

**FLOODPLAIN STATEMENT OF FINDINGS
EL PORTAL WASTEWATER TREATMENT PLANT REHABILITATION PROJECT
YOSEMITE NATIONAL PARK**

INTRODUCTION

Executive Order (EO) 11988 (Floodplain Management) and EO 13690 (Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input) require the National Park Service (NPS) and other federal agencies to clearly identify the likely impacts of proposed actions in floodplains and to improve the Nation's resilience to flood risk. The objective of EO 11988 is to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. EO 13690 was issued to establish a Flood Risk Management Standard for federally funded projects to improve the nation's resilience to floods and to insure new federal infrastructure will last as long as intended. NPS procedures for complying with the floodplain Executive Orders are outlined in NPS Directors Order and Procedural Manual 77-2 (DO 77-2 and PM 77-2, respectively). This Floodplain Statement of Findings (FSOF) documents compliance with these NPS floodplain management procedures. In accordance with the floodplain Executive Orders and NPS guidelines for implementing the orders, the National Park Service has clearly identified the flood hazards associated with the proposed repair and rehabilitation of the El Portal Wastewater Treatment Plant (EP WWTP) in Yosemite National Park (Park) and has prepared this FSOF.

The purpose of this FSOF is to review the proposed project in sufficient detail to:

- Provide an accurate and complete description of the flood hazard assumed by implementation of the proposed action (without mitigation)
- Describe the effects on floodplain values associated with the proposed action
- Provide a thorough description and evaluation of mitigation measures developed to achieve compliance with EO 11988, EO 13690, DO 77-2, and PM 77-2

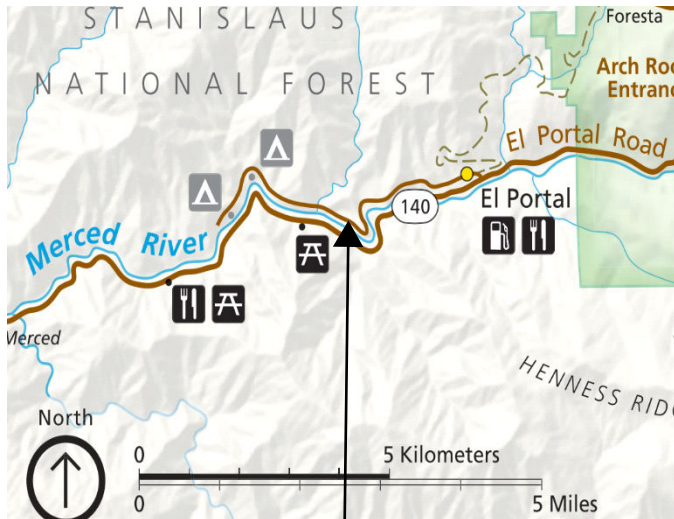
Proposed Action

The NPS is preparing a Categorical Exclusion (CE) for the repair and rehabilitation of the EP WWTP within the El Portal administrative area of Yosemite National Park (figure 1: project location map). The proposed rehabilitation of the facility will involve constructing new and rehabilitating existing structures within the fence line of the current facility with the goal of addressing current deficiencies and ensuring reliable operation for the next 50 years. The proposed new processes, structures, and improvements are summarized below (figure 2: proposed improvements):

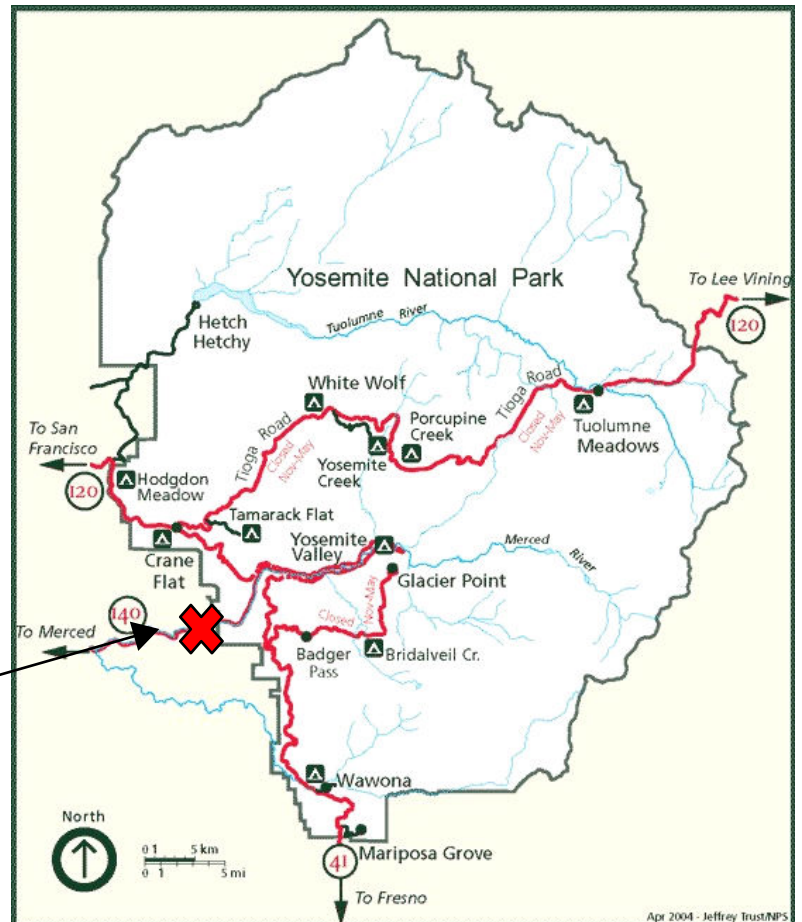
- New Operations Building - A new operations building would be constructed to accommodate office space, laboratory space, lunchroom, overnight sleeping quarters, locker room with showers, and bathrooms.
- New Maintenance Building - A new maintenance building would be constructed with shop space and storage.
- Influent Pumping - A new influent pump station would be constructed to lift raw wastewater to the new treatment processes, with the intended hydraulic profile to not require any additional pumping prior to discharge to the percolation ponds.

- Preliminary Treatment - A new headworks facility would be constructed with screening and grit removal. The new headworks would be in a building with odor control.
- Secondary Treatment - Secondary treatment bioreactors and clarifiers operate as a system. The bioreactors receive wastewater flow from the influent flow equalization wet-well following screening and grit removal. Settled sludge collects as a blanket in the bottom of the clarifier and is pumped back to the bioreactors as return activated sludge (RAS) or is wasted to the aerobic digesters as waste activated sludge (WAS). High-efficiency blowers would be installed in a new blower building. A new RAS and WAS pump station would include flow-based RAS control and dedicated WAS pumping.
- Tertiary Treatment - The tertiary phosphorus removal process (rapid mixers, flocculation mixers, tube/plate settlers, sludge collection mechanisms) would be replaced in kind. The tertiary filtration process (sand filter media, underdrains, backwash and air scour systems) would be replaced with a dual media filters and underdrains in the existing filter cells, with new backwash and air scour systems. The tertiary pumps would be replaced in kind. The tertiary facility would be covered with an open-walled, roofed structure to minimize algal growth in the summer. During the next phase (Design Development/Construction Documents), replacement of the sand filters with disk filters would be explored.
- Disinfection - The existing ultraviolet (UV) System would be maintained, and an open-walled, roofed structure would be added to protect equipment from the elements. Davit cranes or a bridge crane would be added to lift the UV modules for lamp replacement.
- Aerobic Digestion - New aerobic digesters would be constructed to directly receive WAS. During the next phase (Design Development/Construction Documents), aerobic digestion process alternatives would be explored.
- Dewatering - Dewatering will be housed in a new facility using new rotary screw presses. The existing dewatering facility will be demolished.
- Chemical Addition - All chemical storage and pumping processes, including magnesium hydroxide, alum, PAC, and polymer would be consolidated, with proper containment and separation, within dedicated spaces in a new facility.
- Sludge Drying Beds - New drying beds would be provided at the location of the existing secondary processes.
- Security- Facility security improvements will be made including installing access gates, fencing, security cameras, exterior lighting, and signage.
- SCADA- This project may address issues with the greater El Portal service area utilities communication systems as optional bid items. Recommendations for improvements to the communications system include upgrading remote site logic controllers and instrumentation at lift stations, wells, and water tanks, installing shelters to protect remote site instrumentation, and establishment of a remote Emergency Operations Center.
- Demolition- Old treatment process facilities will be demolished and foundations backfilled as processes are switched over to newly constructed processes.
- Other Improvements- Replacement and upgrade of the electrical systems throughout the treatment plant; Revegetation and restoration of landscaped elements; Paving and striping of access roads and parking areas; Walkway installation.

Figure 1: Project Location - Rehabilitate El Portal WWTP



EP WWTP





Site Description

The EP WWTP is located north of the Merced River and just north of Foresta Road in El Portal, California. The facility covers an area of approximately 8.5 acres and is associated with the larger El Portal NPS Administrative complex. The WWTP was originally constructed in 1974 and has since undergone several upgrades.

Floodplain Attributes

The best available data were used to determine the extent of existing floodplain boundaries and water surface characteristics of the Merced River. The Merced River is a designated Wild and Scenic River. The proposed action is located within Segment 4 (El Portal), designated as a “Recreational” segment.

Flood hazard areas regulated by the NPS include the 100-year floodplain (1% annual chance of inundation), the 500-year floodplain (0.2% chance of annual inundation), and the Extreme Floodplain (largest magnitude flood possible at a site). The current and proposed facilities are located within the 500-year floodplain of the Merced Wild and Scenic River. The facility is located above the Ordinary High-Water Mark (OHWM) and outside of the 100-year floodplain.

NPS Director’s Order 77-2 and Procedural Manual 77-2 consider the evaluation of actions that may be grouped into the following three categories:

- Class I Actions – include administrative, residential, warehouse and maintenance buildings, and nonexempted (overnight) parking lots
- Class II Actions – those that will create “an added disastrous dimension to the flood event.” Class II actions include schools, clinics, emergency services, fuel storage facilities, large sewage treatment plants, and structures such as museums that store irreplaceable records and artifacts.
- Class III Actions – Class I or Class II Actions that are located in high hazard areas such as those subject to flash flooding.

The proposed project is considered a Class II Action. Following EO 11988, the regulatory floodplain for Class II Actions is the 500-year floodplain and any Critical Action needs to be mitigated up to that level. Additionally, following EO 13690, any proposed action that involves federal capital investment must include a Federal Flood Risk Management Standard (FERMS).

General Characteristics of Flooding in the Area

Flooding in the project area can be categorized as one of two general types: (1) *Spring floods* that occur as a result of spring and summer snowmelt and associated runoff, and (2) *Winter floods* or *rain on snow events* that occur during the late fall and winter (September through April) as a result of intense rainfall or rainfall on snow. Most of the runoff from the Merced River basin occurs from November through July.

The January 1997 flood was the largest recorded flood within the park with a peak discharge of 10,000 cubic feet per second at Happy Isles and 25,000 cubic feet per second at Pohono Bridge. The flood inundated roads, picnic areas, park offices, and lodging units. It caused extensive damage to NPS facilities, including roads, bridges, buildings, and Yosemite Valley’s electric, water, and sewer systems. The El Portal Road and the main sewer line from Yosemite Valley to the EP WWTP also sustained significant damage and required repair and rebuilding. The WWTP itself was not flooded and did not sustain any damage. The flood also altered natural features and caused downed trees, movement of landslide talus into streams, channel erosion, and substantial changes in channel morphology. This flood

was estimated to have a recurrence interval of 90 years, or about a 1.1% chance of occurring in any given year.

The Merced River channel in El Portal can shift during large floods, including movement of large boulders that define the channel. Flooding has been an important aspect of the development of riparian communities along the Merced River and its tributaries that intersect drier adjacent vegetation types of El Portal. Within this area, El Portal Road and small levees alter the floodplain by restricting flow during flood events and forming a barrier to channel migration.

The Park calculated Critical Action flood elevations for the project area based on Federal Emergency Management Agency (FEMA) Flood Insurance Studies (FIS) and Flood Insurance Rate Maps (FIRMs) for the project area. These resources identify the 100-year flood elevations but do not provide flood elevations for the 500-year event. Per FEMA's implementing guidelines for EO 11988 and 13690, agencies may use a Freeboard Value Approach (FVA) in establishing FFRMS flood elevations in areas where the 100-year Base Flood Elevation (BFE) levels are known. This method adds 2 feet to the BFE for non-critical actions and adds 3 feet to the BFE for critical actions. Using this method, the Park determined that Critical Action floodplain elevations for the project area range from 1,704 feet above sea level (asl, NAVD 88) at the eastern (upriver) portion of the project area at the Spur Road/Foresta Road junction to 1,693 feet asl at the western (downriver) portion of the project area (figure 3: affected floodplain within project area).

JUSTIFICATION FOR USE OF THE FLOODPLAIN

The 2014 Merced Wild and Scenic River Plan (MRP) Environmental Impact Statement (EIS) identified the EP WWTP as a crucial facility to the functioning of the Park and Administrative Area:

"The El Portal Wastewater Treatment Plan services both El Portal and Yosemite Valley. This plant currently processes one million gallons of wastewater per day, well under its capacity. Although plant capacity is not a constraint, the presence of the facility is essential and prohibits alternative lands uses at the same location." (MRP EIS, pg. 6-28).

Further, the MRP analyzed the feasibility of relocating the facility outside of the river corridor and concluded that this was not possible:

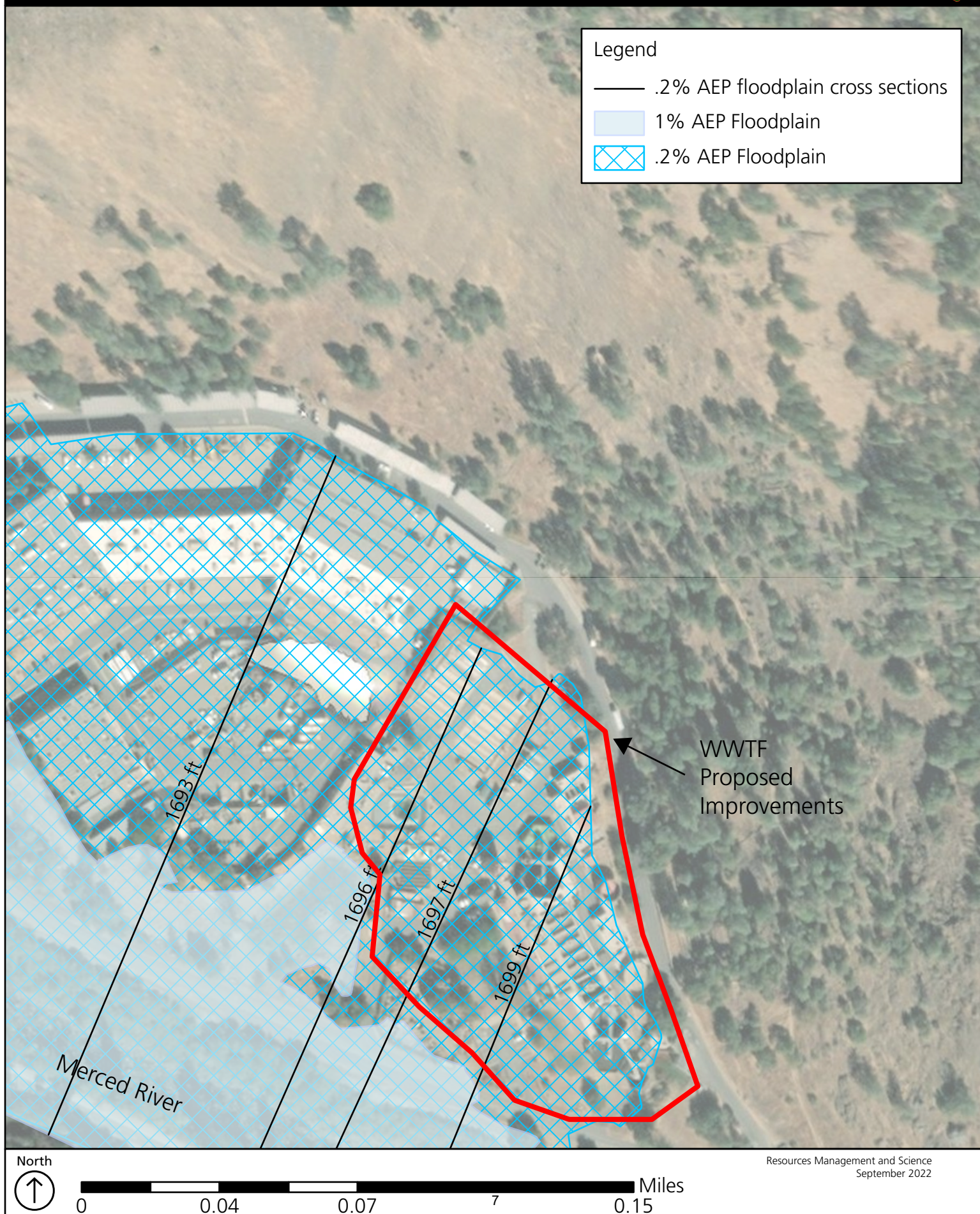
"No alternative areas of sufficient size or location are available outside the corridor in El Portal...This facility is essential to support public use of the river corridor, public health and safety, and resource protection." (MRP EIS pg. 7-19, Table 7-1).

Thus, the retention of the El Portal Wastewater Treatment Plant in its current location was included in all action alternatives analyzed under the MRP. The Park does not recommend deviating from this conclusion for the proposed rehabilitation project.

Alternatives Considered

The EP WWTP consists of various treatment processes in sequence. In 2020 and 2021, the park conducting several treatment strategy workshops and value analyses to evaluate possible treatment options for each process in consideration of cost, effectiveness, reliability, constructability, etc. Alternatives were evaluated and the preferred alternatives for each process were chosen as a basis for the design of the facility rehabilitation. Based on the conclusions of the MRP (see above), all options assumed the retention of the WWTP within the existing facility footprint and moving the facility to a new location was not considered. The three basic alternatives for the rehabilitation effort were as follows:

Figure 3: Affected Floodplain within Project Area



- Rehabilitate existing liquids and solids treatment
- Rehabilitate existing liquids treatment, haul thickened waste activated sludge offsite
- Construct new facilities for liquids and solids treatment onsite

The first alternative would involve rehabilitating existing process structures within the facility as-is to bring them up to code and increase operational efficiency. The workshops determined that retrofitting the existing processes would fail to provide process simplicity and flexibility, and be complex and costly to implement. The first alternative would have posed essentially the same flood risk as the current facility does.

The second alternative would rehabilitate existing liquids process structures within the facility, and abandon on-site solids treatment processes in favor of hauling solids off site. While this alternative would have resulted in fewer new process structures being built on site, ultimately the reliance on hauling solids offsite was determined to pose prohibitive cost, safety, and flexibility issues.

The third alternative would construct new process structures onsite and demolish old process structures as the new treatment processes are brought online. This was selected as the chosen alternative by the park. This alternative may pose either more or less flooding hazards than the current facility, depending on the final locations, elevations, and components of the specific processes.

POTENTIAL HAZARDS TO HUMANS, FACILITIES, AND THE ENVIRONMENT

Risks to Human Life, Health, and Safety

During a major flood event, the EP WWTP could become inundated with floodwaters. Inundation could interfere with human access and use of the facility and could cause potentially hazardous conditions for humans due to potential risk of inundation. Humans could potentially be trapped within occupied structures such as the Operations and Maintenance buildings. However, floods of consequence on the Merced River almost always occur with some warning and typically require a prolonged period of intense rain for at least 24 hours to create extreme flood conditions, particularly for the river to rise to the level of the 500-year floodplain. The NPS and other agencies have a comprehensive monitoring system in place to provide an early warning system for major flooding, which provide sufficient time for evacuation.

Failure of the WWTP would impact park visitors, NPS staff, and residents throughout the entire Yosemite Valley, El Portal, and adjacent communities. Failure of the facility through flood damage would leave these communities without functional sanitary waste treatment, posing continued health risks after immediate flooding hazards abate until the facility is repaired.

Risks to Facilities

Flooding of sufficient depth or velocity could damage the facility, while floating debris could result in damage to structures and facilities, requiring additional repair and maintenance. The WWTP represents a significant investment for the Park and damage to the facility could be extremely costly to repair. Some or all recreational, housing, and administrative facilities in Yosemite Valley and El Portal would potentially need to be closed pending the repair of the facility or the provision of alternate waste treatment or disposal options.

Risks to the Environment

Hazards posed to the environment include the release of fuel, wastewater, and/or chemicals stored onsite following inundation of containment structures. Overflows may place downstream areas at risk by contaminating water for drinking, irrigation, hydroelectric power generation, and other municipal uses.

Risks to Natural Floodplain Values

All proposed improvements will take place within the footprint of the existing facility. No changes or risks to natural floodplain values will result from the proposed action.

DESIGNS OR MODIFICATIONS TO MINIMIZE HARM TO FLOODPLAIN VALUES OR RISKS TO LIFE AND PROPERTY

The NPS will maintain its existing monitoring system and flood evacuation plan, detailing responsibilities of individual park employees for advanced preparedness measures; removing or securing park property; records and utility systems; monitoring communication; and conducting rescue and salvage operations.

The design of all new structures or substantial improvements to existing structures will incorporate requirements and methods for minimizing flood damage, as contained in the National Flood Insurance Program “Floodplain Management Criteria for Flood-Prone Areas” (CFR 44, 60.3) and in accordance with any local, county, or state requirements for flood-prone areas.

As part of the WWTP rehabilitation effort, the facility layout will be altered as old facility processes and support structures are removed and new ones are constructed. Design development for this action will include elevational criteria for the Critical Action flood event. New structures and site grading will be designed in such a way as to minimize flood damage. Finished floor elevations of structures will be raised above the applicable flood elevations when feasible. Structures which cannot be feasibly raised, design will incorporate wet floodproofing technology or incorporate berm/levees. Wet flood proofing includes breakaway walls or vents, or incorporate robust flood-proof design, if feasible and consistent with the function of these structures. The top of the berm/levee would be raised above the elevations of the Critical Action flood event to prevent incursion of floodwater into the facility. As per Procedural Manual-77-2, Section VI. G, such structural flood protection measures would be professionally engineered to effectively manage flood hazards.

Buildings that do not contribute to the critical nature of the proposed action (e.g. chemical storage, etc.) and are not critical to the operation of the facility (e.g. the Maintenance Building), buildings would only be raised and/or floodproofed to the 2 feet freeboard level. The determination of which buildings would be subject to the 3- or 2-foot freeboard level and approximate flood depths to finish floor elevations will be identified during project design development, in coordination with the Park, NPS Denver Service Center, and the design firm.

The proposed facility rehabilitation effort includes improvements and additions to the facility’s SCADA system. These improvements include adding remote operation capabilities for certain crucial processes. In the event that the facility needs to be evacuated due to flooding hazards, key portions of the facility would be able to continue to be monitored and operated from a pre-determined remote emergency operations center located outside of the floodplain.

The elevation of the top of open-top storage tanks, containment basins, and structures which hold hazardous substances should be designed to be above the Critical Action flood elevations or otherwise armored to protect against breach or failure during inundation.

Conclusion

The NPS has determined that the El Portal Wastewater Treatment Plant must remain within the regulatory floodplain and there are no practicable alternatives to relocating this critical facility. Repairs and rehabilitation of the El Portal Wastewater Treatment Plant shall take place in compliance with regulations and policies to prevent impacts to floodplain values and loss of human life or property. The NPS concludes that with specified mitigation measures in place there will be no unacceptable risks to human health and safety, unacceptable impacts to property, or substantial long-term adverse impacts to floodplain values. Therefore, the NPS finds the proposed action to be acceptable under Executive Order 11988, Executive Order 13690, and the NPS Directors Order 77-2 for the protection of floodplains.

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