

# City of Corona

## Grape Hill Visual Impact Study & Site Propagation Mapping



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## SCOPE OF REPORT

1. Submit detailed photo simulations depicting before and after conditions and identifying the potential visual impacts of the proposed Grape Hill Tower #2 telecommunications facility, with views from both public areas and private residences.
2. Provide RF Propagation Maps for the proposed Grape Hill telecommunications facility.

## GRAPE HILL TOWER #2 VISUAL IMPACT STUDY

In the continued development of the City of Corona DWP, SCADA Network as well as the overloading of the current tower at Grape Hill it is necessary to either reduce the loading of the tower or construct a new tower. Since reducing the load on the current tower is not feasible, the only option is to construct a new tower. The tower is designed for a total height of 90-ft yet will only be constructed to 60-ft. Structurally the tower is designed for the needs of today as well as future growth. Grape Hill is a critical site for multiple agencies within the City of Corona as well as serves as a repeater site for other communication systems.

The visual impact study utilizes photographs and images taken from sites which have a potential view of the Grape Hill. The photos and images were then altered to reflect the visual impact of the planned tower. Photographs for this study were taken from both public and commercial areas within the vicinity of the tower site. The remainder of this report will show the photographs in their original state, followed by the altered image.

Grape Hill is a low power RF communication site that consists of multiple Point to Point FCC Licensed microwave paths, Licensed VHF, UHF two-way radio systems, 900MHz SCADA system, 5GHz Un-Licensed equipment, and Cellular carriers. The site does not transmit any high-power television or radio channels. All Transmitting equipment operates within the guidelines and specs of the Manufacture as well as the FCC concerning the Equivalent Isotropically Radiated Power (EIRP) levels.





Figure 1 - Project Limits

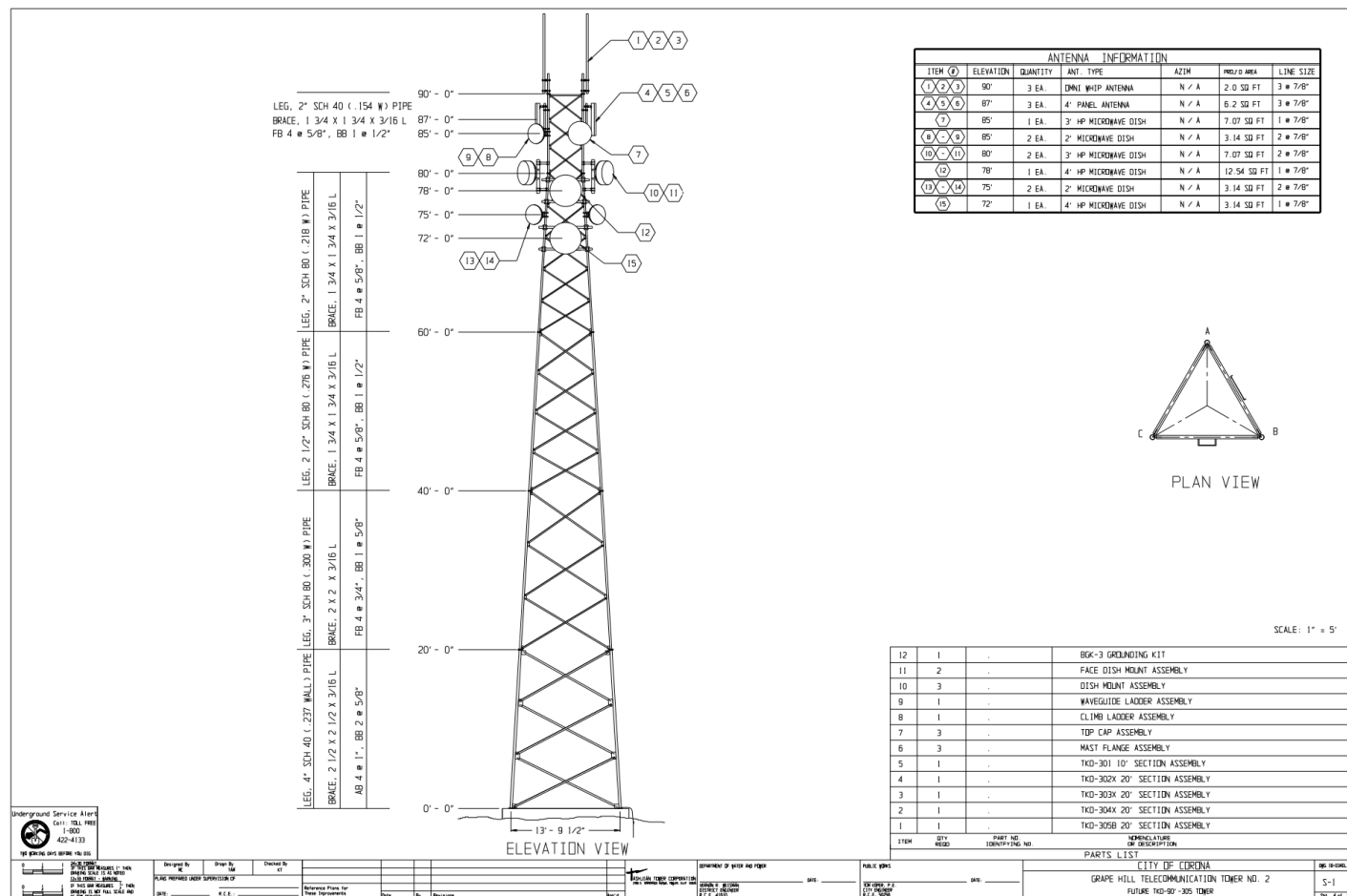


Figure 2 - Grape Hill Tower 2 Plan

ANTENNA INFORMATION						
ITEM #	ELEVATION	QUANTITY	ANT. TYPE	AZIM	PROD'D AREA	LINE SIZE
(1) (2) (3)	90'	3 EA.	OMNI WHIP ANTENNA	N / A	2.0 SQ FT	3 # 7/8"
(4) (5) (6)	87'	3 EA.	4' PANEL ANTENNA	N / A	6.2 SQ FT	3 # 7/8"
(7)	85'	1 EA.	3' HP MICROWAVE DISH	N / A	7.07 SQ FT	1 # 7/8"
(8) (9)	85'	2 EA.	2' MICROWAVE DISH	N / A	3.14 SQ FT	2 # 7/8"
(10) (11)	80'	2 EA.	3' HP MICROWAVE DISH	N / A	7.07 SQ FT	2 # 7/8"
(12)	78'	1 EA.	4' HP MICROWAVE DISH	N / A	12.54 SQ FT	1 # 7/8"
(13) (14)	75'	2 EA.	2' MICROWAVE DISH	N / A	3.14 SQ FT	2 # 7/8"
(15)	72'	1 EA.	4' HP MICROWAVE DISH	N / A	3.14 SQ FT	1 # 7/8"

Figure 3 - Antenna Loading





Figure 4 - Satellite view of Grape Hill



Figure 5 - Satellite view of Site

Grape Hill Visual Impact Study & Site  
Propagation Mapping

Location Map showing Photo Site

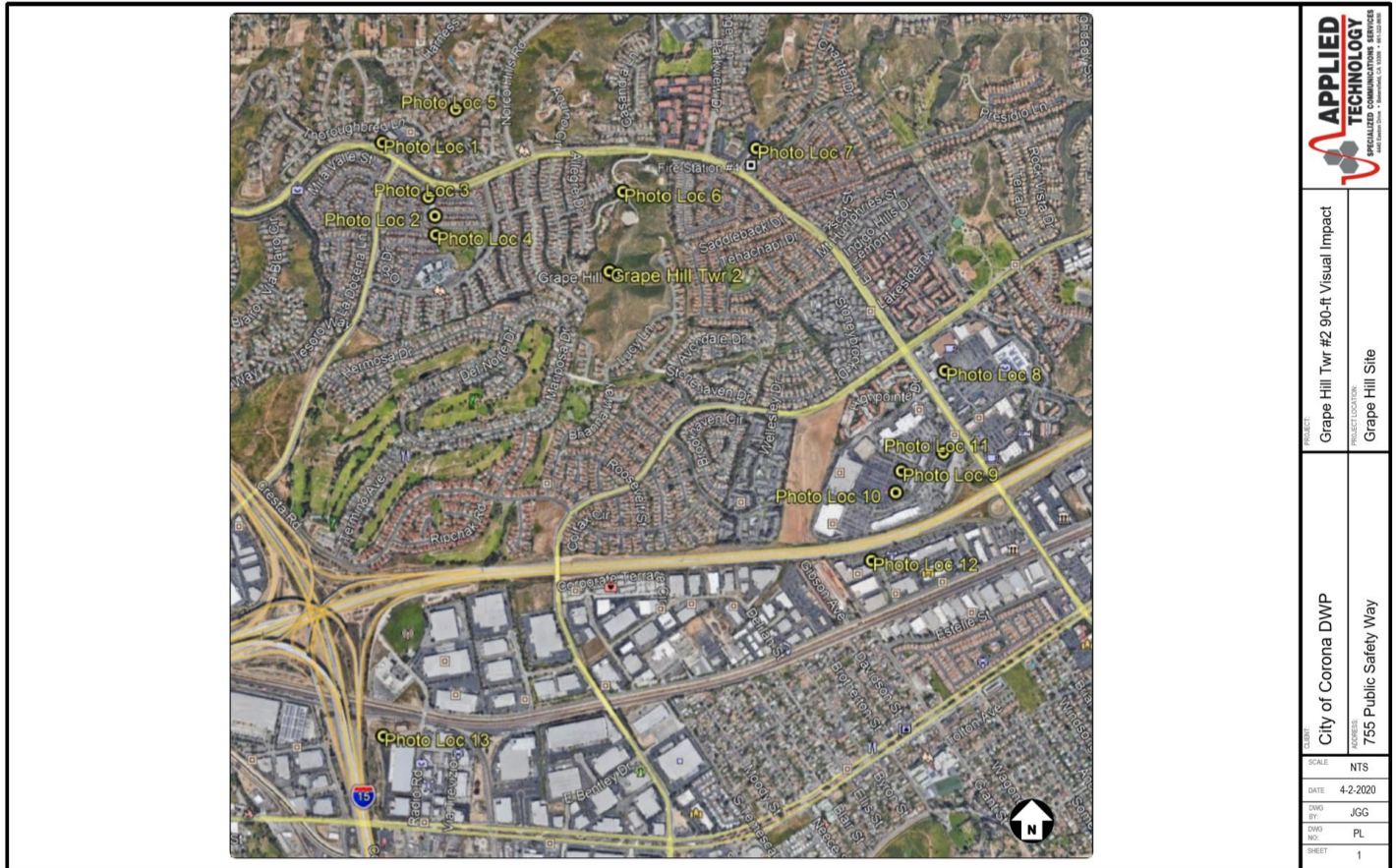


Figure 6 - Photo Location Map



*Location 1 – CVS on Hidden Valley Pkwy and El Paso Dr*



*Photo Site 1 - CVS on Hidden Valley Pkwy and El Paso Dr*

From the CVS parking lot, the view toward Grape Hill is visible in a few areas. Property trees block the view toward the tower. In general, a person standing 6-foot-tall visiting the CVS store would focus on the parking lot and the storefront rather than Grape Hill in the distance. The new tower would not draw them at Grape Hill. This location was chosen for its view toward the site; however, as mentioned the layout of the retail store would not be negatively impacted by the tower placement.

As shown in the enhanced conceptual drawing the second tower at Grape Hill will not visually impact the area.



Altered Photo Site 1 - CVS on Hidden Pkwy and El Paso Dr



*Location 2 – Neighborhood of Cooper Ave and Falconcrest Dr*



*Photo Site 2 - Neighborhood of Cooper Ave and Falconcrest Dr*



Altered Photo Site 2 - Neighborhood of Cooper Ave and Falconcrest Dr

<b>APPLIED TECHNOLOGY</b> SPECIALIZED COMMUNICATIONS SERVICES 4440 Easton Drive • Bakersfield, CA 93309 • 661-322-8650	
PROJECT	City of Corona DWP 755 Public Safety Way Grape Hill Site
PROJECT LOCATION	City of Corona DWP 755 Public Safety Way Grape Hill Site
SCALE	NTS
DATE	4-2-2020
DWG BY	JGG
DWG NO	V2
SHEET	1



*Location 3 – Neighborhood on Heron Dr and Goldeneagle Dr*



*Photo Site 3 - Neighborhood View on Heron Dr and Goldeneagle Dr*

From this neighborhood play area, the view toward Grape Hill is faint. The tower is in view, but it is hidden behind the dormant tree. Once the tree has restored its leaves, the view from this public area toward Grape Hill would be limited.



Altered Photo Site 3 - Neighborhood View on Heron Dr and Goldeneagle Dr



*Location 4 – Neighborhood Grass Field on Coopers Ave*



*Photo Site 4 - Neighborhood Grass Field on Coopers Ave*



Altered Photo Site 4 - Neighborhood Grass Field on Coopers Ave

*Location 5 – Neighborhood of Gunsmoke Rd an El Paso Dr*



*Photo Site 5 – Neighborhood of Gunsmoke Rd an El Paso Dr*





Altered Photo Site 5 – Neighborhood of Gunsmoke Rd an El Paso Dr

*Location 6 – Neighborhood below the Yuma Water Storage Tank on Impersivo Dr*



*Photo Site 6 - Neighborhood below the Yuma Water Storage Tank on Impersivo Dr*





Altered Photo Site 6 - Neighborhood below the Yuma Water Storage Tank on Impersivo Dr

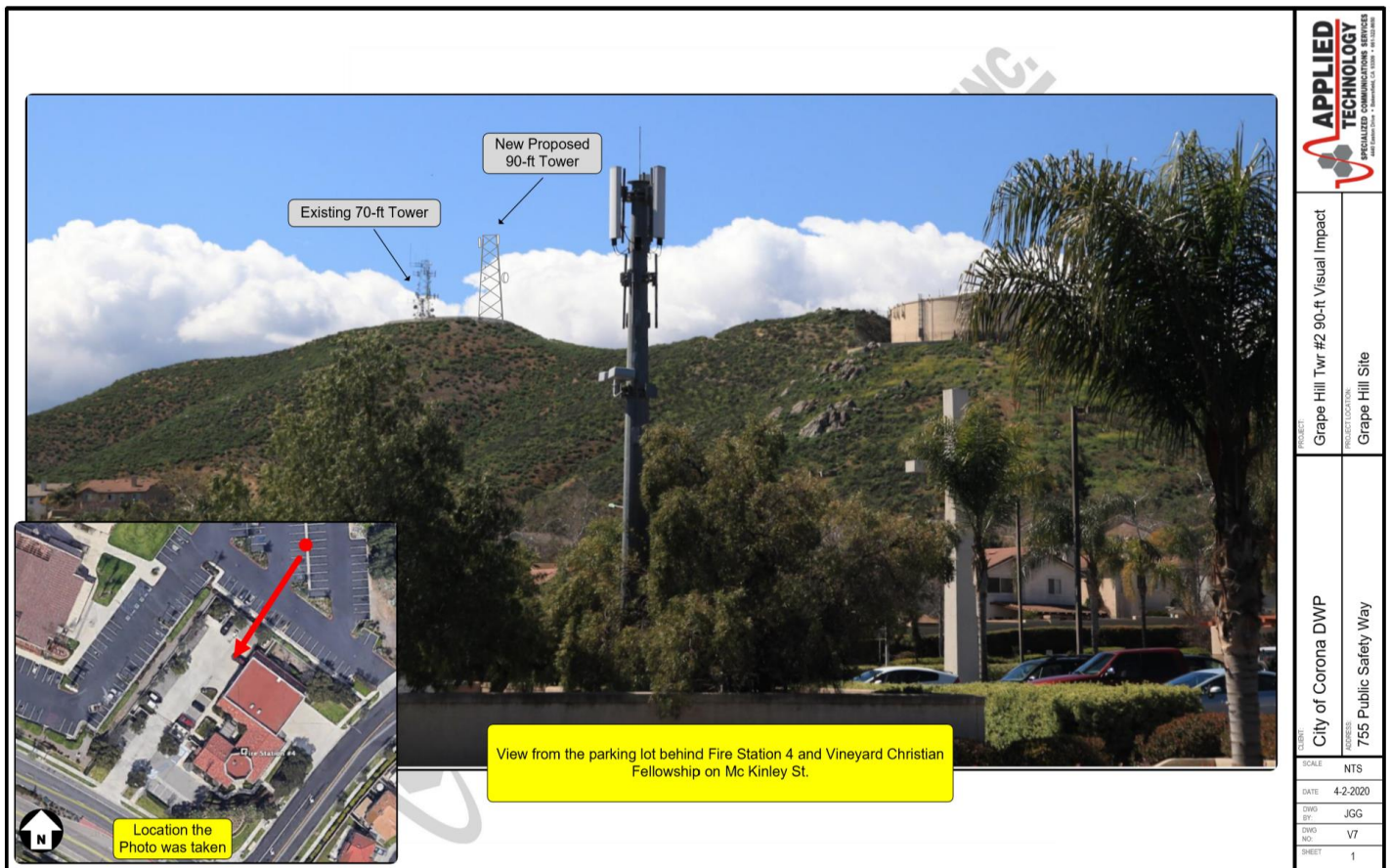


*Location 7 – View from the parking lot behind Fire Station 4 and Vineyard Christian Fellowship on Mc Kinley St.*



*Photo Site 7 - View from the parking lot behind Fire Station 4 and Vineyard Christian Fellowship on Mc Kinley St.*

This location provides an excellent image of Grape Hill with many additional vertical objects in view. In this photo, there is the existing Grape Hill tower, a cellular monopole in the Fire Station 4 yard, light posts, vertical cross, and the Yuma storage water tank. Add the trees into the view, and a person walking toward the Church would not visually be drawn to look at the new tower at Grape Hill.



Altered Photo Site 7 - View from the parking lot behind Fire Station 4 and Vineyard Christian Fellowship on Mc Kinley St.



*Location 8 – Public area view from a shopping center on Mc Kinley St.*



*Photo Site 8 - Public area view from Corona Hills Marketplace shopping center on Mc Kinley St.*

From the Corona Hills Marketplace shopping center, the Grape Hill tower is visible, but the distance reduces the perspective of the new tower. The buildings and trees will block the view toward Grape Hill. The site is only visible when finding a location that has a view of the tower.



Altered Photo Site 8 - Public area view from Corona Hills Marketplace shopping center on Mc Kinley St.



*Location 9 – Neighborhood below the Yuma Water Storage Tank on Impersivo Dr*



*Photo Site 9 - UFC Gym Parking Lot*

From this view, the palm trees help to reduce the visual impact of the new tower. This view with the distance and the tower will not add any additional impact to Grape Hill.



Altered Photo Site 9 - UFC Gym Parking Lot



*Location 10 – Costco Parking Lot, near gas pumps*



*Photo Site 10 - Costco Parking Lot, near Gas Pumps*

This photo is a broader view to capture more of the parking lot and surrounding structures. The photo was taken at standing height. As a person moves around the parking lot either within the car or on foot, the view toward Grape Hill is just slightly above natural visual view. While walking, most persons look down or focus on their destinations and do not look up to distant objects. This idea makes the towers at Grape Hill not noticeable unless a person is actively searching for the landmark.



Altered Photo Site 10 - Costco Parking Lot, near Gas Pumps



*Location 11 – Big 5 Parking Lot off Mc Kinley*



*Photo Site 11 - Big 5 Parking Lot*

Cars exiting the parking in this area have a view toward Grape Hill. The view is limited as local trees help to hide the towers from view. Cars traveling into the parking are heading Southwest direction which puts the Grape Hill tower out the side window. From this view, drivers would be focusing on where to park rather than a tower site off in the distance.



Altered Photo Site 11 - Big 5 Parking Lot

*Location 12 – McKinley Crossroads Shopping Center*



*Photo Site 12 - McKinley Crossroads off Teller St*

Within the McKinley Crossroads shopping center, the surrounding trees on the property limited the view toward Grape Hill. This help block the entire site from view. With the existing tower in place, the new tower from this point of view will not have a visual impact on the area.





Altered Photo Site 12 - McKinley Crossroads off Teller St

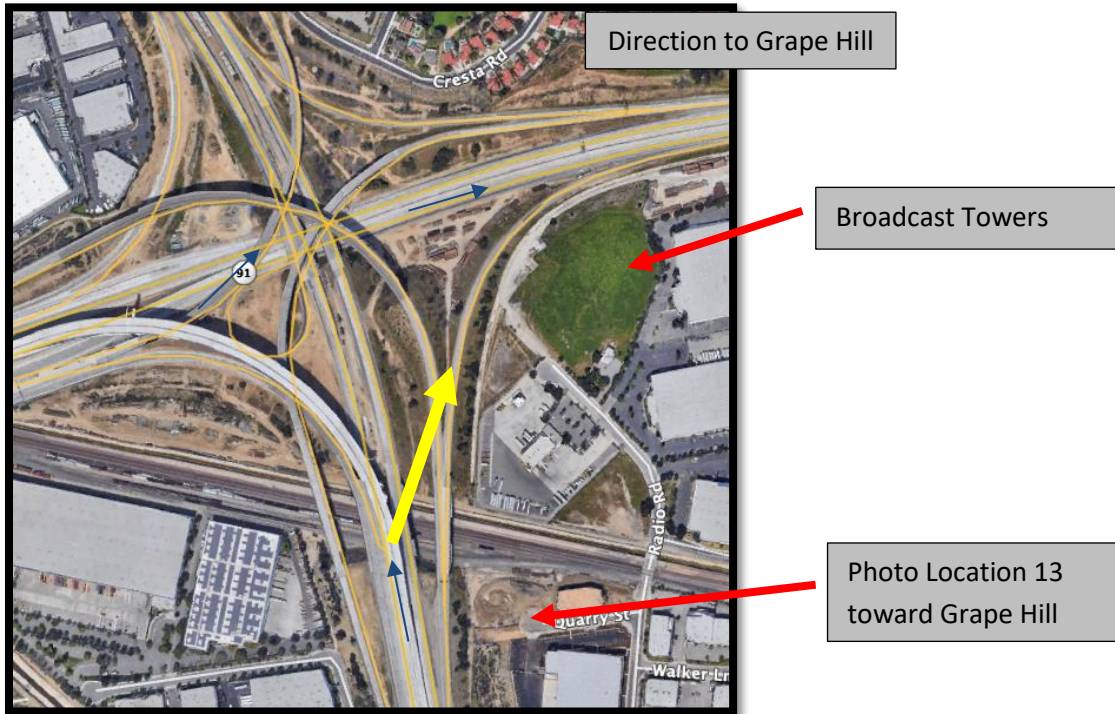
*Location 13 – View from Quarry St.*



*Photo Site 13 Quarry St view toward Grape Hill*

This photo shows the high-powered broadcast towers within the lower terrain of the city. These broadcast towers have a more significant visual impact on the city than the view of Grape Hill in the distance. This view is a sample of an industrial area. The travelers on both the 15 and 91 freeway interchange have a view of both the broadcast towers and Grape Hill. These towers are not as visible while drivers are focused on the bend in the overpasses.





*Image 1 - Image showing travelers vision*

As shown with Image 1 of the overview of the 91 and 15 interchanges, the view toward Grape Hill toward the northeast.



Altered Photo Site 13 Quarry St view toward Grape Hill

## GRAPE HILL TOWER #2 RF PROPAGATION STUDY

The following maps depict the RF Signal mapping generated from Grape Hill on the SCADA 902-928MHz spectrum. The criteria used for the study is based on the DWP SCADA system, which currently uses the GEMDS INET-II radio. The transmit power the unit provides is up to 30dBm. The propagation study uses the Master station at Grape Hill with a DB-589-Y Omni antenna at 60-ft with 75-ft of LDF4-50 Hardline cable. The remote locations were set to a typical receive height of 20-ft. The remote antenna will be a standard 10dB gain Yagi with 30-ft of LMR-400 type coaxial cable.

The 915MHz propagation was analyzed using both Pathloss 5.0 and RF Cad computer software. Using the same radio configuration for both propagations provided similar results. The RF Cad Propagation shows the 915MHz spectrum on a map overlay while the Pathloss overlay is terrain based. Both give examples of how the RF signal will propagate from the Grape Hill Tower.

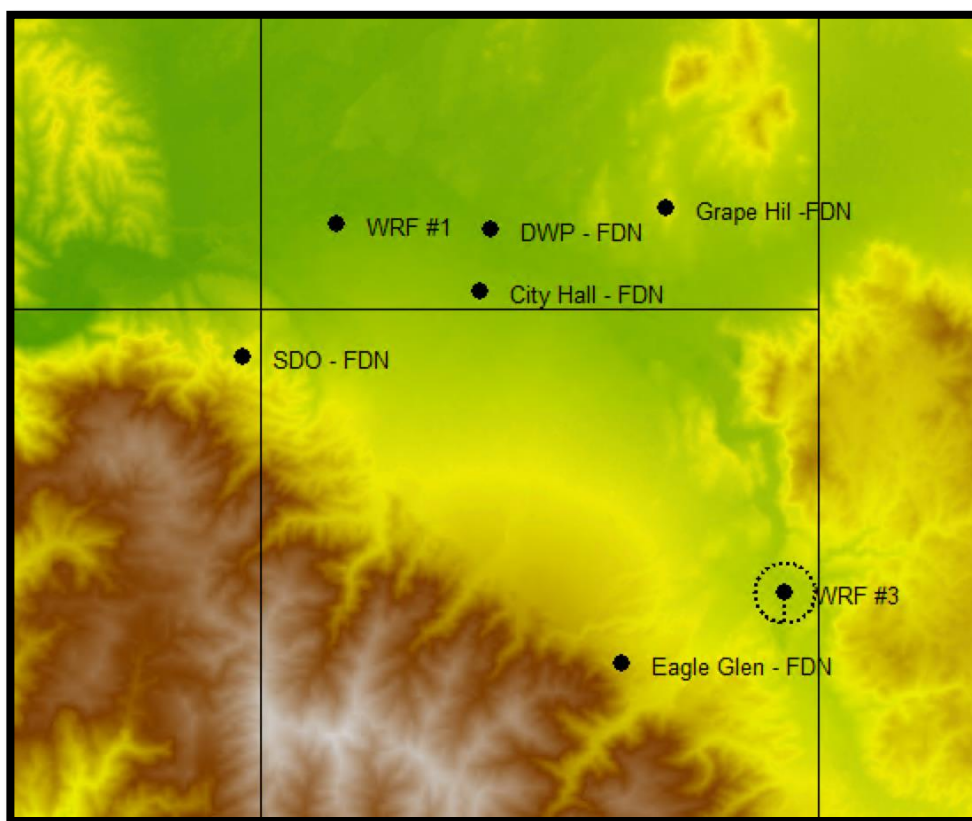


Image 2 - Terrain Variations



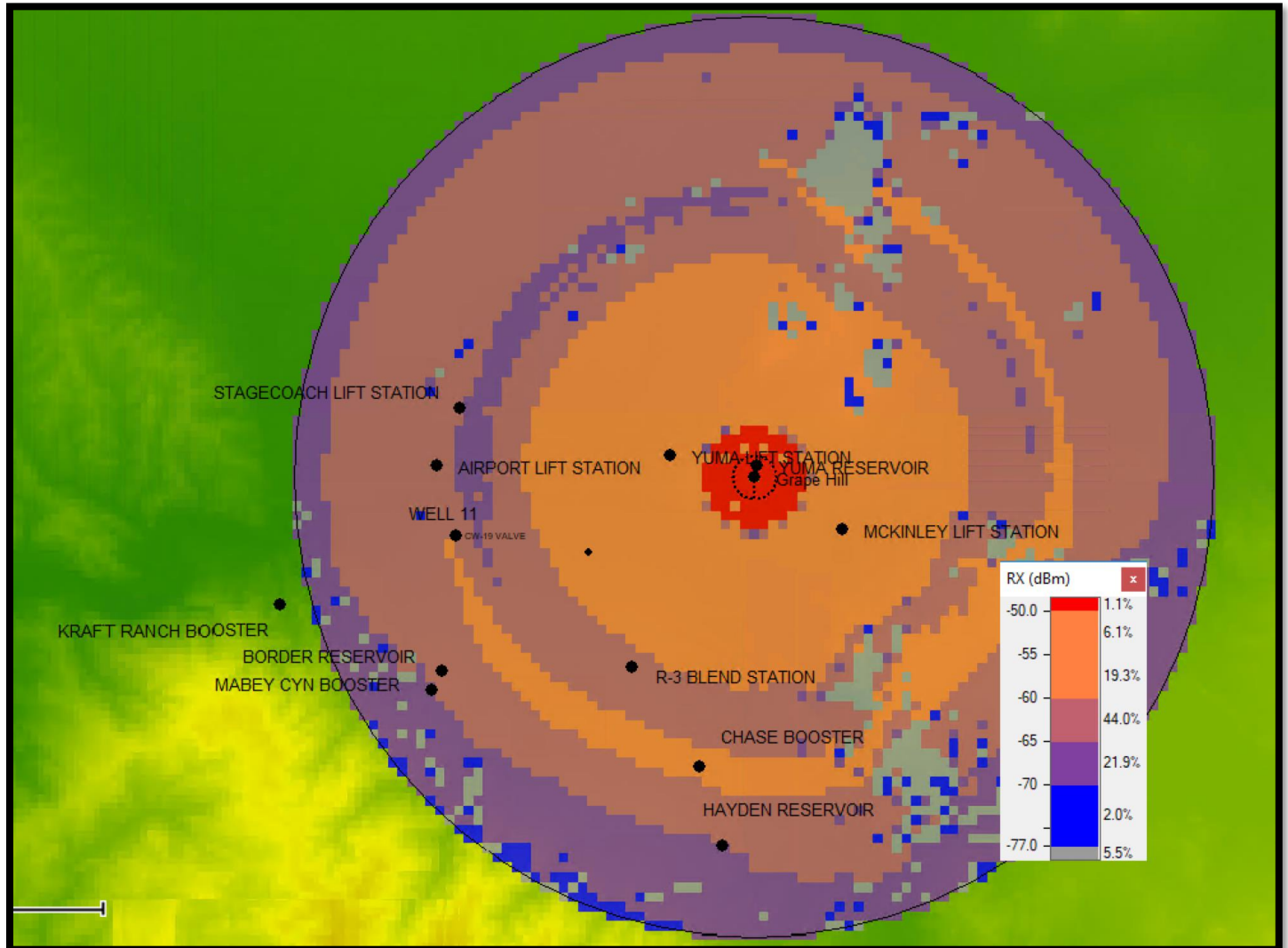


Image 3 - 915MHz Signal Propagation

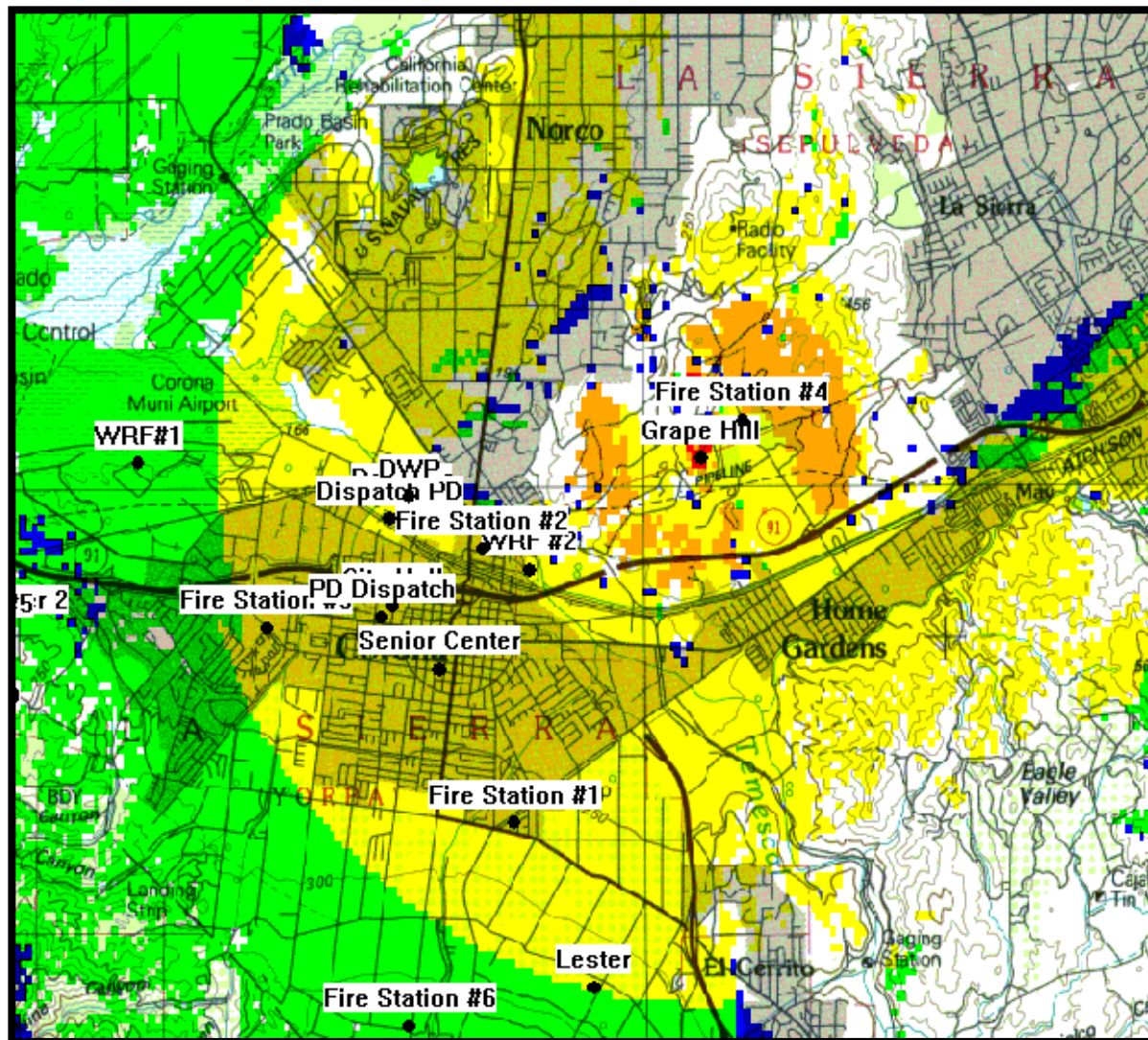


Image 4 - RF Cad Propagation at 915MHz

Propagation Display Settings X

<input checked="" type="checkbox"/>	-50.00	dBm/W	Color
<input checked="" type="checkbox"/>	-55.00	dBm/W	Color
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<input checked="" type="checkbox"/>	-65.00	dBm/W	Color
<input checked="" type="checkbox"/>	-70.00	dBm/W	Color

Shading: 80 %

OK Cancel

Image 5 – RF Cad RSSI Display Levels

### VHF RF Propagation Scale

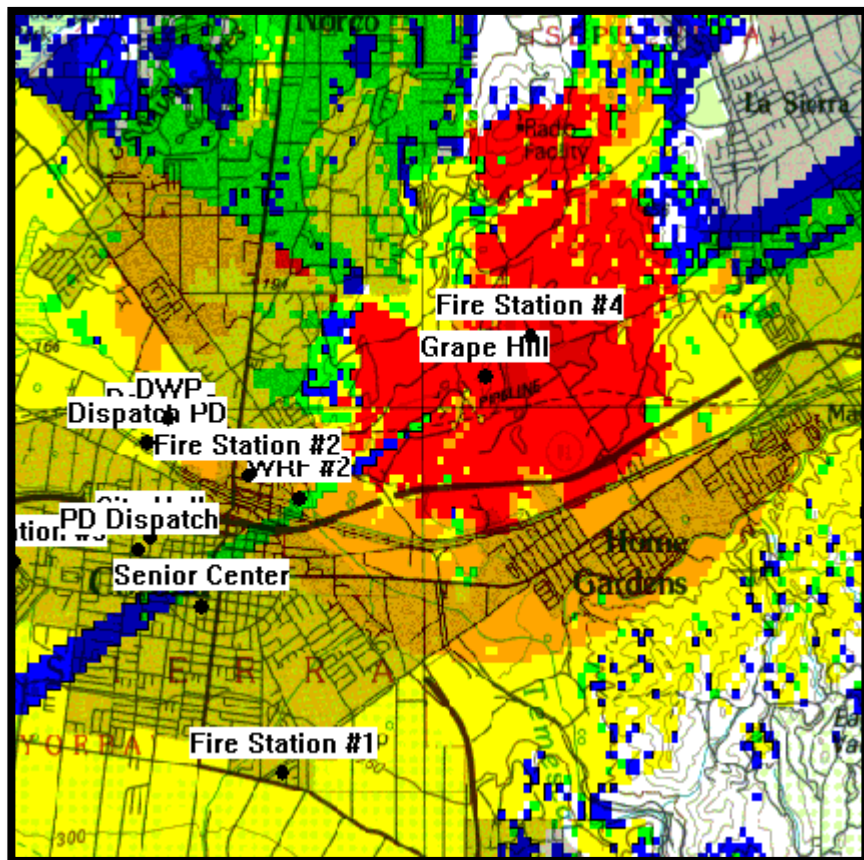


Image 6 - 150MHz VHF Propagation

Propagation Display Settings

<input checked="" type="checkbox"/>	-50.00	dBmW	Color
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<input checked="" type="checkbox"/>	-60.00	dBmW	Color
<input checked="" type="checkbox"/>	-65.00	dBmW	Color
<input checked="" type="checkbox"/>	-70.00	dBmW	Color

Shading: 80 %

OK Cancel

#### VHF 150MHz Propagation Criteria

Tx – 30dBm power level @ 60-ft using a DB222 Antenna

Rx – 30dBm @ 3-ft

Image 7 - RSSI Levels



## CONCLUSION

In Conclusion, the study intended to demonstrate that the Grape Hill tower will not present any negative impact on the area. In contrast, the tower provides the height needed to improve the Department of Water and Power SCADA Network as well as Public Safety communications needs. Thus completing the original network design, improving Network reliability and stability. As well as enhancing the DWP SCADA Network, the tower is designed for future projects.

The tower at Grape Hills provides remote sites on the 900MHz SCADA system access to the network. The Grape Hill tower real estate for the new potential two-way simulcast Fire Department Radio System.

It is recommended to complete the Grape Hill Tower #2.