

SECTION II

ALTERNATIVES

Alternatives considered for analysis must be consistent with Glen Canyon NRA enabling legislation as well as the existing GMP and must meet the purpose and need for action as defined in this EA. These considerations, as well as input from interdisciplinary team members and members of the public, formed the basis of the two alternatives that were developed; Alternative A, the no action alternative, and Alternative B, the management action alternative.

Alternatives Considered

Alternative A: Continue With Current Management/No Action Alternative

Under this alternative, no changes from current placement, size, use or management of facilities at Lees Ferry would be implemented. The Current Development Concept Plan for Lees Ferry, which was written in 1980, identifies the boundaries of the developed area and proposed renovations, most of which have not taken place.

Alternative B: Proposed Upgrades and Improvements

The proposed projects in this alternative can be grouped by their association with specific features of the Lees Ferry area. These features include the Lees Ferry Compound area, the Paria River, the ramp area, communications area and Lees Ferry access road. The proposed construction schedule for these projects is seven to ten years, depending on availability of funding.

Impacts to Cultural Resources and §106 of the National Historic Preservation Act

In this EA, impacts to cultural resources are described in terms of type, context, duration, and intensity, which is consistent with the regulations of the Council on Environmental Quality that implemented the National Environmental Policy Act. These impact analyses are intended, however, to comply with the requirements of both NEPA and §106 of the National Historic Preservation Act (NHPA). In accordance with the Advisory Council on Historic Preservation's regulations implementing §106 of the NHPA (36 CFR Part 800, Protection of Historic Properties), impact to cultural resources were also identified and evaluated by; 1) determining the area of potential effects; 2) identifying cultural resources present in the area of potential effects that are either listed in or eligible to be listed in the National Register of Historic Places; 3) applying the criteria of effect to National Register eligible or listed cultural resources that may be impacted; and 4) considering ways to avoid, minimize or mitigate adverse effects.

Under the Advisory Council's regulations a determination of either adverse effect or no adverse effect must also be made for affected National Register listed or eligible cultural resources. An adverse effect occurs whenever an impact alters, directly or indirectly, a characteristic of a cultural resource that qualifies it for inclusion in the National Register, e.g. diminishing the integrity (or the extent to which a resource retains its historic appearance) of its location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the alternatives that would occur later in time, be farther removed in distance or be cumulative (36 CFR 800.5, Assessment of Adverse Effects). A determination of

no adverse effect means there is an effect, but the effect would not diminish the characteristics of the cultural resource that qualify it for inclusion in the National Register.

CEQ regulations and the NPS Conservation Planning, Environmental Impact Analysis and Decision Making (Director's Order #12) also call for a discussion of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g. reducing the intensity of an impact from major to moderate or minor. However, any resultant reduction in intensity of impact due to mitigation is an estimate of the effectiveness of mitigation under NEPA only. The level of effect as defined by §106 may not be similarly reduced. Cultural resources are non-renewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under §106 may be mitigated, the effect remains adverse.

Projects included in Alternative B

Rehabilitate Drainage Structures Located along Lees Ferry Access Road, including Cathedral Wash and No Name Wash.

This project would rehabilitate roadway drainage on Glen Canyon NRA Lees Ferry access road (See Map 4) from Marble Canyon (SR 89A) to the boat launching ramp at the Colorado River; a distance of 5.78 miles. Much of the existing drainage is undersized, susceptible to clogging or erosion, difficult to clean and maintain, and inadequately designed and constructed. The roadway is located in an extremely erosive geologic formation. As a consequence, surface water carries and deposits large quantities of sediment into ditches and drop inlets filling them and flooding the road. This creates a hazard for vehicular traffic as storm water runoff erodes graded ditches and road side fill slopes. Some roadway culverts are undersized and/or improperly aligned. The hydraulic structure crossing No Name Wash is often overtopped, leaving heavy deposits of soil on the road surface and eroding the roadway prism to the extent that it jeopardizes travel. Undersized collection features and conveyances such as inlet basins and down drains, paved ditches, urban section ditches, and curbs are subject to overflow. Surface drainage is not properly collected and transported to protected discharge points. Many drainage structures are also experiencing severe outlet erosion (see Figures 1, 2 & 3). All these effects are sufficient to jeopardize the roadway prism and travel way (See Map 4)

Ditches must be cleaned by hand because their design does not allow mechanized roadway maintenance equipment to be used. Additionally, an earthen berm and several spur dikes protecting the road that parallels Cathedral Wash constantly require reconstruction. The effect of all these issues is that the cost of maintenance in personnel and equipment is very high and correcting the drainage issues on this roadway would save the park staffing and cost and would also provide a safer road surface for the traveling public when visiting the Lees Ferry Area.

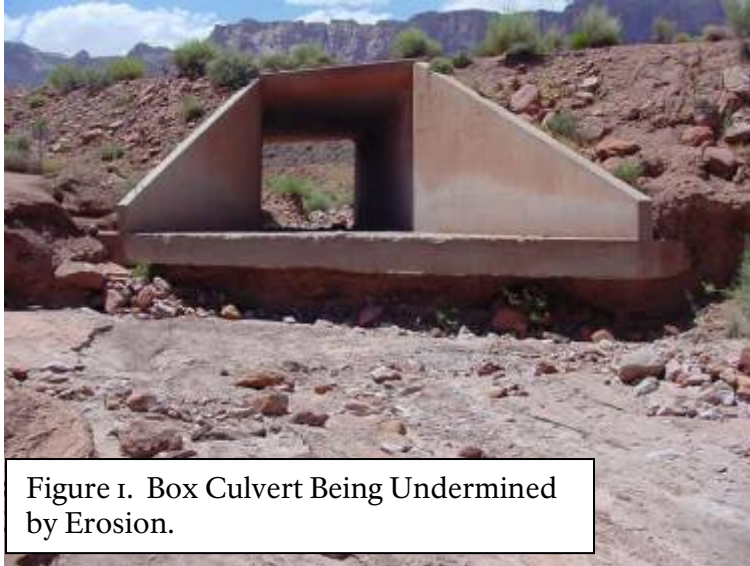


Figure 1. Box Culvert Being Undermined by Erosion.



Figure 2. Metal Culvert Being Undermined by Erosion.

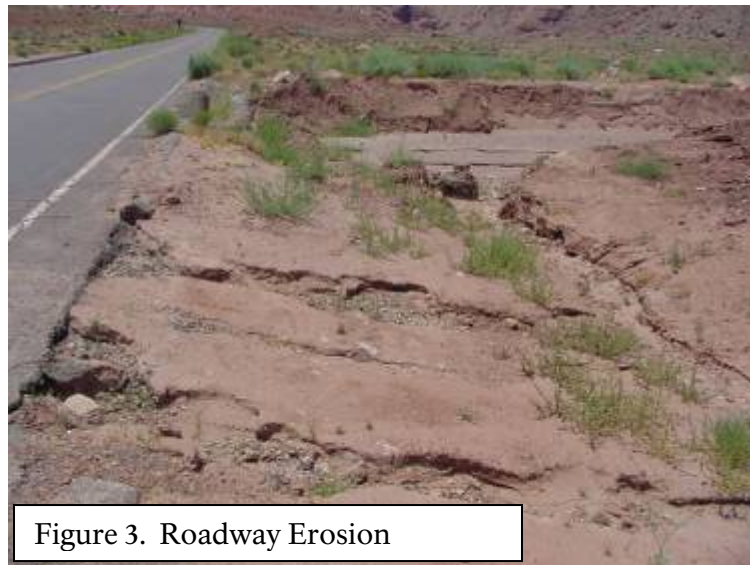
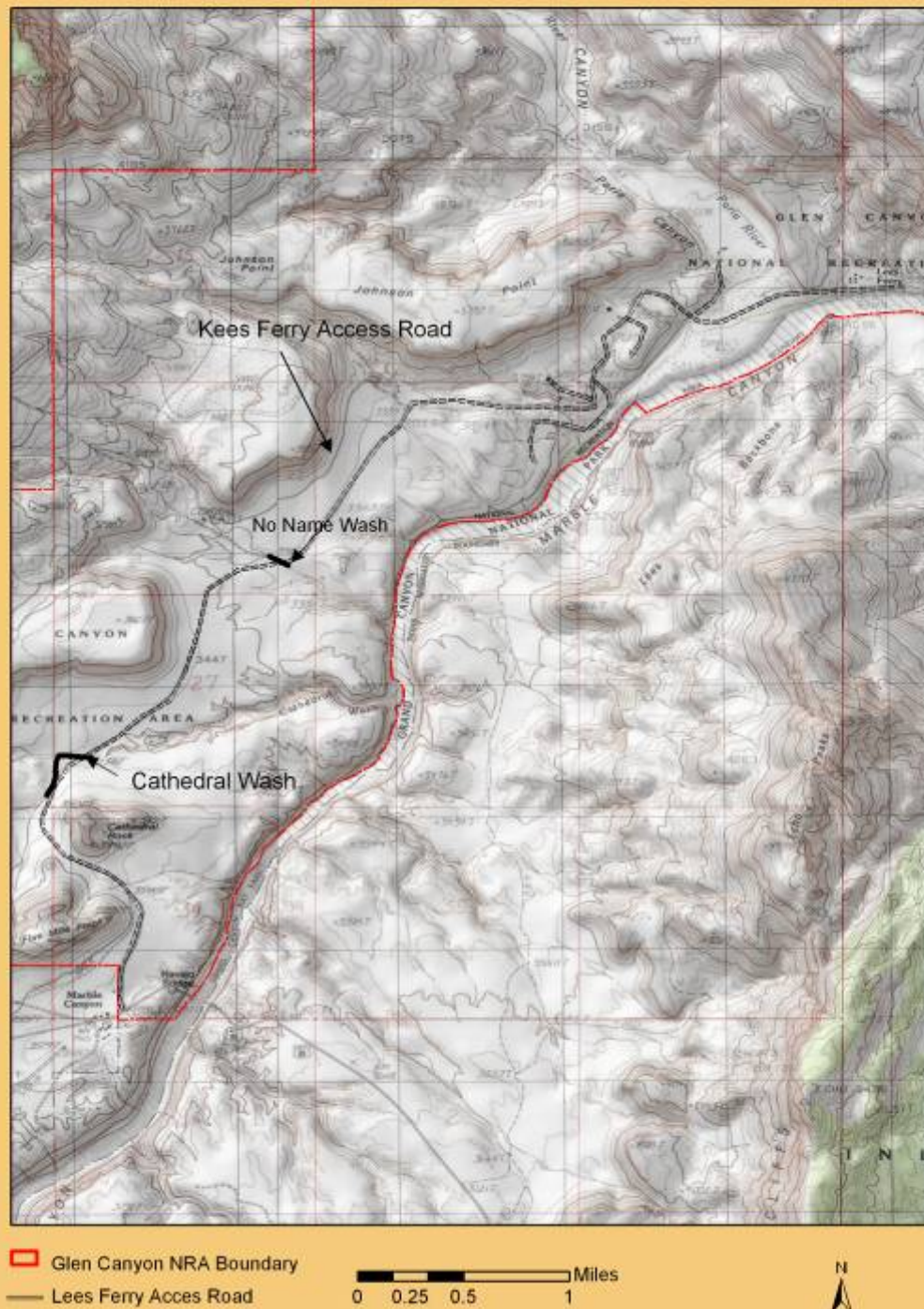


Figure 3. Roadway Erosion

The project would fix the drainage deficiencies on this roadway by installing properly designed drainage features (including box and metal culverts) and repairing existing erosion damage and providing protection against future erosion. This project would also include the installation of self- cleaning culverts where possible. It would also include the installation of concrete curbs, paved rundown ditches, down drain culverts, rock filled wire basket outlet protection and check dams to manage runoff and reduce erosion. Additionally, all roadside drainage ditches would be converted from U- ditches to V- ditches (refers to shape of ditch sides) so that mechanized cleaning methods can be used. Design would minimize visual impact by burying oversized culverts and/or using black or stained pipe, staining light colored rock filled wire baskets and other construction materials.

**Map 4. Drainage Structures Located
Along Lees Ferry Access Road**



Lees Ferry Compound Upgrade

This project addresses a coordinated, staged development of three projects. The individual projects include the replacement and upgrade of the existing facilities: the Grand Canyon NP Contact Station, the Maintenance Facility and the Water Treatment Facility (see Figure 3). All improvements will be located within the existing footprint of the current compound area. The compound area, which is approximately .72 acres, is located directly west of the 14- day parking area (see Figures 4 & 5).

The current Grand Canyon NP contact station, which is a double wide trailer (1310 square feet in size) placed in the compound in 1978, will be replaced with a new modular structure, approximately 1800 square feet in size. This building will be relocated toward the entrance of the compound in order to more easily receive orientation groups for down river trips. This building is intended to function as a Grand Canyon NP administrative center, not as a visitor center. Additionally, a storage structure and a boat shade structure dedicated to Grand Canyon NP activities will be incorporated in the compound's layout.

The upgraded Lees Ferry Maintenance Facility will include a 2000 square foot multi- function building and a 384 square foot enclosed storage building. In addition, shade structures for the maintenance and law enforcement ranger boats, backhoe, and a hazardous materials storage structure will complete the upgrades. The grounds will be paved in the high use areas with asphalt pavement and Portland cement concrete and will include a vehicle wash area with an oil/water separator (see Figure 6).

Installed in 1977, the existing water treatment plant and its associated features will be replaced with a modern facility that has the necessary equipment to meet current and future environmental codes and regulations. This facility will include pumps and storage tanks.

Wherever possible, like structures and functions, such as shade structures, will be combined to save space, materials and cost. Visual impact of the maintenance facilities will be reduced, where possible, by locating these behind the contact station and by screening. Vehicular and pedestrian traffic patterns will be reviewed to optimize space and reduce conflict.

The project includes the demolition and/or removal of existing structures, including removal of existing concrete pavement. Construction includes the excavation for foundations. Foundations must be of suitable depth and plan size to accommodate structure loads and soil conditions. Electricity, telephone, potable water, and waste water utilities exist, but will require some realignment and/or extension to the new structures. Disturbance will only be within the previously affected areas. A new egress road will allow pull through access. This road will start and end in the 14- day parking lot. The contact station will be American with Disability Act (ADA) accessible. Once construction is completed, the compound will be fenced to provide security for the water treatment plan, equipment, and buildings.



Figure 4. Front Entrance to Lees Ferry Compound

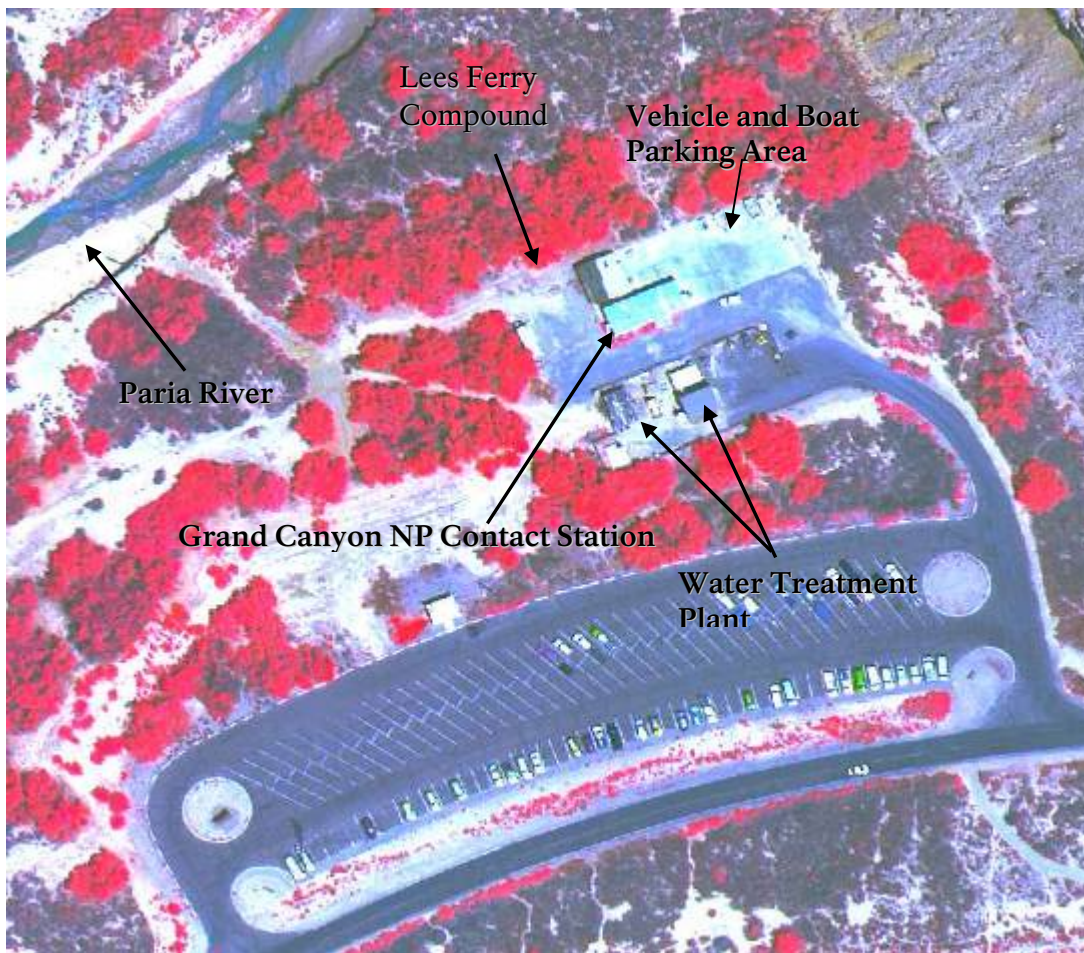
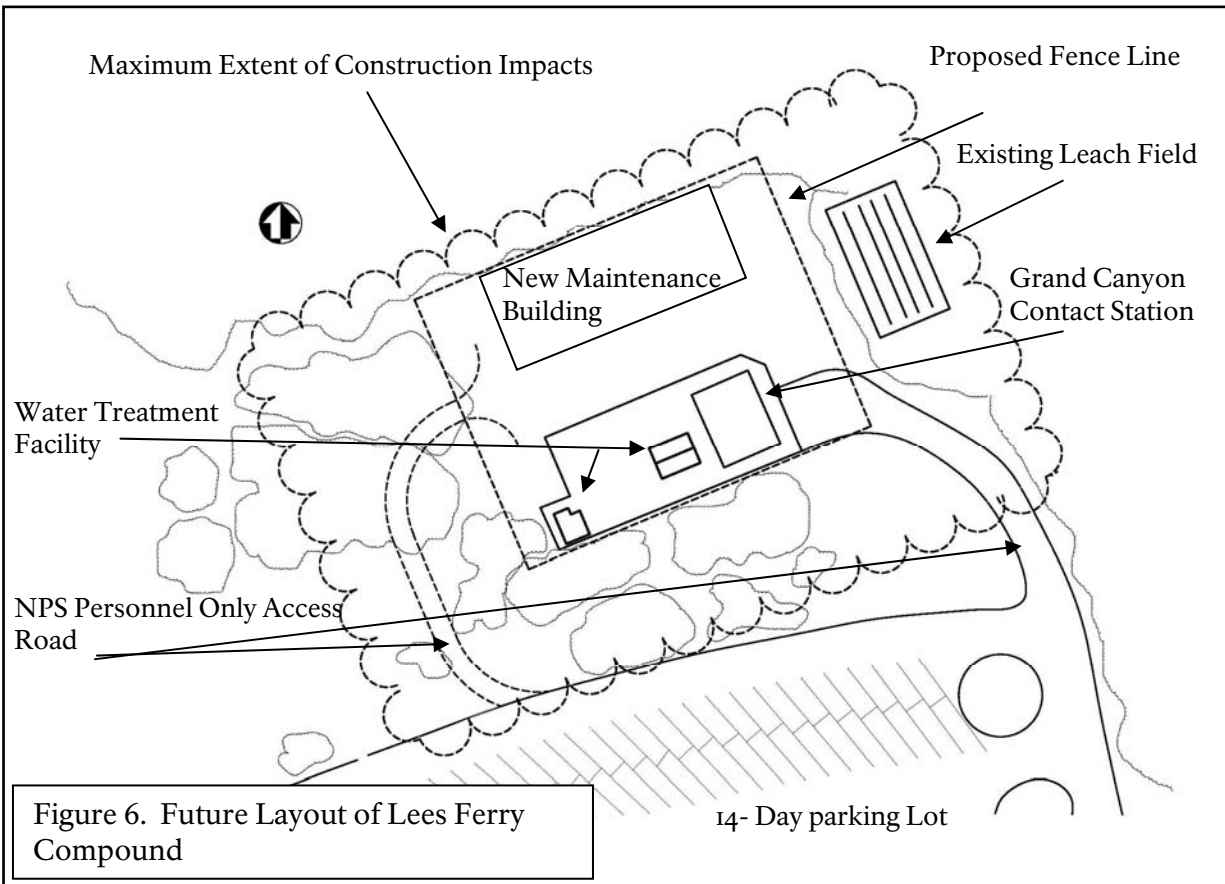


Figure 5. Current Layout of Lees Ferry Compound



Remove Curb at Graded Raft Launch Ramp

The original configuration of the graded raft launch ramp, built in 1960's era, included the placement of a large concrete curb that extends from the top of the south side of the ramp to the access road and parking area. Over the last 10 years the ramp size has been increased to the south, causing the curb to become a safety impediment to ramp users. Removal will require the demolition of the curb, movement of a large informational sign and associated electrical power and a large trash dumpster (see Figure 7). Once these items are removed or relocated, the site will be filled with appropriately sized river gravel and compacted for use and curb will be replaced. This should alleviate some of the congestion at the ramp by providing private parties with the ability to back straight down to the river. The non- native tamarisk trees will be replaced by a small shade structure and picnic tables.



Figure 7. Aerial Photograph of Ramp Area at Lees Ferry

Replacement of Floating Courtesy Dock.

The current floating courtesy dock was installed in 1982 and is comprised of interlocked floating chambers with a non-skid surface, shore-based supports and anchors and a large information sign. This dock is generally used by day visitors wishing to see the Colorado River up close and passengers embarking and disembarking from motor boats, rafts, kayaks and canoes headed upriver toward Glen Canyon Dam (see Figure 8). While the downriver trip passengers may use the dock to get a good look at the river, they generally do not embark or disembark by way of this dock. The integrity of the current dock has been compromised by collisions with boats and river flood debris. While a patch-work of repairs has kept the dock usable, replacement is the only choice to ensure visitor safety (see Figures 9 & 10). The new dock system would be manufactured at the factory and trucked to Lees Ferry. Once there, the old dock system would be removed via the ramp and the new

one floated into place. Replacement of this system assumes that the anchors, entrance ramp, and shore-based supports would also need to be replaced at the same time.

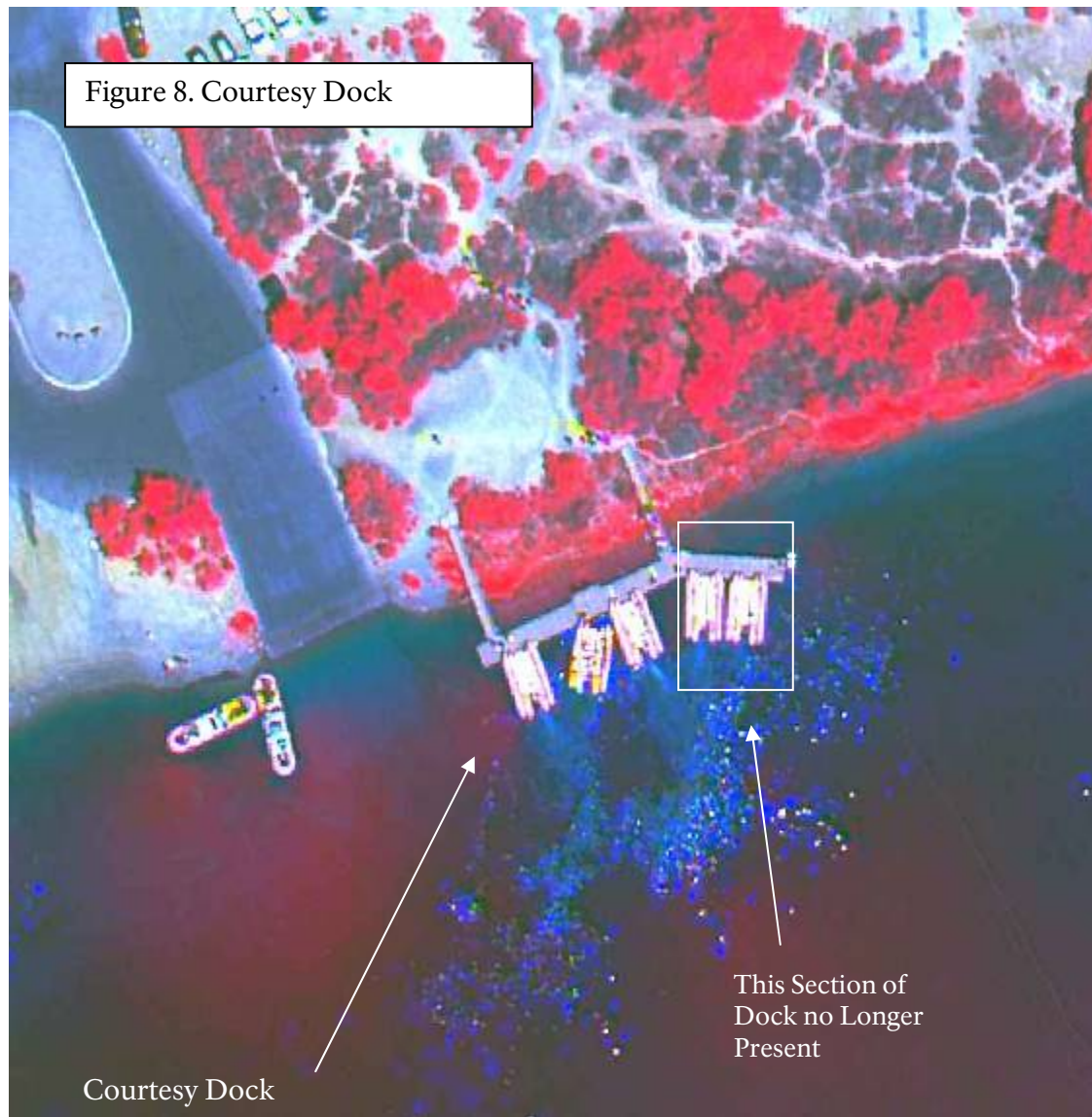




Figure 9. Courtesy Dock South End Support and Access Ramp

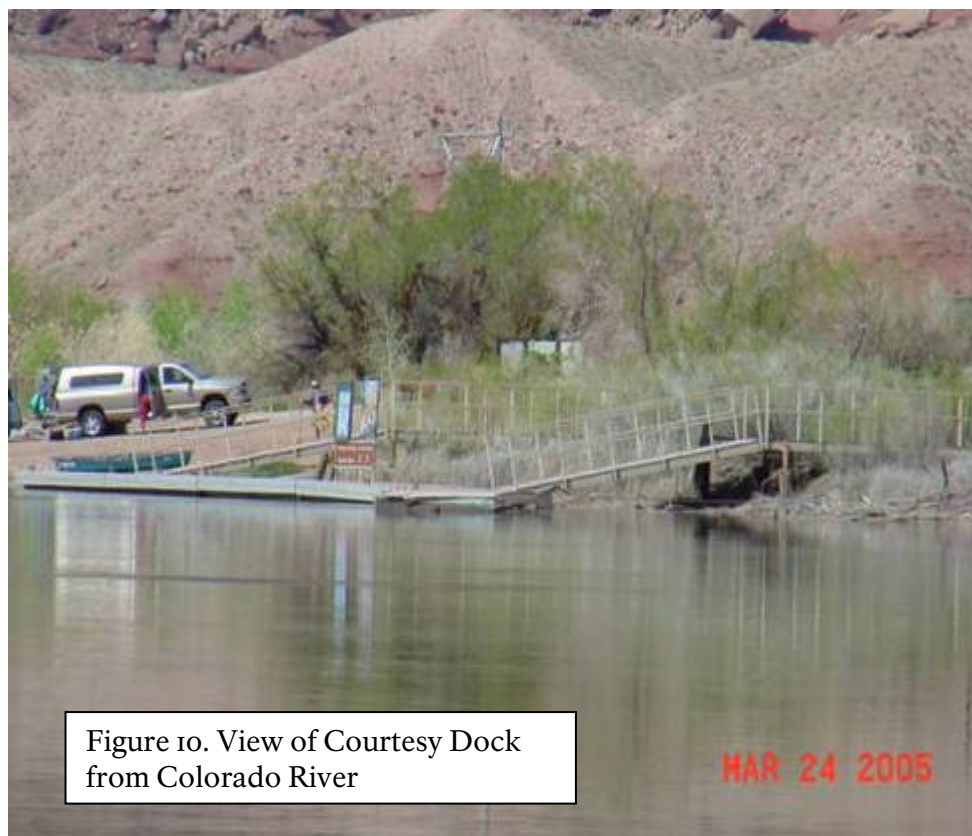


Figure 10. View of Courtesy Dock from Colorado River

Replacement of Potable Water Intake at the Colorado River

The current Potable Water Intake (see Figures 11 and 12), which consists of a collection field (a wet sink lined with rocks), a screened intake pipe located in the river and a wet well with pump and transfer pipeline (located on dry land); all which were constructed in 1977.

The raw water taken from the Colorado River is high in sodium compounds, which over time has corroded the metal intake pipe and screen, internal workings of the pump and the metal transfer pipeline. This project would require the temporary removal of the rocks lining the wet sink, the

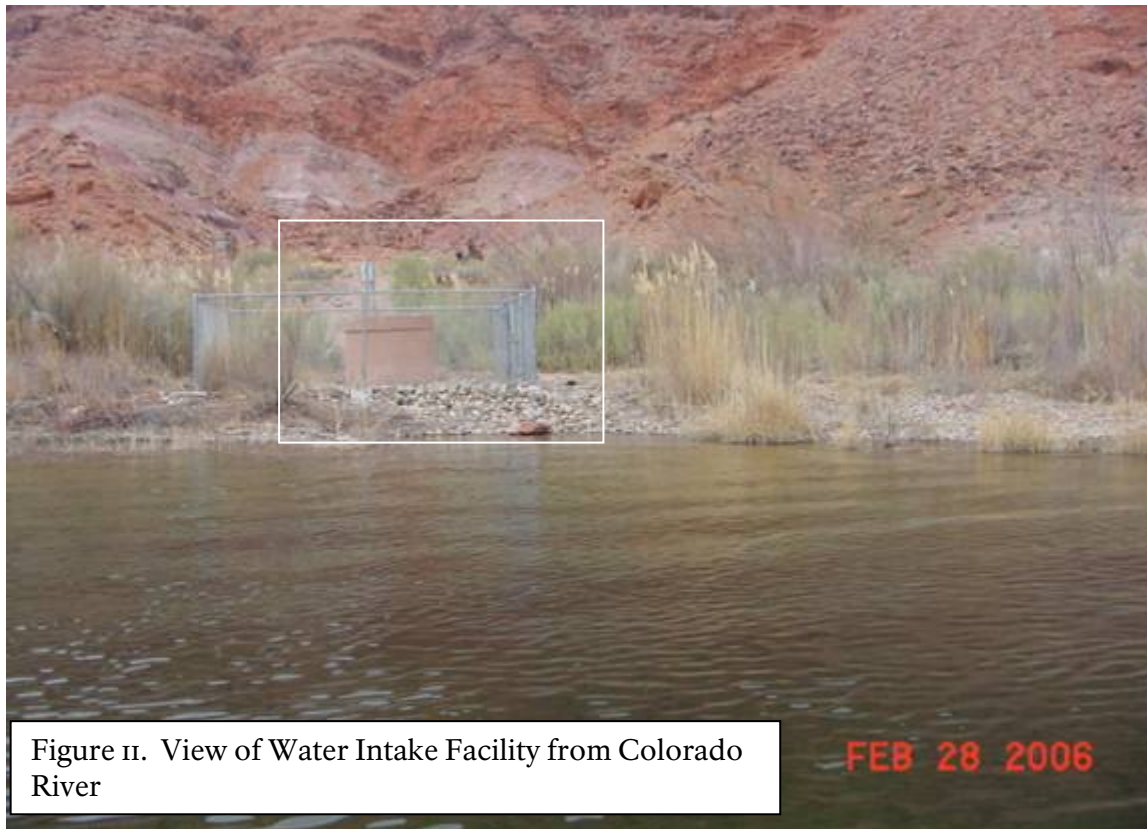
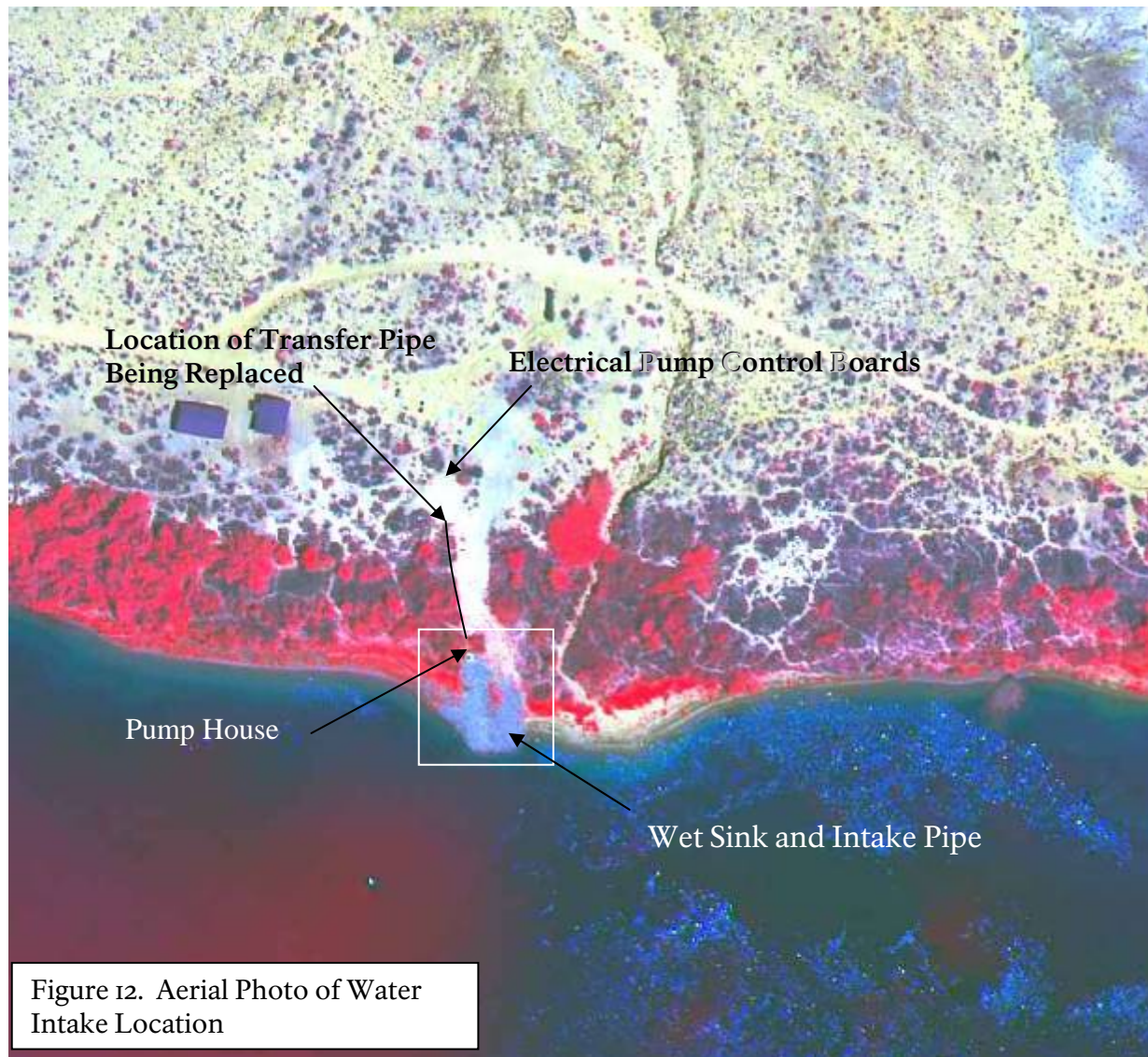


Figure 11. View of Water Intake Facility from Colorado River

replacement of the intake pipe and rocks in wet sink being returned. Additionally, the existing well pump will be overhauled if possible or replaced if too badly corroded and the transfer pipeline will be replaced from the pump to the junction with the distribution pipeline. All the work will take place within the existing disturbed area.



Install Narrowband Repeater for Grand Canyon National Park On the Paria Plateau Overlooking Lonely Dell Ranch.

The proposed project would require the placement of a narrowband radio repeater at the break over of the Paria Plateau (see Figure 13). Currently Glen Canyon NRA has a narrowband solar powered repeater at this location (see Figure 14). This situation requires the Grand Canyon NP rangers stationed at Lees Ferry to relay information to and from their park through this repeater, which then affects the ability of other users to have timely access. This project would install a new repeater facility, which would include a tower, antenna and small equipment building. Once completed this facility would house both Grand Canyon and Glen Canyon narrowband repeaters and associated equipment. This repeater facility would be powered by electrical power via the Page Electric Utility (PEU) power lines that also occupy this area (see Map 5). The Glen Canyon solar powered repeater would be dismantled and removed from the site. Switching from solar to electrical would provide a reliable source of power, including generator derived power in the case of

emergency power loss. In order for these items to be installed, a new graded dirt road would need to be constructed from the end of the current road to the new location. It is thought that the power poles at the break over were originally installed using a helicopter as no evidence of a road currently exists. This road would also allow PEU to access the remaining portion of their lines for regular maintenance and in cases of emergency for service disruptions. Due to budget restraints, it is likely that the access road would be completed in advance of the installation of the repeater. The repeater facility will consist of a digital narrowband (12.5 KHz) VHF system that will provide digital conventional narrowband networks for law enforcement and medical uses.



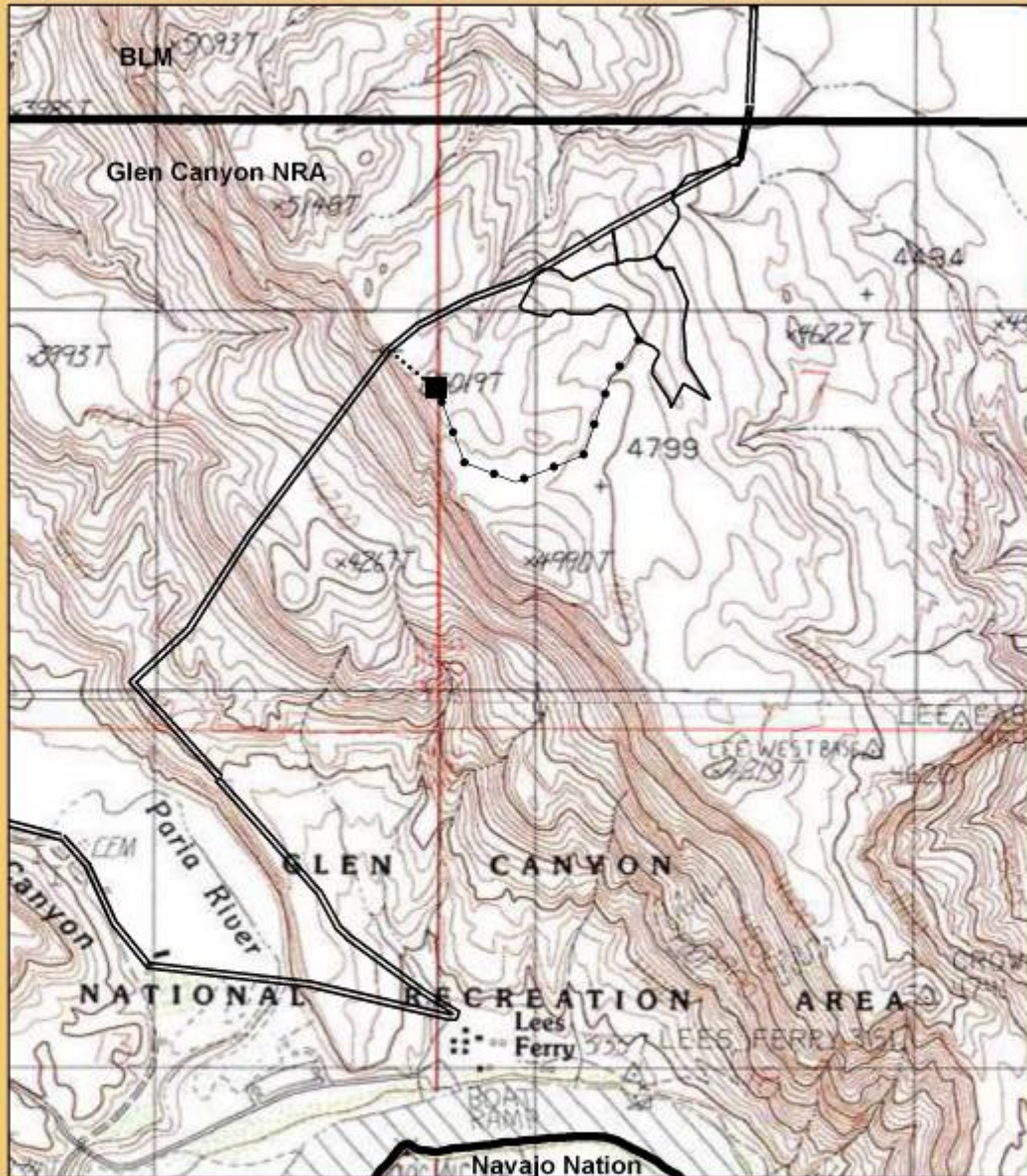
Figure 13. Current Solar Powered Repeater



Figure 14. Proposed Grand Canyon NP Electrical Powered Repeater

The site configuration will include an 8' x 8' x 6' environmental shelter that will either sit on a concrete pad or sit on 4 concrete blocks. It will have either a 47 foot articulating tower or a 60 foot adjoining tower with VHF and UHF antennas (see Figures 15 & 16 – these are mockups only. The actual facilities will take up no more space than identified below, but may ultimately look slightly different). The shelter and antenna will be fenced to provide security. The Permanent size of the facility will occupy an approximate 12' by 12' footprint. The temporary construction footprint will be approximately 25' by 25'. This facility is located within a utility corridor in a Recreation and Resource Utilization Zone. Neither the existing solar powered facility nor the proposed narrowband repeater facility could be easily seen from the Lees Ferry Area. The existing telephone poles and line can generally only be seen from the Lonely Dell area if pointed out and they are silhouetted by shadows. The tower would be located adjacent to the PEU pole before the line breaks over the plateau toward Lees Ferry. In order to make the tower unobtrusive, it would be painted a color that would blend into the surrounding rocky slopes.

Map 5. Proposed Location of
Grand Canyon NP Narrowband Repeater



- Proposed Overhead Electrical Line
- ... Proposed Primitive Access Route
- Existing Electrical Lines
- Existing Primitive Access Route
- Proposed 12 x 12 Repeater Facility

0.5 0.25 0 Miles



Paria Tower and Antennas

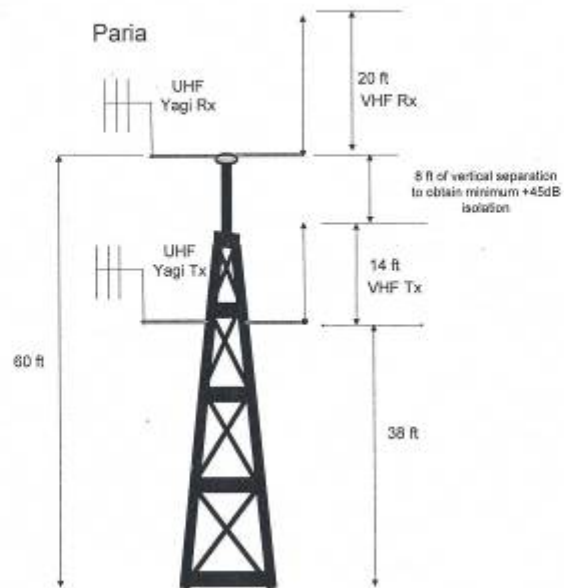


Figure 15

Paria Floor Drawing

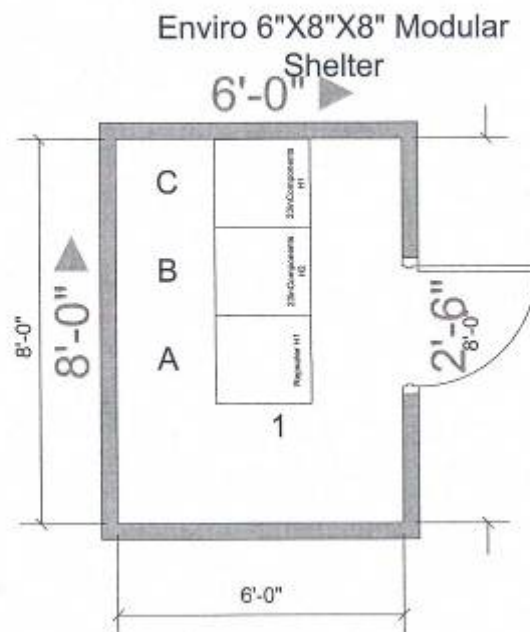


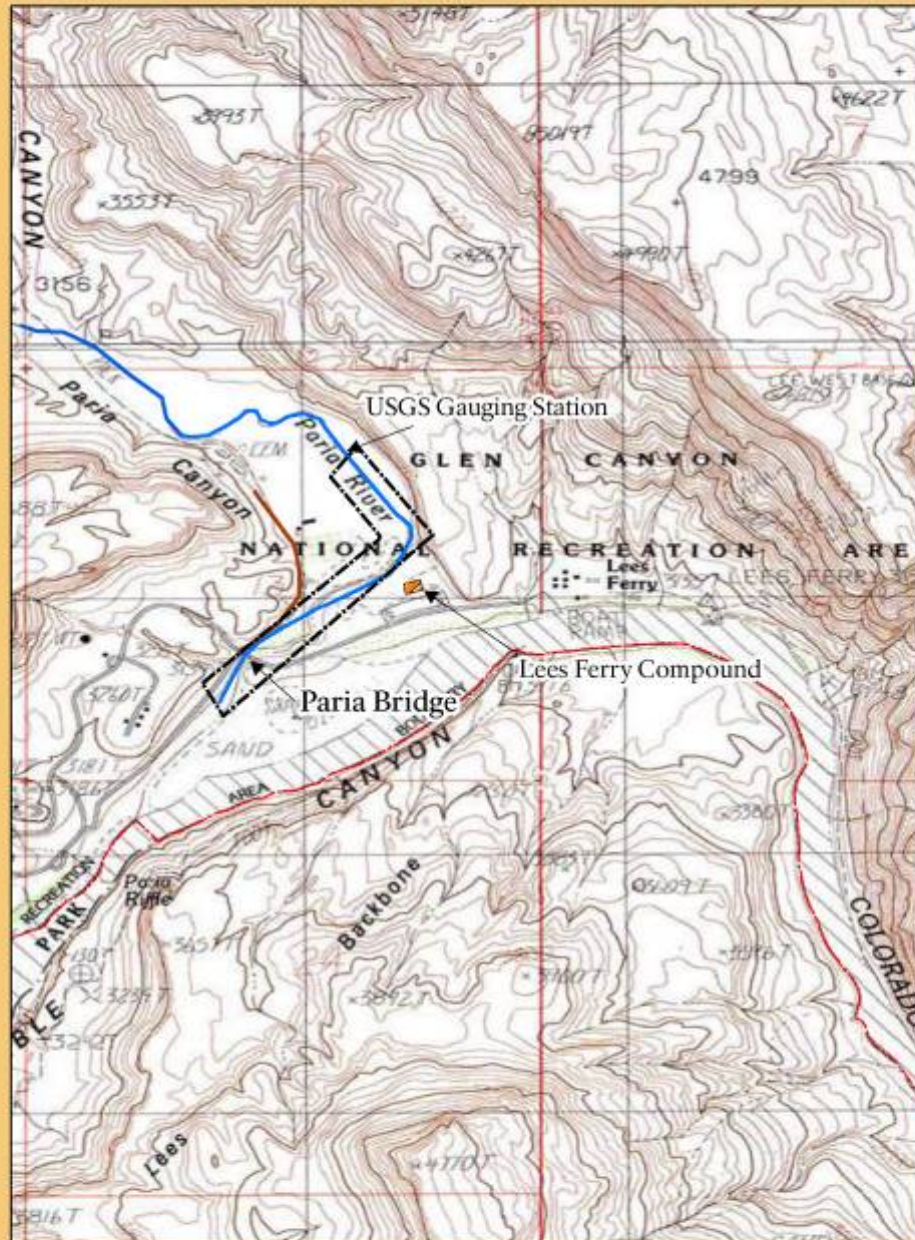
Figure 16

Stabilization of erosion of the Paria River bank

While the Paria River has changed course during the years it has flowed through, ongoing down-cutting has created a situation where its current stream course is probably semi-permanent barring especially high levels of flooding (500 year event). This course has caused severe erosion problems along the access road to Lonely Dell Ranch (Figure 17) and at the bridge (Figure 18), where the Lees Ferry Area Access Road crosses the Paria River. Large amounts of fill (boulders, cement and native soils) are regularly placed into the river at these two points in an attempt to slow the erosion.



Map 6. Paria River Bank Stabilization Locations



- Area of Hydrologic Study
- Glen Canyon NRA Boundary
- Hydrological Study Area
- Current Flow Pattern of the Paria River

0 0.25 0.5 Miles



The proposed project would include a hydrologic study of the river from the point where it passes the USGS gauging station to its convergence with the Colorado River, with special emphasis on the preceding and proceeding 1500 feet of river bed on either side of the bridge (Map 6).

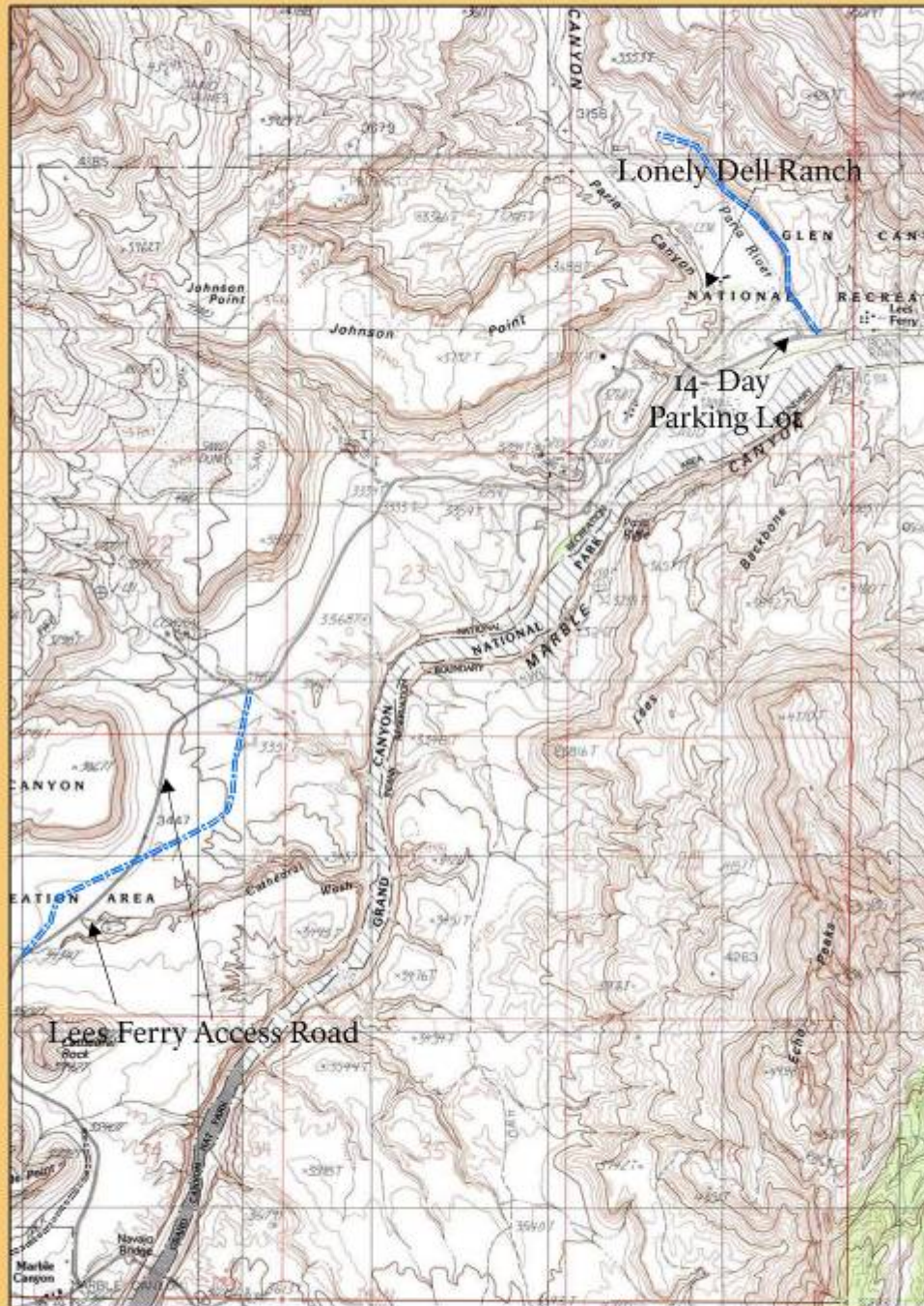
Stabilization may require the installation of a gabion system (rock-filled wire baskets), bank armoring and/ or finger dikes to slow and re-route stormwater coming down the Paria River. Placement of these types of systems requires extensive site preparation including grading and possible impoundment or re-routing of flowing stormwater.

Before construction can begin, the NPS will be required to obtain an individual Section 404 Clean Water Act permit from the U.S. Army Corps of Engineers as they have regulatory oversight on this type of project. As part of their permitting process, they will complete an Environmental Assessment based on the approved design. NPS policy would allow the Glen Canyon NRA Superintendent to use this EA as the appropriate NPS project level NEPA document as the U.S. Army Corps of Engineer's NEPA process includes the same public scoping and comment processes as the NPS.

Establish the Arizona Road Hiking Trail.

Lees Ferry was established at the mouth of the Paria River as part of a wagon road from Utah to Arizona called the "Arizona Road". Several parts of the original wagon road from the 1870's still exist in the Lees Ferry area Map). Other parts were paved over to form the modern Lees Ferry access road. In the 1880's young couples from Arizona would travel north along the road to be married in the Church of Latter Day Saints (LDS) temple in St. George, Utah. It was during this time- period that it gained the nickname of the "Honeymoon Trail". A large portion of the route can still be seen via signposts on BLM lands to the north of Marble Canyon. The proposed project would establish a hiking trail along several portions of this trail that are still intact within the boundaries of Glen Canyon NRA (see Map 7). Establishment of a hiking trail would entail maintenance work to make the trail safe for visitors. It would also include the placement of numbered posts that correspond with a hiking guide, which would be made available to visitors at the information kiosk at the entrance station.

Map 7. Proposed Arizona Road Hiking Trail



Proposed Arizona Road Hiking Trail

0 0.25 0.5 1 Miles



Replacement of the USGS Gauging Station on the Paria River

The USGS through the Flagstaff office monitors Paria River water levels and sediment loads as a part of their routine national stream monitoring program and to obtain required information for the Glen Canyon Dam Adaptive Management Program. Installed in 1932, this gauging site, which is located inside the boundary of the LFLD Historic District, is the oldest gauging station on any tributary to the Colorado River. Figure 19 shows the current gauging station. Figure 20 shows the original USGS monument, installed in 1932. Current gauging operations are insufficient due to meandering of the Paria River, which has over the past 74 years altered its flow pattern so that the current site is completely blocked by sediment build up. While the USGS has been trying to keep gauge in operation it has become inoperable, and a new gauging station needs to be built on the opposite bank where the active water channel is deepest during periods of flow. The planned gauging station will be 3' by 3' by 7' building that will be



Figure 19. Existing Gauging Station

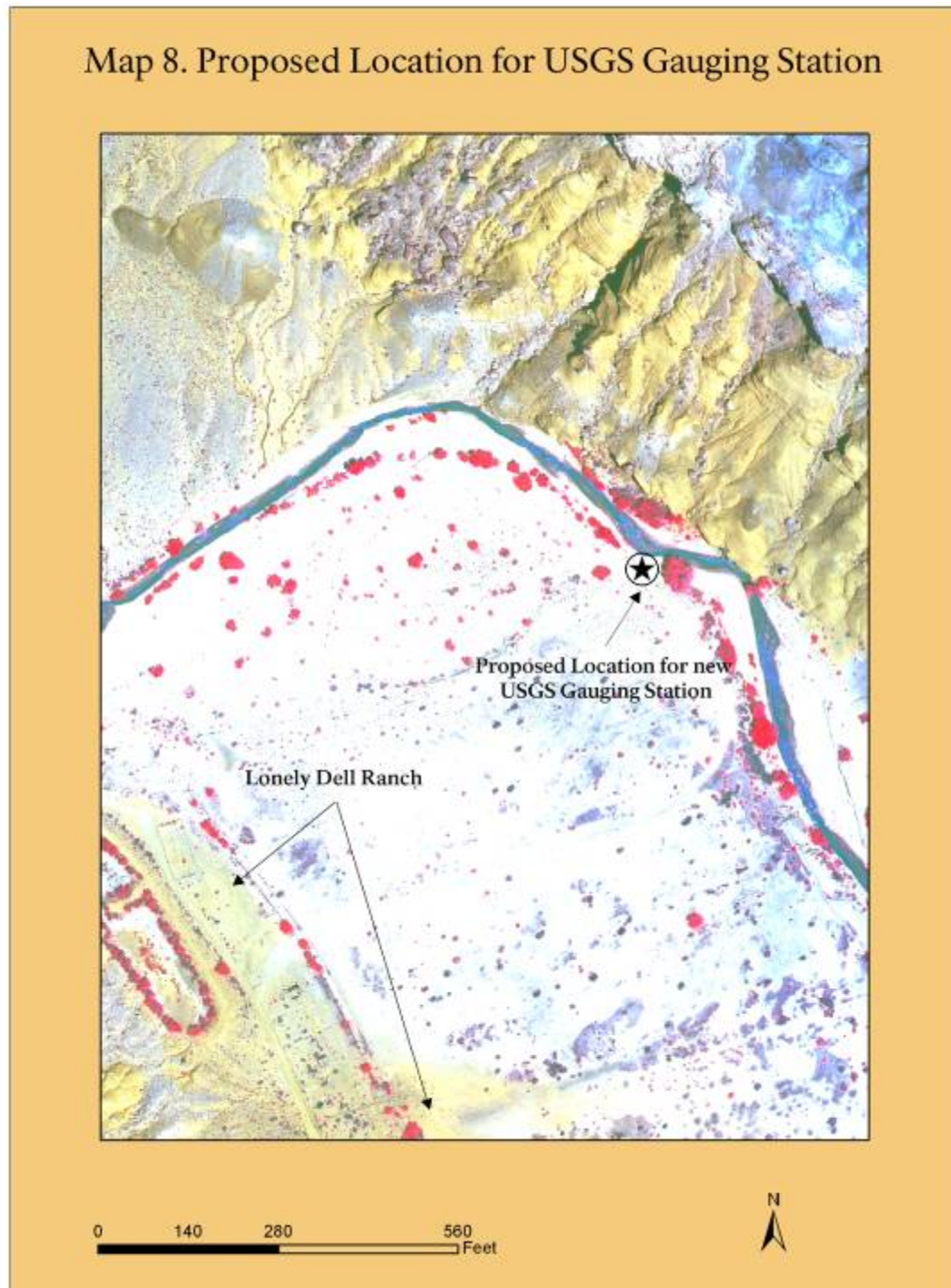


Figure 20. Original Gauging Station Monument



Figure 21. Approximate View of the Proposed Gauging Station Site from the Picture Window Cabin at Lonely Dell Ranch

designed to be visually complementary to the local environment and will not be visible from the Weaver Ranch House area. Figure 21 shows the view looking from the area north of the Weaver Ranch House to the proposed location of the new gauging station building. The new station will be using state of the art equipment. The proposed location for the new station is identified on Map 8.



ALTERNATIVES CONSIDERED BUT DISMISSED FROM FURTHER CONSIDERATION

There were no other alternatives considered during the development of this EA.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is the alternative that will promote the policies expressed by the National Environmental Policy Act (NEPA). This includes alternatives that meet the following criteria to the greatest extent possible:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
- Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
- 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.
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
- Enhance the quality of renewable resources and approach the maximum attainable recycling of resources that can be depleted.

Environmentally preferable is defined as “the alternative that will promote the national environmental policy as expressed in NEPA §101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources” (CEQ 1978).

In the NPS, the No Action Alternative must also be considered in identifying the Environmentally Preferred Alternative. Alternative A, the No Action Alternative, represents the current management direction for Glen Canyon NRA. Alternative A does not provide for replacement of the courtesy dock, water intake, water treatment plant nor replacement of any of the other projects included in this EA and the goals of the National Environmental Policy Act are not fully realized. Alternative A would result in short and long-term impacts to these facilities at Lees Ferry by allowing continued deterioration, which could compromise the health and safety of the public and NRA staff, and may eventually lead to closure of some facilities as unsafe.

The environmentally preferable alternative is Alternative B, the Lees Ferry Improvement Alternative, because it surpasses the No Action Alternative in realizing the full range of goals stated in NEPA §101. Alternative B would improve health and safety and reduce long- term resource deterioration. As a result, this alternative would achieve the following:

- Reduce the risk to health and safety and other undesirable consequences of not replacing of existing facilities.
- Improve long- term protection of natural and cultural resources.
- Integrates resource protection with an appropriate range of visitor uses.