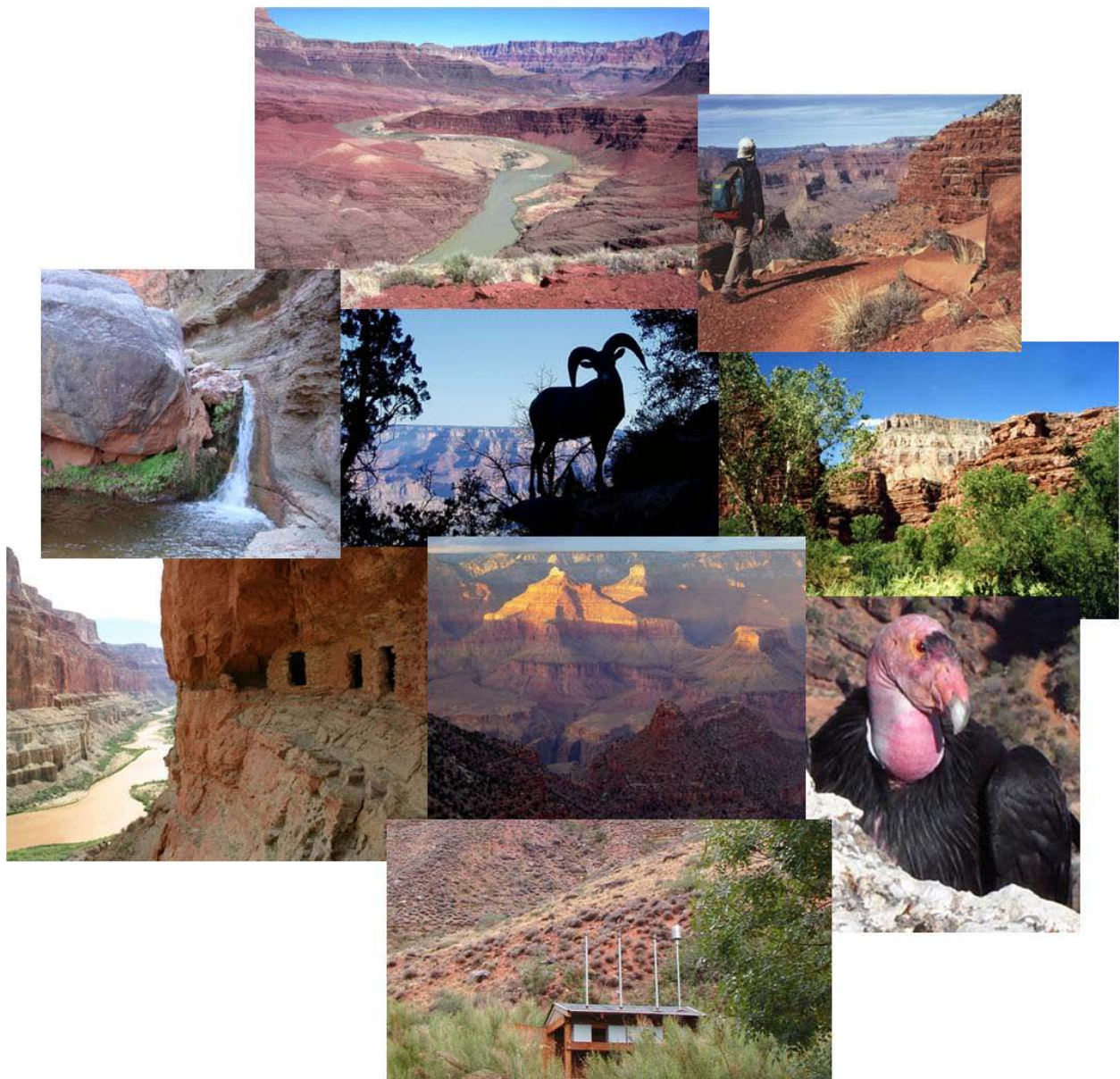




National Park Service
U.S. Department of the Interior
Grand Canyon National Park
Grand Canyon, Arizona

Science and Resource Management Facility Environmental Assessment

February 2010



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Science and Resource Management Facility

Environmental Assessment

Summary

Grand Canyon National Park proposes to construct a new science and resource management (SRM) facility on South Rim. Present facility location and condition are substandard. This Environmental Assessment (EA) evaluates a No Action Alternative and two additional alternatives to address the purpose and need for action. The Preferred Alternative includes construction of a new LEED-certified SRM facility, utility installation, off-site storage, parking, and several other site improvements.

No alternative would have more than minor impacts on special status species, general wildlife, vegetation, archeological resources, ethnographic resources, visual/scenic quality, watershed values, air quality, soundscapes, floodplains and wetlands, visitor experience, environmental justice, prime and unique farmland, socioeconomic environment, wilderness character, public health and safety, or Indian trust resources. Alternative 2, the Preferred Alternative, would result in minor to moderate impacts to historic resources, cultural landscapes, and park operations. No impairment of park resources or unacceptable impacts would occur through implementation of any alternative.

Public Comment

In November, 2009, GRCA released a similar EA which evaluated two action alternatives. This EA was prepared to respond to comments received from the public and from agency staff. A primary change is that this document analyzes three action alternatives, one of which was dismissed in the 2009 EA.

If you wish to comment on this environmental assessment, you may post comments online at <http://parkplanning.nps.gov/grca> or mail comments to: Steve Martin, Superintendent, Attn: SRM Facility EA, Grand Canyon National Park, P.O. Box 129 / 1 Village Loop, Grand Canyon, Arizona 86023.

This environmental assessment will be on public review for 30 days. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee we will be able to do so.

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CHAPTER 1 PURPOSE AND NEED

Introduction

Grand Canyon National Park (GRCA) is located on the Colorado Plateau in northwestern Arizona. On January 11, 1908, GRCA was established as a national monument and then dedicated as a national park on February 26, 1919. Over 1.2 million acres of Grand Canyon were set aside as a place of national and global importance to preserve and protect natural and cultural resources and ecological processes, as well as scenic, aesthetic, and scientific values; and to provide visitors opportunities to experience and understand environmental inter-relationships, resources, and values of Grand Canyon without impairing resources (NPS 1995).

The purpose of this environmental assessment is to examine environmental impacts associated with the proposal to construct a new science and resource management facility at Grand Canyon National Park. The new facility would be constructed in Grand Canyon Village. This EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality (CEQ) regulations (40 CFR §1508.9), and NPS Director's Order (DO) 12 (Conservation Planning, Environmental Impact Analysis, and Decision-Making).

Background

Prior to 1999, Science and Resource Management division offices were housed in various locations on South Rim, including the back portion of the park's clinic building, a trailer behind the clinic, and the second floor of the historic railroad depot. In 1999, consistent with the GMP decision to move NPS functions out of the building complex known as the Mission 66 maintenance yard, a new Facilities Management Division (FMD) complex was constructed on Shuttle Bus Drive and FMD staff and functions were moved from the Mission 66 yard location. In 2004, the park built a new Emergency Management Services (EMS) facility and all NPS EMS personnel were moved into office spaces adjacent to and near the clinic that had, until that time, been occupied by SRM personnel.

Despite the GMP direction to turn the Mission 66 maintenance yard area over to park concessions operations, SRM offices and functions have gradually moved into the areas that previously housed FMD. Maintenance shops and offices have been upgraded to accommodate SRM staff, but this location provides less than optimal working conditions; primary concerns include inadequate facilities, poor access for visitors and researchers, and future plans for these buildings.

Inadequate facilities

Current office space is located in a converted warehouse and auto shop where concerns include inadequate heating and cooling, lack of weatherproofing, leaky roofs, ice hazards due to a lack of drainage and pests in the buildings.

Visitor Access and Research

Park managers would like the SRM facility to be accessible to and provide educational opportunities for visitors. Opportunities could include displaying museum collections, providing access to research materials, and interpreting SRM projects and functions. The SRM facility is currently located on the corner of Center Road and Albright Avenue away from highly visited South Rim areas. Although this location can be accessed by visitors, the area is neither identified on the park map nor accessible by shuttle bus. In addition, as a warehouse and

distribution location, the addition of visitor traffic would conflict with operational traffic in the same location.

Future Plans for Mission 66 Maintenance Yard

Finally, as called for in the 1995 General Management Plan (GMP), some or all of the Mission 66 maintenance yard buildings may be converted for other NPS functions or transferred to park concessioners. As noted in a 2009 Memo to File for GMP Implementation, GRCA intends to transition the buildings in this location, with the exception of the Powell building, to park concessions operations. Therefore, it has been recommended that SRM offices and functions be moved from this location.

Purpose and Need

The purpose of the proposed action is to improve working conditions and meet work-space requirements for SRM at GRCA. The project is needed to accomplish the following objectives

1. Co-locate SRM offices and functions in one facility to the extent feasible (estimated need for 8,400 square feet interior space)
2. Minimize harm to natural resources, natural ecological communities and processes, cultural resources, visitor experience, and human health and safety
3. Attain Leadership in Energy and Environmental Design (LEED) certification in a building adequate for SRM needs
4. Provide a facility that includes space to enhance visitor experience
5. Develop a park research facility

Relationship to Other Plans and Policies

This EA has been prepared in accordance with the National Environmental Policy Act of 1969 and implementing regulations, 40 CFR Parts 1500-1508; NPS DO 12 and Handbook (Conservation Planning, Environmental Impact Analysis, and Decision-making).

Current plans and policies pertaining to this proposal include the 1995 GRCA General Management Plan (NPS 1995) and NPS Management Policies 2006 (NPS 2006). Information on how this proposal meets goals and objectives of these plans and policies includes

- As stated above, the proposal is consistent with the 1995 GMP, which identified an objective of building any new facilities in previously disturbed locations. Also, a recent memo to file for implementation of GMP-identified actions called for Mission 66 maintenance and warehouse area rehabilitation for concessioner maintenance and commissary (NPS 2009). The Mission 66 maintenance and warehouse area buildings known as Powell, McKee, and Dutton are used by the park and Grand Canyon Association. A majority of area park uses will be relocated to achieve the GMP vision. When the NPS vacates the area, the Mission 66 maintenance yard can be reassigned for other uses. Buildings may be moved, renovated for reuse, or removed, pending completion of Section 106 compliance.
- The proposal is consistent with goals and objectives of Management Policies 2006 which state park facilities within park boundaries should be located to minimize impacts to park resources. The proposed site of new SRM building was identified to minimize harm to all park resources.

Figure 1 Project location in the park

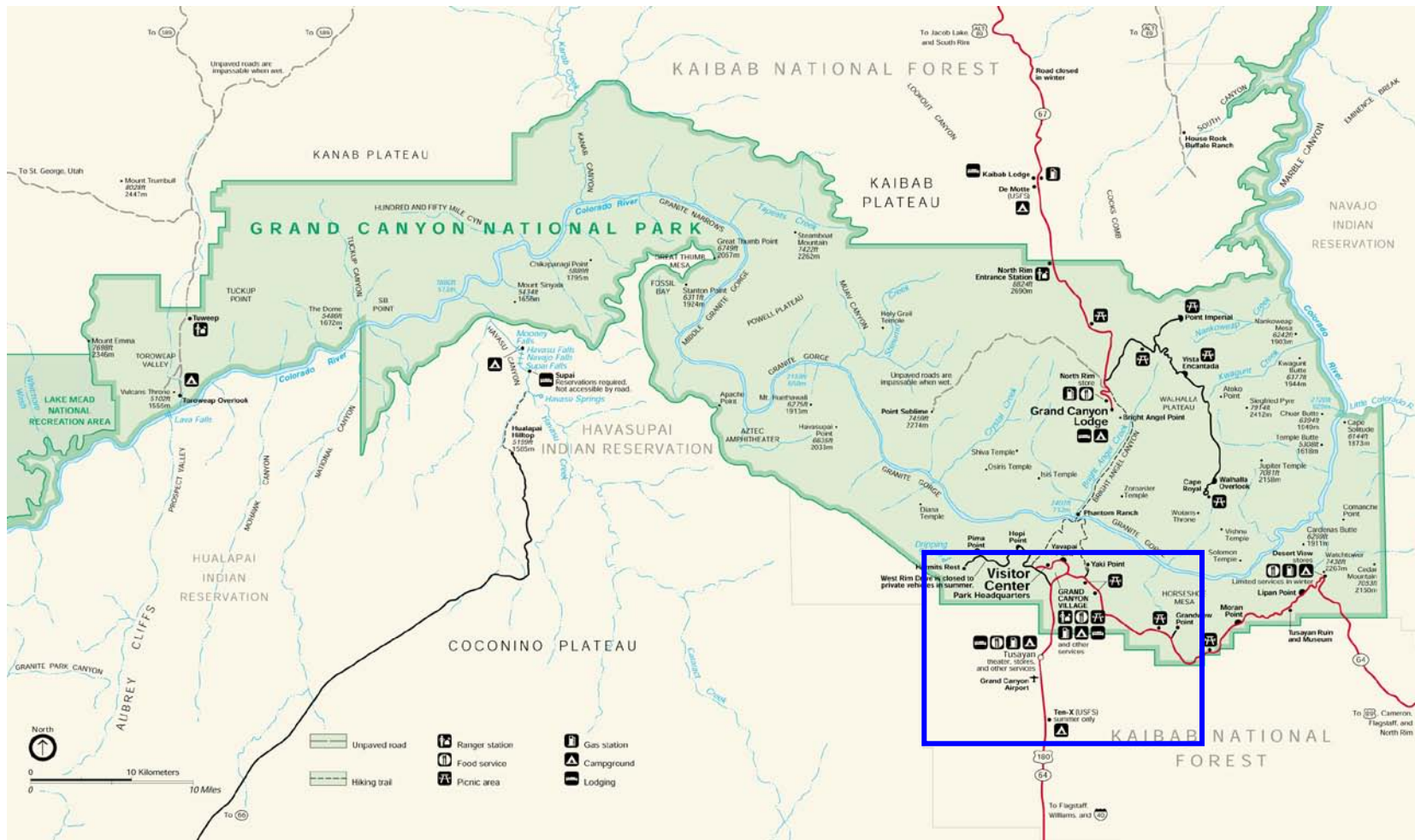
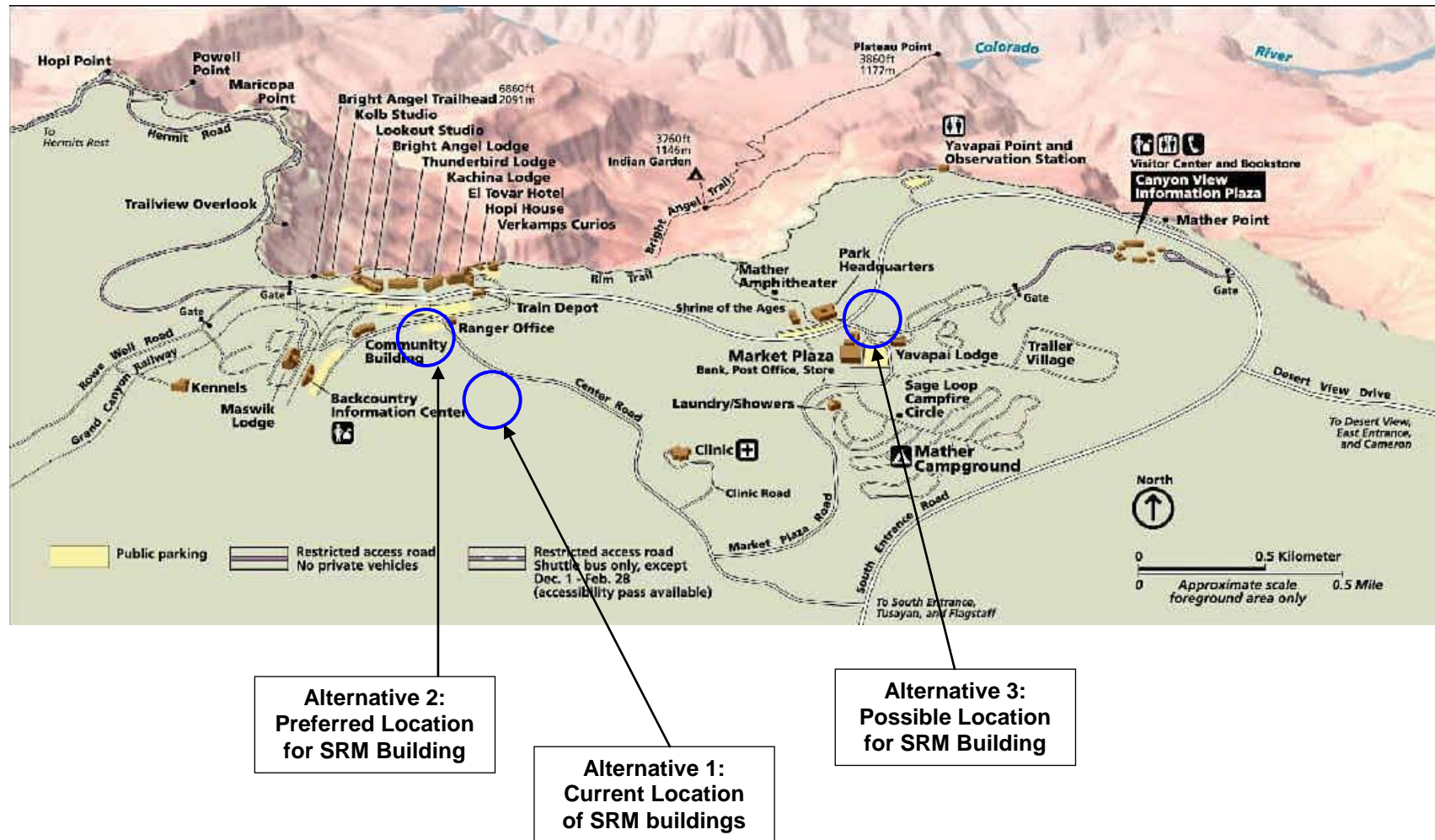


Figure 2 Specific project locations

Appropriate Use

Section 1.5 of Management Policies 2006, Appropriate Use of the Parks, directs the NPS to ensure allowed park uses will not cause impairment of, or unacceptable impacts on, park resources and values. A new form of park use may be allowed within a park only after a determination has been made in the professional judgment of the park manager that it will not result in unacceptable impacts.

Section 8.1.2 of Management Policies 2006, Process for Determining Appropriate Uses, provides evaluation factors for determining appropriate uses. All proposals for park uses are evaluated for

- consistency with applicable laws, executive orders, regulations, and policies;
- consistency with existing plans for public use and resource management;
- actual and potential effects on park resources and values;
- total costs to the Service; and
- whether public interest will be served.

Park managers must continually monitor all park uses to prevent unanticipated and unacceptable impacts. If unanticipated and unacceptable impacts emerge, the park manager must engage in a thoughtful, deliberate process to further manage or constrain the use or discontinue it.

Office and administrative facilities are a common and vital structure in most park units. Proper location, sizing, construction materials and methods will ensure unacceptable impacts to park resources and values will not occur. The proposed new SRM facility is consistent with the park's GMP and other related park plans. With this in mind, the NPS finds that construction and use of a new SRM facility is an acceptable use at Grand Canyon National Park.

The next question is whether such use, and the associated necessary and appropriate impacts, can be sustained without causing unacceptable impacts to park resources and values. That analysis is found in Chapter 3, Affected Environment and Environmental Consequences.

Scoping

Scoping is a process that identifies resources that may be affected by a proposed project, and explores possible alternative ways to achieve the project's objectives while minimizing adverse impacts. Grand Canyon National Park conducted internal scoping with appropriate National Park Service staff, as described in more detail in the Consultation and Coordination chapter. The park also conducted external scoping with the public and interested and affected groups.

External scoping was initiated with distribution of a scoping letter to inform the public of the proposal to construct a new SRM building, and to generate input on preparation of this EA. The scoping letter dated April 7, 2009 was mailed to the park's mailing list of approximately 280 people.

During the 30-day scoping period, ten responses were received. These included responses from seven individuals, one environmental group, the Department of Environmental Quality, and the U.S. Fish and Wildlife Service.

Internal and public scoping resulted in the following substantive issues

- construction of the new SRM facility will disturb native vegetation and has potential to introduce or spread exotic plant species
- possible impacts to park operations could include parking for SRM vehicles and for those using the facility as well as existing parking needs in the preferred location
- location of and access to storage needs to be accommodated for SRM functions
- new facility needs to comply with Secretary of Interior's Standards for the Treatment of Historic Properties if the new building is built within the Grand Canyon National Historic Landmark District

Identified issues were first used to formulate alternatives and mitigation measures. Impact topics were then selected for detailed analysis based on substantive issues, environmental statutes, regulations, executive orders, and NPS Management Policies. A summary of impact topics and rationale for selection or dismissal are given below.

In addition to scoping, several comments were received during the November, 2009 public comment period on a similar EA. Because of those comments, the 2009 EA has been revised and is now being re-released to address those comments. Comments generally echoed those raised during scoping. See Consultation and Coordination section for additional information.

Impact Topics

Impact Topics Retained for Further Analysis

Impact topics for this project have been identified on the basis of Federal laws, regulations, and executive orders; Management Policies 2006; and GRCA park staff knowledge of resources. Impact topics carried forward for further analysis in this environmental assessment are

- Historic Resources and Cultural Landscapes
- Park Operations

Impact Topics Dismissed From Further Analysis

Impact topics, as listed below, were initially considered, but dismissed from further consideration in this document. During internal scoping, the park's interdisciplinary team conducted a preliminary resources analysis to determine context, duration, and intensity of effects the alternatives may have on those resources. If the magnitude of effects was determined to be either negligible or minor, there is no potential for significant impact and further impact analysis is unnecessary; therefore, the resource was dismissed as an impact topic.

For purposes of this section, an impact of negligible intensity is "at the lowest levels of detection, barely perceptible, and not measurable." An impact of minor intensity is "measurable or perceptible, but slight, localized, and would result in a limited alteration or would impact a limited area." The rationale for dismissing these specific topics is stated for each resource.

Special Status Species The Endangered Species Act of 1973 requires examination of impacts on all Federally-listed threatened, endangered, and candidate species. Section 7 of the Endangered Species Act requires Federal agencies consult with the U.S. Fish and Wildlife Service (USFWS) to ensure any action authorized, funded, or carried out by the agency does not jeopardize continued existence of listed species or critical habitats. In addition, Management Policies 2006 and DO 77, Natural Resources Management Guidelines, require the NPS to examine impacts on Federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species.

This impact topic was dismissed from further analysis based on the fact that no known special status species occur in the project area and mitigation measures are included in this document for any future occurrence of these species in the project area.

General Wildlife According to Management Policies 2006, the NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of animals.

Location of the proposed SRM building is in a previously disturbed park area that contains no surface water, minimal vegetation, and is generally flat with no major geologic features. The presence of humans, human-related activities, and structures have removed or displaced much of the native wildlife habitat in the project area, which has limited the number and variety of wildlife occurrences in the area. Elk and deer do occur in the project area on occasion; however, it is not considered primary habitat due to limited vegetation, and availability of similar habitat nearby. Some smaller wildlife such as rodents and reptiles and their habitat would be displaced or eliminated during SRM construction. Disturbed areas would be revegetated and rehabilitated following construction, resulting in minor adverse impacts to wildlife and wildlife habitat in the immediate area of construction.

During construction, noise would increase, which may disturb wildlife in the general area. Construction-related noise would be temporary, and existing sound conditions would resume following construction activities. Therefore, temporary construction noise would have a minor short-term adverse effect on wildlife. Because these effects on general wildlife would be minor in degree, this topic was dismissed from further analysis.

Archeological Resources In addition to the National Historic Preservation Act (NHPA) and Management Policies 2006, NPS DO 28B (Archeology), affirms a long-term commitment to appropriate investigation, documentation, preservation, interpretation, and protection of archeological resources inside NPS units. As one of the principal stewards of America's heritage, the NPS is charged with preservation of educational, scientific, and traditional cultural values of archeological resources for the benefit and enjoyment of present and future generations. Archeological resources are nonrenewable and irreplaceable, so it is important all management decisions and activities throughout the National Park system reflect a commitment to the conservation of archeological resources as elements of our national heritage.

The proposed location for the SRM building was previously surveyed, and no archeological sites were identified in the immediate project area (NPS 2003). Therefore, the proposed project area is not expected to contain archeological deposits; however, appropriate steps would be taken to protect any archeological resources inadvertently discovered during construction. Because the project will not disturb any known archeological sites, effects on archeological resources would be negligible. Therefore, this topic was dismissed from further analysis.

Ethnographic Resources NPS DO 28 (Cultural Resource Management) defines ethnographic resources as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it. According to DO 28 and Executive Order 13007 on sacred sites, the NPS should try to preserve and protect ethnographic resources.

In consultation with Native American tribes, ethnographic resources are not known to exist in the proposed project area. Native American tribes traditionally associated with the park were apprised of the proposed project in a letter dated September 3, 2009. One response was

received from the Navajo Nation stating the project will not impact any Navajo traditional cultural properties. Because no ethnographic resources were identified in the project area, this topic was dismissed from further analysis.

Public Health and Safety Park managers seek to provide a safe and healthful environment for visitors, employees, and residents. As mentioned in the Purpose and Need, there are health and safety concerns with long-term use of the current SRM offices located in the Mission 66 maintenance yard, including inadequate heating, cooling and ventilation, lack of weather proofing, leaky roofs, ice hazards due to lack of drainage, and building pests. These existing concerns need to be remedied, however they are considered minor, long term, and localized. Implementation of any Alternative would result in minor adverse short-term impacts on public health and safety during new facility construction or remodeling—either of which would result in long-term minor beneficial impacts. Because impacts on public health and safety are expected to be minor this topic was dismissed from further analysis.

Visual/Scenic Quality Conserving national park scenery and providing for visitor enjoyment are elemental NPS purposes as identified in the 1916 Organic Act. The preferred location for the SRM facility is presently a vacant lot—the former site of the Babbitt Brothers store—within a heavily developed park area. The Preferred Alternative proposes improvements that would enhance the area’s visual quality through construction of a LEED-certified facility. The building’s architecture would be specifically designed to fit the character of nearby historic buildings. The location would not obstruct canyon views or other aesthetic park view sheds. Visual/scenic impacts from this project are expected to be minor, beneficial, and localized. Therefore, visual/scenic resources were dismissed from further analysis.

Topography, Geology, and Soils According to Management Policies 2006, the NPS will preserve and protect geologic resources and features from adverse effects of human activity, while allowing natural processes to continue. These policies also state the NPS will strive to understand and preserve park soil resources and prevent, to the extent possible, unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources.

Proposed construction of a new SRM facility would be in a park area that does not contain significant topographic or geologic features. Further, the new building’s general location was previously disturbed by past utilities construction and the historic Babbitt Brothers store. Minimal topography modifications would be required to provide a level surface on which to construct the building, which would have a negligible to minor effect to area topography. The building construction would also require excavation, which would displace and disturb soils, primarily in the new building’s footprint. Soils may also be disturbed and compacted on a temporary basis in locations used to access construction.

Given there are no significant topographic or geologic features in the project area, and the area has been previously disturbed, proposed actions would result in negligible to minor, temporary and permanent adverse effects to topography, geology, and soils. Because these effects are minor or less this topic was dismissed from further analysis.

Water Resources NPS policies require protection of water quality consistent with the Clean Water Act. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." To enact this goal, the U.S. Army Corps of Engineers has been charged with evaluating Federal actions that result in potential degradation of waters of the United States and issuing permits for actions consistent with the

Clean Water Act. The U.S. Environmental Protection Agency also has responsibility for oversight and review of permits and actions, which affect waters of the United States.

No standing water, major or minor drainage, or riparian habitat occurs in or adjacent to the project area. The Grand Canyon Village area is characterized by the absence of surface water, which generally drains through the groundwater system or returns to the atmosphere via evapotranspiration. Surface runoff usually only occurs following severe storm events, largely due to the permeable nature of the upper sedimentary layers underlying the Grand Canyon Village area (NPS 1995, Roundy and Vernon 1996), and the evapotranspiration potential of the surrounding pinyon-juniper vegetation type (Huntoon 2000).

Proposed construction would involve soil disturbance at the building site and for site utilities. Impacts to water resources could result through live vegetation removal and resultant erosion and/or subsurface flow. Increased runoff due to paving can result in increased peak flows and higher sediment loads in some situations. Higher sediment loads can cause accelerated channel erosion, sedimentation, and flooding in downstream channel systems. However, due to the limited size and extent of ground disturbance proposed for this project (less than two acres including previously disturbed areas), the generally flat terrain, the area's location in the Grand Canyon Village development zone, and adherence to mitigation measures, overall impacts to water resources would be negligible and would occur only during construction. For these reasons, water resources were dismissed from further analysis.

Floodplains and Wetlands Executive Order 11988, Floodplain Management, requires all Federal agencies avoid construction in the 100-year floodplain unless no other practicable alternative exists. The NPS under Management Policies 2006 and DO 77-2 (Floodplain Management) will strive to preserve floodplain values and minimize hazardous floodplain conditions. According to DO 77-2, certain construction in a 100-year floodplain requires preparation of a statement of findings for floodplains.

The proposed project area for the new SRM building is not in a 100-year floodplain; therefore, a statement of findings for floodplains will not be prepared. Because there are no floodplains in the project area, and thus would be no unacceptable impacts, this topic was dismissed from further analysis.

Air Quality Grand Canyon National Park is a Federally mandated Class I Area under the Clean Air Act. As such, park air receives the most stringent protection against increases in air pollution and in further degradation of air quality-related values. The Act then sets a further goal of natural visibility conditions, free of human-caused haze. Park air quality is generally good, and park pollution levels fall below those established by the Environmental Protection Agency to protect human health and welfare. However, visibility is usually well below natural levels due to air pollution; most pollution originates far outside park boundaries, and arrives as a well-mixed regional haze rather than as distinct plumes.

Section 118 of the Clean Air Act requires all Federal facilities to comply with existing Federal, state, and local air pollution control laws and regulations. The park Air Quality Specialist has determined that this project, due to its limited scope, would not require NPS consultation with the State of Arizona regarding air quality. However, because ground disturbance is involved, there is a possibility of raising fugitive dust during project. Application of mulch and gravel on the site after work is completed would provide long-term dust control. Mulch and gravel would stabilize the soil surface and reduce wind speed/shear against the ground surface.

Trenching and other minor onsite work would increase dust and combustion-related emissions. Dust raised during ground disturbance would be limited by project size and equipment used. Clearly marking project boundaries would avoid unnecessary soil disturbance and consequent dust generation. Water sprinkling can control fugitive dust emissions from light traffic in the project area. Construction equipment can adversely affect air quality by exhaust emissions. Minimizing the extent to which construction equipment idles would help reduce this effect. Indirect air quality impacts from routine daily vehicle emissions from visitors, employees, and official business would be unchanged.

Therefore, local air quality may be temporarily degraded by dust generated by construction activities and emissions from construction equipment. This degradation would result in an overall negligible impact to air quality, and would last only as long as construction activities. Impacts to overall park or regional air quality are not expected. Therefore, air quality was dismissed from further analysis.

Soundscapes The NPS is mandated to articulate operational policies that require, to the fullest extent practicable, protection, maintenance, or restoration of the natural soundscape resource in a condition unimpaired by inappropriate or excessive noise sources. Natural sounds are intrinsic elements of the environment often associated with parks and park purposes. They are inherent components of “the scenery and the natural and historic objects and the wild life” protected by the NPS Organic Act. They are vital to the natural functioning of many parks, and may provide valuable indicators of various ecosystems’ health. Intrusive sounds are of concern to the NPS because they sometimes impede the service’s ability to accomplish its mission.

The proposed SRM facility location falls within the development zone identified in the park’s GMP. Construction activities would generate some noise in the development zone above ambient conditions. Noise sources include vehicles, equipment, and additional people in the area conducting work. Noise impacts from this project would only last the duration of construction. Minimizing idling of construction vehicles and equipment would help reduce noise impacts. All construction would occur during daylight hours when noise from roads and associated traffic already affect the project area. Any additional traffic would only be temporary and would negligibly affect the areas in the short-term. Therefore, this project would have no considerable effects on soundscape. Similarly, effects of past, present, and foreseeable future actions on soundscape would be short-term and would not considerably affect soundscape. Therefore, soundscape was dismissed from further analysis.

Visitor Experience The 1916 NPS Organic Act and Management Policies 2006 direct national parks to provide for public enjoyment. Proposed construction activities would occur in main South Rim visitation areas and are expected to improve overall park visitor experience. Visitors may experience only negligible adverse short-term impacts from associated construction traffic. No long-term impacts are expected to visitor parking or traffic patterns. Anticipated minor beneficial longer-term impacts include access to the new SRM facility and improved aesthetics by site in-fill. Visitor experience was therefore dismissed from further analysis.

Environmental Justice Executive Order 12898 requires consideration of impacts to minority and low-income populations to ensure these populations do not receive a disproportionately high number of adverse or human-health impacts. This issue was dismissed from further analysis as the proposed project will not specifically affect minority or low-income populations.

Prime and Unique Farmland The Farmland Protection Policy Act of 1981, as amended,

requires Federal agencies to consider adverse effects to prime and unique farmlands that would result in conversion of these lands to non-agricultural uses. Prime or unique farmland is defined as soil that particularly produces general crops as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. This proposed project's location and surrounding lands have been evaluated by appropriate park technical area specialists and specialists from the Natural Resources Conservation Service. Based on their observations, the project area is not considered prime or unique farmland (Camp 2002). Therefore, this topic was dismissed from further analysis.

Socioeconomic Environment Socioeconomic values consist of local and regional businesses and residents, the local and regional economy, and park concessions. The local economy and most business in neighboring communities are based on construction, recreation, transportation, tourist sales, services, and educational research; the regional economy is strongly influenced by tourist activity. The GMP Environmental Impact Statement (EIS) discussed socioeconomic environment and impacts extensively. Some short-term benefits to local and regional businesses could occur from construction-related expenditures and employment. Local and regional businesses would be negligibly affected long term. All socioeconomic impacts from this project would be short-term and likely beneficial. For these reasons, socioeconomic environment was dismissed from further analysis.

Wilderness Character Most of the park has been recommended for wilderness designation. Until Congress formally acts on this recommendation, NPS policies require these areas be managed under Wilderness Act provisions. However, the proposed project area is part of the development zone defined in the GMP, and outside recommended wilderness. Proposed actions in this area would not occur in recommended wilderness and would not directly affect wilderness character or wilderness values. For these reasons, wilderness character was dismissed from further analysis.

Vegetation According to Management Policies 2006, the NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of plants. Both native and invasive non-native vegetation exist in the project area. Vegetation, including some mature trees would be displaced, removed, disturbed, and/or compacted in construction areas particularly in the footprint of the new building, along utility corridors and in new parking sites or areas. Construction of new trails to provide access to the newly situated building would also disturb vegetation. Disturbed areas would be revegetated and rehabilitated following construction; therefore, project area vegetation removal and disturbance is expected to result in minor adverse impacts to vegetation. Because effects on vegetation would be minor and would not result in any unacceptable impacts, this topic was dismissed from further analysis.

Indian Trust Resources Secretarial Order 3175 requires any anticipated impacts to Indian Trust resources from a proposed project or action by Department of the Interior agencies be explicitly addressed in environmental documents. The Federal Indian Trust responsibility is the legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and represents a duty to carry out Federal law mandates with respect to American Indian and Alaska Native tribes. Grand Canyon National Park does not have any Indian Trust resources; therefore, this topic was dismissed from further analysis.

CHAPTER 2 ALTERNATIVES

During May 2009, an interdisciplinary team of National Park Service employees met to develop project alternatives. This meeting resulted in definition of project objectives as described in Purpose and Need, and a list of alternatives that could potentially meet these objectives. A total of three action alternatives and the No Action Alternative were originally identified for this project. Of these, two of the action alternatives were dismissed from further consideration as described later in this chapter. One action alternative and the No Action Alternative were carried forward for further evaluation in an environmental assessment released in November, 2009. As a result of feedback received during the comment period on that EA, a decision was made to develop and fully evaluate Alternative 3, which would locate a new SRM facility near park headquarters. See Table 1 for a comparison of alternative components.

Alternatives Carried Forward

Alternative 1 – No Action

Under this alternative, no changes to the existing condition would be made except necessary building repairs, such as roofing the McKee building. Existing health and safety concerns described in Purpose and Need would continue. SRM staff offices and storage would remain in the Dutton, Powell, and McKee buildings located in the Mission 66 maintenance yard. These buildings would not be used by the park concessionaire, demolished, or used by other NPS staff; Figures 3 and 4 show the current SRM office location and layout.

Figure 3 Current SRM office location on Albright Avenue

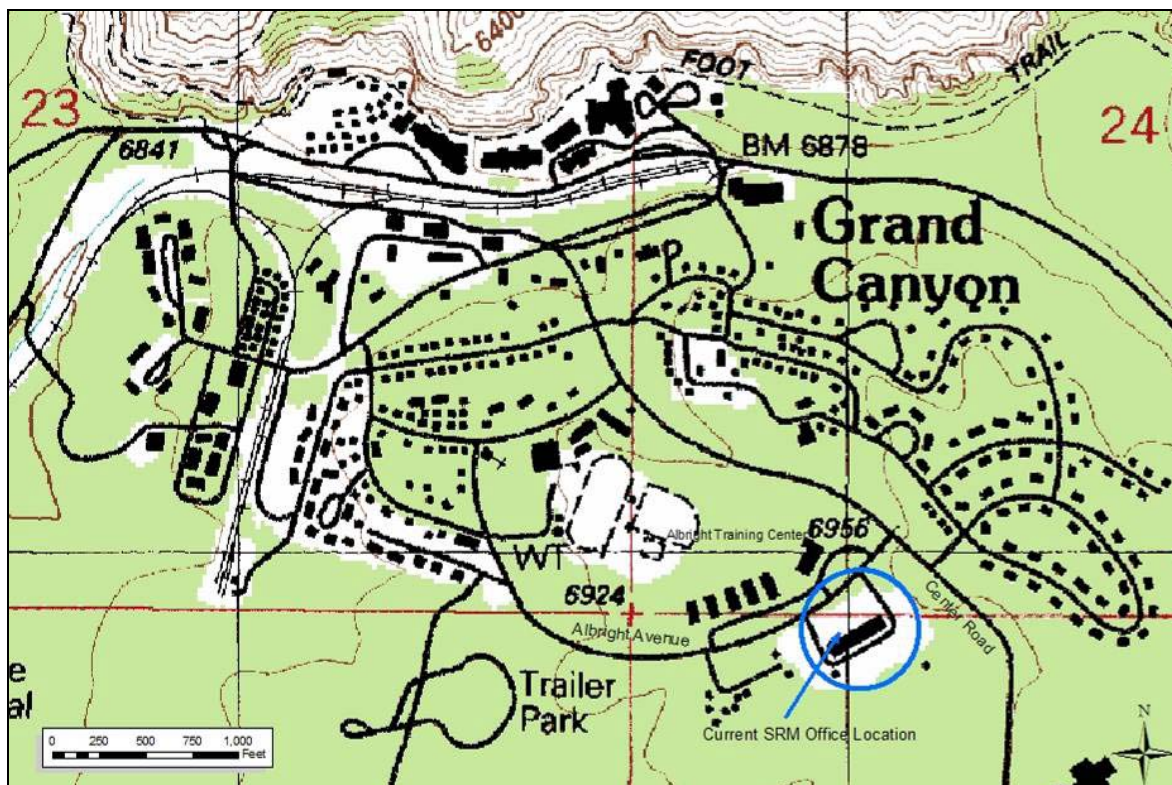


Figure 4 Mission 66 maintenance yard including current SRM offices co-located with Xanterra and Grand Canyon Association



Alternative 2 – Construct New SRM Facility near Magistrate’s Office (Preferred Alternative)

A new facility would be constructed to house SRM staff and functions adjacent to the Magistrate’s Office. This site is a vacant, previously disturbed area once the location of the Babbitt Brothers Store, an employee pub, recreation center, and most recently, after fire destroyed the original building, a picnic area. The following further describes Alternative 2.

Building Features

The proposed building would be approximately 8,500 square feet, two floors, universally accessible, and include employee offices and work spaces, meeting space, restrooms, small public-use library, and some storage. Design would allow for after-hours use of meeting space and restrooms while keeping offices secure. A fire protection system for the entire building, consisting of smoke and heat detection alarms and sprinklers, would also be provided.

The building would be designed to achieve LEED certification. Building design components would include rainwater catchment to irrigate vegetation; solar collectors to provide hot water for an in-floor heating system; passive solar to aid in building heating and cooling; natural cross ventilation to reduce energy consumption; solar tubes and energy efficient interior lighting; open office work stations to allow layout flexibility over the life of the building; exterior lighting to meet dark sky policy; and a sympathetic and compatible design sensitive to its location in the Grand Canyon Village National Historic Landmark District (NHL).

The building site would occur on the disturbed lot's south side to avoid conflict with an existing sewer line and minimize impacts to the Babbitt Brothers store foundation. At the same time the building would be located to use solar energy and, therefore, could not be situated too close to the tall ponderosa trees on the project area's south side.

Facility Use

The new building would primarily be used by NPS employees for science and resource management functions. However, there would be a small library with internet access, park publications, and information available to the public.

Current employee offices in the Mission 66 maintenance yard buildings would be relocated to the new building. Functions for the Mission 66 maintenance yard would be determined in the future but are expected to be reassigned to other uses, divisions or organizations, or considered for demolition or relocation if appropriate. The Powell building could house historic boats now located in the McKee building, and could provide overflow office and meeting space for temporary staff and volunteers. The historic boats now stored in the McKee Building would need to be moved to allow for reassignment. A historic boat museum, in initial planning stages, will be located in the building currently used as the concessioner's engineering warehouse (building number 569 "Laundry Building"). The museum would house the boats long term.

Utilities

The building would be served by utilities existing near the site including water, sewer, electric, and telephone. Existing overhead utilities would be placed underground. Connecting to utilities and converting overhead to underground would require trenching in the project area. For the purposes of running underground utilities, the project area would likely include the utility corridor across Center Road in the vicinity of the Ranger Operations building.

Access

Access to the new SRM building would be by footpaths leading to/from the parking areas. Additionally, vehicle loading zone access would be provided as needed, likely at the rear of the building, off Center Road. Refinement of building access will occur during the design-build phase of this project.

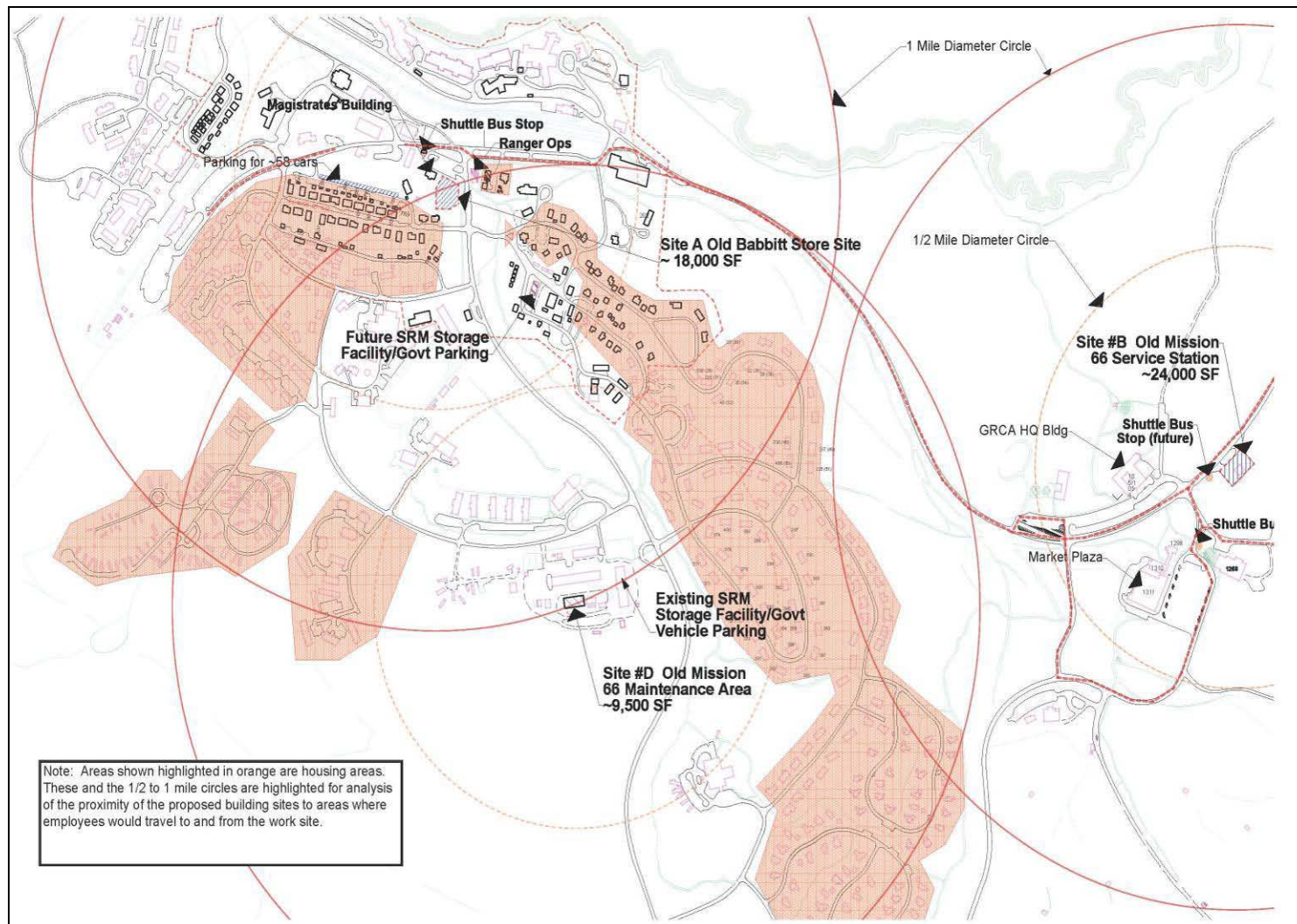
Parking

The proposed SRM building site is near existing parking Lot C, which is currently used by visitors in the village, employees for Ranger Operations and for Magistrate's Office access. The capacity of this parking lot is insufficient to accommodate additional use for visitors and employees using the new building, so employees would be encouraged to walk, bike, or use other nearby parking options. Most SRM employees who would work in the new facility live within ½ mile of Site A, shown in Figure 5, and many travel that distance or greater by foot or bicycle to the current facilities. The overall number of parking spaces in this lot would remain as current (39 spaces, 2 of which are handicapped accessible). Approximately 50 parking spaces are identified for construction of an employee parking area on Apache Alley, north and west of the proposed building site, see Figure 6.

Revegetation

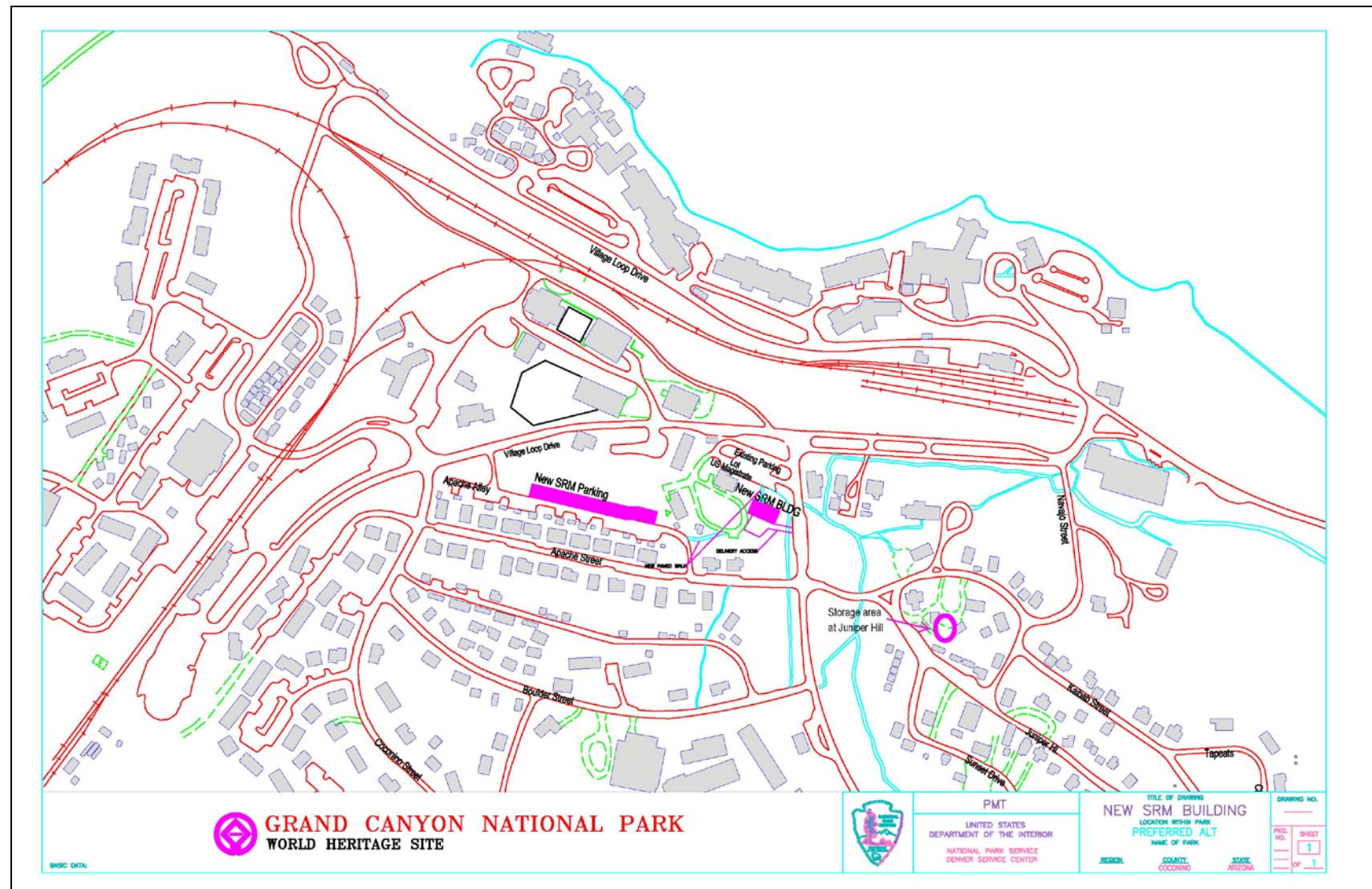
Existing project area native vegetation would be preserved to the extent possible. All areas disturbed by new building and parking area construction would be revegetated and recontoured to the style of the native landscape, as appropriate. Native vegetation, rocks, or other natural features would be used as appropriate.

Figure 5 Preferred Alternative SRM building location (shown as Site A)¹



¹ Also see Appendix A. Location Site A became Alternative 1 and Site B became Alternative 3. Site D is near the current facility location.

Figure 6 Preferred Alternative SRM building location and parking area



Storage and Staging

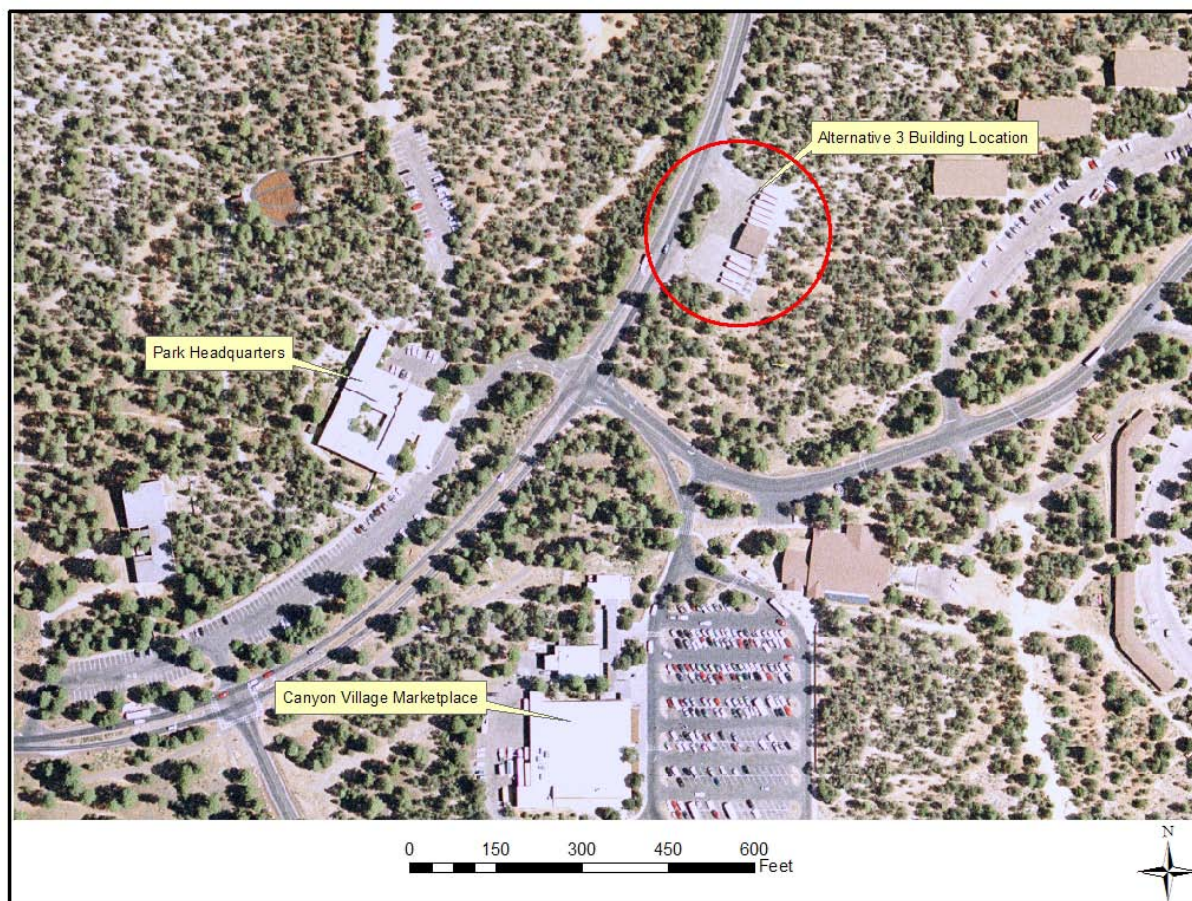
Because of constraints associated with site in-fill at this location, the new building would not have adequate storage for all SRM field equipment and supplies. Therefore, supplies and equipment storage and staging would be accommodated in another location, likely in the CCC-era maintenance yard on Juniper Hill. This location is within walking distance of the proposed SRM building location (see Figure 6). Building improvements or new facility construction in the Juniper Hill area would be considered to best accommodate SRM needs. Additional compliance for storage facilities would be completed if needed.

This alternative is based on preliminary designs and best information available at the time of this writing. Specific distances, areas, and layouts used to describe the alternative are only estimates and could change during final site design. If changes during final site design are inconsistent with the intent and effects of the selected alternative, then additional compliance would be completed, as appropriate.

Alternative 3 – Construct New SRM Facility near Park Headquarters

A new facility would be constructed to house SRM staff and functions just south and east of the park headquarters building (see Figures 5 and 7). This site is a vacant, previously disturbed area, once the location of the park gas station. The following further describes Alternative 3.

Figure 7 Location of SRM facility under Alternative 3



Building Features

As described for Alternative 2, the proposed building would be approximately 8,500 square feet, two floors, universally accessible, and include employee offices, general work spaces, meeting space, restrooms, small public-use library, and some storage. Design would allow for after-hours use of meeting space and restrooms while keeping offices secure. A fire protection system for the entire building, consisting of smoke and heat detection alarms and sprinklers, would also be provided.

The building would be designed to achieve LEED certification as described in Alternative 2. This location is not within the Grand Canyon Village National Historic Landmark District (NHLD) and therefore design components would not need to be sympathetic with the district and surrounding historic buildings. The building would however be designed aesthetically.

Facility Use

The new building would primarily be used by NPS employees for science and resource management functions. However, there would be a small library with internet access, park publications, and information available to the public.

Current employee offices in the Mission 66 maintenance yard buildings would be relocated to the new building. Functions for the Mission 66 maintenance yard would occur as described in Alternative 2.

Utilities

Minimal utilities exist in this location. Water, sewer, electric, and communication lines would need to be brought into the area and would require trenching.

Access

Access to the new SRM building would be by footpaths leading to/from the building and parking areas. Nearby shuttle bus stops currently include the Shrine of the Ages and Market Plaza.

Parking

Construction of a parking area for the new facility would be included on-site. It is estimated that 15,000 square feet of the 24,000 square foot area would be developed for 60 parking spaces. Employees would be encouraged to walk, bike, or ride the park shuttle bus to and from the building to allow adequate parking for some employees to drive, government vehicles, and visitors to the facility.

Revegetation

Native vegetation surrounding the site would be preserved to the extent possible. Native vegetation, rocks, or other natural features would be used as appropriate to landscape around the building and parking area.

Storage and Staging

The existing disturbed area at this location is inadequate for construction of both an office building as described for Alternative 2 and additional storage facilities for all SRM field equipment and supplies. It is estimated that an additional acre or less of soil and vegetation disturbance, including removal of several trees, would occur at this location if storage and staging facilities were constructed on site. Although field equipment and supplies could be located at Juniper Hill as described for Alternative 2, for purposes of analysis this alternative assumes additional disturbance and location of all SRM offices, field equipment, vehicles and supplies on site.

All alternatives are based on preliminary designs and best information available at the time of this writing. Specific distances, areas, and layouts used to describe the alternatives are only estimates and could change during final site design. If changes during final site design are inconsistent with the intent and effects of the selected alternative, then additional compliance would be completed, as appropriate.

Mitigation Measures

The following mitigation measures were developed to minimize the degree of adverse effects and would be implemented as needed during the proposed action's construction phase. The park's Project Manager would be responsible for implementation of mitigation measures.

Contractor Orientation Contractors working in the park are given orientation concerning proper conduct. This orientation is provided both in writing and verbally at a preconstruction meeting. This policy would continue for this project. Orientation would include, but would not be limited to

- Wildlife should not be approached or fed
- Collecting any park resources including plants, animals, and historic or prehistoric materials, is prohibited
- Contractor must have a safety policy and a vehicle fuel-spill and leakage policy

Limitation of Area Affected The following mitigation measures would be implemented to minimize area affected by construction activities and potential for adverse impacts

- Staging areas for a construction office (trailer), construction equipment, and material storage would either be located in previously disturbed areas near the project site or in other disturbed areas that best meet project needs and minimize new ground disturbance. All staging areas would be returned to pre-construction conditions or better once construction is complete. Standards for this, and methods for determining when standards are met, would be developed in consultation with the park's Vegetation Program Manager
- Construction zones would be fenced with construction tape, snow fencing, or similar material before construction begins. Fencing would define the construction zone and confine activity to the minimum construction area required. All protection measures would be clearly stated in construction specifications, and workers would be instructed to avoid conducting activities beyond the construction zone as defined by fencing

Soil Erosion To minimize soil erosion, the following mitigation measures would be implemented

- Standard erosion control measures such as silt fences, sand bags, or equivalent control methods would be used to minimize any potential soil erosion
- Grading and trenching operations would be by backhoe, track hoe, Pionjar, ditch digger and/or trencher, with excavated material side-cast for storage. Any trenching restoration operations would follow guidelines approved by park staff. Compacted soils would be scarified, and original contours reestablished
- Any revegetation efforts would use site-adapted native species and/or site-adapted native seed, and park policies regarding revegetation and site restoration would be incorporated

Vegetation To minimize vegetation impacts, prevent exotic vegetation introduction, and minimize spread of noxious weeds, the following mitigation measures would be implemented

- The park's Vegetation Program staff would provide input on salvage potential or would complete the salvage process on their own. They would provide guidance to park staff

and contractors on tree avoidance at project sites where necessary and would also spot-check work progress

- All construction equipment that leaves the road would be pressure-washed prior to entering the park and would be clean of any soil, plant matter, or other materials. The Contracting Officer's Representative (COR) or a Vegetation Program representative would check the equipment for cleanliness prior to work beginning
- Staging area locations for construction equipment would be determined and approved by the COR and Vegetation Staff. If necessary, as determined by Vegetation staff, exotic vegetation would be treated prior to beginning construction and in staging areas
- Pruning necessary for this project, and for any future periodic maintenance in the area, would adhere to the park's tree pruning guidelines with the goal of retaining health and integrity of trees and shrubs treated. Damage to trees or roots in or adjacent to project areas during construction would be avoided as much as possible. Any damaged plant material would be pruned or removed, under Vegetation Program guidance
- All fill materials would be obtained from a park-approved source. Project area topsoil would be retained whenever feasible for reuse onsite when the project is completed. Topsoil would be windrowed onsite or in another approved location to retain soil health
- All restoration efforts would use site-adapted native seed and/or plants obtained from the South Rim Nursery and managed by the Vegetation Program
- A construction erosion control plan would be developed and implemented to prevent soil loss and plant material transport offsite

Special Status Species To protect any unknown or undiscovered threatened, endangered, or special status species, the construction contract would include provisions for discovery of such. These provisions would require cessation of construction activities until park staff evaluated the impact, and would allow contract modification for any measures determined necessary to protect the discovery. Mitigation measures for known special status species are

California Condor

- If a condor lands within 300 feet of the construction site, construction would cease until it leaves on its own or permitted personnel employ techniques that result in the individual condor leaving the area
- Construction workers and supervisors would be instructed to avoid interaction with condors, and to contact appropriate park or Peregrine Fund personnel immediately if and when condor(s) occur at a construction site
- The construction site would be cleaned at the end of each day work is conducted (i.e., trash disposed of, scrap materials picked up) to minimize likelihood of condors visiting the site. Park condor staff would complete a site visit to ensure adequate clean-up measures are taken
- To prevent water contamination and potential condor poisoning, the park-approved vehicle fluid-leakage and spill plan would be adhered to for this project. This plan would be reviewed by the park's Wildlife Biologist to ensure adequacy in condor protection for this project
- If condor nesting activity is known within 0.5 miles of the project area, light and heavy construction in the project area would be restricted during the active nesting season, if viable nests persist. Active nesting season is February 1 to October 15, or until young are fully fledged. These dates may be modified based on the most current information, in consultation with the park's Wildlife Biologist and the U.S. Fish and Wildlife Service

Mexican Spotted Owl (MSO)

- Prior to construction activities, the park's Wildlife Biologist would be contacted for any new information related to MSO or their status near the project area

Soundscapes To reduce noise, construction equipment would not be left idling any longer than necessary for safety and mechanical reasons, and no construction would occur at night

Cultural Resources The following mitigation measures would minimize construction impacts on cultural resources

- If previously unknown archeological resources are discovered during the project, a park Archeologist would be contacted immediately. All work in the immediate vicinity of the discovery would be halted until the resources could be identified, documented, and an appropriate mitigation strategy developed, if necessary, in accordance with stipulations of the applicable programmatic agreements among the NPS, the Arizona State Historic Preservation Officer, and the Advisory Council on Historic Preservation
- All workers would be informed of the penalties of illegally collecting artifacts or intentionally damaging any archeological or historic property. Workers would also be informed of correct procedures if previously unknown resources are uncovered during construction activities
- Areas selected for equipment and materials staging are expected to be in existing disturbed areas where there is no potential for archeological resource disturbance. If sites selected for these activities change during later design phases for implementation, additional archeological surveys would be conducted
- Monitoring by a cultural resource specialist would occur for ground disturbing activities, specifically trenching, associated with the project
- Review and concurrence on preliminary designs of the proposed building, by the Arizona State Historic Preservation Office, must be completed prior to construction
- All construction within the Grand Canyon Village National Historic Landmark District would be in accordance with the Secretary of Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes

Visitor Experience Unless otherwise approved by the park, operation of heavy construction equipment would be restricted to dawn to dusk, year-round, thereby minimizing construction impacts on visitor experience

Park Operations and Safety NPS, concessionaires, other park employees, and residents would receive public notification on project implementation and road delays or road closures, as appropriate, to minimize construction impacts on park operations, and minimize safety risks to employees, visitors, and residents

Air Quality The following mitigation measures would minimize impacts to air quality

- To reduce entrainment of fine particles from hauling material, sufficient freeboard would be maintained, and loose material loads (aggregate, soils, etc.) would be tarped
- To reduce tailpipe emissions, construction equipment would not be left idling any longer than necessary for safety and mechanical reasons
- To reduce construction dust in the short term, water would be applied to problem areas. Equipment would be limited to the fenced project area to minimize soil disturbance and consequent dust generation
- Landscaping and revegetation would control long-term soil dust production. Mulch and plants would stabilize soil and reduce ground surface wind speed/shear

Alternatives Considered and Dismissed

The following alternatives were considered for project implementation but ultimately dismissed from further analysis. Reasons for dismissal are provided in the following descriptions.

- **Alternative Locations for a New SRM Facility**

Two additional locations were considered for construction of a new SRM facility. One location was the current maintenance complex next to Facilities Management Division offices. This location is inconsistent with the GMP in that it would construct additional facilities in a non-disturbed area. It would also increase vehicular traffic, rather than decrease it, since most employees would drive to work rather than walk or bicycle (no shuttle or pathway access). Building an additional facility in this area could require redesign and rebuilding of the existing access road to accommodate additional vehicular traffic. The other location was the current location at the Mission 66 maintenance yard. This location was dismissed for a number of reasons, including, primarily, the GMP direction and current management intent to transition the area to concessions operations.

The park used a site-selection matrix (Appendix A) that includes criteria such as sustainability, site-planning characteristics, conformance with the park's GMP, cost, environmental impacts, circulation, parking, and accessibility. Through site-selection analysis, the park found the Preferred Alternative and Alternative 3 locations met more project selection criteria; therefore these two locations were dismissed from further analysis.

- **Remodel Existing Buildings**

An alternative was considered that would have extensively redesigned the Dutton, Powell, and McKee buildings currently in use by SRM. Under this alternative, existing office space in the Powell building would be converted to meet SRM staff needs for storage and staging of supplies and equipment. The Dutton building would be redesigned for use as a transitory bunkhouse. The McKee building would be redesigned and rebuilt as office space.

As a Mission 66-era facility, significant rehabilitation efforts would be needed. These efforts would include roofing, insulation, pest exclusion, door and window replacement, restroom facility upgrade and expansion, and other items as needed. The Powell and McKee buildings have already been reconfigured from engine bays, a warehouse, and an auto shop in an attempt to meet SRM office needs. Additional reconfiguration would be needed for long-term use. However, because the GMP calls for transfer of these buildings to park concessioners, partners, or other NPS uses, this alternative is not considered feasible. Therefore, this alternative to remodel existing Mission 66 buildings was dismissed from further analysis.

Alternative Summaries

Table 1 summarizes major components of each alternative and compares the ability of alternatives to meet the project objectives identified in Purpose and Need. As shown in the table, Alternatives 2 and 3 best meet each objective identified for this project, while the No Action Alternative does not address all of the objectives.

Table 1 Summary of Alternatives and Project Objectives

Project Objectives	Alternative 1 No Action Alternative	Alternative 2 Preferred Alternative	Alternative 3 Construct facility near Park Headquarters
	Meets Project Objectives?	Meets Project Objectives?	Meets Project Objectives?
Attain LEED certification in a building adequate for SRM needs	No Current facilities are not LEED certified and are not adequate for SRM long-term needs	Yes Would result in construction of a LEED-certified building that meets SRM current and projected needs	Yes Would result in construction of a LEED-certified building that meets SRM current and projected needs
Facility includes space to enhance visitor experience	No Current facilities do not include space to enhance visitor experience	Yes New SRM building would provide space for enhanced visitor experience	Yes New SRM building would provide space for enhanced visitor experience
Develop a research facility in the park	No While present conditions allow for some research, current SRM facilities do not accommodate research needs	Yes New SRM building designed to facilitate SRM research needs	Yes New SRM building designed to facilitate SRM research needs

Table 2 summarizes anticipated environmental impacts for all alternatives. Only those impact topics carried forward for further analysis are included. Chapter 3, Affected Environment and Environmental Consequences, provides a more detailed explanation and analysis of impacts.

Table 2 Environmental Impact Summary by Alternative

Impact Topic	Alternative 1 No Action Alternative	Alternative 2 Preferred Alternative	Alternative 3 Construct facility near Park Headquarters
Historic Resources and Cultural Landscapes	Minor adverse long-term impacts from lack of infill in Grand Canyon Village NHL and from deferred maintenance and continued deterioration of Mission 66 maintenance yard buildings	Moderate beneficial long-term impacts from appropriate NHL infill. Cumulative impacts would be minor adverse long term	Minor adverse long-term impacts from lack of infill in Grand Canyon Village NHL. Impacts to historic resources and cultural landscapes outside the NHL would not be expected. Cumulative impacts would be minor adverse long term
Park Operations	Negligible to minor adverse long-term impacts due to continuation of current park operations and necessary repairs to Mission 66 maintenance yard buildings	Minor long-term beneficial impact from consolidated SRM administrative functions. Minor beneficial long-term impacts to park operations from reduced maintenance needs at the new SRM facility. Cumulative impacts minor beneficial long term	Minor long-term beneficial impact from consolidated SRM administrative functions. Minor beneficial long-term impacts to park operations from reduced maintenance needs at the new SRM facility. Cumulative impacts minor beneficial long term

Identification of the Environmentally Preferred Alternative

The environmentally Preferred Alternative is determined by applying criteria suggested in the National Environmental Policy Act of 1969, which guides the Council on Environmental Quality. CEQ provides direction that “[t]he environmentally preferable alternative is the alternative that would promote the national environmental policy as expressed in NEPA’s §101

1. Fulfill responsibilities of each generation as trustee of the environment for succeeding generations
2. Assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings
3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences
4. Preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice
5. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life’s amenities
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources

Through internal and public scoping, the Environmentally Preferred Alternative is determined to be Alternative 2, the Preferred Alternative. This alternative best meets the purpose and need for action and best addresses overall NPS objectives and evaluation factors while minimizing impacts to park resources. The Preferred Alternative promotes safe, healthful, productive, esthetically and culturally pleasing surroundings identified in Criteria 2 and 3. It also protects important historic and cultural resources identified in Criteria 4. Building design for each action alternative would include environmentally sustainable features identified in Criteria 6. Finally, the Preferred Alternative best achieves a balance between population and resources use identified in Criteria 5.

CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the present condition (affected environment) the project area and changes (environmental consequences) expected from implementing action alternatives or taking no action. The No Action Alternative sets the environmental baseline for comparing effects of other alternatives. Impact topics (see Chapter 1) define the scope of environmental concern for this project. The environmental effects, or changes from present baseline condition, described in this chapter reflect identified relevant impact topics and include intensity and duration of the action, mitigation measures, and cumulative effects.

The National Environmental Policy Act requires that environmental documents disclose environmental impacts of proposed Federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided should the proposed action be implemented. Direct, indirect, and cumulative effects and impairment are analyzed for each resource topic carried forward. Potential impacts are described in terms of type, context, duration, and intensity. General definitions are defined as follows, while more specific impact thresholds are given for each resource at the beginning of each resource section.

- **Type** describes impact as either beneficial or adverse, direct or indirect
 - *Beneficial* A positive change in resource condition or appearance or change that moves resource toward a desired condition
 - *Adverse* A change that moves resource away from a desired condition or detracts from its appearance or condition
 - *Direct* An effect caused by an action occurring in the same time and place
 - *Indirect* An effect caused by an action later in time or farther removed in distance, but still reasonably foreseeable
- **Context** describes the area or location where impact will occur. Are effects site-specific, local, regional, or even broader?
- **Duration** describes length of time effect will occur; short or long term
 - *Short term* Impacts generally last only during construction; resources resume pre-construction conditions following construction
 - *Long term* Impacts last beyond the construction period; resources may not resume pre-construction conditions for a longer period of time following construction
- **Intensity** describes impact degree, level, or strength. For this analysis, intensity has been categorized into negligible, minor, moderate, and major. Because intensity definitions vary by resource topic, they are provided separately for each impact topic analyzed

Methodology

Impact analysis and conclusions in this chapter were based on park staff knowledge of resources and sites, review of existing literature and park studies, information provided by NPS and other agency specialists, and professional judgment. Detailed information on natural and cultural resources in Grand Canyon National Park summarized in the 1995 GMP/EIS was specifically referenced for information on affected resources in the project area.

Cumulative Effects

Council on Environmental Quality regulations, which implement the National Environmental Policy Act of 1969 (42 USC 4321 et seq.), require assessment of cumulative impacts in Federal project decision-making process. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past,

present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for the No Action and action alternatives.

Cumulative impacts were determined by combining an alternative's impacts with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at Grand Canyon National Park and, if applicable, the surrounding region. Because the scope of this project is relatively small, the geographic and temporal scope of the cumulative analysis is similarly small. The geographic scope for this analysis includes actions in park boundaries, while the temporal scope includes projects in a range of approximately ten years.

Grand Canyon National Park encompasses approximately 1.2 million acres in northern Arizona. The project is located on South Rim in Grand Canyon Village, approximately six miles north of Tusayan, Arizona. Grand Canyon Village serves as the park's south entrance and is the first park development that visitors encounter. Grand Canyon Village is a destination point for many Grand Canyon visitors and provides services such as lodging, restaurants, post office, bank, gift shops, entertainment, and orientation.

Given this, the following projects were identified for the purpose of conducting cumulative effects analysis.

Historic Railroad Depot Rehabilitation

A 2008 historic structure report provides specific treatment recommendations for rehabilitation of this structure. Major interior and exterior building improvements are anticipated 2013-2014, including repairs to non-functioning restrooms and accessibility upgrades. Due to drainage problems on the building's north side, the paved lane adjacent to the building may be removed to re-grade and facilitate drainage away from the building. Approximately 0.5 acres would be disturbed.

Bright Angel Trailhead Area Design Plan

GRCA plans to implement a design plan for the Bright Angel Trailhead area starting in 2012. Proposed actions include developing a plaza near the primary trailhead, enhancing trail connections and way finding, constructing a new restroom near the proposed plaza and existing mule corral, and improving parking area vehicle circulation. Future phases could include hardening the parking surface and delineating parking spaces, additional revegetating and landscaping, and enhancing way finding and interpretive signs.

Employee Housing

GRCA currently has a shortage of employee housing. Beginning in 2010, approximately 64 housing units will be constructed in eight, eight-plex apartment buildings. The buildings, along with parking, access, and utilities will occur in Grand Canyon Village in a previously disturbed area where trailer housing units are currently located with an estimated ground disturbance of five to ten acres.

South Rim Visitor Transportation Plan

The purpose of the South Rim Visitor Transportation Plan is to provide a transportation system that addresses the park's most pressing transportation issues through the year 2020. The plan accommodates current and anticipated levels of South Rim visitation, facilitates enhanced visitor experiences and protects park resources. The preferred alternative includes constructing new parking areas near the Visitor Center (formerly Canyon View Information Plaza); expanded

shuttle bus service from Tusayan; expanded shuttle bus transit in the Village and to Hermits Rest; and improvements at South Entrance Station to reduce wait times such as additional vehicle lanes and tour bus parking/management. Most of these improvements are in place or in development.

Heritage Education Campus (HEC)

The 1995 GMP called for new interpretive facilities to be concentrated in the powerhouse area of Grand Canyon Village. Currently, the Grand Canyon Visitor Center (formerly Canyon View Information Plaza) provides visitor orientation and an introduction to GRCA's educational themes. To complement these services, the HEC planned for implementation beginning in 2011 will offer in-depth interpretive opportunities and acquaint visitors with the heart of the historic village. The following projects are HEC components:

Livery Stable

The livery stable and corral (building number 563, constructed in 1907) are in use by the park concessionaire for mule operations. The livery stable would be used for interpretive displays and as an exhibit area for guided tours and talks. The park is currently evaluating mule operations in the park in an environmental assessment (EA) planned for completion in late 2009. That EA addresses the current and future use of this facility.

Laundry Building

A museum to interpret the history of the Colorado River and display historic boats (Historic Boat Museum) is proposed for the building currently used as the concessioner's engineering warehouse (building number 569, constructed in 1927), and will include exhibits, office space, and storage.

Maintenance Building

This building, number 572, also known as the engineering building, was constructed in 1931 by the Atchison Topeka & Santa Fe Railroad. It is currently used as office space by Xanterra. A Canyon Arts and Inspiration Gallery is proposed for this building. The interior would consist of changeable partitions depending on building activities.

Powerhouse Building

This building, number 567, constructed in 1926 by the Atchison Topeka & Santa Fe Railroad, is a National Historic Landmark within the Grand Canyon Village National Historic Landmark District. A National Park Service Museum is proposed for this building and could include a multi-story interior space with exhibits, restrooms, lobby, and bookstore.

Colter Hall, Victor Hall, and Victor Annex

These concession-employee dormitories could be converted to lower priced visitor lodging with a hostel-style design (central lounge area and shared restrooms).

Maswik Cabins

Twenty-seven historic cabins could be converted from employee housing to visitor lodging.

Historic Resources and Cultural Landscapes

Affected Environment

The National Historic Preservation Act, DO 28, and Management Policies 2006 guide the NPS to preserve cultural resources unimpaired for the enjoyment of present and future generations. The proposed project has the potential to impact historic resources and cultural landscapes described in more detail below.

Historic Resources

Grand Canyon Village National Historic Landmark District

The Grand Canyon Village Historic District is part of the larger Grand Canyon Village South Rim setting. This district includes almost 250 buildings, four of which have been designated individually as national historic landmarks, including El Tovar Hotel, Grand Canyon powerhouse, Grand Canyon railroad station (depot), and Grand Canyon park operations (Ranger Operations) building. The district encompasses the majority of the original village site. Its establishment and development are directly related to South Rim tourist activities and subsequent expansion in accordance with the national park's original master plan. The historic village setting is dominated by the canyon edge and surrounding topography with its ponderosa pine, pinyon and juniper forests (NPS 1996).

Grand Canyon Village was first established in the 1880s as a stop serviced by horse drawn stagecoaches and, over time, developed into a natural visitor focal point. Rugged and rustic, the district retains a cohesive architectural character, consistent with early twentieth century park establishment (ARD 2000). Most buildings were designed in the rustic style using native stone and wood. The district possesses a high degree of integrity in design, materials and workmanship related to its period of significance (1898–1941). Some of the more significant district structures include the superintendent's residence (first park headquarters), post office, Apache Street residences, ranger's dormitory, horse barn, mule barn, and blacksmith's shop. All of these structures exhibit rustic qualities, evoking an image of pioneer construction with dominating roofs and cross gable wall dormers, shingled walls, and board and batten skirts below the sill line (NPS 1995).

Magistrate's Office and Ranger Operations Building

Within the project area, the historic magistrate's office and ranger operations buildings, constructed in the rustic park architecture may be affected based on proximity to the Preferred Alternative location for new SRM facility. The following descriptions are taken from the Grand Canyon Village National Historic Landmark District Cultural Landscape Report (2004).

"The Magistrate's Building (Bldg. #SRB0166) was built in 1935 and served as a post office and ranger services office before being adaptively re-used as the local judicial magistrate's and NPS law enforcement offices. The rectangular building has a gable roof with exposed rafter tails."

"The Ranger Operations Building (Bldg. #SRB0103) is located at the intersection of Center Road and Village Loop Drive. Built in 1929, the building is now designated as a National Historic Landmark. According to a 2000 Historic Structure Report, the Grand Canyon Ranger Operations Building was styled after a rustic Swiss chalet. The building is a two-story stone and wood-frame structure of classic park rustic design."

Mission 66 Maintenance Yard

The NPS has informally reviewed this area for historic Mission 66 significance. Although most buildings in this area are not considered eligible for listing on the National Register, the Utility Building (McKee) will be treated as historic until a formal eligibility determination is completed. This maintenance yard was originally designed by Cecil Doty to include eight buildings: all weather lumber storage, warehouse, protection building, equipment storage, car port, hay barn, general storage, and shops building. The only buildings constructed as originally conceived are the current Utility Building (McKee) and NPS Warehouse (Powell). Additional buildings have been added to the site over the years, but would not contribute to the historic significance of the complex. These additional structures include the engineering building, Grand Canyon Association receiving/shipping center, NPS laundry building, museum collection building, and Xanterra maintenance facility (NPS 2003a).

The area is characterized by little to no vegetation and utilitarian-style buildings surrounded by asphalt and constructed of modern, synthetic materials (see Figure 8). Most buildings are made of metal and/or concrete with large bay openings with roll doors. An eight-foot chain link fence surrounds the area. Beyond the fence, a native pine forest ecosystem dominates the landscape, and serves as a buffer between this utility complex and resident and visitor use areas beyond.

Figure 8 McKee Building in Mission 66 maintenance yard



Cultural Landscapes

As defined in Director's Order-28, Cultural Resource Management Guideline, cultural landscapes are settings humans create in the natural world. They are intertwined patterns of things both natural and constructed, expressions of human land manipulation and adaptation. Characteristics of cultural landscapes include land uses and activities, patterns of spatial organization, response to the natural environment, cultural traditions, circulation networks, vegetation, buildings, structures, and features. Cultural Landscape Reports (CLRs) have been completed for several park areas including the Grand Canyon Village National Historic Landmark District.

The Village CLR defines the period of significance as 1897-1942, and identifies and evaluates association for various district areas. For example, the Visitor and Community Services Area

includes the Magistrate's Building and former Babbitt Brothers Store site (proposed location for SRM building). The Babbitt's Store, constructed in 1926 (see Figure 9), was destroyed by fire in 1994, and is now an undeveloped lot. The CLR describes the current state of this location as: *The central civic space remains intact although the 'plaza' has been fully converted to a parking lot and Babbitt's Store is missing. Because of this, the public plaza/central gathering space quality that existed during the period of significance is diminished. Additionally, the 1954 re-routing of South Entrance Road further diminished the importance of the space as all visitors entered the district from the east, rather than the south (NPS 2004).*

Figure 9 Babbitt Brothers Store circa 1947



Intensity Level Definitions

Methodology used for assessing impacts to historic resources and cultural landscapes is based on how the project will affect features for which these resources and landscape are significant. The thresholds for this impact assessment are

Negligible Impacts would be at lowest levels of detection with neither adverse nor beneficial consequences; historic properties would receive no change to diagnostic artifacts, defining features, or characteristics that contribute to National Register of Historic Places (National Register) eligibility

Minor **Adverse** Impacts would be detectable but would not diminish overall resource integrity. Impacts such as feature degradation or displacement could occur and would be measurable, but would be localized and would not result in changes to defining elements. They would not affect or jeopardize defining features or characteristics of a historic resource or a character-defining pattern or feature of a landscape listed in or eligible for listing on the Register or aspects of integrity that contribute to eligibility for the National Register.

Beneficial Historic structures and features would be stabilized and preserved in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Preservation of landscape patterns and features would be in

accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*

Moderate **Adverse** Disturbance of a site or sites would result in loss of overall integrity and detection of measurable changes to character-defining elements and would contribute to increased instability of historic resources and features. For cultural landscapes, impacts would alter a character-defining pattern(s) or feature(s) of the cultural landscape, but would not diminish landscape integrity to the extent that its National Register eligibility was jeopardized. Moderate effects would jeopardize a structure's National Register eligibility

Beneficial Effects would include increasing stability of a structure or historic feature, maintaining structure setting, or rehabilitating a landscape or its patterns or features. A structure, historic feature, or landscape would be maintained and restored in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with guidelines for the treatment of cultural landscapes*

Major **Adverse** Disturbance of an historic resource or a landscape's patterns or features would result in loss of overall integrity and significant change to character-defining elements or would alter a character-defining pattern or feature of a landscape to the extent it would no longer be eligible to be listed on the National Register. Impacts would include destabilization of structures or cultural contexts, and an increase in exposure or vulnerability to natural elements (e.g. fire, flood, wind)

Beneficial An historic structure or feature or a landscape's patterns or features would be maintained and restored in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. Beneficial effects could include maintaining native or culturally significant vegetation

Context All impacts to historic resources and cultural landscapes would be localized

Alternative 1 – No Action

Under Alternative 1, no new construction would occur. The lack of infill where the historic Babbitt Brothers Store once stood would result in continued minor adverse impacts to the Grand Canyon Village NHL. Additionally, deferred maintenance of the Mission 66 maintenance yard buildings would continue due to loss of original function as a maintenance facility. These buildings have not been well maintained and are in need of substantial exterior and interior repairs and rehabilitation. Continued deterioration of Mission 66 maintenance yard buildings would result in minor, long-term, adverse impacts to historic resources and cultural landscapes.

Cumulative Effects Historic South Rim resources and cultural landscapes have been impacted as a result of modifications to historic buildings and structures, and intrusion of incompatible modern buildings into historic districts. In addition, deterioration of some buildings as a result of natural weathering and use has compromised defining architectural characteristics of structures. These past impacts are moderate adverse long term.

Recently implemented, in-progress and foreseeable future projects with potential to affect historic resources include the Historic Railroad Depot Rehabilitation, South Rim Visitor Transportation Plan, Bright Angel Trailhead Area Design Plan, Heritage Education projects, adaptive reuse of historic buildings, new construction within the historic district including fences and sheds, and ongoing maintenance of historic structures throughout the South Rim area. These projects have been or will be assessed for effects to historic resources, and discussed with the State Historic Preservation Officer (SHPO). Consultation with the park's cultural resource staff and SHPO would ensure any adverse impacts of future projects on historic resources would be minimized. Therefore, cumulative impacts to historic resources and cultural landscapes would be adverse minor long term.

Conclusion Alternative 1 implementation would result in minor adverse long-term impacts on historic resources and cultural landscapes from lack of infill in the Grand Canyon National Historic Landmark District, and from deferred maintenance and continued deterioration of Mission 66 maintenance yard buildings. Cumulative impacts would be minor adverse long term.

Alternative 2 – Preferred Alternative

A new SRM facility would be constructed in the historic Babbitt Brothers Store location near the Center Road/Village Loop intersection. New facility design and construction would be sensitive to the historic nature of the NHLHD and two nearby historic structures (Ranger Operations and Magistrate's Office).

The proposed building location is significant for its association with and use as a central civic space. As described in the affected environment, the CLR states that the *civic space remains intact although the 'plaza' has been fully converted to a parking lot and Babbitt's Store is missing. Because of this, the public plaza/central gathering space quality that existed during the period of significance is diminished. Additionally, the 1954 re-routing of South Entrance Road further diminished the importance of the space as all visitors entered the district from the east, rather than the south.* Minor beneficial impacts would result through construction of a SRM facility in the former Babbitt's Store location bringing activity back into this space. Negligible adverse impacts would continue to result because the primary entrance to the NHLHD occurs from the east instead of its historic pattern from the south.

The Village NHLHD CLR recommends new construction be minimized as much as possible and states, "If new facilities must be introduced, site them in previously developed or disturbed locations, such as the former site of Babbitt's Store at the intersection of Village Loop Drive and Center Road (NPS 2004)." Based on this information, and more recent discussions with the SHPO, construction of a facility such as this in the proposed location would fulfill this recommendation and have moderate beneficial impacts on the cultural landscape.

Cumulative Effects Alternative 2 implementation, combined with past, present, and reasonably foreseeable future actions, would result in minor adverse impacts to historic resources and cultural landscapes. Present and reasonable foreseeable future actions are carefully assessed to minimize adverse impacts to historic resources and cultural landscapes. Alternative 2 would result in moderate beneficial impacts and would lessen the overall adverse cumulative effect. Cumulative impacts under Alternative 2 would be minor adverse long term.

Conclusion Alternative 2 implementation would result in moderate beneficial long-term impacts to historic resources and cultural landscapes from appropriate NHLHD infill. Cumulative impacts would be minor adverse long term.

Alternative 3 – Construct New SRM Facility near Park Headquarters

Implementation of Alternative 3 would result in construction of a new SRM facility in the location of a former gas station near the Park Headquarters. Since the proposed building location is not in the NHL, the lack of infill where the historic Babbitt Brothers Store once stood would result in continued minor adverse impacts to the Grand Canyon Village NHL. New facility design and construction at this location would not impact the historic nature of the NHL.

Cumulative Effects Historic South Rim resources and cultural landscapes have been impacted as a result of modifications to historic buildings and structures, and intrusion of incompatible modern buildings into historic districts. In addition, deterioration of some buildings as a result of natural weathering and use has compromised defining architectural characteristics of structures. These past impacts are moderate adverse long term.

Recently implemented, in-progress and foreseeable future projects with potential to affect historic resources include the Historic Railroad Depot Rehabilitation, South Rim Visitor Transportation Plan, Bright Angel Trailhead Area Design Plan, Heritage Education projects, adaptive reuse of historic buildings, new construction within the historic district including fences and sheds, and ongoing maintenance of historic structures throughout the South Rim area. These projects have been or will be assessed for effects to historic resources, and discussed with the State Historic Preservation Officer (SHPO). Consultation with the park's cultural resource staff and SHPO would ensure any adverse impacts of future projects on historic resources would be minimized. Therefore, cumulative impacts to historic resources and cultural landscapes would be adverse minor long term.

Conclusion Alternative 3 implementation would result in minor adverse long-term impacts on historic resources and cultural landscapes from lack of infill in the Grand Canyon National Historic Landmark District. Impacts to historic resources and cultural landscapes outside the NHL would not be expected. Cumulative impacts would be minor beneficial long term.

Park Operations

Affected Environment

Park operations refer to adequacy of staffing levels and quality and effectiveness of park infrastructure in protecting and preserving vital resources and providing for effective visitor experience. Infrastructure facilities include roads providing access to and in the park, housing for staff required to work and live in the park, visitor orientation facilities, administrative buildings, management support facilities, and utilities such as phones, sewer, water, and electric. For this project, infrastructure with potential to be affected includes the existing Mission 66 buildings that presently house the SRM facilities as well as the infrastructure associated with the proposed new SRM facility.

The park Superintendent is ultimately responsible for GRCA park operations management. In 2008, the park employed 445 full-time staff (NPS 2009b) to manage operations including visitor services and facilities, resource management and preservation, planning and environmental compliance, emergency medical services, law enforcement, search and rescue operations, fire center operations, air operations, facilities management and maintenance, and administrative duties. Implementation of any of the alternatives will not affect staffing levels; however, each alternative would impact daily working conditions for approximately 40-50 of park SRM staff. Each action alternative would have varying facility design, construction, and maintenance costs.

Intensity Level Definitions

Negligible	A localized change in operations, barely perceptible or measurable. No measurable difference in operating costs from existing levels and no change in financial balance between revenue sources and operating costs. Park operations not affected or effect at or below lower levels of detection; no appreciable effect on park operations
Minor	A slight and localized change in operations with few measurable consequences to existing park facilities. Slight additions or reductions in operating costs from existing levels. Slight change in current staffing arrangements or operations required to reach a balance with funding
Moderate	An apparent change with measurable consequences to in-park facilities. Requires additions or reductions in operating costs from existing levels. Changes required in park operations or result in a financial imbalance between available funding and annual operating costs
Major	A readily apparent change with measurable consequences in and outside the park. Substantial additions or reductions in operating costs from existing levels. Changes require new administrative structures and/or result in a significant financial imbalance between available funding and annual operating costs
Context	All impacts to park operations would be localized

Alternative 1 – No Action

No measurable improvements or construction would occur under Alternative 1 and no change to current park operations would be necessary. Under the No Action Alternative, park staff would continue to minimally maintain buildings in the Mission 66 maintenance yard. SRM staff and facilities would remain in place as they presently exist. Under this alternative, maintenance costs are expected to increase over time, albeit slowly, as buildings age. Overall operational costs are expected to remain stable or slowly increase, as adjusted for inflation. An exception to this would be one-time costs associated with installation of a new roof, for example. Therefore, impacts to park operations under Alternative 1 would be adverse negligible to minor long term.

Cumulative Effects South Rim park operations have been affected through implementation of past projects. Past impacts are minor beneficial long term, and include increased efficiency and balance between funding and operational costs. Adverse long-term minor impacts have also resulted from increased operating costs. Most recently implemented, in-progress, and foreseeable future projects described at the beginning of this chapter have potential to affect park operations. These projects are reviewed for potential effects to park operations and created to minimize adverse impacts. Therefore, impacts to park operations would be adverse minor long term.

Conclusion Alternative 1 Implementation would result in negligible to minor adverse long-term impacts from continuation of park operations. Cumulative impacts would be beneficial minor long term.

Alternative 2 – Preferred Alternative

SRM building construction and associated road surfaces and parking would create a spike in operational costs, followed by an expected stability in maintenance costs, comparable to or less than those associated with Alternative 1. Consolidation of SRM administrative functions and offices into one facility would lead to improved park operations. Construction of a new facility under the preferred alternative would provide a working environment that meets current health and safety standards. Deficiencies, such as rodent infestations, poor heating, cooling and ventilation associated with the current Mission 66 yard facilities would not be present in the new building.

All project components would be planned for efficiency in park operations. Building materials would be durable and require minimal maintenance. SRM consolidation into one building in close proximity to other park operations would alleviate some traffic concerns and reduce congestion that impacts park operations. Development of new employee parking along Apache Alley would eliminate congestion concerns at parking lot C.

Cumulative Effects Alternative 2 Implementation combined with past, present, and reasonably foreseeable future actions would result in long-term minor beneficial impacts to park operations. As discussed above, beneficial impacts have occurred in the past as a result of increased efficiency and balance between funding and operational costs. Adverse impacts have also occurred due to increased operating costs. Present and reasonably foreseeable future actions are carefully assessed to minimize adverse impacts to park operations. Alternative 2 would add both adverse and beneficial impacts to the overall cumulative impact which would be minor beneficial long term.

Conclusion Implementation of Alternative 2 would result in minor beneficial long-term impacts to park operations from decreased maintenance needs at the new SRM building. Beneficial impacts would be long-term minor from SRM staffing consolidation into one building in closer proximity to other park facilities and divisions. Cumulative impacts would be minor beneficial long term.

Alternative 3 – Construct New SRM Facility near Park Headquarters

SRM building construction and associated road surfaces and parking would create a spike in operational costs, followed by an expected stability in maintenance costs, comparable to or less than those associated with Alternative 1. Consolidation of SRM administrative functions, offices, parking and storage into one area would lead to improved park operations. Construction of a new facility under the preferred alternative would provide a working environment that meets current health and safety standards. Deficiencies, such as rodent infestations, poor heating, cooling and ventilation associated with the current Mission 66 yard facilities would not be present in the new building.

All project components would be planned for efficient park operations. Building materials would be durable and require minimal maintenance. SRM consolidation into one building in close proximity to other park operations would alleviate some traffic concerns and reduce congestion that impacts park operations.

Cumulative Effects Alternative 3 Implementation combined with past, present, and reasonably foreseeable future actions would result in long-term minor beneficial impacts to park operations. As discussed above, beneficial impacts have occurred in the past as a result of increased

efficiency and balance between funding and operational costs. Adverse impacts have also occurred due to increased operating costs. Present and reasonably foreseeable future actions are carefully assessed to minimize adverse impacts to park operations. Alternative 3 would add both adverse and beneficial impacts to the overall cumulative impact which would be minor beneficial long term.

Conclusion Implementation of Alternative 3 would result in minor beneficial long-term impacts to park operations from decreased maintenance needs at the new SRM building. Beneficial impacts would be long-term minor from SRM staffing consolidation into one building in closer proximity to other park facilities and divisions. Cumulative impacts would be minor beneficial long term.

Unacceptable Impacts

As described in Purpose and Need, the NPS must prevent any activities that would impair park resources and values. The impact threshold at which impairment occurs is not always readily apparent. Therefore, the NPS will apply a standard that offers greater assurance that impairment will not occur. The NPS will do this by avoiding impacts it determines unacceptable. These are impacts that fall short of impairment, but are still not acceptable in a particular park environment. Park managers must not allow uses that would cause unacceptable impacts; they must evaluate existing or proposed uses and determine whether associated impacts on park resources and values are acceptable. Virtually every human activity taking place in a park has some degree of effect on park resources or values, but that does not mean the impact is unacceptable or a particular use must be disallowed. To determine if unacceptable impacts could occur to park resources and values, impacts of proposed actions in this EA were evaluated based on monitoring information, published research, and professional expertise, and compared to the guidance on unacceptable impacts provided in Management Policies 1.4.7.1 that defines unacceptable impacts as impacts that, individually or cumulatively, would

- Be inconsistent with a park's purposes or values, or
- Impede attainment of a park's desired future conditions for natural and cultural resources as identified through the park's planning process, or
- Create an unsafe or unhealthful environment for visitors or employees, or
- Diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values, or
- Unreasonably interfere with
 - Park programs or activities, or
 - An appropriate use, or
 - The atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations in the park
 - NPS concessioner or contractor operations or services

By preventing unacceptable impacts, park managers also ensure the proposed use of park resources will not conflict with conservation of those resources. In this manner, park managers ensure compliance with the Organic Act's separate mandate to conserve park resources and values. Using the bulleted guidance above, the following text analyzes potential for unacceptable impacts for all alternatives carried forward in this Environmental Assessment.

- All three alternatives are consistent with the park's purposes and values. The park was established to preserve, protect, interpret, and research the Grand Canyon and surrounding landscape. If no SRM building were constructed under Alternative 1 (No Action), then park

operations would continue to operate in their current manner, becoming somewhat more inefficient over time due to resources being expended for maintenance and upkeep of buildings used in a way not originally intended when constructed. However, these inefficiencies would not impede the park from maintaining its purposes and values as established in its enabling legislation. If the SRM building were constructed under Alternative 2 (Preferred) or Alternative 3, park operations would be improved, consistent with the park's enabling legislation. Implementation of any of these alternatives would not interfere with preservation of park natural and cultural resources

- No alternative impedes attainment of the park's desired future, and while Alternative 1 (No Action) would delay this action, it could still be considered in the future. Alternative 2 (Preferred) and Alternative 3 would construct a new SRM building consistent with the GMP intent to construct new facilities in disturbed areas. Alternatives 2 and 3 would construct a new SRM building to meet operational needs.
- Under these alternatives visitors would continue to have opportunities to enjoy, learn about, or be inspired by park resources and values. Alternative 1 (No Action) would maintain visitor use and experience exactly as it is now. Alternatives 2 (Preferred) and 3 would somewhat enhance visitor use and experience through providing a facility with access to research materials
- Each alternative would provide for employee work facilities that do not unreasonably interfere with park programs, an appropriate use, the natural atmosphere, or concessioner activities. Alternative 1 (No Action) would only involve construction-related activities during necessary building repairs, thereby causing short-term disturbance and possible displacement of employee work areas. During SRM facility construction under Alternative 2 (Preferred) or Alternative 3, there would be short-term temporary visitor and employee disturbances as a result of noise, dust, more limited parking, trail closure, and construction equipment. These inconveniences would be limited to the construction period only

Overall, analysis of effects on resources, park operations, and employee and visitor health and safety indicates there are no major adverse effects under Alternatives 1-3; effects were analyzed as negligible to moderate. Based on this, and the above analysis, there would be no unacceptable impacts from these alternatives.

Impairment

NPS Management Policies 2006 require analysis of potential effects to determine whether or not actions would impair park resources. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid or minimize to the greatest degree practicable, adversely impacting park resources and values.

However, the laws do give the NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill park purposes, as long as the impact does not constitute impairment of affected resources and values. Although Congress has given the National Park Service management discretion to allow certain impacts in park, that discretion is limited by the statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. Prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values. An impact to any park resource or value

may, but does not necessarily, constitute impairment, but an impact would be more likely to constitute impairment when there is a major or severe adverse effect upon a resource or value whose conservation is

- necessary to fulfill specific purposes identified in the park's establishing legislation or proclamation;
- key to the park's natural or cultural integrity; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. The NPS threshold for considering whether there could be impairment is based on whether an action would have major (or significant) effects. This EA identifies less than major effects for all resource topics. Guided by this analysis and the Superintendent's professional judgment, there would be no impairment of park resources and values from implementation of any one of these alternatives.

CONSULTATION AND COORDINATION

Internal Scoping

As discussed in Purpose and Need, this project has been in discussion for well over a year. In 2008, the park, in partnership with Northern Arizona University, offered students opportunity to be involved in SRM facility planning. A team of students and faculty mentors reviewed current and future SRM facility needs and developed recommendations to improve efficiency, safety, comfort, and sustainable practices as defined by the LEED criteria. A site visit and interviews with park, Xanterra, and Grand Canyon Association staff further informed the process. The final student report determined the current SRM office location at the Mission 66 maintenance yard area is not likely suitable for SRM offices due to heavy traffic associated with neighboring storage and distribution areas. It was recommended the most sustainable use for this area would be as a storage and distribution area for park and concessionaire operations. Information gained in this process was used in preparation of this EA.

Internal scoping on an SRM building was conducted by an interdisciplinary team of Grand Canyon National Park professionals in an open house format on March 25, 2009. Additional meetings were held May 21, 2009 and July 9, 2009. During these meetings, staff discussed the purpose and need for the project; various alternatives; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and possible mitigation measures. Over the course of the project, team members have conducted individual site visits to view and evaluate all proposed construction sites. Results of meetings and discussions among the interdisciplinary team and park management were used in preparation of this EA.

External Scoping

External (public) scoping was conducted between April 6 and May 6, 2009 to provide information and solicit comments on the proposal to develop a new GRCA SRM facility. A public scoping letter was mailed to the park's approximately 280-person list as well as interested agencies and Native American tribes.

Public Comment

In November, 2009, GRCA released a similar EA which evaluated two action alternatives. This EA was prepared to respond to comments received from the public and from agency staff during the comment period on the 2009 EA. A primary change is that this document analyzes two action alternatives, one of which was dismissed in the 2009 EA. Other comments responded to in this document include clarification of various issues, including parking, building location and access, vegetation removal and consistency with the GMP.

Agency Consultation

In accordance with the Endangered Species Act, the National Park Service contacted the U.S. Fish and Wildlife Service regarding Federally listed special status species, and in accordance with National Park Service policy, the National Park Service also contacted the Arizona Game and Fish Department regarding state-listed species. The USFWS responded with a list of species in a letter dated April 27, 2009. Following the USFWS response and review of the batch consultation biological assessment for parkwide construction projects in the park (NPS 2002), the park's Wildlife Biologist and Section 7 Coordinator determined the Preferred Alternative would have no effect on special status species (Ward 2009, Noojibail 2009) if appropriate mitigation measures were included in this EA.

In accordance with National Historic Preservation Act Section 106, the NPS provided the Arizona State Historic Preservation Officer opportunity to comment on project effects. This letter was sent May 14, 2009. Several informal conversations about the project and one site visit have occurred between park staff and the SHPO. The park will formally consult with the SHPO with preliminary building designs prior to project initiation.

Native American Consultation

All affiliated Native American tribes were contacted during EA development to determine any project area ethnographic resources, and who wanted to be involved in the environmental compliance process, including the Havasupai Tribe, Hopi Tribe, Hualapai Tribe, Kaibab Band of Paiute Indians, Las Vegas Paiute Tribe, Navajo Nation, Paiute Indian Tribe of Utah, Pueblo of Zuni, San Juan Southern Paiute Tribe, White Mountain Apache, and Yavapai-Apache Nation. A letter was sent September 3, 2009. One response was received from the Navajo Nation stating the project will not impact any Navajo traditional cultural properties.

Environmental Assessment Review and List of Recipients

This environmental assessment will be released for public review in November 2009. To inform the public of EA availability, the NPS will publish and distribute a press release to various agencies, tribes, and members of the public on the park's mailing list. Copies of the environmental assessment will be provided to interested individuals upon request. Copies of the document will also be available on the internet at <http://parkplanning.nps.gov/grca>.

This EA is subject to a 30-day public comment period. During this time, the public is encouraged to submit their written comments to the National Park Service address provided at the beginning of this document. Following the close of the comment period, all public comments will be reviewed and analyzed, prior to the release of a decision document. The National Park Service will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the environmental assessment as needed.

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 Cumulative Impact, 40 CFR 1508.7 www.nepa.gov/nepa/regs/ceq/1508.htm
 Endangered Species Act, 1973, Public Law 93-205 www.gpoaccess.gov/uscode
 Farmland Protection Policy Act, 1981, Public Law 97-98 www.thomas.loc.gov
 General Authorities Act (National Park Service), 1970 and 1978, Public Law 91-383; 94-458
www.gpoaccess.gov/uscode
 National Environmental Policy Act, 1969, Public Law 91-190, 42 U.S.C. 4321-4347
www.nepa.gov/nepa/regs/nepa/nepaegia.htm
 National Historic Preservation Act, 1966, 16 U.S.C. 470 et seq. available online at
www.gpoaccess.gov/uscode
 National Park Service Organic Act, 1916, 16 U.S.C. 1 2 3, and 4 available online at
www.planning.nps.gov/document/organic_act.pdf
 Secretary of the Interior's Standards for the Treatment of Historic Properties (including
 Guidelines for the Treatment of Cultural Landscapes, 36 CFR 68 available online at
www.nps.gov/history/hps/tps/standguide/

National Park Service Director's Orders referenced in this document are available online at
www.nps.gov/applications/npspolicy/DOrders.cfm

Director's Order 12	Conservation Planning, Environmental Impact Analysis, and Decision-Making
Director's Order 28	Cultural Resources Management
Director's Order 28-A	Archaeology
Director's Order 47	Soundscape Preservation and Noise Management
Director's Order 77	Natural Resources Management
Director's Order 77-1	Wetlands Protection
Director's Order 77-2	Floodplain Management

Executive Orders referenced in this document are available online at
www.archives.gov/Federal-register/executive-orders

Executive Order 11990	Protection of Wetlands
Executive Order 11988	Floodplain Management
Executive Order 12898	General Actions to Address Environmental Justice In Minority Populations and Low-Income Populations
Executive Order 13007	Indian Sacred Sites

Secretarial Orders referenced in this document are available online at www.usbr.gov/mp/ccao/newmelones/RMP/RIR/5.0-Indian_Trust_Assets.pdf
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ACRONYMS

CCC	Civilian Conservation Corps
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLR	Cultural Landscape Report
COR	Contracting Officer's Representative
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMS	Emergency Management Services
FMD	Facilities Management Division
GCA	Grand Canyon Association
GMP	General Management Plan
GRCA	Grand Canyon National Park
HEC	Heritage Education Campus
LEED	Leadership in Energy and Environmental Design
MSO	Mexican Spotted Owl
NEPA	National Environmental Policy Act
NHLD	National Historic Landmark District
NHPA	National Historic Preservation Act
NPS	National Park Service
SF	Square Feet
SHPO	State Historic Preservation Officer
SRM	Science and Resource Management
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service

APPENDIX A SITE SELECTION CRITERIA AND ANALYSIS (CRITERIA LISTED IN ORDER OF IMPORTANCE)²

Criteria	Site A Old Babbitt Store (Alternative 2)	Site B Service Station (Alternative 3)	Site C New FMD Area (Dismissed)	Site D Current Location (Alternative 1)
Site Description	Store Footprint was ~7,500 SF	Old Mission 66 Service Station	Developed and undeveloped land	Powell, Dutton, McKee buildings
Previous and/or existing use	Retail; later uses such as library and pub; now vacant lot	Gasoline, product sales, vehicle repair; now vacant lot	Developed for FMD, helibase and transportation, or forested	Mission 66 era maintenance yard; gas pumps; warehouses
Developable Area	18,000 SF	24,000 SF	As needed	Few constraints
Sustainability				
Will proposed use create negative environmental impacts?	No	No	No	No
Does site lend itself to environmentally sustainable and energy efficient design?	Yes	Yes, but less so than Site A due to orientation	Yes building; no with respect to commuter time and costs	No; buildings can't be reasonably retrofitted for sustainability
Can topographic features and landscape reduce impact of potential natural hazards (e.g. minimize flood risk, modify wind speed/direction?)	No known natural hazards	No known natural hazards; however, elevation and exposure will make lightning protection mandatory	No known natural hazards; however, elevation and exposure will make lightning protection mandatory	No known natural hazards
Is site served by existing greenway/ bike trails?	Yes	No	No	Yes
Will user travel to site require minimum energy?	Yes, with respect to housing and other offices	No	No	No
Site Master Planning Characteristics				
Is site sufficient to accommodate core program needs?	Yes	Yes; may require onsite parking construction	Yes; may require onsite parking construction	No
Is site capable of accommodating efficient building footprints and flexible building layouts, including subsurface construction?	Yes; however, foundations of previous building may preclude building at extreme north end of site adjacent to existing parking lot	Yes; however, location of previous building in center of site may pose additional adverse conditions	Yes	Yes
Is proposed use compatible with surrounding uses, character/scale?	Yes; occupancy type and adjacent building scale consistent with new	Yes; forest to east/southeast provides buffer between new	Somewhat; may be possible to leave existing forest stands as buffer	No; no buffers from adjacent industrial and transportation land uses

² Sites A-D are shown on Figure 5

Criteria	Site A Old Babbitt Store (Alternative 2)	Site B Service Station (Alternative 3)	Site C New FMD Area (Dismissed)	Site D Current Location (Alternative 1)
	facility plans	facility and visitor lodging facilities	with more industrial adjacent land uses	
Does site require new or updated infrastructure?	No	No	Depends on location; basic infrastructure in vicinity	No
How proximate is site to existing housing?	Fairly close proximity	Not proximate; located some distance	Not proximate; located fairly great distance	Not proximate; located some distance
Does site have attractive features such as open spaces, buffer zones, views?	Yes, natural and cultural features; located within ¼ mile of canyon rim	Limited; site backs the forest, fronts main park road and is within ½ mile of rim	Limited; forested areas exist for buffer zones	No; fully developed industrial site lacks attractive features
Will proposed use affect surrounding neighborhoods?	Slight increase in traffic; natural buffers to residential areas	Slight increase in traffic	No; slight increase in traffic would be consistent with surrounding area	Proposed use would prohibit area from being developed for further GMP-envisioned industrial use
Does site help visibility of project to park visitors?	Yes, which is desirable in this case	Yes, which is desirable in this case	No	No
Conformance with GMP				
GMP provisions	Indicates new building site for "Visitor and Community Services"; infill consistent with provision to build in disturbed areas	Indicates site be converted to transit use	Indicates that "all of the land....and expanding into undisturbed forested lands" will be for FMD, transportation, etc.	Indicates site be used by concessionaire for operation and transportation needs
Is site development consistent with GMP?	Yes	No	No	No
Does site pose any health and safety issues?	No	Maybe; possible soil contamination from Service Station operations	No	Traffic type and volume concerns as well as fumes from gas tanks when being filled
Is site area adequate for proposed project?	Yes	Yes	Yes	Yes
Does site area allow possible future expansion?	Yes	Yes	Yes	Yes
Is site location in proximity to related functions?	Yes	Yes	No	No
Is site previously disturbed?	Yes	Yes	No for land not used for FMD, etc.	Yes

Criteria	Site A Old Babbitt Store (Alternative 2)	Site B Service Station (Alternative 3)	Site C New FMD Area (Dismissed)	Site D Current Location (Alternative 1)
Circulation, Parking and Accessibility				
Is site served well by existing streets?	Yes	Yes	Yes	Yes
Is site served by public transit?	Yes	Not at present, but planned	No, and none planned	No, and none planned
To what extent will site affect/be affected by existing traffic patterns?	Additional parking on Apache Alley could affect traffic at Village Loop Road intersection. Alley access from east (Apache Street) would be limited to residents	May have slight effect on Yavapai/South Entrance Road intersection	May have a noticeable impact on existing vehicular traffic on Shuttle Bus Road	No affect
Can site accommodate well-organized and efficient site vehicular circulation (e.g., loading, delivery)?	Yes, design limits onsite vehicular circulation to deliveries/service only. Passenger drop off/loading in existing north side parking lot	Yes	Yes	Yes, site currently used for these vehicle types
What will be travel time for users (home/work, work/storage)?	Minimal from in-park housing and to/from SRM storage area	Additional time required from in-park housing and to/from SRM storage area; Market Plaza can be congested	Maximum time required from in-park housing and to/from SRM storage area	Additional time required from in-park housing and to/from SRM storage area
Do conditions at site pose extreme difficulty in accommodating disabled users?	Site is sloped but only moderately; accommodation achieved without undue effort or cost	No	Accommodation will likely be achieved without undue effort or cost	No
Financial				
Is site capital development affordable?	Yes. Additional costs of relocating primary electric and telephone lines should be anticipated	Yes	Yes, but results in additional land development costs (tree removal, fill, utility extension)	Yes, although costs for rebuild or an extensive remodel would be high
Are site operational costs affordable?	Yes, especially if design incorporates energy saving features and low- maintenance materials			
Will site development replicate existing facilities and cause abandonment or under-use of existing facilities?	No	No	No	Yes; this site is less desirable in part because of these impacts
Will development of site appeal to	Yes	Possibly	Possibly	Unlikely

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potential donors?				
Is site presently served with utilities?	Yes	Yes	Yes; less proximal than other sites	Yes
Existing Site Features				
Is site previously developed and uncontaminated?	Yes	Yes	Not previously developed	Yes
Is existing green space onsite?	Yes	No, but adjacent to site	Yes	No
What proportion of the site is currently occupied by green space?	~20%	None	Most areas are green space, some of which would be lost due to development	None
Could existing green space be easily expanded to other site areas?	Yes	Yes	Yes	N/A
Are there existing impermeable surface areas on site?	No, but soil compacted from earlier development	No, but soil likely highly compacted from earlier development	No	Yes
Does site have storm water run-off problems?	Existing drainage ditch and culvert flank site's east side and appear to carry storm water to Bright Angel Wash. Design would attempt to limit impermeable site surfaces to absolute minimum	No	No	Possibly
What is site natural hydrology? Are hydrological characteristics beneficial or negative?	Beneficial	Beneficial	Beneficial or negative depending on exact location of building site	Unknown
Do prevailing winds favor the site?	No	No	No	No
Does existing topography or structures create high or low pressure areas?	No	No	No	No
Do existing topographic or vegetative elements on, or adjacent to, site	No	No	Possibly	N/A

Criteria	Site A Old Babbitt Store (Alternative 2)	Site B Service Station (Alternative 3)	Site C New FMD Area (Dismissed)	Site D Current Location (Alternative 1)
cause shading issues?				
Is existing shading useful or a problem respecting solar gain?	Benign	Benign	Benign	No shading exists
What is site orientation?	N/S	NW/SE	TBD	E/W
Is long axis N/S or E/W?	N/S	No long axis	TBD	E/W
What are site sun angles/azimuths?	TBD	TBD	TBD	TBD
Does site offer potential for views?	Views of historic district; vegetation	Views of forest	Views of forest	No
Is site scenery positive or negative in character?	Positive	Positive	Positive	Negative
Is wildlife prevalent on site or in environs?	Yes	Yes	Yes	No
Other				
Is Sec 106 action required?	Yes	Yes	Yes	Yes
Do site conditions allow for immediate development?	Yes	Yes	No	Yes if redesign and remodel, work around employees