

*Environmental Assessment/  
Finding of No Significant Impact*

**Yosemite Lodge and Camp 4  
Sewer Line Repair and Replacement**

December 4, 1998

**YOSEMITE NATIONAL PARK  
OFFICE OF FLOOD RECOVERY  
CALIFORNIA**

**UNITED STATES DEPARTMENT OF THE INTERIOR • NATIONAL PARK SERVICE**

***(Inside Cover)*** From January 1 to 3, 1997, a tropical storm with heavy rains melted a portion of the snowpack in the higher elevations of Yosemite National Park, causing serious flooding in Yosemite Valley. The flood caused few changes to the natural environment, but left roads, utilities, buildings, campgrounds, and other visitor and park facilities severely damaged. Most of the damage occurred to facilities located well within the established 100-year floodplain. Although the 1997 flood was the highest recorded flow, there have been three other floods of this magnitude since 1937. As the water receded, it became graphically apparent that many of the park's roads, utilities, and other facilities were not capable of withstanding even a less severe flood.

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**Finding of No Significant Impact**  
**Yosemite Lodge and Camp 4 Sewer Line Repair and Replacement**  
**Yosemite National Park, California**

***I. Purpose and Need***

The very poor condition of the Yosemite Lodge and Camp 4 sewer line was revealed after the January 1997 flood. This flood inundated the sewer line with sand and gravel which was hydro-flushed from the line in the spring of 1997. Later that summer, the sewer line was surveyed with a closed-circuit television camera. The survey revealed that over 1,000 pounds of sand and gravel had infiltrated the line in only five months after hydro-flushing. The substantial amount of sand and gravel indicates the lack of sewer line integrity and that sewage is leaching into the environment. The closed-circuit camera survey also revealed that over time, the pipe lining deteriorated, the pipe sagged, joints separated, grease accumulated, the iron corroded, and tree roots infiltrated the line. The degradation and blockage of the sewer line has reduced the flow capacity of the line below the industry standard of two feet per second. The sewer line is inadequate, and poses a threat to natural resources and human health and safety. These conditions need to be corrected as soon as possible, regardless of whether lodging or employee housing is constructed in the Yosemite Lodge area.

The purpose of the proposal is to:

- remedy the deficiencies of the existing sewer line in a cost-effective manner;
- provide adequate sewer service to Yosemite Lodge and Camp 4 that meets industry standards;
- decrease maintenance requirements associated with the sewer system;
- reduce the likelihood of blockage;
- improve sewer line efficiency;
- ensure visitor accommodations (both camping and lodging) in accordance with approved plans; and
- prevent compromised health and safety conditions.

***II. Proposal and Alternatives***

The Environmental Assessment (EA) evaluated three alternatives: no action, slipline and replace, and the proposed action. Under no action the existing sewer line would remain in place without improvements. The slipline and replace alternative almost completely uses the existing sewer line trenches. This alternative consists of sliplining the majority of the existing pipe and replacing shorter segments. The proposed action repairs and replaces approximately 2,890 lineal feet of sewer line almost completely in previously disturbed areas, in a location 20 to 200 feet north of the existing sewer line.

### **III. Anticipated Environmental Effects and Mitigation Measures**

**Natural Resources.** The relocation and replacement of the proposed sewer line involves trenching which could be 20 feet wide. Most of this trenching, however, will occur in previously developed areas. The trenching will not have a major impact on natural resources. Seventeen incense cedars, five ponderosa pines, and one black oak will have to be removed. There will be negligible impacts to wildlife.

The proposed sewer system has already been designed. Materials have been ordered and the work crew is immediately available. Since the proposed action can proceed immediately, the construction can be completed before the rise in the water table. Proceeding immediately will prevent unnecessary impacts to natural resources associated with the continued leaking of sewage from the existing pipe. The slipline and replace alternative could not be constructed this year because of the time required to design the sewer system, negotiate and award a contract, and order slipline materials. Therefore, the slipline and replace alternative could not be completed before the rise in the water table.

**Cultural Resources.** Approximately 570 lineal feet of the proposed sewer line crosses the eastern portion of an archeological site. Based on the cumulative information gained from archeological investigations and site evaluations (e.g. Hull 1998), a determination of *No Effect* has been found for the proposed action. This is because the site area that the proposed sewer line transects does not have cultural resource integrity. As an added precaution, the NPS will monitor the trenching activities to ensure the protection of unknown archeological resources that may be in the area. There will be *No Effect* on Camp 4, a site determined eligible for listing on the National Register of Historic Places.

The NPS has modified the original NPS phase 1 design proposal to avoid an archeological site. The original phase 1 design adversely effected a small area of site CA-MRP-748/H. To mitigate this effect, data recovery measures were required and the State Historic Preservation Office (SHPO) was consulted. Data recovery measures are no longer necessary, however, because the phase 1 design has been modified and the small area of site CA-MRP-748/H will be avoided.

**Park Operations.** The proposed action would correct the deficiencies associated with leaking, poor slopes, and the overall poor condition of the existing main trunk line. Since the replacement line would correct poor slopes, flow velocities would meet or exceed industry standards. The improved slopes and improved condition of the pipe would substantially decrease annual maintenance costs and therefore have a beneficial impact on park operations.

**Visitor Experience.** Locating the replacement line 20 to 200 feet north of the existing sewer line and sealing the manholes to prevent system infiltration would reduce the risk of future flood damage to the line. The proposed system would be closed and slightly higher in elevation than the current line. Relocating the sewer line near the 1997 100-year flood extent line would decrease the risk of flood damage from smaller flood events. There will not be an increased risk of flooding to persons, properties, or structures along the Merced River. Overall, the proposed action will have a beneficial impact on the visitor experience.

**Mitigation Measures.** Mitigation measures have been developed to reduce the anticipated environmental effects of the proposed action. These measures (delineated in the EA) include: fencing trees, salvaging and replacing topsoil, hand excavation around tree roots, clean-cutting roots exposed by trenching, putting up safety fencing, maintaining sewer service, and monitoring all trenching activities to ensure the protection of unknown archeological resources.

#### IV. Review

No formal public review was conducted as part of this EA because of the urgency to complete the project before the water table rises. This action is currently involved in ongoing litigation (Sierra Club v. U.S., C-98-3213 CRB, U.S. District Court, San Francisco) and there has been ample opportunity to hear the concerns, comments, and suggestions of the plaintiffs through their court filings. These comments and suggestions have been addressed and incorporated into the EA. The proposed action described in the EA, in most circumstances, would be considered a National Park Service (NPS) Categorical Exclusion [516 DM 6 app. 7, 7.4 C (16)] "Installation of underground utilities in previously disturbed areas having stable soils." Due to these circumstances, a formal public review period was not deemed necessary. Moreover, neither CEQ's NEPA regulations (40 CFR 1506.6) nor NPS policy require public review of EA's.

The NPS has coordinated with the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the California State Historic Preservation Office while preparing the EA; the agencies support the proposed action. The NPS will continue to consult with the Yosemite Consultation Committee, composed of individuals from the American Indian Council of Mariposa County, Inc.

#### V. Finding

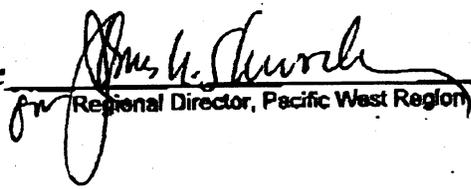
The proposed action will correct poor layout, restore sewer system integrity, create proper gravity flow, minimize line maintenance, remove abandoned manholes, and eliminate health and safety risks. Neither of the other two alternatives considered in the EA fully meet objectives to correct sewer line deficiencies. The EA for Yosemite Lodge and Camp 4 Sewer Line Repair and Replacement is incorporated by reference into this Finding of No Significant Impact. Based on the analysis in the EA, and the ability of the mitigation measures to eliminate or minimize impacts, the NPS has determined that the proposed action does not constitute a major federal action significantly affecting the quality of the human environment. Neither wetlands nor floodplains are adversely affected; there is no significant contribution to cumulative or indirect impacts associated with the proposed action. Thus, an EIS will not be prepared and the proposed action will be implemented.

Recommended:

  
Superintendent, Yosemite National Park

12/4/98  
Date

Approved:

  
Regional Director, Pacific West Region

12/4/98  
Date



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## 1 PURPOSE AND NEED

The flooding of January 1997 damaged infrastructure within Yosemite Valley, including the Yosemite Lodge and Camp 4 sewer line. After the flood, the Yosemite Valley sewer system was inoperable for six weeks and the very poor condition of the Yosemite Lodge and Camp 4 sewer line was revealed. The flood inundated the sewer line with sand and gravel which was hydro-flushed from the line in the spring of 1997. Later that summer, the sewer line was surveyed with a closed-circuit television camera. The survey discovered that over 1,000 pounds of sand and gravel had infiltrated the Yosemite Lodge and Camp 4 sewer line in only five months after hydro-flushing. This substantial amount of sand and gravel indicates the lack of sewer line integrity and that sewage is leaching into the environment.

The existing sewer line is a concrete-lined ductile iron pipe that was installed at various times to fit differing on-site conditions. At one time, sewage from Yosemite Lodge flowed west out of Yosemite Valley through a 21-inch line. Over time, sewer lines have been removed and reconnected to flow east to the Yosemite Creek sewage lift station. Due to these changes, the existing routing is far from ideal. Many branch lines connect to the main trunk line at angles opposing the direction of the main flow. These opposing angles create turbulence, which causes solid material to drop out of suspension and block the sewer line.

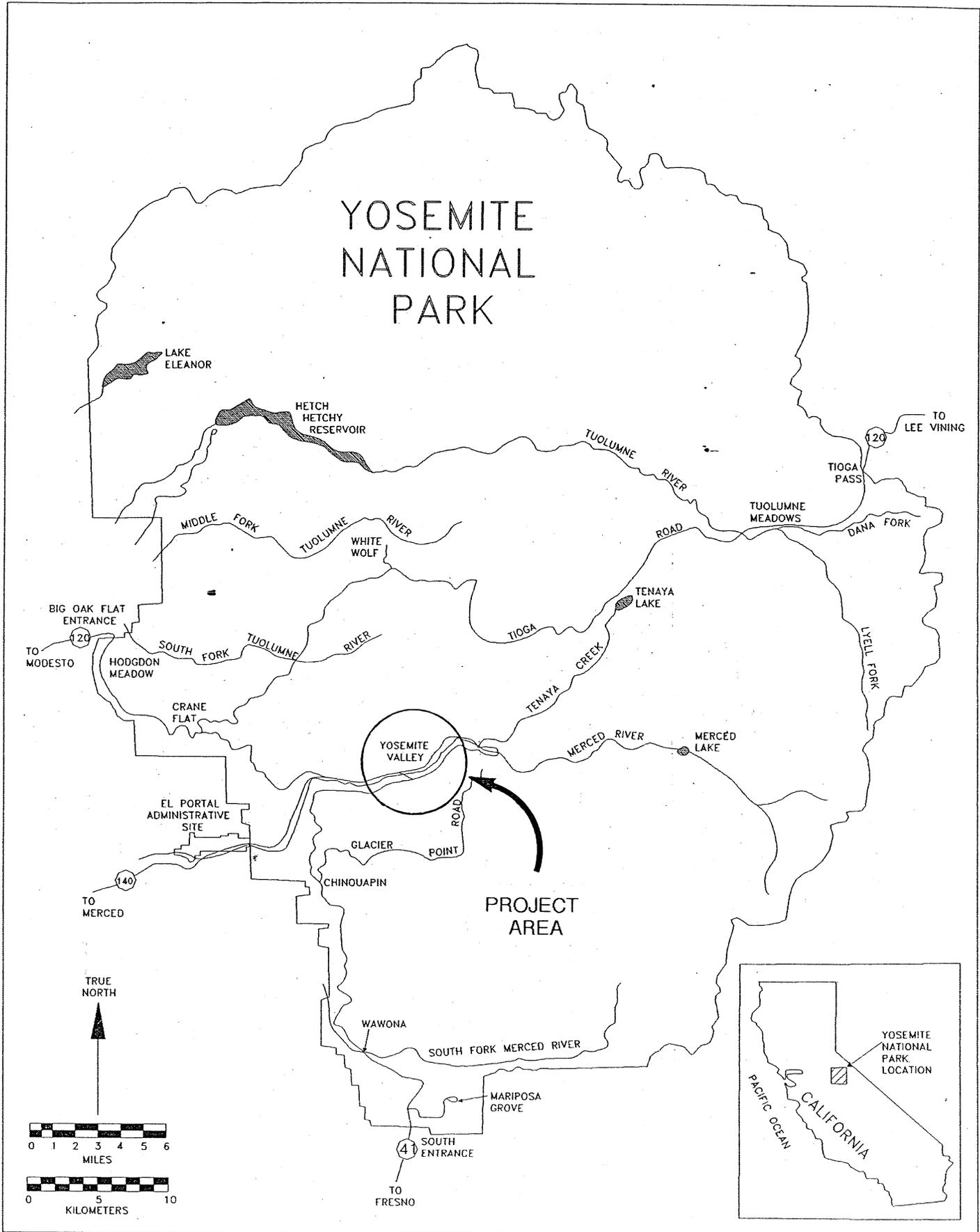
A closed-circuit camera survey revealed that over time, the lining deteriorated, the pipe sagged, joints separated, grease accumulated, the iron corroded, and tree roots infiltrated the line. The degradation and blockage of the sewer line has reduced the flow capacity of the line to below industry standard of two feet per second. The sewer line is inadequate, and poses a threat to natural resources and human health and safety. These conditions need to be corrected as soon as possible, regardless of whether lodging or employee housing is constructed in the Yosemite Lodge area.

The purpose of the proposal is to:

- remedy the deficiencies of the existing sewer line in a cost-effective manner;
- provide adequate sewer service to Yosemite Lodge and Camp 4 that meets industry standards;
- decrease maintenance requirements associated with the sewer system;
- reduce the likelihood of blockage;
- improve sewer line efficiency;
- ensure visitor accommodations (both camping and lodging) in accordance with approved plans; and
- prevent compromised health and safety conditions.

### ***Scope of Environmental Assessment***

The project area consists of approximately one acre in the eastern portion of Yosemite Valley. This area is in the immediate vicinity of Yosemite Lodge, southeast of Camp 4, and north of the Merced River (see Project Location Map p.2).



This EA has been prepared in compliance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) Regulations, and U.S. District Court Order No. C 98-3213 CRB (Breyer 1998).

## **2 EXISTING CONDITIONS**

In the summer of 1997, a closed-circuit camera was used to inspect the interior of the sewer line. This investigation revealed multiple cracks, holes, sags (areas where there is a dip in the line), offsets (areas where sections of the pipe have separated), and unsatisfactory vertical alignments (negative slopes and substandard flow areas). The investigation also revealed tree root infiltration and over 1,000 pounds of sand and gravel that had recently accumulated since the line was cleaned after the 1997 flood. Eighty-five percent of the existing line does not meet the industry standard flow requirement of two feet per second (Subtronic 1998).

The existing sewer line that services Yosemite Lodge and Camp 4 is in very poor condition. There is sewage leaching from the pipe. There are negative slopes that cause sewage to flow in the opposite direction of desired flow. This backflow causes leakage and/or ponding of sewage. Ponding separates solids and creates blockages that result in sewage overflowing from manholes. There are a number of sharp angles in the line that also contribute to blockage problems. These angles create backflow and turbulence. Turbulence causes solid material to drop out of suspension and block flow.

## **3 ALTERNATIVES**

Sewer line improvements are needed to correct the deficiencies associated with leaking, poor slopes, sharp angles, and the overall poor condition of the existing line. To minimize impacts, be cost effective, and create a sustainable system, the existing sewer line and existing trenches will be reused as feasible. To minimize maintenance, the entire collection system will be gravity operated. All branch lines will be gravity fed into the existing main trunk line. Main trunk line flows will be gravity fed to the existing Yosemite Creek pump station. Sewage will then continue to be pumped through the existing force main to the treatment plant in El Portal.

### **3.1 No Action**

Under no action, the existing sewer line would remain in place without improvements.

### **3.2 Slipline and Replace**

This alternative is based on concerns raised by the Sierra Club. It almost completely uses the existing sewer line and existing trenches. This alternative consists of sliplining (insertion of a polyethylene pipe into the existing pipe) and replacing segments of the existing sewer line as follows:

- sliplining approximately 2,260 lineal feet (Segments 1 and 4, see Project Map p.4);
- replacing approximately 525 lineal feet in the same location (Segments 2 and 3); and
- replacing 310 lineal feet of line to eliminate negative slopes (Segment 5).



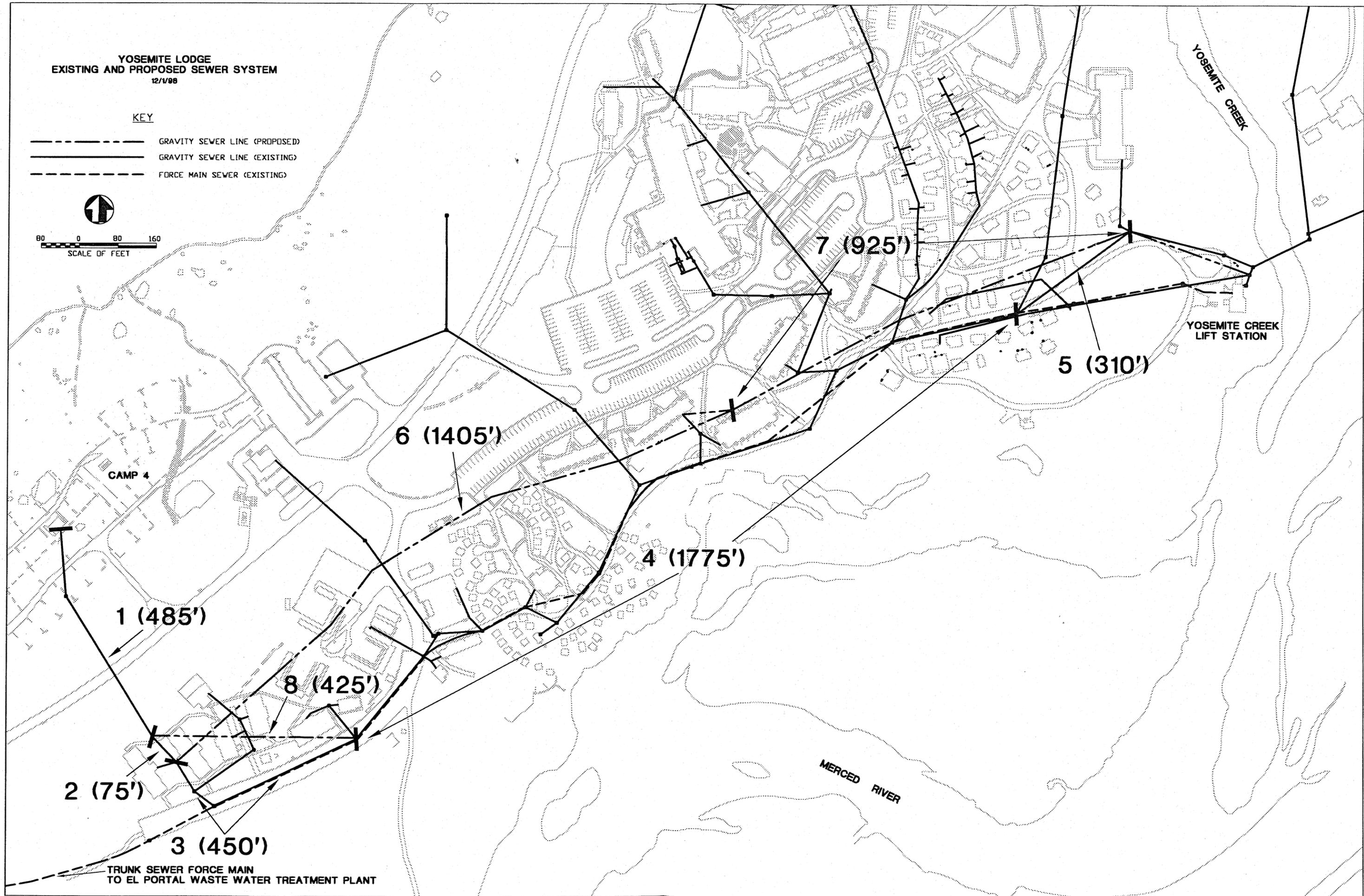
**YOSEMITE LODGE  
EXISTING AND PROPOSED SEWER SYSTEM**  
12/1/98

**KEY**

- GRAVITY SEWER LINE (PROPOSED)
- GRAVITY SEWER LINE (EXISTING)
- - - FORCE MAIN SEWER (EXISTING)



80 0 80 160  
SCALE OF FEET



CAMP 4

YOSEMITE CREEK  
LIFT STATION

MERCED RIVER

TRUNK SEWER FORCE MAIN  
TO EL PORTAL WASTE WATER TREATMENT PLANT

Polyvinyl chloride (PVC) pipe would be used for the replacement segments. All excavation trenches would be wide enough to meet Occupational Safety and Health Association (OSHA) standards. Trench width is dependent upon the depth of the replacement piping, not the size of replacement piping. To meet OSHA standards, in some places trenches may be as wide as 20 feet. Due to the water table and pipe depth, de-watering would be required during trenching and installation of pipe more than 7 feet deep.

### **3.3 Proposed Action**

To maintain sewer service to Yosemite Lodge and Camp 4, the National Park Service (NPS) proposes to repair and replace approximately 2,890 lineal feet of sewer line in Yosemite Valley. The proposed action consists of:

- sliplining approximately 485 lineal feet (Segment 1);
- relocating and replacing approximately 1,405 lineal feet almost completely in previously disturbed areas (Segment 6);
- relocating and replacing approximately 925 lineal feet near the same location as an existing abandoned sewer trench (Segment 7); and
- removing 15 manholes.

Polyvinyl chloride (PVC) pipe would be used for the replacement segments. The replacement line would be located from 20 to 200 feet north of the existing sewer line. The replacement segment would generally transect areas previously disturbed by: lodging, employee housing, utility lines, and the removal of flood damaged buildings, asphalt walkways, underground storage tanks, and other features. The holes left by manhole removal would be filled with dirt and/or sand. These areas would naturally revegetate.

As in the Slipline and Replace Alternative, all excavation trenches would be wide enough to meet OSHA standards. Trench width is dependent upon the depth of replacement piping, not the size of replacement piping. To meet OSHA standards, in some places trenches may be as wide as 20 feet. Due to the water table and pipe depth, de-watering would be required during trenching and installation of pipe more than 7-feet deep.

The NPS has modified the original NPS phase 1 design proposal to avoid an archeological site. The original phase 1 design adversely effected a small area of site CA-MRP-748/H. To mitigate this effect, data recovery measures were required and the State Historic Preservation Office (SHPO) was consulted. Data recovery measures are no longer necessary, however, because the phase 1 design has been modified and the small area of site CA-MRP-748/H will be avoided.

### **3.4 Alternatives Considered but Dismissed**

#### **3.4.1 Slipline, Relocate, and Replace**

This alternative includes sliplining, relocating, and replacing segments of the sewer line as follows:

- sliplining approximately 2,260 lineal feet (Segments 1 and 4); and
- relocating and replacing approximately 425 lineal feet in a direct route (Segment 8).

Alternative 3.2, the slipline and replace alternative, modifies and improves this alternative per the Sierra Club's suggestions. Since the slipline and replace alternative is similar to this alternative (except for one small segment), this alternative has been dismissed.

#### **3.4.2 Close Yosemite Lodge and Camp 4**

This alternative consists of postponing sewer repairs pending the completion of further NEPA analysis for lodging and employee housing in the project area. This would necessitate the closure of the Yosemite Lodge and Camp 4, both of which depend on the existing sewer line. Future planning for the Yosemite Lodge area is not likely to be finalized for many months. As a result, Yosemite Lodge and Camp 4 would have to remain closed for a prolonged period of time. This closure would be a significant adverse impact to visitors. This alternative would not meet the park's objectives for this proposal, which include ensuring adequate sewer service to visitor overnight accommodations (both camping and lodging), in accordance with approved plans such as the General Management Plan (GMP) and the Concession Services Plan (CSP). Therefore, this alternative was dismissed.

#### **3.4.3 Move Sewer Line out of Floodplain**

The NPS determined that there is no practicable or economical alternative for relocating sewer utilities for the Yosemite Lodge and Camp 4 areas entirely out of the floodplain. This is because sewer utilities for these facilities must connect to the Yosemite Creek sewage lift station. This lift station is the only lift station in Yosemite Valley that pumps sewage out of the valley to the waste water treatment plant in El Portal. Since this lift station is in the floodplain, there is no feasible way to locate the Yosemite Lodge and Camp 4 sewer utilities completely out of the floodplain. Therefore, this alternative was dismissed.

### **4 AFFECTED ENVIRONMENT**

A summary of the resources associated with the project follows. Additional information about resources in the area can be found in the Draft Valley Implementation Plan.

#### **4.1 Natural Resources**

There are three major biotic communities in the Yosemite Lodge area – riparian, oak woodland, and mixed conifer. The project would occur in a previously disturbed area which is surrounded by mixed conifers. The forest in the lodge area is similar to other forested areas in Yosemite Valley. These forests have become established since the turn of the century. Based on historic photographs, the lodge area was predominantly an open area with scattered black oak and ponderosa pine. The predominance of cedar trees in the area is due to human influence on the ecosystem of Yosemite Valley. Fire suppression has led to an increase in conifer density and a decrease in oak density, changing the historic character of the valley and reducing areas of high value resource.

The Yosemite Lodge area also contains non-native landscaped areas that are maintained by the concessioner. Some of these concession areas are marked with restoration signs. These concession signs are intended to prevent visitors from trampling landscaping. Although these signs appear similar to NPS signs, they are not official park signs and there are no ecological restoration sites within the project area.

Wildlife found in the area includes red-tailed hawk, red-shouldered hawk, great horned owl, 17 species of bats, raccoon, skunk, mule deer, coyote, and gray fox. Special status species that may occur in the Yosemite Lodge/Camp 4 area appear in the table below.

***Special Status Species***

<b><i>Species</i></b>	<b><i>Federal</i></b>	<b><i>State</i></b>	<b><i>Occurrence/Habitat Preference</i></b>
Peregrine falcon <i>Falco peregrinus anatum</i>	X	X	Forages over rivers, lakes and streams. Usually nest on high cliffs near water. Search for prey from high exposed perch where they can chase and dive on prey from above. Three active nest sites in the valley.
Willow flycatcher <i>Empidonax traillii</i>		X	Breeds in mountain meadows and riparian area with willow thickets and standing or running water. Apparently no longer nests in the valley; last recorded in 1966.
California spotted owl <i>Strix occidentalis occidentalis</i>	X	X	Breeds primarily in old-growth mixed conifer, but also found in oak/woodland habitat. Confirmed nest sites near Happy Isles, Mirror Lake, and the Chapel.
Northern goshawk <i>Accipiter gentilis</i>	X	X	Found in coniferous forests. Migrates and winters as far south as northern Mexico.
Cooper's hawk <i>Accipiter cooperii</i>		X	Found in variable habitats. Hunts by flying low over trees and hiding in terrain.
Sharp-shinned hawk <i>Accipiter striatus</i>		X	Hunts in open coniferous forests and edges of meadows and clearings. Nests in forest. One old (1930) record if nesting in Yosemite Valley.
Long-eared owl <i>Asio otus</i>		X	Nests in riparian forests and oak/conifer woodlands. One nesting record in Yosemite Valley form 1915.
Mountain quail <i>Oreortyx pictus</i>	X		Rare breeder and migrant in Yosemite Valley. Habitat of brushy steep slopes and wooded edges of meadows and clearings.
Harlequin duck <i>Histrionicus histrionicus</i>	X		No recent records in Yosemite Valley, but past history of breeding.
Spotted bat <i>Euderma maculatum</i>	X		Occurs in mixed conifer zone, residing in cliffs, caves and crevices. Confirmed sighting in Yosemite Valley.
Townsend's big-eared bat <i>Plecotus townsendii</i>	X		Roosts in caves, mines and buildings. Forages in wide variety of habitats. Captured in Yosemite Valley in 1993.
Western mastiff bat <i>Eumops perotis californicus</i>	X		Habitat includes vertical cliffs and crevices. Occurrence and reproduction documented in Yosemite Valley in 1993. Known to travel up to 15 miles between roost and foraging sites. In the valley, most commonly forages over meadows.
Pallid bat <i>Antrozous pallidus</i>	X	X	Wide variety of roost sites, including trees, caves, mines, buildings, and bridges. Forages in wide variety of habitats, catching ground-dwelling arthropods.
Fringed myotis bat <i>Myotis thysanodes</i>	X		Roosts in caves, mines, buildings, and other protected locations. Found in oak, pinon, and juniper forests.
Small-footed myotis bat <i>Myotis ciliolabrum</i>	X		Little is known about this species. Has been found beneath rock slabs and in crevices. May forage in the lodge area.
Yuma myotis bat <i>Myotis yumanensis</i>	X		Always near ponds, streams, or lakes. Roosts in buildings. Nursery colonies in caves, mines, buildings or under bridges.
Long-eared myotis bat <i>Myotis evotis</i>	X		Habitat includes coniferous forests of high mountains. Roosts in caves and buildings. May forage in the valley.
Long-legged myotis <i>Myotis volans</i>	X		Wide range from coast to high Sierra; occurs in montane coniferous, pinon/juniper, and pine/oak woodlands. Roosts primarily in hollow trees, large snags or lightning-scarred live trees.

The project area is north of a scenic segment of the Wild and Scenic Merced River. Scenic designation is given to rivers or sections of rivers that are "free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads." The wild and scenic river corridor through Yosemite Valley, including the Yosemite Lodge area, is defined as the mapped 100-year floodplain, all wetlands and meadows, and 1/8 mile on both sides of major waterfalls tributaries.

The Yosemite Lodge area is located upstream of El Capitan Moraine, which is the hydraulic control for the central chamber of Yosemite Valley. In effect, the moraine functioned as a "check dam" during the 1997 flood, causing water to impound behind it. The Yosemite Lodge area was inundated with this impounded water, which created considerable depths and relatively low velocities. Since many of the Yosemite Lodge cabin units were located fairly close to both the Merced River and Yosemite Creek, they were subject to substantial water depth during the flood event (NPS Water Resources Division 1997).

#### 4.2 Cultural Resources

There are several types of prehistoric and historic cultural resources in and around the Yosemite Lodge area. Of these resources, one known prehistoric archeological site (CA-MRP-748/765/H) exists within the Area of Potential Effect (APE) for the subject undertaking. The site exists on the western portion of the Yosemite Lodge area (formerly the employee housing annex), north of Leidig Meadow and south of Camp 4. Surface prehistoric remains consist primarily of sparse obsidian debitage (flaked stone). Recovered subsurface remains consist of a diverse cultural assemblage of obsidian flaked-stone tools and debitage, ground stone milling equipment, and some historic-period materials that predate 1914 (Hull et al. 1995).

Previous impacts to the site include the construction of concessionaire employee dormitories and housing units, motel rooms, subsurface utility lines, paved parking areas, an abandoned road, a bicycle path, and Northside Drive.

Based on archeological excavation work undertaken in 1989, 1990, and 1998, the site was determined significant (based on National Register of Historic Places Criteria D) in areas that retain deposit integrity and data potential. As part of the 1998 site re-evaluation, Hull et.al recommended (1) avoidance or data recovery in the western site area if the impacts extend below 50 cm, and (2) construction monitoring in all other areas of the site.

Specifically, Hull (1998:136) states that: *In particular, it is clear from the augering and excavations in the eastern portion of CA-MRP-748/H that this area holds relatively little research potential. Densities of prehistoric cultural material are very low, and temporarily diagnostic artifacts are lacking. Likewise, historic artifacts are absent from this zone.*

Conversely, with respect to areas of significance, it has been found that the western two-thirds of the site hold significant lithic artifacts in all but the most peripheral zones of the site. The peripheral zones are located in an undeveloped area west of the former employee housing annex and south of Northside Drive.

Camp 4 is eligible for listing in the National Register under Criteria A in the area of recreation/entertainment for its significant association with the growth and development of rockclimbing in Yosemite Valley during the "golden years" of pioneer mountaineering (National Register of Historic Places Keeper 1998).

### **4.3 Park Operations**

The eastern edge of the project area contains the Yosemite Creek sewage lift station. This lift station services the entire Yosemite Valley. The project area also contains several drinking water wells.

Two of the 37 campsites in Camp 4 provide year-round accommodations for Search and Rescue (SAR) volunteers. Ten to fifteen people typically occupy these sites.

The NPS is responsible for maintaining utility service for the Yosemite Lodge and Camp 4 areas.

Prior to the flood, the Yosemite Lodge annex was located west of Yosemite Lodge and housed 290 concession employees in dormitories, tent cabins, and cabins. Due to flood damage, the entire Yosemite Lodge employee housing annex is being or has been removed. After the flood, most of these employees were laid off and the remainder were relocated to visitor accommodations.

### **4.4 Visitor Experience**

Yosemite Lodge, constructed in 1915, is the westernmost developed area in Yosemite Valley. Prior to the flood, there were 495 guestrooms, a lobby, meeting room, two restaurants, a bar, cafeteria, several gift shops, tour desk, bicycle rental, swimming pool, post office, amphitheater, and a service dock. Due to flood damage, 250 guestrooms are being or have been removed. Yosemite Lodge now provides 245 guestrooms.

Also removed from the area was a service station, underground storage tanks, and associated contaminated soil. This area is currently undergoing remediation to restore ground water quality.

The future of the flooded Yosemite Lodge area, the flooded employee annex area, and the former service station area is being determined through ongoing planning. Until these plans are approved, these areas will remain open space and will revegetate naturally. If these areas are not properly restored, they may be inundated with non-native plant species.

Camp 4, located north of Leidig Meadow, was appropriated for Army use in 1906 and abandoned soon after because of poor sanitary facilities. Later, on this site in the late 1920s, Yosemite Valley's first winter campground was established complete with two frost-proof toilets. Today, Camp 4 contains 37 campsites (35 of which are open to the public), rest room facilities, and a campground kiosk. The capacity of Camp 4 is 220 persons per night, but this number is frequently exceeded during peak season use.

## **5 ENVIRONMENTAL CONSEQUENCES**

A summary table of the environmental consequences of each alternative is on pages 14 and 15. The following factors were used to evaluate alternatives:

- protect scenic, cultural, and natural resources;
- provide for visitor enjoyment;
- improve efficiency of park operations; and
- provide cost effective, environmentally responsible and otherwise beneficial development.

## **5.1 No Action**

### **5.1.1 Natural Resources**

Sewage would continue to leach from cracks, holes, and offsets in the existing sewer line. Unsatisfactory vertical alignments would remain that cause sewage back-ups and potentially overflow into the Merced River. No action would perpetuate these conditions which contaminate the natural environment, including soil and ground water. This environmental degradation would eventually be a significant adverse impact to natural resources that would persist until the sewer line was permanently repaired. If major maintenance is needed to maintain sewer service, there could be impacts to natural resources from maintenance activities.

### **5.1.2 Cultural Resources**

There would be minimal impacts to archeological or historic resources associated with anticipated future minor maintenance repairs. There may be discovery of or impacts to archeological resources associated with potential major maintenance repairs. These impacts could probably be mitigated through cultural resource monitoring or data recovery as appropriate. No action would have an overall minor impact to cultural resources in the Yosemite Lodge/Camp 4 sewer line area.

### **5.1.3 Park Operations**

Sand and gravel would continue to infiltrate the sewer line. Maintenance activities would continue to increase with the continued deterioration of the existing line. Due to the poor condition, slopes, and overall capacity of the existing pipe, future money would need to be allocated to repair the line. The cost of these repairs would eventually escalate beyond the cost of replacement. Future repairs could cause interruptions in sewer service. The flow volumes would remain below the industry standard of two feet per second. No action would result in moderate to major impacts to park operations given the total cost of recurring maintenance and the potential length of sewer service disruptions.

### **5.1.4 Visitor Experience**

The sewer line would remain well within the floodplain. Due to the lack of integrity of the existing line, the sewer system would remain highly susceptible to failure during seasonal highwater and/or flood events. There are potential health risks associated with leaching of sewage from cracks, holes, and offsets in the sewer line. Additionally, continual service disruptions would have a periodic impact to park visitors staying at Yosemite Lodge and Camp 4.

## **5.2 Slipline and Replace**

### **5.2.1 Natural Resources**

Sliplining parts of the existing pipe (particularly Segment 4) would not correct unsatisfactory vertical alignments that cause sewage back-ups and potentially overflow into the Merced River. Since the sewer line would remain well within the floodplain and in close proximity to the river, the potential risk of sewage entering the river would remain. Sewage entering the river could significantly impact natural resources. This

alternative could not be constructed this year because of the time required to design the sewer system, negotiate and award a contract, and order slipline materials. Therefore, the slipline and replace alternative could not be completed before the rise in the water table. (Once the water table rises, work would be extremely difficult and may be impossible.)

In the interim, the sewer system could be left as is or shut down. Shutting down the sewer system is the only guaranteed way to prevent sewage from leaking into soils and groundwater in and around Yosemite Lodge and Camp 4. Although shut down would prevent leakage and benefit natural resources, shut down would significantly impact visitors.

Due to the many sags, offsets, and unsatisfactory vertical alignments in the line, sliplining Segment 4 may not be mechanically possible. In areas where sliplining would be difficult or impossible, the existing line would have to be excavated for point repairs or line replacement where sags are beyond repair. This would cause impacts to natural resources surrounding repair areas. All excavation trenches would be wide enough to meet OSHA standards. In some places, trenching would be as wide as 20 feet which would impact natural resources in the short term. In addition to trenching and point repairs, one four-foot diameter at breast height (dbh) ponderosa pine and three incense cedars would have to be removed.

There would be negligible impacts to wildlife.

### **5.2.2 Cultural Resources**

Due to excavation in areas where sliplining is difficult or impossible, there may be discovery of or impacts to archeological resources. Potential impacts associated with excavation and trenching could be minimized through cultural resource monitoring and/or data recovery as appropriate. The replacement sewer line (Segments 2 and 3) would also require monitoring.

### **5.2.3 Park Operations**

Since sliplining the existing pipe would not correct unsatisfactory vertical alignments, sewage back-up and overflow risks would continue to persist. The unsatisfactory vertical alignments would not decrease maintenance needs and costs.

Due to corrosion, roots, and the poor condition of the existing pipe, sliplining could not occur until after intense cleaning, root removal, and point repair in Segment 4. Due to sags, offsets, and unsatisfactory vertical alignments, sliplining may not be mechanically possible in this section. Due to the numerous excavations that are anticipated, sliplining a major part of the line would be extremely difficult and almost as costly as full replacement. Sliplining would not solve problems associated with sharp angles and poor slopes. Negative slope areas create turbulence in the line and cause the solids to fall out and pool, creating blockages and backflow in the line. Due to these conditions, this alternative poses major long-term operational impacts to park maintenance resources.

### **5.2.4 Visitor Experience**

Since the sewer line would remain well within the floodplain, it would remain susceptible to failure during future flood events. Replacing the line where it presently exists could result in the same flood damage to the line that occurred during the 1997 flood. The angular layout of the existing line would continue to perpetuate ponding and blockage.

These conditions could result in sewage backing-up into lodging facilities or overflowing from manholes near the Merced River. Temporary disruption for maintenance would occur during these situations, causing moderate short-term impacts to visitors.

This alternative cannot be implemented until the new design is complete and the water table lowers in the fall. Until the design is complete and construction begins, the sewer system could remain as is or be shut down. Shutting down the sewer system until the fall of 1999 is the only guaranteed way to prevent sewage from ponding, backing up into lodging facilities, and leaking into soils and groundwater in and around Yosemite Lodge and Camp 4. This would mean closure of Yosemite Lodge and Camp 4 during the summer which would have a significant impact to visitors. If the sewer system was left as is, the short-term impacts to visitors would be the same as in no action.

### **5.3 Proposed Action**

#### **5.3.1 Natural Resources**

Even though the relocation and replacement of the line involves trenching (some of which could be 20 feet wide), trenching would not occur in high value resource areas. Most of this trenching would occur in previously developed areas. The trenching would not have a major impact on natural resources. Seventeen incense cedars, five ponderosa pines, and one black oak would have to be removed. Twelve of these trees are located within tree root rot zone (zone where the soil contains fungus that can infect trees). The predominance of cedar trees in the area is due to human influence on the ecosystem of Yosemite Valley. Fire suppression has led to an increase in conifer density and a decrease in oak density, changing the historic character of the valley and reducing areas of high value resource.

The proposed sewer system has already been designed. Materials have been ordered and the work crew is immediately available. Since the proposed action can proceed immediately, the construction could be completed before the rise in the water table. Once the water table begins to rise, more water needs to be pumped from trenches during construction. This causes sediment displacement, increased saturation of adjoining areas, and increased risk to ground water quality.

Overall, locating the replacement line 20 to 200 feet north of the existing sewer line would have a positive environmental impact to the river, especially the oxbow wetland located near the Hemlock lodge unit. The proposed sewer system will have sealed manholes, which would prevent floodwater from entering the system, as was the case during the 1997 flood event. The proposed sewer line would be located within the 100-year floodplain, but close to the 1997 100-year flood extent line.

Removing manholes and filling the holes with dirt and/or sand would protect meadow areas which are a high value resource. The dirt and/or sand fill would eliminate the unnatural drainage and transport of precipitated water from meadow areas by interrupting the conduit left by the abandoned sewer line.

The Merced River's scenic and recreational values would be improved by replacing the existing line further away from the river's edge. Visitors would have a more park-like experience along the rivers' edge to walk, fish, photograph, swim, and raft in an environment that is not compromised by manholes and utility corridors. The improved condition of the pipe would prevent sewage from leaching into soil and ground water.

There would be negligible impacts to wildlife.

### **5.3.2 Cultural Resources**

Approximately 570 linear feet (Segment 6) of sewer line replacement work crosses the eastern portion of site CA-MRP-748/765/H. Based on the cumulative information gained from archeological investigations and site evaluations (e.g. Hull 1998), a determination of *No Effect* has been found for the proposed action. This is because the site area that the proposed sewer line transects does not have cultural resource integrity. During the proposed action, as an added precaution, the NPS will monitor the trenching activities to ensure the protection of unknown archeological resources that may be in the area. There will be *No Effect* on Camp 4, a site determined eligible for listing on the National Register of Historic Places.

### **5.3.3 Park Operations**

The proposed action would correct the deficiencies associated with leaking, poor slopes, and the overall poor condition of the existing main trunk line. Since the replacement line would correct poor slopes, flow velocities would meet or exceed industry standards. The improved slopes and improved condition of the pipe would substantially decrease annual maintenance costs.

### **5.3.4 Visitor Experience**

Compared to the other alternatives, locating the replacement line 20 to 200 feet north of the existing sewer line and sealing the manholes to prevent system infiltration would reduce the risk of future flood damage to the line. This is because the proposed system would be closed and slightly higher in elevation than the current line. Floodwater is slow to reach the area of the proposed replacement line. Relocating the sewer line near the 1997 100-year flood extent line (edge of the floodplain) would decrease the risk of flood damage from smaller flood events. There will not be an increased risk of flooding to persons, properties, or structures along the Merced River. Because of this, a Statement of Findings for floodplains will not be prepared.

The sewer line improvements would reduce the possibility of back-ups into lodging facilities. Over time, the proposed sewer line would result in fewer disruptions to sewer services which would benefit visitors. Some visitors may be disturbed by the loss of trees that need to be removed for construction of the proposed sewer line. The removal of these trees would have a moderate visual impact to the immediate area.

**Summary of Environmental Consequences**

Impacts to	No Action	Slipline & Replace Alternative	Proposed Action
<b>Natural Resources</b>	<p>Sewage would continue to leach from cracks, holes, and offsets.</p> <p>Unsatisfactory vertical alignments would remain that cause sewage back-ups and potentially overflow into the Merced River.</p> <p>If major maintenance is needed, there could be impacts to natural resources from maintenance activities.</p>	<p>Sliplining would not correct unsatisfactory vertical alignments that cause sewage back-ups that could significantly impact natural resources.</p> <p>This alternative could not be completed before the rise in the water table. In the interim, the sewer system could be left leaching.</p> <p>In areas where sliplining would be difficult or impossible, there would be trenching (as wide as 20 feet in some places) for point repairs or line replacement.</p> <p>One 4-foot diameter at breast height (dbh) ponderosa pine and 3 incense cedars would have to be removed.</p> <p>There would be negligible impacts to wildlife.</p>	<p>Trenching in some areas could be as wide as 20 feet.</p> <p>Most trenching would occur in previously developed areas and not in high value resource areas.</p> <p>17 incense cedars, 5 ponderosa pines, and 1 black oak would have to be removed, however, 12 of these trees are located within tree root rot zone.</p> <p>The construction could be completed before the rise in the water table.</p> <p>The proposed sewer line would be located near the 1997 100-year flood extent line (further away from the river).</p> <p>Filling the holes from abandoned manholes with dirt and/or sand would protect meadow areas (a high value resource).</p> <p>The improved condition of the pipe would prevent sewage from leaching into soil and ground water.</p> <p>There would be negligible impacts to wildlife.</p>
<b>Cultural Resources</b>	<p>There would be minimal impacts to archeological or historic resources associated with anticipated future minor maintenance repairs.</p> <p>There may be discovery of or impacts to archeological resources associated with potential major maintenance repairs.</p> <p>There would be an overall minor impact to cultural resources in the sewer line area.</p>	<p>Due to excavation in areas where sliplining is difficult or impossible, there may be discovery of or impacts to archeological resources.</p> <p>Potential impacts associated with excavation and trenching could be minimized through cultural resource monitoring and/or data recovery as appropriate.</p> <p>The replacement segments would also require monitoring.</p>	<p>Based archeological investigations and site evaluations, a determination of <i>No Effect</i> has been found for the proposed action.</p> <p>As an added precaution, the NPS will monitor the trenching activities to ensure the protection of unknown archeological resources that may be in the area.</p> <p>There will be <i>No Effect</i> on Camp 4, a site determined eligible for listing on the National Register of Historic Places.</p>

**Summary of Environmental Consequences (continued)**

<b>Impacts to</b>	<b>No Action</b>	<b>Slipline &amp; Replace Alternative</b>	<b>Proposed Action</b>
<b>Park Operations</b>	<p>Sand and gravel would continue to infiltrate the sewer line.</p> <p>Maintenance activities would continue to increase with the continued deterioration of the existing line.</p> <p>Due to the poor condition, slopes, and overall capacity of the existing pipe, future money would need to be allocated to repair the line.</p> <p>Future repairs could cause interruptions in sewer service.</p> <p>The flow volumes would remain below the industry standard of two feet per second.</p>	<p>Sewage back-up and overflow risks would continue to persist.</p> <p>Remaining unsatisfactory vertical alignments would not decrease maintenance needs and costs.</p> <p>Sliplining a major part of the line would be extremely difficult and almost as costly as full replacement.</p> <p>Sliplining would not solve problems associated with sharp angles and poor slopes.</p> <p>Negative slope areas would continue to create turbulence causing blockage and backflow.</p> <p>These adverse conditions pose major long-term operational impacts to park maintenance resources.</p>	<p>The proposed action would correct the deficiencies associated with leaking, poor slopes, and the overall poor condition of the existing main trunk line.</p> <p>Flow velocities would meet or exceed industry standards.</p> <p>Sealed manholes would prevent floodwater from entering the sewer system.</p> <p>The improved slopes and improved condition of the pipe would substantially decrease annual maintenance costs.</p>
<b>Visitor Experience</b>	<p>The sewer line would remain well within the floodplain, susceptible to failure during future flood events.</p> <p>There are potential health risks associated with leaching of sewage from cracks, holes, and offsets.</p> <p>Continual service disruptions would have a periodic impact to park visitors staying at Yosemite Lodge and Camp 4.</p>	<p>The sewer line would remain well within the floodplain, susceptible to failure during future flood events.</p> <p>The angular layout of the existing line would perpetuate ponding and blockage.</p> <p>Sewage could back-up into lodging facilities or overflow from manholes near the Merced River.</p> <p>Temporary disruption for maintenance would occur during back-ups.</p> <p>Until the design is complete and construction begins, the sewer system could be shut down.</p> <p>If the sewer system were shut down, there would be a significant impact to visitors.</p>	<p>Moving the sewer line 20-200 feet north of the existing line would reduce the risk of future flood damage.</p> <p>There will not be an increased risk of flooding to persons, properties, or structures along the Merced River.</p> <p>The sewer line improvements would reduce the possibility of back-ups into lodging facilities.</p> <p>Over time, the proposed sewer line would result in fewer disruptions to sewer services.</p> <p>Some visitors may be disturbed by the loss of trees that need to be removed.</p> <p>The removal of these trees would have a moderate visual impact to the immediate area.</p>

## **6 MITIGATION MEASURES**

The following mitigation measures have been developed to reduce the anticipated environmental effects of the proposed action.

### **6.1 Natural Resources**

- Temporary barriers (fencing) will be placed to protect natural resources. This includes temporary barriers to protect trees near the construction zone.
- Topsoil including grasses, twigs, leaves, pine needles and rocks less than one foot in diameter shall be stripped within the work limits to a depth of four inches. Topsoil will be windrowed immediately adjacent to the area it was stripped from. Windrows will not exceed a maximum of eighteen inches in height. Stripping will be done ten days or less prior to excavation.
- Soil may contain infected root material. If the soil is moved to a different location than where it was excavated, new infections and tree mortality could result. Therefore, the contractor will be required to replace as much soil as possible in the same location from which it was taken.
- The contractor will be required to excavate as far as possible from trees which are to be saved. Any damaged living roots encountered over two inches in diameter must be given a clean straight cut on the exposed end with a chain saw or hand clippers. Smaller diameter roots may be disregarded.
- Hand excavation will be performed within the drip line (area immediately at base of tree where tree roots exist) of selected trees as directed by the park's contracting officer or designated representative. The contractor will be required to carefully excavate around all roots two inches in diameter and larger to prevent damage.
- The trench alignment will be restored through natural processes or with native vegetation consistent with future restoration efforts.
- The windrowed topsoil will be replaced immediately upon closing the trench. The topsoil will be raked into place to blend into surrounding topography.
- The holes left by abandoned manholes will be filled with dirt and/or sand to protect the unnatural drainage and transport of precipitated water from meadow areas.

### **6.2 Cultural Resources**

- Temporary barriers will be placed to protect significant archeological resources. A qualified archeologist will approve the location of barriers.
- The park shall continue to consult with the Yosemite Consultation Committee, which includes individuals of the American Indian Council of Mariposa County, Inc.
- The services of a Native American representative shall be used to monitor the sewer line trenching.
- The Monitoring and Inadvertent Discovery Plan will be followed while conducting archeological monitoring during the sewer line trenching. This plan establishes

guidelines by which previously unknown cultural resources are taken into account.

- A report of the archeological monitoring results shall be prepared to meet the Secretary of Interior's guideline's for documentation.

### **6.3 Park Operations**

- Only the park's contracting officer or designated representative shall authorize the removal of protection fencing materials when no longer needed.
- Safety and/or resource barrier fencing shall consist of orange polypropylene material, grid pattern with tensile strength of 750 lbs/ft and minimum height of four feet.
- Sewer service shall be maintained throughout construction, temporary bypass lines shall be used as necessary.

### **6.4 Visitor Experience**

- Temporary barriers will be placed to define the immediate work area, to prevent unauthorized entry into the work area, and to protect the public from construction operations.
- Fences and barriers shall be structurally adequate and neat in appearance.

## **7 CUMULATIVE IMPACTS**

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 have been considered for each alternative in context of present conditions, ongoing planning, and reasonably foreseeable future changes.

The flood highlighted the fact that natural riparian processes need to be restored and infrastructure and facilities need to be moved away from the river and moved out of the 100-year floodplain as much as practicable. Much smaller floods had previously damaged much of the same infrastructure and facilities affected by the 1997 flood. Flood recovery goals include replacing infrastructure and facilities in more resilient places, rather than putting effort and money into the repair of damaged infrastructure and facilities as has been done in the past.

### **7.1 Background**

Present conditions include the following approved plans: General Management Plan, Concession Services Plan, and Vegetation Management Plan. Ongoing planning includes the Merced River Management Plan, Yosemite Valley Housing Plan, and Valley Implementation Plan. Reasonably foreseeable future changes in Yosemite Valley include the amount and location of employee housing, amount and location of overnight visitor accommodations, regulation of day use visitors to reduce traffic congestion, increased shuttle bus operations, and restoration of high value resource areas.

### **7.1.1 General Management Plan**

The five broad goals of the park's GMP are:

1. To reclaim priceless natural beauty;
2. To markedly reduce traffic congestion;
3. To allow natural processes to prevail;
4. To reduce crowding; and
5. To promote visitor understanding and enjoyment.

This includes removing or relocating infrastructure and facilities to more resilient places, removing private vehicles from Yosemite Valley, removing facilities from floodplains, and restoring previously disturbed areas to natural conditions.

### **7.1.2 Concession Services Plan**

The CSP defines the management of concession services in Yosemite National Park. The plan establishes the amount of lodging, availability and location of food service, location and type of merchandise services, available visitor activities, and available visitor and employee services.

### **7.1.3 Vegetation Management Plan**

The Vegetation Management Plan provides for the preservation of Yosemite plant communities for the next ten years and beyond. This plan describes management actions which will preserve and restore the vegetation structure (or range of structure variability) that would have existed today without Euro-American interference and perpetuate the Native American Indian and natural fire regime.

### **7.1.4 Merced River Management Plan**

The Merced River Management Plan will address appropriate use and protection of the Merced River. This plan will describe actions to be taken for protection, enhancement, and restoration of the river corridor for the entire main stem drainage of the Merced River including Yosemite Valley. This includes policies to preserve the outstandingly remarkable values that contribute to the Merced River's designation as Wild and Scenic.

### **7.1.5 Yosemite Valley Housing Plan**

The Yosemite Valley Housing Plan will fulfill the GMP's specific objectives for removing nonessential residential housing from Yosemite Valley. The plan will delineate actions to provide new and replacement housing for a large portion of the nearly 1,900 employees who work in Yosemite Valley. About 1,400 of those employees are housed in the developed east end of the valley during the summer season.

### **7.1.6 Valley Implementation Plan**

The planning objectives of the Valley Implementation Plan (VIP) are to:

- clarify the environmental constraints in the valley so that site layout and functional relationships will be directly influenced by resources values;

- use resource based guidelines to identify areas suitable for development and to identify the suitable use of valley areas;
- ensure the integration of all proposed uses and the efficient functioning of each of the developed areas;
- integrate the VIP with other removal, rehabilitation, and relocation proposals in the valley;
- reconcile any potential inconsistencies among the VIP, Yosemite Valley Housing Plan, CSP, and other plans with respect to site layout and functional relationship; and
- identify sites to be restored to natural conditions and incorporate revegetation actions.

## **7.2 Effects of Yosemite Valley Planning**

As a result of the above listed plans, reasonably foreseeable future changes in Yosemite Valley include the amount and location of employee housing, amount and location of overnight visitor accommodations, reduction of private vehicles, regulation of day use visitors, increased shuttle bus operations, and restoration of high value resource areas. These changes in Yosemite Valley will:

- have an overall beneficial effect on natural resources that contribute to Yosemite's uniqueness and attractiveness including its exquisite scenic beauty, outstanding wilderness values, and diversity of Sierra Nevada environments;
- continue to identify, protect, and share with the public historic and prehistoric cultural resources;
- have an overall beneficial effect on the efficiency of park operations; and
- have an overall beneficial effect on making the varied resources of Yosemite Valley available to people for their enjoyment, education, and recreation.

## **7.3 No Action**

No action would make an adverse incremental contribution to the effects of other Yosemite Valley planning efforts. Considering the magnitude of the effects of these ongoing and future actions, this adverse incremental contribution is negligible and would not constitute an adverse significant contribution to cumulative impacts to natural resources, cultural resources, park operations, or visitor experience in Yosemite Valley. An explanation of no action's contribution to the overall conditions in Yosemite Valley is described below.

The existing sewer line in its present condition cannot accommodate current sewage in an environmentally responsible manner. This includes accommodating the sewage generated from Yosemite Lodge and Camp 4 as they presently exist. The continuance of sewage leaching from the sewer line could significantly affect the water quality of the Merced River. No action combined with possible changes in the amount and location of overnight visitor and employee housing accommodations in the Yosemite Lodge area would increase sewage leaching and maintenance problems. If additional lodging,

housing, and/or camping were provided in the Yosemite Lodge area, this increase combined with the lack of a sufficient sewer system could contribute to significant environmental consequences related to water resources.

No action would also make actions associated with changes in the amount and location of overnight visitor and employee housing accommodations in Yosemite Valley less viable. These actions include preserving Camp 4, partially replacing visitor accommodations at Yosemite Lodge, and possibly replacing employee housing in the area. Failure to provide overnight visitor facilities in the park and employee housing accommodations would be a significant impact to visitors because levels of service would decrease and visitor accommodations at Yosemite Lodge and Camp 4 would be inadequate. If Yosemite Lodge and Camp 4 were closed, as they were after the flood, the displacement of visitors and the subsequent concentration of impacts to others areas of Yosemite Valley could significantly affect the quality of visitor experience and natural and cultural resources of Yosemite Valley. No action also would expend park operational resources on future maintenance needs, instead of using these resources to protect or restore natural and cultural resources.

#### **7.4 Slipline and Replace**

The slipline and replace alternative's contribution to the effects of other Yosemite Valley planning efforts include:

- an adverse incremental contribution to natural resources;
- no incremental contribution to cultural resources;
- an adverse incremental contribution to park operations; and
- an adverse incremental contribution to visitor experience.

Considering the magnitude of the effects of these ongoing and future actions, the adverse incremental contributions to natural resources, park operations, and visitor experience are negligible and would not constitute an adverse significant contribution to cumulative impacts in Yosemite Valley. An explanation of the slipline and replace alternative's contribution to the overall conditions in Yosemite Valley is described below.

The slipline and replace alternative, combined with possible changes in the amount and location of overnight visitor and employee housing accommodations, would increase maintenance problems. This alternative would also make alternatives associated with changes in the amount and location of overnight visitor and employee housing accommodations in Yosemite Valley less viable. These actions include preserving Camp 4, partially replacing visitor accommodations at Yosemite Lodge, and possibly replacing employee housing in the area. If additional lodging, housing, and/or camping were provided in the lodge area, this increase combined with the lack of a sufficient sewer system could contribute to significant environmental consequences related to water resources. Failure to provide overnight visitor facilities in the park and employee housing accommodations would be a significant impact to visitors because levels of service would decrease and visitor accommodations at Yosemite Lodge and Camp 4 would be inadequate.

Although this alternative restores the integrity of the sewer line, back-ups and overflows due to uncorrected and unsatisfactory vertical alignments could significantly affect natural resources, as in no action. Therefore, the slipline and replace alternative would

require the NPS to expend park operational resources on future maintenance needs, instead of using these resources to protect or restore natural and cultural resources.

Construction and other ground-disturbing activities that could be initiated under other plans (such as the VIP) would have varying degrees of impacts to cultural resources. However, because this alternative would not impact cultural resources, there would be no incremental cumulative impact to cultural resources.

## **7.5 Proposed Action**

The proposed action's contribution to the effects of other Yosemite Valley planning efforts include:

- a positive incremental contribution to natural resources;
- no incremental contribution to cultural resources;
- a positive incremental contribution to park operations; and
- a positive incremental contribution to visitor experience.

Considering the magnitude of the effects of ongoing and future actions, these incremental contributions, although positive, would not constitute a significant contribution to cumulative impacts in Yosemite Valley. An explanation of the proposed action's contribution to the overall conditions in Yosemite Valley is described below.

The proposed action would occur in one of approximately 4,480 acres in Yosemite Valley. Almost this entire single acre has been previously disturbed. Although the proposal includes the removal of 23 trees, most of these trees are cedars which are abundant in the valley. Restoration actions included in other plans (such as the VIP) would more than offset this loss. Considering possible changes in the amount and location of employee housing, the amount and location of overnight visitor accommodations and actions facilitating the reduction of private vehicles, regulation of day use visitors, and increased shuttle bus operations, the proposed action would result in essentially no change in Yosemite Valley.

Implementation of these long-term plans for Yosemite Valley together with the proposed action would result in net benefits to natural resources in Yosemite Valley. The benefits of Yosemite Valley planning include significant positive cumulative effects on the Merced River and its adjacent surrounding environs. These benefits will be realized as infrastructure and facilities are moved to more resilient environments and riparian areas are restored. The proposed action contributes to these positive cumulative effects by eliminating the risk of sewage back-ups and overflows by moving the sewer line further away from the river.

The proposed action is consistent with flood recovery goals to replace infrastructure and facilities in more resilient places, rather than put effort and money into the repair of damaged infrastructure and facilities. In addition to moving infrastructure (the sewer line) away from the river, the proposed action would enable the replacement and relocation of other facilities and structures out of the floodplain. This would enable the restoration of high value riparian resources that are located near the river's edge. As a result of the proposed action, and possible changes in the amount and location of overnight visitor and employee housing accommodations, the potential for flood damage would be significantly decreased.

The proposed action would not limit the range of future changes in the amount and location of overnight visitor and employee housing accommodations in Yosemite Valley. The proposed action is cost effective and would not result in significant expenditure of future park operational resources; therefore, resources could be devoted to other projects. This would result in a minor beneficial cumulative impact to park operations and visitor experience.

Construction and other ground-disturbing activities that could be initiated under other plans (such as the VIP) would have varying degrees of impacts to cultural resources. However, because this alternative would not impact cultural resources, there would be no incremental cumulative impact to cultural resources.

## **8 COMPLIANCE**

Actions taken by the NPS in connection with sewer line improvements will comply with all applicable laws, regulations, and executive orders. The following paragraphs describe applicable laws, regulations, and executive orders.

### ***National Environmental Policy Act (NEPA) of 1969 (42 USC 4341 et seq.)***

NEPA was established to ensure that environmental consequences of federal actions are identified, documented and considered in the decision-making process. Regulations implementing NEPA are set forth by the Council on Environmental Quality (refer to next paragraph).

### ***Council on Environmental Quality (CEQ) Regulations Implementing NEPA (40 CFR Parts 1500-1508)***

CEQ Regulations implementing NEPA establish the requirements for Environmental Assessments (EAs) and Environmental Impact Statements (EISs) and the process by which federal agencies fulfill their obligations under NEPA. The Regulations also define such key terms as "cumulative impact," "mitigation," and "significantly" to ensure consistent application of these terms in environmental documents.

### ***Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.)***

ESA protects threatened and endangered species, as listed by the U.S. Fish and Wildlife Service (USFWS), from unauthorized take and directs federal agencies to ensure that their actions do not jeopardize the continued existence of such species.

### ***National Historic Preservation Act of 1966, as amended (Public Law 89-665)***

Section 106 of the National Historic Preservation Act requires that federal agencies consider the effect of proposed actions on properties on or eligible for listing on the National Register of Historic Places (NRHP).

### ***Floodplains and Wetlands***

Executive Orders 11988-Floodplain Management and 11990-Protection of Wetlands require an examination of impacts to floodplains and wetlands of potential risk involved in placing facilities within floodplains and protecting wetlands.

### ***Wild and Scenic Rivers Act (Public Law 90-542)***

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve certain rivers with outstanding natural, cultural, or recreational features in a free-flowing condition for the enjoyment of present and future generations. Federal agencies can not participate in activities that would have a direct and adverse effect on river values.

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