Lewis and Clark National Historical Park

Rehabilitation of the Fort Clatsop Visitor Center and Associated Septic System

Environmental Assessment

Proposed by
National Park Service
March 2020

UNITED STATES DEPARTMENT OF INTERIOR - NATIONAL PARK SERVICE – REGION 9

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CHAPTER 1: PURPOSE AND NEED FOR ACTION

Proposal

Lewis and Clark National Historical Park proposes to renovate, repair, and re-construct the Fort Clatsop Visitor Center and its associated septic system in order to improve the visitor experience and to improve health, safety, energy efficiency, and cultural resource protection.

Background

Between 2015 and 2019, Lewis and Clark National Historical Park welcomed 280,537 visitors to the park annually on average (NPS 2020). Approximately 64% of park visitors, or 180,521 annually, used the Fort Clatsop Visitor Center (NPS 2020).

The Visitor Center was constructed in 1963 as part of the NPS "Mission 66" initiative. An addition to the building was added in 1991, expanding the Visitor Center from 3,330 square feet to 12,000 square feet. No major rehabilitations of the building and its systems have been undertaken since then.

The Fort Clatsop Visitor Center's first septic drainfield was replaced in 1986. In 1996, corrective action was taken to address the high groundwater table in the drainfield area as well as faulty construction practices that were leading to poor performance. Corrective action was again taken in 2000.

Purpose & Need

The purpose of this action is to rehabilitate the Fort Clatsop Visitor Center and its associated septic field to improve visitor enjoyment and to improve health, safety, energy efficiency, and cultural resource protection.

The need for this action is to correct multiple deficiencies in the aging systems, as identified in park audits and operational reviews by subject matter experts including:

- In 2019, an audit by accessibility experts from the National Park Service recommended that the entrance plaza to the Visitor Center, the public restrooms, and certain fixtures should be improved in order to meet current Architectural Barriers Act Accessibility Standards (ABAAS) and best practices.

- An inspection from the National Park Service regional fire marshal recommended that the exterior doors be replaced and additional sprinklers should be installed under eaves to meet National Fire Prevention Association standards.

- The NPS's Museum Management Program Museum Checklist has identified two structural deficiencies in the museum collection room. It is located next to a bathroom, increasing the chance of flooding. Moreover, while it is large enough to protect the park's physical artifacts, it is not large enough to house the park's archive and rare book collection.

- Inspections by the US Public Health Service and the Oregon Department of Ecology have identified that the Visitor Center's septic drainfield is failing and needs to be replaced in order to meet with State of Oregon Department of Environmental Quality's Onsite Wastewater Treatment System's manual, 2014 Edition and Water Pollution Control Federation health and safety regulations. The US Public Health Service also found the current pumping configuration in the building is a safety hazard.

- The visitor restrooms were originally constructed as a separate building in 1963. The entryway was then enclosed during the 1991 Visitor Center expansion but the ventilation was not changed. As a result, visitors can occasionally experience foul odors.

- An energy efficiency inspection by HECO Engineering and NPS staff recommended replacement of single pane windows, new energy efficient lighting, insulation and replacement of multiple air-handling units, some of which date to 1963.

- HECO Engineering and NPS staff also found that the interior of the Visitor Center could be improved for the visitor experience with upgrades to the theater including seating, finishes, audio, and visual systems; replacement of interior finishes; and update of finishes in the multi-purpose room.

Location:
The project area is around and including the Visitor Center in the Fort Clatsop Unit of Lewis and Clark National Historical Park. It is on the west bank of the Lewis and Clark River near Astoria, Clatsop County, Oregon. The undertaking occurs within the original 125 ac. boundary of Fort Clatsop National Memorial. The elevation of the project area is from 12 to 15 m (40 to 50 ft.) above sea level (NGVD 1929).

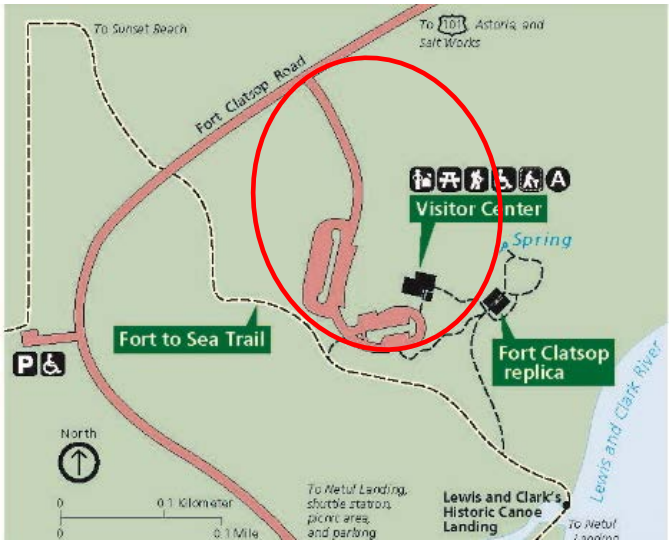


Figure 1: Project Area Outlined in Red

Issues & Impact Topics Retained for Further Analysis:

- Soils
- Vegetation
- Wildlife and Wildlife Habitat
- Water Quality
- Visitor Use and Experience
- Museum Collections

Impact Topics Dismissed from Further Analysis:

The following topics are dismissed from further analysis in this Environmental Assessment for the reasons provided below.

Air Quality & Climate
Lewis and Clark NHP is designated as a Class II Air Quality area under the *Clean Air Act (1997)*. The park strives to maintain the highest air quality standards, and project work within the historical park is completed in accordance with regional standards. The project would result in a negligible increase of Green House Gas emissions (GHGs) from the use of construction equipment. Construction related activities would result in a localized increase of vehicle exhaust, emissions, and dust throughout the construction period. Periodic use of heavy equipment over the construction period would produce limited emissions relative to those produced from visitor and local transportation within the park and would make an inconsequential contribution to the park's overall emissions profile. Any increase in GHGs would cease once construction is complete. Improving the building's energy efficiency would lower the park's emissions in the long run. Therefore, this topic was dismissed from further analysis.

Soundscapes
While natural sounds such as birds, chipmunks, and the wind in the trees can be experienced in the project area, its proximity to roads mean that the sounds of cars, log trucks, and other people are generally present. The project would cause temporary and intermittent negative impacts to natural soundscapes during construction. Periodic use of various types of equipment over the construction period would produce sounds that would make a minor contribution to the park's overall soundscape profile in the short term. Any increase in construction noise would cease once construction or maintenance activities are complete; therefore, this topic was dismissed from further analysis.

Federally Threatened and Endangered Species & Species of Concern
An official federal species list (consultation code 01EOFW00-2020-SLI-0035) was obtained from the U.S.Fish and Wildlife (USFWS) Information for Planning and Conservation (IpaC) website (https://ecos.fws.gov/ipac/) on October 18, 2019. The list identified the following five species with the potential to occur within the project area: fisher (Proposed Threatened), red tree vole (Candidate), marbled murrelet (Threatened), Northern spotted owl (Threatened), and Western snowy plover (Threatened). There is no critical habitat for any of these species inside the project area, and none of these species has ever been documented in or near the project area or the broader Fort Clatsop unit. Therefore, the NPS has determined that this project will have "no effect" on federally listed sp

Wetlands and Floodplains

Executive Order 11990 Protection of Wetlands requires federal agencies to avoid, where possible, adversely impacting wetlands. In accordance with Management Policies and Director's Order 77-1 Wetlands Protection, proposed actions that have the potential to adversely affect wetlands must be addressed in a Statement of Findings for wetlands. Site visits were conducted in 2019 and 2020 and verified that there would be no impacts to wetlands as described in DO 77-1. While there is a constructed drainage ditch behind the Visitor Center, it was constructed in an upland area and is not situated or associated with wetlands. Due to the absence of floodplains and wetlands greater than 0.01 acres in size in the project area, no impacts as described in DO 77-1 are expected. Therefore, no Statement of Findings would be prepared and the topic of wetlands was dismissed from further analysis.

Archeological Resources

In accordance with Section 106 of the National Historic Preservation Act, archeological testing was conducted by an NPS Cultural Resource Specialist at the proposed location. A pedestrian survey and 14 shovel tests were conducted to assess the possibility that previously unrecognized archeological resources would be impacted by the creation of the septic drainfields. The shovel test sites were placed less than 20 meters apart in the wooded area located between the park's Headquarters and Fort Clatsop Road. Shovel probes were also conducted for the geotechnical survey of the potential location of the new drainfield and the geotechnical surveys were also monitored. No pre-contact American Indian archaeological resources were identified during pedestrian surface survey of the Area of Potential Effect (APE). Two historic-era pit features were recorded. Three non-diagnostic historic or modern-era artifacts were encountered in sub-surface shovel probes. As a result, NPS recommended and the Oregon State Historical Preservation Office (SHPO) concurred with the finding of "no adverse effect" for the project.

Ground-disturbing construction would be monitored by a professional archaeologist. The park's Cultural Resources staff would be notified and additional consultation with the State Historic Preservation Office, federally recognized tribes, and affiliated groups would occur in accordance with federal regulations and NPS policy if cultural resources were discovered during construction activities.

Historic Structures and Cultural Landscapes

While the original visitor center was constructed during the Mission 66 era, the substantial expansion done in 1991 means that the building has lost its historical integrity and does not meet the national criteria register for Mission 66 Era resources (Carr et al 2015). SHPO concurred with these findings in 2019.

According to the NPS Directors Order 28: Cultural Resource Management Guideline (NPS 1998) , a cultural landscape is a reflection of human adaptation and use of natural resources, and is often expressed in the way land is organized and divided as patterns of settlement, land use, systems of circulation, and in the types of structures that are built. A cultural landscape

inventory has been conducted for the Fort Clatsop Unit, and affected structures – parking lot, visitor center, current septic drainfield, and proposed new location of the septic drainfield were found to be non-contributing (NPS 2018). SHPO concurred with these findings in 2019.

Indian Trust Resources and Sacred Sites
There are no Indian trust resources within Lewis and Clark National Historical Park. The park is not aware of any Indian sacred sites at or near the project site.

Environmental Justice
In accordance with the National Office of Environmental Policy and Compliance (OEPC) Environmental Compliance Memorandum, Astoria, OR was assessed to contain both minority and low-income populations. However, this environmental assessment demonstrates that the impacts that could result from implementation of the alternatives would be few and would not be disproportionately high with regard to human health or environmental impacts on minorities or low-income populations. The proposed actions would allow the use of the area by all people regardless of race or income, and any construction workforces would not be hired based on race or income.

Socioeconomics
The park staff and planning team does not anticipate any impacts on the socioeconomic environment to alter the physical or social structure of nearby communities because the implementation of either alternative would neither change local or regional land use nor appreciably affect local business or other agencies.

CHAPTER 2: ALTERNATIVES

Five alternatives were considered by the NPS for updating the Visitor Center and addressing the failing waste water system: No Action, Upgrade the Visitor Center and rehabilitate the existing drainfield, Upgrade the Visitor Center and build a connection to a municipal sewer line, Upgrade the Visitor Center and relocate drainfield to a previously disturbed location, and Upgrade Visitor Center and construct a new system with a new drainfield location.

Only the last alternative, Upgrade the Visitor Center and construct a new septic drainfield, and the No Action alternative are fully described and analyzed in this EA. The other three alternatives were considered but dismissed from full analysis, for the reasons presented in the section Alternatives Considered but Dismissed.

Alternative A – No Action

Alternative A describes the conditions that would exist if no rehabilitation, repairs, or reconstruction were done for the Visitor Center and septic system. Under Alternative A, no work would occur, and the current conditions would remain in place.

The Visitor Center and its septic system were constructed in 1963 as part of "Mission 66" and underwent a major expansion and renovation in 1996. Many of these updates are now at the end of their lifespan and /or do not meet current health, safety, or accessibility criteria. The structures would continue to operate under current conditions, failing to provide the most safe, healthy, accessible experience possible for our visitors. Park collections would continue to be vulnerable to damage. Park resources would continue to be spent conducting ad-hoc repairs as components of the system continue to fail.

The existing septic system has surpassed its life expectancy. It was originally placed in poorly draining soils and multiple corrective actions over the years have failed to remedy ongoing issues of sewage backing up. These issues would persist and resulting repairs and closures would continue to negatively impact the visitor experience and require park resources for repeated attention. While the Oregon Department of Environmental Quality (DEQ) and the US Public Health Service has allowed the park to continue to operate the drainfield pending a replacement, the agencies may eventually force the park to stop using the drainfield. The park would then have to rely a tanked trailer restroom system or construct pit toilets in the parking lot for the long term.

Alternative B – Rehabilitate Outdated Visitor Center and Construct New Septic System (NPS Preferred Alternative)

Visitor Center:
The Fort Clatsop Visitor Center was constructed in 1963 as part of the NPS "Mission 66" initiative. An addition to the building was added in 1991, expanding the Visitor Center from 3,330 square feet to 12,000 square feet. No major rehabilitations of the building and its systems have been undertaken since then. Under Alternative B, the following actions would occur:

- Entryway: The front entry would be expanded to facilitate better flow and the brick ground surface will be replaced with concrete to make it ABBAS compliant. The new entry would be 20 feet wide and extend 27 feet beyond the current outer doors. The total height of the entry would be 16 feet. Figure 2, below, is a conceptual drawing of the new entryway.

- Canoe shelter: as part of the enlarged entryway in the Visitor Center, the Chinookan canoe "Okulam" would be moved inside for display. The wooden shed structure that housed the canoe would be utilized as a gathering place for visitor groups to receive orientation to the site from staff. The shelter may be moved to another developed site in front of the Visitor Center to facilitate better visitor flow.

- Restrooms: existing facilities would be completely stripped and rebuilt to meet ABBAS standards. A new HVAC system will be installed adjacent on the exterior of the building.

- Fire sprinklers: new fire sprinklers would be installed under exterior overhangs to meet NFPA standards and correct fire safety deficiencies.

- General Interior improvements: A renovation of the HVAC system and installation of new insulation for the entire building is planned. Replacement of exterior windows, doors and door hardware is planned. UV filtering material would be applied to windows in areas of the exhibit hall and in the research library where park museum collections are exhibited/stored in vicinity to natural light, i.e. exterior windows. Installation of new finishes in visitor areas would be installed. In the multi-purpose room, entrance foyer and bookstore, worn and aged acoustic ceiling and flooring would be replaced. Existing halogen, incandescent and fluorescent lighting would be replaced with more energy efficient light emitting diode (LED) lighting.

- Visitor Center theater room: Renovation of theater seating, finishes, audio, and visual systems are planned. The seating configuration would be updated following a Universal Design approach, which would address the needs of visitors with a wider range of needs than the current configuration allows for and mitigate accessibility issues.

- Curatorial Storage Space: The existing research library and curatorial storage would be expanded to create space for the cabinets currently in the unsecured library to be moved into the secured curatorial space. To do this, the wall separating the storage space and library space would be demolished and rebuilt into current library space. A fire rated door would also be installed for storage space entrance. Existing vinyl flooring in the storage space would be replaced with a flooring alternative suggested by the NPS Museum Management Program. Housing all museum collections in the curatorial storage space would allow more control of environmental conditions (temperature, humidity, light) that can lead to deterioration of sensitive objects. The room would also receive two coats of vapor barrier.

During construction, portions of the Visitor Center would be closed to visitors for up to six months. To accommodate visitors during construction, a 75 yard decommissioned trail between

the visitor parking area and the fort area would be reopened. Two trailers would be set up in the overflow parking area or the grass area in the center of the parking circle to be used for a temporary visitor center and office space. A tanked trailer restroom system would be installed nearby to provide accessible restrooms during construction.

Figure 2: Conceptual Design of new Visitor Center Entry Area

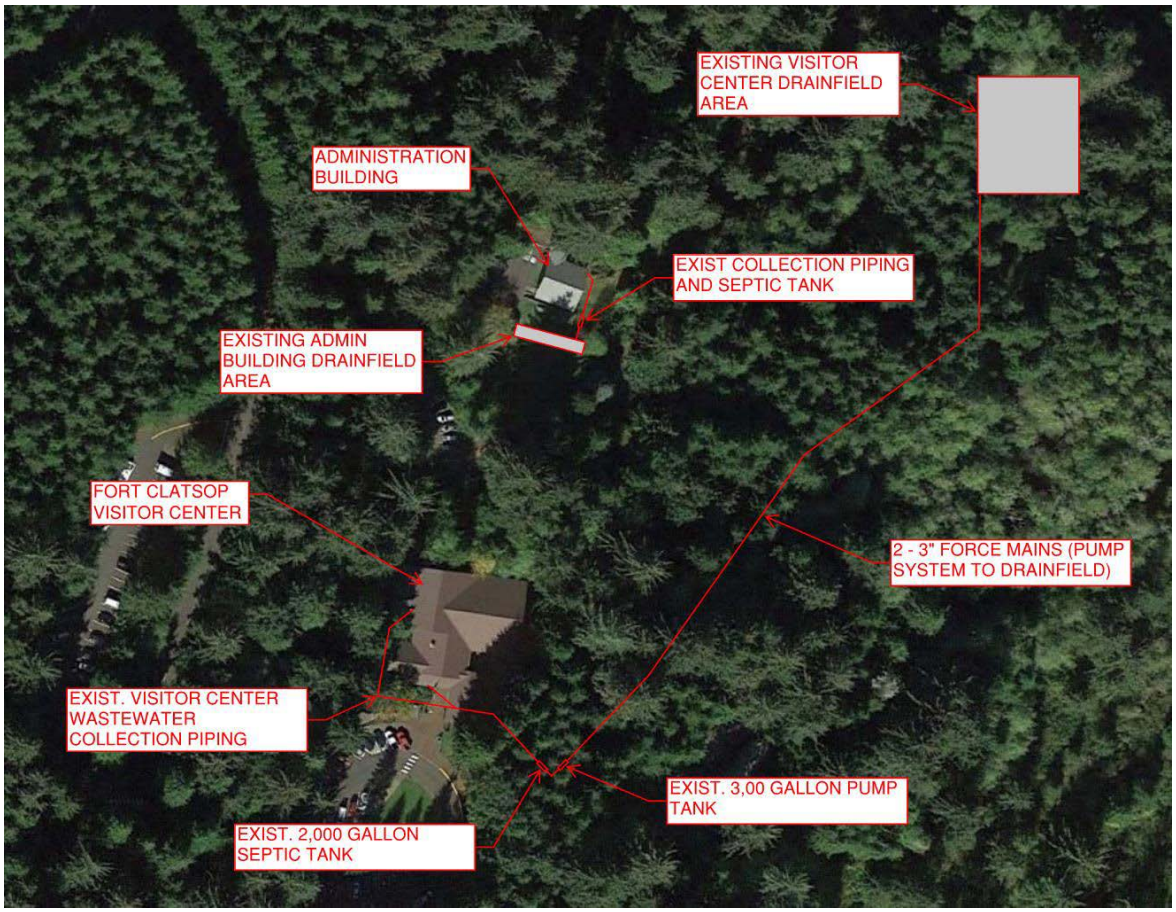
Wastewater System:
Under Alternative B, a new wastewater system would be constructed which would meet all DEQ requirements and have the ability to service current and anticipated volumes for the Visitor Center. New pipe would be installed to carry the effluent from the restrooms to a new septic tank behind the Visitor Center, and then on to a wastewater treatment facility, ending at a new drainfield. The current drainfield would be decommissioned. The existing septic tank would be filled with sand, existing drainfield laterals and septic lines would be abandoned in place, and the field would be planted with native trees and managed to develop back into forest. All above ground appurtenances would be removed and disposed of.

Figure 3: Current Fort Clatsop wastewater system

The proposed route and layout for the wastewater system is shown below in Figure 4. This route will start from the south side of the Fort Clatsop Visitor Center where visitor restrooms are located. An external gravity collection system including a new gravity main from the Visitor Center restrooms would connect to the proposed septic tank on the east side of the building. If needed, additional laterals would carry discharge out of the northeast corner of the building, joining the external gravity collection system just before entering the new septic tank. A septic tank with the capacity of up to 20,000 gallons would be required. From the septic tank, a line would go northeast across a wooded area to an administrative trail. The route would follow the trail before trending northwest across an open grass area which also contains the septic tank for the Administration Offices. The route would continue to the northwest beneath the paved parking area before entering the wooded area northwest of the Administration Office, where the wastewater treatment facility and drainfield would be sited.

System components would be installed in mechanically excavated trenches of varying depth and width. Trenches would be excavated by backhoe, small excavator, or ditch witch. The majority of the route would likely be within areas previously disturbed through construction of park infrastructure, while some areas have no known previous development.

To minimize the amount of ground disturbance, staging and stockpiling areas shall be located in previously disturbed sites approved by the National Park Service. All staging and stockpiling areas shall be returned to pre-construction conditions following construction. Construction sites would abide by best management practices regarding avoidance of tree damage. Trees would have fencing established to prevent vehicle damage to main stem, root pruning would be used to trim roots within below grade work zones, and care would be given to avoid compaction of soils over root systems. System components are prefabricated.


EXISTING VISITOR CENTER DRAINFIELD AREA
ADMINISTRATION BUILDING
EXIST COLLECTION PIPING AND SEPTIC TANK
EXISTING ADMIN BUILDING DRAINFIELD AREA
FORT CLATSOP VISITOR CENTER
2 - 3" FORCE MAINS (PUMP SYSTEM TO DRAINFIELD)
EXIST. VISITOR CENTER WASTEWATER COLLECTION PIPING
EXIST. 3,00 GALLON PUMP TANK
EXIST. 2,000 GALLON SEPTIC TANK

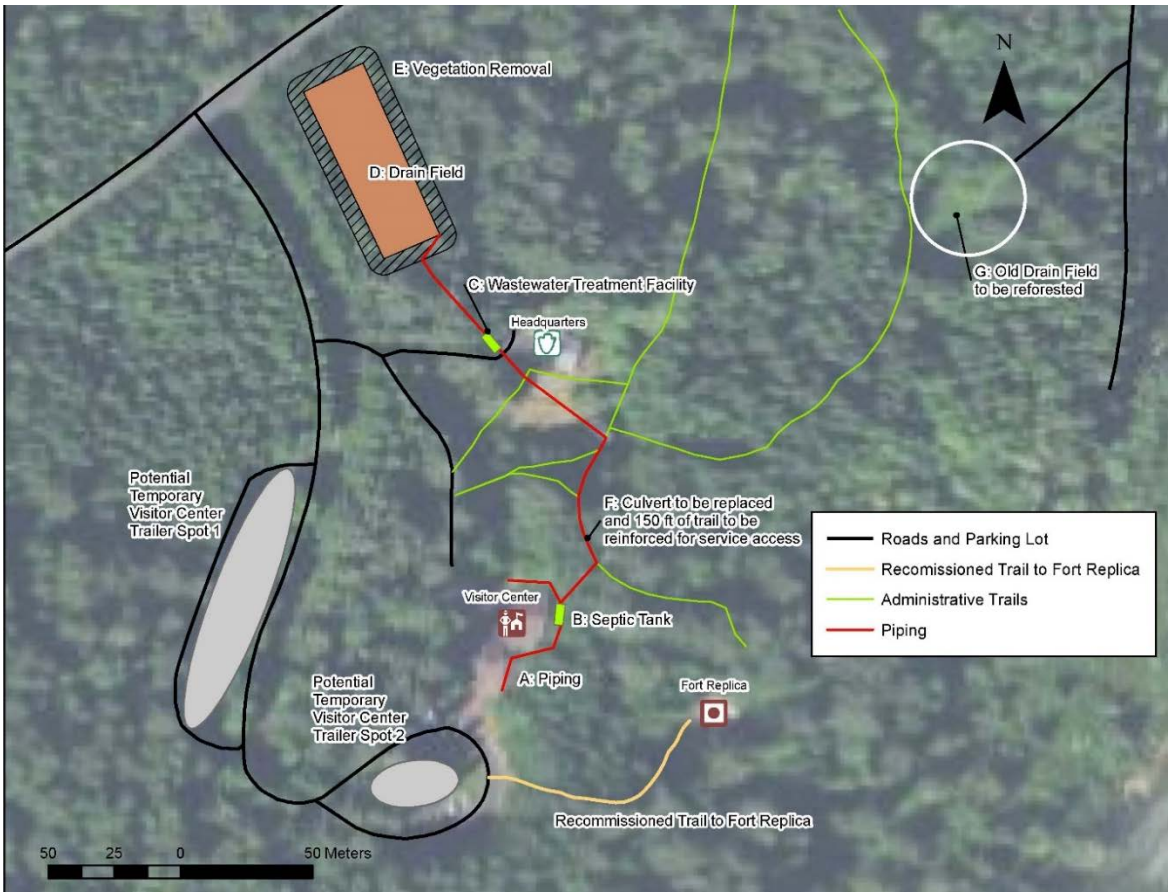


Figure 4: Schematic drawing of proposed wastewater system layout and Visitor Center temporary facilities

Construction activities would include:

A. Piping: clearing vegetation and digging 510 linear feet of trench 2 feet wide by up to 3 feet deep, to accommodate installation of 2”- 6” pipe. (1,020 square feet of vegetation clearing, and 3,060 cubic feet of soil excavation)
B. Septic Tank: clearing all vegetation and digging a hole 16’ wide x 41’long x 14’ deep at the NE corner of the Visitor Center to accommodate installation of 20,000 gallon pump system (656 square feet of vegetation clearing, and 9,184 cubic feet of soil excavation) .
C. Wastewater Treatment System: clearing all vegetation and digging a hole 10.6 feet wide by 35 feet long by 7 feet deep to accommodate installation of a 5,000 gallon Wastewater Treatment System. (371 square feet of vegetation clearing and 2,597 cubic feet of soil excavation)
D. Drainfield: clearing all vegetation and digging a hole 72 feet wide by 208 feet long by 3 feet deep to install the drainfield. (44,928 cubic feet of soil excavation).
E. Vegetation Removal: Additional buffers of vegetation may need to be cleared to accommodate construction activities around drainfield. This may amount to an area up to 110 feet wide by 250 long being cleared of vegetation. (27,500 square feet total of vegetation clearing).

F. Culvert replacement and trail hardening: where the piping would intersect a drainage ditch which is currently conveyed under an administrative trail by a twelve foot culvert, the old culvert would be removed and replaced with a new one during pipe installation.
G. Restoration of 0.3 acres of previous drainfield to native mixed conifer forest.

Combined, this work would result in an estimated total impacted area of 0.66 acres, including 0.63 acres of 30-40 year old planted forest dominated by Douglas fir, and up to 2,250 cubic yards of excavated soils. Tree/limb removal would only occur outside of avian nesting season (April 1 through July 31). Some soil would be used to backfill excavated areas, and the excess would be disposed of at an off-site upland disposal site. Native vegetation would be set aside and used to revegetate any disturbed area that would not need to be maintained as open lawn. The old drainfield would be converted back into native forest through planting of native tree species such as Western hemlock and Sitka spruce, and the new drainfield would be seeded with grass and maintained as an open lawn.

Given the limited space available for the septic tank installation along the east side of the visitor center, a portion of the existing drainage channel there may require hard piping, or diversion through a culvert, to reduce the setback requirement and meet water quality standards. To maintain the required separation between the wastewater system and the drainage ditch, an existing culvert beneath the trail northeast of the visitor center may be replaced with a longer 50 ft. (15.2 m) section of culvert. The edges of this 150-foot long drainage ditch, which was moved during the Visitor Center renovation of 1991, would be modified to a more natural slope and revegetated. The bottom of the ditch may be re-sloped as well for improved drainage. In order to accomplish this, the section of trail leading up to the culvert would need to be hardened with additional gravel to support the heavy equipment required for this operation.

This alterative would improve park operations by creating a long-term septic system that would be in compliance with public health and safety regulations. It would relocate the drainfield to an area with better draining soils. The proposal would also use a wastewater treatment system which lower the amount of nitrogen, e coli, and other organics entering soils and groundwater by repeatedly circulating the effluent through multiple filters.

This action alternative would include applying the Best Management Practices (BMPs) detailed in Appendix A.

Alternatives considered but dismissed from further analysis:

Table 1: Alternatives dismissed from further consideration.

Alternative	Reason for Dismissal
Connect the park to a municipal sewer line	The closest municipal sewer line is approximately two miles away from the project area. In addition, the park is outside of the Warrenton Urban Growth Boundary and Oregon Administrative Rule 660-015-0000(11) states: "Local Governments shall not allow the establishment or extension of sewer systems outside urban growth boundaries or unincorporated community boundaries, or allow extensions of sewer lines from within urban growth boundaries or unincorporated community boundaries to serve land outside those boundaries, except where the new or extended system is the only practicable alternative to mitigate a public health hazard and will not adversely affect farm or forest land."
Rehabilitate existing drainfield	The existing Visitor Center drainfield has undergone multiple investigations and rehabilitation efforts since its initial construction in 1986. These attempts to improve system performance have proven unsuccessful and currently portions of the existing drainfield are out of service. Removing the old septic system and bringing in clean soil was also ruled out: the Hebo series soils would effectively serve as a bathtub, limiting percolation.
Relocate drainfield to another already disturbed location	Soil evaluations were completed at the existing site on two separate occasions with engineers and representatives from Oregon DEQ. Nine test pits were excavated and their soils evaluated. According to Oregon DEQ's technical report, only the site northwest of the Administration Building has the soils suitable and is large enough for a septic drainfield.

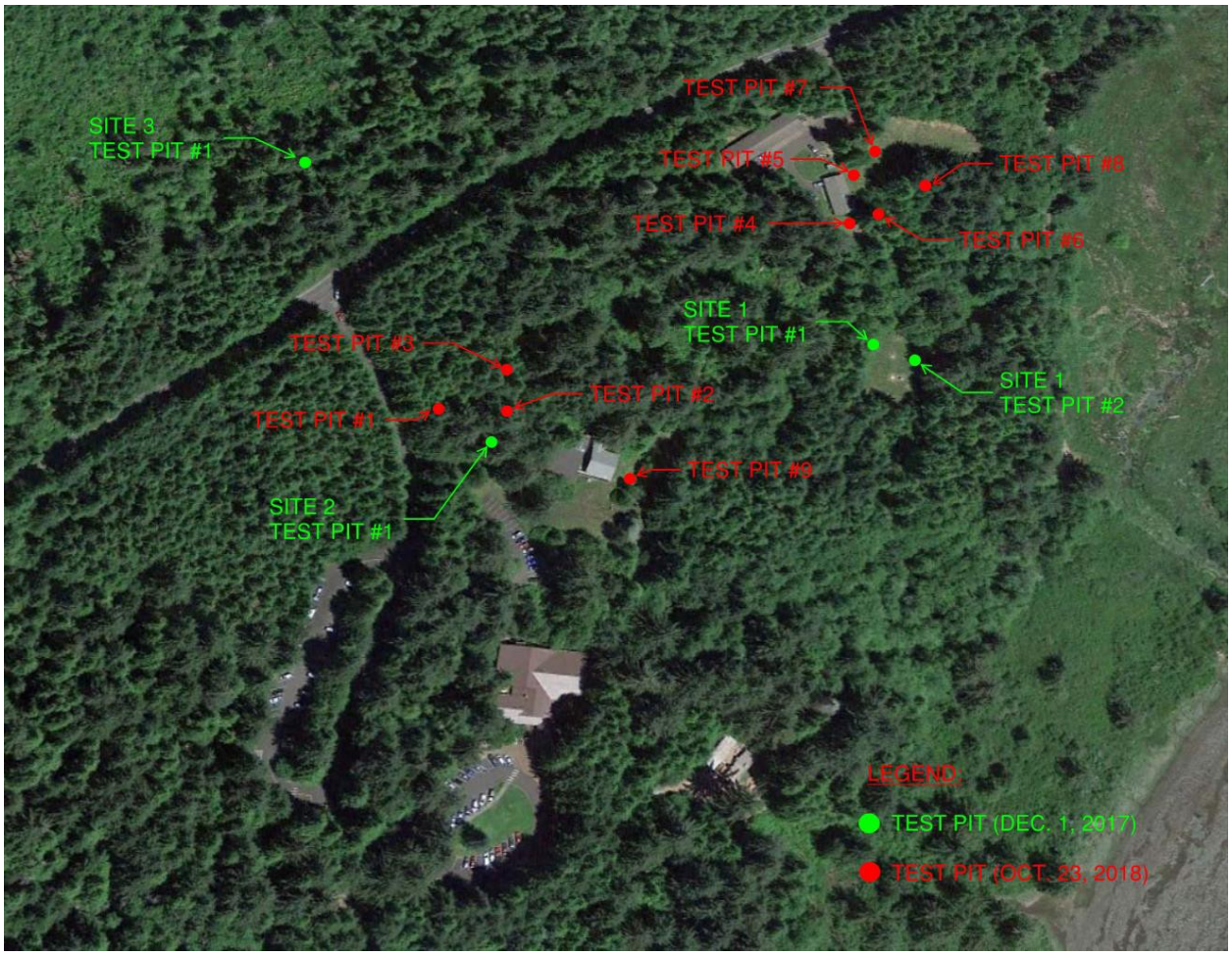


Figure 5: Locations of 13 soil tests. Oregon DEQ analysis states that the only area large enough with suitable soils is at Site 2, the proposed location of the drainfield under The Preferred Alternative (Davido Consulting Group 2019). Suitable soils were also found at Test Pits #6 and #8. This smaller area may be a potential future replacement area for the maintenance and resource building systems should the need arise.

CHAPTER 3: EFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the affected environment (existing setting or baseline conditions) and analyzes the potential environmental consequences (direct, indirect, and cumulative impacts or effects) that would occur as a result of implementing the alternatives.

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). In order to determine the cumulative impacts, it was necessary to examine past, present, and reasonably foreseeable future actions at Lewis and Clark National Historical Park. Cumulative impacts are considered for the no action and the preferred alternative. The following projects were identified for the purpose of conducting the cumulative effects analysis:

Past Actions

- 1963: Visitor Center, parking areas, trails to fort replica, & original septic system construction completed
- 1991: Visitor Center expansion
- 1986: Original septic system replaced with current facility
- 1996 -2000: Various projects to correct septic system deficiencies attempted
- 2005: Remodel of bookstore area inside Visitor Center
- 2007: Trail leading from parking lot to Fort Clatsop replica decommissioned
- 2019: New waterline inside the boundary of Fort Clatsop National Memorial

Present Actions

- Maintenance staff time is spent on frequent unscheduled repairs of septic, HVAC, and other Visitor Center systems.
- Seats in theater continue to break and require repair and removal.
- The Visitor Center basement occasionally floods and Maintenance staff are diverted to address this issue.
- Forest thinning, hazard tree removal, and invasive species control will be ongoing in the surrounding Fort Clatsop unit.

Foreseeable Future Actions

- The park intends to update the interior exhibits in the Visitor Center.
- The septic system from the Administrative offices will be merged into this new system.
- Rehabilitation of picnic area to make it more accessible is planned.
- Parking areas around Visitor Center will be repaved in 2024-25.
- The shelter currently over the Okulam Canoe may be re-positioned to another nearby area outside the Visitor Center to facilitate orientation.

Table 2: Summary of the proposed actions and anticipated impacts:

LOCATION	ACTION	ISSUE	IMPACT TOPIC
Visitor Center Front Entrance	Reconfigure to meet current codes, improve access, circulation, and sense of place	Facilities unavailable for limited duration during construction	Visitor Use and Experience
Visitor Center Entry Restrooms	Reconfigure and improved to meet ABAAS standards, and additional Unisex Family stall added	Facilities unavailable for limited duration during construction	Visitor Use and Experience
Visitor Center Interior	Upgrade HVAC system &lighting; update interior finishes (ceilings, floors, and walls); Update seating to meet current ABAAS criteria in Theater;	Facilities unavailable for limited duration during construction	Visitor Use and Experience Museum Collections
Visitor Center Overflow Parking	Install temporary Visitor Center during construction to Provide Visitor Services during construction	Different experience than usual, change to traffic flow and parking options	Visitor experience
Visitor Center Forest between Fort Replica and Parking Lots	Re-open formerly decommissioned trail to continue to provide access to Fort replica	Removal of less than 10 shrubs; resurfacing of trail	Visitor experience Vegetation Wildlife and Wildlife Habitat
Septic: Existing septic drainfield	Decommission and then restore to forest	Conversion of 0.3 acres of open managed lawn into natural forest	Geology and Soils Vegetation Wildlife and Wildlife Habitat Water Quality
Septic: Forest plantation next to Administrative Building, lawn, trail, and forested area next to Visitor Center	Installation of new Septic tank, piping, wastewater treatment facility, and drainfield	0.66 acres of vegetation removal and conversion of young forest to managed lawn, and 2,250 cubic yards of soils excavated.	Geology and Soils Vegetation Visitor Use and Experience Wildlife and Wildlife Habitat Water Quality

GEOLOGY, SOILS, AND TOPOGRAPHY

Affected Environment

Geology of Lewis and Clark NHP generally consists of a stratum of older Cenozoic marine and estuarine sedimentary rocks with minor volcanic rocks covered by a layer of post-early Miocene marine sedimentary and minor volcanic rocks. Soils in the project area consist of Hebo silt clay loam and Walluski silt loam. The existing visitor center drainfield is located in an area that consists primarily of Hebo Series soil, which is poorly draining with very slow permeability, a high water table (0"-12" below surface), and is frequently saturated. This makes Hebo soils unsuitable for further drainfield development (Davido Consulting Group 2019). The Walluski soils underlying the proposed location for the new drainfield are characterized as "moderately well-draining" and the depth to the water table is typically between 27"-36".

Impacts of Alternative B – (NPS Preferred)

Under this alternative, permanent and temporary disturbance of up to 0.66 acres of soil would occur and up to 2,250 square yards of soil would be excavated to accommodate the installation of the new septic tank, sewer pipes, wastewater treatment facility, and drainfield. Some of this material would be used to back fill the excavated areas. Excess soil would be taken off-site to an upland disposal location. After construction is completed, soils would be stabilized by replanting with native species or seeded with grass. Decommissioning the current drainfield would entail abandoning the existing system in place and then replanting with native trees, so there would only be minor, local soil disturbance associated with planting in that area.

The only impact on soils from the Visitor Center improvements would be compaction of the re-commissioned footpath through the woods as an alternative entrance to the fort replica. This 300-foot long path has already been compacted from past use as an official trail during the 2005-2006 Bicentennial celebrations. After construction, the trail will once again be decommissioned by covering it with duff and branches and allowing it to naturally revegetate.
Overall, the impacts to soils in the short-term would be moderate and adverse but for the long term these impacts would be minor due to the small volume of soil removal.

Cumulative Effects of Alternative B

Past actions, such as historical logging followed by the construction of the Visitor Center and associated parking lots and septic system, had adverse effects on soils in the project area. Disturbance of up to 0.66 acres (2-3,000 square yards) of soil under this alternative would add a relatively small amount of soil disturbance to an area already heavily altered by past actions. There are no planned future actions in the vicinity that would result in further significant soil disturbance. Therefore alternative B would incrementally add to the overall adverse cumulative effect when included with other past, present, and reasonably foreseeable future actions within the project area, but overall impacts would be less than significant.

Impacts of Alternative A – No Action

Under Alternative A, there would be no action and no measurable impacts on soils within the project area. Soil would continue to exist in the present state until repairs and rehabilitation activities would require short-term adverse and negligible impacts to soils if and when areas need to be dug up to replace deteriorated components of the septic system. After these minor repairs, these areas would be backfilled with existing soils.

Cumulative Effects of Alternative A

Past actions, such as historical logging followed by the construction of the Visitor Center and associated parking lots and septic system, had adverse effects on soils in the project area. Continued routine repairs and rehabilitation to the aging septic system would continue to have local adverse impacts to soils from compaction. Future projects, such as the updating of Visitor Center exhibits, would have no impact on soils. Because Alternative A results in little or no disturbance to soils in relation to project related activities, it would not incrementally add to the overall adverse cumulative effect when included with other past, present, and reasonably foreseeable future actions within the project area.

VEGETATION

Affected Environment

The park is within the Sitka spruce vegetation zone. This zone forms a narrow band along the Pacific Northwest coast from southeastern Alaska to northern California. The moist, temperate maritime climate and deep, humus-rich soils create ideal growing conditions for conifer trees, resulting in climax spruce-hemlock forests of lush biodiversity and trees of massive size. Sitka spruce (*Picea sitchensis*) and western hemlock (*Tsuga heterophylla*) are the park's dominant conifer species. Western red cedar (*Thuja plicata*), Douglas fir (*Pseudotsuga menziesii*), red alder (*Alnus rubra*), cascara (*Rhamnus frangula*), red elderberry (*Sambucus racemosa*) and several willows (*Salix* species) are also common. Salal (*Gaultheria shallon*), huckleberries (*Vaccinium* species), and many ferns, mosses, liverworts, and lichens share the forest understory.

Nearly all of the giant trees were cut for timber between 1850 and 1950 (Agee 1989). Since establishment as a National Memorial in 1956, the cutover timberlands have been managed by the NPS to recreate, as much as possible, the historic scene of 1805-6. The NPS began a concerted reforestation effort in the project area in the early 1970's through the 1990's which heavily favored Douglas fir. Douglas fir does not occur naturally at these densities in this area, and is prone to infection from Swiss needle cast in our moist coastal rainforests. These stands are now 30-40 years old and in the "competitive exclusion" stage of forest development, wherein the trees are crowded and little light reaches the forest floor, leaving it relatively depauperate. Throughout the forested portions of the Fort Clatsop unit, including the project area, ongoing restoration efforts aimed at restoring native coastal Sitka spruce rainforests are preferentially cut Douglas fir. The stand within the project area represents an unnatural density and abundance of this species. No plant species or communities of concern occur within the project area.

Impacts of Alternative B (NPS Preferred)

Under Alternative B, a permanent loss of up to 0.63 acres of 30-40 year old planted forest would result from the installation of a drainfield in the forest between the administrative building and Fort Clatsop road. Site preparation for the drainfield will necessitate the removal of all existing vegetation, including trees, understory, and ground cover. Within the 78' x 208' footprint of the drainfield proper (letter "D" in figure 4), 65 trees ranging in size from 5 – 85 cm (2 – 33.5 inches) dbh will be cut and removed. Of these, 40 are planted Douglas firs that would not naturally occur at this density in a natural Sitka spruce rainforest. Most of these are in the 25 – 60 cm (10 – 23.6 inches) dbh class. The remainder are Sitka spurce and Western hemlock in the sam dbh class. While this stand was not identified as a top priority for treatment in the Fort Clatsop Forest Restoration EA (2011), some of these Douglas fir would eventually be slated for falling or snag creation to meet the desired future condition of native rainforest.

To protect the lateral lines in the drainfield, there will be a buffer zone up to 20 feet around the drainfield (letter "E" in figure 4). If the full buffer zone is needed, up to an additional 45 trees may be cut, but whenever possible, the buffer will be less than 20 feet.

Whenever possible, the largest trees will be wrenched out instead of cut and set aside to be reused as large woody debris in future habitat restoration projects. Trees that are being retained would have fencing established to prevent vehicle damage to main stem, root pruning would be used to trim roots within below grade work zones, and care would be given to avoid compaction of soils over root systems. A portion of the understory species such as Sitka spruce and Western hemlock seedlings, and ferns and shrubs would be salvaged and replanted into the old drainfield site to restore it into native coastal forest. Soil disturbance would be minimized to the greatest extent possible to reduce disturbance to native plants and reduce the potential for the introduction or spread of invasive non-native plant species. After installation of the new drainfield, the site would be planted with grass and maintained as an open lawn. The siting of the drainfield would be positioned to preserve the largest, oldest trees in the area, so they will continue to provide a visual buffer and reduce the adverse effects of the vegetation clearing. An additional 0.03 acres of vegetation consisting mostly of native shrubs such as salal and huckleberries would be removed for the installation of the new septic tank, wastewater facility, and pipeline. Combined, this work would result in an estimated total impacted area of 0.66 acres and 2,214 cubic yards of excavated soils.

To help mitigate for the loss of 0.66 acres of forested plant community resulting from installation of the new system, the old drainfield (0.3 acres) will be planted with salvaged native trees and managed to develop into a mature closed canopy forest. The planting will commence the first winter after the drainfield is decommissioned.

While the Visitor Center is under construction, an alternative route to the Fort exhibit will be necessary. A previously decommissioned footpath, 75 yards long, through the forest will be re-opened for this purpose. No trees will need to be cut for this, but some herbaceous understory plants and mosses will be removed. These will be revegetated and the trail will be decommissioned once again after project completion.

The goal of the project is for 70% survival of planted trees and a percent cover of understory species to be at 80% after five years in revegetated areas. If these goals are not met, additional planting will take place. Because the revegetated areas are small, monitoring will be done by ocular assessment rather than formal plots and a photo point of the restored drainfield.

Cumulative Effects of Alternative B

The Fort Clatsop unit of LEWI is 1291 acres. Construction and expansion of the park's visitor center and parking lot converted approximately three acres of forest into developed areas and lawns, but subsequent efforts at reforestation also converted approximately ten acres of lawns and pastures back into forests. The addition of the new drainfield would result in up to an additional 0.66 acres of developed area, but this would be offset by the conversion of 0.30 acres of developed area (the current septic field) back into native forest, resulting in a net loss of 0.36 acres of forested landscape in the project area. This net loss will have a permanent adverse effect on the amount of forested plant community in the Fort Clatsop unit, but it will be minor. If it is deemed necessary to relocate the Resources building septic field in the future, an additional amount of forested landscape (less than 0.5 acres) would also need to be converted to managed lawn. This would likewise be mitigated by converting the current drainfield back into forested habitat. Overall, impacts on plants and plant communities from this project would incrementally add to adverse cumulative effects from past, present, and foreseeable future actions, but due to the limited area, it would not be significant.

Impacts of Alternative A – no action

Under this alternative, there would be no impacts to vegetation within the project area. The forested areas would continue to develop along a successional pathway towards late seral old growth. If the park is forced to close the current drainfield and use a tanked trailer restroom system in the long term, the current drainfield would be converted back into a forest under this Alternative as well.

Cumulative Effects of Alternative A

Past actions such as logging and the development of park infrastructure including Visitor Center, septic system, roads, and parking lots have adversely affected the natural vegetation within the project area. Planting of native trees as part of an NPS reforestation program has resulted in the development of the 40-ish year old forest stand currently present on site. Future actions may include thinning the stand to accelerate its development towards late seral forest, identifying and treating hazard trees, and invasive plant species control. Under the no action alternative, there would be no adverse impacts to currently forested areas. The old septic field would continue to be maintained as lawn. Alternative A would result in minor beneficial change to vegetation through planting the current drainfield if it is condemned by Oregon DEQ or the US Public Health Service. It would not incrementally add to the overall adverse cumulative effect when included with other past, present, and reasonably foreseeable future actions within the project area.

WILDLIFE AND WILDLIFE HABITAT

Affected Environment

The forested area which would be cut and converted to meadow for the drainfield currently supports the usual mix of mid-seral adapted animal species common to the area such as deer, elk, chipmunks, squirrels, songbirds, amphibians, and invertebrates. There are no special habitats within the area, and due to its proximately to buildings and roads is not frequently used by wildlife.

Wildlife common in the vicinity of the project area include Douglas squirrel, Townsends chipmunk, pacific wren, and red-legged frogs. Bald eagles are commonly present near the project area, but the closest nest is over half a mile away and on the other side of the Lewis and Clark River. Bald Eagles are no longer an endangered species, but bald and golden eagles are still protected by multiple federal laws, such as the Eagle Act, the Migratory Bird Treaty Act, the Lacey Act, and other state and municipal protections. Consultation with the USFWS confirmed that there is no critical habitat for any threatened or endangered species within the project area.

Impacts of Alternative B – (NPS Preferred)

Under this alternative, habitat alteration and displacement of some wildlife species would occur. Construction related activities and noise would likely cause many species to completely avoid the area during construction. A permanent loss of 0.66 acres of forested habitat would permanently displace some wildlife from the disturbed areas. However, this forest habitat type is the most common habitat encountered in the Fort Clatsop unit, and wildlife could move to very similar habitat immediately adjacent to the project area. Since wildlife disturbance is associated with site preparation activities, adverse impacts are expected to be temporary and minor to wildlife and wildlife habitat in the vicinity. During the evening hours during construction, wildlife could potentially return to the project area. Larger wildlife such as black-tailed deer and Roosevelt elk may benefit in the long-term from the removal of vegetation found in the project area since this would create a small fragmented habitat that may benefit them by providing forage.

Cumulative Effects of Alternative B

Past actions, such as the construction of the Visitor Center, parking areas, and septic system, had adverse impacts on the wildlife and wildlife habitat in the project area. Continued routine repairs and rehabilitation to the aging Visitor Center and septic system would continue to have local short-term adverse impacts to wildlife. Future projects, such as invasive species control and other forest restoration activities such as thinning, could incrementally add to adverse effects on wildlife, but would have long term benefits to native wildlife habitat. Because Alternative B results in both short-term and long-term adverse impacts from disturbance to wildlife and wildlife habitat in relation to project related activities, it would incrementally add to the overall adverse cumulative effect when included with other past, present, and reasonably foreseeable future actions within the project area.

Impacts of Alternative A – No Action

Under the No Action alternative, there would continue to be minor routine repairs that would have negligible effects on wildlife. The forested habitats would continue to develop into mature forest and provide similar habitat to that available throughout the majority of the Fort Clatsop unit.

Cumulative Effects

Past actions, such as the construction of the Visitor Center, parking areas, and septic system, had adverse impacts on the wildlife and wildlife habitat in the project area. Continued routine repairs and rehabilitation to the aging Visitor Center and septic system would continue to have minor local short-term adverse impacts to wildlife. Future projects, such as ongoing invasive species control and other forest restoration activities such as thinning, could incrementally add to adverse effects on wildlife, but would have long term benefits to native wildlife habitat. Because Alternative A results in little or no disturbance to wildlife and wildlife habitat in relation to project related activities, it would not incrementally add to the overall adverse cumulative effect when included with other past, present, and reasonably foreseeable future actions within the project area.

WATER QUALITY

Affected Environment

Aquatic systems within the project area and the greater park have been altered. Immediately to the north of the visitor center, an drainage channel runs through the project area. The dirt channel is approximately three feet wide and 120 feet long. Water flow here is ephemeral: it rarely exceeds one foot in depth and on average has only a few inches of water flowing through it during the late fall, winter, and spring. It was constructed c. 1991 in order to direct the flow of run off from the expanded visitor center roof and new parking lots. Eventually, it enters the groundwater, then emerges from a spring, which flows into the Lewis and Clark River. This spring is believed to have been one of the water sources for the Lewis and Clark party while they wintered at Fort Clatsop. Groundwater is plentiful in the project area.

Impacts of Alternative B – (NPS Preferred)

Impacts to surface waters would include temporary disturbance of a drainage course which feeds into the historic spring behind the visitor center. Construction will be planned for when the ditch is dry. If there is any water in it during construction from unexpected rain, straw wattles will be used to hold back the flow while the culvert is being replaced. Prior to culvert replacement, logistics and staging will be completed to minimize the duration of the operation. The existing culvert will be lifted to place the new sewage pipe perpendicularly under it, and then replaced. After this work is complete, the drainage channel would be recontoured to a more natural gradient and sinuosity and revegetated with riparian sedges and shrubs.

Alternative B would site the new drainfield in an area with more permeable soils, which will be able to absorb the outflow rather than causing it to bubble to the surface. The current drainfield

may be leaking into the high water table, negatively impacting the aquifer. This drainfield would be decommissioned, eliminating this threat. Overall, there would be a long-term beneficial impact to water quality from this alternative.

Cumulative Effects of Alternative B

Under this alternative, there would be a long term beneficial impact on groundwater and surface water quality in the Fort Clatsop unit. By moving the septic drainfield to a location with more suitable soils, continued percolation of effluent into the high water table and onto the ground surface would be abated. The possible addition of the Administrative Buildings septic into this system would be beneficial due to the superior filtering technology of the new system. Cumulative impacts on the drainage course would be beneficial, as recontouring and revegetating the stream bed will result in less erosion of sediment into the stream channel over time.

Impacts of Alternative A – No Action

In the recharge zone of aquifers, solid and liquid wastes can degrade groundwater. Septic systems can be a source of pollution if they are overloaded or sited on unsuitable soils. Under this alternative, the existing drainfield would continue pose a threat to the underlying aquifer because it is sited in Hebo series soil, which have a very high water table (0" – 12" below the surface).

Cumulative Effects of Alternative A

Under the No Action alternative, surface and groundwater would continue to be adversely impacted by periodic leakage of effluent into the surrounding aquifer and onto the ground surface. The possible adverse impacts of this on water quality will increase the longer it is allowed to continue to remain unaddressed. In the long-term, water quality would improve if the current drainfield is condemned and tanked trailered restrooms are used.

VISITOR USE AND EXPERIENCE

Affected Environment

Between 2015 and 2019, approximately 64% of park visitors, or 180,521 annually, used the Fort Clatsop Visitor Center (NPS 2020). Approximately 45% of park visitors arrive in the three months between June and August and visitation peaks between the hours of 11am and 3pm (NPS 2020). In addition to visiting the Fort Clatsop replica and the exhibits, movies and bookstore in the Visitor Center, visitors also enjoy recreational activities such as hiking, running, wildlife viewing, and participating in Ranger – led kayak tours.

The current Visitor Center does not meet modern building standards for safety or accessibility which negatively impacts the visitor experience. (HECO Engineers/Holladay Engineering 2019). See the *Purpose and Need* section for a summary of the deficiencies identified by subject matter experts.

Impacts of Alternative B – (NPS Preferred)

Implementing Alternative B would require temporarily closing portions of the Visitor Center for up to six months, resulting in a short-term adverse effect on the visitors. Construction would likely occur outside of the summer months to minimize disruption to visitors, though this is not guaranteed. The Visitor Center closure would be mitigated through the installation of two temporary trailers and a trailered restroom outside of the Visitor Center, where park staff would continue to offer interpretive services. A decommissioned trail through the woods from the parking lot to the Fort Clatsop replica would be re-opened, so that visitors would still have easy access to the fort replica.

In the long term, this alternative will result in a more safe, accessible, and enjoyable visitor experience. The temporary adverse impacts to visitors during the construction period would be offset by improved accessibility, modern climate control, and better circulation. The improvements implemented under this project will set the stage for future improvements to the interior exhibits in the Visitor Center.

Construction noise during the installation of the new septic system would have a minor temporary adverse impact on the visitor experience. While the new drainfield would be screened by rows of trees, there would be a minor long-term visual impact to visitors driving on Fort Clatsop Rd and the park entrance road.

Cumulative Effects

Portions of the Visitor Center would be closed if the park decided to replace the exhibits in the Visitor Center, though that closure will be more limited in time and extent that the one proposed to correct the deficiencies in the building's core systems. The picnic area near the Visitor Center parking lot will also be closed temporarily in the future if the park decides to make accessibility improvements. Similar to Alternative B, both of these projects would have short-term negative impacts to the visitor experience in order to provide long-term benefits to the visitor experience.

Impacts of Alternative A – No Action

Under the No Action alternative, the Visitor Center would continue have elements that are inaccessible to some segments of the population, and multiple health and safety hazards would persist. The visitor experience would not be optimized for the accessibility and safety of all visitors. If no action is taken to improve the septic system, other agencies may force the park to close the current system, leading to the use of trailered restrooms or pit toilets in the long term.

Cumulative Effects of Alternative A

Without fixing the core building systems, the park would reevaluate plans to improve the visitor center's exhibits. Without modern climate control, new exhibits would degrade faster than normal. As in Alternative B, the picnic area near the Visitor Center parking lot will also be closed temporarily in the future if the park decides to make accessibility improvements.

MUSEUM COLLECTIONS

Affected Environment

The park's museum collection includes over 77,000 objects ranging from archaeological artifacts to herbarium plant specimens. The collection also includes the Robert E Lange's rare book collection and over 80 linear feet of park archival documents.

The National Park Service's Museum Handbook provides policies, procedures, and guidance for the preservation, protection and care of National Park Service Collections. It includes the NPS Checklist for Preservation and Protection of Museum Collections (NPS 2009). According to this checklist, the park's museum storage has the following deficiencies:

- The collections storage room has inadequate space to house all collections. Four locking museum cabinets housing the park's archives and rare books are located in the research library.
- The collections storage space is near capacity and does not have adequate space for multiple individuals to be in the space at one time.
- The space is in an area that will flood if pipes break because it shares a wall with an employee restroom.

Impacts of Alternative B – (NPS Preferred)

Alternative B would correct the deficiencies in the park's museum storage by enlarging the collections room and installing vapor barrier layers to better protect it against flooding. During construction, the park collections would be temporarily located in a different space that meet's the NPS standards for museum collections. After construction, the physical security of the park archival documents and rare books would be improved by placing them with the physical artifacts behind a separate alarmed door. The entire collection would be better protected against pipes breaking.

Cumulative Effects

Improving the museum storage space will allow for better protection of artifacts when they are rotated off of current or future interpretive exhibits.

Impacts of Alternative A – No Action

The No Action alternative would not result in benefits to the park's museum collection. The museum storage space would continue to have identified deficiencies that make the archives and rare books susceptible to theft and the entire collection susceptible to flooding.

Cumulative Effects of Alternative A

Under the No Action alternative, there would be limited museum space to accommodate artifacts currently on display if they are replaced with new exhibits.

Chapter 4: Consultation and Coordination

The NPS involved the public during the NEPA process to provide an opportunity for the public to comment on the proposed project. Consultation and coordination with federal and state agencies and other interested parties was also conducted to refine the alternatives and identify issues and/or concerns related to park resources. This section provides a brief summary of the public involvement and agency consultation and coordination that occurred during planning.

- Preliminary outreach began by the park Superintendent in the Spring of 2019 in meetings with the Lewis & Clark National Park Association and discussions with local community groups.

- A 30 day scoping period was announced via a press release to 32 media contacts. It was also posted to the park's Facebook page, where it was viewed by 689 people. The scoping was conducted from February 12th through March 12th, 2020 on the NPS webpage https://parkplanning.nps.gov/. Only one comment was received, and it was in favor of a temporary closure to fix the Visitor Center.

- A public meeting to review this Environmental Assessment will be during the Environmental Assessment's 30 day review period to gather comments on the proposed action.

- The NPS initiated consultation with the Oregon State Historic Preservation Office, Confederated Tribes of the Grand Ronde, the Confederated Tribes of Siletz Indians, the Chinook Indian Nation, and Clatsop-Nehalem Confederated Tribes on August 31, 2017 before conducting the first series of soil testing. The NPS has prepared and shared with these groups two archaeological survey reports for the two phases of preliminary soil testing and a broader cultural resources survey for the project (Stokeld 2017; Stokeld 2018; Stokeld and Lefave 2019). These reports reached a conclusion of "no adverse effect" from the project on historic properties. Oregon SHPO has concurred with these findings.

- The NPS initiated Section 7 consultation via the USFWS's online Information for Planning and Consultation (IPaC) system on October 18, 2019. No critical habitat and no federally listed species are in the project area.

- The Oregon Department of Environmental Quality was present for the preliminary soils testing, reviewed data, and has had frequent conversations with park staff and consultants over the design of a new wastewater system.

- The US Public Health Service inspected the park's wastewater system in 2017 and made recommendations.

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Appendix A

Best Management Practices for Action Alternative

The following best management practices would minimize the degree and/or extent of adverse impacts and would be implemented if the action alternative were selected.

General Construction

- The NPS is responsible for any testing, surveying, digging, measuring, verifying of existing conditions, etc. necessary to perform the complete design and construction of the selected alternative. Percolation and other soil tests, inspection of existing system for suitability and serviceability tree clearing, air or pipe tests, etc. would also occur within the scope of work.
- The NPS must ensure the contractor would comply with all local, State, and Federal laws, and regulations.
- The project shall include a pre-construction meeting and a final inspection meeting, in addition to regularly scheduled project meetings and site visits.
- All construction-generated debris (not including vegetation) would be removed from the park to an approved landfill.
- Equipment must be free of any fluid leaks (fuel, oil, hydraulic fluid, etc.) upon arrival to the work site and would be inspected at the beginning of each shift for leaks. Leaking equipment would be removed off site for necessary repairs before the commencement of work.
- All construction equipment that would leave paved or dirt roads would be pressure-washed prior to entering the park and shall be clean of any soil, plant matter, or other materials. NPS natural resource specialists or the project manager shall inspect the vehicles prior to entry into the park.
- Fueling of any type, whether equipment or vehicles, must be done either on non-pervious surfaces such as concrete or asphalt, or deploy a spill containment pad.
- Equipment, material, and supply storage would be within approved areas only.
- Parking of personal vehicles would be within designated areas only.
- Any park infrastructure affected during construction, including, but not limited to paved and unpaved roadways, walkways, and turf, would be restored to pre-construction conditions upon completion of the project.
- Construction zone would be clearly marked. Fencing or other type of NPS approved temporary barriers would be installed. At completion of action/project all temporary marking/fencing/flagging must be removed.

Air Quality

- To reduce noise and pollution emissions, construction equipment would not idle any longer than is necessary for safety and/or mechanical reasons.
- All haul loads must be tarped.

Archeological Resources – these seem like mitigations to me. Or add to project description.

- Should construction unearth cultural resources, work would be stopped in the area of discovery and the park would consult with the park Cultural Program Manager, State Historic Preservation Office (SHPO) in accordance with §36 CFR 800.13, Post Review Discoveries.
- In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.
- The State Historical Preservation Office, tribes, and affiliated groups will be invited to monitor construction.

Lightscapes and Soundscapes

- Hours of outdoor construction would be limited to hours between sunrise and sunset; therefore, no artificial lighting would be needed.

Soils and Vegetation

- Construction zones would be identified (i.e. flagging, construction tape, etc.) to confine activity to the minimum work area required.
- Construction sites would abide by best management practices regarding avoidance of tree damage. Trees would have fencing established to prevent vehicle damage to main stem, root pruning would be used to trim roots within below grade work zones, and care would be given to avoid compaction of soils over root systems.
- Soil disturbance shall be minimized to the greatest extent possible to reduce disturbance to native plants and reduce the potential for the introduction or spread of invasive non-native plant species.
- To minimize the amount of ground disturbance, staging and stockpiling areas shall be located in previously disturbed sites approved by the National Park Service. All staging and stockpiling areas shall be returned to pre-construction conditions following construction.
- Erosion control measures that provide for soil stability and prevent movement of soils would be implemented, such as installing silt fencing along the edge of construction.
- Vegetation material removed during the project that is unusable for revegetation efforts shall be cut and scattered onsite. If the material needs to be stored off-site, NPS staff shall work with the project manager to determine the appropriate location.
- Any transplant and revegetation efforts would be coordinated through the Resource Management program to echo the existing, native landscape.

Wildlife

- Tree/limb removal would only occur outside of avian nesting season (April 1 through July 31).
- Construction personnel would be oriented on appropriate behavior in the

presence of wildlife and the proper handling and disposal of food and/or other attractants.

- Park resource staff throughout the duration of the project would monitor construction site and staging areas in case any special status species unexpectedly appear in the project area. Should any appear, and if park staff become concerned about potential adverse impacts on the species from construction or other project related activities, work would stop and not resume until necessary protective steps are taken to avoid any impacts to the special status species.