

Appendix A

Record of Non-Applicability (RONA)

**RECORD OF NON-APPLICABILITY (RONA)
FOR CLEAN AIR ACT CONFORMITY
RIVERSIDE COUNTY, NON-PALO VERDE VALLEY PORTION OF THE
MOJAVE DESERT AIR BASIN**

INTRODUCTION

The U.S. Environmental Protection Agency (USEPA) published *Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule*, in the 30 November 1993, Federal Register (40 CFR Parts 6, 51, and 93). The U.S. Navy published *Interim Guidance on Compliance with the Clean Air Act General Conformity Rule* in Appendix F, OPNAVINST 5090.1B, dated 1 November 1994. These publications provide implementing guidance to document Clean Air Act (CAA) Conformity Determination requirements.

Federal regulations state that no department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license to permit, or approve any activity that does not conform to an applicable implementation plan. It is the responsibility of the Federal agency to determine whether a Federal action conforms to the applicable implementation plan, before the action is taken (40 CFR Part 1 51.850[a]).

Federal actions in areas that are unclassified for CAA criteria pollutants are exempt from conformity determinations if they would be less than 100-ton to 250-tons, per the CAA Prevention of Significant Deterioration thresholds established for major new sources of pollutants in unclassified areas.

PROPOSED ACTION

Activity: The Proposed Action consists of the construction and operation of a communications tower and associated equipment, as well as the construction and maintenance of access to the tower site.

Proposed Action Name: Marine Corps Air Station (MCAS) Yuma Communication Tower at Spring Hill

Proposed Action Summary: The Proposed Action consists of site preparation; construction of a fenced enclosure; installation of an up to 200-foot-tall (61-meter-tall) communications tower, equipment shelter (shed), solar panel array, and emergency backup generator; construction of a new approximately 1,000-foot-long (300-meter-long) unpaved access road; and re-grading of an existing jeep trail and existing public road leading toward the proposed tower site. Once completed, routine (e.g. monthly) maintenance visits would be required. The primary power source for the communications tower and associated equipment would be solar, with emergency power provided by a propane-fueled backup generator.

Specific features of the proposed action are described in the Environmental Assessment.

Air Emissions Summary: Construction required for the MCAS Yuma Communications Tower at Spring Hill was assumed to take place during a one-year period. Based on the air quality analysis for the proposed action, the maximum estimated emissions would be below CAA Prevention of Significant Deterioration thresholds established for major new sources of pollutants in unclassified areas and would be less than 10 percent of projected regional emissions (Table 1).

Table 1. Estimated Construction Emissions

Total Emissions, Tons/year						
	CO	VOC	NO _x	SO _x	PM ₁₀	PM _{2.5}
	tons	tons	tons	tons	tons	tons
Emission Source	(total)	(total)	(total)	(total)	(total)	(total)
Heavy Construction Equipment	5.00	1.29	10.53	0.01	0.56	0.497065
Construction Vehicles	1.72	0.53	3.55	0.00	0.22	0.217222
Worker Trips	1.68	0.15	0.08	0.00	0.02	0.015627
Fugitive Dust					1.84E+01	1.84E+00
Totals	8.39	1.96	14.16	0.02	19.21	2.57

Date RONA prepared: August 3, 2009

EMISSIONS EVALUATION AND CONCLUSION

Emissions associated with construction were calculated using the URBEMIS Model, Version 9.2.2, which contains California Air Resources Board's Offroad Diesel Emission Factors (CARB 2007), the EMFAC2007 model (CARB 2007), the EPA's AP-42 emission factors (EPA 1998), and the South Coast Air Quality Management District's (SCAQMD) California Environmental Quality Act (CEQA) Air Quality Handbook emission factors for fugitive dust and construction operations (SCAQMD 1993). Operational emissions would be negligible.

The Marine Corps concludes that CAA Prevention of Significant Deterioration thresholds for applicable criteria pollutants would not be exceeded nor would the projected emissions be regionally significant (i.e., greater than 10 percent of the air basin's emission budgets) as a result of implementation of the Proposed Action. The emissions data supporting that conclusion is shown in Table 1, which is a summary of the calculations, methodology, data, and references included in Appendix A of the EA for the MCAS Yuma Communications Tower at Spring Hill. Therefore, the Marine Corps concludes that further formal Conformity Determination procedures are not required, resulting in this RONA.

RONA APPROVAL

To the best of my knowledge, the information presented in this RONA is correct and accurate and I concur in the finding that the Proposed Action is not subject to the General Conformity Rule.

Name

Date

Title

Table A-1
Construction Heavy Equipment Emissions - Proposed Action
Spring Hill Tower

Equipment	OFFROAD Emission Factors								Emissions					2009 Emissions, tons (total)							
	FUEL	HP	Load Factor	CO (lb/ahr)	VOC (lb/ahr)	NOX (lb/ahr)	SOX (lb/ahr)	PM10 (lb/ahr)	No of Equipment	Hrs Per Day	Days in Service	CO (lb/day)	VOC (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	CO tons (total)	VOC tons (total)	NOX tons (total)	SOX tons (total)	PM10 tons (total)
GRADING																					
Dozer	DIESEL	357	59	1.7411	0.3621	3.2071	0.0020	0.137	1	8	250	13.93	2.90	25.66	0.02	1.10	1.74	0.36	3.21	0.00	0.14
Motor Grader	DIESEL	174	57.5	0.7443	0.1846	1.4391	0.0014	0.0823	1	8	250	5.95	1.48	11.51	0.01	0.08	0.74	0.18	1.44	0.00	0.08
Water Truck	DIESEL	189	50	0.4534	0.1725	1.7336	0.0019	0.0914	1	8	250	3.63	1.36	13.87	0.02	0.49	0.45	0.17	1.73	0.00	0.06
											23.51	5.75	51.04	0.05	2.15	2.94	0.72	6.38	3.61	0.00	0.28
TOWER INSTALLATION																					
Crane	DIESEL	399	43	0.7157	0.1913	1.877	0.0018	0.0726	1	8	250	5.73	1.53	15.02	0.01	0.58	0.72	0.19	1.88	0.00	0.07
Rough-Terrain Forklifts	DIESEL	90	60	0.4493	0.1306	0.7797	0.0007	0.0716	2	6	250	7.19	2.09	12.48	0.01	1.15	0.00	0.25	1.50	0.00	0.14
Traction Loader/Bulldozer	DIESEL	108	65	0.3651	0.0393	0.6071	0.0006	0.0554	1	8	250	2.95	0.79	4.85	0.00	0.44	0.37	0.10	0.61	0.00	0.06
Cement/Mortar Mixers	DIESEL	10	96	0.0391	0.0092	0.0532	0.0001	0.0003	2	8	250	0.83	0.13	0.85	0.00	0.05	0.09	0.02	0.11	0.00	0.01
											16.47	4.55	33.28	0.03	2.22	2.05	0.57	4.15	0.00	0.28	

Table A-2
Construction Truck Emissions - Proposed Action
Spring Hill Tower

Purpose	Vehicle Class	No. of Trucks per Day	Speed (mph)	Vehicle Miles Traveled	PM10														Emissions, tons total				
					CO Running Exhaust (g/mi)	VOCs Running Exhaust (g/mi)	NO _x Running Exhaust (g/mi)	SO _x Running Exhaust (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Days in Service	CO lbs/day	VOC lbs/day	NOX lbs/day	SOX lbs/day	PM10 lbs/day	CO tons (total)	VOC tons (total)	NOX tons (total)	SOX tons (total)	PM10 tons (total)	
					10.408	3.198	21.478	0.025	1.263	0.038	0.028	250	13.77	4.23	28.41	0.03	1.78	1.72	0.53	3.55	0.00	0.22	
Phase I - Infrastructure	Heavy Duty Trucks	20	15	30	10.408	3.198	21.478	0.025	1.263	0.038	0.028	250	13.77	4.23	28.41	0.03	1.78	1.72	0.53	3.55	0.00	0.22	

Source: EMFAC2007, Heavy Duty Trucks, Year 2009

Assumptions: Round trip to construction site travel assumed to be 20 miles. Trip to construction site entrance at average speed of 15 mph.

Table A-3
Construction Worker Commute Emissions - Proposed Action
Spring Hill Tower

Construction Worker Estimates and Emission Calculation:

Construction Phase	Vehicle Class	No. of Workers Number of Workers	Speed (mph)	VMT (mi/vehicle-day)	CO		NO _x		VOCs				SO _x		PM ₁₀				CO lbs/day	VOC lbs/day	NO _x lbs/day	SO _x lbs/day	PM ₁₀ lbs/day	Total Days in Service	Emissions, tons total						
					Running Exhaust (g/mi)	Start-Up (g/start)	Running Exhaust (g/mi)	Start-Up (g/start)	Running Exhaust (g/mi)	Start-Up (g/start)	Hot-Soak (g/hr)	Resting Loss (g/hr)	Running Evaporation (g/mi)	Diurnal Evaporation (g/hr)	Running Exhaust (g/mi)	Start-Up (g/start)	Running Exhaust (g/mi)	Start-Up (g/start)							Tire Wear (g/mi)	Brake Wear (g/mi)	CO tons (total)	VOC tons (total)	NO _x tons (total)	SO _x tons (total)	PM ₁₀ tons (total)
Overall Construction	Light-duty truck, catalyst	40	27	49	3.235	11.289	0.304	0.56	0.069	0.618	0.193	0.024	0.047	0.054	0.204	0.007	0.014	0.016	0.008	0.013	13.40	1.17	0.94	0.01	0.13	250	1.66	0.15	0.03	0.0018	0.0158

Assume stoppage after 6 hours
Assume 45 minutes run time total
2009 Emission Factors from EPA/CAQ2007,
average temp 68F, assume 40 mile round trip.

Table A-4
 Fugitive Dust Emissions
 Spring Hill Tower

Surface Disturbance/Grading

Based on URBEMIS emission factor 20 lbs/acre/day
 Assume 3.5 acres total

Project	Amount of Disturbance, acres	Uncontrolled Emissions, lbs/day	Controlled Emissions, lbs/day	PM10 Emissions total, tons	PM2.5 Emissions total, tons
Grading	3.5	70	34.3	1.72E-02	3.60E-03

Travel on Unpaved Roads

Table A-5
 Summary of Construction Emissions
 Spring Hill Tower

Total Emissions, Tons/year

Emission Source	CO tons (total)	VOC tons (total)	NOX tons (total)	SOX tons (total)	PM10 tons (total)	PM2.5 tons (total)
Heavy Construction Equipment	5.00	1.29	10.53	0.01	0.56	0.497065
Construction Vehicles	1.72	0.53	3.55	0.00	0.22	0.217222
Worker Trips	1.68	0.15	0.08	0.00	0.02	0.015627
Fugitive Dust					1.84E+01	1.84E+00
Totals	8.39	1.96	14.16	0.02	19.21	2.57

Table A-6
 Backup Generator Emissions
 Spring Hill Tower

Kilowatts	MMBTU/hr	Emission Factors, lbs/MMBTU					Emissions, tons/year				
		CO	VOC	NOx	Sox	PM10	CO	VOC	NOx	Sox	PM10
120	0.409458491	0.386	0.12	3.17	0.000588	0.04831	0.015805	0.004914	0.129798	2.41E-05	0.001978

Assume 200 hours of operation per year
 Emission factors from EPA AP-42, Section 3.2, for reciprocating engine.

Appendix B

Visual Resource Management Report and Associated Documents

VISUAL IMPACTS ASSESSMENT, MCAS YUMA SPRING HILL COMMUNICATIONS TOWER, RIVERSIDE COUNTY, CALIFORNIA

BY

Dulaney Barclay
Allison Parrish
Mark Weitz

Prepared for

U.S. Department of the Navy
U.S. Marine Corp
Marine Corp Air Station, Yuma, AZ

And

U.S. Department of the Interior
Bureau of Land Management
Palm Springs-South Coast Field Office
Palm Springs, California

Prepared by

TEC, Inc.
1658 Cole Boulevard, Suite #190
Golden, Colorado 80401

July 16, 2009

Table of Contents

Introduction.....	1
Description of Facilities.....	1
BLM Visual Resource Management Classification System.....	4
Visual Resource Inventory.....	4
Visual Contrast Rating.....	7
References.....	11
Appendix (VRM Forms).....	12

List of Figures

Figure 1: Project Location Map.....	2
Figure 2: Site Layout.....	3
Figure 3: Visual Resource Classification System Matrix.....	5
Figure 4: Tower location from KOP #1.....	9
Figure 5: Tower facility from KOP #1.....	9
Figure 6: Tower location from KOP #2.....	10
Figure 7: Tower facility from KOP #2.....	10

Introduction

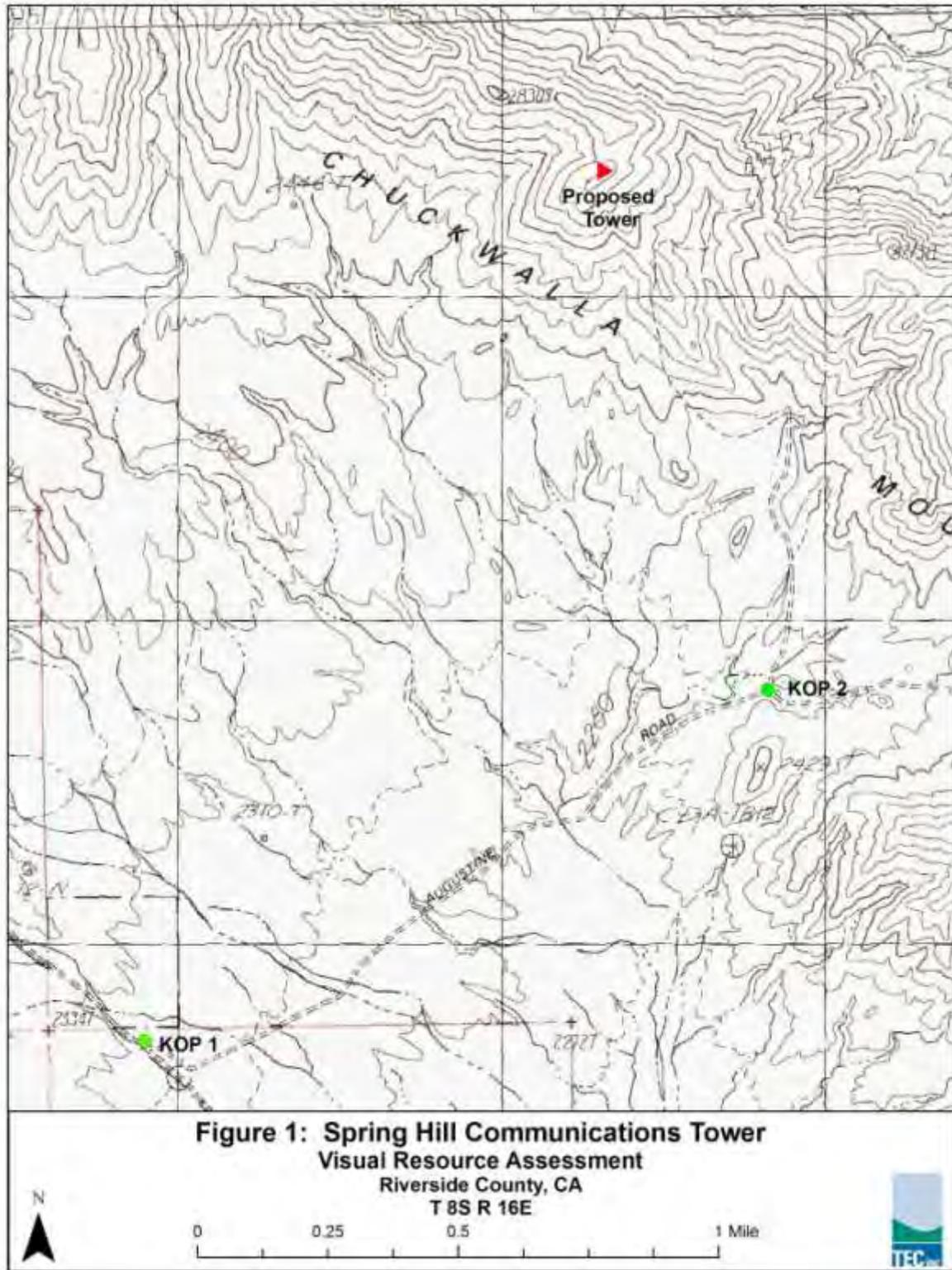
The U.S. Department of the Navy, U.S. Marine Corps, Marine Corps Air Station (MCAS), Yuma, Arizona is proposing to install a communications tower site on BLM lands in Riverside County, California. In support of MCAS Yuma's mission, the communications tower will provide Very High Frequency (VHF) and Ultra High Frequency (UHF) connections with the eastern portion of the Chocolate Mountain Aerial Gunnery Range (CMAGR). The project area is located within the California Desert District, Palm Springs Resource Area in Sections 12 and 13, Township 8 South, Range 16 East (Figure 1). The facilities at the site will consist of a communications tower with transceivers and an antenna on it, solar power panels, a backup generator, and a small shelter. The facility will be enclosed within a perimeter fence. The site will occupy approximately 0.4 acres when completed (Figure 2). Access to the site would be via a new access road that will extend to the site from an existing unimproved jeep road that branches off from the Augustine Pass Road. The Augustine Pass Road branches off from the Bradshaw Trail, a 75-mile long county road and designated National Backcountry Byway. Backcountry Byways (BCB) are a system of low standard roads and trails on public lands that pass through areas of high scenic value and public interest. The Bradshaw Trail BCB is also a historic route used by early settlers into Southern California. It was designated as a BCB by the California BLM State Director in 1989 because of its historic importance and high scenic and touring values.

A visual resource impact assessment of the project is required as part of the environmental assessment being prepared for the facility under the National Environmental Policy Act of 1971 as amended (NEPA). A visual resource inventory and two visual contrast ratings were conducted for the communications tower site on June 24-25, 2009 by Dulaney Barclay and Allison Parrish of the Denver TEC, Inc. office.

Description of Facilities

The proposed communications tower would be a free-standing, three-legged galvanized grey metal tower that would support three VHF/UHF AM/FM transceivers augmented with a high performance directional antenna. The tower will also support a microwave relay link to Black Mountain. The tower will stand approximately 200 feet (61 meters) tall and will be 21 feet wide at the bottom (face width) and 5 feet wide at the top. The tower will be lit by two steady burning red lights in compliance with Federal Aviation Administration (FAA) guidance and Federal Communications Commission (FCC) regulations for aviation safety. Additional lights may be placed approximately midway up the tower. The tower will be the most visible component of the site to users of the Bradshaw Trail BCB and Augustine Pass Road given its height above the surrounding landscape.

Power to the site will be primarily provided by electricity generated from on-site solar panels. An on-site propane-powered generator will provide back-up power to the site, when needed, to ensure continuous operation of the site. The solar panel array will consist of up to eighty-eight 120-watt panels with each panel expected to measure approximately 2 feet by 4 feet (0.6 meters by 1.2 meters). Each



array will measure 47 feet (14.2 meters) by 10 feet (3.18 meters) and stand approximately 9 feet (3 meters) tall. Power generated by the solar array in excess of immediate demand will be stored in a battery array that would be housed in a small shelter within the fenced enclosure. The back-up generator and 500 gallon (1, 900 liter) propane tank will be located within the fenced enclosure at the southeastern edge of the site. Both will stand approximately 4 to 5 feet tall and will be visible from certain observation points along the Augustine Pass Road but will not be visible from the Bradshaw Trail.

A small shed will enclose electronic equipment such as the batteries, charger/controllers, repeaters, circuit breakers, and signal amplifiers. The shelter will be 26 feet by 17 feet (7.9 meters by 5.2 meters) in size and 8 feet tall. The size might be expanded if other government agencies decide to install their equipment at the facility. The shed will be visible from certain observation points along the Augustine Pass Road but will not be visible from the Bradshaw Trail. The entire facility will be enclosed within a chain link fence with razor wire across the top and a turtle guard across the bottom. The fence itself will stand approximately 8 feet tall and will be visible from certain observation points along the Augustine Pass Road but will not be visible from the Bradshaw Trail.

Access to the site will be via existing and new unpaved roads that lead to the site from the south. The primary access to the site will be via the Bradshaw Trail from the town of Palo Verde approximately 39 miles away. No improvements will be made to the Bradshaw Trail which receives periodic grading by the Riverside County Transportation Department. Approximately 1.5 miles of the Augustine Pass Road that branches off the Bradshaw Trail and approximately 1.1 miles of an unnamed jeep trail which branches off the Augustine Pass Road will be utilized to access the site. Both the Augustine Pass Road and the unnamed jeep trail will be re-graded to a width of 8 feet (2.4 meters). A new access road approximately 1300 feet long and 8 feet wide (2.4 meters) will connect the unnamed jeep road and the tower site.

In addition to vehicular access, the site will also be accessed via helicopter. An unimproved helicopter landing site measuring 100 feet by 100 feet (30 meters by 30 meters) will be established at the site to the south of the fenced enclosure. The landing site will be located approximately 175 feet from the communications tower and at least 50 feet from the fenced enclosure and will not require any improvements. A footpath will lead from the landing site to a gate on the fenced enclosure. Usage of the landing site would be temporary will have no long-term effect on the overall visibility of the site.

BLM Visual Resource Management Classification System

The BLM Visual Resource Management (VRM) Classification System has two processes it implements in evaluating visual impacts to the scenic values of a landscape. These components are a visual resource inventory (VRI) and a visual contrast rating (VCR).

Visual Resource Inventory

The VRM inventory process considers scenic quality of the landscape, viewer sensitivity, and distance from the viewer to the landscape. The three factors are scenic quality, sensitivity, and visibility/distance

Visual Impacts Assessment, MCAS Yuma Spring Hill Communications Tower, Riverside
County, California

zones. Scenic quality is a measure of the visual appeal of a tract of land (Visual Resource Inventory Manual, Page 3). During the inventory process, tracts of land are given a rating of A, B or C based on seven key factors (landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modification). These features are ranked on a comparative basis with similar features within the same physiographic province. Areas with the most variety and most harmonious composition have the greatest scenic value (Visual Resource Inventory Manual, Page 3). Sensitivity levels are a measure of the concern for the scenic values of a landscape that the public (users) has (Visual Resource Inventory Manual, Page 3). Public lands are given a high, medium, and low sensitivity level by considering the type of user, amount of use, public uses, adjacent land uses, and special management or research objectives (Visual Resource Inventory Manual, Page 4). Finally, landscapes are divided into 3 distance zones based on relative visibility from travel routes and observation points (Visual Resource Inventory Manual, Page 4). The three distance zones are foreground-midground (f/m), background (b), and seldom seen (ss). Foreground-midground zones are those areas seen from travel routes and observation points that are less than 3 to 5 miles away. The outer boundary of this zone is defined as the point where the texture and form of individual plants are no longer apparent on the landscape. Background zones are those areas seen from travel routes and observation points that are more than 5 miles away and usually less than 15 miles away. Vegetation is visible as light and dark patterns but individual plants are not discernible. Seldom seen zones are those areas more than 15 miles away (Visual Resource Inventory Manual, Page 5).

		Visual Sensitivity Levels					
		High		Medium		Low	
Scenic Quality	Special Areas	I	I	I	I	I	I
	A	II	II	II	II	II	II
	B	II	III	III*	III	IV	IV
	C	III	IV	IV	IV	IV	IV
		f/m	b	s/s	f/m	b	s/s
		Distance Zones					

Source: BLM Handbook H-841D-1

Figure 3: Visual Resource Inventory Classification System Matrix

Visual Impacts Assessment, MCAS Yuma Spring Hill Communications Tower, Riverside County, California

Based on the scenic quality, public sensitivity, and distance from the viewer to the resource, tracts of public lands are divided into management classes utilizing a classification matrix that portrays the relative value of the visual resources (Figure 3). Each class also has a management objective associated with it (Visual Resource Inventory Manual, Page 5). The management objectives of the classes and their definitions are as outlined in the Visual Resource Inventory Manual (H-8410-1, Page 6) are as follows:

Class I The objective is to preserve the existing character of the landscape. This class provides for natural ecological changes; it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

Class II The objective is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape.

Class III The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Class IV The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. The management activities may dominate the view and be the major focus of the viewer attention. Every attempt should be made to minimize the impact of the activities.

As the current project area is not within an established VRM class, a project specific VRM analysis was conducted for Sections 12 and 13 of Township 8S, Range 16E. These two sections constitute the Sensitivity Level Rating Unit (SLRU) for this project. The landscape of the SLRU is uniform and demonstrates similarity in landform, vegetation, and color with adjacent areas. The landforms consist of massive, rough mountains, smooth to bumpy ridges, and nearly flat valley floors containing sinuous water courses. Isolated cones are present on ridgetops as well as on the valley floors. Mountain and ridge slopes have straight to slightly sinuous water courses. The vegetation, consisting of creosotebush, ocotillo, cholla, and Joshua trees, is irregular and indistinct in form, and the lines are sharp and jagged. Colors are generally neutral and drab consisting primarily of browns, yellows, grays, and blacks with some greens, reds, and blues. Textures of both the land and vegetation are rough, bumpy, and coarse. While the SLRU demonstrates a variety of landforms and colors, they are not exceptional relative to the surrounding landscape. The cultural modifications in the SLRU consist of only a few roads including the Bradshaw Trail, Augustine Pass Road, and an unnamed jeep road. The roads neither greatly add nor greatly subtract from the natural landscape. The current SRLU receives an overall rating of 13, placing it within a "B" classification.

Visual Impacts Assessment, MCAS Yuma Spring Hill Communications Tower, Riverside County, California

The SLRU is visible in the foreground for users of the Augustine Pass Road, and is visible in the middleground and background for travelers in both directions on the Bradshaw Trail. It is seldom seen at great distances for travelers eastbound on the Bradshaw Trail and the Chuckwalla Mountains block visibility at great distances to the east. The visual sensitivity of the SLRU is rated as moderate based on two factors which offset each other. The SLRU has high sensitivity for users of the Bradshaw Trail, a designated BCB, and the Augustine Pass Road. The recreational users of these two roads have a high sensitivity to changes in scenery because they visit the area infrequently and do so for very short periods of time. However, because of its remoteness from any population centers, the total number of users in the SLRU is small. The small number of users does not generate a lot of public concern for the area and that has the effect of decreasing the sensitivity level.

Referring to the classification matrix (see Figure 3), the project area is classified as a Class III based on a B rating for scenic quality, medium visual sensitivity levels, and visibility in the foreground-middleground for both the Bradshaw Trail and the Augustine Pass Road. The management objective for a Class III SLRU is to partially maintain the existing character of the landscape with only moderate changes to it. Management activities can attract attention but should not dominate the view of the casual observer.

Visual Contrast Rating

Two key observation points (KOPs) were selected that were the most likely observation points for users of the Bradshaw Trail and Augustine Pass Road. The points chosen were a kiosk at the intersection of the Bradshaw Trail and Augustine Pass Road (KOP #1) and the intersection of the Augustine Pass Road and an unnamed jeep trail (KOP #2). KOP #1 is approximately 1.04 miles from the tower location and KOP #2 is approximately 1.89 miles away.

Photorealistic simulations were prepared for each of the KOPs as an aide in the analysis. To create the simulations, a tower was identified near TEC office in Golden, Colorado that appeared to be comparable to the proposed tower based on descriptions we received. Similar to the proposed tower site, the identified tower is located in a similar topographic context on the top of a hill. The selected tower is a three legged, self-supporting, gray metal radio tower with an antenna on top that stands approximately 200 feet tall and has a 19 foot face width at its base. A small building containing communications gear is located adjacent to the tower and the entire facility is contained within a galvanized metal fence enclosure measuring approximately 50 feet by 50 feet. Observation points were then selected at 1.06 and 1.89 miles from the tower with roughly similar elevation differences (740 feet and 930 feet lower than the tower's location, respectively) as that between the two KOPs and the proposed tower site.

Photographs of the tower were taken from the two observation points under differing lighting conditions in the middle of the day using a Canon EOS Rebel XSi digital SLR set to 100 ISO. The camera was equipped with a Canon EF-S 18mm to 55mm image stabilized zoom lens set to 31mm to approximate the 50mm focal length of a 35mm film camera (31mm lenses setting X 1.6 crop factor=49.6mm output view). This setting provided a field of view that approximates the view field of the human eye. Photoshop CS4 was used to copy the tower from the photographs taken at the two observation points and insert it into the corresponding photographs taken from the key observation

points. To determine the visibility of the solar arrays, shelter structure, fuel tank and generator, we used client supplied CAD data and height information as well as on-site observations and GIS mapping to establish lines of sight from the key observation points. The solar arrays and shelter structures were drawn to scale into the photographs taken from the KOPs if it was determined they would be visible. The photorealistic simulations are presented below. The first picture depicts the current view of the natural landscape. The second photo represents what the landscape will look like after construction of the communications tower facility.

The Visual Contrast Rating worksheets were filled out in the field with both evaluators conducting the analysis. The land forms visible at KOP #1 consisted of triangles, domes, trapezoids, crescents and lines. Lines vary from bumpy to smooth on the ridgetops, straight to curved on the mountain slopes, and sinuous on the valley floors. Colors are dull and neutral, consisting of browns, grays, blacks, yellows and reds. The texture of the landscape is coarse and rough. The vegetation has irregular forms and jagged, irregular, complex lines. Vegetation colors are primarily brown, yellow, and green with some light blues also present. Similar to the texture of the land, the texture of the vegetation is coarse and rough. The character of the landscape at KOP #2 is very similar to that at KOP #1 with forms dominated by lines, triangles, domes, trapezoids, and crescents. Lines are irregular and bumpy. Colors are also primarily dull and neutral consisting of browns, blacks, yellows, reds, and grays and the texture of the land is coarse and rough.

The characteristics of the proposed communications tower are considerably different from those of the natural landscape. The forms are linear, blocky, and symmetrical and the lines are straight regular and simple. The colors are similar to some in the natural landscape and include gray, brown, and black. The texture of the tower is smooth and fine.

Contrasts at KOP #1 are mostly weak (Figures 4 and 5). The weak contrasts are a result of greater distances involved with KOP #1 and the angle of observation. At a distance of almost 2 miles, only the upper portion of the tower can be seen from KOP #1. It is visible against the sky but does not attract attention without scrutiny. The other facilities at the communications site are not visible because of the great distance involved and also because they are set back from the edge of the slope such that the line of sight of the observer is above them. The access road is hidden from view behind a low ridge but the unnamed jeep road is quite visible extending up the mountain slope. The gray color of the metal tower is similar to the grays of the surrounding natural landscape. From this KOP, the objectives of a Class III VRM class are exceeded. Class III objectives allow for a moderate level of contrast and the contrast is rated at this location as weak.

Contrasts at KOP #2 are strong because of the closer proximity to the tower location and the angle of observation renders more of the associated facilities and the access road visible to an observer (Figures 6 and 7). The entire tower, the solar array, and the small shed are all visible from this angle because the set back from the edge of the slope is considerably less. The unnamed jeep road and the access road are quite prominent in this view. The strong contrasts are a result of dissimilar forms, lines, and



Figure 4: View of tower location from KOP #1 (50mm equivalent focal length)



Figure 5: View of tower from KOP #1 (50mm equivalent focal length)



Figure 6: View of tower location from KOP #2 (50mm equivalent focal length)



Figure 7: View of tower from KOP #2 (50mm equivalent focal length)

textures with the land and vegetation. Color contrasts are weak as the gray metal of the tower, red-brown color of the shelter, and gray-brown color of the solar array are similar to those colors in the natural landscape.

While the management objectives of a Class III VRM class are not met at KOP #2, the cumulative effects when combined with the contrasts from KOP #1 do meet the objectives. The weak contrasts at KOP #1 offset the strong contrasts at KOP #2 such that the cumulative effect is a moderate contrast that meets the objective of a Class III VRM class to partially retain the existing character of the landscape.

References

U.S. Department of the Interior, Bureau of Land Management
Manual H-8410-1-Visual Resources Inventory. Available on line at
<http://www.blm.gov/nstc.VRM/8410.html>

APPENDIX

VISUAL RESOURCE INVENTORY FORM

VISUAL CONTRAST RATING FORMS

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SCENIC QUALITY FIELD INVENTORY

Date 6/24/2009

District California Desert

Resource Area Palm Springs

Scenic quality rating unit
Sections 12 & 13, T.8S, R.16E

1. Evaluators (names)

Dulaney Barclay, Allison Parrish

2. LANDSCAPE CHARACTER (Feature)

	a. LANDFORM/WATER	b. VEGETATION	c. STRUCTURE (General)
FORM	Massive, blocky, rough mountains descending to flat to gently rolling valley bottoms.	Irregular, indistinct.	N/A
LINE	Straight to slightly sinuous on mountain slopes; bumpy and smooth ridgetops; flat valley floor; sinuous water courses.	Sharp, jagged.	N/A
COLOR	Browns, yellows, grays, reds, and black. Colors are neutral and dull.	Green in washes; yellows, grays, and browns elsewhere.	N/A
TEXTURE	Course, rough, bumpy, rugged.	Rough and scrubby; uniform.	N/A

3. Narrative

The landscape is defined by desert scrubland. Topography is characterized by rough, massive mountains, isolated cones, bumpy to smooth ridges, and broad, flat to gently rolling valley bottoms. Ridge and mountains tops feature curvy, sinuous lines with straight deep lines on slopes. Valley floors are characterized by transitional lines distinguished by gradually flat to hilly topography as elevation increases. Sinuous, dry washes (arroyos) spread out into the valleys, and are denoted by darker green lines. The terrain is rough, bumpy, and coarse. Colors are dull and neutral, and include yellows, blacks, browns, grays, and reds with limited green. Vegetation is generally not thick and does not exhibit a large degree of variation; creosotebush is the dominant species but is intermixed with some ocotillo, cholla, and Joshua trees. Little variety exists across the immediate geographic area as a whole in terms of landform, structure, and vegetation.

4. SCORE (Circle Appropriate Level)*

	HIGH	MEDIUM	LOW	EXPLANATION OR RATIONALE
a. Landform	5	(3)	1	The dominant landforms are not exceptional within the regional setting. Water is scarce, and vegetation does not have much variety. Colors are drab and neutral. Adjacent scenery adds moderately, but is not exceptional.
b. Vegetation	5	(3)	1	
c. Water	5	3	(0)	
d. Color	5	(3)	1	
e. Adjacent Scenery	5	(3)	0	
f. Scarcity	5+	3	(1)	
g. Cultural Modification	2	(0)	-4	
TOTALS	0 + 12 + 1 = 13			

SCENIC QUALITY CLASSIFICATION

A 19 or more

B 12-18

C 11 or less

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

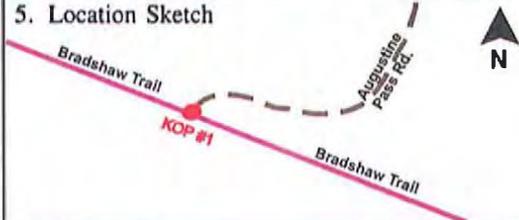
Date 6/25/2008

District California Desert

Resource Area Palm Springs

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name Spring Hill MCAS Yuma, Communications Tower	4. Location Township <u>8S</u> Range <u>16E</u> Section <u>23</u>	5. Location Sketch 
2. Key Observation Point KOP #1 - Bradshaw Trail Kiosk		
3. VRM Class Class III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Triangles/Domes/Lines/ Trapezoids/Crescents	Irregular	N/A
LINE	Bumpy/Smooth/Curved/Straight/ Sinuous	Sharp/Jagged/Irregular/Complex	N/A
COLOR	Brown/Gray/Black/Yellow/Red	Brown/Yellow/Green/Blue	N/A
TEX- TURE	Coarse/Rough/Scrubby	Coarse/Rough/Scrubby	N/A

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	N/A	N/A	Linear/Symmetrical
LINE	N/A	N/A	Straight/Regular/Simple
COLOR	N/A	N/A	Gray
TEX- TURE	N/A	N/A	Smooth/Fine

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

ELEMENTS	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (Explain on reverse side)					
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)										
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None							
Form			X				X													
Line			X				X													
Color				X			X													
Texture			X				X													
Evaluator's Names																		Date		
Dulaney Barclay, Allison Parrish																		6/25/2009		

SECTION D. (Continued)

Comments from item 2.

The project contrasts weakly with the elements of the landscape from this KOP. The weak contrast is a result of the great distance (approximately 1.9 miles) between the project and the KOP. Only the tower can be seen at this distance and from this direction. While the tower can be seen, it does not attract attention. Other elements of the facility are not visible due to set back from the edge of the slope. The access road is hidden behind a low ridge. The visual resource management objective of partially retaining the existing character of the landscape is met.

Additional Mitigating Measures (See item 3)

N/A

SECTION D. (Continued)

Comments from item 2.

The project contrasts strongly with the elements of the landscape from this KOP. The strong contrast is a result of highly dissimilar forms and character of the lines. Texture also contrasts strongly. These three strong contrasts attract the viewer's attention. The proximity of the project to this KOP and the angle of observation add to the visibility of the project. The contrast from KOP #2 is weak. The cumulative effect from the two KOP's is a moderate contrast that meets the objective of a Class III VRM class, allowing for only a moderate change to the characteristic landscape.

Additional Mitigating Measures (See item 3)

N/A

Appendix C

Rare and Sensitive Plant Survey Final Report

**Marine Corps Air Station (MCAS) Yuma,
Communications Tower at Spring Hill;
Rare and Sensitive Plant Survey
Final Report**

Prepared for:

NAVFAC Southwest,
Central IPT Building 1
1220 Pacific Highway
San Diego, CA 92132-5190
Contact: Rob Lovich (619) 532-1478

Prepared by:

ICF Jones & Stokes
1 Ada, Suite 100
Irvine, CA 92618
Contact: Mark Bethke
(949) 333-6600

June 2009

ICF Jones & Stokes. 2009. Marine Corps Air Station (MCAS) Yuma Communications Tower at Spring Hill; Rare and Sensitive Plant Survey Final Report. June. (ICF J&S 00430.09.) Irvine, CA. Prepared for: NAVFAC Southwest.

Contents

	Page
Executive Summary	1
1.0 Introduction	2
1.1 Background.....	2
1.2 Project Location.....	3
1.3 Project Description.....	3
1.4 Existing Conditions.....	4
2.0 Methodology	5
2.1 Literature Research.....	5
2.2 Survey Protocol.....	5
3.0 Results	7
3.1 Plant Composition and Vegetation Communities.....	7
3.2 Focused Surveys.....	8
4.0 References	9

Appendix A	Special-Status Species Table
Appendix B	Plant Compendium
Appendix C	Field Notes
Appendix D	Photographic Record Log

Figures and Tables

Figures

	Follows Page
Figure 1 Regional Vicinity Map	4
Figure 2 Aerial Local Vicinity Map.....	4
Figure 3 USGS Topographic Map.....	4
Figure 4 Proposed Site Layout/Area of Potential Effect.....	6
Figure 5 Communications Tower and Helicopter Pad Locations.....	6
Figure 6a Project Overview.....	6
Figure 6b Project Overview.....	6

Tables

	Page
Table 1 Compiled Survey Dates, Locations, Acreages, and Observed Target Species	7

Acronyms and Abbreviations

AMSL	above mean sea level
BLM	Bureau of Land Management
CMAGR	Chocolate Mountains Aerial Gunnery Range
CNDDB	California Natural Diversity Database
CNPS	California Native Plants Society
GIS	Geographic Information System
GPS	Global Positioning System
MCAS	Marine Corps Air Station
NAVFAC Southwest	Navy Facilities, Southwest Region
NRCS	National Resource Conservation Service
topo map	USGS 7.5-minute topographical quadrangle map
UHF	ultra high frequency
USGS	U.S. Geological Survey
USMC	U. S. Marine Corps
VFR	visual flight rules
VHF	very high frequency

Executive Summary

Marine Corps Air Station (MCAS) Yuma, California, is proposing to add a new communication facility to improve coverage east of the Chocolate Mountain range on Bureau of Land Management (BLM) property. As part of the proposed new facility, an existing jeep trail would be improved for service vehicle access, along with a new access road to the facility, helicopter pad, tower pad, and adjacent laydown yard at the top of Spring Hill. Furthermore, a staging area is proposed at the south side of Bradshaw Trail, at the intersection with Augustine Pass Trail.

ICF Jones & Stokes was tasked with performing rare and sensitive plant surveys for the proposed project area. Three pedestrian surveys were performed between May 11 and May 31, 2009, for 19 special-status plant species that were documented as occurring within and near the proposed project area. Based on visual survey sweeps of the project area and added buffers, none of the 19 target species were observed.

1.0 Introduction

1.1 Background

The proposed action is needed by Marine Corps Air Station (MCAS) Yuma, and would support their mission:

The principal mission of MCAS Yuma is to provide aviation ranges, support facilities, and services that enhance the combat capability of Marine Corps and other military forces to defend the nation's interests.

The purpose of the proposed action is to provide improved communications with aircraft (including low-altitude aircraft) and vehicles within restricted military area R-2507, which is associated with the Chocolate Mountains Aerial Gunnery Range (CMAGR). The proposed action would improve coverage east of the Chocolate Mountains in R-2507 on Bureau of Land Management (BLM) property.

The proposed action is needed because there are currently poor very high frequency (VHF) and ultra high frequency (UHF) connections within a large portion of R-2507 east of the Chocolate Mountains, particularly for low-altitude aircraft and vehicles on the ground. The current low-altitude coverage deficiency forces flight crews to execute maneuvers that are both costly and dangerous as they enter and leave the range area. Specifically, in order to establish communications with range management personnel prior to training runs, aircraft must climb vertically to approximately 3,000 feet (950 meters) above mean sea level (AMSL) and then descend back to their low-altitude flight profile. This maneuver wastes fuel and when executed at night while flying in low-level formation, constitutes a danger to all the aircraft in that formation (U.S. Navy 2003). Communications with ground vehicles within portions of the CMAGR also need improvement to ensure that there are continuous, redundant communication links with personnel working within this live bombing range. Other federal agencies and first responders that operate in eastern Riverside County (such as the BLM, U.S. Border Patrol, and Riverside County Sheriff Department) also might benefit from improved communications coverage in the area.

The overall goals of the proposed action's purpose have been divided into more specific objectives, listed below. The primary objective of the proposed action is to:

1. Provide communications coverage for aircraft (including low-altitude aircraft) and ground vehicles in those portions of R-2507 east of the Chocolate Mountains that have deficient communications coverage.

Secondary objectives of the proposed action's purpose and need include the following:

2. Meet Objective 1 with a communications tower site that can connect by line-of-sight to MCAS Yuma's existing network of microwave communications towers (thereby avoiding the costs and communication signal delays associated with satellite connections).
3. Meet Objective 1 with a communications tower site that is outside the CMAGR in order to provide unrestricted maintenance access to the communications equipment (sites within the CMAGR cannot safely be accessed when the range is in use, and the CMAGR is in use virtually all days except holidays and during target repair).
4. Meet Objective 1 utilizing a communications tower site with relatively flat existing topography in order to minimize necessary grading and other ground disturbances associated with communications equipment installation.
5. Provide sufficient equipment capacity at the communications tower site to accommodate the future installation of communications equipment by other federal agencies and/or first responders.

1.2 Project Location

The proposed communication facility is located on the southern slopes of the Chuckwalla Mountain Range. The site is accessed from Interstate 10 by exiting at Red Cloud Road, then traveling south and east along Bradshaw Trail to Augustine Pass Trail. The project area occurs within the U.S. Geological Survey (USGS) 7.5-minute topographical quadrangle map (topo map) for Augustine Pass, California (1987), within Township 8 South, Range 16 East, Section 12 and 13, northeast of the CMAGR, within eastern Riverside County (Figures 1, 2, and 3).

1.3 Project Description

The U. S. Marine Corps (USMC) proposes to construct a communications tower and install associated equipment with the capacity to meet the USMC's communications needs as described above. The tower, equipment, and site would be sized to accommodate the addition of other agencies' communications equipment and would include the following elements:

- Communications tower
- Backup generator
- Transceivers¹ and antenna (on tower)
- Shelter (shed) to house electronics equipment
- Solar power panels
- Perimeter security fencing with gate

The proposed components of the communications facility are described below, followed by the anticipated construction and maintenance requirements and the

¹ A transceiver combines a transmitter and a receiver

communications link that would connect the site to range management personnel at MCAS Yuma. The descriptions of proposed components are based on a study conducted by the Naval Surface Warfare Center – Corona Division titled *MCAS Yuma R-2507 Low Altitude Radio Communications Technical Report/Cost Proposal* (U.S. Navy 2003) and applicable naval planning requirements and federal regulations.

The two site access methods that would be accommodated by the proposed project are helicopter and ground. Helicopters accessing the site would use visual flight rules (VFR). A landing site would be established on the top of Spring Hill, but no instrument landing system would be installed. Ground access would require the repair of existing unpaved jeep trails, the creation of a new unpaved access road leading to the top of Spring Hill, and continuous maintenance of these roads. The proposed impacts from the communications facility and new road construction from the existing jeep trail would be 1.8 acres.

1.4 Existing Conditions

1.4.1 Geology, Topography, and Soils

The project area is within the Colorado Desert Geomorphic Province, between the Peninsular Range Province to the west, Colorado River to the east, Mexican border to the south, and transverse Range Province to the north. The Colorado Desert Province includes two distinct geologic regions, the Salton Trough and the more topographically variable Chocolate and Chuckwalla Mountains to the east. The project area lies within Chuckwalla Valley, alongside the southern facing slopes (Chuckwalla bench) of the Chuckwalla Mountain range.

The project area and adjacent areas are largely undeveloped, with existing improvements limited to unpaved roads, trails, and trail kiosks. The top of Spring Hill exhibits relatively level terrain and is surrounded by steep and rugged slopes. Surface elevations within the proposed project area range from approximately 2,750 feet (840 meters) AMSL at the tower site to 2,250 feet (690 meters) AMSL at the Augustine Pass Trail/Bradshaw Trail intersection.

According to the National Resource Conservation Service's (NRCS) Web Soil Survey, the survey area is listed as NOTCOM (mapping not complete). However, upon visual observation of the existing roads, proposed staging areas, laydown yard, facility access road, helicopter pad, and tower locations during the pedestrian survey, the areas are composed of desert pavement, talus slopes, alluvial slopes, and alluvial washes.

1.4.2 Climate

The climate within the Chuckwalla Valley and Mountain range is that of arid, upland desert typified by hot days, cool nights, low rainfall, and low humidity. Mean annual temperature ranges from 65°F to 75°F, with average winter lows at



K:\IRVINE\GIS\PROJECTS\AUGUSTINE_PASS\00430_09\MAPDOC_09\REPORT\FIG1_REGIONAL_VICINITY.MXD AWC: (06-03-09)

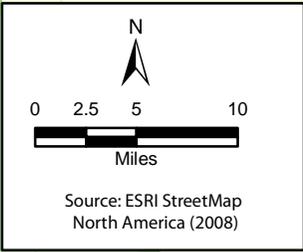


Figure 1

Regional Vicinity Map

**MCAS Yuma, Communications Tower at Spring Hill
Rare and Sensitive Plant Survey Final Report**

K:\IRVINE\GIS\PROJECTS\AUGUSTINE_PASS\00430_09\MAPDOC\REPORT\FIG1_REGIONAL_VICINITY.MXD AWC (06-03-09)

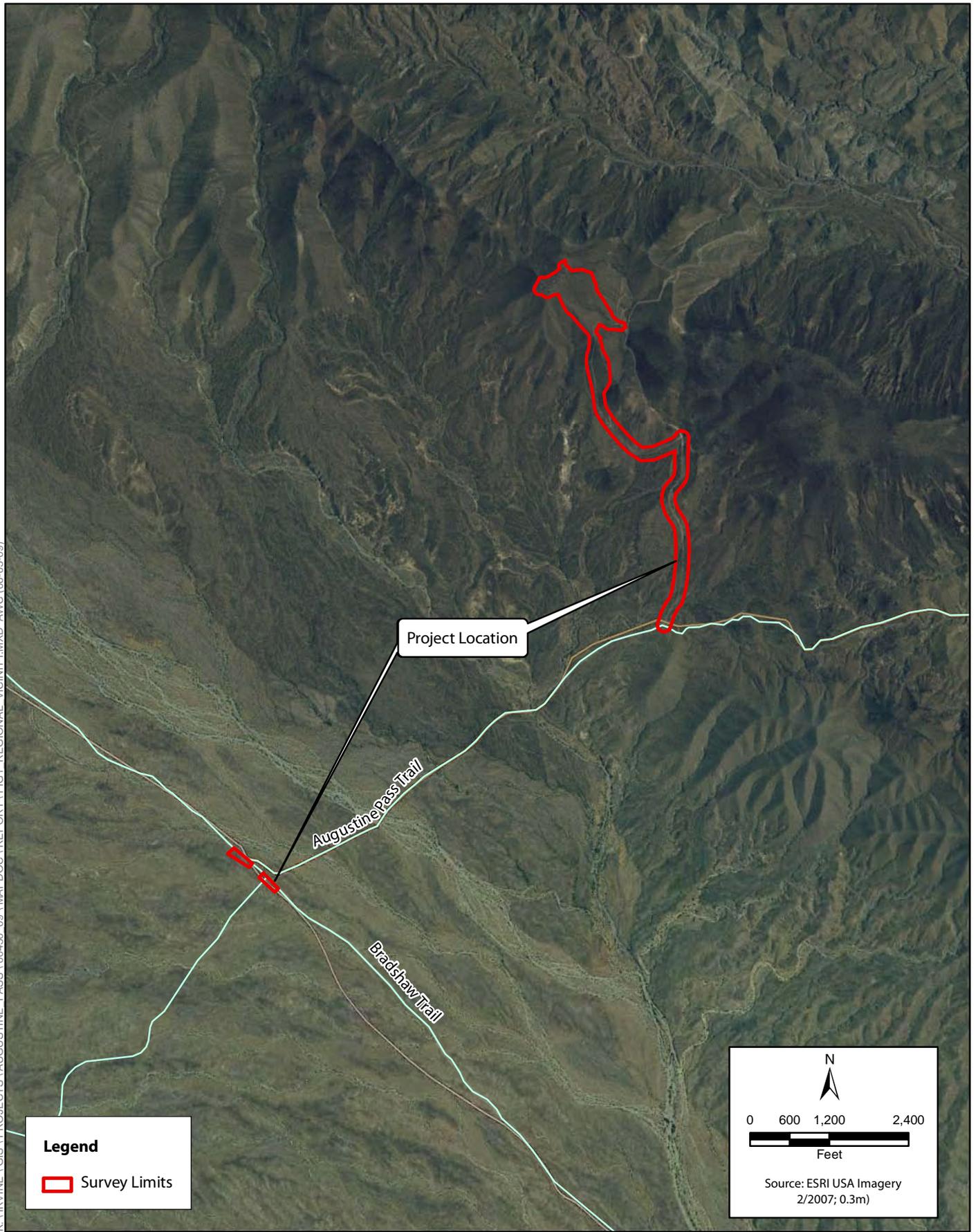


Figure 2
Aerial Local Vicinity Map
MCAS Yuma, Communications Tower at Spring Hill
Rare and Sensitive Plant Survey Final Report

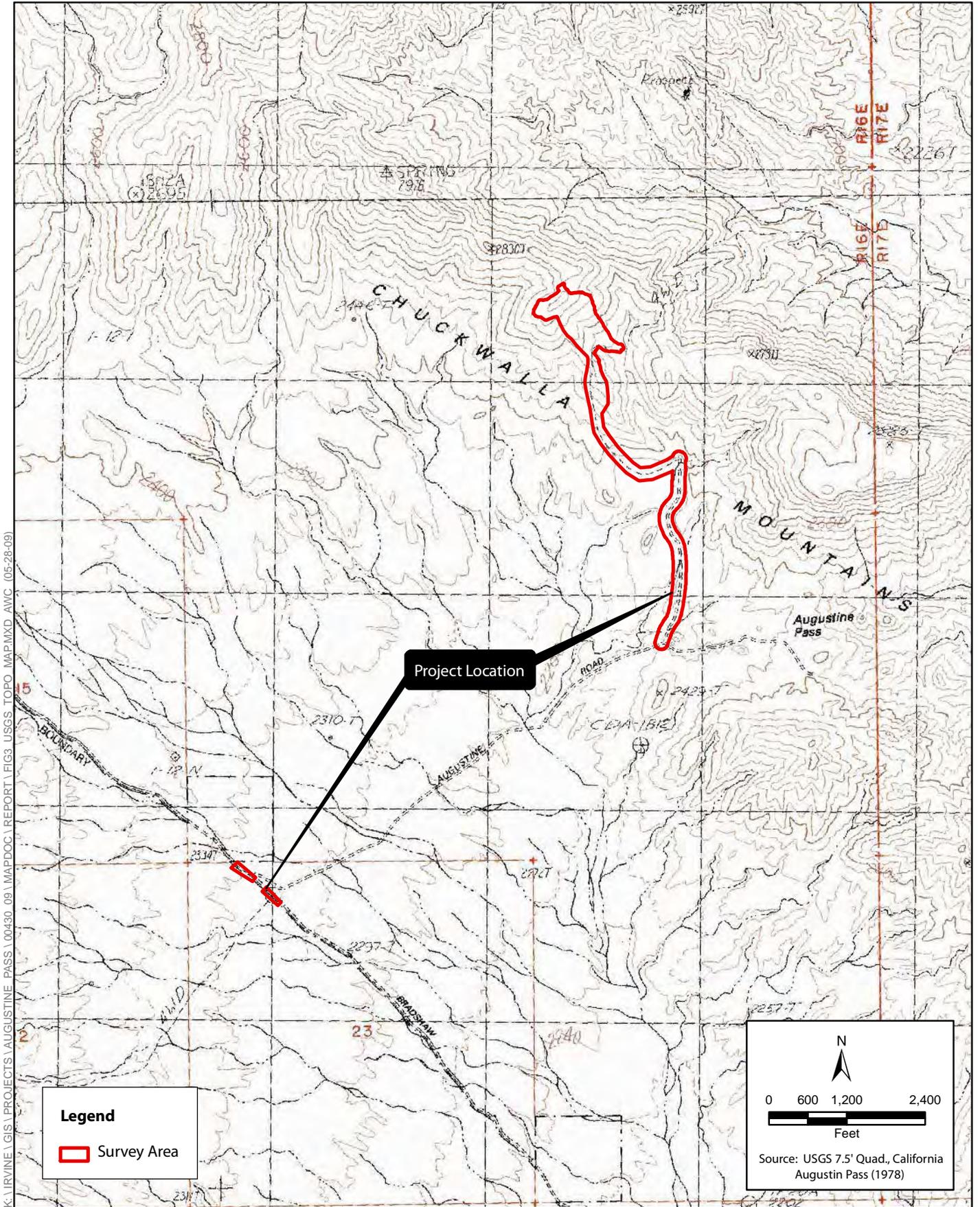


Figure 3
USGS Topographic Map
MCAS Yuma, Communications Tower at Spring Hill
Rare and Sensitive Plant Survey Final Report

67 °F and average summer highs at 102 °F. Average annual precipitation is approximately 2 to 3 inches, which is highly variable from year to year, especially during summers (Spellenberg 2003). Winter storms are typically gentle and last a few days. These are contrasted with summer monsoons, which occur between July and September and are typified by violent thunderstorms that can lead to heavy precipitation events over a short period. Although winters are generally mild, there are occasional winter frosts. The mean freeze-free period is from 275 to 325 days. Weather conditions for the survey dates are described in Section 3.0, “Results.”

2.0 Methodology

2.1 Literature Research

Navy Facilities, Southwest Region (NAVFAC Southwest) provided ICF Jones & Stokes with a compendium of target rare and sensitive plants that have a potential for occurrence within and near the proposed communication facility’s project area. Conjointly, a literature search encompassing the northwestern Sonoran Desert was conducted prior to the field surveys to determine the rare and sensitive plant species most likely to occur within the proposed project area. The California Natural Diversity Database (CNDDB 2009) and California Native Plants Society’s (CNPS) Rarefind on-line inventory (CNPS 2008) were accessed for all USGS 7.5-minute topographical quadrangle maps within and adjacent to the proposed study areas (Augustine Pass, Pilot Mountain, Aztec Mines, Chuckwalla Spring, Pegleg Well, Lion Head Mountain, Iris Wash, Iris Pass, and Red Cloud Canyon).

In total, 19 species were identified as having potential to occur within the project area. The 19 species include Angel Trumpet (*Asceisanthes longiflora*), Harwood’s Milkvetch (*Astragalus insularis* var. *harwoodii*), Coachella Valley Milkvetch (*Astragalus lentiginosus* var. *coachellae*), Fairy Duster (*Calliandra eriophylla*), Crucifixion Thorn (*Castela emoryi*), Las Animas Columbrina (*Colubrina californica*), Spiny Abrojo (*Condalia globosa* var. *pubescens*), Foxtail Cactus (*Coryphantha alversonii*), Glandular Ditaxis (*Ditaxis claryana*), California ditaxis (*Ditaxis serrata* var. *californica*), Crown-of-thorns (*Koeberlinia spinosa* ssp. *tenuispina*), Spearleaf (*Matelea parvifolia*), Munz’s Cholla (*Opuntia munzii*), Desert Unicorn Plant (*Proboscidea althaeifolia*), Orocopia Sage (*Salvia greatae*), Coues’ Cassia (*Senna covesii*), Mesquite Nest Straw (*Stylocline sonorensis*), Jackass Clover (*Wislizenia refracta* ssp. *palmeri*), and Mecca Aster (*Xylorhiza cognate*). For a complete description of these species and their habitat requirements, see Appendix A.

2.2 Survey Protocol

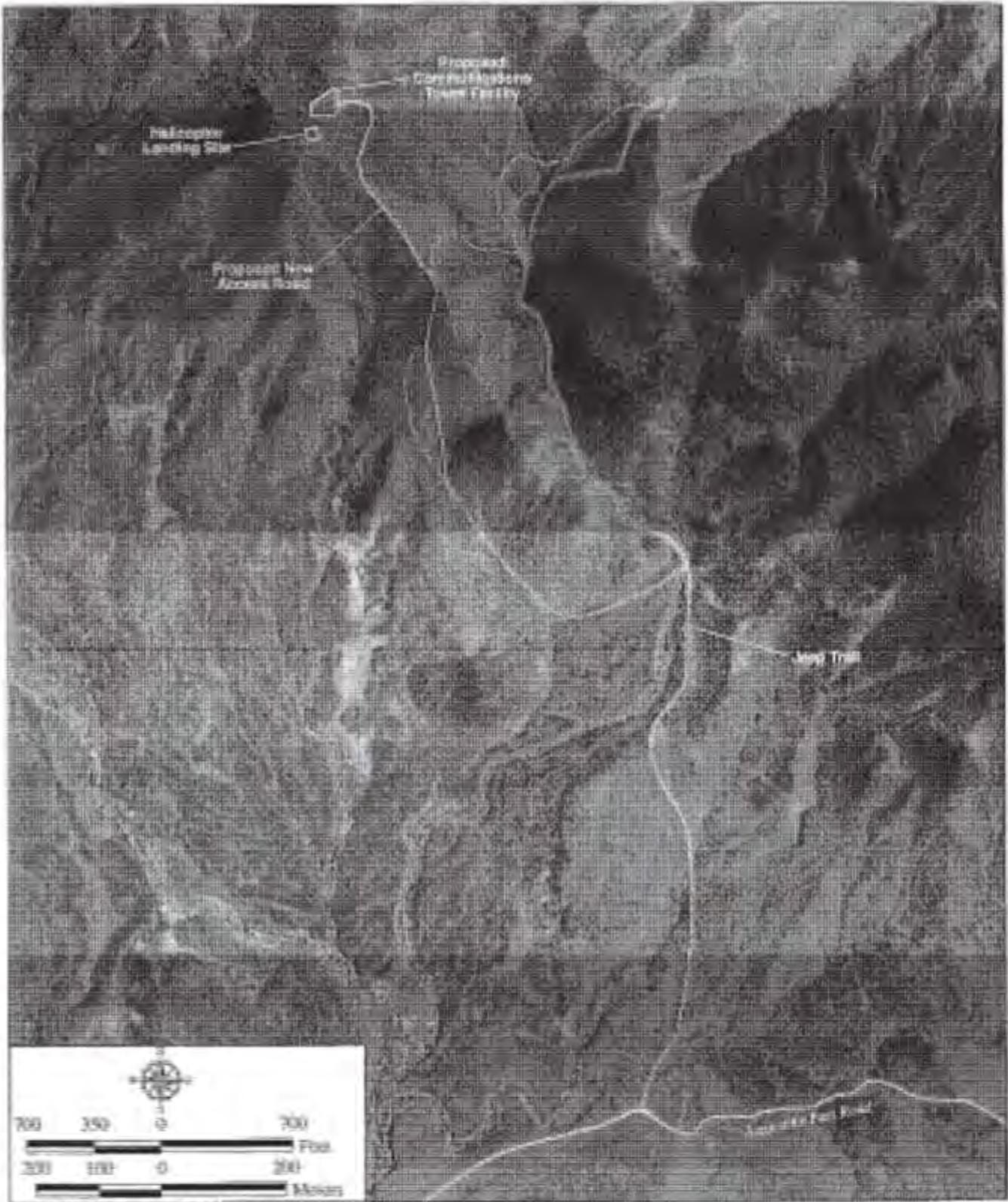
NAVFAC Southwest provided ICF Jones & Stokes with the proposed project area limit description and corresponding line drawing maps for the proposed road

improvements, staging area, laydown yards, construction, and facility installation (Figures 4 and 5). During this survey, ICF Jones & Stokes met with Tom Richmond (project manager) and Ben Fellows (project engineer) to review the proposed project footprint and the precise proposed layout of the proposed facility access road, tower, helicopter pads, and the laydown yard at the top of Spring Hill. The approximate centerline of the proposed facility access road was temporarily flagged by ICF Jones & Stokes for visual reference. A 50-foot survey buffer was established around the proposed road improvement footprint for disturbance activities associated with the project description. A larger buffer (greater than 50 feet) was established around the proposed facility access road, laydown yard, helicopter landing pad, and tower locations to ensure adequate area was covered in case of slight alterations to the proposed project alignment (see Figure 6a). In total, the survey area consisted of 46.47 acres (42.57 acres within the initial survey area and 3.90 acres that were added to the survey at a later date).

The rare and sensitive plant surveys were conducted using the CNPS survey guidelines for rare plants (CNPS 2001). The surveys were conducted using pedestrian transects within the proposed project footprint and buffer. The total survey area was covered, and spacing between transects was dependent upon the target species in the survey area and the amount of vegetative cover. As per the CNPS survey guidelines, the survey areas were mapped (Figures 6a and 6b), and plant lists were compiled (Appendix B, Plant Compendium; Appendix C, Field Notes). If found, rare plant populations would be recorded, verified, mapped, photographed, and collected.

Global positioning system (GPS) units were utilized by the survey crew to record potential target species individuals and populations, survey extents, and photographic point locations. The GPS units utilized during both surveys included a 2008 Series Trimble® Geo XH™ sub-foot accurate model, and one Garmin GPS Rino® 120 and one Garmin GPS Rino® 530HCx, both of which have an accuracy from 10–50 feet (3–15 meters). GPS data was differentially corrected to decrease receiver error, and then exported as shape files to a Geographic Information System (GIS) for map production. In addition, digital photography was utilized to document vegetation communities and features associated with the proposed project area (see Appendix D, Photo Log).

The three surveys were performed by ICF Jones & Stokes between May 11 and May 31, 2009 (Table 1). The survey area consisted of the proposed project area and the appropriate survey buffers.

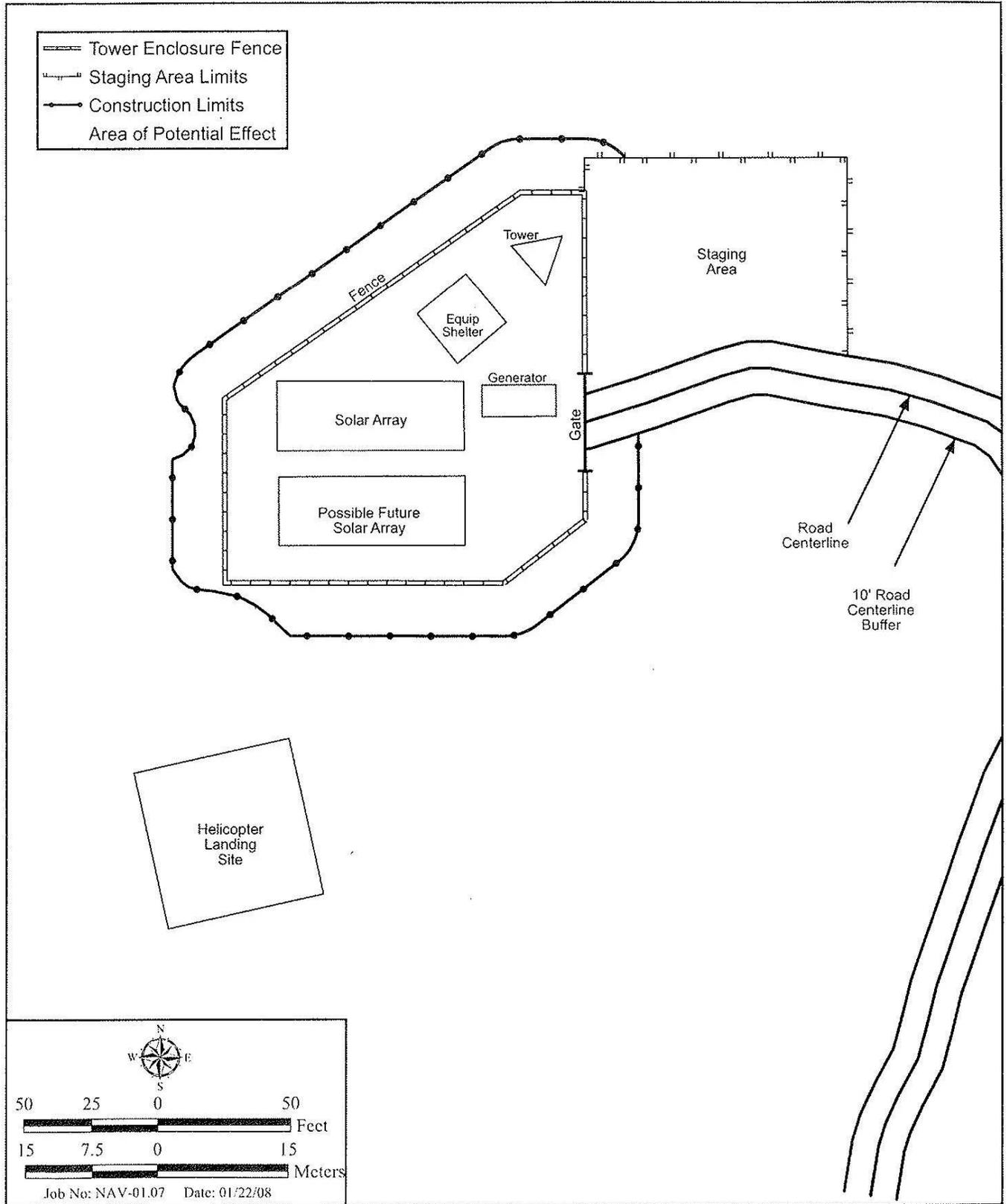


Communications Tower and Helicopter Pad Locations

MCAS YUMA COMMUNICATIONS TOWER

Figure 4

Figure provided by NAVFAC Southwest



F:\ArcGIS\NAV-01.07 Yuma\CommTower\Map ENV FA Fig4_APE.mxd 3/8

Proposed Site Layout/Area of Potential Effect

MCAS YUMA COMMUNICATIONS TOWER

Figure 5

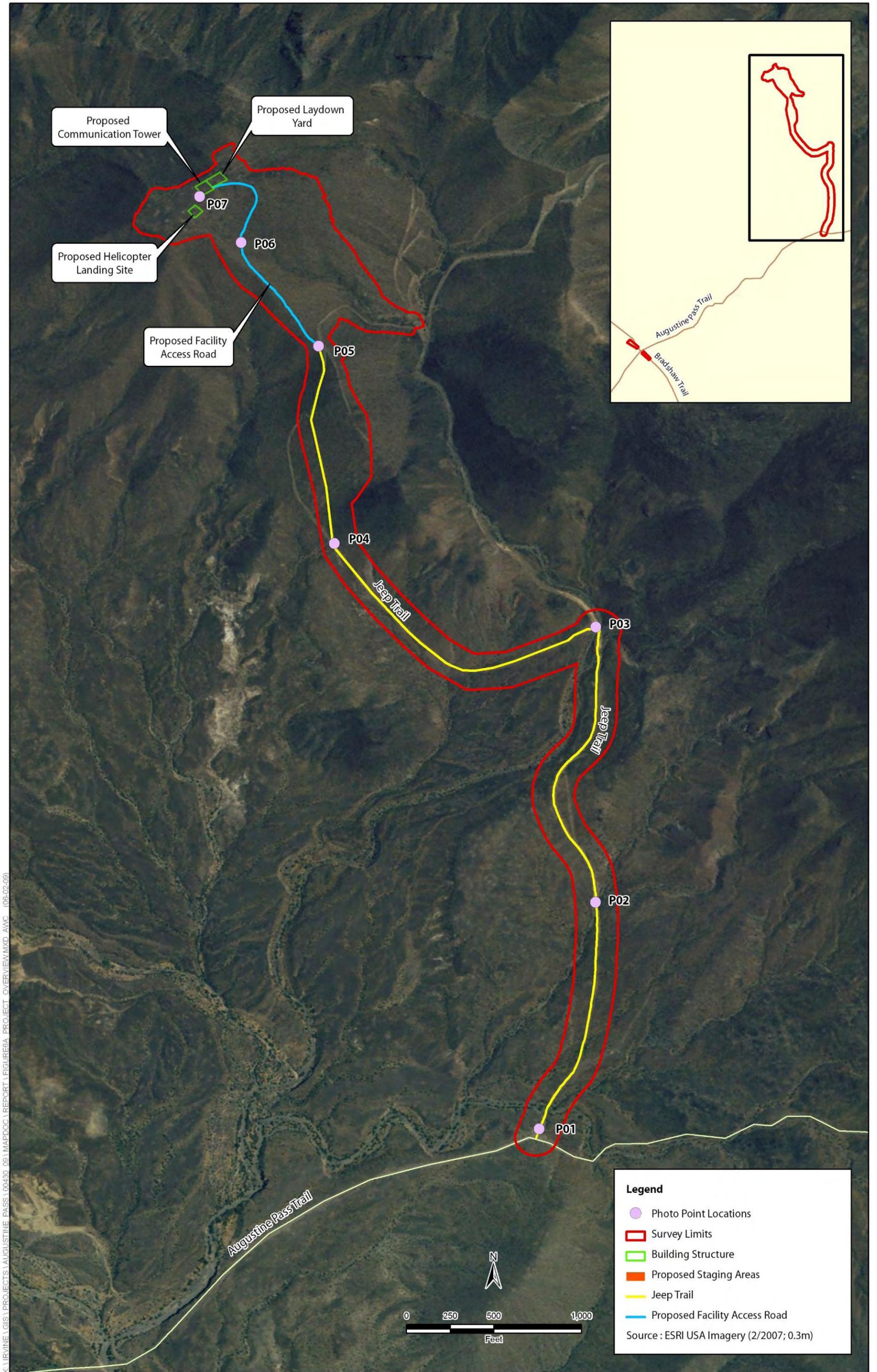


Figure 6a
Project Overview



Figure 6b
Project Overview
MCAS Yuma, Communications Tower at Springhill; Rare and Sensitive Plant Survey Draft Report

Table 1. Survey Dates, Locations, Acreages and Observed Target Species

Survey	Date	Locations surveyed	Acreages surveyed	Target Species Observed
1	May 11	Jeep trail, proposed facility access road, proposed laydown yard, communication and helicopter pad locations; plus buffers.	42.57	None
2	May 18	Jeep trail, proposed facility access road, proposed laydown yard, communication and helicopter pad locations; plus buffers.	42.57	None
3	May 31	Proposed staging area (Bradshaw Trail and Augustine Pass Trail).	3.90	None

3.0 Results

NAVFAC Southwest authorized two qualified ICF Jones & Stokes biologists to perform vegetation mapping and focused rare plant surveys of the survey area. The 42.57-acre project area was surveyed on May 11 and 18, 2009 (Figure 6a). A third survey was added for May 31, 2009, to survey the 3.90-acre proposed staging area at the intersection of Bradshaw Trail and Augustine Pass Trail (Figure 6b). Information presented includes location, acreages surveyed, and results pertaining to target species observed.

3.1 Plant Composition and Vegetation Communities

The dominant plant species throughout the project area, from the intersection at Augustine Pass Trail and the jeep trail to the proposed tower and helicopter pad location, include the following shrub and succulent species: Creosote (*Larrea tridentata*), Mojave Yucca (*Yucca schidigera*), Ocotillo (*Fouquieria splendens*), Burrobush (*Ambrosia dumosa*), Cheesebush (*Hymenoclea salsola*), Indigo Bush (*Psoralea shottii* and *P. arborescens* var. *arborescens*), Smoke Tree (*Psoralea spinosus*), Ratany (*Krameria erecta*, *K. grayii*), Brittlebush (*Encelia farinosa*, *E. frutescens* var. *frutescens*), Alkali Goldenbush (*Isocoma acradenia* var. *acradenia*), Jojoba (*Simmondsia chinensis*), Teddy-Bear Cactus (*Cylindropuntia bigelovii*), Branched Pencil Cholla (*Cylindropuntia ramosissima*), and Hedgehog Cactus (*Echinocereus engelmannii*). Within the three ephemeral waterway crossings along the jeep trail, additional shrub species include Catclaw (*Acacia greggii*), Desert Lavender (*Hyptis emoryii*), and Rush Milkweed (*Asclepias subulata*).

Shrub and succulent species within the staging areas south of the intersection of Bradshaw Trail and Augustine Pass Trail include Creosote (*Larrea tridentata*), Mojave Yucca (*Yucca schidigera*), Ocotillo (*Fouquieria splendens*), Burrobush

(*Ambrosia dumosa*), Ratany (*Krameria erecta*, *K. grayii*), Goldenbush (*Isocoma acradenia* var. *acradenia*), Jojoba (*Simmondsia chinensis*), Catclaw (*Acacia greggii*), Rush Milkweed (*Asclepias subulata*), Teddy-Bear Cactus (*Cylindropuntia bigelovii*), Branched Pencil Cholla (*Cylindropuntia ramosissima*), Hedgehog Cactus (*Echinocereus engelmannii*), Sweetbush (*Bebbie juncea*), and Cottontop (*Echinocactus polycephalus* var. *polycephalus*).

The more dominant annual and perennial herbaceous species observed throughout the project area include Wire-Lettuce (*Stephanomeria pauciflora* var. *pauciflora*), Wreathplant (*Stephanomeria exigua* var. *exigua*), Steve's Pincushion (*Chaenactis steviodes*), Forget-Me-Nots (*Cryptantha maritime*, *C. muricata*, *C. nevadensis*), Peppergrass (*Lepidium nitidum* var. *nitidum*), Ditaxis (*Ditaxis lanceolata*, *D. serrata*), Rattlesnake Spurge (*Chamaesyce albomarginata*), Phacelia (*Phacelia distans*, *P. fremontii*), Brown-Eyed Primrose (*Camissonia claviformis*), Plantain (*Plantago ovata*, *P. platigonia*), Spineflowers (*Chorizanthe brevicornu* var. *brevicornu*, *C. rigida*), Desert Buckwheats (*Eriogonum deflexum* var. *deflexum*, *E. mohavense*, *E. inflatum* var. *inflatum*, *E. inflatum* var. *deflatum*, *E. thomasii*), Mustard (*Brassica rapa*, *B. turnfortii*), and Arabian Schismus (*Schismus arabicus*).

Plant communities, as classified by Holland (1986), include Sonoran Creosote Bush Scrub, Sonoran Mixed Woody, and Succulent Scrub. According to the Sawyer and Keeler-Wolf (1995) classification, the plant community series that occupies the project area includes Creosote Bush-White Bursage, White Bursage, and Ocotillo. None of these communities are classified as sensitive by CNPS.

Also located within the project area at the tower and helicopter pad site and the staging area are areas of desert pavement and varnish. Disturbed areas are present at the staging area and along the jeep trail, most likely from recreational activities.

Appendix B lists a complete compendium of all plant species observed in the survey area. Appendix C includes survey field notes.

3.2 Focused Surveys

The May 11, 2009, survey was performed by Jonas Winbolt and Glen Kinoshita. The survey occurred from 6 a.m. to 12 p.m. Weather conditions were sunny and clear, wind speed from 0 to 5 mph, with an ambient temperature from 85° to 100°F.

The May 18, 2009, survey was conducted between 5:30 a.m. to 9:30 a.m. Weather conditions included an early monsoon event, with intermittent cumulonimbus thunderclouds with light precipitation, variable wind speed from 0 to 10 mph, with an ambient temperature from 85° to 95°F and relatively high humidity.

Jonas Winbolt of ICF Jones & Stokes was contacted by Jesse Martinez of NAVFAC Southwest to survey an additional staging area along the south side of Bradshaw Trail, at the intersection of Bradshaw Trail and Augustine Pass Trail. A third site visit was conducted to survey this additional area. The third survey occurred on May 31, 2009, between 7:30 a.m. and 11:15 a.m. Weather conditions were sunny and clear, wind speed from 3 to 7 mph, and an ambient temperature range from 87° to 98° F.

No target sensitive or rare plant species were observed within the survey area during any of the focused surveys. A compendium was compiled of all identifiable plant species (Appendix B).

4.0 References

- California Department of Fish and Game (CDFG). 2009. California Natural Diversity Database Rarefind 3.1.0. May. Accessed: May 2009.
- California Native Plant Society. 2001. CNPS Botanical Survey Guidelines. June 2. Available: http://www.cnps.org/cnps/rareplants/pdf/cnps_survey_guidelines.pdf. Accessed: June 2, 2009.
- California Native Plant Society. 2008. Rarefind Online Database. September. Accessed: May 2009.
- Holland, R. F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Unpublished report. California Department of Fish and Game: Sacramento, CA.
- Natural Resources Conservation Service. 2008. Web Soil Survey 2.0. Available: <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>. Accessed: November 2008.
- Sawyer, J. O. and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society: Sacramento, CA.
- Spellenburg, R. 2003. *Sonoran Desert Wildflowers*. The Globe Pequot Press: Helena, MT.
- U.S. Navy. 2003. *MCAS Yuma R 2507 Low Altitude Radio Communications Technical Report/Cost Proposal*. Naval Surface Warfare Center, Corona Division.

Appendix A
Special-Status Species Table

Appendix A

Special-Status Species Information

This appendix addresses all species with applicable special regulatory or management status whose general range includes the study area or whose habitat occurs within or near the study area and/or vicinity. Information provided includes: 1) definitions of terms to describe likelihood of occurrence, 2) a table of special-status codes and their meanings, and 3) a species information table listing the English and scientific names, current special-status, likelihood of occurrence, and specific notes relevant to likelihood of occurrence. Table A-1 provides explanations of codes used in the special-status field of Table A-2.

Conclusions provided in this report are limited to biology and do not address regulatory or management issues. For interpretation of this information under applicable laws, regulations, and court precedent, see the relevant portion of the Rare and Sensitive Plant Survey Report. Judgments regarding likelihood of occurrence are based on evaluation of available biological information regarding regional and local conditions, species biology, available evaluations of the study area and vicinity, and professional experience conducting field investigations across California over many years. Though professional, such judgments are necessarily subjective at least in part.

Specific factors substantially affect likelihood of occurrence for individual species on any particular study area. These factors are relevant at multiple scales, including regionally, locally, and within the study area. These factors include the presence or absence of other particular species (e.g., predators, prey), climate, ongoing disturbances, historical land use, and other past disturbances such as fire history, surface and subsurface hydrology, soil texture and chemistry, study area and habitat size and topology (i.e., shape and fragmentation), past population fluctuations of the species in response to random and nonrandom events, and many other factors, including many not readily visible. Note that some species, including some amphibians and many birds and bats, can occur in multiple roles. Thus, likelihood of occurrence, habitat use, and abundance may vary accordingly. Where multiple codes are given for a species, underlined codes refer to the likelihood of occurrence in potentially constraining roles (e.g., breeding, as opposed to migration or dispersal, for many state Species of Special Concern birds).

Finally, note that likelihood of occurrence for a given species refers to a time scale of a few years up to perhaps 10 years under current or assumed resources and conditions.

Terms for Likelihood of Occurrence in the Study Area

Confirmed Absent

If the likelihood of occurrence is *confirmed absent*, the species is confirmed to be absent on the study area as a formal and/or practical matter. Most often, this is a determination based on negative results of a focused survey for the species conducted in appropriate habitat at appropriate time(s) of year, using biologically sound methods and qualified personnel. In the remaining cases, it may be based on a simple study area examination, where it is easily determined that the species is absent because of the study area context. For example, a tidal marsh insect would not occur in a dry mountainside study area, or a disturbance-intolerant chaparral shrub would not occur in a long-standing, degraded grassland study area located far from chaparral. When a species is confirmed absent, the relevant fieldwork in all cases was conducted within a time frame sufficiently recent to conclude that the species remains absent, based on study area conditions and the species' known ecology. In most cases a specific, established survey protocol and/or guidelines have been followed.

Less than Reasonable

If the likelihood of occurrence is *less than reasonable*, the likelihood of occurrence, although remotely possible, is less than that required for any potentially applicable regulatory threshold. Further, the likelihood that the site is meaningfully valuable to any population(s) of this taxon is less than reasonable. The species may or may not include the study area within its current, general range. However, no appropriate, or adequately extensive, or effectively connected habitat is present. Neither the species nor any indication of its presence was detected. In some cases, based on the best available information, this likelihood may indicate that the study area has a very high probability of being outside of the species' current range. In all of the above cases, the species may not be definitively ruled out but is strongly believed to be absent based on professional evaluation of all available evidence. In some cases, the species may occur on rare occasions and in low numbers, but with no more than brief, incidental use of the study area; that is, the site is also judged to lack any important function for the species. Certainly, there are no substantial populations directly utilizing the study area at any time of year. Further evaluation should not normally be required.

Low

If the likelihood of occurrence is *low*, occurrence of the species is reasonable but unlikely because of some combination of facts. For example, 1) the study area was the subject of unsuccessful searches conducted under relevant and reasonable circumstances, 2) potential habitat present is marginal or minimal in extent, 3) the best available information suggests the species is absent from the study area, and/or 4) available information sheds no clear light on the species likelihood on the study area, but it is known to be rare at best in the vicinity. Neither the species nor any indication of its presence was detected. Although individuals may have been missed, it is unlikely that substantial populations are present. Further evaluation should usually not be required for individual species except, in most cases, for biologically threatened or endangered species. Note, however, that where several non-listed species hold this status, a higher likelihood of occurrence for “one or more” will generally hold. This is due both to the increased number of species and the fact that an array of possibilities often correlates with greater site biodiversity and lower relevant (but not readily detected) disturbance levels.

Moderate

If the likelihood of occurrence is *moderate*, the study area is within the range of the species, and contains potentially appropriate habitat. Neither individuals nor diagnostic sign were detected. It is nevertheless reasonable that some individuals may have been overlooked. The best available information on the species with regard to the study area is either very uncertain, or may be equally weighted for and against occurrence. Depending upon local and special legal status, extent of habitat, and the nature and sensitivity of the project, focused surveys for the species may be warranted or presence may be assumed.

High

If the likelihood of occurrence is *high*, the study area is known to be within the range of the species, and contains potential habitat with a high likelihood of occupancy. Although no individuals or diagnostic sign were detected during current fieldwork by a qualified observer, the species is likely to be present to some degree given the best available information. Depending upon regulatory status, local rarity, public interest, extent of habitat on the study area, and the nature of potential project impacts, a substantial basis may exist for either conducting focused surveys for the species or for assuming presence.

Confirmed Present

If the likelihood of occurrence is *confirmed present*, a qualified biologist or other reliable source has confirmed the presence of the species and there is no specific evidence that the species has subsequently become absent. Depending on the species and other information available, it may or may not be possible to determine, without further studies, what portions of the study area are currently in use.

Table A-1. Status Code Explanations

Status code	Explanation
Federal Codes	
FE	Federally endangered
FT	Federally threatened
FPE	Federally proposed endangered
FPT	Federally proposed threatened
G1	Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals OR less than 2,000 acres
G2	6–20 EOs OR 1,000–3,000 individuals OR 2,000–10,000 acres
G3	21–100 EOs OR 3,000–10,000 individuals OR 10,000–50,000 acres.
G4	Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat
G5	Population or stand demonstrably secure to ineradicable due to being commonly found in the world.
Subspecies Level	Subspecies receive a T-rank attached to the G-rank; with the subspecies, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the <u>subspecies</u> or <u>variety</u>
GH	All sites are historical; the element has not been seen for at least 20 years, but suitable habitat still exists (SH = All California sites are historical)
GX	All sites are extirpated ; this element is extinct in the wild (SX = All California sites are extirpated)
GXC	Extinct in the wild; exists in cultivation
G1Q	The element is very rare, but there is taxonomic question associated with
State Codes	
SE	State endangered
ST	State threatened
SR	State rare (used for plants only)
SCE	State candidate for endangered listing
SCT	State candidate for threatened listing
SSC	State species of special concern
CFP	California fully protected species
CSP	California specially protected species
CNDDDB	Tracked by the California Department of Fish and Game Natural Diversity Database, but with no other special regulatory or management status
S1	Less than 6 EOs OR less than 1,000 individuals OR less than 2,000 acres
S2	6–20 EOs OR 1,000–3,000 individuals OR 2,000–10,000 acres
S3	21–100 EOs or 3,000–10,000 individuals OR 10,000–50,000 acres
S4	Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat. NO THREAT RANK.

Status code	Explanation
S5	Demonstrably secure to ineradicable in California. NO THREAT RANK.
California Native Plant Society (CNPS)	
1A	CNPS List 1A plant ("Plants presumed extinct in California")
1B	CNPS List 1B plant ("Plants rare, threatened or endangered in California and elsewhere")
2	CNPS List 2 plant ("Plants rare, threatened or endangered in California, but more common elsewhere")
3	CNPS List 3 plant ("Plants that comprise List 3 are united by one common theme--we lack the necessary information to assign them to one of the other lists or to reject them. Nearly all of the plants remaining on List 3 are taxonomically problematic.")
4	CNPS List 4 plant ("Plants in this category are of limited distribution or infrequent throughout a broader area in California, and their vulnerability or susceptibility to threat appears low at this time. While we cannot call these plants "rare" from a statewide perspective, they are uncommon enough that their status should be monitored regularly. Should the degree of endangerment or rarity of a List 4 plant change, we will transfer it to a more appropriate list or deleted from consideration.")
.1	Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2	Fairly endangered in California (20-80% occurrences threatened)
.3	Not very endangered in California (<20% of occurrences threatened or no current threats known)
P	"pt" or "pd": the taxon has been formally proposed to be down-listed, either from endangered to threatened ("pt"), or delisted completely ("pd")
N/A	Not applicable

Table A-2. Special-Status Species Information for Study Area

Species/Natural Communities	Special Status ¹	Habitat Use	Likelihood of Occurrence	Rationale
PLANTS				
Angel Trumpet (<i>Acleisanthes longiflora</i>)	G5 S1.3 2.3	Perennial herb that occurs in dry places, generally on limestone within Sonoran desert scrub. Elevation range is between 10 and 2,500 m. Blooming period is in June.	Less than Reasonable	No carbonate outcrops were noted in the area. Survey occurred outside of blooming period. Visual coverage of the survey area yielded no individuals observed.
Harwood's Milkvetch (<i>Astragalus insularis</i> var. <i>harwoodii</i>)	G5T3 S2.2? 2.2	Annual herb that occurs within sandy or gravelly areas. Elevation range is between 0 and 600 m. Blooming period is between February and May.	Less than Reasonable	No sandy soils were present within and adjacent to the project site. However, suitable gravelly area present within the survey area; limited to the three ephemeral washes along the jeep trail. Project area is outside of the elevation range requirements for the species. Visual coverage of the survey area, specifically within the ephemeral washes yielded no individuals observed.
Coachella Valley Milkvetch (<i>Astragalus lentiginosus</i> var. <i>coachellae</i>)	G5T2 S2.1 1B.2	Annual herb that occurs within sand, wind-swept dunes in Sonoran desert scrub. Elevation range is between 150 and 600 m. Blooming period is between February and May.	Confirmed Absent	No sand or dune habitats are located within and adjacent to the survey area. Project area is outside of the elevation range requirements for the species. Visual coverage of the survey area yielded no individuals observed.

Table A-2. Continued

Species/Natural Communities	Special Status¹	Habitat Use	Likelihood of Occurrence	Rationale
Fairy Duster (<i>Calliandra eriophylla</i>)	G5 S2.3 2.3	Shrub that occurs in sandy washes, slopes, and mesas within Sonoran desert scrub. Elevation range is between 120 and 1,500 m. Blooming period is from January and March.	Confirmed Absent	No sandy washes, slopes, or mesas are present within or adjacent to the survey area. Surveys were outside of blooming period for this species; however, this shrub would have been easily identifiable even when not blooming. Visual coverage of the survey area yielded no individuals observed.
Crucifixion Thorn (<i>Castela emoryi</i>)	G3 S2.2 2.3	Shrub that occurs within dry, gravelly washes and slopes within Sonoran desert scrub. Elevation range is between 90 and 670 m. Blooming period is between April and July.	Confirmed Absent	Dry, gravelly washes and slopes are present within and adjacent to the survey area. However, this shrub would have been easily identifiable even when not blooming. Visual coverage of the survey area yielded no individuals observed.
Las Animas Columbrina (<i>Colubrina californica</i>)	G4 S2S3.3 2.3	Shrub that occurs in Creosote bush scrub. Located within elevations less than 1,000 m. Blooming period is between April and June.	Confirmed Absent	Creosote bush scrub is located within and adjacent to the survey area. However, this shrub would have been easily identifiable even when not blooming. Visual coverage of the survey area yielded no individuals observed.
Spiny abrojo (<i>Condalia globosa</i> var. <i>pubescens</i>)	G5T3T4 S3.2 4.2	Shrub that occurs along washes and dry sandy plains within the Sonoran desert scrub. Elevation range is between 140 and 1,000 m. Blooming period is between March and May.	Confirmed Absent	No sandy plains are present within and adjacent to the survey area. This shrub would have been easily identifiable even when not blooming. Visual coverage of the survey area yielded no individuals observed.

Table A-2. Continued

Species/Natural Communities	Special Status¹	Habitat Use	Likelihood of Occurrence	Rationale
Foxtail Cactus (<i>Coryphantha alversonii</i>)	G3 S3.2 4.3	Perennial herb (stem succulent) that occurs within rocky areas (usually granitic) in Sonoran desert scrub. Elevation range is between 75 and 1,525 m. Blooming period is between April and June.	Confirmed Absent	Rocky, granitic soils were present within and adjacent to the survey area. However, if present would have been easily identifiable during the field surveys, Visual coverage of the survey area yielded no individuals observed.
Glandular Ditaxis (<i>Ditaxis claryana</i>)	G4G5 S1S2 2.2	Perennial herb that occurs within sandy soils within Creosote bush scrub. Located in elevations less than 100 m. Blooming period is between October and March.	Less than Reasonable	No sandy soils are present within or adjacent to the survey area. However, the project site lies within the Creosote brush scrub. Project area is outside of the elevation range requirements for the species. Visual coverage of the survey area yielded no individuals observed.
California Ditaxis (<i>Ditaxis serrate</i> var. <i>californica</i>)	G5T2T3 S2.2 3.2	Perennial herb that occurs in sandy or rocky soils within Creosote bush scrub. Located in elevations less than 200 m. Blooming period is between March and December.	Less than Reasonable	Project area lies within the Creosote bush scrub plant community, but is outside of the elevation range requirements for the species. Visual coverage of the survey area yielded no individuals observed.
Crown-of-thorns (<i>Koelerlinia spinosa</i> ssp. <i>tenuispina</i>)	G4T4 S2.2 2.2	Shrub that occurs in Sonoran creosote desert scrub. Elevation range is between 150 through 510 m. Blooming period is from May through July.	Confirmed Absent	Suitable habitat is present onsite; however, the project area is outside of the elevation range requirements for the species. This shrub would have been identifiable if it was present within the survey area. Visual coverage of the survey area yielded no individuals observed.
Spearleaf (<i>Matelea parvifolia</i>)	G5? S2.2 2.3	Perennial herb that occurs in dry and rocky areas. Elevation range is between 700 and 1,000 m. Blooming period is from March through May.	Less than Reasonable	Suitable dry and rocky habitat occurs onsite. However, visual coverage of the survey area yielded no individuals observed.

Table A-2. Continued

Species/Natural Communities	Special Status¹	Habitat Use	Likelihood of Occurrence	Rationale
Munz's Cholla (<i>Opuntia munzii</i>)	G1 S1.2 1B.3	Perennial herb (stem succulent) that occurs within gravelly or sandy soils located in washes and canyon walls. Noted to occur in Sonoran desert scrub. Elevation range is between 150 and 600 m. Blooming period is May.	Confirmed Absent	Project area is outside of the elevation range requirements for the species. This perennial herb would have been identifiable if it was present within the survey area. Visual coverage of the survey area yielded no individuals observed.
Desert Unicorn Plant (<i>Proboscidea althaeifolia</i>)	G5 S3.3 4.3	Perennial herb that occurs in sandy places. Located within elevations less than 1,000 m. Blooming period is from May through August.	Less than Reasonable	Project area lacks soil requirements for this species. No sandy environments encompassing desert plains or washes are within or adjacent to the project area. If the species is present within or adjacent to the project area, the lack of precipitation has not germinated existing populations. Visual coverage of the survey area yielded no individuals observed.
Orocopia Sage (<i>Salvia greatae</i>)	G2 S2.2 1B.3	Shrub that occurs on alluvial slopes. Elevation range is between 30 and 825 m within the Sonoran desert scrub plant community. Blooming period is March and April.	Confirmed Absent	Survey dates were outside the blooming period for the shrub; however, this shrub would have been easily identifiable even when not blooming. Visual coverage of the survey area yielded no individuals observed.
Coues' Cassia (<i>Senna covesii</i>)	G5? S2.2 2.2	Perennial herb that occurs in dry, sandy desert washes, and slopes within the Sonoran desert scrub plant community. Elevation range is between 500 and 600 m. Blooming period is from March through June.	Less than Reasonable	No sandy washes or slopes are present within and adjacent to the survey area. Project area is outside of the elevation range requirements for the species. Visual coverage of the survey area yielded no individuals observed.

Table A-2. Continued

Species/Natural Communities	Special Status¹	Habitat Use	Likelihood of Occurrence	Rationale
Mesquite Nest Straw (<i>Stylocline sonorensis</i>)	G3G5 SX 1A	Annual herb that occurs in open, sandy drainages and arroyos. Elevation for occurrence is approximately 400 m. Blooming period is April.	Less than Reasonable	Open, sandy drainages and arroyos are not present within or adjacent to the survey area. Project area is outside of the elevation range requirements. Additionally, the survey was completed outside of the blooming period. Visual coverage of the survey area yielded no individuals observed.
Jackass Clover (<i>Wislizenia refracta</i> ssp. <i>palmeri</i>)	G5T5? S1.2? 2.2	Annual herb that occurs within sandy washes, beach dunes, alkali lake margins and desert scrubs. Elevation range is between 0 and 200 m. Blooming period is from April through November.	Confirmed Absent	No sandy washes or dunes, alkali lake margins were present within and adjacent to survey area. Project area is outside of the elevation range requirements for the species. Visual coverage of the survey area yielded no individuals observed.
Mecca Aster (<i>Xylorhiza cognate</i>)	G2 S2.2 1B.2	Perennial herb that occurs in arid canyons. Elevation range is between 20 and 240 m. Blooming period is from January through June.	Less than Reasonable	Project area is outside of the elevation range requirements for the species. This perennial herb would have been identifiable if it was present within the survey area. Visual coverage of the survey area yielded no individuals observed.

Appendix B
Plant Compendium

KINGDOM PLANTAE - PLANTS

PHYLUM ANTHOPHYTA - ANGIOSPERMS

CLASS MAGNOLIOPSIDA - DICOTYLEDONS

Asclepiadaceae - Milkweed Family

Asclepias subulata
Rush Milkweed

Asteraceae - Sunflower Family

Ambrosia dumosa
Bur Sage
Bebbia juncea var. *aspera*
Sweetbush
Chaenactis stevioides
Steve's Pincushion
Encelia farinosa
Brittlebush
Encelia frutescens var. *frutescens*
Button brittlebush
Isocoma acradenia var. *acradenia*
Alkali Goldenbush
Stephanomeria exigua var. *exigua*
Small Wreathplant
Stephanomeria pauciflora var. *pauciflora*
Wire-Lettuce

Boraginaceae - Borage Family

Amsinckia tessellata
Devil's Lettuce
Cryptantha sp.
Forget-me-not
Cryptantha maritima
Guadalupe Cryptantha
Cryptantha muricata
Prickly Cryptantha
Cryptantha nevadensis
Nevada Forget-me-not

Brassicaceae - Mustard Family

Brassica rapa
Field Mustard
Lepidium nitidum var. *nitidum*
Shining Peppergrass

Cactaceae - Cactus Family

Cylindropuntia bigelovii
Teddy Bear Cactus
Cylindropuntia echinocarpa
Wiggin's Cholla
Cylindropuntia ramosissima
Branched Pencil Cholla
Echinocereus engelmannii
Hedgehog Cactus
Echinocactus polycephalus var. *polycephalus*
Cotton-Top Cactus
Mammillaria grahamii var. *grahamii*
Fish-hook Cactus

Euphorbiaceae - Spurge Family

Chamaesyce albomarginata
Rattlesnake Spurge
Ditaxis lanceolata
Desert Silverbush
Ditaxis serrata
Saw-toothed Ditaxis

Fabaceae - Pea Family

Acacia greggii
Catclaw Acacia
Dalea mollissima
Soft Prairie Clover
Psoralethamnus arborescens var. *arborescens*
Mojave Indigo-Bush
Psoralethamnus schottii
California Indigo-bush
Psoralethamnus spinosus
Smoketree

Fouquieriaceae - Ocotillo Family

Fouquieria splendens
Ocotillo, coachwhip

Hydrophyllaceae - Waterleaf Family

Phacelia distans
Common Phacelia
Phacelia fremontii
Fremont's Phacelia

Lamiaceae - Mint Family

Hyptis emoryii
Desert Lavender
Salvia columbariae
Chia

Krameriaceae - Ratany Family

Krameria erecta
Pima Ratany
Krameria grayii
White Ratany

Loasaceae - Stick-leaf Family

Mentzelia affinis
Yellow Blazing Star
Mentzelia involucrata
Slender Stick-leaf

Malvaceae - Mallow Family

Malva parviflora
Cheeseweed
Sphaeralcea ambigua var. *rugosa*
Thick-leaf Desert Mallow

Onagraceae - Evening-primrose Family

Camissonia claviformis
Brown Eyed Primrose

Plantaginaceae - Plantain Family

Plantago ovata
Desert Plantain
Plantago patagonia
Patagonia Plantain

Polemoniaceae – Phlox Family

Loeseliastrum shottii
Schott's calico

Polygonaceae - Buckwheat Family

Chorizanthe brevicornu var. *brevicornu*
Brittle Spine-flower
Chorizanthe rigida
Rigid Spine-flower
Eriogonum deflexum var. *deflexum*
Flat-topped Buckwheat
Eriogonum mohavense
Western Mojave Buckwheat
Eriogonum inflatum var. *deflatum*
Deflated Desert Buckwheat
Eriogonum inflatum var. *inflatum*
Inflated Desert Buckwheat
Eriogonum thomasii
Thomas Buckwheat

Simmondsiaceae - Jojoba Family

Simmondsia chinensis
Jojoba

Zygophyllaceae - Caltrop Family

Larrea tridentata
Creosote Bush
Fagonia laevis
California Fagonia

**CLASS LILIOPSIDA -
MONOCOTYLEDONS**

Liliaceae - Lily Family

Yucca schidigera
Mojave Yucca

Poaceae - Grass Family

Pleuraphis rigida
Galeta Grass
Schismus arabicus
Arabian Schismus
Vulpia myuros
Rat-tail Fescue

PHYLUM GNETOPHYTA - GNETALES

CLASS GNETOPSIDA - GYMNOSPERMS

Ephedraceae - Ephedra Family

Ephedra sp.
Ephedra

Appendix C
Field Notes

5/11/09 MCAS Yuma Lower site
 @ Spring Hill

w/ J Winbelt
 - east of Indio
 - examine const. pond of pet. road exp.

Fog spl Aug 123
 Lar tri Evi tho golden drake cottontop
 Amb dmn Cho wip Kraeger Malva sp Fagaria
 Cam cla sketch mentech Cuyunr laeri
 Cho v ig Evi tho hedgerow 123
 Gch ara Evi tho Engelm 123
 teddy bear (Horn?) Phatve havelcoats golden drake
 Cha ste Phatve 123
 Yuc sch Vulpia sp Evi intinf Cuyunr 3
 Lep nit Dilant sp Kraeger 123

very weak record
 Hummingbird, juncos, turkey vulture, striped green
 - terrain lava field, heavily eroded road
 creosote bushes scrub
 - lit for existing road, jug trail, pad
 pad
 new road
 ext road - 3
 jeep trail

map = pre-tail
 - *Dilaxis serrata*
 (var *Californica*)

GLENN KINOSHITA

Syntherisma ambigua var. n
Kraegeria excelsa
Eriogonum detleauxii var. *barbatum*
G. mandata chisensis
Ipomoea cradenii var. *bractea*

15 → RB exit (RT)
 Camino San Bernardino (LA)
 45 ranch plw (U-turn)
 Lone Hawk (RT)
 Lone Dove (LT)
 road on vt 10215

5/19/09 Yuma
 Lar tri Evi tho Camino towards W/TM
 Appemo silver choker Ditcher wash milkweed *Syphedon* sp
 Amb dmn Kraegeria sp Procr. sp. *Jeop* trail
 Ste Jean sp Austes Coy mar Mad tan
 Evi tho Schava Cam cla desert washed
 Fog spl Phatve hedge cec
 Beb jun Lep nit

gloves

Tojoba Evi intdet Lar tri Fog spl
 Phatve Phatve sp golden drake hedge cec
 Cha sp Fag lae teddy bear Eriogon
 teddy bear drake Cyl ram Cha ste Phatve
 cottontop Men att Kraeger Cho bre
 Yuc sch God col Evi tho Kraeger
 Iso aer Cha ste Austes Fog lae

Cam cla Tojoba Phatve Cam cla
 Ditcher Amb dmn Lep nit Men att
 Coy mar Hypemo Beb jun ground diary
 Schava Kraeger Evi tho *Mammillaria*
 Aca gre Evi intdet Phatve Austes
 Cha alb + bagged sample Dal met

- dandy, muggy
 229 925 mi total 4-1 pm

Appendix D

Photographic Record Log



Photograph: 1

Location: Photo Point Location #1
(Augustine Pass Trail and jeep trail intersection)

Direction: Facing west

Comment:
Augustine Pass Trail and jeep trail split at marker.



Photograph: 2

Location: Photo Point Location #1
(Augustine Pass Trail and jeep trail intersection)

Direction: Facing north

Comment:
Ephemeral Waterway #1 at dip in roadway.
(Red arrow depicts proposed tower and helicopter pad site).

1



Photograph: 3

Location: Photo Point Location #2
(Jeep trail split at ephemeral waterway)

Direction: Facing south

Comment:
Ephemeral Waterway #2.

Photograph: 4

Location: Photo Point Location #2
(jeep trail split at ephemeral waterway)

Direction: Facing north

Comment:
Ephemeral Waterway #2.





Photograph: 5

Location: Photo Point Location #2
(Jeep trail split at ephemeral waterway)

Direction: Facing east southeast

Comment: Ephemeral Waterway #3, crossing. Channel incising and scour visible (*red arrow*) due to heavy intermittent storm flows.



Photograph: 6

Location: Photo Point Location #2
(jeep trail split at ephemeral waterway)

Direction: Facing west southwest

Comment: Minimal incising and scouring on southwest side of Ephemeral Wash #3 crossing.



Photograph: 7

Location: Photo Point Location #3
(jeep trail)

Direction: Facing south southeast

Comment: View of Augustine Pass valley.



Photograph: 8

Location: Photo Point Location #3
(jeep trail)

Direction: Facing north northwest

Comment: Split in jeep trail. Proposed facility access road is to the right (*red arrow depicts road centerline*).



Photograph: 9

Location: Photo Point Location #4
(jeep trail/new road split)

Direction: Facing south

Comment:
Existing jeep trail.



Photograph: 10

Location: Photo Point Location #4
(jeep trail/access road split)

Direction: Facing northwest

Comment:
Proposed facility access roadway (red line depicts approximate road centerline location) will follow ridgeline and side-slope toward hilltop.



Photograph: 11

Location: Photo Point Location #6
(proposed facility access road)

Direction: Facing south, southwest

Comment:
Proposed facility access road down side-slope (*red line depicts approximate centerline of proposed access road*). The existing jeep trail/access road split is visible in the background (*red arrow*).



Photograph: 12

Location: Photo Point Location #6
(proposed facility access road)

Direction: Facing north northeast

Comment:
Facility access road leading to top of hill along the side slope. (*Red line depicts approximate centerline of proposed access road*).



Photograph: 13

Location: Photo Point Location #7
(proposed communication facility)

Direction: Facing southeast

Comment:
Vantage point encompassing the proposed tower facility and helicopter landing pad.



Photograph: 14

Location: Photo Point Location #7
(proposed communication facility)

Direction: Facing northwest

Comment:
Vantage point encompassing the proposed tower facility and staging area.



Photograph: 15

Location: Photo Point Location #8 (proposed southeastern staging area).

Direction: Facing northwest

Comment: Bradshaw Trail to the right of the photo. Visual evidence of disturbance in staging area limits.



Photograph: 16

Location: Photo Point Location #9 (proposed southeastern staging area).

Direction: Facing southeast

Comment: Bradshaw Trail to the left of the photo. Visual evidence of disturbance in staging area limits.



Photograph: 17

Location: Photo Point Location #10 (proposed northwestern staging area).

Direction: Facing northwest

Comment: Bradshaw Trail to the right of the photo. Visual evidence of disturbance in staging area limits.



Photograph: 18

Location: Photo Point Location #11 (proposed northwestern staging area).

Direction: Facing southeast

Comment: Bradshaw Trail to the left of the photo. Visual evidence of disturbance in staging area limits.



Photograph: 19

Location:
Bradshaw Trail

Direction: Facing north.

Comment:
Chuckwalla bench and mountain view. (Red arrow depicts proposed communication facility at Spring Hill).



Photograph: 20

Location: Top of the hill near the proposed tower facility.

Direction: Facing south.

Comment:
Chuckwalla Valley overview. (Red arrow depicts the junction of Bradshaw Trail and Augustine Pass Trail).