United States
Department of
Agriculture

Forest
Service

March 2012

Environmental Assessment

MENDENHALL VALLEY SNOW STORAGE

JUNEAU, ALASKA

Juneau Ranger District, Tongass National Forest
Juneau, Alaska

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List of Acronyms

ADEC.....State of Alaska Department of Environmental Conservation
ADFG.....State of Alaska Department of Fish and Game
ADLWD .....State of Alaska Department of Labor and Workforce Development
AHRS.....Alaska Heritage Resources Survey
ANHP.....Alaska Natural Heritage Program
AWC ..... Anadromous Waters Catalog
BE .....Biological Evaluation
BMP .....Best Management Practice
BPA..... Bus Parking Area
CBJ..... City and Borough of Juneau
CCC.....Civilian Conservation Corps
CEQ..... Council on Environmental Quality
DCM .....Design Criteria Manual
EA .....Environmental Assessment
EPA..... United States Environmental Protection Agency
FEMA .....Federal Emergency Management Agency
FSM..... Forest Service Manual
GAS.....Gastineau Aeromodeler's Society
HMCP .....Hazardous Materials Control Plan
LMP .....Limited Maintenance Plan
MBTA.....Migratory Bird Treaty Act
MGRA .....Mendenhall Glacier Recreation Area
MIS .....Management Indicator Species
MOA .....Municipality of Anchorage
NEPA .....National Environmental Policy Act
NWI.....National Wetlands Inventory
PM 10.....Particulate Matter 10 millimeter diameter
ROS..... Recreation Opportunity Spectrum
SHPO ..... State Historic Preservation Office
SWPPP.....Stormwater Pollution Prevention Plan
USACE .....United States Army Corps of Engineers
USC.....United States Code
USDA..... United States Department of Agriculture
USFS.....United States Forest Service
USFWS .....United States Fish and Wildlife Service
USGS ..... United States Geological Survey

SUMMARY

The Tongass National Forest proposes to issue a special use permit to the City and Borough of Juneau to construct and operate a snow disposal site at the tour bus parking area near the United States Forest Service Mendenhall Glacier Visitor Center. The project area is located approximately one-quarter of one mile south of the Visitor Center and is within the Juneau Ranger District, Tongass National Forest, Alaska. This action is needed to 1) promote public safety by allowing City and Borough of Juneau to remove snow from public roads and sidewalks; and 2) provide a snow disposal site that is environmentally sound, fiscally prudent, compatible with adjacent land uses, and compliant with applicable water quality regulations.

The Proposed Action may cause minor adverse impacts to an unmapped floodplain, surface water quality and flows, disturbed wetlands, terrestrial and aquatic wildlife, and vegetation.

In addition to the Proposed Action, the Forest Service also evaluated the following alternative:

No Action Alternative: A No Action Alternative typically assumes the continuation of current activities and uses. However, snow storage is currently occurring at the tour bus parking lot under a temporary agreement. The City and Borough of Juneau does not have a special use permit to store the snow on the site. The United States Forest Service is bringing the practice into compliance by either stopping the storage activity (No Action Alternative) or issuing a permit to allow it under appropriate conditions (Proposed Action).

Although the No Action Alternative would result in the need for the City and Borough of Juneau to develop and operate a snow disposal site elsewhere in the Mendenhall Valley, any such site would not be located on National Forest System lands and would not be subject to the Forest Service National Environmental Policy Act analysis.

Based upon the effects of the alternatives, the responsible official will decide whether or not to issue a special use permit to the City and Borough of Juneau to construct and operate a snow disposal site at the tour bus parking area near the Mendenhall Glacier Visitor Center.

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INTRODUCTION

Document Structure

The Forest Service has prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the Proposed Action and the No Action Alternative. The document is organized into four parts:

- *Introduction:* The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- *Comparison of Alternatives, including the Proposed Action:* This section provides a more detailed description of the agency's proposed action and the No Action alternative. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Environmental Consequences:* This section describes the environmental effects of implementing the proposed action and the No Action alternative. This analysis is organized by resource area. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the Proposed Acton.
- *Agencies and Persons Consulted:* This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Juneau Ranger District Office in Juneau, Alaska.

Background

The United States Forest Service (USFS) is evaluating a request for a special use permit from the City and Borough of Juneau (CBJ) to construct and operate a snow disposal site at the tour bus parking area (BPA) near the USFS Mendenhall Glacier Visitor Center. The project area is located approximately one-quarter of one mile south of the visitor center (Figure 1).

The CBJ is located in southeast Alaska in a mild, maritime climate. Annual snowfall averages 94 inches per year in Juneau (Alaska Climate Research Center, 2012). In recent years (2006 to 2009), snowfall has exceeded 160 inches per year. The peak snowfall recorded in the Mendenhall Valley is 200 inches.

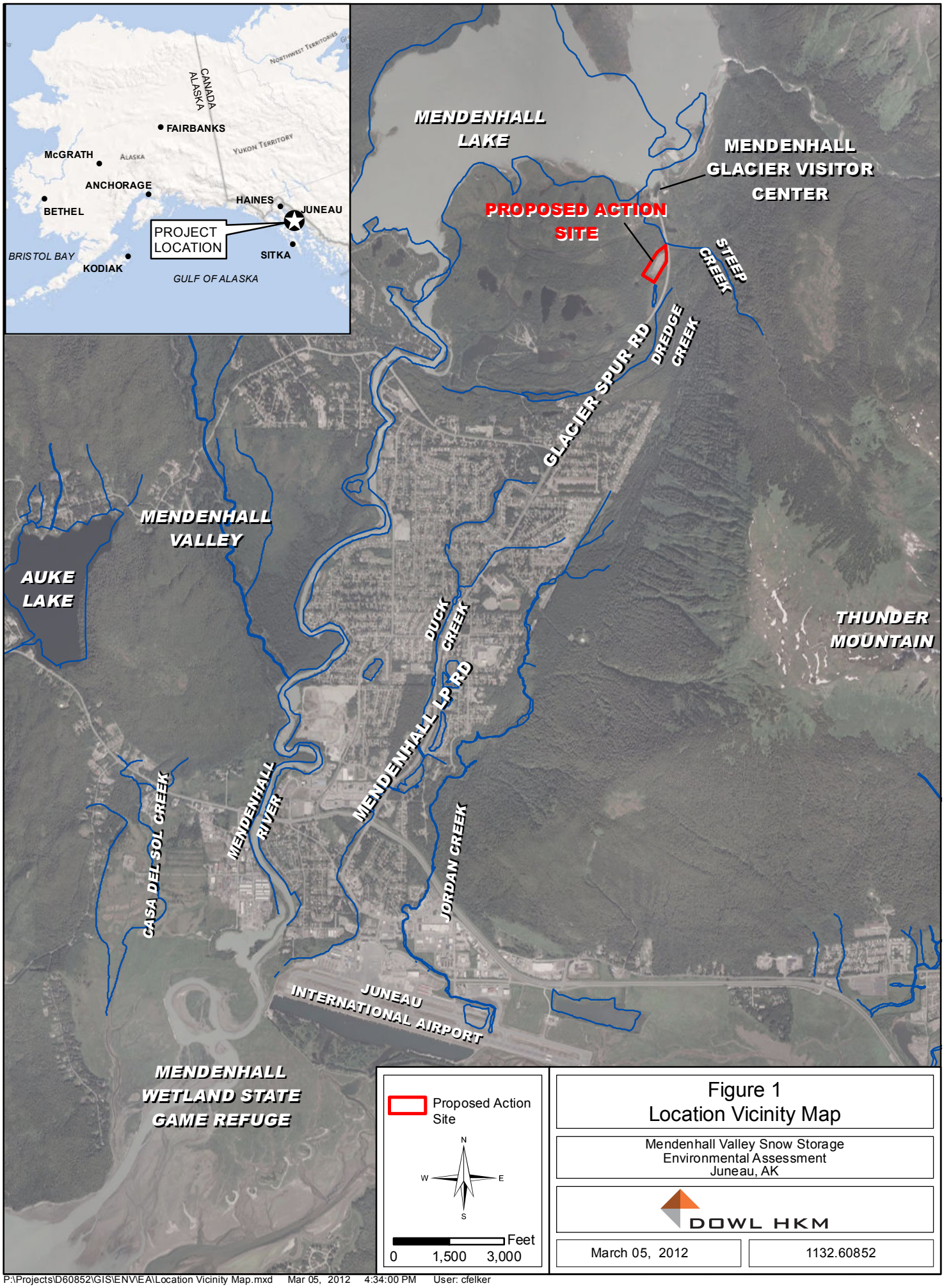

Figure 1
Location Vicinity Map

Mendenhall Valley Snow Storage
Environmental Assessment
Juneau, AK

DOWL HKM

March 05, 2012

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Clearing CBJ roads and sidewalks of ice and snow is essential to safe transportation throughout the community. Public roads maintained by the CBJ, which total over 250 lane-miles, do not have sufficient right-of-way to allow for long-term storage along them. Snow removed from the roads and sidewalks must be hauled to a snow disposal site. Haul costs are a major component of snow removal costs and are the most variable cost associated with snow removal operations (DOWL HKM 2010). The cost of CBJ winter street maintenance operations for both the downtown and Mendenhall Valley areas between 2006 and 2010 ranged from $1.2 to $1.9 million per year.

Juneau's location between the mountains and Gastineau Channel results in limited lands for needed urban development, including public facilities such as snow disposal sites. Sites used in past years by the CBJ have been lost through development of the areas for higher value uses or due to incompatibilities between residential uses and snow disposal operations. Regulatory review of snow disposal operations has also increased in recent years, resulting in a need to develop a snow disposal site that provides appropriate water quality treatment for snow melt water.

A Snow Management Study completed by CBJ in 2010 evaluated a total of 38 sites for snow disposal in the Juneau-Douglas area, of which 21 were in the Mendenhall Valley (DOWL HKM, 2010). The evaluation process identified land disposal sites with high potential to be used for snow storage from Mendenhall Valley operations. The highest ranked option was the continued use of the BPA because it is developed for tour bus parking, is currently used as a snow disposal site, has good access, is located near the areas with the most demand for snow removal which lowers haul costs, has no adjacent residential or other incompatible uses, and has room for the site to be redesigned to include water quality treatment prior to melt-water discharge. For this reason, CBJ submitted an application for a special use permit to develop and operate a snow disposal site at the BPA.

Purpose and Need for Action

The purpose of this analysis is to consider whether or not to issue a special use permit which would allow CBJ to design, construct and operate a site for disposal of snow removed from public streets and sidewalks in the Mendenhall Valley. Specifically, the snow disposal site would:

- Provide convenient access for trucks hauling snow from the Mendenhall Valley;
- Use Best Management Practices (BMPs) and treatment design based on research conducted in the Municipality of Anchorage to provide water quality treatment for snow melt;
- Be located in an area with compatible land uses; and
- Provide room for safe and efficient snow disposal operations.

This action is needed to 1) promote public safety by allowing CBJ to remove snow from public roads and sidewalks in the Mendenhall Valley, and 2) provide a snow disposal site that is environmentally sound, fiscally prudent, compatible with adjacent land uses, and compliant with applicable water quality regulations.

Proposed Action

The Forest Service is considering whether or not to issue a special use permit to CBJ to construct and operate a snow disposal site in the USFS BPA. The snow disposal site would occupy approximately 2 acres within the existing tour bus parking area. The snow disposal site would consist of a snow disposal pad and a snow melt water detention pond (Figure 2). The snow storage site would include a detention pond to allow sediment to settle out of snow melt water and chlorides to be diluted. Since heavy metals in melt water tend to attach to sediment, this treatment process would also reduce these pollutants in the water discharged from the site.

Construction would be largely contained within the existing disturbed portion of the parking area, but up to one acre of previously disturbed vegetation would be cleared in the southwest corner of the tour bus parking area. The snow disposal site pad would be graded to encourage snow melt drainage to flow west into a detention pond for dilution treatment of chlorides and settling of sediment prior to discharge into adjacent disturbed wetlands. Existing drainage ditches around the parking lot would be reconfigured to route surface flow from the remainder of the parking lot around the snow disposal site. Construction of the snow disposal site would be expected to take three to six months.

Ten- to twenty-yard dump trucks would haul the snow to the area and dump it onsite. The trucks would access the site through the existing access gate off of Mendenhall Spur Road. Snow plows would begin storing snow at the back of the storage area. They would pile the snow to 30-40 feet high starting at the west end, and then back their way out towards the entrance as they fill the storage area. A bulldozer or snow cat is used at the storage area to push the snow into place in the pile. Equipment fueling would occur on the site via a truck-mounted fuel tank during site operations.

The site would be maintained and operated by CBJ Street Maintenance Department. Hauling typically occurs during daytime hours, but hauling and equipment operations on the site occasionally occur throughout the day and night during periods of high snowfall. The site would only be used for storage of snow from the Mendenhall Valley service area.

Decision Framework

Given the purpose and need, the Deciding Official will review the proposed action and the other alternatives in order to make the following decisions:

The USFS will decide whether or not it will issue a special use permit to the CBJ to dispose of snow in the USFS BPA.

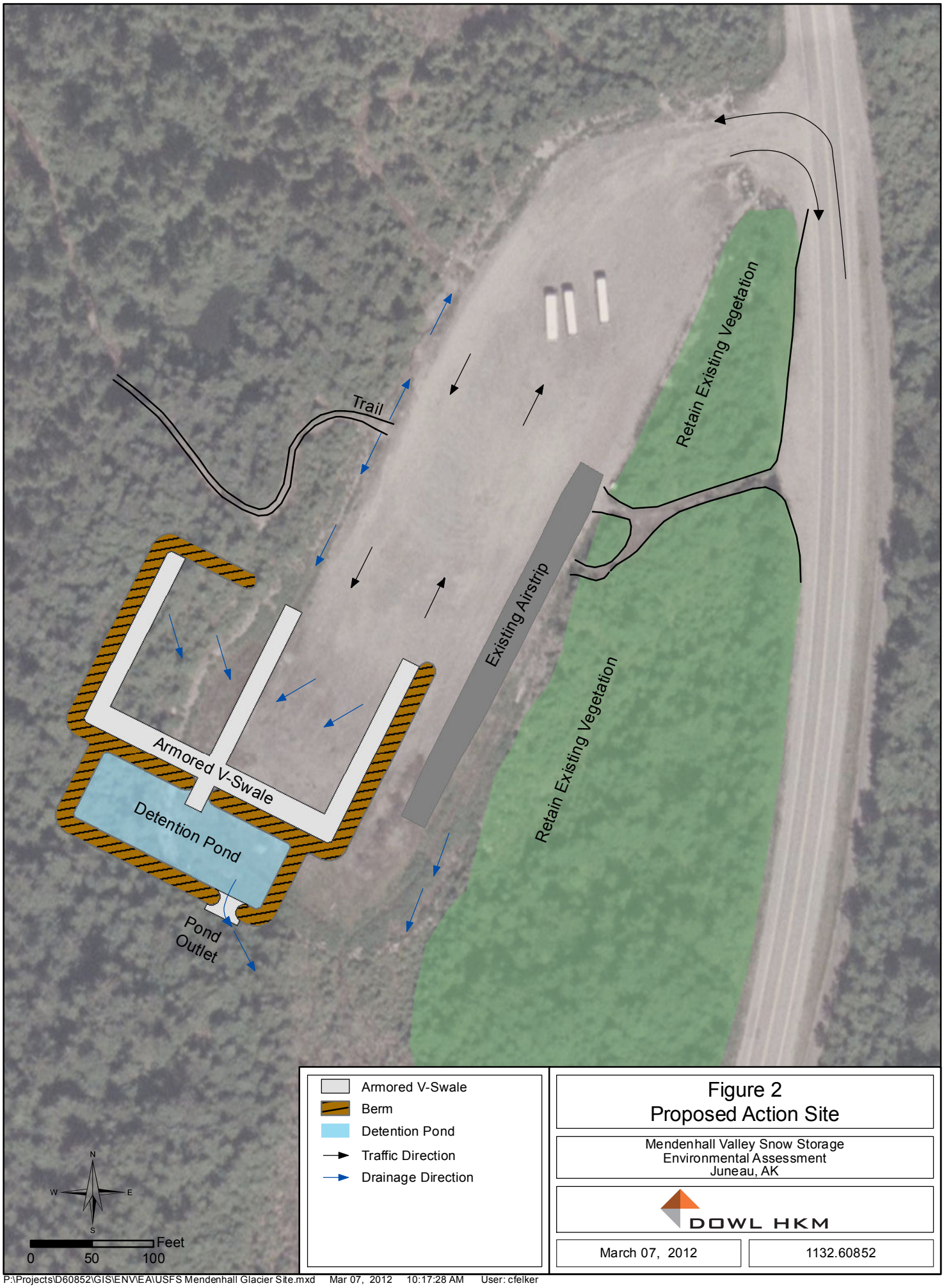

Figure 2
Proposed Action Site

Mendenhall Valley Snow Storage
Environmental Assessment
Juneau, AK

DOWL HKM

March 07, 2012 | 1132.60852

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Public Involvement

The public scoping process for this project was advertised in the Juneau Empire newspaper on May 29 and June 1, 2011. The scoping period ran from May 29 through June 20, 2011.

As part of the public involvement process, agency scoping letters were sent on May 25, 2011 and the USFS held an agency scoping meeting on June 2, 2011. Information provided for the meeting is included in a Scoping Summary Report found in the Project Planning Record at the Juneau Ranger District. Notes from the agency meeting and comments received are included in the Scoping Summary Report.

A public meeting was held June 2, 2011, interested individuals and groups were provided an opportunity to comment on the project proposal, alternatives that should be considered, possible environmental impacts and potential mitigation measures that should be incorporated into this project. A summary of information gathered during the public scoping process is provided in the Scoping Summary Report. Twenty written comments were received during the scoping period. Of these 20, two comments were from public agencies, one was from the Audubon Society, and several were from the members of the Gastineau Aeromodelers Society. Using the comments from the public, other agencies, and special interest groups (see *Issues* section), the interdisciplinary team developed a list of issues to address.

Issues

The Forest Service separated the issues into two groups: significant and non-significant issues. Significant issues were defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…" A list of non-significant issues and reasons regarding their categorization as non-significant may be found in the project record.

As for significant issues, the Forest Service identified 13 topics raised during scoping. These issues include:

Air Quality: Concern was expressed over whether vehicle emissions associated with operating the snow disposal site would affect air quality and wetlands directly adjacent to the parking lot.

Noise: Operation of the snow disposal site requires use of equipment such as front end loaders and dump trucks, both of which generate noise. Human use of the area during winter is recreational in nature and occurs at a lower level than summer use; there are no residences or other noise sensitive receptors nearby.

Water and Wetland Resource concerns are addressed under four separate headings in the EA:

Floodplains: A small floodplain is located near the southeast boundary of the tour bus parking lot; the location of the snow disposal site does not overlap with the boundary of the floodplain.

Surface Water: The snow melt water has the potential to contain contaminants that could affect surface water quality. The snow disposal site includes several design features for removing or diluting contaminants from melt water before it discharges to surface water. Surface water quality has been monitored at the site in previous years, and sampling will continue to be conducted if the snow disposal site is permitted.

Ground Water: Shallow ground water at the tour bus parking lot is hydrologically connected to surface waters. Contamination of surface water from snow melt water could have minor affects on shallow ground water but would not affect deeper groundwater.

Wetlands: Wetlands in the project area are associated with the drainage ditches along the southern perimeter of the tour bus parking lot and have been impacted by pea gravel fill from the lot. Several comments received expressed concerns over impacts to wetlands from construction and operation of the snow disposal site; the mitigation sequence of avoidance and minimization before mitigation was encouraged.

Fish and Wildlife concerns are addressed under two separate headings in the EA:

Terrestrial Wildlife Habitat or Species: A number of migratory songbirds, resident songbirds and a sensitive species use habitat within and in proximity to the tour bus parking lot. Agencies and public comments expressed concern over loss of habitat as a result of vegetation clearing for the snow disposal site.

Aquatic/Riparian Wildlife Habitat: Water directly downstream of the tour bus parking lot provides habitat for anadromous fish species, and several agencies and individuals expressed concern about the potential impacts to fish from discharging snow melt water to those surface waters.

Vegetation: The proposed snow disposal site design would require clearing of disturbed and early successional vegetation; concern was expressed about the potential effects on vegetation from the clearing.

Compatible Land Use and Outdoor Recreation: Lands surrounding the tour bus parking lot are part of the Mendenhall Glacier Recreation Area, managed by the Forest Service. Because recreational use of the area is high, some people expressed concern about the site's compatibility with adjacent land uses.

Environmental Justice: Executive Order 12898 requires that a Federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its activities on minority and low-income populations. There are no residences near the tour bus parking lot and the proposed action would not adversely affect minority or low-income populations.

Economic and Fiscal: Comments received included concerns about the long-term costs of operating a snow disposal site at the tour bus parking lot, and about the potential effects the proposal could have on tour bus operators.

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ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered for the Mendenhall Valley Snow Disposal project. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative (i.e., treatment pond design) and some of the information is based upon the environmental, social and economic effects of implementing each alternative (i.e., the amount of clearing, etc.).

Alternatives

Alternative 1

No Action

A No Action Alternative typically assumes the continuation of current activities and uses. Snow storage has been occurring at the BPA under a temporary agreement. The Forest Service wants to bring the activities under current policy by either stopping the storage activity (No Action Alternative) or issuing a permit to allow it with certain terms and conditions (Proposed Action). The existing conditions at the Forest Service site are shown on Figure 3.

This EA analyzes the effects the proposed action would have on resources in considering whether or not to issue a special use permit to the CBJ to dispose of snow in the BPA.

The CBJ needs to operate a snow disposal site somewhere in Mendenhall Valley and if the No Action Alternative is selected CBJ will need to construct and operate a site elsewhere in the valley. The CBJ completed a Snow Management Study in 2010 looking at several snow disposal options. The site at the USFS BPA was identified as the preferred site. However, the study also identified other potential sites for snow disposal. Two of the highly ranked sites are considered to be the most likely alternative locations if the BPA is not selected: Cinema Drive and Industrial Boulevard. The potential development of an alternative snow disposal site on non-National Forest System lands is not subject to Forest Service NEPA analysis and so it not addressed under the No Action Alternative, but is addressed in the cumulative effects analyses. Additional information on these effects is documented in the 2010 Snow Management Study and supporting information available from the CBJ.

Figure 3
Existing Conditions

Mendenhall Valley Snow Storage
Environmental Assessment
Juneau, AK

DOWL HKM

February 23, 2012

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Alternative 2

The Proposed Action

The CBJ is requesting a special use permit to construct and operate a snow disposal site at the USFS tour bus parking area (BPA) near the Mendenhall Glacier Visitor Center (Figure 1). The BPA, located approximately one-quarter of one mile south of the Visitor Center, was constructed to provide parking for tour buses waiting for tourists to finish their visits at the Glacier. For the last several years, CBJ has used a portion of the tour bus parking area for snow disposal under a temporary agreement with the USFS. Snow has been piled at the southern end of the parking lot where melt water flows across the gravel surface of the parking lot before reaching surface waters.

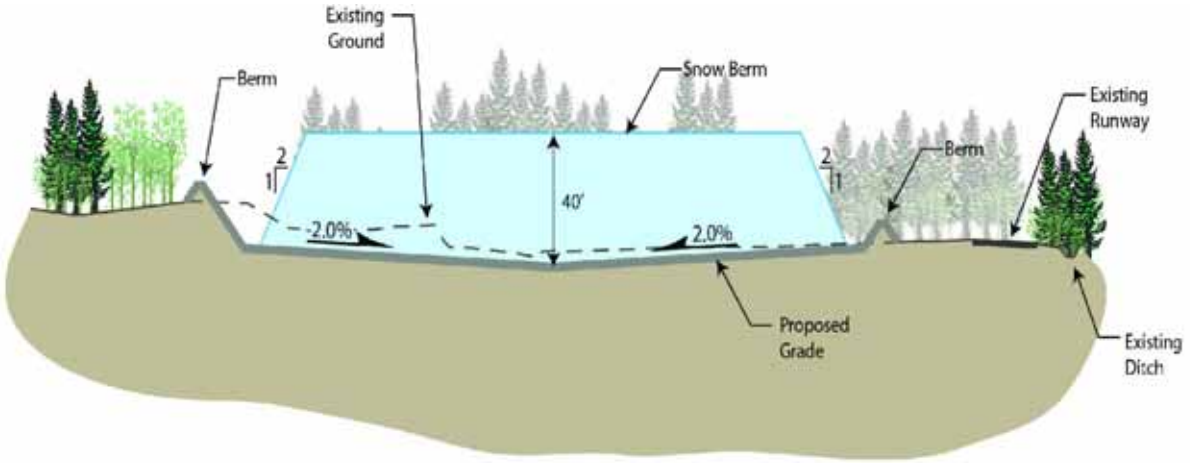
The Municipality of Anchorage (MOA) has conducted several studies on snow melt treatment which have been presented at local and international conferences (Wheaton and Rice, 2003). The proposed treatment design and Best Management Practices (BMPs) outlined below are based on the MOA's research on improving the water quality of melt water discharge (Table 1). The snow disposal site has been designed for site specific conditions at the USFS bus parking lot, including the depth of groundwater, the relative porosity of the soils, the surface hydrology, the anticipated volume of snow that will need to be stored at the site annually, the volume and timing of melt water, its rate of melt (flow), and the type and properties of contaminates in snow melt water that the site will treat.

There are two components of the snow disposal site that contribute to the effective management of collected snow and its melt water; a snow disposal pad and a detention pond (Wheaton and Rice, 2003). The snow disposal pad will be a low gradient v-swale designed to collect and control melt water at the site (Figures 4 and 5). On a flat snow pad, melt water ponds along the outer edges of the pad and discharges from multiple points; this leads to erosion and sediment mobilization. The V-shape of the pad diverts melt water inward and through the snow pile, ensuring predictable discharge points that are more easily managed for water quality, and flow routes that minimize erosion of the pad and surrounding areas (MOA, 2000). The pad is designed with a 1% gradient such that the majority of sediment will be retained on the pad, rather than being discharged with melt water to the receiving detention pond. A berm surrounds the pad to minimize the potential for melt water to leave the pad untreated. Armor rock is placed along the edges of the berm and through the bottom of the v-swale; the rock is pervious enough to allow flow between the void spaces in the v-swale, but solid enough to prevent erosion. Fencing around the site, permanent or temporary, could be included to help retain litter on the site and keep public off the snow pile.

The detention pond has been designed to provide 24 hours of detention for snow melt water to allow settling of sediments and heavy metals in the melt water, and to allow chlorides to be adequately diluted before the melt water enters surrounding surface waters. The pond capacity is designed to be approximately 20,000 cubic feet, based on anticipated volumes of stored snow and subsequent melt water. The depth of water in the pond was limited to just two feet to maintain separation between the detained water and the shallow ground water located three to four feet below the surface at the BPA (DOWL HKM, 2011). The surface area of the pond was sized to accommodate the desired capacity and depth. The berms of the detention pond will

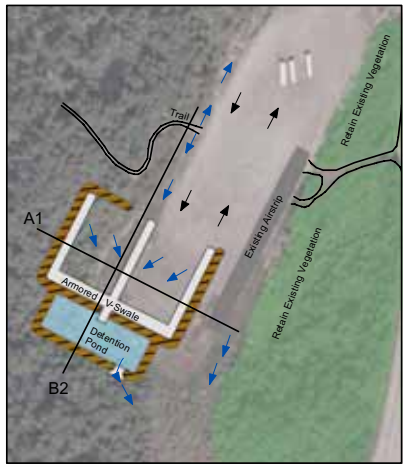
Table 1. Snow Disposal Site Design Criteria Table

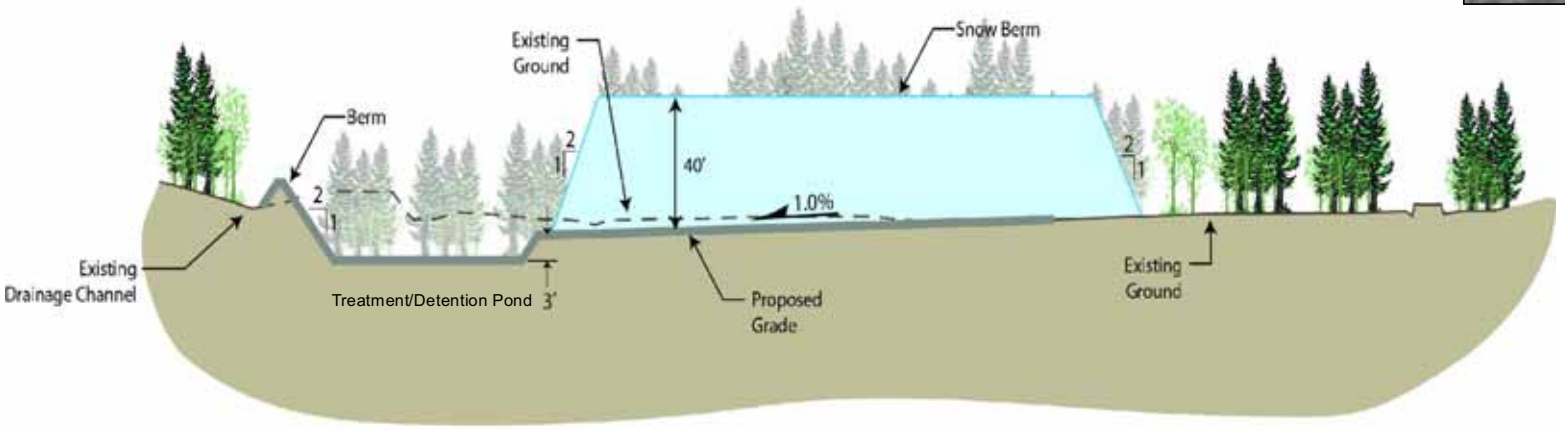
Element	Criteria	Source
Pad Design	Single or multiple V-swale cross-sections.	MOA Design Criteria Manual (DCM), Chapter 2, March 2007
V-Swale	Side Slope: 2% Longitudinal Slope: 1%	MOA DCM, Chapter 2, March 2007
Berm Design	Minimum Height: 3 feet Side Slopes: 2:1 Minimum Crest Width: 1 foot	MOA DCM, Chapter 2, March 2007
Channel and Berm Armoring	Armor all critical pad surfaces and flow channels, provide permanent or temporary setback markers. All armor shall be at least 6-inches thick with all finished armored surfaces feathered to the finished grade of the vegetated pad.	MOA DCM, Chapter 2, March 2007
Pad Outlet Weirs	Construct rectangular outlet weirs or other acceptable devices at the end of the V-swale	MOA DCM, Chapter 2, March 2007
Detention Pond Design	Design detention pond to provide 24-hour detention of melt water.	Wheaton and Rice, 2003
Detention Pond Outlet Design	Provide a floating oil-absorptive boom guyed around the detention pond outlet. Provide cleanout access aprons at all inlets to detention ponds. Provide heavy maintenance vehicles access to all pond control structures.	MOA DCM, Chapter 2, March 2007
Traffic Access	Prohibit uncontrolled vehicular access to the site. The existing lockable gate shall be maintained. Construct access driveway with a minimum width of 24 feet and a maximum width of 34 feet.	MOA DCM, Chapter 2, March 2007



SECTION A1

No Scale





SECTION B2

No Scale

Figure 4
Snow Disposal Site Sections

Mendenhall Valley Snow Storage
Environmental Assessment
Juneau, AK

DOWL HKM

March 07, 2012 | 1132.60852

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V-SWALE SECTION

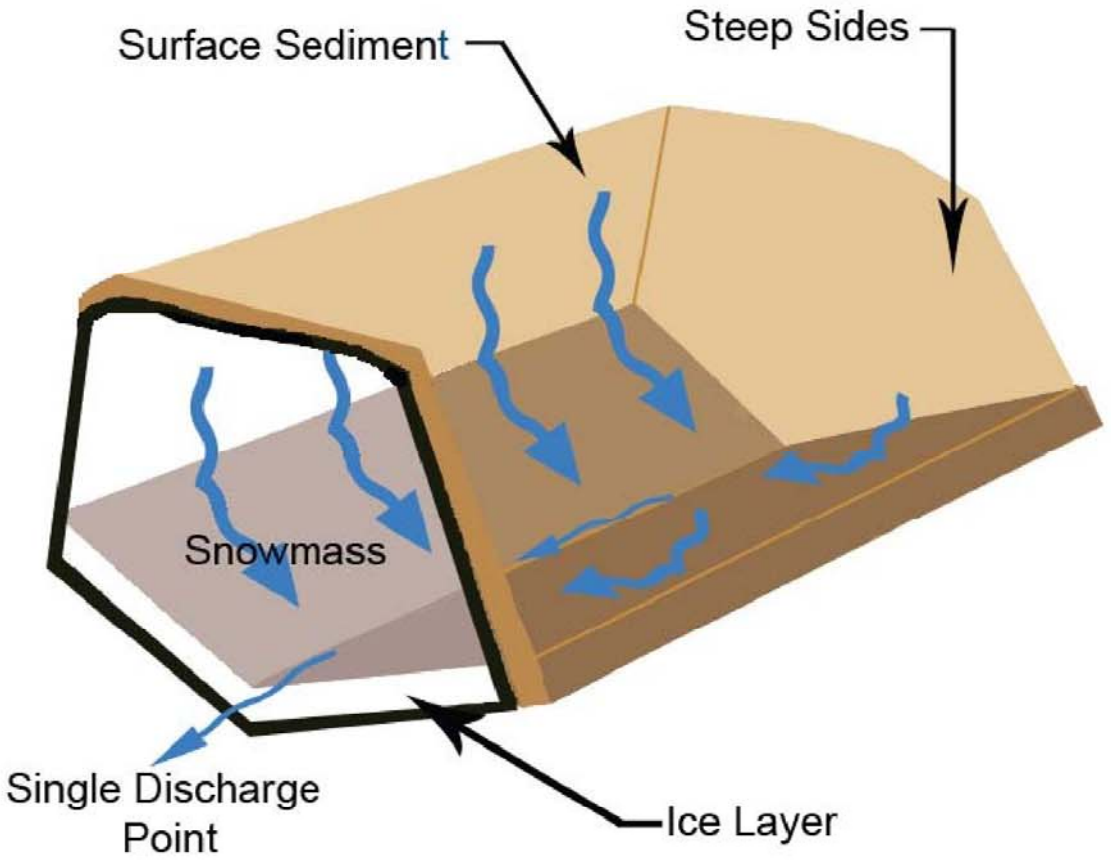

Image courtesy of Scott Wheaton

Figure 5
V-Swale Section

Mendenhall Valley Snow Storage
Environmental Assessment
Juneau, AK

DOWL HKM

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measure three to four feet high and the outfall will be constructed of pervious material that allows water to seep out over time. In the event of high rain events, overflow water will be directed out a slipway at the constructed outfall. Due to the height of the berm and the release of water through the outfall, the detention pond would not be accessible to fish.

Neither the pad nor the pond will be lined, as native soils found under and surrounding the parking lot fill material are relatively impervious sands and silts (DOWL HKM, 2011). Due to the impervious nature of the native soils and the likelihood that the pad surface will be frozen or saturated during melt periods, ground water infiltration from melt water from the storage pad and is not expected, and the pond is sized accordingly.

Mitigation Measures for Any Action Alternative

In response to public comments on the proposal, mitigation measures were developed to ease some of the potential resource impacts the various alternatives may cause. The mitigation measures may be applied to any of the action alternatives.

To avoid and minimize potential environmental impacts from the project, the following mitigation measures would be implemented:

- BMPs for the design and operation of snow storage facilities will be implemented. The BMPs are focused on addressing chlorides, hydrocarbons, heavy metals and sediment in melt water. The BMP's will be amended, as necessary, if potential contaminants or contaminant regulations change in the future.
- The collection and control of melt water at the site will be accomplished by the shaping and storing of snow on a v-swale pad to allow sediment to settle before melt water is discharged to a receiving detention pond.
- The detention pond will allow further settling of sediment and provide for dilution of chlorides. An absorbent boom will be placed near the outfall to absorb hydrocarbons.
- Removal of sediment from the detention pond and the snow storage pad will be addressed in a CBJ maintenance plan to be submitted to and approved by USFS. Sediment will be removed periodically as the rate of accumulation dictates.
- BMPs to avoid and minimize erosion and to control sedimentation during construction will also be implemented to minimize the impact to water quality, wetlands, and aquatic species. The project will have an Erosion and Sediment Control Plan from which the Contractor will prepare a Storm Water Pollution Prevention Plan (SWPPP) and Hazardous Materials Control Plan (HMCP). These plans would detail erosion and siltation control measures and other pollution prevention measures that would be used during project construction to minimize water quality impacts. The measures will include Forest Service Manual (FSM) Supplement direction on Noxious Weed Management regarding use of weed-free erosion control materials, guidelines for re-vegetating disturbed areas with native plants and seed mixes approved for the Tongass National Forest, preventing introduction and spread of invasive plants, and the procedure for conducting risk assessments for ground disturbing activities (USFS, 2007).

- Specific BMPs for fueling would be incorporated into a site operations plan. These BMPs would include measures such as those listed below.
    - Fuel transfer personnel must be properly trained in fuel handling and transfer procedures and emergency response actions.
    - Fuel trucks will be equipped with emergency spill response kits adequate to handle a release equivalent to the volume of the storage capacity of the truck.
    - Fuel truck driver must conduct visual inspection of all hoses and connections prior to initiating transfer.
    - Fuel transfer should occur in a single designated area away from wetlands and/or surface waters.
    - Prior to departure, driver will confirm all truck valves are secure and no leaks are present, as well as confirm that all valves/covers on the receiving equipment are secure and no leaks are present.
    - Any releases should be reported to the Juneau District Ranger immediately
    - The operator will work with the Forest Service to ensure proper spill remediation, as well as other required agencies.
- A long-term, consistent water quality sampling program will build on existing sampling efforts to monitor effectiveness of melt water treatment and ensure downstream water quality is protected. The CBJ will be responsible for developing and implementing the water quality sampling program.
- The area to be cleared will be clearly marked; no vegetation clearing beyond what is necessary will occur.
- Although construction and operations work areas will have restricted access to ensure public safety, access to recreation will be maintained or a reasonable alternative access provided during construction. If construction at the BPA would occur during the cruise ship season, it would be undertaken in such a way that the lot would continue to serve its purpose as a tour bus parking lot.

Permits to be obtained include an Alaska Construction General Permit (ADEC), Section 404 Permit for a Discharge of Fill Material (USACE), and Section 401 Water Quality Certification (ADEC). A Title 16 Fish Habitat Permit from ADFG may be obtained for in- stream work upstream of the beaver pond, if necessary.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Direct and indirect effects can occur as a result of project activities and their connected actions. A direct effect is an effect caused by an action that occurs in the same time and place as the action. An indirect effect is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable. The analyses of effects were based on professional

judgment using information provided by Forest Service staff or in consultation with staff from other federal or state agencies, relevant references and technical literature citations, and subject matter experts. The intensity of effects are classified as noted below.

Negligible: The action might result in a change, but the change would not be measurable or would be at the lowest level of detection.

Minor: The action might result in a detectable change, but the change would be slight.

Moderate: The action would result in a clearly detectable change and could have an appreciable effect but not a widespread and highly noticeable effect.

Major: The action would result in effects that are highly noticeable and widespread.

Table 2. Summary of Environmental Consequences Associated with Each Alternative

	Alternative 1	Alternative 2
Physical Environment		
Air Quality	Negligible to minor beneficial effect from reduced air emissions during winter months.	Short-term increase in emissions during construction. No change from current levels during operations; minor increase in emission compared to No Action.
Noise	Minor beneficial effect from reduced noise emissions during winter months.	Short-term increase in noise levels during construction. No change from current levels during operations; minor increase in noise compared to No Action.
Floodplains	Negligible to minor impact to unmapped floodplain.	No impact to unmapped floodplain during construction and operations.
Surface Water	Minor beneficial impact to water quality. Negligible to minor adverse impact to water flow/levels due to reduced melt water contribution.	Negligible to minor adverse impact on water quality during construction. Negligible beneficial impact to water quality during operations compared to current conditions; minor adverse impact to water quality compared to No Action . Negligible impact to water flows/levels.
Ground Water	Negligible beneficial impact to water quality.	Negligible adverse impact on shallow ground water quality during construction. Negligible beneficial impact to water quality during operations compared to current conditions; negligible to minor adverse impact to water quality during operations compared to No Action.
Wetlands	Negligible indirect beneficial impact from increase in water quality. Negligible to minor adverse impact resulting from reduced melt water contribution to water levels.	Minor adverse impact on wetlands from fill of 0.18 acre during construction. Negligible beneficial impact from potential water quality effects during operations compared to current conditions; negligible adverse impact from potential water quality effects compared to No Action.

Table 2. Summary of Environmental Consequences Associated with Each Alternative (Continued)

	Alternative 1	Alternative 2
Biological Environment		
Terrestrial Wildlife Habitat or Species	No impact to migratory birds, threatened, endangered, or sensitive species. .	Minor direct adverse impact to individual goshawks from disturbance during construction and minor reduction in prey species from clearing 1.0 acre of disturbed vegetation. No impact to threatened or endangered species.
Aquatic/Riparian Wildlife Habitat or Species	Negligible beneficial impact to habitat and species due to improvements in water quality.	Minor direct adverse impact from fill of 0.18 acre disturbed wetland and potential from hydrocarbon spills during construction. Negligible beneficial impact during operations compared to current conditions; minor indirect impact from site operations compared to No Action.
Vegetation	No impact to vegetation.	Minor direct adverse impact from loss of 1.0 acre of disturbed upland vegetation and 0.18 acre of disturbed wetland vegetation.
Human Environment		
Compatible Land Use	No impact to land use compatibility.	No adverse impact to land use compatibility.
Outdoor Recreation	Negligible to minor beneficial impact on recreation.	Minor direct and indirect adverse impacts on recreation.
Environmental Justice	No impact to minority or low-income population.	No adverse impact on minority or low-income population.
Economic and Fiscal	Impact to economics and CBJ fiscal resources possible, depending on location on non-National Forest System lands developed for snow disposal.	Negligible to minor adverse fiscal impact to CBJ from development costs. Minor beneficial economic impact from construction employment and earnings.

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ENVIRONMENTAL CONSEQUENCES

This section summarizes the physical, biological, and human environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the chart above. The recently completed and reasonably foreseeable projects considered for the analysis of cumulative effects of the proposed action are described in Appendix A.

Air Quality

The EPA designated the Mendenhall Valley area of Juneau as a moderate non-attainment area when the federal Clean Air Act Amendments of 1990 were enacted. A non-attainment area is one in which the level of an air pollutant is higher than the level allowed by the federal standards. The non-attainment classification for the Mendenhall Valley was based on violations of the 24-hour standard for particulate matter (particles in the air with a diameter less than or equal to 10 micrometers [PM10]) that occurred throughout the 1980s. Sources of particulate matter were primarily fugitive dust (46% from paved roads and 40% from unpaved roads), residential wood smoke (10%), and other sources such as vehicle emissions (4%) (ADEC, 1993). Though air quality in the Mendenhall Valley has been monitored consistently over the past 20 years, there have been no measured violations of the EPA's PM10 standard since 1994. ADEC produced a Limited Maintenance Plan (LMP) for the Mendenhall Valley and requested the EPA reclassify the area under the LMP option. As a result, the EPA re-designated the Mendenhall Valley as a PM10 Maintenance Area (ADEC, 2011a). A maintenance area is an area that was designated non-attainment in the past but which currently meets air quality standards.

The Mendenhall Valley has also been close to exceeding the PM2.5 (particles with diameter less than 2.5 micrometers) health based standard of 24-hour fine particle standard; however, Juneau is not currently on the EPA's list of non-attainment areas for fine particle air pollution (ADEC, 2011b). Sources of fine particles in the Mendenhall Valley are wood burning stoves and vehicle emissions.

The CBJ Assembly has also designated the Mendenhall Valley as a Smoke Hazard Area due to particulate matter emissions from solid-fuel (wood) burning equipment. The CBJ has adopted measures to reduce environmental impacts from this type of equipment, particularly during times when particulate matter levels in the air are considered high.

Environmental Consequences

No Action Alternative: There would be a negligible to minor beneficial effect due to the fact that air emissions in the immediate vicinity of the BPA would decrease during winter months. If the No Action Alternative is selected, the CBJ would need to construct and operate the snow disposal site at some other location within the Mendenhall Valley.

Proposed Action Alternative: There would be a short-term increase in emissions during construction activities. Operation of a snow disposal site at the BPA would not change emissions

from current operations, but there would be a minor increase in noise compared to the No Action Alternative.

Cumulative Effects: Most of the reasonably foreseeable projects in the Juneau area would involve some type of construction activity, resulting in short-term increases in air emissions during construction activities. The effects of the Proposed Action considered with the effects of the cumulative projects are expected to be negligible to minor on local air quality.

Noise

The Mendenhall Valley and the BPA can be fairly noisy places during the summer tourist season, which is defined by the cruise ship schedule from early May to the end of September. Four different helicopter companies operate tours of the Juneau Icefield and Mendenhall Glacier from the Juneau area, and the flight path from companies operating from the Juneau International Airport takes groups of up to six helicopters at one time up the Thunder Mountain and Heintzleman Ridges to the Juneau Icefield (USFS, 1999 and CBJ, 2001). Though the flight path is not directly over the BPA, helicopters are easily heard during their approaches to and departures from the icefield. Between May and September each year, buses transporting cruise ship visitors load and unload over 350,000 passengers to the BPA. Peak visitation from cruise ship passengers was recorded in 2009 with 407,936 individuals entering the BPA; this number does not include independent travelers or residents who arrived at the BPA via non-commercial transportation modes. Model airplanes also use the BPA at the end of the day once the buses are gone. Winter season at the glacier and throughout the Mendenhall Valley is considerably quieter. There are no helicopter tours, no tour buses, and minimal local traffic.

Environmental Consequences

No Action Alternative: There would be a minor beneficial effect due to the fact that noise in the immediate vicinity of the BPA would be decreased during winter months under this alternative. If the No Action Alternative is selected, the CBJ would need to construct and operate the snow disposal site at some other location within the Mendenhall Valley.

Proposed Action Alternative: There would be a short-term increase in noise levels during construction activities. Noise in the vicinity of the BPA would remain similar to current levels during operation of the site. There would be a minor increase in noise levels during operation compared to the Not Action Alternative. The BPA is not near any residential areas that would be adversely affected by snow disposal site operations.

Cumulative Effects: Most of the reasonably foreseeable projects in the Juneau area would involve some type of construction activity, resulting in short-term increases in noise in construction areas during construction activities. The effects of the Proposed Action considered with the effects of the cumulative projects are expected to be negligible to minor on noise levels in the project area.

Floodplains

Flood Insurance Rate Maps from the Federal Emergency Management Agency (FEMA) were reviewed to identify floodplains on the proposed site (FEMA, 1990). The BPA is located outside mapped floodplains; however, a site-specific field study of the site identified a small floodplain near the southeast boundary of the tour bus parking area (Figure 6) (CBJ, 2011).

Environmental Consequences

No Action Alternative: The amount of water draining into this floodplain would be decreased under this alternative, increasing available capacity for high flow events. There would be negligible to minor beneficial effects on the unmapped floodplain at the BPA under this alternative. If the No Action Alternative is selected, the CBJ would need to construct and operate the snow disposal site at some other location within the Mendenhall Valley.

Proposed Action Alternative: Development of a snow disposal site at the BPA would not impact mapped floodplains. Additional storage would be provided by the treatment pond, resulting in higher capacities for high flow events.

Cumulative Effects: Development activities in floodplains would be regulated or in accordance with the Executive Order on floodplains on USFS lands and under CBJ's floodplain permitting process minimizing adverse effects on floodplains. The effects of the Proposed Action considered with the effects of the cumulative projects are expected to be negligible to minor on overall flood capacity in the local area.

Surface Water

Surface water is abundant in the Mendenhall Valley (see Figure 1). Mendenhall Lake at the terminus of the Mendenhall Glacier is located at the northern extent of the valley. The lake is drained by the Mendenhall River which flows south through the valley for approximately five miles before it outlets to the north end of Gastineau Channel.

The State of Alaska identifies impaired water bodies under the Clean Water Act. A designation of impairment indicates that the water body is not meeting the water quality standards for designated uses of the water body, such as drinking water, recreation, fish propagation, or other uses. Three creeks are designated as impaired water bodies in Mendenhall Valley: Jordan Creek, Duck Creek and Casa del Sol Creek (also known as Pederson Hill Creek). None of these creeks are located near the BPA.

The BPA is located just south of Mendenhall Lake and between Steep Creek and Dredge Creek (Figure 7). None of the water bodies adjacent to the BPA have been classified as impaired (ADEC, 2010). The headwaters of Steep Creek are located on the slopes at the northern end of Thunder Mountain. The creek flows north directly to Mendenhall Lake and is separated from the south end of the BPA (the Proposed Action site) by a small divide oriented perpendicular to the parking lot at its midpoint. Dredge Creek flows from the steep slopes of Thunder Mountain south to Dredge Lake, a manmade lake, and west to the Mendenhall River. Directly south of the BPA, a beaver pond drains into Dredge Creek. There are numerous manmade and natural lakes

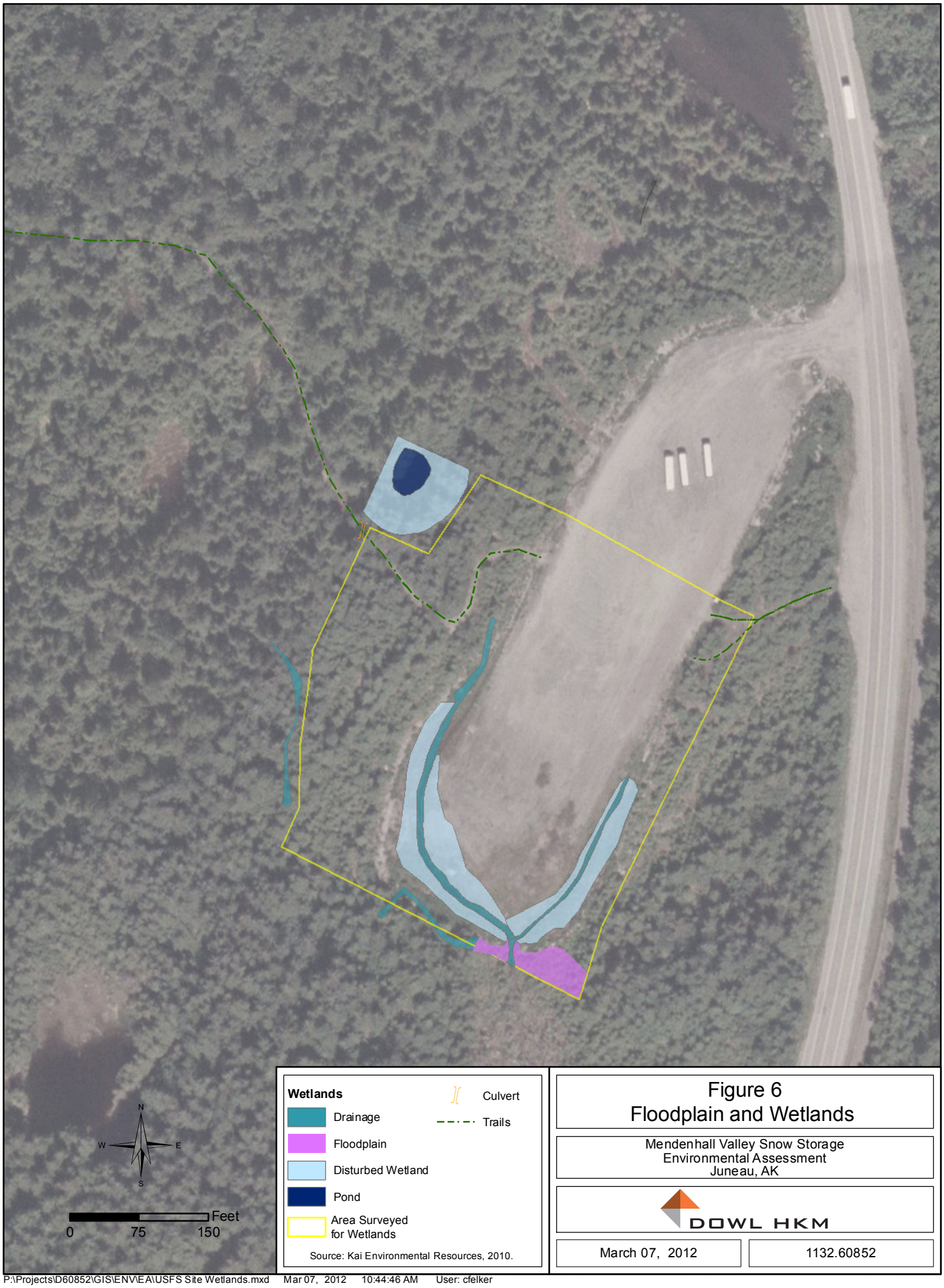

Figure 6
Floodplain and Wetlands

Mendenhall Valley Snow Storage
Environmental Assessment
Juneau, AK

DOWL HKM

March 07, 2012

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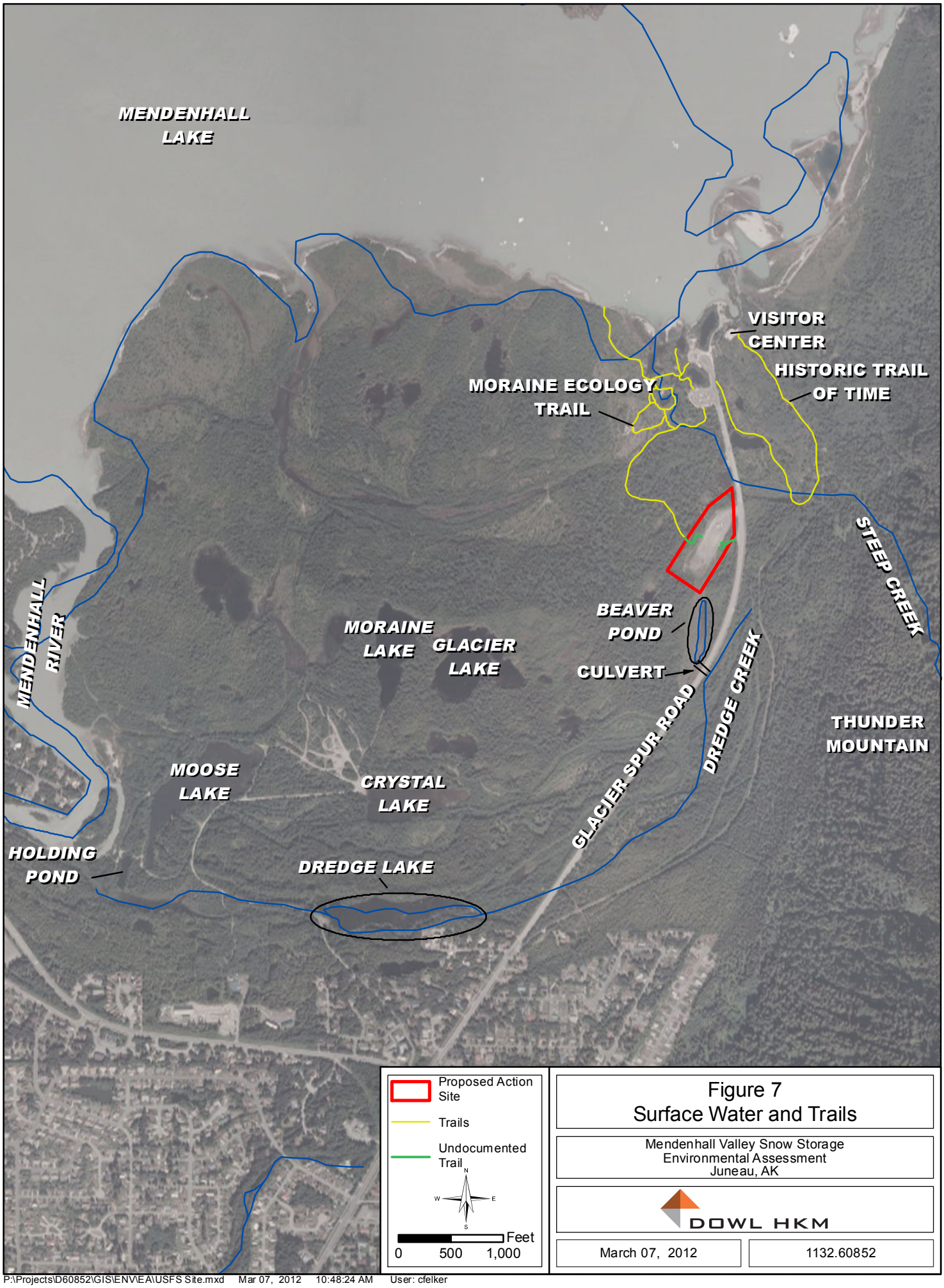

Figure 7
Surface Water and Trails

Mendenhall Valley Snow Storage
Environmental Assessment
Juneau, AK

DOWL HKM

March 07, 2012

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and ponds in the glacial outwash area south of Mendenhall Lake (Figure 7). Glacier Lake and Moraine Lake, two naturally formed kettle ponds, outlet south toward a series of manmade lakes. Crystal Lake, Moose Lake and the Holding Pond are manmade lakes that drain south and west to the Mendenhall River.

Drainage ditches around the southern perimeter of the tour bus parking lot flow directly into the beaver pond to the south. The ditches themselves have minimal bed and bank features, and seasonally variable water depths. From the floodplain identified on Figure 4 south to the beaver pond, the channel has a wetted width of approximately 2 feet, riffle morphology and a cobble-boulder substrate; some cover features are present. The beaver pond normally flows into Dredge Creek through a small diameter culvert under Glacier Spur Road. The beaver pond is oriented north to south along the road and covers an area of approximately 1.5 acres. During extreme high water, the pond also outlets south along the Glacier Spur Road drainage ditch to Crystal Lake.

Water quality sampling was conducted at the inlet and outlet of the beaver pond (downstream of the melting snow and the southern half of the bus parking lot) in October 2010 and June 2011 (results presented in Table 1, Appendix B). The sampling revealed the presence of barium, iron, magnesium, potassium and zinc. Water quality criteria for freshwater aquatic life are set for iron, but water quality criteria for zinc require a measure of water hardness, which was not obtained for these samples. There are no standards set for the others (ADEC, 2008). Iron levels in the water sampled at the pond inlet and outlet in June 2011 were below the water quality criteria for a chronic exposure level. Water sampled at the inlet in November 2010 exceeded the criteria for chronic exposure of iron (Table 1, Appendix B). Zinc was not detectable in the June 2011 water samples, but was present at low levels in the October 2010 water samples. Chloride was detected in all water samples, but at levels well below water quality criteria for acute and chronic exposure levels (ADEC, 2008). The samples were also tested for hydrocarbons, arsenic and mercury, but levels were below detectable limits (Table 1, Appendix B).

Because the tour bus parking lot straddles a divide between the Steep Creek and Dredge Creek drainages and contributes to the headwaters of Dredge Creek, there are no areas upstream of the snow disposal area to use in establishing the background water quality of Dredge Creek. Instead, samples were collected from Steep Creek upstream and downstream of the bus parking lot. Upstream samples provided some information on general water quality in the area, while downstream sample results provided information on whether runoff from the northern half of the lot used for parking buses is affecting water quality in Steep Creek. Differences in water quality between Dredge Creek and Steep Creek downstream of the lot may be attributed to snow storage and melt water on the Dredge Creek side of the lot.

Most metals detected in Dredge Creek were also present in Steep Creek, though at lower concentrations (Table 1, Appendix B). Exceptions are copper and zinc which were not detected in Steep Creek during either sampling period. The sources of heavy metals in stormwater, including copper, zinc and lead, are typically the dry and wet deposition of exhaust from diesel- and unleaded gas-fueled vehicles, tire wear and break pad wear (Armstrong, 1994; King County, 2011). Heavy metals are also transported in snow removed from urban streets and are present in melt water from snow storage sites (Novotny et al., 1999). Levels of barium, magnesium,

potassium, total suspended solids, and turbidity were slightly elevated downstream of the parking lot compared to upstream. Chloride levels were slightly lower downstream of the parking lot in October, 2010 compared to upstream; this result does not seem consistent with use of the parking lot for snow storage but the additional downstream flow in Steep Creek likely provided a dilution effect for any chlorides present. Turbidity was higher in the vicinity of the beaver pond compared to the upstream level in Steep Creek, but was still well below water quality criteria. The Steep Creek samples were also tested for hydrocarbons, arsenic and mercury, but levels were below detectable limits.

Water quality was also sampled at the tour bus parking lot three times each in 2007 and 2008 and once in 2009, but from puddles on the lot and the snow pile edges rather than at the inlet to the beaver pond (See Table 2, Appendix B). Chloride levels in those samples ranged between 0.6 mg/L and 42.6 mg/L, all well below water quality criteria for freshwater aquatic life. Arsenic was detected in some of these samples, and the highest concentration observed was 0.0048 mg/L from the parking lot puddles. This is well below the freshwater criteria for aquatic life of 0.34 mg/L for acute exposure and 0.16 mg/L for chronic exposure (ADEC, 2008). The metals detected (chromium, lead, and zinc) could not be compared to water quality criteria without knowing the hardness of the water (ADEC, 2008); hardness was not determined for these samples. The presence of heavy metals in water collected from the parking lot is consistent with use of the lot for diesel-fueled bus parking as well as storage of snow collected from urban streets. These samples were also analyzed for hydrocarbons using the Hexane Extractable Material test method for oil and grease and total petroleum hydrocarbons (EPA, 1995); in all but one sample taken April 17, 2007 from the parking lot puddles, hexane concentrations were below method reporting levels. Hexane was present at a concentration level of 5.6 mg/L in the parking lot puddles on that occasion, but there is no water quality criteria information available for either chronic or acute exposure to hexanes for freshwater aquatic life (ADEC, 2008).

Stormwater captured from the two parking lots closest to the BPA passes through oil-water separators before being discharged to Steep Creek near its outlet to Mendenhall Lake. Stormwater runoff in the bus parking lot infiltrates into the gravel parking surface, or is conveyed as surface water when the lot subsurface is saturated. All runoff from the southern half of the lot and the snow pile drains south to the existing ditches and beaver pond. Runoff from the northern half of the lot flows north to the Steep Creek drainage and Mendenhall Lake.

Stormwater along Glacier Spur Road runs into a ditch system which flows south toward Crystal Lake.

Environmental Consequences

No Action Alternative: The No Action Alternative will result in a reduction in the volume of water entering the beaver pond and Dredge Creek from the BPA. There would be a minor beneficial impact to water quality for runoff from the BPA, since the lot will continue to be used for tour bus parking. If the No Action Alternative is selected, the CBJ would need to construct and operate the snow disposal site at some other location within the Mendenhall Valley.

Proposed Action: Construction at the USFS site could result in direct short-term water quality impacts from the release of petroleum hydrocarbons such as lubricants or fuel from construction equipment, or release of sediment from ground disturbing activities. Again, construction BMPs would reduce the risk of unintentional release of hazardous materials and sediment. Given these measures, the proposed action will result in a negligible to minor adverse direct impact on water quality during construction.

Operation of the proposed project could have a negligible beneficial impact to water quality compared to current conditions. Based on water quality sampled in Steep Creek and the beaver pond, continued use of the area for tour bus parking, and the design of the proposed detention pond, the proposed action would result in minor adverse impacts to surface water quality compared to the No Action Alternative.

The volume of melt water contributing to flow in Dredge Creek and Dredge Lake will continue to be higher than under the No Action Alternative; but the proposed action will not change flows in Dredge Creek and the volume of water in Dredge Lake compared to current conditions.

Cumulative Effects: The projects considered in the cumulative effects analysis typically involve construction activities, which could have short-term, mostly local, adverse effects on surface water quality from soil disturbance and erosion. The water quality effects would be minimized through compliance with the state's general construction permit for stormwater discharges. Cumulative effects on local surface water are anticipated to be negligible to minor.

Ground Water

Unconsolidated deposits of silt, sand and gravel comprise the water-yielding aquifer in the Mendenhall River Valley (United States Geological Survey [USGS], 1999). The aquifer consists of alluvial and glacial deposits which are intermixed with water-confining silt and clay beds. Water enters the aquifer primarily as seepage through the bed of the Mendenhall River; precipitation accounts for a smaller amount of water entering the aquifer. Glacial melt water also contributes to the aquifer. It is channeled through bedrock valleys until it emerges onto the alluvial and glacial deposits of the aquifer (USGS, 1999). The majority of ponds and lakes in the area south of Mendenhall Lake are ground water fed. Ground water also discharges to the lower reaches of streams, directly to salt water bodies, by evapotranspiration, or to wells. Freshwater in the Mendenhall Valley aquifer is hydraulically connected to saltwater bodies such that if the freshwater column is lowered enough (drawn down by wells), saltwater can migrate inland and contaminate the freshwater in the aquifer (USGS, 1999).

A geotechnical investigation conducted at the BPA in October 2011 revealed shallow ground water at two to four feet below the surface (DOWL HKM, 2011). This shallow ground water is hydrologically connected to surface water and flows south to the beaver pond and Dredge Creek drainage.

Environmental Consequences

No Action Alternative: This alternative is expected to have a negligible beneficial impact on ground water quality and levels. Pollutants associated with snow melt would be reduced and less water would infiltrate into the site to raise the shallow water table. If the No Action Alternative is selected, the CBJ would need to construct and operate the snow disposal site at some other location within the Mendenhall Valley.

Proposed Action: Construction activities such as slope grading have the potential to directly impact ground water near the surface; petroleum hydrocarbons such as lubricants or fuel used in construction equipment could be spilled, or sediment released. Construction BMPs would reduce the risk of unintentional release of hazardous material or contaminated waste. The proposed action will result in negligible adverse direct impacts to water quality during construction.

Operation of the proposed project could have a negligible beneficial impact to water quality compared to current conditions. Based on water quality sampled in Steep Creek and the beaver pond, continued use of the area for tour bus parking, and the design of the proposed detention pond, the proposed action could result in minor adverse impacts to ground water quality compared to the No Action Alternative.

Cumulative Effects: The projects considered in the cumulative effects analysis typically involve construction activities, which could have adverse effects on ground water through unintentional releases of fuels or other pollutants during construction activities. These effects would be minimized through BMPs used to reduce the potential for discharge of pollutants. Cumulative effects on local ground water are anticipated to be negligible to minor.

Wetlands

USFWS' National Wetland Inventory (NWI) maps identify wetlands in close proximity to the BPA that are classified as freshwater ponds (NWI, 2011). The beaver pond is not visible on the aerial imagery or the mapped wetland layer on the NWI website. Two small freshwater emergent wetlands are also indicated within a half mile of the parking lot; one to the northwest and one to the southwest (see Figure 8).

The Juneau Wetlands Management Plan (JWMP) does not cover the area near the BPA, but wetlands areas within and directly adjacent to the site were delineated and mapped by CBJ in 2011 during the scoping phase of this project (CBJ, 2011). The drainage ditches along the southern perimeter of the bus parking lot are surrounding by disturbed wetlands and flow through a small floodplain area as they move towards the beaver pond (see Figure 6). These wetlands are flat areas with standing water that surround the parking lot drainage ditches. They have been impacted by pea gravel fill, most likely from past snow storage activities and the tour bus parking area. Due to existing site conditions, United States Army Corps of Engineers (USACE) is currently considering whether or not to take jurisdiction of the area (CBJ, 2011). Another small drainage was noted to the west of the southern end of the lot (CBJ, 2011). West of the midpoint of the parking lot is a pond surrounded by palustrine scrub/shrub wetland.

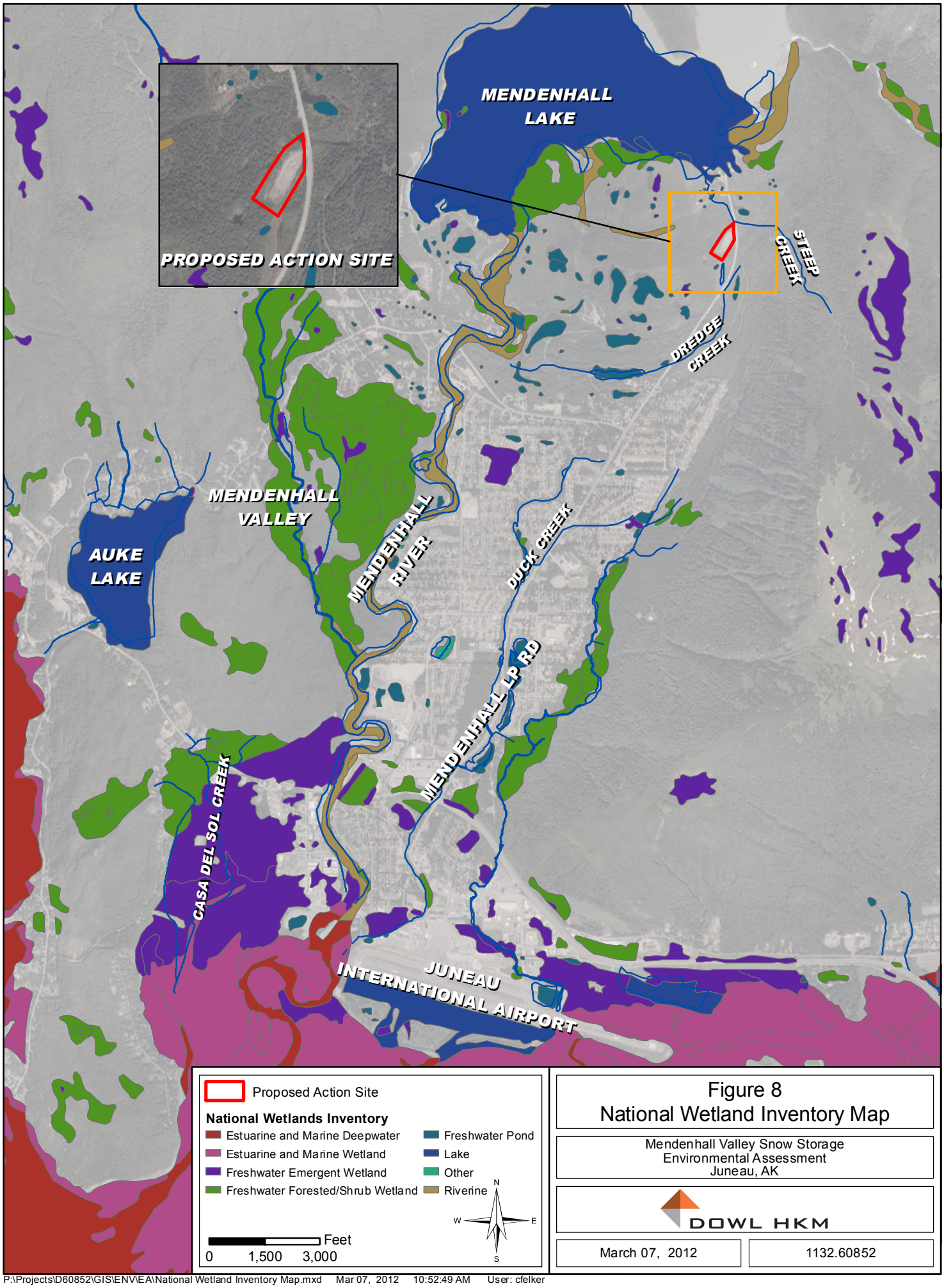

Figure 8
National Wetland Inventory Map

Mendenhall Valley Snow Storage
Environmental Assessment
Juneau, AK

DOWL HKM

March 07, 2012

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Environmental Consequences

No Action Alternative: Under the No Action Alternative, snow disposal at the BPA would be discontinued. The volume of snow melt water discharged to adjacent wetlands would be reduced with removal of the snow disposal site. Changes in water quantity could affect the hydrology and soils of the site, as well as the type of vegetation that grows there. This could reduce the area of wetlands surrounding the tour bus parking lot. Changes in water quality would have negligible indirect benefits to the wetlands, as the site would continue to be used for tour bus parking. If the No Action Alternative is selected, the CBJ would need to construct and operate the snow disposal site at some other location within the Mendenhall Valley.

Proposed Action: There would be a low potential for spills during construction as stated above. Construction would also result in minor long-term adverse impacts to wetlands from the fill of approximately 0.19 acres of disturbed wetlands and 0.08 acres of natural and manmade drainages. All fill material would be clean and free of contaminants.

Snow melt water could potentially contaminate the disturbed wetlands, ditches and floodplains on the site with heavy metals, hydrocarbons, sediment, and chlorides. Based on water quality sampled in Steep Creek and the beaver pond, continued use of the area for tour bus parking, and the design of the proposed detention pond, the proposed action could result in a negligible beneficial impact to wetlands compared to current conditions and negligible adverse impact compared to the No Action Alternative.

Cumulative Effects: The proposed action would result in the filling of a small amount of disturbed wetland. Other recent and proposed projects could also result in impacts to wetlands in the Mendenhall Valley and Juneau overall. Wetland effects are minimized and mitigated, if necessary, through local and federal permitting processes and compliance with Executive Order 11990 on National Forest System lands. Cumulative effects on wetlands in the Mendenhall Valley are anticipated to be minor.

Wildlife Habitat

Terrestrial

Mammals

Black bears (*Ursus americanus*) are abundant in close proximity to the BPA, especially during late summer and early fall when salmon are spawning in the valley creeks.

Brown bear (*U. arctos*) are less abundant, but do occur in the Mendenhall Valley; they prefer the less developed areas of the Montana Creek and Nugget Creek drainages. Wolves (*Canis lupus*), coyote (*Canis latrans*), and red fox (*Vulpes vulpes*) have also been observed in winter on occasion near the BPA, when they descend in elevation from the Nugget Creek and Steep Creek drainage. Smaller mammals that occur or are expected to occur in the valley include Sitka black-tailed deer (*Odocoileus hemionus sitkensis*), beaver (*Castor Canadensis*), porcupine (*Enthezon dorsatum*), marten (*Martes americanus*), marmot (*Marmota caligata*), river otter (*Lutra canadensis*), snowshoe hare (*Lepus americanus*), red squirrel (*Tamiascuirus hudsonicus*) and

northern flying squirrel (*Glaucomys sabrinus yukonensis*), ermine (*Mustela ermine*), little brown bat (*Myotis lucifugus*), and several species of voles (*Microtus* sp. and *Clethrionomys* sp.).

Birds

Bald and golden eagles and their nests are protected under the Bald Eagle Protection Act (16 U.S.C. Section 668 et seq.), which is regulated by the United States Fish and Wildlife Service (USFWS). Migratory birds in general are protected under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703). Under MBTA it is illegal for anyone (unless permitted by regulations) to "take" (hunt, pursue, wound, kill, posses, or transport) migratory birds, their eggs, feathers, or nests. Destruction of active bird nests, eggs, or nestlings can result from spring and summer vegetation clearing and grubbing, which would violate the MBTA. No bald or golden eagle nests are known to be present near any of the sites (USFWS, 2011).

A number of migratory songbirds and resident songbirds protected under the MBTA may occur near the USFS site. The Birds of Juneau Alaska Checklist lists 282 species that have been observed along the Juneau road and trail system (Juneau Audubon Society, 2007). Of these, 32 species are common or fairly common in forested areas of Juneau. They include songbirds such as swallows (*Hirundo rustica* and *Tachycineta bicolor*), winter wren (*Troglodytes troglodytes*), thrushes (*Catharus ustulatus*, *C. guttatus*, *Ixoreus naevius*, and *Turdus migratorius*), warblers (*Vermivora celata*, *Dendroica coronate*, *D. petechia*, *D. townsendi*, and *Wilsonia pusila*), sparrows (*Passerculus sandwichensis*, *Melospiza melodia*, and *M. lincolnii*), dark-eyed junco (*Junco hyernalis*), chestnut-backed chickadee (*Poecile rufescens*), Pacific slope flycatcher (*Empidonix difficilis*), American pipit (*Anthus rubescens*), red crossbill (*Loxia curvirostra*), common redpoll and pine siskin (*Cardeulis flammea* and *C. pinus*). Corvids are also common in the area, including Steller's jay (*Cyanocitta stelleri*), northwestern crow (*Corvus caurinus*), common raven (*C. corax*), and black-billed magpies (*Pica hudsonia*). Common and fairly common raptors are limited to American kestrel (*Falco sparverius*) and merlin (*F. columbarius*). Red-breasted sapsucker (*Sphyrapicus ruber*) and rufous hummingbird (*Selasphorus rufus*) are also typically observed.

Members of the Juneau Audubon Society have identified the BPA as a good place to observe Townsend's solitaire (*Myadestes townsendi*, rare in Juneau), alder flycatchers (*E. alnorum*, uncommon in Juneau), and various warblers in the shrub habitat surrounding the existing parking area.

Threatened, Endangered, and Sensitive Species

There are no terrestrial species listed as threatened or endangered in the Tongass National Forest. There are a number of sensitive species that have been identified in the Tongass, but most do not occur within the area impacted by the proposed action (DOWL HKM 2012). Although the site is not located in productive old-growth forest, the sensitive species Queen Charlotte goshawk (*Accipiter gentilis laingi*) is known to breed within the Dredge Lakes area with nest sites located 0.5 miles southwest of the bus parking lot (last known active nest in territory) and 0.6 miles east-northeast of the bus parking lot in the Nugget Creek area (historic nests, presumed inactive).

Environmental Consequences

This is a summary of more detailed analyses available as part of the Project Planning Record that can be found at the Juneau Ranger District. Potential impacts to wildlife were analyzed in two documents in accordance with USFS Manuals 2672 and 2620: a biological evaluation (BE) to address endangered, threatened, and proposed species listed under the Endangered Species Act, as well as USFS Alaska Region Sensitive Species, and a wildlife report to address Tongass National Forest management indicator species (MIS), and migratory birds.

No Action Alternative: Under the No Action Alternative, there would be no impacts to migratory birds, threatened, endangered, or sensitive species at the BPA. If the No Action Alternative is selected, the CBJ would need to construct and operate the snow disposal site at some other location within the Mendenhall Valley.

Proposed Action Alternative: Construction of the snow disposal pad and detention pond will occur in summer months during the goshawk breeding season and there is some potential for construction noise to disturb individuals (DOWL HKM 2012). Clearing of up to 1.0 acre of disturbed vegetation could have a direct minor impact on individual goshawks. These disturbances are expected to be localized and/or of short duration and would likely result in minor effects on those individuals. While this area is not considered optimal habitat for goshawk, it is within the foraging area of a known goshawk nest; the actual location of the nest is not known. The vegetation to be removed may not be suitable for nesting, but could occur within 600 feet of a nest. As directed on page 4-100 of the Forest Plan (USDA 2008), a goshawk nesting survey would be conducted prior to construction.

There is some potential that clearing of up to 1.0 acre of disturbed vegetation would result in the nests of some migratory birds being destroyed or abandoned during the nesting season. The area would be thoroughly surveyed for active nests prior to clearing, if scheduled during the nesting season. Construction activities would also result in localized disturbance, which could temporarily displace some individuals of a variety of species. These disturbances are expected to be localized and/or of short duration and would likely result in negligible effects on those individuals.

Cumulative Effects: The proposed action would result in the loss of a small amount of habitat. Other recent and proposed projects could also result in impacts to habitat in the Mendenhall Valley and Juneau overall. Cumulative effects on local wildlife are anticipated to be negligible to minor.

Riparian/Aquatic

Western toads (*Bufo boreas*) are widespread in Southeast Alaska. They breed in ponds, lakes, streams and backwater habitats and overwinter in burrows within forested habitat adjacent to aquatic features (ADFG, 2011a). The species potentially occurs near the BPA (Armstrong et al., 2004).

There are many fish species that occur in waterbodies in Mendenhall Valley. The Mendenhall River is listed in the Anadromous Waters Catalog (AWC, #111-50-10500) for presence of

sockeye, coho, chum, and pink salmon (*Oncorhynchus nerka*, *O. kisutch, O. keta,* and *O. gorbushca,* respectively), steelhead (*O. mykiss*), cutthroat trout (*O. clarki*) and Dolly varden (*Salvelinus malma*) (ADFG, 2011b).

Steep Creek is considered anadromous due to presence of sockeye, including spawning habitat (AWC #111-50-10500-2006). The Dredge Creek and Dredge Lake complex are considered anadromous due to presence of and rearing habitat for coho, and presence of pink salmon, cutthroat trout, and Dolly Varden (AWC #111-50-10500-2004). The beaver pond adjacent to the south end of the USFS bus parking lot is directly connected via a 24-inch culvert under Glacier Spur Road to upper reaches of Dredge Creek. A survey of the beaver pond and creek on September 13, 2011 confirmed the presence of juvenile coho and Dolly Varden in both the pond and upper reaches of the creek (ADFG, 2011c, Appendix C). Coho captured above the culvert in the beaver pond were large and beginning to smolt, while coho captured below the culvert were young-of-the-year up to 80 mm. The inlet of the culvert was noted to be in poor condition and plugged with debris.

Environmental Consequences

This is a summary of more detailed analyses available as part of the Project Planning Record that can be found at the Juneau Ranger District. Potential impacts to riparian and aquatic species were analyzed in two documents in accordance with USFS Manuals 2672 and 2620: a biological evaluation (BE) to address endangered, threatened, and proposed species listed under the Endangered Species Act, as well as USFS Alaska Region Sensitive Species, and a wildlife report to address Tongass National Forest MIS.

No Action Alternative: Under the No Action Alternative, there would be negligible beneficial impacts to riparian and aquatic species and habitat due to improvements in water quality. If the No Action Alternative is selected, the CBJ would need to construct and operate the snow disposal site at some other location within the Mendenhall Valley.

Proposed Action: Construction of a snow disposal site at the BPA could have minor adverse effects on riparian and aquatic species due to the fill of 0.18 acres of disturbed wetlands on the site. Other potential impacts could result from release of petroleum hydrocarbons, such as lubricants or fuel used to operate heavy equipment, or sediment from ground disturbing activities. Hydrocarbon spills and leaks from construction machinery, or sedimentation from erosion of exposed soils could result in harm to individual coho or Dolly Varden. Construction BMPs would reduce the potential for these effects. Harmful effects are expected to be localized and/or of short duration and would likely result in minor adverse impacts on those individuals (DOWL HKM 2012).

Operation of the site could also have direct and indirect adverse impacts to aquatic life by introducing contaminants to these habitats from snow melt water. Heavy metals, sediment, and chlorides often found in snow melt water, if released to surface waters in concentration levels toxic to aquatic freshwater life, would result in harm to individual coho or Dolly Varden. A water quality monitoring program will be developed and implemented by the CBJ to ensure melt water discharged to anadromous surface waters does not contain contaminants with levels above those toxic to aquatic life, including fish. This measure in combination with the design of the

treatment pond could result in negligible beneficial impacts compared to current conditions. Harmful effects are expected to be localized and/or of short duration and would likely result in minor adverse impacts on those individuals compared to the No Action Alternative (DOWL HKM 2012). Project activities will also result in a negligible reduction in disturbed wetlands. Impacts to water quality and fish species from this reduction would be negligible.

Cumulative Effects: The proposed action would result in minor adverse effects on riparian and aquatic species. Other recent and proposed projects could also result in impacts on these species. Cumulative effects on riparian and aquatic resources are anticipated to be negligible to minor.

Vegetation

Forests in the Mendenhall Valley are dominated by early successional Sitka spruce, which is youngest at recently exposed terrain near the face of the glacier (BPA) and somewhat more mature (less than 150 years old) as distance from the face of the glacier increases. The young forest is composed of a single-layered closed canopy (stem exclusion) which allows very little sunlight to reach the forest floor; the herbaceous layer is primarily moss and there is no shrub layer within these forested areas. Edge habitats are densely vegetated with deciduous shrubs and trees such as alder, cottonwood and willows. Forested areas are intermixed with meadow or bog areas with less well-drained soils. These wet areas are dominated by sedges, rushes and grasses.

Threatened, Endangered, and Sensitive Species

The Alaska Natural Heritage Program (ANHP) database was consulted regarding records of threatened, endangered, or sensitive plant species occurrences. The database shows there are no threatened or endangered plant species listed in southeast Alaska (ANHP, 2011). The USFS Alaska Region Sensitive Plant list identifies three species that could potentially occur in the ditches and parking lot shoulders around the BPA may provide suitable habitat for these species; all three are moonworts of the *Botrychium* genus (USFS, 2011a). Spatulate moonwort (*B. spathulatum*) is known to occur on Kruzof Island near Sitka and in southern Yukon Territory. Habitat types include coniferous forest, forest edge, forest woodland, grassland/herbaceous, old field, sand/dune, coniferous woodland, herbaceous wetland, riparian, and habitats associated with moderate disturbance (NatureServe 2012). The general habitat for the species includes human disturbance in historically well drained areas (USFS, 2011b). Moosewort moonwort (*B. tunux*) is known from sparsely vegetated upper beach sand habitat in the Yakutat and Cordova areas of Southeast Alaska (NatureServe, 2012). The general habitat description for the species include human disturbance in historically well drained areas (USFS, 2011b). Yakutat moonwort (*B. yaaxudakeit*) is known from sparsely vegetated upper beach sand habitat in the Yakutat and Cordova areas of Southeast Alaska (NatureServe, 2012). General habitat for all three moonwort species includes human disturbance in historically well drained areas (USFS, 2011b).

Environmental Consequences

This is a summary of more detailed analyses available as part of the Project Planning Record that can be found at the Juneau Ranger District. Potential impacts to vegetation were analyzed in two documents in accordance with USFS Manual 2670. A biological evaluation and a botany

resource report were completed to address endangered, threatened, and proposed species listed under the Endangered Species Act, as well as USFS Alaska Region Sensitive Species, general vegetation and rare plants.

No Action Alternative: Under the No Action Alternative, there would be any adverse impacts to vegetation at the BPA beyond those associated with use of the parking area for bus parking. If the No Action alternative is selected, the CBJ would need to construct and operate the snow disposal site at some other location within the Mendenhall Valley.

Proposed Action Alternative: The proposed action would require clearing of approximately one acre of previously disturbed vegetation to construct the proposed snow disposal site and the fill of 0.18 acres of disturbed wetland vegetation. The upland vegetation is comprised of early successional and pioneering species that do well in recently disturbed areas and the vegetation is not unique in the Mendenhall Valley. The disturbed areas immediately surrounding the BPA have the potential to provide habitat for three species identified as sensitive in the Tongass National Forest. A field survey for sensitive plants will be conducted prior to the start of any new construction at the BPA to ensure any plants, if present, are avoided. The survey will also delineate presence of any rare or invasive plant species at the USFS site so that impacts to rare plants are avoided and spread of invasive species is prevented.

The proposed action will result in a minor direct adverse impact on vegetation at the USFS site.

Cumulative Effects: The proposed action would result in a minor adverse impact on vegetation. Other recent and proposed projects could also result in impacts on vegetation. Cumulative effects on vegetation are anticipated to be negligible to minor.

Compatible Land Use

Mendenhall Glacier Recreation Area Management Plan

The most current management plan for the Mendenhall Glacier Recreation Area (MGRA) was finalized in 1996 (USDA, 1996) as an amendment to the 1997 Tongass National Forest Land and Resource Management Plan (Tongass Plan). The MGRA plan provides overall management direction and objectives for the MGRA, and takes precedence over the higher level Tongass Plan for this area. The overall management direction of the 1996 plan is to:

Manage the area principally for recreation use while retaining the area substantially in its natural condition. Primary emphasis will be placed on protecting natural resource values while balancing natural resource use with human recreation needs.

Specific management objectives are provided for each of five management units within the MGRA. The management units include the Visitor Center Unit, Dredge Lakes Unit, West Lakeshore Unit, McGinnis Mountain Unit, and Mendenhall Lake Unit (Figure 9). The BPA is located in the Visitor Center Unit at the boundary of the Dredge Lakes Unit. The 1996 plan uses a Recreation Opportunity Spectrum (ROS) to describe the recreation opportunities to be provided

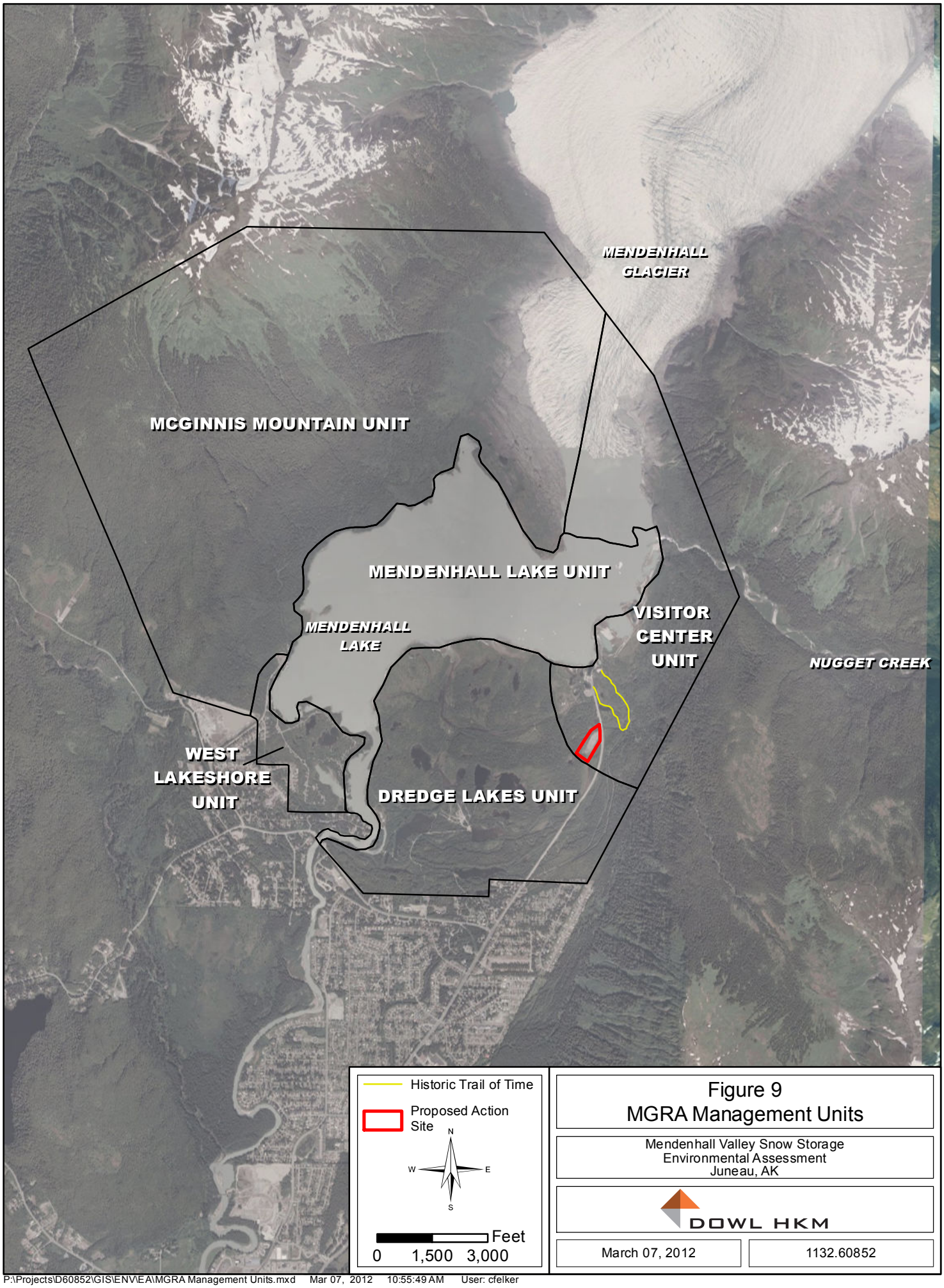

Figure 9
MGRA Management Units

Mendenhall Valley Snow Storage
Environmental Assessment
Juneau, AK

DOWL HKM

March 07, 2012 | 1132.60852

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in each management unit of the recreation area. The Visitor Center Unit is designated as Urban class and the Dredge Lake Unit is primarily classified as Roaded Natural (USDA, 1996). Urban ROS class areas are managed for high concentrations of people and frequent interactions between large numbers of users. Facilities such as visitor's centers and campgrounds are well developed with complex interpretive amenities available. Motorized access and travel facilities are standard. Roaded Natural areas typically see low to moderate concentrations of human use, and interaction between users is substantially less than in Urban classes (USDA, 1996). As such, the Visitor Center Unit is intensively managed and accommodates heavy use, while the Dredge Lakes Unit is managed for low to moderate use and dispersed recreation.

Environmental Consequences

No Action Alternative: Under the No Action Alternative, snow disposal at the USFS site would not occur and the area would continue to be used as a tour bus parking area. This alternative would have no impact on consistency with the MGRA management plan.

Proposed Action: Since the Visitor Center Unit of the MGRA is classified as an urban area and is managed to accommodate a high volume of people and mechanized transportation; construction and operation of the snow disposal site at the USFS would be consistent with the management plan. The proposed action will result in no impacts to management of the MGRA.

Cumulative Effects: The relevant USFS projects considered as part of the cumulative effects analysis are expected to comply with the provisions of the MGRA management plan.

Outdoor Recreation

The BPA is located in the Tongass National Forest and within the MGRA. Outdoor recreation is the predominant human activity in the surrounding area; parking is the primary activity at the BPA. Hiking, mountain biking, wildlife viewing, sightseeing, ice skating, cross-country skiing, rafting, kayaking and camping are the most common uses of the MGRA. Many of the participants are local Juneau residents, but in summer visitors from out of state are more common. The great majority of tourists arrives on cruise ships and spends less than a day in town. They take hiking, biking, or rafting tours, view wildlife such as salmon, bears, beavers, and porcupine, and enjoy the impressive scenery of the Mendenhall Glacier and surrounding natural areas. Guided walking and biking tours are offered in the MGRA that use the trail which bisects the Project Area. Local residents, including members of the Juneau Audubon Society, use the trail for birding and accessing the Moraine Ecology Trail.

The Gastineau Aeromodelers Society (GAS) has an improved gravel runway within the BPA that they use for take offs and landings of their model airplanes. GAS use of the site occurs primarily on summer evenings after tour buses have left the lot, but can also occur on weekends during winter months. Friends and family members of GAS members often gather at the BPA to watch the planes.

Environmental Consequences

No Action Alternative: Snow disposal at the BPA would not occur under this alternative. This could have a negligible to minor beneficial effect on other recreation uses in and around the BPA. If the No Action Alternative is selected, the CBJ would need to construct and operate the snow disposal site at some other location within the Mendenhall Valley.

Proposed Action: Construction of a snow disposal site at the BPA could have temporary direct impacts on recreation uses of the area during construction activities. In addition, operation of the site could have direct impacts on recreation users during snow hauling operations. Most recreation uses of the area occur in the summer and fall however, and snow hauling operations would occur during the winter. Other indirect impacts on recreation could occur due to the visual intrusion of the snow pile on recreation users.

GAS members have expressed concerns about potential effects a berm and/or fencing could have on their use of the BPA. The potential effect is expected to be minor, however, as the height of the berm is lower than any vehicles that might otherwise be parked in this area. Further coordination with GAS during final site design is expected to minimize the effect on GAS' use of the BPA.

Given the low number of recreation users in the winter months at the BPA and the current use of the site as a tour bus parking area, direct and indirect adverse impacts on recreation are expected to be minor.

Cumulative Effects: The projects considered as part of the cumulative effects analysis are not anticipated to have substantive adverse effects on outdoor recreation. Short-term adverse effects could occur in localized areas during construction activities. The proposed action would result in construction disturbances, but these are expected to be short-term and minor. Cumulative effects on outdoor recreation are anticipated to be negligible to minor.

Environmental Justice

Executive Order 12898 requires that a Federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its activities on minority and low-income populations. In considering issuing the special use permit for a snow disposal site on National Forest System lands, the Forest Service must determine whether the proposed action would have a disproportionately high and adverse human health or environmental effect on the residents within the proposed project area who are classified as members of a minority population.

There are no residences close to the USFS site.

Environmental Consequences

No Action Alternative: This alternative would not disproportionately affect minority or low-income populations. There would be no environmental justice impact. If the No Action

Alternative is selected, the CBJ would need to construct and operate the snow disposal site at some other location within the Mendenhall Valley.

Proposed Action: There are no residences near the USFS site and it would not disproportionately affect minority or low-income populations. There would be no environmental justice impact.

Cumulative Effects: The projects considered as part of the cumulative effects analysis are not anticipated to have substantive adverse effects on environmental justice.

Economic and Fiscal Setting

The CBJ has a population of 31,711 and serves as the State capitol and a regional service hub for Southeast Alaska (U.S. Census Bureau, 2011). Employment within the CBJ is dominated by local and state government employment (41%), followed by employment in trade, utilities and transportation (19%). Construction accounts for 5% of CBJ employment and mining for just over 2%. Overall, unemployment in the CBJ has consistently been lower than the state unemployment rate over the last ten years (Alaska Department of Labor and Workforce Development [ADLWD], 2011).

Both median family incomes ($76,437) and household incomes ($88,429) in the CBJ in 2009 were approximately 17-18% higher than statewide incomes (ADLWD, 2011). Although mining accounts for only 2% of employment, wages in mining are the highest, averaging $86,400 in 2009 (ADLWD, 2011). Government wages range from $47,200 for state and local employees to $77,900 for federal employees. Construction employees earned an average of $59,600.

The CBJ budget for 2012 totals $325 million (CBJ, 2012). Revenues are dominated by user fee and permit revenues (40%), state revenues (22%), sales tax (14%) and property tax (13%). The 2012 budget for the Public Works Streets Division is $5.3 million. Costs associated with winter street maintenance operations ranged from $1.2 to $1.9 million from 2006-2010, with contractor costs for hauling snow accounting for up to 84% of the total cost in high snow years (DOWL HKM, 2010).

Environmental Consequences

No Action Alternative: The No Action Alternative would not directly impact the social or economic environment in Juneau. If the No Action Alternative is selected, the CBJ would need to construct and operate the snow disposal site at some other location within the Mendenhall Valley. CBJ costs for hauling snow could increase or decrease depending on changes in snow disposal operations.

Proposed Action: Development of a snow disposal site at the BPA would have negligible to minor short-term costs to the CBJ for site development, estimated at $570,000. The construction would have minor beneficial impacts on the economy from construction jobs and earnings. Operating costs would not change substantively from current costs. No economic impacts to

tour bus operators are anticipated, as the snow storage pad would be situated such that bus traffic is not affected.

Cumulative Effects: The projects considered as part of the cumulative effects analysis are not anticipated to have substantive fiscal effects on the USFS or CBJ. Construction activities would likely have short-term beneficial effects on the local economy.

Resources Not Affected

The Proposed Action and No Action Alternative will not affect the following resource categories.

Roadless Area

The BPA is located outside the Juneau Urban Inventoried Roadless Area. The BPA lies within 500 feet of Glacier Spur Road. Since the proposed site is within a developed area, use of the BPA for a snow disposal site would not have any adverse effect on roadless area values.

Historical and Cultural Resources

Cultural resources are the objects, structures, features, monuments, districts, artifacts, and landscapes that represent the activities of people. The Alaska Heritage Resources Survey (AHRS) database was consulted to identify potential cultural resources on or near the BPA. The National Register of Historic Places (National Register) database was also reviewed to determine if any listed places were on or near the site.

The only known site in the general area of the BPA is the Trail of Time (Historic Mendenhall Glacier Trail, JUN-1114). The Trail of Time has been determined eligible for the National Register under Criterion A for its association with the development of tourism and recreation at Mendenhall Glacier and for its association with the Civilian Conservation Corps (CCC). The Trail of Time is separated from the BPA by the Glacier Spur Road and forested areas. Given the separation from the site and the vegetation conditions in the area, the Trail of Time is not expected to be affected by development of a snow disposal site in the tour bus parking area.

There is a trail from the BPA to the west which has not yet been documented and may be remnant of an old CCC trail (Figure 7). The trail is located north of the proposed development area. Construction of the USFS bus parking lot has previously impacted this trail and ground disturbance associated with this project will have no further impact. Given the recent outwash from the retreating glacier, there is little potential for buried, undiscovered prehistoric resources in the area.

On February 14, 2012 the SHPO concurred with the USFS that the proposed action will result in No Historic Properties Affected.

Hazardous Material and Waste

The ADEC Contaminated Sites database was investigated for known contaminated sites around the BPA. There are no active contaminated sites within 0.5 miles of the BPA. The potential for encountering hazardous materials or wastes at the BPA is minimal.

CONSULTATION AND COORDINATION

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

FEDERAL, STATE, AND LOCAL AGENCIES:

United States Environmental Protection Agency
United States Army Corps of Engineers
United States Fish and Wildlife Service
National Marine Fisheries Service
Alaska Department of Environmental Conservation
Alaska Department of Natural Resources
Alaska Department of Fish and Game
Alaska State Historical Preservation Officer
City and Borough of Juneau

TRIBES:

Central Council Tlingit & Haida Indian Tribes of Alaska
Goldbelt, Incorporated
Sealaska Corporation
Douglas Indian Association

OTHERS:

Juneau Chamber of Commerce
Juneau Watershed Partnership
Gastineau Aeromodelers Society
Beaver Patrol
Juneau Audubon Society
Southeast Conference
Cycle Alaska
Gastineau Guiding
Princess Cruiselines

The personnel involved in preparing this EA are listed in the following table.

Table 3: List of Preparers

Name	Affiliation/Project Role	Profession
Federal Agency Reviewers		
Marti Marshall	USFS/Review	Juneau Ranger District, District Ranger
Jim Case	USFS /Review	Juneau Ranger District, Land Use
Karen Iwamoto	USFS /Review	Tongass National Forest, NEPA/Planning
Project Sponsor		
Michele Elfers	CBJ/ Project Manager	Engineering
Ed Foster	CBJ Public Works / Review Facility Operations	Street Maintenance Director
Hazel Reynolds	CBJ Public Works / Review Facility Operations	Street Maintenance, Valley Shop Supervisor
Contractor		
Maryellen Tuttell, AICP	DOWL HKM/ Project Manager; Author, Project Alternatives; QA/QC	Manager of Planning and Environmental Services
Bradley Melocik, PE	DOWL HKM/ Design Engineer	Senior Engineer
Hilary Lindh	DOWL HKM/ Author, Affected Environment and Environmental Consequences	Environmental Specialist-Biologist
Irene Gallion	DOWL HKM/ Public Involvement	Planner
Michelle Ritter	DOWL HKM/ Cultural Resources	Planner

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APPENDICES

APPENDIX A

CUMULATIVE PROJECTS CONSIDERED

Past, Present, and Reasonably Foreseeable Projects
Within the Temporal and Geographic Boundaries
of the No Action and Proposed Action Alternatives

Recently Completed Actions

USFS Nugget Creek Falls Trail: New trail construction completed 2011, several bridges required.

DOT&PF Glacier Highway Spur Road: Pavement Rehabilitation, replace drainage as required 2010

Present Actions

USFS Mendenhall Glacier Recreation Area Management Plan: Updating of 1996 Recreation Plan, requesting comments from local and guided users of the recreation area until November 1, 2011. NEPA documentation is required and the plan should be finalized in 2013.

USFS Scenic Overlook: Trail of Time, construction fall 2011 through spring 2012.

USFS Ongoing Trail Maintenance: Trail of Time, fall 2011 through fall 2012.

Foreseeable Future Actions (Projects Approved, May Be Subject to Funding Availability)

USFS Installation of an Intelligent Traffic System: Small sensors on concrete pads and signs will be installed in the bus parking lot, and signs will be installed along Glacier Spur Road.

USFS West Glacier Trailhead Improvements: Installation of vault toilets and construction of a shelter at the commercial launch area anticipated in 2012.

USFS Mendenhall Glacier Visitor Center: A need has been identified for additional restroom facilities at the MGVC.

USFS Trail Maintenance: Maintenance of existing trails at both MGVC and West Glacier locations will continue to be required. Activities may include vegetation clearing, interpretive amenities, or trail re-surfacing.

CBJ Mendenhall Valley Snow Disposal Site: If the USFS does not issue a special use permit for snow disposal at the MGVC tour bus parking area, CBJ would need to construct an alternative Valley snow disposal site. The new site would likely be located at a site off Cinema Drive or off Industrial Boulevard.

APPENDIX B

WATER QUALITY SAMPLING RESULTS

Table 1. Water Quality Sampling Results from Downstream of USFS Site and Steep Creek 2010-2011.

Analyte	Beaver Pond Inlet		Beaver Pond Outlet		Downstream Steep Crk.		Upstream Steep Crk.		Reporting Limit (RL) TestAmerica Lab, Inc.	Method Reporting Limit (MRL) Analytica Group Lab	Aquatic Life Criteria for Fresh Water[1]	
	10/26/2010	6/6/2011	10/26/2010	6/6/2011	10/26/2010	6/6/2011	10/26/2010	6/6/2011			Acute	Chronic
Mercury (mg/L)	<MRL	ND	<MRL	ND	<MRL	ND	<MRL	ND	0.0002	0.0002	0.0014	0.00077
Arsenic (mg/L)	<MRL	ND	<MRL	ND	<MRL	ND	<MRL	ND	0.05	0.1	0.34	0.15
Barium(mg/L)	0.064	0.058	0.049	0.029	0.049	0.029	0.041	0.0298	0.01	0.01	Not Listed	Not Listed
Chromium (mg/L)	<MRL	ND	<MRL	ND	<MRL	ND	<MRL	ND	0.01	0.01	0.016	0.011
Copper(mg/L)	0.012	ND	<MRL	ND	<MRL	ND	<MRL	ND	0.01	0.005	Appendix A*	
Iron(mg/L)	1.6	0.765	0.072	ND	0.072	ND	<MRL	ND	0.1	0.05	Not Listed	1.0
Lead (mg/L)	<MRL	ND	<MRL	ND	<MRL	ND	<MRL	ND	0.05	0.05	Appendix A*	
Magnesium(mg/L)	0.92	1.32	0.82	0.445	0.82	0.445	0.6	0.455	0.1	0.1	No Information	
Potassium(mg/L)	1.4	1.74	1.5	ND	1.5	ND	1	ND	1.0	1.0	No Information	
Zinc(mg/L)	0.0073	ND	ND	ND	ND	ND	ND	ND	0.02	0.005	Appendix A*	
TSS (mg/L)	<MRL	ND	<MRL	ND	<MRL	ND	7	ND		4	No Information	
Turbidity(NTU)	5.2	ND	0.57	ND	0.57	ND	0.23	ND		0.1	May not exceed 25 NTU above natural conditions[2].	
Chloride(mg/L)	0.856	18.200	0.603	ND	0.603	ND	0.670	ND	0.5	0.5	860	230
1,2-Dichlorobenzene	<MRL		<MRL		<MRL		<MRL			0.003	Unlisted	
1,3-Dichlorobenzene	<MRL		<MRL		<MRL		<MRL			0.003	Unlisted	
1,4-Dichlorobenzene	<MRL		<MRL		<MRL		<MRL			0.003	Unlisted	

Benzene	<MRL	ND	<MRL	ND	<MRL	ND	<MRL	ND	0.0005	0.001	Unlisted
Chlorobenzene	<MRL		<MRL		<MRL		<MRL			0.001	Unlisted
Ethylbenzene	<MRL	ND	<MRL	ND	<MRL	ND	<MRL	ND	0.0005	0.001	Unlisted
Toluene	<MRL	ND	<MRL	ND	<MRL	ND	<MRL	ND	0.0005	0.001	Unlisted
Xylenes, Total	<MRL	ND	<MRL	ND	<MRL	ND	<MRL	ND	0.0001	0.003	Unlisted
Acenaphthene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		Unlisted
Acenaphthylene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		No Information
Anthracene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		Unlisted
Benzo(a) anthracene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		No Information
Benzo (a) pyrene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		Unlisted
Benzo(b) fluoranthene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		No Information
Benzo (ghi) perylene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		No Information
Benzo (k) fluoranthene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		No Information
Chrysene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		No Information
Debenzo (a,h) anthracene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		No Information
Fluoranthene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		Unlisted
Fluorene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		Unlisted

Indeno (1,2,3-cd) pyrene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		No Information
Naphthalene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		No Information
Phenanthrene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		No Information
Pyrene		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		Unlisted
Total Aqueous Hydrocarbons		ND>0.0048		ND >0.0049		ND>0.0048		ND >0.0049	0.0048-0.0049		No Information

[1]Water Quality Criteria for Toxic and Other Deleterious Organic and Inorganic Substances, ADEC, 2008.
[2]Water Quality Standards, ADEC, 2011c.
*Appendix of ADEC Water Quality Criteria; limit must be calculated based on water hardness.
ND= Not Detected, or below level detectable in laboratory analysis.
MRL=Method Reporting Limit for Analytica Group. laboratory
RL=Reporting Limit for TestAmerica Laboratories, Inc.

Table 2. Water Quality Sampling Results from 2007-2009.

Analyte	Back Edge Creek			Parking Lot Puddles			Control Parking Lot	Snow Dump		Valley Snow Dump	Method Reporting Limti (MRL)	Aquatic Life Criteria for Fresh Water[1]	
	4/12/2007	4/17/2007	4/26/2007	4/12/2007	4/17/2007	4/26/2007	3/24/2008	3/24/2008	4/24/2008	1/20/2009		Acute	Chronic
Mercury (mg/L)	<MRL	<MRL	-	<MRL	<MRL	-	<MRL	<MRL	<MRL	-	0.0002	0.0014	0.00077
Arsenic (mg/L)	<MRL	<MRL	-	0.00476	0.00426	-	<MRL	0.00409	0.000236	-	0.1	0.34	0.15
Chromium (mg/L)	0.00437	0.00734	-	0.0442	0.0384	-	0.0172	0.0470	0.00124	-	0.01	0.016	0.011
Lead (mg/L)	0.00304	<MRL	-	0.023	0.0199	-	0.0133	0.0617	0.000154	-	0.05	Appendix A*	
Zinc (mg/L)	0.0286	0.0192	-	0.166	0.133	-	0.0192	0.1740	-	-	0.005	Appendix A*	
Magnesium (mg/L)	0.902	0.909	-	10.0	9.49	-	1.1	11	0.386	-	0.1	Unlisted	Unlisted
Chloride (mg/L)	19.6000	42.6	32.4**	1.11	1.91	0.601**	3.94	11.5	0.952	25.8**	0.5	860	230
Hexane (mg/L)	<5.4	<5.4	-	<5.4	5.6	-	<5.7	<5.4	<5.8	<5.3**	5.4-5.8	No Information	

[1]Water Quality Criteria for Toxic and Other Deleterious Organic and Inorganic Substances, ADEC, 2008.
*Appendix of ADEC Water Quality Criteria; limit must be calculated based on water hardness.
**only analysis conducted on these samples
MRL=Method Reporting Limit for Analytica Group. laboratory

APPENDIX C

DREDGE CREEK FISH SAMPLING MEMORANDUM

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

DIVISION OF HABITAT

SEAN PARNELL, GOVERNOR

Douglas Island Center Building
802 W. 3rd Street, Douglas
P.O. BOX 110024
JUNEAU, AK 99811-0024
PHONE: (907) 465-4105
FAX: (907) 465-4759

MEMORANDUM

TO: Jackie Timothy
Regional Supervisor

DATE: 9/13/2011

FILE NO:

SUBJECT: Dredge Creek Trapping

FROM: Tess Quinn
Fish and Wildlife Technician IV TQ

TELEPHONE NO: (907) 465-1635

On Tuesday, September 13, 2011, Fish and Wildlife technician Matt Kern and I met with Environmental Specialist Hilary Lindh from Dowl HKM out at the flooded beaver pond adjacent to the bus parking area by the Mendenhall Glacier visitor center. The purpose of the visit was to set baited minnow traps in the pond and below the culvert in the stream. This activity would provide information on the presence of anadromous fish in the pond and Dredge Creek, and how this environment would be affected by the area being used for City and Borough of Juneau snow storage.

Matt and I set a total of thirteen minnow traps baited with treated salmon eggs. Seven traps were set in various habitat types above the culvert connecting the pond with Dredge Creek. Six traps were set below the culvert in Dredge Creek. The traps were set in the morning and allowed to soak overnight. We returned to the site the next morning to find all but one trap teeming with big healthy coho salmon and Dolly Varden. 283 coho salmon and three Dolly Varden were captured below the culvert and 28 coho salmon and 10 Dolly Varden were captured in the beaver pond. We noted that the coho captured above the culvert in the pond were large and beginning to smolt, while the coho captured below the culvert were young-of-the-year up to 80mm.

We discussed that the culvert possibly posed a challenge to fish until certain water flow, or until the fish were large enough to pass the pipe. The inlet of the culvert is mangled and plugged with debris, but the outlet seems intact and juvenile coho were schooled up at the mouth of the pipe. Fixing this pipe would enhance upstream movement of juvenile fish and create more available rearing habitat.

Waypoint	Latitude	Longitude	Notes	Sample Effort	Sample Results
1	58.408265	-134.54723	Trap sent on side of pond next to large boulder.	Minnow Trap	6 CO, 70-100mm; 5 DV, 90-100mm
2	58.40828	-134.54747	Trap set in middle of beaver pond, in LWD.	Minnow Trap	2 CO, 75-80mm
3	58.408401	-134.54753	Trap set near island in LWD.	Minnow Trap	No Fish
4	58.408294	-134.54768	Trap set near island between boulder and LWD.	Minnow Trap	1 CO, 85mm
5	58.40819	-134.54753	Trap set in middle of pond near LWD.	Minnow Trap	1 CO, 75mm
6	58.40814	-134.54741	Trap set on roadside bank in LWD	Minnow Trap	4 CO, 70-110mm
7	58.407988	-134.54763	Trap set between two boulders near roadside bank.	Minnow Trap	5 DV, 100-180mm
8	58.408011	-134.54706	Trap set at outlet of culvert.	Minnow Trap	85 CO, 45-80mm
9	58.407958	-134.54718	Trap set just below outlet of culvert.	Minnow Trap	60 CO, 45-75mm; 1 DV, 70mm
10	58.407941	-134.5471	Set trap along roadside retaining wall bank.	Minnow Trap	13 CO, 35-60mm
11	58.407917	-134.54714	Trap set along river-right bank.	Minnow Trap	45 CO, 45-75mm; 2 DV, 70-200mm
12	58.407883	-134.54721	Trap set in pool debris jam .	Minnow Trap	47 CO, 40-80mm
13	58.407841	-134.54726	Trap set in small side pool.	Minnow Trap	33 CO, 45-70mm
14	58.410416	-134.54708	Top of pond at bus parking lot.		
15	58.411567	-134.5473	Top of creek. Reduces to a seep.		

Table 1: Dredge Creek Sample Data

Figure 1: Looking upstream on beaver pond.

Figure 2: Looking downstream on upper limit of Dredge Creek.

Figure 4: Trap full of coho below culvert.

Figure 3: Dolly Varden below culvert.

Figure 5: Dredge Lakes Trap Site Map

CC List:

Jackie Timothy, Southeast Regional Supervisor
Hilary Lindh, Dowl HKM Environmental Specialist
Thor Eide, JRD/ANM Bio Sci Tech
Matt Kern, Fish and Wildlife Technician IV