Environmental Assessment
For a
Gravel Acquisition Plan
Denali National Park and Preserve
Alaska

United States Department of the Interior
National Park Service
Denali National Park and Preserve

May 2003

184/111789

United States Department of the Interior

NATIONAL PARK SERVICE
Denali National Park and Preserve
Post Office Box 9
Denali Park, Alaska 99755

IN REPLY REFER TO:

May 23, 2003

Dear Reader:

We are seeking your review of and substantive comments on the enclosed environmental assessment (EA) and subsistence evaluation regarding a 10-year plan to produce mineral materials (sand, gravel, and rock) to maintain the Denali Park Road and other park facilities in Denali National Park and Preserve. This draft EA addresses the requirements in the National Environmental Policy Act of 1969 and Title VIII of the Alaska National Interest Lands Conservation Act of 1980 (ANILCA). Section 810 of ANILCA requires an evaluation of the potential restrictions to subsistence activities that could result from the proposed plan.

Four action alternatives and a no-action alternative are evaluated in this EA. At this time, the National Park Service (NPS) has no clear preference between alternatives 4 and 5; both would satisfy NPS needs for mineral materials in an environmentally and economically sound manner. The no-action alternative would not meet the NPS needs to maintain the park road in a safe condition for park buses and visitors.

Public comments will be accepted until June 23, 2003. Public meetings on the EA will be held on the following dates and in the following locations to address any questions or comments you might have at that time:

Monday, June 9	Anchorage; 7:00 – 10:00 p.m.: National Park Service Regional Office, 3rd Floor Conference Room, 2525 Gambell Street.
Tuesday, June 10	McKinley Village; 7:00 - 10:00 p.m.; Community Center; Mile 230 George Parks Highway.

Your comments will allow for selection or modification of an alternative that provides adequate supplies of mineral materials to maintain the park road and other park facilities at a reasonable cost with minimal adverse impacts to park resources and values. We look forward to hearing from you.

Sincerely,

Paul R. Anderson

Paul R. Anderson
Superintendent

L7619 (AKSO-RER)

June 4, 2003

Dear Reader:

We recently sent you an environmental assessment (EA) and subsistence evaluation regarding a 10-year plan to produce mineral materials (sand, gravel, and rock) to maintain the Denali Park Road and other park facilities in Denali National Park and Preserve. The May 2003 cover letter stated we would hold public meetings on the EA on Monday, June 9 in Anchorage from 7:00 to 10:00 p.m. at the National Park Service Regional Office and on Tuesday, June 10 in the McKinley Village Community Center from 7:00 to 10:00 p.m. Because of conflicts with the North Access Study Project open house meetings, the Gravel Acquisition Plan EA open house meetings will be scheduled to coincide with the North Access Study open house meetings at the following times and locations:

- **Tuesday, June 10, from 5 PM to 8 PM at the Tri-Valley Community Center in Healy, Alaska, and**

- **Thursday June 12, from 5 PM to 8 PM at the Loussac Library Wilda Marston Theater, Anchorage, Alaska.**

We hope this letter reaches you in time and the revised schedule helps to reduce the number of public meetings you plan to attend. We look forward to seeing you.

Sincerely,

Bud Rice

Bud Rice
Project Manager

cc:
Superintendent DENA

National Park Service
U.S. Department of the Interior

Denali National Park
and Preserve

P.O. Box 9
Denali Park, Alaska
99755

907-683-9583
907-683-9617 fax

Denali National Park and Preserve News Release

Date: May 23, 2003
For Immediate Release
Contact: Stacey Chadwick

Environmental Assessment for A Gravel Acquisition Plan Denali National Park and Preserve, Alaska

The National Park Service (NPS) has released for public comment an Environmental Assessment (EA) which evaluates the impacts associated with the development and use of mineral materials (rock, gravel, and sand) along the Denali Park Road in Denali National Park and Preserve.

The NPS is evaluating the no-action alternative and four action alternatives to address the park needs for mineral materials over the next ten years. The no-action alternative allows continued use of mineral materials from external sources, the Teklanika Pit near milepost (MP) 29 of the park road, the Toklat River extraction area near MP 54, and completion and reclamation of the North Face Corner site near MP 89. This alternative does not satisfy the projected ten-year needs to maintain and rehabilitate deteriorating conditions of the park road and other facilities, particularly at its western end.

The action alternatives would satisfy the projected ten-year mineral material needs along the Denali Park Road with varying approaches. The second alternative would authorize the NPS to extract mineral materials from up to nine sites, thereby reducing truck-hauling distances. The third alternative would focus on three large sites with more emphasis placed on obtaining mineral material needs from external sources, thereby reducing extraction impacts in the park. Alternative 4 and 5, the NPS preferred alternatives, would allow extraction of mineral materials from up to 5 sites during any one year during the 10-year planning period. Phase one of these two alternatives would authorize extraction near MP 91 at former gold mining claims in the Downtown Kantishna area, with the aim to reclaim the area at the end of the extraction period. The second phase of these alternatives would authorize extraction at either North Face Corner or Moose Creek Terrace near MP 89, if needed, near the end of the ten-year period.

Printed copies of the EA will be distributed to local libraries, visitor centers, and those who request printed copies. The EA will be posted on the Denali National Park and Preserve web site at: *http://www.nps.gov/dena/home/planning/~~saea.html~~*.

The EA will be available for public review on May 27, 2003. The public comment period closes June 27, 2003. If you would like to comment on the project, please submit your comments in

writing to Superintendent, Denali National Park and Preserve, P.O. Box 9, Denali Park, Alaska 99755. Comments also may be e-mailed to *DENA_Public_Comments@nps.gov*

The NPS will make a decision about the gravel acquisition plan after the close of the public comment period and consideration of those comments.

Please specify in the subject line that you wish to comment the Gravel Acquisition Plan EA. If you have any questions about the EA, please call the Superintendent's office at (907) 683-9581 or the project manager, Bud Rice at (907) 257-2466.

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ABSTRACT

This *Environmental Assessment for the Gravel Acquisition Plan* considers the no-action alternative and four action alternatives to obtain mineral materials (rock, gravel, and sand) to maintain the Denali Park Road and park facilities within Denali National Park and Preserve. This plan updates the 1992 Borrow Use Management Plan, which was intended to cover approximately 10 years. Since completion and implementation of the Denali Entrance Area and Road Corridor Environmental Impact Statement of 1996, the NPS finds it needs more mineral materials to complete the projects outlined in that plan. The NPS seeks public and local, state, and federal agency comment on the environmental assessment (EA) and the NPS preferred alternatives. The NPS is complying with the National Environmental Policy Act of 1969 and other applicable laws and regulations in addressing this plan and decision.

The no-action alternative and four action alternatives and their expected impacts are briefly described below.

- **Alternative 1 - No-Action Alternative:** This alternative would result in continued use of the approved material extraction sites at Teklanika Pit and Toklat River at the extraction rates approved in the 1992 Borrow Use Management Plan. It also includes the minimal extraction remaining at the North Face Corner to facilitate reclamation of that site and completion of a bus turnaround and visitor rest stop. All mineral material needs beyond the volume supplied by the in-park resources would need to be imported from external sources.

- **Alternative 2 – Maximum Flexibility/Short Hauls:** This alternative would result in authorization to extract mineral material from up to 8 sites and use of the North Face Corner for processing and stockpiling until reclamation at a future date. The 8 extraction sites would be Teklanika Pit, East Fork River, Toklat River, Beaver Pond, Boundary, Camp Ridge, Downtown Kantishna, and Kantishna Airstrip.

- **Alternative 3 – Minimum Visual Intrusion/Long Hauls:** This alternative would result in the development of one new major extraction site at the western end of the park road in addition to Teklanika Pit and Toklat River, namely the Moose Creek Terrace site. Use of external sources would be emphasized for the first four park road segments. The NPS would enter into agreements with ADOT, the Alaska Railroad, or AHTNA Corporation to secure long-term use of material sites along the George Parks Highway. Teklanika Pit would be used primarily for stockpiling of external source material, and for minimal extraction and screening for road surfacing material only. All of these sites are distant or shielded from view of the visiting public on the Denali Park Road.

- **Alternative 4 – Phased Development with Moderate Number of Sites *(NPS Preferred)*:** This alternative would authorize use of 5 extraction sites at any one time, including phased development at the western end of the park road, as needed. Sites in this alternative would include Teklanika Pit, East Fork River (for emergencies), Toklat River, Beaver Pond, Downtown Kantishna, and Moose Creek Terrace. The first phase would involve the extraction of material at Downtown Kantishna, with the goal to reclaim those former mining claims. The Moose Creek Terrace site would be developed only after Downtown Kantishna was exhausted and material was needed for projects at the western end of the park road.

- **Alternative 5 – Economic Alternative with Moderate Hauls *(NPS Preferred)*:** This alternative would be similar to Alternative 4, except in phase 2 the North Face Corner site would be developed after Downtown Kantishna was exhausted and material was needed for projects at the western end of the park road.

BRIEF SUMMARY OF IMPACTS

- **Alternative 1 - No-Action Alternative** would result in negligible to minor impacts to the park's air quality, geologic resources, hydrology, water quality, aquatic resources, wildlife values and habitat, vegetation and wetlands, floodplains, cultural resources, scenic values, subsistence and wilderness. This alternative would adversely affect no more than about 1 acre of surface area and have no new wetlands impacts. This alternative would result in the importation of up to 220,000 cubic yards (CY) of material over 10 years, which would result in greater emissions of fugitive dust and more damage to the park road from about 228,000 gravel truck miles. Scenic values and public access and safety along the park road would be adversely affected more from this alternative than others because of increased gravel hauling. NPS objectives to maintain and improve road safety

conditions, particularly at the western end, would be compromised. Local business could benefit from increased purchases from external sources, but Kantishna businesses may suffer if road conditions deteriorate.

- Alternative 2 would result in negligible to minor impacts to the park's air quality, geologic resources, hydrology, water quality, aquatic resources, wildlife values and habitat, vegetation and wetlands, floodplains, cultural resources, subsistence and wilderness. This alternative would result in the greatest new surface disturbance in the park of about 5 acres and the destruction of up to 19.4 acres of wetlands, including the least common wetland types of all alternatives. This alternative would produce up to 362,500 CY of gravel from the park and require up to about 12,500 CY of imported material. Fugitive dust and damage to the park road from about 108,000 miles of gravel hauling would be minimized, but the increased number of sites in the Kantishna area could adversely affect visitor access and safety in that area of the park. Scenic integrity along the park road would be compromised at a greater number of sites, particularly in the Kantishna area, than with any other alternative. NPS objectives to maintain and improve road safety conditions, particularly at the western end, would be realized. Local business would not benefit from increased purchases from external sources, but road conditions at the western end of the park road would be maintained so that Kantishna area businesses would not be adversely impacted.

- Alternative 3 would result in negligible to minor impacts to the park's air quality, geologic resources, hydrology, water quality, aquatic resources, wildlife values and habitat, vegetation and wetlands, floodplains, cultural resources, scenic values, subsistence and wilderness. This alternative would adversely affect 2.6 acres of surface area and 8.5 acres of wetlands over the next 10 years. This alternative would produce about 240,000 CY of gravel from park sources and require importing up to 135,000 CY of material. Impacts from fugitive dust and damage to the park road from 175,000 gravel truck miles would be intermediate between no-action and Alternatives 2, 4, and 5. Damages to the park road would be greatest in the eastern part of the park. Scenic integrity along the park road would be protected with fewer sites away from the road corridor. NPS objectives to maintain and improve road safety conditions, particularly at the western end, would be realized. Local business would benefit from increased purchases from external sources, and road conditions at the western end of the park road would be maintained so that Kantishna area businesses would not be adversely impacted.

- Alternative 4 would result in negligible to minor impacts to the park's air quality, geologic resources, hydrology, water quality, aquatic resources, wildlife values and habitat, vegetation and wetlands, floodplains, cultural resources, scenic values, subsistence and wilderness. This alternative would adversely affect about 3.3 acres of surface area and 12.4 acres of wetlands over the next 10 years, not including the Downtown Kantishna area, which was previously disturbed. This alternative would produce up to 362,500 CY of gravel from the park and require up to about 12,500 CY of imported material. Fugitive dust and damage to the park road from about 106,000 miles of gravel hauling would be minimized. Scenic integrity would be compromised at up to 6 locations along the park road, but most of these would be hidden from public view. The Moose Creek Terrace site would adversely impact hikers along the popular Moose Creek valley for a couple of years at the end of the 10-year period. Local business would not benefit from increased purchases from external sources, but road conditions at the western end of the park road would be maintained so that Kantishna area businesses would not be adversely impacted.

- Alternative 5 impacts would be nearly identical to those described for Alternative 4, except in phase 2 of the project the North Face Corner site would be developed instead of Moose Creek Terrace. This would impact the scenic integrity along the park road for all visitors to the Kantishna area at the end of the 10-year period.

A decision (finding of no significant impact) will be released ~~within 15 workdays~~ after the end of the comment period on the EA. For further information contact: Robert Arnberger, Regional Director, National Park Service, Alaska Regional Office, 2525 Gambell Street, Anchorage, Alaska 99503 (907-257-2690) or Paul Anderson, Superintendent, Denali National Park and Preserve, P.O. Box 9, Denali Park, Alaska 99755 (907-683-9581).

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CHAPTER 1
PURPOSE AND NEED

The National Park Service proposes to identify sources from which mineral material, principally gravel, may be obtained to meet administrative needs for park construction projects along and maintenance of the 93-mile-long Denali Park Road. This Gravel Acquisition Plan and Environmental Assessment evaluates five alternatives that describe a range of options for potential gravel extraction sites and their concomitant haul distances and restoration objectives. The purpose is to identify gravel borrow sources that will meet administrative needs of Denali National Park and Preserve for at least the next 10 years.

In fall 1998 park staff reviewed the existing Gravel Acquisition Plan (NPS 1992) and determined it was inadequate to meet projected needs over the next 10 years. The existing approved gravel acquisition plan addresses the demand for routine road maintenance needs only. The plan specified use of the Teklanika Pit and Toklat River as the primary source sites from within the park. The 1992 plan does not address mineral materials necessary for park road reconstruction and new facility construction associated with the 1997 Entrance Area and Road Corridor Development Concept Plan, also known as the Frontcountry Plan (NPS 1997). Additionally, no gravel sources were identified on the western end of the park road, which results in unreasonably long haul distances for any roadwork requiring gravel past Mile 63.

The Frontcountry Plan indicated annual future gravel needs would be about 8,000 cubic yards for routine maintenance and up to 26,400 cubic yards (cy) for repairs and improvements. Appendix C of the Frontcountry Plan amended the Gravel Acquisition Plan to allow use of gravel from in-park sources to correct safety concerns, for structural and geometric road repairs, and for other reconstruction and improvements. This plan also states the NPS would continue to investigate alternative materials and evolving technologies to minimize gravel requirements in maintenance activities. This plan identified the future gravel source sites as Teklanika Pit, Teklanika River, Toklat River, private lands and previously disturbed NPS lands in Kantishna, and as a last resort the Moose Creek Terrace about 1 mile upstream of the North Face Lodge. A more recent gravel needs assessment indicates the park would need just under 375,000 cy of material from 2003 through 2012, or about 37,500 cy/yr (Appendix A). An updated, comprehensive plan is needed to identify appropriate mineral material sources to adequately provide for park needs with minimal adverse effects on park resources.

The goal of this plan is to provide adequate volume and quality of mineral materials to maintain the park road to its historic character as emphasized in park road plans, the General Management Plan, and the Frontcountry Plan (NPS 1982, 1986, 1994, and 1996.) Mineral materials are needed for both road rehabilitation projects that are required to meet this objective, and for routine maintenance and repairs.

Road character should remain in keeping with the character of the land; a primitive, low-speed road located in a wild and pristine land. Road character has four threads:

1) Provide access to wilderness,
2) telescope from urban (paved from entrance to Savage River, milepost [MP] 0 to MP 14.9) to rustic (two-lane gravel through rolling terrain from Savage River to Teklanika River, MP 14.9 to MP 30) to primitive (one-lane winding gravel road with passing areas over mountainous terrain from Teklanika River westward, beyond MP 30),

3) remain a sinuous path emphasizing the dramatic terrain, and
4) keep engineered structures, signs, and other items to a minimum.

Furthermore, the 1986 GMP and appendix C of the Front Country DCP/EIS indicate the park road driving surface should remain gravel, and the 1994 Road System Evaluation indicates the park road beyond MP 30 should be constructed of native materials where applicable.

This environmental assessment (EA) has been prepared to evaluate potential environmental impacts of the NPS preferred alternative and other alternatives and to inform the public, regulatory agencies and other interested parties. The EA findings and public comment will form the basis for a decision by the NPS Alaska Regional Director regarding gravel acquisition for the park. The NPS has analyzed alternatives and mitigating measures to minimize adverse environmental impacts to the park. This document has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and regulations of the Council of Environmental Quality (40 CFR Part 1500).

BACKGROUND

A single, 93-mile road serves Denali National Park and Preserve. The park road provides controlled vehicle access into the park for visitors, park administration, and inholders. The road begins at the junction with the George Parks Highway (Alaska Highway 3) and ends at the Kantishna airstrip (Map 1.1).

The park road has an asphalt surface from Mile 0.0 at the George Parks Highway to the Savage River Bridge at Mile 14.9, where controlled access begins beyond the check station. The remainder of the road has a gravel surface. The road prism and surface condition vary considerably from the Savage River Bridge to the Kantishna Airstrip. Calcium chloride, a dust palliative, is applied to the park road from the Savage River Bridge at Mile 14.9 to the Teklanika River Bridge at Mile 31.2 to reduce fugitive dust and help retain fines on the road surface. This in turn helps reduce the loss of gravel material and the rate of wear and tear on the road. In summer 2002 the NPS tested the application of calcium chloride to the park road between Mile 72 and 74. The dust palliative may be applied to additional segments of the park road after environmental testing and monitoring is instituted.

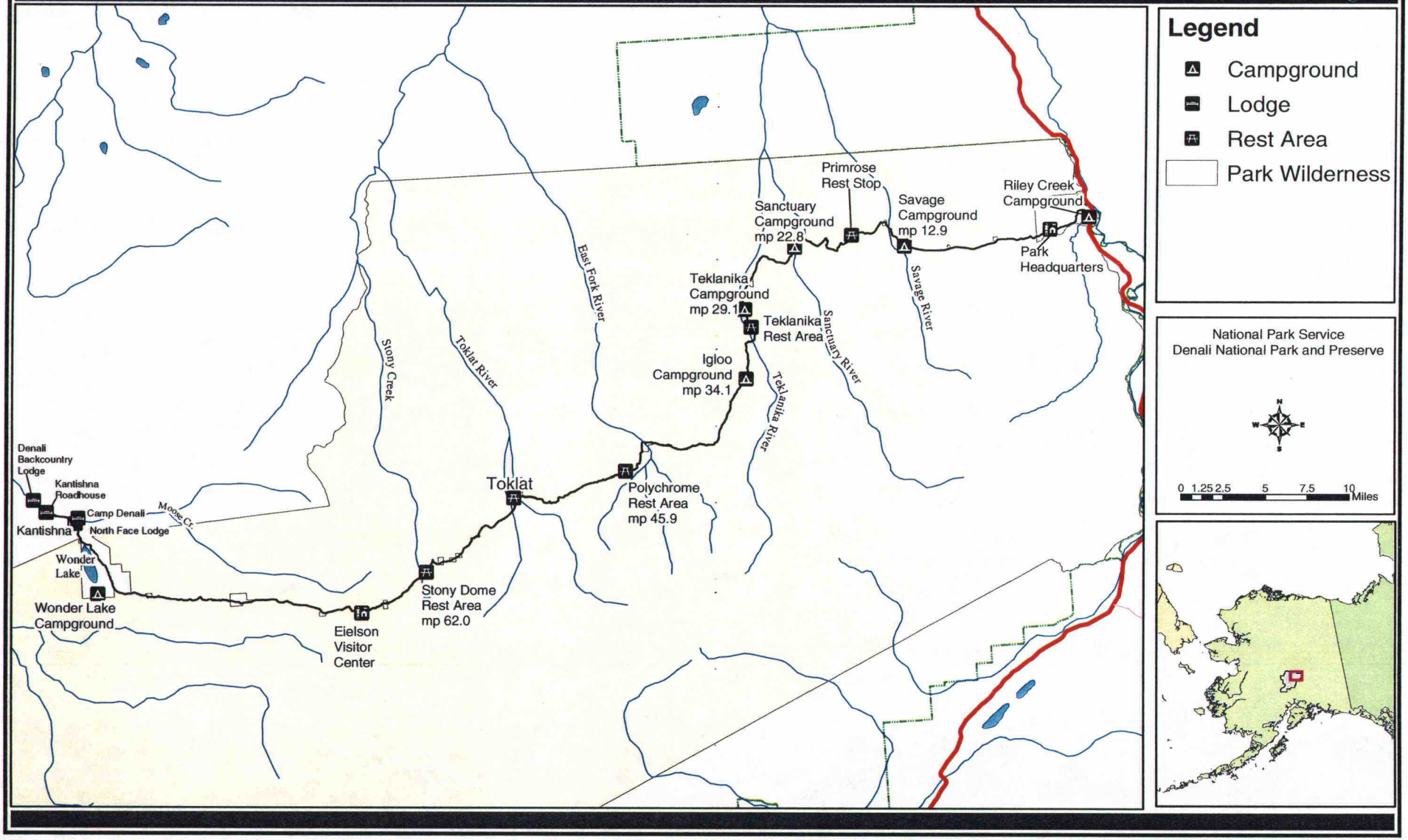
The purposes of the Denali Park Road System are to:
1) provide visitors of all abilities opportunities to travel by vehicle through a rugged wilderness area, observing at close range both wildlife in its natural habitat and world class scenery;
2) provide circulation within administrative and public use areas; and
3) facilitate interpretation of the park resources (NPS 1994).

Additionally, the Denali Park Road provides for adequate and feasible access to landowners in the Kantishna area pursuant to Title XI of ANILCA.

In addition to application on the road, gravel is required to support the park infrastructure. Over the last 10 to 15 years, visitor uses and administrative functions have increased the need for visitor and administrative facilities and services in the frontcountry. The Frontcountry Plan includes proposals for visitor use and resource protection and related facility development such as new buildings, trails, and campgrounds.

Map 1.1 - Denali National Park and Park Road

Denali National Park and Preserve
National Park Service
U. S. Department of the Interior



The park's Strategic Plan states that the management objective for Denali is to provide efficient public transportation for visitors in a manner compatible with protection of park resources (NPS 1997). As such, visitor transportation, visitor services, and administrative facilities must be provided, but within the parameters of resource protection. These two management objectives -- providing safe and efficient transportation and visitor services and protection of natural resources -- are both paramount to the integrity and function of Denali National Park and Preserve and must be balanced.

LEGAL AND POLICY FRAMEWORK

NPS Organic Act and Amendments

The 1916 Organic Act directed the Secretary of the Interior and the NPS to manage national parks and monuments to:

> "...conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." (16 U.S.C. 1.)

The Organic Act also granted the Secretary the authority to implement:

> "...rules and regulations as he may deem necessary or proper for the use and management of the parks, monuments and reservations under the jurisdiction of the National Park Service." (16 U.S.C. 3.)

The 1978 amendments to the 1916 NPS Organic Act and 1970 NPS General Authorities Act expressly articulated the role of the national park system in ecosystem protection. The amendments further reinforce the primary mandate of preservation by stating:

> "The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided for by Congress." (16 U.S.C. 1-a1.)

The NPS Organic Act and the General Authorities Act prohibit impairment of park resources and values. The 2001 NPS Management Policies uses the terms "resources and values" to mean the full spectrum of tangible and intangible attributes for which the park is established and are managed, including the Organic Act's fundamental purpose and any additional purposes as stated in the park's establishing legislation. The impairment of park resources and values may not be allowed unless directly and specifically provided by statute. The primary responsibility of the NPS is to ensure that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

The evaluation of whether impacts of a proposed action would lead to an impairment of park resources and values is included in this environmental assessment. Impairment is more likely when there are potential impacts to a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

Park Purposes and Values

On February 26, 1917, Congress established the original Mount McKinley National Park as "... a public park for the benefit and enjoyment of the people... for recreation purposes by the public and for the preservation of animals, birds, and fish and for the preservation of the natural curiosities and scenic beauties thereof ... said park shall be, and is hereby established as a game refuge." (39 Stat. 938). In 1922 and 1932 subsequent legislation expanded the park boundaries to the east and north, including lands in the Wonder Lake area for the purpose of protecting winter game habitat, especially for moose.

In 1980 Congress passed and President Carter signed the Alaska National Interest Lands Conservation Act (ANILCA). Section 202(3)(a) of ANILCA added about 3.8 million acres to Mount McKinley National Park and renamed it as Denali National Park and Preserve, and the additions are to be managed for the following purposes:

> To protect and interpret the entire mountain massif, and additional scenic mountain peaks and formations; and to protect habitat for, and populations of fish and wildlife including, but not limited to, brown/grizzly bears, moose, caribou, Dall sheep, wolves, swans and other waterfowl; and to provide continued opportunities, including reasonable access, for mountain climbing, mountaineering and other wilderness recreational activities. Subsistence uses by local residents shall be permitted in the additions where such uses are traditional.

Section 701 (1) of ANILCA established the Denali Wilderness of approximately 1.9 million acres, which is basically all of the former Mount McKinley National Park minus the park entrance area and road corridor to the old boundary near Wonder Lake with various development nodes along the road corridor.

NPS Gravel Management Laws, Policies, and Directives

Policies regarding the use of in-park gravel are based on the Mineral Materials Act of 1947 and the NPS General Authorities Act of 1970. The Mineral Materials Act prohibits the disposal of common variety mineral materials by sale or donation from any "national parks and monuments." Common variety mineral materials are sand, stone, gravel, clay, cinder, pumice, and petrified wood. The General Authorities Act, on the other hand, states the Secretary of the Interior may sell or lease services, resources, or water from within an NPS unit so long as the resource use activity does not jeopardize or interfere with the primary natural and historic resources of the area (16 U.S.C 1a-2(e)). Such activities must 1) provide public accommodations or services within the immediate vicinity of the NPS unit to persons visiting the area, and 2) there are no reasonable alternatives by which to acquire or perform the necessary services, resources, or water.

Section 9.1.3.3 of the NPS Management Policies addresses borrow pits and spoil areas (NPS 2001). Materials from these sites are to be extracted and used only in the park for administrative

uses by the NPS or its agents and contractors. Uses of these borrow materials shall not impair park resources or values and must be the most reasonable alternative based on economic, environmental, or ecological considerations, including compliance with other applicable federal, state, or local requirements. Parks should use existing source sites and develop new sites only after completing a park-wide borrow management plan that addresses cumulative effects of borrow extraction, restoration, and importation.

Special Directive 91-6 (NPS 1991) gives guidance to Park managers on implementing NPS gravel acquisition policy. It requires that a complete economic and environmental analysis be completed when inside Park sources are being proposed for development or use. Such an analysis was conducted for the initial Gravel Acquisition Plan at Denali and is on file with the Superintendent of Denali National Park and Preserve.

Director's Order 35 permits the sale of certain park resources under conditions set by the agency. The Department of the Interior's Office of the Solicitor has advised the park that 16 U.S.C. §1a-2(e) provides a legal basis for the sale of mineral materials in National Park System units, including Denali National Park. Because §9.1.3.3 of NPS Management Policies conflicts with this legal interpretation, the park must obtain a waiver from the Director of the National Park Service prior to authorizing the sale of mineral materials to any places of public accommodations. If granted, the park must then comply with the statutory requirements of §1a-2(e) and other applicable laws in the authorization of the sale or lease of mineral materials. Although it is legally permissible, the park is not compelled to sell or lease mineral materials to lodges or other places of public accommodations.

The draft NPS Director's Order - 77 provides field guidance to assist NPS managers with interpreting and implementing the 2001 NPS Management Policy on in-park use of mineral material sources. The purpose of this guidance is to ensure protection of park resources, reduce administrative costs where possible, and ensure that NPS managers have all the facts needed to make informed decisions and avoid potential litigation. The steps offered in this guidance present a systematic approach to the analysis of in-park extraction of mineral material and encourage a well-documented planning and decision-making process and compliance with relevant legal mandates. Director's Order – 77 would replace Special Directive 91-6 once it is approved.

NPS Management Policies (2001) – 4.1.5 Restoration of Natural Systems:
"The Service will re-establish natural functions and processes in human- disturbed components of natural systems in parks unless otherwise directed by Congress.... The Service will seek to return human- disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated. The Service will use the best available technology, within available resources, to restore the biological and physical components of these systems, accelerating both their recovery and the recovery of landscape and biological-community structure and function."

NPS Management Policies (2001) – 9.1.1 Facility Planning and Design:
"The protection of each park's resources and values will be the primary consideration in facility development decisions... Designs for park facilities, regardless of their origin (NPS, contractor, concessioner, or other), will be harmonious with and integrated into the park environment. They will also be subject, throughout all phases of design and construction, to the same code compliance; the same high standards of sustainable design, "universal design," and functionality; and the same review and approval processes. Park Service requirements for sustainable design and functionality include protection of the natural and cultural environments, resource conservation, energy conservation, pollution prevention, defensible space for fire safety, and fostering education about sustainable design and practices.

appropriate. The GAP identified only two gravel sources inside the park for road maintenance that meet the criteria established and NPS Special Directive 91-6. These two sources are the existing Teklanika Pit and the Toklat River. The plan restricts use of this material to approximately 10,000 cubic yards per year and it is only to be used for routine maintenance. It is not to be used for road rehabilitation or reconstruction projects or any other park development project. Material for those types of projects is to be obtained from outside the park.

Road System Evaluation (1994)

The objective of the RSE was to evaluate and present in one volume all the various existing documentation related to roads in the park. It established a goal for all road-related work based on a defined purpose and use of each road, and attempted to provide a comprehensive inventory of all roads in the park, including related resources, visitor experiences, and physical condition data. This document further refined the definition of road character for the Denali Park Road. Finally, it recommended road improvements, which were to be consistent with the overall goal of the park, stated purpose and use of each road, and park road philosophy, as well as provide a safe, maintainable facility.

Entrance Area and Road Corridor Development Concept Plan Environmental Impact Statement (1997)

This plan, also known as the Frontcountry Plan, provides specific direction for road management and specific development proposals to meet the current and future needs of individuals and commercial tour groups who visit the park. The environmental impact statement evaluates the impacts of the proposal and a range of alternatives. This document forms the basis for NPS decisions on management of the frontcountry of Denali National Park and Preserve. The 1997 Frontcountry Plan amended the Gravel Acquisition Plan to allow use of gravel from in-park sources to make road safety improvements and for structural and geometric repairs. It indicates that the National Park Service would continue to investigate alternative materials and evolving technologies to minimize gravel requirements in maintenance activities. Appendix C of the plan provides information on proposed new gravel extraction sites, proposed road repairs and reconstruction, and a description of the Denali Park Road character to be maintained.

Resource Management Plan, Denali National Park and Preserve. Project Statement I-800: Administrative Use of Resources (1998)

Administrative use of resources is defined as the use or alteration of a natural resource in the administration of park operations. This project statement acknowledges that gravel and sand are required in the park for road and trail maintenance and construction, and for other construction purposes. It describes Special Directive 91-6, and lists other park documents used to guide gravel policy. The statement describes the problems associated with the 1992 Gravel Acquisition Plan and recommends that a Parkwide Sand, Rock, and Gravel Plan be conducted to analyze existing and potential internal and external extraction sites. The new plan would determine the most cost effective and environmentally sound ways to provide sand, rock, and gravel for long-term NPS maintenance and construction needs.

Gravel Acquisition at the North Face Corner, Environmental Assessment (1999)

This plan provided for extraction and use of gravel from the North Face Corner near mile 89 of the park road for critical maintenance and construction along the western 24 miles of the Denali Park Road. The project also corrected unsafe sighting distances along a blind curve in that part of the road used by local traffic and pedestrians. The plan authorized the extraction, processing, and use of up to 40,000 cubic yards of mineral materials for two to six years. After the project reaches its design limits, the State right of way would be relocated about 160 feet to the southwest. The

old roadbed would be reclaimed and a bus shelter/rest stop would be constructed next to the new road. Site reclamation would include a revegetated, 2:1 backslope.

Dust Abatement Activities on the Denali Park Road, Environmental Assessment (1999)

This plan calls for the application of calcium chloride to parts of the Denali Park Road to reduce dust from vehicular traffic and help to bind smaller particles to the road surface. The dust particles are a respiratory irritant, reduce visibility of scenic vistas and wildlife from the park road, create a safety hazard for drivers on the park road and adversely impact aquatic resources and vegetation along the road corridor. The plan calls for the testing, application, and monitoring of the dust palliative along nine road segments between the Savage River Bridge and the Kantishna Airstrip.

ISSUES AND IMPACT TOPICS

Issues are potential environmental problems that may result from the federal action, in this case to approve a 10-year gravel acquisition plan for the Denali Park Road corridor. National Park Service personnel and lodge operators at the western end of the park road initially identified issues. These issues were used to help formulate the alternatives and mitigation. Impact topics selected for detailed analysis were based on substantive issues; environmental statutes, regulations, and executive orders; and NPS Management Policies. A brief rationale is provided for each issue and impact topic analyzed in the environmental consequences part of the EA (Chapter 4). Issues and topics considered but not addressed in this EA are also identified. Chapter 5, consultation and coordination, discusses scoping and consultation with members of the public, including Native groups, other federal agencies, and state agencies.

Natural Resources

Effects on Air Quality

Dump trucks and heavy processing equipment could degrade local air quality and produce dust particles affecting scenic vistas and wildlife viewing.

Effects on Geologic Resources

Park personnel, the Alaska Department of Transportation and Kantishna lodge owners expressed concern that existing gravel source sites are insufficient for future road maintenance and area projects. The NPS is limited by the General Authorities Act, the Mineral Materials Act, NPS policies, and existing park plans with regards to extraction and use of mineral materials inside the park. Source sites outside the park should be used when feasible economically and practical, but park personnel and lodge owners identified a need for mineral materials for various interior and west-end uses far from external sources. Strategically located borrow sites should not be exhausted in the short term because they may be needed over the long term. Extraction activities could: 1) undermine overlying strata and compromise slope stability, 2) accelerate erosion and increase sedimentation to surface waters, and 3) negatively affect permafrost in and adjacent to extraction sites.

Effects on Hydrology, Water Quality and Aquatic Resources

Concern has been expressed that gravel source sites in river bars and sites located across streams from access roads would cause sedimentation and turbidity in streams unless adequate protection or bridges are provided. Source sites adjacent to streams and wetlands need to be restored quickly

to protect water quality. Borrow site development could retain surface flows or intercept groundwater.

Effects on Wildlife Values and Habitat

Concern has been noted that extraction and processing sites should be located to minimize disturbance or displacement of wildlife and their movements and away from important wildlife habitat. Current operations and facilities at Teklanika and Toklat have temporary, short-term effects on wildlife in the area.

Effects on Vegetation and Wetlands

Riparian and scrub shrub wetlands are known to exist on many of the sites included in the Borrow Site Inventory. Concern has been expressed that vegetation and wetlands would be destroyed or adversely affected from development or expansion of in-park gravel source sites. Mineral material source sites should be designed to minimize adverse impacts to park vegetation and in such a manner that reclamation and revegetation is facilitated.

Effects on Soils

Overburden and muck from extraction sites and excavation reject from structural repair projects may need to be stockpiled for future reclamation of past and future extraction sites. Permafrost may be an issue in various soils, and thermokarst or deep frost thaws may occur where the overlying insulating vegetation is scraped off or disrupted. Clearing vegetation, capture or diversion of overland water flow, and over-steepened slopes may increase erosion and cause loss of soils.

Effects on Floodplains

Executive Order 11988 (Floodplain Management) requires the NPS, and other federal agencies, to evaluate the impacts its actions are likely to have on floodplains. Review of the GAP alternatives must reflect consideration for avoidance or minimization of effects to floodplain resources.

Cultural Resources

Effects on Historical Resources

Historical resources exist at some locations in the park, including the proposed Kantishna Historic District and the historic East Fork Cabin. The environmental analysis needs to address the relationship of potential gravel extraction and processing sites to historical resources, and the potential for adverse effects on those resources.

Effects on Archeological Resources

Extraction site activities could potentially affect currently unknown archeological resources.

Social and Economic Resources

Effects on Scenic Values and Visitor Enjoyment

The general public and lodge owners are concerned that gravel extraction and processing sites could adversely impact the scenic integrity of the park and visitors' enjoyment of the spectacular natural scenery and wildlife in that setting. The Denali Park Road is to be maintained to a standard providing safe travel for visitors while also maintained in its rustic, historical character as a narrow, meandering gravel-surfaced road. Traffic, delays and noise could adversely affect visitor use and enjoyment of the park.

Effects on Public Access and Safety

Kantishna Lodge owners have expressed concern that the condition of the park road at the western end is poor and unsafe. Extraction area high walls, heavy equipment operation, material transport trucks, fuel storage, and processing equipment could pose safety hazards to park visitors as well as park employees.

Effects on Park Management

The National Park Service is concerned that gravel source sites for park road maintenance and special administrative projects would be adequate for the next ten years or more and would be spaced in such a manner to be efficient and cost-effective without causing unreasonable adverse impacts to park resources and values. The NPS is concerned that long haul distances with heavy gravel trucks would accelerate wear and tear on the road. The NPS is also concerned that any additional borrow sites are strategically located to minimize adverse impacts to visitor use areas.

Effects on Local Economy

The use of gravel source sites outside the park could help mineral material owners and contractors outside the park, depending on the amounts purchased by the NPS and the haul distances to and into the park. Authorizing the use of sufficient gravel at the western end of the park road would help maintain transportation and administrative facilities in a manner that facilitates safe and efficient public access, thereby benefiting lodge and concession operators in the area.

Effects on Subsistence

Local subsistence resources and/or legally permitted subsistence uses, such as the subsistence activities in the Kantishna Hills accessed by the park road, could be adversely affected by the proposed gravel acquisition activities.

Effects on Wilderness

Noise generated by gravel processing operations could adversely affect the solitude of nearby wilderness areas. The use of an area for gravel extraction and processing would preclude the area from wilderness suitability.

Cumulative Impacts

Concern was expressed that past gravel extraction sites have partially recovered and reopening and expanding those sites would further delay natural recovery. Others have expressed concern that developing large new gravel source sites at the western end of the park road could facilitate new developments such as additional lodges in Kantishna or a North Access route. The plan needs to address restoration of abandoned, continuing, and future NPS extraction sites. NPS commitment to restore previously disturbed extraction sites in addition to concurrent restoration of active extraction sites could result in a reduction of unrestored disturbed areas in the park. Thus, the cumulative impact of NPS maintenance activities on natural, cultural and social and economic resources may be reduced through implementation of this plan. Furthermore, NPS gravel extraction activities would need to be considered in addition to the impacts of mining in the Kantishna Hills of the park as documented in the mining EIS and subsequent mining claim validity assessment and restoration efforts.

Issues and Impact Topics Considered but Dismissed from Further Consideration

Threatened and Endangered Species

The Endangered Species Act requires an analysis of impacts on all federally listed threatened and endangered species, as well as species of special concern. In compliance with Section 7 of the Act, the U.S. Fish and Wildlife Service (USFWS) has been consulted. No Federally designated threatened or endangered species are known to occur within Denali National Park (pers. comm. Ted Swem, USFWS, Fairbanks, Alaska, June 9, 2000), and none are anticipated to be affected by this plan.

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations,* requires all federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. This plan is not expected to result in significant changes in the socioeconomic environment of the area, and therefore is expected to have no direct or indirect impacts to minority or low-income populations or communities.

PERMITS AND APPROVALS NEEDED TO COMPLETE PLAN

Several state and federal permits could be necessary for implementation of the proposed gravel acquisition plan, depending upon the specific activity at sites included in the selected GAP alternative. Permits and approvals that may be needed are summarized as follows:

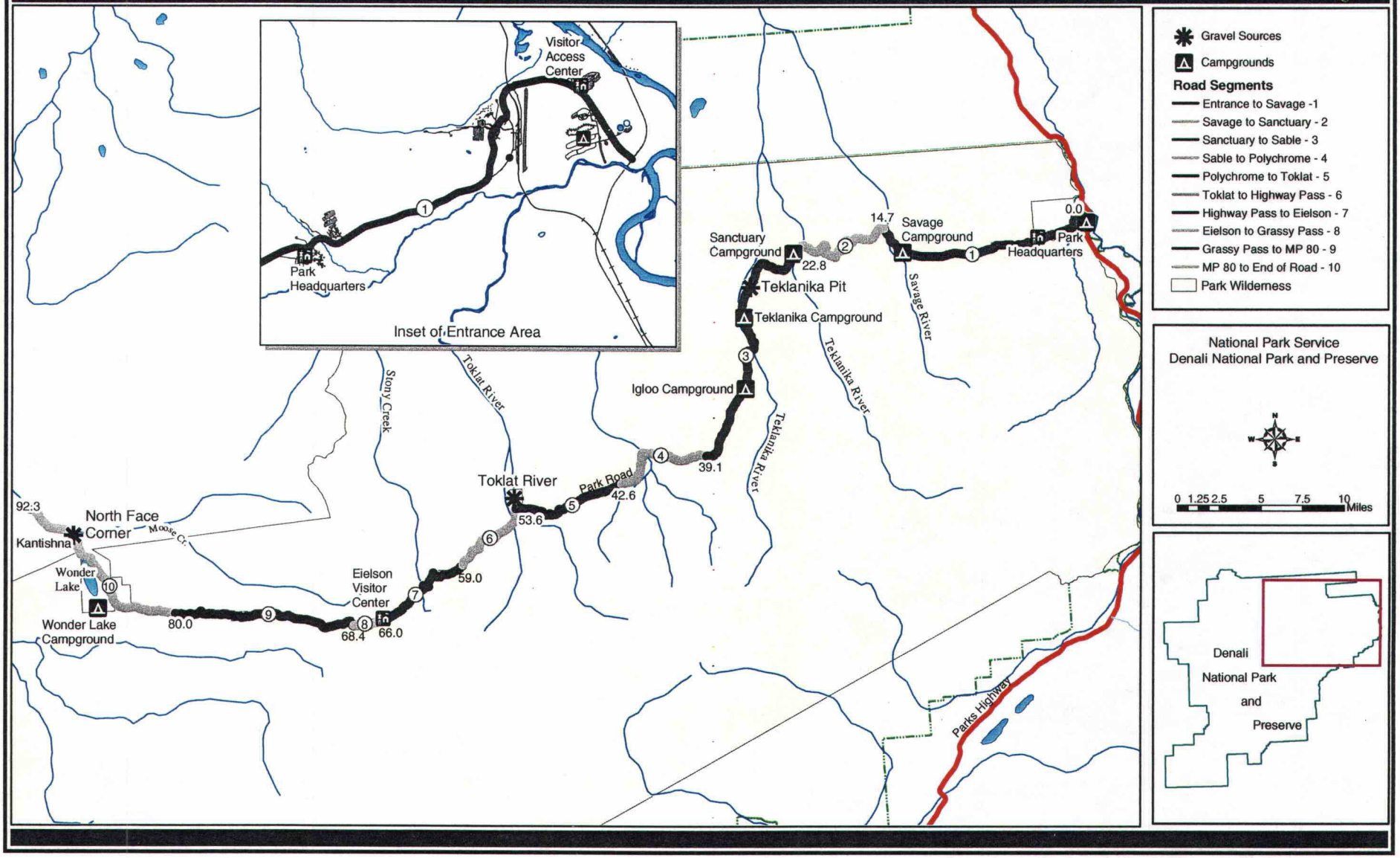
- A Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers would be needed for any project activities located in waters of the United States, including wetlands. This would specifically include any discharge of fill materials for construction of access roads or drainage facilities, storage of overburden, or reclamation activities.
- A National Pollutant Discharge Elimination System (NPDES) permit under Clean Water Act Section 402 might be required for stormwater discharge from gravel extraction sites.
- The Alaska Department of Environmental Conservation (ADEC) would need to issue a Certificate of Reasonable Assurance that the proposed project would comply with applicable provisions of Section 401 of the Clean Water Act, and with the Alaska Water Quality Standards, 18 AAC 70.
- A Title 16 Fish Passage Permit from the Alaska Department of Fish and Game would be required for any new access routes across a water body holding fish.
- Gravel source sites, including the existing Teklanika Pit and the Toklat crusher pad, may need to be registered with the federal Mining Safety and Health Agency.

MATERIAL NEEDS

The NPS calculated the volume of mineral material used in recent years (2000 to 2002) and projected mineral material needs over the next 10 years (2003 to 2012.) These volume estimates were derived from projects completed or projected along 10 road segments from the park entrance to the Kantishna Airstrip (Map 1.2). The projected gravel use totals are based on NPS experience with annual road maintenance and major construction projects identified in former planning documents or the NPS project management information system (PMIS). It is difficult for

Map 1.2 - Park Road Segments and Existing Gravel Sources

Denali National Park and Preserve
National Park Service
U. S. Department of the Interior



the NPS to accurately project road or gravel needs beyond the next 10 years, hence the 10-year planning period.

In fiscal year 2000 (FY00) the NPS used a total of about 33,350 cubic yards (cy) of material (including 16,000 cy from external sources) for various road maintenance, repair, rehabilitation, top-course and crowning, and building projects. In FY01 the NPS used a total of about 25,150 cy of material (5,000 cy from external sources) for road maintenance, construction of a bypass road for the Kantishna Airstrip, and trail projects. In FY02 the NPS used a total of about 34,000 cy of material (10,000 cy from external sources) for road reconstruction in the Grassy Pass area, road realignment in the entrance area, and general road maintenance, repair, and rehabilitation. The average annual mineral material need for these 3 years was about 30,833 cy. The gravel sources for this work were the North Face Corner in Kantishna, the Toklat River, the active Teklanika Pit and external sources.

For the next 10 years, the NPS estimates a total of 340,405 cy of material would be needed for known and foreseen projects. With a 10 percent emergency/contingency factor, that total may be as much as 374,445 cy. The average annual need for this period would then be 37,445 cy. See Appendix A for recent annual use totals and projected annual needs.

The present authorized extraction at Teklanika Pit (Mile 27) could supply up to an estimated 35,000 cy of material in the next 10 years. After screening to 1-inch minus, the material from this site approximates specifications for D-1 gravel for top course material. Gravel from the Teklanika Pit has been hauled to road segments 2 through 4, depending on project needs. The NPS estimates material needs for road segments 2 through 4 from 2003 through 2012 to be about 73,500 cy for maintenance and projects.

In the past, external gravel sources have been used for projects in the park entrance area along road segment 1 (see Map 1.2), and have been imported westward as far as Mile 35 in the Igloo Creek Canyon (road segment 3). Gravel for projects along road segments 2 and 3 have been provided from both in-park and external sources. Assuming external sources provided ½ of the material needs for projects along road segments 2 and 3, then external sources supplied an estimated 36,820 cy between FY00 and FY02. In this document, external sources are estimated to provide as little as 12,500 cy of material (Alternatives 2, 4 and 5) or as much as 220,900 cy (Alternative 1). The volume of material imported from external sources will be determined through the combined analysis of material and transportation costs and the environmental and administrative effects of importation.

The Toklat River Bar (Mile 54) is presently authorized to produce an average of 7,500 cy/yr. Over the next 10 years this site would produce up to 75,000 cy at this rate, but recent studies indicate 11,100 cy could be extracted from the Toklat River annually with no harm to the floodplain. Material from this site is screened and/or crushed before application. Generally the crushed material must be mixed with fines from other locations before it can be used as top course material.

The North Face Corner site was authorized to produce up to 40,000 cy between 1999 and fall 2001, and a rest stop was to be completed by the end of summer 2002. The NPS has been delayed in completing this project, and the final 10,000 cy will be hauled to locations along the park road or stockpiled elsewhere by the end of 2003. Combined with the annual 7,500 cy from Toklat, this gravel could address the projected need of 16,205 cy for the western part of the park road in 2003.

After 2003 the only authorized gravel source the NPS would have for the western part of the park road, other than top course material from Teklanika, would be the Toklat site with about 7,500 cy/yr. For all projected material needs for 2004 to 2012, excluding material from Teklanika or outside sources, the NPS estimates the total gravel needs for the western end of the park road for these 9 years at about 188,400 cy, or almost 21,000 cy/yr. The range of gravel needs for western end projects over this period is 14,050 cy/yr to 37,700 cy/yr. Clearly the Toklat source site, as now authorized, could not supply this amount of gravel over this period of time.

MATERIAL SITES

The NPS has completed a series of steps and filters to winnow the number of material sites to be considered in this plan. The first step is to ensure material source sites used are consistent with applicable laws, policies, and directives (see legal and policy framework.) First and foremost, the development of any material site or sites must not be in derogation of park purposes or values as emphasized in the enabling legislation.

Draft Director's Order 77 – Natural Resources Management Guidelines – provides guidance related to the 2001 NPS Management Policies with regard to administrative uses of resources in general and the administrative use of mineral materials in particular. Administrative uses of resources must be consistent with NPS policy and with park management objectives and should seek to minimize damage to the resource. Examples of administrative uses of park natural resources may include:

- Use of locally obtained park resource materials for trail construction, maintenance, or rehabilitation;

- Materials such as sand, gravel, and stone ... to provide locally available (and less costly) materials for road and bridge construction, etc.

NPS Management Policies (2001) state in part:

- Materials from borrow pits, quarries, and other clay, stone, gravel or sand sources on NPS lands, including submerged lands, will be extracted and used only:

    - By the NPS or its agents or contractors;
    - For in-park administrative uses;
    - After compliance with the National Environmental Policy Act, including written findings that extraction and use of in-park borrow materials will not, or does not, impair park resources or values, and is the park's most reasonable alternative based on economic, environmental, or ecological considerations; and
    - After compliance with other applicable federal, state, and local requirements.

Criteria Used to Identify Material Sites in the Park

The NPS began with the 1988 borrow site inventory and added potential borrow sites identified in various planning documents over the years since that inventory and then applied selection criteria to filter those sites. Nine rating criteria were used to select the preliminary site index. These criteria were:

- Development of the source will minimize wetlands and floodplains disturbance, as directed by pertinent NPS policies.
- The site and associated access roads will not be a significant intrusion on park road vistas and view sheds.
- The source will not be located in designated wilderness or lands being studied for wilderness designation.
- Development of the source will not involve major new impacts to undisturbed wildlife habitat.
- Development of the site will not adversely impact important cultural resources.
- Access to the source will not involve multiple crossings of rivers or perennial streams (Toklat River excepted), particularly streams in the Kantishna area where anadromous fisheries could be adversely impacted.
- Development of the source will not adversely impact major visitor use or destination areas.
- Sites must be situated such that full restoration is possible after extraction is completed.
- The source contains good quality material in sufficient quantity.

These criteria are described in more detail below:

1. The National Park Service is responsible for implementing the Executive Order on Floodplain Management (E.O. 11988), which directs the agency to avoid, to the extent possible, impacts associated with floodplain modification. Additional guidance for floodplain management is derived from Director's Order 77-2. These guidelines require planning and development activities in the parks recognize and protect floodplains, and restrict construction and other development in such areas. Accordingly, gravel pits should be located well outside of the 500-year floodplain. The exception to this criterion is a gravel pit specifically located within of the banks of a braided river, such as the Toklat. These sites may be used if they have adequate bed-load transport to insure quick and substantial gravel replenishment, and meet all other criteria listed below.

   In addition, Executive Order 11990 directs the NPS to: 1) provide leadership and to take action to minimize the destruction, loss, or degradation of wetlands, and 2) to avoid direct or indirect support of new construction in wetlands unless there are no practicable alternatives to such construction. The Director's Order #77-1 specifies that the NPS avoid adverse wetland impacts to the extent practicable, minimize impacts that could not be avoided, and compensate for remaining unavoidable adverse wetland impacts via restoration of degraded wetlands.

2. The site and associated access roads will not be a significant intrusion on park road vistas and view sheds. Consideration will be made for extraction sites resulting in temporary impacts to vistas. A gravel source immediately adjacent to the park road (i.e., on a bench or bluff), or a "small project or specialized pit" rather than a major source, may be considered for development if it can be restored to a "natural appearance" within 2 years of opening and using the source.

3. The source will not be located in designated wilderness or lands being studied for wilderness designation. Small, replenishable gravel pits may be opened in alluvial sites for use in trail construction in wilderness, but these small pits may not be served by heavy equipment (bulldozers, dump trucks, front-end loaders). Most of the gravel pits

suggested for the preliminary site index are located within wilderness exclusion nodes along the park road, or in the Kantishna area of the park and preserve, which was evaluated as unsuitable for wilderness designation in the GMP.

4. Development of the source will not involve major impacts to undisturbed wildlife habitat. A thorough analysis by DENA wildlife biologists will be required to determine if a proposed gravel pit is located within a significant, historic, or active wildlife habitat.

5. Development of the source will not adversely impact known or suspected important historical or archeological resources and their settings.

6. Access to the source will not involve multiple crossings of rivers or perennial streams, particularly streams in the Kantishna area where anadromous fisheries could be adversely impacted. The exception to this rule is the use of braided river sites, such as the Toklat River. Any travel through channels at these sites must be conducted during periods of low water and during time periods when no fish spawning or migration takes place.

7. Development of the source will not adversely impact major visitor use or destination areas. Major use and destination areas are defined as visitor centers, bus stops, interpretive waysides, and pullovers. Impacts include the development of gravel sources within the viewshed of such areas. Other major visitor use areas may include sections of the park road, which are heavily traveled by pedestrians walking from area lodges to visitor attractions.

8. Sites must be situated such that full reclamation is possible after extraction is completed. To accomplish this, the site should be restored so that it mimics the natural landforms of the area, blends with surrounding topography, restores normal surface water flows, and has stable slopes and soils.

9. The source contains a sufficient quantity of good quality material relative to waste material to justify development. Laboratory tests for material to be used on the park road should be obtained from each pertinent site, using a sampling scheme that represents the entire extraction area. The lab tests should identify the quality, characteristics, and suitability of the material for various uses, and include: 1) **gradation** - determine the size range of particles; 2) **L.A. Abrasion** – determine how long it will take the material to break down under traffic wear; 3) **freeze-thaw** – determine how long it will take the material to break down because of freeze-thaw actions; 4) **Plasticity Index** - determine the clay content; and 5) **modified Proctor** (for pit-run and crushed product) – determine how well the material compacts during construction.

Material Sites Considered but Eliminated from Further Evaluation

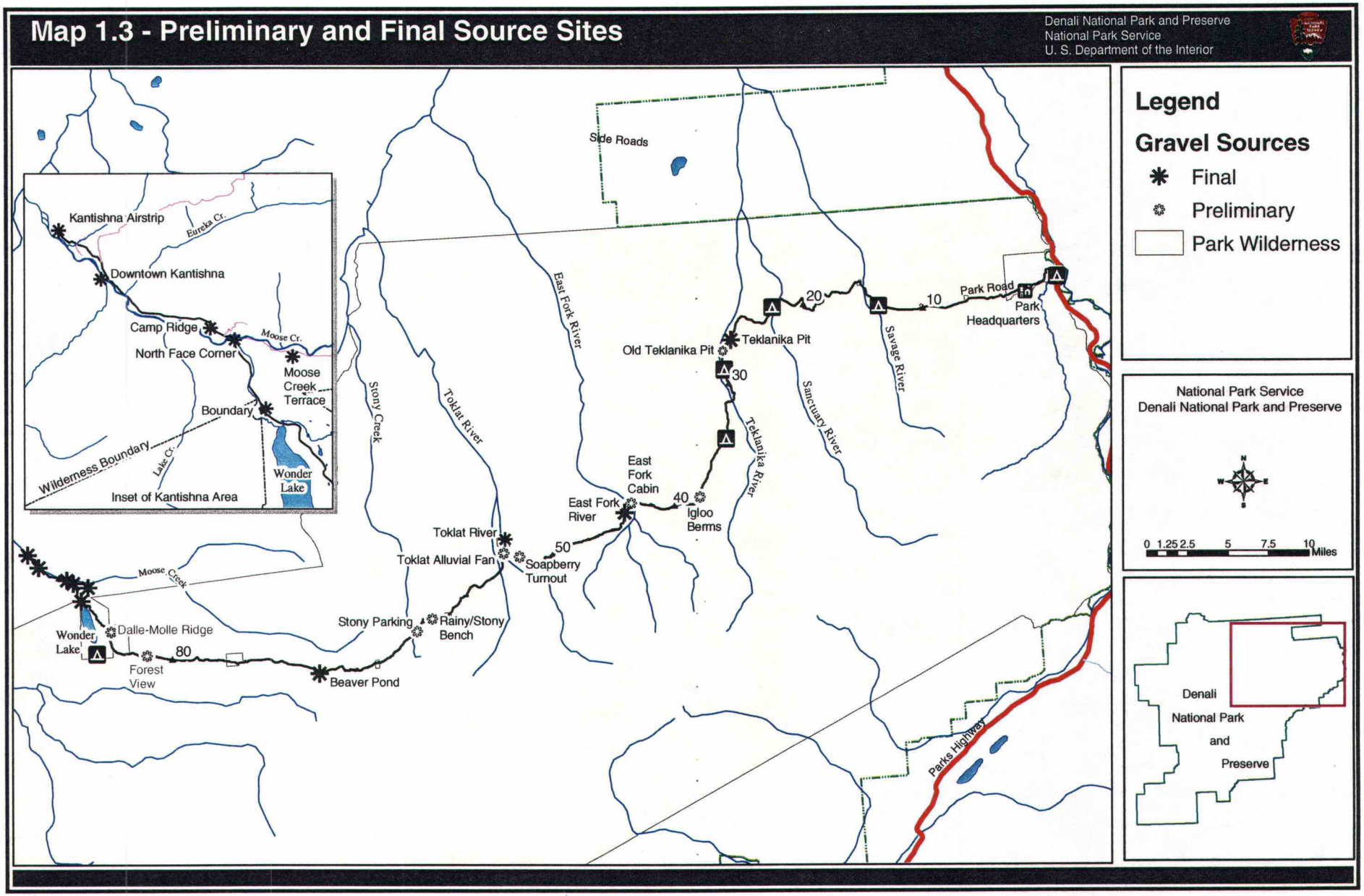
Because of serious deficiency with one or more of the criteria noted above, nine preliminary mineral material sites were eliminated from further evaluation (see Map 1.3). The Old Teklanika Pit is eliminated because the ongoing Teklanika Pit is sufficient to meet the needs in that part of the park for the next 10 years. Eight other preliminary sites were eliminated based on two or more criteria in each case, summarized as follows:

Milepost	Site Name	Reasons Eliminated (#s correspond to criteria above)
38	Igloo Berms	1, 9
43.5	East Fork Cabin	1, 2, 4, 5
51	Soapberry Turnout	4, 8, 9
53.4A	Toklat Alluvial Fan	1, 2, 3, 4, 7, 9
60.5	Rainy/Stony Bench	2, 7
62	Stony Parking	2, 7, 9
81.7	Forest View	2, 4
84.7	Dalle-Molle Ridge	2, 7

Material Sites Evaluated in this Plan

The following sites remain in the final site inventory for consideration for future material source sites along the Denali Park Road corridor because they meet the criteria indicated above and are thought to be capable of providing sufficient quantities and quality of mineral materials for park projects over the next 10 years (Map 1.3):

Milepost	Site Name
27.2	Teklanika Pit
27.5	Old Teklanika Pit (include as test site for future consideration)
43.6	East Fork River
53.4B	Toklat River
70	Beaver Pond
88	Boundary
89A	Moose Creek Terrace
89B	North Face Corner
90	Camp Ridge
92	Downtown Kantishna
93	Kantishna Airstrip


Map 1.3 - Preliminary and Final Source Sites
Denali National Park and Preserve
National Park Service
U. S. Department of the Interior
Legend
Gravel Sources
Final
Preliminary
Park Wilderness
Side Roads
Kantishna Airstrip
Eureka Cr.
Downtown Kantishna
Camp Ridge
Moose Cr.
North Face Corner
Moose Creek Terrace
Boundary
Wilderness Boundary
Lake Cr.
Wonder Lake
Inset of Kantishna Area
East Fork River
Stony Creek
Toklat River
Old Teklanika Pit
Teklanika Pit
20
10
Park Road
Park Headquarters
Savage River
30
Sanctuary River
Teklanika River
East Fork Cabin
East Fork River
40
Igloo Berms
Toklat River
Toklat Alluvial Fan
50
Soapberry Turnout
Moose Creek
Wonder Lake
Dalle-Molle Ridge
80
Forest View
Stony Parking
Rainy/Stony Bench
Beaver Pond
Parks Highway
National Park Service
Denali National Park and Preserve
0 1.25 2.5 5 7.5 10 Miles
Denali National Park and Preserve

External Material Sites Near the Park

Map 1.4 shows the location of 12 mineral material sites along the George Parks Highway that are potential external supply sources for Denali National Park mineral material needs. These sites are owned by AHNTA Regional Corporation, the Alaska Department of Transportation, the Alaska Railroad Corporation or local commercial companies. From north to south, the material sites indicated on Map 1.4 are identified as follows:

Map Number	Pit Name	Owner
37-2-143-2	–	ADOT
–	Evans-Dry Creek	Evans Industries
37-2-006-2	–	Usibelli Coal Co.
34-2-007-2	–	ADOT
	Evans-Nenana River	Evans Industries
37-2-008-2	–	ADOT
37-2-009-2	–	ADOT
37-2-010-2	–	ADOT
522-051-2	–	AHTNA Native Corp.
37-2-009-2	–	AHTNA Native Corp.
522-050-2	–	AHTNA Native Corp.
522-064-2	–	Alaska Railroad Corp.

Cost Analysis of External and In-Park Material Sources

An economic evaluation was conducted to compare the cost of using gravel from various source sites within and outside the park. The overriding factor influencing the economic basis for comparison of the various alternatives is the cost of hauling material from the extraction site to the point of use. Hauling cost is directly proportional to the distance traveled. A secondary factor is the cost of obtaining materials, based on either the cost of processing in-park sources or the purchase of materials from non-NPS external sources. The cost analyses presented in the accompanying tables provided in Appendix B are primarily based on these two factors.

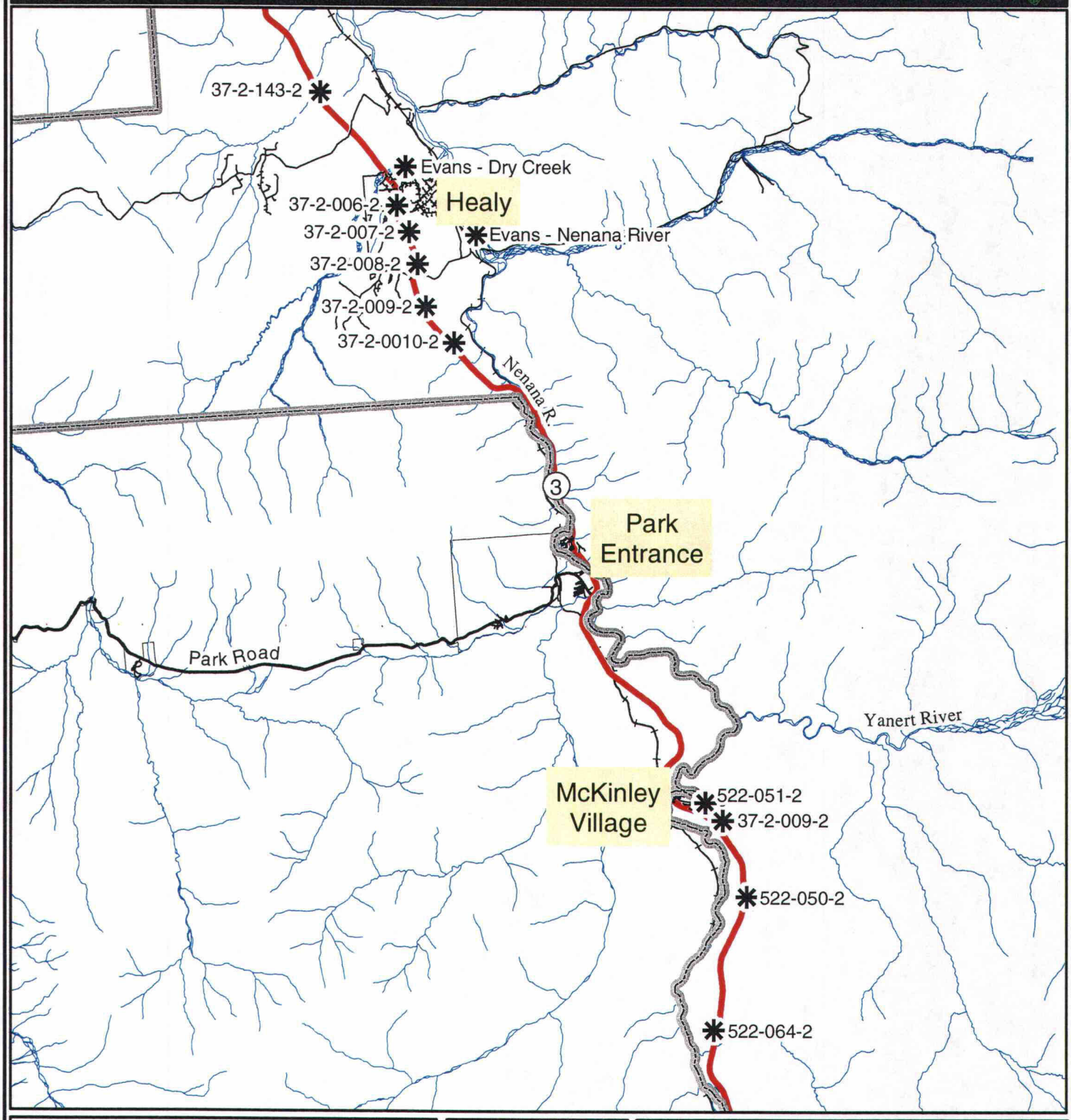
The cost of material from an external source versus from an internal source was determined through the combined material cost and transportation distance. Whether the gravel would be transported by NPS personnel or by a contractor also affects the cost of using an external source.

For projects using pit-run gravel, the break-even cost for a contractor hauling material from the Alaska Railroad Pit (as an example) external to the park or from the Teklanika Pit at Milepost (MP) 27.5 would be to MP 15.1 of the park road. Projects between the park entrance and approximately MP 15.1 would be less costly using an external source of pit-run gravel. Projects west of MP 15.1 would be less costly using NPS pit-run gravel.

For projects using D-1 gravel, the break-even cost for a contractor hauling material from the Alaska Railroad Pit external to the park or the Teklanika Pit at MP 27.5 would be to MP 16 of the park road. Projects between the park entrance and approximately MP 16 would be less costly using an external source of D-1gravel. Projects west of MP 16 would be less costly using NPS-processed D-1 gravel.

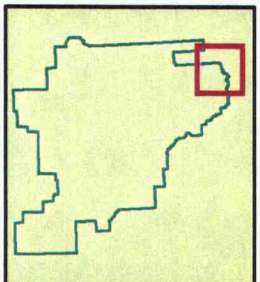
Map 1.4 - External Gravel Sources

Denali National Park and Preserve
National Park Service
U. S. Department of the Interior



Legend

- Gravel Sources
- Park Boundary



National Park Service
Denali National Park and Preserve
GIS

0 1 2 4 6 8 Miles

Table B1 summarizes the cost, miles traveled, and volume of gravel to be used for the various alternatives using outside contractors. Table B2 summarizes the cost, miles traveled, and volume of gravel to be used for the various alternatives using NPS personnel and equipment for hauling.

Background and pricing information used to develop the evaluation tables was obtained from two sources -- NPS staff familiar with park gravel operations and data obtained independently by Hart Crowser. Information provided by NPS used in the evaluation included:

- A list of proposed projects requiring gravel;
- Projects consisting of normal road maintenance or related work require D-1 material.
- A 10-year projection of annual material quantities (cubic yard volumes) required for each project;
- Plans for the five GAP alternatives, each with desired source locations and estimated maximum material volumes;
- Processing cost for pit-run material from Teklanika Pit = $7.59 per cubic yard
- Processing cost for pit-run obtained from Toklat = $7.59 per cubic yard;
- Processing cost for surfacing material on projects using Toklat source = $19.04/cubic yard (based on cost calculated for processing gravel at the authorized North Face Corner site).
- The estimated cost for using NPS equipment for hauling gravels in 2003 is $69.00/hr (includes personnel, fuel, fuel economy, amortization, and annual maintenance).

Hart Crowser obtained the following information or developed logistical assumptions to formulate the estimates:

- 2003 contractor hauling estimate = $85.00 per hour trucking;
- Trucks hauling gravel would move at an average speed of 20 mph in the park (includes back hauls while empty);
- Cubic yard cost calculated on a per-mile basis (includes round trip for truck making empty load in one direction);
- $6.50 per cubic yard for cost of external pit-run located 10 miles from the park entrance;
- $14.00 per cubic yard for external D-1 material from site located 10 miles from the park entrance (if buying greater than 500 cubic yards);
- Assumes 10 cubic yards of gravel per truck used within the park;
- Assume 18 cubic yards of gravels for trucks obtaining gravel from an external source
- Travel distances based on average milepost locations for each road segment;
- Cost for gravel outside the park would vary. Gravel from State of Alaska land sources would be nearly free (involving a royalty payment that currently is $1 per cubic yard) but would require NPS personnel and equipment to process, therefore the price per cubic yard from a private supplier was used for outside material cost.
- Assumes a 5 percent annual inflation rate for costs beyond 2003.

Basic assumptions used in the evaluation include:

- Placement cost will be the same regardless of source; therefore, these costs were not included in the calculations.
- Reclamation cost would also remain fixed because this would be included in the developer's base cost.
- Contingency gravel volumes were not specifically allocated to source sites because both the source and project need are unknown. The 10-year costs estimated for the project-

specific 10-year gravel needs were increased by a factor of 10 percent to account for the contingency gravel cost per individual alternative.

- No adjustments were made for new equipment purchases required by the park.

The cost analysis encountered several data gaps that may affect the calculations. The following assumptions and/or calculation adjustments were used to accommodate information deficiencies:

- The locations of "other, construction, trails, remediation" projects is unknown; these estimated quantities of gravel were adjusted so as not to exceed the volume of available gravel from each selected source.
- Travel distances from the multiple external sources available were set at 10 miles from park entrance, to represent an average distance from these sources.
- NPS hauling does not include the cost of insurance for equipment used.

CHAPTER 2
DESCRIPTION OF THE ALTERNATIVES

INTRODUCTION

This chapter includes a description of the no-action alternative and four action alternatives to obtain gravel along the Denali Park Road for the next 10 years. It also includes a summary comparison of the alternative actions, a summary table of expected environmental impacts of the alternatives, brief descriptions of measures that would mitigate adverse impacts of the alternatives. The alternatives, representing a reasonable range of options, are:

1. **No-Action** – This alternative would result in continued use of the approved material extraction sites at Teklanika Pit and Toklat River at the extraction rates approved in the 1992 Borrow Use Management Plan. It would also include the minimal extraction remaining at the North Face Corner to facilitate reclamation of that site and completion of a bus turnaround and visitor rest stop (Map 2.1). All mineral material needs beyond the volume that could be supplied by the in-park resources would need to be imported from external sources.

2. **Maximum Flexibility/Short Hauls** – This alternative would result in authorization to extract mineral material from up to 8 sites and use of the North Face Corner for processing and stockpiling until reclamation at a future date. The 8 extraction sites would be Teklanika Pit, East Fork River, Toklat River, Beaver Pond, Boundary, Camp Ridge, Downtown Kantishna, and Kantishna Airstrip (Map 2.2).

3. **Minimum Visual Intrusion/Long Hauls** – This alternative would result in the development of one new major extraction site at the western end of the park road in addition to Teklanika Pit and Toklat River, namely the Moose Creek Terrace site. Use of external sources would be emphasized for the first four park road segments. The NPS would enter into agreements with ADOT, the Alaska Railroad, and/or AHTNA Corporation to secure long-term use of material sites along the George Parks Highway. Teklanika Pit would be used primarily for stockpiling of external source material, and for minimal extraction and screening for road surfacing material only. All of these sites are distant or shielded from view of the visiting public on the Denali Park Road (Map 2.3).

4. **Phased Development of Moderate Number of Sites** ***(NPS Preferred)*** – This alternative would authorize use of 6 extraction sites, including phased development at the western end of the park road, as needed. Sites in this alternative would include Teklanika Pit, East Fork River (for emergencies), Toklat River, Beaver Pond, Downtown Kantishna, and Moose Creek Terrace. The first phase would involve the extraction of material at Downtown Kantishna, with the goal to reclaim those former mining claims. The Moose Creek Terrace site would be developed only after Downtown Kantishna was exhausted and material was needed for projects at the western end of the park road (Map 2.4).

5. **Economic Alternative with Moderate Hauls** ***(NPS Preferred)*** – This alternative would be similar to Alternative 4 except the long-term major source site in the Kantishna area would be the North Face Corner instead of Moose Creek Terrace (Map 2.5). As in Alternative 4, phase 1 would entail extraction and reclamation at Downtown Kantishna. Phase 2 would involve development of the North Face Corner deposit from the western side to shield the North Face Lodge from sight and sound of the site. In defining the alternatives, this alternative was

anticipated to be the most economical because (unlike Alternatives 3 and 4) the road up Moose Creek would not need to be reinforced and the haul distance from North Face Corner would be approximately 2 miles less than from Moose Creek Terrace.

DESCRIPTION OF SOURCE SITES

As noted in Chapter 1, this plan evaluates a total of 10 material source sites in the park for the alternatives. Below are brief descriptions of the locations, access points or routes, expected maximum material volumes, estimated annual material production, known or suspected material characteristics, areal extent, life expectancy, and reclamation potential for the 10 source sites. A brief description of potential external source sites is provided in Chapter 1 (see also NPS 1992). Drawings, photographs, and more detailed descriptions for each source site are provided in Appendix C.

1. Teklanika Pit

Location and Access:
This site lies about 100 feet southeast of Mile 27.2 of the Denali Park Road in T 14 S, R 10 W, and Section 19 of the Fairbanks Meridian (FM). The park road restricts the site to the northwest, and the Denali Wilderness boundary restricts the site to the southeast. The site is accessed by a 250-foot long by 12-foot wide road that descends into the southwest end of the pit from the south side of the Denali Park Road.

Site Size and Estimated Volumes:
The existing pit dimensions are about 600 feet long by 200 feet wide and 30 feet deep. The new extraction area dimensions would be about 350 feet long by 200 feet wide (70,000 ft^2 or 1.5 acres) with a deposit thickness of at least 30 feet, which would produce up to about 75,000 cy of pit-run material. The NPS stockpiled approximately 500 cy of pit-run material at this site at the end of 2002.

Material Characteristics:
The material is derived from glacial fluvial gravel composed of volcanics, sandy sediments, and conglomerates. The particles are slightly to well-rounded and mixed in size, such that at least 85% of the pit-run material is usable for road surfacing.

Extraction, Processing, Storage, and Use:
This site would be operated throughout the summer season as needed. The process and storage area is in the middle of the pit floor, which is not visible from the park road. A bulldozer would push overburden toward the area of the pit being restored. The bulldozer would move overburden to the southeast side of the pit for revegetation of previously disturbed areas and to lessen visual impacts from the road. The bulldozer or a front-end loader would pull material down into the pit where it would be screened to remove oversize material. Most of the screening and stockpiling would occur during the summer months. NPS or contractor dump trucks would haul the material to park road maintenance sites during summer. Most of the material (85% or more) would be used for road surfacing. The oversize material would be used for ditches, gabions, or other road maintenance applications requiring larger particles.