



National Park Service
U.S. Department of the Interior
Glen Canyon National Recreation Area
Arizona

Greenehaven Wastewater System Improvement Project Environmental Assessment



Greenehaven Wastewater System Improvement Project

Environmental Assessment

Summary

The Greenehaven Development Corporation Wastewater Treatment Plant is located within the Greenehaven master-planned development along US Route 89 approximately 8 miles north of Page, Arizona. The Greenehaven Development Corporation Wastewater Treatment Plant has insufficient capacity to handle current wastewater loads. In May 2005, the Arizona Department of Environmental Quality issued a notice of violation and an order to close one of two existing treatment lagoons, upgrade the other treatment lagoon, and construct a new force main sewer line to divert wastewater from Greenehaven to the City of Page Wastewater Treatment Plant.

This environmental assessment evaluates two alternatives: a No-Action Alternative and a Proposed Action Alternative. The No-Action Alternative addresses current and future conditions if no new sewer line is constructed. The Proposed Action Alternative addresses impacts from the construction of a 6-inch high-density polyethylene sewer line that will transport the additional Greenehaven wastewater to the City of Page Wastewater Treatment Plant. The modern City of Page facility has sufficient capacity to handle the additional waste. The proposed sewer line would cross National Park Service lands in Glen Canyon National Recreation Area, and would tie into a current line serving the Recreation Area's Wahweap Marina.

This environmental assessment has been prepared in compliance with the National Environmental Policy Act to provide a decision-making framework that 1) analyzes a reasonable range of alternatives to meet objectives of the proposal, 2) evaluates potential issues and impacts to Glen Canyon National Recreation Area's resources and values, and 3) identifies mitigation measures to lessen the degree or extent of any impacts. Resource topics analyzed in this document because of anticipated environmental impacts include air quality; topography, geology, and soils; vegetation; water quality; wildlife and habitat; and public health and safety. Other resource topics have been dismissed from detailed analysis because the project would result in negligible or minor effects to those resources. No major, long-term environmental impacts are anticipated as a result of this project. Public scoping was conducted by the National Park Service to assist with the development of this document. Two public comments were received during the scoping period.

Public Comment

If you wish to comment on the Environmental Assessment, you may post comments online at <http://parkplanning.nps.gov/> or mail comments to Superintendent, Glen Canyon National Recreation Area, P.O. Box 1507, Wahweap Warehouse, Page, Arizona 86040-1507. This Environmental Assessment will be on public review for 30 days (October 4 – November 4), during which time comments will be accepted. It is the practice of the National Park Service to make all comments, including names and addresses of respondents who provide that information, available for public review following the conclusion of the Environmental Assessment process. Individuals may request that the National Park Service withhold their name and/or address from public disclosure. If you wish to do this, you must state this prominently at the beginning of your comment. Commentators using the website can make such a request by checking the box "keep my contact information private." The National Park Service will honor such requests to the extent allowable by law, but you should be aware that the National Park Service may still be required to disclose your name and address pursuant to the Freedom of Information Act. We will make all submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

List of Acronyms

AAC	Arizona Administrative Code
ADA	Arizona Department of Agriculture
ADEQ	Arizona Department of Environmental Quality
ADOC	Arizona Department of Commerce
ADOT	Arizona Department of Transportation
AGFD	Arizona Game and Fish Department
APP	Aquifer Protection Permit
ARS	Arizona Revised Statutes
BLM	Bureau of Land Management
BMP	Best management practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
DO	Director's Order
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
GDCWTP	Greenehaven Development Corporation Wastewater Treatment Plant
gpd	Gallons per day
HDPE	High- density polyethylene
mg/L	Milligrams per liter
MP	Milepost
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRA	National Recreation Area
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
PEPC	Planning, Environment and Public Comment
ROW	Right-of-way
RV	Recreational vehicle
SHPO	State Historic Preservation Office
SO	Secretarial Order
US	United States
USACE	U.S. Army Corps of Engineers

USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WTP	Wastewater treatment plant

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PURPOSE AND NEED

Introduction

The existing Greenehaven Development Corporation Wastewater Treatment Plant (GDCWTP) has insufficient capacity to handle current and future wastewater loads. It currently is in violation of State of Arizona wastewater regulations and water quality standards. A proposal to construct a new, 6- inch wastewater sewer line from the GDCWTP to the City of Page Wastewater Treatment Plant (WTP) would provide wastewater management that consistently meets all state requirements and has sufficient capacity to accommodate future flows. The new 6- inch sewer line, which would cross Glen Canyon National Recreation Area (Glen Canyon NRA) lands, would connect into an existing 8- inch NPS sewer line that currently serves the Wahweap Marina Area on the park.

The purpose of this Environmental Assessment is to examine the environmental impacts associated with the proposal to construct a new wastewater line and associated infrastructure. This Environmental Assessment has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, regulations of the Council on Environmental Quality (CEQ) (40 CFR 1508.9), and NPS Director's Order (DO)- 12 (*Conservation Planning, Environmental Impact Analysis, and Decision- Making*).

Background

Glen Canyon National Recreation Area (NRA) is a 1.25- million- acre recreation and conservation unit of the NPS located in southwestern Utah and northeastern Arizona. Its major recreational component is Lake Powell, a man- made lake formed by the Glen Canyon Dam on the Colorado River. Lake Powell covers a large area in Utah, extending 180 miles northeast from the Utah–Arizona border. Three highways and four marinas provide access to the lake.

The 484- acre Greenehaven community currently consists of approximately 263 housing units, a self- serve service station, a small convenience store, a sales office and boat/recreational vehicle (RV) storage with a dump/pump- out station, and the GDCWTP. The approximately 5- acre treatment plant site is located in the northeast corner of the Greenehaven property. It includes two lined evaporation lagoons. The dump/pump- out station receives gray water and sewage wastes from boat and RV holding tanks; this sewage flows into a chambered septic tank prior to entering the Greenehaven wastewater system. At present there are no other facilities within the Greenehaven development that contribute sewage to the GDCWTP.

The original GDCWTP development approvals included the installation of a facultative sewage lagoon and a planned second sewage lagoon, with eventual surface aeration and land use application to hold and manage wastewater from the development. In 1986, the State of Arizona adopted new environmental regulations that placed more stringent control over wastewater treatment plants with surface and/or groundwater discharges. In 2004 a faulty flow meter was discovered. The increased wastewater volumes at GDCWTP exceeded the permitted flows under its current permit of 25,000 gallons per day (gpd). Greenehaven Development, Greenehaven Water Company, and Greenehaven Sewer Company were cited by the Arizona Department of Environmental Quality (ADEQ) for exceeding the design capacity of the treatment plant (Appendix A). These notices of violation were resolved and ADEQ subsequently approved and issued an Aquifer Protection Permit (APP) to Greenehaven on April 5, 2006.

As part of the violation resolution process with ADEQ, it was determined that the originally planned wastewater system would not meet current State of Arizona environmental standards. Presently, Greenehaven

is operating under a consent order issued by ADEQ to address the upgrade of the wastewater treatment facilities. On August 15, 2006, Greenehaven entered into Consent Judgment CV2006- 011349 with ADEQ to construct the required modifications and improvements within a defined timeline to provide wastewater management that consistently meets all state requirements and that has sufficient capacity to accommodate projected future flows.

According to the current agreement and regulations required by ADEQ, Lagoon No. 1 is to be closed. A clean closure application for this action was submitted to ADEQ on May 31, 2006. Also in accordance with the agreement, Lagoon No. 2 has been upgraded to an 80,000- gpd lined lagoon and has received ADEQ approval to be used as an emergency backup to the lift/pump stations for the proposed force main (sewer pipeline) from GDCWTP to the City of Page WTP. Greenehaven has reached an agreement with the City of Page for the acceptance and treatment of Greenehaven's wastewater. Lagoon No. 2 is to be used as an emergency backup system during the construction of the new sewer pipeline to the City of Page facility.

The proposed project to construct the sewer pipeline and associated sewer station is located in an area on federal land administered by the Glen Canyon NRA and, for most of its proposed length, is within an existing Arizona Department of Transportation (ADOT) right- of- way (ROW) easement on NPS land. The project area appears in the Ferry Swale (1985) and Page (1985), Arizona, USGS 7.5- minute quadrangles, in Township 42 North, Range 8 East, Section 32; and Township 41 North, Range 8 East, Sections 3–5, 10, 11, and 14 (Figures 1 and 2).

Purpose and Need

The purpose of the proposed project is to provide Greenehaven residential development with a safe, effective way to manage their sewage in compliance with ADEQ standards. The proposal is to construct a 6- inch sewer line and associated lift station that would move sewage from the GDCWTP to a connection point with the Glen Canyon NRA sewer line (located on the recreation area) that leads to the City of Page WTP.

The proposed project is needed because there is insufficient capacity at the GDCWTP to handle current planned wastewater loads from the Greenehaven Development. The current system exceeds its design capacity and is in violation of ADEQ water quality and wastewater treatment standards.

Routing Greenehaven wastewater through the NRA to the City of Page WTP would meet the project objectives of complying with necessary ADEQ requirements and providing a safe, healthy, functional, and efficient wastewater treatment system (see Table 1, page 18).

Relationship to Other Plans and Policies

The proposed new wastewater line would be consistent with the overall management directions provided by the Glen Canyon National Recreation Area (NRA) General Management Plan (GMP) (NPS 1979) and the Greenehaven Development Plan (2006).

The Glen Canyon NRA operates under the management goals and objectives set forth in the GMP (NPS 1979). The GMP provides long- term management guidance for the park. The GMP identified zones which define how different areas of the recreation area will be managed to achieve desired resource conditions and meet the recreation area's goals and objectives. The recreation area is divided into four zones: 1) Natural Zone, 2) Recreation and Resource Utilization (RRU) Zone, 3) Cultural Zone, and 4) Development Zone.

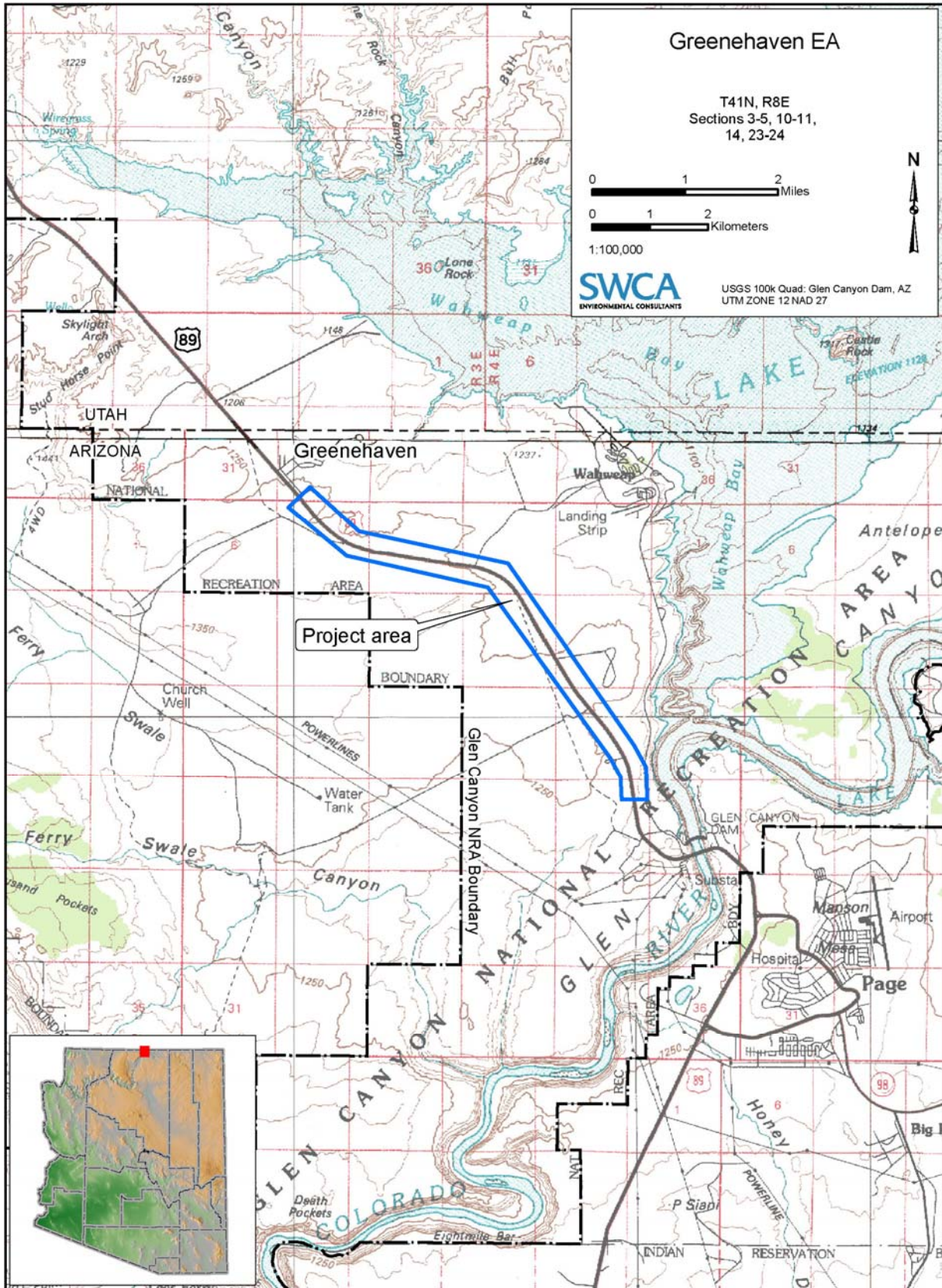


Figure 1 – General Location of the Project Area

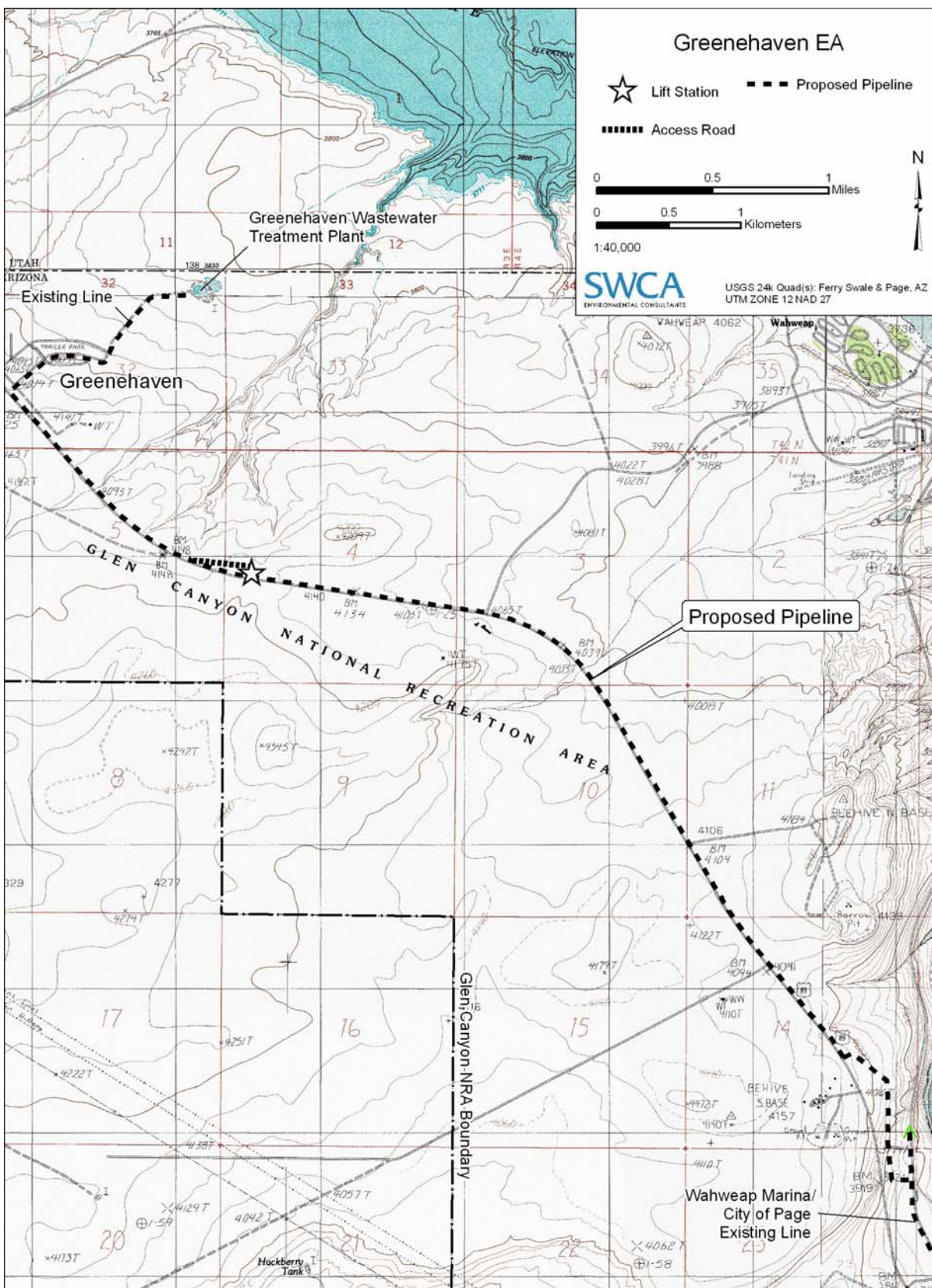


Figure 2 – Proposed Pipeline Location

The RRU Zone (approximately 557,890 acres) consists of areas possessing somewhat less scenic value for utility rights- of- way or development. The proposed sewer line would be consistent with the objectives for this zone as described in the Glen Canyon NRA GMP (NPS 1979).

Public Scoping

Scoping is a process to identify the resources that may be affected by a project proposal, and to explore possible alternative ways of achieving the proposal while minimizing adverse impacts. Glen Canyon NRA staff conducted both internal scoping with appropriate NPS staff and external scoping with the public and interested/affected groups and agencies.

Glen Canyon NRA staff conducted both internal scoping and external scoping with the public and interested and affected groups and agencies. The NPS identified members of an internal interdisciplinary team (ID team), which met multiple times in 2006 and 2007 to discuss the purpose and need for the project; possible alternatives; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and possible mitigation measures and the results of public scoping. The team consisted of park division managers from Glen Canyon NRA, Staff Engineer and Environmental Specialist from Arizona Department of Transportation, and staff from Greenehaven Properties and their consultant, SWCA Inc.

The objectives, issues, and impact statements and alternatives described in this document were identified by the team and described in a public scoping newsletter that was issued in October 2006. Comments from two individuals were received from member of the public during this scoping period.

External scoping was initiated with the distribution of a scoping letter to inform the public of the proposal to construct a new sewer line, and to generate input on the preparation of this Environmental Assessment. The scoping letter dated October 5, 2006, was mailed to residents of Greenehaven and of Page, and a variety of federal, state, and tribal entities (Appendix B). Scoping information was also posted on the Glen Canyon NRA website. A tool to aid in scoping efforts is the NPS Planning, Environment and Public Comment (PEPC) website (<http://parkplanning.nps.gov/>). This site provides access to current plans, environmental impact analyses, and related documents for public review. Users of the site can submit comments on proposed projects. The site contains all of the currently active plans and environmental documents for the agency. Glen Canyon NRA documents can be accessed by selecting “Glen Canyon NRA” from a list of parks by name.

During the 30- day scoping period, two responses were received from the public through letters and PEPC. A letter response from the U.S. Fish and Wildlife Service (USFWS) dated November 15, 2006, indicated the potential for the endangered California condor to occur within the project area. The letter recommended that evaluation of possible effects to the species be included in the EA. USFWS also recommended that consultation with the Arizona Game and Fish Department (AGFD) and potentially affected tribes be done to ensure that sensitive species are not affected by the project.

A second comment via an undated email was received from a concerned resident from the Greenehaven development. The resident expressed interest in who would provide financial backing for the proposed project, as well as benefactors as a result of the project. The resident was also concerned about a potential increase in water costs associated with the project and the possible increase in development of vacant lots on the property as a result of increased capacity at the GDCWTP.

No other federal or state agencies or tribes responded during the scoping period.

More information regarding scoping can be found in the *Consultation and Coordination* chapter of this document.

Impact Topics Retained for Further Analysis

Impact topics for this project have been identified on the basis of federal laws, regulations, and orders; NPS 2006 *Management Policies*; and NPS knowledge of resources within the Glen Canyon NRA. Impact topics that are further analyzed in this Environmental Assessment, and the reasons for doing so, follow. For each of these topics, the following text also describes the existing setting or baseline conditions (i.e., affected environment) within the project area. This information will be used to analyze impacts against the current conditions of the project area in the *Environmental Consequences* chapter.

Air Quality

The Clean Air Act of 1963 (42 USC 7401 *et seq.*) was established to promote public health and welfare by protecting and enhancing the nation's air quality. The Act establishes specific programs that provide special protection for air resources and air quality-related values associated with NPS units. Section 118 of the Clean Air Act requires a park unit to meet all federal, state, and local air pollution standards. Glen Canyon NRA is designated as a Class II air quality area under the Clean Air Act. A Class II designation indicates the maximum allowable increase in concentrations of pollutants over baseline concentrations of sulfur dioxide and particulate matter as specified in Section 163 of the Clean Air Act. Further, the Clean Air Act provides that the federal land manager has an affirmative responsibility to protect air quality related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts (EPA 2000).

The existing GDCWTP has experienced minimal odor issues since its inception and odors were not cited as an issue in the ADEQ notice of violation to Greenehaven (Appendix A). Lagoon-type wastewater treatment facilities can be the source of objectionable odors.

Facultative lagoons are typically aerobic (oxygen is present) on the surface and anoxic or anaerobic (oxygen is absent) on the bottom. Anaerobic processes on the bottom convert the organic matter to organic acids that are subsequently converted to methane, ammonia, hydrogen sulfide, and other gases within the anaerobic layer. The hydrogen sulfide and ammonia bubble up through the aerobic zone and are oxidized, provided that sufficient oxygen is present. The methane, which is odorless, is released into the atmosphere.

Under certain climate conditions, particularly in spring and fall when the temperature differences between the surface and deeper waters disappear, the ponds will "turn over," bringing the anaerobic materials to the surface. If there is insufficient oxygenation capacity, odors will be released. Similarly, windy conditions can generate currents that can bring the deeper materials to the surface and cause odor episodes. During these periods, the intrusion of oxygen into the anaerobic layer kills off the organisms that convert the organic acids to methane and other gases and enhances the odor problem.

Production of such odors is typically controlled through proper management and controlled wastewater loading of the facility. Waste from Greenehaven's customers does not include high-loading materials from commercial users, or waste from boat or RV users, directly into its system. In addition, land use application areas act as a buffer between the wastewater treatment facility and the nearest residential areas.

ADEQ recommends a minimum distance of 1,000 feet from the nearest property line for lagoon systems. The single lagoon at Greenhaven is an average of 1,200 feet from the nearest development. However, a buffer zone alone may not be adequate to disperse odors under certain climatic or pond operating conditions.

In addition to odors generated by normal operations at the GDCWTP, construction activities such as hauling materials and operating heavy equipment could also result in temporary increases of vehicle exhaust, emissions, and fugitive dust in the general project area. Overall, the project could result in short-term degradation of local air quality. The Class II air quality designation for Glen Canyon NRA may be affected by the proposal. As a result, this topic has been retained for further analysis.

Topography, Geology, and Soils

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

Surficial soils within the project area predominantly consist of sandstones, siltstones, and other depositional materials. The prevailing soil mapping unit in the area is the Wahweap Series. This series consists of shallow to deep soils derived from old dune deposits, excessively well-drained soils formed from wind-eroded sands, and sandstone alluvium. Slopes range from gently sloping 1–2 percent to 4–10 percent. Soil moisture is low, which is typical for an arid to semi-arid location, and low organic matter content (typically less than 1 percent) is characteristic. Soil moisture content in the area of the NPS Wahweap wastewater system area ranged from 0.7 to 4.6 percent during field testing conducted in 1999 at the proposed new water percolation pond site, which is located southwest of the existing NPS treatment ponds. Soil textures ranged from fine sand to loamy fine sand. These characteristics make soil erosion potential difficult to severe and create challenging conditions for restoring vegetation on disturbed soils. Recovery time for a grassland community is typically 5 to 7 years.

Soil depth and other physical characteristics along the proposed GDCWTP pipeline corridor and at the City of Page WTP site are assumed to be similar to conditions existing at the Wahweap treatment facility, based on observations of surface soil and vegetation characteristics in those areas.

The proposed construction of a new sewer line and associated lift station would be located in an area of the Glen Canyon NRA that does not contain significant topographic or geologic features. Furthermore, the general location for the new sewer line and lift station has been previously disturbed by past construction of utilities and the construction of US Highway 89. Modifications to the topography would displace and disturb soils, primarily within the footprint of the new pipeline and lift station. Soils may also be disturbed and compacted on a temporary basis in the locations used to access the construction site. Although there are no significant topographic geologic features in the project area and the area has been previously disturbed, the proposed action would require over 6 miles of disturbance along the proposed pipeline route. Because these effects could contribute cumulatively to overall impact of the project, this topic has been retained for further analysis.

Vegetation

According to NPS (2006) *Management Policies*, NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of

plants (NPS 2006). The vegetation community that exists within the project area is disturbed upland vegetation characterized as Colorado Plateau Blackbrush- Mormon- tea Shrubland (NatureServe 2007). Common species include blackbrush (*Coleogyne ramosissima*), sagebrush (*Artemisia filifolia*), saltbush (*Atriplex canescens*), snakeweed (*Gutierrezia sarothrae*), narrowleaf yucca (*Yucca angustissima*), Russian thistle (*Salsola kali*), and various grasses. Blackbrush is an abundant shrub species that forms large monotypic expanses on the Colorado Plateau. It is the most widespread plant community in Glen Canyon NRA and in Greenehaven. Plant species richness is relatively low. Sahara mustard (*Brassica tournefortii*), an Arizona Department of Agriculture (ADA)- prohibited noxious weed, is located within the project area.

Vegetation would be displaced, disturbed, and/or compacted in the area of construction, particularly along the sewer line corridor, the lift station, and the lift station access road. A portion of the sewer line corridor has previously been disturbed during the construction of US Highway 89 and the installation of a fence at the 100- foot line from the centerline of the highway. Disturbed areas would be revegetated and rehabilitated following construction. Because mitigation is required to lessen these effects, and because an ADA- prohibited noxious weed was located in the project area, this topic has been retained for further analysis.

Water Quality

NPS policies require protection of water quality consistent with the Clean Water Act (CWA). The purpose of the CWA is to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” To realize this goal, the U.S. Army Corps of Engineers (USACE) 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 CWA. The U.S. Environmental Protection Agency (EPA) also has responsibility for oversight and review of permits and actions that affect waters of the United States.

The most prominent surface water body in the vicinity of the project area is Lake Powell. It is the second largest man- made lake in the United States and has a surface area of 226 square miles and a volume capacity of 27 million acre- feet.

The Glen Canyon Dam, which was authorized by the Colorado River Storage Project Act of 1956 (Public Law 84- 485), created Lake Powell. The project’s primary purposes are 1) to regulate the Colorado River and create a reservoir to meet downstream water requirements, 2) flood control, and 3) hydroelectric power generation. In 1972, Congress established Glen Canyon NRA (Public Law 92- 593) to provide for public recreation on the lake and adjacent lands.

Arizona’s water quality standards for surface water are contained in Title 18, Chapter 11 of the Arizona Administrative Code (AAC). These standards define the water quality goals for surface waters in Arizona. They designate the uses to be protected in Arizona’s surface waters and prescribe the criteria that ADEQ determines are necessary to maintain and protect water quality for the designated uses. Water quality standards, applied through National Pollutant Discharge Elimination System (NPDES) permits, provide the regulatory basis for establishing water quality-based discharge limitations and other discharge controls for point source discharges to surface waters.

ADEQ also administers a regulatory program to prevent groundwater contamination. This program requires all new and existing facilities that proposed to discharge to groundwater to obtain an APP. Greenehaven holds an APP that was issued in April 2006 (APP No. 101365).

ADEQ determined that the GDCWTP was in violation of the Arizona Revised Statutes (ARS) Title 49- 101 *et seq.* and applicable rules, and issued a notice of violation to the Greenehaven Sewer Company for exceeding

permitted capacity levels of effluent. This situation represents a minor to moderate adverse short-term risk to human health.

The proposed project area does not contain surface waters, and is mostly dry except for periodic runoff during storm events. The size of the new lift station footprint (approximately 2,500 square feet) would increase the amount of impervious surface in the area, which could increase the erosion potential of the area. Because the project may result in minor to moderate effects to water resources, this topic has been retained for further analysis.

Wildlife and Habitat

According to NPS (2006) *Management Policies*, NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of wildlife (NPS 2006). Wildlife commonly found in Glen Canyon NRA includes mule deer, elk, desert bighorn sheep, pronghorn, black bear, bobcat, mountain lion, coyote, porcupine, badger, weasel, fox, chipmunk, ground squirrel, raccoon, cottontail rabbit, bats, lizard, snake, mice, and over 300 species of birds. There are also numerous invertebrate species. The project area is in a heavily used visitor transportation corridor and hence is little used by larger animals.

The proposed sewer line, lift station, and access road areas do not contain any designated ecologically critical habitat, wild and scenic rivers, or other unique natural resources, as referenced in 40 CFR 1508.27. These types of natural resources are also absent from the vicinity of the City of Page WTP.

Waterfowl and shorebird species may use the open-water wastewater treatment ponds for brief temporary periods during migration and during the winter months for resting and security cover. The new lined Lagoon No. 2 would offer unsuitable nesting habitat or security cover for these bird groups.

Because minor effects to wildlife and wildlife habitat have the potential to occur as a result of the ground-disturbing activities associated with the proposed project, this topic has been retained for further analysis.

Special Status Species

The Endangered Species Act (ESA) of 1973 requires examination of impacts of proposed projects on all federally listed threatened, endangered, and candidate species. Section 7 of ESA requires all federal agencies to consult with the USFWS (or designated representative) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. In addition, the NPS (2006) *Management Policies* and DO 77 *Natural Resources Management Guidelines* require NPS to examine impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species (NPS 2006). For the purposes of this analysis, USFWS and AGFD were contacted regarding federally and state-listed species to determine whether any of these species could potentially occur within or near the project area.

Two special status (federally endangered) species were identified that may occur in the project area: the bald eagle and California condor (SWCA 2007a). These were evaluated for potential impacts from the proposed development. The bald eagle has since been delisted (USFWS 2007). The California condor (*Gymnogyps californianus*) may be attracted to construction activity. To protect California condors, mitigation measures will be employed during sewer line construction.

A letter from the USFWS dated November 15, 2006 (Appendix D), indicated that the endangered California condor may occasionally be in the project area. Recently, the California condor has been observed

frequenting construction sites at several NPS units in the southwestern United States. Such occurrences have increased as this species expands its presence and range. It has been noted that construction or other disturbance activities tend to attract the temporary attention of California condor. If this event should occur during the construction of the Greenehaven force main along US Highway 89, Greenehaven would immediately notify the local office of the USFWS and take appropriate actions to either avoid or minimize adverse effects to the condor. A letter from the AGFD dated February 10, 2005 indicated there are no state-listed species or designated critical or essential habitat in the proposed project area (Appendix C).

As suggested by the USFWS in their November 15, 2006, response, any possible effects to special status species that have the potential to occur in the proposed project area will be assessed. This topic has been retained for further analysis.

Public Health and Safety

The most important purpose of wastewater treatment is to reduce pathogens in wastewater and prevent the spread of waterborne diseases. Treated effluent from Lagoon No. 2 is treated to Class II criteria (which require that not more than 10 percent of effluent biochemical oxygen demand values exceed 60 milligrams per liter [mg/L] and that total suspended solids not exceed 100 mg/L) and applied to a land use application area at Greenehaven as approved by ADEQ.

Because of public health and safety concerns, ADEQ determined that GDCWTP was in violation of ARS Title 49- 101 *et seq.* and applicable rules, and issued a notice of violation to the Greenehaven Sewer Company for exceeding their permitted capacity levels of effluent (Appendix A). Greenehaven Sewer Company violations were dismissed at the time of the issuance of its APP (No. 101365) on April 5, 2006.

Many wastewater treatment processes include the addition of chemicals, and there are risks to public health and safety associated with their storage and handling. However, there would be no use of chemicals at the GDCWTP if wastes are pumped to the City of Page WTP. Any biologically active waste that is currently dissipated through land use application is treated chemically with chlorine to render the material pathologically sterile prior to application.

Vectors are animals, such as rodents, flies, mosquitoes, and birds, which transmit pathogenic organisms to humans. Even if they do not transmit diseases, these animals often are viewed as pests. They can be attracted to or breed at wastewater treatment plants. Vector problems have not been experienced at the GDCWTP, despite the presence of an open- air treatment pond.

Because the GDCWTP is currently in noncompliance and these violations pose a risk to public health and safety, this topic has been retained for further analysis.

Impact Topics Dismissed from Further Analysis

Impact topics dismissed from further consideration are as follows. The rationale for dismissing these specific topics is stated for each resource.

Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA), as amended in 1992 (16 USC 470 *et seq.*); NPS DO 28 *Cultural Resource Management Guidelines*; and NPS (2006) *Management Policies* require the consideration of impacts on historic properties that are listed in or eligible to be listed in the National Register

of Historic Places (NRHP). The NRHP is the nation's inventory of historic places and the national repository of documentation on property types and their significance. The above-mentioned policies and regulations require federal agencies to coordinate consultation with the State Historic Preservation Office (SHPO) regarding the potential effects to properties listed in or eligible for the NRHP.

NPS, as steward of many of America's most important cultural resources, is charged with preserving historic properties for the enjoyment of present and future generations. Management decisions and activities throughout the National Park System must reflect awareness of the irreplaceable nature of these resources. NPS will protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with the policies and principles contained in the NPS (2006) *Management Policies* and the appropriate DOs. For the purposes of the following discussion, cultural resources include archeological resources, historic structures, cultural landscapes, ethnographic resources, and museum collections.

Archeological Resources

On December 14, 2006, SWCA Environmental Consultants (SWCA) completed a 44-acre cultural resources survey for the proposed installation of a force main sewer line north of Page, Coconino County, Arizona (Figure 1; Appendix A). The project area is on the Ferry Swale and Page, Arizona, USGS 7.5-minute quadrangles, in Section 32, Township 42 North, Range 8 East, and in Sections 3, 4, 5, 10, 11, and 14, Township 41 North, Range 8 East. The project area is on federal land administered by the Glen Canyon National Recreation Area (GCNRA), and is mostly within an Arizona Department of Transportation (ADOT) right-of-way (ROW). Because this is on federal land, a cultural resources survey was conducted in compliance with Section 106 of the National Historic Preservation Act (NHPA). The archaeological survey was performed under Archaeological Resources Protection Act (ARPA) Permit No. 06GLCA01. No sites were found.

In 1991, the Advisory Council on Historic Property, the Director of the NPS Intermountain Region, the Superintendent of Glen Canyon NRA, and the State Historic Preservation Officers from the State of Utah and Arizona entered into a Programmatic Agreement on the execution of Sections 110 and 106 of the National Historic Preservation Act. This agreement allows qualified archeologists from Glen Canyon NRA to determine the level of inventory that needs to be performed for any undertaking (in this case the construction of the proposed pipeline). It further states that if no cultural resources are located during the inventory, the Glen Canyon NRA project archeologist are to document this finding in the case file and the park can then proceed with the project, without further SHPO consultation.

Because the proposed locations for the sewer line and lift station were previously surveyed and no archeological sites were identified in the immediate project area, the proposed project area is not expected to contain archeological resources; however, appropriate steps would be taken to protect any archeological resources that are inadvertently discovered during construction. Because the project is unlikely to disturb any known archeological sites, this topic has been dismissed from further analysis.

Historic Structures

The term "historic structures" refers to both historic and prehistoric structures, which are defined as constructions that shelter any form of human habitation or activity. The project area does not contain any historic structures that may be eligible for NRHP inclusion. The proposed location for the sewer line and lift station were previously surveyed, and no historic structures were identified in the immediate project area (SWCA 2007b). Because the project will not impact any known historic structures, this topic has been dismissed from further analysis.

Ethnographic Resources

Per NPS DO- 28 *Cultural Resource Management*, ethnographic resources are defined 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 EO 13007 on sacred sites, NPS should try to preserve and protect ethnographic resources.

Ethnographic resources are not expected to exist in the proposed project area, based on the lack of cultural materials that have been identified in the project vicinity. In addition, Native American tribes traditionally associated with the Glen Canyon area were apprised of the proposed project in a letter dated October 5, 2006. Two responses confirmed their cultural affiliations with the area, but indicated that no impacts to significant ethnographic resources are expected. Therefore, this topic has been dismissed from further analysis.

Cultural Landscapes

According to NPS DO 28 *Cultural Resource Management Guideline*, a cultural landscape is a reflection of human adaptation and use of natural resources, and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. No features exist within the general project area that are likely to contribute to a significant cultural landscape. Therefore, this topic has been dismissed from further analysis.

Museum Collections

According to DO 24 *Museum Collections Management*, NPS requires the consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material), and provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, NPS museum collections. SHPO has concurred with the results of previous cultural resource surveys, stating that no significant cultural resources are likely to exist within the project area (Appendix D). Because the proposed project is unlikely to yield significant cultural artifacts, the topic of museum collections has been dismissed from further analysis.

Natural Resources

Paleontological Resources

According to NPS (2006) *Management Policies*, paleontological resources (fossils), including both organic and mineralized remains in body or trace form, will be protected, preserved, and managed for public education, interpretation, and scientific research (NPS 2006). The project area does not contain paleontological resources. The proposed location for the sewer line and lift station were previously surveyed, and no paleontological resources were identified in the immediate project area. Because the project does not have any paleontological resources, this topic has been dismissed from further analysis.

Wetlands

For regulatory purposes under the CWA, wetlands are “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.”

Executive Order (EO) 11990 *Protection of Wetlands* requires federal agencies to avoid, where possible, adversely impacting wetlands. Further, Section 404 of the CWA authorizes the USACE to prohibit or regulate,

through a permitting process, discharge of dredged or fill material or excavation within waters of the United States. NPS policies for wetlands as stated in NPS (2006) *Management Policies* and DO 77- 1 *Wetlands Protection*, strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with DO 77- 1 *Wetlands Protection*, proposed actions that have the potential to adversely impact wetlands must be addressed in a Statement of Findings for wetlands.

No wetlands are located in the project area; therefore, a Statement of Findings for wetlands will not be prepared, and the impact topic of wetlands has been dismissed from further analysis.

Floodplains

EO 11988 *Floodplain Management* requires all federal agencies to avoid construction within the 100- year floodplain unless no other practicable alternative exists. NPS under its 2006 *Management Policies* and DO 77- 2 *Floodplain Management* will strive to preserve floodplain values and minimize hazardous floodplain conditions. According to DO 77- 2 *Floodplain Management*, certain types of construction within a 100- year floodplain require preparation of a Statement of Findings for floodplains.

The project area is not located within a 100- year floodplain. Therefore, a Statement of Findings for floodplains will not be prepared, and the topic of floodplains has been dismissed from further analysis.

Soundscape Management

In accordance with NPS (2006) *Management Policies* and DO 47 *Sound Preservation and Noise Management*, an important component of NPS mission is the preservation of natural soundscapes associated with NPS units (NPS 2006). Natural soundscapes exist in the absence of human- caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human- caused sound considered acceptable varies among NPS units as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas.

The proposed location for the sewer line and lift station and most of the construction activity would occur in a pre- existing, disturbed ROW. A short portion of the pipeline would cross a relatively undisturbed portion of the NRA from the U.S. 89 corridor to the connection point with the NPS pipeline. Existing sounds in this area are primarily generated by vehicular traffic from US Highway 89. During construction, human- caused sounds would likely increase due to construction activities, equipment, vehicular traffic, and construction crews. Any sounds generated from construction would be temporary, lasting only as long as the construction activity, and would have a negligible to minor adverse impact to the surrounding area.

The pumps in the lift station work on- demand when the volume of sewage in the tanks reaches a critical level. This can be very intermittent, depending on amount of sewage presented throughout the day. The noise generated by these pumps is much less than the ambient noise generated by traffic on U.S. 89, which is within 100 feet of the lift station. Therefore, neither the construction of the pipeline and lift station nor the operation of the lift station is expected to appreciably increase the noise levels in the general area.

Therefore, the topic of soundscape management was dismissed from further analysis.

Lightscape Management

In accordance with its 2006 *Management Policies*, NPS strives to preserve natural ambient landscapes, which are natural resources and values that exist in the absence of human- caused light (NPS 2006). Glen Canyon NRA strives to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements. Glen Canyon NRA also strives to ensure that all outdoor lighting is shielded to the maximum extent possible, to keep light on the intended subject and out of the night sky.

The proposed action may incorporate minimal exterior lighting on the lift station building, but the lighting would be directed toward the intended subject with appropriate shielding mechanisms, and would be placed in only those areas where lighting is needed for safety reasons. The amount and extent of exterior lighting on the lift station building would have negligible effects on the existing outside lighting or natural night sky of the area; therefore, this topic has been dismissed from further analysis.

Social Resources

Socioeconomics

The Greenehaven community and the City of Page are located in Coconino County, Arizona. Coconino County encompasses 18,617 square miles; it is the largest county in Arizona and the second largest county in the United States.

The City of Page was founded in 1957 to provide housing for workers during construction of the Glen Canyon Dam, and was incorporated in 1975. It has evolved into the gateway community for Glen Canyon NRA facilities near the dam. In 1990, the population of Page was 6,598 people. The year 2000 census showed that Page grew by 3.2 percent over the decade to a population of 6,809, and the 2006 census showed an increase to 7,230 (ADOC 2007). Tourism and power generation are the largest sources of revenue in Page. Major private employers are ARAMARK, the Navajo Generating Station, and the Page Unified School District; major public employers are the Bureau of Reclamation, the City of Page, and NPS. Children from Greenehaven attend school in Page even though the community is within the Fredonia School District.

The proposed action would neither change local and regional land use nor would it appreciably impact local businesses or other agencies. Implementation of the proposed action would provide a negligible beneficial impact to the economies of Page and Coconino County from minimal increases in employment opportunities for the construction workforce and the revenues for local businesses and governments generated from these additional construction activities and workers. Any increase in workforce and revenue, however, would be temporary and negligible, lasting only as long as construction. Because the impacts to the socioeconomic environment would be negligible, this topic has been dismissed from further analysis.

Prime and Unique Farmlands

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 the conversion of these lands to non- agricultural uses. Prime or unique farmland is classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), and is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. Because the proposed project location is within an area that has already been disturbed by previous development in the ROW and the land is not supported by an irrigation system, the topic of prime and unique farmlands has been dismissed from further analysis.

Indian Trust Resources

Secretarial Order (SO) 3175 requires that any anticipated impacts to Indian Trust resources from a proposed project or action by the U.S. Department of the Interior agencies be explicitly addressed in environmental documents. The federal Indian Trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian Trust resources at Glen Canyon NRA. The lands encompassing Glen Canyon NRA are not held in trust by the Secretary of the Interior for the benefit of Indians. Therefore, the project would have no effect on Indian Trust resources, and this topic was dismissed from further analysis.

Environmental Justice

EO 12898 *General Actions to Address Environmental Justice in Minority Populations and Low- Income Populations* requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low- income populations and communities. Because the new sewer line and lift station would not impact NPS staff or park visitors regardless of race or income, and the construction workforces would not be hired based on their race or income, the proposed action would not have disproportionate health or environmental effects on minorities or low- income populations or communities. Therefore, the topic of environmental justice has been dismissed from further analysis.

Visitor Use and Experience

According to NPS (2006) *Management Policies*, the enjoyment of park resources and values by people is part of the fundamental purpose of all park units (NPS 2006). NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks, and will maintain within the parks an atmosphere that is open, inviting, and accessible to every segment of society. Further, NPS will provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks. NPS (2006) *Management Policies* also state that scenic views and visual resources are considered highly valued associated characteristics that NPS should strive to protect (NPS 2006).

Visual resources include the natural and man- made physical features that give a particular landscape its character and value as an environmental factor. The physical feature categories, which form the overall impression a viewer receives of an area, include landform, vegetation, water, color, adjacent scenery, scarcity, and man- made (cultural) modification (BLM 1984). Criteria used in the analysis of visual resources include scenic quality and visual sensitivity from key public viewpoints.

Scenic Quality. The scenic resources for the Lake Powell area have been divided into four classes, described below. Criteria used to differentiate between scenic resource classes were established in the General Management Plan (NPS 1979) and include diversity of color, contrast, form, and geologic uniqueness. Class I areas are identified as outstanding scenery that typically include “deep canyons; unique geological structures and intricately carved landscapes.” Class II areas have superior scenery and may contain just a single property characterized by immensity or unique physiographical distinctions. Class III areas are interesting but less unique or prominent than Class I or II areas. Nonetheless, they contribute to the interest of the overall scenery. Class IV areas are described as unremarkable. Among other characteristics, they can include flat, monotonous expanses of shrub or pinyon- juniper communities.” Scenery throughout Glen Canyon NRA is

generally considered high quality. About 40 percent of the area that includes the foreground surrounding the Greenehaven area has been designated Class III.

Visual Sensitivity. Visual sensitivity for this analysis was based on the volume of travel on US Highway 89, because this route provides public viewpoints of the project area. Volumes of travel were obtained from ADOT. Areas that are visible from highways with 3,000 or more average annual daily trips are assigned a high sensitivity level. Areas that are visible from highways with 1,000 to 2,999 average annual daily trips are assigned a medium sensitivity level. Areas that are visible from highways with fewer than 1,000 average annual daily trips are assigned a low visual sensitivity level. US Highway 89, in the vicinity of the project site, carries more than 10,000 average annual daily trips. Therefore, it was assigned a “high” sensitivity level.

The existing WTP is not visible from most parts of Greenehaven, the Glen Canyon NRA, or Lake Powell. It cannot be seen from US Highway 89 or the Wahweap north entrance road. The proposed lift station would be located within the ADOT ROW approximately 200 feet east of milepost (MP) 555 on the north side of US Highway 89. While a high number of park visitors would have a view of the lift station, it would be located above the sight line from the roadway, and the stuccoed exterior wall would be the only infrastructure that would be visible to the public. Therefore, the topic of visitor use and experience has been dismissed from further analysis.

Park Operations

The majority of the pipeline and the lift station will be located within an existing ADOT right of way that is not directly administered by the park service. While a small portion of the pipeline and the connection point with the Glen Canyon pipeline would be located within the park, Glen Canyon NRA and Greenehaven Properties have entered into an agreement where in exchange for a right of way and connection point, Greenehaven Properties would be responsible for all maintenance of their pipeline up to and including the connection. Glen Canyon NRA (for a stipulated user fee) would then allow transit of sewage from Greenehaven through the NPS managed pipeline to the City of Page Wastewater Treatment Plant. The NPS would be responsible for maintenance on their section of the pipeline and the increase volume of wastewater from Greenehaven may cause a slight increase in the number of maintenance hours required for the system.

Greenehaven Properties would also be responsible integrating their control and alarm system with the Glen Canyon NRA system so that they can stop the flow of sewage should problems arise in the NPS or City’s portion of the transportation and treatment process. Construction of the new sewer line and lift station will not have a measurable effect on park staff or on how and where they conduct their work. The proposed sewer line will not be built by the NPS nor maintained by the NPS. It simply will cross NPS lands. There could possibly be short-term, negligible effects to park operations during construction, as well as a long-term, negligible impact to maintenance operation, but no significant effects are anticipated. For this reason, the topic of park operations has been dismissed from further analysis in this document.

Transportation and Access

Within the GDCWTP area, the primary roadway is US Highway 89. Between Greenehaven and the City of Page, US Highway 89 crosses the Colorado River on a two-lane bridge. US Highway 89 serves as a connector between Interstates 17 and 40 to the south and Interstate 15 to the north and west. The mix of traffic on US Highway 89 includes a substantial portion of heavy trucks, which provide both local services and long-haul transportation of goods.

Tourist traffic to Glen Canyon NRA is heavier during the summer than during the winter months. However, traffic in the vicinity is characterized as light throughout the year, and all roads operate well below their design capacities throughout the year. During construction, impacts to traffic or traffic patterns would be minimal. The abandoned road proposed for access to the lift station is currently not in use. Access to the Glen Canyon NRA will be maintained. Because the proposed project is not expected to have any impacts to transportation patterns or access, this topic has been dismissed from further analysis.

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ALTERNATIVES CONSIDERED

Two alternatives have been considered in detail in this Environmental Assessment: the No- Action Alternative (Alternative A) and the Proposed Action Alternative (Alternative B). Both were assessed and analyzed during preparation of this document. A summary table comparing alternative components is presented at the end of this chapter.

All practicable efforts will be made to make NPS facilities, programs, services, employment, and meaningful work opportunities accessible and usable by all people, including those with disabilities.

Alternatives Carried Forward

Alternative A—No Action

Under Alternative A, the new sewer line from the Greenthaven development to the City of Page WTP would not be constructed. The land is currently used as an ADOT ROW under NPS jurisdiction and would remain consistent with current conditions under this alternative. The GDCWTP would also remain in violation with ADEQ because of its insufficient capacity to handle current and future wastewater loads.

Alternative B—Construct New Sewer Line

Under the Proposed Action Alternative, NPS would grant a 60- foot ROW for the installation and operation of an 8- inch high- density polyethylene (HDPE) sewer pipeline, and a lift station to be used for transport of wastewater from Greenthaven to the City of Page WTP. The sewer line would be placed along the north side of US Highway 89, where it would extend for approximately 6 miles before joining an existing NPS sewer line. The pipeline would start at Greenthaven near MP 556 and follow the ADOT ROW on NPS lands to a point 600 feet west of MP 551. It would then exit the ADOT ROW and follow an adjacent haul road for 4,034.15 feet, at which point it would join the existing NPS sewer line at the Glen Canyon NRA entrance road (see Figure 2).

Accompanying the pipeline would be a sewage lift station, which would be constructed approximately 1 mile southeast of the Greenthaven Development. The lift station would be installed adjacent to and outside the NPS ROW fence, and would use a gated access from US Highway 89 as an access point to the station.

The City of Page WTP has a rated flow capacity of 2.5 million gpd and a rated biochemical oxygen demand of 4,170 pounds per day. The Page facility currently treats a maximum flow of 900,000 gpd, with a maximum biochemical oxygen demand of 1,880 pounds per day (45 percent of capacity). Maximum daily volume of wastewater generated by the Greenthaven wastewater system will be 250,000 gallons per day. This volume of wastewater would have a biochemical oxygen demand of about 520 pounds per day. If the flow rate from NPS force main reached the maximum flow of 325,000 gpd and Greenthaven wastewater reached the maximum flow of 250,000 gpd, the total maximum flow at the Page plant would be 1,475,000 gpd and the maximum biochemical oxygen demand would be 2,554 pounds per day. With the addition of NPS and Greenthaven wastewater, on a maximum day the City of Page WTP would operate at about 61 percent of both its flow and biochemical oxygen demand capacity.

Construction Activities

The estimated timeline for construction of the sewage pipeline and associated infrastructure is 13 months.

Phase I of construction has already been completed. During this phase, the installation of various infrastructure components to accommodate the new pipeline was completed. Lagoon No. 2 at Greenehaven, which is an 80,000- gpd, 2.3- acre primary treatment lagoon lined with a 45- millimeter- thick flexible membrane, was installed in order to treat current wastewater loads once Lagoon No. 1 is shut down during Phase II. Lagoon No. 2 currently operates as an emergency backup holding facility. In addition, the transfer/chlorination building, lift pump station, and new pipelines to the land use application area were constructed. Land use application will be achieved at Lagoon No. 2 by chlorination and ultraviolet radiation. Once ADEQ gives operational approval for these improvements, they will provide the ability to treat effluent that is discharged into Lagoon No. 2 and applied to the land use application areas.

Phase II includes the construction of a force main sewer line through the ADOT ROW on NPS lands, connection to NPS force main, closure of Lagoon No. 1, and construction of the lift pump stations off an abandoned access road. Once these components have been installed, ADEQ will test and approve the conveyance of wastewater from the Greenehaven development to the City of Page WTP by direct pumping into the force main pipeline.

The pipeline would require a 28- foot- wide construction easement and a 12- foot- wide permanent easement. The lift station will require a construction easement of 50 × 50 feet and a permanent easement of 30 × 35 feet, with a 14- foot- wide access easement for maintenance. The pump station would consist of a wet well, two 20- horsepower constant- speed pumps with one on standby, level sensors, and a control panel. The wet well would be approximately 6 feet in diameter and 14 feet deep, and would be constructed entirely below grade. The wet well would be sized to prevent the development of anaerobic conditions. The pumps would be operated using wastewater level controls, and a fiberglass building would be installed on a concrete slab above the pump stations' wet well. This structure would house electrical control panels and would include space for equipment if chemical dosing were required to control odors.

The initial lift/pump station would be constructed to lift the sewage from the Greenehaven wastewater site to the second lift/pump station, located at the southwest corner of North Wahweap Drive and North Anasazi Drive; the sewage would continue within an ADOT easement east along US Highway 89 to approximately MP 554.8, the location of the third lift/pump station. From this pump station, waste will flow into the T at the NPS force main line to the City of Page WTP.

During this construction phase, the Lagoon No. 1 treatment pond would be drained and the accumulated sludge would be air dried. The biosolids would then be removed and disposed of at an approved disposal site and the area would be revegetated with native grasses.

Alternatives Considered and Dismissed

During the planning stages of this document, it was determined that the No- Action Alternative (Alternative A) and the Proposed Action Alternative (Alternative B) were the only alternatives that needed to be analyzed for the purposes of this document. Because Alternative B is the solution ADEQ approved with the issuance of Aquifer Protection Permit No. 101365, it was deemed the only viable alternative other than the No- Action.

Mitigation Measures

The following mitigation measures have been developed to minimize the degree and/or severity of adverse effects, and would be implemented during construction of the Proposed Action Alternative, as needed:

- To minimize the amount of ground disturbance, staging and stockpiling areas would be located in previously disturbed sites, away from visitor use areas to the extent possible. All staging and stockpiling areas would be returned to pre- construction conditions following construction.
- Construction zones would be identified and fenced with construction tape or some similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone as defined by the construction zone fencing.
- Revegetation and recontouring of disturbed areas would take place following construction, and would be designed to minimize the visual intrusion of any structures. Revegetation efforts would strive to reconstruct the natural spacing, abundance, and diversity of native plant species using native species. All disturbed areas would be restored as nearly as possible to pre- construction conditions shortly after construction activities are completed. Weed control methods would be implemented to minimize the introduction of noxious weeds. Some trees may be removed, but, to the extent possible, other existing vegetation at the site would not be disturbed.
- Because disturbed soils are susceptible to erosion until revegetation takes place, standard erosion control measures such as silt fences and/or sand bags would be used to minimize any potential soil erosion.
- Fugitive dust generated by construction would be controlled by water sprayed on the construction site, if necessary.
- To reduce noise and emissions, construction equipment would not be permitted to idle for long periods of time.
- To minimize possible petrochemical leaks from construction equipment, the contractor would regularly monitor and check construction equipment to identify and repair any leaks.
- Construction workers and supervisors would be informed about special status species. Contract provisions would require the cessation of construction activities if a species were discovered in the project area, until park staff reevaluates the project. This would allow modification of the contract for any protection measures determined necessary to protect the discovery.
- Should construction unearth previously undiscovered cultural resources, work would be stopped in the area of the discovery and Greenehaven would immediately notify NPS staff and the Advisory Council on Historic Preservation, as necessary, according to §36 CFR 800.13, *Post Review Discoveries*. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act of 1990 would be followed.
- To minimize the potential for impacts to park visitors, variations of construction timing may be considered. One option includes implementing daily construction activity curfews, such as not operating construction equipment between the hours of 6 pm to 7 am in summer (May–September), and 6 pm to 8 am in the winter (October–April).

Alternative Summaries

Table 1 summarizes the major components of Alternatives A and B, and compares the ability of these alternatives to meet the project objectives (the objectives for this project are identified in the *Purpose and Need* chapter). As shown in the following table, Alternative B meets each of the objectives identified for this project, while the No- Action Alternative does not address all the objectives.

Table 2 summarizes the anticipated environmental impacts for Alternatives A and B. Only those impact topics that have been carried forward for further analysis are included in this table. The *Environmental Consequences* chapter provides a more detailed explanation of these impacts.

Table 1 – Alternatives Summary and Extent to Which Each Alternative Meets Project Objectives

Alternative A—No Action	Alternative B—New Sewer Line and Lift Station
A new pipeline with associated infrastructure would not be constructed. The existing wastewater from Greenehaven would continue to be treated at the Greenehaven wastewater treatment facility with no additional improvements to structural deficiencies or wastewater capacity.	A new 6-inch HDPE sewer pipeline and lift/pump station would be constructed in an ADOT ROW on NPS land, and within an NPS ROW. The pipeline would convey wastewater from GDCWTP to the City of Page WTP, where excess flows can be accommodated.
Meets Project Objectives?	Meets Project Objectives?
No. Continuing the existing conditions would not provide the safe treatment of current wastewater loads from Greenehaven. In addition, GDCWTP would remain in non-compliance with ADEQ and would pose an unnecessary risk to the health and safety of Greenehaven residents and the surrounding environment.	Yes. Routing Greenehaven wastewater to the City of Page WTP would meet necessary ADEQ requirements. The health and safety of Greenehaven residents and the surrounding environment would remain intact. This alternative minimizes environmental impacts to the extent possible, and would not result in impairment to any park resources.

Table 2 – Environmental Impact Summary by Alternative

Impact Topic	Alternative A—No Action	Alternative B—Preferred Alternative
Air Quality	Adverse, direct, negligible, local effects of short duration from nuisance odors from treatment cells.	Adverse, direct, moderate, short-term effects from ground-disturbing activities. Adverse, direct, negligible, short-term effects from nuisance odors from treatment cells.
Topography, Geology, Soils	No effects on topography or geology. Adverse, direct, negligible to minor, short-term, localized effects to soils from maintaining the existing facility.	Adverse, direct, moderate, short-term effects on topography and soils due to ground disturbing activities. Beneficial, minor, long-term effects on Lagoon No. 1 closure site, where revegetation and recontouring will occur. Beneficial, direct, minor, short-term effects on soils from maintaining upgraded facility. No effects on geology.
Vegetation	No changes would occur in vegetation. No impairment of vegetation resources.	Adverse, direct, moderate, short-term effects on vegetation during ground-disturbing activities in pipeline area. Beneficial, direct, minor, long-term effects on vegetation from recontouring and revegetation efforts at Lagoon No. 1 closure site.
Water Quality	At this time, no significant adverse effects on water quality are anticipated as a result of continued treatment of excess wastewater flows at Greenehaven.	Adverse, direct, minor, short-term effects from construction activities that may increase potential for soil erosion in the immediate project vicinity until post-construction revegetation is accomplished.

Table 2 – Environmental Impact Summary by Alternative (Continued)

Impact Topic	Alternative A—No Action	Alternative B—Preferred Alternative
Wildlife and Habitat	No changes would occur in wildlife populations or their supporting habitats. No impairment of wildlife resources or habitat.	Adverse, direct, moderate, short-term effects on wildlife and habitat during ground-disturbing activities. Beneficial, direct, moderate, long-term effects on wildlife and habitat after revegetation and recontouring improve existing conditions.
Special Status Species	No changes would occur to special status species or their supporting habitats. No impairment of special status species habitat.	No changes would occur to special status species or their supporting habitats. No impairment of special status species habitat.
Public Health and Safety	Adverse, indirect, moderate, long-term effect on public health and safety at GDCWTP because of inability to adequately treat current and projected flows of wastewater. Adverse, negligible, long-term effect on public health and safety from sludge management, and potential for animal vectors.	Adverse, direct, minor, short-term effects to public health and safety during ground-disturbing activities near US Highway 89. Possible disruption to transportation networks may pose some risk. Beneficial, direct, minor, long-term effects on public health and safety once construction is complete and Greenehaven is operating in compliance with ADEQ standards.

Identification of the Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria suggested in NEPA, which guides the CEQ. The CEQ provides direction that “[t]he environmentally preferable alternative is the alternative that would promote the national environmental policy as expressed in NEPA’s Section 101.”

The six evaluation criteria are as follows:

- fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- ensure for all generations 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; and
- enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Alternative A does not meet any of the evaluation criteria because it would maintain current operational practices at the GDCWTP, which have been demonstrated to be unsafe and to threaten the health of Greenehaven residents and the surrounding environmental resources. In addition, the current practices have been cited by ADEQ as violating Arizona water quality and waste treatment standards. Maintaining the

current, inadequate operational practices at Greenehaven does not ensure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings; does not attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences; and does not achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities. Thus Alternative A does not meet three of the evaluation criteria as outlined by NEPA. The other three evaluation criteria are not applicable to this effort.

Alternative B is the environmentally preferred alternative because it best addresses the evaluation criteria. Alternative B, *Construction of a New Sewer Line*, would provide needed infrastructure to accommodate current wastewater loads from Greenehaven and ensure ADEQ compliance. Providing reliable wastewater treatment to the residents of Greenehaven would ensure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings; would attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences; and would achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities. Thus Alternative B would meet three of the evaluation criteria. The other three evaluation criteria are not applicable to this effort.

No new information was put forward during public scoping or consultation with other agencies to necessitate the development of any new alternatives, other than those described and evaluated in this document. Because it meets the Purpose and Need for the project and the project objectives, and is the environmentally preferred alternative, Alternative B is also recommended as the NPS Preferred Alternative. For the remainder of the document, Alternative B will be referred to as the Preferred Alternative.

ENVIRONMENTAL CONSEQUENCES

This chapter analyzes the potential environmental consequences, or impacts, that would occur as a result of implementing the proposed project. Topics analyzed in this chapter include air quality; topography, geology, and soils; vegetation; water quality; wildlife and habitat; special status species; and public health and safety. Direct, indirect, and cumulative effects, as well as 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 section.

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

Cumulative Effects: CEQ regulations, which implement NEPA (42 USC 4321 *et seq.*), require an assessment of cumulative impacts in the decision- making process for federal projects. 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 both the No- Action and Preferred alternatives.

Cumulative impacts were determined by combining the impacts of the Preferred Alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at Glen Canyon NRA and, if applicable, the surrounding region. The geographic scope for this analysis includes elements mostly within the Glen Canyon NRA boundaries, while the temporal scope includes projects within a range of approximately 10 years. Given this, the following projects were identified for the purpose of conducting the cumulative effects analysis, listed from past to future:

Past:

- Construction of Lagoon No. 2 as an emergency holding tank, and associated supporting infrastructure, for future land use application.

Present:

- Daily operations at GDCWTP;
- Traffic on US Highway 89; and
- Ongoing housing units being developed within Greenehaven.

Future:

- Additional development at Greenehaven (future growth at Greenehaven is limited to within Section 32 and to a maximum number of 1,109 units).

Impairment: NPS (2006) *Management Policies* require analysis of potential effects to determine whether actions would impair park resources (NPS 2006). 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 to minimize to the greatest degree practicable adversely impacting park resources and values. However, the laws do give NPS the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values.

Although Congress has given NPS the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The 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 constitute an impairment, but an impact would be more likely to constitute an impairment to the extent that it has a major or severe adverse effect on a resource or value whose conservation is:

1. necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
2. key to the natural or cultural integrity of the park; or
3. 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 concessionaires, contractors, and others operating in the park. A determination on impairment is made in the Conclusion section for each of the resource topics analyzed in this chapter.

Air Quality

Intensity Level Definitions

GDCWTP was designed to accommodate wastewater needs for the residents of the Greenehaven residential community. The methodology used for assessing impacts to air quality is based on how the project will affect current air quality standards. The thresholds for these impacts are as follows:

- Negligible:** There would be no smell of sewage. Dust from construction activities could be controlled by mitigation. Ambient air quality concentrations of criteria pollutants would be less than 60 percent of National Ambient Air Quality Standards (NAAQS).
- Minor:** There would be a slight smell of sewage during brief periods of time. Dust from construction activities would be visible only during the work period and could be readily mitigated. Ambient air quality concentrations of criteria pollutants would be less than 80 percent of NAAQS.
- Moderate:** Strong sewage smells would sometimes be evident in high-use areas. Dust from construction activities would be visible over a large area and for extended periods of time. Mitigation would be possible but would be only partially effective. Ambient air quality concentrations of one or more criteria pollutants would exceed 80 percent of NAAQS, but would not exceed the standards (100 percent).
- Major:** Sewage smells would be readily evident for extended periods of time over large areas. Dust from construction activities would be visible over a large area and for extended periods of time, and mitigation would be unable to alleviate impacts. Ambient air quality concentrations of one or more criteria pollutants would equal or occasionally exceed 100 percent of NAAQS.
- Impairment:** Air emissions would exceed standards, and air quality in the Glen Canyon NRA would be adversely affected to the point that the purpose of the park could not be fulfilled, and park resources could not be experienced and enjoyed by future generations.

Impacts of Alternative A (No- Action Alternative)

The No- Action Alternative would result in no additional impact to air quality because no additional ground-disturbing activities would take place under this alternative. The existing GDCWTP has not received comments regarding odors from ADEQ inspectors. It is expected that odors would remain at their current level, with no effect under the No- Action Alternative.

Cumulative Effects: If further development occurs as planned at Greenehaven, local, long-term cumulative effects to air quality are expected to occur as a result of the No- Action Alternative.

Conclusion: The No- Action Alternative would result in no effect to air quality over the short-term and long-term because no construction activities would occur on the project area and current odor conditions at Lagoon No. 1 would remain. The No- Action Alternative would not result in the impairment of air quality in Glen Canyon NRA.

Impacts of Alternative B (Preferred Alternative)

Generation of dust is likely with any activity that disturbs the soil surface. Soils in the project area are sparsely vegetated because of the low rainfall and high heat conditions. Substantial areas of bare and exposed soils are part of the existing landscape in the vicinity of the existing wastewater treatment facility, potential pipeline

corridor, and elsewhere throughout the region. If the thin surface crust is disturbed, these soils are susceptible to wind erosion and re-suspension during high wind periods, which occur frequently during spring and fall months.

Implementation of the Preferred Alternative would create an adverse, direct, moderate, short-term effect on air quality. Construction activities such as hauling materials and operating heavy equipment could result in temporary increases of vehicle exhaust, emissions, and fugitive dust in the general project area. Any exhaust, emissions, and fugitive dust generated from construction activities would be temporary and localized, and would likely dissipate rapidly because air stagnation in the project vicinity is rare. Overall, the project could result in a moderate degradation of local air quality, and such effects would be temporary, lasting only as long as construction. Dust would be controlled and mitigated using conventional measures such as wetting the soil. The Class II air quality designation for Glen Canyon NRA would not be affected by the proposal.

Smoke from diesel engines and other construction equipment would be generated during construction of the new facilities and demolition of Lagoon No. 1. The air quality effect of these emissions, assuming the use of best management practices (BMPs) (a standard procedure) for emissions control would be a negligible, direct, adverse impact to air quality. The emission period would be short-term, lasting less than 13 months.

The existing GDCWTP has not experienced comments of odors from ADEQ inspectors during inspections. To help reduce the chance of any future odor events, Greenehaven has installed an aerator in Lagoon No. 2. Odors would not be expected from the pump station wet wells because they would be designed to prevent anaerobic conditions. Provisions would be included in the system design to add a stabilizing chemical such as ferric chloride or bioxide to the wastewater at the pump station wet well to prevent the wastewater from becoming anaerobic within the force main. Under the Preferred Alternative, the potential for generation of nuisance odors in the recreation area would be virtually eliminated. This would be a beneficial, direct, minor, short-term, local air quality impact.

Cumulative Effects: The incremental effects of road and construction dust and nuisance odors from facility operations would tend to dissipate quickly and would not contribute to a cumulative impact when combined with similar air emissions from other projects. There may be a temporary incremental increase in total dust emissions when vehicle traffic on the dirt access road coincides with wind-borne dust eroding from the nearby landscape.

Conclusion: Odors would be eliminated in the vicinity of Greenehaven because the existing treatment plant would be taken out of service and the effluent would be pumped to the City of Page WTP. Eliminating nuisance odors would prevent an ADEQ violation and would provide a beneficial, direct, long-term effect. During construction of facilities and closure of the existing Lagoon No. 1 site, direct, minor, short-term adverse air quality impacts would be experienced from blowing dust from disturbed ground in the construction site vicinity. These impacts would be mitigated by dust-control measures such as watering and minimizing the area of disturbance. Improvements to the potential for nuisance odors to occur would provide a beneficial, negligible, short-term effect as a result of the Preferred Alternative. The Preferred Alternative would not result in the impairment of air quality in Glen Canyon NRA.

Topography, Geology, and Soils

Intensity Level Definitions

Impacts to topography, geology, and soils were evaluated using the process described in the introduction of the *Environmental Consequences* chapter. Impact threshold definitions for topography, geology, and soils are as follows:

- Negligible:** Topography, geology, and soils would not be affected, or effects would not be measurable. Any effects to soil productivity or fertility would be slight and short-term, and would occur in a relatively small area.
- Minor:** Effects to topography, geology, or soils would be detectable, but would affect a small area. If mitigation was needed to offset adverse effects, it would be relatively simple to implement and would likely be successful.
- Moderate:** Effects to topography, geology, or soils would be readily apparent, and would occur over a relatively large area. Mitigation would probably be necessary to offset adverse effects, and its success would likely be successful.
- Major:** Effects to topography, geology, or soils would be readily apparent, and would substantially change the soil or geologic characteristics over a large area in and out of the Glen Canyon NRA. Extensive mitigation would probably be necessary to offset adverse effects, and its success could not be guaranteed.
- Impairment:** A permanent adverse change would occur to topography, geology, or soils in a large portion of the Glen Canyon NRA, affecting the resource to the point that the park's purpose could not be fulfilled and enjoyment by future generations of the topography, geology, or resources supported by soils would be precluded.

Impacts of Alternative A (No- Action Alternative)

Under the No- Action Alternative, the sewage pipeline and supporting infrastructure would not be constructed to accommodate current waste flows at the GDCWTP. Ground-disturbing activities that may occur as a result of the day-to-day operations would continue without change. As a result, no impacts to topography or geology would occur under this alternative.

A minor adverse, direct, long-term effect to soils would occur as a result of localized activities under existing conditions at Greenehaven.

Cumulative Effects: The localized, negligible adverse effects of ground-disturbing activities associated with routine facility maintenance, when combined with soil disturbance activities of further development at Greenehaven, would contribute only minor adverse cumulative soil effects.

Conclusion: The No- Action Alternative would not have any effect on topography or geology. The effects to soils that would result from maintaining the existing treatment facility would be short-term, localized, and negligible in intensity. The No- Action Alternative would not result in the impairment of soils or geological resources in Glen Canyon NRA.

Impacts of Alternative B (Preferred Alternative)

Under the Preferred Alternative, a 6-mile-long sewage pipeline with associated infrastructure would be constructed and operated on NPS land within an ADOT ROW. The proposed construction of the new sewer line and associated lift station would be located in an area of NPS lands that does not contain significant topographic or geologic features. The general location for the new sewer line and lift station has been previously disturbed by past construction of utilities and of US Highway 89. Modifications to the topography would displace and disturb soils, primarily in the footprint of the new pipeline and lift station, and would have a minor effect on the topography in this area.

Soils would experience minor to moderate disturbance in three locations. All effects would be direct and localized.

- At the existing treatment site, approximately 2 acres of soils would be graded and revegetated to reestablish the native desert environment.
 - Short-term, moderate, adverse effects would occur during the construction and rehabilitation period when these soils were exposed to erosion.
- Approximately 18 acres of soils would be disturbed by the installation of the pipeline from GDCWTP to the connection of NPS pipeline. This area would be revegetated in areas that do not require long-term use and maintenance to reestablish the native desert environment. It is expected that an overall long-term, moderate, adverse impact to soils will occur as a result of this disturbance.
 - A 28-foot-wide construction corridor would be required during pipeline installation. The corridor has been previously disturbed by the construction of facilities such as roads and the installation of ADOT fencing. Short-term, moderate, adverse impacts would occur from erosion until an adequate vegetation cover was developed.
 - Within this corridor, a permanent, 10-foot-wide strip (7.6 acres in total) would be required for long-term operations and maintenance of the pipeline. These activities would produce short-term, minor, adverse effects on soils that would be readily mitigated using conventional BMPs.
- Approximately 3 acres of soils would be permanently converted to Lagoon No. 2 holding ponds.
 - Long-term, minor, adverse effects would occur from the permanent conversion of otherwise vacant lands into the Lagoon No. 2 holding ponds.
 - Additional soils around the construction perimeter would be graded and revegetated after construction was completed. Disturbance to these soils would constitute a short-term, minor, adverse effect. Soil conservation BMPs would be used to minimize wind and water erosion of excavated soils; soils would be stockpiled, backfilled, and prepared for revegetation.

Erosion problems currently occur along about 20–30 percent of the pipeline alignment in areas where intense thunderstorms wash soils off the upslope embankment and onto the road. Installation of the pipeline would not have any effect on this ongoing maintenance problem. This alternative would not affect local geologic formations or characteristics. It also would not result in the placement of any facilities in geologically hazardous areas.

Cumulative Effects: Along US Highway 89, pipeline operations and maintenance would disturb very few areas that have not already been affected by road shoulder maintenance. Applying conventional soil conservation and BMPs would further reduce the potential for contributing to regional soil losses. Negligible cumulative impacts to soils are expected to occur from sewer line construction and ongoing maintenance within the Greenehaven pipeline corridor, when combined with further development at Greenehaven.

Conclusion: The Preferred Alternative would not have any effect on geology. A total of slightly less than 10 acres of soils would be affected by this alternative. Effects would include minor, direct, short-term, adverse effects to 2 acres of soils at the GDCWTP that have already been disturbed by construction, and long-term, direct, beneficial effects from restoration efforts following the closure of Lagoon No. 1. Moderate, long-term, direct, adverse effects to 7.6 acres of soils would occur along the pipeline route where a 12-foot-wide strip is needed for maintenance of the pipeline. Minor, long-term, direct, adverse effects are expected within the approximately 3 acres of Lagoon No. 2 holding ponds. This area was previously disturbed in 1975 during excavation of the material for the lagoons. BMPs would be used to minimize all of these effects. The Preferred Alternative would not result in the impairment of soils or geological resources in Glen Canyon NRA.

Vegetation

Intensity Level Definitions

Impacts to vegetation were evaluated using the process described in the introduction of the *Environmental Consequences* chapter. Impact threshold definitions for vegetation are as follows:

- Negligible:** Individual native plants may occasionally be affected, but measurable or perceptible changes in plant community size, integrity, or continuity would not occur.
- Minor:** Effects to native plants would be measurable or perceptible, but would be localized within a small area. The viability of the plant community would not be affected and the community, if left alone, would recover.
- Moderate:** A change would occur over a relatively large area in the native plant community that would be readily measurable in terms of abundance, distribution, quantity, or quality. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.
- Major:** Effects to native plant communities would be readily apparent, and would substantially change vegetation community types over a large area in and out of the Glen Canyon NRA. Extensive mitigation would be needed to offset adverse effects, and its success could not be guaranteed.
- Impairment:** A permanent adverse change in native plant communities would occur in a large portion of the Glen Canyon NRA. The change would be highly noticeable, could not be mitigated, and would affect vegetation to the point that the park's purpose could not be fulfilled and enjoyment of the vegetation resource by future generations would be precluded.

Impacts of Alternative A (No- Action Alternative)

Under the No- Action Alternative, no land disturbance would occur. Therefore, this alternative would not affect the existing plant communities. No direct changes in existing vegetation resources from short- or long-term perspectives would occur. Existing noxious weed populations that have been identified for the purposes of this Environmental Assessment will remain undisturbed.

Cumulative Effects: There would be no incremental changes in existing vegetation conditions resulting from this alternative. Therefore, there would be no changes contributing to a cumulative vegetation effect.

Conclusion: There would be no impact to or impairment of vegetation resources under this alternative.

Impacts of Alternative B (Preferred Alternative)

Under the Preferred Alternative, NPS would grant a portion of ADOT and NPS ROW to the GDCWTP for the construction and operation of a 6-mile-long sewage pipeline and associated infrastructure. Vegetation assemblages along adjacent roads and within the ROW consist of native or weed species. Sahara mustard (*Brassica tournefortii*), an ADA-prohibited noxious weed, is located within the project area (SWCA 2007a). The invasion of noxious weeds and other exotic plant species in disturbed soil locations is a chronic vegetation resource management problem. Based on the size of the new facilities to be constructed and the relatively short duration of construction activities, this effect would be mitigated using BMPs. Prior to entering or leaving the site, all earth-moving and hauling equipment will be washed and inspected to prevent the spread of non-native plant species. Once construction is complete, disturbed soils will be reseeded with native plant species to help prevent the reestablishment of noxious weeds in the future. This method would require weed control practices to be implemented during and after the revegetation process in order to ensure that only native vegetation is returned to the area. It is expected that impacts will be minor, short-term, and beneficial if BMPs are properly administered during and after construction phases of the project.

Construction activities would also result in the loss of some vegetative communities located within the project area. The location of the proposed sewer line and associated lift station is in a previously disturbed area of the park in an existing NPS ROW. The area contains little to no water and minimal vegetation, and is generally flat with no major geologic features. The presence of humans, human-related activities, and structures has removed or displaced much of the native wildlife habitat in the project area. Because the area is already largely disturbed, it is expected that additional disturbance to vegetation within the project area will result in adverse, direct, moderate, short-term impacts.

After construction, disturbed areas would be revegetated and rehabilitated in areas where the GDCWTP is not required to maintain a maintenance easement. A vegetative cover of grasses would be established within 3 to 5 years at the closed Lagoon No. 1 site and along the ADOT and NPS ROWs. Habitat restoration to the climax black brush and sand-shrub/grass land communities would take many more years to achieve because of the low and inconsistent rainfall, which is the primary environmental constraint on vegetation development. Reseeding and revegetating disturbed areas will help mitigate impacts to vegetation from ground-disturbing activities and improve existing conditions long-term. This would result in a beneficial, direct, long-term effect on vegetation.

Cumulative Effects: Vegetation loss from sewer line construction, when combined with maintenance activities and further development at Greenehaven, result in a minor adverse cumulative effect. Temporary loss of about 7 acres of vegetation following construction would be partially offset by permanent revegetation of 3 acres under the Preferred Alternative. Other current and proposed activities such as continued maintenance on the ADOT and NPS ROWs may contribute slightly to a cumulative impact to vegetation.

Conclusion: Implementation of the Preferred Alternative would have a short-term, direct, moderate, adverse impact during construction activities and a long-term, direct, minor, beneficial impact on vegetation overall. The project would result in an overall increase in native vegetation and decrease in the potential for the spread of noxious weeds. Applying vegetation restoration measures and minimizing disturbance areas during project construction would lessen adverse impacts. The Preferred Alternative would not result in the impairment of vegetation in Glen Canyon NRA.

Water Quality

Intensity Level Definitions

Impacts to water quality were evaluated using the process described in the introduction of the *Environmental Consequences* chapter. Impact threshold definitions of water quality are as follows:

- Negligible:** Impacts would not be detectable. Water quality parameters would be well below all water quality standards for the designated use. Both quality and flows would be within the historical ambient and variability conditions.
- Minor:** Impacts would be detectable, but water quality parameters would be well below all water quality standards for the designated use. Both quality and flows would be within the range of ambient conditions, but measurable changes from historical norms would occur. State water quality antidegradation policy would not be violated.
- Moderate:** Changes to water quality flows would be readily apparent, but water quality parameters would be below all water quality standards for the designated use. Water quality or flows would exceed the historic baseline on a limited time and space basis. Mitigation would probably be necessary to offset adverse effects and would likely be successful. State water quality antidegradation policy would not be violated.
- Major:** Changes to water quality flows would be readily apparent, and some water quality parameters periodically would be approached, equaled, or exceeded. Flows would be outside the range of ambient conditions and could include a complete loss of water in some areas or flooding in other areas. Extensive mitigation would be needed to offset adverse effects, and its success could not be guaranteed. State water quality antidegradation policy may be violated.
- Impairment:** Waters routinely exceed state-established water quality numeric standards for designated use, or the state antidegradation policy is violated.

Impacts of Alternative A (No- Action Alternative)

The GDCWTP is currently in violation of a requirement of AAC R- 18- 9- B301(l)2 / ARS § 49- 241 that prohibits a treatment facility with flows less than 20,000 gpd and operating under a general permit before January 1, 2001, not be expanded to accommodate increased flows (Appendix A). A site inspection by ADEQ on November 16, 2004, revealed that the GDCWTP had been expanded and that flow rates were greater than 50,000 gpd.

Cumulative Effects: There would be no anticipated adverse cumulative surface water or groundwater quality impacts from this alternative because perennial surface water features are either absent in the area of influence or because visitors or environmental receptors would not be exposed to effluent constituents. The alternative would have a minor to moderate, indirect, beneficial, cumulative effect to Lake Powell surface water quality by reducing the contribution of human waste into the lake. This reduction would increase human health protection and decrease water quality degradation.

Conclusion: There are no reported or recognized water quality problems in local groundwater conditions that would be compounded by inorganic chemical or bacteriological constituents typically associated with treated wastewater effluent. There are no surface water features that would be directly or indirectly affected

by implementation of the No- Action Alternative. The No- Action Alternative would not result in the impairment of either surface water or groundwater resources of Glen Canyon NRA.

Impacts of Alternative B (Preferred Alternative)

Groundwater

As part of the APP, ADEQ would require testing of groundwater and a groundwater quality monitoring program to ensure that groundwater would not be not adversely affected by discharge of treated effluent to groundwater. The wastewater treatment processes proposed for this alternative would allow effluent discharged to groundwater to meet all applicable water quality standards listed on the APP. The upgrades in GDCWTP process would result in substantial improvements to the treated effluent water quality. These upgrades would include aeration, fully lined pond effluent chlorination, land use application, an advanced integrated pond system, constructed wetlands, sand filtration, and ultraviolet disinfection. The quality of the treated effluent discharged to groundwater would be improved with respect to biochemical oxygen demand, total suspended solids, and total nitrogen, such that State of Arizona groundwater quality recharge standards would be achieved.

At an evaporation rate of more than 80 inches per year, 3 acres of shallow, lined evaporation pond would eliminate this water from the subsurface system. The size of the pond was designed to handle monthly variations in effluent flow and to eliminate possible surface discharges of infiltrated groundwater.

Surface Water

There would be no direct discharge of treated effluent to Lake Powell or any other permanent surface water body with this alternative. Effluent from the Page facility would continue to be spray- irrigated on the municipal golf course. Because spray- irrigation deliveries are balanced against the vegetation needs, there is typically no surface runoff from such facilities. Therefore, there would be no impacts to the quality of existing surface waters.

The City of Page WTP produces treated effluent that meets ADEQ water quality standards. The additional effluent from Greenehaven would place minimum additional treatment demands on the Page facility to maintain water quality performance requirements and to annually treat more wastewater. Analyses of both treatment and volume capacities by the City indicated the plant would be capable of meeting all treatment and performance requirements without needing to construct new treatment facilities. These water quality effects would be minor to moderate, beneficial, long- term, indirect impacts to maintaining the water quality of existing surface water bodies in the area.

The new 6- acre effluent holding pond at the Page WTP that the NPS funded is bermed in order to avoid accumulation of precipitation during large storm events. The berm also prevents the accumulation of drainage from off- site. The holding pond is sufficient for containing rainfall from a 100- year, 24- hour storm event without producing any discharge that would flow into the Colorado River. Therefore, no adverse effects to Colorado River water quality would occur from holding- pond overflows during or following a storm.

Adverse impacts to local surface waters from an accidental release of untreated wastewater from the transmission pipeline would be a negligible to minor, highly localized, short- term impact. The only location that offers an opportunity for rapid contamination of surface water from the pipeline is the bridge crossing of the Colorado River. To minimize the risk of a pipeline leak or rupture contaminating the river, the pipeline will be placed in a larger pipe (secondary containment) that would be attached to the bridge. Leak detectors providing continuous monitoring and automated alarms via telemetry would quickly alert operators to the

situation. In other areas, the absence of surface waters would preclude the potential for surface water contamination, even in the unlikely event of a pipeline rupture. Small leaks would quickly be detected by observing moist soils or unusually lush vegetation in the arid setting, and would be repaired promptly.

Cumulative Effects: There would be no anticipated adverse cumulative surface water or groundwater quality impacts from this alternative because perennial surface water features are either absent in the area of influence or because visitors or environmental receptors would not be exposed to effluent constituents. The alternative would have a minor to moderate, indirect, beneficial, cumulative effect to Lake Powell surface water quality by reducing the contribution of human waste into the lake. This reduction would increase human health protection and decrease water quality degradation.

Conclusion: Substantial upgrades would be made to GDCWTP process, resulting in improvements to the treated effluent water quality such that it would meet State of Arizona standards for groundwater recharge. These changes would be a long-term, direct, beneficial impact to groundwater quality.

There are no reported or recognized water quality problems in local groundwater conditions that would be compounded by inorganic chemical or bacteriological constituents typically associated with treated wastewater effluent. There are no surface water features that would be directly or indirectly affected by implementation of the Preferred Alternative. The Preferred Alternative would not result in the impairment of either surface water or groundwater resources of Glen Canyon NRA.

Wildlife and Habitat

Intensity Level Definitions

Impacts to wildlife and habitats were evaluated using the process described in the introduction of the *Environmental Consequences* chapter. Impact threshold definitions for wildlife and habitats are as follows:

- Negligible:** Wildlife and habitats either would not be affected or the effects would be at or below the level of detection and would be so slight that they would not be of any measurable or perceptible consequence to wildlife populations.
- Minor:** Effects to wildlife and habitats would be measurable or perceptible, but would be localized within a small area. Although mortality of individual animals might occur, the viability of wildlife populations would not be affected and the community, if left alone, would recover.
- Moderate:** A change to wildlife and habitats would occur over a relatively large area. The change would be readily measurable in terms of abundance, distribution, quantity, or quality of populations. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.
- Major:** Effects to wildlife and habitats would be readily apparent, and would substantially change wildlife populations over a large area in and out of the Glen Canyon NRA. Extensive mitigation would be needed to offset adverse effects, and its success could not be guaranteed.
- Impairment:** A permanent adverse change in wildlife and habitats would occur in a large portion of the Glen Canyon NRA. The change would be highly noticeable, could not be mitigated, and would affect wildlife and habitats to the point that the park's purpose could not be fulfilled and enjoyment of wildlife and habitat by future generations would be precluded.

Impacts of Alternative A (No- Action Alternative)

The No- Action Alternative would not include any new land disturbance. Therefore, this alternative would not affect existing wildlife populations and habitat conditions in the area. There would be no direct or indirect changes in wildlife populations or their supporting habitats from either short- or long- term perspectives.

Cumulative Effects: There would be no incremental changes in existing wildlife populations or habitat conditions resulting from this alternative. Therefore, there would be no changes contributing to a cumulative wildlife population or wildlife habitat effect.

Conclusion: There would be no direct or indirect, short- or long- term impacts to either wildlife populations or their supporting habitats from this alternative because no decrease or increase in habitat would occur. There would be no impairment of wildlife resources under this alternative.

Impacts of Alternative B (Preferred Alternative)

The location of the proposed sewer line and associated lift station is in a previously disturbed area of the park in the existing ROW. The area contains little to no water and minimal vegetation, and is generally flat with no major topographic features. The presence of humans, human- related activities, and structures has removed or displaced much of the native wildlife habitat in the project area, which has limited the number and variety of wildlife occurrences. Some smaller wildlife such as rodents, reptiles, and amphibians and their habitat would be displaced or eliminated during construction of the new sewer line and lift station.

During construction, a short- term increase in noise would occur, which could disturb wildlife in the general area. Construction- related noise would be temporary, and existing sound conditions would resume following construction activities. Therefore, the temporary noise from construction would have an adverse, moderate, negligible effect on wildlife.

Installation of the wastewater transmission pipeline would have an adverse, moderate, short- term, direct, adverse impact to small- mammal and songbird populations and habitats associated with the alignment corridor. Pipeline installation activities would affect roadside areas that have already been adversely affected by highway traffic and other types of human activities. These conditions limit wildlife uses to occupancy for brief periods by species tolerant of human presence and activities. Temporary wildlife displacement effects would occur within 75 to 150 feet of pipeline installation activities during the construction period. The newly lined effluent holding pond, Lagoon No. 2, already exists as a disturbed area; therefore, there would be no additional alteration of existing upland desert grassland and shrub vegetation in that area.

Disturbed areas would be revegetated and rehabilitated following construction. A vegetative cover of grasses would be established within 3 to 5 years. Habitat restoration to the climax black brush and sand- shrub/grass land communities would take many more years to achieve because of the low and inconsistent rainfall, which is the primary environmental constraint on vegetation development. Revegetation within the project area would result in a beneficial, negligible to minor, long- term impact to wildlife and wildlife habitat in the immediate area of construction.

Cumulative Effects: The cumulative effect of this alternative would be a negligible, long- term impact to wildlife resources. There would be a net gain of about 2 acres restored at the existing plant site of desert grassland and shrubland to long- term productive wildlife habitat. Restoration of any native plant community that is disturbed would take several years because low annual precipitation means slow vegetation recovery rates. This restoration may be offset by sewer line construction and maintenance activities and further

development, resulting in a loss of habitat and a long- term negligible adverse cumulative effect to wildlife resources.

Conclusion: This alternative would produce adverse, short- term, direct impacts to wildlife and habitats during construction. After construction, a beneficial, direct, long- term effect on wildlife and habitats would occur in those areas where revegetation and recontouring is accomplished. A net increase of about 2 acres of new habitat and open space would be produced, compared with existing conditions. Habitat recovery at the restoration area would occur several years after land recovery from Lagoon No. 1. No sensitive or high- interest wildlife resources or habitats would be adversely affected with this alternative. No special- interest or high- value wildlife habitat features would be lost or damaged. There would be no impairment of wildlife resources at Glen Canyon NRA.

Special Status Species

Intensity Level Definitions

Impacts to special status species were evaluated using the process described in the introduction of the *Environmental Consequences* chapter. Impact threshold definitions for special status species are as follows:

- Negligible:** The action could result in a change to a population or individuals of a species or designated critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence and would be well within natural variability.
- Minor:** The action could result in a change to a population or individuals of a species or designated critical habitat. The change would be measurable, but small and localized and of little consequence. Mitigation measures, if needed to offset the adverse effects, would be simple and successful. This impact intensity equates to a USFWS “may affect, not likely to adversely affect” determination.
- Moderate:** Impacts on special- status species, their habitats, or the natural processes sustaining them would be detectable and occur over a large area. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful. This impact intensity equates to a USFWS “may affect, likely to adversely affect” determination.
- Major:** The action would result in a noticeable effect to viability of a population or individuals of a species or resource or designated critical habitat. Impacts on a special- status species, critical habitat, or the natural processes sustaining them would be detectable, both in and out of the park. Loss of habitat might affect the viability of at least some special- status species. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed. This impact intensity equates to a USFWS “may affect, likely to jeopardize the continued existence of a species or adversely modify critical habitat for a species” determination.
- Impairment:** A permanent adverse change in special- status species would occur in a large portion of the Glen Canyon NRA. The change would be highly noticeable, could not be mitigated, and would affect species to the point that the park’s purpose could not be fulfilled and enjoyment by future generations would be precluded.

Impacts of Alternative A (No- Action Alternative)

Under the No- Action Alternative, no land disturbance would occur. Therefore, this alternative would not affect existing special- status plant or animal species.

Cumulative Effects: There would be no changes in existing conditions resulting from this alternative. Therefore, there would be no changes contributing to a cumulative effect.

Conclusion: There would be no impact to or impairment of special- status species under this alternative.

Impacts of Alternative B (Preferred Alternative)

Under this alternative, land disturbance would occur along the proposed pipeline route. Of the existing special- status plant or animal species, only the California condor is thought to be present in the project area, and only occasionally and for short periods. It is anticipated that the Preferred Alternative would have a negligible, direct, short- term effect on the California condor. Most of the disturbance discussed in this Alternative would occur on the ground within a 28- foot- wide construction easement, and would not affect suitable nesting or foraging habitats or availability. It is anticipated that any long- term disturbance caused by the proposed pipeline would not result in any further disturbance that does not already exist from the adjacent highway or existing NPS pipeline. Potential direct, short- term, adverse impacts to the California condor would only occur if the birds were attracted to the construction areas to feed on trash or dead animals, and/or drink fluid spills; however, necessary mitigation/conservation measures recommended by the USFWS and implemented for other projects at Glen Canyon NRA would be implemented with the Preferred Alternative to ensure that this sensitive species would not be disturbed. These mitigation measures include (1) ensuring that all trash and carrion would be removed from the construction area and disposed of appropriately, (2) immediately cleaning up fluid leaks or spills, (3) instructing all personnel to avoid interaction, and (4) reporting sightings of California condors to the Resource Advisor.

Cumulative Effects: Effects on special- status species resulting from this alternative would be negligible, direct, adverse, and short- term and would, when combined with development of more Greenehaven sites, contribute to a negligible to minor, adverse, cumulative effect to special status species.

Conclusion: There would only be a direct impact if an individual California condor were to be attracted to the construction site for feeding or drinking purposes; however actions would be taken to avoid this occurrence using USFWS recommended mitigation measures. It is anticipated that there would be a negligible, direct, adverse, short- term effect on special status species. The Preferred Alternative would not result in the impairment of special status species in Glen Canyon NRA.

Public Health and Safety

Intensity Level Definitions

Impacts to public health and safety were evaluated using the process described in the introduction of the *Environmental Consequences* chapter. Impact threshold definitions for public health and safety are as follows:

- Negligible:** Public health and safety would not be affected or the effects would be at or below the level of detection.
- Minor:** Effects to public health and safety would be measurable or perceptible, but would be localized within a small area.

- Moderate:** Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.
- Major:** Effects to public health and safety would be readily apparent. Extensive mitigation would be needed to offset adverse effects, and its success could not be guaranteed.
- Impairment:** A permanent adverse change in public health and safety would occur in a large portion of the Glen Canyon NRA. The change would be highly noticeable, could not be mitigated, and would affect the public to the point that the park's purpose could not be fulfilled and enjoyment of its resources by future generations would be precluded.

Impacts of Alternative A (No- Action Alternative)

The purpose of wastewater treatments is to reduce pathogens in wastewater and prevent the spread of waterborne diseases. Treated effluent from GDCWTP Lagoon No. 2 is treated to Class II criteria (which require that not more than 10 percent of effluent biochemical oxygen demand values exceed 60 milligrams per liter [mg/L] and that total suspended solids not exceed 100 mg/L) and applied to a land use application area at Greenehaven as approved by ADEQ. However, because GDCWTP is exceeding their permitted capacity of effluent, ADEQ determined that GDCWTP was in violation of ARS Title 49- 101 *et seq.* and applicable rules, and issued a notice of violation to the Greenehaven Sewer Company for compromising public health and safety. Under the No- Action Alternative, the sewage pipeline and associated infrastructure would not be constructed. The GDCWTP would remain in noncompliance, thus contributing unnecessarily to a public health and safety risk. The No- Action Alternative would result in both a short- term and long- term, direct, adverse major impact on public health and safety for Greenehaven residents.

Cumulative Effect: Without proper wastewater and sewage treatment facilities, additional development at Greenehaven could result in an increase in risks to public health and safety. The no- action alternative may actually preclude additional development. The no- action alternative when combined with reasonably foreseeable future actions would result in a direct, adverse cumulative impact.

Conclusion: The No- Action Alternative would result in unacceptable health risk to Greenehaven residents and would have both a long- term and short- term major, direct, adverse impact on public health and safety.

Impacts of Alternative B (Preferred Alternative)

The Preferred Alternative would transport wastewater from the GDCWTP to an enclosed pipeline to the City of Page WTP. There, it would be consolidated and treated with the city's wastewater in a modern sewage treatment plant that meets water quality standards and discharge permit requirements. The Preferred Alternative would result in additional sludge generation at the City of Page WTP. This facility already handles sludge on a regular basis and has a proven record of meeting health and safety requirements for its safe handling and disposal. Therefore, sludge management would be substantially improved.

Sludge handling and disposal would have negligible impacts on human health and safety because proper sludge handling, storage, and disposal techniques would be employed. In addition, sludge handling and storage at the Greenehaven facility site would last only a few weeks, and the storage site would be off- limits to anyone without adequate health and safety training. Sludge will be transported to an approved off- site disposal area.

Routing Greenehaven wastewater to the Page facility would increase flows through the City of Page WTP by about 12 percent. This would result in a proportional increase in the use of chemicals during treatment.

However, the staff at the Page facility has the demonstrated ability to handle these materials in a safe manner. Therefore, increases in chemical use at the plant would have a negligible effect on public health and safety.

The City of Page WTP uses chlorination for disinfection. Chlorine is highly toxic to many aquatic species and has been linked to human health concerns. However, it continues to be used in applications such as drinking water treatment, wastewater treatment, and swimming pools because, when it is handled and applied correctly, the benefits of disinfection vastly outweigh adverse environmental and human health effects. The use of chlorine at the Page WTP would represent a negligible effect on public health and safety.

Heavy earth-moving and construction equipment would be required for constructing the pipeline and upgrading the Greenehaven Lagoon No. 2 WTP site. The transport and use of the equipment would have a negligible effect on public health and safety. The roadways have sufficient capacity to accommodate the transport of heavy equipment, and on US Highway 89 it would not be noticeable among the other large trucks that routinely use the road. Pipeline construction activities could cause minor traffic disturbances along the alignment, resulting in direct, minor, localized, short-term, adverse effects to motorists. However, the contractor would use standard BMPs for traffic control to ensure the safety both of motorists and workers.

Cumulative Effects: The Preferred Alternative would complement other measures currently being implemented to reduce public health and safety risks within the project vicinity.

Conclusion: The ability to provide adequate wastewater treatment would have a beneficial, moderate, long-term, indirect effect on public health and safety at Greenehaven and throughout the southern portion of Lake Powell. Improved sludge management would be a beneficial, direct, minor, long-term, local effect. There would be no change in the threat to public health and safety from the handling of increased amounts of chemicals because the staff at the Page facility has demonstrated the ability to handle these materials safely. Minor, short-term, direct adverse effects to the safety of motorists could occur during pipeline construction.

CONSULTATION AND COORDINATION

External Scoping

External (public) scoping was conducted to inform various agencies and the public about the proposal to construct a new sewer line from Grenehaven Development to the City of Page Wastewater Treatment Plant and to generate input on the preparation of this Environmental Assessment. This effort was initiated with the distribution of a scoping letter, which was bulk- mailed to residents of Grenehaven and of Page, and a variety of federal, state, and tribal entities (Appendix B). In addition, the scoping letter was posted on the Glen Canyon National Recreation Area website. With this press release, the public was given 30 days to comment on the project beginning October 5, 2006.

In addition to the aforementioned public entities, the following agencies and Native American tribes were sent scoping information or were contacted for information regarding the project:

Federal Agencies

U.S. Fish and Wildlife Service
National Park Service

State Agencies

Arizona Department of Environmental Quality
Arizona Department of Transportation

Affiliated Native American Group

Navajo Nation

Municipality

City of Page

During the 30- day scoping period, two responses were received from the public through letters and email. A letter response from the U.S. Fish and Wildlife Service (USFWS) dated November 15, 2006, indicated the potential for the endangered California condor to occur within the project area. The letter recommended that evaluation of possible effects to the species be included in the EA. USFWS also recommended that consultation with the Arizona Game and Fish Department (AGFD) and potentially affected tribes be done to ensure that sensitive species are not affected by the project.

A second comment via an undated email was received from a concerned resident of the Grenehaven Development. The resident expressed interest regarding who would provide financial backing for the proposed project, as well as who would benefit from the project. The resident was also concerned about a potential increase in water costs associated with the project and the possible increase in development of vacant lots on the property as a result of increased capacity.

No other federal or state agencies or tribes responded during the scoping period.

Internal Scoping

Internal scoping was conducted by an interdisciplinary team of professionals from Glen Canyon National Recreation Area, the Intermountain Support Office, and Grenehaven Development Corporation. Interdisciplinary team members met informally on multiple occasions to discuss the purpose and need for the

project; possible alternatives; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and possible mitigation measures. The team also gathered background information and discussed public outreach for the project. The results of the meeting are documented in this Environmental Assessment.

Environmental Assessment Review and List of Recipients

The Environmental Assessment will be released for public review in October 2007. To inform the public of the availability of the Environmental Assessment, NPS will publish and distribute a letter or press release to various agencies, tribes, and members of the public on the Glen Canyon National Recreation Area's mailing list, as well as place an ad in the local newspaper. Copies of the Environmental Assessment will be provided to interested individuals upon request. Copies of the document will also be available for review at the Glen Canyon National Recreation Area visitor center and on the Internet at <http://parkplanning.nps.gov/>.

The Environmental Assessment is subject to a 30-day public comment period. During this time, the public is encouraged to submit their written comments to the NPS 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. NPS will issue responses to substantive comments received during the public comment period and will make appropriate changes to the Environmental Assessment, as needed.

List of Preparers

National Park Service

Barbara Wilson
Environmental Specialist

Greenehaven Development Corporation

Carl S. Bixler
Vice President, Project Manager

SWCA Environmental Consultants

Charles Coyle
Project Manager

Ralph Ellis
Project Coordinator

Claire Bingaman
Environmental Planner

Keith Pohs
Senior Environmental Planner

Suzanne Rhodes
Botanist

Glenn Dunno
GIS/CADD Specialist

REFERENCES

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- BLM 1984 U.S. Department of the Interior Bureau of Land Management. *Manual 8400, Visual Resource Management*. Washington D.C.: United States Government Printing Office. 1984.
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- SWCA 2007b SWCA Environmental Consultants. *A Cultural Resources Survey of 44 Acres for a Proposed Force Main Sewer Line for the Greenehaven Development, North of Page, Coconino County, Arizona*. May 7, 2007.
- USFWS 2007 U.S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Removing the Bald Eagle in the Lower 48 States From the List of Endangered and Threatened Wildlife. *Federal Register* 72(130). July 9, 2007.

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Appendix A

NOTICE OF VIOLATION



Janet Napolitano
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street Phoenix, Arizona 85007
(602) 771-2300 www.adeq.state.az.us



Stephen A. Owens
Director

CERTIFIED MAIL
Return Receipt Requested

Case ID #: 30379

May 20, 2004

Greenhaven Water CO
Attention: John E. Bowman
PO Box 5122
Page, AZ 86040

Subject: Greenhaven Water CO, 18839
Lat: 37deg, 0' 0" N / Long: 111deg, 32' 60" W

NOTICE OF VIOLATION

The Arizona Department of Environmental Quality (ADEQ), has reason to believe that Greenhaven Water CO as the owner/operator of Greenhaven Water CO, has violated a requirement of the Arizona Revised Statutes (A.R.S.), a rule within the Arizona Administrative Code (A.A.C.), or an applicable permit/license, administrative order or civil judgment. ADEQ discovered the violations alleged below during an inspection completed on April 28, 2004.

I. LEGAL AUTHORITY and NATURE OF ALLEGED VIOLATION(S)

1. **A.A.C. R18-5-505(B)**

Failure to obtain an Approval to Construct from ADEQ prior to construction of an extension to an existing public water system.

The installation of the water distribution system to serve Greenhaven subdivision Unit VII has been initiated without receiving an Approval to Construct from ADEQ. The water company has repeatedly been informed of the requirement for ADEQ approval(s) before initiating construction.

2. **A.A.C. R18-4-104(L)**

Failure to notify ADEQ within 48 hours of the discovery of a failure to comply with a monitoring requirement

The Water Supplier failed to notify of the failure to do initial tap water sampling for Lead and Copper, in strict conformance with R18-4-104(L).

3. **A.A.C. R18-4-310(A)**

Failure to conduct initial tap water monitoring for lead and copper

The Water System failed to conduct initial lead and copper monitoring during the initial monitoring year of 1995 or any year thereafter, in strict conformance with R18-4-310(A).

Northern Regional Office
1515 East Cedar Avenue Suite F Flagstaff, AZ 86004
(928) 779-0313

Southern Regional Office
400 West Congress Street Suite 433 Tucson, AZ 85701
(520) 628-6733

Printed on recycled paper

Notice of Violation
Greenhaven Water CO
May 20, 2004
Page 2

II. DOCUMENTING COMPLIANCE

1. Within 30 calendar days of receipt of this Notice, please submit documentation that the violation(s) never occurred, or submit to ADEQ / Northern Regional Office(NRO) a) an "Application for Approval to Construct Water Facilities", b) obtain an "Approval to Construct Drinking Water Facilities." All the above shall be based on plans and specifications submitted by an Arizona registered professional engineer applying technical knowledge, proficiency and skill which would be applied by qualified registrants who practice in the same profession in the same area of expertise, c) perform initial lead and copper tap water monitoring and submit notice of "failure to notify..." and monitoring results to John Caulkins, ADEQ/ DWQEU, 1110 W. Washington St., Phx. Az. 85007.

III. SUBMITTING COMPLIANCE DOCUMENTATION

Please send all compliance documentation and any other written correspondence regarding this Notice to ADEQ at the following address:

Arizona Department of Environmental Quality, Attention: Jerry A. Breckenridge, NRO Field Services East Unit, 1515 E Cedar Ave, Ste F, Flagstaff, AZ 86004 MC: R2000F

IV. STATEMENT OF CONSEQUENCES

1. The time frames within this Notice for achieving and documenting compliance are firm limits. Failure to achieve or document compliance within the time frames established in this Notice will result in an administrative compliance order or civil action requiring compliance within a reasonable time frame, substantial civil penalties, and/or the suspension or revocation of an applicable permit/license. ADEQ will agree to extend the time frames only in a compliance schedule negotiated in the context of an administrative consent order or civil consent judgment.
2. Achieving compliance does not preclude ADEQ from seeking civil penalties, and/or suspending or revoking an applicable permit/license for the violation(s) alleged in this Notice as allowed by law.

V. OFFER TO MEET

ADEQ is willing to meet regarding this Notice. To obtain additional information about this Notice or to schedule a meeting to discuss this Notice, please contact Jerry A. Breckenridge at (928) 773-2709.

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Janet Napolitano
Governor

ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

1110 West Washington Street Phoenix, Arizona 85007
(602) 771-2300 www.adeq.state.az.us



Stephen A. Owens
Director

CERTIFIED MAIL
Return Receipt Requested

Case ID #: 30153

May 20, 2004

Greenhaven Sewer CO
Attention: John E. Bowman
PO Box 5122
Page, AZ 86040

Subject: Greenhaven Sewer - WWTP, 1408
Lat: 37deg, 0' 0" N / Long: 111deg, 33' 3" W

NOTICE OF VIOLATION

The Arizona Department of Environmental Quality (ADEQ), has reason to believe that Greenhaven Sewer CO as the owner/operator of Greenhaven Sewer - WWTP, has violated a requirement of the Arizona Revised Statutes (A.R.S.), a rule within the Arizona Administrative Code (A.A.C.), or an applicable permit/license, administrative order or civil judgment. ADEQ discovered the violations alleged below during an inspection completed on April 13, 2004.

I. LEGAL AUTHORITY and NATURE OF ALLEGED VIOLATION(S)

1. A.A.C. R18-9-A301(D)(1)(e)(i)

Beginning construction prior to receiving notification of Provisional Verification of General Permit Conformance

Installation of sewer collection system to serve Greenhaven subdivision Unit VII has been initiated without receiving an approval from ADEQ. The facility has repeatedly been informed of the requirement for ADEQ approval(s) before initiating construction.

II. DOCUMENTING COMPLIANCE

1. Within 30 calendar days of receipt of this Notice, please submit documentation that the violation(s) never occurred, or Within 30 Days of receipt of this Notice, please submit documentation that the violation(s) never occurred, or an ADEQ/ Northern Regional Office (NRO) Notice of Intent to Discharge and obtain a "Provisional Verification of General Permit Conformance" based on plans and specifications submitted by an Arizona Registered Professional Engineer applying technical knowledge, proficiency and skill which would be applied by qualified registrants who practice the same profession in the same area of expertise.

Northern Regional Office
1515 East Cedar Avenue Suite F Flagstaff, AZ 86004
(928) 779-0313

Southern Regional Office
400 West Congress Street Suite 433 Tucson, AZ 85701
(520) 628-6733

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Notice of Violation
Greenhaven Sewer - WWTP
May 20, 2004
Page 2

III. SUBMITTING COMPLIANCE DOCUMENTATION

Please send all compliance documentation and any other written correspondence regarding this Notice to ADEQ at the following address:

Arizona Department of Environmental Quality, Attention: Jerry A. Breckenridge, NRO Field Services
East Unit, 1515 E Cedar Ave, Ste F, Flagstaff, AZ 86004 MC: R2000F

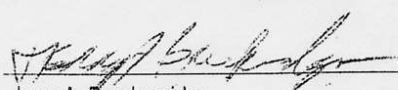
IV. STATEMENT OF CONSEQUENCES

1. The time frames within this Notice for achieving and documenting compliance are firm limits. Failure to achieve or document compliance within the time frames established in this Notice will result in an administrative compliance order or civil action requiring compliance within a reasonable time frame, substantial civil penalties, and/or the suspension or revocation of an applicable permit/license. ADEQ will agree to extend the time frames only in a compliance schedule negotiated in the context of an administrative consent order or civil consent judgment.
2. Achieving compliance does not preclude ADEQ from seeking civil penalties, and/or suspending or revoking an applicable permit/license for the violation(s) alleged in this Notice as allowed by law.

V. OFFER TO MEET

ADEQ is willing to meet regarding this Notice. To obtain additional information about this Notice or to schedule a meeting to discuss this Notice, please contact Jerry A. Breckenridge at (928) 773-2709.


Harley R. Hiett P.E., Manager
NRO Field Services East Unit


Jerry A. Breckenridge
NRO Field Services East Unit

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Bartholomew Engineering, Inc.
P.O. Box 4809
Cave Creek, AZ 85327-4809
(480) 488-9775, (480) 488-2681 fax
E-mail: be@doitnow.com

Aquifer Protection Permit Application Packet
for Greenhaven Corporation and
Greenhaven Sewer Company
B.E. Project #040206
March 11, 2005

B.9 ENFORCEMENT ACTIONS

Currently, there are two Notices of Violation (NOV's) issued to Greenhaven Sewer Company.

They are:

1. Notice of Violation No. 30153
Construction of sewer lines without ADEQ approval of plans for Unit 7.
2. Notice of Violation No. 33456
Operation of Wastewater Treatment Plant over 24,000 GPD without an Individual Aquifer Protection Permit (APP).

Submittal and approval of these APP's satisfies the requirements to relieve the NOV's.

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Appendix B

SCOPING LETTER



National Park Service
U.S. Department of the Interior

FOR IMMEDIATE RELEASE
October 5, 2006 06-29

Glen Canyon National
Recreation Area

691 Scenic View Dr.
PO Box 1507
Page, AZ 86040-1507

CONTACT: Kevin Schneider
928-608-6208

Glen Canyon News Release

Public Input Sought on Proposed Greenhaven Wastewater Project

Page, AZ – Glen Canyon National Recreation Area and Greenhaven Development Corporation have initiated an environmental assessment (EA) on a project that would allow the Greenhaven community to connect to the park's wastewater main. Glen Canyon National Recreation Area is soliciting public comments on the scope of the EA to help identify issues and alternatives for the planning process and the EA analysis.

The purpose of the project is to transport wastewater from the wastewater site at Greenhaven to the National Park Service's main wastewater line. The Arizona Department of Environmental Quality has determined that utilizing a force main to connect to the existing National Park Service force main, with the wastewater ultimately transported to the city of Page's wastewater treatment plant is in the best interest of public health, safety and welfare for the region. All impacts of the project will be limited to the road corridor along U.S. Highway 89 and will include the placement of the in-ground piping, lift stations, and required monitoring devices.

The wastewater generated by Greenhaven would join all wastewater generated in the Wahweap area and flow to the city of Page's wastewater treatment plant. In 2002, the National Park Service paid a \$1.1 million tap fee to the city of Page to utilize the city's wastewater treatment plant and fund improvements in the city. The National Park Service also built a lift station in Page, lined the city's wastewater treatment pond, and constructed a wastewater pipeline in the city, which amounted to an additional \$1.16 million in improvements. Glen Canyon pays for wastewater generated at Wahweap at the city's standard commercial rate of \$2.50 per thousand gallons.

All public comments must be received by November 6, 2006. Comments may be submitted online at: parkplanning.nps.gov/glca or by mailing them to: Greenhaven Wastewater EA, Glen Canyon National Recreation Area, P.O. Box 1507, Page, AZ 86040. A scoping letter with additional information is available at parkplanning.nps.gov/glca. There will be another public comment opportunity once the document is released later this fall.

– www.nps.gov/glca –

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Appendix C

AGFD LETTER



THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT

2221 WEST GREENWAY ROAD, PHOENIX, AZ 85023-4399
(602) 942-3000 • AZGFD.GOV

GOVERNOR
JANET NAPOLITANO
COMMISSIONERS
CHAIRMAN, W. HAYS GILSTRAP, PHOENIX
JOE WELTON, TUMA
MICHAEL M. GOLIGHTLY, FLAGSTAFF
WILLIAM H. MCLEAN, GOLD CANYON
SUSAN E. CHILTON, ARIZONA
DIRECTOR
DUANE L. SHROUFE
DEPUTY DIRECTOR
STEVE K. FERRELL



February 10, 2005

Mr. Donn Pillmore
Thebeau Consulting
PO Box 55
Kanab, UT 84741

Re: **Special Status Species Information for Township 42 North, Range 8 East, Section 32, Township 42 North, Range 8 East, Sections 3-5, 10, 11, 13, 14, and 23; Proposed Sewer Line Corridor Along Highway 89 for Lake Powell View Properties at Greenhaven.**

Dear Mr. Pillmore:

The Arizona Game and Fish Department (Department) has reviewed your request, dated February 4, 2005, regarding special status species information associated with the above-referenced project area. The Department's Heritage Data Management System (HDMS) has been accessed and current records do not indicate the presence of any special status species as occurring in the project vicinity (3-mile buffer). In addition, this project does not occur in the vicinity of any Proposed or Designated Critical Habitats.

The Department's HDMS data are not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity.

Making available this information does not substitute for the Department's review of project proposals, and should not decrease our opportunities to review and evaluate new project proposals and sites. The Department is also concerned about other resource values, such as other wildlife, including game species, and wildlife-related recreation. The Department would appreciate the opportunity to provide an evaluation of impacts to wildlife or wildlife habitats associated with project activities occurring in the subject area, when specific details become available.

AN EQUAL OPPORTUNITY REASONABLE ACCOMMODATIONS AGENCY

Mr. Donn Pillmore
February 10, 2005
2

If you have any questions regarding this letter, please contact me at (602) 789-3618. General status information and county distribution lists for special status species are also available on our new web site at <http://www.azgfd.com/hdms>, as well as some abstracts for special status species.

Sincerely,



Sabra S. Schwartz
Heritage Data Management System, Coordinator

SSS:ss

cc: Rebecca Davidson, Project Evaluation Program Supervisor, Habitat Branch
Rick Miller, Habitat Program Manager, Region II

AGFD# 02-04-05(02)

Appendix D

USFWS LETTER



United States Department of the Interior

U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 Fax: (602) 242-2513



In Reply Refer to:

AESO/SE
22410-2007-I-0072

November 15, 2006

Memorandum

To: Superintendent, Glen Canyon National Recreation Area, Page, Arizona
(Attn: Greenhaven EA)

From: Field Supervisor

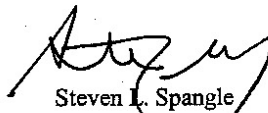
Subject: Greenhaven Wastewater Connection

Thank you for your October 5, 2006, scoping letter requesting comments to identify issues and alternatives for analysis in an environmental assessment (EA) regarding a proposed connection of the Greenhaven community to the Glen Canyon National Recreation Area wastewater main in Coconino County, Arizona. We offer the following comments.

Based on the description of the project area, the endangered California condor (*Gymnogyps californianus*) may occur in the area. We recommend that project analysis include evaluation of possible effects of the proposed action to the species. We have previously provided you with several conservation measures to address impacts to the California condor, and you have implemented some or all of those measures for several other projects. We recommend implementing those measures that are appropriate for this proposed action.

The State of Arizona and various American Indian Tribes maintain lists of sensitive species that may not be protected by Federal law. We recommend that you contact the Arizona Game and Fish Department (AGFD) and any affected tribes to determine if sensitive species may occur in your action area. We also encourage you to invite the AGFD and any affected tribes to participate in the review of your proposed action.

Thank you for the opportunity to comment. If we can be of further assistance, please contact Bill Austin (928) 226-0614 (x102) or Brenda Smith (x101) of our Flagstaff Suboffice.



Steven L. Spangle

cc: Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
President, Navajo Nation, Window Rock, AZ
Chairperson, Kaibab Band of the Paiute Indians, Fredonia, AZ

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