PDS2013-MUP-13-012 AT&T Jacumba
Geographic Service Analysis

AT&T designed the site with 12 antennas, 4 per sector to be able to provide LTE service to close a very large gap along Interstate 8; provide service to the community of Jacumba to the South and the community to the Northwest of the site, as well as the railway. The requested height is required to provide coverage to this expansive area that is presently not serviced by AT&T. The Jacumba Sponsor supports the project as designed so that the community both to the South and Northwest can be serviced and the gap along Interstate 8 closed.

Staff inquired if AT&T can flush mount and stack the antennas per the Verizon facility attached in the project issues checklist. Stacking the antennas first reduces 12 antennas to 6, and further reduces the 12 antennas at 86' RAD to only 3. This design alternative greatly reduces the effectiveness of the site. AT&T is proposing this one site to serve the Jacumba community and close the gap in coverage along I-8. The requested RAD of 86' and the proposed triangular configuration with all 12 antennas at the same RAD center is done so to produce the required coverage to serve this coverage objective.

Locating the antennas on the current sign would allow for only a 63' RAD center. At this height coverage is significantly reduced and the site would not connect to the AT&T site located on I-8 to the West of the site and calls would be dropped. In addition, many areas in the Jacumba community, along the rail path and in the community to the Northwest would have little to no coverage.

The following are additional technological reasons why AT&T is proposing the design as submitted.

1) Triangular mounting gives AT&T a better receive diversity on the uplink signal (from handset to Base station) which improves the uplink throughput and performance.
2) ATT will be using 700-D/E block pret for LTE for which performs better with greater horizontal separation. This separation minimizes the interference internally between the system.

3) The triangular mounting allows for all the technologies (each antenna is not transmitting the same technology) are at the same rad center and same plane. This allows for better performance, reduces call drops and creates much stronger handover from site to site.

4) When all the antennas are in the same plane the radiation pattern from all the antennas for all technologies is the same and the Downlink signal from the tower to the Mobile unit (a person's cell phone) has equal strength and coverage pattern. The mobiles units are low power devices now. The mobile units will make more successful contacts to the tower if the antennas signals are coming from the same height. The mobile unit can easily sync with the tower and properly handoff to the next site. This same concept applies to E911, which results in a better, safer E911 system.

5) When antennas are split mounted vs. one plane the data throughput gets affected adversely. The main problem is for the areas which are on the fringe of coverage area. The technology which is on higher RAD center has a better probability of a successful call whereas with the lower RAD center it has low probability or no success.

In summary, AT&T has designed the proposed project to serve the Jacumba community, Interstate 8 and the surrounding area. Any deviation from the proposed design will reduce the effectiveness of this site. There is presently no coverage to this community. This site is proposed to close that coverage gap. If the coverage

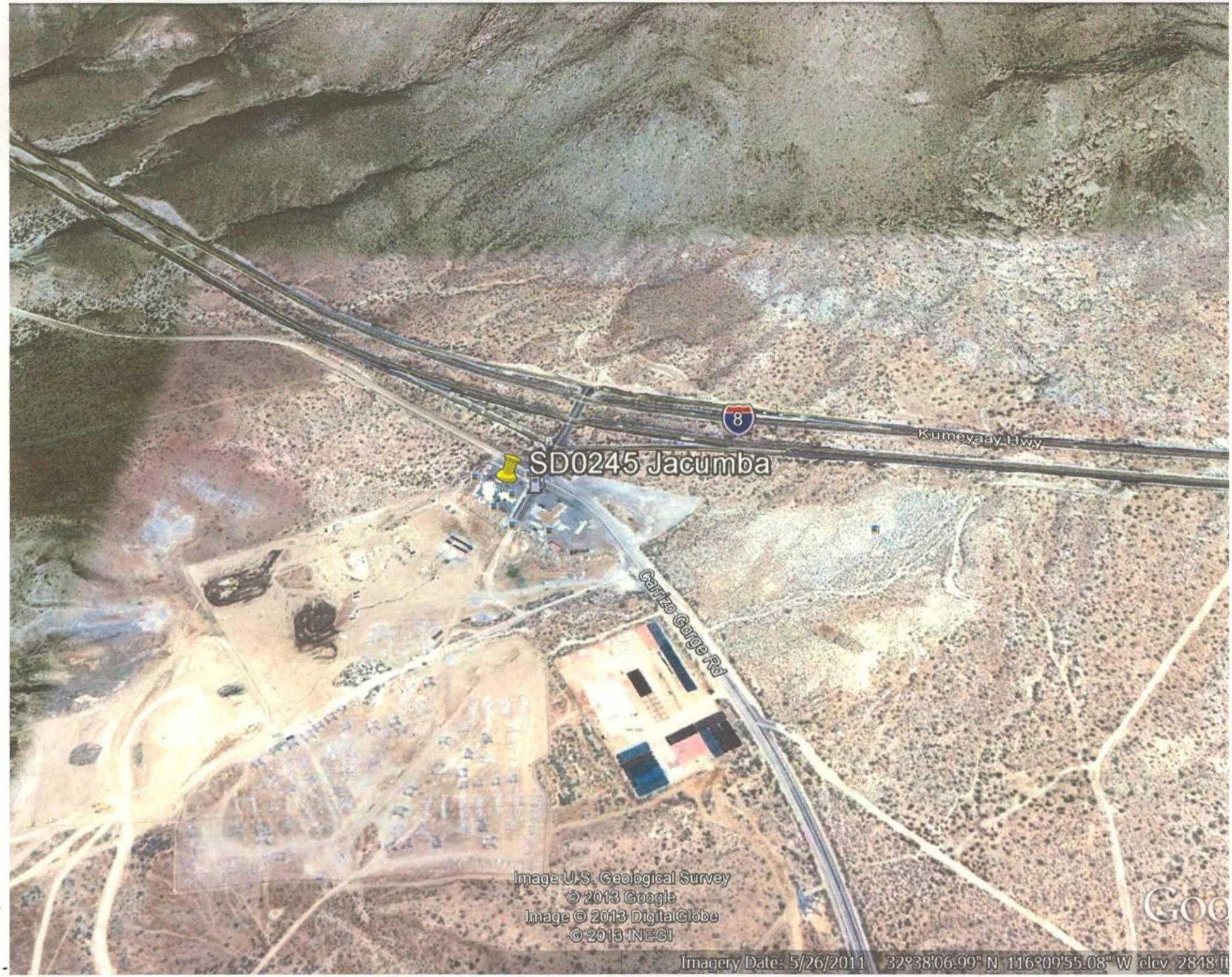
is compromised, than additional sites may be required to cover this community and to hand off to

COVERAGE AND CAPACITY

This site provides AT&T Mobility coverage East and West along Interstate 8 and will provide coverage south to the community of Jacumba. Please refer to the coverage map that illustrates the coverage that this site provides and the coverage gap closed by constructing this site. This site is required to provide coverage for AT&T customers where a gap currently exists and to provide expanded coverage to connect to surrounding AT&T sites.

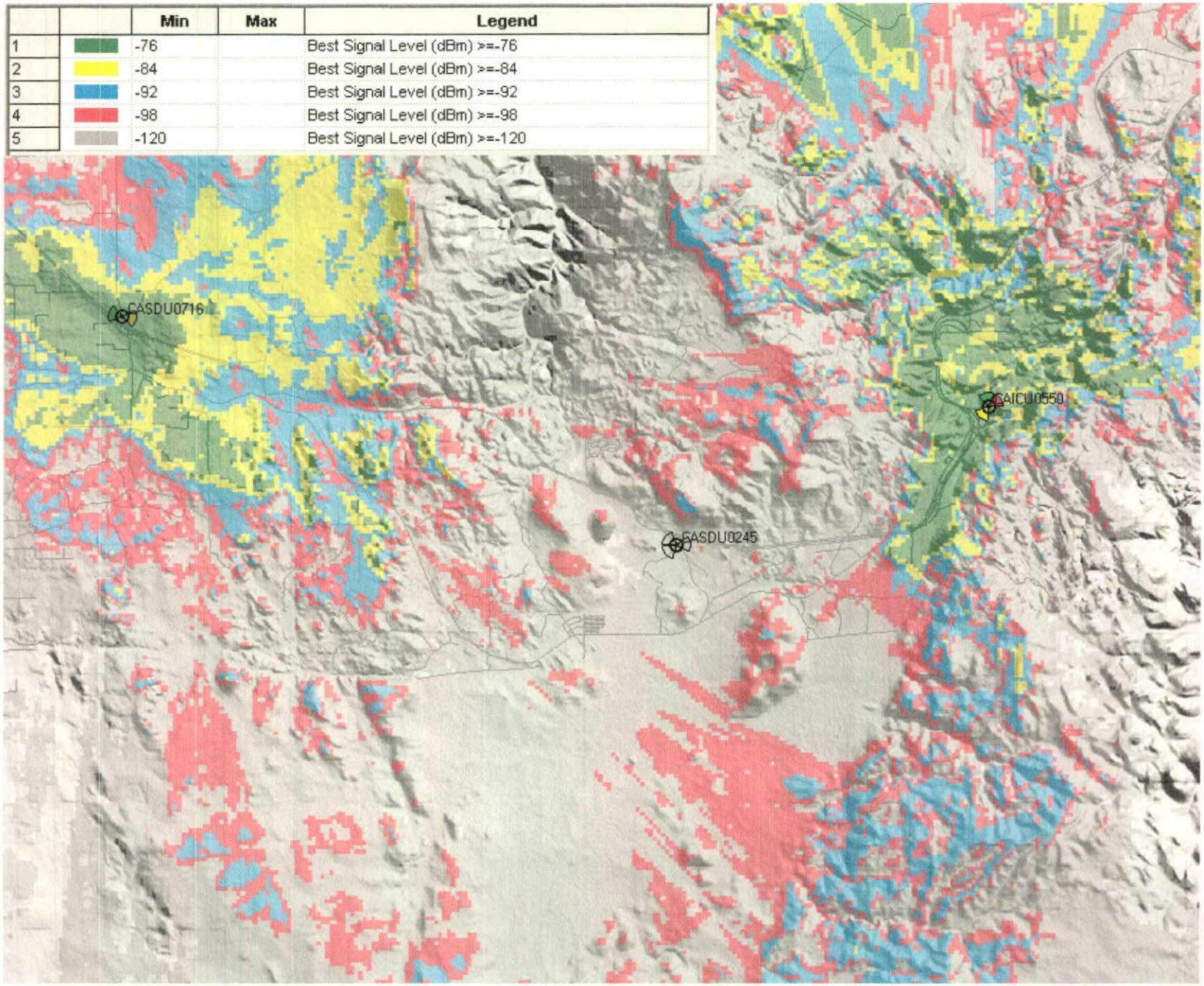
ALTERNATIVE DESIGN:

AT&T has designed this site with 4 antennas per sector. Each sector has 2 LTE antennas and 2 Voice antennas. All 4 antennas are required to provide the necessary capacity for the site. The 2 voice antennas and the 2 LTE antennas are required to be on the same plane. One alternative would be to stack two sets of 6 antennas each. Each sector would have 2 panel antennas. The pole would need to be raised an additional 10 feet to allow for the bottom stack to maintain the 86' RAD center.


8
Kumeyaay Hwy
SD0245 Jacumba
Carrizo Gorge Rd
Image U.S. Geological Survey
© 2013 Google
Image © 2013 DigitalGlobe
© 2013 INEGI
Imagery Date: 5/26/2011 32°38'06.99" N 116°09'55.08" W elev 2848 ft

COMPOSITE COVERAGE WITHOUT SD0245

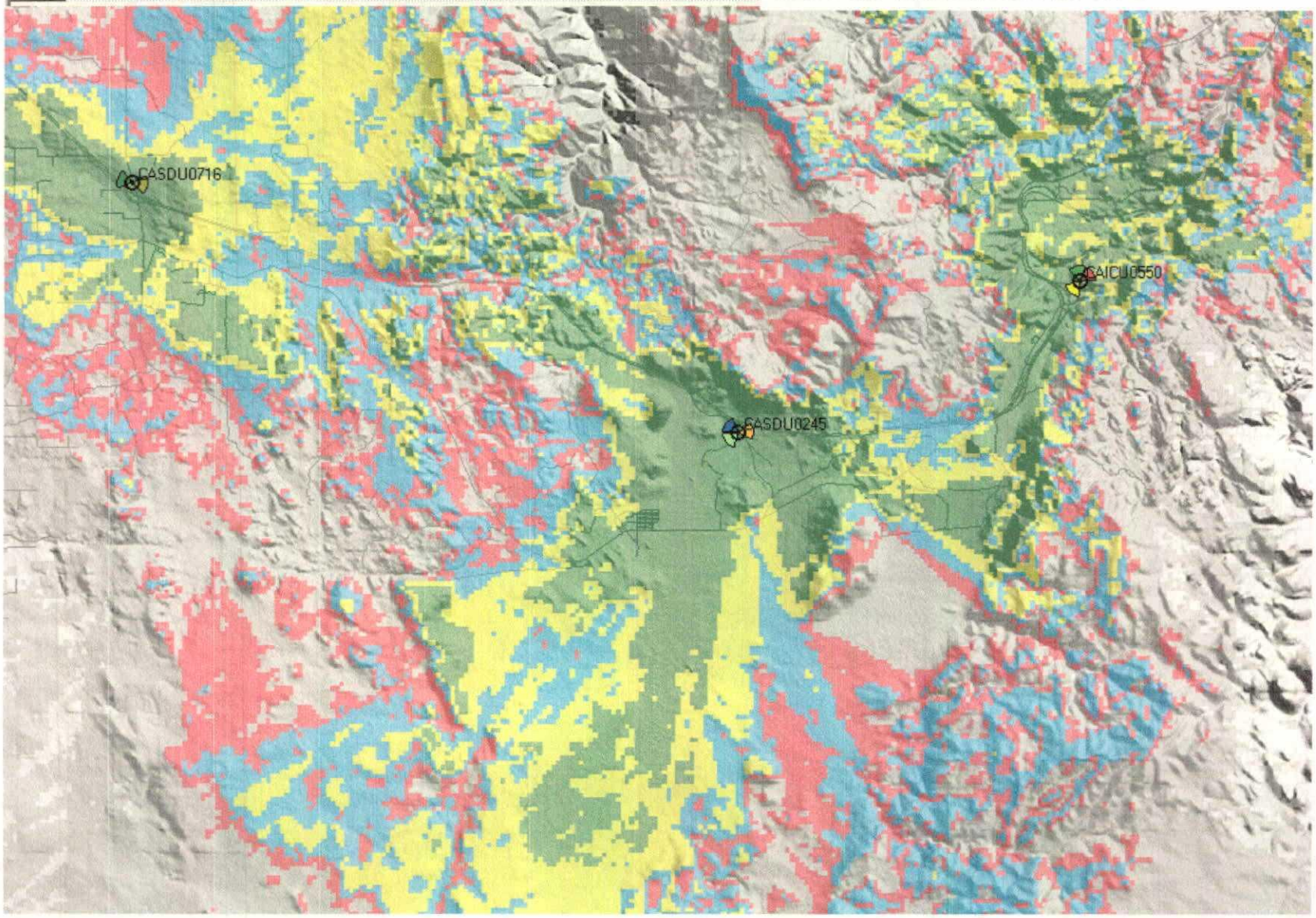
		Min	Max	Legend
1		-76		Best Signal Level (dBm) >=-76
2		-84		Best Signal Level (dBm) >=-84
3		-92		Best Signal Level (dBm) >=-92
4		-98		Best Signal Level (dBm) >=-98
5		-120		Best Signal Level (dBm) >=-120



COMPOSITE COVERAGE WITH SD0245 AT 86FT. AS PROPOSED

		Min	Max	Legend
1		-76		Best Signal Level (dBm) >=-76
2		-84		Best Signal Level (dBm) >=-84
3		-92		Best Signal Level (dBm) >=-92
4		-98		Best Signal Level (dBm) >=-98
5		-120		Best Signal Level (dBm) >=-120

The proposed height is required to cover the community of Jacumba to the South, the railroad, make connections to the East and West on I-8 and cover the community Northwest of the site on the North side of I-8



SD0245 COVERAGE ONLY AT 86FT. AS PROPOSED

		Min	Max	Legend
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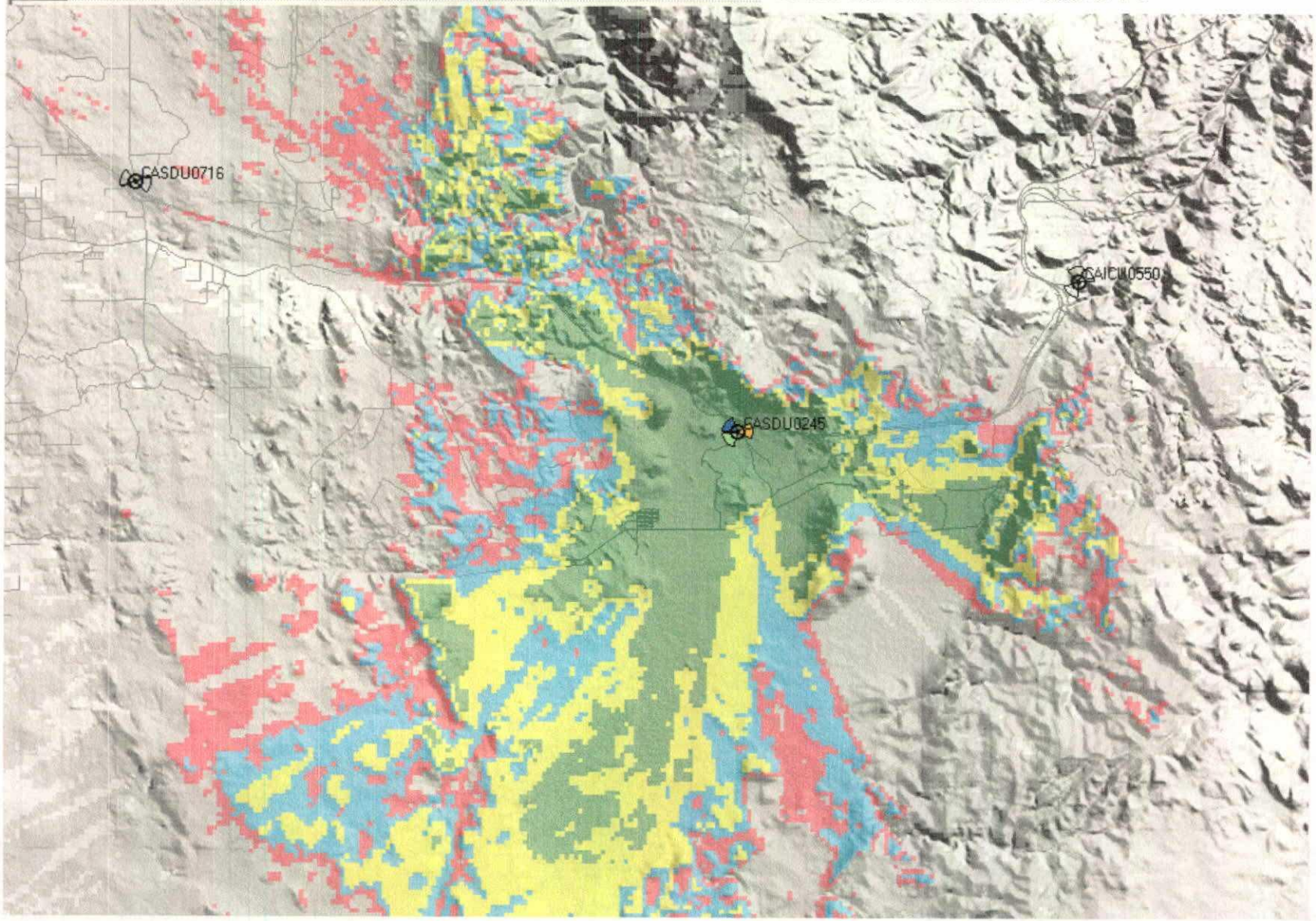

SD0245 COVERAGE ONLY AT 63FT. LOCATED ON EXISTING SIGN HEIGHT

		Min	Max	Legend
1		-76		Best Signal Level (dBm) >=-76
2		-84		Best Signal Level (dBm) >=-84
3		-92		Best Signal Level (dBm) >=-92
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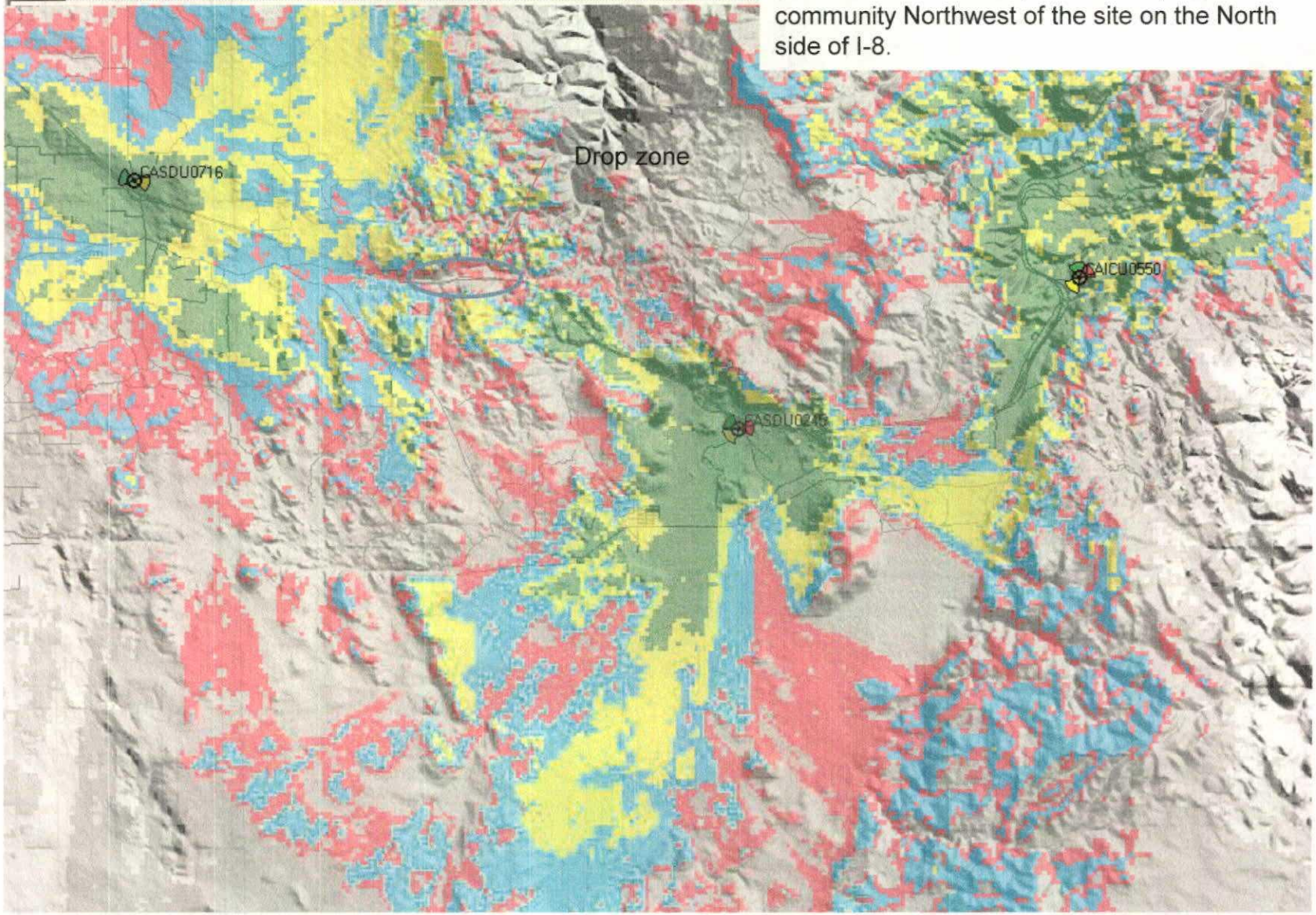
5		-120		Best Signal Level (dBm) >=-120

The reduced height of 63' will not make the connection to the West and calls will be dropped on I-8. In addition the service area will be significantly reduced in the community of Jacumba to the South, the railroad, and to the community Northwest of the site on the North side of I-8.



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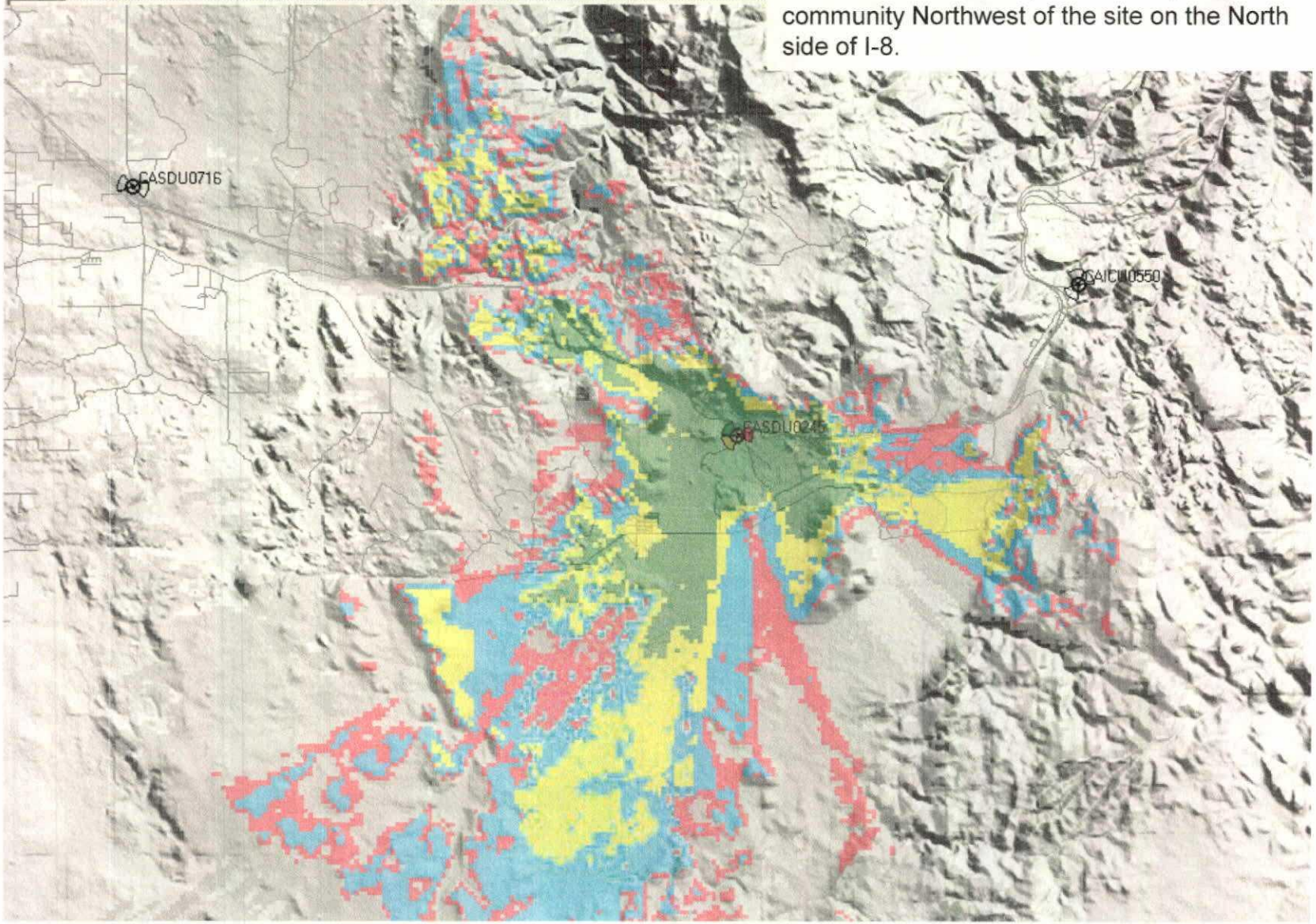
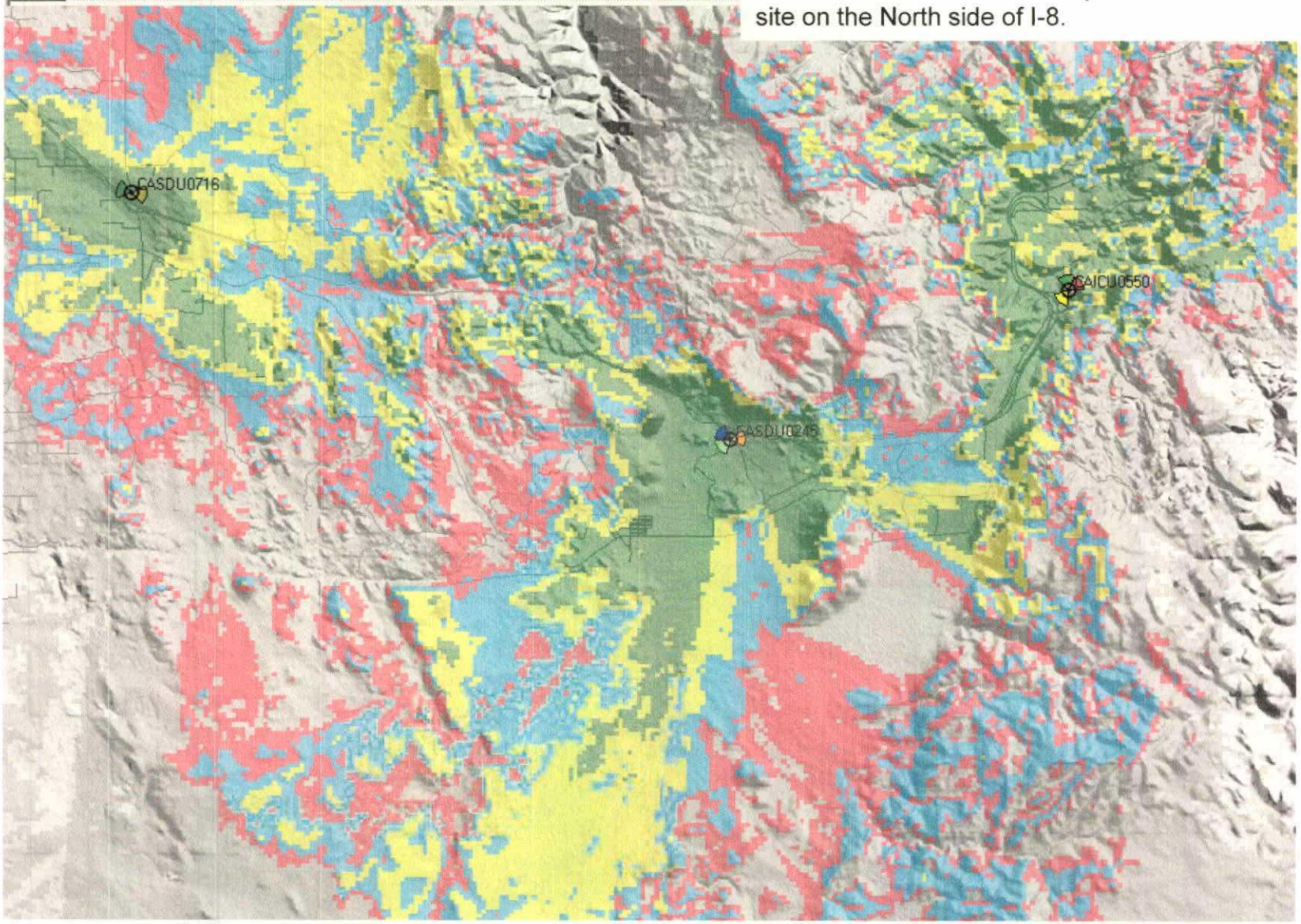


COMPOSITE COVERAGE WITH SD0245 with Split RAD on new Sign

	.	Min	Max	Legend
1		-76		Best Signal Level (dBm) >=-76
2		-84		Best Signal Level (dBm) >=-84
3		-92		Best Signal Level (dBm) >=-92
4		-98		Best Signal Level (dBm) >=-98
5		-120		Best Signal Level (dBm) >=-120

The Split RAD Center reduces the antenna count from 12 to 6 antennas and reduces the quality and the service area will be significantly reduced in the community of Jacumba to the South, the railroad, and to the community Northwest of the site on the North side of I-8.



SD0245 COVERAGE ONLY with Split RAD on NEW Sign

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