USDA Forest Service

United States Department of Agriculture

# Tusayan East Wireless Communications Sites

## Final Environmental Assessment

**Tusayan Ranger District, Kaibab National Forest, Coconino County, Arizona**

**February 2016**

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Cover Page Picture – View from Grandview Lookout Tower, Tusayan Ranger District, looking towards Grand Canyon, taken by Ken Jacobs, June 2014.

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# SUMMARY

The Kaibab National Forest (KNF) proposes to authorize construction of new telecommunication facilities designed to accommodate Federal Communications Commission (FCC) licensed wireless carriers, local government, and general public needs to improve wireless communications service on the State Route 64 (SR 64) corridor in the Tusayan and Grand Canyon South Rim area. The project area is located within the Tusayan Ranger District, Kaibab National Forest. This action is needed because wireless service is currently lacking or unreliable in this area.

The KNF proposes to authorize construction of new communication facilities at Skinner Ridge and near Grandview Lookout Tower. The proposed facilities include new towers at both sites, and associated infrastructure.

The Land and Resource Management Plan for the Kaibab National Forest (Kaibab Forest Plan) shows the Skinner Ridge site as a proposed classified electronics site on the Electronics Site and Utility Corridors Map in Appendix F. The proposed Grandview site is adjacent to the existing Grandview Microwave Site, also appearing on the map in Appendix F. Appendix F is a reference showing the existing and proposed sites at the time the plan was signed in 2014 and does not convey plan direction.

The Skinner Ridge Communications Site is located within Section 7, T29N, and R4E (Figure 1.3) and is accessed via Forest Road (FR) 302 east approximately 9 miles from SR 64 in Tusayan to FR 343 and east for approximately 1.5 miles to the top of Skinner Ridge. An existing primitive road, FR343G, provides access close to the site approximately 340 feet to the northeast. Approximately 100 feet of new road would be constructed to serve as a driveway into the communications site (maximum 0.1 acres of disturbance, rounded up). This new road would provide access to the site from FR 343G. Some minor reshaping of FR 343G would be required. A new free standing lattice tower 125 feet above ground level (AGL) and associated equipment buildings is proposed at the Skinner Ridge Communications Site.

The Grandview Communications Site is located within Section 28, T30N, R4E (Figure 1.6) and is accessed via SR 64 to FR 310 to FR 310F. Approximately 190 feet of new road would need to be constructed from the end of FR 310F to the communications site for facility site access (maximum 0.1 acres of disturbance, rounded up). Also, there would be minor upgrading of the existing 400 feet of FR 310F to add road surfacing materials and to install drainage features to address potential soil erosion and ensure a firm driving surface. Depending on the alternative chosen, a tower between 110 and 120 feet AGL and associated equipment buildings are proposed to be constructed at the Grandview Communications Site.

Visual analysis, including visual simulations, found the proposed towers would be obscured from view by trees that line the SR 64 corridor and would be far enough off the highway so that there would be no head-on long duration views (areas where the tower would be visible in the direct line of sight of an observer in a vehicle for a period of time greater than a few seconds). The few potential views of the proposed Grandview tower from a vehicle traveling along the highway (three short duration views) are from the side and not easily discernable at the average speeds for this roadway. The scenic integrity objectives of the Kaibab Forest Plan for viewsheds at both the

Skinner Ridge and Grandview Communications Sites would be slightly affected but would retain current status.

In addition to the No Action Alternative, (Alternative 1), and the Proposed Action, (Alternative 2), the Forest Service also evaluated two additional Action Alternatives, Alternatives 3 and 4. Alternative 3 would modify the 110 foot monopole tower proposed at the Grandview site in Alternative 2 by use of a simulated ponderosa pine tree tower. Alternative 4 would authorize a lattice tower, 120 feet above ground level, at the Grandview site. The additional height of the tower in Alternative 4 would provide higher antenna positions that would improve service for an additional wireless service provider.

Most of the effects of the three Action Alternatives are similar because the activities similar. The differences between the alternatives are associated with the tower design for Grandview Tower in Alternative 3 (simulated tree tower), and increased height of ten feet (120 ft.) and lattice tower design in Alternative 4.

Under Alternatives 2 and 3, wireless coverage and reliability on the SR 64 corridor near Grandview would be slightly less for the wireless carrier located at the bottom position on the tower when compared to Alternative 4 (with the higher tower) because lower antennae positions generally reduce the distance that a wireless signal will travel.

The responsible official will decide whether to implement the Proposed Action, an alternative to the Proposed Action, or whether further environmental documentation is needed. The Responsible Official for this project will be the Forest Supervisor.

# 1.0 CHAPTER 1 – PURPOSE AND NEED

## 1.1 INTRODUCTION

The Kaibab National Forest (KNF) is proposing to construct two new communications tower facilities at locations, that are designed to improve wireless service on the SR 64 corridor in the Tusayan/Grand Canyon South Rim areas. The proposed action is a key component of a broad effort by the FCC licensed wireless carriers to design and implement new wireless communications facilities that would improve governmental and personal wireless communication services in the Town of Tusayan, KNF, and the SR 64 corridor through the Grand Canyon National Park (GCNP) south rim, where such services are currently not available and/or reliable. The area involved in implementation of the proposal totals approximately 1.0 acres for both tower sites, access roads, and trenching for a powerline in Forest Road 310 road which includes activity on both National Park (0.1 acres) and National Forest System lands (0.2 acres). These actions are proposed to be implemented on the Tusayan Ranger District of the Kaibab National Forest.

The KNF has prepared this environmental assessment (EA) to determine whether construction of two new communications facilities would significantly affect the quality of the human and natural environment and thereby require the preparation of an environmental impact statement. By preparing this EA, the KNF is fulfilling agency policy and direction to comply with the National Environmental Policy Act (NEPA). For more details of the proposed action, see the Proposed Action and Alternatives section of this document.

## 1.2 BACKGROUND

The Tusayan East Wireless Communications Sites project is a proposal (Proposed Action) submitted by DW Tower LLC (Proponent), to establish wireless and microwave communications tower facilities at the Skinner Ridge and Grandview communications sites on the Kaibab National Forest (KNF). The proposed Skinner Ridge Communications Site was previously considered in a Proposed Action called GC Hub. The GC Hub project was later renamed the Skinner Ridge Wireless Communications Site. The project was again renamed Tusayan East when it was combined with the proposed Grandview Communications Site. The KNF, in conjunction with wireless industry, the Town of Tusayan, and Coconino County, cooperatively participated in a process to address wireless communications needs for the State Route 64 (SR 64) corridor. Previously, an environmental assessment and decision called the HWY 64 Wireless Communications Sites Project (2011), authorized construction of communications sites and towers at the exiting Tusayan site, near the GCNP south entrance and a new site called the Anita Communications Site, approximately seven miles south of Tusayan adjacent to Hwy 64. Construction is pending at these two sites. This proposal is a continuation of establishing wireless and microwave communications for the area and would provide a continued response to that effort (Figure 1.1).

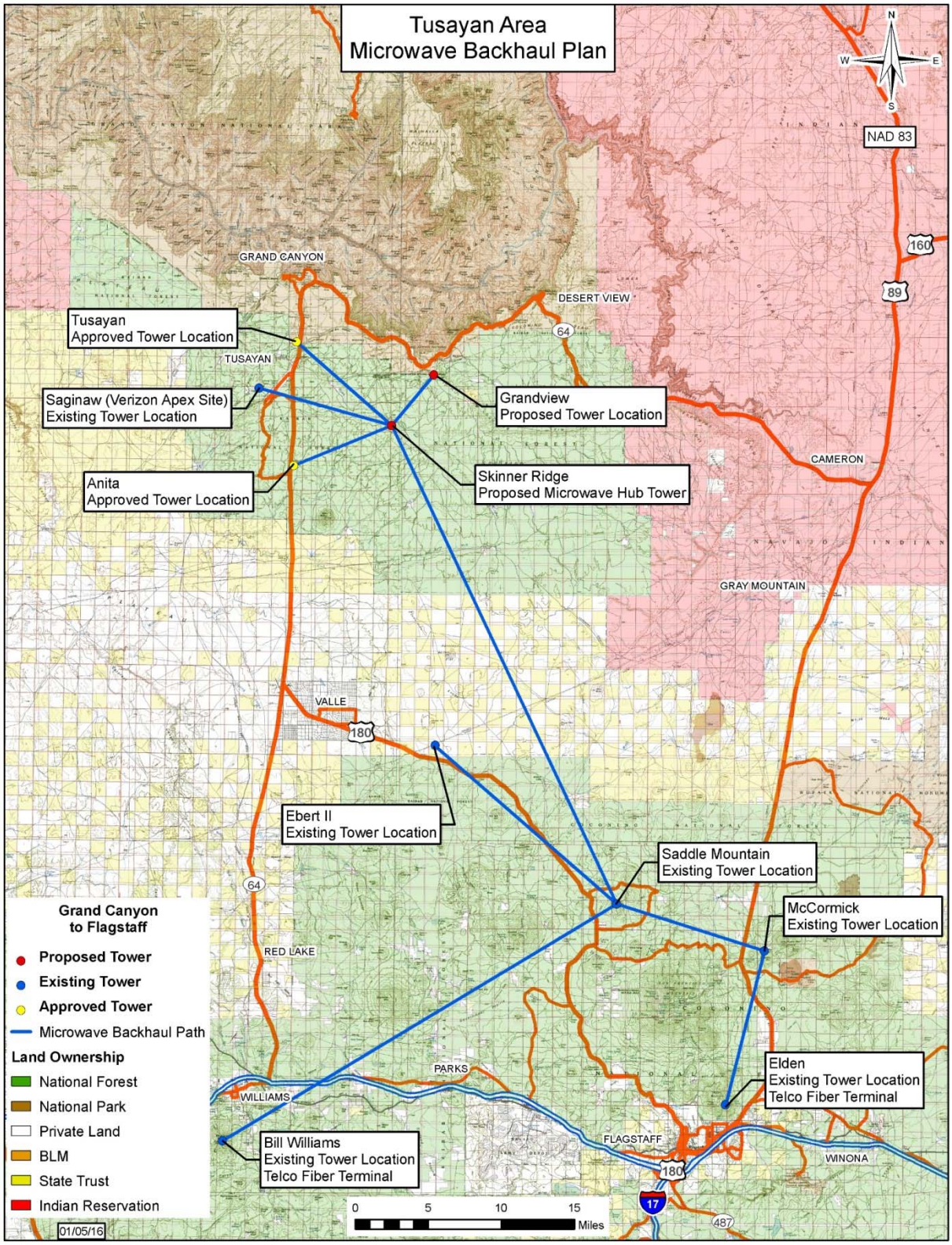


**Figure 1.1 – Microwave Backhaul Map.**

In response to competitive interest expressed by other wireless industry facility providers to develop the proposed sites, KNF issued a prospectus in June of 2014 to solicit proposals from the wireless communications industry to improve wireless services in the Tusayan area and the SR 64 corridor. The prospectus offered the successful applicant(s) the opportunity to pursue an application for development of two new communications facilities located on the Tusayan Ranger District at sites identified in the Kaibab Forest Plan as proposed for such uses. In September 2014, KNF selected a proposal and awarded potential development opportunities for both sites to DW Tower LLC.

## 1.3 PROPOSED PROJECT LOCATION

Figure 1.2 depicts the location of the proposed Grandview and Skinner Ridge Towers in relation to the general vicinity of the Town of Tusayan, Grand Canyon National Park and Grand Canyon Village, Desert View, and SR 64.

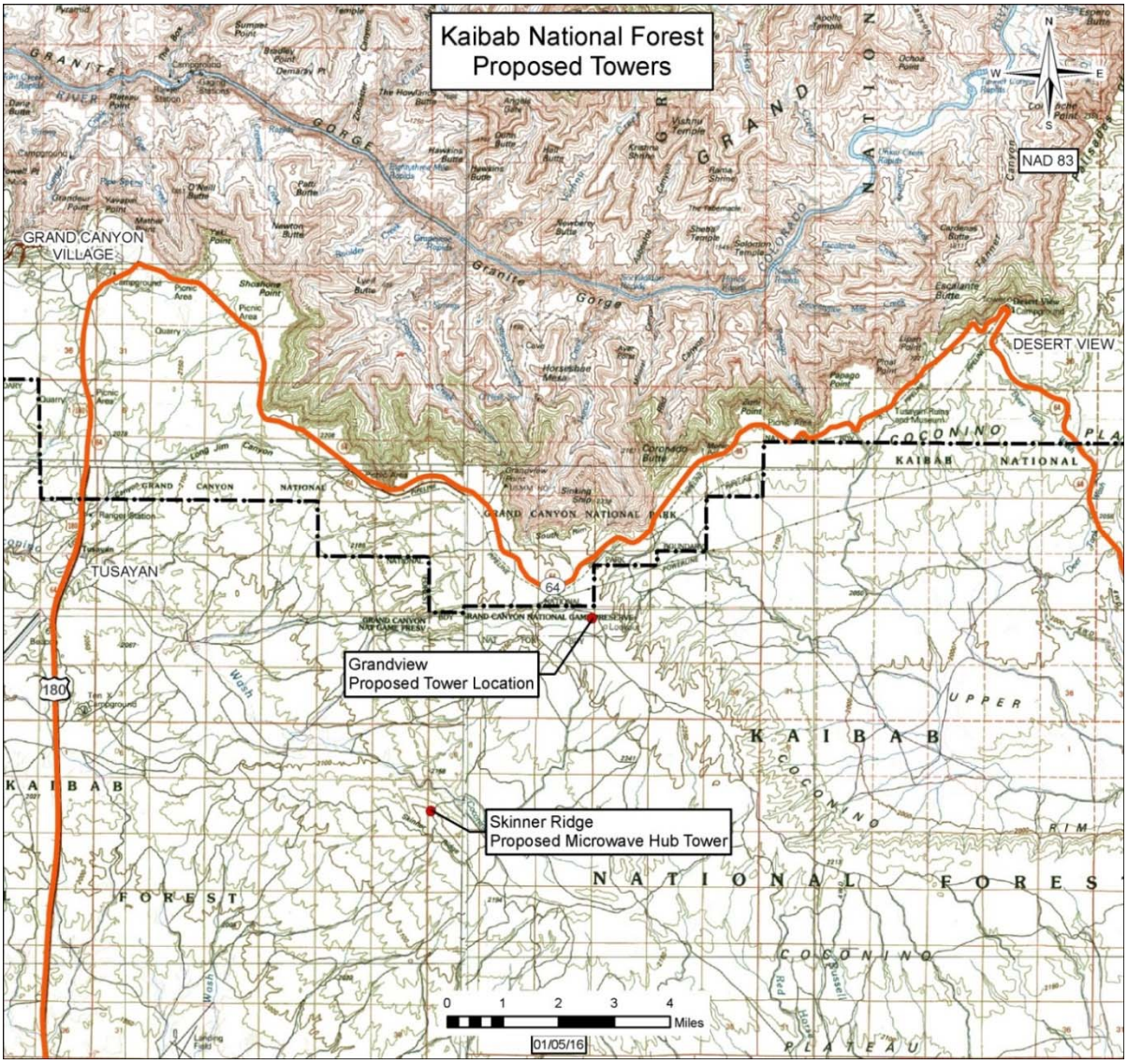


**Figure 1.2 – Vicinity map.**

### 1.3.1 Proposed Tower Facility – Skinner Ridge

The proposed Skinner Ridge Communications Facility is a key component of the developing regional wireless communications system. This tower site was selected due to its strategic location offering high elevation, lack of terrain obstructions, line of sight to existing microwave locations and planned wireless towers in the area. Skinner Ridge would not function as a cell coverage facility because of the remote location. Skinner Ridge's primary purpose would be that of a microwave hub for the wireless carriers providing signal backhaul out of the GCNP and Tusayan areas to landline fiber optics in the Williams and Flagstaff areas.

**Location**

DW Tower proposes to construct a microwave hub communications facility at a location referred to as Skinner Ridge, within Section 7, T29N, R4E, in the Tusayan Ranger District, KNF (Figures 1.2, 1.3 and 1.4).

**Figure 1.3 – Skinner Ridge Communications Site location looking south from tower location.**

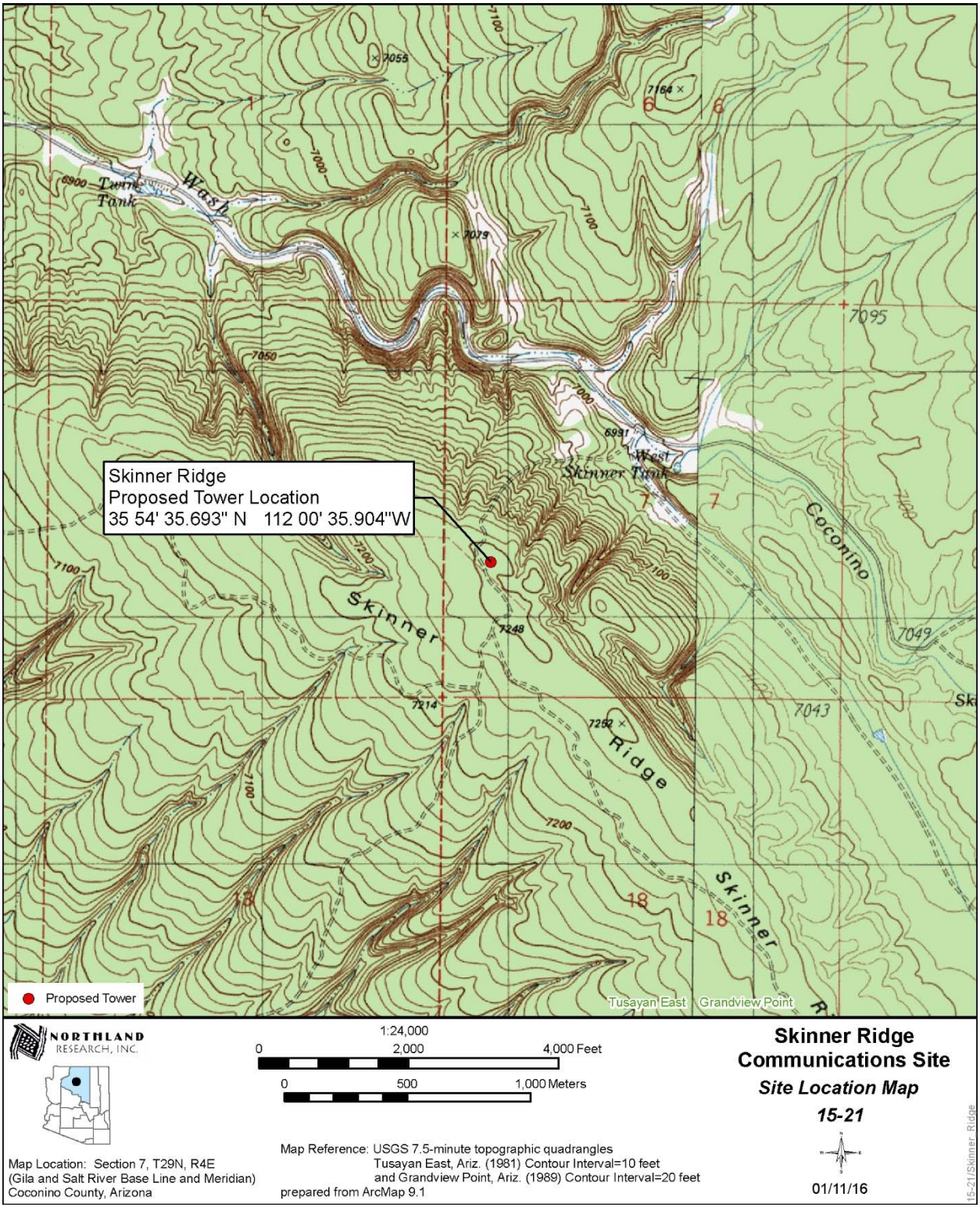


**Figure 1.4 – Skinner Ridge Communications Site location map**.

### 1.3.2 Proposed Tower Facility – Grandview

KNF proposes to construct a colocation wireless communications facility at a location referred to as Grandview, near the Grandview Lookout Tower on the KNF. The Grandview Site is a key component of the wireless communications system providing wireless service for the SR 64 corridor (see Figure 1.1).

Propagation studies and wireless customer complaints show that the area on the SR 64 corridor east of Grand Canyon Village to Desert View is currently not receiving adequate or reliable wireless service (see Chapter 3, Wireless Service Affected Environment). Typically, in order to provide seamless wireless coverage for all of the licensed wireless carriers active in an area, a tower is needed approximately every 7 miles unless extremely tall towers or mountain tops are used. The Grandview Communications Site provides a location for a cell tower that would improve service on the SR 64 corridor between Desert View and the South Rim's Grand Canyon Village.

**Location**

The proposed tower is located within Section 28, T30N, R4E (Figures 1.5 and 1.6), approximately 380 feet west of FR 310 and 1600 feet northwest of the Grandview Lookout Tower.

**Figure 1.5 – Grandview Communications Site location looking south at the tower location.**

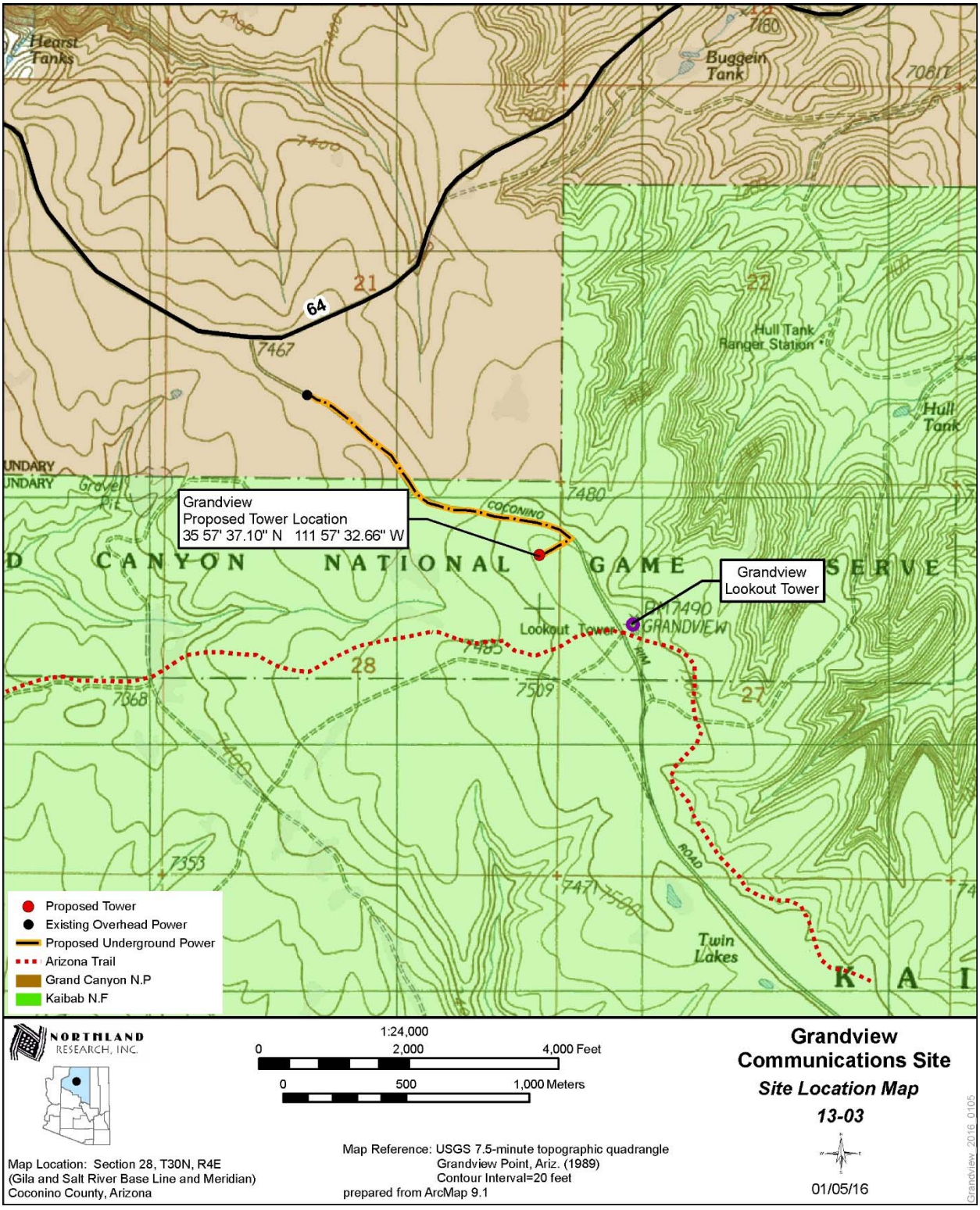


**Figure 1.6 – Grandview Communications Site location map.**

## 1.4 DOCUMENT STRUCTURE

The Kaibab National Forest (KNF) has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the Proposed Action, or Alternatives to the Proposed Action. The document is organized into five parts:

Introduction: This section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

Alternatives: This section provides a more detailed description of the agency's Proposed Action as well as alternative methods considered for achieving the stated purpose. This discussion also includes design criteria and mitigation measures developed to reduce impacts. Finally, a summary table comparing the environmental consequences associated with each alternative is provided.

Environmental Consequences: This section describes the environmental effects of implementing the Proposed Action and other alternatives. This analysis is organized by broad groupings of resource areas. Within each area, the affected environment is described first, followed by the effects of Alternatives considered. No action represents no change from the current conditions and therefore is not described in detail except where notable consequences would occur.

Agencies and Persons Consulted: This section provides a list of preparers and agencies consulted during the development of the environmental assessment.

Appendices: The appendices provide more detailed information to support the analyses presented in the environmental assessment.

## 1.5 NEED FOR THE PROPOSAL

This proposal is needed because the public and government agencies have come to expect reliable wireless telephone and internet service for general use and emergencies while traveling major transportation corridors and visiting major recreation destinations. The increasing use of evolving wireless technologies such as smart phones, tablets, and internet services provided by wireless carriers are creating need for additional communications facilities. The SR 64 corridor north of Valle on the KNF, through the Town of Tusayan and GCNP are currently not receiving adequate or reliable wireless service from any of the providers.

The Forest Service (FS) has been given direction from Congress and the President to facilitate implementation of the Nation's strategy for wireless communications. On August 10, 1995, President Clinton released a memorandum entitled "Facilitating Access to Federal Property for the Siting of Mobile Services Antennas." In this memorandum, the following is stated:

> *Upon request, and to the extent permitted by law and where practicable, executive departments and agencies shall make available, Federal Government buildings and lands for the siting of mobile service antennas.*

On February 8, 1996, the Telecommunications Act of 1996 was enacted, giving further direction to Federal agencies. In response to the memorandum and the Telecommunications Act, the General Services Administration released a bulletin listed in the Federal Register on June 16, 1997, titled "Placement of Commercial Antennas on Federal Property." This bulletin provides general guidelines and processes for implementation of President Clinton's memorandum. Regarding granting of siting requests, the bulletin states:

> *Requests for the use of property, right-of-way, and easements by duly authorized telecommunications service providers should be granted unless there are unavoidable conflicts with the department's or agency's mission, or current or planned use of the property or access to that property.*

The proposed action is a key component of a broad effort by the FCC licensed wireless carriers to design and implement new wireless communications facilities that would improve governmental and personal wireless communication services in the Town of Tusayan, KNF, and the SR 64 corridor through the GCNP south rim, where such services are currently not available and/or reliable. The proposed action responds to the need for additional colocation towers to provide antennae space for the FCC licensed carriers to broadcast and receive cellular telephone signals (coverage tower site) from the public and governmental users in the SR 64 corridor and Tusayan areas.

**Microwave Backhaul Needs**

In order to provide reliable wireless telephone and broadband internet service, increased microwave backhaul capacities are needed to connect voice and data wireless signals coming to and from the GCNP/Tusayan area to the regional landline telephone system. All wireless carriers must connect their cell sites to the landline telephone system (backhaul) in order for calls from subscribers to be directed to their destination. This is usually accomplished by having the local telephone company provide digital transmission facilities via copper or fiber cables to the cell tower site with connectivity through the telephone network back to the carrier's switch. The Tusayan area is not within a telephone company's service area and this location is remote, making construction charges to build a fiber optic line to the area cost prohibitive. For the Tusayan area, the carrier's only option for backhaul is to install a microwave radio system to connect the cell site to a location where they can access a telephone company's network. Because there are limited local telephone facilities in the Tusayan and GCNP area, the wireless carriers currently use microwave links back to Bill Williams Mountain near Williams, Arizona. With the advent of 4G wireless technology, the bandwidth requirements dictate additional capacity. The microwave route currently being used connecting to Bill Williams Mountain is already congested; consequently, there are not enough frequencies available for all of the added links that are needed now and in the future. Additional backhaul systems and microwave routes must be developed to handle the expanding wireless use.

The proposed Skinner Ridge facility located on National Forest System lands would provide a needed new link and paths to expand wireless backhaul capacity. Figure 1.1 shows how the

proposed Skinner Ridge facility links the existing and planned tower sites in the Tusayan area with the carriers' switching facilities in Flagstaff. The proposed Skinner Ridge Tower would effectively supplement existing backhaul paths and provide an additional microwave link between existing and planned wireless sites in the Tusayan area with landline telephone systems.

**Coverage Tower Sites Needs**

The wireless industry plan for the area includes new coverage tower sites located on the SR 64 corridor from the Town of Tusayan east to Desert View, where current wireless service is unreliable or completely lacking. The proposed Grandview Cell Tower facility located on the KNF south of GCNP would provide wireless service to the SR 64 corridor between existing and planned towers at Grand Canyon South Rim Village and Desert View. The proposed Grandview tower would connect via microwave to the Skinner Ridge Microwave Tower. Figure 1.1 shows the location of the proposed Grandview Tower in relation to the other planned and existing tower sites in the Tusayan area.

## 1.6 PROPOSED ACTION

KNF proposes to authorize construction of two tower sites on the Tusayan Ranger District as follows:

### 1.6.1 Skinner Ridge

This would be a microwave hub communications facility at a location referred to as Skinner Ridge Wireless Communications Tower Site (see Figure 1.4).

This site was selected due to its elevation, lack of terrain obstructions, line of sight to existing and planned towers.

The components of the proposed facility would include the following:

a) Construction of a 125 foot tall self-supporting lattice tower (Appendix C).

b) Construction of a 60 foot by 12 foot radio equipment building. The building would have a maximum height of 10 foot. (Appendix C).

c) Installation of a solar hybrid power system which would include solar panels and a backup propane powered generator. The proposed solar hybrid power system would be approximately 66 solar panels covering approximately 600 square feet at full build-out as depicted in the concept drawings (see Appendix C).

d) The tower, equipment building, and solar power system would be enclosed in a 100 feet by 100 feet compound by a 6 foot tall chain link fence.

e) Clearing of all vegetation within the 100 feet by 100 feet area (approximately 0.25 acre lease area).

f) Issuance of a Forest Service Communications Site Lease to authorize construction and operation of the proposed facility for a 20 year term.

The proposed Skinner Ridge communications facility is located within Section 7, T29N, and R4E, Gila and Salt River Meridian (see Figure 1.4).

**Proposed Access Route**

Access to the site would be via FR 302 east from SR 64 in Tusayan for approximately 9 miles to FR 343 and east for approximately 1.5 miles to the top of Skinner Ridge. An existing primitive road FR343G provides access close to the site approximately 340 feet to the northeast. A driveway, approximately 100 feet long, connecting FR343G and the site would be constructed. No new authorizations are anticipated for use of SR 64 or FR 302/343 as SR 64 is a State Highway and FR 302 and 343 are part of the KNF road system open to public use. Upgrade of the FR343G and construction of the 100 foot long driveway would require authorization from KNF. The existing roads proposed for access (FR 302, 343, 343G) are of adequate standard for site construction and operational access.

### 1.6.2 Grandview

This site would be a wireless communications tower site referred to as the Grandview Wireless Communications Site (see Figure 1.6)

This site was selected due to its elevation, lack of terrain obstructions, line of sight to existing and planned towers. The specific location is also proposed because it reduces impacts to the Grand Canyon National Park, Coconino Rim Roadless Area, Arizona National Scenic Trail, and the Grandview Lookout Tower and Cabin.

The components of the proposed facility would include the following:

a) Construction of a 110 foot tall free standing monopole tower (Appendix B).

b) Construction of a 60 foot by 12 foot radio equipment building. The building would have a maximum height of 10 foot. (Appendix B).

c) Power would be provided from an existing overhead distribution line inside the GCNP located approximately 1 mile north of the tower site.

d) The only construction activity associated with the proposed tower would be installation of the Arizona Public Service Company's underground power line following Forest Road 310. The power would be run underground approximately 4,595 feet from the existing overhead power line on FR 310 for 1,650 feet inside the GCNP.[1] The power line would continue for 2,945 feet on National Forest System lands, to the communications facility following FR 310 to FR 310G, as depicted on the attached maps. The underground distribution line would be placed in a conduit within the existing FR 310 road disturbance profile (see Figure 1.6). An approximate 44 inch deep trench would be dug with trenching equipment within the road profile. The conduit would be placed in the trench with a minimum 36 inch cover. A pull box would be placed every 1000 feet. The pull box is approximately 2 feet by 3 feet by 3 feet deep

[1] The 1,650 feet of power line inside the GCNP will require clearance and authorization by NPS in a separate process. That portion of the power line under NPS jurisdiction will be addressed as a future cumulative effects project in this document, (see Chapter 3, Cumulative Effects Sections.)

and has a cover. The pull box provides an access point to the conduit where the wire can be pulled through the conduit. It would be installed so that the box is underground and the cover would be level with the ground surface. Pull boxes would be installed far enough from the FR 310 travel surface so that it would not interfere with road travel or road maintenance activities. The Arizona Public Service Company (APS) underground power line would terminate inside the lease area connecting to an 800 amp electrical service entrance panel. All construction activities associated with installation of the underground power line would be confined to within the existing impacted FR 310 and FR 310G road prism.

e) The tower, and equipment buildings would be enclosed in a 100 feet by 100 feet compound by a 6 foot tall chain link fence.

f) Clearing of all vegetation within the 100 feet by 100 feet area (approximately 0.23 acre lease area) would be required.

g) Issuance of a Forest Service Communications Site Lease to authorize construction and operation of the proposed facility for a 20 year term.

The proposed Grandview communications facility would be located within Section 28, T30N, and R4E, Gila and Salt River Meridian (see Figure 1.6). The location is west of FR 310 approximately 380 feet where trees would block views of the tower from the road, and views from areas west of FR 310 (Coconino Rim Roadless Area and the Arizona Trail).

**Proposed Access Route**

Proposed access to the Grandview Site would be via SR 64 to FR 310 to FR 310F. Access requires travel on FR 310 inside GCNP. Use of that portion of the road will be coordinated and authorized with GCNP. No new authorizations are anticipated for use of SR 64 or FR 310 as SR 64 is a State Highway and FR 310 is part of the KNF road system open to public use. Access requires extension of FR 310G approximately 190 feet (maximum 0.1 acres of disturbance) and minor upgrading of approximately 400 linear feet of the existing two track road (FR 310F). The 400 feet of primitive road can be used "as is" except for minor re-construction to add road surfacing material and install drainage features to address potential soil erosion and ensure a firm driving surface. The lease holder would install drainage and erosion control features as part of use and extension of FR 310F road to ensure proper road drainage and reduce accelerated erosion and runoff. Upgrades of FR 310F and extension would require authorization by KNF as part of the lease. The existing Forest road (FR 310) proposed for access is of adequate standard for site construction and operational access. Existing roads are generally not of adequate standard for construction operation and maintenance of the proposed facility if wet conditions are present. The lease holder would not anticipate needing to perform regular snowplowing and therefore does not propose to upgrade or maintain the roads to all weather standards.

**Total Amount of New Disturbed Area for Both Communication Sites**

Each 100 foot by 100 foot footprint equals about 0.25 acres that would be disturbed through clearing and construction. The new access road construction to Skinner Ridge and Grandview towers would add a maximum of 0.2 acres or less of disturbance. Total disturbed area would be equal to approximately 0.7 acres.

## 1.7 PUBLIC INVOLVEMENT AND TRIBAL CONSULTATION

The proposal was listed in the KNF Schedule of Proposed Actions on April 1, 2015 and has appeared on every quarterly edition to the present time. The Proposed Action was provided to the public and other agencies for comment during scoping in January 2015. A total of 68 physical addresses received hard copy mailings. One organization and one business commented. The interdisciplinary team reviewed and summarized all comments in a Scoping Report located in the project record. General comments or comments that are already decided by law, regulation, or through another process will not receive further evaluation. The following comments are considered in this environmental assessment.

- A local chapter of an environmental organization made 11 comments in a letter submitted on March 3, 2015. Three of these comments were determined to be issues pertaining to potential effects on visual and scenic resources to be carried forward for analysis in the EA. The remaining eight comments were determined to be opinion or general comments. It should also be noted that the commenter used maps from the Tusayan East Wireless Communications Sites Prospectus to describe issues with Forest Plan Scenery Management Concern Levels and Classifications versus the map provided in the Proposed Action. The location of the towers on the map in the Prospectus was slightly different than the map in the Proposed Action, and the Concern Levels the commenter referred to for Scenic Attractiveness and Landscape Visibility Distance Zones were different from those in the Proposed Action. This analysis correctly uses the more accurate classifications mapped in the Proposed Action. The Scenery Management System was used for the detailed analysis and is responsive to the commenters' issues, and their concerns have been represented and are carried forward as Issues 1–3 below.
- Another wireless carrier made a comment in an email to DW Tower that was submitted to the Kaibab National Forest for consideration in scoping. This comment was determined to be an issue because it implied that the 110 foot tower at the Grandview site would not meet the purpose and need of the project. This issue will be carried forward for analysis in the EA.

In addition, the Forest conducted consultation with federally recognized tribes and scoping of tribal communities (See Chapter 4 - Consultation and Coordination). Several tribes voiced concerns over potential impacts to the Grand Canyon and the Red Butte Traditional Cultural Property (TCP) and were sent copies of the visual analysis upon request.

Agency comments were also received from the National Park Service at Grand Canyon National Park addressing concerns for visual effects to the National World Heritage Site, including West and East Rim Drives, Desert View Drive, North Rim, the East Rim and Desert View Cultural Landscapes and effects from the portion of the buried power line that would occur on the Park. The Parks concerns and comments were considered and included in the visual analysis, (see Chapter 3).

In accordance with Forest Service Regulation, the KNF provided the 30 day opportunity to comment on the Draft EA. A legal notice was published in the Arizona Daily Sun on February February 17, 2016 posting the locations wherer the EA is available for review and comment period deadline. In addion, a letter was sent to 13 individuals,representing government and tribal agencies

a wirelsess carier and the Sierra Club. Only one comment was received (GCNP) in response to this effort. Appendix E contains GCNP's comments and the KNF response.

## 1.8 DECISION FRAMEWORK

The Forest Supervisor of the Kaibab National Forest is the Responsible Official who will decide which actions, if any, to implement. This decision will be based on:

1. Whether the proposed activities and alternatives address the issues, are responsive to national policy/guidance and direction in the Forest Plan, and meet the purpose of and need for action on the Kaibab National Forest.
2. Whether the information in this analysis is sufficient to implement the proposed activities.
3. Whether the proposed activities would have significant effects and therefore require the preparation of an Environmental Impact Statement.

If an action alternative is selected, project implementation could begin in the third quarter of 2016. Most construction actions would be accomplished within eight to ten weeks.

## 1.9 ISSUES

Issues are points of discussion, debate, or dispute about environmental effects that may occur as a result of the Proposed Action or an Alternative. It is these potential environmental effects, particularly potential negative effects, which provide focus for analysis, influence alternative development, and lead to development of mitigation measures. Issues are used to display differing effects between the Proposed Action and the Alternatives regarding specific resource elements.

A list of potential issues was developed by the project interdisciplinary (ID) team on the basis of their knowledge of the Proposed Action and the area affected, and the public comments submitted during scoping.

These "potential issues" are reviewed to determine: a) the significant issues to be analyzed in depth, and b) issues which are not significant or which have been covered by prior environmental review, and therefore should be eliminated from detailed analysis (Project Record, Issue Analysis and Alternative Development, Response to Scoping Comments, April 27, 2015).

Four significant issues were identified. Design features were developed to ensure the protection of natural and cultural resources.

**Issue 1**: Scenery may be degraded by new communication towers in the Grandview and Skinner Ridge viewsheds possibly conflicting with Scenery Management System Objectives for Scenic Attractiveness – Typical.[2]

[2] The location shown on the Prospectus Map, used in comments, shows the classification as "Distinctive" for the Grandview Tower Site.

**Issue 2:** Scenery may be degraded by new communication towers in the Grandview and Skinner Ridge viewsheds conflicting with Scenery Management System for special status objectives Distance Zones – Foreground Concern Level Moderate.[3]

**Issue 3:** Communications towers at Grandview and Skinner Ridge may not meet Scenic Integrity Objectives (SIO's) for a "high" classification because they would not be "visually subordinate" to the forest landscape as required.

**Issue 4:** Another wireless service provider and potential multi-user occupant is concerned that a lower antennae position at the proposed Grandview Tower might not provide adequate service, and that at least a 120 foot tall tower would be needed to provide satisfactory services. They asked that an alternative be considered for a taller tower.

In addition to these issues identified through public scoping, several additional areas of resource concern identified by both the public and resource specialists regarding sensitive resources will be included in visual analysis, including:

1. Visual effects on the Arizona Trail.
2. Visual effects on the Coconino Rim Roadless Area.
3. Visual effects on the Grandview Lookout and Grandview Cabin Sites which are listed on the National Register for National Historic Places.
4. Visual effects on the Red Butte Traditional Cultural Property (TCP).
5. Visual effects to the Grand Canyon World Heritage Site and GCNP, including the East and West Rim Drives, Desert View Drive, the North Rim, the East Rim and Desert View Cultural Landscape, and the portion of the buried power line on the Park.

[3] The location shown on the Prospectus Map, used in comments, shows the classification as "Special Scenic – Concern Level High" for the Grandview Tower Site.

# 2.0 CHAPTER 2 – ALTERNATIVES

This chapter describes the Alternatives considered for the project. This section also presents the Proposed Action in comparative form, defining the differences between each Alternative and providing a clear basis for choice among options. Four Alternatives are being considered:

## 2.1 ALTERNATIVE 1 – NO ACTION

The No Action Alternative best addresses the issues brought forward in Issues 1, 2 and, 3 because no towers or associated construction would be authorized at the proposed communications sites.

## 2.2 ALTERNATIVE 2 - PROPOSED ACTION

### 2.2.1 Skinner Ridge Communications Site

The Skinner Ridge Communications Site is located within Section 7, T29N, and R4E Gila and Salt River Meridian (see Figure 1.4). Construction, operation, and maintenance of the site would include the following activities:

- Construction of a 125 foot tall self-supporting lattice tower (Appendix C).
- Construction of a 60 foot by 12 foot radio equipment building. The building would have a maximum height of 10 foot. (Appendix C).
- Installation of a solar hybrid power system which wouldinclude solar panels and a generator. The proposed solar hybrid power system would be approximately 66 solar panels covering approximately 600 square feet at full build-out.
- The tower, equipment building, and solar power system would be enclosed in a 100 feet by 100 feet compound surrounded by a 6 foot tall chain link fence.
- Clearing of all vegetation within the 100 feet by 100 feet area (0.25 acre lease area).
- Issuance of a Forest Service Communications Site Lease to authorize construction and operation of the proposed facility for a 20 year term.
- Implementation of a Communications Site Management Plan.

#### 2.2.1.1 Access Route

Proposed access to the site would be via FR 302 east from SR 64 in Tusayan for approximately 9 miles to FR 343 and east for approximately 1.5 miles to the top of Skinner Ridge, (see Figure 1.4). An existing primitive road FR 343G provides access close to the site approximately 340 feet to the northeast. A driveway, approximately 100 feet long connecting FR 343G and the site would be constructed. No new authorizations are anticipated for use of SR 64 or FR 302/343 as SR 64 is a State Highway and FR 302 and 343 are part of the KNF road system open to public use. Construction of the 100 foot long

driveway would require authorization from KNF. The existing roads proposed for access (FR 302, 343, 343G) are of adequate standard for site construction and operational access.

### 2.2.2 Grandview Communications Site

The proposed Grandview communications facility would be located west of FR 310 approximately 380 feet to where trees would block views from the road, and areas east of the road (Coconino Rim Roadless Area and the Arizona Trail), within Section 28, T30N, and R4E, Gila and Salt River Meridian (see Figure 1.6). Construction, operation, and maintenance of the site would include the following activities:

- Construction of a 110 foot tall free standing monopole tower (Appendix B).
- The site is designed to accommodate anticipated wireless communications needs within a 100 foot by 100 foot area for the foreseeable future.
- Construction of two radio equipment buildings approximately 24 feet by 25 feet in initial buildout. Buildings would be a maximum of 10 foot high. Two additional buildings approximately the same size could be added at full build out (Appendix B). There are currently four FCC liscensed carriers active in this area. Full buildout would occur when remaining carriers budgeted for construction at this location.
- Power would be provided from an existing overhead distribution line located inside the GCNP, approximately 1 mile north of the tower site. The power would be run underground approximately 1,650 feet on GCNP land and 2,945 feet on National Forest System lands for a total of 4,595 feet south from the existing overhead power line within the existing road prism of FR 310 to FR 310F. The portion of the power line on National Forest System lands would follow existing KNF designated transportation corridors.
- The tower and equipment buildings would be enclosed in a 100 feet by 100 feet compound surrounded by a 6 foot tall chain link fence.
- Clearing of all vegetation within the 100 feet by 100 feet area (about 0.25 acre lease area) would be required.
- Issuance of a Forest Service Communications Site Lease to authorize construction and operation of the proposed facility for a 20 year term.
- Implementation of a Communications Site Management Plan

#### 2.2.2.1 Access Route

Proposed access to the Grandview Site would be via SR 64 to FR 310 to FR 310F, (see Figure 1.6). Access requires travel on FR 310 inside GCNP. Use of that portion of the road would be coordinated and authorized with GCNP. No new authorizations are anticipated for use of SR 64 or FR 310 as SR 64 is a State Highway and FR 310 is part of the KNF road system open to public use. Access requires extension of FR 310G approximately 190 feet (maximum 0.1 acres of disturbance) and minor upgrading of approximately 400 linear feet of the existing two track road (FR 310F). The 400 feet of primitive road can be used "as is" except for minor re-construction to add aggregate road surfacing material and install

drainage features to address potential soil erosion and ensure a firm driving surface. The lease holder would install drainage and erosion control features as part of use and extension of FR 310F road to ensure proper road drainage and reduce accelerated erosion and runoff. Upgrades of FR 310F and extension would require authorization by KNF as part of the lease.

The existing Forest Road (FR 310) proposed for access is of adequate standard for site construction and operational access. Existing roads are generally not of adequate standard for construction, operation and maintenance of the proposed facility if wet conditions are present. The lease holder would not anticipate needing to perform regular snowplowing and therefore does not propose to upgrade or maintain the roads to all weather standards.

## 2.3 ALTERNATIVE 3 – A 110 FOOT TALL MONOPOLE TREE TOWER AT THE GRANDVIEW COMMUNICATIONS SITE

Alternative 3 would use a 110 foot tall monopole simulated tree tower designed to look like a ponderosa pine tree. Alternative 3 is designed to respond to visual issues by disguising the tower to make it resemble a ponderosa pine tree so it blends with the surroundings. All other components associated with the facility including equipment buildings, power, access, fencing, and compound size are identical to those proposed under Alternatives 2 and 4. The facility design concept is displayed in Appendix B.

Construction, operation, and maintenance of the site would be the same as the activities listed in the Proposed Action.

The proposed Skinner Ridge Communications Site facility would be the same as Alternative 2.

## 2.4 ALTERNATIVE 4 – A 120 FOOT TALL LATTICE TOWER AT THE GRANDVIEW COMMUNICATIONS SITE

Alternative 4 would authorize construction of a 120 foot tall lattice tower at the Grandview Communications Site. It addresses Issue 4 that the 110 foot tower in the Proposed Action at Grandview is insufficient in height to fully meet wireless service objectives in that area; it represents the alternative that provides the most potential communications user colocation opportunities. The tower facility design concept is displayed in Appendix B. All other components associated with the facility including equipment buildings, power, access, fencing, and compound size are identical to those proposed under Alternatives 2 and 3 except that it would be a lattice tower design 120 feet tall. See Appendix A-2 for lattice design representation.

Construction, operation, and maintenance of the Grandview and Skinner Ridge Communications Sites would be the same as the activities listed in the other action alternatives, except, that the Forest Service Communications Site Leases would be issued for a 30 year term instead of 20 years. Thirty years is the maximum timeframe a lease can be issued for.

# 2.5 DESIGN CRITERIA/MITIGATION MEASURES

The following design criteria were developed to reduce impacts to scenery, biological resources, and soils and would apply to each action alternative.

## 2.5.1 Project Design Features that Reduce Visual Impacts

### 2.5.1.1 Skinner Ridge Project Design Features

- All galvanized shiny surfaces including the tower, ice bridges, antennae support structures, and chain link fencing would be painted dark green or treated with a product called Natina Steel to mitigate shiny reflective surfaces on the tower and chain link fence. Natina Steel (a.k.a. galvanized metal stain) is used to create a rustic brown finish on galvanized surfaces that will not fade, crack, or peel over time from sun exposure. Typical pigment based colorants (i.e., paint and/or powder coating) fade, crack, and start to peel within only a few years. Natina Steel reacts with the zinc in galvanized metal and quickly (over 1 to 3 weeks depending on sunlight and heat intensity) creates a natural rustic brown patina to better blend galvanized surfaces/structures into surrounding terrains.

- The proposed tower is limited to 125 feet AGL. This reduces the amount of tower above the tree canopy and thereby limits the locations where the tower can be seen in the immediate area of the tower, eliminates all or most long distance views of the tower, and eliminates the need for lighting required by the FAA. An FAA "Determination of no Hazard to Air Navigation" was made and received by DW Tower on April 23, 2013 verifying there would be no need for lights or other mitigation if the towers remain at or below the proposed heights.

- All microwave dishes and antennae would be painted a dark green color that matches the color of the forest canopy.

- The equipment shelters and compound would only have switch activated outdoor lighting that would be used only when necessary to perform emergency repairs or maintenance.

- The equipment shelter and propane tanks would be painted Forest Service (FS) dark brown. This color has been used by the FS on signs and buildings and blends in with the forest background well.

- The proposed location is, for the most part, screened from views from FR 343 and the areas of concern by existing tree cover and vegetation. The proposed tower is located approximately 350 feet northeast of FR 343.

### 2.5.1.2 Grandview Project Design Features

- The proposed tower height would be limited to 120 feet or less, limiting the portion of the tower that would be silhouetted above the surrounding tree canopy in potential views from SR 64 and GCNP. The proposed Grandview tower could be visible from

three viewpoints along SR 64 inside GCNP. The effects of tower visibility at these points are discussed in detail in the Visual Effects Analysis, Chapter 3, and Appendix A.

In addition, towers will not require lighting by the FAA. (FAA "Determination of No Hazard to air navigation" dated 10/28/14, verifying there would be no need for tower lights).

- All galvanized shiny surfaces including the tower, ice bridges, antennae support structures, and chain link fencing would be treated with a product called Natina Steel to mitigate shiny reflective surfaces on the tower and chain link fence. Natina Steel (a.k.a. galvanized metal stain) is used to create a rustic brown finish on galvanized surfaces that will not fade, crack, or peel over time from sun exposure.

- All microwave dishes and antennae would be painted a dark green color that matches the color of the forest canopy.

- The equipment shelters and propane tanks would be painted FS dark brown. This color blends in well with the forest background and has been used successfully many times on tower sites on National Forest System lands.

- To address dark sky concerns the equipment shelters and compound would only have shielded switch activated outdoor lighting that would be used only when necessary to perform emergency repairs or maintenance.

- The tower would be located approximately 380 feet west of FR 310 where trees will block views from FR 310. The proposed location mitigates visual concerns associated with FR 310 and areas east of FR 310 (Coconino Rim Roadless Area) that are designated "Distinctive" scenic attractiveness, and "Special Scenic Areas" under the Scenery Management System. The proposed location is in a small clearing approximately 380 feet south and west of FR 310 surrounded by variably aged ponderosa pine and juniper trees. The trees visually screen the facility and tower from views from FR 310.

- The tower would be located approximately 1600 feet northwest of the Grandview Lookout facility and Arizona National Scenic Trail (see Figure 1.6). The proposed location mitigates visual concerns associated with the Coconino Rim Roadless Area, the Arizona Trail, Grandview Trailhead and the historic Grandview cabin and lookout. The proposed tower location takes advantage of tree screening to limit potential views of the tower from the Grandview Lookout and cabin area, the trailhead, and from the Arizona National Scenic Trail west of Grandview. The communications tower would be visible from the top of the Grandview lookout tower, but not from ground level.

- A common microwave system would be required at the Grandview Communications Site to reduce the number of dishes on the tower, thereby reducing the size of the tower and visual impacts. All wireless carriers must connect their cell sites to the landline telephone system (backhaul) in order for calls from subscribers to be directed to their destination. The only option for backhaul at Grandview is via microwave. Each

wireless carrier must have microwave connectivity in order to provide wireless service from the proposed Grandview Tower. If a common microwave system is used the carriers can use a single microwave dish four to six feet in diameter for transmission and reception of backhaul signals. If a common microwave system isn't used each carrier would have to have two dishes each for their system resulting in eight dishes (if four carriers are located on the tower) that would need to be placed on the tower. If a common microwave system is used the four carriers could have connectivity by using only two microwave dishes. Multiple microwave dishes increase the tower provile and visual impacts.

### 2.5.2 Stipulations for Access Road Use for the Skinner Ridge Site

Stipulations: The lease holder would implement the following mitigation measures as part of any KNF authorization for use of FR 302, FR 343, and FR 343G.

a) The lease holder would participate with the Forest Service, commensurate with use, in road maintenance activities in accordance with KNF standards to that portion of FR 302 and FR 343 that is used for communications site access. The lease holder would remedy any road damage caused by site construction or tenant access.

b) The lease holder would maintain the 340 linear feet of FR 343G needed for access and the 100 foot long driveway in accordance with FS Southwestern Region 3 minimum standards for a single lane 12 foot wide fair weather road.

c) In general, the FR 343G and the driveway would be re-shaped so that the centerline is crowned. The blading would proceed in an orderly fashion by successive passes with a grader parallel to the road centerline, progressing from the lower side to the upper side of the roadway and back across. In the process, all ruts shall be filled and a crown formed on the roadway creating a 12 foot wide travel surface.

d) The lease holder would not anticipate needing to perform regular snowplowing and therefore does not propose to upgrade FR 343G to all weather standards or improve FR 302 and FR 343. If snowplowing is necessary because of an emergency repair situation, the KNF will be contacted and a case specific permit will be obtained from KNF by the lease holder.

e) The lease holder would be responsible for repairing any road damage to FR 302, FR 343, or FR 343G resulting from emergency snowplowing or wet weather site access by the lease holder or tenants.

f) The lease holder would contact KNF whenever winter access is needed for emergency maintenance. If the roads are snow free and firm, access will be via wheeled vehicles. If the roads are closed because of snow cover, access will be by over-snow vehicles only.

g) The lease holder would install a gate in accordance with Forest Service specifications on FR 343G near the FR 343 if determined to be desirable by the Forest Service.

### 2.5.3 Stipulations for Access Road Use for Grandview Site

Stipulations: The lease holder proposes and is committed to implementing the following mitigation measures as part of any KNF authorization for use of FR 310 and FR 310F.

a) The lease holder would participate with the Forest Service, commensurate with use, in road maintenance activities to that portion of FR 310 that is used for communications site access. The lease holder would remedy any road damage caused by site construction or tenant access.

b) The lease holder would reconstruct and extend FR 310F by blading and installing drainage features; and by adding road surfacing material where needed to ensure a firm and stable travel way. In general, FR 310F would be re-shaped so that the centerline is crowned. The blading would proceed in an orderly fashion by successive passes with a grader parallel to the road centerline, progressing from the lower side to the upper side of the roadway and back across. In the process, all ruts would be filled and a crown formed on the roadway.

c) The lease holder would maintain FR 310F to FS Southwestern Region 3 minimum standards for a single lane fair weather road.

d) The lease holder does not anticipate needing to perform regular snowplowing and therefore does not propose to upgrade the roads to all weather standards. If snowplowing is necessary because of an emergency repair situation, the KNF will be contacted and a case specific permit will be obtained by the lease holder.

e) The lease holder will be responsible for repairing any road damage resulting from emergency snowplowing to access the communications site.

f) The lease holder will contact KNF and GCNP whenever vehicular winter access is needed for emergency maintenance. If the roads are snow free and firm, access will be via wheeled vehicles. If the roads are closed because of snow cover, access will be by over-snow vehicles only.

g) h. The lease holder will install a gate in accordance with Forest Service specifications on FR 310F at the intersection of FR 310 if determined to be desirable by the Forest Service.

### 2.5.4 Project Design Features that Reduce Impacts to Wildlife

**Skinner Ridge and Grandview Design Features**

- Neither of the proposed communications sites is located within a designated goshawk post-fledging family area.
- The lease holder would monitor the construction site for goshawks. If a goshawk is seen it will be reported to KNF and appropriate measures will be stipulated by KNF and applied to construction activities.
- Tower design would incorporate features (no guy wires or lights) to minimize the risk of accidental collision into the tower by birds.

- The project will implement the following conservation measures for condors:

    1. At least one week prior to the beginning of any human project-related activity, a KNF biologist will contact the Peregrine Fund to identify condor locations and type of behavior or activity in or near the activity area. If multiple activities are undertaken within a similar timeframe, condor activity will be monitored by a biologist during that period. Educate all crews about the potential for condors to arrive on-site, and the appropriate actions to take. The lease holder would provide a qualified biologist to perform these tasks if approved by KNF.
    2. The need to alter implementation schedules, adjust work areas, or take other appropriate action will be evaluated by a forest biologist and applied when condor nesting near a project site becomes an issue, on a case-by-case basis. The important factor is rapid notification to avoid condor or human injury, and appropriate steps to allow project continuation without interfering with condor behavior.
    3. To prevent water contamination and potential condor poisoning, the district-approved vehicle fluid-leakage and spill plan will be adhered to. The plan will be reviewed by the district biologist for adequacy in addressing condors.
    4. If condors arrive and remain in, or very near, human activity areas, the following actions will be taken:

        Elevate the awareness of crews working in the area of the potential for condors to visit an area.

        Educate crews working in the area of potential visitation by condors and how to respond.

        Project workers and supervisors will be instructed to avoid interaction with condors and to contact the appropriate personnel immediately if and when condor(s) occur at a project site.

        If a condor occurs at the project site, only federally permitted personnel will employ techniques to cause the condor to leave the site as necessary. The particular project activity will temporarily cease if injury of a condor is imminent until a biologist can assess the situation and determine the correct course of action.

        Project sites will be cleaned up at the end of each work day (i.e., trash disposed of, scrap materials picked up) to minimize the likelihood of condors visiting the site. District staff will complete a site visit to ensure adequate clean-up measures.
    5. A portion of the construction for the buried power line would occur on GCNP (1,650 feet). That portion of the project would require clearance and authorization by the NPS. Any design features or mitigation required for condors or other wildlife not addressed by Forest Service requirements would be included in NPS permitting and authorization. NPS would also be notified if there are sightings of wildlife that would require agency notification and/or that could affect wildlife resources on the GCNP.

### 2.5.5 Project Design Features that Reduce the Impacts of Noxious Weeds

**Skinner Ridge and Grandview Design Features**

- The lease holder will inventory and document noxious and invasive plant infestations before construction begins and report findings to the KNF.
- The lease holder will ensure that all construction equipment will be pressure washed to remove any soil or vegetative material before entering KNF lands
- The lease holder will inspect the roadway leading into the communication sites and communications area of disturbance annually during the growing season to detect establishment of invasive species.
- The lease holder will remove any invasive/noxious weed species infestations from the lease area and surrounding area of disturbance that become established after construction by implementing a treatment plan developed by the lease holder and approved by KNF.
- The lease holder will monitor the site for invasive/noxious weeds for 2 years following construction.
- For the portion of the buried power line project that would occur on GCNP (1,650 feet), applicable design features, mitigation, and onsite monitoring requirements would be stipulated through the NPS authorization, clearance and permitting process.

## 2.6 COMPARISON OF ALTERNATIVES

This section provides a comparison of the effects of the alternatives. Information in Table 2.1 is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively.

**Table 2.1 – Comparison of Alternatives.**

| Topic | No Action Alternative 1 | Proposed Action Alternative 2 | 110 foot Monopole Tree Tower Alternative 3 | 120 foot Lattice/Monopole Tower Alternative 4 |
|---|---|---|---|---|
| **ISSUES** | | | | |
| **Issue 1: Scenery – Scenery Management System (SMS) Objectives, Scenic Attractiveness**<br>Scenery Forest Plan Objectives may be compromised by development of communication facilities at the Grandview and Skinner Ridge Communications Sites | | | | |
| **Skinner Ridge Communications Site** | There would be no effects on SMS objectives for Scenic Attractiveness as no towers or associated infrastructure would be approved or constructed at the communication sites. | SMS objectives for Scenic Attractiveness Category – Typical are maintained for the overall landscape and the minor deviation created by the proposed tower would be within tolerance for the category. | Not Applicable – There are no changes to the Skinner Ridge Tower in Alternative 3. | Not Applicable - There are no changes to the Skinner Ridge Tower in Alternative 4. |
| **Grandview Communications Site** | There would be no effects on SMS objectives for Scenic Attractiveness as no towers or associated infrastructure would be approved or constructed at the communication sites. | Meets SMS objectives for Scenic Attractiveness Category of Typical. The proposed location mitigates visual concerns associated with FR 310 and areas east of FR 310 (Coconino Rim Roadless Area) that are designated "Distinctive" scenic attractiveness, and "Special Scenic Areas" in the Scenery Management System by locating the tower in an area classified as SMS Scenic Attractiveness Category of Typical. | Meets objectives for SMS Scenic Attractiveness Category of Typical. Same as Alt 2 except the use of a simulated pine tree tower helps it blend in better with the surrounding vegetation from most views. The characteristic landscape deviation created by the tree tower would be less than Alternatives 2 or 4 from close-up viewpoints (Photo Points (PP) 4, 5, 6). The visual effects as seen from PP 1, 2, 3, and 7 would be less than Alternative 2 and 4 because the line, color, form, and texture of the simulated tree is more consistent with the surrounding tree canopy. | Meets objectives for SMS Scenic Attractiveness Category of Typical. Slightly more effect than Alternatives 2 and 3 in close-up views due to the additional height of the tower and wider profile. In long distance views from GCNP, the lattice tower appears least visible of the alternatives because of the open nature of the lattice tower and effects of light refraction. |

**Table 2.1 – Comparison of Alternatives.**

| Topic | No Action Alternative 1 | Proposed Action Alternative 2 | 110 foot Monopole Tree Tower Alternative 3 | 120 foot Lattice/Monopole Tower Alternative 4 |
|---|---|---|---|---|
| **Issue 2 - Scenery – Scenery Management System (SMS) Objectives - Landscape Visibility Foreground – Concern Level Moderate** | | | | |
| **Skinner Ridge Communications Site** | There would be no effects on SMS objectives for Landscape Visability as no towers or associated infrastructure would be approved or constructed at the proposed communications site. | SMS objectives for Landscape Visibility Category–Foreground Concern Level Moderate are maintained for the overall landscape; the minor deviation created by the proposed tower would be within tolerance for the category. | Not Applicable – There are no changes to the Skinner Ridge Tower in Alternative 3. | Not Applicable - There are no changes to the Skinner Ridge Tower in Alternative 4. |
| **Grandview Communications Site** | There would be no effects on SMS objectives for Landscape Visibility as no towers or associated infrastructure would be approved or constructed at the proposed communications site. | Meets SMS objectives for Landscape Visibility Moderate classification. The proposed location mitigates visual concerns with foreground concern levels. The proposed tower is located in an area classified as Foreground Concern Level Moderate which allows for sight deviations to the landscape. | Meets objectives for the SMS Landscape Visibility Moderate classification. Simulated ponderosa pine tree tower blends in with surrounding vegetation; the visual deviation created by the tower would be less than Alternatives 2 or 4 from close-up viewpoints. Effects from long distance views are less than Alternative 2, and similar to Alternative 4 because of the greater mass of the tower profile. | Meets objectives for the SMS Landscape Visibility Moderate classification. More effect than Alt 2 and 3 in close-up views due to less blending with the surrounding tree vegetation. Lattice tower may be less evident from long distance views from GCNP. |

**Table 2.1 – Comparison of Alternatives.**

| Topic | No Action Alternative 1 | Proposed Action Alternative 2 | 110 foot Monopole Tree Tower Alternative 3 | 120 foot Lattice/Monopole Tower Alternative 4 |
|---|---|---|---|---|
| **Issue 3** Highway Corridor Scenic Integrity Objectives (SIO) at Grandview and at Skinner ridge are high. | | | | |
| **Skinner Ridge Communications Site** | There would be no effects on SMS SIO's as no towers or associated infrastructure would be approved or constructed. | Represents minor deviations to the landscape. Visually subordinate because of the scale of the project and that the tower would only be visible from 3 locations on FR 343. Some amount of visual impact is inherent and planned with communications site forest plan identifications. | Not Applicable – There are no changes to the Skinner Ridge Tower in Alternative 3. | Not Applicable - There are no changes to the Skinner Ridge Tower in Alternative 4. |
| **Grandview Communications Site** | There would be no effects on SMS SIO's as no towers or associated infrastructure would be approved or constructed. | Represents minor deviations to the landscape. The strategic location, using tree screening when viewed from FR 310, limits potential views and mitigates SIO goal concerns. Some amount of visual deviation is inherent with a communications tower located at an identified communications site. Alt 2 is consistent with Kaibab Forest Plan SIO objectives due to the use of mitigation measures to minimize visual impacts such as restricted height, colors, strategic location, and because of Kaibab Forest Plan Communications Site identification. | Meets SIO goals. Represents the least visual impact overall of the alternatives because a simulated ponderosa pine tree tower is consistent with the form, line, color, and texture of the surrounding landscape and tree canopy. Mitigation measures to minimize visual impacts include restricted height, colors, strategic location, simulated tree tower. Kaibab Forest Plan Communications Site identifications make Alt. 3 consistent with SIO objectives for the area. | Creates the most visual deviation of the 3 alternatives in close-up views and less deviation in the landscape in long distance views from GCNP. Mitigation including restricted height, colors, strategic location; Kaibab Forest Plan Communications Site identifications allow Alt. 4 to maintain SIO objectives for the area. |

**Table 2.1 – Comparison of Alternatives.**

| Topic | No Action Alternative 1 | Proposed Action Alternative 2 | 110 foot Monopole Tree Tower Alternative 3 | 120 foot Lattice/Monopole Tower Alternative 4 |
|---|---|---|---|---|
| **Issue 4**<br>**Availability of wireless services – Grandview Communications Site**<br>Adequacy of service on the Grandview Tower is not sufficient on the 110 foot tall tower. A120 foot tall tower would improve service for an additional provider. | | | | |
| **Grandview Communications Site** | Does not meet purpose and need. Continued limited service along SR 64. | Grandview – Meets wireless service objectives. | Same as Alternative 2. | Best meets purpose and need by providing higher and more antenna positions for wireless carriers and other communications uses. |
| **Issue 5**<br>**Grand Canyon National Park – Grandview Communications Site**<br>Potential visual effects to Grand Canyon National Park from Grandview Tower | | | | |
| **Grandview Communications Site** | There would be no visual effects to GCNP as no towers would be built. | The 110 feet monopole tower is slightly less evident than the l20 foot tall lattice tower in Alternative 4 and the 110 foot tall monopole tree tower in long distance views from GCNP in Alternative 3. The monopole is somewhat consistent with the form and texture of the foreground and background vegetation. | Less evident to the casual observer than Alternative 2 and Alternative 4. A tree tower is consistent with the form, line, color, and texture of the foreground and background tree canopy in views from GCNP, making it blend with the landscape the best of the 3 action alternatives. | Least evident in long distance views from GCNP due to narrower or smaller tower components (legs, cross braces) with open spaces between and the greater effects of light refraction on those smaller components. The least consistent alternative in regards to form, line, color, and texture of the surrounding landscape. |
| **RESOURCES** | | | | |
| **Cultural Resources Grandview Communications Site**<br>a) Effects to historic Grandview Lookout Tower<br>b) Effects to historic Grandview Cabin<br>c) Effects to Red Butte TCP | There would be no visual effects to the Grandview Lookout Tower, Cabin or Red Butte TCP, as no towers would be built | Visual effects to the Grandview Tower and Cabin are slight and not substantial. Views of the towers from these sites at ground level are obscured by vegetation and there is no effect. The towers can be seen from the top of the steps and catwalk of the Grandview Lookout Tower. The deviation from this view is about the same as the tower | The 110 foot tall tree tower makes the least deviation from these features. From ground level there is no effect because the towers are hid from view by trees and vegetation. In the one view where the tower is evident, from the top of the Grandview Lookout Tower, this alternative creates the least deviation and blends best with the form, color, and texture of the larger landscape of the | This tower is similar to Alternative 2, with no discernable difference at ground level viewing. It would create the most deviation in the view from the top of the stairs of the Grandview Lookout Tower. Minor effect, no adverse effect. |

**Table 2.1 – Comparison of Alternatives.**

| Topic | No Action Alternative 1 | Proposed Action Alternative 2 | 110 foot Monopole Tree Tower Alternative 3 | 120 foot Lattice/Monopole Tower Alternative 4 |
|---|---|---|---|---|
| d) Effects to East Rim Drive and Desert View Drive Cultural Landscapes. | | in Alternative 4 and more than the tree tower in Alternative 3. Minor effect, no adverse effect.<br><br>There is no effect to the Red Butte TCP as the towers are too distant to be discernable from the surrounding tree vegetation.<br><br>There would be minor to negligible effects to the Cultural Landscape at the East Rim Drive and Desert View Drive Cultural Landscapes because of topography, distance and forest tree canopy that block most potential views of the proposed tower. | three alternatives. Minor effect, no adverse effect.<br><br>There is no effect to the Red Butte TCP as the towers are too distant to be detectable from the surrounding trees and vegetation.<br><br>There would be minor to negligible effects to the Cultural Landscape at the East Rim Drive and Desert View Drive Cultural Landscapes because of topography, distance and forest tree canopy that block most potential views of the proposed tower. | There is no effect to the Red Butte TCP as the towers are too distant to be detectable from the surrounding tree vegetation.<br><br>This alternative has the lowest, long distance visual impact as infrastructure recedes into the background reducing adverse effects at Grand Canyon overlooks along SR 64 (Est Rim Drive/Desert view Drive Cultural Landscape Areas.) |
| **Recreation**<br>Scenic Trails<br>Effects to the Arizona National Scenic Trail | There would be no visual effects to the trail, as no towers would be built | The tower would only be visible in one location on the trail for a short duration for a typical hiker or mountain biker. This location is where a forest fire has removed trees along a short section of trail. This is the only place the tower can be viewed from the trail. This view is at a 90˚ angle to the trail and can easily go unnoticed.<br><br>Visual effects to the trail would be minor, not substantial, and any views of the tower from the trail would be partial and of short duration. | The tower would only be visible in one location on the trail for a short duration for a typical hiker or mountain biker. The simulated tree tower causes the least effect to the trail because the simulated tree is consistent with the form, line, color, and texture of the surrounding tree canopy in comparison to Alternatives 2 and 4. The tree tower blends more with the surroundings than the monopole and lattice towers. The casual observer on the trail would likely not notice the simulated tower proposed under Alt. 3. | The tower would only be visible in one location on the trail for a short duration for a typical hiker or mountain biker. The taller lattice tower is slightly more noticeable than the 110 monopole and more noticeable than the simulated tree tower. |

**Table 2.1 – Comparison of Alternatives.**

| Topic | No Action Alternative 1 | Proposed Action Alternative 2 | 110 foot Monopole Tree Tower Alternative 3 | 120 foot Lattice/Monopole Tower Alternative 4 |
|---|---|---|---|---|
| | | There would be short term disturbance effects to recreationist due to construction noise and increased human presence for the 8 to 10 weeks of site installation. There would be generator noise for five minutes once each month for equipment testing. Because the generators are located inside the equipment building the noise is muted and would only be discernable for no more than a few hundred feet. Disturbance effects to recreationists would be negligible. | | |
| **Effects to the Coconino Rim Roadless Area** | There would be no visual effects to the Coconino Rim Roadless Area, as no towers would be built | No effect, - the towers would not be seen from the Coconino Rim | Same as Alternative 2 | Same as Alternative 2 |
| **Wildlife** | None | Minor and short term disturbance effects from the eight to ten weeks of construction noise. Long term, there would be generator noise for five minutes once each month for equipment testing. Because the generators are located inside the equipment building the noise is muted and would only be discernable for no more than a few hundred feet. Disturbance effects to wildlife would be negligible. | Same as Alt 2 | Same as Alt 2 |
| **Soil** | None | Disturbance on 0.7 acres | Same as Alt 2 | Same as Alt 2 |

# 3.0 CHAPTER 3 – ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for the comparison of the action alternatives, along with the No Action Alternative, as presented in the table above. The differences between action alternatives are the differing tower types and heights at the Grandview Communications Site. Activities proposed for the Skinner Ridge Site are the same in Alternatives 2, 3 and 4. No Action, Alternative 1, is the current condition and is the baseline for the analysis. Environmental Consequences of the No Action Alternative are only displayed when there would be a consequence.

## 3.1 VISUAL QUALITY

The KNF Recreation Opportunity Spectrum and Scenery Management System Guidebook was used address potential visual impacts resulting from construction of the proposed towers (Project Record). The Scenery Management System (SMS) is a system for the inventory and analysis of the aesthetic values of National Forest System lands. It combines elements of the landscape character (natural features), landscape visibility (the human values of the relative importance of scenery and sensitivity based on distance from an observer), and constituent information about the meaning people give to the identified landscape. It provides a way to analyze the impacts of management activities on forest scenery.

The Visual Simulations at both the proposed Skinner Ridge and proposed Grandview Communications Sites were analyzed using the SMS landscape character elements (Landscape Character, Scenic Attractiveness, Landscape Visibility, and Constituent Information/Scenic Integrity Objectives). The visual analysis, including photo points and tower simulations for both the Skinner Ridge Communications Site and Granview Communications Site is included here and in the project record. In addition, Appendix A has been included for the Grandview Communications Site and contains the detailed photo simulations from the seven viewpoints by alternative, used for this analysis.

### 3.1.1 Affected Environment – SR 64 Corridor

The landscape character along the SR 64 corridor is represented by pinyon-juniper woodland/ sagebrush north of Valle, Arizona, changing to ponderosa pine to the north approaching and inside GCNP. Red Butte is the most distinctive landmark visible when traveling north on SR 64 from Valle. The Grand Canyon, a World Heritage Site, is the most distinctive landmark when traveling east/west along SR 64 inside the Park.

The segment of SR 64 most affected by the project is the portion inside GCNP. Scenery management goals and any effects to Grand Canyon relative to its designation as a World Heritage Site will be considered in this analysis under cumulative effects.

**Scenic Attractiveness** – The majority of the Tusayan Ranger District has been classified with a scenic attractiveness of "B – Typical" including the areas where the proposed towers would be located. Red Butte and the Coconino Rim Area are exceptions and are classified "A – Distinctive." Figure 3.1 illustrates the scenic attractiveness levels for the area.

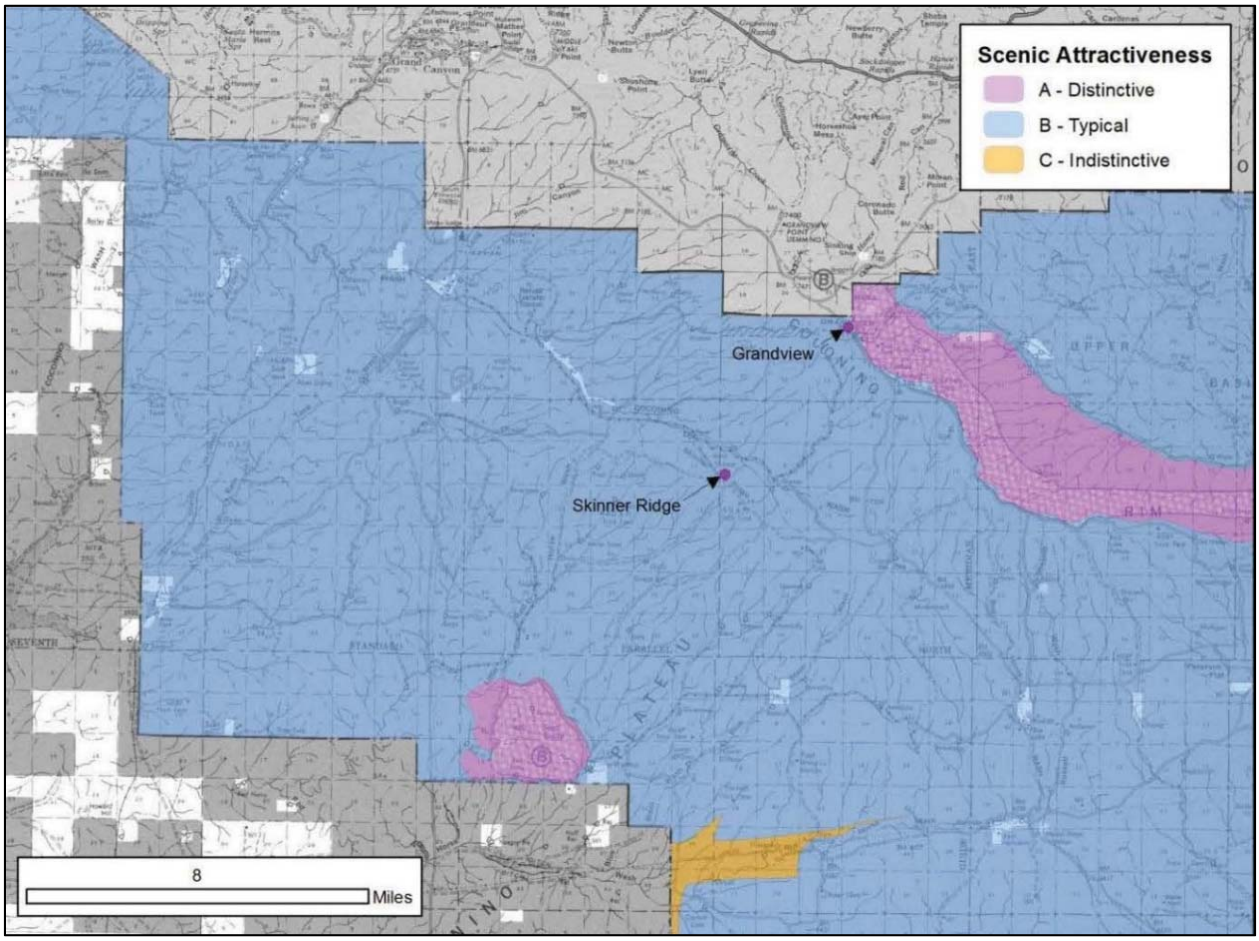


**Figure 3.1 – Scenic Attractiveness. Note: Proposed Grandview Tower is located East of FA 310 in "Typical" Scenic Attractiveness.**

**Landscape Visibility** – SR 64/180 is the primary means for travel to Grand Canyon National Park. The concern level for visibility is Foreground - moderate, except at the Red Butte and Coconino Rim area near the Grandview Site where it is Special Scenic – high, as shown on Figure 3.2.

**Scenic Integrity Objective –** The district highways and major forest roads have been classified by Scenic Integrity Objectives (SIO's). The SIO in the area of both communication sites is "High" (Figure 3.3).

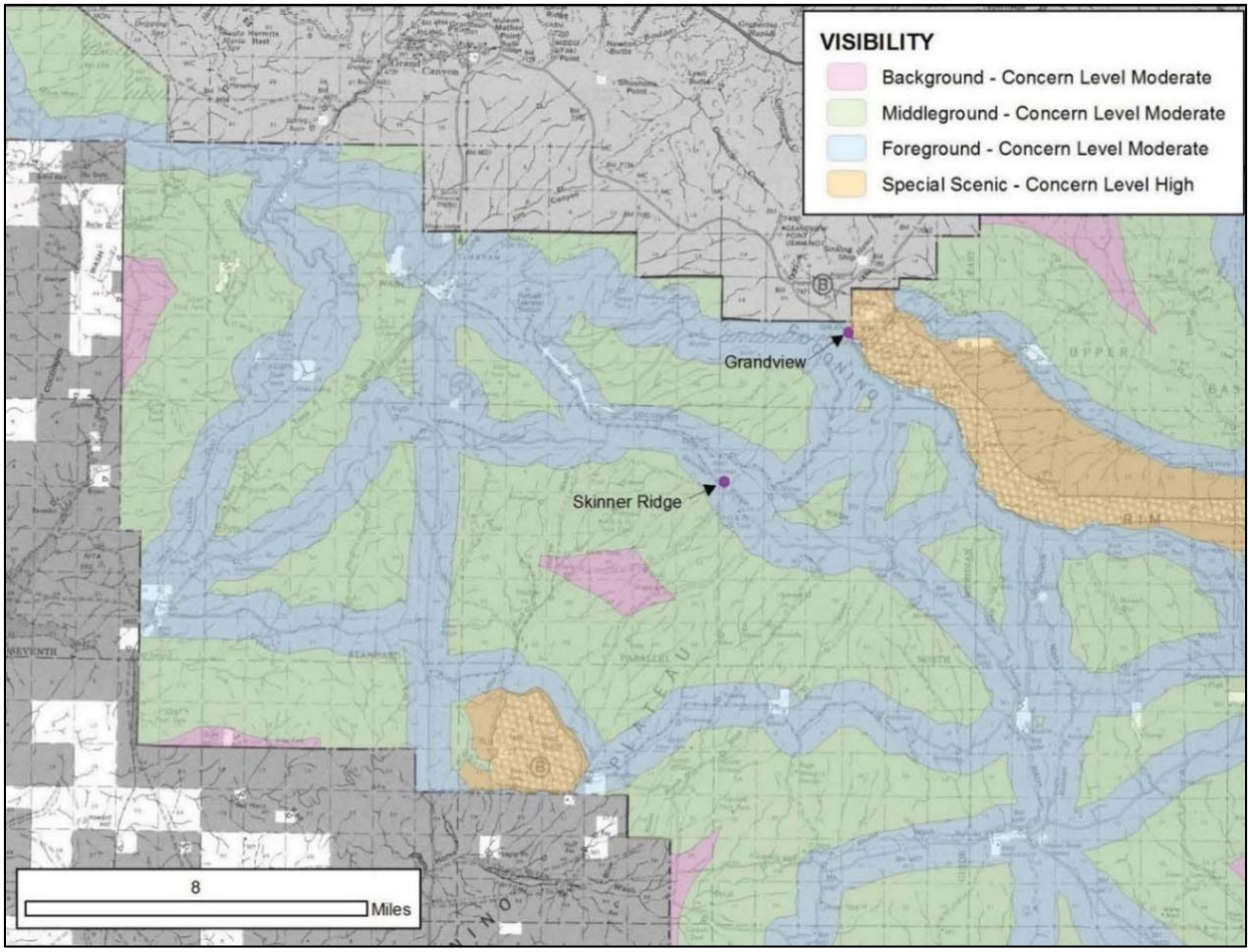


**Figure 3.2 – Landscape Visibility. Grandview Tower is located in Foreground – Concern Level Moderate**

**Red Butte** – Red Butte is a unique geological formation of the Coconino Plateau in northern Arizona. The top of Red Butte provides an excellent 360° view of the surrounding area, including the San Francisco Peaks. The Red Butte Trail (Trail 37) is part of the developed forest trail system of the Kaibab National Forest. It climbs from 6,460 ft. elevation at the trailhead to 7,326 ft. elevation on top of Red Butte. Red Butte is culturally important to many local tribes and plays a part in ceremonial traditions. In 2010, Red Butte was determined eligible to the National Register of Historic Places as a Traditional Cultural Property (TCP) due to its ongoing and historic cultural significance to area tribes. It is a Management Area in the Forest Plan where the desired condition is that the "environment is essentially unmodified. Naturally occurring scenery dominated the landscape."

**Sensitive Resources** – The Grandview site is near several important scenic and culturally important features including the Coconino Rim Roadless Area, Arizona National Recreation Trail, and the Grandview Lookout Tower and Cabin. The Lookout Tower and Cabin are both on the National Register of Historic Places. And, just north off the Forest, the Grandview site is near the Grand Canyon, a National World Heritage Site.

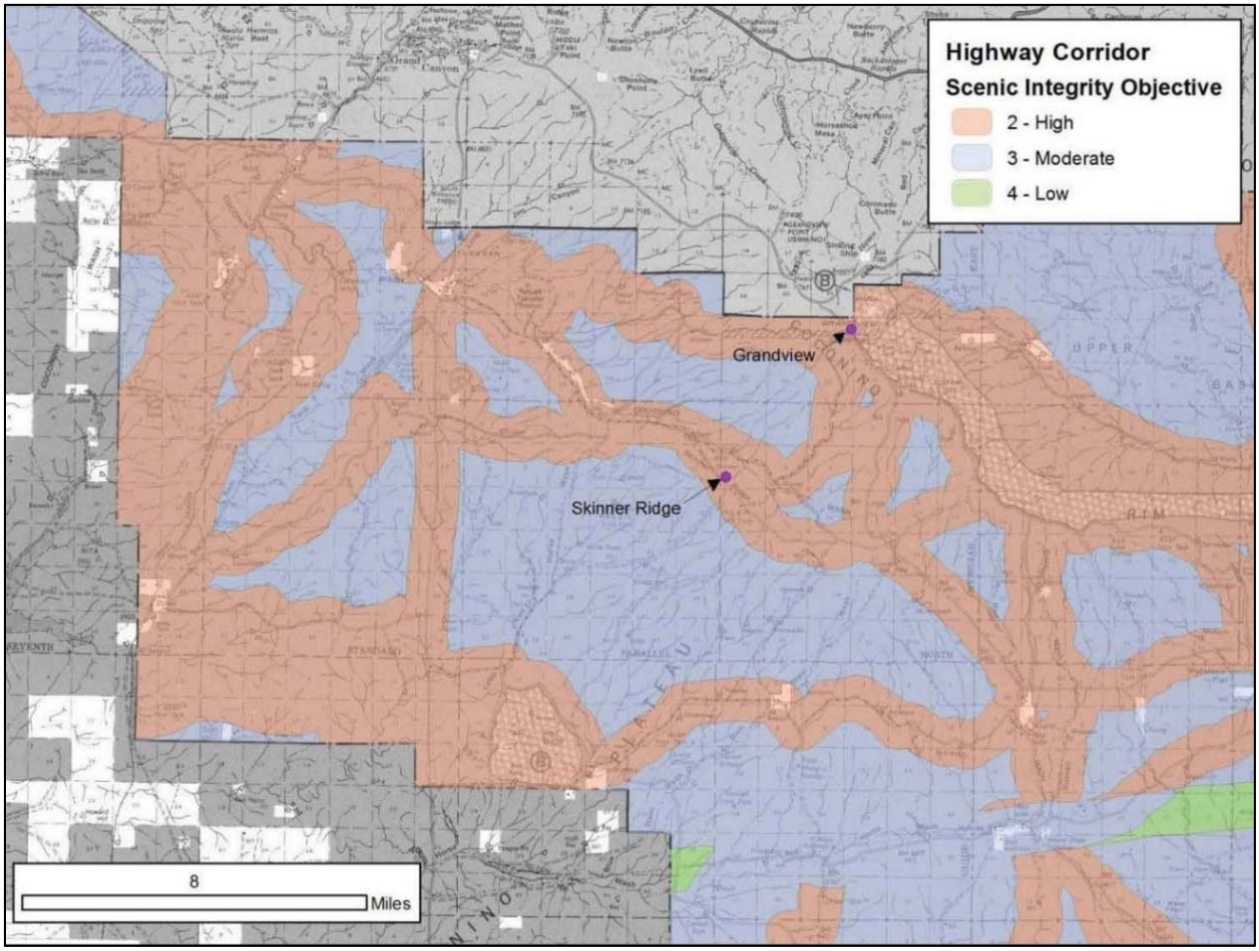


**Figure 3.3 – Scenic Integrity Objective.**

## 3.1.2 Environmental Consequences

### 3.1.2.1 Skinner Ridge Communications Site

#### Visual Analysis/Photo Simulation Methodology

The following methods were used to develop photo simulations:

- Visual simulations depicting the proposed tower were created by taking pictures of helium balloons tethered to a string 135 feet long over the proposed tower location for height and location reference. Helium balloons were flown over the site on June 6, 2014 using two 3 foot diameter red balloons.
- Areas of concern were visited to see if the balloon was visible. Those areas included SR 64 corridor from Valle to Tusayan through GCNP to Desert View, West Rim Drive GCNP, the Arizona National Scenic Trail, the top of Red Butte, and forest roads in the area (FR 343, FR 310). The Arizona National Scenic Trail (Trail 101) was walked from a point one mile south of Grandview Lookout to a point one mile west of Grandview Lookout to determine if the balloons were visible. The Red

Butte Trail (Trail 37) was also walked to the top of Red Butte. The balloons at the proposed Skinner Ridge site could only be seen from three locations on FR 343. Photographs were taken at the three viewpoints where the balloons could be seen as follows (see Figure 3.4):

Photo Point 1 - Photograph taken on KNF, FR 343 – Looking north.
Photo Point 2 - Photograph taken on KNF, FR 343 – Looking northeast.
Photo Point 3 - Photograph taken on KNF, FR 343 – Looking southeast

- Height of the balloons in the photographs is 135 feet.
- Trees in the area of the proposed tower are generally about 50–60 feet tall.
- Visual simulations were created for a 125 foot tall four leg lattice tower (Appendix A).
- Simulations were created from three view points on FR 343 where the balloons could be seen to provide visual representation of the proposed tower in relation to the forest surroundings (Figure 3.4).

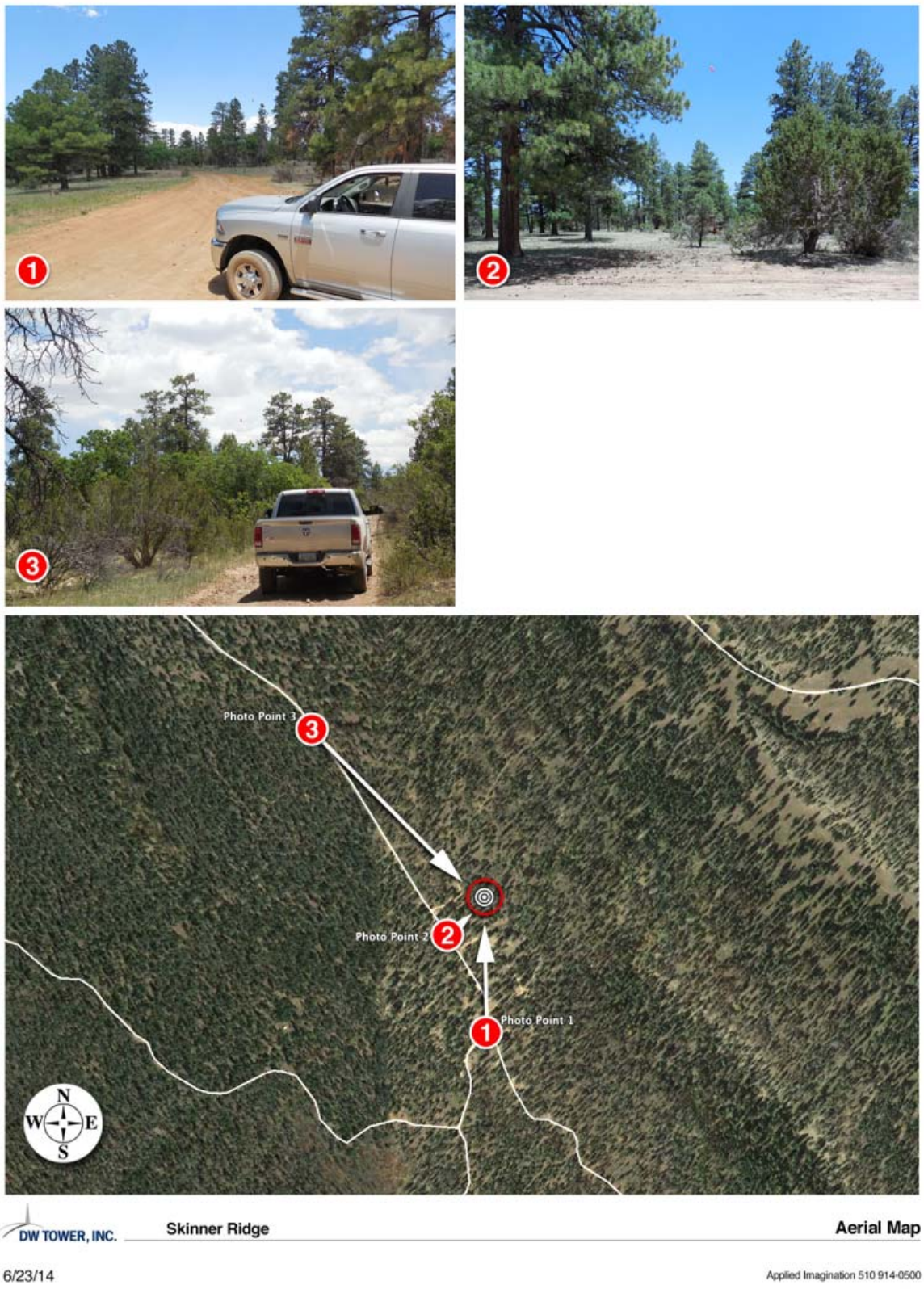


**Figure 3.4.a – Skinner Ridge Photo Point locations on FR 343.**


**Figure 3.4.b – FR 343 – Looking North.**


**Figure 3.4.c – FR 343 – Looking Northeast.**


**Figure 3.4.d – FR 343 – Looking Southeast.**

## Alternative 1 – No Action Alternative

Under the No Action Alternative no communication site facilities would be authorized. There would be no changes and therefore no direct or indirect effects to Visual Resources.

## Alternatives 2, 3 and 4

Visual impacts associated with the Skinner Ridge Communications Site are the same for all three action alternatives.

The analysis considers the following scenic management objectives from SMS is and summarized for the Skinner Ridge Site as follows:

**Landscape Character** – The proposed Skinner Ridge Tower is located on a flat ridge approximately 9 miles southeast of the Town of Tusayan on the north side of FR 343 in Section 7, T29N, R4E, Gila and Salt River Meridian, Coconino County, Arizona. Vegetation is composed of ponderosa pine, Gambel oak, scattered pinyon and juniper trees, and numerous cliff rose shrubs. Grand Canyon National Park is located approximately 4 miles to the north. The Proposed Skinner Ridge Tower location is a Kaibab Forest Plan identified communications site map.

- **Scenic Attractiveness** - The proposed Skinner Ridge Tower facility location on the north side of FR 343 places it in the SMS "Typical" Scenic Attractiveness category (see Figure 3.1).
- **Visibility** - The location is within an SMS category of - Landscape - "Foreground - Moderate Concern Level" (see Figure 3.2).
- **Constituent Information/Scenic Integrity** – Skinner Ridge is in a "High" Highway Corridor Scenic Integrity Objective (SIO) area. Areas of visual concerns include the Red Butte TCP, the Arizona National Scenic Trail, highway corridors and GCNP (see Figure 3.3).

**The summary of visual analysis is as follows:**

**<u>Concern Area</u> – Forest Plan Scenery Management Effects**

Before and after photo comparisons were made at the only three locations that the proposed tower could be seen from FR 343 (Photo Views 1, 2 and 3). The tower would not be visible from any other highways or forest roads or areas of concern in KNF and GCNP. The tower is only partially evident in Photo Views 1, 2 and 3, and these views would be of short duration when traveling the road in a vehicle. FR 343 is an unmaintained lightly traveled forest road.

**Scenic Attractiveness Category – "Typical" –** The proposed tower would create a relatively small deviation to the "Typical" landscape, only being evident in three view points along the nearest Forest Road (FR 343). Views of the tower from two of the viewpoints (Views 1 and 3) are partially screened by trees allowing for only the top portion of the tower to be viewed and are only slightly evident due to screening from the natural

tree vegetation. The view from View 2 is more evident as much more of the full length of the tower is in view; however, for a typical traveler on the forest road the view is of short duration and at 90˚ to the road. Objectives for Scenic Attractiveness Category – Typical are maintained for the overall landscape and the minor deviation created by the proposed tower would be within tolerance for the category.

**Landscape Visibility - Foreground – Concern Level Moderate** - The Foreground "Concern Level Moderate" classification states: "The landscape appears slightly altered and noticeable deviations are visually subordinate to the landscape character."

Visual simulation results were similar to those described above at the three viewpoints. When considered in the context of the surrounding landscape, the scale of the tower and communications facility remains subordinate as directed by the Kaibab Forest Plan and will meet objectives for the Foreground "Moderate Concern Level" classification.

**Scenic Integrity Objective** – The proposed Skinner Ridge Tower is located in an area with a "High" Highway Corridor Scenic Integrity Objective (SIO). A "High" objective is described in the Kaibab Forest Plan as "The characteristic landscape appears intact, deviations may be present, but must repeat form, line color, texture, and pattern common to the landscape so completely and at such a scale that they are not evident."

The characteristic landscape of the Skinner Ridge area would continue to appear intact under the proposed Skinner Ridge tower. Because the scale of the project (0.35 acres) is very small when compared to the scale of the characteristic landscape included in the SIO category, the proposed Skinner Ridge Tower could be considered to meet scenic integrity objectives for the area. In addition, on FR 343 the proposed tower would only be seen between gaps in the tree canopy from three locations. The tower would not be visible from FR 302 or any other highways or forest roads or areas of concern. The tower is only partially evident in Photo Views 1, 2 and 3 from locations on FR 343, and these views would be of short duration when traveling the road in a vehicle, which would be the most common observance. FR 343 is an unmaintained lightly traveled forest road.

To be consistent with Forest Plan visual objectives for "High" Scenic Integrity Objectives the visual impacts must be mitigated to the fullest extent possible while still meeting the purpose and need of the proposed facility.

**<u>Concern Area</u> – Visual Effects to SR 64 and Forest Road 343, FR302**

The flat topography, existing tree heights, and tree canopy density block any potential views of the proposed Skinner Ridge Tower from the SR 64 corridor, the Arizona National Scenic Trail, or from any other long distance vantage points on the KNF and GCNP. Forest Road 302 is the closest Forest Road with substantial traffic. The proposed tower would not be visible from any location on FR 302 because the tower would be screened from view by existing tree canopy and topography.

The proposed location is, for the most part, screened by existing tree cover and vegetation from FR 343 and the areas of concern. The proposed Skinner Ridge Tower is located approximately 350 feet northeast of FR 343 and is only visible from three specific locations.

The proposed tower would be seen through gaps in the trees at three locations on FR 343.

Treatment of shiny galvanized surfaces by using the Natina treatment would make the tower less noticeable from FR 343 and allow it to blend with the surrounding forest areas (See Visual Effects Mitigations, below).

**<u>Concern Area</u> – Visual Effects to the Red Butte TCP from the Skinner Ridge Tower Facilities**

Because of the distance between Red Butte and Skinner Ridge (7.7 miles) and because the view from Red Butte is looking down to Skinner Ridge, the proposed tower wouldnot be noticeable to the casual observer from Red Butte. When viewing Skinner Ridge from Red Butte, Coconino Rim provides a topographical backdrop behind the location of the proposed tower eliminating any potential silhouetted views of the tower from Red Butte (Figure 3.5). The proposed Skinner Ridge Tower wouldnot be visible to the casual observer and would not have adverse visual impacts to the view from Red Butte provided visual mitigation measures are implemented to eliminate any shiny reflective galvanized surfaces on the tower.

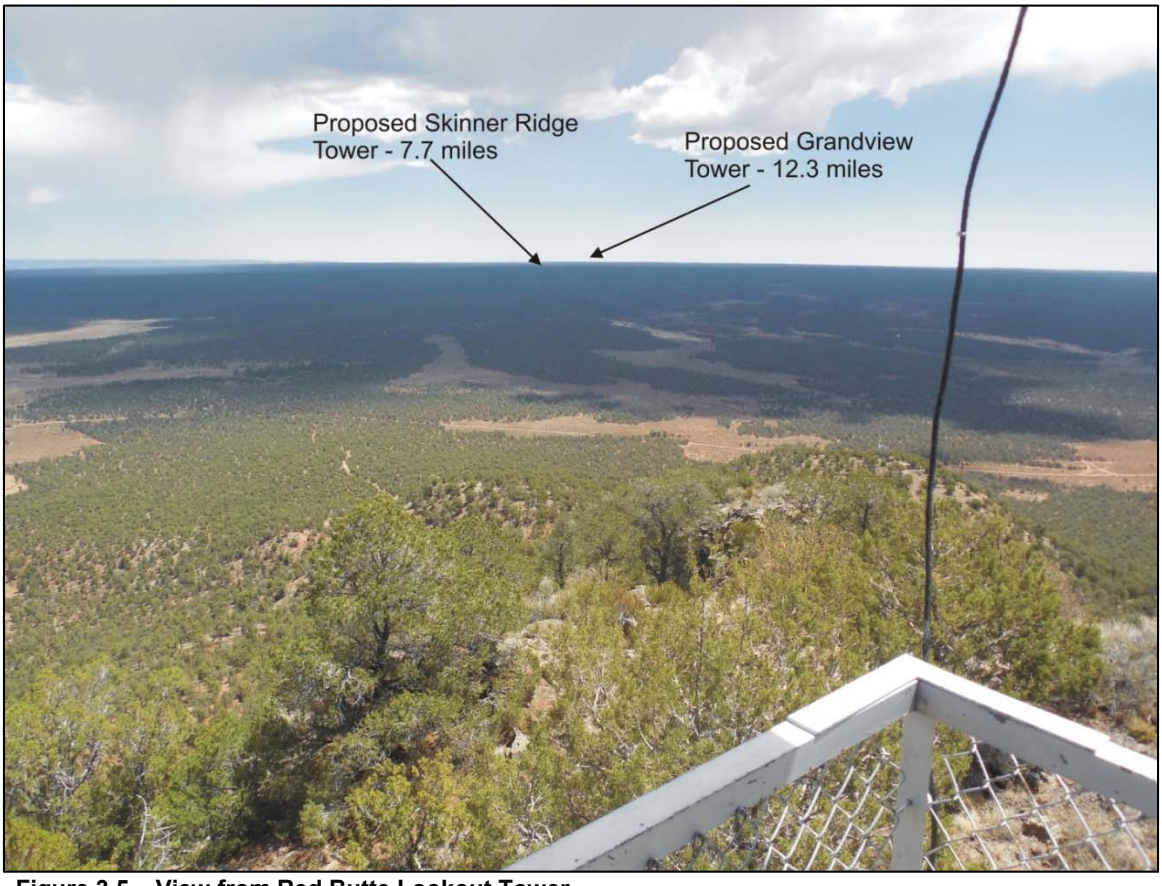


**Figure 3.5 – View from Red Butte Lookout Tower.**

The photograph above shows the distance to the proposed tower. The proposed Skinner Ridge Tower would likely not be visible with the naked eye because of the distance and because Coconino Rim provides a topographical backdrop making it blend with the forest canopy, provided the tower is painted and treated to eliminate all shiny reflective

galvanized surfaces. The proposed Skinner Ridge Tower would not be visible or noticeable to the casual observer from Red Butte.

**<u>Concern Area</u> – Potential Visual Impacts to the View from the West Rim Drive and Grand Canyon Village**

There are no views from the West Rim Drive or Grand Canyon Village where the Skinner Ridge Tower can be seen. Vegetation, distance, and topography negate any potential views of the tower from this area. The proposed Skinner Ridge tower is 15.25 miles southeast of Hopi Point. Potential views in the vicinity of Hermit's Rest would be even farther, in excess of 15 miles requiring optical enhancement. There would be no visual impacts to these areas of GCNP resulting from the proposed Skinner Ridge Tower.

**<u>Concern Area</u> – Potential Visual Impacts to the View from the North Rim and North Rim Village**

Because of the distance between the North Rim and South Rim, the proposed Skinner Ridge Tower would not be visible to the naked eye. In addition the view of the proposed towers from the North Rim would be looking down because of the elevation difference. The proposed Skinner Ridge Tower would have a back-drop of trees and topography when viewed from the North Rim eliminating silhouette views above the existing tree canopy. If the towers are painted a dark color or treated to eliminate shiny reflective surfaces it would blend into the background and would not be visible to the casual observer from the North Rim.

### 3.1.2.2 Grandview Communications Site

**Visual Analysis/Photo Simulation Methodology**

Visual simulations of the proposed tower alternatives were created by taking pictures of helium balloons floated over the proposed tower location for height and location reference. Helium balloons were flown over the site on June 6, 2014 using one 3 foot diameter and one 2 foot diameter balloon (Appendix A).

- Areas of concern listed in the prospectus were visited to see if the balloon was visible. Those areas included SR 64 corridor from Valle to Tusayan through GCNP to Desert View, the Arizona National Scenic Trail, the top of Red Butte, Desert View Watchtower in GCNP, West Rim Drive in GCNP, and forest roads in the area.

- The SR 64 corridor from GCNP South Rim Village to Desert View and FR 310 from the SR 64 junction south 4 miles was driven to see if the balloons were visible from GCNP. The Arizona National Scenic Trail (Trail 101) was walked from a point 1 mile south of Grandview Lookout to a point one mile west of Grandview Lookout to determine if the balloons were visible. The Red Butte Trail (Trail 37) was also walked to the top of Red Butte.

- Photo Points were identified and photographs were taken at six viewpoints where the balloons could be seen including a photo from the top of Grandview Lookout Tower. Photographs were also taken from the top of Red Butte and Grandview Point

inside of GCNP where the balloons could not be seen because of the distance and aspect (Figure 3.6a). Photographs were taken at the seven viewpoints where the balloons could be seen as follows:

Photo 1 - Photograph taken inside GCNP at Moran Point.
Photo 2 - Photograph taken inside GCNP on SR 64.
Photo 3 - Photograph taken inside GCNP on SR 64.
Photo 4 - Photograph taken on KNF, FR 310.
Photo 5 - Photograph taken on KNF from Arizona National Scenic Trail west of Grandview Lookout.
Photo 6 - Photograph taken on KNF from top of Grandview Lookout Tower.
Photo 7 - Photograph taken from Grandview Point inside GCNP

- Height of the balloons in the photographs is 115 feet.
- Grandview lookout is 80 feet tall and was also used for visual reference to verify balloon height and visual simulation accuracy.
- Trees in the area of the proposed tower are generally about 30–60 feet tall with the tallest near 65–70 feet.
- Visual simulations were created for three different tower types (Appendix A - monopole at 110 foot tall – Alternative 2; simulated monopole tree tower at 110 foot tall – Alternative 3; lattice at 120 foot tall – Alternative 4).

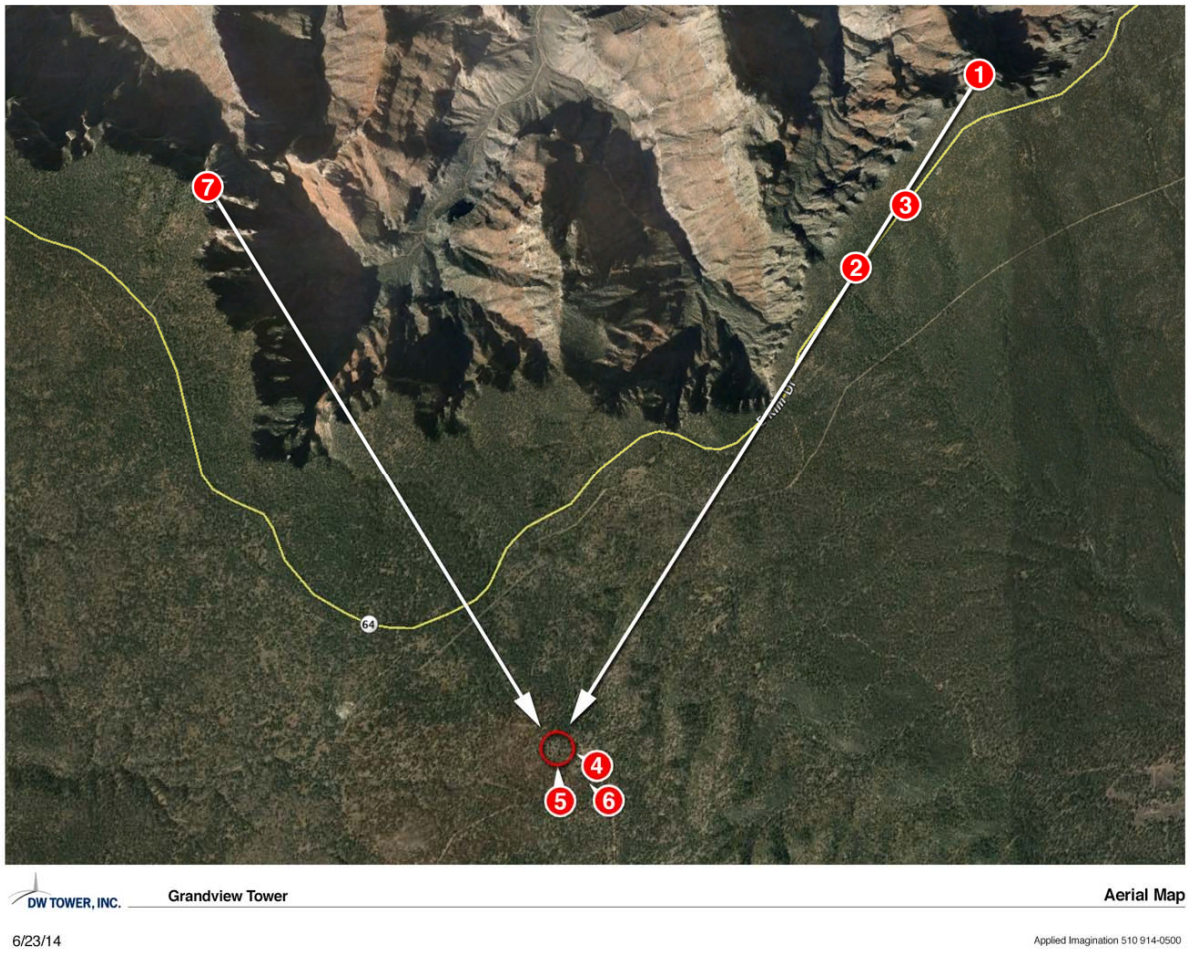


**Figure 3.6.a – Grandview Photo Point locations map.**

### Grandview Tower Alternatives Photo Simulations Comparison

The following photo simulations provide a side by side comparison of the different tower types proposed by Alternatives 2–4. Comparison photographs taken are from viewpoints 1 – 6. Specific photo's for the seven photo points by alternative are located in Appendix A – Grandview Photo Simulations. The following summary of simulations depict, from left to right, Alternative 2 (110 feet monopole), Alternative 3 (110 feet simulated tree tower), and Alternative 4 (120 feet lattice tower) from the six photo points.


**Figure 3.6.b – View 1 (top three photos) taken from Photo Point 1 – Looking Southwest from Moran Point and View 2 (bottom three photos) taken from Photo Point 2 – Looking Southwest from SR 64.**


**Figure 3.6.c - View 3 (top three photos) taken from Photo Point 3 – Looking Southwest from SR 64 and View 4 (bottom three photos) taken from Photo Point 4 — Looking Northwest from FR 310.**

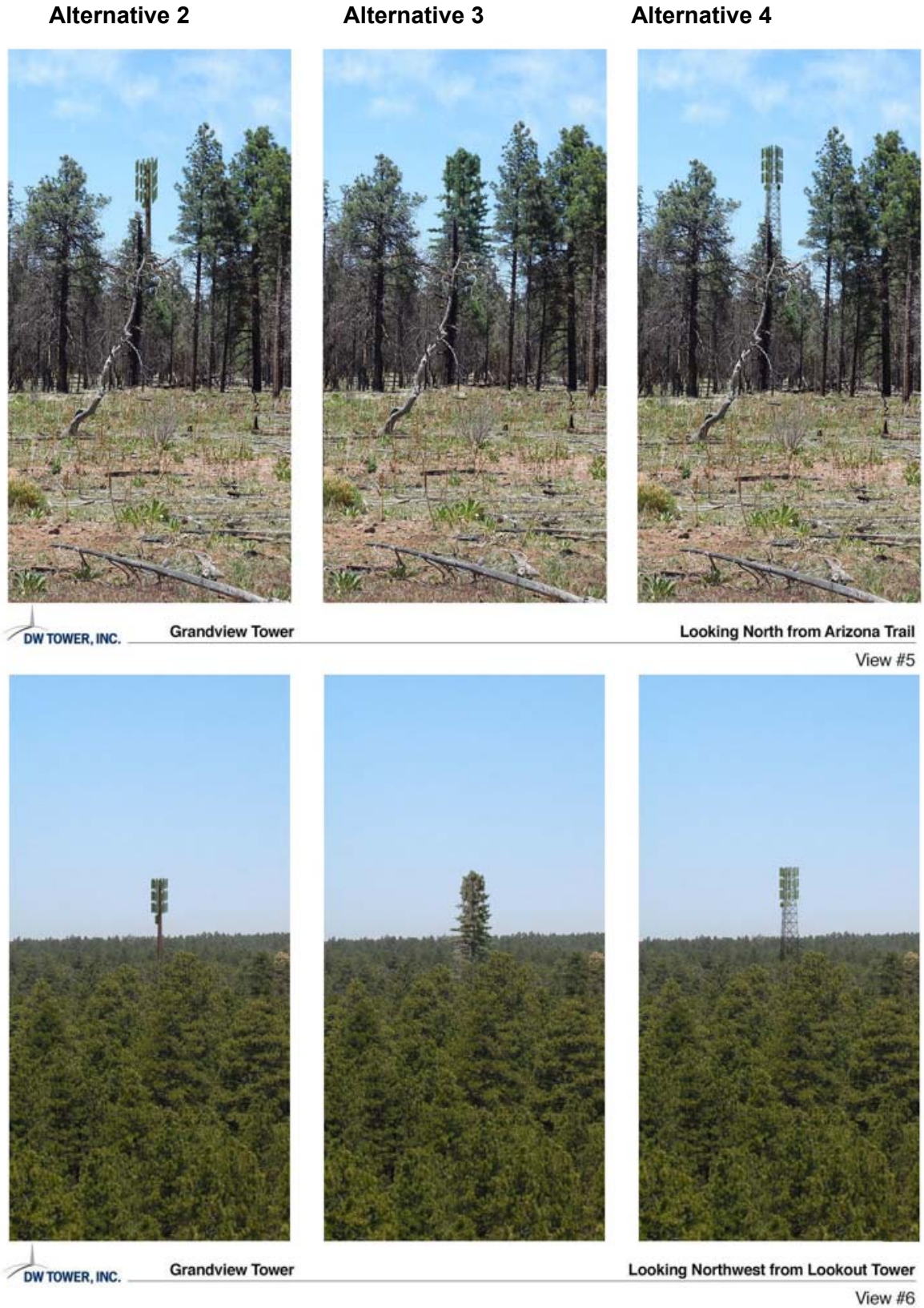


**Figure 3.6.d – View 5 (top three photos) taken from Photo Point 5 – Looking North from the Arizona Trail and View 6 (bottom three photos) taken from Photo Point 6 –– Looking Northwest from the Grandview Lookout Tower.**

The Kaibab Forest Plan has identified the Scenery Management System goals for Tusayan Ranger District, summarized for the Grandview Communications Site as follows:

**Landscape Character** – The proposed Grandview Tower is located on a flat ridge approximately 1600 feet (0.3 miles) northwest of the Grandview Lookout Tower and Cabin, which are on the National Register of Historic Places. Vegetation is composed of ponderosa pine, sparse Gambel oak, and scattered pinyon pine and Utah juniper trees. The Arizona National Scenic Trail (101) runs east/west approximately 1,600 feet (0.3 miles) south of the proposed tower site. Grand Canyon is approximately two miles to the north of the tower location, (1/4 miles from the GCNP boundary).

- **Scenic Attractiveness -** The proposed Grandview tower facility is located on the west side of FR 310 placing it in the SMS "Typical" Scenic Attractiveness category (See Figure 3.1).

- **Landscape Visibility -** The location is within an SMS "Foreground - Moderate Concern Level." The proposed Grandview tower facility is located west of FR 310 to avoid Kaibab Forest Plan "Special Scenic" areas, and "Distinctive Scenic Attractiveness Areas" associated with the Coconino Rim, Arizona National Scenic Trail and the Grandview Lookout and Cabin Historic Sites (See Figure 3.2).

- **Constituent Information/Scenic Integrity –** The proposed Grandview Tower is located within a Highway Corridor Scenic Integrity Objective "High" category. Areas of visual concerns include the Coconino Rim Roadless Area, Grandview Lookout and Cabin (National Historic Preservation Sites), Red Butte TCP, the Arizona National Scenic Trail, the SR 64 corridor, Forest Roads, and GCNP, (See Figure 3.3).

### Alternative 1 – No Action Alternative

Under the No Action Alternative no communication site facilities would be authorized. There would be no changes and therefore no direct or indirect effects to Visual Resources.

### Alternative 2 – Proposed Action – 110 foot Monopole Tower

**<u>Concern Area</u> - Scenery Management Effects**

**Special Scenic Areas - Scenic Attractiveness – "Typical" -** The proposed location mitigates visual concerns associated with FR 310 and areas east of FR 310 (Coconino Rim Roadless Area) that are designated "Distinctive" scenic attractiveness in the SMS. The proposed tower location is in an area classified as Scenic Attractiveness Category of "typical." Views from Photo Points 4 and 6 provide simulations of the proposed tower from locations on FR 310 where the balloons were visible and the top of the Grandview Lookout tower. In View 4, the tower is mostly obscured by surrounding tree vegetation and the exposed portion of the tower is somewhat consistent with the form and texture of the adjacent tree canopies. (This description applies to all three action alternatives). The visual deviation resulting from the proposed 110 foot monopole tower is small in scale when viewed with the general landscape and could be considered to be within tolerance for

meeting objectives for the moderate and typical classifications that allow for slight deviations.

**Landscape Visibility - Foreground – Concern Level Moderate –** The proposed location also mitigates concerns about potential conflicts with visibility concern levels because the proposed tower is located in a Foreground – Concern Level Moderate area. The Prospectus (Prospectus Tusayan East Wireless Communications Sites, July 2014) depicted the proposed location in a Special Scenic – Concern Level High area. However, the tower location proposed by the selected applicant is outside the High area, into Moderate. The proposed location is in a small clearing approximately 380 feet south and west of FR 310 surrounded by uneven-aged ponderosa pine and juniper trees. The trees visually screen the facility and tower from views from FR 310 except at View 4 where the proposed tower could be seen through a gap in the trees. (This description applies to all three action alternatives). The 110 foot tall monopole tower in the Proposed Action would meet objectives for the Foreground – Concern Level Moderate classification.

**Scenic Integrity Objective "High" –** The Kaibab Forest Plan states, "the characteristic landscape appears intact. Deviations may be present, but must respect form, line, color, texture and pattern common to the landscape so completely and at such scale that they are not evident."

Views from Photo Point 4 provide simulations of the proposed tower as seen from one location on FR 310; Photo Point 5 is the only location on the Arizona National Scenic Trail where the balloon was visible. In Views 4 and 5 the tower is mostly obscured by surrounding tree vegetation and the exposed portion of the tower blends with the adjacent tree canopies. The potential view of the tower from FR 310 and from the Arizona National Scenic Trail would be short duration and at 90 degree angles which would likely make the tower not noticeable to the casual observer traveling on FR 310 or hiking and mountain biking the Trail.

The characteristic landscape of the Grandview area would continue to appear intact under all three action alternatives because the scale of the proposal when compared to the landscape is very small. The potential views of the tower from photo points where the proposed tower could potentially be seen from SR 64 corridor in GCNP are from long distances and are very small in scale when compared to the general landscape of the area. The proposal is consistent with Forest Plan direction as long as the visual impacts are mitigated to fullest extent possible while still meeting the purpose and need of the proposed facility. (This description applies to all three action alternatives) A 110 foot tall monopole tower in the Proposed Action would meet objectives for the SIO "High" classification.

**<u>Concern Area</u> – Hwy 64, Forest Road 310 and the Coconino Rim Roadless Area**

By being located approximately 400 feet west from FR 310, the proposed tower location takes advantage of tree screening to limit potential views of the tower from areas of visual concern (FR 310, SR 64, Coconino Rim Roadless Area). The Grandview Tower as proposed would likely not be noticeable to the casual observer from these areas of concern.

The proposed tower location is farther west from the Coconino Rim than Grandview Lookout Tower. Therefore the proposed tower would not be as silhouetted or sky lighted as compared to the lookout tower when viewed from SR 64 west of Desert View.

**Concern Area – Grandview Lookout Tower, Trailhead, and Cabin and the Arizona National Scenic Trail**

Because of the flat topography of the Tusayan Ranger District, existing tree heights, and tree density surrounding the proposed tower location, most potential views of the tower from the Arizona National Scenic Trail and the Grandview Lookout Tower and Cabin would be screened (see Figures 3.7 and 3.8). View 5, Appendix A, is looking toward the proposed tower from the Trail. This is the only location the balloon, flown at 115 feet AGL over the proposed tower location, was visible. The photo simulation illustrates how most of the tower is obscured by tree vegetation. The top portion of the tower also blends in well with tree canopies, as it doesn't protrude above the surrounding canopy heights when viewed from the Trail.

The proposed location mitigates visual concerns associated with the Arizona National Scenic Trail, Grandview Trailhead and the historic Grandview Cabin. The proposed tower location, approximately 1600 feet northwest of the Grandview Lookout Tower and Arizona National Scenic Trail, takes advantage of tree screening to limit potential views of the tower from the Grandview Lookout area, the trailhead, and from the Trail west of Grandview. The tower would not be visible from the Grandview Cabin. The proposed tower is located far enough north of the Arizona National Scenic Trail to mitigate visual impacts as seen from that portion of the Trail. Only one location was identified on the Trail west of the lookout trailhead where the balloon was visible. A photo was taken and a simulation was created from that view.

The proposed tower may be seen through gaps in the trees at a location on FR 310 (View 4) north of the lookout; and may be seen from a single location in a burned area on the Arizona National Scenic Trail south of the proposed tower. However, the tower is not silhouetted in the skyline, and is partially screened by the tree canopies surrounding the location making any views of the tower short duration even when walking, and limited to small specific areas along the road and trail.

In the view from the top of the Grandview Lookout Tower the proposed tower does exhibit the upper part of the tower structure extending above the general canopy level. This is the most evident view of the tower, however the deviation is still of small scale when blended with the general landscape and would still be within tolerance for meeting objectives for the moderate and typical classifications, that allow for slight deviations.

**Figure 3.7 – View from the top of Grandview Lookout Tower looking down at the Cabin. This image shows the consistent tree canopy between the Cabin and the proposed tower location.**

**Figure 3.8 – Ground level view looking towards the proposed tower location (approximately 1600 feet) depicting tree screening of the tower location.**

**<u>Concern Area</u> – Visual Effects on Red Butte TCP**

Because of the distance between Red Butte and the proposed Grandview Tower (12.3 miles) and because the view from Red Butte is looking down to Grandview, the proposed tower would be very difficult to see with the unaided eye and would not be noticeable to the casual observer from Red Butte (see Figure 3.5). Consequently, a visual simulation could not accurately be produced. The proposed Grandview Tower would not have adverse visual impacts to the view from Red Butte and would not impact the Traditional Cultural Property.

**<u>Concern Area</u> – Grand Canyon National Park**

**Potential Visual Impacts to the View from SR 64 – East Rim Drive**

The balloon was visible with the aid of binoculars from two areas on SR 64 inside of GCNP, (Views 1, 2 and 3, Appendix A). The tower's profile above the ridge line from these views would be similar to the Grandview Lookout Tower, except from a further distance. Views of the balloons (proposed tower) while traveling on SR 64 were short duration between tree gaps, limited to only when traveling west on SR 64. Therefore one could conlude that

the proposed Grandview Tower would not likely be noticeable to the casual observer in GCNP. The visual anlysis conclusions were verified by additional field visits using the Grandview Lookout tower as reference. Grandview lookout tower is close to the proposed tower location and is of similar height with a larger profile. An additional factor that reduces potential visual impacts in GCNP is that the proposed Grandview Tower is located south of the Grand Canyon approximately 2 miles, putting it outside the typical viewshed of people visiting the Grand Canyon. The Grand Canyon visitor's attention and view of interest is towards the canyon and in the opposite direction of the proposed tower.

The visual simulation viewpoints are used to identify the area that short duration views of the proposed tower could occur. There are no other known points where there would be views of the proposed towers from SR 64, East Rim Drive, the West Rim Drive and/or Hermit roads, or the south and east gates.

**<u>Concern Area</u> – Grand Canyon National Park**

**Potential Visual Impacts to the View from Desert View Watch Tower**

Potential visual impacts from the proposed Grandview Communications Tower to the historic Desert View Watchtower and the North Rim are of concern to GCNP staff.

Desert View Watchtower and other viewpoints between Desert View and Grandview Point were assessed for potential visual impacts and additional analysis was conducted on September 9, 2015 to confirm photo simulations and visual effects analysis done inside the GCNP for the Grandview site (See Jacobs, Visual Assessment Addendum, 9/2015 in the project record), with the following results and conclusions:

1. From the top of Desert View Watch Tower, Grandview Lookout Tower cannot be seen without aid (Figure 3.9). The lookout tower could be seen with binoculars. The proposed Grandview Communication Tower is located approximately 1,600 feet northwest of Grandview Lookout Tower. The existing lookout tower and the proposed Grandview Cell Tower would not be visible to the casual observer when looking from the top of the Desert View Watch Tower.

2. The proposed Grandview Cell Tower would not be seen from Navajo Point. Trees block any potential views.

3. The existing Grandview Lookout Tower cannot be seen from Lipan Point without the aid of binoculars; therefore, the proposed Grandview Cell Tower would not be apparent with the naked eye when looking form Lipan Point (Figure 3.10).

**<u>Concern Area</u> – Grand Canyon National Park**

**Potential Visual Impacts to the View from the North Rim**

Because of the distance between the North Rim and South Rim, the proposed Grandview Tower would not be visible to the naked eye. In addition the view of the proposed tower from the North Rim would be looking down because of the elevation difference. The proposed towers would have a back-drop of trees and topography when viewed from the

North Rim eliminating silhouette views above the existing tree canopy. If the tower is painted a dark color or treated to eliminate shiny reflective surfaces it would blend into the background and would not be visible to the casual observer from the North Rim.


**Figure 3.9 – Distance between the proposed Grandview tower and the Desert View Observation tower is 9.52 miles.**


**Figure 3.10 – View of existing Grandview Lookout Tower as seen from the top of the Desert View Observation tower.**

The existing lookout tower could not be seen without the aid of binoculars.

### Potential Visual Impacts to the View from the West Rim Drive and Grand Canyon Village

There are no views from the West Rim Drive or Grand Canyon Village where the Grandview Tower can be seen. Vegetation, distance, and topography block any potential views of the tower from this area. The proposed Grandview Tower is located approximately 13.4 miles southeast of Hopi Point. Potential views in the vicinity of Hermit's Rest would be even farther, in excess of 15 miles requiring optical enhancement. There would be no visual impacts to these areas of GCNP resulting from the proposed Grandview Tower. This was verified by driving West Rim Drive and by topographical profile and line of site software (Project Record) showing topography and vegetation blocks potential views from West Rim Drive from Hermit's Rest area to the Village.

### Alternative 2 – Visual Impact Summary

Direct and indirect visual effects of a 110 foot monopole tower are similar to Alternative 3 and 4, except the camouflage technology of the simulated tree tower appears to allow the tree tower to blend better with the surroundings. Alternative 2 would meet objectives for the Scenic Attractiveness classification of "typical" visibility classification of "Foreground Concern Level - Moderate" and the SIO of "High." The Forest Plan identification of communication sites enables the proposal to be consistent with Forest Plan visual objectives for "High" Scenic Integrity Objectives as long as visual impacts are mitigated to the fullest extent possible while still meeting the purpose and need of the proposed facility. Alternative 2, with recommended mitigation, would meet Scenic Integrity Objective High criteria.

### Alternative 3 – 110 foot Monopole Simulated Ponderosa Pine Tree Tower

**Concern Area – Scenery Management Effects**

**Special Scenic Areas – Scenic Attractiveness – "Typical"** – The simulated ponderosa pine tree tower is consistent with form, line, color and texture of the surrounding ponderosa pine tree canopy. The resulting visual deviation from the tree tower would be very slight and would be unnoticeable to the casual observer. In addition the tower facility is of small scale when viewed with the general landscape and would likely be unnoticeable to the casual observer and within tolerance for meeting objectives for the moderate and typical classifications.

**Landscape Visibility – Foreground – Concern Level Moderate** - The 110 foot tall simulated ponderosa pine tree monopole tower would meet objectives for the Foreground – Concern Level Moderate classification.

**Scenic Integrity Objective "High** – A simulated ponderosa pine tree tower mitigates visual impacts to the fullest extent possible; therefore, Alternative 3 would meet Scenic Integrity Objective High criteria.

**Concern Area – SR 64, Forest Road 310 and the Coconino Rim Roadless Area**

The simulated ponderosa pine tree tower proposed in Alternative 3 provides camouflage and visual consistency with the form, line, color, and texture of surrounding vegetation thereby reducing visual effects of the tower. Visual effects to SR 64 and FR 310 are minor from short distance and long distance views and are verified by photo simulations, (View 4).

**Concern Area – Grandview Lookout, Trailhead, and Cabin and the Arizona Trail**

The effects would be similar to those stated above. The simulated tree tower provides additional camouflage and visual consistency with the landscape, further reducing visual effects to these concern areas.

**Concern Area – Grand Canyon National Park**

As previously stated, the simulated ponderosa pine tree tower reduces visual effects to views from the GCNP due to consistency with the form, line, color, and texture of the surrounding landscape and tree canopy. The simulated tree tower under Alternative 3 would likely not be noticed by a casual observer from the park. Relative to the World Heritage Site designation, visual impacts would be negligible in the GCNP because of their distance and low impact/minimal design.

**Concern Area – Red Butte TCP**

Because of the distance between Red Butte and the proposed Grandview Tower (12.3 miles) and because the view from Red Butte is looking down to Grandview, the proposed tower would be very difficult to see with the unaided eye and would not be noticeable to the casual observer from Red Butte. Consequently, a visual simulation could not accurately be produced. The proposed Grandview Tower would not have adverse visual impacts to the view from Red Butte and would not impact the Traditional Cultural Property.

The tower would be even more difficult to see from the Red Butte TCP due to the additional camouflage and blending provided by the simulated tree tower. There would be no effects on the TCP.

**Alternative 3 – Visual Impact Summary**

Direct and indirect visual effects of a 110 foot monopole simulated ponderosa pine tree tower are similar to Alternative 2 and 4, except the camouflage technology of the simulated tree tower may allow the tree tower to blend better with the surroundings because a simulated tree is more consistent with the form, line, color, and texture of the forest setting. Alternative 3 would meet objectives for the Scenic Attractiveness classification of "typical" visibility classification of "Foreground Concern Level - Moderate" and the SIO of "High." The Forest Plan identification enables the proposal to be consistent with Forest Plan visual objectives for "High" Scenic Integrity Objectives as long as visual impacts are mitigated to the fullest extent possible while still meeting the purpose and need of the proposed facility. Alternative 3 would best meet Scenic Integrity Objective High criteria.

## Alternative 4 – 120 foot Lattice Tower

**Concern Area –Scenery Management Effects**

**Special Scenic Areas – Scenic Attractiveness – "Typical"** – Direct and indirect effects of a 120 foot lattice tower are similar to Alternative 2 except ten feet of additional height would make the tower slightly more noticeable to the casual observer from the closer views, (Views 4, 5, 6). The lattice tower would likely be slightly less visible compared to Alternative 2 when viewed from long distances (Photo Points 1, 2, 3, 7). The visual deviation resulting from the proposed 120 foot lattice tower is small scale when viewed with the general landscape and would be considered to be within tolerance for meeting objectives for the moderate and typical classifications that allow for slight deviations.

**Landscape Visibility – Foreground – Concern Level Moderate** – Direct and indirect effects of a 120 foot lattice tower are similar to Alternative 2 except ten feet of additional height would make the tower slightly more noticeable to the casual observer from the closer views (Photo Points 4, 5, 6). The lattice tower would likely be slightly less visible compared to Alternative 2 when viewed from long distances (Photo Points 1, 2, 3, 7). When considered in the context of the surrounding landscape, the scale of the tower and communications facility remains subordinate as directed by the Kaibab Forest Plan and would meet SMS objectives for the Foreground "Moderate Concern Level" classification.

**Scenic Integrity Objective "High"** – Direct and indirect effects of a 120 foot lattice tower are similar to Alternative 2 except ten feet of additional height would make the tower slightly more noticeable to the casual observer from the closer views (Photo Points 4, 5, 6). The lattice tower would likely be slightly less visible compared to Alternative 2 when viewed from long distances (Photo Points 1, 2, 3, 7). Long distance views (Views 1, 2, 3, 7) indicate that the lattice tower may be less evident than the monopole alternative and slightly less evident than the simulated tree tower because of its open profile or silhouette. The lattice tower appears less visible at greater distances because light diffusion would have a greater visual effect on the small diameter lattice components. Light diffusion scatters the light making the object less visible at long distances.

**Concern Area – Hwy 64, Forest Road 310 and the Coconino Rim Roadless Area**

This is similar to effects described under Alternative 2. Alternative 4 would have slightly less visual impact to views from SR 64 when compared to Alternative 2 because they are long distance and subject to the mitigating impacts of light diffusion. There would be slightly more visual effects to the view from FR 310 resulting from the taller tower and increased overall profile of the lattice tower components.

**Concern Area – Grandview Lookout, Trailhead, and Cabin and the Arizona Trail**

This is similar to the effects stated above under Alternative 2. However, photo simulations indicate that the extra tower height under Alternative 4 and the wider overall profile of the lattice tower make the tower slightly more evident in the close up views (Photo Points 5, 6).

**Concern Area – Grand Canyon National Park**

This is similar to the effects stated under Alternative 2. Photo simulations indicate that the lattice tower may be less visible compared to Alternatives 2 and 3 in the long distance views from GCNP (Photo Points 1, 2, 3, 7) because of the effects of light diffusion on the open components of the lattice tower.

**Concern Area – Red Butte TCP**

Because of the distance between Red Butte and the proposed Grandview Tower (12.3 miles) and because the view from Red Butte is looking down in elevation to Grandview, the surrounding trees would provide a background eliminating any potential protuberance into the skyline above tree canopy. The distance and the tree canopy background when viewed from Red Butte would make the proposed tower very difficult to see with the

unaided eye from Red Butte and would not be noticeable to the casual observer. Consequently a visual simulation could not accurately be produced. The proposed Grandview Tower would not have adverse visual impacts to the view from Red Butte and would not impact the Red Butte Management Area or Traditional Cultural Property.

Due to the distances involved, the slightly taller tower in Alternative 4 would not be discernable to a casual observer from the TCP and there would be no effect.

**Alternative 4 – Visual Impact Summary**

Direct and indirect visual effects of a 120 foot lattice tower are similar to Alternatives 2 and 3. The 120 foot lattice tower would be more noticeable from close views (Photo Points 4, 5, 6) because of the taller height and wider overall structure, as compared to a monopole. Photo simulations indicate that the lattice tower may be less visible compared to Alternatives 2 and 3 in the long distance views from GCNP (Photo Points 1, 2, 3, 7) because of the effects of light diffusion on the stucture of the lattice tower. Alternative 4 would meet objectives for the Scenic Attractiveness classification of "typical" visibility classification of "Foreground Concern Level -moderate" and the SIO of "High." The project design and mitigations enables the proposal to be consistent with Forest Plan visual objectives for "High" Scenic Integrity Objectives.

### 3.1.2.3 Scenery Management Summary

The Kaibab Forest Plan, page 65 states, "Desired conditions for Recreation Backcountry: Facilities are few in number, use the minimum area needed, and have simple construction designs that blend in with the surrounding area. They are made of native material or other well matched materials." Also, the FEIS for the Forest Plan, page 227 states, "Electronic sites/structures are by their very nature, in juxtaposition to the visual elements that define or ground one within the National Forest landscape. If placed insensitively, this form of development can conspicuously advertise human caused change, resulting in a marked degradation of the scenic quality of the natural landscape".

The FEIS for the Forest Plan recognizes that communication sites will unavoidably cause a degree of deviation in the landscape. The challenge, especially in this area where there are sensitive visual resources both on the Forest and in the adjacent Grand Canyon National Park, is to find the least intrusive design for these structures and sites while meeting the purpose and need of improved wireless communication. The alternatives considered in this analysis have proposed tower heights that are the minimum needed to meet purpose and need and communication site objectives for a colocation facility that can accommodate four wireless carriers. The action alternatives considered in this analysis all show different degrees of effort to meet visual quality objectives while providing for multiple users and a viable wireless communication service. Forest Plan direction has been followed in the development of the alternatives and form the basis for the conclusions presented in the visual analysis.

The effects on the visual resource from the proposed towers and facilities at Skinner Ridge Communications Sites and the Grandview Communication Site under Alternatives 2–4 result in limited and slight deviations from a few viewpoints along SR 64 and FR 310 and

343. The deviations are not substantial and would not exceed objectives for the classifications of "Typical" scenic attractiveness category, the Visibility "Foreground - Moderate Concern Level" or the Highway Corridor "High" Scenic Integrity Objectives at either site. The elements of landscape character, landscape visibility, and constituent information were considered. The proposed towers in all three alternatives would not change the Kaibab National Forest's visual quality objectives for the area under the Scenery Management System. There would be no changes to the current Scenic Attractiveness categories for the area; no changes to the Forest's visual distance zones and visual concern levels objectives; and no changes to Scenic Integrity Objectives (SIO) for the area. Effects on Concern Areas such as SR 64, FR 310 and 343, the Coconino Rim Roadless Area, the Grandview Lookout, Cabin, and Trailhead, the Arizona National Scenic Trail, the Red Butte Management Area and TCP and the GCNP are minor and not substantial. Strategic tower location in combination with mitigation for color and height reduce the deviations caused by the tower and facilities to slight and non-substantial. Visual Quality remains within objectives set for this SIO.

The effects from the 110 foot tree tower and facility proposed at the Grandview Site in Alternative 3 would be similar to Alternatives 2 and 4. The additional camouflage and consistency with color form, line and texture provided by the simulated tree tower would make it less apparent to the casual observer when compared to the other alternatives. The simulated tree tower is especially more effective in mitigating potential views of the tower from the Arizona National Scenic Trail.

Visual impacts were similar for the three tower Alternatives at the Grandview Site. The visual difference between the 110 foot tall and the 120 foot tall tower alternatives is not great. The 120 foot tower is only slightly more visible in the photo simulations in close-up views and less visible in long distance views. The camouflage technology of the tree tower appears to make it blend with the surroundings better than a lattice or monopole tower of the same height in close-up views because a simulated tree is consistent with the form, color, and texture of the forest setting.

### 3.1.3. Cumulative Effects

The viewshed associated with being able to see the proposed towers including much of the Tusayan District, and the south and north rims of the Grand Canyon, and activities that have occurred within the last 10 years, or may occur in the next 10 years, that might add effects that are cumulative to those direct and indirect effects of the proposed towers have been considered in this cumulative effects analysis. Past, present and future activities that modify visual quality, such as the existing towers at the Tusayan Communications Site, to the northwest, and the Saginaw-Manistee Communications Site at the Grand Canyon Airport, were considered in the existing scenery classification. Planned towers at the Tusayan and Anita Communications Site were also considered. The planned tower at the existing Tusayan Communications Site is just south of the border with GCNP near the south entrance gate. The planned tower at Anita Communications Site is seven miles south of Tusayan just off the east side of SR 67. There is the potential for future wireless communications development on the adjacent Grand Canyon National Park, but no sites or schedule for development have been determined that would be available for analysis of reasonably foreseeable future projects. The towers at the Tusayan and Anita Communications Sites

do not add cumulatively to visual effects from the proposed Skinner Ridge and/or Grandview towers communication sites because they cannot be viewed at the same time. The distances between the installations are great enough that any visual effects from an individual tower are not added to by viewing the other towers at a later time. There are no known planned projects at this time that would add cumulatively to visual effects from the proposed towers. Therefore, the proposed action, when considered with past, present, and forseeable actions would not contribute to a substantial cumulative effect.

### 3.1.4 Visual Impact Mitigation

#### 3.1.4.1 Skinner Ridge Design Features

- All galvanized shiny surfaces including the tower, ice bridges, antennae support structures, and chain link fencing would be treated or painted dark green. A product called Natina Steel is recommended to mitigate shiny reflective surfaces on the tower and chain link fence. Natina Steel (a.k.a. galvanized metal stain) is used to create a rustic brown finish on galvanized surfaces that will not fade, crack, or peel over time from sun exposure. Typical pigment based colorants (i.e., paint and/or powder coating) fade, crack, and start to peel within only a few years. Natina Steel reacts with the zinc in galvanized metal and quickly (over 1 to 3 weeks depending on sunlight and heat intensity) creates a natural rustic brown patina to better blend galvanized surfaces/structures into surrounding terrains.

- The proposed tower is limited to 125 feet AGL. This reduces the amount of tower above the tree canopy and thereby limits the locations where the tower can be seen in the immediate area of the tower, eliminates all or most long distance views of the tower, and eliminates the need for lighting required by the FAA. An FAA "Determination of No Hazard To Air Navigation" was made and received by DW Tower on April 23, 2013 verifying there would be no need for lights or other mitigation if the towers remain at or below the proposed heights.

- All microwave dishes and antennae would be painted a dark green color that matches the color of the forest canopy.

- The equipment shelters and compound would only have a shielded switch activated outdoor lighting that would be used only when necessary to perform emergency repairs or maintenance.

- The equipment shelter and propane tanks would be painted Forest Service (FS) dark brown. This color has been used by the FS on signs and buildings and blends in with the forest background well. This color has been used many times on DW Tower equipment shelters on National Forest System lands.

- The proposed location is, for the most part, screened from views from FR 343 and the areas of concern by existing tree cover and vegetation. The proposed tower is located approximately 350 feet northeast of FR 343.

### 3.1.4.2 Grandview Design Features

- The proposed tower heights would be limited to 120 feet or less, limiting the portion of the tower that would be silhouetted above the surrounding tree canopy in potential views from SR 64 and GCNP. In addition, the tower would not require lighting by the FAA. The FAA issued a "Determination of No Hazard to Navigation" on October 28, 2014.

- All galvanized shiny surfaces including the tower, ice bridges, antennae support structures, and chain link fencing would be treated with a product called Natina Steel or similar product to mitigate shiny reflective surfaces on the tower and chain link fence.

- All microwave dishes and antennae would be painted a dark green color that matches the color of the forest canopy.

- The equipment shelter and propane tanks would be painted FS dark brown.

- The equipment shelters and compound would only have shielded switch activated outdoor lighting that would be used only when necessary to perform emergency repairs or maintenance.

- The tower would be located approximately 380 feet west of FR 310 where trees would block views from this road. The proposed location mitigates visual concerns associated with FR 310 and areas east of FR 310 (Coconino Rim Roadless Area) that are designated "Distinctive" scenic attractiveness, and "Special Scenic Areas" in the Kaibab Forest Plan. The proposed location is in a small clearing approximately 380 feet south and west of FR 310 surrounded by variably aged ponderosa pine and juniper trees. The trees visually screen the facility and tower from views from FR 310.

- The tower would be located approximately 1600 feet northwest of the Grandview Lookout facility and Arizona National Scenic Trail (see Figure 1.6). The proposed location mitigates visual concerns associated with the Coconino Rim Roadless Area, the Arizona Trail, Grandview Trailhead and the historic Grandview cabin and lookout. The proposed locationtakes advantage of tree screening to limit potential views of the tower from the Grandview Lookout and cabin area, the trailhead, and from the Arizona National Scenic Trail west of Grandview. The communications tower would be visible from the top of the Grandview Lookout Tower, but not from ground level.

- A common microwave system would be required at the Grandview Communications Site to reduce the number of dishes on the tower, thereby reducing the size of the tower and visual impacts associated with multiple microwave dishes.

# 3.2 WIRELESS SERVICE

## 3.2.1 Affected Environment

**Current Wireless Service/Design Process Rationale**

The SR 64 corridor north of Valle on the KNF, the Town of Tusayan and through GCNP to the east is currently not receiving adequate or reliable wireless service from any of the providers. The lack of adequate wireless communications facilities on the SR 64 corridor defined the need for the two new facilities (Skinner Ridge and Grandview). The proposed action responds to and addresses that need. The lack of wireless communications facilities are two-fold and described as follows:

1. **Cellular Coverage Tower Needs** There are not enough colocation towers to provide antennae space for the FCC licensed carriers to broadcast and receive cellular telephone signals from the public and governmental users to provide seamless service on the SR 64 corridor. The proposed location of the Grandview facility is based on current lack of reliable wireless service on the SR 64 corridor between the South Rim Village and Desert View.
2. **Microwave Backhaul Tower Needs** In order to provide reliable wireless and broadband internet service, adequate microwave backhaul capacities are needed to connect voice and data wireless signals coming to and from the GCNP/Tusayan area to the regional landline telephone system. The Tusayan area currently does not have adequate microwave backhaul capacities. The proposed Skinner Ridge facility responds to this need.

## 3.2.2 Environmental Consequences

### 3.2.2.1 – No Action Alternative

The No Action Alternative does not meet the Purpose and Need for the project. Wireless personal communication services along the SR 64 corridor from Valle to Grandview are currently unavailable and/or unreliable. The No Action Alternative would result in continued poor wireless communication services in the area which could result in longer response time to emergency services and limited internet/cellular opportunities to the traveling public, the community of Tusayan, and the surrounding rural area.

### 3.2.2.2 – Alternatives 2, 3 and 4

#### Skinner Ridge Communications Facility – Potential Increased Microwave Backhaul Capacities

The proposed Skinner Ridge facility located on the Kaibab National Forest south of GCNP, would provide the needed link to expand wireless backhaul capacity to their respective switches. Figure 1.1 shows how the proposed Skinner Ridge facility links the existing and planned tower sites in the area with the carriers' switching facilities in Williams and Flagstaff. The proposed Skinner Ridge Tower would effectively provide an additional microwave link between the existing and planned wireless sites in the Tusayan area with the Saddle Mountain Hub, which will connect with landline fiber optics in Williams and

Flagstaff. Some of the sites depicted in Figure 1.1 are in place and some are proposed, waiting for approval. Most future backhaul would likely go through the proposed Skinner Ridge site. Skinner Ridge would connect to the existing Saddle Mountain Tower on the Coconino National Forest with several alternative paths to fiber switch facilities at Bill Williams Mountain, Flagstaff, and Mount Elden.

### Grandview Communications Site – Potential Wireless Service Levels

Propagation studies, as described below, were conducted to verify lack of signal in the target area and to project anticipated service from the proposed tower facility. DW Tower conducted propagation studies in response to the Tusayan East Wireless Communications Prospectus. Another wireless company also provided propagation maps supporting their contention that the proposed Grandview Tower needs to be at least 120 feet AGL.

The following describes the signal strength represented by the various colors on the first set of propagation maps

- Propagation Studies and Signal Strength: Propagation studies are color-coded computer-generated graphical representations of the situation, including *whether or not service exists* in a given area or at a given location, as well as what signal strength is present at a given point in the service area. *The quality of service is primarily a factor of the signal strength* at a given location from which a call is being made or received. The signal strength is shown in a color-coded format, with different signal strengths being denoted by different colors. *Signal strength is the bottom line test or determiner of the presence of useable service*. Signal strength is the primary determiner of both voice quality and reliability. For all intents and purposes, the need for a minimum level of signal strength drives everything else from a technological perspective. (L.S. Monroe, Center for Municipal Solutions).

- The smaller the dBm number, the stronger the signal will be. The dBm symbol is an abbreviation " decibels relative to one milliwatt" and is used to define radio signal strength. The commonly accepted signal levels (dBm) for all but metropolitan markets and proven workable for any Specialized Mobile Radio Service (SMRS), Cellular or Personal Communication Service (PCS) carrier are shown below.

On-Street Service: -101 dBm
In-Vehicle Service: -96 dBm
In-Building Service: -85 dBm

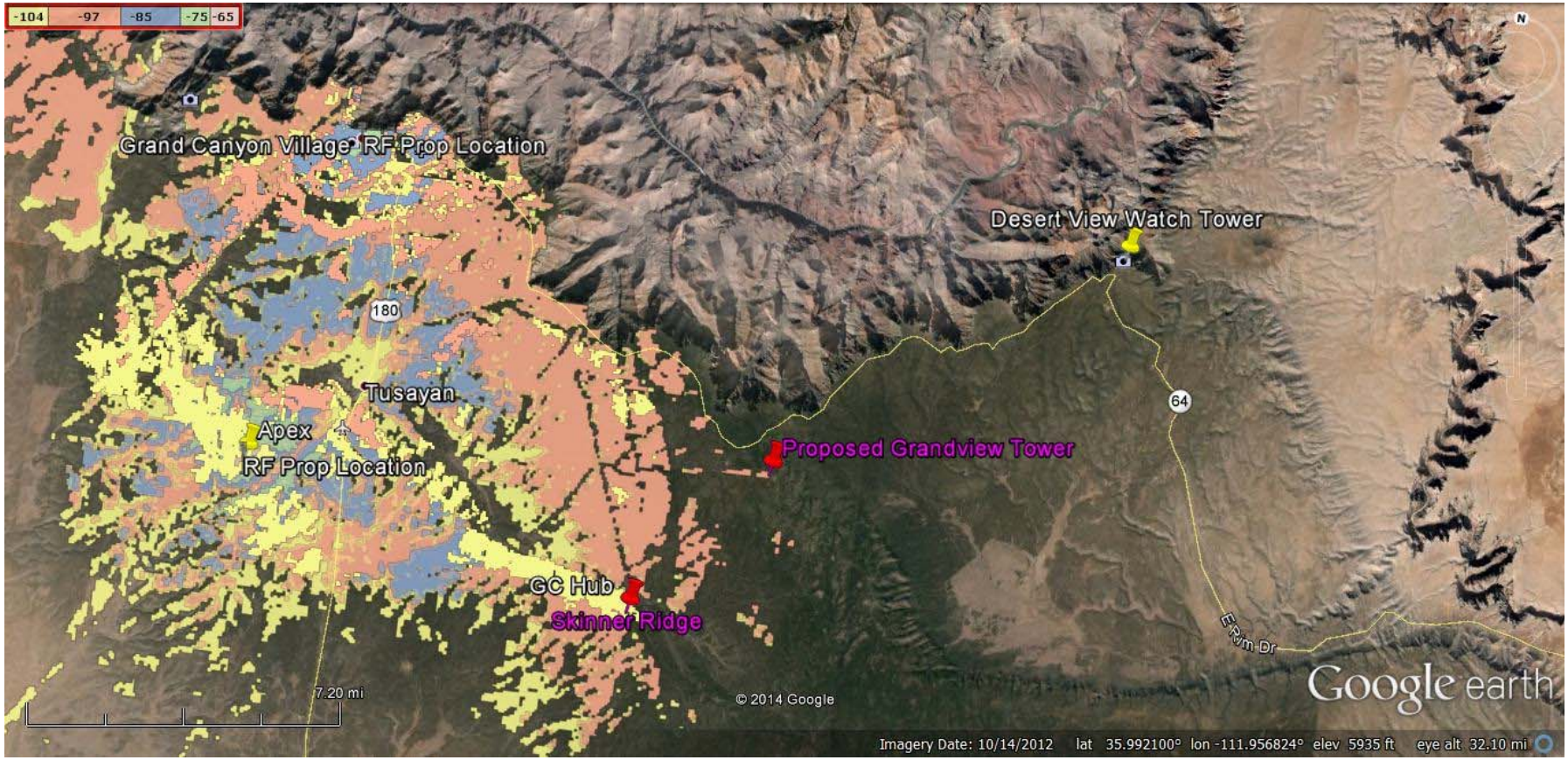


**Figure 3.11 – Current signal strength without Grandview.**

There is currently weak and unreliable wireless service in the Desert View/SR 64 corridor areas not depicted on this image from towers on the Navajo Reservation and roaming service provided by other providers from the existing Park Service tower at Desert View. The existing wireless networks in this area lack capacities for multiple wireless users to operate at the same time resulting in dropped calls and the lack of ability to transmit or receive data.

### Wireless Service Levels, Alternatives 2 – 3

The following propagation maps depict the wireless service levels that would be provided by implementation of Alternatives 2 and 3 (110 foot AGL towers).

Figure 3.10 shows strong signal on the SR 64 corridor overlapping with signals to the west coming from existing towers in the Grand Canyon Village near the Grand Canyon Airport to Desert View. This image depicts the service level provided from an operating frequency of 850 Megahertz (MHz) at 80 feet AGL. The image shows that there will only be a couple of small areas where continuous service could be compromised.

The propagation maps indicate that there is little difference between propagation to the target area between 80 feet AGL and 110 feet AGL (Figure 3.11) with a broadcast frequency of 850 MHz, which is used by one of the major FCC licensed carriers. Antennae positions below 80 feet would start to be compromised because some trees in the area are 60 feet tall. Therefore, in order to accommodate the proposed four carriers the tower would need to be at least 110 feet tall. There needs to be at least 10 feet vertical separation between different carriers' antennae. The proposed Grandview Tower is at the minimum necessary height to accommodate the existing and foreseeable needs of the FCC licensed wireless carriers operating in this area to provide reliable service to the SR 64 corridor. The proposed facility would not provide wireless service below the rim of the Grand Canyon in wilderness areas of Grand Canyon National Park and is verified by propagation maps and analysis.

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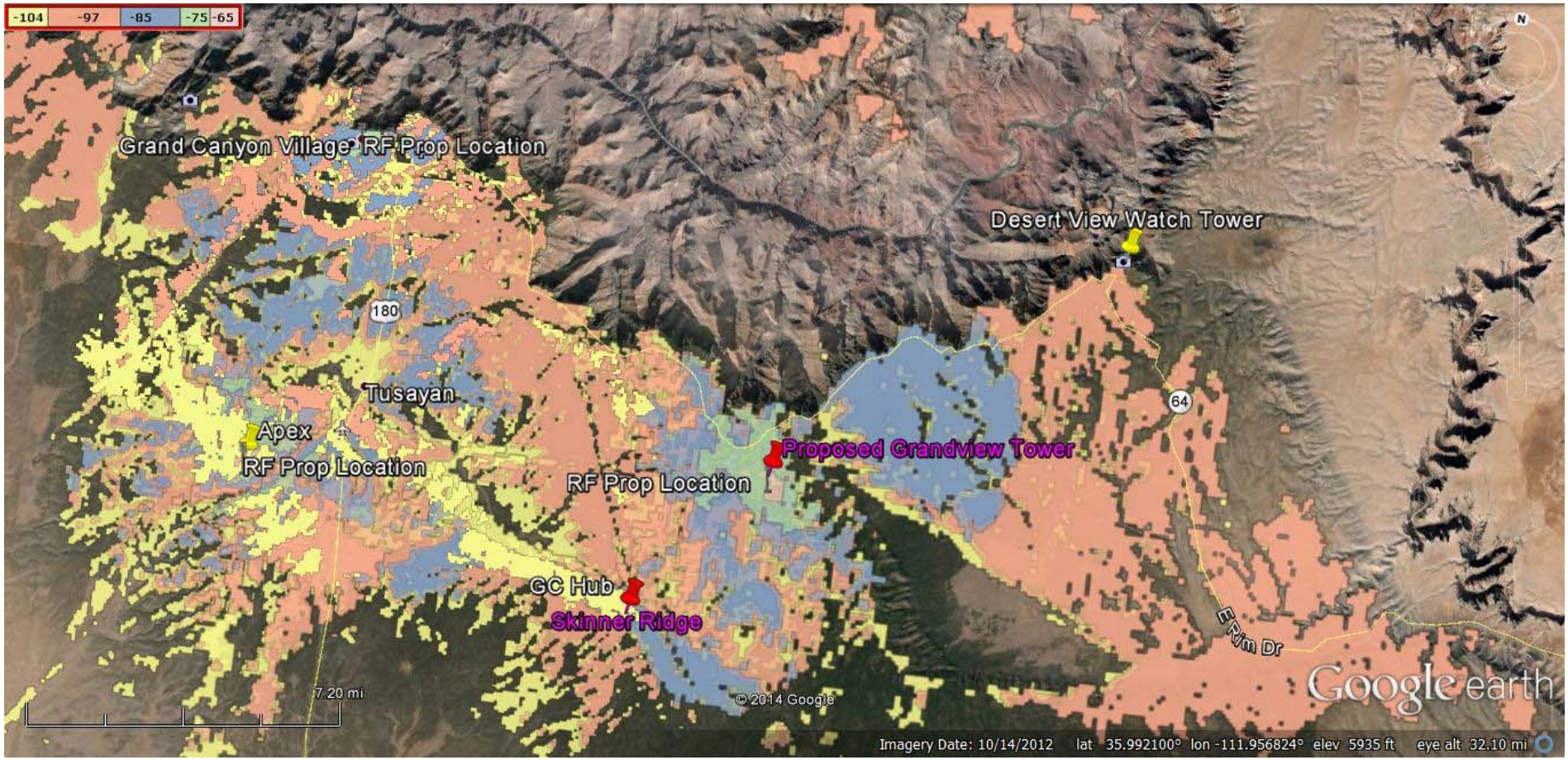


**Figure 3.12 – Propagation from Grandview at 80 feet AGL.**

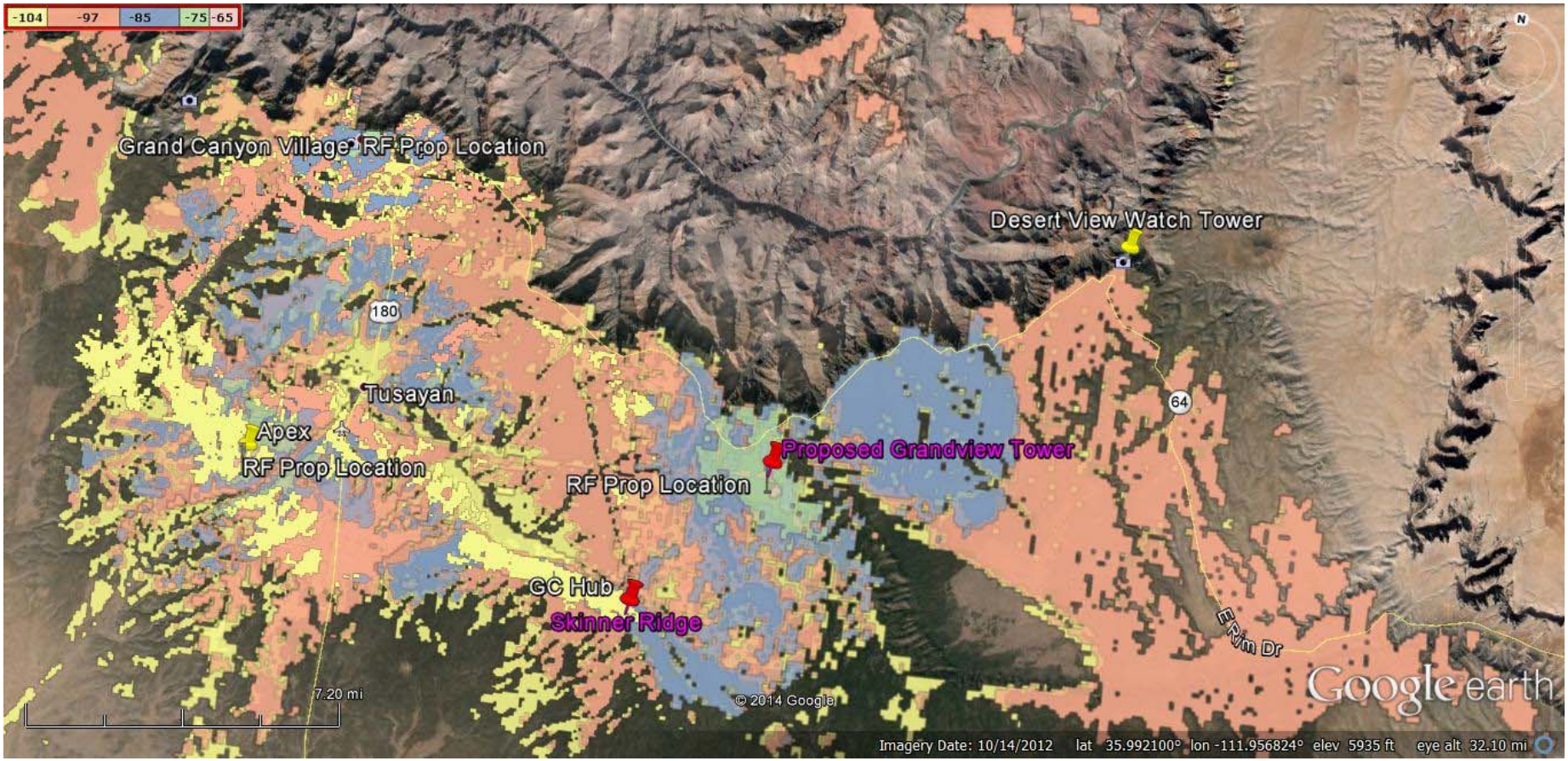


**Figure 3.13 – Grandview Propagation at 110 feet AGL.**

### Wireless Service Levels, Alternative 4

Alternative 4 was developed in response to a scoping comment received from an FCC licensed wireless carrier providing service in this area operating in the 1900MHz frequency band.

Under Alternative 4, the communications sites leases for both locations will be issued, for a 30 year time period instead of 20 years. Forest Service Handbook (FSH) 2709.11 calls for communications site leases for wireless facilities to be issued for generally a 30 year term. A twenty year lease potentially gives the Forest Service management options for termination and removal of the facility, rehabilitation of the land at an earlier date than a 30 year lease if technology evolved and the facility becomes obsolete and is no longer needed. The wireless industry does not anticipate technology changes in the next 30 years that would eliminate the need for these towers.

A carrier licensed by the FCC to operate in the 1900MHz band needs to compete with carriers that are licensed for 850MHz. Operating at higher frequencies negatively affects the signal propagation distance. The 1900MHz network does not cover as well or as large of an area as networks operating at 850MHz. In order to counter the effects of operating at 1900MHz, a carrier that operates in the 1900MHz frequency band will typically need antennas at taller heights on towers and a larger quantity of tower sites. The carrier that commented contends that in order for them to operate effectively they need an antenna position 20 feet taller. Alternative 4, a 120 foot AGL tower, would provide a carrier operating in the 1900MHz band with a higher antenna position should they become a co-user.

The following propagation maps (Figures 3.14 – 3.16) provided by the commenting carrier, depict their performance at different heights compared to performance of operators at 850MHz frequencies. The blue color depicts signal strength for adequate service.

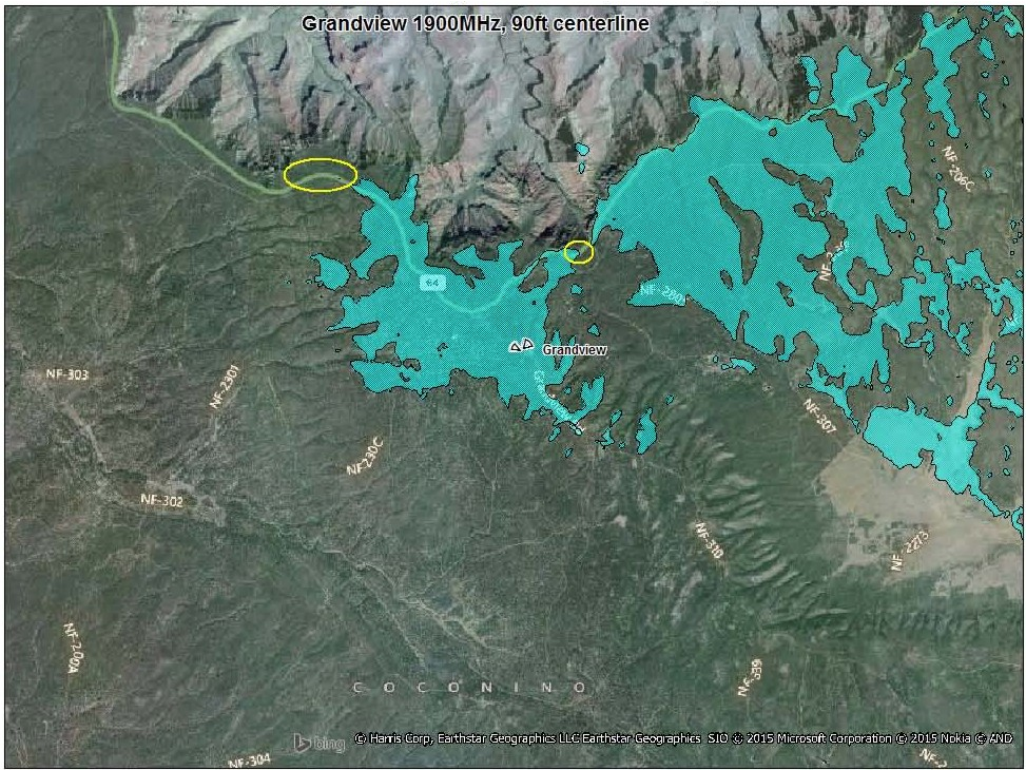


**Figure 3.14 – Propagation of a 1900 MHz antenna at a height of 90 feet.**

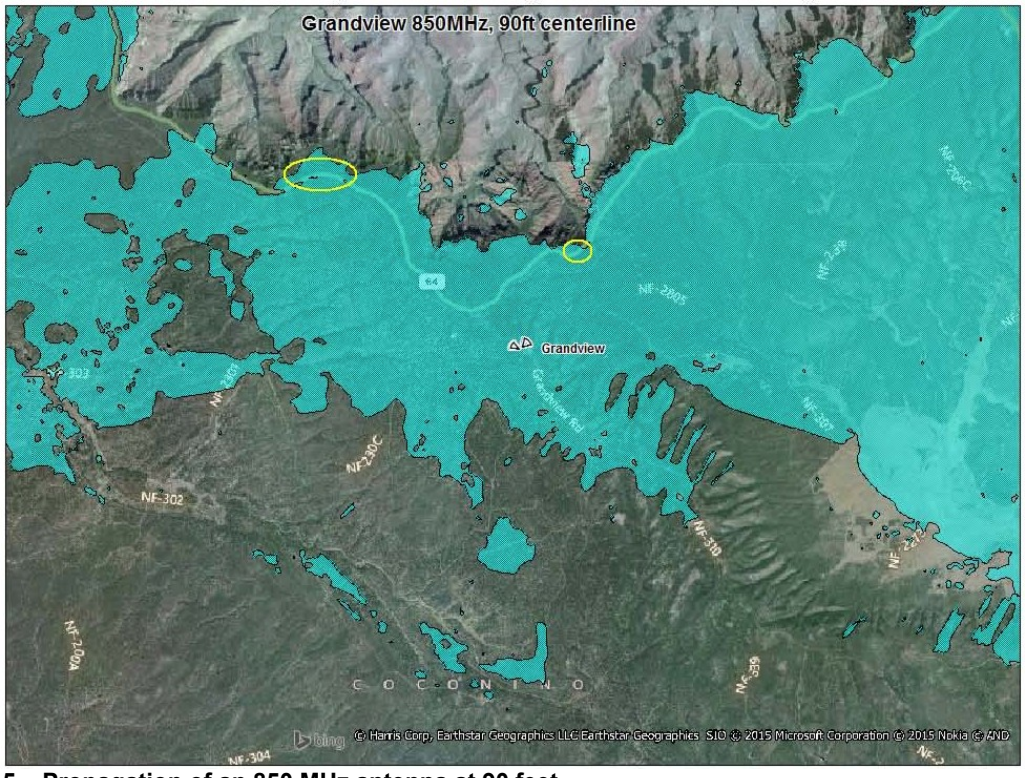


**Figure 3.15 – Propagation of an 850 MHz antenna at 90 feet.**

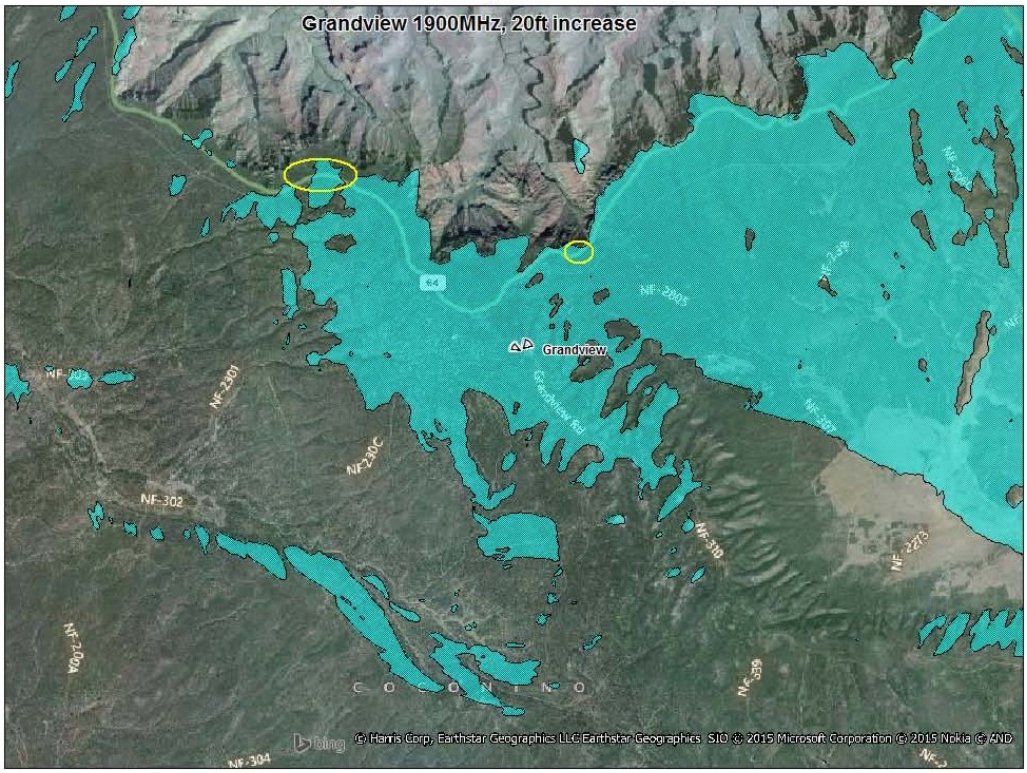


**Figure 3.16 – Propagation of a 1900 MHz antenna at 110 feet. Increasing the antenna height by 20 feet improves the coverage at 1900 MHz.**

The proposed Alternative 4 Grandview Tower is tall enough to accommodate the existing and foreseeable needs of the FCC licensed wireless carriers operating in this area to provide reliable service to the SR 64 corridor. The proposed facility would not provide wireless service below the rim of the Grand Canyon in wilderness areas of Grand Canyon National Park and is verified by propagation analysis.

## 3.3 EARTH AND WATER RESOURCES

This section provides a general description of the existing environment with respect to vegetation, including forest vegetation, riparian, and invasive species, and general geology, soils and water.

### 3.3.1 Affected Environment

#### 3.3.1.1 Forest Vegetation

**Skinner Ridge Communications Site**

This site is located at an elevation of 7,248 feet. Vegetation at the proposed Skinner Ridge Communications site includes ponderosa pine, Gambel oak, Utah juniper and pinyon pine. A prolific occurrence of cliff rose is also scattered throughout the site. Understory vegetation includes mullein, wax currant, blue gramma, *Poa* spp., *Senecio* spp., *Townsendia* spp., squirrel tail, yellow phlox, snakeweed, *Carex spp*., *Penstemon* spp., lupine, Indian paintbrush, and buckwheat. One pincushion cactus and one prickly pear

cactus were also observed during surveys conducted June 4, 2015. This site has previously been treated by prescribed fire which caused light mortality in the Gambel oak. Gambel oak is sprouting in the area. Ponderosa pine on the site is severely infected with dwarf mistletoe. At least one of the two large ponderosa pines on the site is fading severely.

### Grandview Communications Site

This site is located at an elevation of 7,480 feet. Vegetation at the proposed Grandview Communication Site is relatively sparse ponderosa pine, Gambel oak, Utah juniper and pinyon pine. Understory vegetation includes cliffrose, mullein, blue grama, snakeweed, squirreltail, *Penstemon spp., Carex spp.,* Indian paintbrush, buckwheat, pussy toes, fleabane and blue grama. Three pincushion cacti were observed on the site (Vegetation surveys, June 4, 2015).

At the proposed tower site, past thinning operations have removed many of the ponderosa pine trees under 12" diameter breast height (dbh). Tree cover on the site is relatively light.

A recent fire has resulted in large open areas just to the west of the tower site. This can be seen in View 5. Tree removal at the tower site would be limited to the immediate tower location.

#### 3.3.1.2 Riparian Habitat

### Skinner Ridge and Grandview Communications Sites

The project area at both proposed communication sites represents an upland site, with no discernible drainages. There are no aquatic, wetland, or riparian areas on or near the sites.

#### 3.3.1.3 Invasive Plants

Projects analyzed since 2005 require consideration of the provisions of the *Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds, Coconino, Kaibab, and Prescott National Forests within Coconino, Gila, Mojave, and Yavapai Counties, Arizona (FEIS)*, as well as the Forest Plan specifically call for project survey and incorporation of Best Management Practices.

The Forest Plan provides direction to prevent the establishment of invasive species/noxious weeds, and control the occurrences of noxious weeds and invasive species by utilizing principles of integrated weed management including prevention, mechanical, chemical and biological control methods.

Surveys were conducted on May 29, 2015 at both sites.

### Skinner Ridge Communications Site

Two individual plant occurrences of Cheatgrass, *Bromus tectorum,* were observed just inside the boundary of the proposed Skinner Ridge site. No other noxious or invasive species were observed.

### Grandview Communications Site

Three individual plant occurrences of Cheatgrass were observed along the edge of the Grandview Site. No other noxious or invasive species were observed.

The portion of the buried power line that would occur on the GCNP, (1,650 feet), would also be inventoried, treated and monitored for noxious or invasive species as required by authorization, clearance and permitting by the NPS, (see Cumulative Effects, Section 3.3.3).

#### 3.3.1.4 General Geology

### Skinner Ridge and Grandview Communications Sites

The proposed Skinner Ridge Communications Site is located at approximately 7,248 feet above mean sea level, and the proposed Grandview Communications Sites is located at approximately 7,480 feet above mean sea level. The geology within the project areas is dominated by the Kaibab Limestone formation, which forms the north and south rims of the Grand Canyon (Chronic 1983). Soil in the area consists of a silty sand that is derived from decomposition of the limestone. Chert nodules occur naturally within the limestone and were readily available to prehistoric peoples for lithic tool making. The porosity of Kaibab Limestone has inhibited the development of a significant surface drainage system (Chronic 1983). Most drainages in the project area are broad and shallow with little entrenchment. There is no discernable drainage system within the project site.

#### 3.3.1.5 Soils

Soils of the KNF were mapped as part of the Terrestrial Ecosystem Survey (TES) of the Kaibab National Forest (Brewer et al. 1991). This information is available at the Kaibab National Forest Supervisor's Office or via the internet at:

http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5138598.pdf.

The TES is used to evaluate and adjust land uses to the limitations and potentials of natural resources and the environment.

### Skinner Ridge Communications Site

Layer 1 – Alluvium: This surface layer usually reaches a depth of up to three feet. Unified soil classification of the soil encountered during field testing is "silts of low plasticity" (sandy silt, with gravel), which consists of approximately 14% gravel, 33% sand, and 53% fines. This layer is slightly damp, loose, and is non-cemented.

Layer 2 - is composed of very dense sandy silt—decomposed limestone and may contain fragments or sections of limestone rock appearing to float. This layer extends to depths ranging from 8.5 to 16.1 feet.

Layer 3 - is rock mass comprised of moderately weathered and fractured, fair, moderately weak limestone below 8 to 16 feet to bedrock.

The proposed Skinner Ridge Communication site occurs on TES map unit 265. This map unit is composed from mixed sedimentary residuum. They are classified as Lithic Eutroboralfs; loamy-skeletal, mixed, cobbly, very fine sandy loams. Soils in this map unit are generally shallow with high rock content. These soils have a moderate risk for sheet and rill erosion and severe risk for unsurfaced roads.

### Grandview Communications Site

Layer 1 – Coarse-grained alluvium: Unified soil classification of the surficial soil encountered during field testing is "gravels with fines" (silty gravel, with sand), which consists of approximately 49% gravel, 18% sand, and 33% fines. The layer is damp, loose to moderately dense, plasticity index of 2, and is weakly cemented. The layer may contain fragments or sections of limestone rock. The layer reaches depths of 6 to 9 feet.

Layer 2 – Very highly weathered and fractured very poor to poor, weak limestone, existing at depths below 6 to 9 feet.

Complete geotechnical investigation reports for both sites can be found in the Project Record.

The proposed Grandview Communication Site occurs on TES map unit 290. This map unit is composed from residuum of limestone and sandstone parent materials. They are classified as Typic Eutroboralfs; fine, montmorillonitic, gravelly very fine sandy loams. Soils in this map unit are generally deeper than those found at the proposed Skinner Ridge Communication Site. These soils have a slight risk for sheet and rill erosion and severe risk for unsurfaced roads. These soils have low bearing strength when wet, which can cause trafficability and travelability problems.

#### 3.3.1.6 Water

### Skinner Ridge and Grandview Communications Sites

No naturally occurring perennial surface water resources are present at either site. Most drainages in the area of or near the project area are broad and shallow with little entrenchment. The proposed Grandview site would be located on a broad flat ridge with no discernable drainage. The proposed Skinner Ridge site is also located on a ridge and has no discernable drainage. There is no discernable drainage system within either of the project sites or within several miles of either site.

## 3.3.2 Environmental Consequences

### 3.3.2.1 Vegetation

#### Proposed Skinner Ridge Communications Site

Vegetation would be removed on the areas of soil disturbance (approximately 0.35 acres) necessary for road construction, facility construction, and fencing. The approximately .35 arces of disturbace is caused by the approximately 0.25 acres of vegetation removed from the proposed communications tower and facilities site, and the approximately 0.1 acres of vegetation that would be removed for the 100 feet by 12 feet access road. An estimate of the number and size of tree species needed to be cleared are shown in Table 3.1.

**Table 3.1 – Estimated Type, Number, and Size of Trees/Shrubs and Other Understory to be Cleared at the Proposed Skinner Ridge Communications Site.**

| Species | Less than 5” dbh/drc* | 5–12” dbh/drc | 12 – 16” dbh/drc | Greater than 16” dbh |
|---|---|---|---|---|
| Gambel Oak | 44 live<br>10 dead | 5 live<br>3 dead | 0<br>0 | 0<br>0 |
| Cliff Rose | 5 young<br>4 mature | N/A | N/A | N/A |
| Utah Juniper | 1 | 1 | | |
| Pinyon Pine | 4 | 6 | | |
| Ponderosa Pine | 0 | 0 | 1 - 15” dbh - snag | 1 - 24” dbh<br>1 - 24” dbh - fading |
| **OTHER VEGETATION**<br>Includes mullein (fire response), snakeweed, lupine, buckwheat, wax currant, 1 pincushion cactus, 1 prickly pear. Grasses include blue grama (most abundant) and squirreltail. Also, previously noted *Penstemon spp*., *Carex spp*. | | | | |
| **Noxious Weeds**<br>3 individual plants of cheat grass were noted—these would be removed by clearing. Noxious weed monitoring is included in project mitigation. | | | | |
| * dbh: diameter breast height, used for ponderosa pine, drc: diameter root, used for woodland species | | | | |

This amount of tree and vegetation removal is not substantial and of no measurable percentage when the ponderosa pine and associated species in the forest surrounding the project area is considered. There are no threatened and endangered or sensitive plant species present. There would be no measurable effects from removal of vegetation at the proposed Skinner Ridge Site.

#### Proposed Grandview Communications Site

Vegetation would be removed on the areas of soil disturbance (approximately 0.35 acres) necessary for road construction, facility construction, and fencing. The approximately .35 arces of disturbace is caused by the approximately 0.25 acres of vegetation removed from the proposed communications tower and facilities site, and the approximately 0.1 acres of vegetation that would be removed for the 190 feet by 12 feet access road. An estimate of the number and size of tree species needed to be cleared are shown in Table 3.2.

| **Table 3.2 – Estimated Type, Number, and Size of Trees/Shrubs and Other Understory to be Cleared at the Proposed Grandview Communications Site.** | | | | |
|---|---|---|---|---|
| Species | Less than 5" dbh/drc* | 5–12" dbh/drc | 12 – 16" dbh/drc | Greater than 16" dbh |
| Gambel Oak | 6 | 6 | 1 - 12" drc | |
| Utah Juniper | 3 | 3 | 2 | 3 - 20" drc |
| Pinyon Pine | 2 | 0 | 0 | 0 |
| Ponderosa Pine | 0 | 16 | 1 | 1 - 22" dbh |
| **OTHER VEGETATION**<br>Fleabane (common), buckwheat, pussy toes (most common), 3 pincushion cacti, blue grama (sparse). Understory vegetation generally sparse. | | | | |
| **Noxious Weeds**<br>2 individual plants of cheat grass were noted—these will be removed by clearing. Noxious weed monitoring is included in project mitigation. | | | | |
| * dbh: diameter breast height, used for ponderosa pine<br>drc: diameter root collar, used for woodland species | | | | |

This amount of tree and vegetation removal is not substantial and of no measurable percentage when the ponderosa pine and associated species in the forest surrounding the project area is considered. There are no threatened and endangered or sensitive plant species present. There would be no measurable effects from removal of vegetation at the proposed Grandview Site.

#### 3.3.2.2 Riparian Habitat

##### Skinner Ridge and Grandview Communications Sites

There is no riparian habitat within the project area; therefore, Alternatives 2–4 would not impact riparian areas.

#### 3.3.2.3 Invasive Plants

##### Skinner Ridge and Grandview Communications Sites

The incorporation of the Best Management Practices would prevent the establishment of new noxious or invasive weed populations; therefore, Alternatives 2–4 would not contribute to the spread of invasive species and/or noxious weeds at either the proposed Skinner Ridge or Grandview Communications Sites. The following mitigation to ensure there are no occurrences during or following construction, and over the life of the special use permit, would be implemented at both sites.

##### Skinner Ridge and Grandview Design Features/Mitigation for Invasive Species/Noxious Weed Control

- The lease holder will inventory and document noxious and invasive plant infestations before construction begins and report findings to the KNF.
- The lease holder will ensure that all construction equipment will be pressure washed to remove any soil or vegetative material before entering KNF lands

- The lease holder will inspect the roadways leading to each site and communications area of disturbance annually during the growing season to detect establishment of invasive species.
- The lease holder will remove any invasive/noxious weed species infestations from the lease area and surrounding area of disturbance that become established after construction by implementing a treatment plan developed by the lease holder and approved by KNF.
- The lease holder will monitor the site for invasive/noxious weeds for 2 years following construction.

#### 3.3.2.4 Soils

Impacts to soil resources are the same for all the action alternatives and are expected to be minimal. The proposed tower sites are on flat locations, minimizing cut and fill that would be required to build the site. A maximum total of less than one acre of soil would be disturbed at each site as displayed in Table 3.3.

**Table 3.3 – Acres of Soil Disturbance under Alternatives 2–4.**

| Source of Soil Disturbance | Acres of Soil Disturbed Skinner Ridge | Acres of Soil Disturbed Grandview |
|---|---|---|
| New road construction | 100 feet/0.1 acres (rounded up) | 190 feet/0.1 acres (rounded up) |
| Tower/buildings | 0.25 | 0.25 acres |
| Utility | No new disturbance | 0.2 acres - All line (2,945 feet) is buried in an existing road prism–no new disturbance[4] |
| Totals | 0.35 | 0.35 |
| Project Total | .7 acres | |

Soil disturbance would be kept to a minimum by using existing access roads to the extent possible at both communications sites.

Construction and site maintenance Best Management Practices will be implemented in accordance with the National Core BMP Technical Guide (FS-990a). The document is available online at:

http://www.fs.fed.us/biology/resources/pubs/watershed/FS_National_Core_BMPs_April2012.pdf

[4] There is also 1,650 feet of buried trench on NPS lands, also within the existing road prism – no new disturbance.

Implementation of Best Management Practices and other construction planning activities will effectively reduce the potential negative effects from construction activities under Alternatives 2–4.

#### 3.3.2.5 Water

Runoff at these sites would be limited and local and would not reach perennial water sources. The Tusayan District, being located on porous, very well drainded limestone is generally dry and most open water consists of a few stock tanks and wildlife drinkers scattered sparsely throughout the district. No impacts to water resources are anticipated at either site from Alternatives 2–4 because there are no naturally occurring perennial surface water resources at the construction sites, nor would any sediment from the sites move into any water resources.

### 3.3.3 Cumulative Effects

#### 3.3.3.1 Vegetation

Past, present, and reasonably foreseeable actions considered for cumulative effects for vegetation include any project that has or will remove vegetation, including within five miles and five years of the proposed tower sites. The Randall Restoration Project and potentially pinyon juniper fuel wood cutting are the only known reasonably foreseeable projects within the cumulative effects boundary and time period. The Randall Restoration Project is thinning and prescribed fire on 7000 acres on four separate units on the Tusayan District. None of the cutting units are visible from the tower sites. Fuelwood gathering is very scattered and typically has little to no effects on vegetation if done legally under permit. Clearing of the approximately 0.7 acres of vegetation for this project is a minor direct and indirect effect and would not contribute to a substantial cumulative effect because it is the vegetation removal is proposed on such a small area extent that contributes minimally when added to other past, present, and foreseeable vegetation removal projects on the Tusayan Ranger District.

#### 3.3.3.2 Soils

Other past, present, and reasonably foreseeable actions that could result in impacts to soil include any earth-moving related developments in the project vicinity. A one mile radius was considered for cumulative soil impacts around each communication site. Other past soil disturbance is primarily associated with existing Forest Roads. There are no other present or reasonably foreseeable activities that would cause soil disturbance.

At the proposed Grandview Site, a portion of the buried power line would be placed in the FR 310 road prism (1,650 feet), on adjacent NPS land on GCNP. The disturbance would occur in the existing road bed and would be additive to that portion of the buried power line that extends onto National Forest System land (2,945 feet). The total affected area is 4,595 feet. Because project disturbance would be in an existing roadbed, with previous disturbance, no additive effects would be expected from this activity, therefore there would be no cumulative effect..

# 3.4 BIOLOGICAL RESOURCES

This section provides a general description of the existing environment with respect to general wildlife, threatened, endangered, and sensitive species, management indicator species, and migratory birds. Information is summarized from the Wildlife Biological Evaluation Reports located in the project record.

## 3.4.1 Affected Environment

As described in the vegetation section, both sites occur in the ponderosa pine vegetation community, with Gambel oak and to a lesser extent, juniper as common associated species. Both sites have been affected by past thinning and recent prescribed fire resulting in an open understory of grasses with a patchy overstory of young to mature ponderosa pine. The tower sites are part of a broader ponderosa pine habitat that encompasses thousands of acres of the surrounding forest. There are a multitude of wildlife species that utilize this habitat. Species that are listed under the Endangered Species Act, Forest Service sensitive species list, or are migratory birds that are known to occur in this habitat type received further evaluation in the Biological Evaluation Reports for this document.

At the proposed Grandview Site, due to the proximity of GCNP being less than ½ mile away, there is a heavy recreational usepresence in the form of dispersed camping around the proposed site. In addition, the site is on the flight path of low flying tour helicopters that operate year round, depending on weather conditions. The proposed Skinner Ridge Site is somewhat more remote with less impact from dispersed camping or air tours.

The project would cause habitat removal on less than one acre at each site, including 0.35 at the proposed Grandview Site and 0.35 acres at the proposed Skinner Ridge Site for a total of 0.7 acres for the project. Other disturbance includes 0.2 acres of trenching in an existing roadbed that would not be considered habitat removal.

The project would cause noise, equipment, vehicle traffic, and heavier human presence to occur from construction activities that include road construction for the access roads at both sites and construction of the towers and infrastructure at both communication sites. Construction would also include trenching for the power source at the proposed Grandview Communications Site. Once construction is completed, disturbance from human presence would be minimal, occurring during times of maintenance or equipment updates.

Longer term, there would be periodic noise from generators. At Skinner Ridge the generator would only come on as a backup power source which could occur during extended periods of no sunlight, due to thick clouds.

In this circumstance the generator would run approximately five minutes until the batteries are brought up to a sufficient level.

At the proposed Grandview Site, the generator would only come on as a backup power source if APS power is lost.

At both sites, the generator would come on once a month for 5 minutes as a routine test of equipment. The generators at both sites would be housed inside the equipment shelter. The interior location of the generator inside the building mitigates noise concerns considerably. The generators would not be heard beyond a few hundred feet from the site.

Backup power for these facilities would be supplied by both batteries and the generators, as described above.

#### 3.4.1.1 Environmental Consequences

##### Total Amount of Habitat Removal for Both Communication Sites

Each approximately 100 foot by 100 foot footprint equals approximately 0.25 acres or a total of approximately 0.5 acres that would have habitat removed through clearing and construction. The new access road construction to Skinner Ridge and Grandview Towers would add a maximum of 0.2 acres or less of habitat removal. Total area of habitat removal would be equal to approximately 0.7 acres. This amount of habitat reduction is minor and not substantial when the total amount of ponderosa pine/Gambel oak habitat for the area is considered. This amount of reduced habitat would not be a measurable percentage.

##### Access Road Construction at the Proposed Skinner Ridge and Grandview Communications Sites

The approximately 100 feet by 12 feet of access road to provide a driveway into the proposed Skinner Ridge Communications Site would clear approximately 0.1 acres (rounded up) of vegetation. The approximately 190 feet by 12 feet of access road to provide a driveway into the Grandview Communications Site would clear approximately 0.1 acres (rounded up) of vegetation. This amount of clearing would not be a substantial effect to vegetation or habitat and not a measurable percentage when compared to the total vegetation in the area.

Disturbance factors of noise from construction equipment and an increased human presence would occur during the two to three day period of construction activity. However, these impacts would be of short duration and not substantial to any known species. There would not be long term effects from disturbance to general wildlife.

##### Trenching for the power source for the Proposed Grandview Communications Site.

Trenching and installation of the power source would not affect vegetation habitat as all disturbances would be in the existing road beds of the FR 310 and FR 310G roads within the portion that is on National Forest System lands, (also, see Cumulative Effects at 3.4.1.2 below – effects of power line trench on NPS lands).

Disturbance factors of noise from construction equipment and an increased human presence would occur during the four to five day period of construction activity. There also could be risk of entrapment by animals falling into the open trench. Risk of entrapment is low because the trench is buried at the completion of each day's construction, so that there

is never an open trench for any length of time. There would not be any long term impacts anticipated and in fact long term impact would be eliminated as compared to above ground power sources that would require overhead vegetation trimming and some removal.

### Construction at the Proposed Skinner Ridge and Grandview Communications Site Facilities

Construction activities for erecting the towers and installing the communication site infrastructure would require clearing vegetation from each 100 foot X 100 foot area. This is approximately 0.25 acres at each site or a total of 0.5 acres. This amount of clearing would not be a substantial effect to vegetation or habitat for any known species and not a measurable percent when compared to the total vegetation in the area.

Disturbance from construction noise and increased human presence would occur for an approximately eight to ten week period. These impacts would be of short duration and not substantial to any known species. There would not be long term effects from disturbance.

For a complete estimated timeline for construction and expected duration of disturbance activities see Appendix D – Proposed Skinner Ridge and Grandview Communications Facility Detailed Work Plan and Construction Timeline.

### Generator Noise

Because the generators are housed within the equipment building, noise from the periodic testing and other infrequent use would not be heard for more than several hundred feet at most. Wildlife could be disturbed by the noise from generators, but effects would be minor and short term.

#### 3.4.1.2 Cumulative Effects

Past, present, and reasonably foreseeable actions considered for cumulative effects for wildlife habitat include any project that has or will remove vegetation and/or wildlife habitat, or cause wildlife disturbance through construction noise and human presence during construction. The cumulative effects boundary for general wildlife for this project is approximately 1 mile, but may be more extensive for some species.

Known projects considered in this cumulative effects analysis are vegetation removal projects that include the Randall Restoration Project and potentially, pinyon juniper fuel wood cutting. The Randall Restoration Project is thinning and prescribed fire on 7000 acres on four separate units on the Tusayan District. None of the cutting units are visible from the tower sites. Fuelwood gathering is very scattered and typically has little to no effects on wildlife habitat if done legally under permit. Clearing of the 0.7 acres of vegetation at the two tower sites is a minor cumulative effect and of no measurable percentage addition to wildlife habitat removed when combined with other vegetation removal projects on the Tusayan Ranger District.

There is a portion of the proposed buried power line at the proposed Grandview Site that is on NPS lands and would be considered a potential future cumulative effects project. Approximately 1,650 feet of trench would be required on NPS lands to connect to the

existing overhead power line, as a continuation of the trench and buried power line extending from the tower site to the forest boundary. As with that portion of the buried power line on National Forest System lands, the trench would be located within the roadbed of FR 310. There could be effects to wildlife from construction noise and entrapment during excavation of the trench and installation of the power line. However, due to the duration of construction of approximately one week, noise effects would be localized and of short duration. Effects of animal entrapment are greatly reduced because the trench is buried daily as installation progresses. Checks for any entrapped animals can be conducted as the trench is reburied and any chance entrapment would be temporary and of short duration.

There could be minor cumulative impacts from noise, trenching, and power line installation activities being done on the two land jurisdictions; however, the activities would occur within days of each other and cumulative impacts would be minor and of short duration and essentially indiscernible from the minor direct and indirect impacts already discussed.

Cumulative impacts from the trenching on NPS land when considering additive effects from other construction activities at the tower sites that could have short term effects to wildlife from noise and habitat removal would also be of short duration and minor and would not extend past the eight to ten week construction period.

No other cumulative impacts to general wildlife species from the other known past, present, or reasonably foreseeable actions would be anticipated because all anticipated effects are minor and of short duration and there are no measurable direct or indirect effects from the proposed project that would be additive or measurably cumulative.

### 3.4.2 Species Considerations for Threatened and Endangered, Proposed and Candidate, Sensitive Species, Management Indicator Species and Migratory Birds

The species considered for this project include those species on the U.S. Fish and Wildlife Service (USFWS) Threatened and Endangered Species List for Coconino County, species on the Arizona Game and Fish Department (AZGFD) list for species with special status within two miles on the project vicinity, and all species on the February 3, 2014 Kaibab National Forest White Paper for Kaibab National Forest Threatened, Endangered, Proposed, and Sensitive Species (TEP&S) list by District, for species that may occur on the Tusayan Ranger District in Coconino County (USFWS, 2015; AGFD 2015; Keckler, 2014). All species from these three lists were evaluated to determine potential presence of the species or suitable habitat within the project area, and are shown in Tables 3.4 through 3.8. The USFWS and AZGFD list were obtained using that agency's online evaluation system. The KNF list was obtained from the Kaibab Forest Biologist. A total of 37 individual species were on the obtained lists and most were eliminated from further consideration because the project is outside the species range or there is no suitable habitat. Ten were considered for the project because they had the potential to be found at the project site (Tables 3.4 through 3.8).

### 3.4.3 Threatened and Endangered Species

The following information is summarized from the Wildlife Biological Assessment Reports located in the project record.

#### 3.4.4.1 Critical Habitat

Neither of the proposed Skinner Ridge or Grandview Communications Sites are located within designated Critical Habitat for any listed species.

| **Table 3.4 – Listing Categories.** | |
|---|---|
| E | Endangered |
| T | Threatened |
| C | Candidate |
| R | Recovery |
| S | Sensitive |
| BGA | Bald and Golden Eagle Protection Act |

**Table 3.5 – Federally Listed or Proposed Species Evaluated for the Proposed Skinner Ridge and Grandview Communications Sites.**

| Species | Federally Listed Species | Considered For Project | Comments |
|---|---|---|---|
| **Amphibians** | | | |
| Chiricahua leopard frog *Lithobates chiricahuensis* | T | No | Kaibab NF outside species range, no suitable habitat near the project sites |
| **Birds** | | | |
| California condor *Gymnogyps californianus* | E | Yes | Nonessential experimental population (section 10(j) of the ESA). On the Tusayan RD, condors are only rare visitors. |
| American peregrine falcon *Falco peregrinus anatum* | R | No | No cliffs present for nesting in or near project. Although peregrines nesting in Grand Canyon may forage on the Tusayan RD, no key foraging areas (areas with high prey density including wetlands or large meadows or relatively open areas) are present in project area. |
| Yellow-billed cuckoo *Coccyzus americanus* | T | No | Project area outside species range, No suitable habitat |
| Mexican spotted owl *Strix occidentalis lucida* | T | No | No habitat on the Tusayan RD. Project is not within designated critical habitat. |
| Southwestern willow flycatcher *Empidonax traillii extimus* | E | No | No habitat is available on Tusayan RD |
| **Fishes** | | | |
| Humpback chub *Gila cypha* | E | No | Kaibab NF outside species range, no suitable habitat at sites |

**Table 3.5 – Federally Listed or Proposed Species Evaluated for the Proposed Skinner Ridge and Grandview Communications Sites.**

| Species | Federally Listed Species | Considered For Project | Comments |
|---|---|---|---|
| Apache trout<br>*Oncorhynchus gilae apache* | T | No | No suitable habitat in project sites |
| Roundtail chub<br>*Gila robusta* | C | No | No suitable habitat in project sites |
| Little Colorado spinedace<br>*Lepidomeda vittata* | T | No | Kaibab NF outside species range |
| Razorback sucker<br>*Xyrauchen texanus* | E | No | Kaibab NF outside species range |
| **Flowering Plants** | | | |
| Fickeisen plains cactus<br>*Pediocactus peeblesianus var. fickeiseniae* | E | No | Project sites outside species range. |
| Sentry milk vetch | E | No | Project sites outside species range. |
| Navajo sedge<br>*Carex specuicola* | T | No | Project sites outside species range. |
| Brady pincushion cactus<br>*Pediocactus bradyi* | E | No | Species not found on the Kaibab NF. |
| Siler pincushion cactus<br>*Pediocactus sileri* | T | No | Species not found on the Kaibab NF. |
| San Francisco Peaks ragwort<br>*Packera franciscana* | T | No | Project sites outside species range. |
| Welsh's milkweed<br>*Asclopias welshii* | T | No | Project sites outside species range. |
| **Mammals** | | | |
| Black-footed ferret<br>*Mustela nigripes* | E | No | No prairie dog towns near sites. |
| **Mollusks** | | | |
| Kanab ambersnail<br>*Oxyloma haydeni kanabensis* | E | No | Project sites outside species range. |
| **Reptiles** | | | |
| Northern Mexican gartersnake<br>*Thamnophis eques megalops* | T | No | Project sites outside species range. |
| Narrow-headed gartersnake<br>*Oxyloma haydeni kanabensis* | T | No | Project sites outside species range. |

**Table 3.6 – List of Recovered Federal Listed Species Accounts and Effects Analysis.**

| Species | No Effect | Not Likely to Jeopardize Continued Existence | May Affect, but Not Likely to Adversely Affect | May Affect, and Is Likely to Adversely Affect |
|---|---|---|---|---|
| California condor (non-essential experimental population)<br>*Gymnogyps californianus* | | X | | |

## 3.4.4 California Condor

### 3.4.4.1 Affected Environment

#### Proposed Skinner Ridge and Grandview Communications Sites

Both the proposed Skinner Ridge and Grandview Communications Sites are located within the nonessential experimental population area designated for the California condor. Condors occur all along the south rim of the Grand Canyon north of the proposed Grandview Communication Tower site. Tracking data provided by the Condor Reintroduction Project and taken from April to July 2015 show numerous occurrences all along the south rim, becoming more numerous towards the South Rim Park Entrance. There is no suitable nesting habitat (cliffs or caves) in the project vicinity. The Peregrine Fund (2009) reported condor breeding behavior associated with three areas of the Kaibab National Forest during the 2009 season; however, there are no known nesting sites on the Tusayan District. GPS relocations show concentrated condor use within the Grand Canyon with long distance flights across the Tusayan District and some carrion foraging activity on the district. Although not documented from the project area, condors can forage over large areas and could occur in the vicinity of the project area in the future.

#### Species Status and Requirements under Endangered Species Act

The California condor (*Gymnogyps californianus*) was listed as endangered on March 11, 1967 (32 FR 4001). Critical habitat was designated in California on September 24, 1976 (41 FR 187). Critical habitat has not been designated outside of California; therefore, the proposed project is not within critical habitat.

The first release of condors into the wild in northern Arizona occurred on December 12, 1996. They were released within a designated nonessential experimental population area in northern Arizona and southern Utah. The area is bounded by Interstate 40 on the south, U.S. Highway 191 on the east, Interstate 70 on the north, and Interstate 15 to U.S. Highway 93 on the west (USFWS 2009).

A designation of nonessential experimental limits the application of section 7(a)(2) of the Endangered Species Act. For the purposes of section 7, the nonessential experimental population is treated as a proposed species except on National Wildlife Refuge System and National Park System lands. Current and future land, water, or air uses such as, but not limited to: commercial and business development; forest management; agriculture; mining and energy resource exploration and development (e.g., coal); livestock grazing; development of transportation and utility corridors (e.g., power transmission lines); communication facilities; water development projects; sport hunting and fishing; air tour operations and outdoor recreational activities (e.g., jeep tours, hiking, biking, boating) should not be restricted due to the designation of the nonessential experimental population of California condors (USFWS 1996a).

### Species Information and Locations

Condors are opportunistic scavengers, feeding only on the carcasses of dead animals. Typical foraging behavior includes long-distance reconnaissance flights, lengthy circling flights over a carcass, and hours of waiting at a roost or on the ground near a carcass (USFWS 1996b). Most California condor foraging in northern Arizona occurs in open areas and throughout the forested areas of the rims of Grand Canyon. Condors are also attracted to human activity; newly released individuals and young inexperienced juveniles are more likely to investigate human activity.

Roost sites include cliffs and tall trees, including snags. Nesting sites for California condors include various types of rock formations such as caves, crevices, overhung ledges, and potholes.

The concern for a mortality, and the possibility of additional mortalities, from collision with a powerline led to aversion training prior to release of condors in both California and Arizona. Newly released, aversion trained condors were not observed perching on power poles in California (USFWS 1996b). There have been no recorded collisions or electrocutions in Arizona since aversion training, although there are comparatively few powerlines in the region (A Review of the Third Five Years of the California Condor Reintroduction Program in the Southwest (2007-2011), May, 2012).

Locations of released condors are well known for the nonessential experimental population. Prior to release, each condor was fitted with patagial (wing-mounted) number tags and radio transmitters. New releases generally remain near the release site immediately after release but have taken to the well-established primary range. The Vermilion Cliffs release site is heavily used by the majority of condors during the winter months followed by increasing use of the Colorado River corridor and South Rim of the Grand Canyon in early spring. The southwest population has been known to fly widely, ranging into eastern Nevada, southwestern Arizona, east along the Mogollon Rim to the New Mexico border, and north as far as Flaming Gorge Wyoming. However, the condors generally travel between two main areas, the Grand Canyon Ecoregion/Colorado River corridor in Arizona and the Kolob Terrace/Zion National Park (Zion NP) area in Utah (USFWS 2012).

In addition to the Grand Canyon area, condors have been observed west to the Virgin Mountains near Mesquite, Nevada; south to the San Francisco Peaks near Flagstaff, Arizona; north to Zion and Bryce Canyon National Parks in Utah; beyond Minersville, Utah; and east to Mesa Verde, Colorado and the Four Corners region (USFWS 2009).

#### 3.4.4.2 Environmental Consequences

### Effects on Habitat and Food Sources

Activities at either the proposed Skinner Ridge or Grandview Communications Sites would not cause any changes to the amount of food source (mammal carrion) due to the small size (less than 1 acre) of habitat loss which would not affect mammal populations.

There is a low probability that condors will investigate human activity associated with the construction of the towers. Human activity will occur primarily during construction and will involve a small crew of construction workers. After tower and antennae installation, routine maintenance will involve human activity at a low level (estimated at less than one several hour visit per month).

In addition to the increased human activity during the approximately eight to ten weeks of construction at the site there would be increased noise from the various construction activities needed to establish the sites. Construction that would create noise effects would include access roads and equipment buildings at both sites, solar array installation at Skinner Ridge, trenching for the power source at Grandview, and fencing at both sites, in addition to the tower construction at both sites.

Noise from the various construction activities could cause disturbance to condors that might visit the area. The effects from construction noise would be of short durations, (eight to ten weeks or less), and in general minor and short term.

Noise from the sporadic and occasional generator backup power and once a month five minute equipment testing would not be expected to cause substantial disturbance to foraging condors.

Birds can collide with any man made structure when in flight, including buildings, towers, fences, and vehicles. Birds most likely to collide with tall structures are those that are nocturnal flyers or have rapid flight behavior. The towers at both proposed sites meet USFWS communication tower guidelines to minimize impacts to birds, including self-supporting (no guy wires) towers, unlighted towers, co-location of facilities, and minimizing vegetative clearing through facility positioning. Both facilities wouldbe fenced. All reasonable measures to minimize the possibility for bird mortality have been incorporated. These guidelines were developed primarily for neo-tropical migrants and, of these, only the lack of guy wires is likely to be of any importance to prevent possible flight collision for condors. Trees in this area are approximately 60 to 80 feet tall. The tower heights of 125 feet at Skinner Ridge and lower at the proposed Grandview site are at lower heights than condors generally soar as they search for carrion. The risk of collision is higher for fast flying species (Nagiller 2000). The condor is not considered a fast flying species. No condor collisions with telecommunication towers have been documented. Numerous telecommunication towers occur within the non-essential experimental population area, including an existing 94 foot tower at the Tusayan Communication Site and several towers in the vicinity of the Grand Canyon airport. Aversion training to power poles, a structure similar to towers, may also result in avoidance of towers.

Proposed activities at both the Skinner Ridge and Grandview Communications Sites could have minimal effects during construction due to noise disturbance to the California condor; however, the proposed communications sites are not likely to jeopardize the continued existence of the California condor because the population is a 10(j) population and the Condor Conservation Measures. The project design features at both sites that minimize impacts to the species include:

1. Project activities would not occur near or cause disturbance to nesting condors.

2. The self-supporting tower (no guy wires) minimizes possible risk of accidental collision.
3. Implementation of the conservation measures reduces possible impacts if condors are attracted to human activities during the eight to ten weeks of construction.
4. Effects from the eight to ten weeks of construction noise could be experienced by visiting condors; however, they would be minor, short duration, and short term.
5. Effects from sporadic generator noise would be minor and negligible to condors.

#### 3.4.4.3 Cumulative Effects

Past, present, and reasonably foreseeable actions considered for cumulative effects for condor habitat include any project that has or will remove vegetation and/or wildlife habitat, or cause disturbance to condors through construction noise and human presence during construction.

Known projects considered in this cumulative effects analysis are vegetation removal projects that include the Randall Restoration Project and potentially, pinyon juniper fuel wood cutting. The Randall Restoration Project is thinning and prescribed fire on 7000 acres on four separate units on the Tusayan District. None of the cutting units are visible from the tower sites. Fuelwood gathering is very scattered and typically has little to no effects on wildlife habitat if done legally under permit. Clearing of the 0.7 acres of vegetation at the two tower sites is a minor cumulative effect and of no measurable percentage addition to wildlife habitat removed when combined with other vegetation removal projects on the Tusayan Ranger District.

There is a portion of the proposed buried power line at the proposed Grandview Site that is on NPS lands and would be considered a potential future cumulative effects project. Approximately 1,650 feet of trench would be required on NPS lands to connect to the existing overhead power line, as a continuation of the trench and buried power line extending from the tower site to the forest boundary. As with that portion of the buried power line on National Forest System lands, the trench would be located within the roadbed of FR 310. There could be effects to condors from construction noise during excavation of the trench and installation of the power line. However, due to the duration of construction of approximately one week, noise effects would be localized and of short duration.

There could be minor cumulative impacts from noise, trenching, and power line installation activities being done on the two land jurisdictions; however, the activities would occur within days of each other and cumulative impacts would be minor and of short duration and essentially indiscernible from the minor direct and indirect impacts already discussed.

Cumulative impacts from the trenching on NPS land when considering additive effects from other construction activities at the tower sites that could have short term effects to condors from noise would also be of short duration and minor and would not extend past the eight to ten week construction period.

No other cumulative impacts to condors from the other known past, present, or reasonably foreseeable actions would be anticipated because all anticipated effects are minor and of

short duration and there are no measurable direct or indirect effects from the proposed project that would be additive or measurably cumulative.

### Condor Conservation Measures

1 At least one week prior to the beginning of any human project-related activity, a KNF biologist will contact the Peregrine Fund to identify condor locations and type of behavior or activity in or near the activity area. NPS/GCNP will also be concurrently notified of pending activity. If multiple activities are undertaken within a similar timeframe, condor activity will be monitored by a biologist during that period. Educate all crews about the potential for condors to arrive on-site, and the appropriate actions to take. The lease holder would provide a qualified biologist to perform these tasks if approved by KNF.

2 The need to alter implementation schedules, adjust work areas, or take other appropriate action will be evaluated by a forest biologist and applied when condor nesting near a project site becomes an issue, on a case-by-case basis. The important factor is rapid notification to avoid condor or human injury, and appropriate steps to allow project continuation without interfering with condor behavior.

3 To prevent water contamination and potential condor poisoning, the district-approved vehicle fluid-leakage and spill plan will be adhered to. The plan will be reviewed by the district biologist for adequacy in addressing condors.

4 If condors arrive and remain in, or very near, human activity areas, the following actions will be taken:

Elevate the awareness of crews working in the area of the potential for condors to visit an area.

Educate crews working in the area of potential visitation by condors and how to respond.

Project workers and supervisors will be instructed to avoid interaction with condors and to contact the appropriate personnel immediately if and when condor(s) occur at a project site.

If a condor occurs at the project site, only federally permitted personnel will employ techniques to cause the condor to leave the site as necessary. The particular project activity will temporarily cease, if injury of a condor is imminent, until a biologist can assess the situation and determine the correct course of action.

Project sites will be cleaned up at the end of each work day (i.e., trash disposed of, scrap materials picked up) to minimize the likelihood of condors visiting the site. District staff will complete a site visit to ensure adequate clean-up measures.

5. A portion of the construction for the buried power line would occur on GCNP, (1,650 feet). That portion of the project would require clearance and authorization by the NPS. Any design features or mitigation required for condors or other wildlife not addressed by Forest Service requirements would be included in NPS permitting and

authorization. NPS would also be notified if there are sightings of wildlife that would require agency notification and/or that could affect wildlife resources on the GCNP.[5]

## 3.4.5 Bald And Golden Eagle Protection Act

### 3.4.5.1 Affected Environment

| Table 3.7 Bald and Golden Eagle Protection Act Affect | | | |
|---|---|---|---|
| Species | No Take Issue Required | Take Issue is Required | Listing Categories |
| Bald eagle<br>*Haliaeetus leucocephalus* | X | | R – Recovery<br>BGA – Bald and Golden Eagle Protection Act |
| Golden eagle<br>*Aquila chrysaetos* | X | | |

| Table 3.8 – Bald and Golden Eagle Protection Act Evaluated for the Proposed Skinner Ridge and Grandview Communications Sites. | | | |
|---|---|---|---|
| | | | |
| Species | Status | Considered For Project | Comments |
| Bald eagle<br>*Haliaeetus leucocephalus* | R/<br>BGA | Yes | Occurs on Tusayan RD in winter. |
| Golden eagle<br>*Aquila chrysaetos* | BGA | Yes | May forage in the area. |

#### Proposed Skinner Ridge and Grandview Communications Sites

Bald and golden eagles are protected under the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act. The bald eagle is also a Forest Service sensitive species. Arizona supports a substantial population of wintering bald eagles. Migratory bald eagles typically arrive in northern Arizona in October and leave in April, with adults more common in fall and immature birds more abundant in January through April (Grubb 2003). Wintering bald eagles are habitat generalists and can be seen anywhere on the district. During winter, the bald eagle diet in northern Arizona is comprised mostly of carrion of large ungulates and small mammals (Grubb and Kennedy 1982). They are sometimes seen scavenging on or perched near a roadkill elk or deer along Highway 64 or near other sources of carrion. In Arizona, large ponderosa pines (*Pinus ponderosa*) are commonly used for night-time roosting by bald eagles (Grubb et al.1989, Joshi 2009). Joshi reported bald eagle "hotspots" as roosts used for ≥5 nights by ≥1 bald eagle(s). There is a "hotspot" located three miles to the south that was used by a single eagle in 2005 and 2006. There

[5] There may be different and/or additional mitigation for condors required by NPS for that portion of the power line trenching project that occurs on NPS lands, and would be included as part of the separate NPS authorization for that portion of the project.

are no suitable night-time roosting sites within or adjacent to the either of the proposed communications sites.

In Arizona, very little information exists about the population size, habitats, or habits of golden eagles. The golden eagle is a carnivore that feeds mainly on small mammals like rabbits, marmots and ground squirrels. They may also eat insects, snakes, birds, juvenile ungulates and carrion. They can fast for days between feedings. They hunt while soaring or from their perch and they may hunt cooperatively. They commonly hunt in the early morning and early evening. Golden eagles are usually found in open country, in prairies, arctic and alpine tundra, open wooded country and barren areas, especially in hilly or mountainous regions. They nest on rock ledges, cliffs or in large trees. The pair may have several alternate nests and they may use the same nests in consecutive years or shift to alternate nest used in different years. In western mountains, nests were built at elevations between 4,000 – 10,000 feet. In Arizona, golden eagles are found in mountainous areas and are virtually vacant after breeding in some desert areas (AGFD 2002).

#### 3.4.5.2 Environmental Consequences

No changes to bald and golden eagle food availability would occur as a result of the small acreage of soil disturbance and project land occupancy **a**t either the proposed Skinner Ridge or Grandview Communications Sites.

The self-supporting tower design (no guy wires) proposed for both of the proposed Skinner Ridge and Grandview sites reduce the risk of possible collision. However, bald eagles generally fly at heights above the proposed tower height when searching for carrion. Rapid flight in pursuit of prey normally occurs around water where bald eagles fish or hunt waterfowl. There is no water in the project area so rapid pursuit flight is not expected in the project vicinity, reducing the collision risk. No bald eagle collisions deaths are expected based on the above information and Longcore's (2005) review of 47 tower mortality studies that did not report any incidences of bald eagle collision.

For the golden eagle, the project area is not their preferred foraging or nesting habitat but they could potentially forage in the area or be passing through. It is unlikely that there would be any collisions with the towers.

Noise from the eight to ten weeks of construction and increased human presence could cause disturbance to foraging bald eagles. However, construction activities would occur during summer months and outside the winter season when most bald eagles are present and so these effects would be minor, short duration, and short term.

Noise from the sporadic and occasional generator backup power and once a month five minute equipment testing would not be expected to cause substantial disturbance to foraging bald or golden eagles.

Project activities at the proposed Skinner Ridge and Grandview Communications Sites are not expected to cause any long term impact to bald or golden eagles or require a take statement under the Bald and Golden Eagle Act for either species because:

1. No winter roosts would be impacted.

2. Food availability will not be impacted.
3. Tower design incorporates features to minimize the risk of accidental collision.
4. Minor short term, short duration effects to foraging eagles from noise, however, construction would be planned for summer months, outside the winter period when bald eagles are mostly present.
5. Minor short term, short duration effects from the eight to ten weeks of construction and human presence could cause foraging golden eagles to avoid the area.
6. There could be short term effects from disturbance caused by occasional and sporadic generator noise, but these effects would be minor and negligible.

#### 3.4.5.3 Cumulative Effects

Past, present, and reasonably foreseeable actions considered for cumulative effects for bald and golden eagles include any project that has or will remove vegetation and/or wildlife habitat, or cause wildlife disturbance through construction noise and human presence during construction.

Known projects considered in this cumulative effects analysis are vegetation removal projects that include the Randall Restoration Project and potentially, pinyon juniper fuel wood cutting. The Randall Restoration Project is thinning and prescribed fire on 7000 acres on four separate units on the Tusayan District. None of the cutting units are visible from the tower sites. Fuelwood gathering is very scattered and typically has little to no effects on eagles if done legally under permit. Clearing of the 0.7 acres of vegetation at the two tower sites is a minor cumulative effect and of no measurable percentage addition to wildlife habitat removed when combined with other vegetation removal projects on the Tusayan Ranger District.

There is a portion of the proposed buried power line at the Grandview Site that is on NPS lands and would be considered a potential future cumulative effects project. Approximately 1,650 feet of trench would be required on NPS lands to connect to the existing overhead power line, as a continuation of the trench and buried power line extending from the tower site to the forest boundary. As with that portion of the buried power line on National Forest System lands, the trench would be located within the roadbed of FR 310. There could be effects to bald and golden eagles from construction during excavation of the trench and installation of the power line. However, due to the duration of construction of approximately one week, noise effects would be localized and of short duration.

There could be minor cumulative impacts from noise, trenching, and power line installation activities being done on the two land jurisdictions; however, the activities would occur within days of each other and cumulative impacts would be minor and of short duration and essentially indiscernible from the minor direct and indirect impacts already discussed.

Cumulative impacts from the trenching on NPS land when considering additive effects from other construction activities at the tower sites that could have short term effects to bald and golden eagles from noise and habitat removal would also be of short duration and minor and would not extend past the eight to ten week construction period.

No other cumulative impacts to bald and golden eagles from the other known past, present, or reasonably foreseeable actions would be anticipated because all anticipated effects are minor and of short duration and there are no measurable direct or indirect effects from the proposed project that would be additive or measurably cumulative. Project activities are not expected to cause any long term effects to the bald or golden eagle.

### 3.4.6 Forest Service Sensitive Species

Table 3.9 lists sensitive species evaluated for the project.

**Table 3.9 – Sensitive Species Evaluated for the Proposed Skinner Ridge and Grandview Communications Sites.**

| Species | State or Forest Listed Species | Considered For Project | Comments |
|---|---|---|---|
| **Amphibians** | | | |
| Northern leopard frog *Rana pipiens* | S | No | No suitable habitat in project sites |
| **Birds** | | | |
| Bald eagle *Haliaeetus leucocephalus* | S | Yes | Occurs on Tusayan RD in winter. |
| Northern goshawk *Accipiter gentilis* | S | Yes | May forage in area. Surveys conducted in 2013 and 2015 at project sites. Species not found during surveys. |
| Burrowing owl (western) *Athene cumicularia hypugaea* | S | No | Prefers open grasslands. No suitable habitat in project sites |
| **Flowering Plants** | | | |
| Arizona phlox *Phlox amabilis* | S | Yes | Project sites surveyed on May 29, 2015 for presence of species and species was not found. |
| Mt. Dellenbaugh sandwort *Arenaria aberrans* | S | Yes | Project sites surveyed on May 29, 2015 for presence of species and species was not found. |
| Tusayan (Disturbed) rabbitbrush *Chrysothaminus molestus* | S | No | Found in open pinyon-juniper grasslands. Project areas likely above species elevation threshold. Species found between 5,710 and 6,880 feet. Project site is pine-oak woodland, and both sites are above 7,000 feet. |
| Arizona (clustered) leatherflower *Clematis hirsutissima var. hirsutissima* | S | Yes | Project sites surveyed on May 29, 2015 for presence of species and species was not found. |
| Grand Canyon rose *Rosa stellata spp. abyssa* | S | No | Project sites outside species range. |
| **Mammals** | | | |
| Spotted bat *Euderma maculatum* | S | Yes | May forage in the area. No roosting habitat in or near projects. |
| Pale Townsend's big-eared bat *Corynorhinus townsendii pallescens* | S | Yes | May forage in area. No roosting habitat in or near projects. |
| Allen's lappet-browed bat *Idionycteris phylliotis* | S | Yes | May forage in area, could roost in nearby large ponderosas. |
| Navajo Mogollon vole *Microtus mogollonensis navaho* | S | No | Typically occupy dry grassy vegetation in conifer forests. Insufficient grass and site rocky. |

All species listed for the Tusayan Ranger District (Kaibab National Forest. 2014. White Paper for Kaibab National Forest TEP&S Species List by District. Last updated February 3, 2014.) that show sensitive species by district were considered. Detailed analysis is located in the Biological

Assessments for the proposed Skinner Ridge and Grandview Communications Sites, located in the project record.

Sensitive bird and mammal species that may occur in or near the project areas based on habitat conditions include: bald eagle, northern goshawk, spotted bat, Allen's lappet-browed bat, pale Townsend's big-eared bat.

Surveys (June 4, 2015). were conducted for the following plant species that may occur in or near the project area based on soil and vegetation types: Mt. Dellenbaugh sandwort, Tusayan rabbitbrush, Arizona leatherflower, and Grand Canyon rose. None of these species occur on either of the project sites.

**Table 3.10 - State and Kaibab National Forest Sensitive Species Findings.**

| Species | No Impact | [1]May Impact Individuals or Habitat But Will Not Trend Towards Listing | [2]Will Impact Individuals or Habitat and Trend Towards Listing |
|---|---|---|---|
| Bald eagle *Haliaeetus leucocephalus* | | X | |
| Northern goshawk *Accipiter gentilis* | | X | |
| Spotted bat *Euderma maculatum* | | X | |
| Allen's lappet-browed bat *Idionycteris phylliotis* | | X | |
| Pale Townsend's big-eared bat *Corynorhinus townsendii pallescens* | | X | |
| Arizona phlox *Phlox amabilis* | X | | |
| Mt. Dellenbaugh sandwort *Arenaria aberrans* | X | | |
| Arizona (clustered) leatherflower *Clematis hirsutissima var. hirsutissima* | X | | |

[1]May impact individuals or habitat, but will not likely contribute towards federal listing or cause a loss of viability to the population or species.
[2]Will impact individuals or habitat with a consequence that the action will contribute to a trend towards federal listing or cause a loss of viability to the population or species.

### 3.4.6.1 Bald Eagle

#### Affected Environment

The affected environment for the bald eagle when it is being considered as a sensitive species is the same as that described for the Bald Eagle Protection Act. See description at 3.4.5.1.

#### Environmental Consequences

The environmental consequences for the bald eagle when it is being considered as a sensitive species is the same as that described for the Bald Eagle Protection Act. See effects discussion at 3.4.5.2.

### 3.4.6.2 Northern Goshawk

#### Affected Environment

Northern goshawks typically nest in large ponderosa pine trees in relatively dense forested areas on the Tusayan District. Goshawks prey on a wide variety of small mammal and bird species.

**Surveys**

The proposed Skinner Ridge Site was surveyed for goshawks on June 26th and 27th, 2013, utilizing the broadcast calling method. A second survey was conducted on May 21, 2015. The proposed Grandview Site was surveyed for goshawks on May 14, 2015. Both the surveys utilized the intensive search methodology in a ¼ mile radius area from the tower location. This survey utilized a three person crew walking in concentric circles looking and listening for signs of goshawk presence, including looking for nests in all large trees. No evidence of any nesting activity or goshawk presence was observed during these two surveys.

#### Environmental Consequences

Tree clearing is minimal and would disturb less than one acre at either site. No changes to overall prey density would occur as a result of the soil disturbance and land occupancy by the proposed towers at either the proposed Skinner Ridge or Grandview Sites.

Surveys conducted in 2013 and 2015 did not locate any current or potential nests in a ¼ mile radius of the proposed Skinner Ridge tower site. The site is located on the eastern edge of an established Four-Forest Restoration Initiative (4FRI) dispersal Post-Fledging Family Area (PFA). Dispersal PFA is an approximately 600 acre area that is currently unoccupied but could potentially support nesting goshawks (Coconino and Kaibab NF 2015). The only direct effect of this action would be disturbance to foraging individuals while construction was in progress. Tree clearing is minimal and only two ponderosa pine trees greater than 24” dbh would be removed. Overall clearing activities would disturb less than one acre. No changes to overall prey density in the immediate vicinity would occur as a result of the soil disturbance and land occupancy by the tower.

At the proposed Grandview tower site, the nearest PFA is 1.4 miles away to the west. There is a known nesting site, occupied in 2014, that is located approximately 0.58 miles to the northeast. Surveys conducted around the site in 2015 failed to locate any goshawks or other potential nests. A visit to the nest in May 2015 determined that this site was unoccupied this year. The only direct effect would be disturbance to foraging individuals while construction was in progress. Tree clearing is minimal and would disturb less than half an acre. Two large ponderosa pines (one 12 - 16” and the other 22” dbh) would be removed.

No changes to overall prey density would occur as a result of the soil disturbance and land occupancy by the tower.

Direct and indirect effects from construction related noise and activity would be short term and of short duration, with most activity that could cause disturbance occurring over the eight to ten week construction period.

Noise from the sporadic and occasional generator backup power and once a month five minute equipment testing would not be expected to cause substantial disturbance to foraging goshawks.

The self-supporting tower design (no guy wires) proposed at both sites reduces the risk of possible collision for goshawks when they are in pursuit of prey. Goshawks generally fly below the ponderosa pine forest canopy. A review of 47 studies on bird mortality at communication towers did not report any goshawk mortalities (Longcore 2005). No accidental collision by goshawks is expected.

Project activities at the proposed Skinner Ridge and Grandview Communications Sites are not expected to cause any effects to the northern goshawk because:

1. No activities occur within a PFA.
2. No changes to prey density will occur.
3 Tower design incorporates features (no guy wires) to minimize the risk of accidental collision.
4 Minor short term, short duration effects to foraging goshawks from eight to ten weeks of construction noise could occur.
5 Effects from sporadic generator noise would be minor and negligible to foraging goshawks.
6 Surveys at the proposed Skinner Ridge site in 2013 and again in 2015 and at the proposed Grandview site in 2015 did not find any evidence of the presence of potential nests of goshawks within a quarter of a mile from the proposed tower locations.

### Cumulative Effects

Past, present, and reasonably foreseeable actions considered for cumulative effects for goshawk habitat include any project that has or will remove vegetation and/or wildlife habitat, or cause disturbance to goshawks through construction noise and human presence during construction.

Known projects considered in this cumulative effects analysis include vegetation removal projects that include the Randall Restoration Project and potentially, pinyon juniper fuel wood cutting. The Randall Restoration Project is thinning and prescribed fire on 7000 acres on four separate units on the Tusayan District. None of the cutting units are visible from the tower sites. Fuelwood gathering is very scattered and typically has little to no effects on wildlife habitat if done legally under permit. Clearing of the 0.7 acres of vegetation at

the two tower sites is a minor cumulative effect and of no measurable percentage addition to wildlife habitat removed when combined with other vegetation removal projects on the Tusayan Ranger District.

There is a portion of the proposed buried power line at the proposed Grandview Site that is on NPS lands and would be considered a potential future cumulative effects project. Approximately 1,650 feet of trench would be required on NPS lands to connect to the existing overhead power line as a continuation of the trench and buried power line extending from the tower site to the forest boundary. As with that portion of the buried power line on National Forest System lands, the trench would be located within the roadbed of FR 310. There could be effects to goshawks from construction noise during excavation of the trench and installation of the power line. However, due to the duration of construction of approximately one week, noise effects would be localized and of short duration.

There could be minor cumulative impacts from noise, trenching, and power line installation activities being done on the two land jurisdictions; however, the activities would occur within days of each other and cumulative impacts would be minor and of short duration and essentially indiscernible from the minor direct and indirect impacts already discussed.

Cumulative impacts from the trenching on NPS land when considering additive effects from other construction activities at the tower sites that could have short term effects to foraging goshawks from noise would also be of short duration and minor and would not extend past the eight to ten week construction period.

No other cumulative impacts to goshawks from the other known past, present, or reasonably foreseeable actions would be anticipated because all anticipated effects are minor and of short duration and there are no measurable direct or indirect effects from the proposed project that would be additive or measurably cumulative.

#### 3.4.6.3 Spotted Bat, Allen's Lappet-browed Bat, and Townsend's Big-eared Bat

### Affected Environment

These three bat species, as well as multiple other bat species, have been detected on the Tusayan District. Spotted bats are widely distributed across western North America and are known to occur in a wide variety of habitat types (Wilson and Ruff 1999:118–119). Crevices and cracks in rock outcrops and cliffs are known to provide day roosts, but little is known about the nighttime roosting habits of this species. Spotted bats have been captured in mist nets foraging over stock tanks on the Tusayan District. Allen's lappet-browed bat is known to occur in a wide variety of habitats in the southwestern U.S. and Mexico (Wilson and Ruff 1999:123-125). Research conducted by Northern Arizona University within the project vicinity found maternity roosts were in large-diameter ponderosa pine snags under sloughing bark (Slovesky and Chambers 2009). They are known to roost behind pieces of loose bark in large conifer snags and trees on the Tusayan and Williams Ranger Districts. Townsend's big-eared bat occurs in a wide variety of habitats in Arizona but mostly occur above 3,000 feet in elevation. This species typically roosts in caves, lava tubes, mines, and abandoned buildings (AGFD 2003). Bat species can be vulnerable to human disturbance at their roost sites.

There is no suitable roosting habitat for the spotted bat or Townsend's big-eared bat located within the proposed communications site. Only one ponderosa pine snag provides suitable roosting habitat for the Allen's lappet-browed bat. Mature ponderosa pine trees and snags are well distributed in the surrounding area. All three bat species may forage in the area.

## Environmental Consequences

Direct effects are those caused by the action and occur at the same time and place. Indirect effects are those effects caused by the action and are later in time and/or further removed in distance. One potential roost site for Allen's lappet-browed bat would be cleared for this project, a 15' tall, 15" diameter broken top snag. No other trees with loose, sloughing bark would be removed. Soil disturbance and land occupancy is minor and would not alter food (insect) base. The bats forage at night; therefore, there would be no impacts to foraging from the eight to ten weeks of construction activities since there would be no activities performed at night. In day to day operations, noise from the sporadic and occasional generator backup power that could occur either day or night due to loss of power or weak batteries, and once a month five minute equipment testing would not be expected to cause substantial disturbance to any of the bat species that might forage in the area.

Although 45 species of bats inhabit North America, only nine have been documented fatalities at human-made structures. Until recent reports of mortality at windfarms, bat collision mortalities have been reported at tall buildings, lighthouses, communication towers, barb wire fences, power lines, and vehicles. Bat fatalities reported at three types of tall structures (building, lighthouse, and communication tower) were comprised of nine species: red bat (*Lasiurus borealis*), silver-haired bat (*Lasionycteris noctivagans*), hoary bat (*L.cinereus*), Seminole bat *(L. seminolus*), northern yellow bat *(L. intermedius*), Mexican free-tailed bat (*Tadarida brasiliensis*), big brown bat (*Eptesicus fuscus),* little brown bat (*Myotis lucifugus*), and southeastern bat (*M. austroroiparius*) (Fiedler 2004). None of the three sensitive bat species have been reported from collisions at communication towers. A multi-year monitoring of six similar communication towers (un-guyed, unlit towers in similar habitat) in northern Arizona reported no bat mortalities (Derby 2006). No mortalities of the three sensitive bat species are expected based on research data.

The proposed Skinner Ridge and Grandview Communications Sites may impact the spotted bat, Allen's Lappet-browed bat, and pale Townsend's big-eared bat but will not trend toward listing because:

1. No potential roosting habitat for the spotted bat or pale Townsend's big-eared bat will be impacted.
2. One potential roost (snag) for Allen's lappet-browed bat would be cleared at the Skinner Ridge Site, but numerous roost sites are present in the surrounding area.
3 No change to insect levels will occur as a result of the soil and vegetation effects of the activities.
4 Foraging would not be impacted during construction because there would be no activities performed at night during the eight to ten weeks of construction.

5 Effects from the occasional and sporadic generator noise would be minor and negligible to foraging bats.

6 A bat monitoring project at six communication sites in similar habitat in northern Arizona did not find any bat mortality during a three year monitoring period (Derby 2006).

### Cumulative Effects

There would be no cumulative impacts because there are no measurable direct and indirect effects from the project that would accumulate with the effects of other past, present, or reasonably foreseeable actions. All of the direct effects are minor and not substantial.

#### 3.4.6.4 Arizona Phlox, Mt. Dellenbaugh Sandwort, and Arizona Leatherflower

### Species Information and Locations

Arizona phlox (*Phlox amabilis*) is endemic to Arizona and is mainly found in southern Coconino, Mohave, Navajo and Yavapai counties. Its habitat is open exposed limestone-rocky slopes within pinyon-juniper woodlands and ponderosa pine-gambel oak communities. It exists at elevations of 3,500 to 7,800 feet. It has been collected on 3–8% south-facing slopes and on east, southeast to west-facing slopes. It grows on limestone-rocky slopes, clay soil and volcanic silt (AGFD 2005). ). It is listed as a Forest Service Sensitive Species (FS Region 3).

Mt. Dellenbaugh sandwort (*Arenaria aberrans*) is an Arizona endemic and is found in north and north-central Arizona in Coconino, Mohave, and Yavapai counties and possibly Gila County. It occurs mainly in oak and pine forests and is also found in open pine and pine-pinyon woodlands, and among junipers. It exists at elevations from 5,500 to 9,000 feet. It grows on south, north, and northeast facing aspects on basaltic soil in Yavapai County and sandy soil in north Coconino County (AGFD 2004).

Arizona leatherflower (*Clematis hirsutissima var. hirsutissima*) is known from the Flagstaff vicinity along the Rio de Flag and Lower Lake Mary, upper Volunteer Canyon, the Tusayan area, and the Chuska Mountains, and western United States. In Arizona, it occurs in moist mountain meadows, prairies, and open woods and thickets usually in limestone soils of ponderosa pine and mixed conifer forests from 6,800 to 9,000 feet in elevation (Arizona Rare Plant Committee 2001). It is listed as a Forest Service Sensitive Species (FS Region 3).

### Affected Environment

On May 29, 2015, Northland Research surveyed the proposed Skinner Ridge and Grandview Communication Sites for Arizona phlox, Mt. Dellenbaugh sandwort, and Arizona leatherflower. No individuals of these species were located.

### Environmental Consequences

None of the species were present in the surveyed area. The proposed Grandview Communications Site will not impact Arizona phlox, Mt. Dellenbaugh sandwort, or Arizona leatherflower because they are not found on the project sites.

#### Cumulative Effects

There would be no cumulative impacts because there are no direct or indirect effects from the proposed project that would accumulate with the effects of other past, present, or reasonably foreseeable actions.

### 3.4.7 Management Indicator Species

#### 3.4.7.1 Affected Environment

Management Indicator Species (MIS) and the habitats they represent are listed in the most recent Kaibab Forest Plan (KNF 2014) along with information on species biology, management effects, population trends, and habitat trends. The general project area is ponderosa pine habitat. No grassland or mixed conifer habitat is present. Indicator habitat was evaluated based on the habitat actually present within the project location which is less than 0.35 acres at each proposed communication site.

Two MIS species were determined to have habitat and should be considered for effects—the Grace's warbler and the western bluebird.

Grace's warbler prefers grouped or clumped ponderosa pine structure. Preferred habitat for the western bluebird is an open ponderosa pine structure.

Both proposed sites have been thinned and treated with prescribed fire in the recent past. Conditions at both sites are in open ponderosa pine with clumps of associated species of pinyon juniper and Gambel oak.

#### 3.4.7.2 Environmental Consequences

All vegetation would be removed from both proposed communication sites. The area to be cleared, including access roads, is .35 acres at the proposed Grandview Site and .35 acres at the proposed Skinner Ridge Site, for a total of 0.7 acres. Specific details of trees to be removed are discussed in the Vegetation Section.

#### Proposed Skinner Ridge Communications Site

Two larger ponderosa pine (24" dbh) would be removed, and one snag (15" dbh – 15 foot tall) ponderosa pine snag would be removed at the Skinner Ridge Site. The Grace's warbler prefers a more closed condition than is present at the Skinner Ridge Site and the removal of two pine trees and one snag would not cause a measurable effect to the western bluebird. The size of this proposed clearing is smaller than much of the open space in natural openings or those left by previous treatments in the surrounding area.

There would be no changes to the forestwide population or habitat trends for either MIS species from clearing at the proposed Skinner Ridge Communications Site.

### Proposed Grandview Communications Site

The Grandview Site is a very open, generally sparse structure that would be preferred by the western bluebird. Only one ponderosa pine over 20" dbh is proposed for removal at this site. Even to a greater degree than the Skinner Ridge Site, the small size of the proposed clearing is smaller than much of the open space and natural openings in the general area.

There would be no effect to the MIS species from clearing at the proposed Grandview Communications Site.

#### 3.4.7.3 Cumulative Effects

There would be no cumulative impacts because there are no direct or indirect effects from the proposed project that would accumulate with the effects of other past, present, or reasonably foreseeable actions.

## 3.4.8 Migratory Birds

### 3.4.8.1 Affected Environment

Executive Order 13186 (January 10, 2001) requires federal agencies to consider management impacts to migratory birds to further the purposes of the Migratory Bird Treaty Act. This analysis considers effects on: 1) Priority Species of Concern listed by Partners in Flight (Latta et al. 1999) and Birds of Conservation Concern (USFWS 2008); 2) Important Bird Areas (IBA's); and 3) effects to important over-wintering areas.

Arizona Partners in Flight (PIF) Priority Species (Latta et al. 1999) and U.S. Fish and Wildlife Service (FWS) Birds of Conservation Concern (USFWS 2008) associated with the ponderosa and pinyon juniper vegetation types present in the project area include northern goshawk, Cordilleran flycatcher, olive-sided flycatcher, purple martin, Grace's warbler, Lewis' woodpecker, flammulated owl, bald eagle, gray flycatcher, gray vireo, black-throated gray warbler, pinyon jay, juniper titmouse, and Bendire's thrasher.

The project is not located within a designated Important Bird Area (IBA). However, all of the GCNP is a Globally Important Bird Area located north of the project. It is an important raptor migration passageway.

No important over-wintering areas are located within or near the project.

### 3.4.8.2 Environmental Consequences of Clearing on Migratory Birds

The clearing of approximately 12 pinyons and junipers, Gambel oak less than 12" dbh, two ponderosa pine greater than 20" dbh, and one 15" dbh snag – 15 feet tall at the proposed Skinner Ridge Site; and 13 pinyons and junipers, 13 Gambel oak, and 18 ponderosa pine at the proposed Grandview Site could result in incidental take of the black-throated gray warbler and pinyon jay if the trees contain a nest. It is unlikely that more than one nest per species could occur in this small area due to bird territory size.

One snag greater than 15" dbh would be cut at the proposed Skinner Ridge Site, however no cavities were observed in it or any trees that would be cut so it is unlikely that any incidental take would occur for the juniper titmouse (an obligate cavity nester). None of the other species would be impacted because they are associated with habitat that is not affected by the project at either proposed communications site.

#### 3.4.8.3 Environmental Consequences of Structures on Migratory Birds

Birds can collide with any man made structure when in flight, including buildings, towers, fences, and vehicles. Alternatives 2–4 meet most USFWS communication tower guidelines to minimize impacts to birds, including self-supporting (no guy wires) towers, co-location of facilities, and minimizing vegetative clearing through facility positioning. Both of the proposed facilities would be fenced. Neither proposed tower would have lighting, so the hazard of night time collisions is minimal. The species of concern that are at risk of collision are the night-migratory songbirds: Cordilleran flycatcher, olive-sided warbler, and Grace's warbler. Due to the relatively short height of the proposed towers, there is a lower risk of collision when compared to tall (500 feet or taller) towers. No mortality is expected at the proposed Skinner Ridge Tower or the proposed Grandview tower based on multi-year monitoring of six similar communication towers (un-guyed, unlit towers) in northern Arizona that reported zero to a small fraction of fatalities per tower per year. (Derby 2006).

#### 3.4.8.4 Cumulative Effects

Identifying a boundary for cumulative effects for migratory birds can be difficult because most of these birds migrate to winter grounds in Central and South America where habitat destruction is believed to be the major cause of decline. This analysis considers other past, present, and reasonably foreseeable activities on the Tusayan Ranger District that could impact migratory birds which include: tree cutting, prescribed burning, and construction of other communication towers. All of these projects may result in small amounts of mortality to migratory birds that are not expected to cause population changes. Alternatives 2–4 have no expected tower collision mortality and extremely minor effects from clearing 0.7 acres of vegetation. These small effects combined with other past, present, and reasonably foreseeable activities would not have a measureable impact on population levels.

### 3.4.9 Project Design Features that Reduce Impacts to Wildlife

- Neither of the proposed communications sites is located within a designated goshawk post-fledging family area.
- Goshawk surveys will be done to protocol prior to construction of the communication sites.
- The lease holder would monitor the construction site for goshawks. If a goshawk is seen it will be reported to KNF and appropriate measures will be stipulated by KNF and applied to construction activities.
- Tower design would incorporate features (no guy wires) to minimize the risk of accidental collision into the tower by birds.

# 3.5 LAND USE

This section provides a general description of the existing environment with respect to a variety of land uses, recreation, range, and Forest Plan land use direction.

## 3.5.1 Affected Environment

### 3.5.1.1 Land Jurisdiction and Ownership

Both of the proposed communication sites are located on land under the jurisdiction of the United States Department of Agriculture, Forest Service, Kaibab National Forest, Tusayan Ranger District. The Grand Canyon National Park boundary is located approximately three and one half miles north of the proposed Skinner Ridge Site and one half mile north of the proposed Grandview site. There are no land exchanges or other forms of major land ownership adjustment planned by the FS in the general vicinity of the project.

### 3.5.1.2 Residences, Businesses

The project area for both proposed communication sites is located on National Forest System lands with a consistent land ownership pattern. Very little private land exists in this area. The closest large block of private land is located at the community of Tusayan, over 8 miles northwest of the proposed Skinner Ridge Site and 10 air miles west of the proposed Grandview Communications Site. The Ten X Ranch private land is located approximately 4 miles west of Skinner Ridge**.** The nearest businesses and residences are located in Tusayan, which serves as a major tourism center for visitors to Grand Canyon National Park. Tusayan offers hotels, general stores, and restaurants and provides employee housing for workers affiliated with the tourism industry.

### 3.5.1.3 Utilities

Power at the proposed Skinner Ridge Site would be provided by installation of a solar hybrid power system which would include solar panels and a generator.

Power at the proposed Grandview Site would be provided from an existing overhead distribution line located inside the GCNP, approximately 1 mile north of the tower site. The power would be run underground approximately 1,650 feet on GCNP land, and for 2,945 feet on National Forest System land, for a total of 4,595 feet south from the existing overhead power line within the existing road prism of FR 310 to FR 310F.

### 3.5.1.4 Transportation

State Route 64 is the main access road to the general project area. SR 64 is the main route to Grand Canyon National Park and experiences heavy traffic, especially during the summer months. Maintaining visual quality along this highway corridor is an objective of the Kaibab National Forest and Coconino County, AZ.

#### Proposed Skinner Ridge Communications Site

The proposed Skinner Ridge Site would be accessed by using existing FR 302 to FR 343 to 343G. Approximately 100 feet of new road would be constructed that would serve as a driveway into the communications site (maximum 0.1 acres of disturbance). This new road would provide access to the site from FR 343G. Some minor reshaping of FR 343G would be required.

Existing FSR 302, 343, and 343G, on average, are on a shallow soil layer consisting of high rock content and greater than 50% fines. These roads generally are not "all weather roads" and are not of adequate standard for construction, operation and maintenance of the proposed facility if wet conditions are present. Use of these roads during wet or winter conditions and plowing snow for winter access will likely have damaging impacts on the surface of the road. With increased commercial use of these roads, in particular during wet weather, maintenance needs will be significantly increased and the surfacing/drainage structures will require improvement. Maintenance of these roads should be the responsibility of the communication site lease holder and maintaining adequate and proper drainage should be strongly encouraged to prevent soil erosion and minimize impacts to the surrounding watershed.

**Stipulations for Access Road Use for the Proposed Skinner Ridge Site**

The lease holder would implement the following mitigation measures as part of any KNF authorization for use of FR 302, FR 343, and FR343G.

a) The lease holder would participate with the Forest Service, commensurate with use, in road maintenance activities in accordance with KNF standards to that portion of FR 302 and FR 343 that is used for communications site access. The lease holder would remedy any road damage caused by site construction or tenant access.

b) The lease holder would maintain the 340 linear feet of FR343G needed for access and the 100 foot long driveway in accordance with FS Region 3 minimum standards for a single lane 12 foot wide fair weather road.

c) In general, FR 343G and the driveway would be re-shaped so that the centerline is crowned. The blading would proceed in an orderly fashion by successive passes with a grader parallel to the road centerline, progressing from the lower side to the upper side of the roadway and back across. In the process, all ruts shall be filled and a crown formed on the roadway creating a 12 foot wide travel surface.

d) The lease holder would not anticipate needing to perform regular snowplowing and therefore does not propose to upgrade FR 343G to all weather standards or improve FR 302 and FR 343. If snowplowing is necessary because of an emergency repair situation, the KNF will be contacted and a case specific permit will be obtained from KNF by the lease holder.

e) The lease holder would be responsible for repairing any road damage to FR 302, FR 343, or FR 343G resulting from emergency snowplowing or wet weather site access by lease holder or tenants.

f) The lease holder would contact KNF whenever winter access is needed for general maintenance. If the roads are snow free and firm, access will be via wheeled vehicles.

If the roads are closed because of snow cover, access will be by over-snow vehicles only.

g) The lease holder would install a gate in accordance with Forest Service specifications on FR343G near the FR 343. Proposed Grandview Communications Site

The proposed Grandview Site would be accessed by using existing FR 310 to FR 310F. Approximately 190 feet of new road will need to be constructed from the end of FR 310F to the communications site for facility site access (maximum 0.1 acres of disturbance). Also, there will be minor upgrading of the existing 400 feet of FR 310F to add road surfacing materials and to install drainage features to address potential soil erosion and ensure a firm driving surface.

Existing FSR 310 and 310F, on average, are on soils with low bearing strength when wet. These roads generally are not "all weather roads" and are not of adequate standard for construction, operation and maintenance of the proposed facility if wet conditions are present Use of these roads during wet or winter conditions and plowing snow for winter access will likely have damaging impacts on the surface of the road. With increased commercial use of these roads, in particular during wet weather, maintenance needs will be significantly increased and the surfacing/drainage structures will require improvement. Maintenance of these roads should be the responsibility of the communication site lease holder and maintaining adequate and proper drainage should be strongly encouraged to prevent soil erosion and minimize impacts to the surrounding watershed.

**Stipulations for Access Road Use for the Proposed Grandview Site**

The lease holder proposes and would be committed to implementing the following mitigation measures as part of any KNF authorization for use of FR 310 and FR 310F. The portion of the 310 road on GCNP between SR 64 and the forest/GCNP boundary would also be subject to any additional or differing stipulations required by the NPS.

a) The lease holder would participate with the Forest Service, commensurate with use, in road maintenance activities to that portion of FR 310 that is used for communications site access. The lease holder would remedy any road damage caused by site construction or tenant access.

b) The lease holder would reconstruct and extend FR310F by blading and installing drainage features; and by adding road surfacing material where needed to ensure a firm and stable travel way. In general, FR 310F would be re-shaped so that the centerline is crowned. The blading would proceed in an orderly fashion by successive passes with a grader parallel to the road centerline, progressing from the lower side to the upper side of the roadway and back across. In the process, all ruts would be filled and a crown formed on the roadway.

c) The lease holder would maintain 310F to FS Region 3 minimum standards for a single lane fair weather road.

d) The lease holder does not anticipate needing to perform regular snowplowing and therefore does not propose to upgrade the roads to all weather standards. If snowplowing is necessary because of an emergency repair situation, the KNF will be contacted and a case specific permit will be obtained by the lease holder.

e) The lease holder will be responsible for repairing any road damage resulting from emergency snowplowing to access the communications site.

f) The lease holder will contact KNF and GCNP whenever winter access is needed for general maintenance. If the roads are snow free and firm, access will be via wheeled vehicles. If the roads are closed because of snow cover, access will be by over-snow vehicles only.

g) The lease holder will install a gate in accordance with Forest Service specifications on FR 310F at the intersection of FR 310.

### 3.5.2 Environmental Consequences

In Alternative 2, the facilities are designed to accommodate anticipated wireless communications needs for the foreseeable future, consequently there would be no additional communication sites needed for the SR 64 corridor between Tusayan and Grandview. In Alternatives 2 and 3, the lower height of the Grandview Tower would accommodate 4 wireless carriers, but with less service provided for a fourth carrier, as compared to the ten foot taller tower proposed in Alternative 4.

There would be no impact to land uses. Existing access roads would be used during project construction and operational activities. Existing roads would not be upgraded beyond the current Forest Service road level designation nor impeded by Alternative 2, 3 or 4. Access to the proposed Skinner Ridge Tower Site would require construction of 100 linear feet of driveway. Access to the proposed Grandview Communications Site would require constructing 190 linear feet of driveway. The driveways would be gated and limited to administrative and communications site access only.

### 3.5.3 Cumulative Effects

There are no direct or indirect effects to current land uses. Therefore, there would be no cumulative impacts to land uses because there are no effects from Alternatives 2–4 that would accumulate with the effects of other past, present, or reasonably foreseeable actions.

## 3.6 Recreation

### 3.6.1 Affected Environment

#### 3.6.1.1 The Proposed Skinner Ridge Communications Site

The adjacent National Forest System land provides opportunities for camping, picnicking, hiking, horseback riding, mountain biking, hunting, and scenery viewing. Current recreation use in this area is moderate and primarily associated with visitors traveling to the nearby Grand Canyon National Park. The general area receives heavy use from big game hunters from late August to early December. Large numbers of elk and deer hunters camp in this area each fall.

The project area is located in open space. Ambient noise could effect recreationist using the nearby area during the eight to ten week construction period. Also, occasional and sporadic short periods of generator noise could be emitted from the site.

#### 3.6.1.2 Proposed Grandview Communications Site

The proposed Grandview Site is near the Arizona National Scenic Trail which receives light use. Effects to the trail and proposed mitigation are discussed in the section on effects on visual resources. The tower was strategically located to use existing vegetation as a screen which is effective for most views. Any glimpses of the tower from the trail are from a distance and of short duration.

The project area is located in open space. Ambient noise could effect recreationist using the nearby area during the eight to ten week construction period. Also, occasional and sporadic short periods of generator noise could be emitted from the site. Ambient noise includes motorized traffic on SR 64 and aircraft noise, both helicopter and fixed wing sightseeing tours on a flight path from the airport to the GCNP. The noise-scape for construction activities is estimated at one-half mile. There are no sensitive receptors (such as residences or churches) located in the anticipated noise-scape for construction activities. The Grand Canyon National Park is adjacent to the proposed Grandview Communications Site, approximately 0.5 miles distant and is impacted by noise associated with vehicle traffic on SR 64 and heavy GCNP visitation at the viewpoints.

#### 3.6.1.3 Recreation Special Use Permits

No recreation special use permits have been issued in the vicinity of the proposed Skinner Ridge. However, there is a priority use outfitter/guide permit for jeep tours in the Grandview area. The guide utilizes the Grandview Lookout Tower as one of his interpretive stops.

#### 3.6.1.4 Existing Forest Plan Land Use Direction

The proposed Skinner Ridge Communication Site and the general area proposed for the Grandview Communications Site have been identified in the Kaibab Forest Plan. Desired conditions for Recreation Backcountry (Kaibab Forest Plan, page 65) states that “facilities are few in number, use the minimum area needed, and have simple construction designs that blend in with the surrounding area. They are made of native materials or other well-matched materials.” Management direction includes: “minimize the amount of land allocated to electronic sites.”

### 3.6.2 Environmental Consequences

Noise levels resulting from the proposed project would be most noticeable during construction related activities, which would result in a temporary increase in noise levels during daytime hours for the eight to ten week construction period. The temporary increase in noise levels due to construction would be minimal compared to the existing ambient noise level. Construction noise is not expected to be discernible in the Grand Canyon National Park because most visitors are inside vehicles. Construction noise would not be audible to most park visitors because there are no trails near the KNF/GCNP boundary in the vicinity of the proposed Grandview Communication Site and popular canyon overlooks are several miles distant, outside the area of noise impact. It is unlikely that bicyclists on the highway through the Park would be impacted. Construction noise levels would be audible to recreationists on the KNF but would occur in an area of high ambient

motorized vehicle and aircraft noise. Hikers on the Arizona National Scenic Trail could experience noise effects from construction for a short distance during the eight to ten week construction period.

There would be generator noise for five minutes once each month for equipment testing at both sites. At the proposed Skinner Ridge Site, the generator would only come on during extended periods of no sunlight, due to thick clouds. In this circumstance the generator would run approximately five minutes until the batteries are brought up to a sufficient level.

At the proposed Grandview Site, the generator would only come on if the APS power is lost.

At both proposed sites, the generator would come on once a month for 5 minutes as a routine test of equipment. The generators at both sites would be housed inside the equipment shelter. The location of the generator inside the building mitigates noise concerns considerably. The generators would not be heard beyond a few hundred feet of the site and disturbance effects to wildlife and recreationist would be negligible.

Alternatives 2–4 do not represent a substantial change in the existing condition of recreation resources and activities. The proposed Grandview Communications Site would be briefly visible to tours for a short distance along FR 310. However, tour operations and access are not affected.

#### 3.6.2.1 Existing Forest Plan Land Use Direction

Alternatives 2–4 are consistent with management direction to minimize the amount of land allocated to electronic sites by locating communications facilities within the Forest Plan identified sites, and utilizing tower designs to accommodate multiple wireless providers to eliminate proliferation of towers and communication sites. Mitigation measures for tower height, color and texture help the proposed towers at the proposed Skinner Ridge and Grandview Communications Sites meet these Forest Plan objectives. The taller tower proposed at the proposed Grandview Site in Alternative 4 would provide a higher quality of service provided by a fourth cellular provider.

### 3.6.3 Cumulative Effects

Three future proposed undertakings were considered for cumulative effects in the area of Recreation. Specifically, future projects considered included the following:

Revision of the Current Travel Management Decision – This is a planned review of motorized camping areas, and open and closed roads under the current Travel Management decision. It is not anticipated that revision of this decision would create any effects that would be additive to effects from the proposed communication sites.

Arizona National Scenic Trail planning – Planning to develop a Comprehensive Management Plan that will establish a corridor for the trail. The trail may be re-located in places, especially to take portions off open roads.

Outfitter/Guide permits (past, present, and future) - Hunting guides utilize the affected area primarily for elk and mule deer. Jeep tour outfitters utilize roads in the affected area, especially at Grandview Fire Tower.

Historic Cabins - Grandview cabin is located at the Grandview Lookout Tower, and may be considered for the Cabin Rental Program in the future. Hull Cabin is within one mile of the proposed Grandview Site and is currently in the Cabin Rental Program. The proposed tower is not visible from either the Grandview or Hull Cabins and so there would be no effects to the Grandview Cabin if it is added to the Cabin Rental Program.

Since there are no substantial or measurable effects on current uses from the proposed communications sites there are no effects from future projects that would be cumulatively additive. There may be opportunity to further shield views of the proposed Grandview Tower from the Arizona National Scenic Trail through re-location in the future planning process.

Neither proposed communication towers affects wildlife or motorized access and so no effects would be additive to current or future outfitter/guide uses; however cellular service would be improved for outfitter/guides and their clients.

Other activities considered for cumulative noise effects include any other project that would produce noise during the eight to ten week construction period within the 0.5 mile noise-scape.

There is a portion of the proposed buried power line at the Grandview Site that is on NPS lands and would be considered a potential future cumulative effects project. Approximately 1,650 feet of trench would be required on NPS lands to connect to the existing overhead power line, as a continuation of the trench and buried power line extending from the tower site to the forest boundary. As with that portion of the buried power line on National Forest System lands, the trench would be located within the roadbed of FR 310.

No highway construction projects are known. Aircraft noise and highway traffic noise would continue at the current levels. There are no cumulative noise impacts because there are no other past, present, and reasonably foreseeable actions generating noise that would result in increased noise levels. Because the construction period is of short duration and other future projects wouldnot coincide with Alternatives 2–4, there would be no cumulative impacts associated with noise.

## 3.7 AIR QUALITY

### 3.7.1 Affected Environment

The U.S. Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants (ground level ozone [O3], carbon monoxide [CO], nitrogen dioxide [NO2], sulfur dioxide [SO2], particulate matter, and lead). According to the EPA website (http://www.epa.gov/region9/air/), northern Arizona meets all NAAQS; therefore, air quality in the project area is good.

### 3.7.2 Environmental Consequences

Short-term and temporary air quality impacts would result from construction-related activities and would include fugitive dust and exhaust emissions from construction equipment. Construction would be of relatively short duration and the air-pollutant emissions would be dispersed relatively

quickly; therefore, air quality standards would not be approached or exceeded. The proposed project would not generate any air pollutants after completion of the construction activities other than occasional dust from operational/maintenance traffic on the access roads, which would not be distinguishable from other forest road use, and occasional use of a backup generator.

### 3.7.3 Cumulative Effects

Other activities considered for cumulative air quality effects include any other project that would produce dust, smoke, or emissions during the eight to ten week construction period. These could include construction on private land in Tusayan, mining activities, and smoke from prescribed fires. The small amount of dust and emissions produced by the project combined with these other foreseeable actions would have minimal cumulative effects on air quality, and air quality standards would not be exceeded.

## 3.8 CULTURAL RESOURCES

### 3.8.1 Cultural Resources and Heritage Desired Future Conditions

Under the previous Kaibab National Forest Plan, the focus of the Heritage Program was to protect and preserve cultural resources in accordance with the National Historic Preservation Act of 1966 as amended. Under the 2014 Plan, the Kaibab National Forest Heritage Program desired conditions and standards were expanded to specifically include the management of Traditional Cultural Properties (TCPs) and also to include the following desired conditions:

- Cultural resources, including known traditional cultural properties, are preserved, protected, or restored.
- Historic artifacts are preserved in situ or, when necessary, curated following current standards.
- All historic properties are evaluated for their eligibility to the National Register and properties that are appropriate are listed to the National Register of Historic Places
- Cultural resource findings will be synthesized and shared with the scientific community and public through formal presentations, publications, and educational venues.
- Public understanding about the cultural resources and historic preservation issues contribute to their protection.
- The Kaibab NF historic documents, including photographs, maps, journals, and Forest Service program management records, are available to the public for research and interpretation.
- Traditional practitioners have access to TCPs for ceremonial use and privacy to conduct ceremonies.
- TCPs are preserved, protected, or restored for their cultural importance and generally free of impacts from other uses.

- The significant visual qualities of TCPs are preserved consistent with the TCP eligibility determination.
- Traditional use of TCPs by the associated cultural groups is accommodated.
- Confidential and/or sensitive information regarding TCPs is protected.

## 3.8.2 Affected Environment

### 3.8.2.1 General Culture History

The earliest occupants date to the archaic period 7000 B.C. and A.D. 1. They were people who hunted and gathered; however, there are only a few sites that have been identified that can be unequivocally attributed to these nomadic people. The transitional period between Archaic populations and Cohonina occupation is poorly understood as archaeologists have found few sites with diagnostic artifacts from this time period. The majority of sites are artifact scatters and small masonry habitation sites affiliated with both the Cohonina and Ancestral Puebloans who occupied the area from A.D. 700-1150. The Cohonina made San Francisco Mountain Gray Ware ceramics using paddle and anvil methods with sites most commonly found across the southern portion of the forest. Most of their habitation structures contain either one or two rooms, indicating limited seasonal use of the area. While there are several scattered multiple-room pueblos, the archaeological record suggests that the Cohonina were highly mobile and scattered themselves across the entire landscape.

Concurrently, Ancestral Puebloans appear to have occupied the area to the south of the Grand Canyon. Probably more sedentary, they lived in larger multiple-room pueblos. They also used coil and scrape methods to produce Tusayan Gray Ware ceramics. Stone terraces at many sites suggest that Ancestral Puebloans had a greater reliance on agriculture than the Cohonina. There is scant evidence of cultures occupying the project area after the Cohonina and Ancestral Puebloans migrated from their territory around A.D. 1150-1200, although it is likely that ancestors of Hualapais, Havasupais and Yavapais (archaeologists refer to this culture as Cerbat) hunted and gathered in the project area much like the Archaic Indians mentioned above. These people also led a nomadic existence and left few items behind that would preserve in the archaeological record.

#### Protohistoric Period

The timing of the onset of the Protohistoric Period on the South Kaibab is debated (Schwartz 1959; Martin 1985). In a general sense, the Protohistoric Period is defined as the time between initial European contact with the New World and historical documentation of indigenous groups. The date of first contact and historical records of different cultures varies across the Southwest.

The Protohistoric occupants of the South Kaibab belonged to the Pai culture, which includes groups such as the Havasupai or Hualapai. The Pai practiced a hunting and gathering subsistence strategy supplemented by seasonal farming during the warmer months (Schwartz 1959). Groups were fairly mobile, moving seasonally between the Grand

Canyon and the uplands of the South Kaibab. Architecture includes jacal and brush structures that supported small mobile bands (Schwartz 1959). Archaeological evidence of Pai groups on the South Kaibab is often unclear as Pai sites have been noted to occur atop older Cohonina sites. The Pai occupants participated in regional trade with other contemporaneous cultures including the Hopi north and east of the San Francisco Peaks. Diagnostic Pai artifacts include local Aquarius Brown Ware and imported Hopi Yellow Ware.

### Historic Period

The historic accounts of the area coincide with Spanish expeditions from Mexico as early as the 16th century. This initial contact, however, left no physical evidence of a Spanish presence on the Kaibab. The arrival of Euroamericans in the 1840s marks a more realistic beginning point of the Historic Period in the region. The United States acquired a large piece of land, including the Kaibab National Forest, with the Treaty of Guadalupe Hidalgo in 1848. Congress funded numerous expeditions into the new region in search of agricultural, mining, and railroad land (Dobyns et al. 1975). In 1853, Lieutenant Amiel Whipple led an expedition through the new land in search of a railroad route. His work eventually resulted in the Atlantic and Pacific Railroad route built in 1882. Another important expedition on the Kaibab was led by Lieutenant Edward Fitzgerald Beale between 1859 and 1860 (Keane and Bruder 2003). Beale surveyed and implemented the Beale Wagon Road which was used by immigrants and migrants into the area and is often considered the forerunner to Route 66 (Keane and Bruder 2003).

The railroad and wagon road brought farmers, ranchers, and loggers into the area in the 1860s (Dobyns et al. 1975). Spur lines ran from the main railroad into the forest facilitating the hauling of logged trees. In 1901, the Grand Canyon Railroad was completed between Williams and the south rim of the Grand Canyon, bringing tourists into the area (Dobyns et al. 1975). The Kaibab became part of the Forest Reserve in 1903, and by 1905 the Forest Service controlled the land and activities taking place on those lands. By the 1930s, the Forest Service took on a conservational role and started implementing ranger stations, lookout towers, roads, dams, recreation sites, and several other resource management projects. The present day Kaibab National Forest boundaries were established in 1934; lumbering, ranching, and recreation continue to be important activities today.

### Forest Reserves and the National Forest

The Forest Reserve Act of 1891 allowed the President of the United States to set aside land for the public domain. The Grand Cañon Forest Reserve was established in 1893 and was under the management of the General Land Office of the Department of the Interior. The Forest Service was established in 1907 and the lands of the Grand Cañon Reserve were transferred to the Department of Agriculture and split up into the Coconino and Tusayan National Forests. The Tusayan was renamed the Kaibab National Forest in the 1930s.

### Native Americans

Traditional Native American uses have continued to occur on the forest into modern times (Cleeland et al 1992). Archaeologists have recorded historic period brush structures, sweat

lodges, hogans and pinyon nut gathering camps. A sweat lodge was recorded on the Navajo Depot, though the majority of them are found on the Tusayan District due to the District's proximity to the Havasuapai Reservation and the Navajo Nation. In addition, the project area is near Traditional Cultural Properties (TCPs); such as Bill Williams Mountain on the Williams Ranger District and the San Francisco Peaks on the Flagstaff District of the Coconino National Forest.

### Tusayan Village (City of Tusayan)

The village of Tusayan began in 1920—one year after the designation of the Grand Canyon as a National Park—as a small sheep ranch operated by the Hull brothers (Whitehurst 2010). Tusayan Village quickly developed into a hub for travelers heading to the Grand Canyon, located just two miles to the north. In 1925, Tusayan became the home of the first official Grand Canyon airport, a landing field authorized by the U.S. Forest Service for commercial flights. The modern airport was opened in 1965; the airport terminal was completed and formally dedicated in 1967. The addition of State Route 64 (designated as a state highway in 1932) between Williams and the Grand Canyon, through the middle of Tusayan, helped ensure the longevity of the village. The combination of the airport and highway funneling visitors to the Grand Canyon help make Tusayan Village one of the most visited small towns in northern Arizona. Incorporation of Tusayan occurred in 2010. With a land area of 144 acres (58 ha), it is the smallest town, by area, in Arizona. As of 2014, the U.S. census estimates only 576 people resided in Tusayan.

## 3.8.3 Environmental Consequences

Cultural resource surveys were conducted in September 2010 and March 2011 for all ground disturbing activities associated with the construction of the two proposed towers on National Forest System lands. Cultural resource evaluation was also conducted on the adjacent GCNP on September 30 through October 10, 2015, regarding the effects of the proposed Grandview Cell Tower on the East Rim Drive and Desert View Cultural Landscapes. Finally, the GCNP and KNF worked together to evaluate the effects of trenching for the buried power line for the proposed Grandview Site that would occur on GCNP and KNF lands. This portion of the project would be under a separate NPS authorization and permitting process (see Cumulative Effects – 3.9.4). However, cultural resource analysis, clearance and consultation are being coordinated between the FS and NPS with the Kaibab NF taking the lead.

The proposed action is to install two communication sites, one at Skinner Ridge and a second near Grandview Lookout Tower. A cultural resource evaluation was conducted of the area of potential effect for both locations which resulted in the identification of potential effects to a National Register of Historic Places listed site-the Grandview Lookout Tower and Cabin and a National Register Eligible Site-Red Butte Traditional Cultural Place (TCP) and the East Rim Drive and Desert View Cultural Landscapes located on GCNP. A viewshed analysis was conducted and the Havasuapai, Hualapai and Hopi Tribes, Kaibab Paiute, Navajo Nation, Yavapai Prescott and Zuni Tribe were consulted regarding the potential for the towers to adversely affect the historic integrity of TCP (see section 4.2 for discussion of tribal consultation).

The proposed Skinner Ridge Tower does not have a direct physical effect on heritage resources. During tribal consultation, concerns were identified about the tower and its potential to have visual effects to the Red Butte Traditional Cultural Property (see section 4.2 for discussion of tribal consultation). On November 17, 2015, the tribes were sent copies of the visual analysis for the proposed towers, and the two cultural resources reports completed by Northland Research. No comments were received from the tribes regarding the project or affects to the TCP as of February 8, 2016. Therefore the KNF will assume that the tribes have no further concerns regarding affects to the TCP from the two cell towers.

The proposed Grandview Cell Tower, however, would have a direct effect on the historic integrity of the Grandview Fire Lookout Tower because it would change the integrity of the historic viewshed from the top of the lookout tower. The effect constitutes a small change in the viewshed to the northwest side of the tower; however, the remainder of the viewshed would be intact. Therefore the effect is not considered to adversely impact the historic integrity of the fire lookout tower.

The proposed cell tower would also have a mild effect on the viewshed of East Rim Drive and Desert View Cultural Landscapes. The GCNP recommended that Alternative 4 has the lowest long distance impact. Infrastructure for this alternative recedes into the background, reducing adverse effects at Grand Canyon overlooks and along SR 64 (East Rim Drive/Desert View Drive cultural landscape area).

The joint evaluation of the proposed buried powerline from an APS distribution line in the GCNP to the Grandview Cell tower indicated that FR 310 had been previously inventoried by GCNP and the Kaibab NF archaeologists. There were no known cultural resources within the road, however there are two sites identified on the GCNP which are adjacent to the road. A historic entrance station is located at the boundary of GCNP with the KNF. It is on the opposite side of FR 310 and would not be affected by proposed construction.

Also Northland Research identified the FR 310 as a possible portion of the Historic Grand Canyon Stage Route. The historic stage route is known to exist in the area but has not been systematically identified. Forest Road 310 is a major access road that receives regular maintenance using heavy equipment. Therefore digging a shallow trench to bury a powerline into, would not have an effect on any remaining historic integrity associated with the Grand Canyon Stage Route.

Because there are known cultural resources near the road, a cultural monitor will be required during the excavation of the entire trench. If cultural resources are identified in the trench, the digging activities will cease and consultation pursuant 36 CFR 800.b.3 will be jointly initiated by the GCNP and Kaibab archaeologists to address the new discovery.

Indirect effects on cultural resources due to the presence of either proposed cell tower would be extremely minimal, if they occurred at all. The largest concern would be from soil erosion occurring in the area of the towers and threatening nearby sites; or potential effects from off road driving, by maintenance workers or the curious public, in the area of the towers. However, both towers would be located near existing roads and gated. Short access roads would be constructed for the purpose of accessing the towers. This would minimize any potential off road driving. Also,

erosion in the area of the proposed towers would not likely occur due to the dense limestone deposits located near the surface at both tower locations. Consequently the likelihood of indirect effects to cultural resources from the towers on cultural resources is extremely low.

The largest effect to cultural resources is the proposed tower at the Grandview Site due to the view of the tower extending into the visual landscape from the historic Grandview Lookout Tower. There are additional effects from the presence of the modern facilities in cultural resource landscapes that would be created by the Skinner Ridge facility, but these effects are considered minor.

### 3.8.4 Cumulative Effects

**Tusayan Ranger District – Past, Present and Forseaable Future Projects and Effects.**

Historically the Kaibab has conducted past and present projects that include thinning projects and timber sales in the general cultural resource landscape throughout the Tusayan District, including activities within the last 10 years up to present time. Both proposed communications sites have had recent thinning projects occur over them and in the surrounding area. There is evidence of recent prescribed fire at both sites that has occurred within the last ten years. At the proposed Grandview Site, evidence of a twenty to thirty acre wildfire or area of prescribed fire is adjacent to the site that left the forest in a mostly open condition.

There are future projects expected to occur through the Four Forest Restoration Initiative. The Russel Thinning Project from the initiative is expected to start and be completed within the next four to five years; however, all of the sites will be flagged for avoidance if mechanical thinning is proposed.

If burning is conducted, fire sensitive sites will be avoided and on the non-fire sensitive sites a low intensity fire will be allowed across them. Burning may have a slight affect to some sites, but the reduction of the fuel will offer better protection to them from the effects of a high heat intensity wildfire.

Since cultural resources have not been affected by past projects, and are not likely to be adversely affected by future projects, there is a very low likelihood that there will be any cumulative effects to sites within this area, with the exception of a high intensity wildfire. There are few cumulative effects anticipated to cultural resources as a result of this project.

**Cumulative Effects Projects Considered on the Adjacent GCNP**

Because the proposed towers can be seen from three viewpoints within the GCNP there would be cumulative effects to the cultural landscapes associated with the East Rim Drive and Desert View Drive areas along SR 64. These effects would remain minor and negligible when added to the cultural landscape effects to the Grandview Fire Lookout Tower visual landscape.

The proposed buried power line to the Grandview Site that is on NPS and National Forest System lands and would be considered a potential future cumulative effects project. Approximately 1,650 feet of trench would be required on NPS and KNF lands to connect to the existing overhead power line on NPS. The trench would be located within the roadbed of FR 310. The section of the power

line that would be on NPS lands would be cleared and authorized by the NPS. Coordination between the NPS and Forest Service has been ongoing throughout the analysis process. Cultural Resource surveys and the clearance process for the section on the NPS is proceeding with KNF Heritage as lead, in coordination with the NPS. Final permitting will be completed under NPS authorization and will be completed before construction on National Forest System lands would be scheduled, if the project is approved.

Cumulative effects from the installation of the powerline are not anticipated, as no direct or indirect effects to cultural resource sites would occur based on there being no known sites present that would be disturbed by the construction activity. If a site is discovered during excavation all work would immediately halt and both agencies would be notified immediately.

## 3.9 SOCIOECONOMICS

This section describes the demographic and economic characteristics found in the project vicinity. It describes the changes to wireless services for the affected communities, potential changes to population, and economic impacts.

### 3.9.1 Affected Environment

Local economic and employment opportunities are primarily found in Tusayan, located approximately 8 miles northwest of the proposed Skinner Ridge Site and 10 miles west of the proposed Grandview Communications Site. The primary economic activities of Tusayan are tourism associated with Grand Canyon National Park. The population of Tusayan is estimated to be around 576 full time residents. The major economic centers for the areas are primarily Flagstaff with a population of 60,000 located 81 miles southeast, and Williams, population 2,800 located 61 miles south.

### 3.9.2 Environmental Consequences

There is a slight difference in performance or level of service between the alternatives considered because of the difference in height of antenna positons.

The proposed telecommunication tower sites are unmanned and therefore effects to the population in the area, long term, would be negligible to non-existent. Local businesses would not suffer any adverse short or long-term economic impacts from any of the alternatives, and no businesses would be closed or eliminated as a result. There may be short-term benefits to the local and regional economy resulting from construction-related expenditures and employment. A longer term positive impact to the local economy would be reliable and consistent wireless internet service to the residents of Tusayan, the major employee housing area for people working in tourism related jobs. Reliable internet service would expand opportunities for economic activities in this isolated area.

### 3.9.3 Cumulative Effects

Implementation of Alternatives 2–4 would result in an increase in wireless personal communication services. Alternatives 2–4 are designed to accommodate all of the licensed wireless carriers in the area as well as future technologies that require vertical real estate. When

considered with other past, present, and foreseeable projects in this area, there are no other projects that will have a similar effect and therefore there are no cumulative effects associated with Alternatives 2–4.

## 3.10 ENVIRONMENTAL JUSTICE

Pursuant to Executive Order 12898 on Environmental Justice, Federal agencies are to make the achievement of environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations, low-income populations, and federally recognized tribes and allowing all portions of the population a meaningful opportunity to participate in the development of, compliance with, and enforcement of Federal law, regulations, and policies affecting human health or the environment regardless of race, color, national origin, or income.

### 3.10.1 Affected Environment

One known minority or low income community is near the project, approximately 30 miles east of the proposed Grandview Communications Site. Red Butte is an important Traditional Cultural Property (TCP) to five area tribes.

### 3.10.2 Environmental Consequences

Alternatives 2, 3 and 4 would not result in disproportionate impacts to low-income populations, nor would it impact minority populations. The Flagstaff, Williams, and Tusayan areas, including its low income and minority populations, are strongly tied to the tourism industry, with cellular companies having a very small percentage of the overall economy. There would be no direct effects on the Cameron community. Improving wireless cellular service in the general area would provide a minor indirect beneficial effect to those peoples living in the area by providing a slight improvement in the quality of life. However, this would be minor for the community of Cameron as residents would still have to drive some distance to the west to pick up improved signal from the proposed Grandview Tower. If future towers were established on the reservation the Grandview Tower could provide an existing link.

### 3.10.3 Cumulative Effects

There would be no cumulative impacts because there are no direct or indirect effects from the proposed project that would accumulate with the effects of other past, present, or reasonably foreseeable actions.

# 4.0 CHAPTER 4 – CONSULTATION AND COORDINATION

The Forest Service consulted the following Federal, state and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

## 4.1 FEDERAL, STATE AND LOCAL OFFICIALS AND AGENCIES

Scoping letters requesting comments were sent to the following federal and state agencies:

FAA Manager, Grand Canyon Airport
FAA Air Traffic Airspace Branch, Ft. Worth, Texas
ADOT Airport Manager, Grand Canyon Airport
ADOT, Phoenix Office
APS, Grand Canyon
AZ Dept. of Water Resources
Town Manager, Town of Tusayan
Coconino County Supervisor, District 1
Superintendent, Grand Canyon Unified School District
Grand Canyon National Park, Superintendent, Fire Management Staff, and NEPA Compliance Staff
USFWS, Phoenix, AZ
Habitat Program Manager, Arizona Game and Fish Department

## 4.2 TRIBES

### 4.2.1 Background

Government-to-government consultation with tribes is guided by existing law, regulation, and policy including the National Environmental Policy Act (NEPA), the Archaeological Resources Protection Act (ARPA), the National Historic Preservation Act (NHPA), the American Indian Religious Freedom Act (AIRFA), the Native American Graves Protection and Repatriation Act (NAGPRA), the National Forest Management Act (NFMA) of 1976, the Religious Freedom Restoration Act (RFRA), Executive Order 13007-Indian Sacred Sites, Executive Order 13175-Consultation and Coordination with Indian Tribal Governments, and Executive Order 12898-Environmental Justice. The Kaibab National Forest has entered into Memoranda of Understanding with the Havasupai Tribe, the Hualapai Tribe, the Hopi Tribe, and the Kaibab Band of Paiute Indians to establish a standard process for consultation with each tribe.

### 4.2.2 Project History

A previous version of this project (Highway 64/180 Wireless Communications Sites Project) analyzed project locations in close proximity to the Red Butte Traditional Cultural Property (TCP). During government-to-government consultation on the project, several tribes submitted concerns about potential visual impacts to the Red Butte TCP and recommended that the Forest select the proposed location farthest from Red Butte.

**Table 4.1 – Summary of Tribal Consultation on Highway 64/180 Wireless Communications Site Project**

| | | | |
|---|---|---|---|
| 2/1/2008 | Forest Supervisor letter to Havasupai, Hopi, Hualapai, Kaibab Paiute, Navajo, Yavapai-Prescott. | Letter | Initiation of tribal consultation |
| 2/1/2008 | Forest Supervisor letter to Bodaway/Gap, Cameron, Coalmine, Coppermine, Lechee, Leupp and To'Nanees'Dizi Chapters of the Western Navajo Agency. | Letter | Initiation of public scoping of tribal communities. |
| 2/14/2008 | Tusayan District Ranger met with the Navajo Nation | Flagstaff, AZ | No concerns |
| 2/19/2008 | Tusayan District Ranger met with the Yavapai-Prescott Indian Tribe | Williams, AZ | No concerns |
| 2/20/2008 | Acting Forest Supervisor met with the Hopi Tribe | Kykotsmovi, AZ | Concerns regarding visual impacts to Red Butte TCP. |
| 3/4/2008 | Kaibab National Forest staff met with the Hualapai Tribe | Peach Springs, AZ | Concerns regarding visual impacts to Red Butte TCP. |
| 3/18/2008 | Tusayan District Ranger met with the Havasupai Tribe | Tusayan, AZ | Concerns regarding Red Butte TCP. Request for field visit. |
| 3/19/2008 | Field Visit with Havasupai Tribe | Project area | Recommend "South Option B," the proposed location farthest from Red Butte. |
| 6/26/2008 | Letter from Forest Supervisor to Havasupai, Hopi and Hualapai confirming recommendations | Letter | Hopi, Havasupai, and Hualapai recommend "South Option B" location and request ongoing consultation. |
| 1/8/2009 | Kaibab NF staff met with the Havasupai Tribal Council | Supai, AZ | Provided update on project. |
| 5/20/2009 | Kaibab NF staff met with the Hopi Tribe | Kykotsmovi, AZ | Provided update on project. |
| 6/18/2009 | Tusayan District Ranger met with Pueblo of Zuni | Zuni, NM | Provided update. Tribe requests cultural resource surveys. |
| 10/26/2009 | Tusayan District Ranger met with Navajo Nation | Flagstaff, AZ | Provided update on project. |
| 2/24/2010 | Kaibab NF staff met with the Havasupai Tribal Council | Supai, AZ | Provided update on project. |
| 3/10/2010 | Williams District Ranger met with Hualapai Tribe | Peach Springs, AZ | Provided update on project. |

| | | | |
|---|---|---|---|
| 2/15/2011 | Kaibab staff met with the Yavapai-Prescott Indian Tribe | Prescott, AZ | Provided update on project. |
| 2/16/2011 | Kaibab NF staff met with the Hualapai Tribe | Peach Springs, AZ | Provided update on project. |
| 2/23/2011 | Kaibab staff met with the Pueblo of Zuni | Zuni, NM | Provided update on project. |
| 2/24/2011 | Kaibab staff met with the Navajo Nation | Window Rock, AZ | Provided update on project. |

### 4.2.3 Project Consultation

While the Highway 64/180 Communications Sites project was never implemented, tribes have requested ongoing consultation on cellular tower proposals on the Tusayan Ranger District. The Forest has provided information about the project during nine regularly scheduled consultation meetings. In response to a request from the Havasupai Tribe, the Tusayan District Ranger also conducted field visits to the proposed project locations with a tribal representative.

### 4.1.4 Comment Summary

Throughout consultation, several tribes have requested additional information regarding visual impacts to the Red Butte TCP and to the Grand Canyon National Park. The final visual analysis indicates the project would not result in visual impacts to those locations. That final visual analysis was sent to tribes for review and comment.

The Havasupai Tribe has requested information related to the operation and management of wireless communications sites on the Forest in general. That information is provided as part of this analysis.

The Forest provided additional information about the project to the Cameron Chapter of the Western Navajo Agency at the Chapter's request.

No other comments, questions, or requests for additional information have been received by the Forest at this time.

**Table 4.2 – Summary of Tribal Consultation on Tusayan East Wireless Communications Sites Project**

| | | | |
|---|---|---|---|
| 12/12/2013 | Acting Williams District Ranger met with Hualapai Tribe | Peach Springs, AZ | Tribe requests ongoing consultation. May be visual impacts. |
| 1/15/2014 | Tusayan District Ranger met with Hopi Tribe | Kykotsmovi, AZ | Discussed new project locations. |
| 10/22/2014 | Tusayan District Ranger met with Hopi Tribe | Kykotsmovi, AZ | Tribe requests visual analysis. |
| 10/23/2014 | Tusayan District Ranger met with Navajo Nation | Window Rock, AZ | Provided briefing on project. |
| 11/3/2014 | Kaibab NF staff met with the Havasupai Tribal Council | Supai, AZ | Council requests visual analysis for project. |
| 11/14/2014 | Tusayan District Ranger met with Zuni Tribal Council | Zuni, NM | Provided briefing on project. |
| 2/13/2015 | Kaibab NF staff emailed scoping letter to tribal contacts for Havasupai, Hopi, Hualapai, Kaibab Paiute, Navajo, Yavapai-Prescott and Zuni | Email | Distributed scoping materials. |
| 3/16/2015 | Field visit with Havasupai Tribe | Project area | Inspected for cultural resources and medicinal plants. No concerns about project location. Requested information on operation and management of wireless sites in general. |
| 5/15/2015 | Forest Supervisor sent a letter to Havasupai, Hopi, Hualapai, Kaibab Paiute, Navajo, Yavapai-Prescott and Zuni with a project update. | Letter | Project information and updated copy of Schedule of Proposed Actions |
| 6/4/2015 | Tusayan District Ranger met with Hopi Tribe | Kykotsmovi, AZ | Provided update. |
| 6/24/2015 | Tusayan District Ranger met with Hualapai Tribe | Peach Springs, AZ | Tribe requests visual analysis. |
| 6/26/2015 | Williams District Ranger met with Yavapai-Prescott Indian Tribe | Prescott, AZ | Provided update on project. |
| 11/17/2015 | The KNF Tribal Liaison emailed a draft of this consultation summary and the project visual analysis to contacts for the Havasupai, Hopi, Hualapai, and Zuni tribes as requested. | Email | Provided visual analysis for review and comment. |

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# APPENDIX A

## PROPOSED GRANDVIEW TOWER PHOTO SIMULATIONS

# APPENDIX A-1

# PROPOSED GRANDVIEW TOWER PHOTO SIMULATIONS

# PHOTO POINT LOCATION MAPS

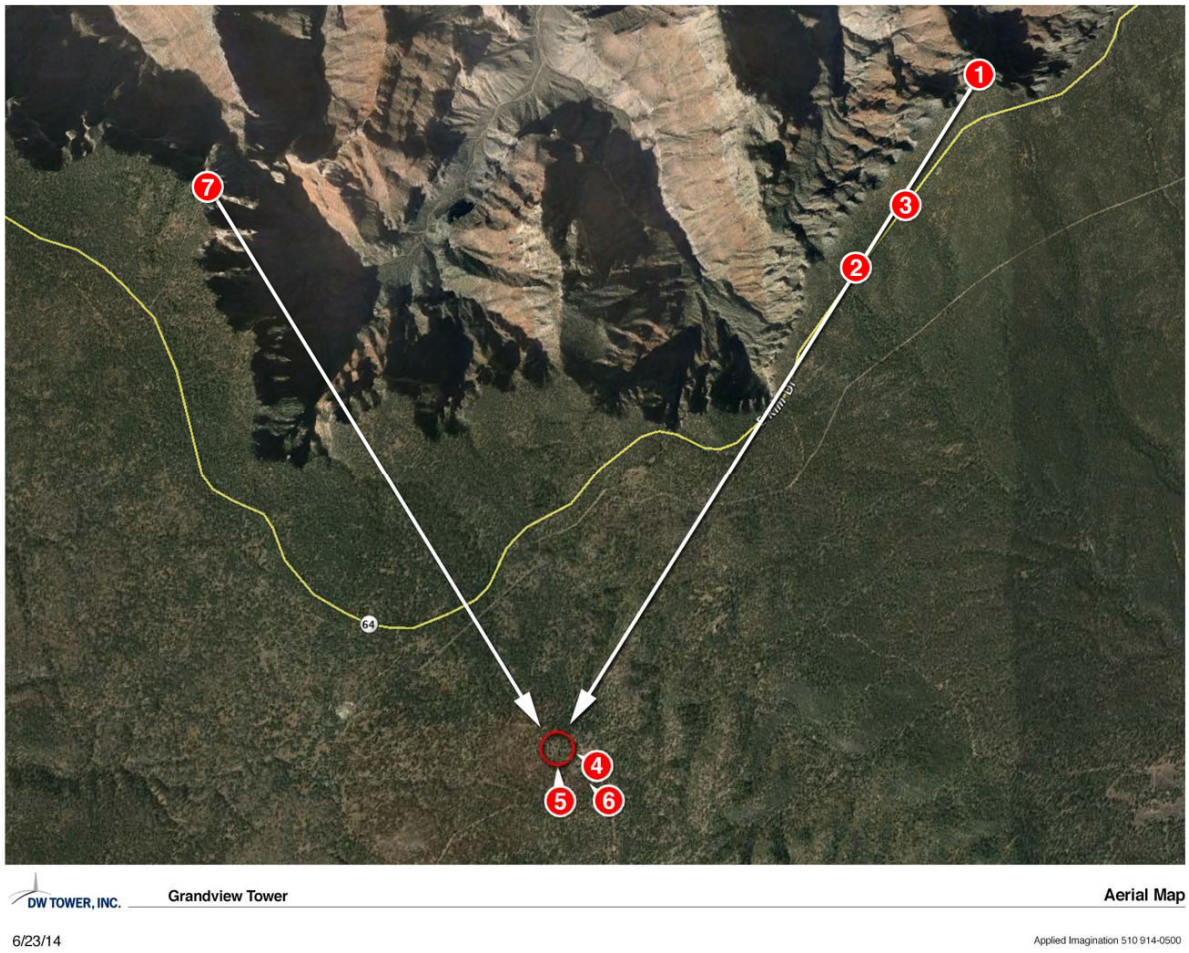
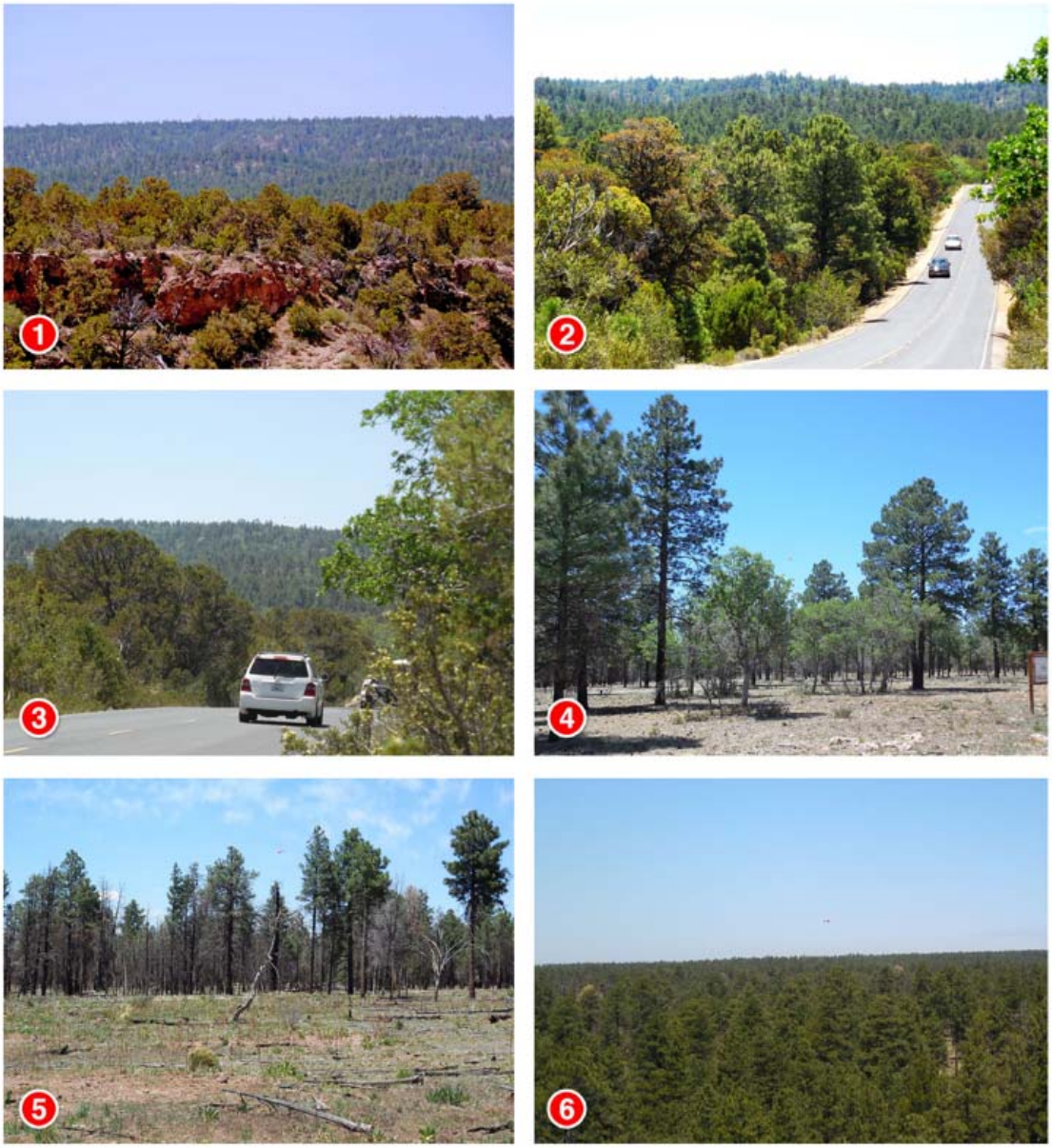



**Photo Point Locations:**

1. Taken inside GCNP at Moran Point
2. Taken inside GCNP on SR 64
3. Taken inside GCNP on SR 64
4. Photograph taken on KNF land, FR 310
5. Photograph taken on KNF from Arizona Trail west of Grandview Lookout
6. Photograph taken on KNF from top of Grandview Lookout Tower
7. Photograph taken from Grandview Point inside GCNP




DW TOWER, INC. Grandview Tower Photo Points

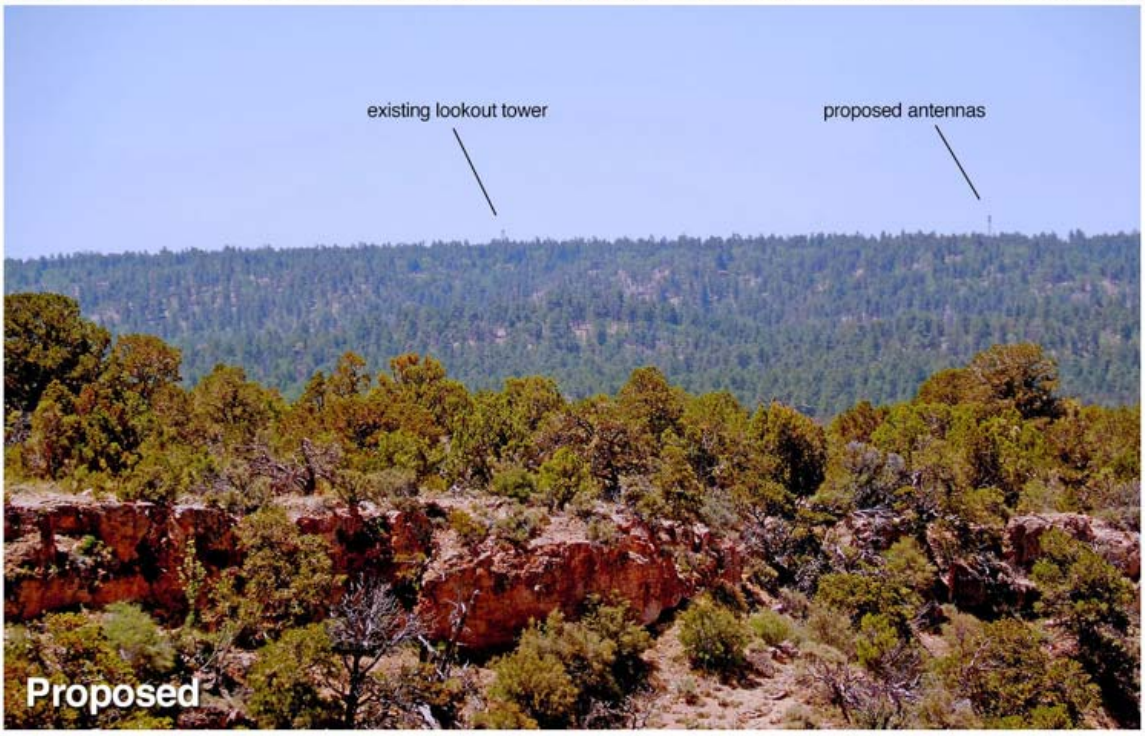
6/23/14

Applied Imagination 510 914-0500

# APPENDIX A-2

# PROPOSED GRANDVIEW TOWER PHOTO SIMULATIONS

# FREE STANDING LATTICE TOWER 110 FEET TALL


DW TOWER, INC.

Grandview Tower

Looking Southwest from Moran Point

View #1

6/23/14

Applied Imagination 510 914-0500



DW TOWER, INC.

Grandview Tower

Looking Southwest from SR64

View #2

6/23/14

Applied Imagination 510 914-0500



DW TOWER, INC.

Grandview Tower

Looking Southwest from SR64

View #3

6/23/14

Applied Imagination 510 914-0500



DW TOWER, INC.

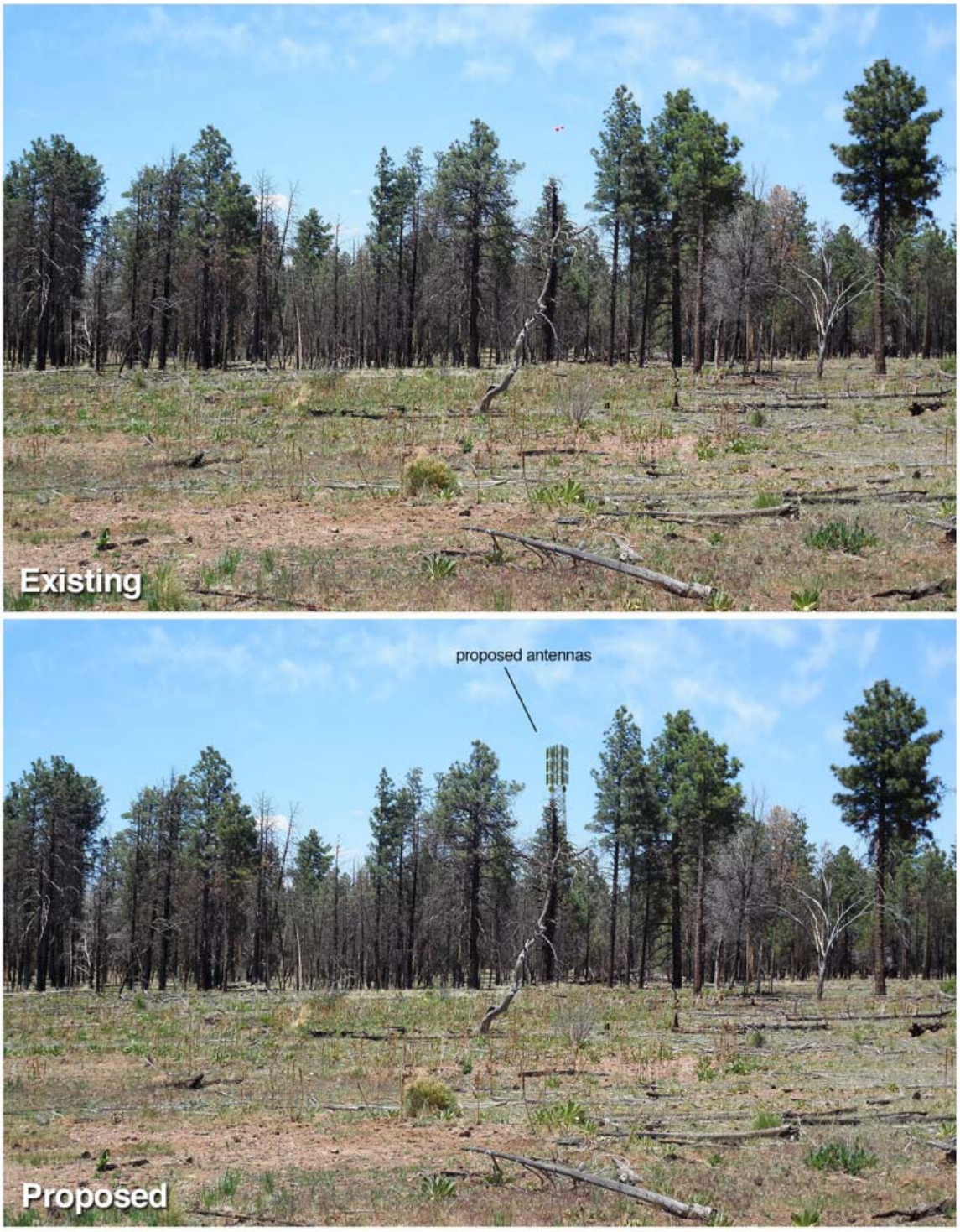
Grandview Tower

Looking Northwest from Road 310

View #4

6/23/14

Applied Imagination 510 914-0500




DW TOWER, INC.

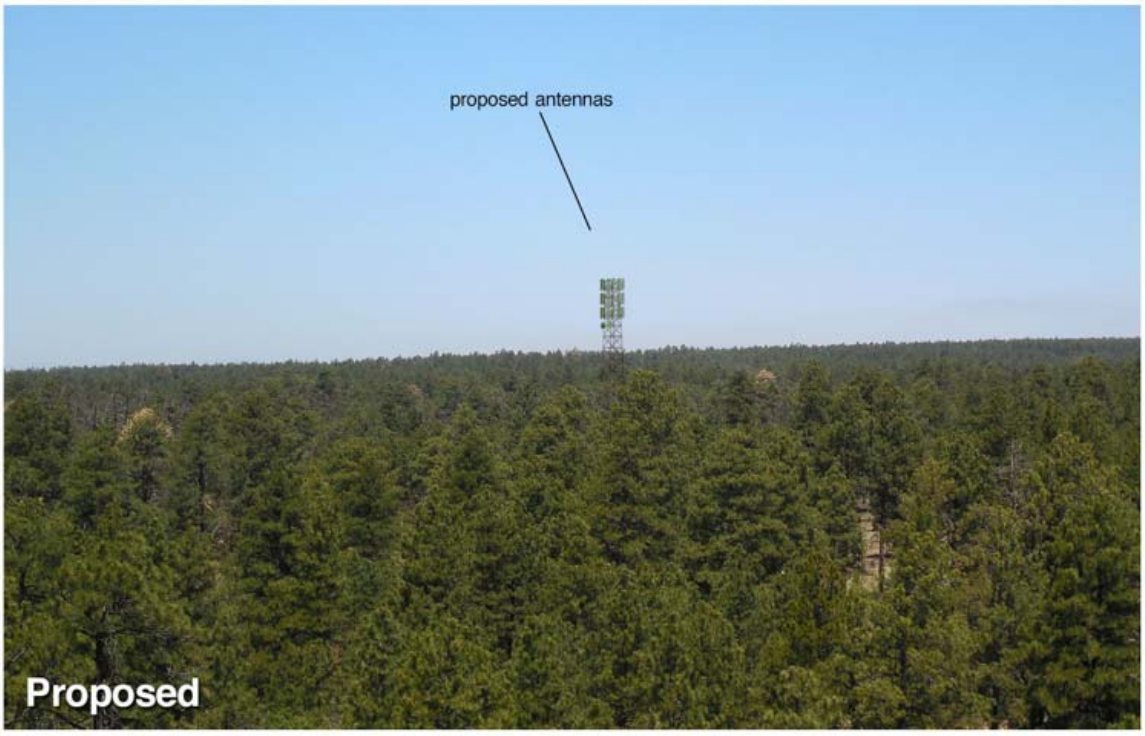
Grandview Tower

Looking North from Arizona Trail

View #5

6/23/14

Applied Imagination 510 914-0500


DW TOWER, INC.

Grandview Tower

Looking Northwest from Lookout Tower

View #6

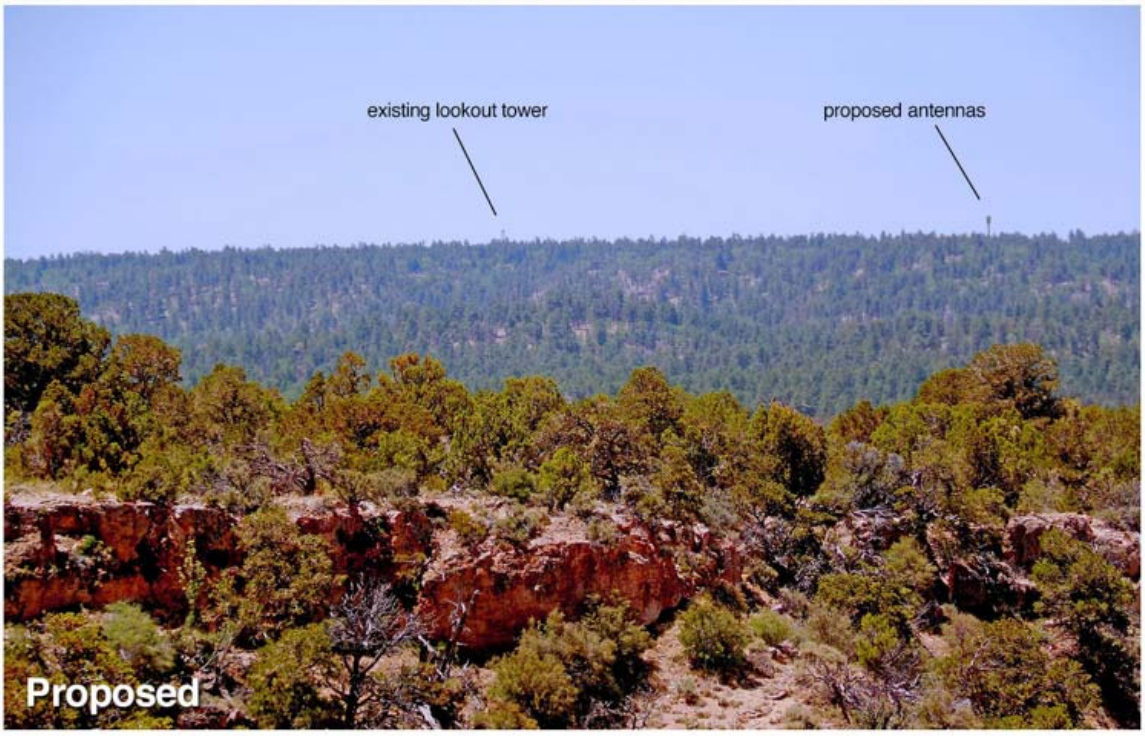
6/23/14

Applied Imagination 510 914-0500

# APPENDIX A-3

## PROPOSED GRANDVIEW TOWER
## PHOTO SIMULATIONS

## FREE STANDING MONOPOLE TOWER
## 110 FEET TALL


DW TOWER, INC. Grandview Tower — Looking Southwest from Moran Point

View #1

6/23/14

Applied Imagination 510 914-0500



DW TOWER, INC.

Grandview Tower

Looking Southwest from SR64

View #2

6/23/14

Applied Imagination 510 914-0500



DW TOWER, INC.

Grandview Tower

Looking Southwest from SR64

View #3

6/23/14

Applied Imagination 510 914-0500


DW TOWER, INC.

Grandview Tower

Looking Northwest from Road 310

View #4

6/23/14

Applied Imagination 510 914-0500



DW TOWER, INC.

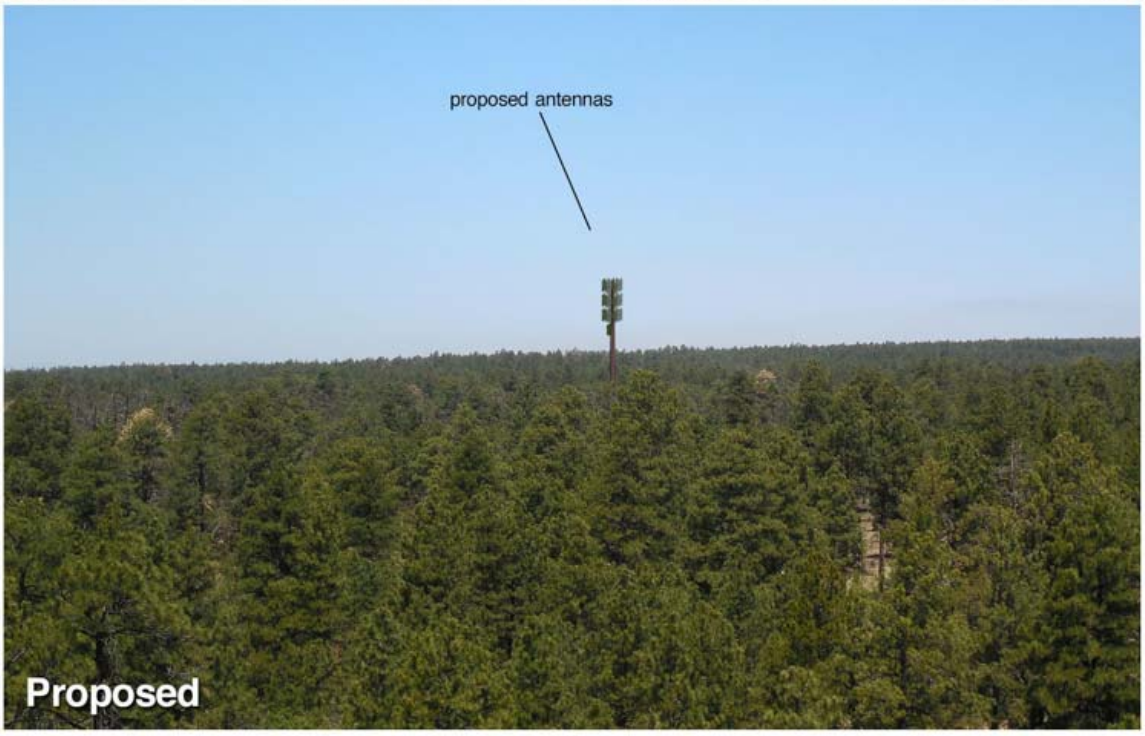
Grandview Tower

Looking North from Arizona Trail

View #5

6/23/14

Applied Imagination 510 914-0500


DW TOWER, INC.

Grandview Tower

Looking Northwest from Lookout Tower

View #6

6/23/14

Applied Imagination 510 914-0500

# APPENDIX A-4

## PROPOSED GRANDVIEW TOWER
## PHOTO SIMULATIONS

## FREE STANDING MONOPOLE TREE TOWER
## 110 FEET TALL



DW TOWER, INC.

Grandview Tower

Looking Southwest from Moran Point

View #1

6/23/14

Applied Imagination 510 914-0500



DW TOWER, INC.

Grandview Tower

Looking Southwest from SR64

View #2

6/23/14

Applied Imagination 510 914-0500



DW TOWER, INC.

Grandview Tower

Looking Southwest from SR64

View #3

6/23/14

Applied Imagination 510 914-0500


DW TOWER, INC.

Grandview Tower

Looking Northwest from Road 310

View #4

6/23/14

Applied Imagination 510 914-0500



DW TOWER, INC.

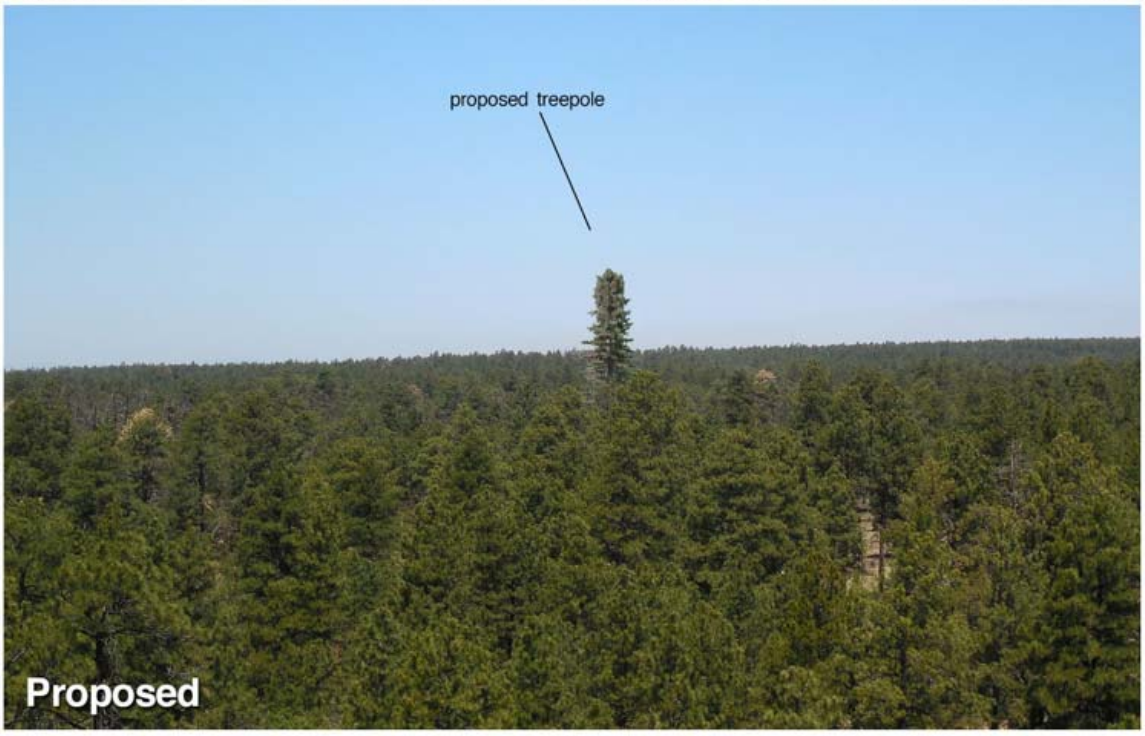
Grandview Tower

Looking North from Arizona Trail

View #5

6/23/14

Applied Imagination 510 914-0500


DW TOWER, INC.

Grandview Tower

Looking Northwest from Lookout Tower

View #6

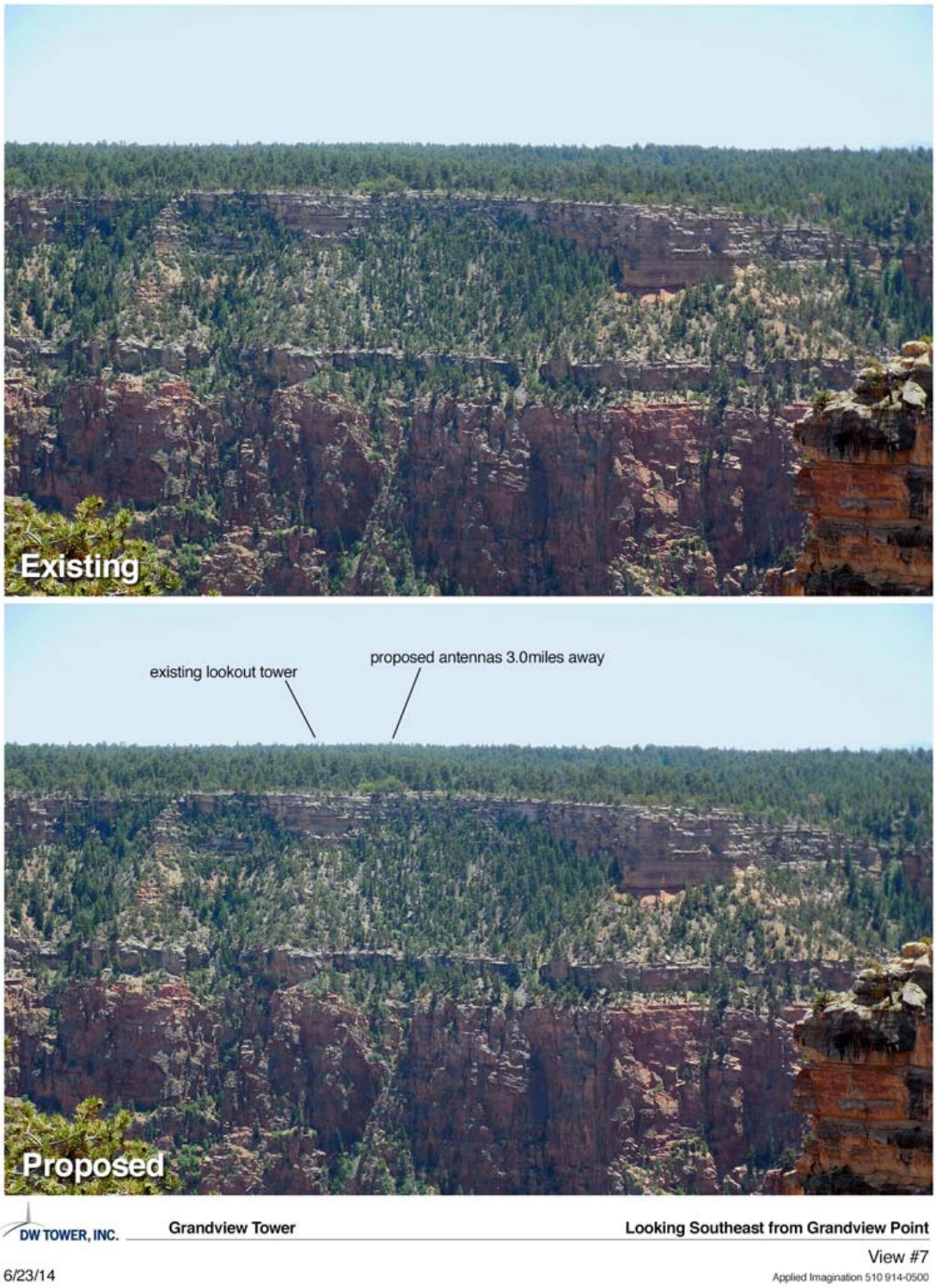
6/23/14

Applied Imagination 510 914-0500

# APPENDIX A-5

# PROPOSED GRANDVIEW TOWER
# PHOTO POINT 7 ANALYSIS

# FREE STANDING TOWER 110 FEET TALL
# VIEWED FROM GRANDVIEW POINT




Because of the distance and elevation of Coconino Rim, Grandview Lookout Tower is not visible to the naked eye under most light conditions; therefore the proposed 110 or 120 foot tall Grandview Tower would not be noticeable to the casual observer. The proposed Grandview Tower would not be a visual factor as seen from Grandview Point.

# APPENDIX B

## PROPOSED GRANDVIEW COMMUNICATIONS FACILITY CONCEPT DRAWINGS

# DW TOWER, INC.

## D.W. HOLDINGS, L.L.C.

SITE MANAGEMENT SYSTEM

## SITE NAME: GRANDVIEW

**SITE ACQUISITION**
DW HOLDINGS

PHONE:
CONTACT:

**ARCHITECT**
YOUNG DESIGN CORP.
10245 E. VIA LINDA, SUITE 211
SCOTTSDALE, AZ., 85258
PHONE: (480) 451-9609
FAX: (480) 451-9608
CONTACT: LUCAS STROBERG

**SURVEYOR**
RLF CONSULTING, LLC
PO BOX 11657
CHANDLER, AZ, 85248
PHONE: (480) 510-3668
FAX: (480) 584-5824
CONTACT: RYAN FIDLER

**LESSOR / OWNER**
FOREST SERVICE - STATE OF AZ

PHONE:
CONTACT:

**LESSEE / COMPANY**
DW HOLDINGS

PHONE:
CONTACT:

**SITE PHOTO:**

**VICINITY MAP:**


**SITE COORDINATES:**

| | |
|---|---|
| LATITUDE | : 35° 57' 37.102" N |
| LONGITUDE | : 111° 57' 32.860" W |
| ELEVATION | : 7526.48' A.M.S.L. |

NORTH

**DRIVING DIRECTIONS:**

TAKE I-10 WEST TO I-17 NORTH, TAKE I-17 NORTH AND CONTINUE ON TO MILTON RD. TURN LEFT ONTO US-180/HUMPHREYS ST. CONTINUE ONTO US-180/N FORT VALLEY RD AND FOLLOW US-180W. HEAD NORTH ON AZ-64. TURN RIGHT ONTO FIRE ROAD 688. TURN RIGHT ONTO FOREST SERVICE ROAD 302. TURN RIGHT ON DIRT ROAD TO SITE ON LEFT.

**ZONING COMPLIANCE:**

| | |
|---|---|
| LOCAL JURISDICTION: | STATE LAND |
| ASSESSORS PARCEL: | N/A |
| ZONING: | TBD |
| USE: | TELECOMMUNICATION FACILITY |
| PARENT PARCEL AREA: | N/A - STATE LAND |
| PROPOSED LEASE AREA: | 10,000 S.F. |
| PARKING REQD: | 0 |
| PARKING PROVIDED: | 1 |

**GENERAL COMPLIANCE:**

HVAC USED ON THIS STRUCTURE IS NOT INTENDED FOR HUMAN COMFORT ITS USE IS SOLELY FOR ELECTRONIC EQUIPMENT COOLING.

DEVELOPMENT AND USE OF THIS SITE WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.

PROVIDE STREET ADDRESS IDENTIFICATION PER MUNICIPAL REQUIREMENTS.
THE USE OF THIS SITE WILL GENERATE NO TRASH.
THIS PROJECT DOES NOT REQUIRE WATER OR SEWER.
THIS PROJECT REQUIRES PERMANENT POWER & TELEPHONE CONNECTION

**A.D.A. COMPLIANCE:**

FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. LANDINGS AND EXITS SHALL COMPLY WITH THE APPLICABLE BUILDING CODE.

**F.C.C. COMPLIANCE:**

ALL PROPOSED ANTENNAS SHALL BE IN COMPLIANCE WITH ALL FEDERAL COMMUNICATIONS COMMISSION (FCC) REGULATIONS, INCLUDING THOSE PROTECTING THE PUBLIC HEALTH AND THOSE PROTECTING HISTORIC DISTRICTS.

**COLLOCATION:**

TOWER SHALL BE DESIGNED IN A MANNER THAT WILL ALLOW FOR THE COLLOCATION OF AT LEASE ONE ADDITIONAL ARRAY ON THE FACILITY.

**PROJECT DESCRIPTION:**

THE PROJECT CONSISTS OF THE INSTALLATION AND OPERATION OF ANTENNAS AND ASSOCIATED EQUIPMENT FOR COMPANY'S WIRELESS TELECOMMUNICATIONS NETWORK. FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

THIS FACILITY IS A STATE APPROVED, PREFABRICATED EQUIPMENT SHELTER, TO HOUSE RADIO EQUIPMENT. NO HAZARDOUS MATERIAL WILL BE STORED WITHIN THE FACILITY.

ALL EXITS SHALL BE OPERABLE FROM THE INSIDE WITHOUT THE USE OF KEYS OR SPECIAL KNOWLEDGE. MANUALLY OPERATED EDGE OR SURFACE MOUNTED FLUSH BOLTS ARE PROHIBITED.

PROPOSED LESSEE ANTENNAS AND ASSOCIATED COAXIAL CABLES
PROPOSED ELECTRICAL SERVICE
PROPOSED INDOOR DIESEL DRIVEN 60-kw STAND-BY GENERATOR
PROPOSED LESSEE EQUIPMENT SHELTER

**SHEET INDEX:**



CLIENT
DW TOWER, INC.
D.W. HOLDINGS, L.L.C.
SITE MANAGEMENT SYSTEM

PLANS PREPARED BY
young design corp
architecture / project management
10245 E. Via Linda, Scottsdale, AZ 85258
ph: 480 451 9609 fax: 480 451 9608
e mail: corporate@ydcoffice.com

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|---|---|---|
| 1 | 06/30/2014 | PRELIMINARY REVIEW |
| 2 | 07/07/2014 | CUSTOMER CHANGES |

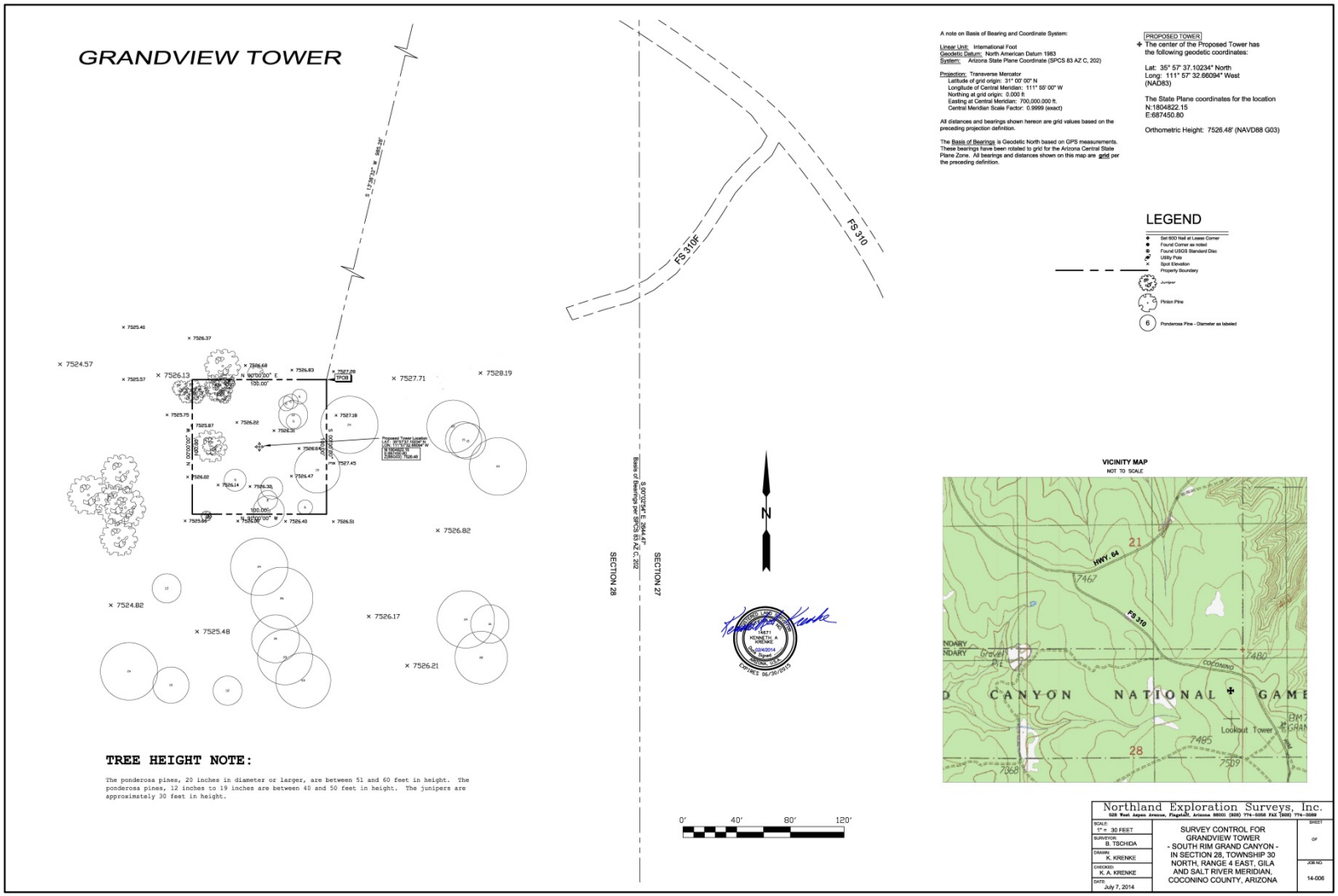
ARCHITECTS JOB NO.
YDC-5908

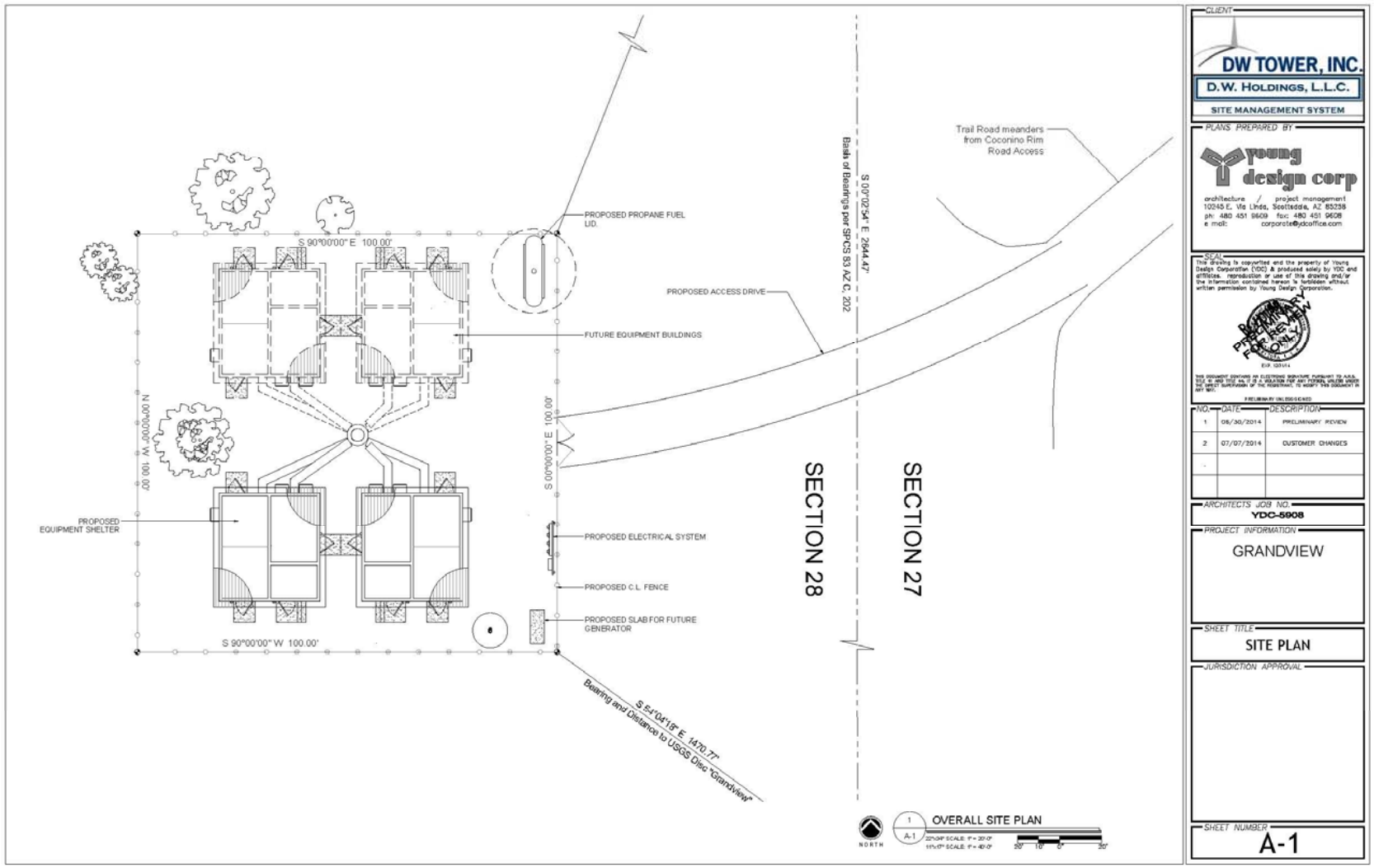
PROJECT INFORMATION
GRANDVIEW

SHEET TITLE
TITLE SHEET

JURISDICTION APPROVAL

SHEET NUMBER
T-1


GRANDVIEW TOWER
FS 310F
FS 310
SECTION 28
SECTION 27
Basis of Bearings per SPCS 83 AZ C, 202
N
0'
40'
80'
120'
LEGEND
Pinion Pine
Ponderosa Pine - Diameter as labeled
VICINITY MAP
NOT TO SCALE
HWY. 64
FS 310
CANYON
NATIONAL
Lookout Tower
TREE HEIGHT NOTE:
The ponderosa pines, 20 inches in diameter or larger, are between 51 and 60 feet in height. The ponderosa pines, 12 inches to 19 inches are between 40 and 50 feet in height. The junipers are approximately 30 feet in height.
A note on Basis of Bearing and Coordinate System:
Linear Unit: International Foot
Geodetic Datum: North American Datum 1983
System: Arizona State Plane Coordinate (SPCS 83 AZ C, 202)
Projection: Transverse Mercator
Latitude of grid origin: 31° 00' 00" N
Longitude of Central Meridian: 111° 55' 00" W
Northing at grid origin: 0.000 ft
Easting at Central Meridian: 700,000.000 ft.
Central Meridian Scale Factor: 0.9999 (exact)
All distances and bearings shown hereon are grid values based on the preceding projection definition.
The Basis of Bearings is Geodetic North based on GPS measurements. These bearings have been rotated to grid for the Arizona Central State Plane Zone. All bearings and distances shown on this map are grid per the preceding definition.
PROPOSED TOWER
The center of the Proposed Tower has the following geodetic coordinates:
Lat: 35° 57' 37.10234" North
Long: 111° 57' 32.86094" West
(NAD83)
The State Plane coordinates for the location
N:1804822.15
E:687450.80
Orthometric Height: 7526.46' (NAVD88 G03)
Northland Exploration Surveys, Inc.
SURVEY CONTROL FOR
GRANDVIEW TOWER
- SOUTH RIM GRAND CANYON -
IN SECTION 28, TOWNSHIP 30
NORTH, RANGE 4 EAST, GILA
AND SALT RIVER MERIDIAN,
COCONINO COUNTY, ARIZONA
SCALE: 1" = 30 FEET
SURVEYOR: B. TSCHIDA
DRAWN: K. KRENKE
CHECKED: K. A. KRENKE
DATE: July 7, 2014
SHEET OF
JOB NO. 14-006


S 90°00'00" E 100.00'
PROPOSED PROPANE FUEL LID.
PROPOSED ACCESS DRIVE
FUTURE EQUIPMENT BUILDINGS
Trail Road meanders from Coconino Rim Road Access
Basis of Bearings per SPCS 83 AZ C, 202
S 00°02'54" E 2644.47'
N 00°00'00" W 100.00'
S 00°00'00" E 100.00'
PROPOSED EQUIPMENT SHELTER
PROPOSED ELECTRICAL SYSTEM
PROPOSED C.L. FENCE
PROPOSED SLAB FOR FUTURE GENERATOR
S 90°00'00" W 100.00'
S 51°04'19" E 1470.77'
Bearing and Distance to USGS Disc "Grandview"
SECTION 28
SECTION 27
NORTH
1
A-1
OVERALL SITE PLAN
CLIENT
DW TOWER, INC.
D.W. HOLDINGS, L.L.C.
SITE MANAGEMENT SYSTEM
PLANS PREPARED BY
young design corp
architecture / project management
10245 E. Via Linda, Scottsdale, AZ 85258
ph: 480 451 9609 fax: 480 451 9608
e mail: corporate@ydcoffice.com
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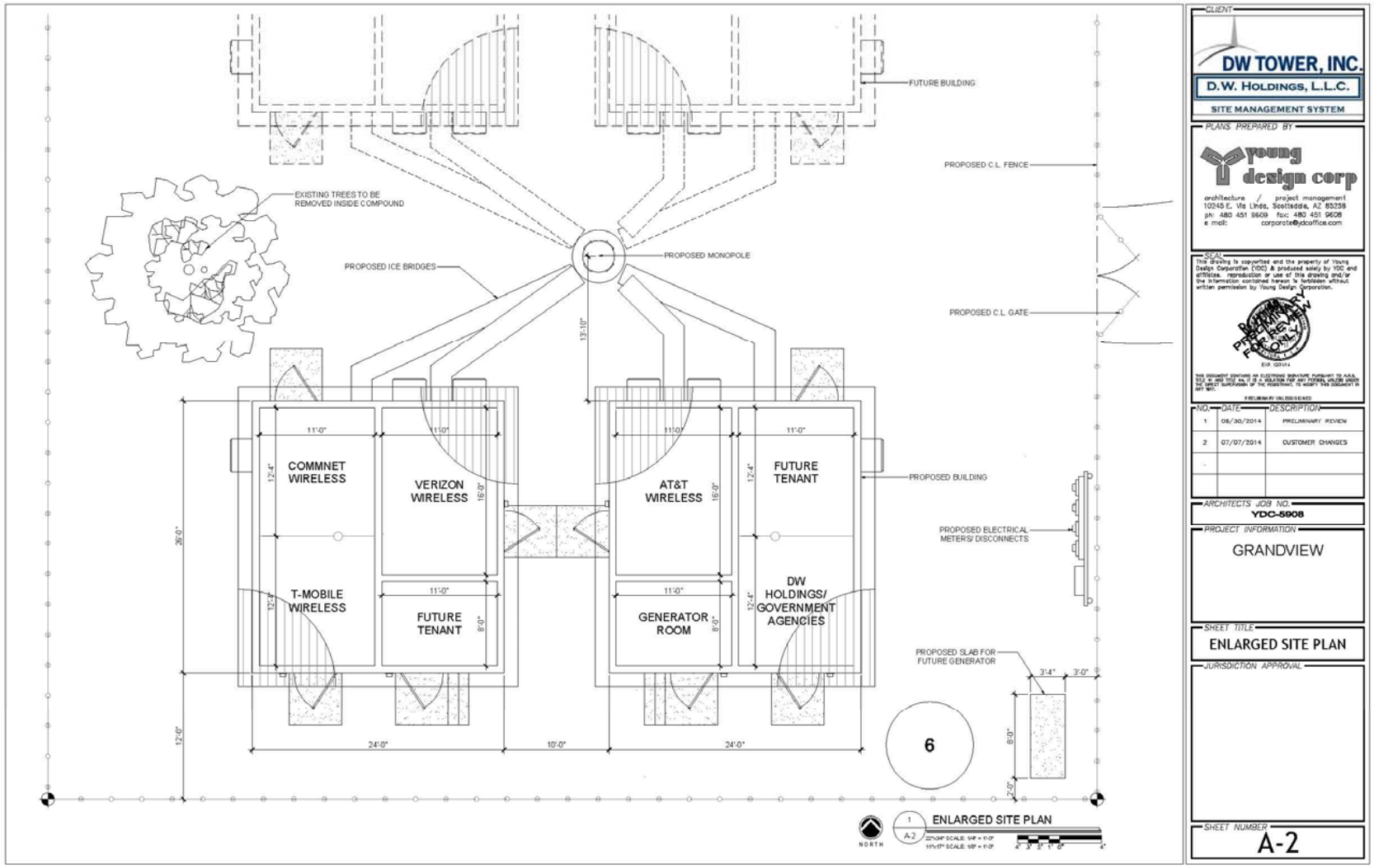
2 07/07/2014 CUSTOMER CHANGES
ARCHITECTS JOB NO.
YDC-5908
PROJECT INFORMATION
GRANDVIEW
SHEET TITLE
SITE PLAN
JURISDICTION APPROVAL
SHEET NUMBER
A-1




CLIENT
DW TOWER, INC.
D.W. HOLDINGS, L.L.C.
SITE MANAGEMENT SYSTEM

PLANS PREPARED BY
young design corp
architecture / project management
10245 E. Via Linda, Scottsdale, AZ 85258
ph: 480 451 9609 fax: 480 451 9608
e mail: corporate@ydcoffice.com

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| | | |

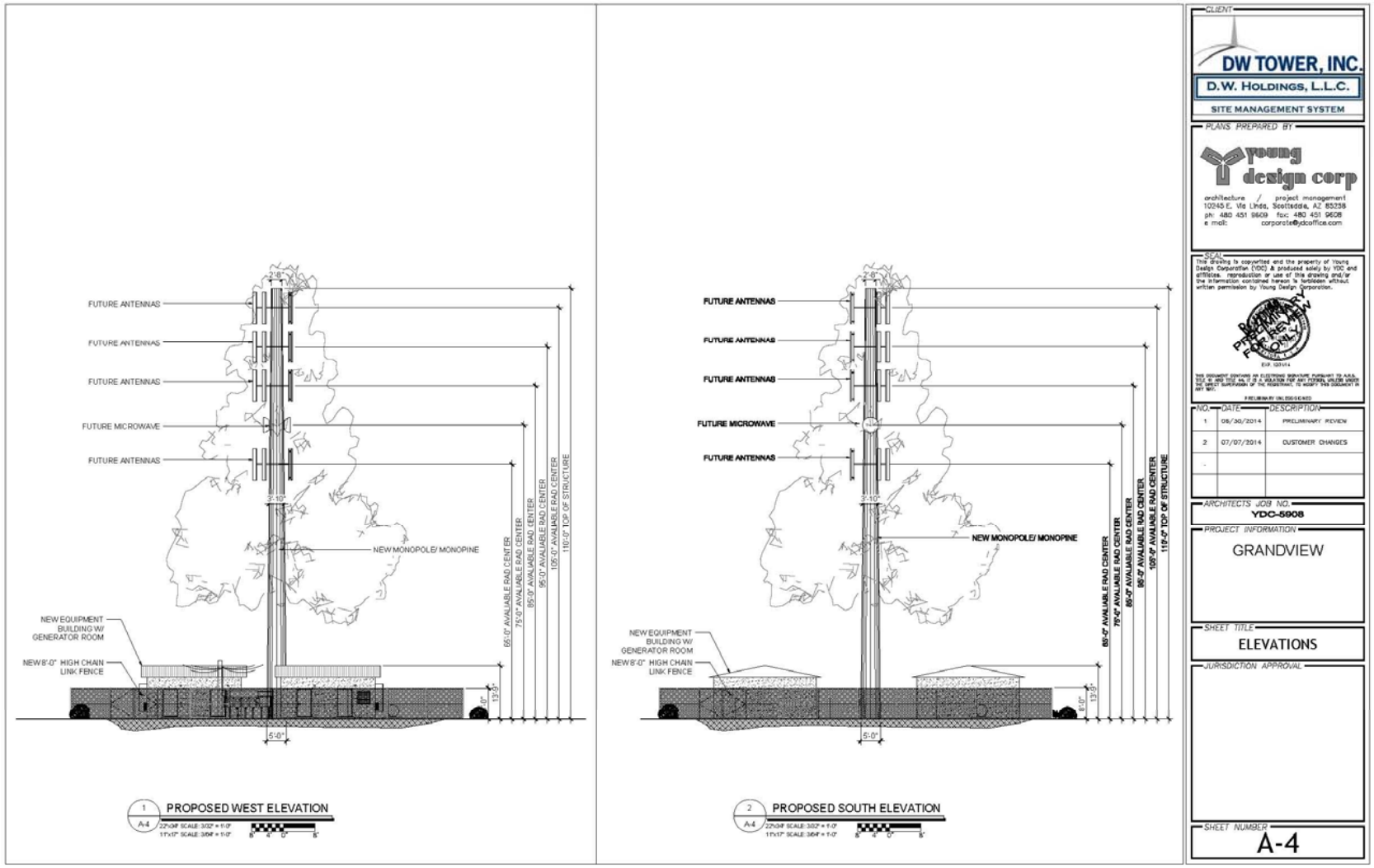
ARCHITECTS JOB NO.
YDC-5908

PROJECT INFORMATION
GRANDVIEW

SHEET TITLE
ENLARGED SITE PLAN

JURISDICTION APPROVAL

SHEET NUMBER
A-2


FUTURE ANTENNAS
FUTURE ANTENNAS
FUTURE ANTENNAS
FUTURE MICROWAVE
FUTURE ANTENNAS
NEW MONOPOLE/ MONOPINE
NEW EQUIPMENT BUILDING W/ GENERATOR ROOM
NEW 8'-0" HIGH CHAIN LINK FENCE
85'-0" AVAILABLE RAD CENTER
75'-0" AVAILABLE RAD CENTER
85'-0" AVAILABLE RAD CENTER
95'-0" AVAILABLE RAD CENTER
105'-0" AVAILABLE RAD CENTER
110'-0" TOP OF STRUCTURE
PROPOSED WEST ELEVATION
PROPOSED SOUTH ELEVATION
CLIENT
DW TOWER, INC.
D.W. HOLDINGS, L.L.C.
SITE MANAGEMENT SYSTEM
PLANS PREPARED BY
young design corp
architecture / project management
10245 E. Via Linda, Scottsdale, AZ 85258
ph: 480 451 9609 fax: 480 451 9608
e mail: corporate@ydcoffice.com
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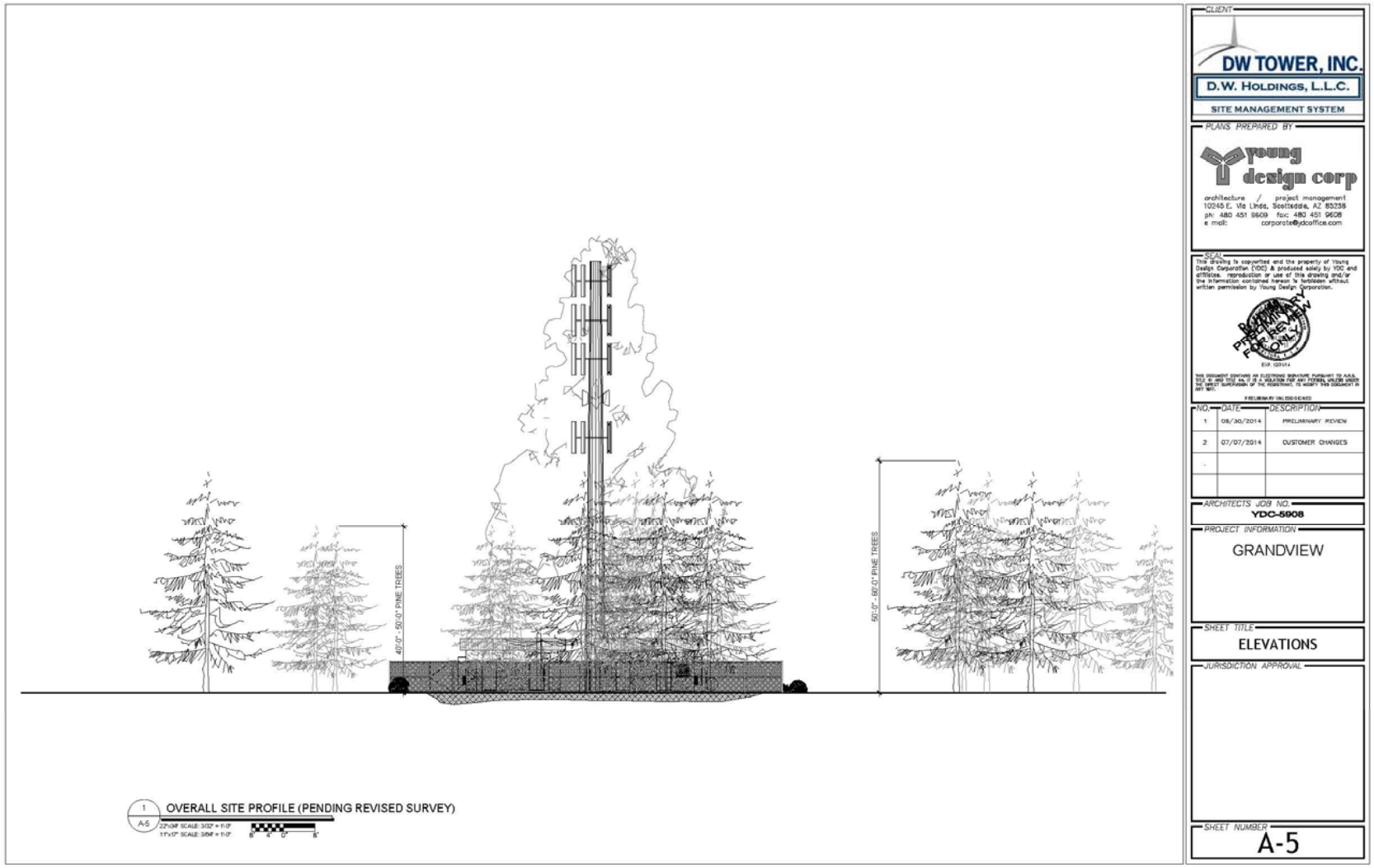
ARCHITECTS JOB NO.
YDC-5908
PROJECT INFORMATION
GRANDVIEW
SHEET TITLE
ELEVATIONS
JURISDICTION APPROVAL
SHEET NUMBER
A-4


40'-0" - 50'-0" PINE TREES
50'-0" - 60'-0" PINE TREES
1
A-5
OVERALL SITE PROFILE (PENDING REVISED SURVEY)
CLIENT
DW TOWER, INC.
D.W. HOLDINGS, L.L.C.
SITE MANAGEMENT SYSTEM
PLANS PREPARED BY
young design corp
architecture / project management
10245 E. Via Linda, Scottsdale, AZ 85258
ph: 480 451 9609 fax: 480 451 9608
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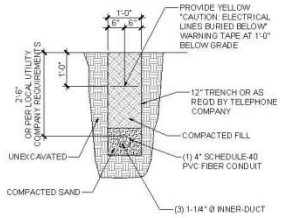
ARCHITECTS JOB NO.
YDC-5908
PROJECT INFORMATION
GRANDVIEW
SHEET TITLE
ELEVATIONS
JURISDICTION APPROVAL
SHEET NUMBER
A-5

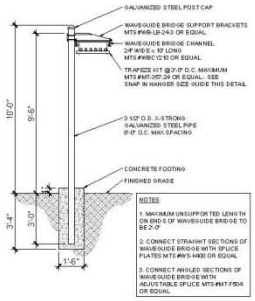
FENCE NOTES:

1. GATE POST AND CORNER POST: 3" O.D. PIPE, 9.11 LBS./ LIN. FOOT-ASTM-F1083
2. LINE POST: 2-1/2" O.D. PIPE, 3.65 LBS./LIN. FOOT-ASTM-F1083 - LINE POST 10' O.C. MAXIMUM
3. GATE FRAME: 1.90" O.D., 2.72 LBS./LIN. FOOT-ASTM-F1083
4. TOP AND BRACE RAIL: 1.66 O.D. PIPE, 2.27 LBS./LIN. FOOT-ASTM-F1083
5. FABRIC: 9 GA. CORE WIRE SIZE 2" MESH, FABRIC TO TOUCH GRAVEL BASE
6. TIE WIRE: MINIMUM 11 GA. GALVANIZED STEEL
7. BOTTOM TENSION WIRE - 7GA.ZINC COATED MUSHROOM TYPE CENTER CATCH
8. GATE LATCH: 1-3/8 O.D. PLUNGER ROD WITH

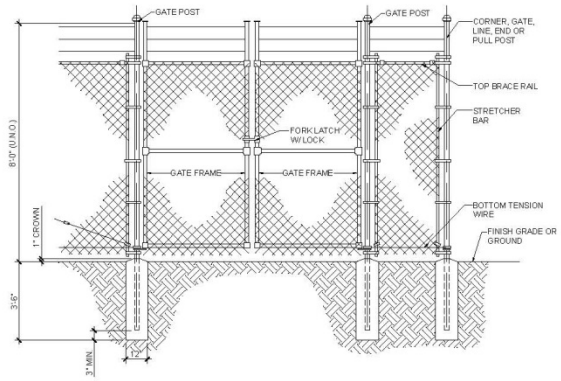
CHAIN LINK FENCE NOTES | 5



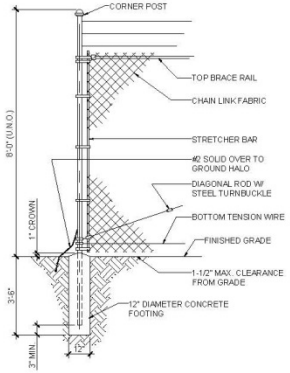

FIBER TRENCH DETAIL | 4




CABLE BRIDGE DETAIL | 2




CHAIN LINK GATES | 3




CHAIN LINK SITE FENCE DETAIL | 1

CLIENT
DW TOWER, INC.
D.W. HOLDINGS, L.L.C.
SITE MANAGEMENT SYSTEM

PLANS PREPARED BY
young design corp
architecture / project management
10245 E. Via Linda, Scottsdale, AZ 85258
ph: 480 451 9609 fax: 480 451 9608
e mail: corporate@ydcoffice.com

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| 2 | 07/07/2014 | CUSTOMER CHANGES |
| | | |
| | | |

ARCHITECTS JOB NO.
YDC-5908

PROJECT INFORMATION
GRANDVIEW

SHEET TITLE
DETAILS

JURISDICTION APPROVAL

SHEET NUMBER
A-6

# APPENDIX C

# PROPOSED SKINNER RIDGE COMMUNICATIONS FACILITY CONCEPT DRAWINGS

# DW TOWER, INC.

## D.W. HOLDINGS, L.L.C.

SITE MANAGEMENT SYSTEM

## SITE NAME: SKINNER RIDGE

**SITE ACQUISITION**
DW HOLDINGS
PHONE:
CONTACT:

**ARCHITECT**
YOUNG DESIGN CORP.
10245 E. VIA LINDA, SUITE 211
SCOTTSDALE, AZ., 85258
PHONE: (480) 451-9609
FAX: (480) 451-9608
CONTACT: LUCAS STROBERG

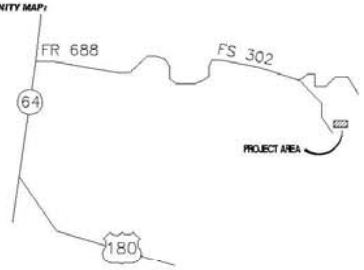
**SURVEYOR**
RLF CONSULTING, LLC
PO BOX 11657
CHANDLER, AZ, 85248
PHONE: (480) 510-3668
FAX: (480) 584-5824
CONTACT: RYAN FIDLER

**LESSOR / OWNER**
FOREST SERVICE - STATE OF AZ
PHONE:
CONTACT:

**LESSEE / COMPANY**
DW HOLDINGS
PHONE:
CONTACT:

**SITE PHOTO:**

**VICINITY MAP:**




**SITE COORDINATES:**
LATITUDE : 35° 54' 35.773" N
LONGITUDE : 112° 00' 35.954" W
ELEVATION : 7258.7' A.M.S.L.

NORTH

**DRIVING DIRECTIONS:**
TAKE I-10 WEST TO I-17 NORTH, TAKE I-17 NORTH AND CONTINUE ON TO MILTON RD. TURN LEFT ONTO US-180/HUMPHREYS ST. CONTINUE ONTO US-180/N FORT VALLEY RD AND FOLLOW US-180W. HEAD NORTH ON AZ-64. TURN RIGHT ONTO FOREST SERVICE ROAD 302. TURN RIGHT ON DIRT ROAD TO SITE ON LEFT.

**ZONING COMPLIANCE:**

| | |
|---|---|
| LOCAL JURISDICTION: | STATE LAND |
| ASSESSORS PARCEL: | N/A |
| ZONING: | TBD |
| USE: | TELECOMMUNICATION FACILITY |
| PARENT PARCEL AREA: | N/A - STATE LAND |
| PROPOSED LEASE AREA: | 10,000 S.F. |
| PARKING REQD: | 0 |
| PARKING PROVIDED: | 1 |

**GENERAL COMPLIANCE:**
HVAC USED ON THIS STRUCTURE IS NOT INTENDED FOR HUMAN COMFORT ITS USE IS SOLELY FOR ELECTRONIC EQUIPMENT COOLING.
DEVELOPMENT AND USE OF THIS SITE WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
PROVIDE STREET ADDRESS IDENTIFICATION PER MUNICIPAL REQUIREMENTS.
THE USE OF THIS SITE WILL GENERATE NO TRASH.
THIS PROJECT DOES NOT REQUIRE WATER OR SEWER.
THIS PROJECT REQUIRES PERMANENT POWER & TELEPHONE CONNECTION

**A.D.A. COMPLIANCE:**
FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. LANDINGS AND EXITS SHALL COMPLY WITH THE APPLICABLE BUILDING CODE.

**F.C.C. COMPLIANCE:**
ALL PROPOSED ANTENNAS SHALL BE IN COMPLIANCE WITH ALL FEDERAL COMMUNICATIONS COMMISSION (FCC) REGULATIONS, INCLUDING THOSE PROTECTING THE PUBLIC HEALTH AND THOSE PROTECTING HISTORIC DISTRICTS.

**COLLOCATION:**
TOWER SHALL BE DESIGNED IN A MANNER THAT WILL ALLOW FOR THE COLLOCATION OF AT LEASE ONE ADDITIONAL ARRAY ON THE FACILITY.

**PROJECT DESCRIPTION:**
THE PROJECT CONSISTS OF THE INSTALLATION AND OPERATION OF ANTENNAS AND ASSOCIATED EQUIPMENT FOR COMPANY'S WIRELESS TELECOMMUNICATIONS NETWORK. FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
THIS FACILITY IS A STATE APPROVED, PREFABRICATED EQUIPMENT SHELTER, TO HOUSE RADIO EQUIPMENT.
NO HAZARDOUS MATERIAL WILL BE STORED WITHIN THE FACILITY.
ALL EXITS SHALL BE OPERABLE FROM THE INSIDE WITHOUT THE USE OF KEYS OR SPECIAL KNOWLEDGE. MANUALLY OPERATED EDGE OR SURFACE MOUNTED FLUSH BOLTS ARE PROHIBITED.
PROPOSED LESSEE ANTENNAS AND ASSOCIATED COAXIAL CABLES
PROPOSED ELECTRICAL SERVICE
PROPOSED INDOOR DIESEL DRIVEN 60-kw STAND-BY GENERATOR
PROPOSED LESSEE EQUIPMENT SHELTER

**SHEET INDEX:**



CLIENT
DW TOWER, INC.
D.W. HOLDINGS, L.L.C.
SITE MANAGEMENT SYSTEM

PLANS PREPARED BY
young design corp
architecture / project management
10245 E. Via Linda, Scottsdale, AZ 85258
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|---|---|---|
| 1 | 06/30/2014 | PRELIMINARY REVIEW |
| 2 | 07/07/2014 | CUSTOMER CHANGES |
| - | | |
| - | | |

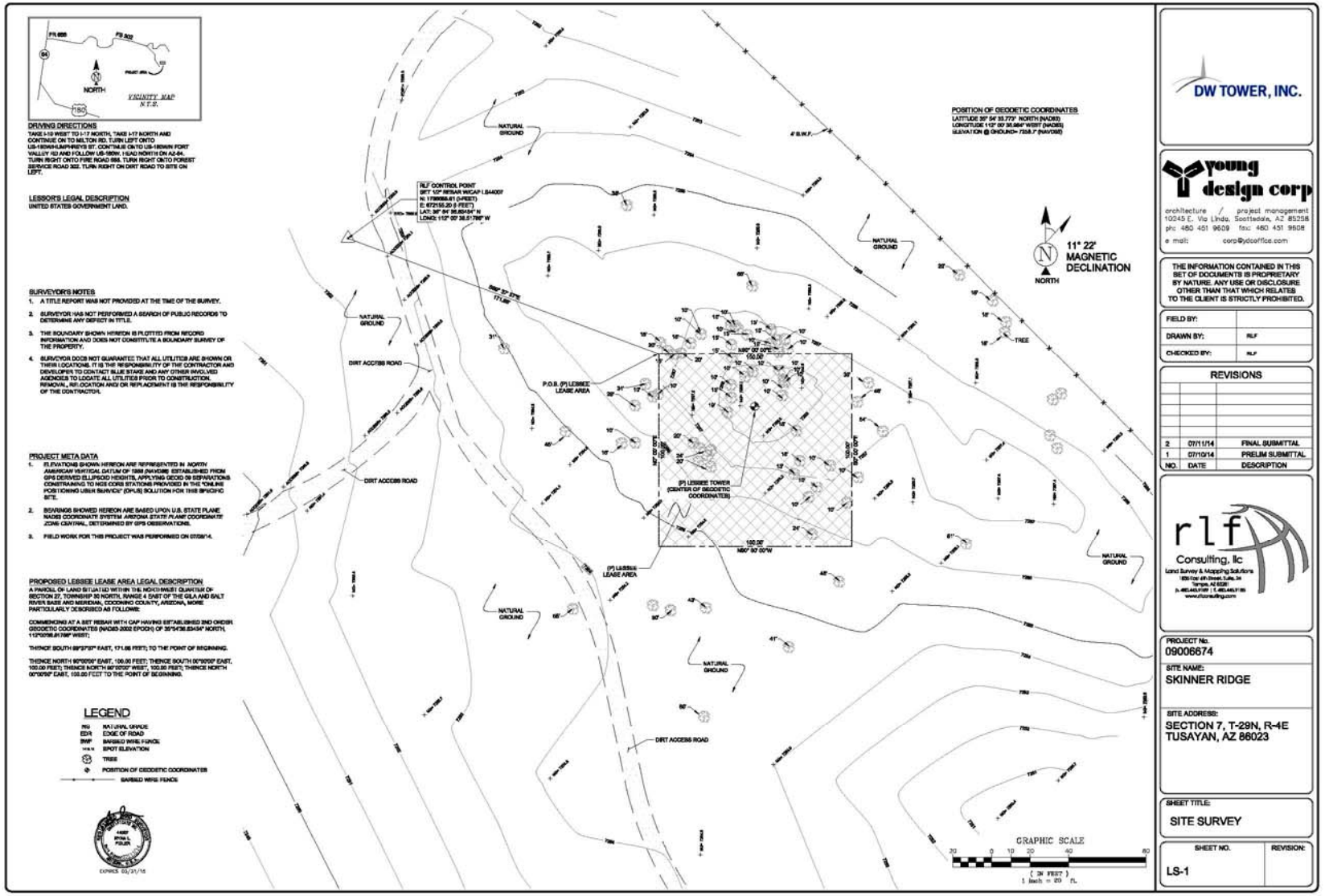
ARCHITECTS JOB NO.
YDC-5685

PROJECT INFORMATION
SKINNER RIDGE

SHEET TITLE
TITLE SHEET

JURISDICTION APPROVAL

SHEET NUMBER
T-1


VICINITY MAP
N.T.S.
DRIVING DIRECTIONS
LESSOR'S LEGAL DESCRIPTION
UNITED STATES GOVERNMENT LAND.
SURVEYOR'S NOTES
1. A TITLE REPORT WAS NOT PROVIDED AT THE TIME OF THE SURVEY.
2. SURVEYOR HAS NOT PERFORMED A SEARCH OF PUBLIC RECORDS TO DETERMINE ANY DEFECT IN TITLE.
3. THE BOUNDARY SHOWN HEREON IS PLOTTED FROM RECORD INFORMATION AND DOES NOT CONSTITUTE A BOUNDARY SURVEY OF THE PROPERTY.
4. SURVEYOR DOES NOT GUARANTEE THAT ALL UTILITIES ARE SHOWN OR THEIR LOCATIONS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND DEVELOPER TO CONTACT BLUE STAKE AND ANY OTHER INVOLVED AGENCIES TO LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION. REMOVAL, RELOCATION AND OR REPLACEMENT IS THE RESPONSIBILITY OF THE CONTRACTOR.
PROJECT META DATA
1. ELEVATIONS SHOWN HEREON ARE REPRESENTED IN NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) ESTABLISHED FROM GPS DERIVED ELLIPSOID HEIGHTS, APPLYING GEOID 09 ELEVATIONS CONSTRAINING TO NGS CORS STATIONS PROVIDED IN THE "ONLINE POSITIONING USER SERVICE" (OPUS) SOLUTION FOR THIS BENCHPOINT SITE.
2. BEARINGS SHOWED HEREON ARE BASED UPON U.S. STATE PLANE NAD83 COORDINATE SYSTEM, ARIZONA STATE PLANE COORDINATE ZONE CENTRAL, DETERMINED BY GPS OBSERVATIONS.
3. FIELD WORK FOR THIS PROJECT WAS PERFORMED ON 07/09/14.
PROPOSED LESSEE LEASE AREA LEGAL DESCRIPTION
A PARCEL OF LAND SITUATED WITHIN THE NORTH HALF QUANTUM OF SECTION 27, TOWNSHIP 30 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:
COMMENCING AT A SET REBAR WITH CAP HAVING ESTABLISHED 2ND ORDER GEODETIC COORDINATES (NAD83-2002 EPOCH) OF 35°54'36.83454" NORTH, 112°00'56.81788" WEST;
THENCE SOUTH 89°37'57" EAST, 171.66 FEET; TO THE POINT OF BEGINNING.
THENCE NORTH 90°00'00" EAST, 100.00 FEET; THENCE SOUTH 00°00'00" EAST, 100.00 FEET; THENCE NORTH 90°00'00" WEST, 100.00 FEET; THENCE NORTH 00°00'00" EAST, 100.00 FEET TO THE POINT OF BEGINNING.
LEGEND
NATURAL GRADE
EDGE OF ROAD
BARBED WIRE FENCE
SPOT ELEVATION
TREE
POSITION OF GEODETIC COORDINATES
BARBED WIRE FENCE
RYAN L. FOLEY
EXPIRES 03/31/15
RLF CONTROL POINT
SET 1/2" REBAR W/CAP LS44007
N: 1789559.61 (+FEET)
E: 672155.20 (-FEET)
LAT: 35° 54' 36.83454" N
LONG: 112° 00' 56.81788" W
POSITION OF GEODETIC COORDINATES
LATITUDE 35° 54' 33.773" NORTH (NAD83)
LONGITUDE 112° 00' 35.464" WEST (NAD83)
ELEVATION @ GROUND= 7288.7' (NAVD88)
11° 22'
MAGNETIC
DECLINATION
NORTH
NATURAL GROUND
DIRT ACCESS ROAD
TREE
P.O.B. (P) LESSEE LEASE AREA
(P) LESSEE TOWER (CENTER OF GEODETIC COORDINATES)
(P) LESSEE LEASE AREA
100.00'
N90° 00' 00"W
GRAPHIC SCALE
( IN FEET )
1 inch = 20 ft.
DW TOWER, INC.
young design corp
architecture / project management
10045 E. Via Linda, Scottsdale, AZ 85258
ph: 480 451 9609 fax: 480 451 9608
e mail: corp@ydcoffice.com
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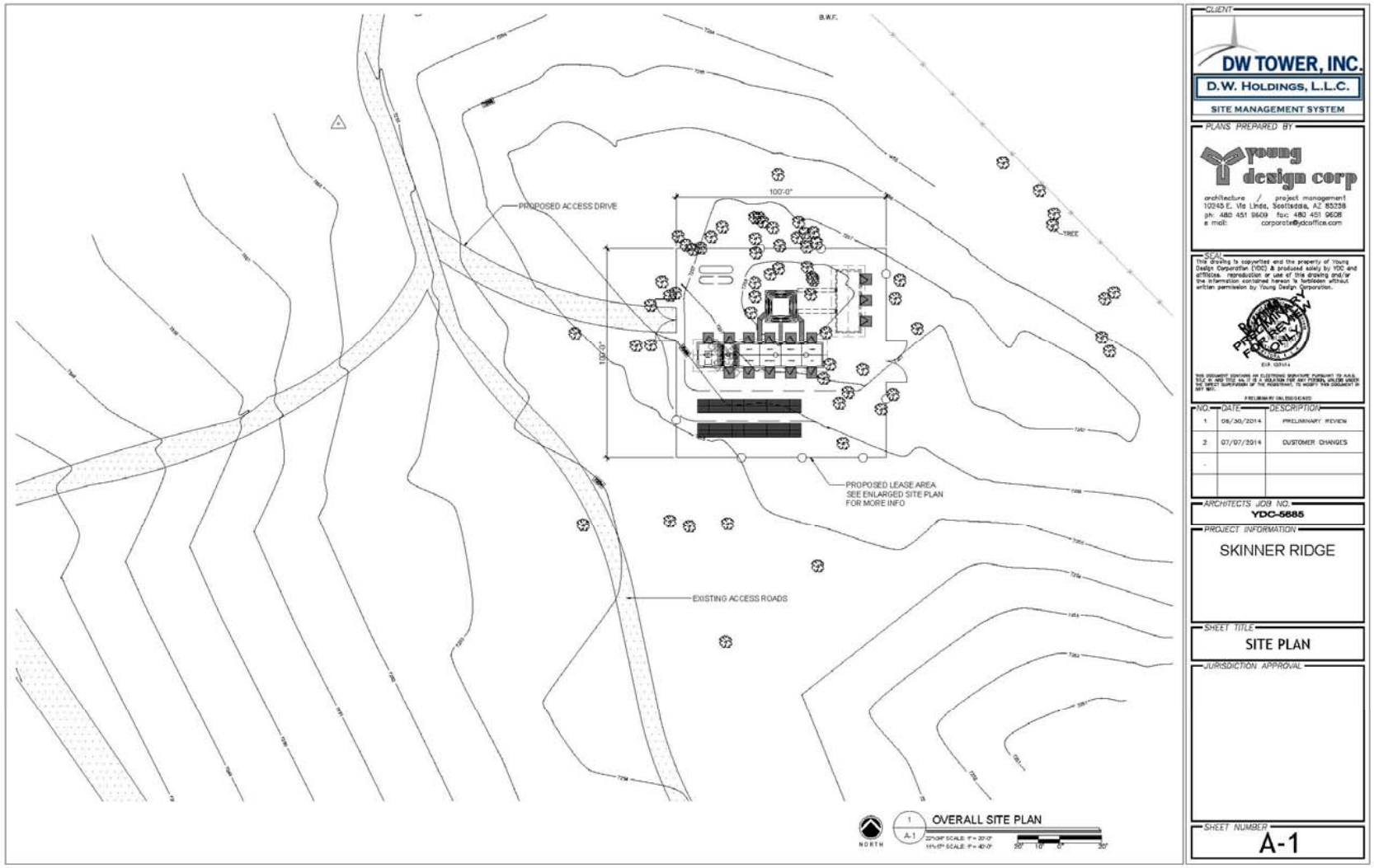
FIELD BY:
DRAWN BY: RLF
CHECKED BY: RLF
REVISIONS
NO. DATE DESCRIPTION
2 07/11/14 FINAL SUBMITTAL
1 07/10/14 PRELIM SUBMITTAL
rlf Consulting, llc
Land Survey & Mapping Solutions
PROJECT No.
09006674
SITE NAME:
SKINNER RIDGE
SITE ADDRESS:
SECTION 7, T-29N, R-4E
TUSAYAN, AZ 86023
SHEET TITLE:
SITE SURVEY
SHEET NO.
LS-1
REVISION:


B.W.F.
PROPOSED ACCESS DRIVE
100'-0"
130'-0"
TREE
PROPOSED LEASE AREA
SEE ENLARGED SITE PLAN
FOR MORE INFO
EXISTING ACCESS ROADS
NORTH
1
A-1
OVERALL SITE PLAN
22"x34" SCALE: 1" = 20'-0"
11"x17" SCALE: 1" = 40'-0"
CLIENT
DW TOWER, INC.
D.W. HOLDINGS, L.L.C.
SITE MANAGEMENT SYSTEM
PLANS PREPARED BY
young design corp
architecture / project management
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PRELIMINARY NOT DESIGNED
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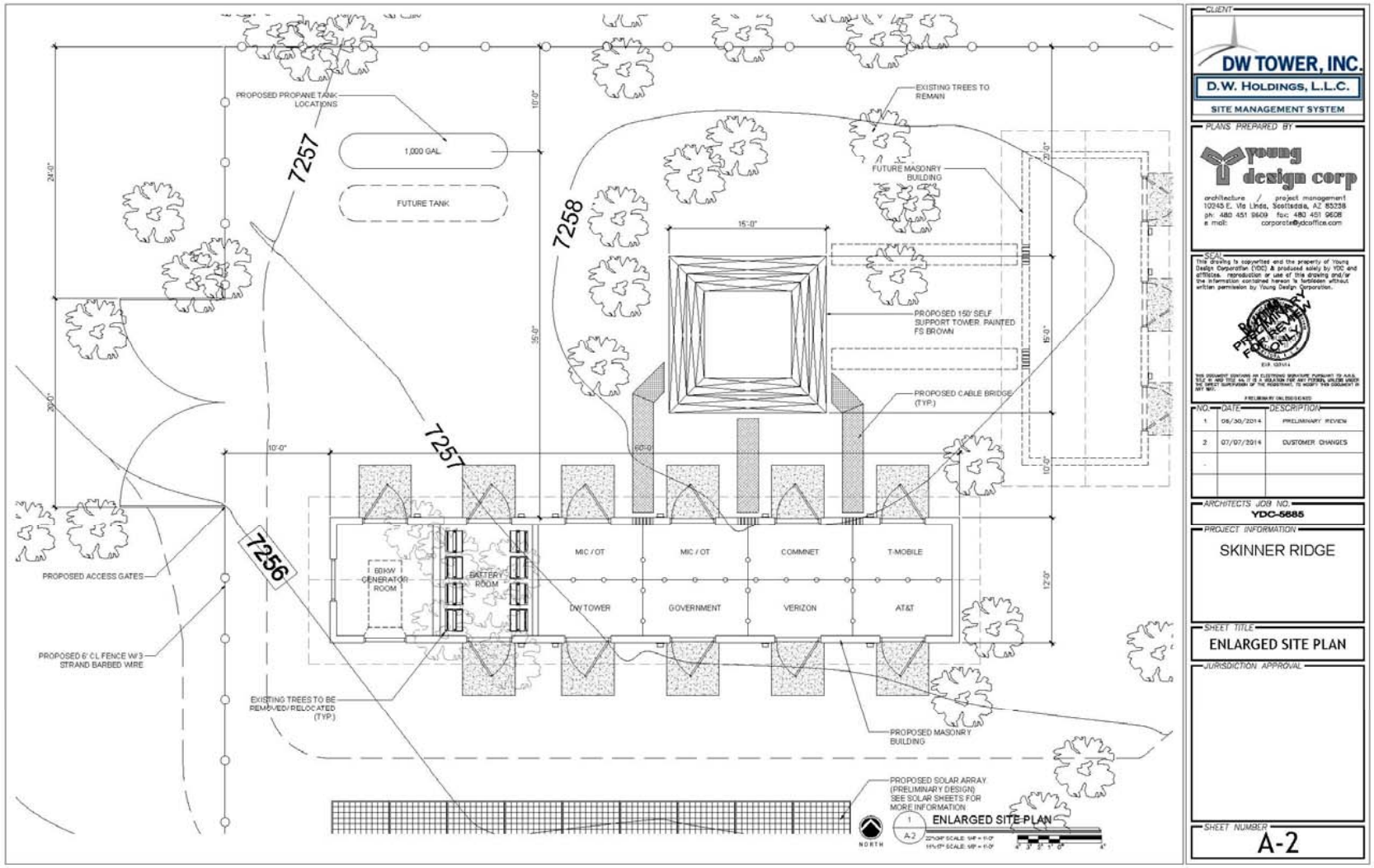
1 06/30/2014 PRELIMINARY REVIEW
2 07/07/2014 CUSTOMER CHANGES
ARCHITECTS JOB NO.
YDC-5885
PROJECT INFORMATION
SKINNER RIDGE
SHEET TITLE
SITE PLAN
JURISDICTION APPROVAL
SHEET NUMBER
A-1


PROPOSED PROPANE TANK LOCATIONS
1,000 GAL
FUTURE TANK
EXISTING TREES TO REMAIN
FUTURE MASONRY BUILDING
7257
7258
7256
PROPOSED 150' SELF SUPPORT TOWER. PAINTED FS BROWN
PROPOSED CABLE BRIDGE (TYP.)
PROPOSED ACCESS GATES
PROPOSED 6' CL FENCE W/ 3 STRAND BARBED WIRE
EXISTING TREES TO BE REMOVED/RELOCATED (TYP.)
60KW GENERATOR ROOM
BATTERY ROOM
MIC / OT
MIC / OT
COMMNET
T-MOBILE
DW TOWER
GOVERNMENT
VERIZON
AT&T
PROPOSED MASONRY BUILDING
PROPOSED SOLAR ARRAY (PRELIMINARY DESIGN) SEE SOLAR SHEETS FOR MORE INFORMATION
NORTH
ENLARGED SITE PLAN
CLIENT
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D.W. HOLDINGS, L.L.C.
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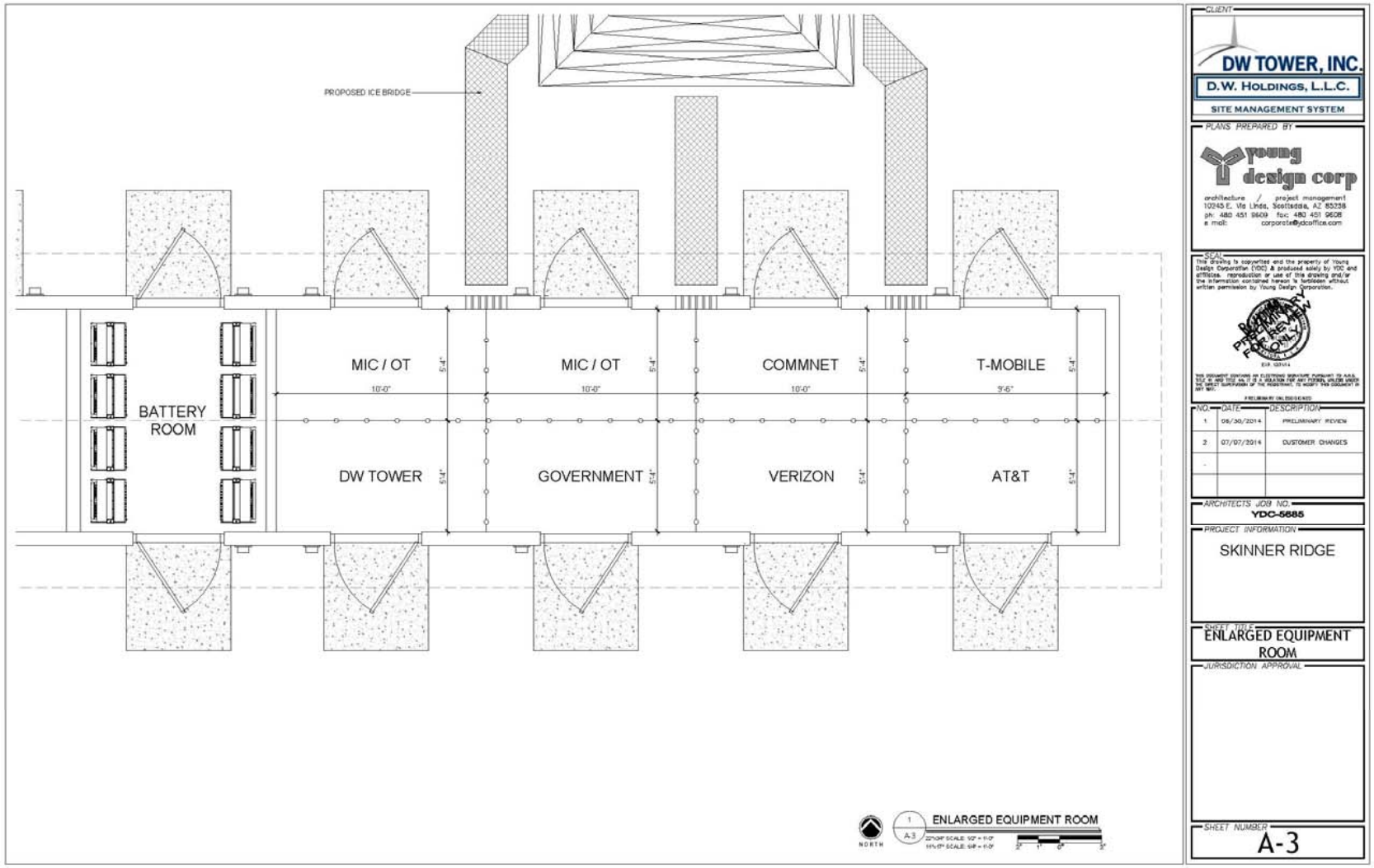
ARCHITECTS JOB NO.
YDC-5885
PROJECT INFORMATION
SKINNER RIDGE
SHEET TITLE
ENLARGED SITE PLAN
JURISDICTION APPROVAL
SHEET NUMBER
A-2


PROPOSED ICE BRIDGE
BATTERY ROOM
MIC / OT
MIC / OT
COMMNET
T-MOBILE
DW TOWER
GOVERNMENT
VERIZON
AT&T
10'-0"
10'-0"
10'-0"
5'-6"
5'-4"
NORTH
1
A-3
ENLARGED EQUIPMENT ROOM
CLIENT
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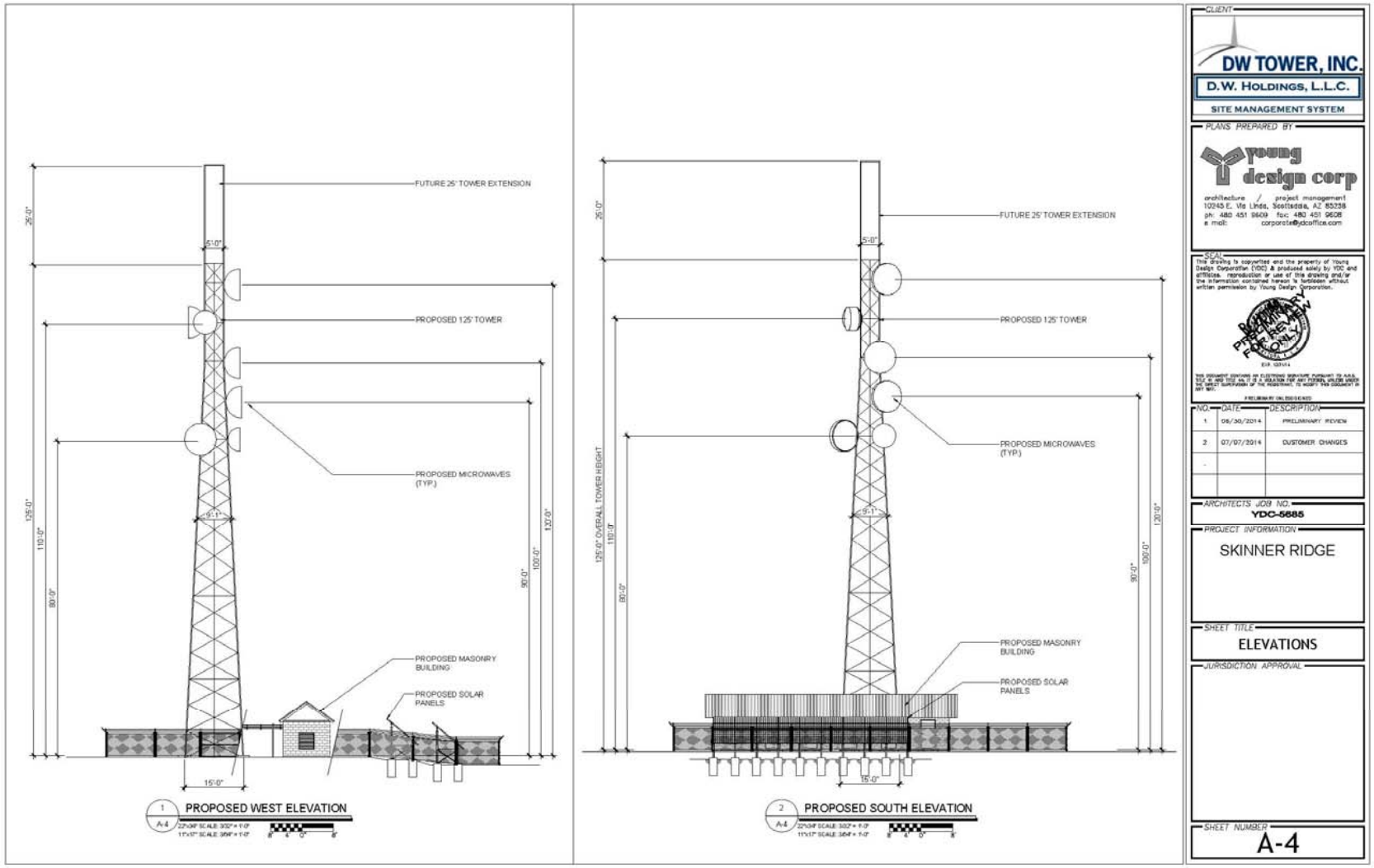
YDC-5885
PROJECT INFORMATION
SKINNER RIDGE
SHEET TITLE
ENLARGED EQUIPMENT ROOM
JURISDICTION APPROVAL
SHEET NUMBER
A-3


FUTURE 25' TOWER EXTENSION
PROPOSED 125' TOWER
PROPOSED MICROWAVES (TYP.)
PROPOSED MASONRY BUILDING
PROPOSED SOLAR PANELS
PROPOSED WEST ELEVATION
PROPOSED SOUTH ELEVATION
125'-0" OVERALL TOWER HEIGHT
CLIENT
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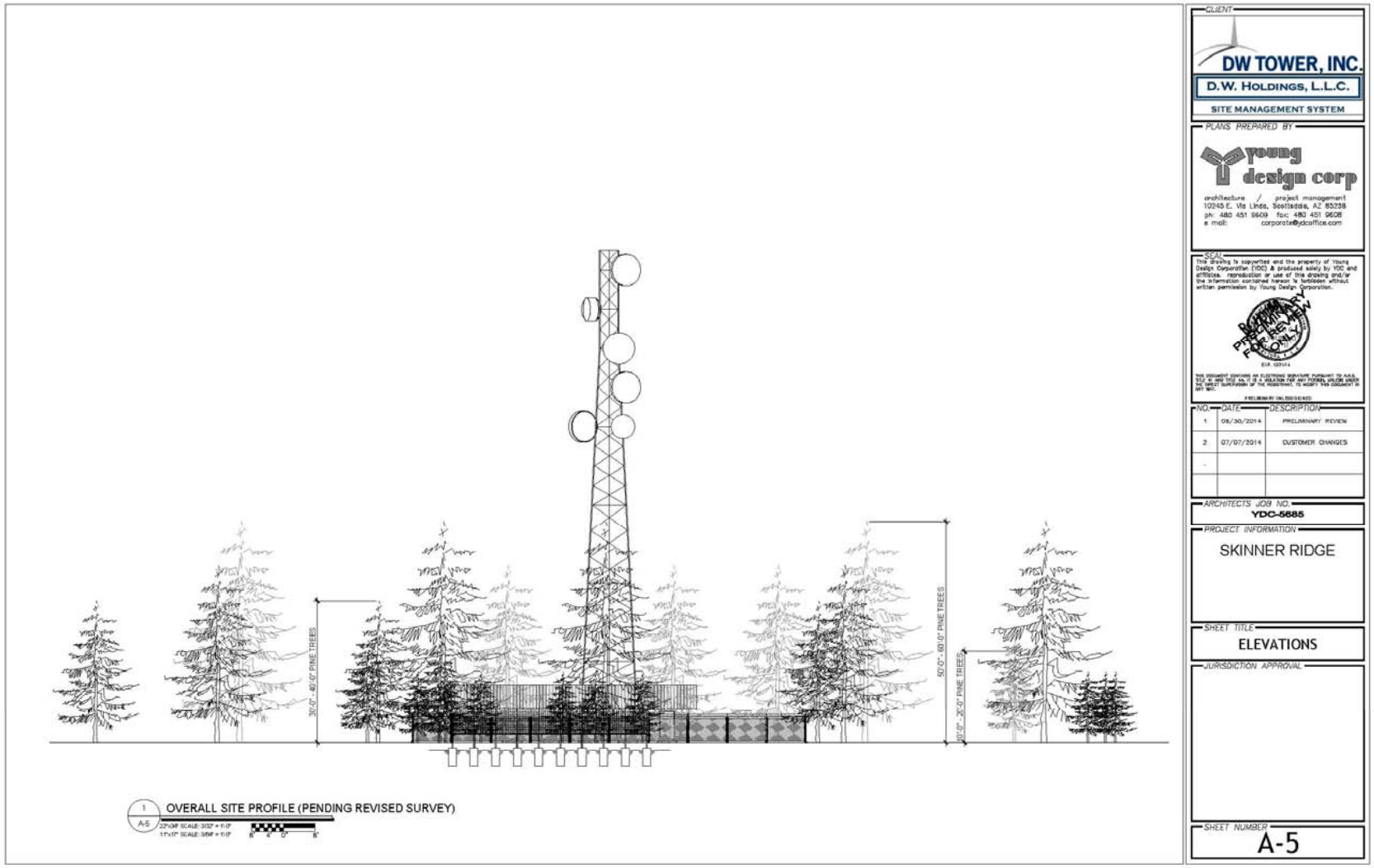
ARCHITECTS JOB NO.
YDC-5885
PROJECT INFORMATION
SKINNER RIDGE
SHEET TITLE
ELEVATIONS
JURISDICTION APPROVAL
SHEET NUMBER
A-4


30'-0" - 40'-0" PINE TREES
50'-0" - 60'-0" PINE TREES
30'-0" - 40'-0" PINE TREES
1
A-5
OVERALL SITE PROFILE (PENDING REVISED SURVEY)
CLIENT
DW TOWER, INC.
D.W. HOLDINGS, L.L.C.
SITE MANAGEMENT SYSTEM
PLANS PREPARED BY
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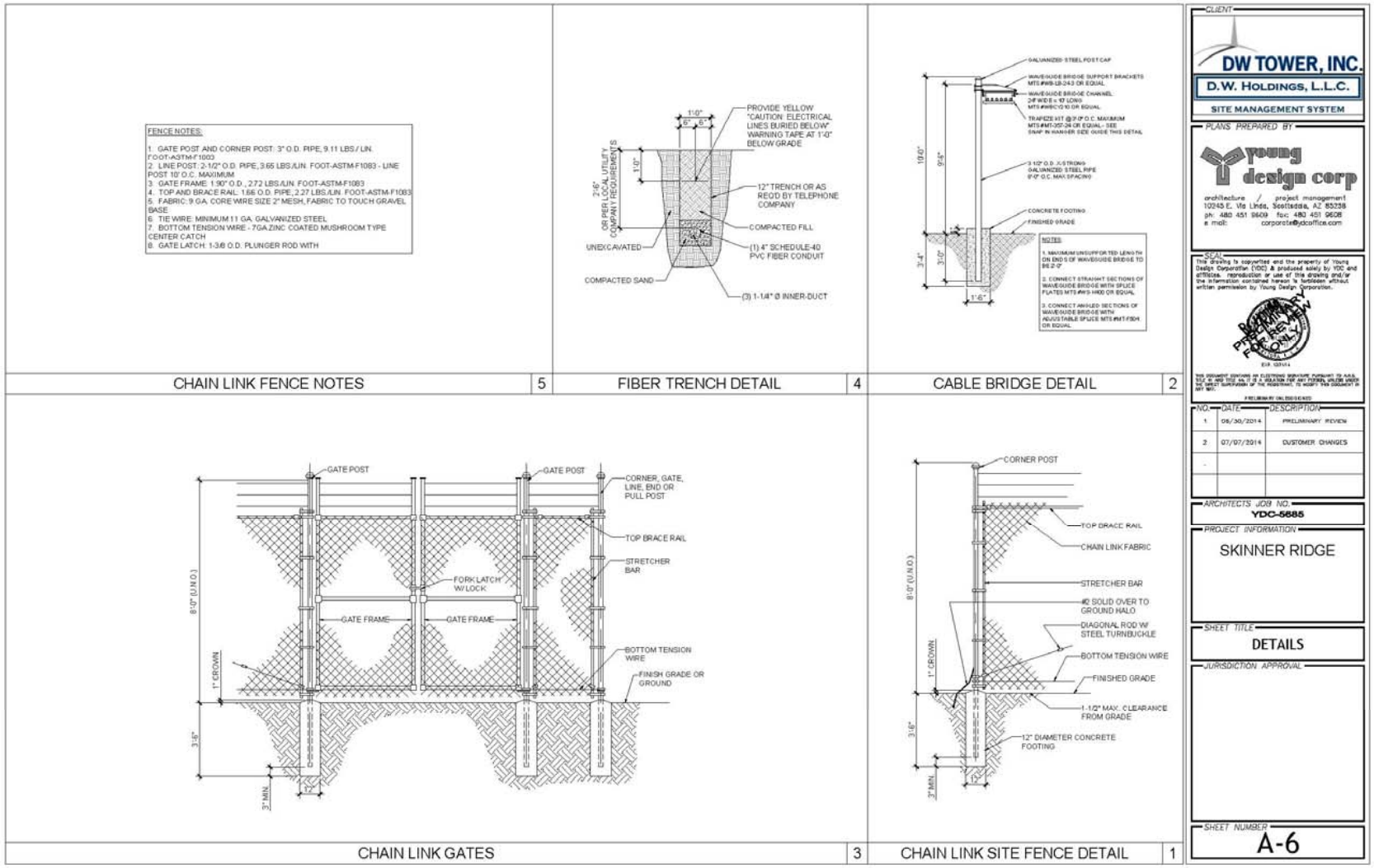
ARCHITECTS JOB NO.
YDC-5885
PROJECT INFORMATION
SKINNER RIDGE
SHEET TITLE
ELEVATIONS
JURISDICTION APPROVAL
SHEET NUMBER
A-5


FENCE NOTES:
1. GATE POST AND CORNER POST: 3" O.D. PIPE, 9.11 LBS./ LIN. FOOT-ASTM-F1083
2. LINE POST: 2-1/2" O.D. PIPE, 3.65 LBS./LIN. FOOT-ASTM-F1083 - LINE POST 10' O.C. MAXIMUM
3. GATE FRAME: 1.90" O.D., 2.72 LBS./LIN. FOOT-ASTM-F1083
4. TOP AND BRACE RAIL: 1.66 O.D. PIPE, 2.27 LBS./LIN. FOOT-ASTM-F1083
5. FABRIC: 9 GA. CORE WIRE SIZE 2" MESH, FABRIC TO TOUCH GRAVEL BASE
6. TIE WIRE: MINIMUM 11 GA. GALVANIZED STEEL
7. BOTTOM TENSION WIRE - 7GA ZINC COATED MUSHROOM TYPE CENTER CATCH
8. GATE LATCH: 1-3/8 O.D. PLUNGER ROD WITH
CHAIN LINK FENCE NOTES
5
PROVIDE YELLOW "CAUTION ELECTRICAL LINES BURIED BELOW" WARNING TAPE AT 1'-0" BELOW GRADE
12" TRENCH OR AS REQ'D BY TELEPHONE COMPANY
COMPACTED FILL
(1) 4" SCHEDULE-40 PVC FIBER CONDUIT
UNEXCAVATED
COMPACTED SAND
(3) 1-1/4" Ø INNER-DUCT
FIBER TRENCH DETAIL
4
GALVANIZED STEEL POST CAP
TRAPEZE KIT @ 3'-0" O.C. MAXIMUM
CONCRETE FOOTING
FINISHED GRADE
NOTES:
CABLE BRIDGE DETAIL
2
GATE POST
GATE POST
CORNER, GATE, LINE, END OR PULL POST
TOP BRACE RAIL
STRETCHER BAR
FORK LATCH W/ LOCK
GATE FRAME
GATE FRAME
BOTTOM TENSION WIRE
FINISH GRADE OR GROUND
8'-0" (U.N.O.)
1" CROWN
3'-6"
3" MIN.
CHAIN LINK GATES
3
CORNER POST
TOP BRACE RAIL
CHAIN LINK FABRIC
STRETCHER BAR
#2 SOLID OVER TO GROUND HALO
DIAGONAL ROD W/ STEEL TURNBUCKLE
BOTTOM TENSION WIRE
FINISHED GRADE
1-1/2" MAX. CLEARANCE FROM GRADE
12" DIAMETER CONCRETE FOOTING
8'-0" (U.N.O.)
1" CROWN
3'-6"
3" MIN.
CHAIN LINK SITE FENCE DETAIL
1
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ARCHITECTS JOB NO.
YDC-5885
PROJECT INFORMATION
SKINNER RIDGE
SHEET TITLE
DETAILS
JURISDICTION APPROVAL
SHEET NUMBER
A-6

# APPENDIX D

## PROPOSED SKINNER RIDGE AND GRANDVIEW COMMUNICATIONS FACILITIES

## DETAILED WORK PLAN AND CONSTRUCTION TIMELINE

# APPENDIX D-1 – GENERAL DETAILED WORK PLAN

The following describes in general terms the actual work and communications site management to be performed by the communications site lease holder at each site and facility management.

**Construction Details:**

**a. Construction Activities**

Construction will begin by removing vegetation and leveling of the 100 foot by 100 foot permit area and establishing the driveway road. This will involve a tractor with blade and possibly a grader. Vegetation and waste material will be removed from the site to a designated disposal area off of National Forest System lands. The tower foundation will be dug using an excavator. Waste material excavated for the tower foundation will be spread on the lease area to level it or removed from the site. Approximately 20 loads of concrete will be brought in for the tower foundation. The foundations for equipment shelters will also be poured at this time. After the concrete is poured, the steel for the tower will be trucked in and assembled in sections within the lease area. The tower will then be stacked using a crane. After the tower is erected, the construction process will conclude with installation of a chain link fence surrounding the compound.

**b. Work force (number of people and vehicles)**

There will be approximately 4 to 6 people on site during construction using two vehicles for access to the site.

**c. Flagging or staking the right-of-way**

The right-of-way and lease area will be staked and flagged by licensed surveyors.

**d. Safety requirements**

OSHA safety requirements will be followed for all construction activities

**Operations**

This section describes the number and type of users that are anticipated at each facility and communications site management by the lease holder.

**a. Number and Type of Communications Uses Anticipated**

The proposed facilities at Grandview and Skinner Ridge are primarily designed to provide tower space and equipment shelters for FCC licensed Personal Communications Services (PCS), cellular, and other radio based services that interconnect with the public switched telephone network. The proposed facilities can provide space for wireless carrier tenants, microwave providers, and space for government (FS, NPS, DPS etc.) with potential expansion designed into the site plan and tower designs.

The proposed tower facilities will be a co-location, designed to accommodate multiple communications users on a single privately owned tower and within common equipment buildings. All tenant radio equipment will be housed inside the lease holder's owned and managed equipment buildings.

The proposed facility will be restricted to low power uses as defined by approved KNF Communications Site Management Plans. All operations and uses will be consistent with the approved Communications Site Management Plan which will be a stipulation of the Forest Service Communications site lease.

The proposed facilities that can accommodate four wireless carriers are expected to be adequate for the foreseeable future. New technology and increased demand could result in additional needs at this site. Because of the intense recreation use at the GCNP that creates heavy emergency response activities, the demand at the site for microwave interconnects may increase. The DW Tower proposed site designs can accommodate future additional communications needs within the authorized area by adding on to the equipment buildings and installation of additional equipment on the tower. The proposed facilities will initially likely provide tenant space to the three wireless carriers listed below, a common microwave system provider, and other miscellaneous low power users.

The four major FCC licensed wireless telephone providers active in the area have provided letters of interest, support, and commitment for this proposal. Wireless communications providers who have expressed support for the proposal and have indicated they would plan to locate equipment at proposed tower facilities includes:

1. **Verizon Wireless**
2. **AT&T Wireless**
3. **T-Mobile**
4. **Commnet**
5. **Microwave providers**

### b. Management/Operations

The communications site lease holder will be required to assign a Project Manager to focus on this facility construction from start to completion. This person will be the primary contact for any questions and will be available for immediate response to KNF seeking information( i.e. APS, NPS etc.) His/her other responsibilities will include but not be limited to:

- Control access to the site
- Oversee original site builds
- Oversee of "Carrier Selected" contractors for carrier build-outs
- Ensure all safety measures are being taken

### c. Maintenance

The lease holder will use in-house and in-place resources to maintain the proposed facilities. The following is a list of the types of ongoing maintenance that will be required at all of facilities proposed under this prospectus:

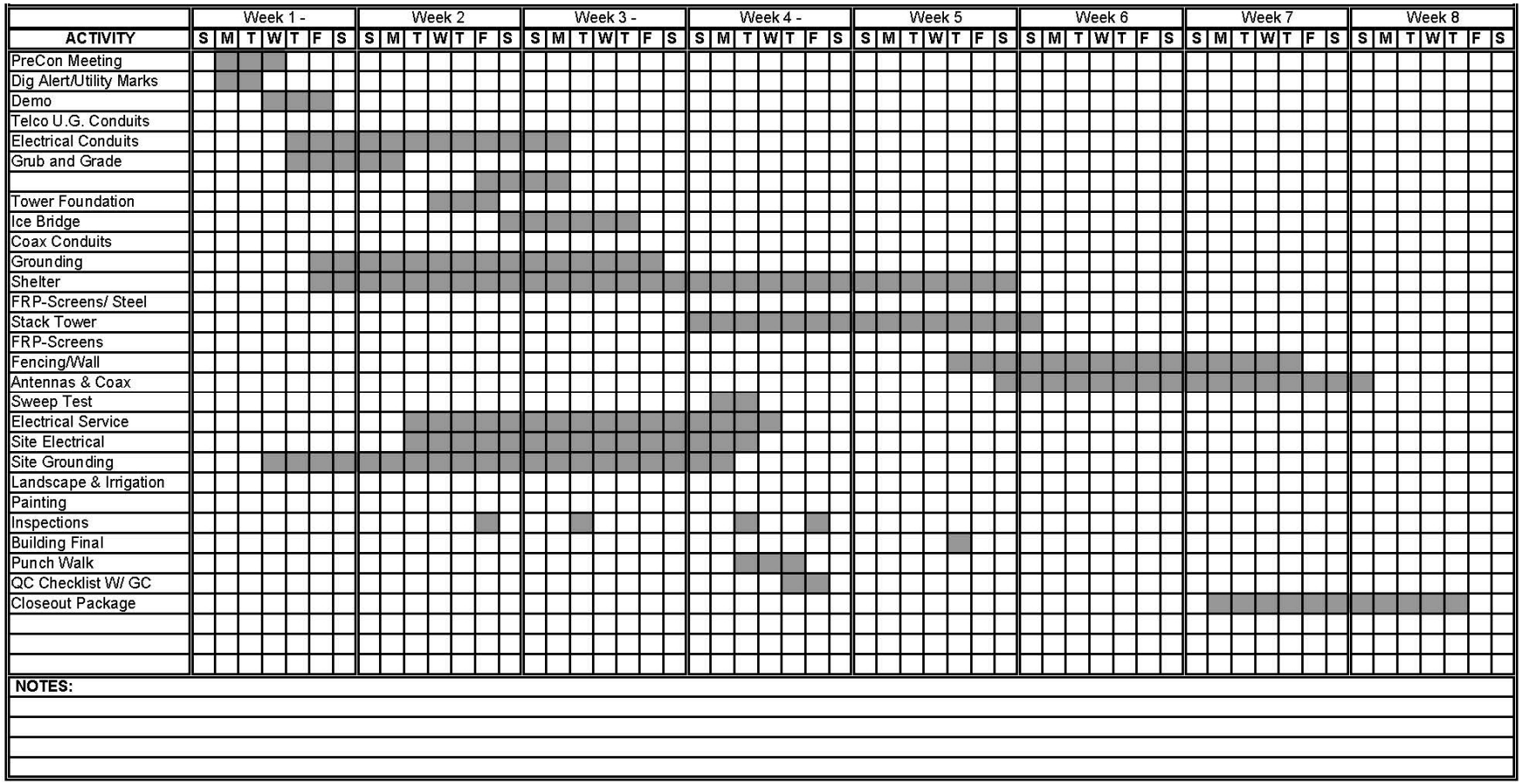
- The lease holder will monitor access road conditions and perform regular maintenance to prevent resource damage associated with site construction and operation. The lease holder will be responsible for controlling tenant use of the road that may cause damage during wet conditions. The lease holder will repair any road damage caused by construction or tenant use.

- The lease holder will monitor for noxious weeds and treat spread related to communications site construction and operation.
- The lease holder will keep security fencing and equipment buildings in good repair and aesthetically acceptable in accordance with the Site Plan including regular painting and cleanup.

# APPENDIX D-2 – PROPOSED CONSTRUCTION TIMELINE

The construction timeline to build the entire communications facility including the tower, utilities, and equipment buildings is expected to take approximately seven weeks. The lease holder will be authorized will run construction simultaneously on both facilities.

**Typical Construction Timeline**



# APPENDIX E

## COMMENTS AND COMMENT RESPONSE TO 30 DAY COMMENT PERIOD

# APPENDIX E

## COMMENTS AND RESPONSE TO COMMENTS – 30 DAY COMMENT PERIOD

**COMMENTS FROM GRAND CANYON NATIONAL PARK**

| # | Page | Chapter/Section | Comment/Proposed Revision | Response to Comments |
|---|---|---|---|---|
| **1** | N/A | General | Thank you for the opportunity to review the Kaibab National Forest's (KNF's) Draft Environmental Assessment (DEA) to analyze the potential effects to forest resources from the proposed Tusayan East Communications Sites Project. The Grand Canyon National Park (GCNP) provided many comments on a preliminary draft of the document in 2015, and we appreciate the KNF's responsiveness in addressing those comments throughout the current DEA. | Thanks to the NPS and staff and GCNP you for your thorough review and feedback. Your comments helped to make the analysis more complete and helped us to thoroughly address any concerns on or about the GCNP. |
| 2 | 58 | Chapter 3.1.2 | (1) Additional Visual Analysis. The visual analysis indicates that the only views of the Grandview Tower alternatives inside the GCNP were at View Points 1, 2, and 3 along SR 64. Please confirm and provide text in the DEA to indicate that the reference balloons were not (and the towers will not be) visible from *any other points* within the GCNP (e.g. at closer locations along SR 64, or along the West Rim/Hermit Road, as it looks back to the village and to the south and east). | Added language at 3.1.2, page 58 t further described the visual analysis conducted within GCNP and clarified findings and effects.as follows:<br>**Existing Text:**<br><br>**Potential Visual Impacts to the View from the West Rim Drive and Grand Canyon Village**<br>There are no views from the West Rim Drive or Grand Canyon Village where the Grandview Tower can be seen. Vegetation, distance, and topography block any potential views of the tower from this area. The proposed Grandview Tower is located approximately 13.4 miles southeast of Hopi Point. Potential views in the vicinity of Hermit's Rest would be even farther, in excess of 15 miles |

| # | Page | Chapter/Section | Comment/Proposed Revision | Response to Comments |
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| | 55 and 56 | Chapter 3.1.2 | | requiring optical enhancement. There would be no visual impacts to these areas of GCNP resulting from the proposed Grandview Tower.<br><br>**Added Text:**<br><br>This was verified by driving West Rim Drive and by topographical profile and line of site software (Project Record) showing topography and vegetation blocks potential views from West Rim Drive from Hermit's Rest area to the Village.<br><br>**ALSO, TEXT ADDED AT:**<br><br>**Concern Area – Grand Canyon National Park**<br><br>**Potential Visual Impacts to the View from SR 64 – East Rim Drive**<br><br>The balloon was visible with the aid of binoculars from two areas on SR 64 inside of GCNP, (Views 1, 2 and 3, Appendix A). The tower's profile above the ridge line from these views would be similar to the Grandview Lookout Tower, except from a further distance. Views of the balloons (proposed tower) while traveling on SR 64 were short duration between tree gaps, limited to only when traveling west on SR 64. Therefore one could conclude that the proposed Grandview Tower would not likely be noticeable to the casual observer in GCNP. The visual analysis conclusions were verified by |

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| | | | | additional field visits using the Grandview Lookout tower as reference. Grandview lookout tower is close to the proposed tower location and is of similar height with a larger profile. An additional factor that reduces potential visual impacts in GCNP is that the proposed Grandview Tower is located south of the Grand Canyon approximately 2 miles, putting it outside the typical viewshed of people visiting the Grand Canyon. The Grand Canyon visitor's attention and view of interest is towards the canyon and in the opposite direction of the proposed tower. |
| 3 | 12 | Chapter 1 - 1.6.2 | (2) Project Description for the GCNP. We would appreciate receiving a detailed description of work specific to the GCNP at such time as it becomes available. The description of the proposed action (in Section 1.6.2) is thorough, but it is difficult to discern exactly which activities will occur on the GCNP and when they are proposed to be conducted. | Added text to 1.6.2 as follows:<br>The only construction activity associated with the proposed tower would be installation of the Arizona Public Service Company's underground power line following Forest Road 310.<br>**Added to the beginning of the following text**:<br>The power would be run underground approximately 4,595 feet from the existing overhead power line on FR 310 for 1,650 feet inside the GCNP.[6] The power line would continue for 2,945 feet on National Forest System lands, to the communications facility following FR 310 to FR 310G, as depicted on the attached maps. The underground distribution line would be placed in a conduit within the existing FR 310 road disturbance profile (see Figure 1.6). An approximate 44 inch deep trench would be dug with |

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| | | | | trenching equipment within the road profile. The conduit would be placed in the trench with a minimum 36 inch cover. A pull box would be placed every 1000 feet. The pull box is approximately 2 feet by 3 feet by 3 feet deep and has a cover. The pull box provides an access point to the conduit where the wire can be pulled through the conduit. It would be installed so that the box is underground and the cover would be level with the ground surface. Pull boxes would be installed far enough from the FR 310 travel surface so that it would not interfere with road travel or road maintenance activities. The Arizona Public Service Company (APS) underground power line would terminate inside the lease area connecting to an 800 amp electrical service entrance panel. All construction activities associated with installation of the underground power line would be confined to within the existing impacted FR 310 and FR 310G road prism. |
| 4 | 119 | Chapter 3 - 3.8 – Cultural Resources | (3) Historic Entrance Station. The historic entrance station on FR 310 at the GCNP/KNF boundary should be addressed briefly in Chapter 3. | Text was added at 3.8.3 to identify and concluded effects on the historic entrance station as follows:<br><br>**Existing Text:**<br><br>The joint evaluation of the proposed buried powerline from an APS distribution line in the GCNP to the Grandview Cell tower indicated that FR 310 had been previously inventoried by GCNP and the Kaibab NF archaeologists. There were no known cultural resources within the road, however |

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| | | | | there are two sites identified on the GCNP which are adjacent to the road.<br><br>**The following text was added at the end of this paragraph:**<br><br>A historic entrance station is located at the boundary of GCNP with the KNF. It is on the opposite side of FR 310 and would not be affected by proposed construction. |
| 5 | N/A | General | As we discussed on the phone, we received the Section 106 SHPO consultation (thank you) and are satisfied that this document will serve GCNP as well. Again, we appreciate the opportunity to review the DEA for the proposed Tusayan East Communications Sites Project, and look forward to further involvement as these activities proceed. As more specific information becomes available, GCNP may need to conduct further analysis of the project and its potential to impact GCNP resources. | The KNF agrees that SHPO concurrence received on January 11, 2016 applies to the activities on the GCNP. |