



Brooks Camp Wastewater Solids Treatment Pond

Environmental Assessment

January 2021



Estimated NPS total costs
associated with developing and
producing this EA: \$20,300



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to assure that their development is in the best interests of all. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

NOTE TO REVIEWERS

If you wish to comment on this document, you may mail comments to:

Brian Smith
240 West 5th Avenue
Anchorage, Alaska 99501

You may also comment for this project online using the Planning, Environment, and Public Comment (PEPC) system at <http://parkplanning.nps.gov>. Retrieve "Brooks Camp Wastewater Solids Treatment Pond (68895)" to provide comments electronically.

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. You can ask us to withhold your personal identifying information from public review, but we cannot guarantee that we will be able to do so.

ON THE COVER

Example of a similar wastewater solids lagoon disposal system under construction.
Photo by PND Engineers, Inc., 2019.

Contents

	Page
1 Proposed Action	5
2 Purpose and Need.....	5
3 Background.....	7
4 Issues	8
Issues Selected for Detailed Analysis	8
Issues Considered but Dismissed	9
5 Alternatives.....	9
Alternative 1: No Action	9
Alternative 2: Construct Wastewater Solids Treatment Pond Near Brooks Camp (Proposed Action and Preferred Alternative)	10
Alternatives Considered but Dismissed	12
6 Affected Environment.....	14
Cultural Resources	14
Soils and Vegetation	15
Visitor Use and Recreation Setting	16
Wildlife	18
7 Impact Analysis	18
Alternative 1: No Action.....	18
Alternative 2: Construct Wastewater Treatment Pond Near Brooks Camp (Proposed Action and Preferred Alternative).....	19
Cultural Resources.....	19
Soils and Vegetation.....	20
Visitor Use and Recreation Setting	21
Wildlife.....	23
Cumulative Impacts.....	25
8 Consultation and Coordination	26
9 References	27

List of Appendices

Appendix A: ANILCA Section 810(A) Subsistence – Summary Evaluation and Findings

List of Tables

Table 1. Summary of Alternatives	13
Table 2. Summary of Impacts	24

List of Figures

Figure 1. Project location for the Brooks Camp WSTP in Katmai National Park and Preserve.	6
Figure 2. Brooks Camp WSTP Site Location and Footprint.	7
Figure 3. Detailed depiction of proposed Brooks Camp WSTP.	11
Figure 4. Vegetation at the 1.8 Mile proposed project site.	16
Figure 5. Katmai Visitor Satisfaction 2004 – 2013.....	17
Figure 6. The VTTS Bus Tour Crossing Margot Creek at mile 15 of the VTTS Road.	22

List of Acronyms

ADEC	Alaska Department of Environmental Conservation
ANILCA	Alaska National Interest Lands Conservation Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DOI	Department of the Interior
EA	Environmental Assessment
EPA	Environmental Protection Agency
HDPE	High-density Polyethylene
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NPS	National Park Service
NRHP	National Register of Historic Places
PEPC	Planning, Environment, and Public Comment
SHPO	State Historic Preservation Office
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VTTS	Valley of Ten Thousand Smokes
WRCC	Western Regional Climate Center
WSTP	Wastewater Solids Treatment Pond

1 Proposed Action

The National Park Service (NPS) is considering the replacement of the decommissioned Brooks Camp wastewater solids disposal cesspool which was in operation from 1997 to 2019 with a new wastewater solids treatment pond (WSTP). The new WSTP would be located at a previously undisturbed location at mile 1.8 of the Valley of Ten Thousand Smokes (VTTS) Road near Brooks Camp, Katmai National Park and Preserve (Katmai). This WSTP would also replace the temporary Brooks Camp wastewater solids disposal operation at the VTTS Road 2.5-Mile Pit, which will reach its capacity in 2023.

The proposed project is consistent with the goals and objectives of applicable NPS Management Policies (Section 9 in NPS, 2006[b]), which state that the NPS will provide necessary and appropriate visitor facilities that are also consistent with conservation of park resources and values. The planning and design process for the replacement WSTP and its attendant facilities meets the criterion expressed in Section 9.1.1 of the policy document that protection of these resources and values be the primary concern. Specific policy considerations that guided the decisions discussed in this Environmental Assessment (EA) include life-cycle costs, integration of the facilities into the park environment, preservation of cultural values, adaptive use, and sustainable energy design.

2 Purpose and Need

The purpose of the project is to construct a new WSTP that would be capable of receiving and treating vault toilet waste and septage (biosolids) generated in Brooks Camp. The NPS action is needed to ensure sanitary systems in Brooks Camp operate sufficiently to protect the public health, as required by NPS Director's Order #83: Public Health (NPS, 1999).

NPS policy also states that utilities will be sited outside park boundaries whenever possible; or will be as unobtrusive as possible if off-site facilities are not feasible. Due to its remoteness, Katmai is unable to connect Brooks Camp with off-site wastewater solids treatment facilities; therefore, the proposed WSTP location is designed to reduce the obtrusiveness of the facility.

The project is needed to provide wastewater solids treatment and disposal at Brooks Camp. This area of Katmai records approximately 14,000 visitor use days per year and is the seasonal home to approximately 30 NPS staff and 30 concessioner staff operating Brooks Lodge. Operation of a functional WSTP is essential for the continued operation of existing plumbed facilities at Brooks Camp including flushable toilets, NPS staff residence kitchen facilities, shower facilities, and laundry facilities. Wastewater from these facilities is run into septic tanks where solids are separated, and liquids are drained into connected leach fields. The captured solids must be emptied periodically and disposed of in an appropriate WSTP in order to maintain the functionality of existing systems.

Additionally, vault toilets throughout Brooks Camp and adjacent areas also require emptying routinely to dispose of biosolids. Operation of a functional WSTP at Katmai is essential to maintain sanitary conditions for the existing vault toilets located at Brooks Campground, Brooks Camp Visitor Center, Brooks Falls trailhead, Brooks Lake, Margot Falls trailhead, and Three Forks Visitor Center.

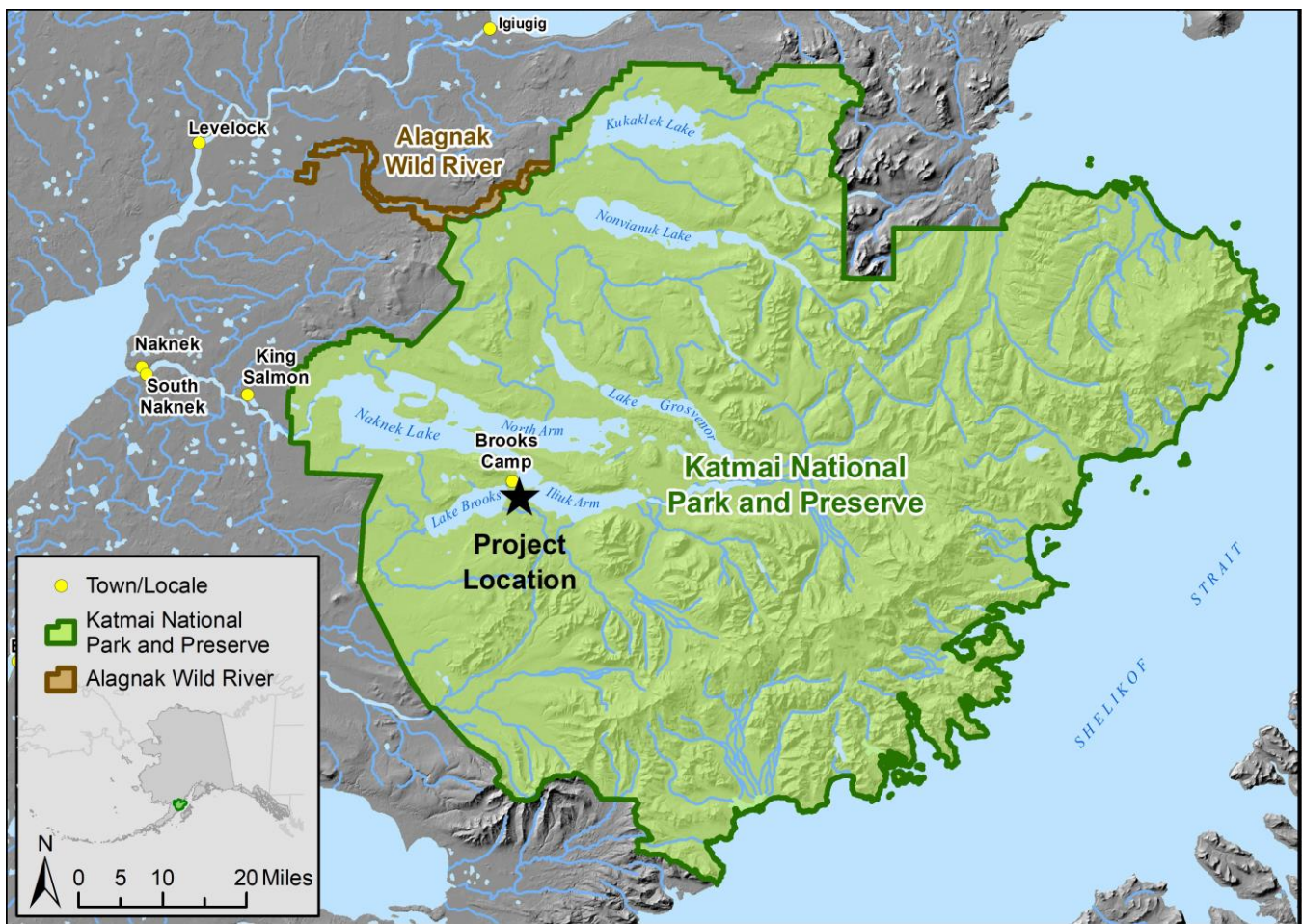


Figure 1. Project location for the Brooks Camp WSTP in Katmai National Park and Preserve.

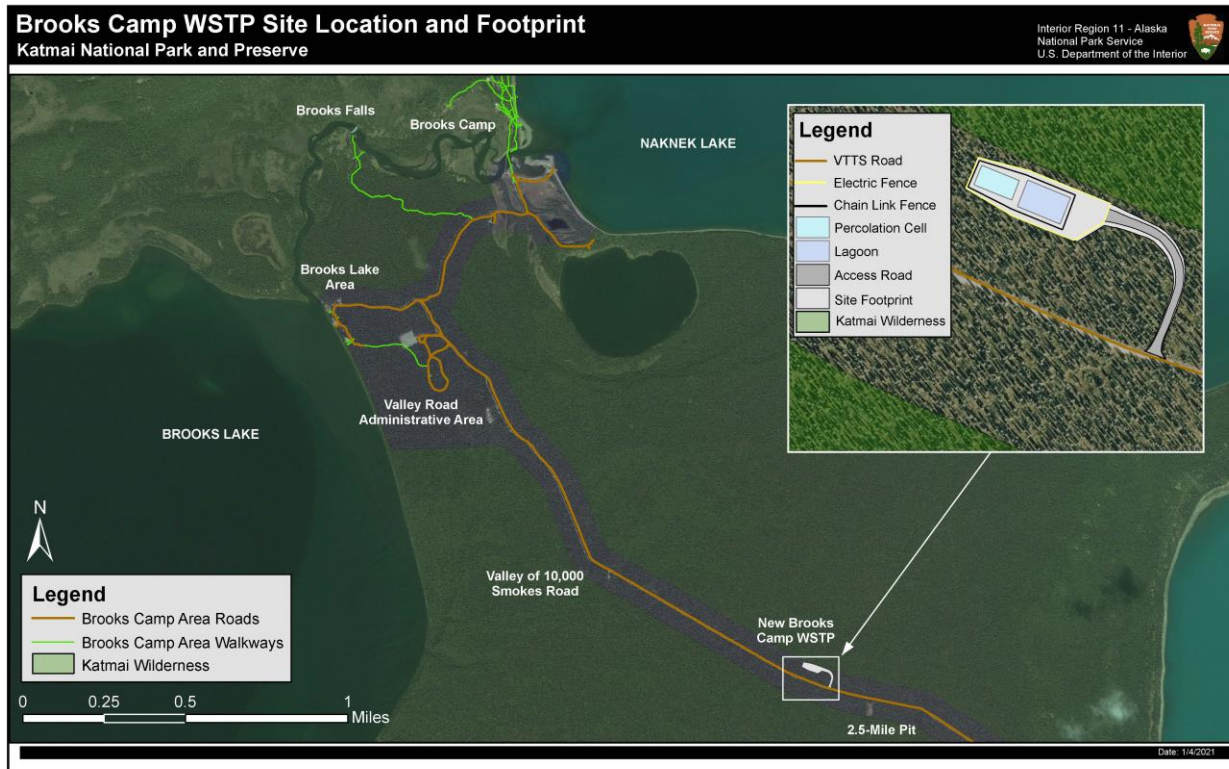


Figure 2. Brooks Camp WSTP Site Location and Footprint.

3 Background

The Brooks Camp area of Katmai National Park, including areas connected by the VTTS Road, contains 6 vault toilets with a combined estimated total capacity of 12,000 gallons. There are also four septic tank and leach field systems located in this area which contain the combined capacity to store approximately 22,500 gallons of septic wastes (PND, 2018). These septic tanks are critically important to maintain functional plumbing systems not only for black water (e.g. toilets), but also for gray water (e.g. sinks and showers). These facilities are emptied up to two times annually and deposited into the current disposal facility. As of 2018, Katmai estimated that approximately 20,000 gallons of biosolids are generated per year at Brooks Camp (NPS, 2018[a]) with that number increasing with visitation. Due to the combination of waste types generated at Brooks Camp, Katmai requires a system of wastewater solids disposal that can accommodate both septic and vault toilet waste in a singular facility.

Katmai constructed the now decommissioned Brooks Camp wastewater solids cesspool in 1993 to dispose of human generated wastewater in this area of Katmai. This facility operated between 1993 and 2019 and provided collection, dewatering, and aerobic and anerobic treatment of solids. The design life of this facility was an estimated 30 years (PND, 2018).

However, in 2017 the NPS determined that the wastewater solids cesspool would reach capacity within a year based on projected input. The system was no longer able to receive biosolids from Brooks Camp by the end of the 2018 season. The NPS, in consultation with the State of Alaska Department of Environmental

Conservation, approved a plan to decommission the facility in 2018. Katmai began implementing this plan in 2019. The plan included moving the Brooks Camp wastewater solids disposal operation to 2.5-Mile Pit, an abandoned borrow pit located at mile 2.5 of the VTTS Road where it would be pumped into trenches, allowed to dewater, and then limed and capped each season by NPS staff. This temporary solution would accommodate 5 years' worth of wastewater solids deposits at which time the site would reach maximum capacity and the wastewater disposal operation would need to be transferred to an alternative location. Katmai began operations at the 2.5-Mile Pit in the summer of 2019 and the site will provide wastewater solids disposal until the end of the 2023 visitor season (NPS, 2018[a]).

The construction of a new WSTP within the boundary of a National Park Unit is prohibited under 36 CFR 6.5 in most circumstances. Katmai National Park received approval to operate the Brooks Camp cesspool constructed in 1993; prior to the deadline in this regulation of January 23, 1995, as a solid waste disposal site within the boundary of the Park. The proposed Brooks Camp WSTP is considered a replacement for the now decommissioned wastewater cesspool. In order to construct the proposed Brooks Camp WSTP the NPS will require a formal exemption from this regulation. The exemption would be on the grounds of the remote nature of Brooks Camp which makes offsite disposal from this location unfeasible.

This EA was initiated before the 2020 Council on Environmental Quality (CEQ) Implementing National Environmental Policy Act (NEPA) Regulations were in effect, and therefore was developed consistent with the 1978 CEQ NEPA Regulations and 2008 Department of the Interior NEPA regulations.

4 Issues

Issues Selected for Detailed Analysis

Cultural Resources

Construction of a new WSTP could reveal previously undisturbed archeological resources located in the project area. The VTTS Road is eligible for listing on the National Register of Historic Places (NRHP) as a historic district. The integrity of the VTTS Road Historic District could be adversely impacted by this project.

Soils and Vegetation

Construction of a new WSTP and related access road would disrupt soils and remove vegetation in the immediate project area. Construction activities and/or elevated maintenance and operations in this area could increase erosion and the possibility of invasive plant species becoming established.

Visitor Use and Recreation Setting

Visitor use at Katmai could be disrupted by any lapse in Katmai's ability to provide functional water and wastewater systems at Brooks Camp. The recreation setting could also be altered due to vegetation removal, construction and operation of a new facility, and the presence of human-waste odors. Additionally, visitor use of Brooks Camp could be impacted by the construction period for the new WSTP.

Wildlife

Wastewater lagoons create an area of impounded surface water which may attract wildlife such as migratory birds and the odors may attract brown bears and other wildlife. Bald and golden eagles are known to occur and could potentially be nesting in the proposed project area. The Migratory Bird Treaty Act and Bald and

Golden Eagle Protection Act requires consideration of impacts to bird species when clearing areas for developmental projects. The project would also remove approximately 1.8 acres of prime brown bear, moose, spruce grouse, red squirrel, and other wildlife-species habitat.

Issues Considered but Dismissed

The following issues were identified, considered, and dismissed from further analysis:

Wetlands

The site of the WSTP near Brooks Camp occurs on an elevated glacial outwash plain and was investigated by a botanist in 2020 for the presence of wetland characteristics. This field survey resulted in the determination that the area proposed for siting of the new WSTP does not include wetlands (Walton, 2020).

Floodplains

The site of the WSTP near Brooks Camp occurs on an elevated glacial outwash plain and is not located within the 100-year floodplain (Burger, 2020).

Other Resources

The NPS also considered but dismissed from further analysis other resources that are not known to exist in the area including Indian Trust Resources and threatened and endangered species (USFWS, 2020[b]). The proposed project site is located within the 300-foot buffer around the VTTS Road in land which has been determined to be ineligible for Wilderness designation.

5 Alternatives

Alternative 1: No Action

Under Alternative 1, a newly upgraded WSTP along the VTTS Road near Brooks Camp would not be constructed. The existing method of biosolids disposal at Brooks Camp would continue, deposition and burial in trenches at the 2.5-Mile Pit along the VTTS Road. This site is estimated to be filled to maximum capacity by 2023, at which point Katmai would be required to develop new alternatives to handle biosolids generated at Brooks Camp.

Disposal in underground trenches is unsustainable. Sites selected for the underground disposal of human waste and effluent must be decommissioned once they have reached capacity. Public and wildlife exclusion from the area must be maintained in order to protect public health. The availability of additional suitable sites that could be used in this manner are limited. Continuation of this method of disposal within Katmai would not adequately address public health and sanitation issues at Brooks Camp.

Park operations at Brooks Camp that rely on functional wastewater disposal systems include kitchen facilities at Brooks Lodge, public shower and flushable toilets provided by Brooks Lodge, NPS kitchen, toilet, and shower facilities located within staff residences, and NPS and concessioner staff laundry facilities. These wastewater sources all flow into underground septic tanks which must be emptied annually. Additionally, vault toilets throughout Brooks Camp and adjacent areas must have the biosolids removed at least annually. All of these operations at Brooks Camp would be unable to continue to function without a WSTP to service this area.

Alternative 2: Construct Wastewater Solids Treatment Pond Near Brooks Camp (Proposed Action and Preferred Alternative)

Under Alternative 2, Katmai would construct a new WSTP at a previously undisturbed area located at mile 1.8 along the VTTS Road. The new site would consist of a facultative lagoon system which uses aerobic and anerobic processes to break down human waste. The remaining liquid wastewater would be separated out and allowed to drain into an adjacent percolation pond where it would percolate into the soil. The new WSTP would occupy approximately 1.8 acres of NPS lands and would be designed to treat human waste generated at Brooks Camp for a period of 30 years. The design specifications would account for anticipated increases in visitor use of Brooks Camp over this period of time.

The proposed project location at mile 1.8 of the VTTS Road underwent geotechnical and percolation testing in 2020 (PND, 2020[b]). The results of these tests indicated that the site would be suitable to contain a new facility of this type based on the soil profiles and percolation rates. The proposed facility site is located within the VTTS Road Historic District, and outside of designated or eligible wilderness areas of Katmai. The distance from Brooks Camp to the proposed facility was favorable for this project as it would reduce travel time to and from the WSTP by park staff when compared to the current disposal operation at 2.5-Mile Pit, and a potential alternative location considered at 5-Mile Pit.

The configuration of the WSTP would include a settling cell (also referred to as a lagoon) where biosolids are deposited, and a percolation cell where liquid wastewater would drain to and percolate into the earth. The lagoon would measure 62 feet wide by 102 feet long by 13 feet deep at its deepest point. An 8-inch diameter high-density polyethylene (HDPE) influent pipe connected to an influent manhole would be installed at the eastern side of the settling cell which would facilitate deposits from a vacuum truck. Solids would accumulate at the bottom of the lagoon and would break down over time through aerobic and anerobic processes. Liquids which occur in the upper portions of the lagoon would be drained to the adjacent percolation cell through a settling cell transfer pipe and flow control assembly. The percolation cell would measure 46 feet wide by 90 feet long by 6 feet deep and would be constructed to the west of the settling cell within the facility footprint.

The WSTP would be enclosed by both a vertical and horizontal perimeter fence. The vertical perimeter fence would be chain-link and would stand 8 feet tall and span approximately 680 linear feet. There would be approximately 15 feet of distance between the perimeter fence and the lagoon or settling cell to facilitate maintenance worker access to the entire facility. The eastern side of the fence would also include a double swing manually operated gate which could be locked during periods of non-activity to provide access control. The horizontal fence would be 6 feet wide, buried beneath grade, and laid flat adjacent to the vertical fence. The purpose of the perimeter fence would be to provide a barrier to animals that would approach the facility, and to further prevent access from animals attempting to dig or burrow into the facility.

In addition to the chain link fence there would be an electric fence constructed adjacent to but outside of the perimeter fence. This fence would span approximately 910 linear feet and stand approximately 4 feet tall with 3 strands of electrified braided poly-wire. The fence would use a system consisting of fiberglass posts with two angle braces per corner, and gate posts would be of a similar style but with a single angle brace. Smaller fiberglass posts would be installed every 20 to 30 feet to suspend the electrified braided poly-wire and prevent contact with the ground or vegetation which could cause an electrical short. The electric fence

would extend beyond the eastern edge of the lagoon towards the access road by approximately 50 feet to allow for the vacuum truck and other maintenance vehicles to access the site within the electric fence. This fence system would be powered by a combination of solar panels connected to a 12-volt battery system (NPS, 2020[c]). The electrified fence system would be compatible with other systems installed in and around Brooks Camp. The main purpose of the electric fence would be to include another deterrent to brown bears and other large mammals from entering the WSTP.

The WSTP would be connected to the VTTS Road by a single lane access road which would be consistent with traditional roadway intersections along the VTTS Road. The road would be approximately 12 feet wide at the intersection with the VTTS Road, approximately 16 feet wide leading into the facility, and would be approximately 350 feet long. The access road would additionally be curved in order to further screen the facility visually from visitors using the VTTS Road (Figure 3). The facility would be set back from the VTTS Road by approximately 120 feet to minimize odors along the VTTS Road. The area between the new WSTP and the VTTS road consists of mixed birch and spruce forests which would remain intact and would serve as a visual barrier between the VTTS Road and the WSTP.

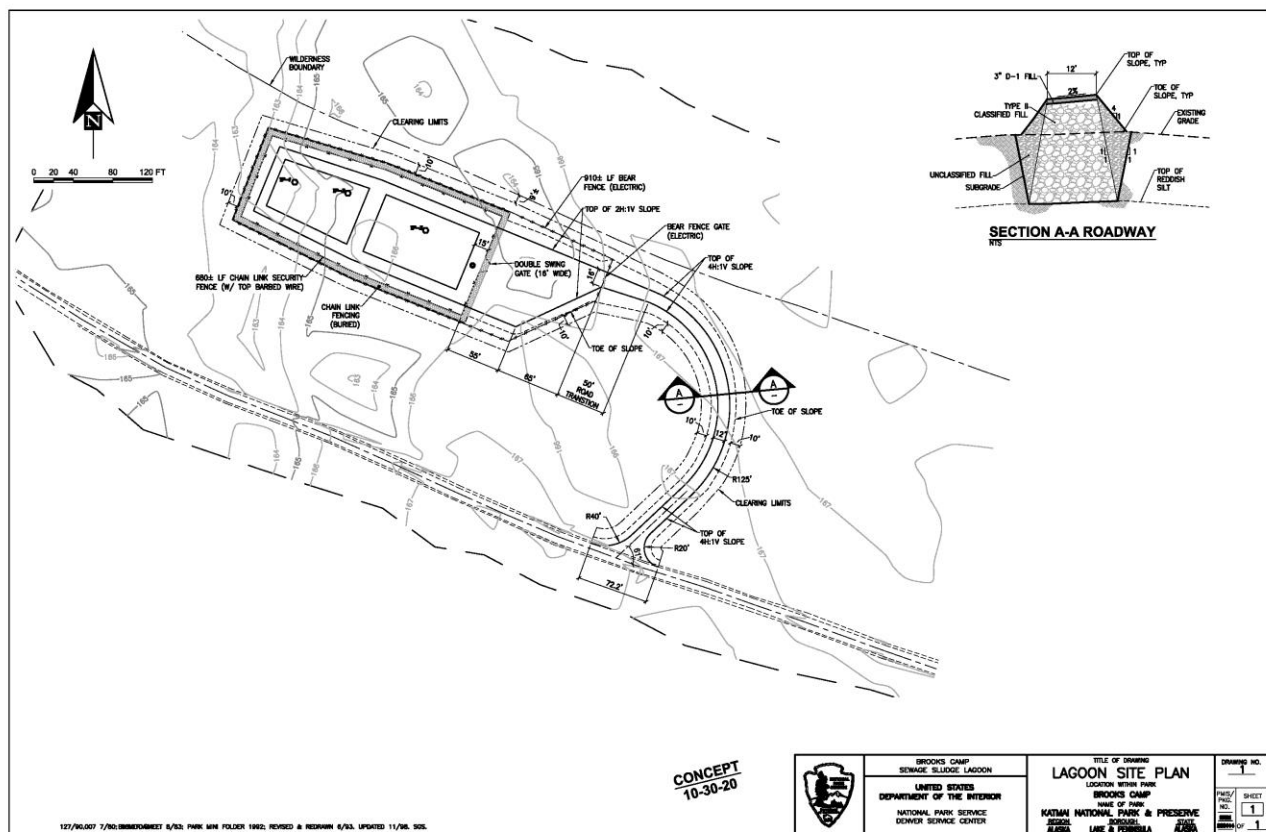


Figure 3. Detailed depiction of proposed Brooks Camp WSTP.

Alternatives Considered but Dismissed

Off Site Disposal of Human Waste Solids

The NPS considered an alternative where wastewater generated at Brooks Camp would be dewatered at a newly constructed facility along the VTTS Road. Once the liquids had been separated from the solids Katmai staff would transport the human waste solids by NPS barge across Naknek Lake, back to Lake Camp where they would then be transported and disposed of at the Naknek Village landfill.

In order to dewater the septage and sludge waste from Brooks Camp the wastewater would be pumped into a large perforated sack located within a roll on roll off dumpster specially designed to accommodate this system. Once the container had been filled a special chemical flocculant would be mixed into the effluent which would chemically bind solids together resulting in the rapid release of water from saturated particles. This process if done correctly would leave a substance remaining within the perforated sack containing dewatered human waste solids (PND, 2019[a]). The entire dumpster would be picked up and taken from the dewatering site within Katmai by NPS barge across Naknek Lake to Lake Camp, where it would then travel by road for disposal at the Naknek Village landfill.

The process of mixing the flocculent with the raw untreated septage and sludge mixture is complex. Each time that wastewater is deposited into the dewatering facility a technician would be responsible for ensuring the correct amount of flocculant is added to the mixture in order to achieve the required amount of dewatering. The park does not currently have the expertise on staff to perform this duty and would be required to go through lengthy training and recruiting processes to maintain the appropriate level of skill on staff to perform this function. The risk of potentially not having the required skilled technicians on staff could pose major issues for the park's ability to provide critical sanitation and public health services at Brooks Camp.

NPS Management Policies 2006 states that parks should use local or municipal utility systems outside parks only when it is economically and environmentally practicable to do so. The additional costs associated with transportation of solid wastes from Brooks Camp to the Naknek Village landfill made this option economically unfeasible (NPS, 2006[b]). Additionally, it was determined during internal analysis of this alternative that the Naknek Village landfill was not appropriately permitted to accept this type of waste stream. This issue factored heavily in Katmai's decision to dismiss this alternative from further consideration.

Alternative Locations Considered

Katmai internally evaluated various sites in the park for their suitability as a location for the proposed Brooks Camp WSTP. The criteria for suitability included distance from Brooks Camp, topography of the terrain, existing use constraints, soil percolation rates, and whether the location contained sufficient area to site the new facility. Three sites were evaluated for this project each of which were located south of Brooks Camp along the VTTS Road. After investigation and internal deliberation, two of these sites were dismissed from further consideration, the reasons for which are detailed below (the third site became the preferred alternative).

5-Mile Pit

The 5-Mile Pit; located at mile marker 4.8 along the VTTS Road, was considered as a possible location for the proposed Brooks Camp WSTP. 5-Mile Pit underwent geotechnical and percolation testing to assist with a

suitability determination in 2019 (PND, 2020[a]). Although the results of these tests were favorable to support a WSTP, it was determined that the construction of a new WSTP in this location would adversely interfere with ongoing NPS operations at 5-Mile Pit. Additionally, the extra distance that park staff would have to travel to access the proposed facility would have resulted in increased costs and staff time needed to complete routine operations. It is for these reasons that the 5-Mile Pit was not selected as the proposed location for this project.

Historic 1.8-Mile Borrow Pit

The Historic 1.8-Mile Borrow Pit is located at mile marker 1.8 along the VTTS Road. The pit is a contributing feature to the VTTS Road Historic District, an eligible property for listing on the NRHP (SHPO, 2018). The borrow pit was tested in 2019 to evaluate the geotechnical properties and percolation rates of the soils there. Both geological tests provided positive information that the site could potentially provide the basic needs for this type of facility (PND, 2020[a]). However, in order to build the proposed Brooks Camp WSTP at this location the entire borrow pit would be demolished to accommodate the larger footprint needed for the facility. Because this feature is a contributing element to the VTTS Road Historic District, Katmai staff decided not to utilize this location to avoid additional unnecessary impacts to the district.

Table 1. Summary of Alternatives

Action	Alternative 1: No Action	Alternative 2: Construct Wastewater Treatment Pond Near Brooks Camp
Construct wastewater treatment pond	<ul style="list-style-type: none"> No new wastewater treatment pond would be constructed. Disposal of biosolids at the 2.5-Mile Pit would continue until that facility reaches capacity likely after the 2023 season. Wastewater disposal systems at Brooks Camp would be unable to continue to function without a WSTP to service this area. 	<ul style="list-style-type: none"> Construct new wastewater treatment pond near mile 1.8 along the VTTS Road. The treatment plant would consist of a facultative lagoon system connected to a leach field for dewatering. This system would remain in operation at Brooks Camp for the next 30 years.
Construct wastewater treatment pond perimeter fence	<ul style="list-style-type: none"> No perimeter fence would be constructed near mile 1.8 along the VTTS Road. 	<ul style="list-style-type: none"> Construct a new chain link perimeter fence surrounding the new Brooks Camp wastewater treatment pond. Construct an electric fence surrounding the chain link perimeter fence intended to keep out bears and other large mammals. The chain link fence would be approximately 680 linear feet, and the electric fence would be approximately 910 linear feet.
Construct wastewater treatment pond access road	<ul style="list-style-type: none"> No access road would be constructed. 	<ul style="list-style-type: none"> Construct a new 350-foot-long access road connected to the VTTS Road. The road would be approximately 12 feet wide at the intersection with the VTTS Road, and approximately 16 feet wide leading into the facility.

6 Affected Environment

Cultural Resources

Limited archeological surveys have been conducted along the VTTS road corridor. Shovel tests were done specifically for National Historic Preservation Act Section 106 compliance support of the geotechnical and percolation testing surveys for this project site, and no archeological resources were found (pers. comm., L. Chisholm, 2020). Surveys were conducted by Gleason in 1990 and McClenahan in 1993, which were walk-over or drive-by surveys of cutbanks and ground surfaces with no subsurface testing. Of these 1990's surveys no cultural remains were identified (NPS, 1997). In 1995, Richard Bland oversaw an archeological investigation at 5-Mile Pit which identified no cultural resources. Many high, well-drained ridges may have been used as travel corridors and overlooks, associated with small camps before spruce forests established in the area about 500 years ago (NPS, 1997).

More recent systematic archeological testing occurred proximate to Brooks Camp in support of the Brooks Camp Developmental Concept Plan (NPS, 1996) and the recently constructed Valley Road Administrative Area (NPS, 2009[c]). The results of systematic subsurface archeological testing to support these projects produced evidence of a single lithic scatter in the Valley Road Administrative Area (pers. comm., L. Chisholm, 2020), an example of a small single-use site.

The Brooks Camp area contains the Brooks River Archeological District National Historic Landmark (NHL), a property on the National Register of Historic Places (NRHP). Extensive archeological remains indicate that people have lived in the Brooks River area where Brooks Camp is located for over 4,500 years. These remains include at least 22 sites also listed on the NHRP containing ancient camps and settlements in the form of buried archeological deposits and surface depressions marking semi-subterranean house ruins occur on abandoned beach ridges and terraces along the shores of Naknek Lake, Brooks River, and Lake Brooks (NPS, 2009[c]). This property has been determined to be nationally significant for its potential to yield scientific information regarding the prehistoric human occupation of Alaska (NPS, 1996). The proposed Brooks Camp WSTP would be located outside of the boundary of the Brooks River Archeological District NHL and is not anticipated to have any direct impacts to the NHL.

Archeological investigations between the Brooks Falls Trailhead and the VTTS Road intersection (MP 0.0) found evidence of many prehistoric house features near the Falls Trail with one only two meters from the road. No other cultural remains were found. These features are contributing elements to the Brooks River Archeological District NHL (NPS, 1997).

The VTTS Road is a 22.5-mile road in Katmai on the northern Alaska Peninsula unconnected to any roads located outside of the Brooks Camp area. The VTTS Road was planned in the summer of 1961 and constructed the following year as part of the Mission 66 NPS development program.

The VTTS Road is eligible for the NHRP as a historic district for its association with the Mission 66 period and as a scenic design road. In keeping with the typical NPS scenic design road, the VTTS Road was constructed to blend into the surrounding landscape. The VTTS Road conforms to these design principles as the road was specifically designed to feature the unique views of Katmai. The property maintains a high degree of integrity and is a remarkable example of an NPS Mission 66 era scenic-design road.

Soils and Vegetation

The soil profile in the project area displays three distinct strata: 1) an organic horizon composed primarily of fine roots, duff, and moderately decomposed organic matter; 2) a light yellowish-brown ash horizon containing discreet, small to large, yellowish-brown globular concentrations, primarily in the upper 10% of the volcanic ash horizon, and that did not appear to be associated with root channels; and, 3) a very dark grayish-brown sandy loam containing a minor ash fragment component (Walton, 2020).

The lower VTTS Road (MP 0.0 to 6.0), traverses a forest dominated by white spruce (*Picea glauca*) with smaller amounts of Alaska birch (*Betula neoalaskana*), grayleaf willow (*Salix glauca*), Bebb's willow (*Salix bebbiana*), Barclay's willow (*Salix barclayi*), diamondleaf willow (*Salix plantifolia*), Sitka alder (*Alnus viridus* ssp. *sinuata*), and balsam poplar (*Populus balsamifera*). The ground cover is a thick moss layer with crowberry (*Empetrum nigrum*), and sometimes mountain cranberry (*Vaccinium vitis-idaea*), growing on top of the moss. *Spirea* spp. branches grow up through the moss. Forest openings have thinner moss layers, more lichens (mostly *Cladonia* and *Cetraria* spp.), and, on moist areas, bluejoint reedgrass (*Calamagrostis canadensis* [NPS, 1997]).

Vegetation at the proposed project site primarily consists of scattered Alaska birch with an understory dominated by crowberry. There is a small amount of bluejoint reedgrass and other herbaceous plants species occurring in the area, and there is a substantial ground cover of upland mosses (Figure 4). White spruce had been a dominant species up until 2 – 3 decades ago but is now largely killed due to a severe spruce bark beetle (*Scolytinae*) outbreak (Walton, 2020). The area is littered with standing dead spruce trees and dead and downed spruce trees as a result of this outbreak, but there are also abundant spruce seedlings and saplings emerging from the forest floor. Spruce beetle activity is a natural process in the area but has been exacerbated by climate warming over recent decades. Spruce beetle activity near Lake Brooks and along the VTTS Road is ongoing, with new beetle activity observed in 2014; however, white spruce outside these areas have remained largely unaffected (Miller, 2016).



Figure 4. Vegetation at the 1.8 Mile proposed project site.

The VTTS Road may serve as a corridor for the transport of invasive plant species (Armstrong and Tourville, 2015). The Katmai Exotic Plant Management Team identified the presence of invasive species occurring at the Valley Road Administrative Area in 2019. Shepherd's purse (*Capsella bursa-pastoris*) was identified between buildings VR13B and VR14A, and along the Valley Road Administrative Area loop road pineapple weed (*Matricaria discoidea*) and annual bluegrass (*Poa annua*) were also detected and manually treated in this area (NPS, 2019). In areas along the VTTS Road, the NPS Alaska Exotic Plant Management Team has treated pineapple weed, shepherd's purse, narrowleaf hawkbeard (*Crepis tectorum*), bird vetch (*Vicia cracca*), and common plantain (*Plantago major*) (Armstrong and Tourville, 2015).

In 2015 the Katmai Exotic Plant Management Team conducted survey operations along the entire length of the VTTS Road followed by subsequent survey in 2016 of high traffic locations for the VTTS Road including the Research Bay Overlook, vault toilets, the pull off before the third river crossing where the NPS road grader is kept, and points where invasive species were previously located (NPS, 2016). The presence of shepherd's purse, common chickweed (*Stellaria media*), pineapple weed, and mouse-ear chickweed (*Cerastium fontanum*) were all confirmed through these surveys.

Visitor Use and Recreation Setting

Visitor use and enjoyment of the Brooks Camp area of Katmai requires that the NPS ensures the health and safety of its visitors in an environmentally sound manner. In 2018, Katmai recorded over 14,000 visitor use

days at Brooks Camp from visitors either staying overnight at Brooks Camp Campground or Brooks Lodge, or through day use visitation. A “visitor use day” is defined as each day a visitor is at the park engaging in some measurable activity (NPS, 2020[b]). The NPS provides potable water, sanitary sewage, electricity, and solid waste services to visitors visiting Brooks Camp, which includes Brooks Lodge, to enhance and contribute to the high-quality visitor experience.

Visitor satisfaction at Katmai has consistently been high (Figure 5). Over a ten-year period from 2004 – 2013 park visitors who have been surveyed regarding their experience at Katmai have reported that they are satisfied with visitor services (average 85% satisfaction), park facilities (average 87% satisfaction), and recreational opportunities (average 92% satisfaction [University of Idaho, 2004 – 2013]). The quality of visitor experience is measured at Brooks Camp through visitor survey and general feedback sent to Katmai following visitation. Utility services such as wastewater treatment and disposal are not generally included in visitor feedback as the systems have been operational during the period that Brooks Camp is open annually. Disruption in wastewater management, treatment, and disposal processes at Brooks Camp would be expected to lower visitor satisfaction.

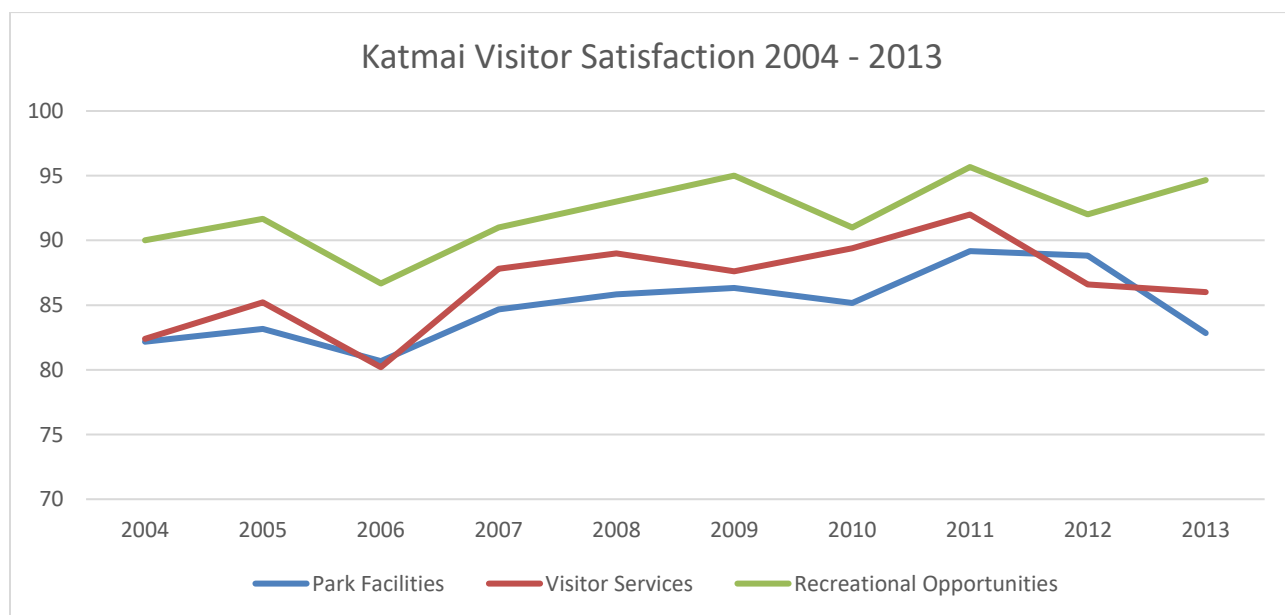


Figure 5. Katmai Visitor Satisfaction 2004 – 2013.

Brooks Camp is Katmai’s primary visitor destination for brown bear viewing, fly-fishing, and access to the Valley of Ten Thousand Smokes. During the summer season (June – September), a lodge and campground serve overnight guests and a bus tour is available to transport visitors to the valley created by the 1912 eruption of Novarupta (NPS, 2013). The VTTS bus tour runs 7 days per week during the visitor season departing from Brooks Camp around 8:00am and returning at approximately 3:00pm. The bus tour has the capacity to host 30 park visitors per trip and is staffed by an NPS ranger offering an interpretive experience of the VTTS Road and guided tour to the Three Forks Overlook. The VTTS bus tour and guided ranger hike is the most popular ranger led hiking activity at Brooks Camp (NPS, 2009[b]).

The primary method of access to Brooks Camp is by float plane arriving from King Salmon, AK. During optimal weather the typical approach used by aircraft coming into Brooks Camp is from the east over Lake

Brooks. Planes fly past Brooks Camp heading south before turning towards the west, crossing over the VTTS Road, and then turning north in preparation for landing on Naknek Lake directly west of the Brooks Camp Developed Area. This flight path directly exposes visitors to landscape views along the VTTS Road.

Wildlife

A variety of wildlife may occur in the proposed project area. Typical mammals include brown bears (*Ursus arctos*), moose (*Alces alces*), wolves (*Canis lupis*), wolverine (*Gulo gulo*), lynx (*Lynx canadensis*), porcupine (*Erethizon dorsatum*), snowshoe hare (*Lepus americanus*), voles (*Clethrionomys* sp. or *Microtus* sp.), shrews (*Sorex* sp.), red squirrels (*Tamiasciurus hudsonicus*), and beavers (*Castor canadensis*), among others (NPS, 1997). Of the diverse wildlife species that inhabit Katmai, the most conspicuous is the brown bear. Katmai is home to the largest protected population of brown bears in North America. Brown bears can occur in the project area for the proposed Brooks Camp WSTP. While brown bears are most commonly encountered along fishing streams and the coast, bears are known to use the VTTS road as a travel corridor through this area of Katmai (NPS, 2008).

Brooks River salmon runs annually attract large numbers (65-100) of brown bears, which take advantage of this abundant food supply. Typically, 40-70 sub-adults and adults are present along with 25-30 cubs. The bears are present on the Brooks River during the month of July to feed on migrating salmon, and again in September to feed on spawning and spawned out salmon concentrated in the river. While up to 100 subadult and adult bears use the Brooks River annually, some of them are present during only one of these two peak periods while others are present during both (NPS, 2009[c]).

The boreal forests in the project area host several songbird species such as the dark-eyed junco (*Junco hyemalis*), gray jay (*Perisoreus canadensis*), American robin (*Turdus migratorius*), varied (*Ixoreus naevius*) and hermit (*Catharus guttatus*) thrushes, spruce grouse (*Falcipennis canadensis*), and black-capped (*Poecile atricapillus*) and boreal (*Poecile hudsonicus*) chickadees. Migratory birds such as tundra swans (*Cygnus columbianus*), greater scaup (*Aythya marila*), common merganser (*Mergus merganser*), and the common goldeneye (*Bucephala clangula*) are also known to use beaver ponds in the area for feeding (NPS, 1996). Birds of prey known to occur in the project area include bald eagles (*Haliaeetus leucocephalus*), golden eagles (*Aquila chrysaetos*), northern goshawks (*Accipiter gentilis*), and osprey (*Pandion haliaetus*) [NPS, 2009{c}]].

7 Impact Analysis

Alternative 1: No Action

Under Alternative 1, a new WSTP would not be constructed at Mile-1.8 along the VTTS Road. The proposed site for this facility would remain intact and unimpacted. Public health and sanitation issues at Brooks Camp would not be addressed over the long term. There would be no additional impacts to park resources including vegetation, soils, wildlife, or cultural resources, although this could result in either decreased visitor use, or increased human-waste issues.

Visitor use at Katmai would continue and enjoyment of park resources would remain high over the short term while 2.5-Mile Pit remains available for the disposal of biosolids generated at Brooks Camp, but by

2023 that site will have reached maximum capacity and visitor satisfaction may shift downwards should Katmai be unable to identify a long-term solution to wastewater management.

Without a functional wastewater disposal system at Brooks Camp, Katmai management would be required to evaluate alternatives to visitor use of the Brooks Camp area. Restroom facilities throughout Brooks Camp could no longer function as intended as there would be no place to dispose of the accumulated biosolids. NPS and concessioner staff living at Brooks Camp would have their access to plumbing systems affected which would impact their ability to cook, bathe, and clean at their housing units. All of the Katmai operated septic tanks would be taken offline as there would be no ability to clean out and dispose of the accumulated sludge. Dining opportunities at the Brooks Lodge would likely be impacted and would no longer operate as intended, creating contractual issues for the NPS. Additionally, visitors to the area may be required to bag and pack out their waste. This could result in human health and safety issues arising at Brooks Camp due to the lack of sanitary systems.

Alternative 2: Construct Wastewater Treatment Pond Near Brooks Camp (Proposed Action and Preferred Alternative)

Cultural Resources

The VTTS Road Historic District was inventoried in 2013 by the NPS and was determined to be eligible for listing on the NRHP in 2018. Features evaluated in determining the eligibility of the VTTS Road Historic District include the physical structure of the road and associated features, trails, the Three Forks overlook, and other defining landscape characteristics. The VTTS Road Historic District encompasses the road prism, 48 borrow pits and associated spur roads, three primitive river crossings, historic trails at Margot Creek and Ukak Falls, as well as the setting, views, land use, circulation, spatial organization, vegetation, and topography (NPS, 2018[b]). Construction of the new Brooks Camp WSTP would add a new, modern feature to the historic district which would degrade its historic values. The intersection of the new Brooks Camp WSTP access road and the VTTS Road would directly impact the historic district and would constitute an adverse effect to the VTTS Road Historic District.

The proposed project would not result in changes to the VTTS Road alignment or scenic views. There are two primary design features which would be incorporated in the WSTP access road to minimize the impacts of introducing this new feature to the VTTS Road Historic District. First, the intersection would be configured as a single lane access road which is consistent with other traditional roadway intersections along the VTTS Road. Second, the access road would be curved to disrupt sight lines directly from the VTTS Road into the new WSTP.

Implementation of Alternative 2 could also potentially impact small single use archeological sites common to upland areas such as prehistoric day camps, hunt-kill sites, or lithic-scatter remains. Construction of the lagoon, percolation cell, and connecting access road would penetrate the Katmai ash layer which acts as a protective layer over archeological resources deposited prior to the 1918 Novarupta volcano eruption. These impacts would be mitigated by conducting a comprehensive archeological field survey of the entire project area prior to construction and having an on-site archeological monitor present during construction activities to ensure that previously unidentified resources would be documented and measures would be taken to avoid, minimize, or mitigate adverse effects to them.

The project will therefore likely cause adverse impacts to the VTTS Road Historic District. When an action is determined to produce adverse effects to an eligible cultural resource (historic property), the action must be mitigated in accordance with the National Historic Preservation Act, Section 106 and its implementing regulations (36 CFR Part 800) to the extent possible in order to prevent, minimize or balance the adverse effects of the action. An adverse effect would require consultation between the National Park Service and the State of Alaska Historic Preservation Office to develop a Programmatic Agreement stipulating mutually agreed-upon mitigation measures limiting the impact of the proposed action. Other interested parties such as the Advisory Council on Historic Preservation and Tribal Governments could be consulting parties or signatories to the Programmatic Agreement. The Programmatic Agreement would identify measures that would be taken to resolve adverse effects on historic properties that cannot be avoided. The Programmatic Agreement would also address any archeological resources found in the project area through systematic archeological surveys.

Soils and Vegetation

Development of the Brooks Camp WSTP described in Alternative 2 would result in the removal of approximately 7,500 cubic yards of topsoil from the project area. The topsoil would be replaced by a compacted gravel surface for the access road and the pad that encompasses the wastewater lagoon and percolation cell. The gravel materials would be sourced from the gravel stockpile located at the 5-Mile Pit along the VTTS Road. The NPS would preserve the top 2 feet of ground cover vegetation and organic soils removed from the project area and transport it to a previously disturbed administrative area along the VTTS Road for temporary storage. Once construction of the WSTP had been completed the NPS would return these native materials to the project area to aid in revegetation and to prevent the establishment of invasive plant species.

The construction of the Brooks Camp WSTP would involve the replacement of native soils with gravel and fill materials necessary to build the lagoon, percolation cell, and access road. These materials would necessarily be compacted during the construction process to ensure their stability and long-term functionality. Compacted gravel and fill materials do not absorb and percolate surface waters in the same manner as native ground and vegetation which could lead to increased levels of erosion in the project area. Surface runoff has the ability to carry sediment from construction materials which would cause impacts to adjacent natural areas that would otherwise be unimpacted by this project. Sediment could be transported down ditches and possibly degrade drainage on the VTTS Road, causing maintenance issues. Due to the relatively flat topography of the project area it is unlikely that elevated levels of surface runoff would extend far into natural areas and impacts are anticipated only in immediate adjacent areas. Katmai staff would monitor this issue periodically and if necessary, implement measures to prevent sedimentation of surrounding areas.

The project would result in the removal of approximately 1.8 acres of vegetation from the project area. This includes numerous trees such as white spruce and Alaska birch, medium sized woody vegetation of alders and willows, and ground cover vegetation such as crowberry, bluejoint reedgrass, and the upland pleurocarpous mosses that cover the forest floor. All of the vegetation located within the footprint of the new facility would be removed. Viable wood removed from the project area would be bucked and cut into firewood for use in the Brooks Camp area. Woody vegetation such as small woody materials, root wads, and other types that cannot be repurposed will be transported to the 5-Mile Pit to be burned.

Construction and development increase opportunity for invasive plant species to establish and would certainly lead to the establishment of disturbance-loving natives (e.g., foxtail barley (*Hordeum jubatum*), and dandelion (*Taraxacum officinale*). There are a number of known invasive plant species that occur at Brooks Camp and along the VTTS Road that have been previously identified (NPS, 2016/2019). Ground disturbance at the proposed project area and long-term operations are potential vectors for the establishment of invasive plant species. Monitoring and removal (if required) of invasive plant species would occur following the construction of the new Brooks Camp WSTP to ensure that any such instances of invasive plant species are immediately addressed. Restoration of newly created bare soil areas is essential to reduce the spread of both invasive plants and weedy native species. Vegetative restoration activities could include a combination of forest floor plugs, direct seeding, and transplants following restoration guidance from NPS Management Policies (2006).

Visitor Use and Recreation Setting

Under Alternative 2 visitor experience related to Brooks Camp would not be impacted by a lapse in the availability of a wastewater utility. Dining facilities, showers, and flushable toilets provided by the Brooks Lodge would remain in operation. Vault toilets would continue to be available for visitor use and would function as intended. There would be no need to develop alternative plans for Brooks Camp as they relate to visitor use, human waste, and the disposal and treatment of wastewater over the next 30 years.

Visitors experiencing the VTTS Road bus tour (Figure 6) would be temporarily impacted during the construction period for this project by potential delays due to increased roadway traffic, construction noise in the project area, and potentially fugitive dust generated by construction activities. Increased NPS activity at the new WSTP related to operation, inspection, and monitoring by NPS staff would result in a minor increase to VTTS Road traffic, which would persist over long periods of time throughout the life of the facility.



Figure 6. The VTTS Bus Tour Crossing Margot Creek at mile 15 of the VTTS Road.

Visitors recreating along the VTTS Road may be subjected to objectionable odors generated from the proposed WSTP. Under normal operating conditions these odors are greatly reduced as long as the solid waste contained in the lagoon remains submerged in the water. During periods of unusually high temperatures or dry conditions, the solid waste contained in the system may not be completely submerged and would extrude higher levels of foul odors. Visitors exposed to these odors would have their experience at Katmai adversely impacted while they are in the vicinity of the WSTP. This would occur most commonly to visitors in close proximity to the proposed WSTP at mile 1.8 along the VTTS Road. It is worth noting that the prevailing winds in the Brooks Camp area during the visitor season are from the south between May – August and from the north during the month of September (WRCC, 2020[a, b]). This means that the predominant winds in this area would most commonly carry odors from the proposed WSTP away from the VTTS Road corridor during the majority of the visitor season. Under normal operating conditions it is unlikely that objectionable odors from this facility would impact activities at the Brooks Camp developed area (EPA, 2011).

The construction of the new Brooks Camp WSTP at mile 1.8 along the VTTS Road would create an identifiable scar in the surrounding forest which would have an adverse impact on the scenic resources of the area. This 1.8-acre deforested area would also be visible from aircraft bringing visitors into Brooks Camp and by visitors on the Dumpling Mountain Trail, a popular hiking location in the Brooks Camp area. Visitors enjoying views of the area surrounding Brooks Camp may have their experience diminished by the visible impacts to scenic resources caused by the proposed Brooks Camp WSTP.

Wildlife

Under Alternative 2 the NPS would commit to the construction of a facility that would be a major attractant to brown bears in the Brooks Camp area of Katmai. The Katmai Bear and Human Management Plan acknowledges that brown bears have a highly developed sense of smell and are likely to investigate any such attractant in their environment. It is for this reason that sewer lines in the Brooks Camp area must be flushed annually at the end of the season (NPS, 2006[a]), and why past and present sites dealing with wastewater disposal at Brooks Camp are enclosed in fencing. Best management practices in the area also recommend electric fencing of wastewater disposal sites such as disposal pits, outhouses, and leach fields when bears exhibit behavior demonstrating interest in these facilities. In order to prevent bears from accessing the proposed WSTP at mile 1.8 along the VTTS Road, the entire facility would be enclosed by a perimeter fence and an electrified fence.

The construction of the proposed WSTP near Brooks Camp would create an area of impounded surface water which could attract migratory birds (Zimmerling, 2006). Wastewater lagoons provide nutrient-rich environments that favor the growth and development of insects that provide a critical food source for migratory birds common to the Brooks Camp area. Additionally, emergent vegetation within wastewater treatment ponds must be controlled to avoid creating breeding areas for mosquitoes and other potential insect pests (EPA, 2011).

The waters within the constructed lagoon are likely to contain elevated levels of pharmaceuticals, pathogens, and bacteria which can thrive in these nutrient rich environments (Markman et. al., 2010; Combalbert and Hernandez-Raquet, 2010). Chemical composition of wastewater lagoons may impact animals which come into contact with the waters, although the exact chemical components responsible for these impacts vary and may not be known in every case. Prolonged exposure could result in saturation of interior down feathers of waterfowl, which in extreme cases can result in death from hypothermia and drowning (USGS, 2009). Exclusion of small mammals and birds from this facility is difficult and unlikely to be achieved. There are likely to be detrimental impacts to wildlife resulting from the construction of this facility. Katmai staff would monitor the WSTP annually for signs of these impacts. If impacts to migratory birds are detected, staff would coordinate with the U.S. Fish and Wildlife Service (USFWS) and implement recommended best management practices to mitigate or reduce those impacts.

Birds that inhabit the area are sensitive to increased noise and human activity, which is especially true during the breeding and nesting season. Vegetation clearing activities necessary for the construction of the Brooks Camp WSTP would be avoided during late spring and summer (May 1 – July 15 [USFWS, 2020{a}]) to minimize impacts to nesting birds. There has been no survey of the project area to identify the presence of bald and/or golden eagle nests. Nesting sites could potentially exist in or near the project area and an investigative survey must take place prior to the commencement of construction activities. If a bald and/or golden eagle nest is encountered, Katmai would coordinate with the USFWS and implement recommended best management practices to mitigate impacts to the birds or their nests.

Species that occur in this area of Katmai would experience disturbance, displacement, and habitat loss as a result of the construction of this facility. The exclusion of large mammals is a stated and necessary goal for the successful implementation of this project. As native vegetation and soils are removed from the project area and replaced by construction fill materials and compacted gravel, mammals such as weasels, marten, red

fox, mink, snowshoe hares, and red squirrels would be forced to abandon tree hollows and ground borrows used for nesting and sheltering, and would lose access to foraging areas.

Table 2. Summary of Impacts

Impact Topic	Alternative 1: No Action	Alternative 2: Construct Wastewater Treatment Pond Near Brooks Camp
Cultural Resources	<ul style="list-style-type: none"> No direct impacts. 	<ul style="list-style-type: none"> The VTTS Road Historic District would be impacted by the construction of a new wastewater treatment facility within the district. Previously unidentified archeological resources located within the project area may be impacted.
Soils and Vegetation	<ul style="list-style-type: none"> No direct impacts. 	<ul style="list-style-type: none"> Approximately 1.8 acres of vegetation and 7,500 cubic yards of topsoil would be impacted by this project. Invasive plant species as well as weedy native species could become established in areas that are developed as a result of this project. Improved areas such as the site footprint for the new WSTP and the access road could contribute to increased levels of erosion from surface water runoff in the project area. Woody vegetation cleared from the project area will be repurposed as firewood or burned at the 5-Mile Pit. The top 2-feet of vegetative matting and organic soils will be saved and repurposed to aid in revegetation of the project area following construction.
Visitor Use and Recreation Setting	<ul style="list-style-type: none"> Visitor use of Brooks Camp would be adversely impacted without a permanent wastewater treatment solution. Public restrooms including flushable toilets provided by Brooks Lodge and NPS managed vault toilets would no longer be available. Dining opportunities at Brooks Lodge would no longer operate as intended. NPS-operated septic systems would be taken offline impacting all plumbing systems in place which provide cooking, cleaning, and bathing for NPS and Concessioner staff who live at Brooks Camp. 	<ul style="list-style-type: none"> Visitor use in Brooks Camp would not be affected as wastewater systems servicing Brooks Camp would remain operational. Visitors recreating along the VTTS road could be subjected to human-waste odors in the immediate vicinity of the 1.8-Mile site location for the new WSTP. The VTTS Road bus tour may experience delay or interruption during the construction period for the new WSTP. The scenic resources of Brooks Camp and the surrounding area would be adversely affected by the clearing and construction of the new WSTP.

Impact Topic	Alternative 1: No Action	Alternative 2: Construct Wastewater Treatment Pond Near Brooks Camp
Wildlife	<ul style="list-style-type: none"> No direct impacts. 	<ul style="list-style-type: none"> Animals such as migratory birds and brown bears would be attracted to the new WSTP. Clearing and removal of vegetation could adversely affect mammals, and breeding and/or nesting birds in the project area. Wildlife in the project area would be disrupted and would experience 1.8 acres of habitat loss from the development of this site within Katmai.

Cumulative Impacts

The discussion of cumulative effects considers past, present, and reasonably foreseeable future actions as they relate to the proposed action and alternatives.

Past Actions

The VTTS Road was constructed in 1966 during the Mission 66 era of NPS construction. The road consists of a single lane 23-mile long by approximately 10-foot wide gravel road with turnouts that runs from Brooks Camp to Three Forks Overlook. The road corridor also includes a multitude of short spur roads that lead to gravel pits which were used for the original acquisition of materials necessary to build the road.

In 1993 the NPS constructed a wastewater solids disposal cesspool at mile marker 1.5 along the VTTS Road. This cesspool was constructed to serve as a collection and treatment facility for human waste that was generated at Brooks Camp. The cesspool was in operation from 1993 – 2017. Once the facility had reached maximum capacity in 2017, the NPS agreed to decommission the facility in consultation with the Alaska Department of Environmental Conservation.

Present Actions

In consultation with the Alaska Department of Environmental Conservation the NPS began burying biosolids generated at Brooks Camp in trenches constructed at the 2.5-Mile Pit in 2017. The 2.5-Mile Pit was a previously disturbed borrow pit that was originally constructed to supply materials for VTTS Road construction in the 1960s. More contemporaneously the site has been used as a miscellaneous storage location for NPS boats and other equipment, and as a firearm qualification range for NPS rangers.

Reasonably Foreseeable Future Actions

If the proposed Brooks Camp WSTP is constructed and in operation the NPS would begin working with the Alaska Department of Environmental Conservation on the decommissioning and closure of the 2.5-Mile biosolids disposal site.

The VTTS Road Historic District has been determined as eligible for listing on the National Register of Historic Places. It is reasonably foreseeable that the NPS would complete the finalizing the National Register entry for this property in the future.

Conclusion

The historic character of the VTTS Road Historic District would be impacted by the addition of a new access road leading to the facility. Although the new WSTP would be constructed in a previously undisturbed

location, siting the facility along the VTTS Road requires a direct connection of the WSTP to the VTTS Road via a new access road which constitutes an adverse effect to the district. Previously unidentified archeological resources located in the proposed project area may be impacted by construction activities. Impacts to archeological resources and to the VTTS Road Historic District will be addressed through consultation with the Alaska SHPO and included in the Programmatic Agreement for this project.

The proposed project would result in direct impacts to approximately 1.8 acres of vegetation and 7,500 cubic feet of soil. There would also be a 1.8-acre loss of wildlife habitat and terrestrial land animals would be excluded from accessing this area of the park for the life of this facility. Migratory birds such as waterfowl could be adversely impacted by this facility and could experience mortality events through prolonged exposure to waters in the lagoon containing an adverse chemical composition.

Visitor use and the recreation setting are also anticipated to be adversely impacted by this facility. Visitors would be temporarily impacted during the construction period for the new WSTP by increased construction activities and by potential delays to the daily VTTS bus tour. Long term impacts to the recreation setting would include exposure of visitors to human-waste odors occurring in the vicinity of the facility at mile 1.8 of the VTTS Road.

NPS operations in this area of the park would increase for the life of the facility. Transportation of biosolids from park wastewater receptacles to the WSTP would occur up to two times annually with the number of deposits increasing along with visitation to the Brooks Camp area. Additionally, NPS operations at the WSTP would be increased to monitor for increased levels of erosion, impacts to wildlife including waterfowl, the establishment of invasive plant species, and to ensure that physical barriers encompassing the facility remain operational to exclude large land mammals. These operations would result in a minor increase to VTTS Road traffic.

Successful implementation of Alternative 2 would allow NPS operations and public visitation at Brooks Camp to continue as planned. There would be no upset to contracted visitor services offered by Brooks Lodge, publicly available restroom facilities would continue to operate, and NPS and concessioner staff living at Brooks Camp would retain access to indoor plumbing systems essential for health and safety.

8 Consultation and Coordination

Alaska State Historic Preservation Office

- Katmai is in consultation with the Alaska State Historic Preservation Office concerning assessment of effects to eligible cultural resources including adverse effects to the VTTS Road Historic District. The NPS will work collaboratively with the Alaska SHPO to develop an agreement document to minimize the adverse impacts to the district.

Tribal and Alaska Native Corporation Consultation

- Certified letter was sent to Alaska Native Tribes and Alaska Native Corporations dated July 28, 2020 informing about the project details and offering Government to Government consultation should they find it necessary.
- Follow up calls with Alaska Native Tribes and Alaska Native Corporations took place between 09/10/2020 – 10/15/2020 to discuss the project and determine if formal consultation was requested.

- In person consultation occurred between Katmai and the Council of Katmai Descendants who represent local tribes, ANCSA corporation Paug Vik Inc. Ltd., and the Levelock Tribal Council.

USFWS, Endangered Species Act: Section 7

- Informal consultation with the U.S. Fish and Wildlife Service through the IPAC system was initiated on 11/04/2020 to determine if threatened and endangered species occur within the proposed project area. No threatened, endangered, or candidate species were identified, and a formal Biological Assessment was not prepared for this project.

9 References

Armstrong, M. S., and J. C. Tourville. 2015. *Invasive species management for Katmai National Park & Preserve, Alagnak Wild River, and Aniakchak National Monument & Preserve: 2015 summary report. Natural Resource Report NPS/KATM/NRR—2015/1096*. National Park Service, Fort Collins, Colorado.

Alaska Department of Environmental Conservation (ADEC):

2018. *Re: Katmai National Park and Preserve – Brooks Camp Area – Mile 2 Pit – Sludge Treatment & Disposal Site Liming and Covering the Dewatering Wastewater – Conditional Approval to Construct – ADEC Plan Number 27769*. Letter. NPS, Alaska Regional Office, Anchorage, AK.

2019. *Re: Katmai National Park- Mile1, Valley of 10,000 Smokes Road-Closure of the Sludge Disposal Site at Mile 1-Conditional Approval to Construct. ADEC Plan Tracking Number 27985*. Letter. NPS, Alaska Regional Office, Anchorage, AK.

Alaska State Historic Preservation Office (SHPO):

2018. *Valley of Ten Thousand Smokes Road Historic District (XMK-00245), Katmai National Park & Preserve*. Letter. Katmai National Park and Preserve, King Salmon, AK.

Burger, P. 2020. *Re: Katmai Wastewater Treatment Plant: Wetlands / Floodplain Statement of Finding*. Email. National Park Service, Alaska Regional Office, Anchorage, AK.

Combalbert, S. and Hernandez-Raquet, G. 2009. *Occurance, fate, and biodegradation of estrogens in sewage and manure*. Journal of Applied Microbiology and Biotechnology. Published online: 31 March 2010.

Markman, S. et al. 2010. *Pollutants affect development in nesting starlings: Sturnus vulgaris*. Journal of Applied Ecology: 2011. 48. 391 - 397. British Ecological Society.

Miller, A.E. 2013. *Forest Insects and Disease: Recent Spruce Beetle Outbreaks Impact Large Areas of South Central Alaska*. Resource Brief. National Park Service, Alaska Regional Office, Anchorage, AK.

Miller, A.E. 2016. *Southwest Alaska Inventory and Monitoring Program Forest Insects Resource Brief*. National Park Service Southwest Alaska Inventory and Monitoring Program.

National Park Service (NPS), Department of the Interior:

1996. *Final Development Concept Plan / Environmental Impact Statement: Brooks River Area, Katmai*. Katmai National Park and Preserve, King Salmon, AK.
1997. *Environmental Assessment, Rehabilitate Valley of 10,000 Smokes Road: Draft Sand, Rock, and Gravel Plan*. Katmai National Park and Preserve, King Salmon, AK.
2004. *Director's Order #83: Public Health*. National Park Service Washington Support Office, Washington, D.C.
- 2006[a]. *Bear-Human Conflict Management Plan: Katmai National Park and Preserve, Aniakchak National Monument and Preserve, Alagnak Wild River*. Katmai National Park and Preserve, King Salmon, AK.
- 2006[b]. *National Park Service: Management Policies 2006*. Policy. National Park Service, Alaska Regional Office, Anchorage, AK.
2007. *NEPA Memo-to-File: Moraine Pit Gravel Extraction for Brooks Camp Projects – PEPC 18024 and Rehabilitation of Valley of Ten Thousand Smokes Road – PEPC 18034*. Memorandum. Katmai National Park and Preserve, King Salmon, AK.
2008. *Climate Monitoring Program in Katmai National Park and Preserve, Kenai Fjords National Park, and Lake Clark National Park and Preserve Environmental Assessment*. NPS Alaska Regional Office, Anchorage, AK.
- 2009[a]. *Katmai National Park and Preserve: Foundation Statement*. Katmai National Park and Preserve, King Salmon, AK.
- 2009[b]. *Katmai National Park and Preserve, Aniakchak National Monument and Preserve, Alagnak Wild River, Long Range Interpretive Plan*. Katmai National Park and Preserve, King Salmon, AK.
- 2009[c]. *Brooks River Area Utilities Replacement and Housing Relocation Environmental Assessment*. Katmai National Park and Preserve, King Salmon, AK.
2013. *Cultural Resources Management Plan for the Brooks River Visitor Access Project, Proposed Barge Landing and Barge Landing Access Road Relocation: Katmai National Park and Preserve*. Katmai National Park and Preserve, King Salmon, AK.
2016. *Invasive Species Management for Katmai National Park & Preserve, Alagnak Wild River, and Aniakchak National Monument & Preserve: 2016 Summary Report*. Final Natural Resources Report. Katmai National Park and Preserve, King Salmon, AK.
- 2018[a]. *Re: Request for Approval, Mile 2 Pit Septage Disposal, Brooks Camp Area, Katmai National Park and Preserve*. Letter. NPS, Alaska Regional Office, Anchorage, AK.
- 2018[b]. *Research Bay Trail and Viewing Platform*. Environmental Assessment. Katmai National Park and Preserve, King Salmon, AK.

2019. *Invasive Species Management for Katmai National Park & Preserve, Alagnak Wild River, and Aniakchak National Monument & Preserve: 2019 Summary Report*. Draft Natural Resources Report. Katmai National Park and Preserve, King Salmon, AK.
- 2020[a]. *10 Year Cyclic Maintenance of the Valley of 10,000 Smokes Road*. PEPC # 97303. Draft NEPA Categorical Exclusion. Katmai National Park and Preserve, King Salmon, AK.
- 2020[b]. *Visitor Use in Katmai National Park and Preserve*. Southwest Alaska Network, Anchorage, AK.
- 2020[c]. *Replace Existing Brooks Camp Electric Fences*. PEPC # 95424. NEPA Categorical Exclusion. Katmai National Park and Preserve, King Salmon, AK.

PND Engineers, Inc.:

2017. *Brooks Camp Wastewater Treatment and Disposal: Treatment and Disposal Alternatives Submittal*. NPS Denver Service Center, Denver, CO.
2018. *Brooks Camp Wastewater Treatment and Disposal: Final Predesign Report*. NPS Denver Service Center, Denver, CO.
- 2019[a]. *Brooks Camp Septage Treatment and Disposal: Value Analysis Draft Report*. NPS Denver Service Center, Denver, CO.
- 2019[b]. *Brooks Camp Septage Treatment and Disposal: Schematic Design Draft Report*. NPS Denver Service Center, Denver, CO.
- 2020[a]. *Brooks Camp Sewage Treatment Design Geotechnical Investigation*. NPS Denver Service Center, Denver, CO.
- 2020[b]. *2020 Brooks Camp Sewage Treatment Design Geotechnical Investigation at 1.8 Mile pit*. NPS Denver Service Center, Denver, CO.

United States Environmental Protection Agency (EPA):

2011. *Principles of Design and Operations of Wastewater Treatment Pond Systems for Plant Operators, Engineers, and Managers*. EPA Office of Research and Development, Cincinnati, OH.

United States Fish and Wildlife Service (USFWS):

- 2020[a]. Website. Accessed October 29, 2020. *Nesting Birds: Timing Recommendations to Avoid Land Disturbance & Vegetation Clearing / Alaska Region*. Retrieved from <https://www.fws.gov/alaska/pages/nesting-birds-timing-recommendations-avoid-land-disturbance-vegetation-clearing>.
- 2020[b]. *Brooks Camp Wastewater Treatment Pond: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project*. Anchorage Fish and Wildlife Conservation Office, Anchorage, AK.

United States Geological Survey (USGS), Department of the Interior:

2009. *Adverse Effects to Northern Shovelers from Exposure to Treated Wastewater from Central Front Range, Colorado, Wastewater Treatment Plants*. Administrative Report. U.S. Geological Survey, Reston, VA.

University of Idaho, Park Studies Unit. 2004 - 2013. *Park Visitor Survey Card Reports, FY04 – FY13*. NPS Visitor Survey Reports. University of Idaho, Moscow, ID.

Walton, J. 2020. *Wetland Delineation Report for Proposed Brooks Camp Wastewater Treatment Plant, Katmai National Park & Preserve*. Report. National Park Service, Alaska Regional Office, Anchorage, AK.

Western Regional Climate Center (WRCC):

2020[a]. Website. Accessed September 24, 2020. *Alaska Local Climate Data Summaries: King Salmon, Alaska. Normals, Means, and Extremes*. Retrieved from <https://wrcc.dri.edu/summary/lcdak.html>.

2020[b]. Website. Accessed September 24, 2020. *United States Prevailing Wind Direction*. Retrieved from https://wrcc.dri.edu/Climate/comp_table_show.php?type=wind_dir_avg.

Zimmerling, R. 2006. *Why Bird and Birders Flock to Sewage Lagoons*. Feature Article Summer 2006, Number 36. Birdwatch Canada.

Appendix A:

ANILCA Section 810(A) Subsistence – Summary Evaluation and Findings

I. Introduction

This section was prepared to comply with Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA). It summarizes the evaluation of potential restrictions to subsistence uses that could result from the proposed action by the National Park Service (NPS) to construct a new wastewater treatment pond (WSTP) near Brooks Camp within Katmai National Park and Preserve.

II. The Evaluation Process

Section 810(a) states:

“In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands...the head of the federal agency...over such lands...shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy or disposition of public lands needed for subsistence purposes. No such withdrawal, reservation, lease, permit or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be effected until the head of such Federal agency–

(1) gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to Section 805;

(2) gives notice of, and holds, a hearing in the vicinity of the area involved; and

(3) determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions.”

A proclamation by President Woodrow Wilson in 1918 created Katmai National Monument from a reservation of approximately 1,700 square miles. Three major purposes of the monument designation were 1) to preserve an area important to the study of volcanism, 2) to preserve the Valley of Ten Thousand Smokes and 3) to conserve an area potentially popular with persons seeking unique scenery and for those with scientific interest. Increased in 1931 to include Brooks Lake, Grosvenor Lake, Lake Colville, and part of Naknek Lake, again in 1942 to include offshore islands within five miles of the monument coastline, and again in 1969 to include the remainder of Naknek Lake, the monument grew to contain 4,361 square miles.

With the passage of ANILCA in 1980, the designation of 3.7 million acres of the monument was changed to a national park, and an additional 308,000 acres was included as a national preserve. Furthermore, 3.4 million acres of the park and preserve were designated as wilderness. The Katmai Preserve was created by ANILCA Section 202(2) for the following purposes (among others):

“...to protect habitats for, and populations of, fish and wildlife including, but not limited to, high concentrations of brown/grizzly bears and their denning areas; to maintain unimpaired the water habitat for significant salmon populations; and to protect scenic, geological, cultural and recreational features.”

The taking of fish and wildlife for subsistence uses is allowed by ANILCA within Katmai National Preserve pursuant to Section 203, however, subsistence activities are not authorized within Katmai National Park.

The potential for significant restriction of subsistence uses must be evaluated for the proposed action’s effect on “...subsistence uses and needs, the availability of other lands for the purposes sought to be achieved and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes.” (Section 810(a), ANILCA).

III. Proposed Action on Federal Lands

Alternative 1 – Existing Conditions (No Action Alternative)

Under Alternative 1, a newly upgraded WSTP along the VTTS Road near Brooks Camp would not be constructed. The existing method of biosolids disposal at Brooks Camp would continue, deposition and burial in trenches at the 2.5-Mile Pit along the VTTS Road. This site is estimated to be filled to maximum capacity by the year 2023 at which point Katmai would be required to develop new alternatives to handle biosolids generated at Brooks Camp.

Alternative 2 – Construct Wastewater Treatment Pond Near Brooks Camp (Proposed Action and Preferred Alternative)

Under Alternative 2, Katmai would construct a new WSTP at a previously undisturbed area located at mile 1.8 along the VTTS Road. The new site would consist of a facultative lagoon system which uses aerobic and anerobic processes to break down human waste. The remaining liquid wastewater would be separated out and allowed to drain into an adjacent percolation cell where it would percolate into the soil. The new lagoon would occupy approximately 1.8 acres of NPS lands and would be designed to treat human waste generated at Brooks Camp for a period of 30 years. The design specifications would account for anticipated increases in visitor use of Brooks Camp over this period of time.

Alternatives 1 and 2 are described in detail in the EA. This project occurs within Katmai National which is closed to Title VIII subsistence uses.

IV. Affected Environment

ANILCA authorized subsistence uses within Katmai National Preserve, the Alagnak Wild River and on adjacent federal public lands managed by the BLM and the USFWS. Becharof National Wildlife Refuge shares a common boundary with the park. The area’s primary subsistence resources include sockeye salmon, silver salmon, whitefish, pike, rainbow trout, moose, caribou, brown bear, ptarmigan, snowshoe hare, furbearing animals, berries and various wild plants.

The proposed project would occur near the Brooks Camp developed area of Katmai National Park located at mile 1.8 along the VTTS Road. Lands within Katmai National Park are closed to subsistence uses. The proposed project is not expected to significantly restrict subsistence uses in Katmai National Preserve or any other federal lands adjacent to Katmai National Park where Title VIII subsistence is authorized.

V. Subsistence Uses and Needs Evaluation

To determine the potential impact on existing subsistence activities, three evaluation criteria were analyzed relative to existing subsistence resources that could be impacted. The evaluation criteria are:

- the potential to reduce important subsistence fish and wildlife populations by (a) reductions in abundance; (b) redistribution of subsistence resources; or (c) habitat losses;
- the effect the action might have on subsistence fishermen or hunter access;
- the potential for the action to increase fisherman or hunter competition for subsistence resources.

1) The potential to reduce populations:

There would be no significant reductions in populations of subsistence fish and wildlife resources as a result of the proposed project to construct a new WSTP near Brooks Camp. There is no Title VIII subsistence use authorized in the proposed area and the proposed project should have no effect on fish, moose, bear, or small game populations occurring on Katmai National Preserve lands or adjacent federally managed lands.

2) Restriction of Access:

The proposed action to construct a new WSTP near Brooks Camp is not expected to limit or significantly restrict the access of subsistence users to natural resources within Katmai National Preserve or any other federal lands adjacent to Katmai National Park where Title VIII subsistence is authorized.

3) Increase in Competition:

The proposed action to construct a new WSTP near Brooks Camp is not expected to result in increased competition for fish, wildlife, or other resources that would significantly restrict subsistence users.

VI. Availability of Other Lands

The proposed project is site-specific located close to the Brooks Camp developed area in Katmai National Park due to the need to provide treatment and disposal for biosolids generated there. While other lands in the immediate area; specifically, along the VTTS Road, could potentially be suitable to site this facility, the facility needs to be located within reasonable driving distance of Brooks Camp which is the source of the waste that requires disposal.

VII. Alternatives Considered

Two alternatives were analyzed for this project and are described in detail in the EA. Both of the alternatives occur within the same area of Katmai National Park in an area where Title VIII subsistence uses are not authorized. Neither of the two alternatives proposed would significantly restrict subsistence uses in Katmai National Preserve or any other adjacent federally managed lands.

VIII. Findings

This analysis concludes that the proposed action will not result in a significant restriction of subsistence uses.