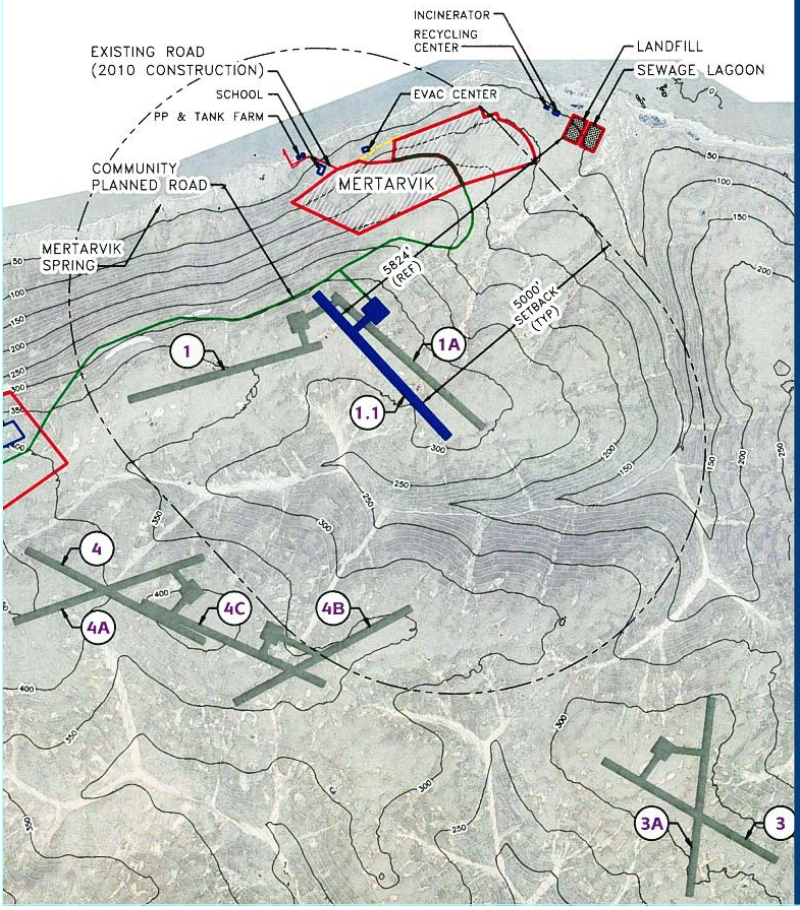
MERTARVIK AIRPORT SITE SELECTION STUDY

PROJECT NO. 52240

December 2012



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1 INTRODUCTION

The village of Newtok, located on the north bank of the Ninglick River in western Alaska, has experienced rapid and continuous erosion that threatens its existence. There is no cost-effective way to protect Newtok from the encroaching Ninglick River, so the residents of Newtok have decided to relocate and construct a new village at a site called Mertarvik, 9 miles to the southeast on Nelson Island (Figure 1 and Appendix A). A collaborative effort of federal, state, and local agencies and organizations (including the Village of Newtok), known as the Newtok Planning Group, has been working to design and construct the infrastructure needed for the phased relocation of Newtok to Mertarvik.

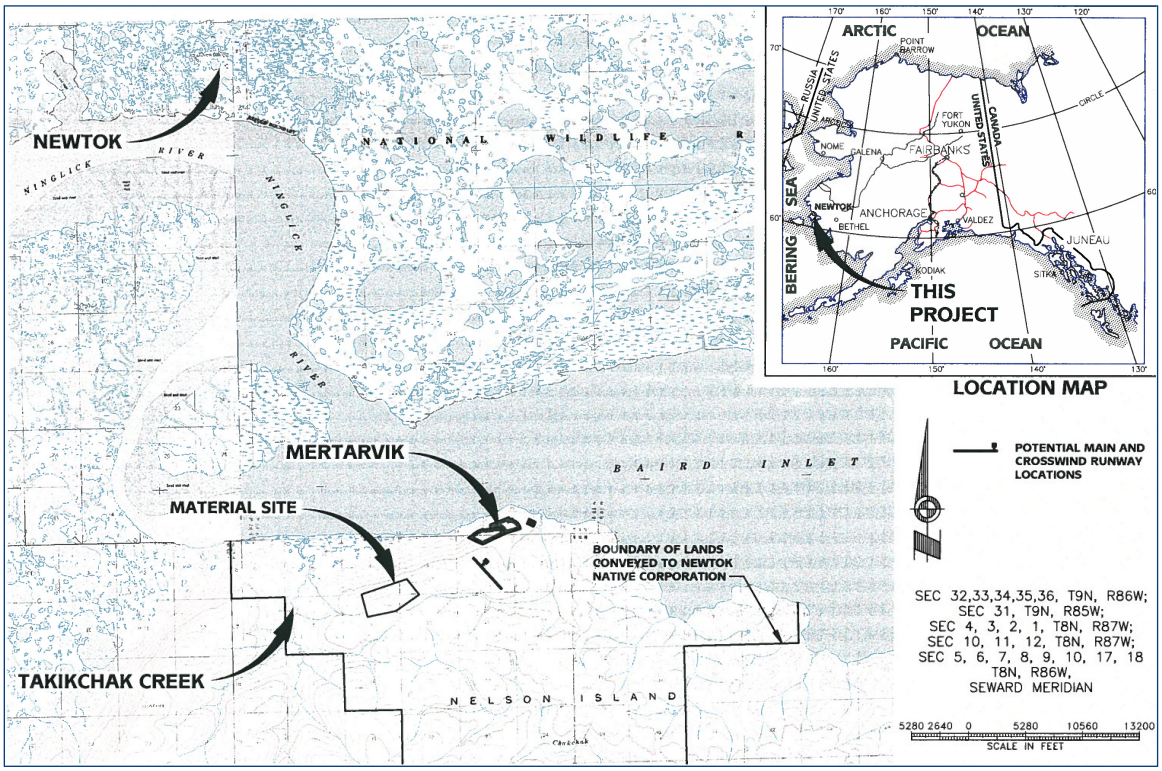

Figure 1 – Location and Vicinity Map

Construction of an airport at the new village site of Mertarvik is critical, as the area has no roads connecting it to other communities. The residents of Mertarvik will rely heavily on air transportation for travel, movement of supplies, and emergency medical evacuations.

The Alaska Department of Transportation & Public Facilities (DOT&PF) commissioned an airport relocation reconnaissance study in 2007 and a follow-up study for site selection and development of an Airport Layout Plan in December 2009.

The culmination of these two studies, which also included coordination with the community's relocation plans, results in recommendation for DOT&PF to select Site 1 (shown below in Figure 2) for future construction of an airport. This report provides the supporting documentation from the scoping and evaluation process used for selecting this alternative for consideration. It also summarizes remaining data gaps by listing additional field investigations or assessments that will be required to complete the NEPA document.

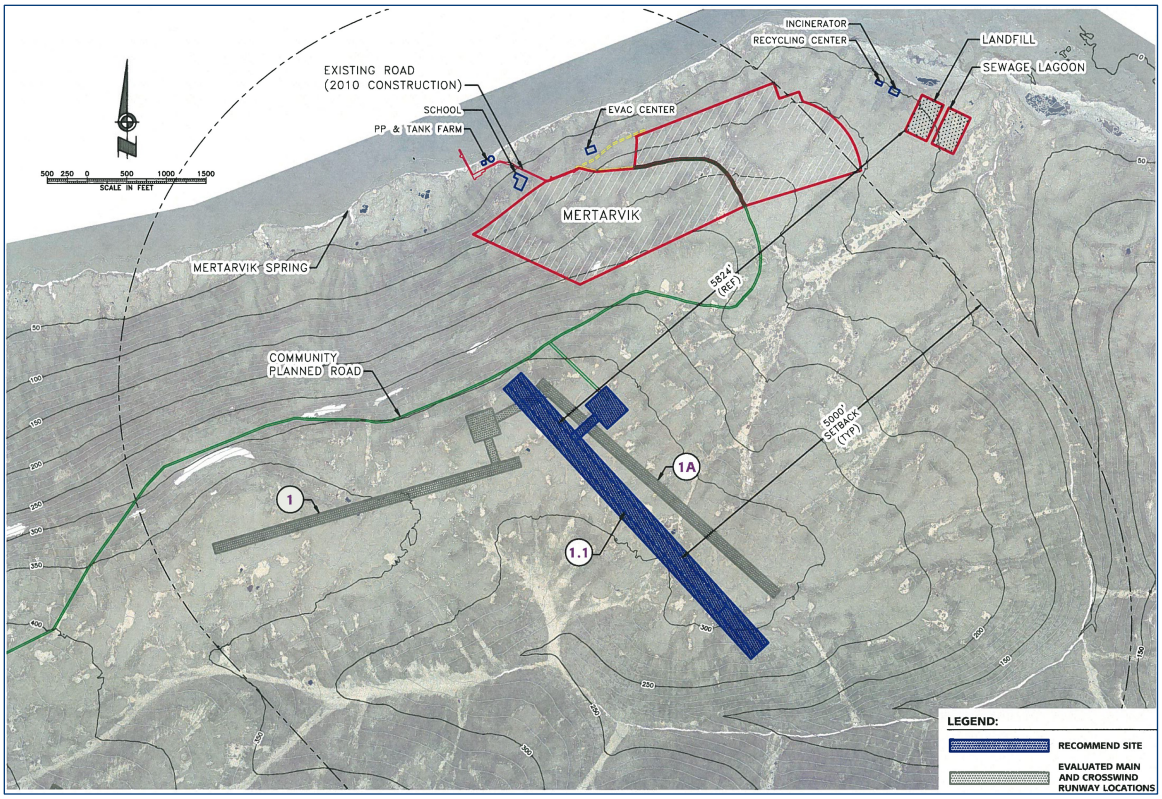

Figure 2 – Evaluated Alternatives at Site 1

2 BACKGROUND

2.1 Airport Relocation Reconnaissance Study (March 2008)

The *Newtok Airport Relocation Reconnaissance Study* (PDC Inc. Engineers, March 2008) established the purpose and need, the facility requirements, and the potential locations for the airport. Six initial alternative airport locations were developed through map studies and input provided by local residents and pilots. Additional information provided by the public and pilots resulted in the elimination of three of those sites from further consideration. The remaining three alternatives (Alternatives 1, 3, and 4) were then compared based on the following criteria:

- Range of orientation for wind coverage, based on wind data from nearby communities and pilot reports
- Proximity to the new community; community planning efforts after the reconnaissance study was completed resulted in a change in the community site
- Airspace penetrations
- Environmental considerations
- Topography and soils (based on limited mapping)
- Site development and maintenance costs
- Proximity to material sources and the barge landing

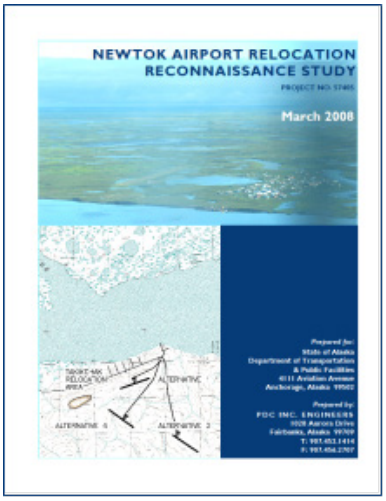

Figure 3 –
Newtok Airport Relocation Reconnaissance Study (PDC, 2008)

Evaluation of the alternatives was based on high-level information as compared to site-specific predesign-level information. At this level, all three alternatives were relatively similar, and because all three appeared viable, they were all carried forward for additional evaluation.

The reconnaissance study also provided recommendations for additional study work to allow selection of a preferred relocation site.

For additional detail regarding the evaluation of the initial airport alternatives, the *Newtok Airport Relocation Reconnaissance Study* can be viewed online at: http://www.commerce.state.ak.us/dca/planning/pub/Newtok_Recon_Report_Mar_2008.pdf.

2.2 Additional Study Work

The aforementioned report recommended key studies or information gathering to support a site selection study, as described below.

2.2.1 Continued Coordination with the Newtok Planning Group Regarding Community Site Location and Layout

When the *Newtok Airport Relocation Reconnaissance Study* was finalized, a community site plan had been presented that conflicted with Alternative Airport Site 1. Whether it would be more advantageous for the airport or the village to occupy this site required further study. The Village of Newtok hired HDR, a planning firm, to further evaluate sites for the community to occupy and to complete a detailed layout plan. A final site layout plan was selected and presented in June 2008 (Appendix B). This site was further northeast than the site presented while the *Newtok Airport Relocation Reconnaissance Study* was under way and did not conflict with Airport Alternative Site 1, making that still viable for consideration.

Through collaborative partnership between the Newtok Planning Group, DOT&PF, and the military Innovation Readiness Training Program (IRTP), community relocation activities based on the new Community Layout Plan began:

- With funding from the BIA Housing Improvements Program, three homes were built in 2009 and three more followed in 2011.
- A barge landing and contractor staging area was constructed in 2009 (Appendix B).
- An access road leading from the barge landing to the planned Mertarvik Evacuation Center was constructed in 2010 (Appendix B).
- The foundation and building pad for the Mertarvik Evacuation Center were constructed in the summer of 2011.

Coordination with the Newtok Planning Group continued throughout this site selection study to ensure coordination with the refinements that were being made to the community layout plan. Particular emphasis has been given to separation distances between the airport sites and the community lagoon and landfill sites and to plans for material site development and future roads to support access to both the material sites and the airport. The most recent layout plan and the basis for airport site selection is shown in Figure 4.

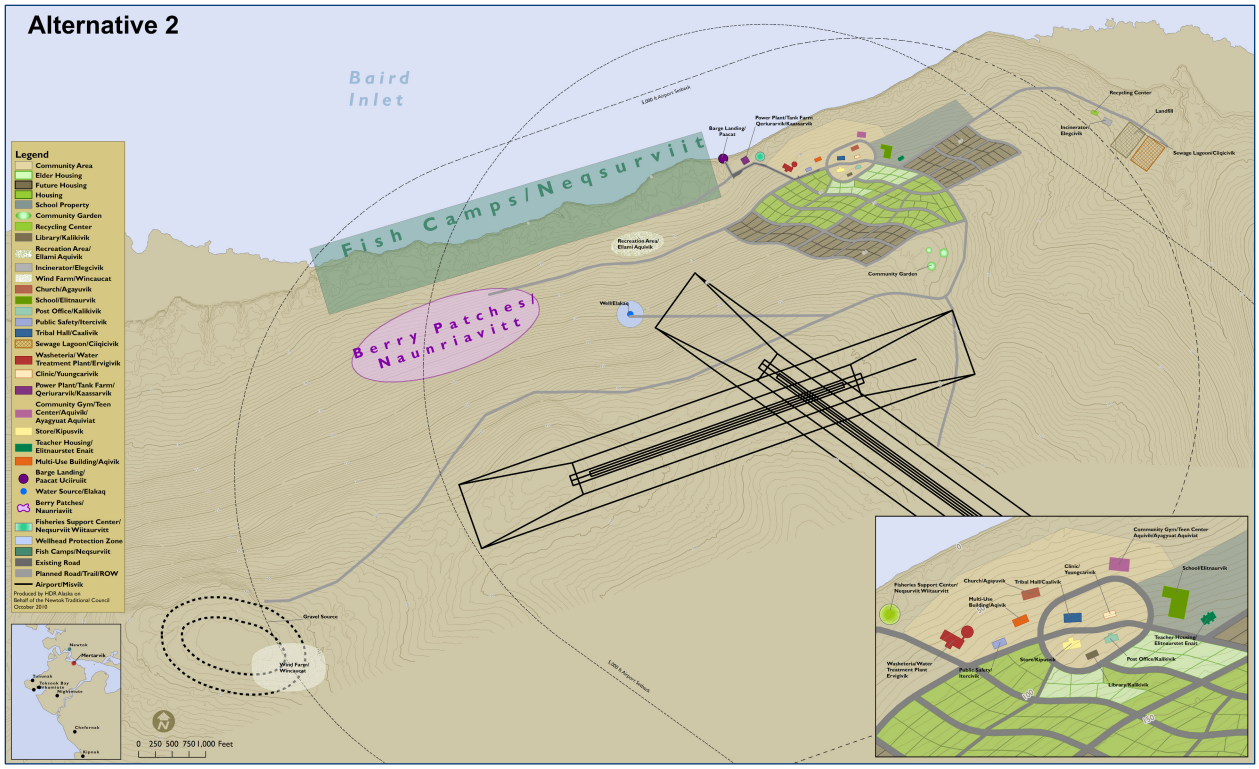

Figure 4 – Mertarvik Community Layout Plan (HDR, 2011)

2.2.2 Collect Additional Wind Data

A wind tower was installed at site on Mertarvik to obtain site specific wind characteristics. Data collection begins in January 2007 and ended in January 2009. Analysis of the data was completed. The data supported evaluation of the alternative sites. Wind data summary and analyses are included in Appendix C.

Figure 5 – Wind Monitoring Tower

2.2.3 Obtain More Detailed Mapping of the Alternative Sites

Through a separate contract, DOT&PF commissioned the acquisition of 5-foot contour mapping to support more detailed horizontal and vertical layout and thus more accurate cost analysis. This mapping covered Airport Alternative Sites 1, 3, and 4 as well as the site proposed for community development. Mapping was received in May 2010.

2.2.4 Conduct Reconnaissance-Level Geotechnical Investigations

Also through a separate contract with DOT&PF, R&M Consultants performed geotechnical exploration of the airport sites and potential material sites and provided preliminary recommendations for conceptual design of the aircraft embankments (Appendix D). DOT&PF's Material Section provided a material site plan including a proposed approach for development.

Documents used in conducting the site selection study and included in Appendix D are:

- *Geotechnical Report – Draft, Mertarvik Airport Location Study – Phase III, Reconnaissance Investigation (Airport Sites 3 & 4; Hill 460 Material Source)*, April 2009, by R&M Consultants

- *Preliminary Test Hole Information, Geotechnical Reconnaissance Investigation – 2010 Exploration Mertarvik Airport Location Study – Phase 3 (Airport Site 1, Lower Ridge Site, Hill 377 & Hill 460)*, October 2010, by R&M Consultants
- *Concept Recommendations – Draft Mertarvik Airport Location Study – Phase III*, December 2010, by R&M Consultants
- *Final Mertarvik Mining Plan and Preliminary Concept for Development*, December 2010, by DOT&PF, Central Region Materials

3 SITE SELECTION – THIS STUDY

The site selection process involved two key analyses that resulted in a recommendation to select Alternative Site 1 as the Preferred Build Alternative for development of a new airport at Mertarvik:

- Pre-design engineering evaluations
- Environmental review

The new airport would support community access for essential services such as medical evacuations and transport of food and people.

3.1 Engineering Evaluations

Geotechnical information, mapping, and the wind analysis supported refined layout and evaluation of Alternatives 1, 3, and 4 (Figure 6). Design criteria for the airport facility, as outlined in the 2008 *Newtok Airport Relocation Reconnaissance Study*, are presented in Table 1.

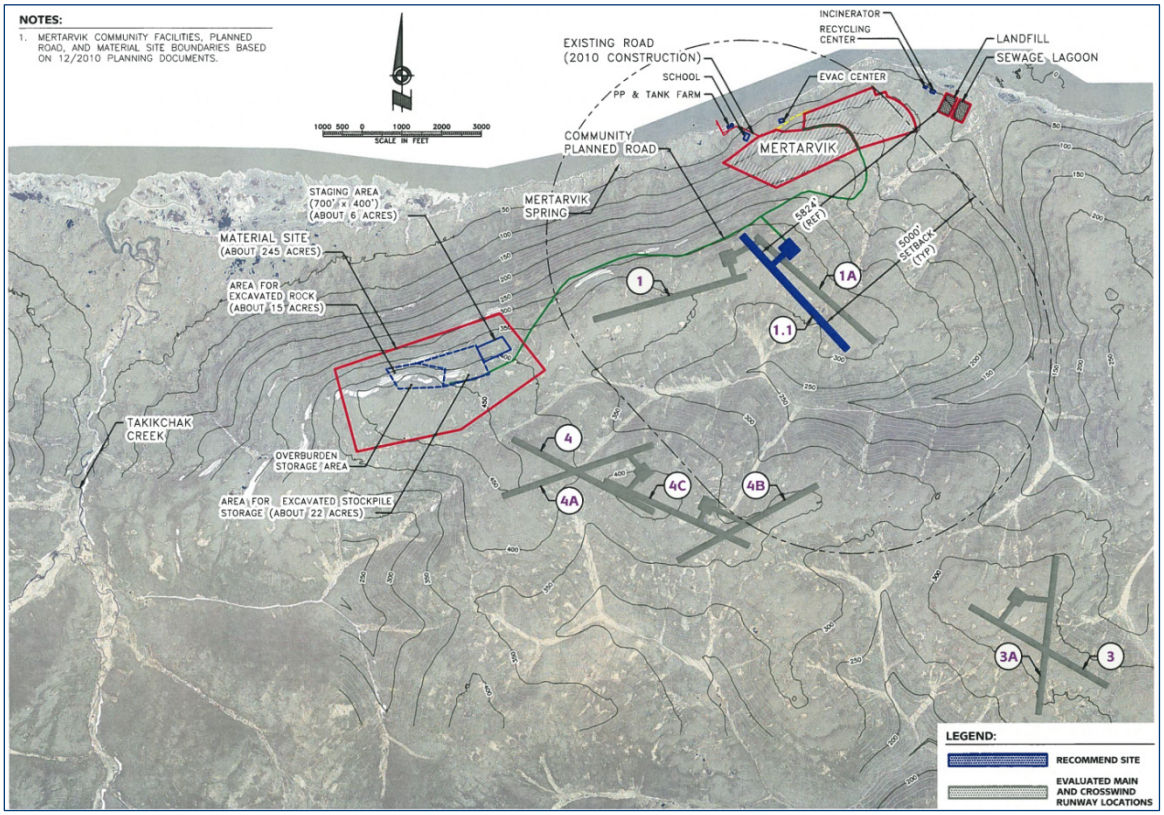

Figure 6 – Runway Layout Options

Table 1 – Design Criteria

Airport Feature	Requirement
Design Aircraft	Sherpa/Short SD330 or Beech 1900
Airport Reference Code	B-II
Airport Facility Designation	Community
Runway Length	4,000' preferred; 3,300' minimum
Runway Width	75'
Runway Safety Area	4,600' x 150' preferred; 3,900' x 150' minimum
Taxiway Width	50'[1]
Taxiway Safety Area	118'[1]
Parking Apron	250' x 400'
Parking Apron Offset from Runway Centerline	400'
Airport Lighting	Runway and taxiway lighting, threshold lighting
Navigation Aids	Rotating beacon, wind cone, and segmented circle

1 Taxiway and Taxiway Safety Area widths increased to the next higher Aircraft Design Group (III) to provide more snow storage area and to support occasional use by larger aircraft.

3.1.1 Geotechnical Considerations

Soils in the airport relocation sites (Sites 1, 3, and 4) are typically silts with high moisture content, with Site 1 having some sand and gravels. Sites 1 and 4 are the closest to the material site that has been identified as Hill 460. There is a second potential material source to the northwest of Site 1.

The geotechnical engineers recommend keeping cuts to a minimum; where cuts are necessary, the depth should not exceed 4 to 5 feet with backslopes of 4:1. Two construction techniques were recommended:

- Overlay on the existing organic mat with staged construction or surcharge to consolidate the organic soils; for concept design purposes, a minimum of 8 feet of borrow embankment was used.
- Excavate organic soils and embank. The native soils are not ideal to work with in a remote location because they either have to be disposed of or dried and used as borrow material. Drying excavated soil for use as borrow results in a double handling of materials, thereby increasing the cost.

In either scenario it is recommended the finished surface be 4 to 5 feet above the surrounding ground to reduce snow drifting and provide adequate ditches for snow accumulation.

3.1.2 Terrain

The terrain of Nelson Island at all three airport sites is mostly rolling hills. The runway alignments were adjusted to best fit the terrain without greatly compromising the wind coverage. Maximum runway grades of 2% with a maximum grade change of 2%, along with the desire to maintain a generally “all fill” embankment, further influenced the alignment options.

3.1.3 Runway Orientation and Winds

Nelson Island experiences varying wind conditions. To achieve the desired wind coverage of 95% at any of the three potential relocation sites requires both a main runway and a crosswind runway.

Options with two runways were therefore developed and optimized for terrain, wind coverage, and apron location. This analysis resulted in Options 1/1A, 3/3A, 4/4A, and 4B/4C. Wind analyses for these evaluations were based on a 13-knot crosswind component (ARC A-II or B-II). Figure 6 shows each layout option, and Table 2 shows the wind coverage percentages and cost estimates; additional detail, including a breakdown of the quantities by facility (runway, taxiway, and apron) and material type (borrow and surface course), is available in Appendix C.

Table 2 – Two-Runway Options

Airport Alternative	Alignment	Wind Coverage (13-knot crosswind)	Cost (not including access)
1/1A	74°/132°	95.18%	$34,472,000
3/3A	6°/120°	96.05%	$40,167,000
4/4A	71°/117°	91.17%	$40,848,000
4/4B	62°/114°	90.91%	$42,608,000

In developing the alternatives, the rolling terrain required tradeoffs in positioning/orienting the main and crosswind runways and the apron locations. No site was level enough not to require substantial fill in some areas. Further, to provide the greatest overall wind coverage with two runways, neither runway could achieve the maximum coverage individually without yet greater volumes of fill material.

It became apparent consideration should be given to providing an "optimal" single runway aligned and oriented to provide the maximum single-runway wind coverage that best fits the terrain.

3.1.4 Single Runway Options

Single-runway airport layouts were then considered; this allowed optimal placement of the apron since it was only necessary to consider taxiway access to a single runway rather than both main and crosswind runways. This evaluation substantially lowered required borrow material requirements and thus construction costs. With a single runway (oriented at 138°, 142°, and 148° for Options 1.1, 3.1, and 4.1 respectively), the wind coverage achieved ranged from 89.15% to 89.15%.

The single runway options also make sense in terms of the reality of funding. Although 95% wind coverage is preferred, given the overall cost of achieving this with two runways it is necessary to consider how far out in the future this ultimate two-runway configuration could be achieved. If not for many years, it might be better to provide the maximum single runway coverage in the near term with an ultimate plan to achieve greater coverage with the increased operational area of a wider runway.

3.1.5 Increased Operational Tolerance Options

According to FAA guidance (AC 150/5300-13, Appendix 1), increasing the operational surface width from the B-II standard of 75 feet to the B-III standard of 100 feet increases the operational tolerance to crosswinds. The wider runway also requires the runway safety area embankment to be widened to B-III standards, i.e., from 150 feet to 300 feet. Advantages of this ultimate plan to achieve 95% wind coverage include:

- It could be developed in stages
- The initial runway will have greater wind coverage than the primary runway in a two-runway configuration

- The apron can be optimally placed
- Overall footprint and costs are reduced

At each of the three sites, layouts were developed to best fit runway and apron to the terrain in an effort to minimize overall cut/fill requirements. These options were titled 1.1, 3.1 and 4.1. Cost and wind coverage of the three options were then compared. For cost comparisons, earthwork quantities for Stage 1 construction at each of the three sites were analyzed. Stage 1 was considered to be construction of a B-II facility (75-foot-wide runway with 150-foot-wide safety area to a length of 4,000 feet).

Table 3 presents a comparison of wind coverage and cost. Preliminary graphics of these layouts and quantities estimates are included in Appendix C.

Table 3 – Single-Runway Options

Airport Alternative	Alignment	Wind Coverage		Cost – Stage 1 (not including access)
		13 knots	16 knots	
1.1	138°	89.26%	94.76%	$21,112,000
3.1	142°	89.37%	94.79%	$23,219,000
4.1	148°	89.19%	94.62%	$22,887,000

3.2 Environmental Review

Prior to selection of a preferred airport site for future development, the environmental conditions surrounding potential development of each alternative were also considered.

3.2.1 Initial Agency Scoping

An initial agency planning/scoping letter was sent to federal, state, local, and tribal entities on April 22, 2011 (Appendix E). The purpose of this introductory letter was to present preliminary airport alternatives and gather information to complete a preliminary environmental analysis. The planning/scoping letter provided four alternative runway locations (1/1A, 2/2A, 3/3A, 4/4A, and 4B/4C) south of Mertarvik. The four proposed alternatives consisted of 75' x 4,000' main runways with equally sized crosswind runways. Materials would come from an identified material source approximately 1.5 miles southwest of Mertarvik. An access road to the airport and material site would be constructed from the village of Mertarvik.

Along with identifying potential main and crosswind runway locations; the scoping/planning letter also stated that as the project develops, a single runway with a wider operational area would be considered to address crosswind requirements. Agencies were asked to provide responses regarding the proposed alternatives. Preliminary analysis based on agency comments and engineering review was then used to support site selection of the recommended Preferred Build Alternative to be carried forward into the process outlined in the National Environmentla Policy Act (NEPA) in future project phases.

Agency responses to the scoping letter, along with any supporting documentation provided, are included in Appendix E.

Potential impacts are summarized below by NEPA category, along with comments received relevant to each category, potential impact summaries, and discussions of any further agency coordination or data gathering that may be necessary to complete the NEPA document.

Table 4 – Environmental Impacts and Agency Comments

Existing Conditions	Agency Input Received	Potential Impacts	Additional Data Required for NEPA
Air Quality			
According to the Alaska Department of Environmental Conservation (ADEC) website, there are no air quality advisories in effect for the proposed project area. Mertarvik is not located in a non-attainment or maintenance area.	None.	Air quality impacts would primarily be temporary construction-related impacts, and any differences between alternatives would be insignificant.	None anticipated.
Coastal Barriers			
There are no designated coastal barriers off the Alaskan coast.	None.	None.	None.
Coastal Zone			
A review of the Coastal Zone Boundaries atlas on December 13, 2010, found that the project area is within the coastal zone of Alaska, and all of the proposed alternatives are located within the Cenaliulriit Coastal Resources Service Area (CRSA).	Christine Ballard of the Alaska Department of Natural Resources (ADNR) commented that the project would require a Coastal Project Questionnaire (CPQ) because of its location within a CRSA (Appendix E, pg. E2-6).	None identified	The Alaska Coastal Management Program (ACMP) was discontinued on July 1, 2011, per AS 44.66.030. This means that a CPQ is not currently required for this project.
Compatible Land Use (Wildlife Hazards)			
FAA has established guidelines for hazardous wildlife attractants on or near airports (Advisory Circular 150/5200-33B). For airports such as Mertarvik that serve piston-powered aircraft, FAA recommends a separation distance of 5,000 feet from land use practices that can constitute a hazardous wildlife attractant. In Mertarvik both the proposed landfill and community sewage lagoon represent this type of hazardous wildlife attractant. All of the proposed airport alternatives exceed the 5,000-foot setback threshold from the landfill and sewage lagoon.	David Longtin of ADEC Village Safe Water (VSW) commented on May 2, 2011 (Appendix E, pg. E2-4), that he was pleased that both the proposed sewage lagoon and landfill were outside of the 5,000-foot protective radius for the airport alternatives. He also suggested that the project consider a gravity-only sewer system that could impinge on the 5,000-foot separation distance. On May 6, 2011, Donald Fancher, DOT&PF Project Manager, replied that engineering studies had not been completed and a preferred alternative had not been identified (Appendix E, pg. E2-10). Furthermore, DOT&PF cannot support creating an avigation hazard within the 5,000-foot safety zone.	Potential compatible land use impacts would not occur provided that the proposed landfill and sewage lagoon are kept outside of the 5,000-foot protective radius of the airport.	Continued coordination with ADEC is recommended to ensure that the locations for the proposed landfill and sewage lagoon are not changed such that they would impinge upon the 5,000-foot protective radius of the airport.
Construction Impacts			
N/A	Thomas Gould, District Conservationist for the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), commented on May 3, 2011 (Appendix E, pg. E2-8), in regard to material use plans, erosion controls, and subsistence use along the access road. His comments were not specific to any proposed alternative. Rather, they addressed general soil conservation practices and whether or not the access road would take into account potential subsistence use activities.	Construction impacts associated with any of the proposed alternatives would likely be minor and temporary in nature. Erosion and sediment control measures in accordance with the Alaska Pollutant Discharge Elimination System (APDES), and standard noise, dust, and emissions abatement protocols would be practiced during construction of any alternative.	Additional data or agency coordination regarding construction impacts is not anticipated to be necessary in order to move forward with the NEPA process. Coordination with ADEC will be necessary at the time of construction in order to ensure the project complies with the APDES Construction General Permit.
Department of Transportation Act, Section 4(f)			
Publicly owned parks, recreation lands, or wildlife and waterfowl refuges are 4(f) lands. The Yukon Delta National Wildlife Refuge encompasses most of Nelson Island with the exception of small private village inholdings. Mertarvik lies within one of these village inholdings, approximately 1.5 miles from the refuge boundary. The proposed project area is located entirely on private lands that were transferred to the Newtok Native Corporation from the Yukon Delta National Wildlife Refuge in 2003. The Alaska Department of Fish and Game (ADF&G) listing of State Refuges, Critical Habitat Areas, and Sanctuaries was reviewed on January 12, 2011. None of the proposed alternatives are within any State-designated special use areas. A review of the Bureau of Land Management (BLM) and the National Park Service (NPS) websites on December 13, 2010, found that no Federal Recreational Areas exist in the proposed project area.	No comments specific to Section 4(f) lands were received.	Section 4(f) lands would not be directly impacted by construction of any of the airport alternatives or material site. No "constructive use" (i.e., indirect impacts) of the Yukon Delta National Wildlife Refuge has been identified. Differences between proposed alternatives in terms of potential constructive use are likely insignificant.	The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over the adjacent Yukon Delta National Wildlife Refuge, and consultation with them during the NEPA process per FAA Order 1050.1E, Section 6.2e, is recommended to determine that constructive use of the 4(f) property would not occur.

Existing Conditions	Agency Input Received	Potential Impacts	Additional Data Required for NEPA
Farmlands			
There are no prime or unique farmlands in Alaska due to established soil temperature thresholds, and therefore none exist at Mertarvik.	None	None	None
Fish, Wildlife, and Plants			
A search of the ADF&G *Atlas to the Catalog of Waters Important to the Spawning, Rearing or Migration of Anadromous Fish* on December 6, 2010, indicated Coho Salmon as the only salmon species in Takikchak Creek, which is approximately 1 mile west of the proposed material site. However, in 2005 USACE biologists found five species of Pacific salmon in Takikchak Creek. Dolly Varden char and stickleback have also been found in Takikchak Creek (U.S. Army Corpos of Engineers [USACE] Environmental Assessment, July 2008). The Ninglick River and the Baird Inlet, which are located approximately 1.5 miles north of the proposed airport locations, are both listed as anadromous fish streams. An existing barge landing is available on the Ninglick River, and no additional work in the river is anticipated. According to the USFWS website, along the Yukon-Kuskokwim Delta the recommended time period for avoiding vegetation clearing on shrub or open (i.e., shrub cover or marsh, pond, tundra, gravel, or other treeless/shrubless ground) habitat is May 5 through July 25. A search of the USFWS bald eagle Nest GIS Mapper on December 13, 2010, indicated there are no bald eagle nests within the proposed project area. Email consultation with the USFWS from the Yukon Delta National Wildlife Refuge was conducted on March 8, 2011, to determine the presence of golden eagles and raptors in the vicinity of the proposed airport locations. The USFWS has not conducted a raptor survey on Nelson Island. They determined that the nearest potential habitat for golden eagles is about 7-8 miles southwest of the project area. If golden eagles are nesting there, it is unlikely that they would be disturbed by the construction of the airport facilities. An Environmental Assessment (EA) provided by the USACE in July 2008 describes the different bird species that can be found throughout the Yukon Delta National Wildlife Refuge, within which Mertarvik is located. The areas surrounding the potential airport locations are the summer home to geese and also the summer home of freshwater ducks, loons, shorebirds, raptors, passerine birds, and ptarmigan. Wetlands within the vicinity of the proposed airport locations are not particularly suitable for nesting waterfowl and shorebirds (USACE, Environmental Assessment, 2008). The USFWS and ADF&G websites were both reviewed on December 13, 2010, to determine if any threatened or endangered species or its habitat is located within the vicinity of the proposed airport locations. The species that are listed include Eskimo Curlew (presumed extinct), Spectacled Eider, Steller's Eider, Steller Sea Lion, and several species of whale. According to the USFWS website (March 16, 2011), the project is located in a region that contains critical habitat for Spectacled and Steller's Eiders, however the USACE July 2008 EA stated that neither of these species of eider nested at or near the area. This EA also states that informal consultation with the USFWS and the National Marine Fisheries Service (NMFS) determined that none of the listed species were present at the Mertarvik site at that time.	Judy Jacobs, USFWS Endangered Species Biologist, commented on May 6 and July 6, 2011 (Appendix E, pg. E2-13 through E2-21 and E2-28). She pointed out that while both spectacled and Steller's eiders nest in the vicinity of Mertarvik, they are not likely to nest at any of the proposed airport locations. The nearest area with a concentration of eider nesting occurs at Kigigak Island, approximately 12 miles to the west of Mertarvik. Betsy McCracken, USFWS Fishery Biologist, commented on May 24, 2011 (Appendix E, pg. E2-27) that the USFWS would like to provide technical assistance and recommendations to minimize and mitigate project impacts to fish and wildlife resources.	Impacts to fish, wildlife, and plants appear to be effectively uniform for all proposed airport alternatives.	Due to Mertarvik's proximity to the Yukon Delta National Wildlife Refuge, continued coordination with the USFWS is anticipated in order to help minimize and mitigate any potential impacts to the fish and wildlife resources of the refuge.
Floodplains			
A review of the Federal Emergency Management Agency (FEMA) online Flood Insurance Rate Maps (FIRM) on December 13, 2010, indicated that the proposed project area is unmapped (UNMAPPED_025064). The proposed airport locations are all well above the flood level and not expected to experience flooding.	Guy McConnell of the USACE responded to the agency scoping letter on May 3, 2011 (Appendix E, pg. E2-9). His response stated that the USACE does not have floodplain or other hazard related data for Mertarvik.	All of the proposed airport locations are well above the expected flood level and unlikely to experience flooding.	Because all of the airport alternatives are located well above any foreseeable flood elevations, additional coordination or data gathering is not anticipated.
Hazardous Materials			
The proposed airport location is undeveloped. A search of the ADEC Contaminated Sites and Leaking Underground Storage Tanks (LUST) databases on December 13, 2010, indicated no contaminated releases, spills, or leaking underground storage tanks exist in the vicinity of the proposed airport locations.	None.	None anticipated.	None anticipated.

Existing Conditions	Agency Input Received	Potential Impacts	Additional Data Required for NEPA
Historical, Architectural, Archaeological, and Cultural Resources			
The USACE Alaska District and USFWS archaeologists surveyed the Mertarvik area in 2002. During this survey several archaeological sites were identified, none of which are expected to be affected by the project. Newtok residents identified several shallow pits located about one mile northeast of the barge landing to be pits where clay was excavated for making pottery (USACE, Environmental Assessment, July 2008).	None.	2002 studies by the USACE and USFWS determined that identified archaeological resources were unlikely to be affected by the relocation of the Newtok airport to Mertarvik.	Formal consultation under Section 106 of the National Historic Preservation Act will be necessary for completion of the NEPA document.
Light Emissions and Visual Effects			
The proposed airport locations are all currently undeveloped, and no residences are affected by any airport light emissions.	None.	None anticipated.	None anticipated.
Natural Resources and Energy Supply			
A single material source has been identified as a sufficient supply of materials, and it would be utilized with any of the proposed airport alternatives (see Figure 6 and Appendix D). Bulk fuel would have to be barged into Mertarvik regardless of which airport alternative is constructed.	None.	None of the proposed airport alternatives are anticipated to impact the availability of natural resources into the foreseeable future.	None anticipated.
Noise			
There is currently no aircraft-related noise at any of the proposed airport alternatives.	None.	According to FAA Order 1050.1E Section 14.6, the proposed project should not require a noise analysis due to the relatively small number of airport operations that would occur at Mertarvik. The number of operations would be consistent, regardless of the airport alternative chosen.	None anticipated.
Socioeconomic, Environmental Justice, and Children's Health and Safety Risks			
According to the Alaska Department of Commerce, Community, and Economic Development (DCCED) the population of Newtok is over 96% Alaska Native ancestry. Because construction of village facilities in Mertarvik is still in the preliminary stages, very few people currently reside in Mertarvik, and those that do are primarily there only on a temporary basis.	None.	Relocation of the airport from Newtok to Mertarvik will not displace any individuals or groups of people. Rather, the relocation of the village of Newtok due to naturally occurring erosion will require the construction of an airport as vital transportation infrastructure for all residents of Mertarvik. Because of this, none of the airport alternatives is likely to cause any socioeconomic disparities. Environmental justice impacts for all of the proposed airport alternatives would be effectively uniform across population demographics. All of the proposed airport alternatives are outside of the village of Mertarvik, and the likelihood that alternatives could create health or safety risks to children would be effectively equal for all alternatives.	None anticipated.

Existing Conditions	Agency Input Received	Potential Impacts	Additional Data Required for NEPA
Solid Waste			
A solid waste disposal site has not yet been developed. However, a landfill is proposed for the area east of Mertarvik (Figures 4 and 6).	James Weise, ADEC Drinking Water Program Manager, commented on the proposed project on May 11, 2011 (Appendix E, pg. E2-22 and E2-23). He pointed out that protection from sanitary concerns is assured with the proposed landfill being more than 5,000 feet from all of the proposed airport sites.	Impacts related to solid waste are not anticipated, provided that the FAA-mandated 5,000-foot separation distance between the airport and landfill is maintained.	None anticipated.
Water Quality			
The Newtok Village Council and VSW have developed a drinking water well approximately 1,200 feet up-gradient from the Mertarvik Spring (Figure 6). The well provides both the quantity and quality of water needed for the community of Mertarvik.	David Longtin, VSW (Appendix E, pg. E2-4) and James Weise, ADEC Drinking Water (Appendix E, pg. E2-22 and E2-23) commented that while the proposed material site does not appear to be directly up-gradient from the community well, care should be taken to not intercept or contaminate the groundwater supply to the community well.	As indicated in the responses noted above, excavation activity upgradient from the community well could negatively impact the quantity and/or quality of water produced by the community well.	Additional studies and/or agency coordination are needed to determine whether or not the proposed excavation for the material site would impact the aquifer that supplies the community well.
Wetlands, Jurisdictional or Non-Jurisdictional			
The USFWS wetlands mapper, reviewed on December 6, 2010, indicated there are wetlands present in the proposed project area. In 2005 the USACE delineated the wetland types around the proposed airport locations, with the exception of Site 3. The delineation indicated that wetlands dominate the region, and the proposed airport locations. The wetland types are typical and widespread throughout the higher ground on Nelson Island (USACE Environmental Assessment, July 2008). The wetland types consist of palustrine emergent persistent/scrub-shrub evergreen/moss and palustrine emergent persistent/scrub-shrub broad leaved deciduous wetland. PDC Inc. Engineers also performed a preliminary wetland delineation. Recent site work has found that palustrine emergent wetlands, palustrine scrub-shrub wetlands, and fresh water ponds are located in the areas of the proposed airport locations. The USACE identified one area of high-value wetlands located within the Takikchak Creek watershed, approximately 1.5 miles northwest of the possible airport locations (see Figure 6 for the location of Takikchak Creek).	Guy McConnell, a USACE biologist, commented on the proposed project on May 4, 2011 (Appendix E, pg. E2-9). Mr. McConnell did not provide any recommendations for a preferred build alternative(s); however, he did provide the following as general guidance for all proposed alternatives: • The USACE Regulatory Division should be contacted for review of activities when the project is better defined. • Baird Inlet and the Ninglick River are navigable waters subject to Section 10 jurisdiction. • Fills of jurisdictional wetlands are expected for project construction and a Section 404 permit would be needed. Judy Jacobs of the USFWS commented on May 6, 2011 (Appendix E, pg. E2-13 through E2-21), that all potential sites for the airport are located farther inland than the wetland complexes surveyed by USFWS biologists and none appear to be within the preferred nesting habitat of threatened eider species. She advised that her office be contacted should project plans change such that extensive coastal wetlands areas would be impacted.	Wetlands impacts are inevitable with the construction of virtually anything in the Mertarvik area. Wetlands dominate the entire region and complete avoidance of impacts to wetlands is essentially impossible. Impacts to wetlands will likely be the most substantiated environmental impact that results from construction of the airport and supporting infrastructure. However, impacts to high-value or rare wetland types are not likely to occur.	The USACE Regulatory Division has requested to review project activities when the project scope is better defined. A USACE 404 wetlands permit will be required. It is anticipated that previous wetland delineations will suffice for completion of the wetlands analysis and permit applications, although early consultation with the USACE should be completed to confirm this.
Wild and Scenic Rivers			
There are no designated Wild and Scenic Rivers in the Mertarvik area.	None.	None.	None.
Other Comments			
Stanley Tom, Newtok Tribal Administrator, commented on April 28, 2011, that three homes that had questionable funding were in fact funded and slated for construction at Mertarvik during the summer of 2011 (Appendix E, pg. E2-1).			

3.3 Environmental Review Summary and Conclusion

Environmental impacts associated with each of the airport alternatives are effectively equal. Preliminary research into the existing conditions at Mertarvik and comments received during the initial planning/scoping phase support this finding. All of the alternatives have little to no difference in the potential severity of their impacts. No "fatal flaws" which could eliminate any of the alternatives from further consideration were identified during the planning/scoping process. Recommendations and concerns about environmental impacts fell uniformly across the proposed alternatives. Because the alternatives proposed are all equally viable based on environmental conditions, it is reasonable that DOT&PF could carry forward a single engineering-preferred build alternative into the NEPA process based on its cost and constructability.

4 PREFERRED BUILD ALTERNATIVE (ALTERNATIVE 1.1)

Engineering studies determined that Alternative 1/1A would be the easiest to access and the most cost-effective to construct, operate, and maintain. This airport is also closest to the community, which during inclement weather is a very important factor. While nearby, the airport site is far enough away to allow for community expansion well beyond the boundaries shown for development.

Additional engineering analysis determined that an "optimized" single-runway (Alternative 1.1, shown in Figure 7) oriented at 138° would be the preferred build alternative. At 100 feet wide and within a 300-foot safety area, this runway would provide sufficient wind coverage without the need for an additional crosswind runway. Staged construction of Alternative 1.1 would allow for operation and use of the airstrip while it is gradually expanded to its ultimate size of 4,000 feet by 100 feet. Potential stages and costs are included in Section 6 below.

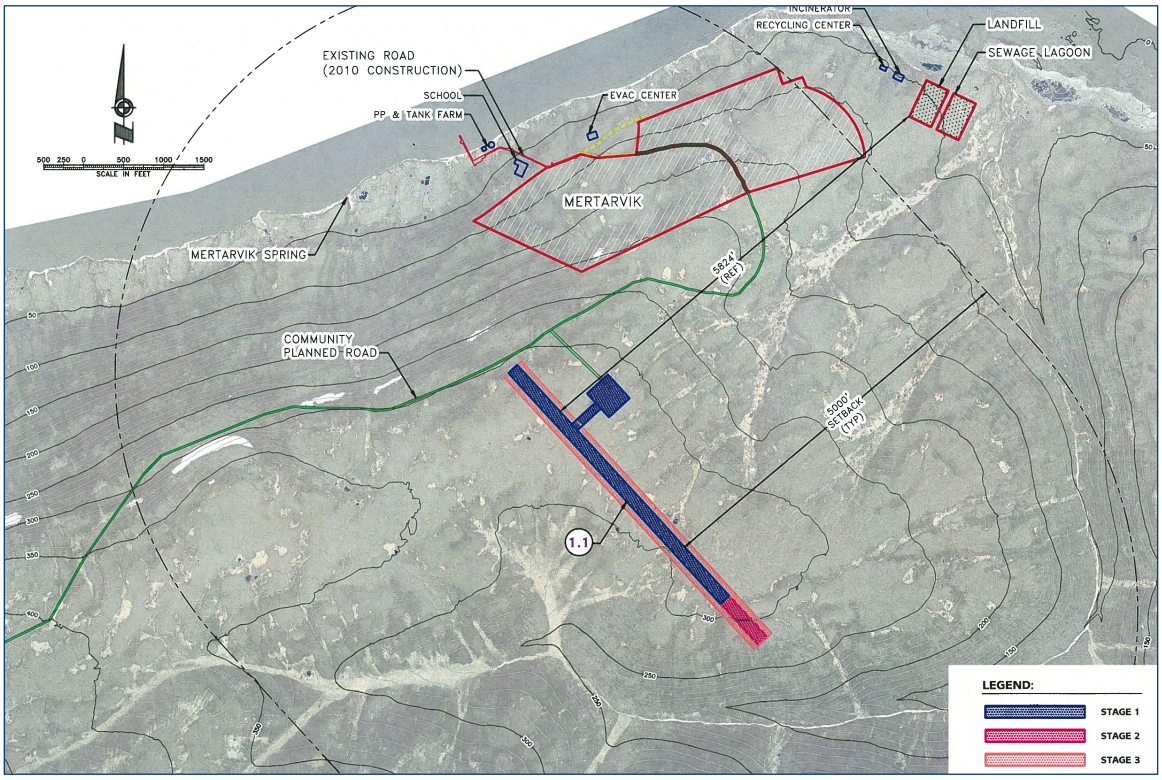

Figure 7 – Alternative 1.1

Because of its proximity to Alternative 1/1A, construction of Alternative 1.1 is not anticipated to cause environmental impacts that were not previously considered by the alternatives presented in the initial agency planning/scoping letter.

The facility footprint of Alternative 1.1 would potentially be smaller due to the consolidation of the multiple runway embankments needed with the main-runway-plus-crosswind-runway alternatives. In addition, due to its more confined development footprint, a widened single runway would likely impact the terrestrial movement of wildlife less than a two-runway configuration spread over a larger area.

Light emissions from Alternative 1.1 would be slightly farther from Mertarvik than they would be with Alternative 1/1A. Noise impacts would primarily be south and west of the core area of Mertarvik, and would likely be similar to noise impacts associated with Alternative 1/1A.

According to wetlands mapping provided by the USACE, the wetlands types that would be impacted by Alternative 1.1 are consistent with the types that would be impacted by Alternative 1/1A. The wetlands types mapped in the area of Alternative 1.1 are:

- Mostly palustrine scrub-shrub/moss peat
- Palustrine emergent persistent
- Palustrine emergent persistent/scrub-shrub deciduous

Alternative 1.1 would not involve work within the coastal wetland areas where the USFWS indicated that spectacled and Steller's eiders may nest.

Alternative 1.1 would not impinge on the 5,000-foot separation distance from the proposed landfill and sewage lagoon locations. Separation from the landfill and sewage lagoon would be slightly greater with Alternative 1.1 than with Alternative 1/1A (see Figure 2).

5 DATA GAP SUMMARY

The following summary reiterates the additional coordination and assessments that are recommended to aid in the development of the NEPA document for construction of the airport.

- Verification that the material site will not intercept or contaminate the aquifer that supplies the community well.
- Continued coordination with the ADEC is recommended to insure that the locations for the proposed landfill and sewage lagoon are not changed such that they would impinge upon the 5,000-foot protective radius of the airport.
- Continued coordination with USFWS to minimize and mitigate impacts to fish and wildlife, and to verify that "constructive use" of a 4(f) property would not occur.
- Allow the USACE Regulatory Division, as requested, to review activities when the project is better defined. Obtain USACE Section 404 Wetlands Permit
- The NRCS has requested to be actively involved in the planning for the access road in order to address access to potential subsistence resources.
- Conduct formal consultation under Section 106 of the National Historic Preservation Act.

6 POTENTIAL AIRPORT DEVELOPMENT STAGES

The engineering analysis in Section 3.1 above was discussed with DOT&PF and FAA in March 2011. Pending results of the environmental scoping, the single-runway option Alternative 1.1 appeared likely to be the selected option. Once environmental scoping verified the existence of no differentiating impacts between the alternatives, selection of Alternative 1.1 was validated.

At this point Alternative 1.1 underwent further analysis, including:

- Refinements of the runway profile and apron location
- Access road included in cost
- Development of a phasing plan
- Unit costs updated to consider most recent bid results

Profiles, cross-sections, and detailed Engineer's Cost Estimate are included in Appendix C. The staging plan is shown on Figure 7 above and summarized below:

- Stage 1 – 75' x 3,300' Runway with 150' x 3,900' Safety Area: $20,534,000
- Stage 2 – 75' x 4,000' Runway with 150' x 4,600' Safety Area: .....$ 4,990,000
- Stage 3 – 100' x 4,000' Runway with 300'x 4,600' Safety Area: $14,759,000

The cost of each stage shown above includes mobilization/demobilization, engineering office, and transportation, as well as erosion and sediment control measures. It does not include right of way acquisition or design phase services.

6.1 Funding Options / Pioneer Runway

Federal funding has tightened and the DOT&PF is exploring other funding sources to build an airport at Mertarvik as soon as possible. Options discussed include construction of a "pioneer runway" through either 1) a partnership with the military IRT program or 2) a State-funded project. Some very preliminary estimating was conducted with an eye to developing a smaller initial facility. Two partial-depth embankment options were developed for DOT&PF's consideration:

- 2,700 feet long: $8,000,000
- 3,300 feet long: $8,700,000

7 NEXT STEPS

Based on the findings in the memorandum and discussions with DOT&PF and FAA, it was determined that the Airport Layout Plan should show two potential Ultimate facilities:

- A single runway with optimized orientation, widened to improve wind coverage
- A "standard" primary + crosswind runway configuration to provide greater wind coverage

The initial stages of the airport relocation project will provide a single 75-foot-wide runway with 89.26% wind coverage. Because future funding levels are uncertain, it is prudent to keep the options for improving wind coverage in the future open to accommodate either of the two Ultimate runway configurations described above. Although widening the single runway to 100 feet would provide additional tolerance for aircraft operations in crosswind conditions, in high crosswinds pilots of small aircraft still have difficulty landing or do not attempt operations.

A "standard" two-runway configuration is undeniably safer and would provide for more reliable operations. This incremental increase in safety and operational reliability will have to be evaluated against the additional cost.

Preparation of the ALP, followed by land acquisition, will help assure that other facilities that would complicate or increase the cost of construction of for either Ultimate facility are not constructed in the vicinity of the airport.

The following summarizes the next steps for the near term:

- Complete Airport Layout Plan (part of the consultant contract under which this site selection memo was produced)
- Complete Environmental Assessment (necessary to obtain federal funding for ROW acquisition and Stage 1 Construction)
- Seek funding for ROW acquisition and Stage 1 construction
- Construct Stage 1 facility