0	0
64	UNKNOWN OPERATOR	Generic	Omni	9.5	450	0	5.97	360	100	ERP	Watt	1	100	145	0	0
65	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	150	0	0
66	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	150	0	0
67	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	165	0	0
68	UNKNOWN OPERATOR	Generic	Omni	9.5	450	0	5.97	360	100	ERP	Watt	1	100	180	0	0
69	UNKNOWN OPERATOR	Generic	Omni	20	450	0	10.81	360	100	ERP	Watt	1	100	180	0	0
70	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	180	0	0
71	UNKNOWN OPERATOR	Generic	Omni	9.5	450	0	5.97	360	100	ERP	Watt	1	100	180	0	0
72	P1	Generic	Aperture	6	6000	183.4	36.36	2	65	EIRP	dBmW	1	1928	25	0	0
73	P2	Generic	Aperture	6	6000	251.3	36.36	2	65	EIRP	dBmW	1	1928	36	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other carriers at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to carrier, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

12.6 Site Pictures



Figure 60: 40' Tower Overview Southeast



Figure 61: 40' Tower Overview West



Figure 62: 40' Tower Overview Northeast



Figure 63: 40' Tower Overview North



Figure 64: 185' Tower Overview North



Figure 65: 185' Tower Overview West



Figure 66: Equipment Overview Northeast

13 Stewart Point



Marin Emergency Radio Authority

Site Name – Stewart Point

Site ID: 19

Site Compliance Report

**315 Paradise Valley Rd
Bolinas, CA 94924**

Site visit date: August 23, 2018
Site visit time: 1:00 PM
Site survey by: Jeff Desira

Latitude: N37-55-49.40
Longitude: W122-43-12.70
Structure Type: Monopole

Report generated date: March 28, 2019
Report by: Sam Cosgrove
Customer Contact: David Mortimer

The site is compliant and will remain complaint upon implementation of the proposed changes.

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13.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine whether the proposed communications site, 19 - Stewart Point, located at 315 Paradise Valley Rd, Bolinas, CA, is in compliance with Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

Sitesafe's field personnel visited 19 - Stewart Point on August 23, 2018. This section contains a detailed summary of the RF environment at the site including:

- Site compliance determination;
- Photographs of the site;
- Diagram of the site;
- Inventory of the make / model of all transmitting antennas found on the site (where possible);
- Record of any Maximum Permissible Exposure ("MPE") measurements taken on the site, as applicable; and
- Theoretical MPE based on modeling.

RF emissions do not exceed MPE limits on the ground level. The area that exceeds MPE limits is on an inaccessible rooftop. Since the area is not accessed by general public, signage is not required. The RF emissions on the ground level do not pose a danger to personnel in the area.



13.2 Site Compliance

13.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, and a thorough review of site access procedures, RF hazard signage and visible antenna locations, Sitesafe has determined that:

The site is compliant with the FCC rules and regulations, as described in OET Bulletin 65, and will remain compliant upon implementation of the proposed changes.

The compliance determination is based on General Public MPE levels due to theoretical modeling and/or physical measurements, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant. Measurements have also been performed to validate the assumptions used in our theoretical modeling of this site.

Modeling is used for determining compliance and the percentage of MPE contribution. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results.

13.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on existing measurements and theoretical analysis of MPE levels. Sitesafe has documented the locations of any RF signs and barriers that are required for compliance. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

This site will be compliant with the FCC rules and regulations.

13.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the rooftop to be:

Maximum Cumulative Theoretical General Public MPE level (Existing Antennas) : 144.2%
Maximum Cumulative Theoretical General Public MPE level (All Antennas): 165.9%
Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 150.9%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

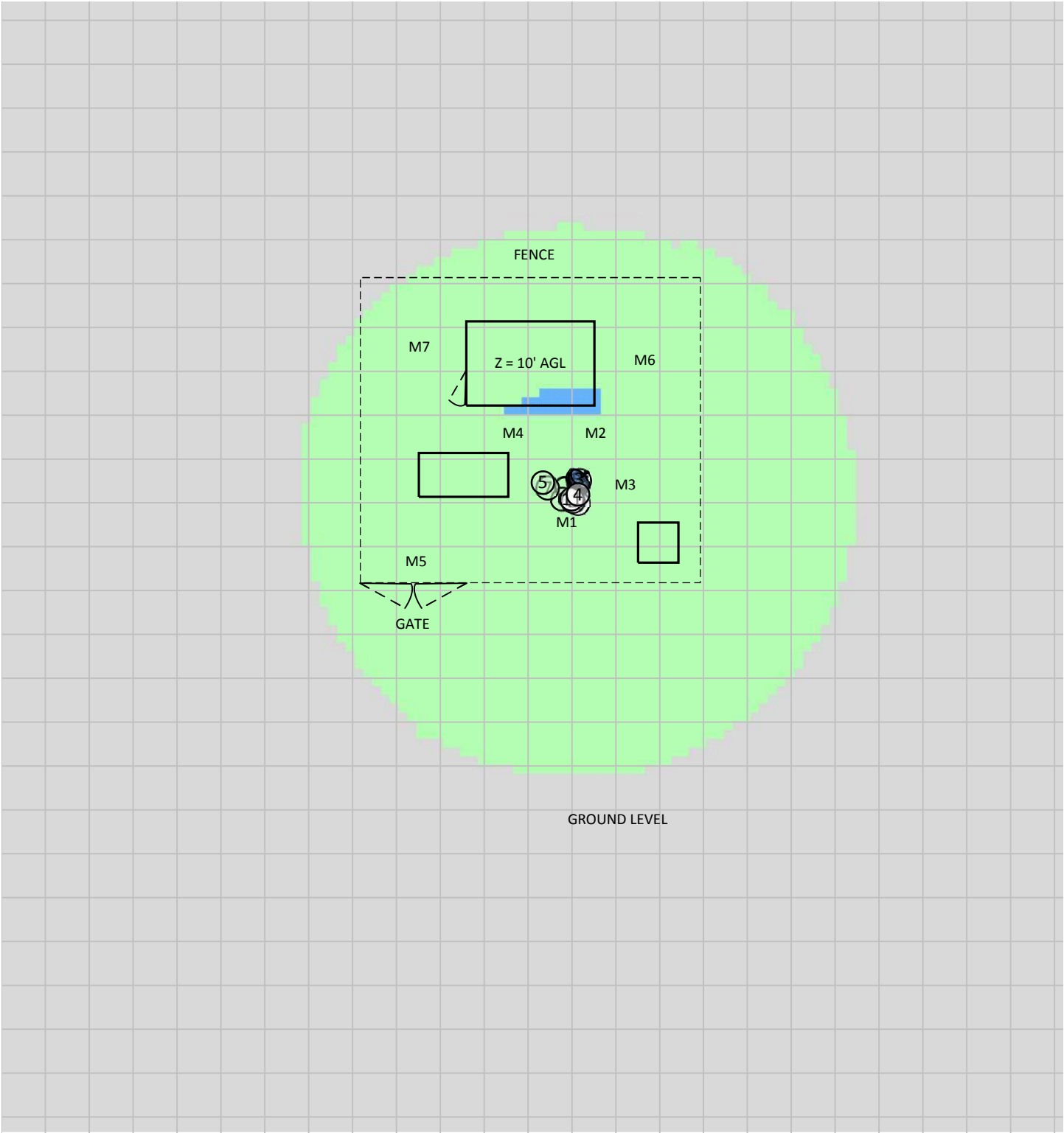


Abbreviations used in the RF Emissions Diagrams

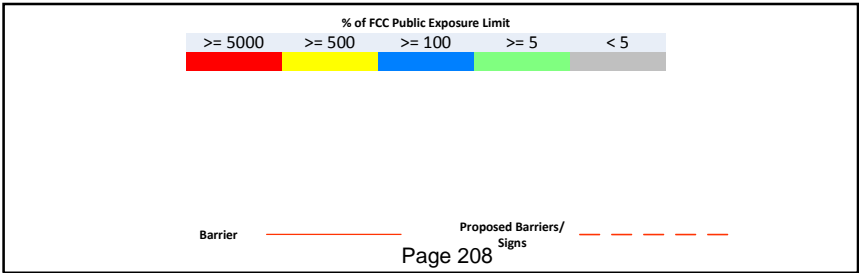
PH=##'	Penthouse at ## feet above main roof
M##	Measurement ## taken during a site visit

As discussed in Section 13.4, site measurement locations for spatial average measurements collected at the time of Sitesafe's visit have been added to the RF emissions diagram. While the theoretical modeling represents worst case MPE levels based on the assumption(s) detailed above, the measurement data is a snapshot of MPE levels at the time of our visit, and dependent on transmitter duty cycle, system implementation and emissions from other RF sources at nearby antenna sites.

RF Exposure Simulation For: Stewart Point
Existing Configuration



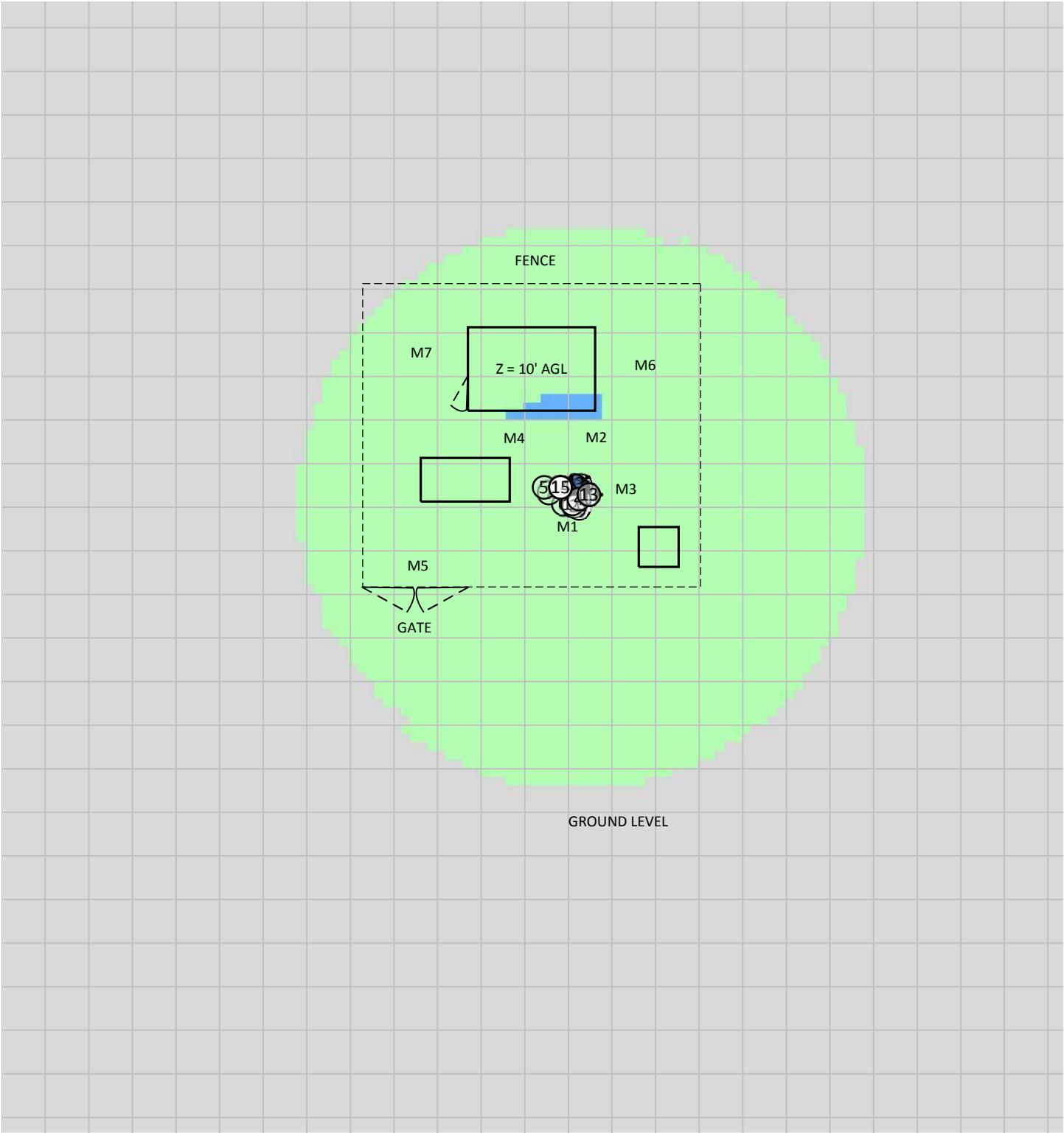
% of FCC Public Exposure Limit
Spatial average 0' - 6'



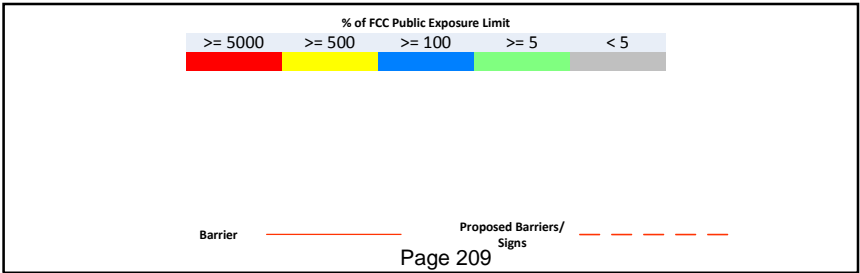
(Feet)
0 8.6 17.1
www.sitesafe.com
Site Name:Stewart Point
11/5/2018 1:33:54 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Stewart Point
All Antennas On Air



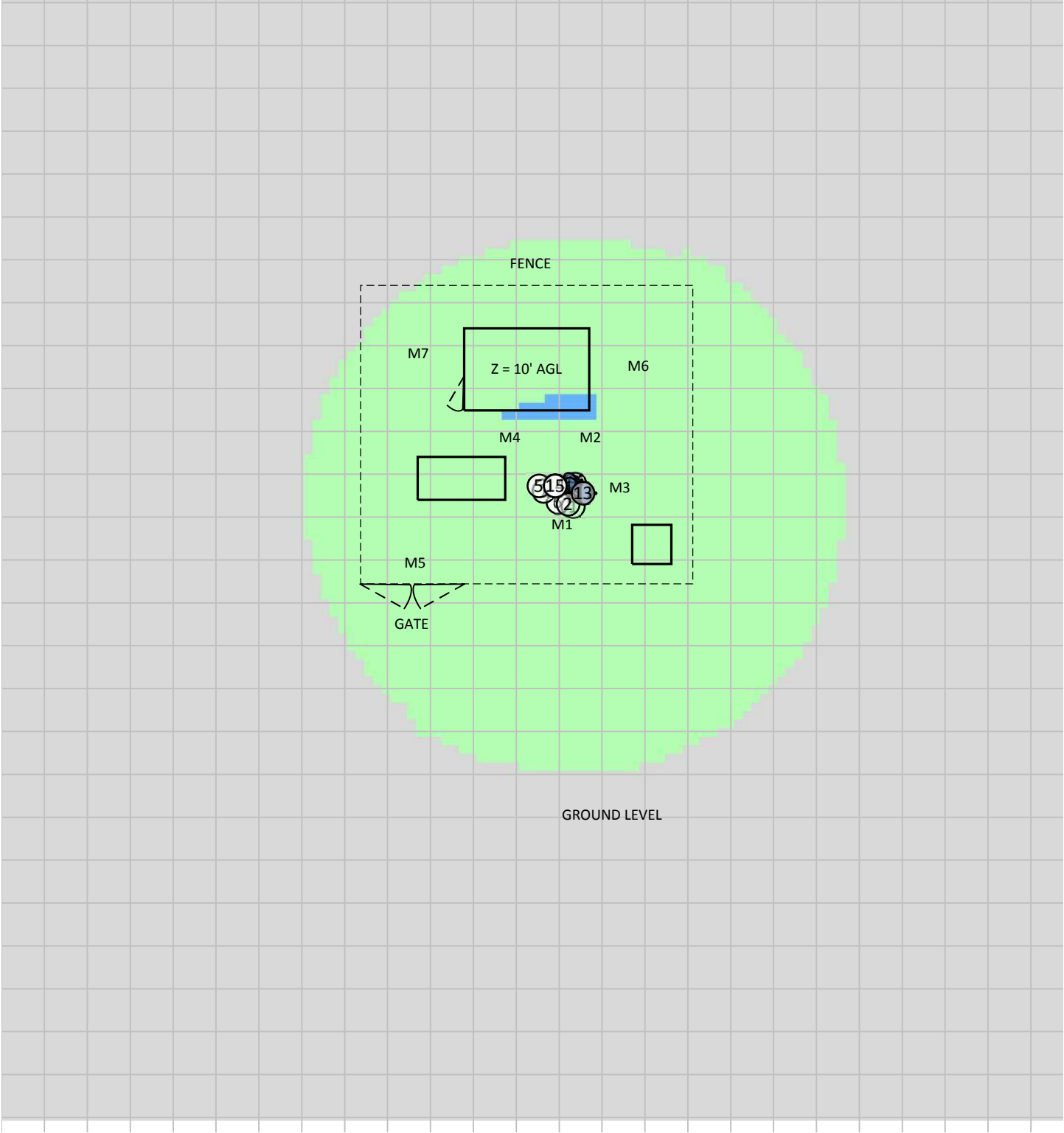
% of FCC Public Exposure Limit
Spatial average 0' - 6'



(Feet)
0 8.6 17.2
www.sitesafe.com
Site Name:Stewart Point
11/5/2018 1:38:54 PM

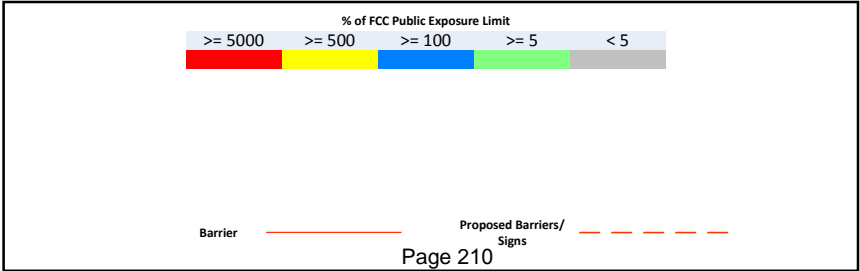
Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Stewart Point
Final Configuration



GROUND LEVEL

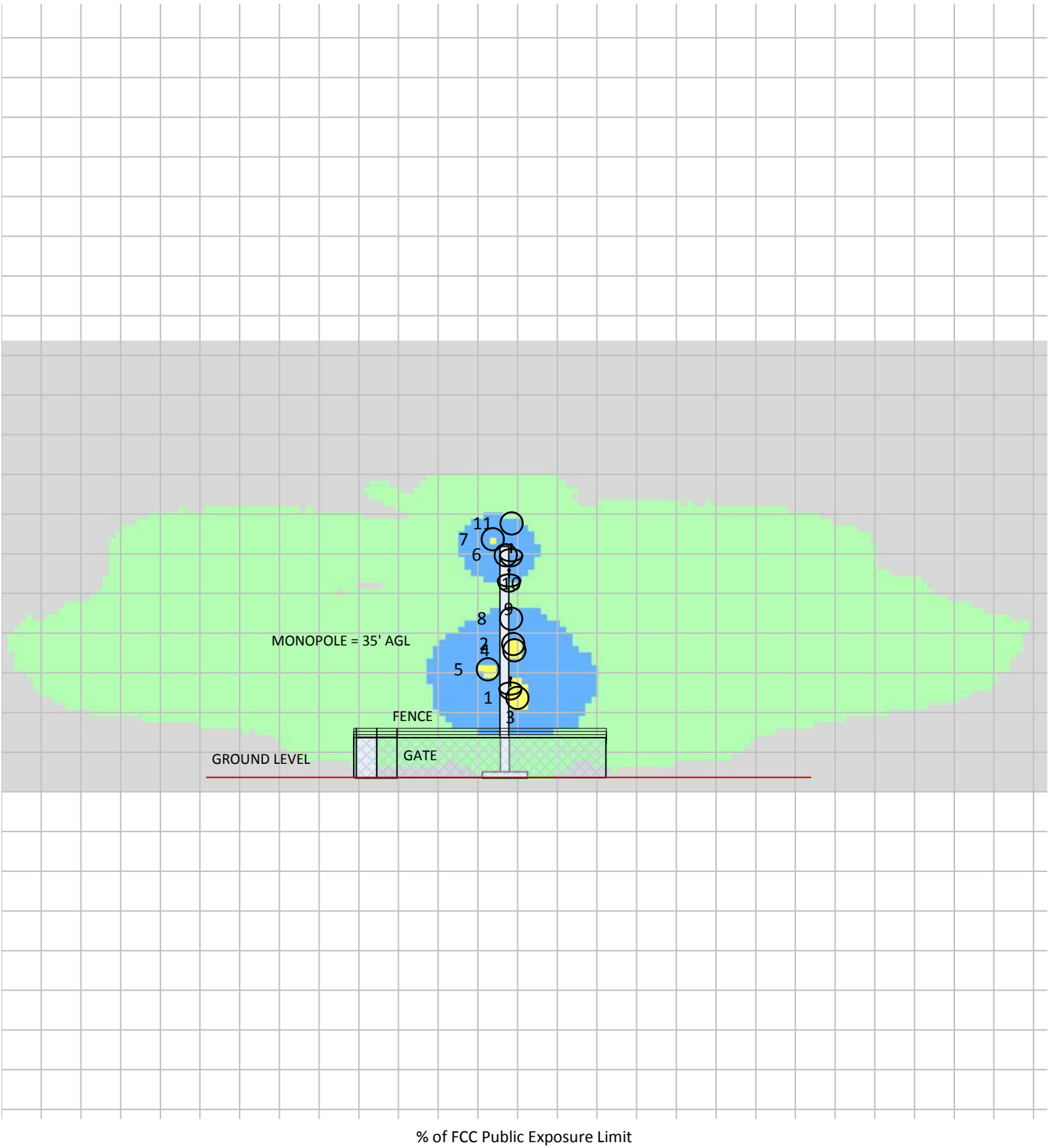
% of FCC Public Exposure Limit
Spatial average 0' - 6'



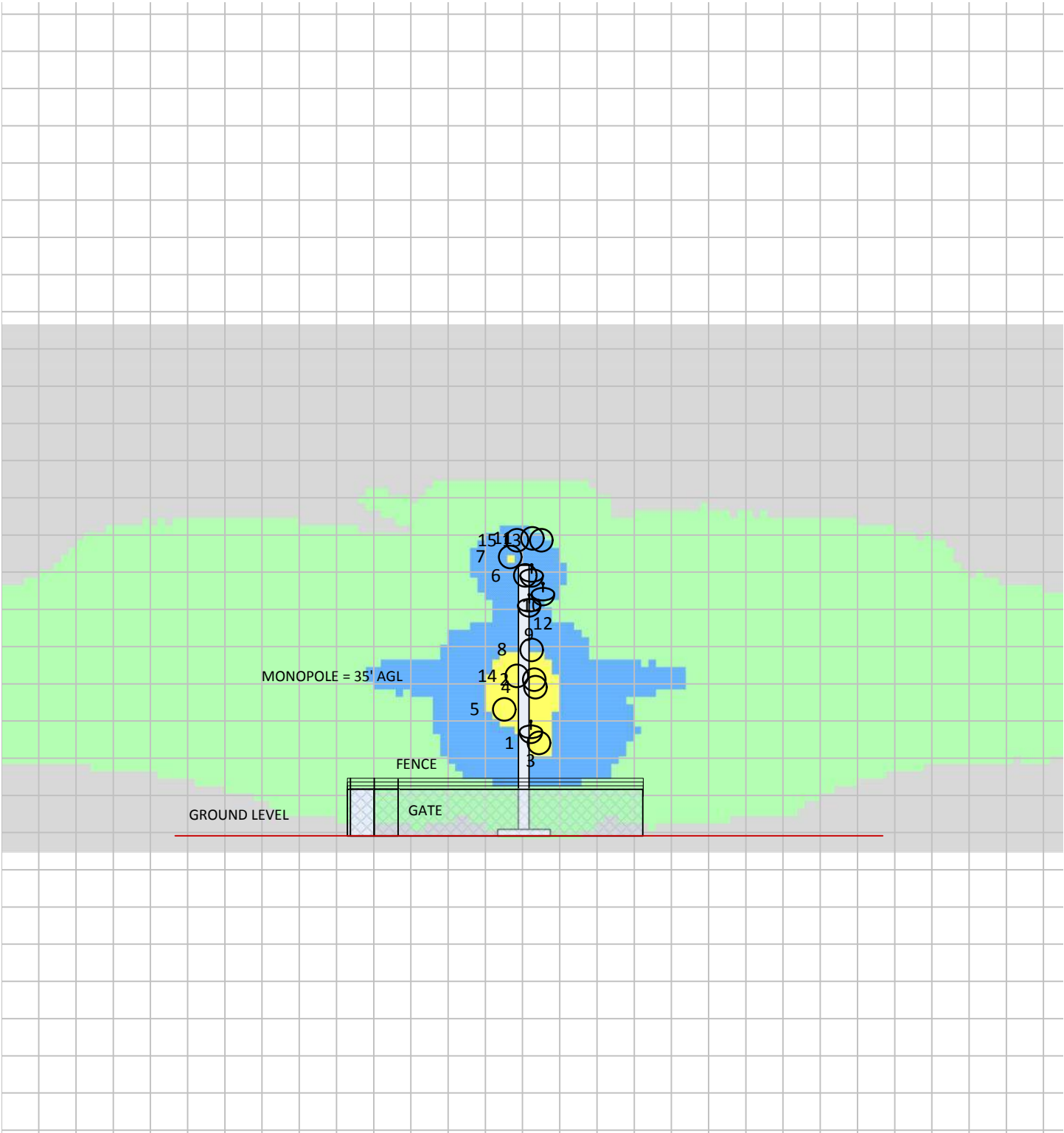
(Feet)
0 8.8 17.5
www.sitesafe.com
Site Name:Stewart Point
11/5/2018 1:40:11 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

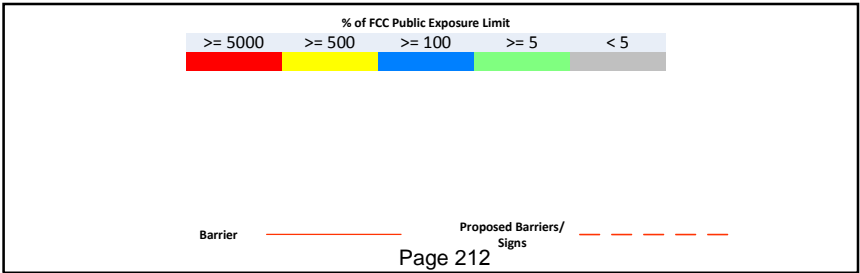
RF Exposure Simulation For: Stewart Point
Elevation View – Existing Configuration



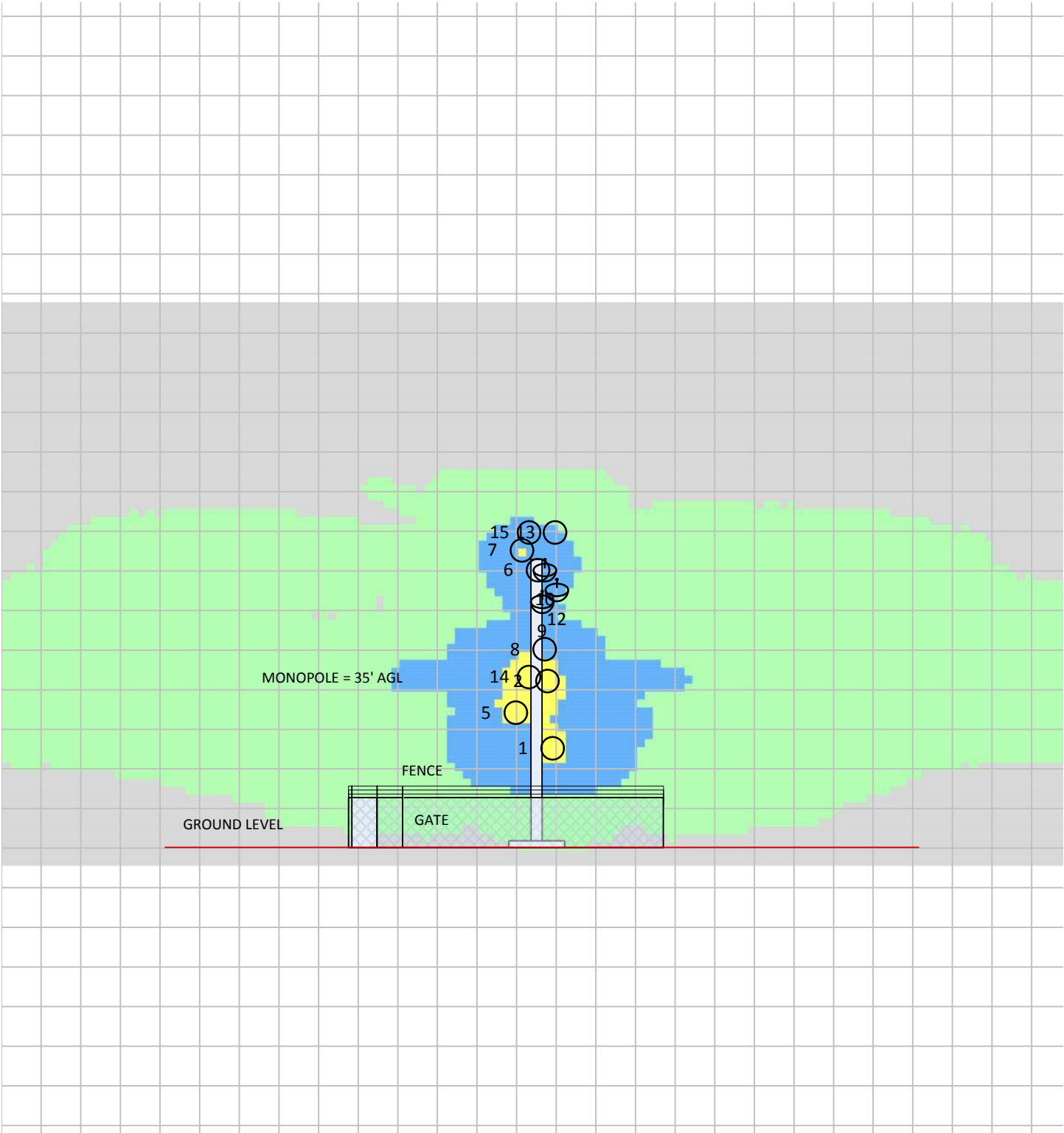
RF Exposure Simulation For: Stewart Point
Elevation View – All Antennas On Air



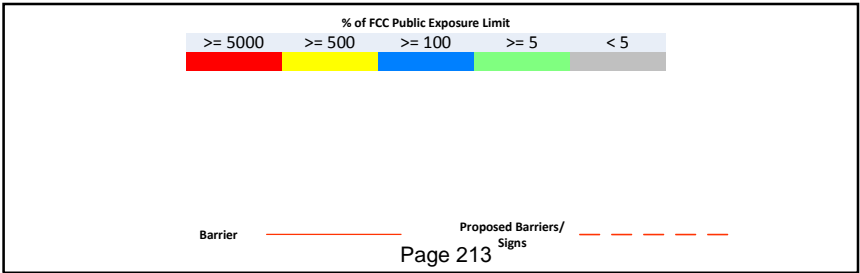
% of FCC Public Exposure Limit



RF Exposure Simulation For: Stewart Point
Elevation View – Final Configuration



% of FCC Public Exposure Limit



13.4 Site Measurements

This section provides a summary of the measurements collected at the site. Actual measurements locations at which these data points were collected are included in the RF emission diagram provided in Section 13.3 of this report. Two types of measurements were collected at each measurement location: maximum (peak) and spatial average. The spatial average measurement consists of a collection of ten (10) measurements within a ten (10) second time interval taken from zero (0) to six (6) feet in height. The purpose of this measurement technique is to identify the average power density over the dimensions of a typical human body.

Table 1 below contains all the measurements collected from accessible areas located at the site at the time of Sitesafe's visit. Whenever possible, measurements are taken in front of the antenna in the transmitting direction. However, because of the antenna configuration at this site, specific emissions could not be discerned from nearby facilities, and no attempt was made to determine power density levels from a specific transmitting antenna.

Highest Measured Occupational Level: 4.00%

This value is equal to:

Highest General Public Level: 20.00%.

Table 1: Spatial Average and Maximum Occupational Measurements					
Measurements Points	Spatial Average	Maximum	Measurements Points	Spatial Average	Maximum
M1	1 %	1 %	M16	<1 %	<1 %
M2	1 %	3 %	M17	<1 %	<1 %
M3	1 %	1 %	M18	<1 %	<1 %
M4	4 %	5 %	M19	<1 %	<1 %
M5	<1 %	1 %	M20	<1 %	<1 %
M6	<1 %	1 %	M21	<1 %	<1 %
M7	<1 %	1 %	M22	<1 %	<1 %
M8	<1 %	<1 %	M23	<1 %	<1 %
M9	<1 %	<1 %	M24	<1 %	<1 %
M10	<1 %	<1 %	M25	<1 %	<1 %
M11	<1 %	<1 %	M26	<1 %	<1 %
M12	<1 %	<1 %	M27	<1 %	<1 %
M13	<1 %	<1 %	M28	<1 %	<1 %
M14	<1 %	<1 %	M29	<1 %	<1 %
M15	<1 %	<1 %			



RF meters and probes have been calibrated and used according to the manufacturer's specifications. Measurements provide a view of the MPE percentage levels at the site at the time of Sitesafe's site visit and are used to validate modeling results. Theoretical modeling is used for determining compliance and the percentage of MPE contributions.

An RF Emission diagram has been included in section 13.3 of this document. All measurement locations are identified in this diagram. The locations of measurements in the RF Emission diagram can be cross referenced with Table 1 (above) to determine the actual spatial average and maximum measurement value per location.

13.5 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was verified on site, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 19 - Stewart Point. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other carriers at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to carrier, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory and representative photographs were obtained or verified during the site visit and were utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	E1	Generic	Omni	9	90	160	2	360	100	TPO	Watt	1	100	12.5	0	0
2	E2	Generic	Omni	12.5	150	160	2.87	360	100	ERP	Watt	1	100	21	0	0
3	E3	Generic	Aperture	4	11000	50	37.66	0	63.4	EIRP	dBmW	1	1333.5	14	0	0
4	E4	Generic	Omni	9.5	450	100	5.97	360	200	ERP	Watt	1	200	20	0	0
5	E5	Generic	Omni	9.5	450	300	5.97	360	200	ERP	Watt	1	200	17	0	0
6	E6	Generic	Omni	9.5	450	180	5.97	360	200	ERP	Watt	1	200	35	0	0
7	E7	Generic	Omni	9.5	450	320	5.97	360	200	ERP	Watt	1	200	37.5	0	0
8	E8	Generic	Yagi	1.2	450	60	9.97	60	100	ERP	Watt	1	100	25	0	0
9	E9	Generic	Aperture	3	5800	50	29.06	0	20	ERP	Watt	1	20	31	0	0
10	E10	Generic	Aperture	4	2400	50	22.96	0	4	ERP	Watt	1	4	35	0	0
11	E11	Generic (Rx)	Omni	10	450	60	2	360	0	ERP	Watt	1	0	40	0	0
12	P1	Generic	Aperture	4	11000	90.7	37.66	0	63.4	EIRP	dBmW	1	1333.5	32.5	0	0
13	P2 (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	39.8	0	0
14	P3	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	21.5	0	0
15	P5 (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	39.8	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

13.6 Site Pictures



Figure 67: Monopole Overview South



Figure 68: Monopole Overview East



Figure 69: Monopole Base



Figure 70: Equipment

14 Tomales



Marin Emergency Radio Authority

Site Name – Tomales

Site ID: 20

Site Compliance Report

**28775 Shoreline Hwy
Tomales, CA 94971**

Latitude: N38-15-39.71

Longitude: W122-54-12.94

Structure Type: Monopole

Report generated date: March 28, 2019

Report by: Sam Cosgrove

Customer Contact: David Mortimer

The site is compliant and will remain compliant upon implementation of the proposed changes.

© 2019 Sitesafe, LLC., Vienna, VA



14.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at the proposed communications site, 20 - Tomales, located at 28775 Shoreline Hwy, Tomales, CA, in relation to Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

This section contains a detailed summary of the RF environment at the site including:

- Diagram of the site
- Inventory of the make / model of all antennas
- Theoretical MPE based on modeling

RF emissions do not exceed MPE limits on the ground level. The area that exceeds MPE limits is on an inaccessible rooftop. Since the area is not accessed by general public, signage is not required. The RF emissions on the ground level do not pose a danger to personnel in the area.



14.2 Site Compliance

14.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, Sitesafe has determined that:

The site is compliant with the FCC rules and regulations, as described in OET Bulletin 65 and will remain compliant upon implementation of the proposed changes.

The compliance determination is based on theoretical modeling, RF signage placement recommendations, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant.

14.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on theoretical analysis of MPE levels. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

The site is compliant with the FCC rules and regulations and will remain compliant upon implementation of the proposed changes.

14.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the rooftop to be:

Maximum Cumulative Theoretical General Public MPE level (All Antennas): 196.8%
Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 196.8%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

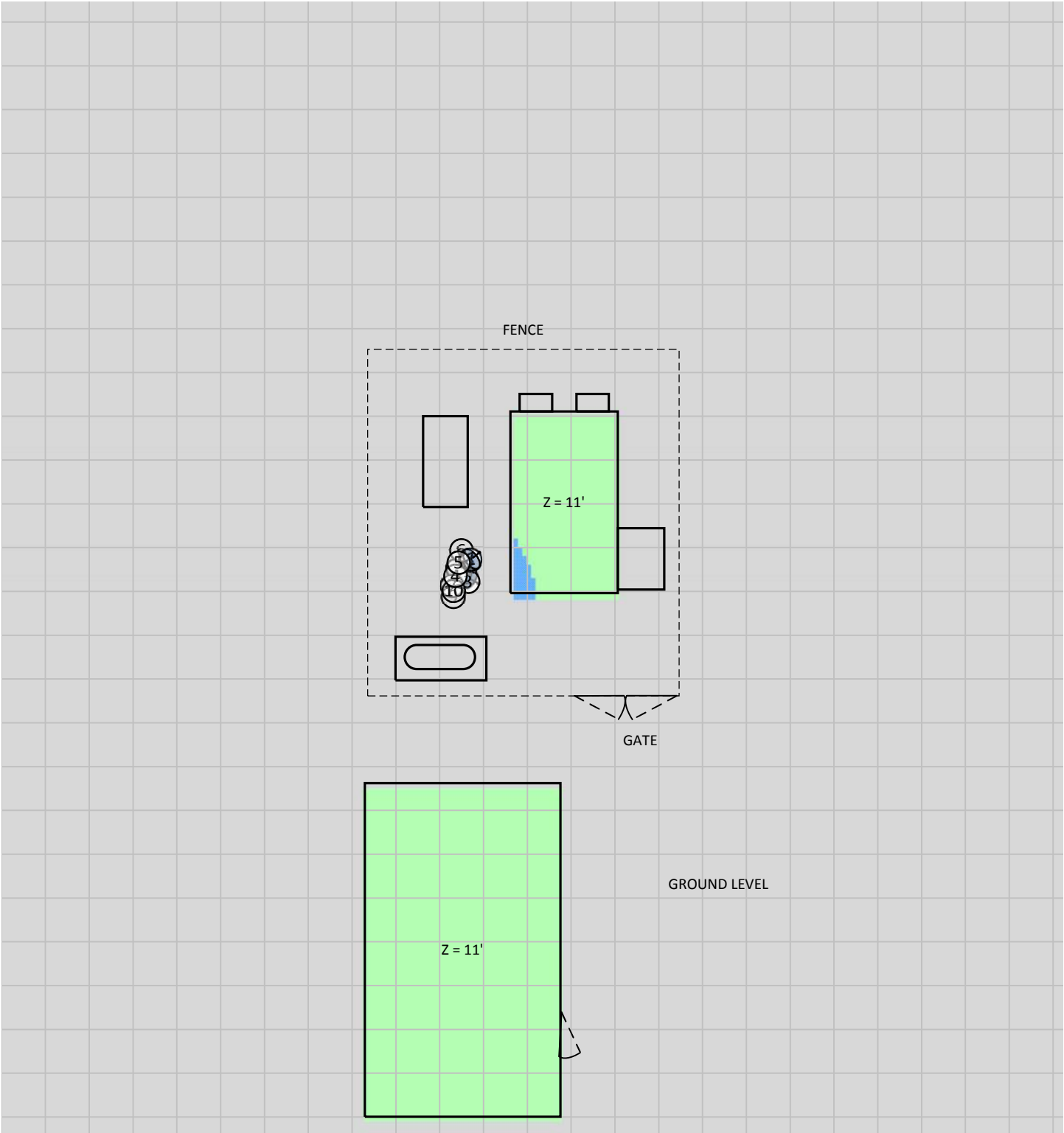
Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

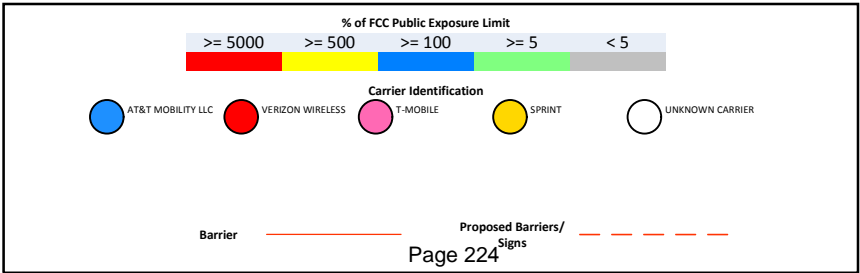
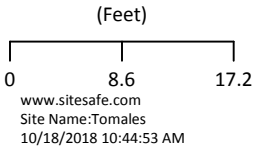
Abbreviations used in the RF Emissions Diagrams

PH=##'	Penthouse at ## feet above main roof
--------	--------------------------------------

RF Exposure Simulation For: Tomales
Final Configuration



% of FCC Public Exposure Limit
Spatial average 0' - 6'



CENTERLINE = 74' 9"

CENTERLINE = 58' 6"

CENTERLINE = 40'

CENTERLINE = 29'

CENTERLINE = 26'

CENTERLINE = 20' 9"

CENTERLINE = 17' 9"

CENTERLINE = 15'

Z = 11' AGL

GROUND LEVEL

% of FCC Public Exposure Limit

Carrier	Barrier Type	Exposure Limit
AT&T MOBILITY LLC	Barrier	>= 5000
VERIZON WIRELESS	Barrier	>= 5000
T-MOBILE	Barrier	>= 500
SPRINT	Barrier	>= 500
UNKNOWN CARRIER	Barrier	>= 500
	Barrier	>= 100
	Barrier	>= 5
	Barrier	< 5

Carrier Identification

- AT&T MOBILITY LLC
- VERIZON WIRELESS
- T-MOBILE
- SPRINT
- UNKNOWN CARRIER

Barrier ————— **Proposed Barriers/Signs** - - - - -

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14.4 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was provided by the customer, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 20 - Tomales. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory was provided by the customer and was utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Len (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	POWER	POWER TYPE	POWER UNITS	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	P1	Generic	Aperture	6	6000	71	36.36	2	0.01	TPO	Watt	1	43.3	15	0	0
2	P2	Generic	Aperture	4	11000	140	37.66	2	0.01	TPO	Watt	1	58.3	40	0	0
3	P3	Sinclair SC476-HF1LDF	Omni	7	746	0	6.06	360	1000	ERP	Watt	1	1000	58.5	0	0
4	P5	Rfi CC807-08 (Rx)	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	74.8	0	0
5	P6	Rfi CC807-08 (Rx)	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	74.8	0	0
6	P7	Andrew DB404	Omni	5	450	0	3.81	360	100	ERP	Watt	1	100	29	0	0
7	P8	Andrew DB404	Omni	5	450	0	3.81	360	100	ERP	Watt	1	100	29	0	0
8	P9	Generic	Omni	10	450	0	0	360	100	ERP	Watt	1	100	20.8	0	0
9	P10	Antel BCD-7506-EDIN-X-25	Omni	6.6	746	0	5.4	360	1000	ERP	Watt	1	1000	17.8	0	0
10	P11	Antel BCD-7506-EDIN-X-25	Omni	6.6	746	0	5.4	360	1000	ERP	Watt	1	1000	26	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

15 Coyote Peak



Marin Emergency Radio Authority Site Name – Coyote Peak Site ID: 21 Site Compliance Report

**Near 1700 Marshall Petaluma Rd
Petaluma, CA 94954**

Latitude: N38-11-09.00
Longitude: W122-49-30.60
Structure Type: Monopole

Report generated date: March 28, 2019
Report by: Sam Cosgrove
Customer Contact: David Mortimer

**The site is compliant and will remain
compliant upon implementation of
the proposed changes.**

© 2019 Sitesafe, LLC., Vienna, VA



15.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at the proposed communications site, 21 - Coyote Peak, located at Near 1700 Marshall Petaluma Rd, Petaluma, CA, in relation to Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

This section contains a detailed summary of the RF environment at the site including:

- Diagram of the site
- Inventory of the make / model of all antennas
- Theoretical MPE based on modeling

RF emissions are predicted to be below 1% MPE in all areas on this site.



15.2 Site Compliance

15.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, Sitesafe has determined that:

The site is compliant with the FCC rules and regulations, as described in OET Bulletin 65 and will remain compliant upon implementation of the proposed changes.

The compliance determination is based on theoretical modeling, RF signage placement recommendations, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant.

15.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on theoretical analysis of MPE levels. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

The site is compliant with the FCC rules and regulations.

15.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the ground to be:

Maximum Cumulative Theoretical General Public MPE level (All Antennas): <1%
Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): <1%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

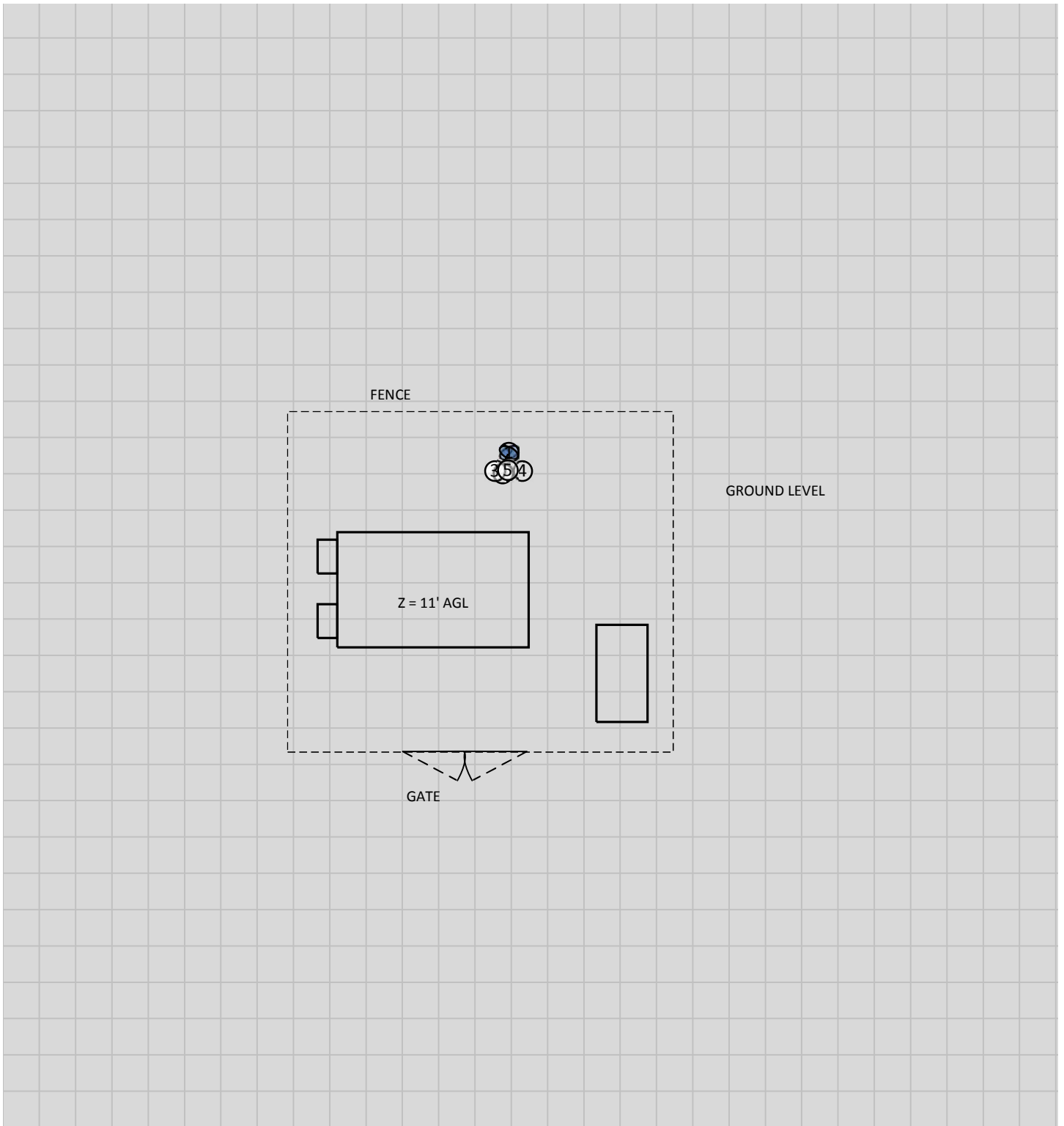
Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

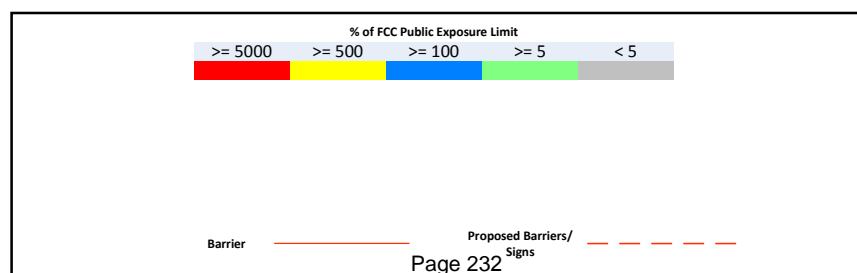
Abbreviations used in the RF Emissions Diagrams

PH=##'	Penthouse at ## feet above main roof
--------	--------------------------------------

RF Exposure Simulation For: Coyote Peak Final Configuration



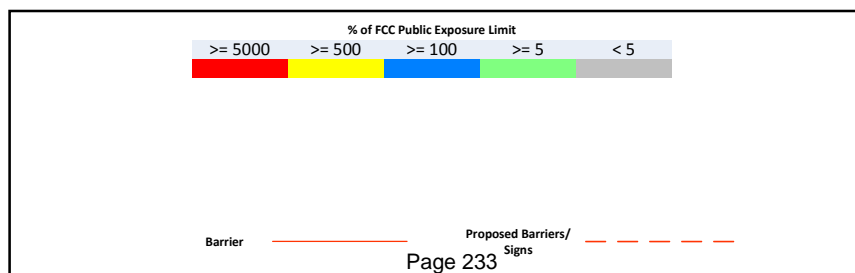
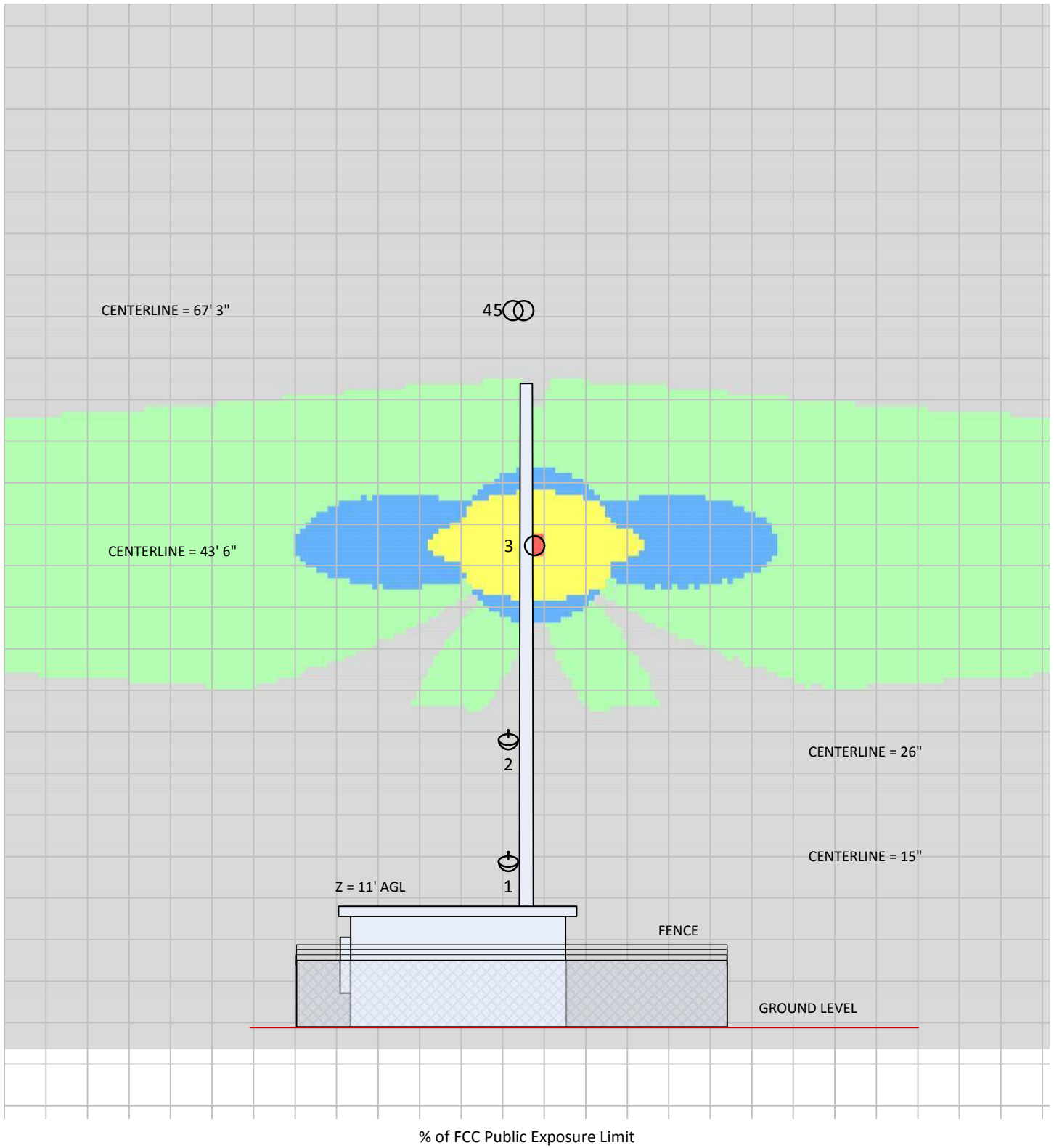
% of FCC Public Exposure Limit
Spatial average 0' - 6'



(Feet)
0 7.3 14.5
www.sitesafe.com
Site Name: Coyote Peak
3/27/2019 2:33:00 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Coyote Peak Elevation View – Final Configuration



15.4 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was provided by the customer, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 21 - Coyote Peak. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory was provided by the customer and was utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Len (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	POWER	POWER TYPE	POWER UNITS	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	P1	Generic	Aperture	3	11000	197.3	37.66	2	0.01	TPO	Watt	1	58.3	15	0	0
2	AMERA	Generic	Aperture	3	11000	320.5	37.66	2	0.01	TPO	Watt	1	58.3	26	0	0
3	AMERA	Generic	Omni	4.7	450	0	2.97	360	1000	ERP	Watt	1	1000	43.5	0	0
4	AMERA (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	64.8	0	0
5	AMERA (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	64.8	0	0

16 Skyview Terrace



Marin Emergency Radio Authority Site Name – Skyview Terrace Site ID: 22 Site Compliance Report

**Near 70 Skyview Terrace
San Rafael, CA 94903**

Latitude: N38-1-01.20
Longitude: W122-32-45.60
Structure Type: Monopole

Report generated date: March 28, 2019
Report by: Sam Cosgrove
Customer Contact: David Mortimer

**The site is compliant and will remain
compliant upon implementation of the
proposed changes.**

© 2019 Sitesafe, LLC., Vienna, VA



16.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine whether the proposed communications site, 22 - Skyview Terrace, located at Near 70 Skyview Terrace, San Rafael, CA, is in compliance with Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

This section contains a detailed summary of the RF environment at the site including:

- Diagram of the site
- Inventory of the make / model of all antennas
- Theoretical MPE based on modeling

RF emissions are predicted to be below 1% MPE in all areas on this site.



16.2 Site Compliance

16.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, Sitesafe has determined that:

The site is compliant with the FCC rules and regulations, as described in OET Bulletin 65 and will remain compliant upon implementation of the proposed changes.

The compliance determination is based on theoretical modeling, RF signage placement recommendations, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant.

16.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on theoretical analysis of MPE levels. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

The site is compliant with the FCC rules and regulations and will remain compliant upon implementation of the proposed changes.

16.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the ground to be:

Maximum Cumulative Theoretical General Public MPE level (All Antennas): <1%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin
and

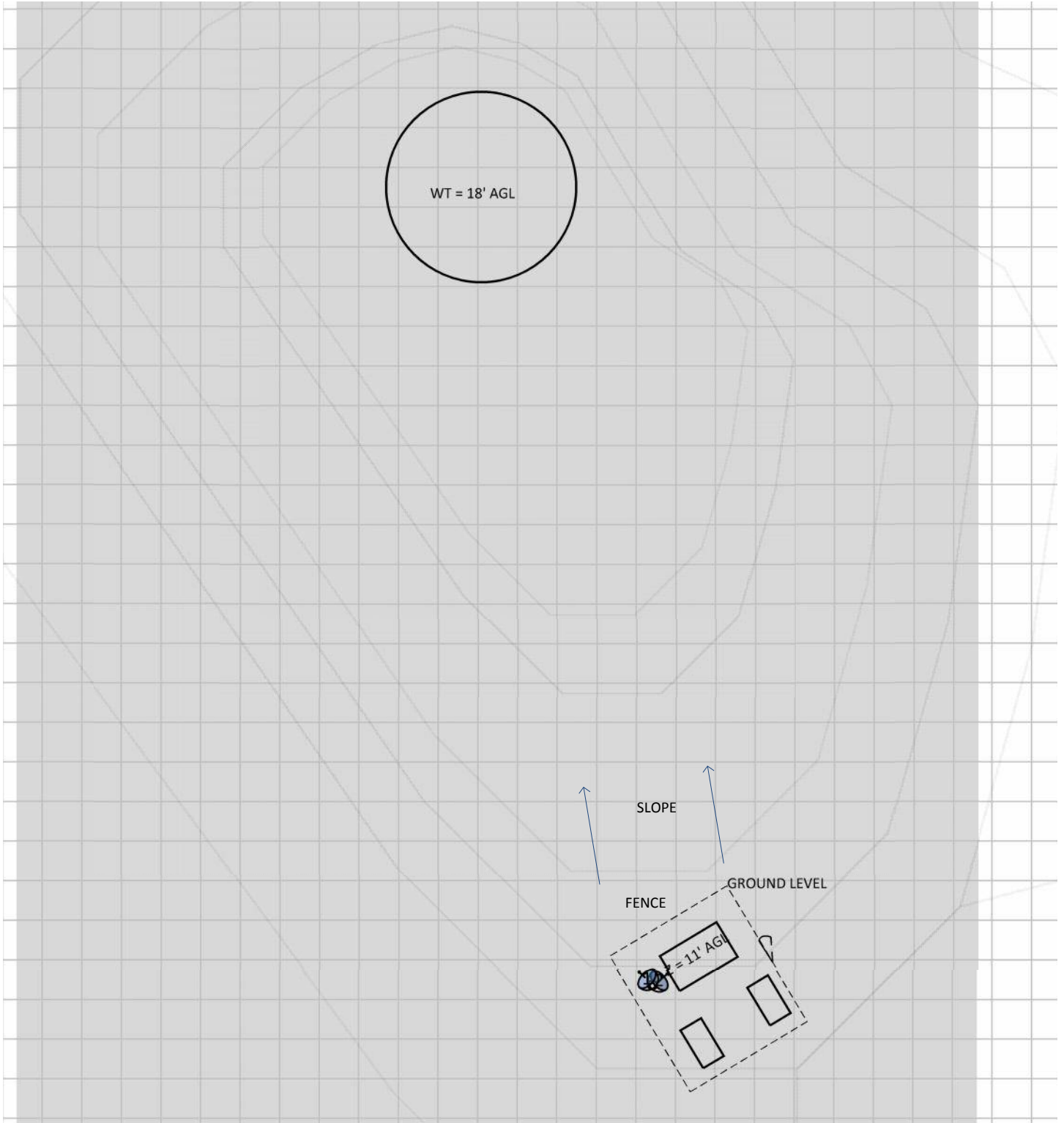
Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

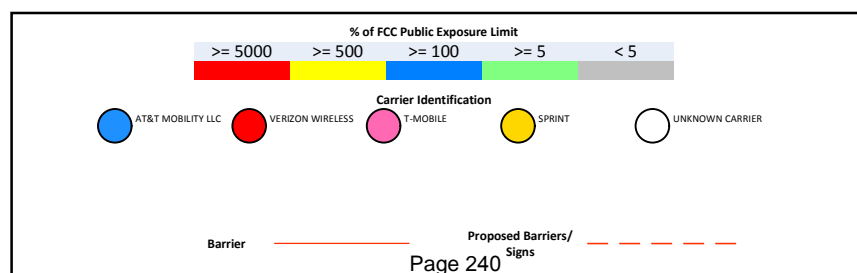
Abbreviations used in the RF Emissions Diagrams

PH=##'	Penthouse at ## feet above main roof
--------	--------------------------------------

RF Exposure Simulation For: Skyview Terrace



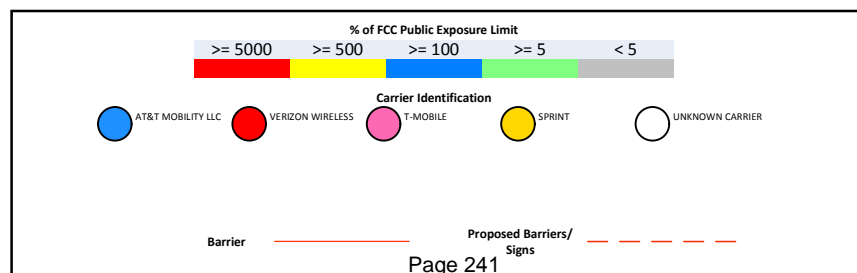
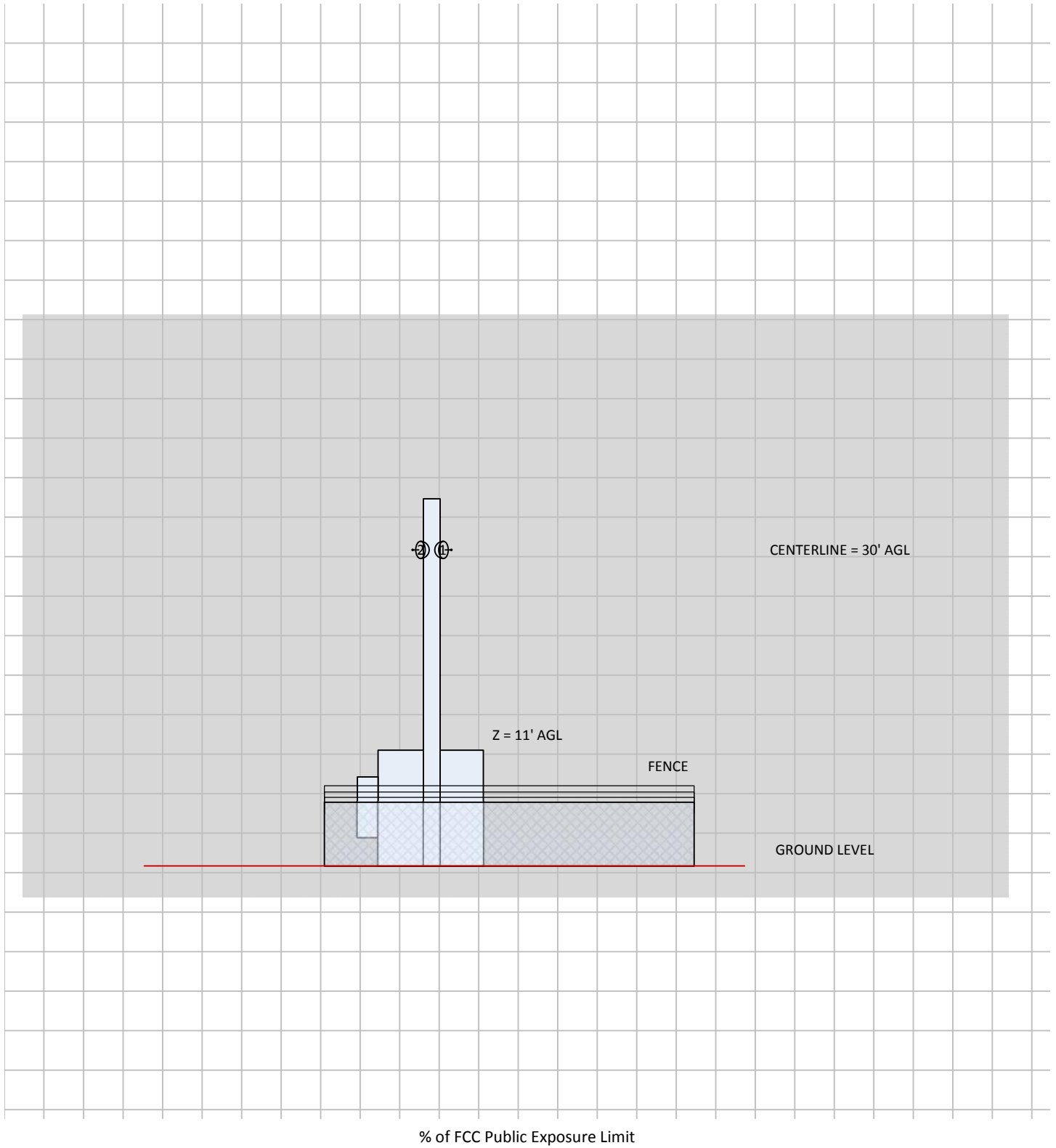
% of FCC Public Exposure Limit
Spatial average 0' - 6'



(Feet)
0 16.5 33.1
www.sitesafe.com
Site Name: Skyview Terrace
8/13/2018 1:56:58 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Skyview Terrace Elevation View



16.4 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was provided by the customer, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 22 - Skyview Terrace. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory was provided by the customer and was utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Len (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	POWER	POWER TYPE	POWER UNITS	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	P1	Generic	Aperture	4	11000	312	37.66	2	0.01	TPO	Watt	1	58.3	30	0	0
2	P2	Generic	Aperture	4	11000	50.7	37.66	2	0.01	TPO	Watt	1	58.3	30	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

17 Muir Beach



Marin Emergency Radio Authority

Site Name – Muir Beach

Site ID: 23

Site Compliance Report

Muir Beach Overlook
Muir Beach, CA 94965

Latitude: N37-51-47.84
Longitude: W122-35-07.84
Structure Type: Water Tank

Report generated date: March 28, 2019
Report by: Sam Cosgrove
Customer Contact: David Mortimer

The site is compliant and will remain compliant upon implementation of the proposed changes.

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17.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at the proposed communications site, 23 - Muir Beach, located at Muir Beach Overlook, Muir Beach, CA, in relation to Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

This section contains a detailed summary of the RF environment at the site including:

- Diagram of the site
- Inventory of the make / model of all antennas
- Theoretical MPE based on modeling

RF emissions are predicted to be below 1% MPE in all areas on this site.



17.2 Site Compliance

17.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, Sitesafe has determined that:

The site is compliant with the FCC rules and regulations, as described in OET Bulletin 65 and will remain compliant upon implementation of the proposed changes.

The compliance determination is based on theoretical modeling, RF signage placement recommendations, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant.

17.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on theoretical analysis of MPE levels. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

Marin Emergency Radio Authority is compliant with the FCC rules and regulations and will remain compliant upon implementation of the proposed changes.

17.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the ground to be:

Maximum Cumulative Theoretical General Public MPE level (All Antennas): <1%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

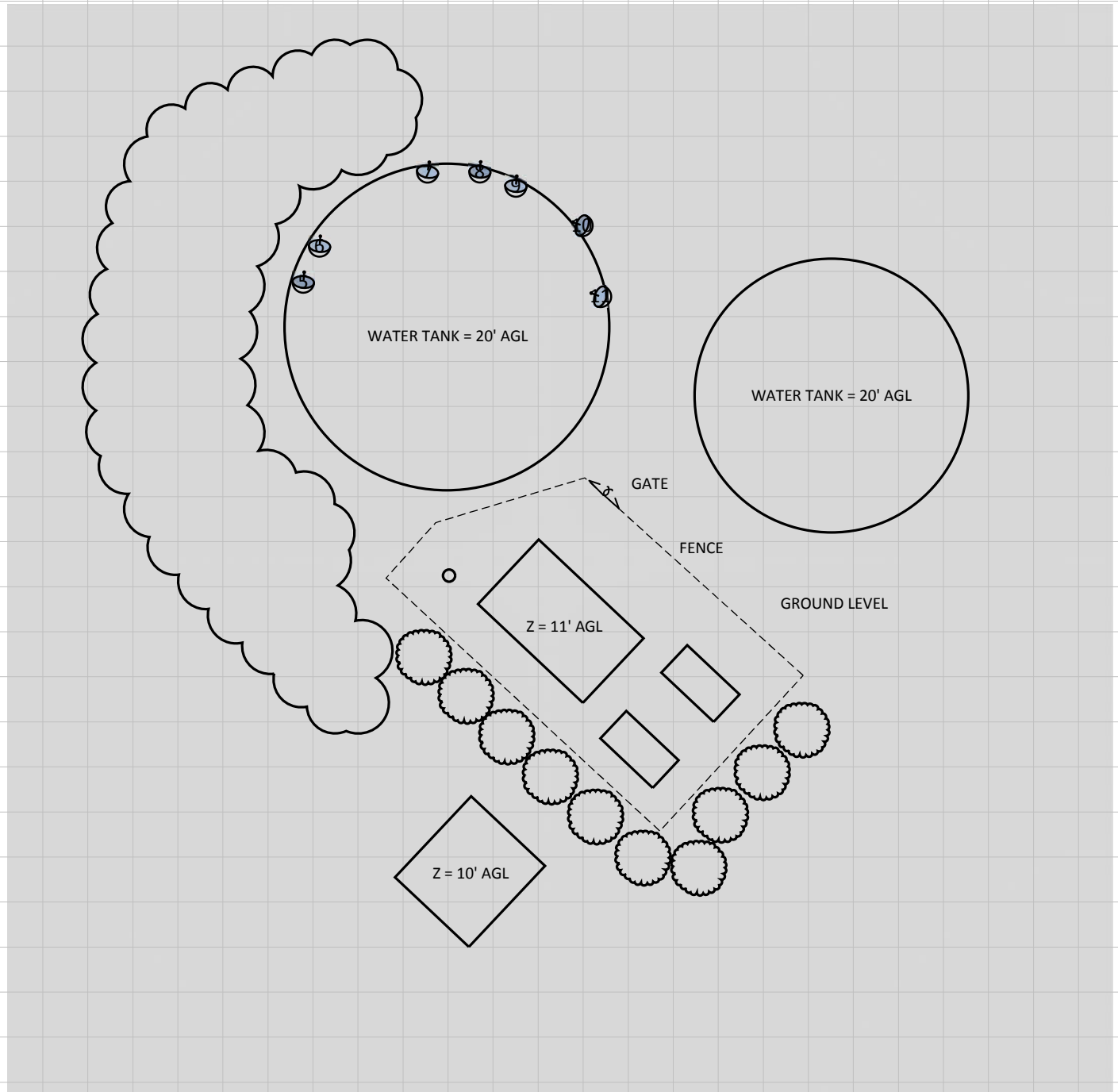
Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

Abbreviations used in the RF Emissions Diagrams

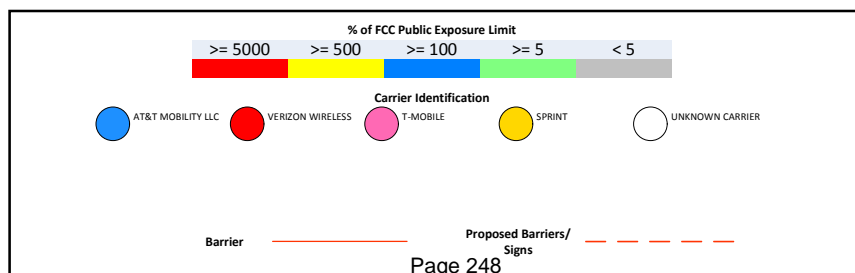
PH=##'	Penthouse at ## feet above main roof
--------	--------------------------------------

RF Exposure Simulation For: Muir Beach Existing Configuration



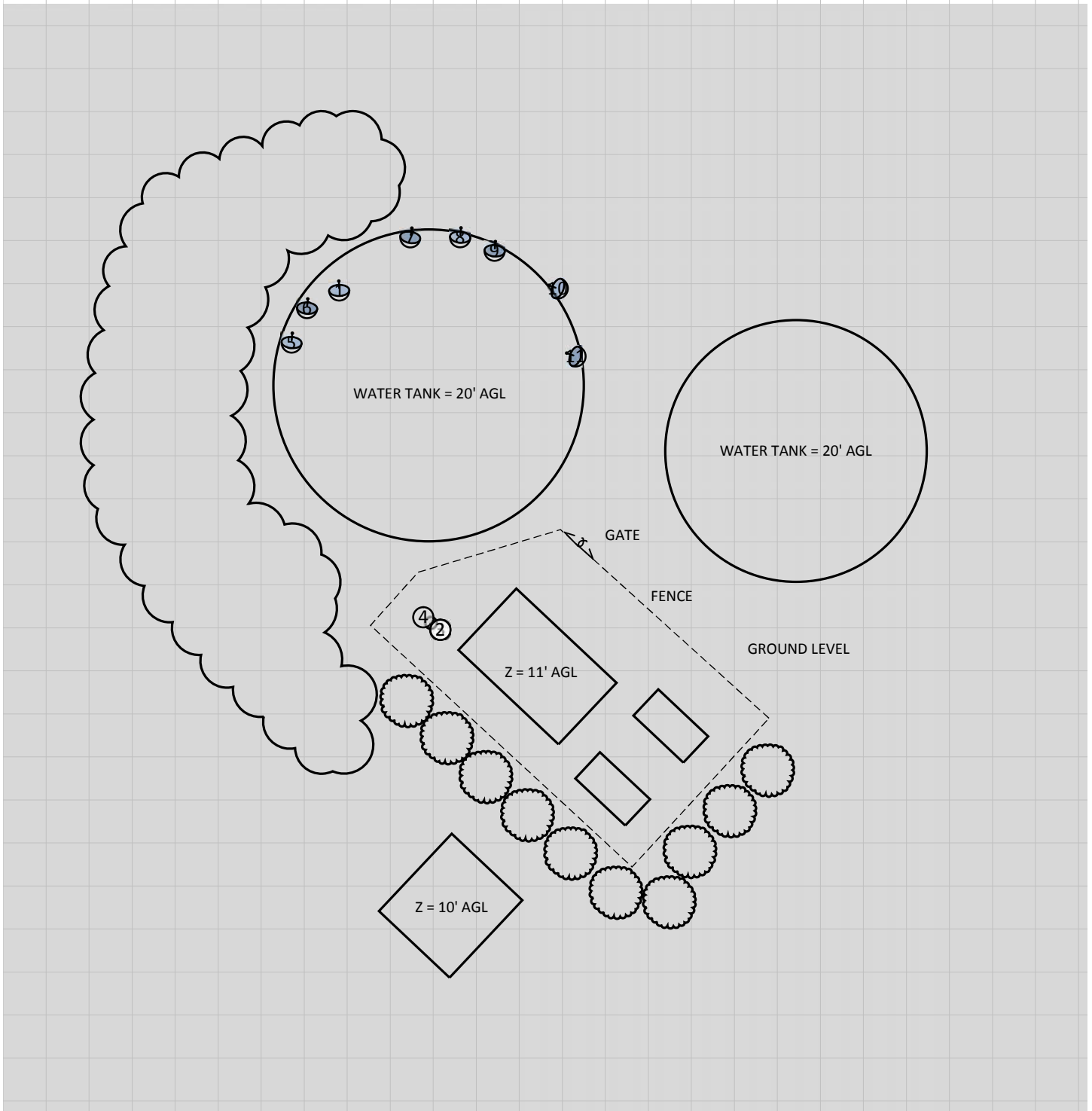
% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)
0 11.2 22.5
www.sitesafe.com
Site Name: Muir Beach
3/27/2019 2:46:50 PM



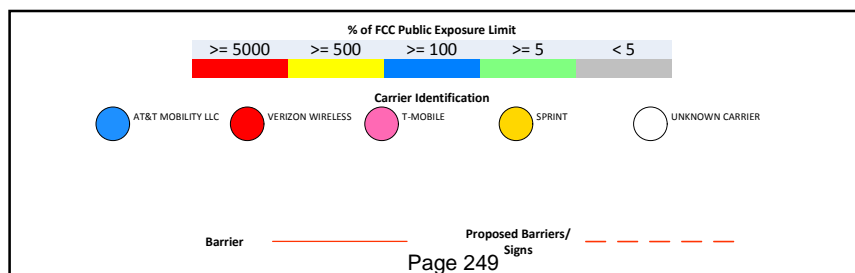
Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Muir Beach All Antennas On Air



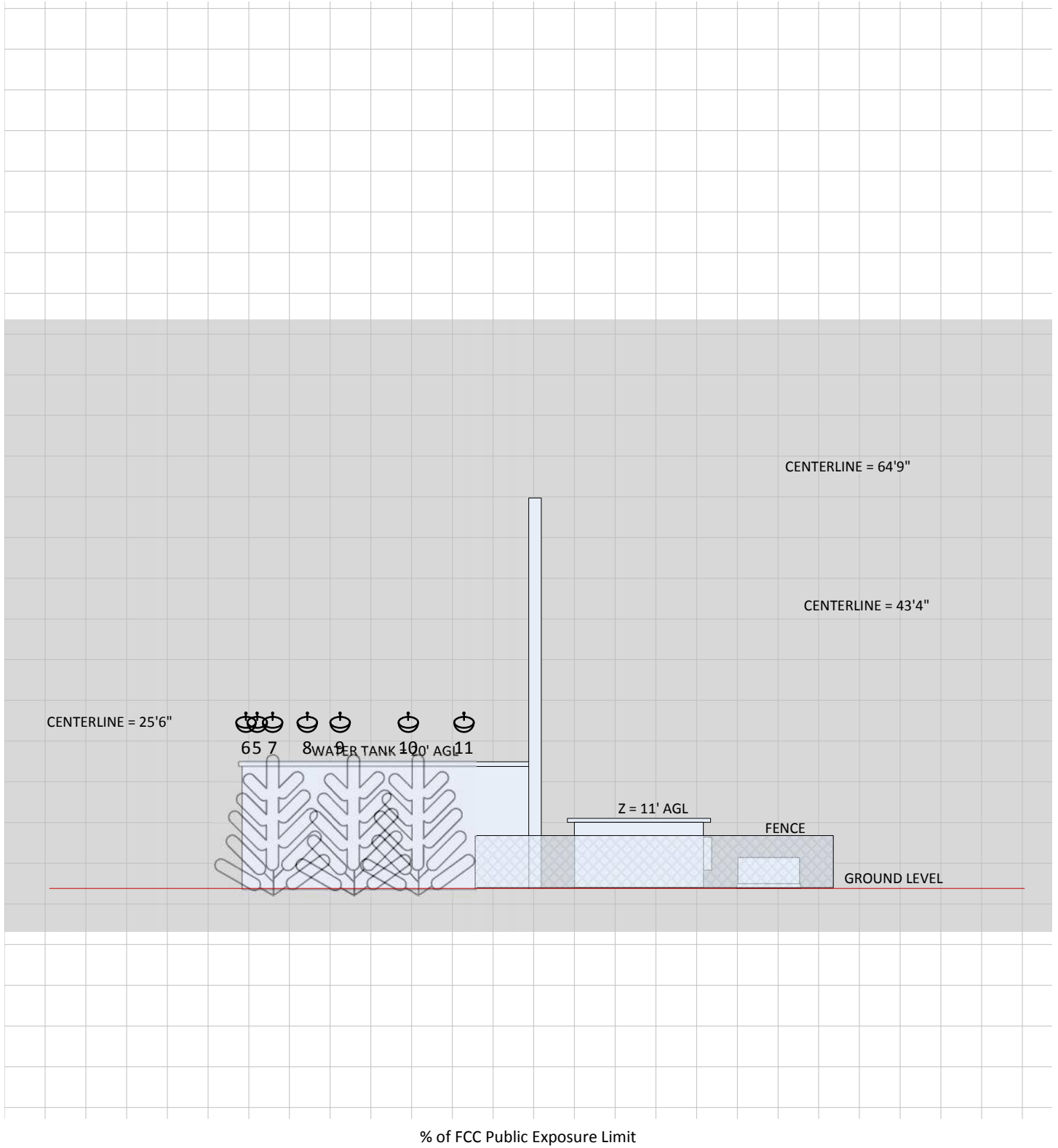
% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)
0 11.2 22.3
www.sitesafe.com
Site Name: Muir Beach
3/27/2019 2:44:54 PM



Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Muir Beach Elevation View – Existing Configuration



Barrier Type	% of FCC Public Exposure Limit
>= 5000	Red
>= 500	Yellow
>= 100	Blue
>= 5	Green
< 5	Grey

17.4 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was provided by the customer, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 23 - Muir Beach. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory was provided by the customer and was utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Len (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	POWER	POWER TYPE	POWER UNITS	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	NERA	Generic	Aperture	4	11000	358	37.66	2	0.01	TPO	Watt	1	58.3	25.5	0	0
2	NERA	Sinclair SC476-HF1LDF	Omni	7	746	0	6.06	360	1200	ERP	Watt	1	1200	43.3	0	0
3	NERA (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	TPO	Watt	1	0	64.8	0	0
4	NERA (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	TPO	Watt	1	0	64.8	0	0
5	Muir Beach Community Services District	Generic	Aperture	2	11245	5.1	31.16	2	60	EIRP	dBmW	1	609.8	25.5	0	0
6	Muir Beach Community Services District	Generic	Aperture	2	11245	5.1	31.16	2	66	EIRP	dBmW	1	2427.4	25.5	0	0
7	Muir Beach Community Services District	Generic	Aperture	4	6000	10	32.86	2	1	TPO	Watt	1	2.4	25.5	0	0
8	Muir Beach Community Services District	Generic	Aperture	2	11245	5.1	31.16	2	54	EIRP	dBmW	1	153	25.5	0	0
9	Muir Beach Community Services District	Generic	Aperture	2	11245	5.1	31.16	2	57	EIRP	dBmW	1	305.5	25.5	0	0
10	Muir Beach Community Services District	Generic	Aperture	4	11485	290.5	37.66	2	61.5	EIRP	dBmW	1	861	25.5	0	0
11	Muir Beach Community Services District	Generic	Aperture	2	11485	290.5	31.16	2	67.5	EIRP	dBmW	1	3428.7	25.5	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

18 Wolfback Ridge



Marin Emergency Radio Authority

Site Name – Wolfback Ridge

Site ID: 24

Site Compliance Report

200 Sundial Rd
Sausalito, CA 94965

Site visit date: August 24, 2018
Site visit time: 5:46 PM
Site survey by: Jeff Desira

Latitude: N37-51-03.91
Longitude: W122-29-54.15
Structure Type: Self-Support

Report generated date: March 28, 2019
Report by: Sam Cosgrove
Customer Contact: David Mortimer

Marin Emergency Radio Authority is compliant and will remain complaint upon implementation of the proposed changes. The site has compliance issues that are not the result of, and therefore not the responsibility of, Marin Emergency Radio Authority.

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18.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at the proposed communications site, 24 - Wolfback Ridge, located at 200 Sundial Rd, Sausalito, CA, in relation to Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

Sitesafe's field personnel visited 24 - Wolfback Ridge on August 24, 2018. This section contains a detailed summary of the RF environment at the site including:

- Site compliance determination;
- Photographs of the site;
- Diagram of the site;
- Inventory of the make / model of all transmitting antennas found on the site (where possible);
- Record of any Maximum Permissible Exposure ("MPE") measurements taken on the site, as applicable; and
- Theoretical MPE based on modeling.

RF emissions exceed MPE limits in the areas near Towers 3 and 4. These towers have FM transmitters mounted on them at heights as low as 25' from the ground level. The powers being run on them are producing emission levels that may pose danger to personnel without RF safety training and RF safety equipment. The operators of this equipment should review the site and take appropriate action to create a safe environment for workers that require access to the area. The proposed antennas will not make a significant difference in RF emissions on site.



18.2 Site Compliance

18.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, and a thorough review of site access procedures, RF hazard signage and visible antenna locations, Sitesafe has determined that:

Marin Emergency Radio Authority is compliant with the FCC rules and regulations, as described in OET Bulletin 65, and will remain compliant upon implementation of the proposed changes. The site has compliance issues that are not the result of, and therefore not the responsibility of, Marin Emergency Radio Authority.

The compliance determination is based on General Public MPE levels due to theoretical modeling and/or physical measurements, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant. Measurements have also been performed to validate the assumptions used in our theoretical modeling of this site.

Modeling is used for determining compliance and the percentage of MPE contribution. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results.

18.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on existing measurements and theoretical analysis of MPE levels. Sitesafe has documented the locations of any RF signs and barriers that are required for compliance. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

This site will be compliant with the FCC rules and regulations.

Remediation for other carriers (Marin Emergency Radio Authority is not responsible for the actions below):

FM Broadcast Antennas

The FM antennas on site should have their power lowered or there should be an RF Safety Plan implemented for anyone accessing this site.

NOTE: The site is regularly accessed by site personnel. Due to the centerline height of the lower of the FM Transmitters, the EME levels on the ground may exceed General Public MPE levels and levels in the building may exceed 5000% MPE levels.

18.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the rooftop to be:

Maximum Cumulative Theoretical General Public MPE level (Existing Antennas) : 50,141.5%
Maximum Cumulative Theoretical General Public MPE level (All Antennas): 50,141.5%
Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 50,141.5%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

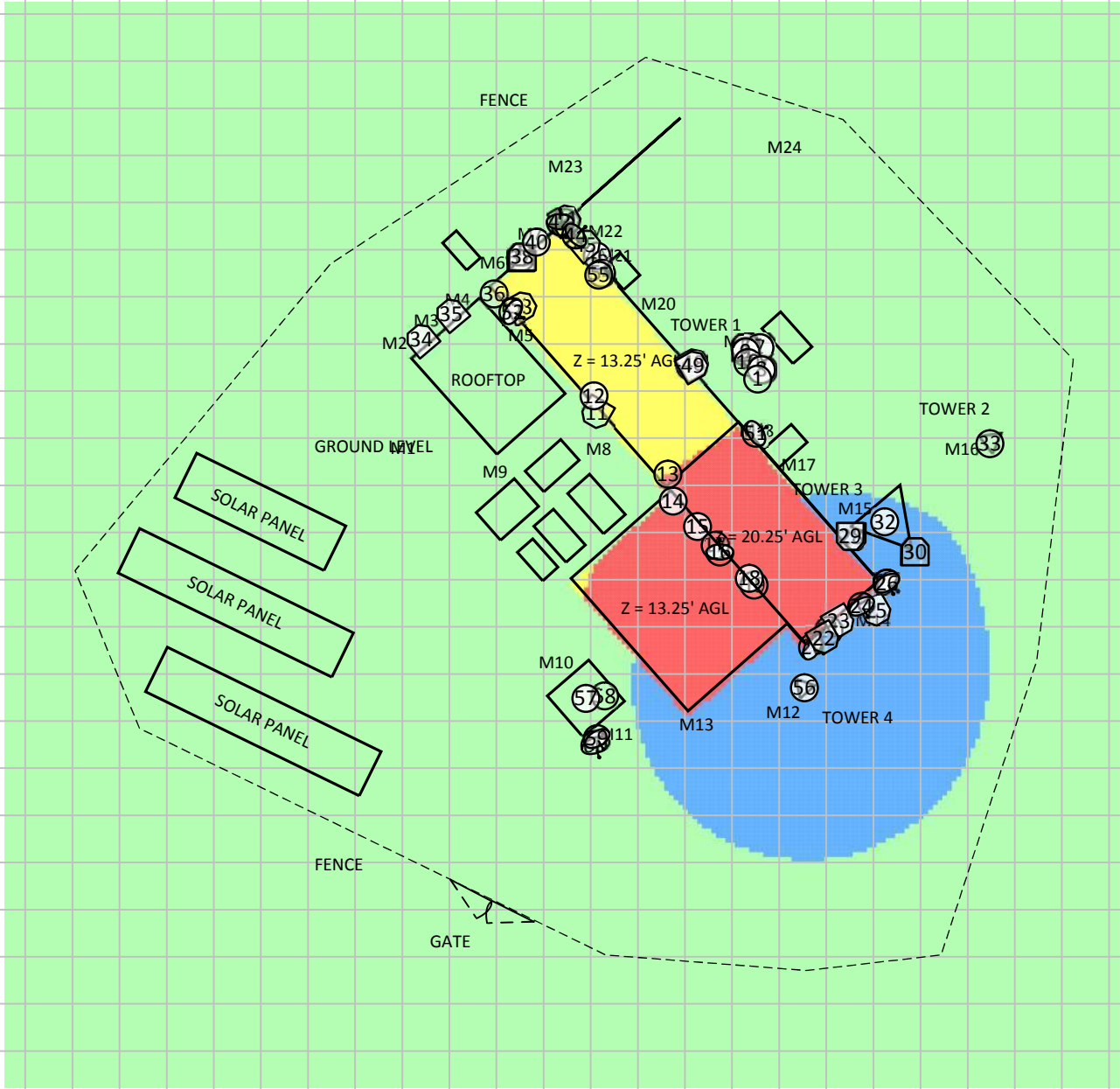


Abbreviations used in the RF Emissions Diagrams

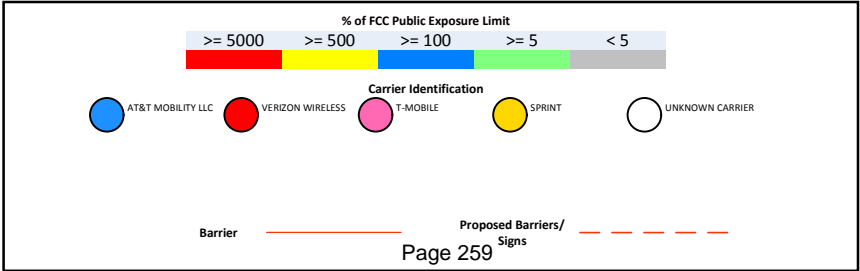
PH=##'	Penthouse at ## feet above main roof
M##	Measurement ## taken during a site visit

As discussed in Section 18.4, site measurement locations for spatial average measurements collected at the time of Sitesafe's visit have been added to the RF emissions diagram. While the theoretical modeling represents worst case MPE levels based on the assumption(s) detailed above, the measurement data is a snapshot of MPE levels at the time of our visit, and dependent on transmitter duty cycle, system implementation and emissions from other RF sources at nearby antenna sites.

RF Exposure Simulation For: Wolfback Ridge
Existing Antennas Only On Air



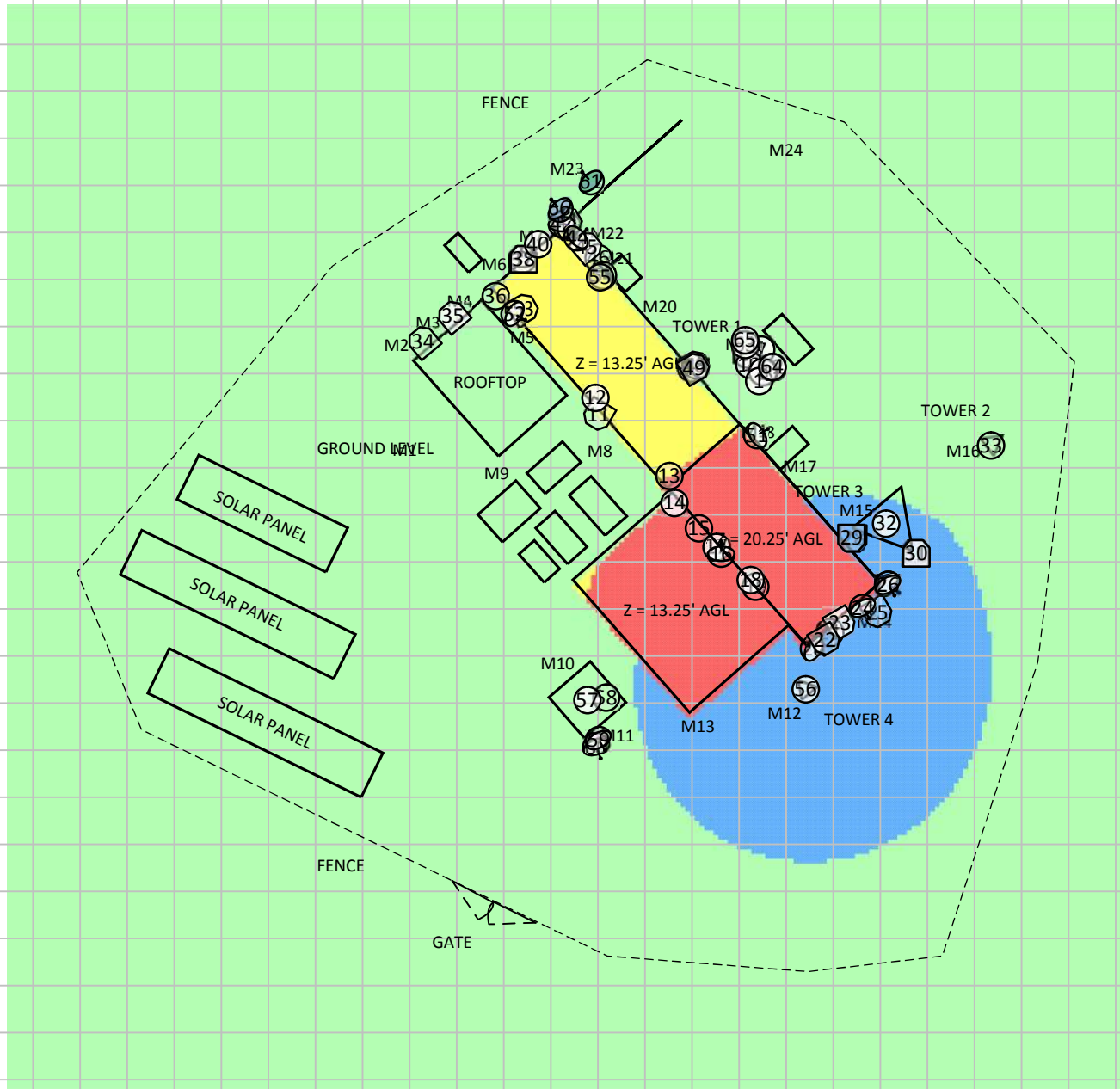
% of FCC Public Exposure Limit
Spatial average 0' - 6'



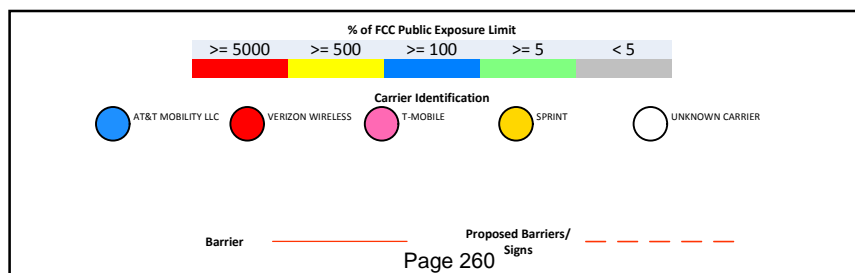
(Feet)
0 17.8 35.6
www.sitesafe.com
Site Name: Wolfback Ridge
8/29/2018 1:53:48 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Wolfback Ridge All Antennas On Air



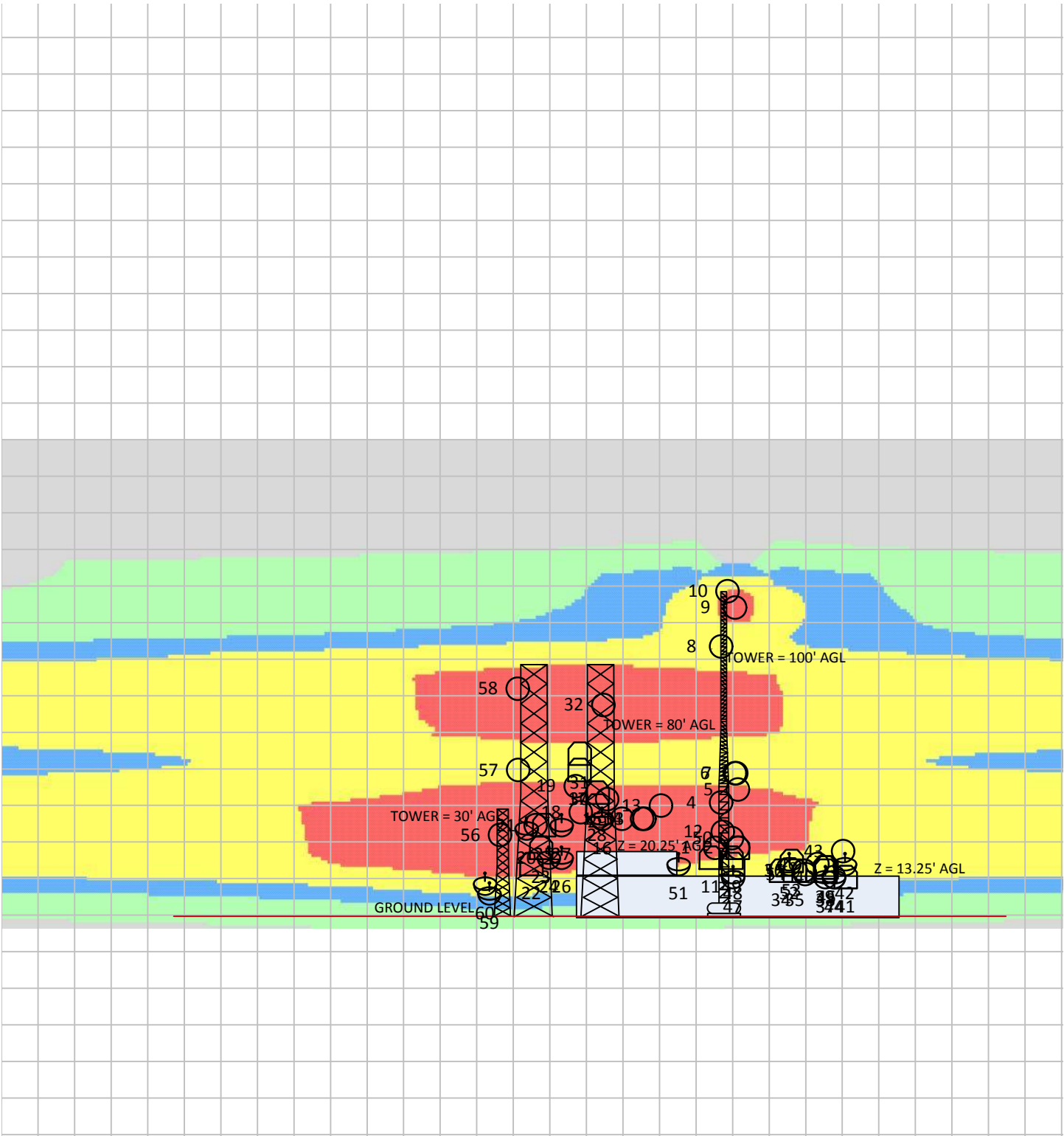
% of FCC Public Exposure Limit
Spatial average 0' - 6'



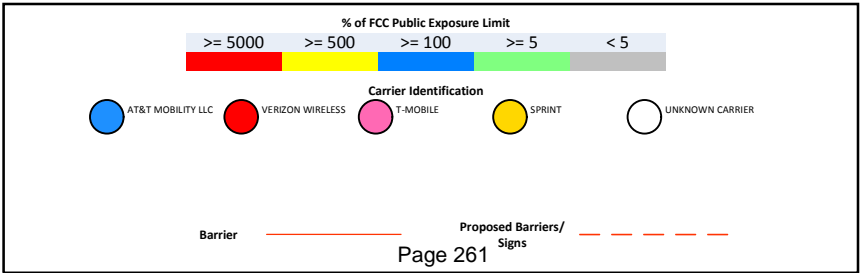
(Feet)
0 17.5 35.1
www.sitesafe.com
Site Name: Wolfback Ridge
8/29/2018 1:52:14 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

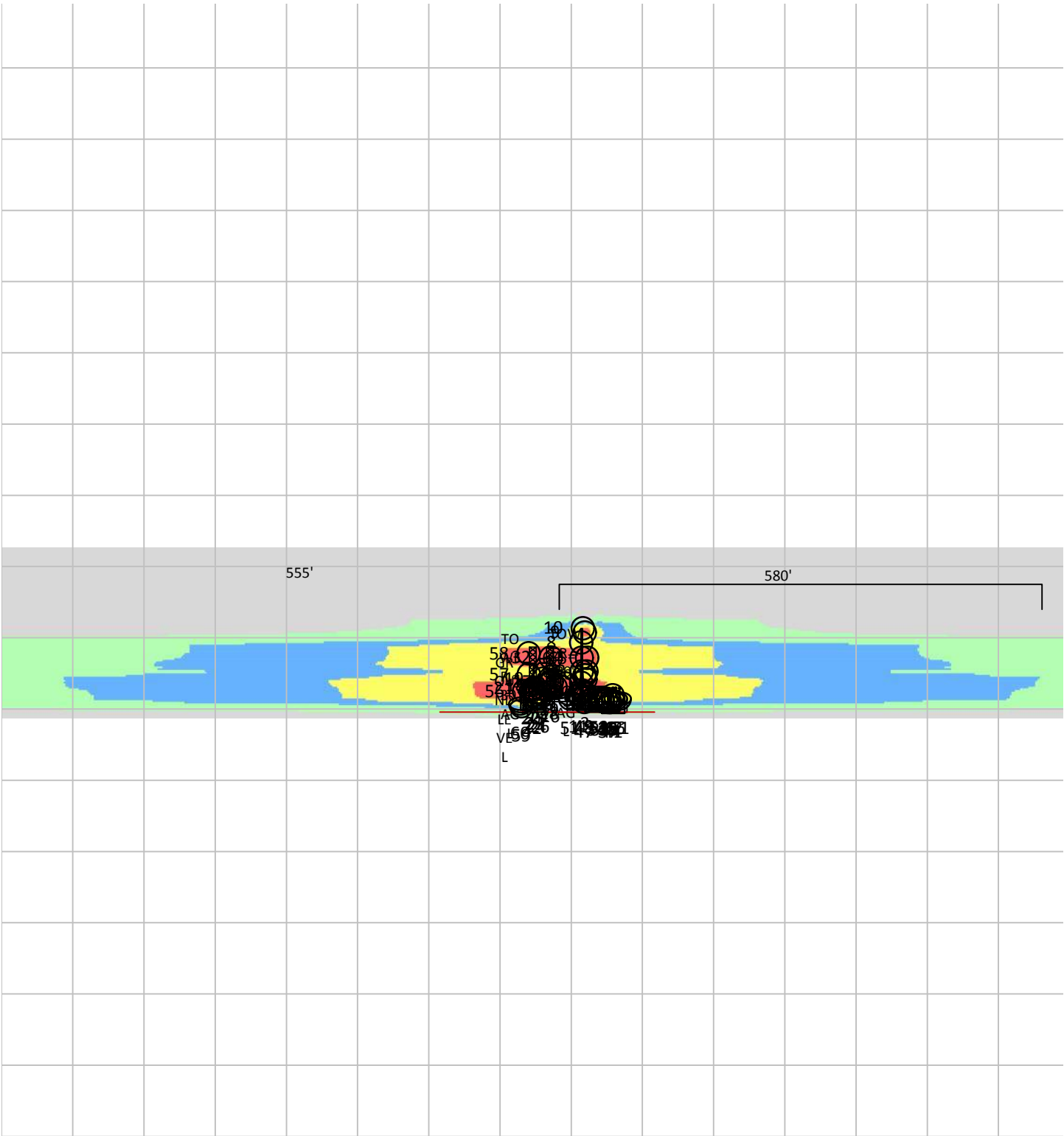
RF Exposure Simulation For: Wolfback Ridge
Existing Antennas Only On Air – Elevation View



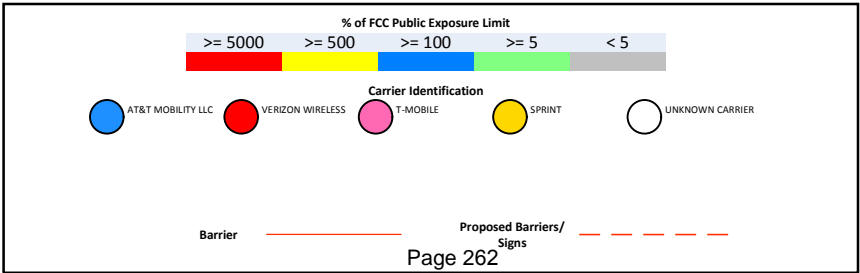
% of FCC Public Exposure Limit



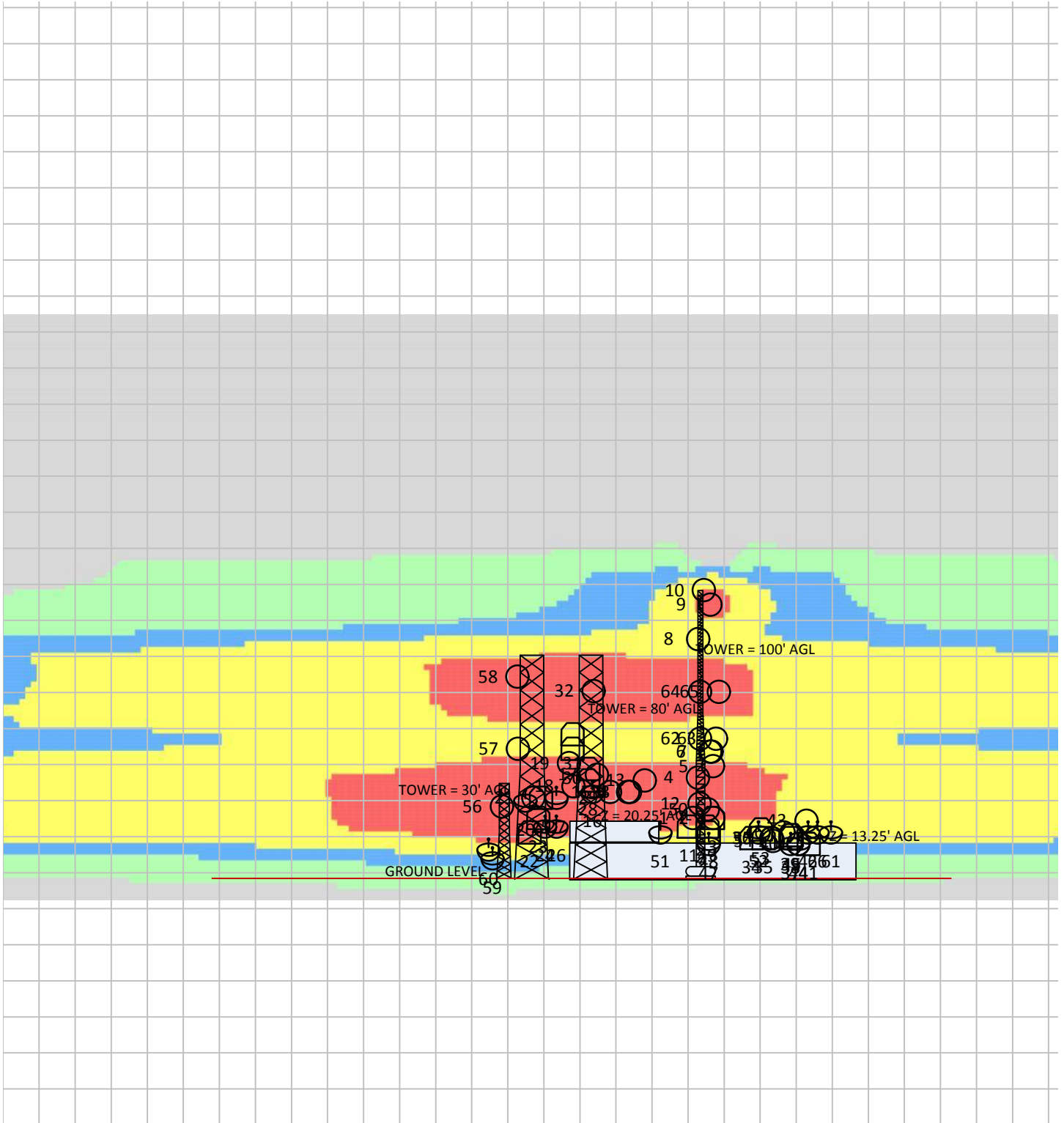
RF Exposure Simulation For: Wolfback Ridge
Elevation View – All Antennas on Air



% of FCC Public Exposure Limit



RF Exposure Simulation For: Wolfback Ridge Elevation View – All Antennas on Air (Detail View)



18.4 Site Measurements

This section provides a summary of the measurements collected at the site. Actual measurements locations at which these data points were collected are included in the RF emission diagram provided in Section 18.3 of this report. Two types of measurements were collected at each measurement location: maximum (peak) and spatial average. The spatial average measurement consists of a collection of ten (10) measurements within a ten (10) second time interval taken from zero (0) to six (6) feet in height. The purpose of this measurement technique is to identify the average power density over the dimensions of a typical human body.

Table 1 below contains all the measurements collected from accessible areas located at the site at the time of Sitesafe's visit. Whenever possible, measurements are taken in front of the antenna in the transmitting direction. However, because of the antenna configuration at this site, specific emissions could not be discerned from nearby facilities, and no attempt was made to determine power density levels from a specific transmitting antenna.

Highest Measured Occupational Level: 28.00%

This value is equal to:

Highest General Public Level: 140.00%.

Table 1: Spatial Average and Maximum Occupational Measurements					
Measurements Points	Spatial Average	Maximum	Measurements Points	Spatial Average	Maximum
M1	4 %	6 %	M16	11 %	18 %
M2	3 %	4 %	M17	5 %	13 %
M3	2 %	3 %	M18	9 %	14 %
M4	1 %	2 %	M19	28 %	49 %
M5	3 %	4 %	M20	8 %	11 %
M6	<1 %	<1 %	M21	12 %	18 %
M7	<1 %	<1 %	M22	21 %	31 %
M8	17 %	39 %	M23	13 %	17 %
M9	20 %	25 %	M24	11 %	17 %
M10	11 %	13 %	M25	<1 %	<1 %
M11	9 %	13 %	M26	<1 %	<1 %
M12	10 %	15 %	M27	<1 %	<1 %
M13	9 %	10 %	M28	<1 %	<1 %
M14	7 %	11 %	M29	<1 %	<1 %
M15	5 %	7 %			

RF meters and probes have been calibrated and used according to the manufacturer's specifications. Measurements provide a view of the MPE percentage levels at the site at the time of Sitesafe's site visit and are used to validate modeling results. Theoretical modeling is used for determining compliance and the percentage of MPE contributions.

An RF Emission diagram has been included in section 18.3 of this document. All measurement locations are identified in this diagram. The locations of measurements in the RF Emission diagram can be cross referenced with Table 1 (above) to determine the actual spatial average and maximum measurement value per location.

18.5 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was verified on site, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 24 - Wolfback Ridge. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory and representative photographs were obtained or verified during the site visit and were utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	E1	Generic	Yagi	3	150	90	9.11	76	100	ERP	Watt	1	100	21	0	0
2	E2	Generic	Omni	9.5	450	0	5.97	360	100	ERP	Watt	1	100	21	0	0
3	E3	Generic	Panel	1.7	2400	0	12.01	90	4	ERP	Watt	1	4	21	0	0
4	E4	Generic	Omni	10	450	0	0	360	100	ERP	Watt	1	100	35	0	0
5	E5	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	39	0	0
6	E6	Generic	Omni	9.5	450	0	5.97	360	100	ERP	Watt	1	100	44	0	0
7	E7	Generic	Yagi	3	150	45	9.11	76	100	ERP	Watt	1	100	44	0	0
8	E8	Generic	Omni	9	90	330	0	360	1000	TPO	Watt	1	1000	83	0	0
9	E9	Generic	Omni	9	107	30	0	360	3000	TPO	Watt	1	3000	95	0	0
10	E10	Generic	Omni	9.5	450	0	5.97	360	100	ERP	Watt	1	100	100	0	0
11	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	210	10.01	90	4	ERP	Watt	1	4	18	0	0
12	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	100	ERP	Watt	1	100	26	0	0
13	UNKNOWN OPERATOR	Generic	Omni	12.5	150	0	2.87	360	100	ERP	Watt	1	100	34	0	0
14	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	30	0	0
15	UNKNOWN OPERATOR	Generic	Omni	12.5	150	0	2.87	360	100	ERP	Watt	1	100	30	0	0
16	UNKNOWN OPERATOR	Generic	Aperture	0	2400	0	22.96	2	4	ERP	Watt	1	4	30	0	0
17	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	36	0	0
18	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	32	0	0
19	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	40	0	0
20	UNKNOWN OPERATOR	Generic	Aperture	4	2400	120	22.96	2	4	ERP	Watt	1	4	27	0	0
21	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	28	0	0
22	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	150	10.01	90	4	ERP	Watt	1	4	16	0	0
23	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	150	10.01	90	4	ERP	Watt	1	4	21	0	0
24	UNKNOWN OPERATOR	Generic	Aperture	2	18000	150	37.66	2	64	EIRP	dBmW	1	1531.1	18	0	0
25	UNKNOWN OPERATOR	Generic	Aperture	4	2400	150	22.96	2	4	ERP	Watt	1	4	28	0	0
26	UNKNOWN OPERATOR	Generic	Aperture	4	2400	150	22.96	2	4	ERP	Watt	1	4	18	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
27	UNKNOWN OPERATOR	Generic	Aperture	4	2400	130	22.96	2	4	ERP	Watt	1	4	28	0	0
28	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	180	10.01	90	4	ERP	Watt	1	4	34	0	0
29	UNKNOWN OPERATOR	Generic	Panel	1.7	2400	180	12.01	90	4	ERP	Watt	1	4	38	0	0
30	UNKNOWN OPERATOR	Generic	Panel	4.6	1900	0	15.43	65	60	TPO	Watt	1	2094.8	45	0	0
31	UNKNOWN OPERATOR	Generic	Panel	4.6	1900	0	15.43	65	60	TPO	Watt	1	2094.8	50	0	0
32	UNKNOWN OPERATOR	Generic	FM Broadcast	15	97	0	4.51	360	82000	TPO	Watt	1	231640.2	65	0	0
33	UNKNOWN OPERATOR	Generic	FM Broadcast	15	107	0	4.51	360	80000	TPO	Watt	1	225990.4	30	0	0
34	UNKNOWN OPERATOR	Generic	Panel	4.6	1900	320	15.43	65	60	TPO	Watt	1	2094.8	14	0	0
35	UNKNOWN OPERATOR	Generic	Panel	4.6	1900	320	15.43	65	60	TPO	Watt	1	2094.8	14	0	0
36	UNKNOWN OPERATOR	Generic	Yagi	3	150	320	9.11	76	100	ERP	Watt	1	100	14	0	0
37	UNKNOWN OPERATOR	Generic	Aperture	3	5800	0	29.06	2	20	ERP	Watt	1	20	12	0	0
38	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	0	10.01	90	4	ERP	Watt	1	4	14	0	0
39	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	0	10.01	90	4	ERP	Watt	1	4	15	0	0
40	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	12	0	0
41	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	60	10.01	90	4	ERP	Watt	1	4	12	0	0
42	UNKNOWN OPERATOR	Generic	Aperture	3	5800	0	29.06	2	20	ERP	Watt	1	20	16	0	0
43	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	20	0	0
44	UNKNOWN OPERATOR	Generic	Aperture	4	11000	50	37.66	2	67.5	EIRP	dBmW	1	3428.7	12	0	0
45	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	50	10.01	90	4	ERP	Watt	1	4	15	0	0
46	UNKNOWN OPERATOR	Generic	Yagi	3	150	330	9.11	76	100	ERP	Watt	1	100	16	0	0
47	UNKNOWN OPERATOR	Generic	Aperture	3	5800	60	29.06	2	20	ERP	Watt	1	20	12	0	0
48	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	60	10.01	90	4	ERP	Watt	1	4	16	0	0
49	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	60	10.01	90	4	ERP	Watt	1	4	18	0	0
50	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	100	ERP	Watt	1	100	24	0	0
51	UNKNOWN OPERATOR	Generic	Aperture	4	2400	60	22.96	2	4	ERP	Watt	1	4	16	0	0
52	UNKNOWN OPERATOR	Generic	Aperture	4	2400	120	22.96	2	4	ERP	Watt	1	4	16	0	0
53	UNKNOWN OPERATOR	Generic	Panel	1.1	2400	60	10.01	90	4	ERP	Watt	1	4	17	0	0
54	UNKNOWN OPERATOR	Generic	Yagi	0.5	850	60	9.97	60	1	TPO	Watt	1	9.9	13	0	0



Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
55	UNKNOWN OPERATOR	Generic	Omni	3	150	0	0	360	25	ERP	Watt	1	25	14	0	0
56	UNKNOWN OPERATOR	Generic	FM Broadcast	15	98	0	4.51	360	75000	TPO	Watt	1	211866	25	0	0
57	UNKNOWN OPERATOR	Generic	FM Broadcast	15	98	0	4.51	360	18000	TPO	Watt	1	50847.8	45	0	0
58	UNKNOWN OPERATOR	Generic	FM Broadcast	15	102	0	4.51	360	16000	TPO	Watt	1	45198.1	70	0	0
59	UNKNOWN OPERATOR	Generic	Aperture	0	2400	150	22.96	0	4	ERP	Watt	1	4	7	0	0
60	UNKNOWN OPERATOR	Generic	Aperture	0	2400	160	22.96	0	4	ERP	Watt	1	4	10	0	0
57	P1	Generic	Aperture	6	6000	317.9	36.36	2	65	EIRP	dBmW	1	1928	16	0	0
58	P2	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	48.5	0	0
59	P3	Sinclair SC476-HF1LDF	Omni	7	700	0	6.06	360	1000	ERP	Watt	1	1000	48.5	0	0
60	P4 (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	64.8	0	0
61	P5 (Rx)	Rfi CC807-08	Omni	9.5	800	0	8	360	0	ERP	Watt	1	0	64.8	0	0
62	P6	Generic	Aperture	4	11000	317.9	37.66	2	67.5	EIRP	dBmW	1	3428.7	16	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

18.6 Site Pictures



Figure 71: Overview East Side of Rooftop



Figure 72: Overview North Side of Rooftop



Figure 73: Overview Northwest Side of Rooftop



Figure 74: Overview Northeast Side of Rooftop



Figure 75: Overview South Side of Rooftop



Figure 76: Overview West Side of Rooftop



Figure 77: Overview East Tower



Figure 78: Overview North Tower



Figure 79: Overview Northeast



Figure 80: Overview North



Figure 81: Overview Northeast (From Southeast)



Figure 82: Overview Northeast (From Southwest)



Figure 83: South Tower Base



Figure 84: South Tower Overview



Figure 85: West Tower Overview

19 OTA Broadcasting



Marin Emergency Radio Authority

Site Name – OTA Broadcasting

Site ID – 25

Site Compliance Report

Mt. Burdell
Novato, CA 94945

Site visit date: August 22, 2018
Site visit time: 11:15 PM
Site survey by: Jeff Desira

Latitude: N38-8-59.60
Longitude: W122-35-35.66
Structure Type: Monopole

Report generated date: March 28, 2019
Report by: Sam Cosgrove
Customer Contact: David Mortimer

The site is compliant and will remain compliant upon implementation of the proposed changes.

© 2019 Sitesafe, LLC. Arlington, VA

19.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at the proposed communications site, 25 - OTA Broadcasting, located at Mt. Burdell, Novato, CA, is in compliance with Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

Sitesafe's field personnel visited 25 - OTA Broadcasting on August 22, 2018. This section contains a detailed summary of the RF environment at the site including:

- Site compliance determination;
- Photographs of the site;
- Diagram of the site;
- Inventory of the make / model of all transmitting antennas found on the site (where possible);
- Record of any Maximum Permissible Exposure ("MPE") measurements taken on the site, as applicable; and
- Theoretical MPE based on modeling.

RF emissions on this site do not exceed MPE limits. The area near the top floor access is predicted to have the highest RF emission levels due to the height and power levels of antenna #9. The levels predicted are still far below MPE. The proposed antenna configuration will lower the MPE percentage predicted on site.



19.2 Site Compliance

19.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, and a thorough review of site access procedures, RF hazard signage and visible antenna locations, Sitesafe has determined that:

The site is compliant with the FCC rules and regulations, as described in OET Bulletin 65, and will remain compliant upon implementation of the proposed changes.

The compliance determination is based on General Public MPE levels due to theoretical modeling and/or physical measurements, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant. Measurements have also been performed to validate the assumptions used in our theoretical modeling of this site.

Modeling is used for determining compliance and the percentage of MPE contribution. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results.

19.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on existing measurements and theoretical analysis of MPE levels. Sitesafe has documented the locations of any RF signs and barriers that are required for compliance. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

This site will be compliant with the FCC rules and regulations.

19.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the site to be:

Maximum Cumulative Theoretical General Public MPE level (Existing Antennas) : 8.7%
Maximum Cumulative Theoretical General Public MPE level (All Antennas): 9.1%
Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 9.1%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

Average from 20 feet above to 26 feet above origin

The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

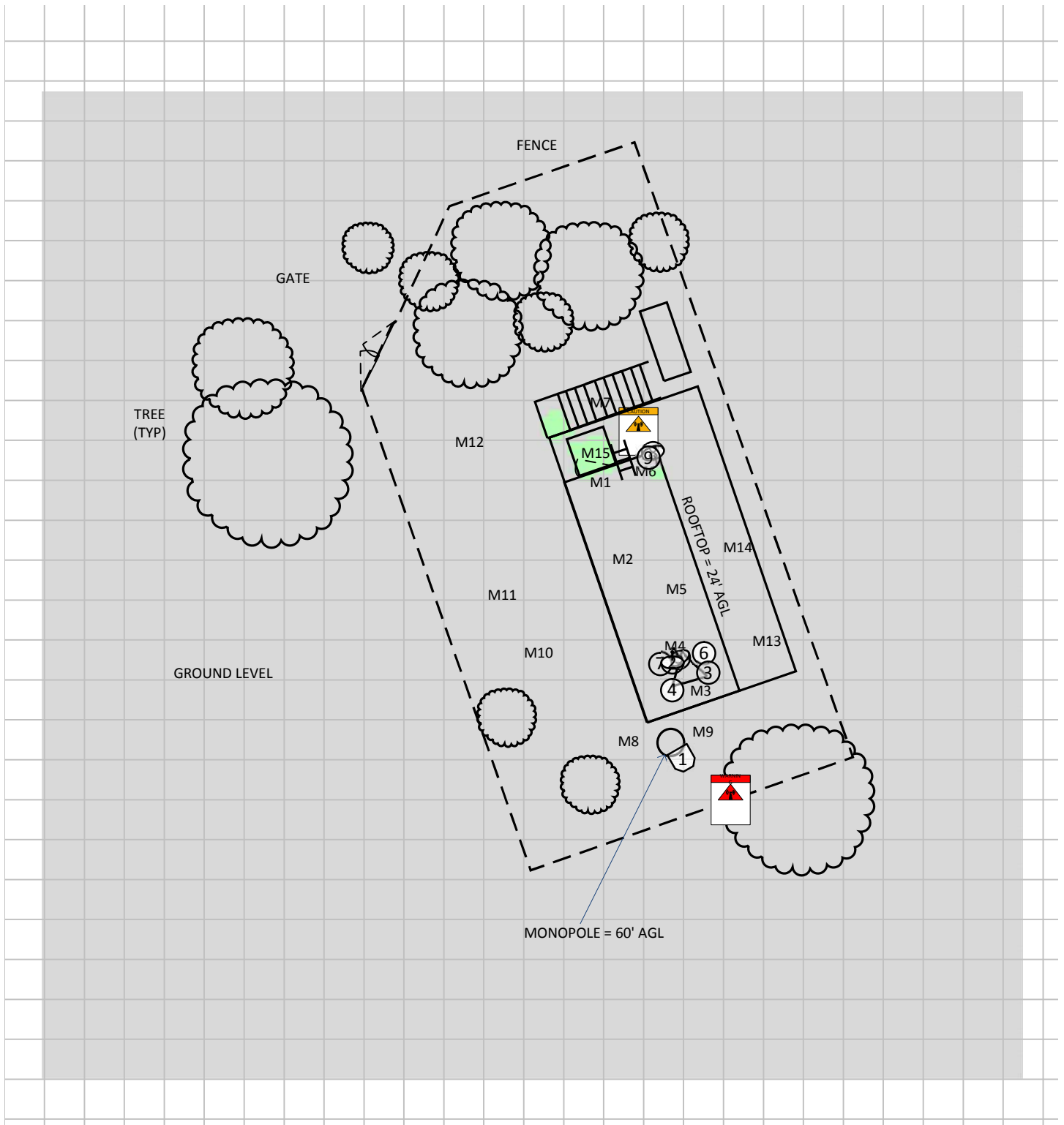


Abbreviations used in the RF Emissions Diagrams

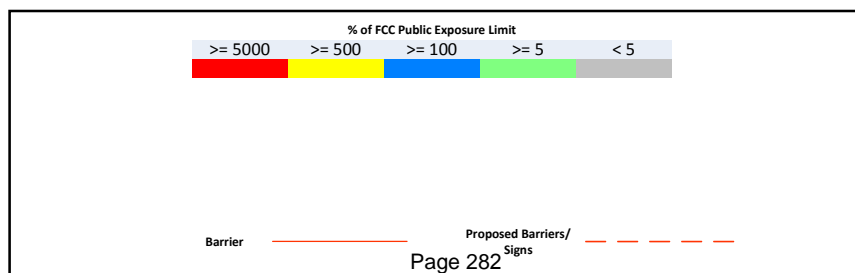
PH=##'	Penthouse at ## feet above main roof
M##	Measurement ## taken during a site visit

As discussed in Section 19.4, site measurement locations for spatial average measurements collected at the time of Sitesafe's visit have been added to the RF emissions diagram. While the theoretical modeling represents worst case MPE levels based on the assumption(s) detailed above, the measurement data is a snapshot of MPE levels at the time of our visit, and dependent on transmitter duty cycle, system implementation and emissions from other RF sources at nearby antenna sites.

RF Exposure Simulation For: OTA Broadcasting Existing Antennas Only On Air



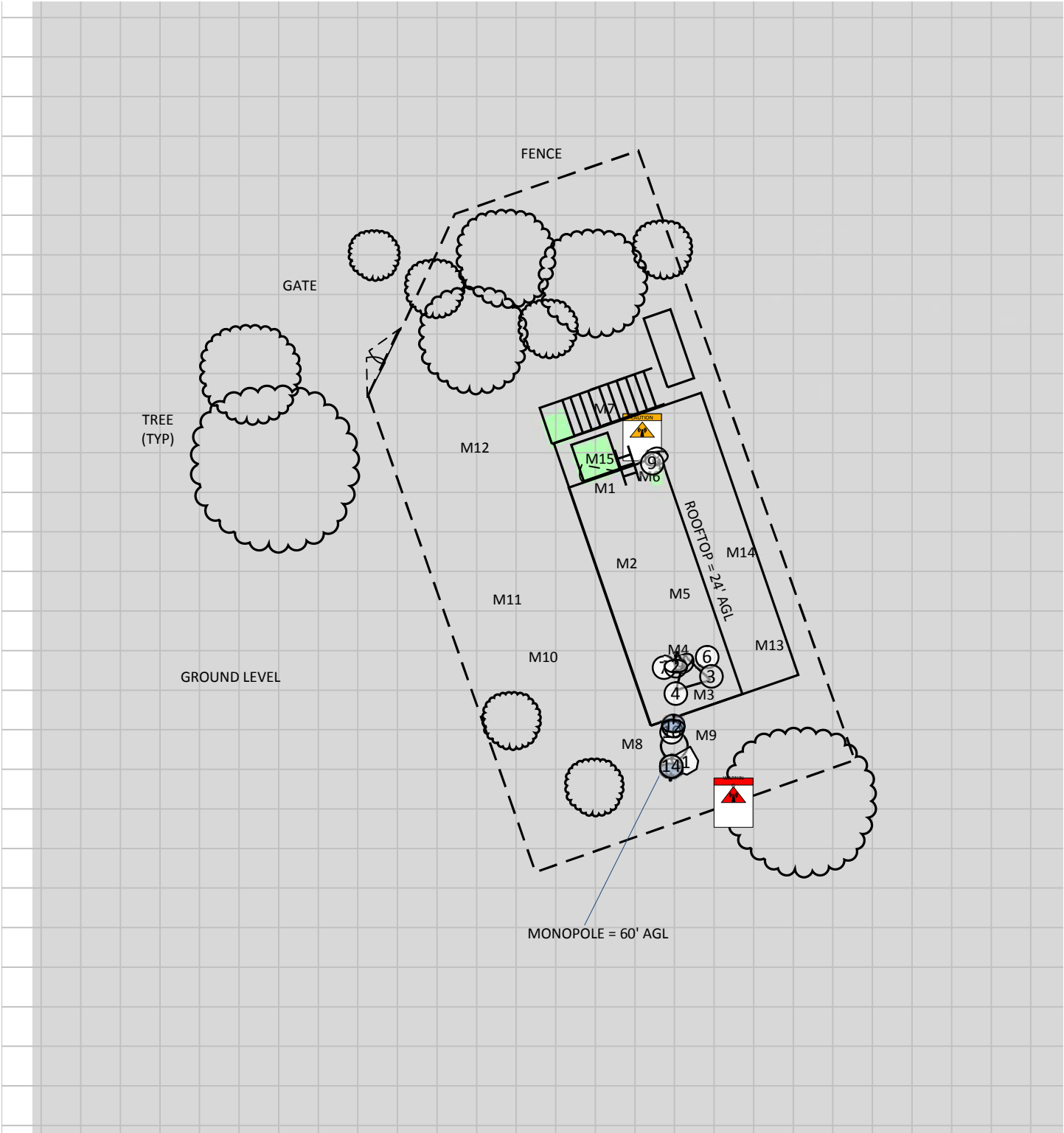
% of FCC Public Exposure Limit
Spatial average 0' - 6'



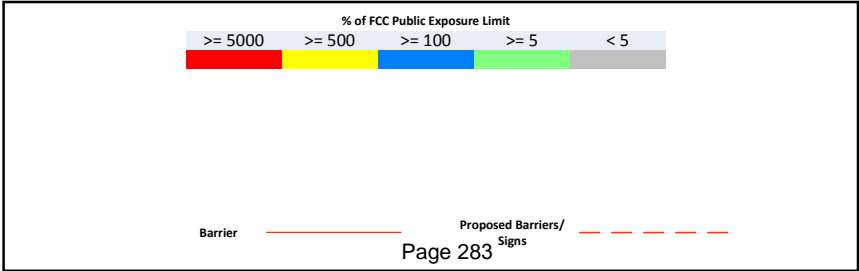
(Feet)
0 11.7 23.4
www.sitesafe.com
Site Name: OTA Broadcasting
10/4/2018 1:23:46 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: OTA Broadcasting
All Antennas On Air



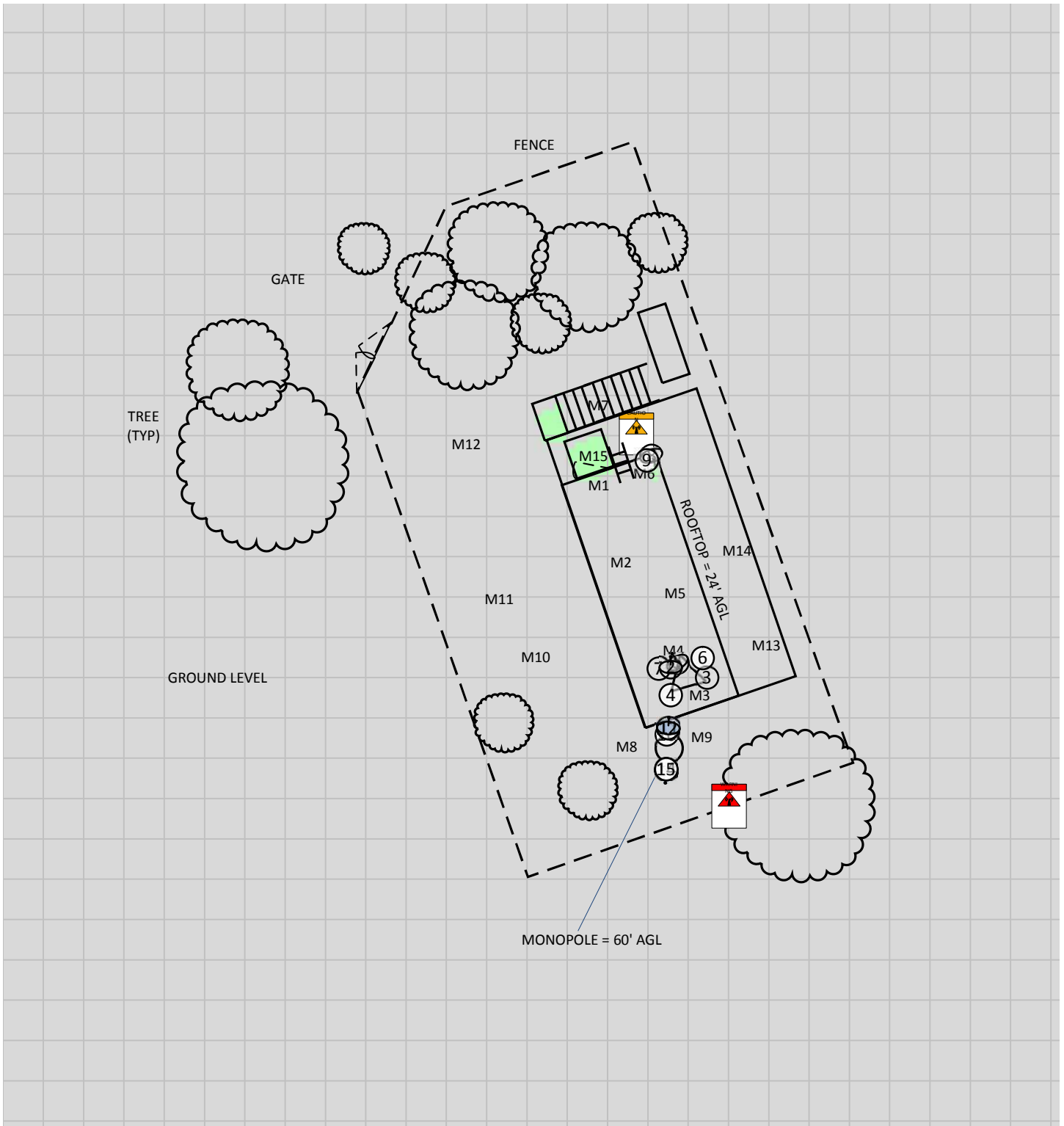
% of FCC Public Exposure Limit
Spatial average 0' - 6'



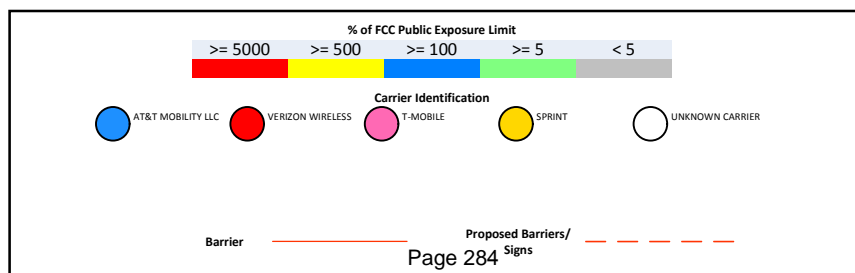
(Feet)
0 11.9 23.7
www.sitesafe.com
Site Name:OTA Broadcasting
10/4/2018 1:30:26 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: OTA Broadcasting Proposed Configuration On Air



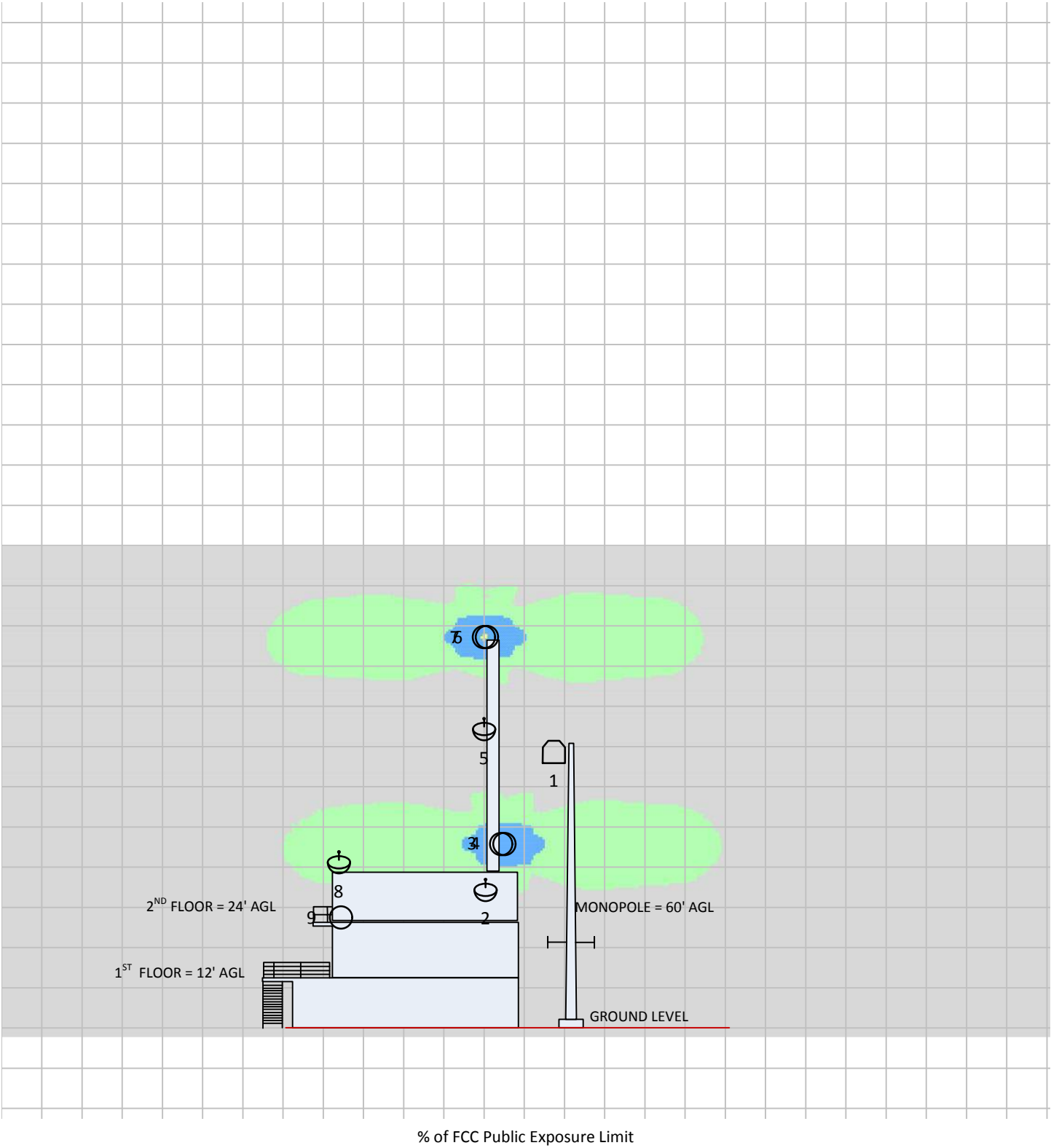
% of FCC Public Exposure Limit
Spatial average 0' - 6'



(Feet)
0 11.6 23.2
www.sitesafe.com
Site Name: OTA Broadcasting
8/28/2018 11:55:11 AM

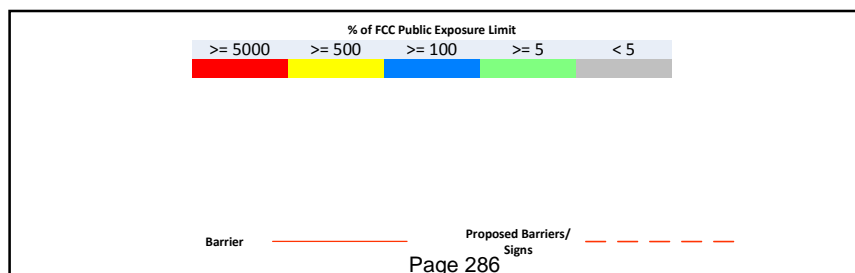
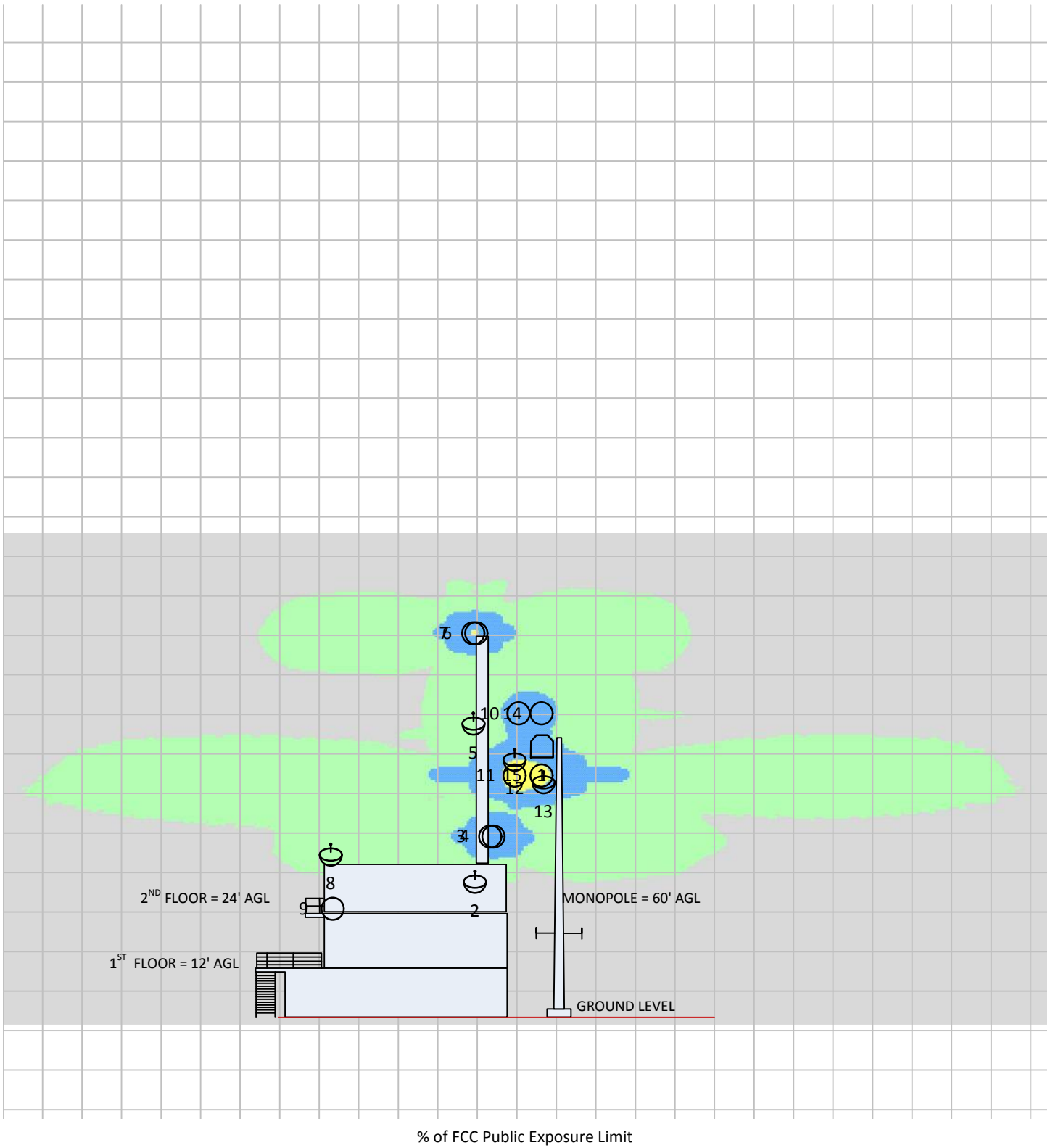
Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: OTA Broadcasting
Elevation View – Existing Antennas Only On Air

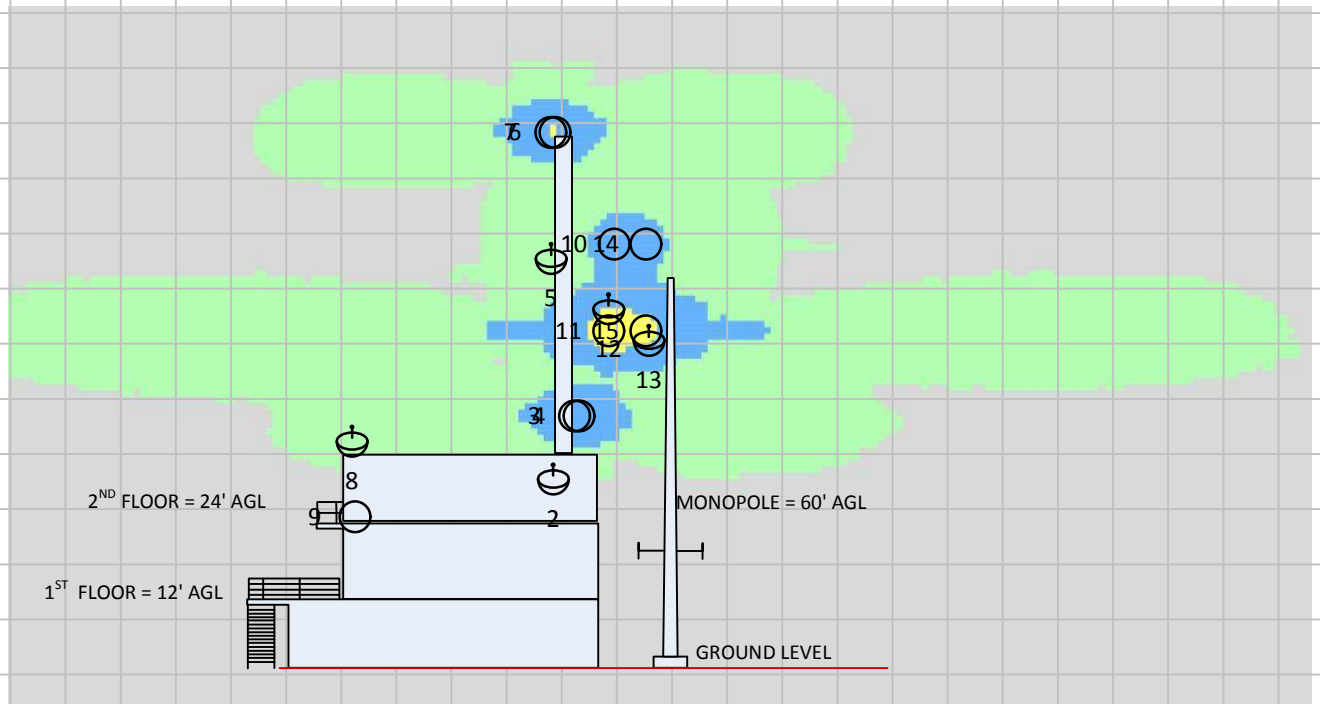


RF Exposure Simulation For: OTA Broadcasting

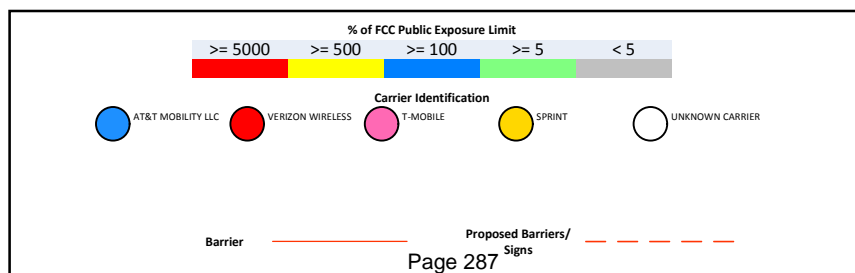
Elevation View – All Antennas On Air



RF Exposure Simulation For: OTA Broadcasting Proposed Configuration On Air – Elevation View



% of FCC Public Exposure Limit



19.4 Site Measurements

This section provides a summary of the measurements collected at the site. Actual measurements locations at which these data points were collected are included in the RF emission diagram provided in Section 19.3 of this report. Two types of measurements were collected at each measurement location: maximum (peak) and spatial average. The spatial average measurement consists of a collection of ten (10) measurements within a ten (10) second time interval taken from zero (0) to six (6) feet in height. The purpose of this measurement technique is to identify the average power density over the dimensions of a typical human body.

Table 1 below contains all the measurements collected from accessible areas located at the site at the time of Sitesafe's visit. Whenever possible, measurements are taken in front of the antenna in the transmitting direction. However, because of the antenna configuration at this site, specific emissions could not be discerned from nearby facilities, and no attempt was made to determine power density levels from a specific transmitting antenna.

Highest Measured Occupational Level: <1%

This value is equal to:

Highest General Public Level: <5%.

Table 1: Spatial Average and Maximum Occupational Measurements					
Measurements Points	Spatial Average	Maximum	Measurements Points	Spatial Average	Maximum
M1	<1 %	<1 %	M10	<1 %	<1 %
M2	<1 %	<1 %	M11	<1 %	<1 %
M3	<1 %	1 %	M12	<1 %	<1 %
M4	<1 %	1 %	M13	<1 %	<1 %
M5	<1 %	<1 %	M14	<1 %	<1 %
M6	<1 %	<1 %	M15	<1 %	<1 %
M7	<1 %	<1 %	M16	<1 %	<1 %
M8	<1 %	<1 %	M17	<1 %	<1 %
M9	<1 %	<1 %	M18	<1 %	<1 %

RF meters and probes have been calibrated and used according to the manufacturer's specifications. Measurements provide a view of the MPE percentage levels at the site at the time of Sitesafe's site visit and are used to validate modeling results. Theoretical modeling is used for determining compliance and the percentage of MPE contributions.

An RF Emission diagram has been included in section 19.3 of this document. All measurement locations are identified in this diagram. The locations of measurements in the RF Emission diagram can be cross referenced with Table 1 (above) to determine the actual spatial average and maximum measurement value per location.

19.5 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was verified on site, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 25 - OTA Broadcasting. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory and representative photographs were obtained or verified during the site visit and were utilized to create the site model diagrams:

Ant #	Operated By	Antenna Model	Ant Type	Length (ft)	TX Freq (MHz)	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	E1 (Decommissioned)	Generic	TV Broadcast	30	668	150	10.67	116	0	TPO	Watt	1	0	60	0	0
2	UNKNOWN OPERATOR	Generic	Aperture	4.6	11000	0	41.86	61	0.01	TPO	Watt	1	153.5	30	0	0
3	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	40	0	0
4	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	40	0	0
5	UNKNOWN OPERATOR	Generic	Aperture	4.6	11000	330	41.86	61	0.01	TPO	Watt	1	153.5	65	0	0
6	UNKNOWN OPERATOR	Generic	Omni	8	150	0	2.61	360	100	ERP	Watt	1	100	85	0	0
7	UNKNOWN OPERATOR	Generic	Omni	4.7	450	0	2.97	360	100	ERP	Watt	1	100	85	0	0
8	UNKNOWN OPERATOR	Generic	Aperture	0	5800	160	29.06	0	20	ERP	Watt	1	20	36	0	0
9	UNKNOWN OPERATOR	Generic	Yagi	0.5	850	160	9.97	60	1	TPO	Watt	1	9.9	24	0	0
10	P1 (Rx)	Sinclair SC479-HF1LDF(D06)	Omni	14.5	700	90	9.5	360	0	ERP	Watt	1	0	67.3	0	0
11	P2	Sinclair SC476-HF1LDF	Omni	7	800	270	6.06	360	1000	ERP	Watt	1	1000	53.5	0	0
12	P3	Generic	Aperture	6	6000	3.34	36.36	2	0.01	TPO	Watt	1	43.3	57	0	0
13	P4	Generic	Aperture	6	6000	185.54	36.36	2	0.01	TPO	Watt	1	43.3	52	0	0
14	P6 (Rx)	Sinclair SC479-HF1LDF(D06)	Omni	14.5	700	90	9.5	360	0	ERP	Watt	1	0	67.3	0	0
15	P7	Sinclair SC476-HF1LDF	Omni	7	800	270	6.06	360	1000	ERP	Watt	1	1000	53.5	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

19.6 Site Pictures



Figure 86: 2nd Floor Access



Figure 87: 2nd floor Overview Facing South



Figure 88: 2nd Floor Tower Overview (1)



Figure 89: 2nd Floor Tower Overview (2)



Figure 90: 2nd Floor Tower Overview (3)

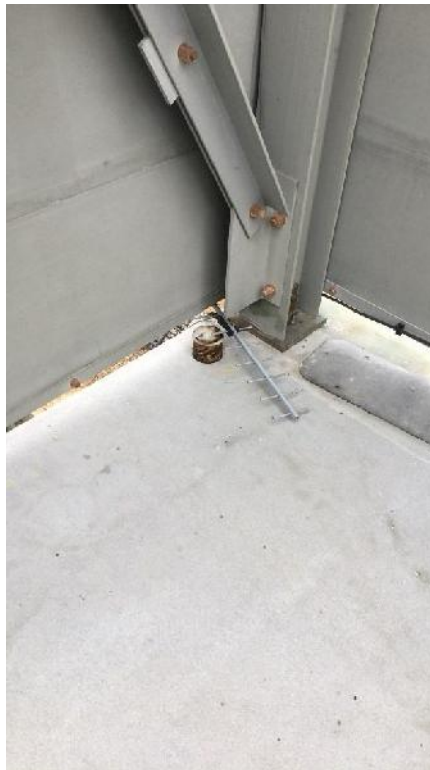


Figure 91: Antenna 9



Figure 92: Monopole Base



Figure 93: Monopole Overview



Figure 94: Antenna 1

20 Mill Valley



Marin Emergency Radio Authority

Site Name – Mill Valley

Site ID: 26

Site Compliance Report

Mill Valley Reservoir
Mill Valley, CA 94941

Latitude: N37-54-10.77
Longitude: W122-33-27.74
Structure Type: Monopole

Report generated date: March 28, 2019
Report by: Sam Cosgrove
Customer Contact: David Mortimer

The site is compliant and will remain compliant upon implementation of the proposed changes.

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20.1 Site Summary

The County of Marin on behalf of Marin Emergency Radio Authority has contracted with Sitesafe, LLC. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine the RF conditions at the proposed communications site, 26 - Mill Valley, located at Mill Valley Reservoir, Mill Valley, CA, in relation to Federal Communications Commission (FCC) Rules and Regulations for RF emissions.

This section contains a detailed summary of the RF environment at the site including:

- Diagram of the site
- Inventory of the make / model of all antennas
- Theoretical MPE based on modeling

RF emissions are predicted to be below 1% MPE in all areas on this site.



20.2 Site Compliance

20.2.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, Sitesafe has determined that:

The site is compliant with the FCC rules and regulations, as described in OET Bulletin 65 and will remain compliant upon implementation of the proposed changes.

The compliance determination is based on theoretical modeling, RF signage placement recommendations, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the Marin Emergency Radio Authority's proposed deployment plan could result in the site being rendered non-compliant.

20.2.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on theoretical analysis of MPE levels. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

The site is compliant with the FCC rules and regulations and will remain compliant upon implementation of the proposed changes.

20.3 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

The theoretical analysis identified the maximum predicted MPE levels on the ground to be:

Maximum Cumulative Theoretical General Public MPE level (All Antennas): 4.3%
Maximum Cumulative Theoretical General Public MPE level (Proposed Antennas): 4.3%

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the operators to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

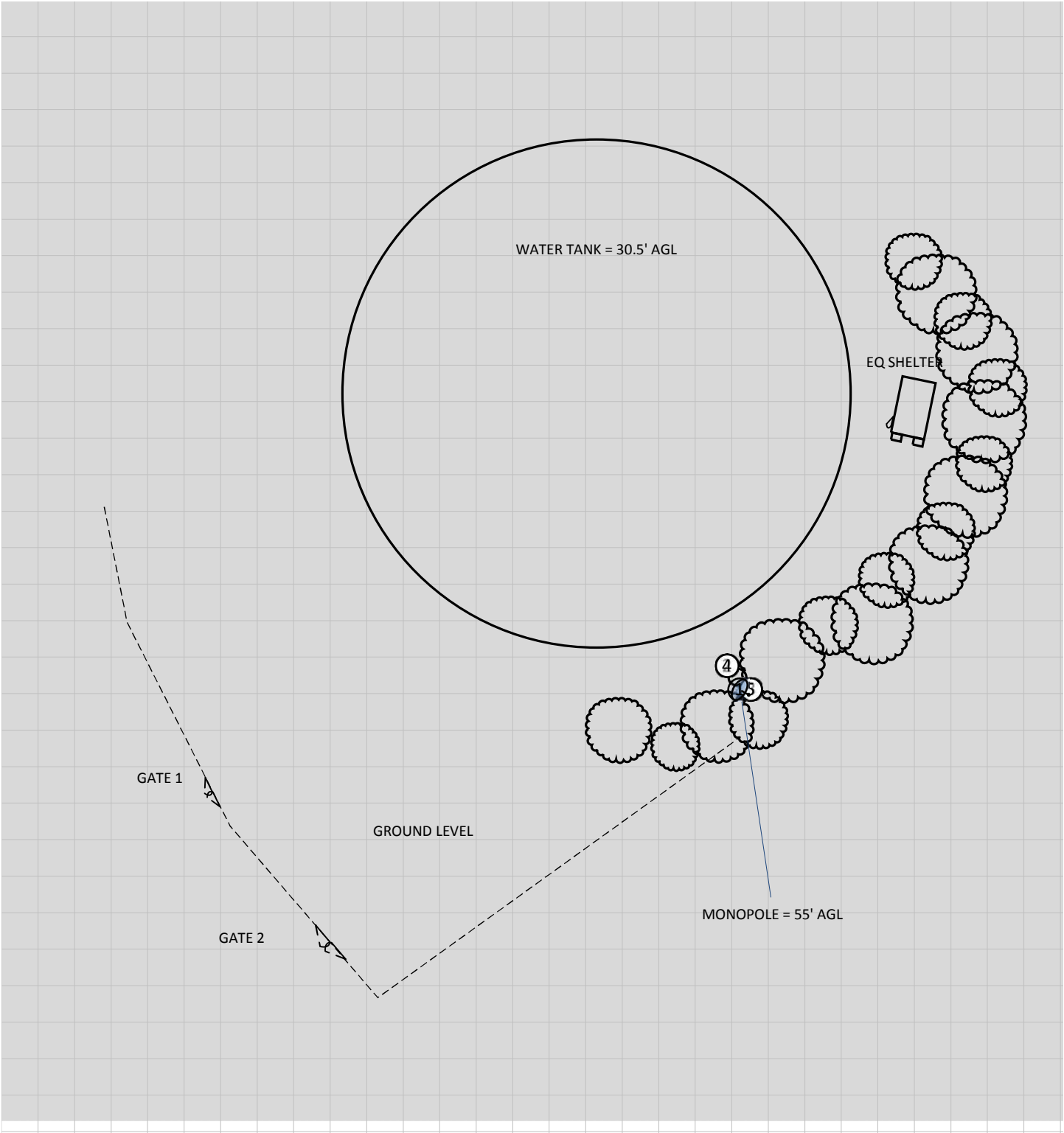
and

Average from 20 feet above to 26 feet above origin

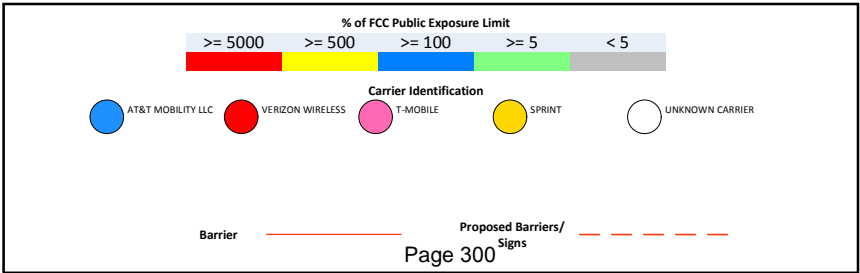
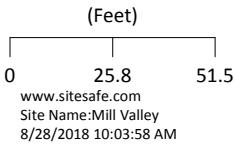
The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

Abbreviations used in the RF Emissions Diagrams

PH=##'	Penthouse at ## feet above main roof
--------	--------------------------------------

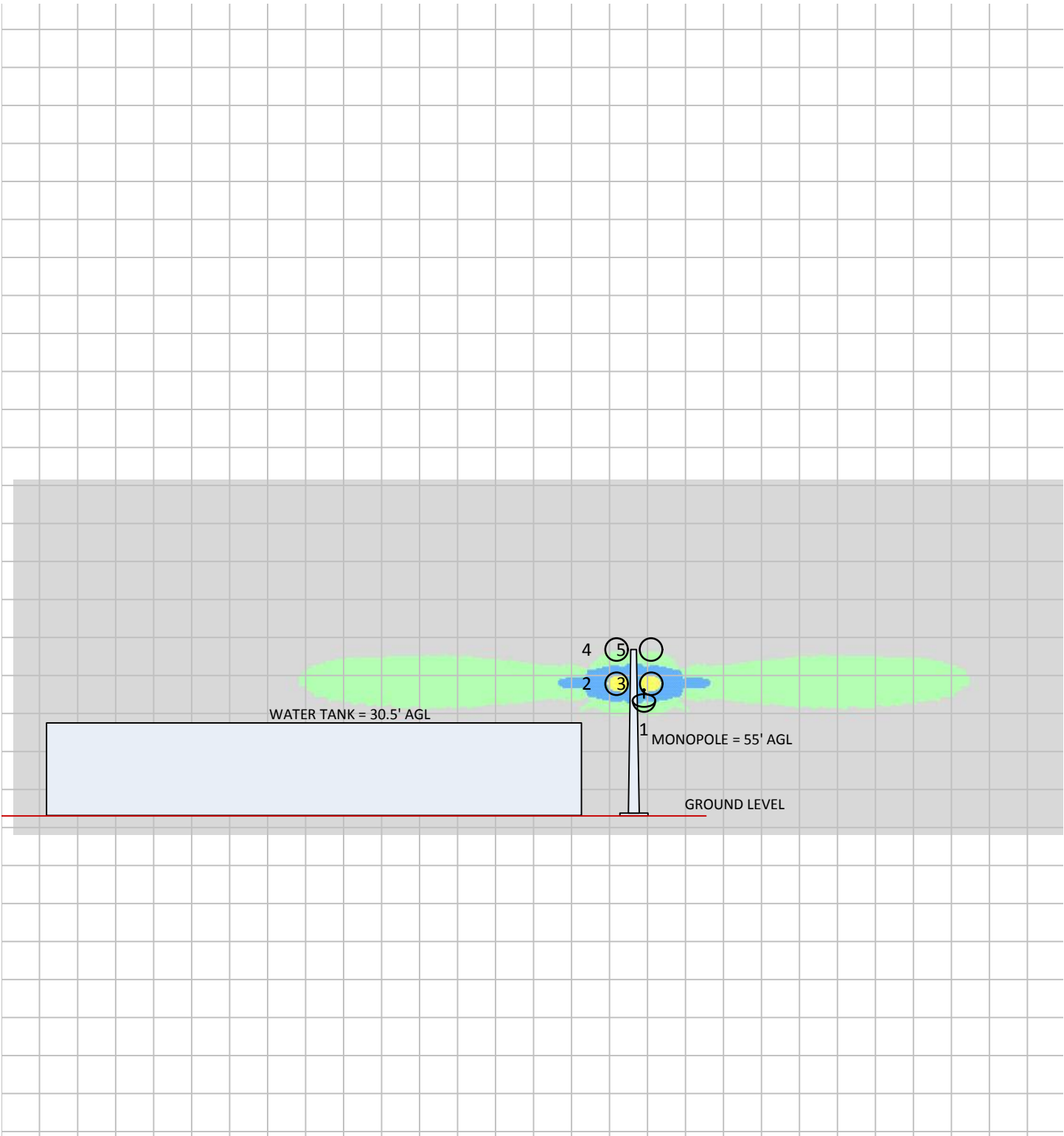


% of FCC Public Exposure Limit
Spatial average 0' - 6'

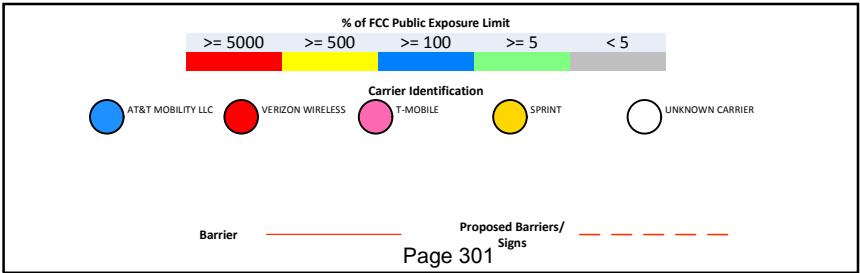


Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Mill Valley
Elevation View – Final Configuration



% of FCC Public Exposure Limit



20.4 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was provided by the customer, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 26 - Mill Valley. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other operators at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



The following antenna inventory was provided by the customer and was utilized to create the site model diagrams:

Table 3: Antenna Inventory

Ant #	Operated By	Antenna Model	Ant Type	Len (ft)	TX Freq (MHz)	TECH	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power Beamwidth (Deg)	POWER	POWER TYPE	POWER UNITS	# of Trans	ERP (Watts)	Z (ft)	DT	EDT
1	P1	Generic	Aperture	4	11000		120	37.66	2	0.01	TPO	Watt	1	58.3	38	0	0
2	P2	Sinclair SC476-HF1LDF	Omni	7	700		0	6.06	360	1000	ERP	Watt	1	1000	43.5	0	0
3	P3	Sinclair SC476-HF1LDF	Omni	7	700		0	6.06	360	1000	ERP	Watt	1	1000	43.5	0	0
4	P4 (Rx)	Rfi CC807-08	Omni	9.5	800		0	8	360	0	ERP	Watt	1	0	54.8	0	0
5	P5 (Rx)	Rfi CC807-08	Omni	9.5	800		0	8	360	0	ERP	Watt	1	0	54.8	0	0

NOTE: Z indicates relative position of the antenna to the origin location on the site, displayed in the model results diagram. The Z reference indicates antenna height above the main site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

21 Frequency Hazards Table

Existing Sites Proposed for Next Gen System		RF Threshold* Existing System (at 485 MHz Operating Frequency)		Existing System RF emissions		Next Gen Temporary Change Over Condition		Next Gen Long-term Condition		Public Safety Arc
EIR No.	Site Name	Controlled	Uncontrolled	Controlled (% Threshold)	Uncontrolled (% Threshold)	Controlled (% Threshold)	Uncontrolled (% Threshold)	Controlled (% Threshold)	Uncontrolled (% Threshold)	Minimum Distance (ft)
1	Prime Site (new location at EOF)	Existing Background RF		553.56	<5	577.10	<5	553.18	<5	0
2	Civic Center	1.6mW/cm ²	0.32mW/cm ²	2677.29	<5	2677.29	<5	2677.29	<5	0
3	Big Rock	1.6mW/cm ²	0.32mW/cm ²	786.21	8.67	786.21	8.67	786.21	8.67	0
4	Mt. Tamalpais	1.6mW/cm ²	0.32mW/cm ²	2418.3	<5	2418.3	<5	2418.27	<5	0
5	Mt. Barnabe	1.6mW/cm ²	0.32mW/cm ²	889.74	<5	967.56	<5	967.56	<5	0
6	Bolinas Fire Station									
7	Bolinas Ridge									
8	Point Reyes Hill	1.6mW/cm ²	0.32mW/cm ²	21.26	20.99	21.45	21.59	16.17	14.36	0
9	Forbes Hill	1.6mW/cm ²	0.32mW/cm ²							
10	Dollar Hill	1.6mW/cm ²	0.32mW/cm ²	71.65	34.79	73.72	35.69	73.72	35.12	0
11	San Pedro Ridge	1.6mW/cm ²	0.32mW/cm ²	192.93	<5	192.93	<5	192.93	<5	0
12	Old Mt.Burdell Site (see #25 for OTA site)									
13	Novato Police Dept									
14	Mt. Tiburon	1.6mW/cm ²	0.32mW/cm ²	9.28	<5	10.07	<5	2.15	<5	0
15	Mill Valley City Hall									
16	Mill Valley Police Station									
17	Bay Hill Road									
18	Sonoma Mountain	1.6mW/cm ²	0.32mW/cm ²	9765.91	<5	9765.91	<5	9765.91	<5	0

Existing Sites Proposed for Next Gen System		RF Threshold* Existing System (at 485 MHZ Operating Frequency)		Existing System RF emissions		Next Gen Temporary Change Over Condition		Next Gen Long-term Condition		Public Safety Arc
EIR No.	Site Name	Controlled	Uncontrolled	Controlled (% Threshold)	Uncontrolled (% Threshold)	Controlled (% Threshold)	Uncontrolled (% Threshold)	Controlled (% Threshold)	Uncontrolled (% Threshold)	Minimum Distance (ft)
19	Stewart Point (Approved with CEQA Amendment)	1.6mW/cm ²	0.32mW/cm ²	144.24	16.18	165.85	16.39	150.93	16.07	0
New Sites Proposed for Next Gen System										
20	Tomales (Approved with CEQA Categorical Exemption)	<i>Existing Background RF</i>		-	-	196.78	<5	196.78	<5	0
21	Coyote Peak (new power to follow Ranch Road)			<5	<5	<5	<5	<5	<5	0
22	Skyview Terrace (EOF Water Tank)			-	-	<5	<5	<5	<5	0
23	Muir Beach			-	-	<5	<5	<5	<5	0
24	Wolfback Ridge	<i>Existing Background RF</i>		50141.5	87.03	50141.5	87.03	50141.5	87.03	0
25	Mt Burdell OTA	<i>Existing Background RF</i>		8.70	<5	9.14	<5	9.14	<5	0
26	Mill Valley Water Tank			-	-	4.31	<5	4.31	<5	0

** Hammett Edison Inc. data source for Next Gen Radio Frequency safety thresholds (TBD)

Notes:

- On sites where percentages do not change a substantial amount or do not change at all between the existing conditions, temporary change over conditions, and next gen long-term conditions, there are other operators responsible for the emissions.
- The percentages listed in the uncontrolled columns are accessible to the general public on the ground level outside of the fences (where existing). Percentages listed in the Controlled column are accessible only to workers in the areas and are inside the fences or on rooftops.



22 Field Technician Certification

I, Jeff Desira, state:

That I am an employee of Sitesafe, LLC., in Vienna, Virginia, which provides RF compliance services to clients in the wireless communications industry; and

That I have successfully completed RF Safety Awareness training, am aware of the hazards and, therefore, can be exposed to RF fields classified for "Occupational" exposure;

That I am familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have been trained in the proper use of measurement equipment, and have successfully completed Sitesafe training in policy, procedure and proper site measurement and modeling; and

That I performed survey measurements of the RF environment at the site identified as 1 customized report for 18 sites on August 28, 2018 at 5:17 PM in order to determine where there might be electromagnetic energy that is in excess of both the Controlled Environment and Uncontrolled Environment levels; and

That the survey measurements were performed with measurement equipment, model Narda NBM-550 2401-01B field intensity meter (serial number E-0538) and model Narda EA 5091 2402-07B field intensity probe, (serial number 01066) calibrated on 6/6/2017; and

That I have prepared this Site Compliance Report and believe it to be true and accurate to the best of my knowledge and based on data gathered.

By: Jeff Desira



23 Engineer Certification

The professional engineer whose seal appears on the cover of this document hereby certifies and affirms:

That I am registered as a Professional Engineer in the jurisdiction indicated in the professional engineering stamp on the cover of this document; and

That I, Michael A McGuire, am currently and actively licensed to provide (in this state/jurisdiction as indicated within the professional electrical engineering seal on the cover of this document) professional electrical engineering services, as an employee of Hurricane Hill Development Company, PLLC , a duly authorized/registered engineering firm (in this state, as applicable) on behalf of SiteSafe, LLC; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That survey measurements of the site environment of the site identified as 1 customized report for 18 sites have been performed in order to determine where there might be electromagnetic energy that is in excess of both the Controlled Environment and Uncontrolled Environment levels; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Klaus Bender.

March 28, 2019



24 Appendix A – Statement of Limiting Conditions

Sitesafe field personnel visited the site and collected data with regard to the RF environment. Sitesafe will not be responsible for matters of a legal nature that affect the site or property. The property was visited under the premise that it is under responsible ownership and management and our client has the legal right to conduct business at this facility.

Due to the complexity of some wireless sites, Sitesafe performed this visit and created this report utilizing best industry practices and due diligence. Sitesafe cannot be held accountable or responsible for anomalies or discrepancies due to actual site conditions (i.e., mislabeling of antennas or equipment, inaccessible cable runs, inaccessible antennas or equipment, etc.) or information or data supplied by Marin Emergency Radio Authority, the site manager, or their affiliates, subcontractors or assigns.

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, observed during the survey of the subject property or that Sitesafe became aware of during the normal research involved in performing this survey. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data provided by a second party and physical data collected by Sitesafe, the physical data will be used.

25 Appendix B – Assumptions and Definitions

25.1 General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The site has been modeled with these assumptions to show the maximum RF energy density. Sitesafe believes this to be a worst-case analysis, based on best available data. Areas modeled to predict emissions greater than 100% of the applicable MPE level may not actually occur, but are shown as a worst-case prediction that could be realized real time. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Thus, at any time, if power density measurements were made, we believe the real-time measurements would indicate levels below those depicted in the RF emission diagram(s) in this report. By modeling in this way, Sitesafe has conservatively shown exclusion areas – areas that should not be entered without the use of a personal monitor, carriers reducing power, or performing real-time measurements to indicate real-time exposure levels.

25.2 Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

25.3 Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

Gain (of an antenna) – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

General Population/Uncontrolled Environment – Defined by the FCC, as an area where RFR exposure may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

Generic Antenna – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Measurement – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

Maximum Permissible Exposure (MPE) – The rms and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed without harmful effect and with acceptable safety factor.



Occupational/Controlled Environment – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are **aware** of the potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

OSHA (Occupational Safety and Health Administration) – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency Radiation – Electromagnetic waves that are propagated from antennas through space.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average energy an average sized human body will absorb while present in an electromagnetic field of energy.

Transmitter Power Output (TPO) – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

26 Appendix C – Rules & Regulations

26.1 Explanation of Applicable Rules and Regulations

The FCC has set forth guidelines in OET Bulletin 65 for human exposure to radio frequency electromagnetic fields. Specific regulations regarding this topic are listed in Part 1, Subpart I, of Title 47 in the Code of Federal Regulations. Currently, there are two different levels of MPE - General Public MPE and Occupational MPE. An individual classified as Occupational can be defined as an individual who has received appropriate RF training and meets the conditions outlined below. General Public is defined as anyone who does not meet the conditions of being Occupational. FCC and OSHA Rules and Regulations define compliance in terms of total exposure to total RF energy, regardless of location of or proximity to the sources of energy.

It is the responsibility of all licensees to ensure these guidelines are maintained at all times. It is the ongoing responsibility of all licensees composing the site to maintain ongoing compliance with FCC rules and regulations. Individual licensees that contribute less than 5% MPE to any total area out of compliance are not responsible for corrective actions.

OSHA has adopted and enforces the FCC's exposure guidelines. A building owner or site manager can use this report as part of an overall RF Health and Safety Policy. It is important for building owners/site managers to identify areas in excess of the General Population MPE and ensure that only persons qualified as Occupational are granted access to those areas.

26.2 Occupational Environment Explained

The FCC definition of Occupational exposure limits apply to persons who:

- are exposed to RF energy as a consequence of their employment;
- have been made aware of the possibility of exposure; and
- can exercise control over their exposure.

OSHA guidelines go further to state that persons must complete RF Safety Awareness training and must be trained in the use of appropriate personal protective equipment.

In order to consider this site an Occupational Environment, the site must be controlled to prevent access by any individuals classified as the General Public. Compliance is also maintained when any non-occupational individuals (the General Public) are prevented from accessing areas indicated as Red or Yellow in the attached RF Emissions diagram. In addition, a person must be aware of the RF environment into which they are entering. This can be accomplished by an RF Safety Awareness class, and by appropriate written documentation such as this Site Compliance Report.

All Marin Emergency Radio Authority employees who require access to this site must complete RF Safety Awareness training and must be trained in the use of appropriate personal protective equipment.

27 Appendix D – General Safety Recommendations

The following are *general recommendations* appropriate for any site with accessible areas in excess of 100% General Public MPE. These recommendations are not specific to this site. These are safety recommendations appropriate for typical site management, building management, and other tenant operations.

1. All individuals needing access to the main site (or the area indicated to be in excess of General Public MPE) should wear a personal RF Exposure monitor, successfully complete proper RF Safety Awareness training, and have and be trained in the use of appropriate personal protective equipment.
2. All individuals needing access to the main site should be instructed to read and obey all posted placards and signs.
3. The site should be routinely inspected and this or similar report updated with the addition of any antennas or upon any changes to the RF environment including:
 - adding new antennas that may have been located on the site
 - removing of any existing antennas
 - changes in the radiating power or number of RF emitters
4. Post the appropriate **NOTICE**, **CAUTION**, or **WARNING** sign at the main site access point(s) and other locations as required. Note: Please refer to RF Exposure Diagrams in Section 5, to inform everyone who has access to this site that beyond posted signs there may be levels in excess of the limits prescribed by the FCC. In addition to RF Advisory Signage, a RF Guideline Signage is recommended to be posted at the main site access point(s). The signs below are examples of signs meeting FCC guidelines.



5. Ensure that the site door remains locked (or appropriately controlled) to deny access to the general public if deemed as policy by the building/site owner.
6. For a General Public environment the five color levels identified in this analysis can be interpreted in the following manner:
 - Gray represents area at below 5% of the General Public MPE limits or below. This level is safe for the General Public to be in for any amount of time.



- Green represents areas predicted to be between 5% and 100% of the General Public MPE limits. This level is safe for the General Public to be in for any amount of time.
- Blue represents areas predicted to be between 100% and 500% of the General Public MPE limits. This level is not safe for the General Public to be in.
- Yellow represents areas predicted to be between 500% and 5000% of the General Public MPE limits. This level is not safe for the General Public to be in.
- Red areas indicated predicted levels greater than 5000% of the General Public MPE limits. This level is not safe for the General Public to be in.

7. For an Occupational environment the five color levels identified in this analysis can be interpreted in the following manner:

- Areas indicated as Gray are at 5% of the Occupational MPE limits or below. This level is safe for a worker to be in at any time.
- Green represents areas predicted to be between 5% and 20% of the Occupational MPE limits. This level is safe for a worker to be in at any time.
- Blue represents areas predicted to be between 20% and 100% of the Occupational MPE limits. This level is safe for a worker to be in at any time.
- Yellow represents areas predicted to be between 100% and 500% of the Occupational MPE limits. Only individuals that have been properly trained in RF Health and Safety should be allowed to work in this area. This is not an area that is suitable for the General Public to be in.
- Red areas indicated predicted levels greater than 500% of the Occupational MPE limits. This level is not safe for the Occupational worker to be in for prolonged periods of time. Special procedures must be adhered to such as lock out tag out procedures to minimize the workers exposure to EME.

8. Use of a Personal Protective Monitor: When working around antennas, Sitesafe strongly recommends the use of a Personal Protective Monitor (PPM). Properly wearing a PPM will forewarn the individual prior to entering an RF exposure area.

Keep a copy of this report available for all persons who must access the site. They should read this report and be aware of the potential hazards with regards to RF and MPE limits.

27.1 Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

Training and Qualification Verification: All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).



Physical Access Control: Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- Locked door or gate
- Alarmed door
- Locked ladder access
- Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

RF Signage: Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

Assume all antennas are active: Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

Maintain a 3 foot clearance from all antennas: There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

Site RF Emissions Diagram: Section 5 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

27.1.1 Additional Information

Additional RF information is available by visiting both www.Sitesafe.com and www.fcc.gov/oet/rfsafety. OSHA has additional information available at: <http://www.osha-slc.gov/SLTC/radiofrequencyradiation>.

APPENDIX E

NOP, COMMENTS MADE AT SCOPING MEETING, & RESPONSES TO NOP

MARIN EMERGENCY RADIO AUTHORITY

95 Rowland Way, Novato, CA 94945

PHONE: (415) 878-2690

FAX: (415) 878-2660

WWW.MERAONLINE.ORG

N O P

NOTICE OF PREPARATION AND NOTICE OF PUBLIC SCOPING MEETING MERA NEXT GENERATION RADIO COMMUNICATIONS SYSTEM PROJECT SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

Facilities and meetings comply with the Americans With Disabilities Act. If special accommodations are needed, please contact the MERA Operations Officer at (415) 473-4368.

The Marin Emergency Radio Authority (MERA), a joint powers agency, acting as the lead agency pursuant to Section 15050 of the CEQA Guidelines, will be preparing a Draft Subsequent Environmental Impact Report (Draft SEIR) for the proposed Next Generation Radio Communications System Project (Next Gen System, or proposed project). The SEIR is being prepared by MERA in accordance with CEQA and the State of California CEQA Guidelines. Pursuant to Sections 15082(a) and 15375 of the CEQA Guidelines, MERA has issued this Notice of Preparation (NOP) to provide Responsible Agencies, Trustee Agencies, and other interested parties with information describing the proposal and its potential environmental effects.

The MERA radio system is vital for emergency countywide communications between police, firefighters and public works crews. The emergency communications system is a network of radio antennas and equipment linked with microwave connections. However, the combination of older equipment and recent changes to frequency requirements by the *Congressional Jobs Bill HR 3630* now requires an upgrade of all UHF (T-band), including MERA's, radio communications systems. Funding for the system is generated by a parcel tax that was authorized by Marin County voters in 2014.

The current system includes 15 active communications sites. The MERA Next Gen System would retain and upgrade 10 of the functioning sites, decommission five existing sites and add equipment to eight new sites, which include previously developed infrastructure not part of the MERA system. New sites include communication and water tank sites and a water wellhead site in northern Marin County.

Existing sites used in Next Gen System:

- Civic Center
- Big Rock Ridge
- Mt. Tamalpais
- Mt. Barnabe
- Point Reyes Hill
- Dollar Hill
- San Pedro Ridge
- Mt. Tiburon
- Sonoma Mountain
- Stewart Point

New sites proposed for Next Gen System:

- Prime Site (Sheriff's dispatch center)
- Tomales (existing cell phone site)
- Coyote Peak (a water wellhead site)
- Skyview Terrace (an MMWD water tank site)
- Muir Beach (a local water tank site)
- Wolfback Ridge (an existing broadcast tower)
- OTA Mt. Burdell (an existing broadcast tower)
- Mill Valley Water Tank (MMWD water tank)

The five sites to be decommissioned as part of the Next Gen System are: Forbes Hill in San Rafael, Mt. Burdell near Novato, Mill Valley City Hall and Mill Valley Police Station, and the Bay Hill Road site in Sonoma County.

LOCATIONS: Figure 1 shows the Next Gen System configuration and Table 1 provides a summary description of the communication sites including assessor parcel numbers and coordinates. A more detailed project description with a list of existing and proposed facilities at each site can be found on the MERA website: <https://www.marincounty.org/depts/pw/divisions/projects/mera>

The Next Gen System would update the current backbone network to utilize new radio frequencies in the 700MHz band to comply with an FCC mandate that public agency radio systems (including MERA) vacate the UHF (T-band) frequencies currently utilized. The Next Gen system would also utilize Project 25 (P25) technology to provide improved public service and emergency radio coverage within the County of Marin.

PROBABLE ENVIRONMENTAL EFFECTS: The Next Gen System is anticipated to have similar environmental effects as those previously evaluated in the original MERA EIR (Marin Public Safety and Emergency Communication System EIR) certified in the year 2000. The probable environmental effects include potentially significant impacts to biological resources, aesthetics, cultural resources, hazards and hazardous materials, and land use regulations. The Next Gen SEIR will evaluate the new environmental impacts resulting from the proposed MERA Next Gen System upgrades and will define compliance activities needed to address new regulations put into place since the original EIR. All CEQA topics relevant to the project will also be considered in the SEIR, including:

1) Land Use & Planning	7) Biological Resources	13) Aesthetics/Visual Resources
2) Population & Housing	8) Energy & Natural Resources	14) Cultural Resources
3) Geology and Soils	9) Hazards and Hazardous Materials Radio Frequency Analysis	15) Agriculture and Forestry Resources
4) Hydrology and Water Quality	10) Noise	16) Greenhouse Gas Emissions
5) Air Quality	11) Public Services and Recreation	17) Mineral Resources
6) Transportation/Traffic	12) Utilities & Service Systems	

REQUEST FOR COMMENTS: To ensure that the SEIR for this project is thorough, adequate, and meets the needs of all agencies reviewing it, MERA requests your comments on the scope and content of the Draft SEIR within the 30-day comment period, which closes **June 18, 2018**. Written comments may be forwarded electronically via email or mailed with postmarks on or before the closing date, to:

Ernest Klock, MERA Operations Officer
3501 Civic Center Drive, Room 304, San Rafael, CA 94903
email: MERa-EIR@marincounty.org

NOTICE OF SCOPING MEETING: To ensure that the SEIR will address any additional issues that may be of concern to the public for this proposed project, MERA will also conduct a public scoping meeting. Public Agencies, community groups and interested members of the public are invited to attend the scoping meeting and present oral or written comments on the issues to be evaluated in the Draft SEIR. The public scoping meeting will be held on **Thursday, May 31, 2018, from 6:30 p.m. to 8:30 p.m.** at 3501 Civic Center Drive, Room 330, San Rafael, CA 94903.

A more detailed preliminary project description of the proposed Next Gen project and other informative materials including the original EIR (SCH #1999092073) are on file with the office of the Marin County Public Works Department, 3501 Civic Center Drive, Suite 304, San Rafael, CA 94903, and are available for public review between the hours of 8:00 a.m. to 4:00 p.m., Monday through Thursday. The information is posted on the MERA website at <https://www.marincounty.org/depts/pw/divisions/projects/mera>. If you have any questions, or need additional information concerning the scoping meeting or would like to request a hard copy of the Summary Project Description, please contact Ernest Klock at 415-473-4368.

Ernest Klock
Operations Officer, MERA

Table 1. MERA Sites and Locations for CEQA Evaluation

Site Name and Number	APN	Jurisdiction	Coordinates	Previous EIR	Comments
1. Prime Site EOF [^]	165-220-11	City of San Rafael	38.019167, -122.541528	N	New site at Sheriff's Dispatch
2. Civic Center	179-270-11	City of San Rafael	37.999056, -122.531306	Y	Upgrades
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17. Bay Hill Road	100-190-07	Sonoma County	N/A	Y	Decommission
18. Sonoma Mountain	136-190-09	Sonoma County	38.261015, -122.903629	Y	Upgrades
19. Stewart Point**	188-090-15	Marin County	38.185833, -122.825167	Y	Upgrades
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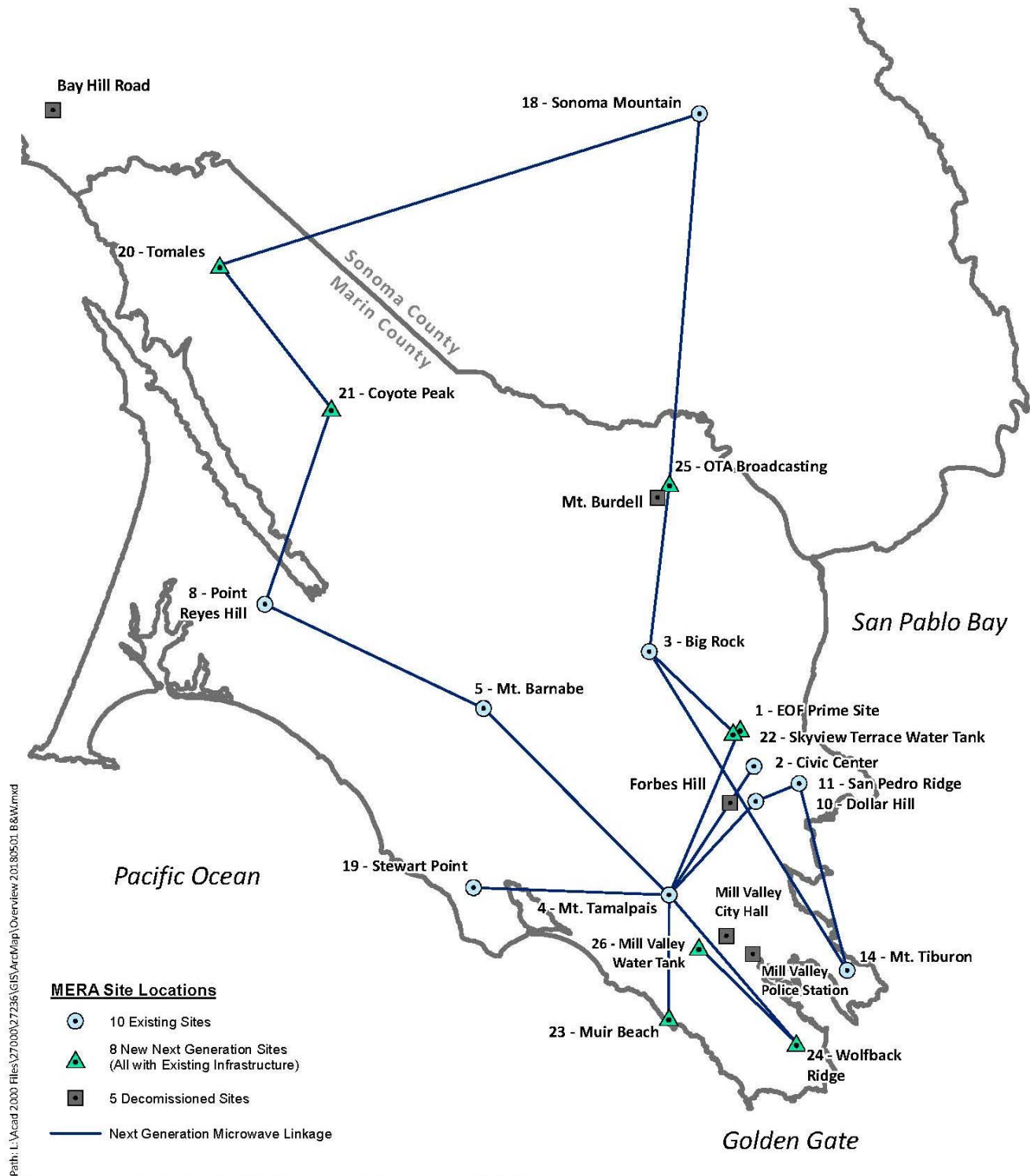


Figure X. MERA Next Generation System Configuration

MARIN EMERGENCY RADIO AUTHORITY

Marin County Posting

95 Rowland Way, Novato, CA 94945

PHONE: (415) 878-2690

FAX: (415) 878-2660

WWW.MERAONLINE.ORG

NOTICE OF PREPARATION AND NOTICE OF PUBLIC SCOPING MEETING MERA NEXT GENERATION RADIO COMMUNICATIONS SYSTEM PROJECT SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

Facilities and meetings comply with the Americans With Disabilities Act. If special accommodations are needed, please contact the MERA Operations Officer at (415) 473-4368.

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The MERA radio system is vital for emergency countywide communications between police, firefighters and public works crews. The emergency communications system is a network of radio antennas and equipment linked with microwave connections. However, the combination of older equipment and recent changes to frequency requirements by the *Congressional Jobs Bill HR 3630* now requires an upgrade of all UHF (T-band), including MERA's, radio communications systems. Funding for the system is generated by a parcel tax that was authorized by Marin County voters in 2014.

The current system includes 15 active communications sites. The MERA Next Gen System would retain and upgrade 10 of the functioning sites, decommission five existing sites and add equipment to eight new sites, which include previously developed infrastructure not part of the MERA system. New sites include communication and water tank sites and a water wellhead site in northern Marin County.

Existing sites used in Next Gen System:

- Civic Center
- Big Rock Ridge
- Mt. Tamalpais
- Mt. Barnabe
- Point Reyes Hill
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- Mt. Tiburon
- Sonoma Mountain
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MARIN EMERGENCY RADIO AUTHORITY Sonoma County Posting

95 Rowland Way, Novato, CA 94945

PHONE: (415) 878-2690

FAX: (415) 878-2660

WWW.MERAONLINE.ORG

This notice was posted on 05/17/2018
and will remain posted for a period of thirty days
through 06/17/2018

Doc No.PST-201800084

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William F. Rousseau, County Clerk

BY: 
Julianna Garfia, Deputy Clerk

State Clearinghouse Confirmation of Receipt

From: "Stratton, Debra" <DStratton@marincounty.org>
Subject: FW: Notice of Preparation/Scoping Meeting MERA NextGen
Date: May 15, 2018 4:04:53 PM PDT
To: "Klock, Ernest" <EKlock@marincounty.org>, John Roberto
<jraplan@sbcglobal.net>

FYI

From: Christine Asiata <Christine.Asiata@OPR.CA.GOV> ^[SEP]**Sent:** Tuesday,
May 15, 2018 4:04 PM ^[SEP]**To:** Stratton, Debra
<DStratton@marincounty.org> ^[SEP]**Subject:** RE: Notice of Preparation/Scoping
Meeting MERA NextGen

Thank you for your submittal, the SCH is in receipt of your NOP, it will start review tomorrow 5/16/2018.

Christine Asiata Rodriguez

From: OPR State Clearinghouse ^[SEP]**Sent:** Tuesday, May 15, 2018 3:11
PM ^[SEP]**To:** Christine Asiata <Christine.Asiata@OPR.CA.GOV> ^[SEP]**Subject:** FW:
Notice of Preparation/Scoping Meeting MERA NextGen

From: Stratton, Debra <DStratton@marincounty.org> ^[SEP]**Sent:** Tuesday, May
15, 2018 3:05 PM ^[SEP]**To:** OPR State Clearinghouse
<State.Clearinghouse@opr.ca.gov> ^[SEP]**Cc:** Klock, Ernest
<EKlock@marincounty.org>; John Roberto
<jraplan@sbcglobal.net> ^[SEP]**Subject:** Notice of Preparation/Scoping Meeting
MERA NextGen

Attached please find SCH document transmittal for the **NOTICE OF PREPARATION AND NOTICE OF PUBLIC SCOPING MEETING MERA NEXT GENERATION RADIO COMMUNICATIONS SYSTEM PROJECT SUBSEQUENT ENVIRONMENTAL IMPACT REPORT.**

Marin Independent Journal

4000 Civic Center Drive, Suite 301
San Rafael, CA 94903
415-382-7335
legals@marinij.com

2071509

MARIN COUNTY PLANNING DEPT
3501 CIVIC CENTER DR
RM 308
SAN RAFAEL, CA 94903-4189

PROOF OF PUBLICATION (2015.5 C.C.P.)

STATE OF CALIFORNIA County of Marin

O. 41PWPMERA- PWMSCSVCS / 10115551 / :

I am a citizen of the United States and a resident of the County aforesaid: I am over the age of eighteen years, and not a party to or interested in the above matter. I am the principal clerk of the printer of the MARIN INDEPENDENT JOURNAL, a newspaper of general circulation, printed and published daily in the County of Marin, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Marin, State of California, under date of FEBRUARY 7, 1955, CASE NUMBER 25566; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

05/17/2018

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Dated this 17th day of May, 2018.

Donna Lazarus

Signature

PROOF OF PUBLICATION

r.BP7-11/10/16

Legal No. 0006156235

THURSDAY, MAY 17, 2018

NOTICE OF PREPARATION AND NOTICE OF PUBLIC SC MERA NEXT GENERATION RADIO COMMUNICATIONS SY SUBSEQUENT ENVIRONMENTAL IMPACT RE

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MERA NEXT GENERATION RADIO COMMUNICATIONS SYSTEM PROJECT
SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

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The five sites to be decommissioned as part of the Next Gen System are: Forbes Hill in San Rafael, Mt. Burdell near Novato, Mill Valley City Hall and Mill Valley Police Station, and the Bay Hill Road site in Sonoma County.

LOCATIONS: Figure 1 shows the Next Gen System configuration and Table 1 provides a summary description of the communication sites including assessor parcel numbers and coordinates. A more detailed project description with a list of existing and proposed facilities at each site can be found on the MERA website: <https://www.marincounty.org/depts/pw/divisions/projects/mera>

The Next Gen System would update the current backbone network to utilize new radio frequencies in the 700MHz band to comply with an FCC mandate that public agency radio systems (including MERA) vacate the UHF (T-band) frequencies currently utilized. The Next Gen system would also utilize Project 25 (P25) technology to provide improved public service and emergency radio coverage within the County of Marin.

PROBABLE ENVIRONMENTAL EFFECTS: The Next Gen System is anticipated to have similar environmental effects as those previously evaluated in the original MERA EIR (Marin Public Safety and Emergency Communication System EIR, SCH #1999092073), which was certified in the year 2000. The probable environmental effects include potentially significant impacts to biological resources, aesthetics, cultural resources, hazards and hazardous materials, and land use regulations. The Next Gen SEIR will evaluate the new environmental impacts resulting from the proposed MERA Next Gen System upgrades and will define compliance activities needed to address new regulations put into place since the original EIR. All CEQA topics relevant to the project will also be considered in the SEIR, including:

1) Land Use & Planning	7) Biological Resources	13) Aesthetics/Visual Resources
2) Population & Housing	8) Energy & Natural Resources	14) Cultural Resources
3) Geology and Soils	9) Hazards and Hazardous Materials Radio Frequency Analysis	15) Agriculture and Forestry Resources
4) Hydrology and Water Quality	10) Noise	16) Greenhouse Gas Emissions
5) Air Quality	11) Public Services and Recreation	17) Mineral Resources
6) Transportation/Traffic	12) Utilities & Service Systems	

REQUEST FOR COMMENTS: To ensure that the SEIR for this project is thorough, adequate, and meets the needs of all agencies reviewing it, MERA requests your comments on the scope and content of the Draft SEIR within the 30-day comment period, which closes **June 18, 2018**. Written comments may be forwarded electronically via email or mailed with postmarks on or before the closing date, to:

Ernest Klock, MERA Operations Officer
3501 Civic Center Drive, Room 304, San Rafael, CA 94903
email: MERA-EIR@marincounty.org

NOTICE OF SCOPING MEETING: To ensure that the SEIR will address any additional issues that may be of concern to the public for this proposed project, MERA will also conduct a public scoping meeting. Public Agencies, community groups and interested members of the public are invited to attend the scoping meeting and present oral or written comments on the issues to be evaluated in the Draft SEIR. The public scoping meeting will be held on **Thursday, May 31, 2018, from 6:30 p.m. to 8:30 p.m.** at 3501 Civic Center Drive, Room 330, San Rafael, CA 94903.

A more detailed preliminary project description of the proposed Next Gen project and other informative materials including the original EIR (SCH #1999092073) are on file with the office of the Marin County Public Works Department, 3501 Civic Center Drive, Suite 304, San Rafael, CA 94903, and are available for public review between the hours of 8:00 a.m. to 4:00 p.m., Monday through Thursday. The information is posted on the MERA website at <https://www.marincounty.org/depts/pw/divisions/projects/mera>. If you have any questions, or need additional information concerning the scoping meeting or would like to request a hard copy of the Summary Project Description, please contact Ernest Klock at 415-473-4368.

Ernest Klock
Operations Officer, MERA

Table 1. MERA Sites and Locations for CEQA Evaluation

Site Name and Number	APN	Jurisdiction	Coordinates	Previous EIR	Comments
1. Prime Site EOF^	165-220-11	City of San Rafael	38.019167, -122.541528	N	New site at Sheriff's Dispatch
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Figure 1. MERA Next Generation System Configuration

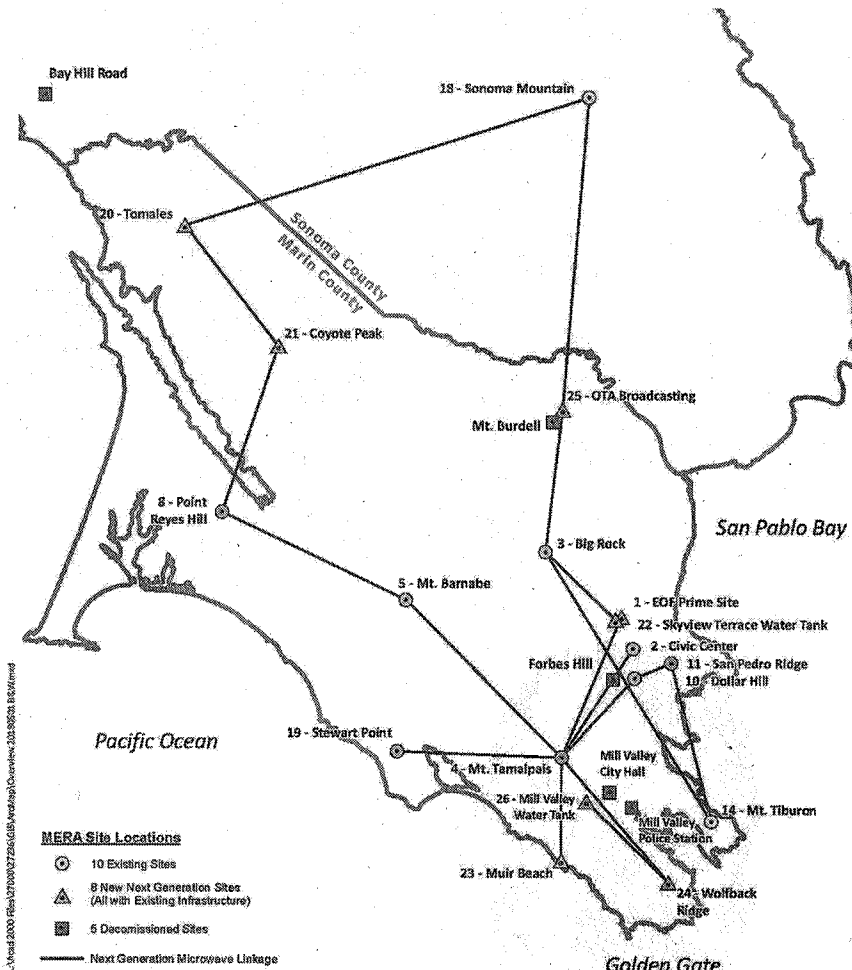


Figure X. MERA Next Generation System Configuration

Scoping Meeting Transcript
STATE OF CALIFORNIA
MARIN EMERGENCY RADIO AUTHORITY (MERA)

In the Matter of:)
)
Next Generation Radio Communications)
System Project Public Scoping Meeting)
Subsequent Environmental Impact Report)
_____)

MARIN COUNTY CIVIC CENTER
3501 CIVIC CENTER DRIVE
SUITE 330
SAN RAFAEL, CA

THURSDAY, MAY 31, 2018

6:30 P.M.

Reported by: Julie Link

CALIFORNIA REPORTING, LLC
229 Napa Street, Rodeo, California 94572 (510) 224-4476

APPEARANCES

NERA STAFF:

Ernest Klock, Operations Officer, NERA

Maureen Cassingham, Executive Officer, NERA

Dave Jeffries, Deputy Executive Officer, NERA

Trisha Ortiz, Legal Counsel, NERA

CONSULTANTS:

Paul Curfman, Senior Environmental Planner, WRA, Inc.

John Roberto, Environmental Consultant, JRA Associates

PUBLIC: (* Via Phone)

I N D E X

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2) Purpose of the meeting	4
3) The MERA System	5
4) Next Generation Project	7
5) Scope of Analysis	14
6) CEQA Process	13
7) Public Comment	--
8) Adjournment	19

1 P R O C E E D I N G S

2 MAY 31, 2018

6:44 p.m.

3 MR. KLOCK: On the record. We are starting the
4 Subsequent Environmental Impact Report Public Scoping
5 Meeting for the Marin Emergency Radio Authority Next Gen
6 Project. We will pause until members of the public show
7 up.

8 (Off the record at 6:44 p.m.)

9 (On the Record at 7:01 p.m.)

10 MR. KLOCK: Yes, on the record. We are going to
11 go ahead and give our presentation on the MERA Next Gen
12 System SEIR Project. It is 7:02. The meeting started at
13 6:30. No members of the public have shown up yet. We will
14 go ahead and give the presentation, reference the slide
15 number and post the presentation online after the meeting.

16 So this is the MERA Next Gen System Subsequent
17 Environmental Impact Report Scoping Meeting on May 31st,
18 2018 for the Marin Emergency Radio Authority. And that was
19 slide 1.

20 I have with me environmental consultants, John
21 Roberto and Paul Curfman. I also have, in the audience,
22 the MERA Executive Officer, Maureen Cassingham and MERA
23 Counsel, Trisha Ortiz and the MERA Deputy Executive Officer
24 Dave Jeffries.

25 Moving to slide 2, the Marin Emergency Radio

1 Authority is comprised of 25 member agencies, the cities
2 and towns around Marin County, County Unincorporated on
3 various police authorities, utility districts and fire
4 protective districts.

5 Moving to slide 3, the agenda. The purpose of
6 this meeting is to receive scoping comments on the scope of
7 our analysis on this Subsequent Environmental Impact
8 Report. We're going to talk a little bit about the
9 existing MERA system. We're going to talk about the Next
10 Generation Project and how it's going to modify the
11 existing MERA system. We're going to talk about the scope
12 of the analysis. And we're going to talk about the CEQA
13 process and how to provide public comment during this
14 phase.

15 Moving to slide 4, the purpose of the scoping
16 meeting. The original MERA EIR was certified in 2000. The
17 findings on that existing MERA system still hold true
18 throughout this SEIR process. We're going to learn about
19 the MERA Proposed Next Gen System Project. We're going to
20 provide direct input on the scope of the Subsequent EIR.
21 Members of the public could provide comment to do that, if
22 they were here. And we're going to learn about additional
23 opportunities for input on the Subsequent EIR, after the
24 Scoping Meeting here, when we're generating the draft
25 document and looking at that.

1 Moving to slide 5, why are we updating the MERA
2 system? It's an aging system. It's difficult to find
3 replacement parts. We want to improve the radio coverage
4 and signal strength. We need to expand the user capacity.
5 There's a Congressional mandate that we vacate the UHF T-
6 band frequencies and move to 700 MHz. And with all that,
7 the voters supported and approved Measure A funding in
8 2014.

9 Really, this is about improving emergency radio
10 coverage for members of the public for their benefit, such
11 that the emergency and first responders can get to members
12 of the public and serve them better. We'll go ahead and
13 run through the objectives of the MERA Next Gen Project on
14 slide 6.

15 So we want to improve coverage and service
16 quality. We want to use existing sites and facilities
17 where possible and minimize tower heights in doing so. We
18 want to modernize the system to increase its resilience,
19 increase the audio quality, increase the reliability and be
20 able to use the 700 to 800 MHz frequencies required by the
21 federal mandate. We also want to improve mutual aid
22 interoperability and integrate the emergency operations
23 facility into the system.

24 So how are we going to do this? The project
25 description involves the use of existing sites and the

1 installation of new sites. I say new sites in that they
2 are new to the MERA system, but they are not new sites in
3 the sense that they don't exist today in some fashion.

4 As we go through the presentation, you'll see
5 that many of the existing sites will still work with the
6 system. The new sites have existing facilities on them.
7 Whether they're communication facilities or other public
8 utilities, all of the new sites do have some disturbance on
9 them. And then with the new system, we'll be able to
10 decommission five sites. We'll go ahead and turn to slide
11 8 and look at the project map. And I'll go ahead and list
12 off all of the sites that we're going to be using in the
13 Next Gen Project System.

14 So the existing sites are at Civic Center, Big
15 Rock Ridge, Mt. Tamalpais, Mt. Barnabe, Point Reyes Hill,
16 Dollar Hill, San Pedro Ridge, Mt. Tiburon, Sonoma Mountain
17 and Stewart Point. The existing sites are denoted part of
18 the legend with a circle.

19 The new sites include the Prime Site at the
20 Emergency Operations Facility, Tomales, Coyote Peak,
21 Skyview Terrace, Muir Beach, Wolfback Ridge, Mt. Burdell at
22 OTA Broadcasting, Mill Valley Water Tank. And those new
23 sites are denoted by a triangle on the exhibit shown on
24 slide 8.

25 And the five decommissioned sites are shown with

1 a gray square. And those Forbes Hill in San Rafael, Mt.
2 Burdell near Novato, Mill Valley City Hall and the Public
3 Safety Building or police station, and the Bay Hill Road
4 site in Sonoma County.

5 With that, I'll turn it over to Paul Curfman, for
6 slide 9.

7 MR. CURFMAN: Thanks, Ernest.

8 Slide 9 shows a copy of the spreadsheet that
9 describes each of the site improvements. And this
10 spreadsheet is up to show you how it's really laid out, not
11 so much to actually read the contents of it. There's a copy
12 of the spreadsheet on the handout that has the map, so an
13 11 X 17 handout with a map on one side. And then also in
14 the back we have two boards that have the same spreadsheet
15 that is fully readable and you can discern all of the site
16 improvements.

17 There's 26 sites, which are on the rows from top
18 to bottom. The first site is across the top. It's the
19 Emergency Operations Facility or the EOF, sometimes called
20 the Prime Site. And that is where the Marin County
21 Sherriff's offices are and Central Dispatch.

22 Then the existing sites are shown in green. And
23 there are multiple existing sites, like two at the Civic
24 Center, continuing down on page one to site 13. All these
25 sites are numbered in the same order that they're presented

1 in the original EIR that was certified in 2000. That's the
2 reason for this numbering system, so when you go to the
3 next page you'll see that the higher numbered sites, sites
4 number 20 through 26, are the new sites. Those are new to
5 MERA as Earnest mentioned. They are not necessarily
6 undeveloped sites. In fact, all of them have existing
7 infrastructure on them including MMWD water tanks, a cell
8 tower in one case, a water well headsite at Coyote Peak.

9 On this spreadsheet also, the sites are located
10 by the assessor's parcel number as well as the coordinates
11 where they are specifically located on latitude and
12 longitude, so that they can be found through mapping
13 programs.

14 And then the last two columns on this spreadsheet
15 describe the existing facilities that are found at the
16 site. And the final column on the right side, it shows the
17 proposed facilities that the next gen project will complete
18 at the site. It's the difference between the existing
19 facilities and the proposed facilities at each site that
20 will be the focus of this Subsequent EIR.

21 So the two spreadsheets that we've been talking
22 about are on slides 9 and 10. And I just wanted to briefly
23 mention the eight new sites at the bottom, that the Prime
24 Site in fact, is the existing Sheriff's Dispatch Center.
25 Tomales is number 20. It's got an existing cell tower site

1 and there are well, numerous other sites that we can talk
2 about. The spreadsheet describes the existing facilities
3 on each site.

4 We picked three sites to go through in the
5 presentation here today as example sites. The first site
6 is the Dollar Hill Site; this is number 10 on the
7 spreadsheet. And this is an existing site. It's one of
8 the most visible sites in Eastern Marin County. It's in
9 the middle of San Rafael and it can be seen from Highways
10 101 and 580, as you're coming in to San Rafael. This
11 photograph is actually taken from the San Rafael High
12 School ball field. And it's a shared site. There are two
13 towers on the site. You can see, right at the apex of
14 Dollar Hill is the single tower. That's the MERA tower.
15 And then there's a triple tower just off to the right or to
16 the northwest of the top of the hill and that is a
17 privately owned site. And these are images of those. The
18 MERA site is the taller, more slender tower. And the
19 privately-owned site is the triple tower.

20 So on that central more slender tower, that tower
21 is a 65-foot tall three-legged tower. Each of the faces
22 are about 12-feet wide or probably exactly 12-feet wide.
23 There are two buildings on the site that are about 10 feet-
24 by-20 feet, and a water tank and a pump on the site. So
25 that's what's represented in the elevation on the left.

1 And then on the right you can see that there's a
2 slightly different tower design, but essentially it's
3 similar. On that tower, there are minor equipment changes
4 proposed. This is slide 13 that we're looking at. And on
5 the proposed equipment, it modifies a couple of the
6 microwave dishes and antenna sites. There's two dishes
7 added, two dishes removed, eight antennas added and three
8 antennas removed. So there's a combination of addition and
9 subtraction that ultimately make the visible changes on the
10 tower.

11 Another site that we chose as an example, the
12 second of the example sites is Tomales. And this is shown
13 on slide 14. And this is an example of a single use site.
14 It's minimally developed at this point. It has a cellular
15 equipment building and a couple of cell towers on the
16 knoll. This is just north on Highway 1 north of Tomales.
17 And at this site, in addition to the cell tower equipment
18 that is there MERA proposes to add a new 75-foot tall
19 monopole, a new shelter just to the right of that equipment
20 structure approximately the same size as that as well as an
21 emergency generator, a fuel tank and a fence around the
22 facility. New power will have to be brought into it as
23 well and that will follow the same path that provides power
24 to this piece of equipment.

25 So this is the diagram of that site, of the

1 proposed equipment there. The 75-foot monopole is the
2 vertical element on the left. Pretty much all you're going
3 to see there is that vertical monopole. Just be aware that
4 the horizontal lines and the diagonal lines are all leader
5 lines, describing what's visible on that elevation.
6 Everything that is there in the drawing is a proposed
7 element including microwave dishes and vertical antennas.

8 In the third site shown on slide 16. And it's
9 the Mt. Tiburon site. The Mt. Tiburon site is existing and
10 this is adjacent to two existing twin MMWD water tanks on
11 Mt. Tiburon. It provides a direct line of sight to a
12 couple of different towers. I can't remember right now.
13 And it's pretty well camouflaged in the woods. It's
14 adjacent to large lot residences in the neighborhood.
15 There's also an open space next to it. There is a public
16 trail that goes right next to the fence, adjacent to it.
17 You can see the fence in the center of the photograph.

18 The existing facilities here include an existing
19 60-foot tall monopole in the center of the photograph, as
20 well as a smaller 22-foot monopole. The design was
21 intended to minimize visual impacts and as a result of the
22 EIR that was produced in 2000 and those were some of the
23 mitigation measures brought to bear on the project.

24 The next slide, slide 17, shows the elevations at
25 the Mt. Tiburon site, comparing the existing to the

1 proposed. We saw the existing. And the proposed would
2 swap out microwave dishes that pretty much look the same
3 and a couple of new antennas would be placed on top of the
4 monopole. And visually, that's pretty much all you're
5 going to see at Mt. Tiburon.

6 The next slide is slide 18 and John is going to
7 present the CEQA requirements and the scope of our
8 analysis.

9 MR. ROBERTO: My name is John Roberto, an
10 Environmental Consultant working with MERA. And I'd like
11 to talk right now a little bit about this Supplemental
12 Environmental Impact Report process. Slide number 18,
13 outlines the subsequent EIR. When we were doing this,
14 there was a full EIR prepared back in the year 2000
15 comprised of three large volumes. Those are available to
16 see and to read on the MERA CEQA website, which we have
17 copies of the address here in the Notice of Preparation, if
18 you wanted to look at that. And you can then read the
19 document there.

20 The Subsequent EIR is going to evaluate the Next
21 Generation Project. And we are going to look at the
22 changes that occurred both as a result of the project and
23 how the environment may have changed at each one of these
24 sites. So we're going to go back and revisit the year 2000
25 EIR to validate the information in there. And we'll make

1 whatever changes to the EIR that are necessary to bring it
2 up to date; and the subsequent EIR will identify any new or
3 more significant impacts that result from the Next Gen
4 Project.

5 In the Supplemental EIR, we will also consider
6 alternatives to the project. And we'll also evaluate
7 cumulative impacts, such as when you place antennas on an
8 existing tower with other facilities for other users, as we
9 have in the case of the San Rafael site. We'll look at the
10 cumulative impact of the radio frequency impacts of all
11 those facilities together and evaluate what that will be.

12 The SEIR will also take a look at the cumulative
13 visual impacts of the MERA site at combined sites with
14 other facilities to see if that makes a significant change.
15 So those are the kinds of things that we're going to look
16 at in the Subsequent EIR.

17 Now in terms of the scope, the scope of the
18 Subsequent EIR is we are going to look at every aspect of
19 the environment, starting with geology and the climatology
20 and the biology. But based on the findings of the original
21 EIR, which was certified in the year 2000, we believe that
22 the effects of the MERA project will be similar, because it
23 is a similar type of project. And those impacts are really
24 in the areas of aesthetics, the visual impact of the
25 facilities in the locations where they are placed, the

1 biologic resources at some of the new sites where there may
2 be other facilities there, but we're going to occupy new
3 ground in that area. And we'll look at what the effects
4 are on the local biology there. We'll look at the radio
5 frequency exposure, as I mentioned earlier, at all of the
6 sites. We'll evaluate the existing condition. We'll
7 evaluate what the MERA project will do. And we'll evaluate
8 what the MERA project will do in sequence with all the
9 other facilities that may be there from other users, at
10 these combined sites.

11 Also, we'll be looking at cultural resources and
12 we'll be having consultations with Native American groups
13 and tribes in this area. And we'll evaluate what those
14 impacts are under Senate Bill 52 that was passed to give
15 real consideration to the impacts on cultural resources.

16 We'll also look at land use regulations and how
17 they may have changed since the original EIR was certified
18 in the year 2000. Other impacts we'll look at will be
19 noise and others, but why are we concentrating on these?

20 Well, typical impacts that you might expect in an
21 EIR, one is traffic. Everybody likes to talk about
22 traffic. But in this situation, after we have construction
23 completed, the traffic generated by this facility will be
24 on the average of one trip a month for a technician to come
25 to the site and check out the equipment. If maintenance

1 needs to be done, there may be more trips, but this will
2 not generate a whole lot of traffic trips on the local road
3 network. So those are the areas of focus of the Subsequent
4 EIR.

5 I'd like to talk just briefly now about the
6 process. The last few days back, on May 17th, we issued a
7 Notice of Preparation that MERA was going to prepare a
8 Subsequent EIR. This is on slide 20. That MERA was going
9 to prepare a Subsequent EIR, that we are holding a MERA
10 Scoping Meeting tonight, May 31st.

11 And after this, the scoping period will end on
12 June 18th. This is the time period when anyone who's
13 interested in this report and the environmental impacts
14 should submit comments on what they want MERA to consider
15 in their SEIR. What should we consider in the SEIR? Have
16 we missed anything? And these are the comments we're
17 looking for from the public and other public agencies.
18 They have until June 18th, under the law, to submit those
19 comments. And they there's a closing period under the law.

20 Over the summer, after the end of that, we will
21 prepare the Draft EIR. And the EIR will be prepared by a
22 firm called WRA that is under contract to MERA to prepare
23 the Draft EIR. When that Draft EIR is completed, and we
24 expect that to be sometime in the fall, we don't know
25 exactly how long it's going to take, but that EIR will be

1 quite detailed. It'll be a detailed description of the
2 project. It'll give detailed impacts on all of these
3 sites. There'll be visual photo simulations of each of
4 these sites and the new facilities go in there, so all the
5 information will be in this draft.

6 When we receive that draft and it's ready for
7 publication, we'll issue a Notice of Completion of the
8 draft. That notice will go in the paper. The draft will
9 become available both on the website and we'll have other
10 ways to get the draft to people in libraries. There'll be
11 a 45-day review period, where the public can look at this
12 Draft EIR and submit comments on the draft to the MERA
13 Board. MERA will also hold a public meeting during that
14 45-day period, to receive public comment on the Draft EIR.
15 Once that process is ended, MERA will then direct its staff
16 to prepare the Final Environmental Impact Report.

17 Now the Final Environmental Impact Report will
18 consist of all comments received on the Draft EIR. We will
19 prepare written responses to all those comments that were
20 submitted on the draft. We will issue a Notice of
21 Availability when we have completed all those responses to
22 comments and they are available for public review. I
23 anticipate that there will be a public review period of
24 about 14 days on the Final EIR.

25 The MERA board will hold a meeting to consider

1 the Final EIR. They may or may not take public comments at
2 that meeting. They are not required to do so, by law. But
3 they will hold a meeting to consider the Final EIR. And at
4 that point, we anticipate that the MERA Board will make a
5 decision on the Final EIR or at some meeting they set later
6 after that meeting.

7 What will happen is, once the SEIR has been
8 certified, then the MERA Board can consider its project and
9 whether or not they want to make any changes to that
10 project or not. And at that point, the MERA Board can move
11 forward with the project or modified project and the EIR
12 process will have been completed.

13 Ernest?

14 MR. KLOCK: Thank you, John.

15 So that concludes our presentation. It is now
16 7:27. I want to make note that one member of the public
17 has arrived during the presentation and if there's no
18 questions on the presentation, we would love to open it for
19 public comment on this project.

20 (Off mic colloquy.)

21 MR. KLOCK: Off the record please.

22 (Off the record at 7:26 p.m.)

23 (On the record at 8:30 p.m.)

24 MR. KLOCK: No additional members of the public
25 showed up. We are hereby closing the Public Scoping

1 Meeting of the MERA Next Gen Subsequent EIR Project.

2 (The meeting was adjourned at 8:30 p.m.)

3

STATE OF CALIFORNIA

Edmund G. Brown Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION

Environmental and Cultural Department
 1550 Harbor Blvd., Suite 100
 West Sacramento, CA 95691
 Phone (916) 373-3710
 Email: nahc@nahc.ca.gov
 Website: <http://www.nahc.ca.gov>
 Twitter: @CA_NAHC



May 29, 2018

Ernest Klock
 Marin Emergency Radio Authority
 3501 Civic Center Dr.
 San Rafael, CA 94903

RE: SCH#1999092073, Marin Public Safety & Emergency Communications, Marin and Sonoma County

Dear Mr. Klock:

The Native American Heritage Commission has received the Notice of Preparation (NOP) for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code § 21000 et seq.), specifically Public Resources Code section 21084.1, states that a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit. 14, § 15064.5 (b) (CEQA Guidelines Section 15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an environmental impact report (EIR) shall be prepared. (Pub. Resources Code § 21080 (d); Cal. Code Regs., tit. 14, § 15064 subd.(a)(1) (CEQA Guidelines § 15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources with the area of project effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code § 21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code § 21084.3 (a)). **AB 52 applies to any project for which a notice of preparation or a notice of negative declaration or mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. § 800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments. **Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.**

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. **Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project:** Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

- a. A brief description of the project.
 - b. The lead agency contact information.
 - c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code § 21080.3.1 (d)).
 - d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code § 21073).
2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code § 21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or environmental impact report. (Pub. Resources Code § 21080.3.1(b)).
 - a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code § 65352.4 (SB 18). (Pub. Resources Code § 21080.3.1 (b)).
3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
 - a. Alternatives to the project.
 - b. Recommended mitigation measures.
 - c. Significant effects. (Pub. Resources Code § 21080.3.2 (a)).
4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
 - a. Type of environmental review necessary.
 - b. Significance of the tribal cultural resources.
 - c. Significance of the project's impacts on tribal cultural resources.
 - d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code § 21080.3.2 (a)).
5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code sections 6254 (r) and 6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code § 21082.3 (c)(1)).
6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
 - a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
 - b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code section 21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code § 21082.3 (b)).
7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
 - a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
 - b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code § 21080.3.2 (b)).
8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code section 21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation

monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code section 21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code § 21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code section 21084.3 (b). (Pub. Resources Code § 21082.3 (e)).
10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
 - a. Avoidance and preservation of the resources in place, including, but not limited to:
 - i. Planning and construction to avoid the resources and protect the cultural and natural context.
 - ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
 - b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
 - i. Protecting the cultural character and integrity of the resource.
 - ii. Protecting the traditional use of the resource.
 - iii. Protecting the confidentiality of the resource.
 - c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
 - d. Protecting the resource. (Pub. Resource Code § 21084.3 (b)).
 - e. Please note that a federally recognized California Native American tribe or a nonfederally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code § 815.3 (c)).
 - f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code § 5097.991).
11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An environmental impact report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
 - a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code sections 21080.3.1 and 21080.3.2 and concluded pursuant to Public Resources Code section 21080.3.2.
 - b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
 - c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code section 21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code § 21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code § 65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code § 65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code section 65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code sections 5097.9 and 5097.993 that are within the city's or county's jurisdiction. (Gov. Code § 65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
 - a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
 - b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: <http://nahc.ca.gov/resources/forms/>

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
 - a. If part or all of the APE has been previously surveyed for cultural resources.
 - b. If any known cultural resources have been already been recorded on or adjacent to the APE.
 - c. If the probability is low, moderate, or high that cultural resources are located in the APE.
 - d. If a survey is required to determine whether previously unrecorded cultural resources are present.
2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
 - a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
 - b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.
3. Contact the NAHC for:
 - a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
 - b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
- a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, section 15064.5(f) (CEQA Guidelines section 15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
 - b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
 - c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code section 7050.5, Public Resources Code section 5097.98, and Cal. Code Regs., tit. 14, section 15064.5, subdivisions (d) and (e) (CEQA Guidelines section 15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions, please contact me at my email address: Sharaya.Souza@nahc.ca.gov.

Sincerely,



Sharaya Souza
Staff Services Analyst
(916) 573-0168

cc: State Clearinghouse

DEPARTMENT OF TRANSPORTATION

DISTRICT 4

P.O. BOX 23660

OAKLAND, CA 94623-0660

PHONE (510) 286-5528

FAX (510) 286-5559

TTY 711

www.dot.ca.gov

*Making Conservation
a California Way of Life.*

June 5, 2018

SCH# 199092073

04-MRN-2018-00093

GTS ID 10879

Mr. Ernest Klock
Marin Emergency Radio Authority
3501 Civic Center Drive, Suite 304
San Rafael, CA 94903

Marin Public Safety and Emergency Communication Radio System – Notice of Preparation (NOP)

Dear Mr. Klock:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above-referenced project. In tandem with the Metropolitan Transportation Commission's (MTC) Sustainable Communities Strategy (SCS), Caltrans mission signals a modernization of our approach to evaluate and mitigate impacts to the State Transportation Network (STN). Caltrans' *Strategic Management Plan 2015-2020* aims to reduce Vehicle Miles Travelled (VMT) by tripling bicycle and doubling both pedestrian and transit travel by 2020. Our comments are based on the NOP.

Project Understanding

The Applicant, Marin Emergency Radio Authority (MERA), a joint powers agency proposes to upgrade 10 of the existing active communication sites, decommission five of the sites, and add equipment to eight new sites that were not part of the MERA radio system (system). The new sites include water tanks and well heads sites in northern Marin County. The system is vital for emergency countywide communications between police, firefighters, and public work crews. The 25 project sites are located in various parts of Marin County. Regional access to and from the County of Marin is provided by US 101, State Route (SR) 1, and SR 37, which bisects the County in a south-north direction and Interstate 580 and SR 131, which bisect the County in an east-west direction.

Cultural Resources

If an encroachment permit is needed for work within Caltrans right-of-way (ROW), we may require that cultural resource technical studies be prepared in compliance with CEQA, Public Resources Code (PRC) 5024, and the Caltrans Standard Environmental Reference (SER) Chapter 2 (<http://www.dot.ca.gov/ser/vol2/vol2.htm>). Should ground-disturbing activities take place within Caltrans ROW and there is an inadvertent archaeological or burial discovery, in compliance

Mr.Klock, Marin Emergency Radio Authority
June 5, 2018
Page 2

with CEQA, PRC 5024.5, and the SER, all construction within 60 feet of the find shall cease and the Caltrans District 4 Office of Cultural Resource Studies (OCRS) shall be immediately contacted at (510) 622-1673.

Encroachment Permit

The applicant will be required to apply for and obtain an encroachment permit for any work within Caltrans right-of-way (ROW) prior to construction. To apply for an encroachment permit, please complete an encroachment permit application, environmental documentation, and five (5) sets of plans clearly indicating State ROW, and submit to the following address: David Salladay, District Office Chief, Office of Permits, California Department of Transportation, District 4, P.O. Box 23660, Oakland, CA 94623-0660. Traffic-related mitigation measures should be incorporated into the construction plans prior to the encroachment permit process. See the website link below for more information: <http://www.dot.ca.gov/hq/traffops/developserv/permits>. The County of Sonoma/applicant can schedule an encroachment pre-application with Arun Guduguntla at arun.guduguntla@dot.ca.gov.

Should you have any questions regarding this letter, please contact Stephen Conteh at (510) 286-5534 or stephen.conteh@dot.ca.gov.

Sincerely,



PATRICIA MAURICE
District Branch Chief
Local Development - Intergovernmental Review

c: State Clearinghouse

From: MERA-EIR
Sent: Wednesday, June 6, 2018 2:01 PM
To: [REDACTED]
Subject: FW: Your Presentation to City of Mill Valley City Council from June 4, 2018

FYI

Ernest Klock

Assistant Director

Marin County Department of Public Works

3501 Civic Center Dr., San Rafael, CA 94913

Ph: (415) 473-6552 Fax: (415) 473-3724

eklock@marincounty.org

From: aivan@cityofmillvalley.org <aivan@cityofmillvalley.org>
Sent: Tuesday, June 5, 2018 9:26 AM
To: MERA-EIR <MERA-EIR@marincounty.org>
Subject: Your Presentation to City of Mill Valley City Council from June 4, 2018

Ann Ivan would like information about:

Hello Mr. Klock,

I work for City of Mill Valley (Code Enforcement) and I have also recently become a HAM KM6QIW and learning all I can about radio. I am also becoming a Southern Marin FD Fire Lookout for Gardner and Dickson lookouts. Would you be able to send me the power point presentation, please? I am very interested in how the topography affects transmissions.

Thank you for all your hard work.

-Ann Ivan 707-230-1583cell or 415-389-4203

Email Disclaimer: <http://www.marincounty.org/main/disclaimers>

Public Comment Regard MERA Project Upgrade

To: mera-eir@marincounty.org

I am a resident of the Novato, Marin Valley Mobile Home Country Club, and a 55+ senior community. This is a City of Novato owned property.

I am a volunteer of this community's Marin Valley Emergency Safety Team (MVEST) and a volunteer of the Marin County CERTS organization

As a CERTS and MVEST volunteer, residents are trained in proper emergency response techniques by local Fire and Police officials. In MVEST, close to 60 resident volunteers are regularly trained in the first response to neighborhood emergencies. An important part of our training is in the use of 2 Way radio communications, currently with business class radios within the Park. I also have an FCC General Class Ham Radio License and am a participating member of ARRL including its ARES, Amateur Radio Emergency Service.

Across the United States and its Territories, we have recently experienced many disasters. As an example the last year's Tubbs Fire, currently Hawaii's volcano eruption and Colorado's Fire, to name a few. In many of these disasters, First Responders have been supported by NGOs, from local ARES Ham Radio groups in recovery efforts.

In September 2017, A Grass fire broke out at the perimeter of Marin Valley Mobile Country Club. The fire consumed some 20 acres of hillside around the Park before it was contained by Aerial bombers and the local fire dept. MVEST volunteers were able to coordinate with local Police and fire personnel in a temporary evacuation of approximately 310 residents.

MERA and local governments seem to follow a resistive doctrine of preventing local neighborhood emergency organization such as MVEST to participate as viable partners in the support of first responders. MVEST has been operating for several years and has proven itself to being effective and responsive to residents of Marin Valley Mobile Country Club and not circumventing first responders. Other similar neighborhood groups have experienced the same resistive response from MERA officials, that being Marin Teams, marinteam@mailman.qth.

As a FCC General License holder I understand the responsibility and liabilities of my use of national radio waves. Currently private repeaters offer limited coverage and reception on 2 meter and 70 centimeter bands. Attempts to install private repeaters to cover all of Marin is impossible both logistically and financially. It is in the best interest of all residents of Marin County, who have voted for the MERA project, to have additional means of personal

emergency communications capabilities during long term complete cell phone and landline failures and for emergency disasters.

It is my hope and request that in the planning and the installation of the new MERA system that approval is made for and granted for the installation of repeaters on each site that can be accessed on the 2 meter and 70 centimeter bands or better.

Access can be authorized to communities that have developed a well organized group of neighborhood emergency response teams that have been recognized by local Fire Departments. These communities like Marin Valley Mobile Country Club is one of these communities and also has volunteers who have FCC General Licenses and who are well trained in the Protocol and Discipline of radio usage endorsed by local Fire and Police jurisdictions.

Please review and adopt the inclusion of 2meter and 70 centimeter repeater installations on all proposed MERA projected sites.

Cordially;

By: Joseph DeAvila, KK6SCN Date: June 15, 2018

196 Marin Valley Drive

Novato CA 94949

Cc: Novato City Council

Cc: Marc Levine

Cc: arodriguez@marinij.com

From: MERA-EIR
Sent: Thursday, June 28, 2018 2:20 PM
To: [REDACTED]
[REDACTED] FW: MERA NEXT GENERATION SYSTEM SUMMARY Comments

FYI

Ernest Klock

Assistant Director
Marin County Department of Public Works
3501 Civic Center Dr., San Rafael, CA 94913
Ph: (415) 473-6552 Fax: (415) 473-3724
eklock@marincounty.org

From: MERA-EIR
Sent: Tuesday, June 19, 2018 4:54 PM
To: smforsman <smforsman@gmail.com>; MERA-EIR <MERA-EIR@marincounty.org>
Subject: RE: MERA NEXT GENERATION SYSTEM SUMMARY Comments

Thanks for your comments Misty. Some of the answers to your questions were in my presentation on May 31 (I think you may have missed some/all of it). In short, voters approved Measure A in 2014 providing funding for the Next Gen System...

<https://www.marincounty.org/depts/bs/board-actions-meetings/2014/july/july-22/mera>

We are required (by the FCC) to vacate the T-band spectrum frequencies used for the existing system and move to the 700 MHz band of frequencies in the next several years. The equipment needs to be changed. This is a public safety communication system used primarily by Fire/Law, but MERA has 25 member agencies...

<http://meraonline.org/>

The general public cannot use this system, but benefits greatly from timely emergency response.

I don't think there's any danger at all from the proposed equipment. The FCC has strict rules about exclusionary fencing to keep people away from potential harm and 700 MHz systems have been in use extensively throughout the State for some time. I've not heard of any ill effects.

We will be giving a presentation about the Skyview proposed tower in mid-July to the Marinwood neighborhoods. I suspect all your questions will be answered if you attend and I will keep all these in mind when generating the presentation. I will let you know when it's scheduled.

Sincerely,

Ernest Klock

Assistant Director
Marin County Department of Public Works
3501 Civic Center Dr., San Rafael, CA 94913
Ph: (415) 473-6552 Fax: (415) 473-3724

eklock@marincounty.org

From: smforsman <smforsman@gmail.com>
Sent: Monday, June 18, 2018 4:15 PM
To: MERA-EIR <MERAEIR@marincounty.org>
Subject: MERA NEXT GENERATION SYSTEM SUMMARY Comments

TO: Ernest Klock, MERA Operations Director
FROM: MISTY FORSMAN
51 Skyview Terrace, San Rafael, CA 94903
smforsman@gmail.com
415-686-4150
RE: MERA Comments

Dear Mr. Klock,

Here are some questions and comments regarding this project which I did not see in the materials available online. If you addressed these at the meeting I attended, I apologize that I missed them.

The following are some questions I have that I would appreciate being addressed in subsequent Public Information:

1. Why this particular plan? It is unclear why this particular plan was developed although it does appear to be well-thought out.
2. Why now? Is there a particular event, or set of events, that contribute to the precise timing of this system?
3. How will the public interact with the MERA system – or will they? How does the public get information about events happening throughout the county?
4. The term “radio” is in the language description; does that imply that having a radio is necessary and/or important to residents? What about visitors?
5. Safety – what are the dangers of the equipment, and from the equipment, proposed in this plan...health wise, and are there any other safety impacts? Are the areas next to and near installations safe? Is there danger from electromagnetic energy or radio or other energy signals?
6. While this is called the “Marin...” plan, does it benefit and impact other counties?
7. Regarding the financing of this plan, please advise regarding the source of funding. Is this financed by Marin homeowners through taxes? Do renters also contribute? Is there a bond issue? Do other counties who might be beneficiaries of the MERA system contribute financially – or contribute in other ways?
8. The information available [MERA NEXT GENERATION SYSTEM - SUMMARY PROJECT DESCRIPTION IN ADVANCE OF CEQA - SUBSEQUENT ENVIRONMENTAL IMPACT REPORT (SEIR)] mentions that the project is “expected to operate for 20 years.” With advances in technology coming to market in shorter and shorter cycles, this seems like an unrealistic time frame. Please comment on this concern.

Thank you.

Sincerely,

Misty Forsman

