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SUMMARY

On July 6, 2007, Alaska Railroad Corporation (ARRC or the Applicant) filed a petition with the Surface Transportation Board (STB or the Board) pursuant to 49 United States Code (U.S.C.) 10502 for the authority to construct and operate approximately 80 miles of new rail line from North Pole, Alaska, to Delta Junction, Alaska. Referred to as the Northern Rail Extension (NRE), the proposed rail line would extend ARRC's existing freight and passenger rail service to the region south of the community of North Pole, and would also include construction of related structures, such as a passenger facility, communications towers, and sidings.

The Board's Section of Environmental Analysis (SEA), together with eight cooperating agencies (the Agencies), prepared the Environmental Impact Statement (EIS)[1] in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) NEPA implementing regulations, and the Board's environmental rules. The EIS is intended to provide Federal, State of Alaska, local agencies, Alaska Natives and the public with clear and concise information about the potential environmental impacts of the proposed action and alternatives, including a No-Action Alternative.

The Agencies are issuing the Draft EIS for public review and comment, and will consider all comments received on the Draft EIS and respond to all substantive comments in a Final EIS. The Final EIS will include the Agencies' final recommended environmental mitigation conditions, as applicable. The Board will consider the entire environmental record, the Draft and Final EISs, all public and agency comments, and SEA's environmental recommendations in making its final decision on the ARRC application to construct and operate the proposed NRE.

S.1 Purpose and Need

The Alaska Railroad network extends from Seward, Alaska, through Anchorage and Fairbanks, ending at Eielson Air Force Base (AFB) through the Eielson Branch rail line (see Figure S-1). The existing Eielson Branch rail line serves Eielson AFB and the North Pole Refinery. At present, commercial freight, other than that associated with Eielson AFB and the refinery, generally enters and leaves the project area by truck via Richardson Highway (Alaska Route 4 from Valdez to Delta Junction and Alaska Route 2 from Delta Junction to Fairbanks) or the Alaska Highway (Alaska Route 2 from Delta Junction to Tok and beyond). The Applicant has stated that the proposed NRE would provide an alternative to Richardson Highway for freight service for commercial and military users and would provide dependable year-round ground access to the Tanana Flats and Donnelly training areas (TAs) on the southwestern side of the Tanana River and west side of the Delta River. The Applicant has also stated that the NRE would provide a transportation alternative to the Richardson Highway for individuals traveling between Fairbanks and Delta Junction, where, at present, there is no public transportation. The rail line would be less susceptible to inclement winter weather than the highway and also could increase tourism in the area.

[1] While much of the EIS generally refers only to SEA, the document reflects input from all eight cooperating agencies.

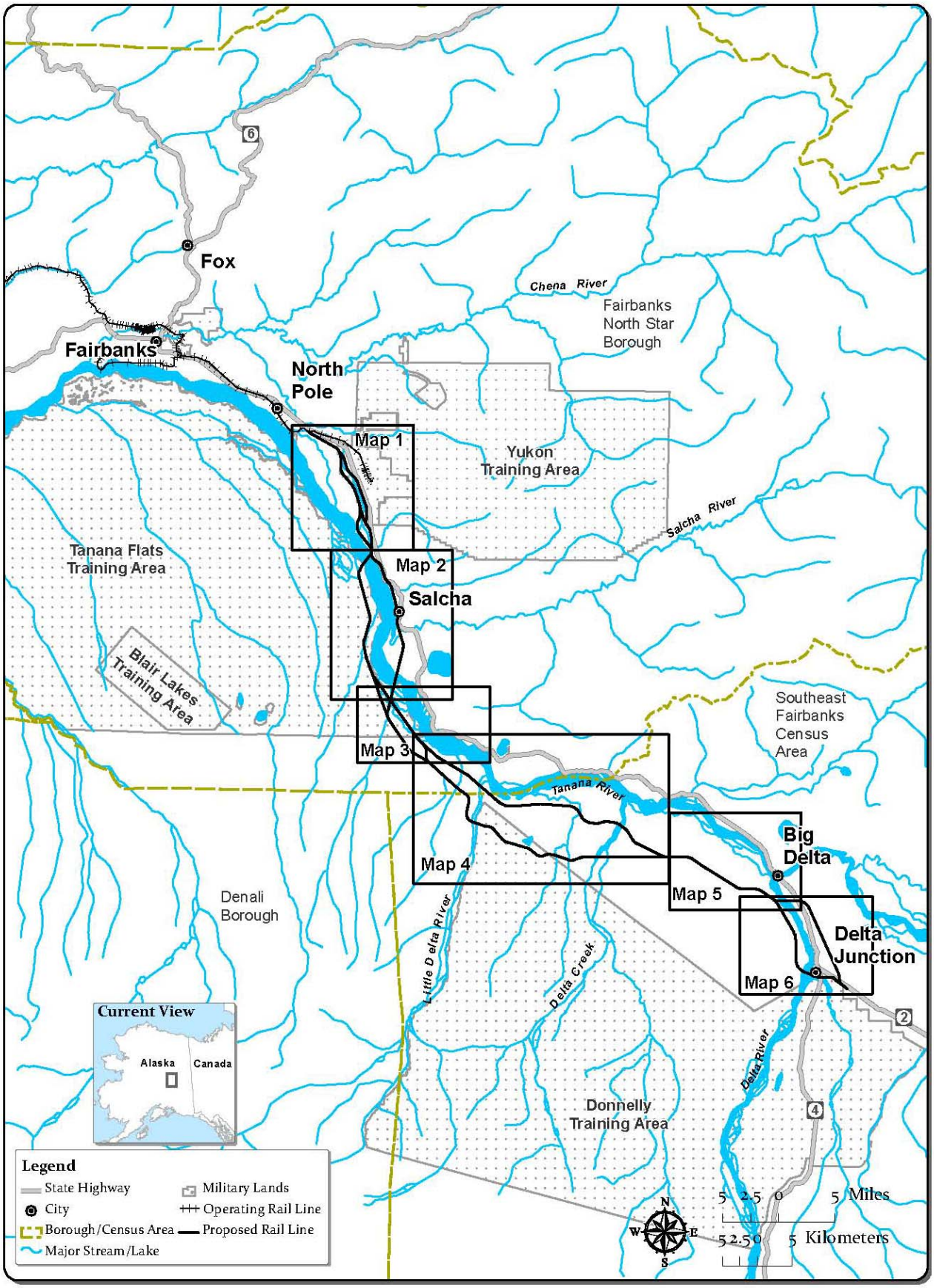

Figure S-1 - Map Key for Areas along the Proposed Northern Rail Extension

S.2 Scoping and Public Involvement

On November 1, 2005, SEA published the Notice of Intent to Prepare an EIS, Draft Scope of Study, Notice of Scoping Meetings, and Request for Comments in the *Federal Register* (*FR*) (70 *FR* 65976). SEA prepared and distributed a newsletter that introduced the proposed NRE, announced SEA's intent to prepare an EIS, requested comments, and gave notice of three public scoping meetings to more than 400 citizens, elected officials, Federal, state, and local agencies, tribal organizations, and other potentially interested organizations. The distribution encompassed the communities surrounding the area of the proposed action and alternatives and groups outside the project area that could have an interest in the project. SEA also posted meeting notices in public locations (*e.g.*, post offices, grocery stores, and restaurants) in the project area and initiated a toll-free project hotline. SEA placed notices of the scoping meetings in several newspapers, including the *Fairbanks Daily News Miner* and the *Anchorage Daily News*. SEA sponsored public scoping meetings in North Pole, Delta Junction, and Anchorage in December 2005. Approximately 80 people attended the scoping meetings, including citizens, representatives of organizations, elected officials, and officials from Federal, state, and local agencies.

SEA considered the agency and public input to the scoping process and on April 3, 2008, issued the final scope of study for the EIS (73 *FR* 18323). SEA placed the final scope of study on the STB Web site, and mailed it to approximately 700 individuals, agencies, and other interested parties on SEA's project mailing list.

SEA consulted with federally recognized tribes and other tribal organizations throughout the preparation of the EIS. SEA also prepared a Government-to-Government Consultation and Coordination Plan, which listed the federally recognized tribes, tribal groups, and Alaska Native Regional Corporations included in SEA's consultation efforts, described the objectives and approach to the consultation process, and provided an opportunity for the recipients to indicate how they wanted to further participate in government-to-government coordination for the proposed NRE.

S.3 Alternatives Considered in the SEA Environmental Review

Under the proposed action, ARRC would construct and operate a single-track rail line in Interior Alaska starting south of the community of North Pole and ending south of the community of Delta Junction. ARRC proposes a 200-foot-wide right-of-way (ROW) that would contain the rail line, sidings at several locations, a power line, a buried communications cable, and an access road. ARRC would construct other facilities, such as communications towers and a passenger platform in Delta Junction, to support rail line operations. ARRC also would build temporary construction support facilities, which ARRC would remove after construction activities ended.

The proposed action and alternatives include common segments, alternative segments, and connector segments, as described in this section, listed in Table S-1, and shown in Figures S-1 through S-7. Table S-1 also identifies the alternative segments and connector segments that comprise ARRC's preference for implementation of the proposed action. SEA does not identify preferred segments in the Draft EIS.

Table S-1
Alternative Segments

Alternative Segments Evaluated in the EIS	The Applicant's Preferred Segments[a]
North Common Segment	✓
Eielson Alternative Segments 1, 2 and 3	**Alternative Segment 3**
Salcha Alternative Segments 1 and 2	**Alternative Segment 1**
Connector Segments A, B, C, and D	**Connector B**
Central Alternative Segments 1 and 2	**Alternative Segment 2**
Connector Segment E	✓
Donnelly Alternative Segments 1 and 2	**Alternative Segment 1**
South Common Segment	✓
Delta Alternative Segments 1 and 2	**Alternative Segment 1**

[a] SEA does not identify preferred segments in the Draft EIS.

The rail line would generally follow the Tanana River and would require one crossing of the Tanana River (for both rail and vehicles), and crossings of the Delta River, Little Delta River, Delta Creek, and possibly the Salcha River. The Little Delta River and Delta Creek would have separate bridges for the track and vehicles; no vehicle access would be provided over the Salcha and Delta Rivers.

S.3.1 North Common Segment

The North Common Segment would start at the east end of the Chena River Overflow Bridge off of the Eielson Branch and extend 2.7 miles southeast to meet the selected Eielson alternative segment (Figure S-2). North Common Segment would run roughly parallel to Richardson Highway, cross Eielson Farm Road, and run along the east side of the Tanana River.

S.3.2 Eielson Alternative Segments

SEA is considering three alternative segments through the Eielson area that would start about 0.5 mile southeast of Eielson Farm Road (Figure S-2). Each segment would pass between the fence line of Eielson AFB on the east and the Eielson Farm Community on the west. If authorized by the Board, the selected Eielson alternative segment would connect with the selected Salcha alternative segment.

S.3.3 Salcha Alternative Segments

SEA is considering two alternative segments for the Salcha section that would start approximately 0.3 mile northwest of the intersection of Old Richardson Highway and Bradbury Drive (Figure S-3). The segments would cross the Tanana River at different places, and, if authorized by the Board, the selected Salcha alternative segment would meet the selected connector segment (A, B, C, or D) to connect to the selected Central alternative segment.

S.3.4 Central Alternative Segments

SEA is considering two alternative segments between the Salcha and Donnelly alternative segments. Both Central alternative segments would run parallel to the west bank of the Tanana River in a southeasterly direction (Figure S-4). If selected, Central Alternative Segment 1 would

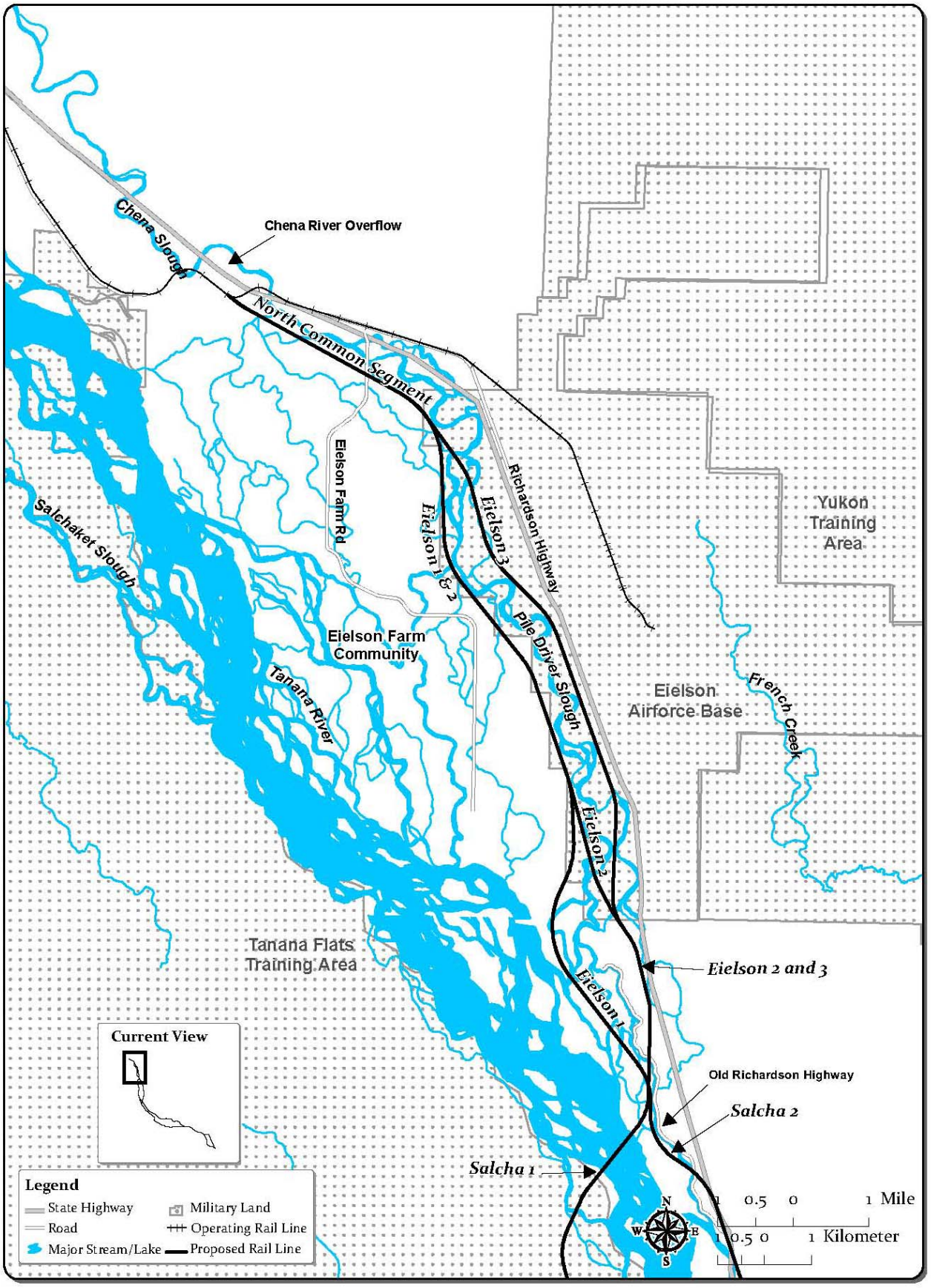

Figure S-2 - North Common Segment and Eielson Alternative Segments within Map Area 1

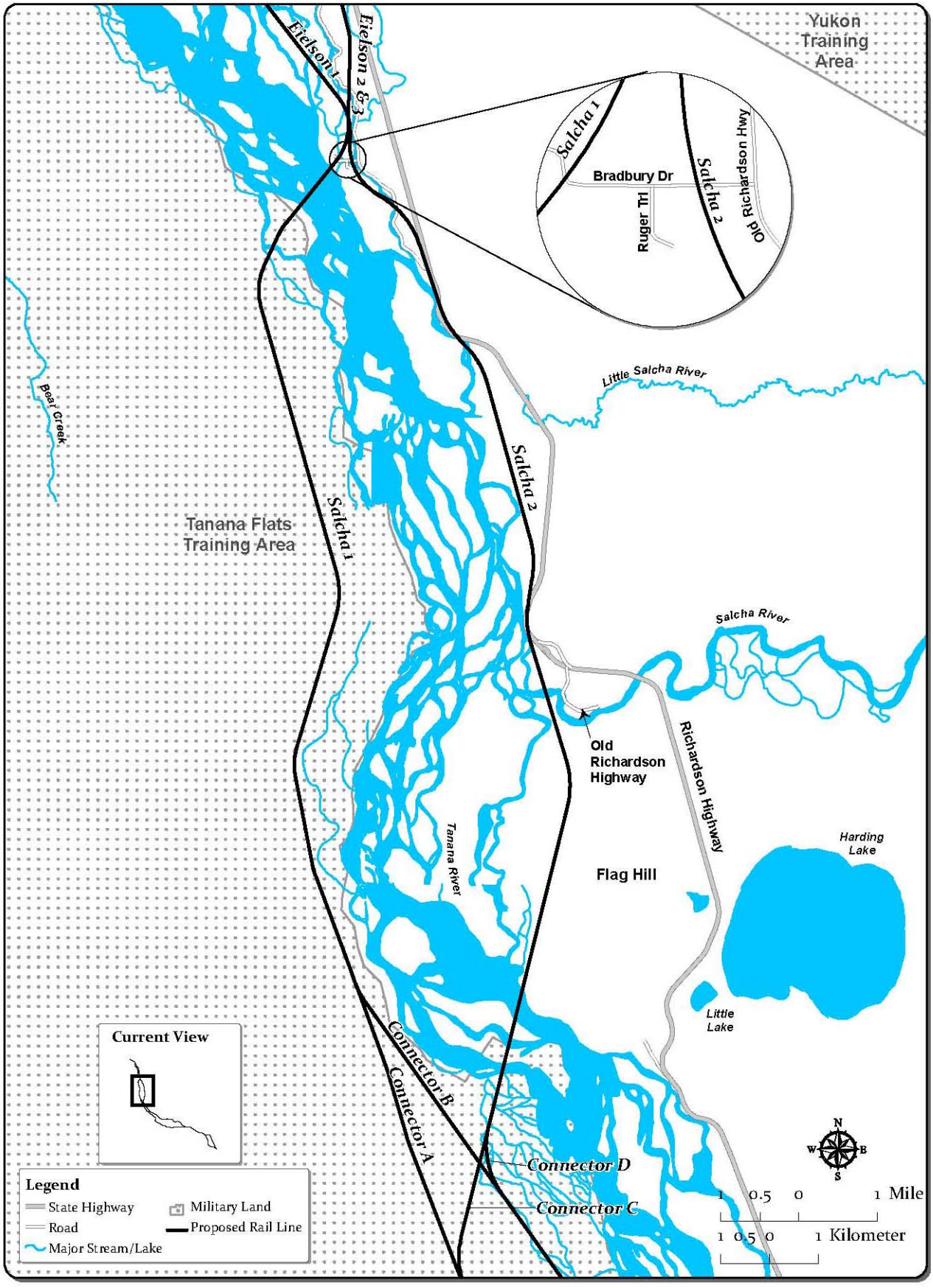

Figure S-3 - Salcha Alternative Segments within Map Area 2

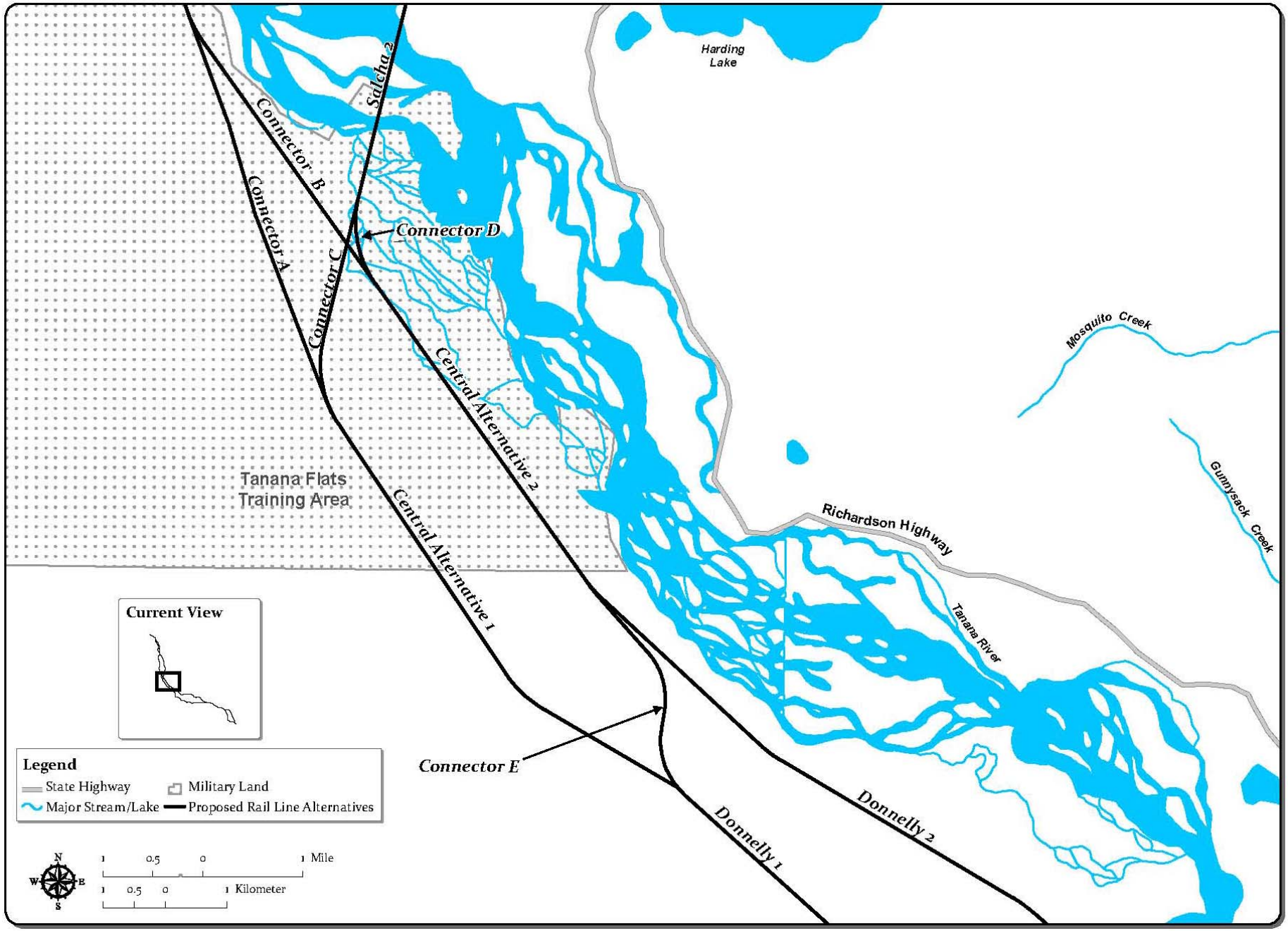

Figure S-4 - Central Alternative Segments and Adjoining Alternative Segments within Map Area 3

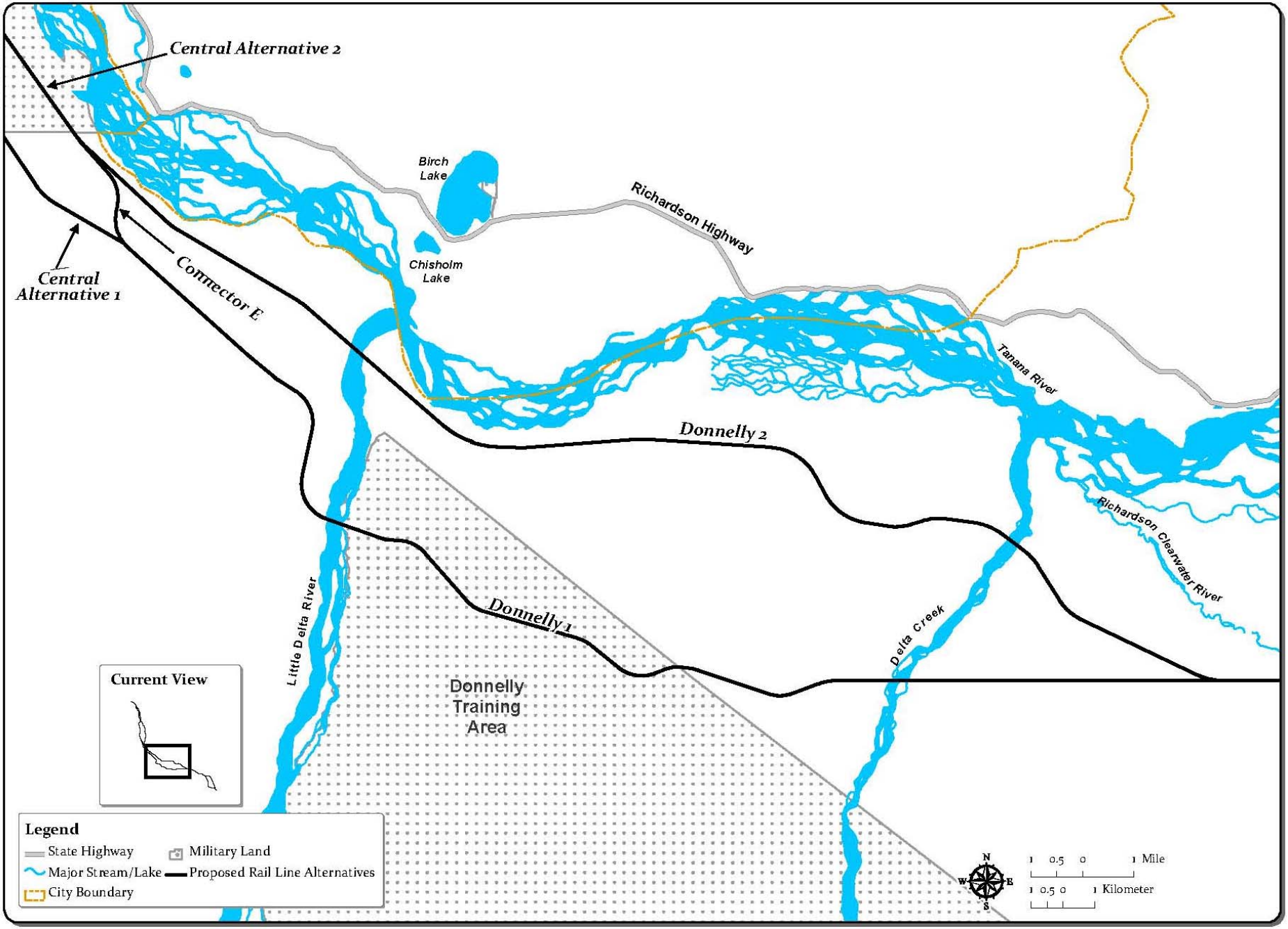

Figure S-5 - Donnelly Alternative Segments within Map Area 4

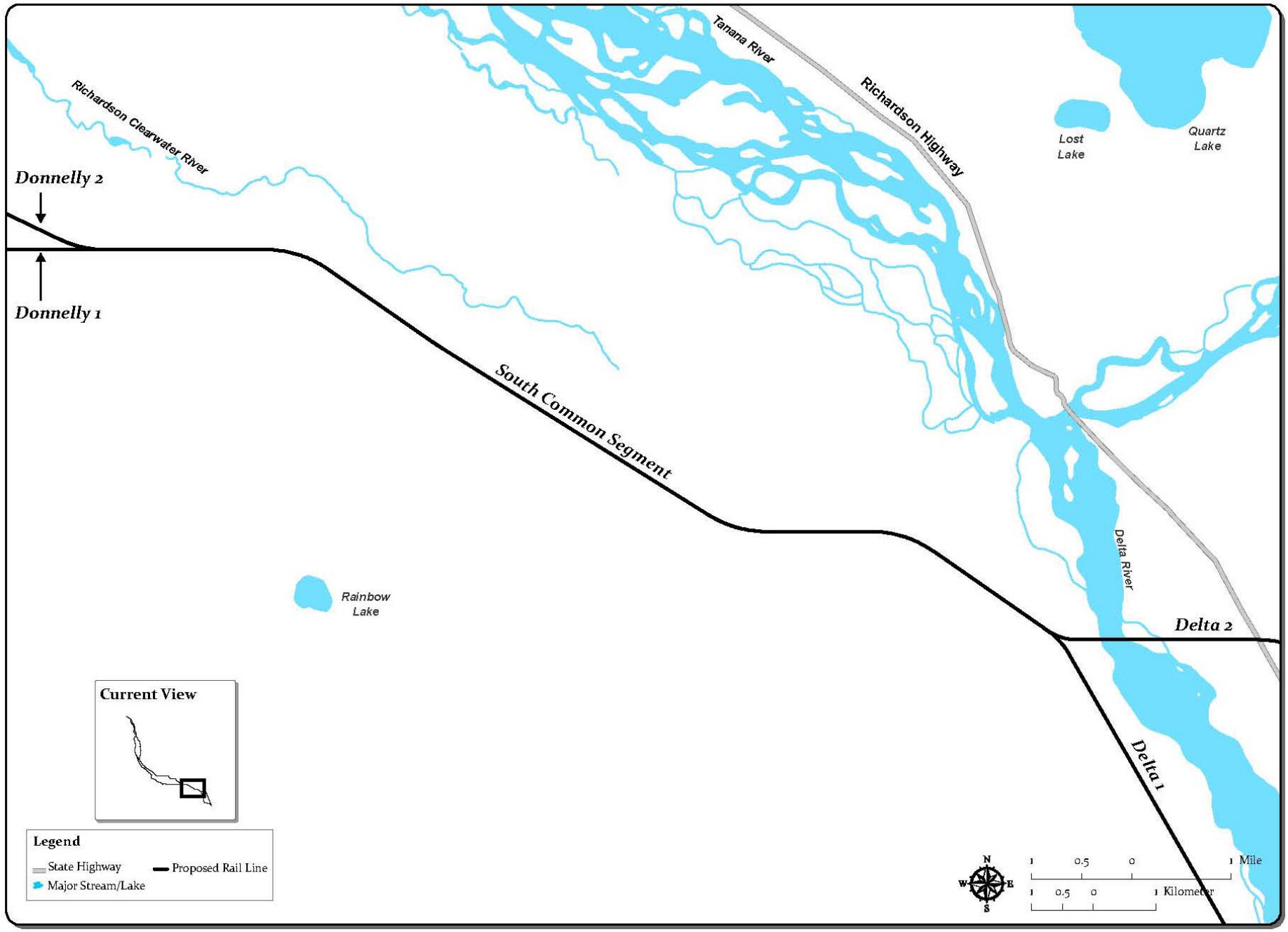

Figure S-6 - South Common Segment and Alternative Segments within Map Area 5

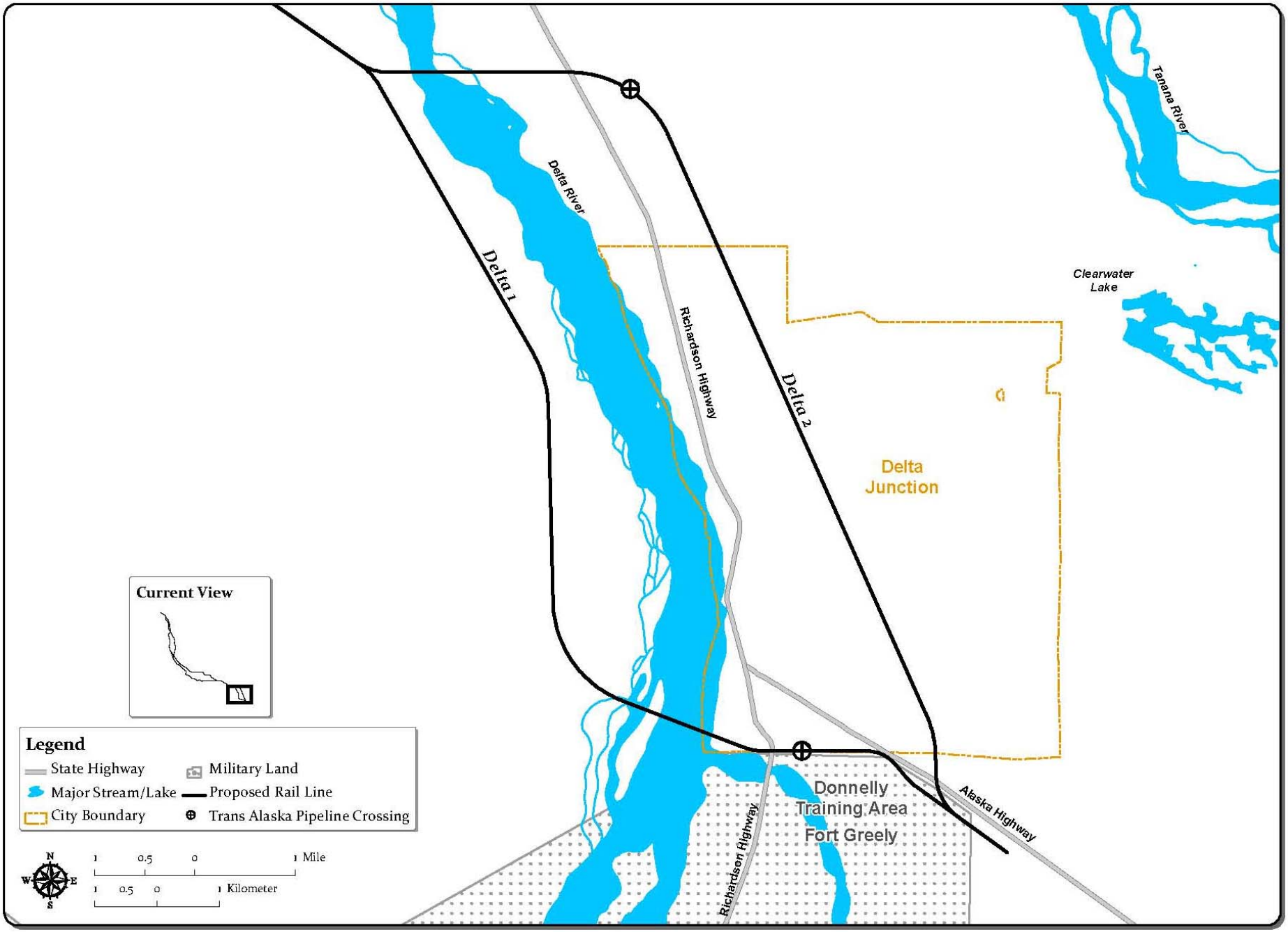

Figure S-7 - Delta Alternative Segments within Map Area 6

connect directly to Donnelly Alternative Segment 1 (if selected). If selected, Central Alternative 2 would connect directly to Donnelly Alternative Segment 2 (if selected) or would connect to Donnelly Alternative Segment 1 (if selected) via Connector Segment E.

S.3.5 Donnelly Alternative Segments

SEA is considering two alternative segments for the Donnelly area (Figure S-5). Both would run on the southwestern side of the Tanana River and end approximately 4 miles east of Delta Creek, where the selected alternative segment would meet South Common Segment. Each alternative segment would cross Delta Creek and the Little Delta River but would run through distinct terrains with different elevation profiles.

S.3.6 South Common Segment

This segment would connect the selected Donnelly alternative segment to the selected Delta alternative segment (Figure S-6). The segment would roughly parallel the Tanana River and be approximately 10.5 miles long.

S.3.7 Delta Alternative Segments

SEA is considering two alternative segments for the Delta area. Each of these segments would cross the Delta River, one north and one south of Delta Junction. The selected alternative segment would end at the terminus of the proposed rail line about 3 miles east of the Tanana River, adjacent to the Alaska Highway (Figure S-7).

S.3.8 No-Action Alternative

The EIS also considers a No-Action Alternative. Under the No-Action Alternative, ARRC would not construct an extension of the existing rail line or construct a dual-modal bridge over the Tanana River.

S.4 Alternatives Eliminated From Detailed Study

With the purpose and need for the proposed action as a primary focus, SEA and the Agencies reviewed the initial ARRC-developed alternative segments and alternative segments proposed during scoping for the EIS. Generally, SEA and the Agencies eliminated from further detailed study alternative segments that would not meet fundamental components of the purpose and need, led to substantial adverse environmental impacts, featured insurmountable construction or operational limitations, or did not provide an environmental or economic advantage over other alternative segments. Specific reasons for the elimination of alternatives included intrusion into military training and operations areas, geological instability, unfavorable topography, potential impacts to important wildlife habitat, and private property concerns.

S.5 Overview of Affected Environment

The project area is southeast of Fairbanks, Alaska, and the proposed rail line would extend between North Pole and Delta Junction. The area is relatively rural, with several large military facilities nearby. Much of the proposed rail line would parallel the Tanana River, a large tributary of the Yukon River, and would also roughly parallel Richardson Highway, one of the major highways in Interior Alaska. The northern end of the project area is adjacent to Eielson

AFB and the southern end in Delta Junction is near the Fort Greely Army installation. There are two military training areas on the western side of the Tanana River, Tanana Flats and Donnelly. The Tanana River Basin is composed of generally flat bottomlands and a prevalence of spruce and hardwood forests, with riparian features such as meandering rivers, side sloughs, and oxbow lakes. The area also provides important habitat for wildlife, such as fish and moose. There is recreational boating on the river in the summer, snowmachining along certain sections in the winter, and numerous state recreation areas nearby.

S.6 Summary of Environmental Consequences

SEA performed an in-depth review of the Applicant's proposal, which included independent environmental analysis of potential project impacts and evaluation of issues raised by government agencies and the public. The following discussion provides an overview and comparison of the potential impacts of the alternative segments. Table S-2 at the end of this Summary compares noteworthy impact variations among the alternative segments.

S.6.1 Topography, Geology, and Soils

Impacts on soil from construction of the proposed rail line would mostly be associated with excavation and fill activities required to maintain the grade of the railbed, or with removal of unsuitable construction material. The existing soil profile would be eliminated in areas subject to excavation or filling.

Salcha Alternative Segment 2, Donnelly alternative segments 1 and 2, and Delta Alternative Segment 1 would require grading and fill to meet the design standard of no more than a 1-percent grade for the rail line. Construction of the railbed would cause some thawing of the permafrost, potentially leading to irregular subsidence of the surrounding soil. The predicted amount of permafrost encountered by each segment would range from 5 to 90 percent of total segment area, and overburden would range from 2 feet to 14 feet. Salcha Alternative Segment 2 (75 to 90 percent, 2 to 7 feet overburden), Central Alternative Segment 1 (2 to 75 percent, 7 to 14 feet overburden), and Donnelly Alternative Segment 1 (5 to 90 percent, 2 to 14 feet overburden) would encounter a greater amount of permanently frozen ground when compared to the rest of the alternative segments.

Seismic activity in the area could affect the entire proposed NRE; however, the Salcha alternative segments cross the Salcha seismic zone, and would have a greater potential for train derailment resulting from a seismic event. Mass wasting events such as landslides, rockslides, or slump would be more likely to affect Salcha Alternative Segment 2. Earthquake-induced soil liquefaction would be an additional risk to the stability and integrity of the proposed NRE.

S.6.2 Water Resources

Impacts to water resources could result from the building of unpaved access roads, excavation of gravel for use in construction, construction of bridges and culverts, use of ice roads and ice bridges, water-supply withdrawals, transportation, and staging areas. The following paragraphs summarize the relevant effects of such project-related activities on surface water, water quality, groundwater, wetlands, and floodplains.

Surface Water and Water Quality

The Applicant would construct bridges and culverts to convey water under the rail line and, on the west side of the Tanana River, convey water under the access road. Bridges would either completely or partially span (or clear) the stream channel and would require construction activities along the streambanks to construct abutments and/or in the channel to construct piers and footings. The construction of culverts would require work in the channel and along streambanks. Impacts from bridges could include changes to natural drainage, sloughing and erosion of the streambank, impacts to permafrost, increased stages and velocities of floodwater, and increased channel scour or bank erosion. The construction of single or multiple culverts in waterbodies could result in localized disturbance of waterway banks to gain access to the channel and disturbance of the channel bed when installing the culverts. The installation of bridges and culverts would result in temporary impacts to water quality from increased sediment transport, increased sediment load, and increased turbidity due to bank and waterbody bed disruption.

Generally, the more bridges or culverts along a given segment as shown in Table S-2, the greater the occurrence of these impacts; however, the magnitude of effects at individual crossings would also depend on site-specific factors. Large bridge crossings along the Salcha, Donnelly, and Delta alternative segments would all likely result in impacts to surface waters due to altered flood hydraulics, increased scour surrounding the piers and downstream aggradation, and could increase the potential for overbank flooding and ice/debris jams.

The construction of the railbed or access roads and the use of floodplains as staging areas or work camps could affect sheet surface water flow if adequate cross drainage is not provided or if fill materials capture surface or subsurface flows and redirect them. In porous floodplain systems, there is the potential for fills associated with access roads to alter subsurface flows. The excavation of borrow areas could affect sheet surface water flow by capturing surface or subsurface flows.

Groundwater

Impacts to groundwater could include effects from infiltration, increased groundwater discharge through ponds created by borrow areas, contamination and comingling of surface water and groundwater from geotechnical boreholes, permanent changes to permafrost thickness and vertical location of the active thaw zone, and temporary groundwater elevation declines from pumping for potable and construction water. The extraction of materials from the borrow areas would likely affect groundwater due to the changes in local hydrogeologic regime resulting from the removal of saturated materials and the creation of new ponds that would serve as sources of groundwater discharge through evaporation during the summer and sources of groundwater recharge during major rainstorms and the break-up of ice.

Wetlands

Loss of wetland vegetation, disturbance of hydric soils, and alteration of wetland hydrology would contribute to the alteration or loss of wetland functions for affected wetlands. Within the project area, most forested, scrub/shrub, and emergent wetlands have high functional capacities for water quality improvement, nutrient export, and contributions to the abundance and diversity of wetland flora and fauna. In addition, hydrology of wetlands near the railbed could be altered, potentially creating new wetland areas or drying existing wetland areas if the water source is cut off.

A total of 33 percent of the area within 500 feet of the proposed alternative segments is wetlands. Assuming that the amount of wetlands on the sites of proposed construction and operations support facilities is the same as the area in general, those facilities would affect 203.3 acres of wetlands and other waters. In addition, construction in the ROW along any of the alternative segments would affect wetlands and other waters. The primary wetlands in the area are palustrine forested and palustrine scrub-shrub wetlands. The ROW of the Applicant's preferred route includes 1,046 acres of wetlands and other waters.

The minimum alternative[2] would include 884 acres of wetlands and other waters, while the maximum alternative[3] would include 1,111 acres. Among the sets of alternatives, Eielson Alternative Segment 3 (100.3 acres), Salcha Alternative Segment 2 (262.3 acres), Connector Segment A (56.2 acres), Central Alternative Segment 1 (51.0 acres), Donnelly Alternative Segment 1 (397.0 acres), and Delta Alternative Segment 1 (94.9 acres) would affect substantially greater areas of wetlands and other waters than their counterpart alternative segments.

Floodplains

Portions of the proposed NRE would be constructed within the floodplain of the Tanana and Delta rivers and some of their tributaries. Portions of the rail line, access road, staging areas, and camps would likely be placed within the 100-year flood zone. The affected areas would be small compared to the total floodplain storage available; thus, effects on floodplain storage would be minimal. Borrow areas in the floodplain could alter the hydraulics and conveyance of the watercourse during flood stage, leading to short-term increase in flood storage or the development of meander cutoffs and a change in sinuosity of the affected reaches. Effects would be more likely in streams crossing broad shallow floodplains and less likely for entrenched streams.

At the sites of the Tanana River bridges on Salcha alternative segments 1 and 2, rock revetments (and a levee, in the case of Option 1 for Salcha Alternative Segment 1) would control surface flow and reduce the width of the floodplain near the bridge, but would not prevent flooding from groundwater upwelling on the upland side of the revetments.

There are a number of differences in floodplain impacts among alternative segment groups. Central Alternative Segment 2 would be within the 100-year floodplain; Central Alternative Segment 1 would be outside the 100-year floodplain. Connector Segment A would be within the 100-year floodplain, Connector segments E and C would be within the 100-year floodplain along half their routes, and Connector segments B and D would be outside the 100-year floodplain.

S.6.3 Biological Resources

Rail line and facilities construction and operations would impact biological resources. The following paragraphs summarize the relevant effects of these project-related activities on vegetation, fisheries, wildlife, and birds. During consultations with Federal and State of Alaska

[2] The minimum alternative affects the fewest acres of wetlands and is also referred to as the "minimum project area." It is made up of the following segments: North Common Segment, Eielson Alternative Segment 2, Salcha Alternative Segment 1, Connector Segment B, Central Alternative Segment 2, Donnelly Alternative Segment 2, South Common Segment, and Delta Alternative Segment 2.

[3] The maximum alternative affects the most acres of wetlands and is also referred to as the "maximum project area." It is made up of the following segments: North Common Segment, Eielson Alternative Segment 1, Salcha Alternative Segment 2, Connector Segment C, Central Alternative Segment 1, Donnelly Alternative Segment 1, South Common Segment, and Delta Alternative Segment 1.

resource agencies, no Federal or state listed threatened, endangered, or candidate plants or animals were identified as occurring within the project area.

Vegetation Resources

The effects of proposed NRE construction and operation on vegetation would be influenced by the vegetation type, soil conditions, and extent of topographic modification required for construction. Primary impacts from the project would be similar across vegetation types; vegetation would be removed and soil structures would be altered. Twenty-seven rare plants are known to occur in the vicinity of the project area and one rare willow was identified along Delta Alternative Segment 2 during field investigations for wetlands.

Impacts to vegetation would occur through direct clearing for construction of the rail line, access roads, and other support facilities, and through the introduction and potential spread of noxious and invasive plants. Estimated vegetation clearing for common support facilities would be 721.6 acres. The ROW of the Applicant's preferred route includes 2,820 acres of vegetation cover. The minimum area alternative would include 2,790 acres of vegetation cover; the maximum area alternative would include 2,885 acres. Some cleared areas would likely be restored after construction; other areas would be covered by fill and permanently impacted. Vegetation clearing would be a long-term impact for forest communities due to the length of recovery time and the need to maintain cleared areas adjacent to the rail line and access road.

Fisheries Resources

Construction of the rail line would result in short-term disturbance and long-term habitat modification to resident and anadromous fisheries. Construction- and operations-related impacts would include the loss or alteration of instream and riparian habitats due to placement of structures. mortality from instream construction. alteration of stream hydrology and blockage of fish movement. and degradation of water quality.

All alternative segments would cross streams or waterbodies with fish resources and would potentially cause the impacts described above. The Applicant's preferred route would cross 27 fish-bearing streams. Among the sets of alternatives, the following segments would result in substantially greater numbers of fish-stream crossings than their counterpart alternative segments: Eielson Alternative Segment 3 (7 crossings), Salcha Alternative Segment 2 (9 crossings), Connector Segments C and D (6 and 4 crossings, respectively), and Donnelly Alternative Segment 2 (8 crossings). Construction and operation of the Tanana River bridge and in-river revetments and channel plugs associated with Salcha Alternative Segments 1 and 2 would result in direct adverse impacts to aquatic habitat in the vicinity.

Regarding the proposed Salcha Alternative Segment 2 crossing of the Tanana River, the Alaska Department of Natural Resources has stated that flow through the side channel, which would be blocked and redirected by the proposed bridge, as designed, is critical for anadromous fish use of the area.

Wildlife Resources

Impacts of the proposed NRE to game mammals (particularly, bears, caribou, moose, wolves, bison, and furbearers) would be influenced by the animal's dependence on specific habitats, the availability of preferred and used habitats, the amount of preferred habitat affected by the project, ecology and life history, and past and current population trends. Because game mammal populations are managed for sustainable human harvest, project-related effects on population abundance, distribution, available habitat, and predator-prey relationships would also affect

management of these game mammals. Common construction-related impacts would include habitat loss and fragmentation, direct mortality from construction, and reduced winter survival and lowered breeding success from exposure to construction noise and human activity. Common operations impacts would include mortality due to collision with trains, reduced survival from attractions to or displacement from the area around the rail line, reduced breeding success due to disturbance, and disruption of predator-prey relationships.

One BLM-listed Alaska Special Status Species, the Canada lynx, has been documented in the project area and could be affected through a loss of habitat and reduction in habitat suitability. The Eielson alternative segments would have the highest occurrences of moose and furbearers. Salcha Alternative Segment 1 and Donnelly Alternative Segment 2 would have higher densities of moose and furbearers than Salcha Alternative Segment 2 and Donnelly Alternative Segment 1. Central Alternative Segment 2 and Connector segments B, C, and D would contribute to the fragmentation of large areas of closed needleleaf forest core habitats and there could be mixed effects to wildlife. All game mammals except bison would be expected to be more common along Delta Alternative Segment 1 than Delta Alternative Segment 2. Among the sets of alternatives, Salcha Alternative Segment 2, Connector Segment A, and Central Alternative Segment 1 would result in substantially greater losses of habitat for most game mammals than their counterpart alternative segments.

Bird Resources

In general, the proposed NRE would affect a small proportion of the available habitat and a small proportion of the total avian population within the project area, with the greatest potential for significant impacts to forest nesting raptors, owls and landbirds. The proposed NRE would reduce the acreage of available habitat for nesting and migratory birds within the Tanana River Valley. Segments constructed through late-succession forest habitats would have the greatest impact on forest nesting landbirds. Power lines and communication towers built to support the rail line would increase collision mortality for all birds, especially when placed near raptor nests and foraging sites or between wetland or agricultural foraging habitats and riverine roosting habitats used by sandhill cranes, geese, swans, and ducks during migration. Twenty-five bird species of conservation concern and seven bird species listed as Bureau of Land Management Alaska Special Status Species have been documented within the project area and would be affected through a loss of habitat and reduction in habitat suitability.

Construction of Eielson alternative segments 1 and 2 and Central Alternative Segment 2 would result in impacts to identified bald eagle and large-raptor nests; Eielson Alternative Segment 3 and Central Alternative Segment 1 would not. Construction of Salcha Alternative Segment 2 would have a notably greater effect on nesting raptors than Salcha Alternative Segment 1. Construction of Connector segments A and B would affect one nesting pair of owls, while Connector segments B, C, and D would contribute to the fragmentation of raptor habitat. Construction of Donnelly Alternative Segment 2 would affect two raptors or their nests, while Donnelly Alternative Segment 1 would only affect one raptor nest.

S.6.4 Cultural Resources

Surface and subsurface disturbances from construction activities would be the sources of potential direct effects to historic properties and archaeological sites, and there could be indirect project effects from increased erosion and watershed changes. Impacts to cultural resources could include direct disturbance or destruction, contamination of organic residues of a site, exposure of archaeological resources, impacts to the aesthetics and visual site setting (depending

on proximity), and changes to groundwater that affect soil pH levels and harm preservation of buried artifacts.

Negligible impacts to prehistoric and historic resources are expected from North Common Segment, the Eielson alternative segments, Salcha Alternative Segment 1, the Central alternative segments, and Connector alternative segments A, B, C, and D because they lie in areas with relatively low archaeological sensitivity for prehistoric sites, low or moderate sensitivity for historic sites, and have no known cultural resources within the Area of Potential Effect (APE). Salcha Alternative Segment 2 is in an area that has high potential for both prehistoric and historic sites. A prehistoric site and an historic site associated with Salchaket Village lie within or near the APE. The Donnelly alternative segments are in areas with relatively high potential for prehistoric resources. Donnelly Alternative Segment 1 contains more identified archaeological sites than Donnelly Alternative Segment 2. There are eight buried prehistoric sites within the APE of Donnelly Alternative Segment 1. Seventeen additional cultural resources were identified within 1,312 feet of the APE boundary for Donnelly Alternative Segment 1. Radiocarbon dating indicated that one of the sites is approximately 13,000 years old (after date calibration), which would make it one of the earliest human habitation sites in North America. Four prehistoric archeological sites were recorded along Donnelly Alternative Segment 2, and 11 archaeological sites were identified within 1,312 feet of the APE boundary. Prehistoric sites were also identified within the APE for South Common Segment (low potential for historic and prehistoric resources), and Delta Alternative Segment 2 (moderate potential for prehistoric and high potential for historic resources). No cultural resources were identified within the APE for Delta Alternative Segment 1 (moderate potential for historic and prehistoric resources).

SEA has developed a draft Programmatic Agreement for the NRE that would guide further cultural resources identification and evaluation efforts. The PA provides for the completion of the Level 2 identification survey if the Board authorizes the project and the locations of ancillary facilities have been established. Additionally, the PA establishes responsibilities for the treatment of historic properties, the implementation of mitigation measures, and ongoing consultation efforts.

S.6.5 Subsistence

Subsistence impacts associated with the proposed NRE would result from restrictions on user access to use areas, including traplines, and resource availability in those areas. The project area lies within the Alaska Department of Fish and Game Fairbanks nonsubsistence designated area, meaning all harvests of wildlife and fish in the project area do not qualify as subsistence activities and are instead managed under general sport hunting regulations, or by personal use or sport fishing regulations. Therefore, SEA evaluated potential impacts to subsistence by examining changes in use areas, user access, resource availability, and competition.

Subsistence resource uses in and near the project area would be affected similarly by the proposed rail line, regardless of the alternative segments selected. Restricted access along the proposed rail line would create a linear barrier preventing free range of hunters and other users across the area. The proposed rail line could limit the movement of wildlife, especially west of the Tanana River, which subsistence users from the east generally access by traveling across the river. Moose mortality due to train-moose collisions could affect moose availability in the area. More limited access and hunting success in the area could cause harvesters to utilize use areas in other communities, increasing the number of harvesters competing for resources in those places.

Delta Junction, Healy Lake, Nenana, Salcha, and Tok would be mostly like to experience such effects.

Impacts to resident and anadromous fish resources resulting from construction, including loss of riparian and stream habitat and potential blockage of fish movements, could decrease the availability of these fish species to harvesters. Construction activities would affect harvest activities, depending on construction timing, access points to the use area, and availability of alternate harvest locations.

S.6.6 Climate and Air Quality

SEA evaluated the potential impacts of increased emissions of National Ambient Air Quality Standards air pollutants by developing emissions estimates for proposed rail line construction and operations. The estimated emissions for all of the alternative segments would be similar because the length of new rail line would be similar regardless of alternative segments selected. Construction-related and estimated annual average operations emissions would be expected to be small fractions of the Fairbanks North Star Borough (FNSB) total annual emissions and would be minimal in the context of existing conditions. Construction-related emissions of nitrogen oxides, particulate matter less than 10 microns, and particulate matter less than 2.5 microns would range from 0.6 to 0.9 percent of FNSB total emissions for each pollutant. These emissions would be spread over the length of the new rail line, and approximately half the rail line would be outside FNSB. None of the construction would occur in the Fairbanks and North Pole carbon monoxide maintenance areas, and estimated emissions would be well below the *de minimus* conformity thresholds (100 tons per year for each pollutant). Operations emissions of nitrogen oxides would represent the greatest increase compared the existing area transportation conditions (highway vehicle emissions), but would still be relatively low. The proposed action would result in a 6.3 percent increase in carbon dioxide emissions by rail operations in Alaska, but the overall effect would be less than a 0.02-percent increase for the state as a whole. Also, carbon dioxide emissions from existing highway activity could decrease as a result of the proposed action to the extent that transportation activity by car or truck would shift to rail. Therefore, the incremental emissions and impacts to climate change from the proposed NRE would be very small.

S.6.7 Noise and Vibration

SEA evaluated whether the alternatives would result in vibration impacts or rail line noise levels (attributable to wayside noise and the locomotive warning horn) that would equal or exceed a 65 decibel day-night average noise level (DNL) and/or result in an increase of 3 a-weighted decibels (dBA) or greater. An estimated 446 receptors along the existing Eielson Branch between the Fairbanks Depot and the connection point for the proposed NRE would experience an adverse noise impact greater than or equal to 65 DNL and an increase of 4 to 10 dBA as a result of the additional rail traffic. An estimated 32 noise receptors near Salcha Alternative Segment 2, and an estimated four receptors near Eielson Alternative Segment 3 would be exposed to adverse noise effects of greater than 65 DNL and an increase in noise level of 15 to 30 dBA. An estimated four receptors along Salcha Alternative Segment 2 would experience vibration levels exceeding the 80-vibration-decibels criterion for human annoyance. The proposed rock storage and transfer facility adjacent to the Eielson Branch near Eielson AFB would generate additional, but temporary, construction noise. Based on the Federal Transit Administration General Assessment method and assuming daytime construction only, there would be no construction noise and vibration impacts from the proposed NRE.

S.6.8 Energy Resources

SEA expects that proposed NRE construction and operations would cause a diversion of freight from truck to rail transport, resulting in no change or a slight decrease in fuel usage. Any fuel savings would result from the substantial fuel efficiency advantage of rail versus truck transport in the movement of freight. SEA has conservatively assumed that operation of the rail passenger service would represent a decrease in energy efficiency because the Applicant has not estimated the shift of passenger traffic from road to rail. However, given the increased efficiency resulting from truck-to-rail diversions of freight, SEA estimates rail line operations would not decrease overall energy efficiency.

S.6.9 Transportation

Impacts to transportation operations could result from the building of the rail line (and associated facilities) and from rail line operations. The paragraphs below summarize the relevant effects of these project-related activities.

Safety

Using available statistics on accidents per train mile, SEA estimated that the proposed NRE would result in an increase of 0.59 predicted train accident per year. The increase would be essentially the same for all routes from North Pole to Delta Junction because the difference in the length of the routes is comparatively small. Similarly, the potential consequences of moving 63 railcars containing hazardous materials annually would be the same for all routes. The potential impacts of the project on road safety would be small during construction, and minimal to potentially positive during operations, which would be equal for all routes. SEA's analysis of highway-rail grade crossing safety indicates that, during operations, accident frequency at each of the existing public at-grade crossings that would be used by proposed NRE rail traffic would range from a minimum rate per year of 0.0093 and a maximum of 0.413 (*i.e.*, one predicted accident every 2.4 to 108 years). The total estimated increase in predicted accident frequency of 0.54 accident per year (from 1.18 to 1.72) for all existing crossings that would be used by proposed NRE traffic is independent of the route of the rail line extension, because the same existing crossings would be used for all routes. For new at-grade crossings, predicted accident frequency would be expected to be much lower than for the existing grade crossings, because total estimated vehicle traffic at the new crossings would be less than 2 percent of that for the existing crossings for any of the alternative routes from North Pole to Delta Junction.

Delay

SEA does not expect that trains on the existing rail line would experience noticeable delays as a result of project construction or proposed increased operations. Construction activities would generate vehicle trips, and construction transportation could cause increased road delays. There would be temporary delays where existing roads were widened to access the Tanana River bridge location on Salcha alternative segment 1 or 2, and for traffic on Richardson Highway in the Salcha area during relocation of the highway for construction of Salcha Alternative Segment 2. Construction of grade-separated and highway/rail at-grade crossings could also cause temporary delays.

SEA anticipates that the impacts of road transportation delay from drivers' commutes to rail stations would be minimal. Vehicle trips on Richardson Highway could decrease slightly during operations because some of the military and commercial freight hauled there could move on the proposed rail line. SEA estimates that the number of vehicles delayed by rail traffic would

increase as a result of the proposed NRE from approximately 1 percent of all vehicles using the highway/rail at-grade crossings to approximately 1.6 percent, and that the average delay experienced by each delayed vehicle would decrease from approximately 1.67 minutes per vehicle to 1.34 minutes per vehicle (because the average train length would decrease). Operations impacts on emergency vehicle response time would be small.

S.6.10 Navigation

Where the selected alternative segments would cross a navigable waterway, as designated by the U.S. Coast Guard and Alaska Department of Natural Resources, there could be small temporary effects to navigability due to temporary bridges and normal bridge construction activities (*e.g.*, setting piers and construction equipment operations). No long-term adverse impacts are expected during rail line operations, because ARRC would construct bridges over designated navigable waterways to allow continued use by vessels. Bridges over designated navigable waters would be required to meet Coast Guard, the Department of Natural Resources, and the Alaska Department of Fish and Game permit requirements, and no construction would begin prior to permit determination.

Bridges across the Tanana River could affect aircraft navigation. When weather conditions are bad, some pilots use the Tanana River to navigate back to Fairbanks. In times of severe fog, pilots might fly very low so they can see the river. Federal Aviation Administration requirements could apply to bridge structures crossing the Tanana River (*e.g.*, lighting) for aircraft safety.

S.6.11 Land Use

The Federal Government, the State of Alaska, and private entities own most of the land the proposed NRE would directly affect. No tribal lands or native allotments have been identified in the ROW of any of the alternative segments. Federal and state lands are used primarily for military training, recreation, hunting, fishing, mining, and timber harvest. Privately owned lands are primarily in agricultural and residential use or in a natural state. Existing land use in the rail line ROW would be permanently changed. Any non-rail associated activities within the ROW would require a permit from ARRC, and any permissions required by the agency, corporation, or individual that owns the property. Permanent support facilities that would be constructed outside of the ROW include permanent access roads, communications towers, and facilities to support rail line operations, including a passenger terminal. Existing land ownership or control and use in these areas would be permanently changed to allow for facility operations. Lands that would be affected by the project are generally undeveloped and away from residences and businesses, with some exceptions. There would be temporary indirect effects to residences and business during construction, primarily from noise and changes to the visual landscape, but these effects would generally be minor.

Commercial timber would be cleared for construction of the rail project. The volume of commercial timber within areas that would be cleared for the project ROW has not been quantified by a timber survey, and ARRC has not developed specific plans for timber salvage from lands that would be cleared for the ROW.

Recreation Resources

Because recreation activities within the project area are generally dispersed over a large area, most potential impacts to recreation would be common to all alternative segments.

Construction-related impacts would include temporary closure of some trails and limited access to some navigable rivers and other access routes. Culverts used to convey water under the rail line would typically limit access for winter and summer use of the waterway. Main river access routes to areas west of the Tanana River via larger rivers and streams (Fivemile Clearwater Creek, Little Delta River, Delta Creek), would be maintained through use of bridges with ample clearance.

Access to recreation resources would be impeded primarily by prohibition of crossing or use of the rail line ROW. Pedestrians or vehicles crossing the rail line ROW where there is no designated crossing would be trespassing and such crossings would be prohibited by law. This legal prohibition would also extend to walking along the tracks. Though illegal ROW crossing would likely occur on occasion, enforcement of the ROW crossing prohibition would generally result in decreased or denied access to hunting and other recreation activities on public lands bisected by the rail line.

Unserialized trails are quite common on state lands along many of the proposed alternative segments. Individuals are not required to report the use or location of these trails to the Alaska Department of Natural Resources. The Alaska Division of Mining, Land & Water has indicated that it would consider closure of these generally allowed trails to be an impact, would require further investigation to determine their location and use, and would require accommodation of these trails.

Section 4(f) Evaluation

SEA identified potential U.S. Department of Transportation Act Section 4(f) resources that would be affected by the proposed NRE. Most these properties are recreational trails used for dogsledding, snowmachining, and skiing; two are cultural resource sites. Ten alternative segments would require use of Section 4(f) resources, based on preliminary determination. By the criteria of Section 4(f) evaluation, the combination of segments that minimize effects to Section 4(f) properties would include the following: North Common Segment, Eielson Alternative Segment 3, Salcha Alternative Segment 1, any of the connector segments, either Central alternative segment, Donnelly Alternative Segment 2, South Common Segment, and either Delta alternative segment. There might be opportunities to minimize or mitigate impacts to Section 4(f) resources, including scheduling construction to avoid times of heavy trail use, and minimizing dust and noise emissions. Coordination is ongoing with appropriate agencies to determine the significance of resources protected under Section 4(f) that would be affected by the proposed NRE.

Hazardous Materials/Waste Sites

There could be environmental impacts from hazardous materials as a result of excavating contaminated sites during construction of roadbeds and railbeds, hill cuts, grade separations, and retaining walls. Borrow areas developed for fill materials could disturb or move contaminated materials. Eleven sites in the project area were identified that present potential risks due to site contamination if excavation were to occur at these locations. Potential sites in the project area include former highway construction camp sites and a petroleum pipeline ROW. The Applicant would use information regarding the locations of these sites, and standard best management practices, to avoid excavation in contaminated areas.

S.6.12 Visual (Aesthetic) Resources

For the most part, the proposed action and alternative segments would meet BLM visual resource management (VRM) objectives.[4] However, in some cases the proposed alternative segments would not be consistent with the VRM objectives related to water crossings, proximity to communities, and geologic disturbance. Salcha Alternative Segment 1 would not meet VRM objectives at its crossing of the Tanana River. Salcha Alternative Segment 2 would not meet VRM objectives due to a hill cut, crossings of the Tanana and Salcha rivers, and its proximity to the community of Salcha. SEA anticipates that the Donnelly alternative segments would not meet VRM management objectives at their crossings of Delta Creek and Little Delta River, and that Delta alternative segments 1 and 2 would not meet VRM management objectives at their crossings of the Delta River and at highway crossings. Visual impacts from temporary facilities would be strong during construction where visible. However, these facilities would be removed and the sites restored after construction is complete, and SEA believes they would likely meet VRM objectives in the long term. Depending on their location, some of the permanent communications towers could have a moderate to strong contrast with the surrounding landscape due to the elevation of the terrain and areas permanently cleared of vegetation surrounding the tower.

S.6.13 Socioeconomics

Most socioeconomic effects would result from the project as a whole, and not from specific combinations of alternative segments that the Board may ultimately authorize. However, there are some socioeconomic effects that would differ across alternative segments, including effects on communities and neighborhoods. Salcha Alternative Segment 2 would require that ARRC relocate the Salcha Elementary School. The effects of all alternatives on community cohesion would be minimal. Eielson Alternative Segment 1 would result in the loss of approximately 2 acres of farming surface area from the Eielson Farm Community, but would have negligible effects on existing travel patterns, social interactions, and agricultural output within the community. The effects of the proposed NRE on public services and housing in the project area would also be minimal. SEA estimates that NRE operations and maintenance would result in the creation of between 10 and 17 ARRC full-time direct and secondary jobs. Because the number of new ARRC full-time employment positions would be small, the effects on housing and public facilities and services would be negligible.

S.6.14 Environmental Justice

SEA did not identify any high and adverse impacts to human populations in the project area. Therefore, there would be no high and adverse impacts to environmental justice populations as a result of the proposed NRE.

S.6.15 Cumulative Effects

SEA evaluated the cumulative impacts for situations where planned or reasonably foreseeable projects would overlap with the NRE in terms of geographic area and timeframe. These projects

[4] The BLM uses its VRM system to measure the scenic quality of a landscape, establish the management objectives for levels of acceptable visual impact, and measure the contrast caused by a project on that landscape from traveled observation points.

could have common potential actions and impacts. Reasonably foreseeable activities within the project area include the expansion or expanded use of the Donnelly Training Area, replacement of or upgrades to the Fort Wainwright rail loading facility, improvements along Richardson Highway, and construction of the Alaska Natural Gas Pipeline. The cumulative effects of these projects and the proposed NRE could result in additional adverse effects for geology and soils, water resources, biological resources, cultural resources, climate, subsistence, noise, transportation safety, land use, and visual resources.

Table S-2 summarizes and compares potential impacts for resource areas and topics for which there are noteworthy differences among the alternatives. Table S-2 does not include resource areas for which the potential impacts would be essentially the same for all the alternatives. Similarly, the table does not include the No-Action Alternative because, under that alternative, existing conditions would remain the same and there would be no impacts.

Table S-2
Summary and Comparison of Potential Impacts

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Eielson Branch (existing)	Not applicable	Not applicable	Not applicable	Not applicable	Adversely affected noise receptors: 446	Not applicable	Not applicable
North Common Segment	Minimal grading/filling 25% permafrost, 5 feet overburden	Crossings would include 1 bridge and 1 culvert.[b] Impacts to wetlands and other waters (acres): 3.5 (forested 0, scrub/shrub 2.6, emergent 0.3, other waters 0.6)	Total vegetation cleared (acres): 61.6 Fish-bearing stream crossings: 2 (2 spawning, 1 anadromous habitat) Direct habitat loss (acres): Bears, 60.5 Caribou, 21.7 Moose, 60.5 Wolves, 61.6 Furbearers, 42.0	Negligible potential for impacts to historic and prehistoric resources Identified sites within APE: 0	No adversely affected noise/vibration receptors	Federal/state land ownership Impacts to fishing 4(f) resource present Potential hazardous material/waste sites	Consistent with VRM objectives

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Eielson Alternative Segment 1	Minimal grading/filling 25% permafrost, 5 feet overburden	Crossings would include 13 culverts and 1 small bridge.[b] Impacts to wetlands and other waters (acres): 16.8 (forested 6.9, scrub/shrub 7.1, emergent 1.5, other waters 1.3)	Total vegetation cleared (acres): 246.4 Fish-bearing stream crossings: 2 (2 spawning, 2 anadromous habitat) Direct habitat loss (acres): Bears, 246.4 Caribou, 123.8 Moose, 246.4 Wolves, 247.3 Furbearers, 237.2 1 bald eagle and 1 red-tailed hawk nest affected	Negligible potential for impacts to historic and prehistoric resources Identified sites within APE: 0	No adversely affected noise/vibration receptors	52 acres private land; 2 acres in agricultural use 2 to 3 residences directly affected 11 recreation access route intersections 4(f) resource present	Consistent with VRM objectives

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Eielson Alternative Segment 2	Minimal grading/filling 25% permafrost, 5 feet overburden	Crossings would include 10 culverts and 3 small bridges.[b] Impacts to wetlands and other waters (acres): 70.8 (forested 23.3, scrub/shrub 43.1, emergent 3.5, other waters 0.9)	Total vegetation cleared (acres): 241.0 Fish-bearing stream crossings: 3 (2 spawning, 2 anadromous habitat) Direct habitat loss (acres): Bears, 241.0 Caribou, 146.4 Moose, 241.0 Wolves, 241.2 Furbearers, 222.9 1 bald eagle and 1 red-tailed hawk nest affected	Negligible potential for impacts to historic and prehistoric resources Identified sites within APE: 0	No adversely affected noise/vibration receptors	78 acres private land; 2 acres in agricultural use 8 recreation access route intersections 4(f) resource present	Consistent with VRM objectives
Eielson Alternative Segment 3	Minimal grading/filling 25% permafrost, 5 feet overburden	Crossings would include 14 culverts and 3 small bridges.[b] Impacts to wetlands and other waters (acres): 100.3 (forested 36.7, scrub/shrub 48.6, emergent 5.7, other waters 9.3)	Total vegetation cleared (acres): 238.5 Fish-bearing stream crossings: 7 (1 spawning, 1 anadromous habitat) Direct habitat loss (acres): Bears, 238.5 Caribou, 124.5 Moose, 238.5 Wolves, 239.3 Furbearers, 222.0	Negligible potential for impacts to historic and prehistoric resources Identified sites within APE: 0	Adversely affected noise receptors: 4	55 acres private land 6 recreation access route intersections 4(f) resource present	Consistent with VRM objectives

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Salcha Alternative Segment 1	Minimal grading/filling 5 to 25% permafrost, 2 to 5 feet overburden Potential for seismic events	Crossings would include 12 culverts and 1 large bridge[b]; large bridge crossing of the Tanana River would result in high impacts due to altered flood hydraulics, increased scour, and downstream aggradation. Impacts to wetlands and other waters (acres): 179.9 (forested 32.2, scrub/shrub 56.7, emergent 0.2, other waters 90.8)	Total vegetation cleared (acres): 434.9 Fish-bearing stream crossings: 3 (2 spawning, 1 anadromous habitat); adverse impact from bridge Higher density of game mammals (particularly bears, wolves, furbearers) than Salcha 2; potential impact to prime moose calving area Direct habitat loss (acres): Bears, 434.9 Caribou, 175.2 Moose, 434.9 Wolves, 447.6 Furbearers, 426.4 1 pair bald eagles, 1 pair great horned owls affected	Negligible potential for impacts to historic and prehistoric resources Identified sites within APE: 0	No adversely affected noise/vibration receptors	14 acres private land 25 to 30 residences directly or indirectly affected Impacts to fishing 1 recreation access route intersection	Inconsistent with VRM objectives: bridge crossing

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Salcha Alternative Segment 2	Substantial grading/filling 5 to 75% permafrost, 2 to 7 feet overburden Potential for seismic events and mass wasting	Crossings would include 12 culverts, 2 small bridges and 4 large bridges[b]; large bridge crossing of the Tanana River would result in high impacts due to altered flood hydraulics, increased scour, and downstream aggradation. Impacts to wetlands and other waters (acres): 262.3 (forested 58.5, scrub/shrub 120.1, emergent 3.0, other waters 80.7)	Total vegetation cleared (acres): 536.8 Fish-bearing stream crossings: 9 (7 spawning, 7 anadromous habitat); adverse impact from bridge Direct habitat loss (acres): Bears, 535.1 Caribou, 299.1 Moose, 536.2 Wolves, 580.4 Furbearers, 506.0 2 pair bald eagles and 3 nest structures; 3 pair peregrine falcon affected	High potential for impacts to historic and prehistoric resources Identified sites within APE: 2	Adversely affected noise receptors: 32 Adversely affected vibration receptors: 4	92 acres private land; 150 homes or businesses temporarily or permanently affected, including the Salcha School 3 recreation access route intersections; impacts to fishing and hunting Potential hazardous material/waste sites 4(f) resource present	Inconsistent with VRM objectives: hill cut, bridge crossing, community

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Central Alternative Segment 1	Minimal grading/filling 75 to 90% permafrost, 7 to 14 feet overburden	Crossings would include 9 culverts and 1 small bridge.[b] Impacts to wetlands and other waters (acres): 51.0 (forested 22.5, scrub/shrub 24.1, emergent 4.2, other waters 0.2) Would lie outside 100-year floodplain	Total vegetation cleared (acres): 122.6 Fish-bearing stream crossings: 1 (1 spawning habitat) Direct habitat loss (acres): Bears, 122.6 Caribou, 65.9 Moose, 122.6 Wolves:, 22.8 Furbearers, 88.9	Negligible potential for impacts to historic and prehistoric resources Identified sites within APE: 0	No adversely affected noise/vibration receptors	Impacts to hunting	Consistent with VRM objectives

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Central Alternative Segment 2	Minimal grading/filling 25% permafrost, 5 feet overburden	Crossings would include 9 culverts and 2 small bridges.[b] Impacts to wetlands and other waters (acres): 6.5 (forested 0, scrub/shrub 6.5, emergent 0) Would lie within 100-year floodplain of the Tanana River	Total vegetation cleared (acres): 84.9 Fish-bearing stream crossings: 2 (no spawning or anadromous habitat) Fragmentation of closed needleleaf habitat (benefit to moose, mixed adverse impact to furbearers) Direct habitat loss (acres): Bears, 84.9 Caribou, 72.5 Moose, 84.9 Wolves, 86.9 Furbearers, 84.3 1 pair bald eagles affected	Negligible potential for impacts to historic and prehistoric resources Identified sites within APE: 0	No adversely affected noise/vibration receptors	Impacts to hunting	Consistent with VRM objectives

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Connector Segment A	Minimal grading/filling 25% permafrost, 5 feet overburden	Crossings would include 3 culverts and 1 small bridge.[b] Impacts to wetlands and other waters (acres): 56.2 (forested 31.9 , scrub/shrub 23.0, emergent 1.1, other waters 0.2) Would lie within 100-year floodplain	Total vegetation cleared (acres): 105.7 Fish-bearing stream crossings: 1 (1 anadromous habitat) Direct habitat loss (acres): Bears, 105.7 Caribou, 64.1 Moose, 105.7 Wolves, 105.7 Furbearers, 91.0 1 pair great horned owls affected	Negligible potential for impacts to historic and prehistoric resources Identified sites within APE: 0	No adversely affected noise/vibration receptors	Federal/state land ownership 1 recreation access route intersection; impacts to hunting and fishing	Consistent with VRM objectives

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Connector Segment B	Minimal grading/filling 25% permafrost, 5 feet overburden	Crossings would include 2 culverts and 1 small bridge.[b] Impacts to wetlands and other waters (acres): 1.6 (forested 0.3, scrub/shrub 0.4, emergent 0.2, other waters 0.7) Would lie outside 100-year floodplain	Total vegetation cleared (acres): 78.5 Fish-bearing stream crossings: 2 (1 spawning, 2 anadromous habitat) Fragmentation of closed needleleaf habitat (benefit to moose, mixed adverse impact to furbearers) Direct habitat loss (acres): Bears, 78.5 Caribou, 68.9 Moose, 78.5 Wolves, 78.5 Furbearers, 78.5 1 pair great horned owls affected	Negligible potential for impacts to historic and prehistoric resources Identified sites within APE: 0	No adversely affected noise/vibration receptors	Federal/state land ownership 1 recreation access route intersection; impacts to hunting and fishing	Consistent with VRM objectives

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Connector Segment C	Minimal grading/filling 25% permafrost, 5 feet overburden	Crossings would include 4 culverts and 3 small bridges.[b] Impacts to wetlands and other waters (acres): 26.3 (forested 10.4, scrub/shrub 13.2, emergent 1.3, other waters 1.4) Half of segment would lie within 100-year floodplain	Total vegetation cleared (acres): 55.6 Fish-bearing stream crossings: 6 (1 spawning, 5 anadromous habitat) Fragmentation of closed needleleaf habitat (benefit to moose, mixed adverse impact to furbearers) Direct habitat loss (acres): Bears, 55.6 Caribou, 41.4 Moose, 55.6 Wolves, 55.6 Furbearers, 45.3	Negligible potential for impacts to historic and prehistoric resources Identified sites within APE: 0	No adversely affected noise/vibration receptors	Federal/state land ownership Impacts to hunting	Consistent with VRM objectives

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Connector Segment D	Minimal grading/filling 25% permafrost, 5 feet overburden	Crossings would include 1 culvert and 3 small bridges.[b] Impacts to wetlands and other waters (acres): 2.9 (forested 0, scrub/shrub 1.5, emergent 0.2, other waters 1.2) Would lies outside 100-year floodplain	Total vegetation cleared (acres): 21.2 Fish-bearing stream crossings: 4 (4 anadromous habitat) Fragmentation of closed needleleaf habitat (benefit to moose, mixed adverse impact to furbearers) Direct habitat loss (acres): Bears, 21.2 Caribou, 19.7 Moose, 21.2 Wolves, 21.2 Furbearers, 21.2	Negligible potential for impacts to historic and prehistoric resources Identified sites within APE: 0	No adversely affected noise/vibration receptors	Federal/state land ownership Impacts to hunting	Consistent with VRM objectives
Connector Segment E	Minimal grading/filling 25% permafrost, 5 feet overburden	Crossings would include 5 culverts and 1 small bridge.[b] Impacts to wetlands and other waters (acres): 3.5 (forested 0.7, scrub/shrub 2.1, emergent 0.3, other waters 0.4) Half of segment would lie within 100-year floodplain	Total vegetation cleared (acres): 58.2 Fish-bearing stream crossings: 1 (1 spawning, 1 anadromous habitat) Direct habitat loss (acres): Bears, 58.2 Caribou, 16.3 Moose, 58.2 Wolves, 58.4 Furbearers, 24.5	Negligible potential for impacts to historic and prehistoric resources Identified sites within APE: 0	No adversely affected noise/vibration receptors	6 acres private land Impacts to hunting and fishing	Consistent with VRM objectives

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Donnelly Alternative Segment 1	Substantial grading/filling 5 to 90% permafrost, 2 to 14 feet overburden	Crossings would include 31 culverts, 4 small bridges, and 2 large bridges[b]; large bridge crossing of Delta Creek and Little Delta River would result in high impacts due to altered flood hydraulics, increased scour, downstream aggradation, and increased potential for overbank flooding and/or debris jams. Impacts to wetlands and other waters (acres): 397.0 (forested 125.8, scrub/shrub 214.0, emergent 2.2, other waters 55)	Total vegetation cleared (acres): 627.5 Fish-bearing stream crossings: 6 (no spawning or anadromous habitat) Fragmentation of closed needleleaf habitat (benefit to moose, mixed adverse impact to furbearers) Direct habitat loss (acres): Bears, 626.9 Caribou, 475.3 Moose, 626.9 Wolves, 658.8 Furbearers, 549.8 1 northern goshawk nest affected	High potential for impacts to historic and prehistoric resources Identified sites within APE: 8	No adversely affected noise/vibration receptors	Federal/state land ownership 6 recreation access route intersections; impacts to hunting 4(f) resource present	Consistent with VRM objectives

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Donnelly Alternative Segment 2	Substantial grading/filling 4 to 12% permafrost, 4 to 12 feet overburden	Crossings would include 44 culverts, 2 small bridges, and 2 large bridges[b]; large bridge crossing of Delta Creek and Little Delta River would result in high impacts due to altered flood hydraulics, increased scour, downstream aggradation, and increased potential for overbank flooding and/or debris jams. Impacts to wetlands and other waters (acres): 302.5 (forested 144.1, scrub/shrub 99.0, emergent 4.2, other waters 55.2)	Total vegetation cleared (acres): 636.4 Fish-bearing stream crossings: 8 (3 spawning, 3 anadromous habitat) Fragmentation of open and closed needleleaf (benefit to moose, mixed adverse impact to furbearers) and closed broadleaf habitat; higher occurrence of furbearers than Donnelly 1 Direct habitat loss (acres): Bears, 636.4 Caribou, 370.2 Moose, 636.4 Wolves, 669.7 Furbearers, 564.9 1 pair peregrine falcons, 1 bald eagle nest affected	High potential for impacts to historic and prehistoric resources Identified sites within APE: 4	No adversely affected noise/vibration receptors	4 acres private land 3 recreation access route intersections; impacts to hunting Potential hazardous material/waste sites 4(f) resource present	Consistent with VRM objectives

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
South Common Segment	Minimal grading/filling 50 to 85% permafrost, 3 to 4 feet overburden	Crossings would include 11 culverts and 3 small bridges.[b] Impacts to wetlands and other waters (acres): 55.5 (forested 11.3, scrub/shrub 43.4, emergent 0.8, other waters 0.3)	Total vegetation cleared (acres): 251.2 Fish-bearing stream crossings: 3 (2 spawning, 2 anadromous habitat) Direct habitat loss (acres): Bears, 251.2 Caribou, 166.3 Moose, 251.2 Wolves, 251.2 Furbearers, 244.2 2 red-tailed hawk, 2 great gray owl, and 1 great horned owl nest affected	Low potential for impacts to historic and prehistoric resources Identified sites within APE: 0	No adversely affected noise/vibration receptors	Federal/state land ownership 2 recreation access route intersections; impacts to fishing 4(f) resource present	Consistent with VRM objectives

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Delta Alternative Segment 1	Substantial grading/filling 5 to 85% permafrost, 3 to 7 feet overburden	Crossings would include 1 culvert and 1 large bridge[b]; large bridge crossing of the Delta River would result in high impacts due to increased scour, bank erosion and/or downstream aggradation. Impacts to wetlands and other waters (acres): 94.9 (forested 14.0, scrub/shrub 34.0, emergent 0.1, other waters 46.8)	Total vegetation cleared (acres): 261.7 Fish-bearing stream crossings: 1 (no spawning or anadromous habitat) All game animals except bison more common than Delta 2; fragmentation of closed needleleaf habitat (benefit to moose, mixed adverse impact to furbearers) Direct habitat loss (acres): Bison, 14.6 Bears, 256.4 Caribou, 198.2 Moose, 256.4 Wolves, 311.2 Furbearers, 247.5	Moderate potential for impacts to historic and prehistoric resources Identified sites within APE: 0	No adversely affected noise/vibration receptors	3 acres private land Federal/state land ownership No recreation access route intersections; numerous legal, informal trails Potential hazardous material/waste sites 4(f) resource present	Inconsistent with VRM objectives: highway crossing

Table S-2
Summary and Comparison of Potential Impacts (cont'd)

Alternative Segments	Topography, Geology, Soils	Water Resources	Biological Resources	Cultural Resources	Noise and Vibration	Land Use[a]	Visual (Aesthetic) Resources
Delta Alternative Segment 2	Minimal grading/filling 5 to 85% permafrost, 2 to 7 feet overburden	Crossings would include 1 large bridge[b]; large bridge crossing of the Delta River would result in high impacts due to increased scour, bank erosion and/or downstream aggradation. Impacts to wetlands and other waters (acres): 60 (forested 4.2, scrub/shrub 19.6, emergent 1.1, other waters 35)	Total vegetation cleared (acres): 281.1; one rare willow identified. Fish-bearing stream crossings: 1 (no spawning or anadromous habitat) Greater disturbance of potential bison habitat than Delta 1; negligible impact to bison Direct habitat loss (acres): Bison, 74.2 Bears, 211.4 Caribou, 104.6 Moose, 211.4 Wolves, 304.0 Furbearers, 209.0	Moderate potential for impacts to historic and prehistoric resources; greater direct impacts on historic resources than Delta 1 Identified sites within APE: 1	No adversely affected noise/vibration receptors	59 acres of private land in agricultural and residential use 1 recreation access route intersection; numerous legal, informal trails Potential hazardous material/waste sites 4(f) resource present	Inconsistent with VRM objectives: highway crossing

[a] Known trails and streams not including all trapping trails and other small winter trails.

[b] Generally, the more bridges or culverts, the greater the potential for the following environmental consequences: bridge construction impacts could include changes to natural drainage, sloughing, and erosion of the streambank, impacts to permafrost, increased stages and velocities of floodwater, and increased channel scour or bank erosion; impacts from construction of single or multiple culverts would likely include localized disturbance of the streambank to gain access to the channel and disturbance of the channel bed when installing the culverts.

S.7 Summary of SEA's Preliminary Recommended Mitigation Measures

SEA encourages applicants to develop voluntary mitigation to address concerns that go beyond the Board's jurisdiction. Accordingly, the Applicant in this case has submitted proposed voluntary mitigation measures for SEA's consideration. The Applicant developed these voluntary mitigation measures in consultation with local communities and interested agencies.

Based on the independent environmental analysis, consultations with appropriate agencies, and available project information, SEA developed preliminary recommended mitigation to address the environmental impacts of the proposed NRE. In addition, SEA intends to recommend that the Board impose the Applicant's proposed voluntary mitigation measures as a condition of petition approval. The proposed action would have negligible effects on all other impact areas.

SEA specifically requests meaningful comments on the preliminary recommended mitigation identified in the Draft EIS and potential additional mitigation measures. SEA will make its final recommendations to the Board on environmental mitigation in the Final EIS after considering all public comments on the Draft EIS. The Board will then make its final decision regarding this project and any environmental conditions it might impose.

S.8 Request for Comments on the Draft EIS

The public and any interested parties are encouraged to submit written comments on all aspects of this Draft EIS. SEA will consider all such comments in preparing the Final EIS, which will include responses to all substantive comments, SEA's final conclusions on potential impacts, and SEA's final recommendations. **The deadline for comments is February 2, 2009.** When submitting comments on the Draft EIS, the STB encourages commenters to be as specific as possible and substantiate concerns and recommendations.

Please mail written comments on the Draft EIS to the address below.

David Navecky
STB Finance Docket No. 34658
Surface Transportation Board
395 E Street, S.W.
Washington, D.C. 20423-0001

Environmental comments may be filed electronically on the Board's Web site at www.stb.dot.gov by clicking on the "E-FILING" link. Comments submitted electronically will be given the same weight as mailed comments; therefore, persons submitting comments electronically do not have to also send comments by mail.

Please refer to STB Finance Docket No. 34658 in all correspondence addressed to the Board, including e-filings.

Further information about the project can be obtained by calling SEA's toll-free number at 1-800-359-5142 (telecommunications device [TDD] for the hearing impaired is 1-800-877-8339).

This Draft EIS is also available on the Board's Web site at www.stb.dot.gov.

S.9 Public Meetings

In addition to receiving written comments on the Draft EIS, SEA and the cooperating agencies will host public meetings. SEA will involve the cooperating agencies in the planning and conduct of the public meetings.[5] At each meeting, SEA will give a brief presentation and interested parties may then make oral comments. SEA will have a transcriber present at each meeting to record the oral comments. Written comments may also be submitted at the meetings. Meetings will be held at the following locations, dates, and times:

Pike's Waterfront Lodge, 1850 Hoselton Road, Fairbanks, Alaska: 5-8 PM, Monday, January 12, 2009

City Council Chambers, 125 Snowman Lane, North Pole, Alaska: 5-8 PM, Tuesday, January 13, 2009

Salcha Senior Center, 6062 Johnson Road, Salcha, Alaska: 5-8 PM, Wednesday, January 14, 2009

Jarvis West Building, Mile 1420.5 Alaska Highway, Delta Junction, Alaska: 5-8 PM, Thursday, January 15, 2009

[5] ADNR will be present at STB's public meetings for the proposed NRE, to hear comments about the project, and in particular, how the proposed location of the project may affect public access to state lands along and adjacent to the proposed transportation corridor. ADNR will provide additional opportunities for potentially affected parties to comment on its process for meeting the obligations under AS 42.40.460. For additional information, please contact ADNR Division of Mining, Land and Water at 907-451-2740.