

Lake and Peninsula Borough  
Socioeconomic and Fiscal  
Impact Assessment for the  
Pebble Project:  
Report and  
Recommendations



InterGroup

CONSULTANTS

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# 1.0 INTRODUCTION

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## 1.1 SCOPE OF ENGAGEMENT

On March 8, 2018, The Pebble Limited Partnership (PLP) applied to the Lake and Peninsula Borough (the Borough) for a Large Project Permit for the Pebble Mine Project (the Project) under Section 9.08 of the Borough Municipal Code. Section 9.08.040 requires that a Socioeconomic and Fiscal Impact Report be prepared to help the Borough evaluate PLP's permit application. The Borough hired InterGroup Consultants Ltd. (InterGroup) to help prepare the report. This report summarizes how the Project could affect people and communities in the Borough including community health and well-being, population, employment and income, education, housing, fuel and energy, subsistence resources, and transportation.

The Pebble Environmental Impact Statement (EIS) and the state and federal permit evaluation process focus on the environmental effects of the mine. They do not focus on the effects on the Borough communities. The Borough asked that this report recommend potential permit requirements that would help the communities minimize any negative effects of the Project and capture and enhance positive benefits.

The report focuses on potential effects of the Project on the seven Lakes Area Villages (Map 1-1: Lakes Area Villages):

- Iliamna;
- Newhalen;
- Nondalton;
- Kokhanok;
- Igiugig;
- Pedro Bay; and
- Port Alsworth.

These villages are closest to the Project site, including travel infrastructure and an associated natural gas pipeline, and are expected to experience the most direct effects. Other communities in the Borough would also experience some of the more regional project effects if the Project proceeds.

In preparing this report, InterGroup held two rounds of community sessions in the Lakes Area Villages from November 12 through 14, 2018 and March 11 through March 22, 2019. The purpose of these sessions was to gain a better understanding of each village; listen to concerns residents have about the Project; and understand how people think the Project might affect them and the communities where they live.

## Map 1-1: Lakes Area Villages



## 1.2 REGULATORY FRAMEWORK

The Project, if it proceeds, would require a Large Project Permit as set out in Chapter 9.08 of the Lake and Peninsula Borough Municipal Code. Chapter 9.09 of the Municipal Code includes the following requirements for a socioeconomic and fiscal impact assessment report prior to approving a Large Project Permit (section 9.08.040 of the Municipal Code):

- **Socioeconomic Impact Assessment:** a forecast of the socioeconomic changes that will occur as a result of the project including population changes, employment changes, income changes, and cultural changes.
- **Detailed Forecast of Effects:** a forecast of changes related to education, housing, fuel and energy, health care, competition for subsistence resources, post closure impacts, and other impacts.
- **Fiscal Impact Assessment:** a schedule of expected costs to the Borough and any local government within the Borough resulting from both direct and indirect socioeconomic effects.

The Municipal Code includes the following requirements prior to the Assembly approving an application for a Large Project Permit (section 09.08.060 of the Municipal Code):

- **Socioeconomic Impact Criteria:** The Assembly shall approve the project under the socioeconomic criteria if the socioeconomic impact report shows that the Project has taken all reasonable efforts to minimize adverse socioeconomic impacts of the Project on the Borough, its residents, and communities. All reasonable efforts means efforts taking into account economic, technical, environmental, and safety factors. The Assembly may impose one or more conditions on the Project that would make the Project consistent with this criteria.
- **Fiscal Impact Criteria:** The purpose of the fiscal impact criteria is to ensure the citizens of the Borough and existing taxpayers will not have to bear increased local government costs. The Assembly shall approve the Project under the fiscal impact criteria if the report shows that the expected project revenues exceed the expected fiscal costs to the Borough including direct and indirect costs. The Borough may impose an obligation on the Project to make payments to the Borough to make up the difference between expected costs and revenue for any year in which expected revenues do not equal or exceed costs.
- **Monitoring:** As part of an approval the Assembly may require the Project to monitor socioeconomic or fiscal impacts.

This report addresses these requirements of the Municipal Code; however, it is noted that to date only a draft environmental impact statement has been prepared, and information in this report may need to be revised and updated as new information becomes available.

The Assembly's decision on the Project's Large Project Permit application may not occur for some time. The configuration of the Project will not be known until the U.S. Army Corps of Engineers selects a preferred alternative, issues the record of decision, and issues or denies a final wetland permit at the end of the EIS process. The final configuration of the Project may not be known until

(or if) the state issues key permits for the Project. The Borough's ordinance anticipates this timing. Borough Code 09.08.050(c) provides that 'The Assembly shall not approve or deny an application made under this chapter until the Record of Decision has been issued by the appropriate federal agency following a final EIS or EA. The Assembly may also delay its approval until key state or federal agency permits are issued, if the federal or state agency permits are integral to the design of the project.' These events may not occur for years. The U.S. Army Corps of Engineer's Record of Decision is roughly one year away. Litigation over the EIS is likely and a final, post-litigation decision by the Corps may be years away. The project has yet to apply for state permits, and therefore key state permitting decisions may also be years away. Therefore, the borough may need to update this report before making decisions on the socioeconomic impact and fiscal impact permit.

### 1.3 PROJECT DESCRIPTION

Section 1.3 of the Pebble Project Draft Environmental Impact Statement (draft EIS) executive summary provides a high-level project description.<sup>1</sup> The Project is being proposed by PLP. The proposed Project is an open pit copper, gold, and molybdenum mine with associated infrastructure. The project has four major components, which vary based on the alternative under consideration:

- The mine site;
- The transportation corridor;
- The Amakdedori port; and
- a natural gas pipeline and corridor.

The Project described in the draft EIS would be developed in four phases:

1. A construction phase of approximately four years with a peak workforce of 2,000 people.
2. An operations phase lasting approximately 20 years with an average annual workforce of 850 people. During this phase the project would operate two 12-hour shifts per day, 365 days per year. Operations activities would include mining in the open pit, processing the mineralized material, expansion of the tailings facilities, and water management. It is also possible that the mine life could be extended after the first phase.
3. A closure phase lasting approximately 20 years. Closure activities would include the removal of production-related facilities, removal of material from the pyritic tailings storage facilities, and reclamation of other facilities. Water management would continue throughout the closure phase.

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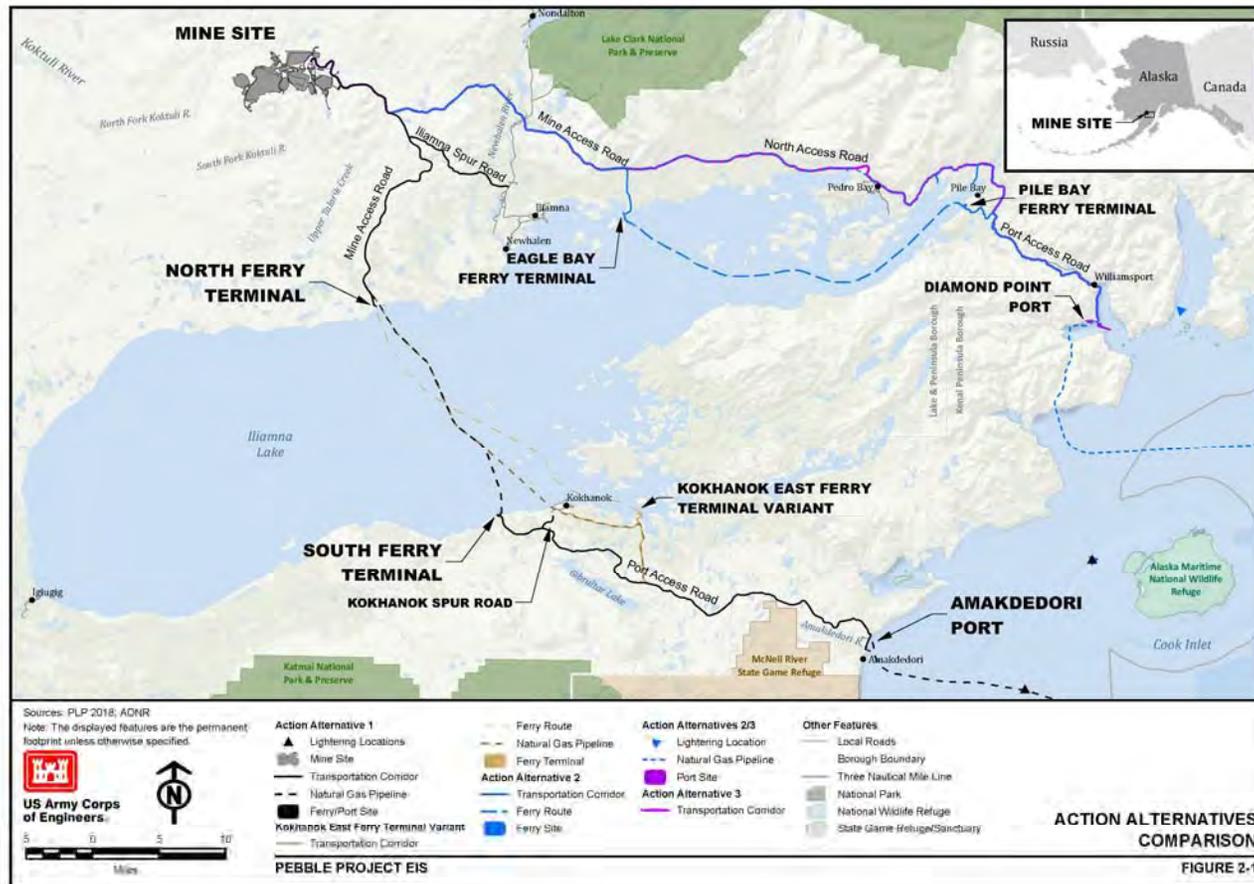
<sup>1</sup> Information in this section is summarized from section 1.3 of the Pebble Project Draft Environmental Impact Statement. A more detailed Project description, including the alternatives being considered is Appendix A.

4. A post-closure phase during which water quality would be monitored and adjustments made to the treatment process as needed.

PLP's preferred alternative includes the Amakdedori port, with an access road to Iliamna Lake that passes near Kokhanok. Materials would be shipped across Iliamna Lake using an ice-breaking ferry with terminals at the south end of the Lake near Kokhanok and at the north end near Newhalen. There would be an access road from the north ferry terminal to the mine site with a connection to the Iliamna and Newhalen road system. The natural gas pipeline corridor would begin near Anchor Point, have an underwater crossing of Cook Inlet to the Amakdedori Port, and then generally follow the transportation corridor to the mine site.

Other alternatives evaluated in the draft EIS include a port at Diamond Point with an access road to Pile Bay. From there, either a ferry route to Eagle Bay or a north access road by Pedro Bay would be used to access the mine site (Map 1-2: Project Location and Alternative Transportation Routes).

## Map 1-2: Project Location and Alternative Transportation Routes



## 1.4 REPORT OUTLINE

This report focuses on key findings and recommendations to assist the Borough with planning related to the Large Project Permit. The balance of the report is organized into the following sections:

- **Project Monitoring Committee:** We provide suggestions on how a monitoring committee might be structured, information that should be collected, and methods for communicating monitoring results to Borough residents.
- **Recommendations for Large Project Permit Conditions:** This section provides recommendations on mitigation, enhancement, and monitoring requirements the Borough should consider requiring as conditions to the Large Project Permit in the event the Project is approved.
- **Recommendations Related to Wetland Compensation:** We provide some suggestions on how to structure wetland compensation project spending to maximize benefits to the Borough.
- **Fiscal Impact Assessment and Payment in Lieu of Taxes:** We provide a high-level summary of potential impacts on the Borough's finances and recommendations related to the payment in lieu of taxes.

A more detailed appendix (Appendix A) setting out analysis of potential effects and mitigation options is also attached. Appendix B includes the summary of the November community sessions. Appendix C is the presentation from the March community sessions.

## 2.0 SOCIAL AND CULTURAL SETTING

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The Borough had a total estimated population of 1,721 people in 2017. The estimated population in the seven Lakes Area Villages was 974 with the largest population in Port Alsworth (238 people) and the smallest in Pedro Bay (32 people).<sup>2</sup> InterGroup's research team had the opportunity to visit each of the Lakes Area Villages twice during the research for this Project. We shared meals and heard stories from residents from a variety of age ranges in all the villages.

It is impossible for outsiders to fully understand and appreciate the way of life and culture in the villages in such a short amount of time. During our time in the communities, we started to gain an appreciation for what village life is like and heard numerous residents share some of the following key values:

- The culture of the villages is intrinsically linked to the land, the water and the air. People value the environment, rely on it for food and water, and care deeply about protecting it for future generations.
- Schools are important hubs in the villages. People are proud of the quality of their schools and school buildings host many important community events.
- Hunting, fishing, and gathering are important for social, economic, and cultural reasons. They provide food for residents, help strengthen bonds between families and across generations, and are enjoyed for social and recreation purposes.
- People enjoy the way of life in smaller villages. They value knowing their neighbours and worry an increase in population or an influx of outsiders might change their communities.

Many residents expressed fear and apprehension about the Project and are concerned that if this version of the Project is licensed, PLP will beginning applying for expanded footprints and continued operations. We understand it has been a long and difficult process for many people over many years. People feel tired from attending meetings and expressed frustration that they have not been heard or listened to. Many people also stated they feel the Project is fundamentally incompatible with the culture and way of life they value so much.

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<sup>2</sup> Information from the Alaska Department of Labor and Workforce Development.

## 3.0 PROJECT MONITORING COMMITTEE

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### 3.1 WHY MONITOR

One theme that arose repeatedly in the community sessions was concern about how people in the Borough could have confidence that PLP would follow through on their commitments and permit requirements and how PLP and the Borough would identify and respond to unanticipated impacts or events.

Monitoring committees are sometimes included as requirements of project development agreements, impact benefit agreements, or regulatory licenses. These committees can help create ongoing relationships between project developers and local communities so that monitoring results can be shared and local residents can have input into how to adapt or respond to unanticipated impacts or events. Examples of monitoring committees for major resource developments reviewed as part of this research process include the Keeyask Hydropower Limited Partnership Monitoring Advisory Committee (Manitoba, Canada) and the Community Vitality Monitoring Partnership Process (Saskatchewan, Canada, Uranium Mining).

Monitoring is usually undertaken for two reasons:

5. To determine whether the actual effects of the Project are consistent with estimates and predictions made at the time of licensing (e.g. are population changes unfolding as expected or are they different from what was expected).
6. To determine whether the mitigation and enhancement measures required by the Borough's permit are effective (e.g. are the employment preferences and education requirements resulting in the desired local employment outcomes).

In both cases, the monitoring results can help trigger adaptations to react to unanticipated effects or to refine mitigation and enhancement measures.

In the event the Borough grants the Project a Large Project Permit, the Borough should establish a Monitoring, Compliance and Implementation Committee (the Committee). The Committee is likely to be more effective if PLP representatives are involved in the monitoring process and their participation should be required as part of the Large Project Permit. It is possible that some information to be monitored, such as cost of living information, should be collected before construction begins to enable comparisons between various aspects of village life before and after Project construction begins and the Project eventually becomes operational.

### 3.2 PURPOSE AND SCOPE OF MONITORING COMMITTEE

The specific structure for the Committee would likely need to be negotiated with the PLP. The scope of the Committee will necessarily be broad. It will be important to have one overarching committee to help ensure that linkages between different aspects of the socioeconomic environment are made. Some topic areas may benefit from technical sub-committees that have the knowledge and skills to examine some topics in more detail (for example, employment, education, transportation

access, fiscal impacts, subsistence resource use). However, these technical sub-committees should report to the main committee.

Key features of the Committee structure might include:

- The purpose of the Committee is to:
  - Enable the Borough and the PLP to share information related to ongoing construction, operations and closure activities.
  - Discuss and provide input into annual monitoring workplans (including environmental, social, and economic monitoring activities).
  - Receive updates on monitoring results and reporting to public and regulatory agencies.
  - Provide input into adaptive management plans to respond when monitoring results indicate unanticipated effects are occurring, mitigation and enhancement measures are not proving effective, or non-compliance with regulatory requirements.
  - Review opportunities to enhance project benefits for residents of the Borough including employment, business, and other potential benefits.
- Committee membership should include representatives from different villages in the Borough and PLP employees possessing knowledge of and decision-making authority related to economic, social, and environmental monitoring. Involved PLP employees should also possess knowledge of the negative impacts and benefits of the Project. The Borough should be permitted to bring its own technical advisors to committee meetings at its discretion.
- It was noted during community meetings that some monitoring may benefit from coordination with other agencies such as the Southcentral Foundation for health and well-being monitoring programs.
- Meetings should occur no less than twice annually and may occur more frequently.
- Material to be reviewed at each meeting (including annual monitoring workplans, monitoring reporting, and similar documents) should be provided to committee members sufficiently in advance of each meeting to allow for review prior to the meeting.
- Sub-committees may be established to address specific technical areas such as employment and training; health and well-being, transportation and access, and subsistence resource use.

### **3.2.1 Responsibilities of the Borough and Pebble Limited Partnership**

While the Committee should include representatives of PLP, it is important to understand the distinct difference between the Borough's and PLP's responsibilities. The Borough is responsible for providing services to its residents and for monitoring the conditions of its residents and its villages. Therefore, activities such as monitoring housing, unemployment in the villages, or K-12 education are the responsibility of the Borough using Borough expenditures from taxes, revenue sharing, and other sources. While some of the money may come from PLP's Borough tax payments, once the funds have been paid to the Borough, they are under the control of the Borough Assembly. The decisions on how to use them to benefit residents belongs to the

Borough, not PLP. PLP is responsible for actions of the company and the care of its employees while employed by PLP.

Some of the actions to benefit Borough residents and PLP employees may complement each other. For example, vocational education, which is the responsibility of the Lake and Peninsula Borough School District, and on-the-job training and career advancement, which is the responsibility of PLP, may complement each other. These two groups may be more successful if they work together to make their programs complementary than if they ignore each other. Similarly, alcohol and drug counselling for employees may be more effective if it dovetails with community-level counselling, and vice-versa.

The Committee may undertake monitoring of certain conditions in the villages that are the Borough's responsibility and certain conditions within the Project, which is PLP's responsibility. While it may benefit both groups to understand what is happening in the Project and the villages, the difference in responsibilities is important and should be remembered.

This report discusses monitoring and Project mitigation that are PLP's responsibility and also includes some related monitoring and activities that the Borough may wish to undertake that are related to potential project effects. Both are included in this report, though the reader is reminded to remember the division of authorities.

### **3.3 WHAT SHOULD BE MONITORED**

The Borough should require monitoring of specific social and economic indicators as a condition of granting a Large Project Permit. Specific recommendations for topics that should be monitored are provided in section 4.0. Other topics could be developed collaboratively with the PLP and may change over time.

### **3.4 FUNDING**

The cost of collecting and reporting on monitoring should be paid for by PLP. Borough members should receive an honorarium in recognition of their contributions and be reimbursed for reasonable expenses such as travel costs to attend meetings. These costs should be included in establishing a payment in lieu of taxes structure between the Borough and PLP.

## 4.0 RECOMMENDATIONS FOR LARGE PROJECT PERMIT CONDITIONS

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The Project will have effects on cultural, social, and economic life in the Borough. This section provides recommendations for conditions the Borough may wish to consider including in a Large Project Permit. Table 4-1: Recommendations for Large Project Permit Conditions summarizes the following for the themes set out in parts A-1 and A-2 of section 09.08.040 of the Borough's municipal code:

- Pathways of potential effects of the Project to people and community identified in the draft EIS prepared by the U.S. Army Corps of Engineers and raised during public meetings held in the Lakes Area Villages for this report. Additional details and analysis of the potential Project effects are provided in Appendix 1.
- Recommendations for mitigation and enhancement measures that could help to mitigate adverse impacts of the Project and enhance Project benefits.
- Recommendations for monitoring that could help confirm whether effects are occurring as predicted in the draft EIS and whether mitigation and enhancement measures are working as intended. The results of the monitoring can then be used to adapt mitigation and enhancement to improve effectiveness.

**Table 4-1: Recommendations for Large Project Permit Conditions**

| <b>POPULATION</b>   |  |   |
|---|--|---|
| <b>Potential Effects</b>  | <b>Mitigation and Enhancement Recommendations</b>  | <b>Monitoring Recommendations</b>   |
| <p>Several factors could affect population:</p> <ul style="list-style-type: none"> <li>• Local job opportunities could encourage former residents to move back home</li> <li>• Job and business opportunities could attract new residents, particularly in villages closest to the Project site</li> <li>• Reduced cost of living could help attract or retain residents</li> <li>• Borough residents working on the Project may move to larger communities for better access to amenities and services</li> </ul> <p>Considering all factors, there will likely be a small increase in population compared to future scenarios without the Project. The largest increases would be expected in Iliamna and Newhalen because of their proximity to the Project will likely locate there though this would be constrained by the availability of land. Other villages would likely see a smaller increase, mostly through people deciding to stay or attracting people with connections to the villages back home.</p> | <ul style="list-style-type: none"> <li>• Require that all Borough villages be designated pick-up points for Project employment and that transportation to and from the Project site is free to employees. This will encourage people to stay in the Borough and can also help increase local employment.</li> <li>• Require that there be convenient pick-up points outside the Borough (for example, Anchorage and Kenia) to minimize the need for non-local workers to relocate to the Borough.</li> <li>• Work with PLP and local villages to determine whether daily commuting between the Project site and local communities to should be allowed to prevent workers from relocating closer to the Project site.</li> </ul> | <ul style="list-style-type: none"> <li>• Monitor population trends in each village to understand how populations are changing and to assist with planning for education, health, and other services.</li> </ul> |

**Table 4-1: Recommendations for Large Project Permit Conditions**

**EMPLOYMENT AND INCOME**

| Potential Effects   | Mitigation and Enhancement Recommendations   | Monitoring Recommendations  |
|---|--|---|
| <p>The Project will increase employment and income opportunities for Borough residents. An estimated 2,000 jobs during the peak of the construction phase and 850 average annual operating jobs.</p> <p>The Project could increase competition for local employees and inflate wages.</p> <p>Project employment would positively change the ability of some residents to participate in subsistence resource use activities through an increase in disposable income to spend on equipment.</p> | <ul style="list-style-type: none"> <li>• Set targets for local employment and business/contracting participation by Borough residents and businesses. Employment targets could include targets for different skill and seniority levels to ensure Borough residents have access to senior management and technical jobs.</li> <li>• To the extent allowed by law, implement employment and business preferences for Borough residents and businesses</li> <li>• Provide financial and/or in-kind support for K-12 education and vocational education for all village residents to maximize local employment and access to higher levels of employment responsibility.</li> <li>• Explore the possibility of flexible work rotations and job sharing to maximize local employment.</li> <li>• Offer life skills courses in stress management and money management.</li> <li>• Work with the Borough to develop and deliver social and cultural awareness training for all employees.</li> </ul> | <ul style="list-style-type: none"> <li>• Monitor employment and business outcomes to ensure targets are being met. Adapt recruitment, training, retention, and other policies if targets are not being achieved.</li> <li>• Monitor employment and unemployment rates to understand the effects of the Project on employment.</li> <li>• Monitor local wage inflation to understand if the Project is having an effect on average wages.</li> </ul> |

**Table 4-1: Recommendations for Large Project Permit Conditions**

**EDUCATION**

| Potential Effects   | Mitigation and Enhancement Recommendations  | Monitoring Recommendations   |
|---|---|--|
| <p>Population growth would increase the number of students. Additional staff or school expansions may be required to address higher numbers of students.</p> <p>The Project would provide opportunities for workforce training and experience.</p> <p>Taxes from the Project would increase Borough revenues that could be used to expand education services.</p> | <ul style="list-style-type: none"> <li>• Require PLP to work with the Borough, LPSD and other partners to implement career mentoring and development programs throughout all phases of the project to maximize Project employment. This may include:                             <ul style="list-style-type: none"> <li>○ Targeted vocational and technical training for specific Project occupations</li> <li>○ Job-shadowing opportunities</li> <li>○ Internships</li> <li>○ Scholarships for colleges or technical schools</li> <li>○ Internal training, career mentoring, and career counselling</li> </ul> </li> <li>• Require PLP to provide funding for new facilities if population changes drive increased student populations.</li> </ul> | <ul style="list-style-type: none"> <li>• Monitor school enrollment changes in each village. If the Project leads to increased population and additional students, require the Proponent to provide funding for new or expanded schools.</li> </ul> |

**Table 4-1: Recommendations for Large Project Permit Conditions**

## HOUSING

| Potential Effects   | Mitigation and Enhancement Recommendations  | Monitoring Recommendations  |
|---|---|---|
| <p>Population growth would lead to a need for more housing. Land availability could limit the ability to build or expand housing.</p> | <ul style="list-style-type: none"> <li>• Require the Access Management Plan for the Project to permit residents and the Borough to make use of the transportation infrastructure to transport housing materials.</li> </ul> | <ul style="list-style-type: none"> <li>• Monitor housing conditions and availability of housing.</li> </ul> |
| <p>New housing would place additional demands on utilities and services such as electricity.</p>                                      | <ul style="list-style-type: none"> <li>• Require PLP to work with villages and housing authorities to plan and develop housing.</li> </ul>  |   |
| <p>Improved transportation connections would lower the cost of building new housing.</p>  |   |   |
| <p>The ability to afford new housing could worsen pre-existing divisions in a village or create new ones.</p>                         |   |   |

**Table 4-1: Recommendations for Large Project Permit Conditions**

**FUEL AND ENERGY**

| Potential Effects   | Mitigation and Enhancement Recommendations   | Monitoring Recommendations   |
|---|--|--|
| <p>The Project would improve transportation connections making it cheaper to deliver fuel, such as oil, gas, and propane, to communities in the Borough.</p> <p>Depending on the alternative chosen, the Project would provide natural gas connections to Iliamna, Newhalen, Nondalton (all alternatives), Kokhanok (Alternative 1), and Pedro Bay (Alternative 2 and 3). These connections would help provide lower cost fuel for heating and potentially electricity generation, although some residents were concerned about linking community infrastructure to the Project.</p> <p>Lower cost fuel for heating and electricity generation, depending on the alternative chosen, would result in differences in cost of living between communities connected to the transportation network and those that are not directly connected to it.</p> | <ul style="list-style-type: none"> <li>• Require the Access Management Plan for the Project to specifically allow for transportation of fuel to help lower local energy costs.</li> <li>• Require PLP to work with the Borough and villages to study ways the Project could help lower energy costs. This may include:                             <ul style="list-style-type: none"> <li>○ Allowing off-take from the Project’s natural gas pipeline for community heating or electricity generation.</li> <li>○ Working with the Borough to bulk purchase fuel (such as diesel fuel).</li> <li>○ Expanding hydro-electric generation and distribution infrastructure.</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Monitor trends in local fuel and energy costs to help identify if energy prices are changing between villages.</li> </ul> |

**Table 4-1: Recommendations for Large Project Permit Conditions**

| <b>COMMUNITY HEALTH AND WELL-BEING</b>   |   |  |
|--|---|--|
| <b>Potential Effects</b>   | <b>Mitigation and Enhancement Recommendations</b>   | <b>Monitoring Recommendations</b>  |
| <p>Population changes and/or increased income could increase drug and alcohol use, adversely affect public safety, and put more demands on health care services.</p> <p>Accidents due to increased traffic will place pressure on local health care practitioners who may not have the necessary resources to respond.</p> <p>The Project will change the ability of Borough residents to engage in subsistence resource use activities, which could have negative effects on their diets.</p> <p>Population increases from the project and/or increased income could result in drugs and alcohol being more easily accessed in the Borough.</p> <p>Residents expressed concern the Project would result in adverse changes to air quality, water quality, and noise and affect the health of residents.</p> | <ul style="list-style-type: none"> <li>• Require PLP to work with the Borough and local health service providers to coordinate on health service delivery including accident and emergency response protocols and supports for community health centres that may be required to respond to transportation or other accidents.</li> <li>• Require PLP to develop and implement an employee code of conduct that addresses worker behavior in Borough communities.</li> </ul> | <ul style="list-style-type: none"> <li>• Require PLP to share air quality, water quality, and noise monitoring results with the Borough and Borough residents.</li> <li>• Work with the Southcentral Foundation to monitor health indicators and health status.</li> <li>• Monitor public safety incidents in the Borough and develop responses to concerns if they arise (for example, funding a public safety officer).</li> </ul> |

**Table 4-1: Recommendations for Large Project Permit Conditions**

| <b>SUBSISTENCE RESOURCE USE</b>   |  |   |
|---|--|---|
| <b>Potential Effects</b>  | <b>Mitigation and Enhancement Recommendations</b>  | <b>Monitoring Recommendations</b>   |
| <p>Population increases will put more pressure on subsistence resources.</p> <p>The abundance and distribution of wildlife and fish will change, making some residents travel to different locations.</p> <p>The Project footprint will eliminate access to some areas currently used for subsistence resource use. Other areas will become more accessible due to the construction of roads and transportation infrastructure.</p> <p>Traffic and noise will change the subsistence resource use experience particularly in areas close to Project infrastructure.</p> <p>Wood resources would diminish due to the Project footprint and easier access.</p> <p>Project employment could positively or negatively affect the ability of residents to engage in subsistence resource use activities.</p> | <ul style="list-style-type: none"> <li>• Require a no hunting, fishing or gathering policy for employees and contractors while at the Project site and/or work camps to minimize competition for local resources.</li> <li>• Require PLP to provide funding to subsistence resource users who have to travel further as a result of the Project (for example subsidizing their fuel costs).</li> <li>• Require PLP to restrict flight activities in subsistence resource use areas during key hunting and fishing seasons.</li> <li>• Require PLP to allow job sharing, shift, and schedule flexibility to allow Borough residents to continue to participate in seasonal subsistence resource use.</li> <li>• To compensate for lost subsistence resource use areas, require PLP to provide funding to support cultural and subsistence education for youth and access to fishing permits for residents.</li> </ul> | <ul style="list-style-type: none"> <li>• Require PLP to share fish and wildlife monitoring results with the Borough and Borough residents.</li> <li>• Monitor subsistence resource use with the involvement of local resource users. Results of the monitoring would be used to respond to negative changes.</li> </ul> |

**Table 4-1: Recommendations for Large Project Permit Conditions**

**TRANSPORTATION**

| Potential Effects   | Mitigation and Enhancement Recommendations  | Monitoring Recommendations  |
|---|---|---|
| <p>Transportation and traffic changes would depend on the alternative selected. Year-round ferry routes would change ice conditions on Lake Iliamna in the winter and residents would need to detour around the open water areas or rely more on land-based travel.</p> <p>Village residents and the Borough would be able to use the roads built for the project or the ferry to transport goods or access areas for resource harvesting.</p> <p>New transportation corridors would increase access to certain areas which may be a positive or negative effect depending on the area and who uses the transportation route.</p> <p>Increased traffic will increase potential for collisions with fish and wildlife.</p> | <ul style="list-style-type: none"> <li>• Require PLP to work with the Borough to develop an Access Management Plan that clearly sets out who has access to the road and ferry and how those rules will be implemented.</li> <li>• Require PLP to mark and maintain snow machine trails (both lake and land-based alternative trails) for transportation between communities affected by the ice-breaking ferry route to the extent feasible</li> <li>• PLP should provide villages with mapping showing the ferry route.</li> <li>• Prohibit residents from outside the Borough from accessing the transportation infrastructure for personal use, sightseeing, hunting, or fishing.</li> </ul> | <ul style="list-style-type: none"> <li>• Conduct monitoring and reporting on the effectiveness of the Access Management Plan.</li> <li>• Monitor wildlife strikes with truck, ferry, barge and other wildlife.</li> </ul> |

## 5.0 RECOMMENDATIONS RELATED TO WETLAND COMPENSATION

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### 5.1 WETLAND COMPENSATION FRAMEWORK

The draft EIS notes that the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency (EPA) signed a memorandum of agreement in June 2018 concerning mitigation sequence for wetlands in Alaska. In particular, the draft EIS notes that out-of-kind compensatory mitigation may be appropriate when it better serves the aquatic resource needs of the watershed.<sup>3</sup>

The draft EIS further notes that PLP is proposing compensatory mitigation for 3,524 acres of unavoidable impacts to waters of the United States (WOUS) and aquatic resource functions in the watersheds. Since the Project is not located in the service area of an approved bank or In-lieu Fee Program (ILF) with appropriate credits available, permittee responsible mitigation (PRM) is the only option. PRM projects using a watershed approach consider the needs of the watershed for advancing and sustaining aquatic resource functions, such as the need for specific habitat enhancements, water quality improvements or flood control. On-site, in-kind PRM projects replace the specific wetland functions that are impacted at or near the proposed site. Off-site, out-of-kind PRM projects focus on preserving, creating, restoring and enhancing WOUS with different functions and values than the impacted WOUS and in watersheds other than the watershed where the impacts would occur.<sup>4</sup>

Finally, the draft EIS notes that PLP's proposed approach to compensate for the permanent loss of wetlands and aquatic habit resulting from the Project will primarily focus on opportunities that benefit water quality and enhance or restore fish habitat through out-of-kind mitigations.<sup>5</sup>

### 5.2 COMPENSATION PLANNING

The EPA's Compensatory Mitigation factsheet<sup>6</sup> notes there are four types of compensatory mitigation options:

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<sup>3</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 5: Mitigation. Page 5-22

<sup>4</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 5: Mitigation. Page 5-24

<sup>5</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 5: Mitigation. Page 5-25

<sup>6</sup> U.S. Environmental Protection Agency. n.d. Wetlands Compensatory Mitigation. Available at [https://www.epa.gov/sites/production/files/2015-08/documents/compensatory\\_mitigation\\_factsheet.pdf](https://www.epa.gov/sites/production/files/2015-08/documents/compensatory_mitigation_factsheet.pdf) [accessed 27 June 2019].

1. Restoration projects involve the re-establishment or rehabilitation of a wetland or other aquatic resource. Restoration may increase wetland function or wetland acres or both.
2. Establishment (creation) projects involve the development of a wetland or other aquatic resource where one did not previously exist. Successful establishment projects result in increases in wetland function and wetland acres.
3. Enhancement projects improve one or more wetland functions. Enhancement projects may be undertaken to improve water quality, flood water retention or wildlife habitat. Enhancement projects increase wetland functions but do not increase net wetland acres.
4. Preservation projects involve the permanent protection of ecologically important wetlands or other aquatic resources through legal or physical mechanisms. Preservation does not result in a net gain of wetland acres and may only be used in certain circumstances.

There may be an opportunity for the Borough to work with the U.S. Army Corps of Engineers and PLP to identify projects that would qualify as out-of-kind compensation projects and also provide benefits to the Borough and its residents. The Borough should develop a list of projects it would like to have developed before the U.S. Army Corps of Engineers and PLP begin the process of identifying mitigation projects. Enhancement projects may provide the best opportunity and might include:

- Projects that improve water quality such as improved sanitation or waste treatment projects.
- Projects that improve wildlife habitat or fish passage such as improved culverts.
- Projects that improve water storage or flood protection.

As part of its ongoing planning related to the Project, the Borough should prioritize its list of projects it would like the Corps and PLP to consider for out-of-kind compensation.

## 6.0 PAYMENT IN LIEU OF TAXES

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### 6.1 PAYMENT IN LIEU OF TAXES OVERVIEW

The draft EIS notes that mining operations are subject to severance taxes on resource extractions in a taxing jurisdiction. The Borough would be the taxing jurisdiction for the Project. Unlike other local government taxing authorities, the use of a severance tax in Alaska is not explicitly mentioned in state statute. Instead it originates from an attorney general opinion related to the creation of the Northwest Arctic Borough. Municipalities have exercised severance tax powers related to fishing, mining and timber harvest.

The draft EIS quotes a 2013 estimate of \$29 million annually in severance taxes during the operations phase of the Project. This is substantially higher than the Borough currently receives in revenues from other sources. There is uncertainty about whether such substantial levels of severance tax revenues would be able to flow directly to the Borough or if the State of Alaska would intervene. Therefore the amount of revenue that the Borough could reasonably expect from a severance tax will require further analysis and legal review.

A Payment in Lieu of Taxes (PILT) can be an alternative to property or severance taxes. During community engagement sessions some residents supported the idea of a PILT while others questioned whether a PILT is preferable to the severance tax. The Northwest Arctic Borough currently receives PILT from the operation of the Red Dog mine.<sup>7</sup> The Borough may wish to consider negotiating a PILT, since it may allow for more flexibility and stability in revenue streams than a severance tax.

### 6.2 CONSIDERATIONS FOR ESTABLISHING PAYMENT IN LIEU OF TAXES

During the community engagement sessions, community members suggested a number of principles that should be considered when establishing a PILT:

- Payments should be structured to provide revenue stability and avoid variations due to production volumes or commodity prices as much as possible.
- Payments should be reviewed and possibly re-structured from time to time. Residents expressed concern that locking in a payment structure on a one-time basis may leave dollars on the table if production volumes increase or the value of the commodity increases.

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<sup>7</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 4: Environmental Consequences. Page 5.3-9

- Payments should be structured to start flowing during the construction phase, since some negative effects of the Project occur during construction and revenues could be used to support training programs that could help maximize potential employment benefits of the Project.
- Residents expressed concern that a PILT could create a boom/bust situation where the Borough loses Project revenue when the Project ceases operating. Some residents suggested using revenues to establish a trust or permanent fund that could provide ongoing revenues in perpetuity.

### 6.3 PRINCIPLES AND PRIORITIES FOR PILT SPENDING

During the community engagement sessions, residents identified a number of potential principles and considerations for spending PILT revenues:

- Payments from PLP must be sufficient to recover all direct costs imposed by the Project on the Borough, and also provide revenue to generally improve the quality of services in the Borough. Examples of direct costs imposed by the Project were noted to include:
  - The Project will increase the administrative burden on the Borough throughout the construction and operation of the Project.
  - If population increases in certain villages require additional infrastructure such as new schools, the cost of that infrastructure should be paid for directly by PLP.
- When the Borough takes on general obligation bonds based on direct costs related to the Project (e.g. for a school expansion related to increased population) PLP's obligation to fund its portion of those costs should continue even if the mine shuts down. This may require bonding or other tools to ensure the required revenues are available to the Borough.
- The Borough should ensure PILT revenues are equitably distributed across the villages. Revenues should not benefit only those villages closest to the Project.
- Projects funded by PILT revenues should provide ongoing benefits to communities and residents. Participants in the community sessions noted in particular that any capital projects should have a planned use after the Project ceases operations. Examples suggested included modular buildings that could be relocated or repurposed once the Project closes for other uses, instead of creating buildings that become abandoned after the Project ceases operations.

A number of priority areas for PILT revenue spending were also identified during the community engagement sessions, including:

- Education and training to support employment both with the Project and other employment opportunities. Examples cited during community engagement included trades and vocational training.
- Expanded pre-school and day-care programming.
- Renewable energy projects.

- Support programs for elders including additional healthcare, recreation, and social services.
- Cultural programming and traditional knowledge sharing programs involving youth and elders.
- Coordinating with partners such as Bristol Bay Native Association and native village corporations to address housing needs and fund housing improvements.
- Coordinating with other governments and agencies including the Southcentral Foundation to improve and expand health and social services delivery.



# APPENDIX A: Socioeconomic and Fiscal Impacts for the Pebble Project



Lake and Peninsula Borough  
Socioeconomic and Fiscal  
Impact Assessment for the  
Pebble Project  
Appendix A: Socioeconomic  
and Fiscal Impacts for the  
Pebble Project



InterGroup

CONSULTANTS

Prepared for the Lake and Peninsula Borough

June 2019



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# 1.0 INTRODUCTION

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## 1.1 PURPOSE OF REPORT

Pebble Limited Partnership (PLP) has begun applying for the permits required to develop a copper-gold mine in the Lake and Peninsula Borough (the Borough). One permit is a Large Project Permit as set out in Chapter 9.08 of the Lake and Peninsula Borough Municipal Code. Chapter 9.09 of the Municipal Code includes the following requirements for a socioeconomic and fiscal impact assessment report prior to approving a Large Project Permit (section 9.08.040 of the Municipal Code):

- **Socioeconomic Impact Assessment:** a forecast of the socioeconomic changes that will occur as a result of the project, including population changes, employment changes, and income changes.
- **Detailed Forecast of Effects:** a forecast of changes related to education, housing, fuel and energy, health care, competition for subsistence resources, post closure impacts, and other impacts.
- **Fiscal Impact Assessment:** a schedule of expected costs to the Borough and any local government within the Borough resulting from the socioeconomic, including both direct and indirect effects.

The Lake and Peninsula Borough hired InterGroup Consultants Ltd. (InterGroup) to help prepare a socioeconomic and fiscal impact assessment report. This report summarizes how the Pebble Project (the Project) could affect people and communities in the Borough, including community health and well-being, population, employment and income, education, housing, fuel and energy, subsistence resources, and transportation.

The purpose of the report is to help the Borough understand how the Project might affect people and communities if it proceeds and what concerns residents have about the Project. The report identifies potential negative impacts and positive benefits of the Project and provides recommendations to the Borough on measures and plans that might help reduce negative impacts and increase potential benefits.

This report addresses these requirements of the Municipal Code; however, it is noted that to date only a draft environmental impact statement has been prepared, and information in this report may need to be revised and updated as new information becomes available.

## 1.2 REPORT OUTLINE

This report is organized into the following sections:

- **Section 2** provides a description of the Project;
- **Section 3** provides an analysis of potential effects (both positive and negative) of the Project and potential options to mitigate negative effects and enhance positive effects; and

- **Section 4** provide an assessment of the potential effects of the Project on the Borough's finances.

### 1.3 SPATIAL SCOPE OF ASSESSMENT

The report focuses on potential effects of the Project on the seven Lakes Area Villages (Map 1.3-1):

- Iliamna;
- Newhalen;
- Nondalton;
- Kokhanok;
- Igiugig;
- Pedro Bay; and
- Port Alsworth.

These villages are closest to the Project site and are expected to experience the most direct effects. Other communities in the Borough would also experience some of the more regional project effects if the project proceeds.

Where possible, information is presented at the village level for the Lakes Area Villages and potential effects and mitigation are made as specific as possible. This is to reflect the unique nature of each village, along with each village's relationship with the Project. In particular, Port Alsworth tends to show different trends than the other Lakes Area Villages. Key differences are presented in historical population changes in Tables 3.2-1 and 3.2-2, population projections in Table 3.2-5, employment in Section 3.4.1, educational attainment rates in Table 3.5-2, and primary home heating sources in Table 3.7-1.

## Map 1.3-1: Lakes Area Villages



## 1.4 METHODS AND SOURCES OF INFORMATION

The analysis in this report relied primarily on four sources of information:

- Community meetings;
- Government statistics;
- Draft Environmental Impact Statement; and
- Case study review.

Other literature sources were used and are cited throughout the document.

### Community meetings

InterGroup held two rounds of community sessions in the Lakes Area Villages from November 12 to November 14, 2018 and March 11 through March 22, 2019. The purpose of these sessions was to gain a better understanding of each village; listen to concerns residents have about the Project; and understand how people think the Project might affect them and the communities where they live.

InterGroup kept informal notes from each session, but sessions were not formally transcribed or recorded. Participation in the sessions was voluntary. Meetings were advertised by the Borough and open to all village residents. Discussion aids, including PowerPoint presentations, maps, and charts, were used to spark conversation.

### Government statistics

This report cites a number of State of Alaska statistics. Many of the indicators used were reported in a document prepared by the McDowell Group for the Pebble Partnership titled: Socioeconomics – Bristol Bay Drainages Updated Detailed Cumulative Baseline Data (2000-2018).

### Draft Environmental Impact Statement

Information obtained from the Draft Environmental Impact Statement prepared by the US Army Corps of Engineers is referenced throughout the document, along with Request for Information responses supplied by PLP.

### Case Studies

Three primary case studies were reviewed to understand potential project effects and mitigation and enhancement options: uranium mining in northern Saskatchewan; diamond mining in the Northwest Territories; and the Red Dog mine in northwestern Alaska.

## Uranium Mining in Northern Saskatchewan

The first northern Saskatchewan uranium deposits were discovered in the early 1950s with the first mine beginning operation in 1953 at the Beaverlodge Mine, which closed in 1982.<sup>1</sup> There are numerous uranium mining and milling facilities in northern Saskatchewan, some of which are currently under care and maintenance as the industry awaits a shift in uranium prices. Some of these facilities include:

- Cluff Lake mine and mill (ceased operations) began operations in 1980 and shut down in 2002.<sup>2</sup> The operation is located approximately 75 km south of Lake Athabasca and 30 km east of the Alberta provincial border. The open pit and underground mine is owned by Orano Canada Inc. (formerly AREVA).
- Rabbit Lake mine (on hiatus) began production in 1975. Production was suspended in 2016 when the mine and mill transitioned to care and maintenance.<sup>3</sup> The mine is located approximately 675 km north of Saskatoon. Rabbit Lake was North America's longest producing uranium mine.<sup>4</sup> Cameco is the owner of the Rabbit Lake mine.<sup>5</sup>
- Key Lake mine (ceased operations) began production in 1983 and shut down in 1997.<sup>6</sup> The underground mine is located approximately 550 km north of Saskatoon. The Key Lake mill, the largest uranium mill in the world, serviced the McArthur River mine through its production.<sup>7</sup> Cameco is the majority owner of the Key Lake mine and mill.
- The McArthur River mine (on hiatus) began production in 1999 and is located approximately 620 km north of Saskatoon.<sup>8</sup> Since 2017 the operation has been shut down indefinitely due

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<sup>1</sup> Teach Nuclear. 2019. Uranium Mining in Northern Saskatchewan. Available at: <https://teachnuclear.ca/all-things-nuclear/canadas-nuclear-history/uranium-mining/uranium-mining-in-northern-saskatchewan/> [accessed April 16, 2019].

<sup>2</sup> Canadian Nuclear Safety Commission. April 2018. AREVA Resources Canada Inc. Cluff Lake Project. Page 3. Available at: <https://nuclearsafety.gc.ca/eng/the-commission/hearings/cmd/pdf/CMD18/CMD18-H102.pdf> [accessed April 18, 2019].

<sup>3</sup> World Nuclear Association. 2019. Uranium in Canada. Available at: <http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/canada-uranium.aspx> [accessed April 16, 2019].

<sup>4</sup> World Nuclear Association. 2019. Uranium in Canada. Available at: <http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/canada-uranium.aspx> [accessed April 16, 2019].

<sup>5</sup> Cameco Corporation. 2019. Rabbit Lake. Available at: <https://www.cameco.com/businesses/uranium-operations/suspended/rabbit-lake> [accessed April 18, 2019].

<sup>6</sup> Cameco Corporation. 2019. McArthur River/Key Lake. Available at: <https://www.cameco.com/businesses/uranium-operations/suspended/mcarthur-river-key-lake> [accessed April 18, 2019].

<sup>7</sup> Cameco Corporation. 2019. McArthur River/Key Lake. Available at: <https://www.cameco.com/businesses/uranium-operations/suspended/mcarthur-river-key-lake> [accessed April 18, 2019].

<sup>8</sup> World Nuclear Association. 2019. Uranium in Canada. Available at: <http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/canada-uranium.aspx> [accessed April 16, 2019].

to continued low uranium prices with no new announcements on future production to date. During operation, McArthur River mine ore is processed at the Key Lake mill. Cameco is the majority owner and operator of the McArthur River underground mine.<sup>9</sup>

- The McClean Lake mine (operating) commenced operation in 1999 and has received a licence for operation until 2027.<sup>10</sup> The McClean Lake mine is located approximately 750 km north of Saskatoon. Orano Canada is the majority owner and operator of the McClean Lake underground mine.<sup>11</sup>
- The Cigar Lake mine (operating) began operation in 2014 and the underground mine has an expected life to 2028.<sup>12</sup> The mine is located approximately 675 km north of Saskatoon. Cameco has a majority ownership stake and is managing the joint venture with Orano, Idemitsu, and TEPCO Resources.<sup>13</sup>

Sources reviewed relating to uranium mining in northern Saskatchewan include the World Nuclear Association, Canadian Nuclear Association, Cameco Corporation, Orano Canada Inc., and reports by the Community Vitality Monitoring Partnership (CVMP). The CVMP is an organization established to monitor the effects of uranium mining/milling activities on the workers, residents and communities of northern Saskatchewan.

### **Diamond Mining in Northwest Territories**

Diamond mining in the Northwest Territories (NWT) began in the 1990s in the Lac de Gras area of the NWT.<sup>14</sup> To date, there are four operating diamond mines in the NWT, including the Diavik, Ekati, and Snap Lake mines located in the Lac de Gras area and the Gahcho Kué mines located near northeastern Great Slave Lake. The Government of the Northwest Territories has made it a priority to ensure diamond mining would benefit the NWT economy and residents, and protect the land, water and animals for future generations by developing agreements with each mine in cooperation with the federal government and Aboriginal organizations. These agreements include socioeconomic, and in some cases, environmental agreements.

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<sup>9</sup> World Nuclear Association. 2019. Uranium in Canada. Available at: <http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/canada-uranium.aspx> [accessed April 16, 2019].

<sup>10</sup> Denison Mines Corporation. 2019. McClean lake and Mill Project. Available at: <https://www.denisonmines.com/projects/core-projects/mcclean-mill-lake-project/> [accessed April 16, 2019].

<sup>11</sup> Denison Mines Corporation. 2019. McClean lake and Mill Project. Available at: <https://www.denisonmines.com/projects/core-projects/mcclean-mill-lake-project/> [accessed April 16, 2019].

<sup>12</sup> Cameco Corporation. 2019. Cigar Lake. Available at: <https://www.cameco.com/businesses/uranium-operations/canada/cigar-lake> [accessed April 16, 2019]; Mining Data Online. 2019. Cigar Lake Mine. Available at: <https://miningdataonline.com/property/26/Cigar-Lake-Mine.aspx> [accessed April 16, 2019].

<sup>13</sup> World Nuclear Association. 2019. Uranium in Canada. Available at: <http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/canada-uranium.aspx> [accessed April 16, 2019].

<sup>14</sup> Government of Northwest Territories. 2019. History of Diamonds in the NWT.

- The Diavik mine began operations in 2003 and is a joint venture owned by Rio Tinto (60%) and Dominion Diamond Corporation (40%). The underground mine is expected to be in production until 2025.<sup>15</sup>
- The Ekati mine began operations in 1998 and the Dominion Diamond Corporation owns the controlling interest. The underground mine is expected to be in production until 2034 and several ongoing exploration and project evaluation activities have the potential to extend the mine life until 2042.<sup>16</sup>
- The Snap Lake mine began operations in 2008 and was put into a care and maintenance state in 2015 so that the underground mine could be re-opened later if desired.<sup>17</sup> The Snap Lake mine is a remote fly-in/fly-out operation. The Snap Lake Mine is owned by De Beers.
- The Gahcho Kué mine began operations in 2016 and has an expected mine life of 12 years.<sup>18</sup> The open pit mine is a remote fly-in/fly-out operation. Gahcho Kué mine is a joint venture between De Beers Canada Inc. (51%) and Mountain Province Diamonds Inc. (49%).<sup>19</sup>

Sources reviewed relating to diamond mining in the NWT include Rio Tinto; Dominion Diamond Mines; De Beers UK Limited; the Government of the Northwest Territories; a joint briefing paper prepared by BHP Billiton, Rio Tinto, and De Beers on the *Positive Impact of Diamond Mining in the Northwest Territories from 1998 to 2012*; and the socioeconomic agreements for the mines.

### **Red Dog Mine Northwestern Alaska**

The Red Dog Mine is a lead and zinc mine located approximately 170 km north of the Arctic Circle in northwest Alaska, near Kotzebue.<sup>20</sup> The open-pit mine began operations in 1989 and has a mine life expectancy of 2031.<sup>21</sup> The Red Dog Mine was developed through an innovative

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<sup>15</sup> Rio Tinto. 2019. About Diavik. Available at: <https://www.riotinto.com/canada/diavik/about-diavik-11458.aspx> [accessed April 16, 2019].

<sup>16</sup> Dominion Diamond Mines. 2018. Operations – Ekati Diamond Mine. Available at: <https://www.ddmines.com/ekati-diamond-mine-operations/> [accessed April 16, 2019].

<sup>17</sup> De Beers UK Limited. 2019. Snap Lake Mine. Available at: <http://canada.debeersgroup.com/operations/mining/snap-lake-mine> [accessed April 16, 2019].

<sup>18</sup> De Beers UK Limited. 2019. Gahcho Kué Overview. Available at: <http://canada.debeersgroup.com/operations/mining/gahcho-kue-mine> [accessed April 16, 2019].

<sup>19</sup> De Beers UK Limited. 2019. Gahcho Kué Overview. Available at: <http://canada.debeersgroup.com/operations/mining/gahcho-kue-mine> [accessed April 16, 2019].

<sup>20</sup> Teck Resources Limited. 2019. About Red Dog. Available at: <https://www.teck.com/operations/united-states/operations/red-dog/> [accessed April 16, 2019]; Bob Loeffler. 2015. Mining and Sustainable Communities. Available at: [https://iseralaska.org/static/legacy\\_publication\\_links/2015-MiningAndSustainableCommunities.pdf](https://iseralaska.org/static/legacy_publication_links/2015-MiningAndSustainableCommunities.pdf) [accessed April 16, 2019].

<sup>21</sup> Teck Resources Limited. 2019. About Red Dog. Available at: <https://www.teck.com/operations/united-states/operations/red-dog/> [accessed April 16, 2019].

operating agreement between the operator Teck and the land-owner NANA. NANA is the Regional Alaska Native corporation owned by the Iñupiat people of northwest Alaska. The mine and concentrator properties are leased from and were developed under the agreement with NANA.<sup>22</sup> Sources include Teck Resources Limited and a 2015 case study completed by Bob Loeffler on the mine's effects on the surrounding communities after 25 years of operation.

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<sup>22</sup> Teck Resources Limited. 2019. About Red Dog. Available at: <https://www.teck.com/operations/united-states/operations/red-dog/> [accessed April 16, 2019].

## 2.0 PROJECT DESCRIPTION

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### 2.1 PROJECT DESCRIPTION

Section 1.3 of the Project Draft Environmental Impact Statement (EIS) executive summary provides a high-level project description.<sup>23</sup> The proposed Project is an open pit copper, gold and molybdenum mine with associated infrastructure. The project has four major components, which vary based on the alternative:

- The mine site;
- The transportation corridor;
- The Amakdedori port; and
- A natural gas pipeline and corridor.

The Project described in the draft EIS would be developed in four phases:

- A construction phase of approximately 4 years with a peak workforce of 2,000 people.
- An operations phase lasting approximately 20 years with an average annual workforce of 850 people. During this phase the project would operate two 12-hour shifts per day, 365 days per year. Operations activities would include mining in the open pit, processing of the mineralized material, expansion of the tailings facilities, and water management. It is also possible that the mine life could be extended after the first phase.
- A closure phase lasting approximately 20 years. Closure activities would include the removal of production-related facilities; removal of material from the pyritic tailings storage facilities and reclamation of other facilities. Water management would continue through the closure phase.
- A post-closure phase during which water quality would be monitored and adjustments made to the treatment process as needed.

The 2018 Project Description provides the following project characteristics:

- A total of 1.44 billion tons of material mined over the life of the Project.
- Final pit dimensions of 6,800 feet in length, 5,600 feet in width, and 1,970 feet in depth.

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<sup>23</sup> Information in this section is summarized from section 1.3 of the Pebble Project Draft Environmental Impact Statement. More detailed information on the Project description can be found in Chapter 2 of the Draft Environmental Impact Statement.

- Mining rate up to 73 million tons per year, average rate of 70 million tons per year.
- Milling rate up to 66 million tons per year.
- Average annual copper-gold concentrate production (dry concentrate) of 613,000 tons.
- Average annual molybdenum concentration production (dry concentrate) of 15,000 tons.
- Final bulk tailings storage facility (TSF) capacity of 1,140 million tons.
- Temporary storage of 155 million tons of pyritic tails in the pyritic TSF.
- Temporary storage of up to 50 million tons of Potentially Acid Generating (PAG) and/or Metal Leaching (ML) waste rock in the pyritic TSF until closure.
- Power plant generating capacity of 270 megawatts (MW).<sup>24</sup>

The proponent's preferred alternative as described in the draft EIS includes the Amakdedori port, with an access road to Iliamna Lake that passes near Kokhanok. Materials would be shipped across Iliamna Lake using an ice-breaking ferry with terminals at the south end of the Lake near Kokhanok and at the north end near Newhalen. There would be an access road from the north ferry terminal to the mine site and with a connection to the Iliamna and Newhalen road system. The natural gas pipeline corridor would begin near Anchor Point, have an underwater crossing of Cook Inlet to the Amakdedori Port, and then generally follow the transportation corridor to the mine site. This infrastructure is for the Project configuration that is currently being licensed. If mine life is extended, the applications to do so may also request changes to the supporting infrastructure.

The Draft EIS also evaluated certain alternative modes for delivering the Project, primarily related to different transportation options. The Action Alternatives are summarized in Table 2.1-1.

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<sup>24</sup> The Pebble Partnership. 2018. The Pebble Project. Project Description. Section 1.1. Pages 1-2.

**Table 2.1-1: Summary of Action Alternatives<sup>25</sup>**

| <b>Project Component</b>       | <b>Action Alternative 1<br/>Applicant's Proposed Alternative</b>   | <b>Action Alternative 2<br/>Road and Ferry with Downstream Dams</b>   | <b>Action Alternative 3<br/>North Road Only</b>   |
|--------------------------------|--|---|---|
| <b>Mine Site</b>               | Mine site at Pebble.   |   |   |
| <b>Transportation Corridor</b> | A transportation corridor with a mine access road, a port access road, and a ferry crossing of Iliamna Lake from the North Ferry Terminal to the South Ferry Terminal. | This alternative would reduce the overall length of access roads. The access route includes a road alignment from the mine site along the northern shore of Iliamna Lake to Eagle Bay; a ferry from Eagle Bay to Pile Bay; and a road alignment to a port at Diamond Point. | This alternative would provide an alternative transportation corridor and natural gas pipeline route and would eliminate the need for ferry transportation across Iliamna Lake. The access route includes a north road alignment from the mine site to a port at Diamond Point on Cook Inlet. |
| <b>Port</b>                    | A port at Amakdedori.  | A port at Diamond Point.  | A port at Diamond Point.  |
| <b>Natural Gas Pipeline</b>    | A natural gas pipeline from the Kenai Peninsula that crosses Cook Inlet to the Amakdedori port, then follows the transportation corridor to the mine site.             | A natural gas pipeline from the Kenai Peninsula that crosses Cook Inlet to the Diamond Point port, then follows the north shore of Iliamna Lake to the mine site.   | A natural gas pipeline from the Kenai Peninsula that crosses Cook Inlet to the Diamond Point port, then follows the transportation corridor (north shore if Iliamna Lake) to the mine site.   |
| <b>Phase Duration</b>          | <b>Construction Phase</b> to last approximately 4 years, during which the facilities would be built, and pre-production mining would occur.                            |   |   |

<sup>25</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 2: Alternatives. Page 2-2.

**Table 2.1-1: Summary of Action Alternatives<sup>25</sup>**

| Project Component | Action Alternative 1<br>Applicant's Proposed Alternative  | Action Alternative 2<br>Road and Ferry with Downstream Dams | Action Alternative 3<br>North Road Only |
|-------------------|---|---|---|
|                   | <p>Commissioning to transition the facilities into full operational status would commence near the end of the construction phase and continue into the operations phase (approximately 4 to 6 months).</p> <p>Operation Phase to last for 20 years. Phase would consist of mining in the open pit, processing of the mineralized material, expansion of the tailing's facility, and water management.</p> <p>Closure Phase to commence once mining and processing are complete and would last for 20 years. During closure, the production-related facilities would be removed, the material removed from the pyritic TSF, and other facilities reclaimed. Water management would continue through the closure phase. The post-closure phase is the period of time after the closure phase when water quality would be closely monitored, and changes and adjustments to the treatment process would be made over the long-term, as needed.</p> |   |   |
| <b>Workforce</b>  | <p><b>Construction Phase</b> is expected to peak at approximately 2,000 personnel.</p> <p><b>Operations Phase</b> expected employ an average annual of approximately 850 personnel. Operating schedule includes two 12-hour shifts per day, 365 days per year.</p>  |   |   |

Variations to the three alternatives of the project that do not comprise a complete functioning alternative were analyzed as variants in the draft EIS under the action alternatives. The following variants were analyzed:

- Summer-only Ferry Operations Variant:** PLP has proposed to use an ice-breaking ferry on Iliamna Lake to allow year-round transportation of concentrate, freight, and diesel fuel. An option to restrict ferry operations to the open water season was suggested during scoping due to concerns with use of an ice breaking ferry. This option is evaluated as a variant to Action Alternatives 1 and 2.<sup>26</sup>

<sup>26</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 2: Alternatives. Page 2-3.

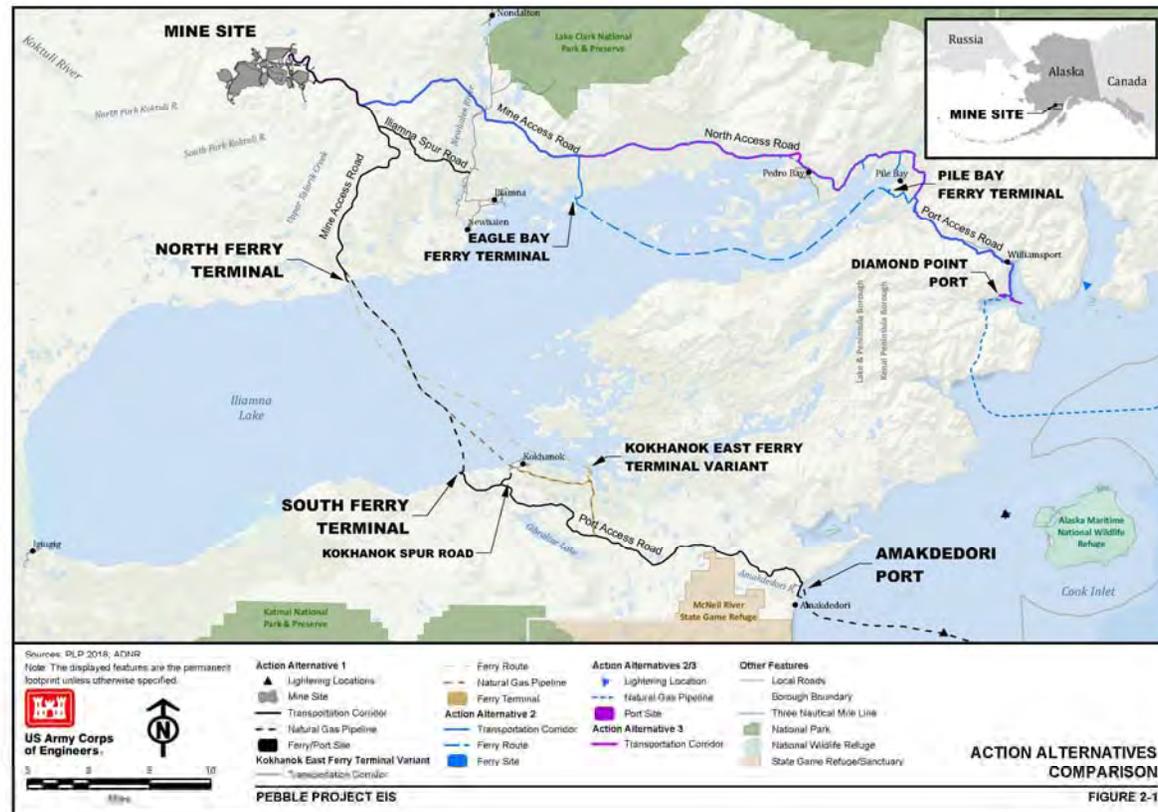
- **Kokhanok East Ferry Terminal Variant:** PLP proposes to construct the south ferry terminal on Iliamna Lake about 5 miles west of Kokhanok as the base case. Evaluation of alternative ferry terminal locations was suggested during scoping. This option considers an alternate south shore ferry terminal location east of Kokhanok (Kokhanok east ferry terminal site) and is evaluated as a variant to Action Alternative 1.<sup>27</sup>
- **Pile Supported Dock Variant:** PLP purposes to construct a sheet pile dock structure filled with granular (gravel) material. This option considers a pile-supported dock design at the port site to minimize in-water impacts and is evaluated as a variant to Action Alternatives 1 and 2.<sup>28</sup>
- **Concentrate Pipeline Variant:** PLP purposes to transport all concentrate produced at the mine in containers using trucks. Evaluation of an option for an ore concentrate pipeline was suggested during scoping due to concerns with ferrying ore concentrate across Iliamna Lake. This variant, evaluated under Action Alternative 3, considers the concept of delivering copper and gold concentrate from mine site to port using a single approximately 6.25 inch-diameter steel pipeline. Under this variant, molybdenum concentrate (approximately 2.5% of the concentrate) would continue to be separated at the mine site and trucked to the port. This variant also includes an option to construct an additional 8-inch return water pipeline to pump the concentrate filtrate back to the mine site for reuse.

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<sup>27</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 2: Alternatives. Page 2-4.

<sup>28</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 2: Alternatives. Page 2-5.

## Map 2.1-1: Project Location and Alternative Transportation Routes



## 3.0 SOCIOECONOMIC IMPACT ASSESSMENT

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This section is organized by theme as set out in the municipal code and additional themes that were identified during community sessions. Each of the themes includes information on:

- Overview of current and expected future conditions without the Project;
- Potential pathways of effect or pressures that may result from the Project; and
- Mitigation, enhancement, and monitoring plans that may help maintain or enhance valued components of the socioeconomic environment.

### 3.1 CULTURAL AND SOCIAL CHANGES

InterGroup's research team had the opportunity to visit each of the Lakes Area Villages twice during the research for this report. We shared meals and heard stories from residents from a variety of age ranges in all the villages.

As we presented the initial results of our work, we were reminded that everything is interconnected. None of the topics included in this report exist independent of the other topics; they are inter-related and each one contributes to the way of life and culture in each village. If one facet of village life changes, other changes ripple out from it.

Aspects of culture and social well-being are described in other sections of this report. This section will provide a brief summary of some of the main themes we heard during our visits to the villages, some village residents describing their culture and way of life in their own words, and a summary of the other sections of this report where facets of culture are described.

#### 3.1.1 Current Cultural and Social Setting

It is impossible for outsiders to fully understand and appreciate the way of life and culture in the villages in such a short amount of time. During our time in the communities, we started to gain an appreciation for what village life is like and heard numerous residents share some of the following key values:

- The culture of the villages is intrinsically linked to the land, the water, and the air. People value the environment, rely on it for food and water, and care deeply about protecting it for future generations.
- Schools are important hubs in the villages. People are proud of the quality of their schools and school buildings host many important community events.
- Hunting, fishing, and gathering are important for social, economic, and cultural reasons. They provide food for residents, help strengthen bonds between families and across generations, and are enjoyed for social and recreation purposes.
- People enjoy the way of life in smaller villages. They value knowing their neighbours and worry an increase in population or an influx of outsiders might change their communities.

Many people stated they feel the Project is fundamentally incompatible with the culture and way of life they value so much. Statements shared at public meetings documented in the draft EIS help illustrate these feelings. Some of the comments are included below.

*"My family is from Pedro Bay, and I continue to live there, as well as with my daughter and my two-year old granddaughter....I choose to live in Pedro Bay because it's small. It's a way of life that I thrive on. Every season is dependent on the animals, the fish, and the birds. Salmon is our lifeline. Quite honestly, we would be nothing without it."*

*"We hunt to feed our families, and we anticipate the salmon and prepare for their arrival as though they were the Pope arriving. It means a lot to us....We are the face of the future. We are not the faces of fear or hate. We will continue to teach our children to respect the land, the fish and the animals. No amount of money or the promise of jobs will sway my mind or my heart to embrace an idea like the mine."<sup>29</sup>*

*"I have spent most of my adult life here in this area. My family has deep roots here, back 3,500 years or more."<sup>30</sup>*

*"I'm a commercial fisherman. My kids are commercial fishermen. We subsist by choice. We subsist by choice."<sup>31</sup>*

*"Being from Igiugig, I grew up surrounded by subsistence and culture. I considered it as a norm to gut salmon on a wooden table and through organs into the river, watching the seagulls swoop down to catch them. It's not every day you see a little girl gutting and filleting a salmon. I spent summers hanging up fish on racks in the smokehouse and picking nets down the river....I fear the thought my children will not know what a moose or salmon tastes like, what blackberries that once spanned over thousands of yards of tundra looked like. How will they know that we had water that was once so fresh you could just dip your water bottle into it? How will they know*

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<sup>29</sup> Pebble Project: Draft Environmental Impact Statement Public Hearing. Newhalen, Alaska. March 27, 2019. Vol. 1, Pages 38-39.

<sup>30</sup> Pebble Project: Draft Environmental Impact Statement Public Hearing. Newhalen, Alaska. March 27, 2019. Vol. 1, Page 50

<sup>31</sup> Pebble Project: Draft Environmental Impact Statement Public Hearing. Newhalen, Alaska. March 27, 2019. Vol. 1, Page 55

*that? Maybe a distant story from years ago when the Mulchatna herd came through the village of Igiugig by the thousands.*<sup>32</sup>

*"He is my foster child. And I am testifying on his behalf because apparently he just cries, poops and sleeps. He is our future, and the future that I want for him is to have what we have currently. We subsist for our fish. We subsist for our berries. I attempt to hunt...I ant him to grow up knowing what fish taste like, what caribou tastes like, what moose tastes like. I don't want him to hear stories, oh, man, you should hear how it is, how we used to do this, how we used to do hat. I don't want him to be watching documentaries on how it used to be here in Igiugig. I want him to grow up knowing salmon, knowing the water, knowing the wildlife here.*<sup>33</sup>

*"So it's – it's home to us. We don't live here, make our money off the fish. We here – we're here to stay. We go to our fish camps. We put up our fish for the winter. We know we will survive.*<sup>34</sup>

*"This is my home. We – we still live off the land. Everything is sacred to us. We still pray to whatever sustains us. I mean, our berries, anything we can gather, we still give thanks to whatever is on earth. We still do our subsistence.*<sup>35</sup>

### 3.1.2 Locations Where Aspects of Culture are Described in this Report

During our time in the villages, many residents explained that effects of the Project on culture were the things that concerned them the most about the Project. We understand that culture can describe values and beliefs, how people acquire and transmit knowledge, and how that knowledge influences their personal behavior and interactions with others in their communities. Effects on culture can touch on many aspects of village life. Aspects of the social and economic environment in the Lakes Area Villages that also affect culture are described in different sections of this report. Table 3.1-1 provides a summary of those sections and references so interested readers can easily find more details.

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<sup>32</sup> Pebble Project: Draft Environmental Impact Statement Public Hearing. Igiugig, Alaska. Vol. 1. March 28, 2019. Pages 31-33

<sup>33</sup> Pebble Project: Draft Environmental Impact Statement Public Hearing. Igiugig, Alaska. Vol. 1. March 28, 2019. Page 47

<sup>34</sup> Pebble Project: Draft Environmental Impact Statement Public Hearing. Nondalton, Alaska. Vol. 1. April 8, 2019. Page 32.

<sup>35</sup> Pebble Project: Draft Environmental Impact Statement Public Hearing. Nondalton, Alaska. Vol. 1. April 8, 2019. Pages 46-47.

**Table 3.1-1: Aspects of Culture Described in Other Sections of the Socioeconomic Impact Assessment**

| <b>Topic</b>          | <b>Summary</b>  | <b>Location in Report</b>   |
|-----------------------|---|---|
| <b>Population</b>     | <p>Village residents value knowing their neighbors and living close to family members. The current populations of the Lakes Area Villages are small and future growth is expected to be concentrated in Port Alsworth and the villages that would be connected to the Project by road (Newhalen, Iliamna, and Kokhanok).</p> <p>A large influx of outsiders due to the Project is not expected but some former residents could decide to return and some residents may decide to stay since there is stable employment close to home.</p> | <p>Section 3.2.1 describes current population in the Lakes Area Villages</p> <p>Section 3.2.2 describes how the Project could affect population growth in the Lakes Area Villages</p>   |
| <b>Transportation</b> | <p>Some village residents value the remoteness of their home communities, which are currently not connected by roads (except for Iliamna and Newhalen).</p> <p>New Project infrastructure could make it easier to access communities and potentially access areas outside the Borough (e.g., the Kenai Peninsula if boat transport is established).</p>   | <p>Section 3.3.1 describes current transportation infrastructure in the Lakes Area Villages.</p> <p>Section 3.3.2 describes how the Project could change transportation and traffic in the Lakes Area Villages.</p>                   |
| <b>Education</b>      | <p>Schools are important to the villages because they help stabilize population, are a major employer, and offer a communal meeting space.</p> <p>If the population grows due to the Project, the school in Newhalen may need to expand. Additional programming may be available in the schools.</p>  | <p>Section 3.5.1 describes schools and programming currently in the Lakes Area Villages.</p> <p>Section 3.5.2 describes how the Project could affect the schools in terms of physical capacity, human resources, and programming.</p> |

| Topic   | Summary  | Location in Report   |
|---|--|--|
| <b>Community Health and Well-being</b>          | <p>Health is more than an absence of disease. It is influenced by social, economic, and physical environments and includes personal and community well-being.</p> <p>The Project could have an effect on subsistence resource use, which reinforces communal and family relationships, and promotes a health diet.</p>   | <p>Section 3.8.1 describes the various factors that influence community health and well-being.</p> <p>Section 3.8.2 describes how the Project could affect subsistence resource use and, by extension, relationships in the villages and the diets of village residents.</p>   |
| <b>Competition for Subsistence Resource Use</b> | <p>Subsistence resource use is an important way for village residents to remain connected to the land and water and their culture.</p> <p>The Project could change subsistence resource use activities by limiting access to certain areas, changing the ability of residents to participate in harvesting activities through employment, and affecting where fish and wildlife are.</p> | <p>Section 3.9.1 describes current resource use activities based on the most recent publicly available information.</p> <p>Section 3.9.2 describes how the Project could change subsistence resource use activities. How these changes could affect community health and well-being is described in Section 3.8.2.</p> |

## 3.2 POPULATION CHANGES

### 3.2.1 Current and Projected Population without the Project

Table 3.2-1 summarizes the population for each of the Lakes Area Villages from 2000 to 2017, as well as the changes for the rest of the Borough, the total for the Borough, and for the state of Alaska as a whole.

The population for the seven Lakes Area Villages increased from 864 people in 2000 to 974 people in 2017 for an average annual growth rate over the period of 0.7%. This contrasts with the population change for the Borough as a whole, which decreased from 1,823 in 2000 to 1,721 in 2017 (a decrease of 0.3% on average annually).

**Table 3.2-1: Population Changes from 2000 to 2017<sup>36</sup>**

|                                  | 2000    | 2017    | Average<br>growth rate<br>2000 to<br>2017 |
|----------------------------------|---------|---------|---|
| Port Alsworth                    | 104     | 238     | 5.0%                                      |
| Nondalton                        | 221     | 144     | -2.5%                                     |
| Iliamna                          | 102     | 100     | -0.1%                                     |
| Newhalen                         | 160     | 230     | 2.2%                                      |
| Igiugig                          | 53      | 57      | 0.4%                                      |
| Kokhanok                         | 174     | 173     | 0.0%                                      |
| Pedro Bay                        | 50      | 32      | -2.6%                                     |
| Lakes Area Villages Total        | 864     | 974     | 0.7%                                      |
| Rest of Borough                  | 959     | 747     | -1.5%                                     |
| Total Lake and Peninsula Borough | 1,823   | 1,721   | -0.3%                                     |
| Alaska                           | 628,346 | 737,080 | 0.9%                                      |

Most of the population growth since 2000 has been concentrated in Port Alsworth (increase of 134 people or 5.0% average annual increase) and Newhalen (increase of 70 people or 2.2% average annual increase). Populations have declined over the same period in some other villages, particularly Nondalton (decrease of 77 people or 2.5% average annual decrease) and Pedro Bay (decrease of 18 people or 2.6% average annual decrease).

Table 3.2-2 shows more recent population changes from 2014 through 2017. The population for the seven Lakes Area Villages increased from 929 people in 2014 to 974 people in 2017 for an average annual growth rate over the period of 1.6%. This increase in population in the Lakes Area Villages drove an overall increase in the Borough's total population of about 0.7% annually.

<sup>36</sup> Alaska Department of Labor and Workforce Development, Division of Research and Analysis (ADOLWD DRA). 2018. Population Estimates. Available at: <http://live.laborstats.alaska.gov/pop/index.cfm> [accessed 8 May 2019]

**Table 3.2-2: Population Changes from 2014 to 2017<sup>37</sup>**

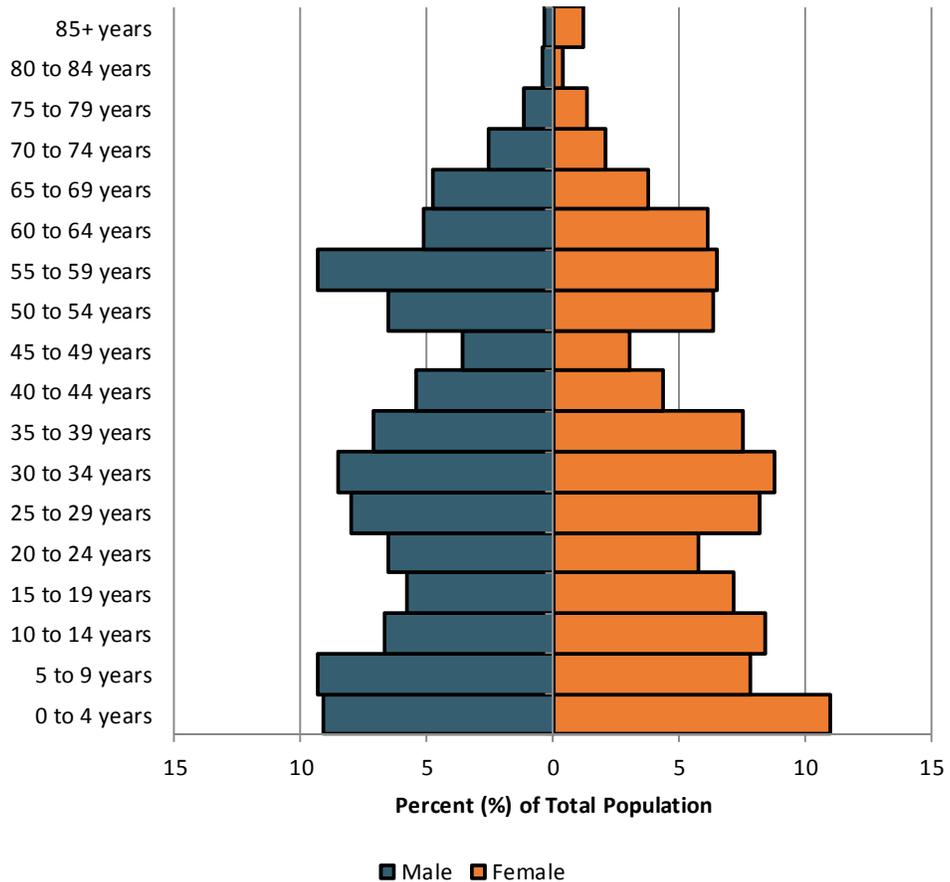
|                                  | 2014    | 2015    | 2016    | 2017    | Average<br>growth rate |
|----------------------------------|---------|---------|---------|---------|------------------------|
|                                  |         |         |         |         | 2014 to 2017           |
| Port Alsworth                    | 180     | 211     | 218     | 238     | 9.8%                   |
| Nondalton                        | 165     | 152     | 153     | 144     | -4.4%                  |
| Iliamna                          | 91      | 94      | 104     | 100     | 3.2%                   |
| Newhalen                         | 225     | 207     | 198     | 230     | 0.7%                   |
| Igiugig                          | 53      | 48      | 53      | 57      | 2.5%                   |
| Kokhanok                         | 168     | 140     | 152     | 173     | 1.0%                   |
| Pedro Bay                        | 47      | 47      | 32      | 32      | -12.0%                 |
| Lakes Area Villages Total        | 929     | 899     | 910     | 974     | 1.6%                   |
| Rest of Borough                  | 758     | 778     | 732     | 747     | -0.5%                  |
| Total Lake and Peninsula Borough | 1,687   | 1,677   | 1,642   | 1,721   | 0.7%                   |
| Alaska                           | 736,906 | 737,467 | 739,709 | 737,080 | 0.0%                   |

Most of the population growth since 2014 was concentrated in Port Alsworth (increase of 58 people or 9.8% average annual increase). Iliamna, Newhalen, Igiugig, and Kokhanok also saw population growth in this period. Population declined over the same period in Nondalton (decrease of 21 people or 4.4% average annual decrease) and Pedro Bay (decrease of 15 people or 12.0% average annual decrease). While the population of Pedro Bay has been decreasing, it dropped dramatically after the school closed in 2010.

Figure 3.2-1 shows the age distribution by sex for 2017 for the Borough as a whole. The Borough is younger (median age in 2017 of 31.9 years) than the State of Alaska as a whole (median age in 2017 of 34.9 years). More than 30% of the Borough's population is under the age of 20. The Borough as a whole shows a smaller proportion of the total population between the ages of 40 to 49 years than either between 30 to 39 years old or 50 to 59 years old.

<sup>37</sup> Alaska Department of Labor and Workforce Development, Division of Research and Analysis (ADOLWD DRA). 2018. Population Estimates. Available at: <http://live.laborstats.alaska.gov/pop/index.cfm> [accessed 8 May 2019]

Figure 3.2-1: Lake and Peninsula Borough Population Distribution by Age and Sex (2017)<sup>38</sup>



With respect to population mobility, a large majority of the population in the Lakes Area Villages remained in the same community as the year prior on average for the period from 2012 to 2016, as summarized in Table 3.2-3. The data are summarized from Alaska Permanent Fund Dividend filings. The reported residence for applicants for sequential years are compared to determine the proportion of population that has remained in a community. For most of the communities, between 83% and 89% of the population was in the community the year before filing for the

<sup>38</sup> Alaska Department of Labor and Workforce Development, Division of Research and Analysis (ADOLWD DRA). 2018. Population Estimates. Available at: <http://live.laborstats.alaska.gov/pop/index.cfm> [accessed 8 May 2019]

Permanent Fund, except for Igiugig, where 78.1% of the population were in the community the year before filing.

**Table 3.2-3: Alaska Permanent Fund Filers Location 1 Year Prior – Average 2012-2016<sup>39</sup>**

|               | Stayed in<br>Community | Entered<br>Community | New PDF<br>Filers |
|---------------|------------------------|----------------------|-------------------|
| Port Alsworth | 83.3%                  | 7.2%                 | 9.5%              |
| Nondalton     | 89.1%                  | 4.8%                 | 6.2%              |
| Iliamna       | 83.9%                  | 8.6%                 | 7.6%              |
| Newhalen      | 86.1%                  | 8.3%                 | 5.6%              |
| Igiugig       | 78.1%                  | 14.0%                | 8.0%              |
| Kokhanok      | 88.6%                  | 6.5%                 | 4.9%              |
| Pedro Bay     | 86.5%                  | 5.9%                 | 7.6%              |

The population projections for the Borough prepared by the Alaska Department of Labor and Workforce Development forecast modest annual growth for the Borough in the range of 0.6% to 0.9% on average each year through 2040. Table 3.2-4 summarizes the forecast total population for the Borough in 2020 and 2040. This modest population growth is forecast to be driven by a high birth rate consistent with a young population, offset by some small amount of net outmigration annually.<sup>40</sup>

<sup>39</sup> Alaska Department of Revenue, Permanent Fund Dividend Division (ADOR PFD). 2018. Summary of Dividend Applications and Payments. Available at: <https://pfd.alaska.gov/Division-Info/Summary-of-Applications-and-Payments> [accessed 7 May -2019]

<sup>40</sup> Alaska Department of Labour and Workforce Development population projections show average annual births of 33 to 39 each year, offset by deaths of between 14 to 18 and net outmigration of between 2 to 9 people each year.

**Table 3.2-4: Lake and Peninsula Borough Projected Population  
 2017 through 2045<sup>41</sup>**

|      | Projected<br>Population | Average Annual Change Over Prior Period |        |                  | Population<br>Change | Average<br>Annual Growth<br>Rate |
|------|-------------------------|---|--------|------------------|----------------------|----------------------------------|
|      |                         | Births                                  | Deaths | Net<br>Migration |                      |                                  |
| 2017 | 1,721                   |   |        |                  |                      |                                  |
| 2020 | 1,751                   | 33                                      | 14     | -9               | 10                   | 0.6%                             |
| 2045 | 2,140                   | 39                                      | 18     | -4               | 17                   | 0.8%                             |

The State population projections are prepared for the Borough as a whole. It is difficult to forecast population growth particularly for small communities such as the Lakes Area Villages. In order to understand the range of possible future populations in the Lakes Area Villages, two illustrative scenarios were prepared based on the total Average Annual Growth projections for the Borough shown in Table 3.2-4. The population in individual villages can change more rapidly and the population in individual villages may change substantially more or less than shown in these projections. Scenario 1 is summarized in Table 3.2-5 and shows population projections for each of the Lakes Area Villages assuming the average annual growth is equal in villages across the Borough.

Table 3.2-6 provides an estimate assuming growth continues to be concentrated in Port Alsworth (growing at about 2.5 times the average projection for the Borough) and to a lesser degree Iliamna and Newhalen (growing at approximately 1.5 times the average projection for the Borough) consistent with more recent trends. This scenario assumes other communities see more limited or no growth, but all communities with the exception of Nondalton are expected to experience population increases.

<sup>41</sup> Alaska Department of Labor and Workforce Development, Division of Research and Analysis (ADOLWD DRA). 2018. Population Estimates. Available at: <http://live.laborstats.alaska.gov/pop/index.cfm> [accessed 7 May 2019]

**Table 3.2-5: Scenario 1: Projected Lakes Area Village Populations  
 Assuming Equal Average Annual Growth (2017 to 2045)<sup>42</sup>**

|                                  | 2017  | 2020  | 2045  |
|----------------------------------|-------|-------|-------|
| Port Alsworth                    | 238   | 242   | 296   |
| Nondalton                        | 144   | 147   | 179   |
| Iliamna                          | 100   | 102   | 124   |
| Newhalen                         | 230   | 234   | 286   |
| Igiugig                          | 57    | 58    | 71    |
| Kokhanok                         | 173   | 176   | 215   |
| Pedro Bay                        | 32    | 33    | 40    |
|                                  |       |       |       |
| Lakes Area Villages Total        | 974   | 991   | 1,211 |
| Rest of Borough                  | 747   | 760   | 929   |
|                                  |       |       |       |
| Total Lake and Peninsula Borough | 1,721 | 1,751 | 2,140 |

<sup>42</sup> Assumes growth over 2017 population is equal to the Average Annual Population Growth Rates provided in Table 3.2-3.

**Table 3.2-6: Scenario 2: Projected Lakes Area Village Populations Assuming Growth Concentrated in Port Alsworth, Iliamna and Newhalen (2017 to 2045)<sup>43</sup>**

|                                  | 2017  | 2020  | 2045  |
|----------------------------------|-------|-------|-------|
| Port Alsworth                    | 238   | 248   | 409   |
| Nondalton                        | 144   | 143   | 129   |
| Iliamna                          | 100   | 103   | 139   |
| Newhalen                         | 230   | 236   | 319   |
| Igiugig                          | 57    | 57    | 64    |
| Kokhanok                         | 173   | 175   | 206   |
| Pedro Bay                        | 32    | 31    | 26    |
| Lakes Area Villages Total        | 974   | 994   | 1,291 |
| Rest of Borough                  | 747   | 755   | 852   |
| Total Lake and Peninsula Borough | 1,721 | 1,749 | 2,142 |

A comparison of the scenarios indicates that by 2045, if growth remains concentrated in Port Alsworth, the population by 2045 could be approximately 40% higher than if growth is more evenly distributed across the Borough.

### 3.2.2 Potential Effects of the Project on the Borough

Population changes are affected by a number of interrelated factors. It is difficult to predict exactly how population might change as a result of the Project. However, certain factors that could tend to increased population or decreased population can be identified.

The Project may increase population in the Lakes Area Villages, and perhaps to a lesser extent the rest of the Borough, by reducing the local cost of living (primarily through lower transportation, fuel, and energy costs) and decreasing out-migration if current residents feel they are better able to find employment and business opportunities close to home. It is also possible that an increase in local employment and business opportunities could induce former

<sup>43</sup> Assumes total Lake and Peninsula Borough populations approximately the same as Table 3.2-3, but with growth concentrated in Port Alsworth (average annual growth rate 2.5 times the average for the Borough), Iliamna and Newhalen (average annual growth 1.5 times the average for the Borough), with lower than average population growth in other parts of the Borough including population declines in Nondalton and Pedro Bay.

residents to move home. However, the availability of local housing and land could be constraints to former residents returning to their home communities. In addition, it is possible that increased income and employment opportunities, coupled with transportation service provided to the Project workforce, could result in some current residents choosing to relocate to other parts of the State.

The draft EIS notes the Project would create an estimated 850 direct jobs during the operations phase. However, the majority of workers are anticipated to be from Anchorage, larger communities in the Kenai Peninsula Borough, and out of state.<sup>44</sup> The draft EIS concludes that the effects of the Project on population are difficult to anticipate but that communities in the vicinity of the Project are not anticipated to see large increases in population from in-migration.<sup>45</sup> However, increased availability of local employment and business opportunities may reduce out-migration, particularly in Iliamna and Newhalen though this may extend to other Lakes Area Villages depending in part on transportation infrastructure. Increased employment and business opportunities may also induce some former residents to return. Potential increases in population may be constrained by the availability of housing and land.

The State of Alaska's population projections currently forecast average annual out-migration from the Borough as a whole of between three to four people each year. Assuming up to one third of the population is of school age, slowing out-migration might result in an additional one or two school age children on average per year. By contrast, the State's population projections assume between 33 to 40 births per year for the Borough as a whole.<sup>46</sup>

A review of the socioeconomic effects of uranium mining in Northern Saskatchewan attributed population growth in Northern Saskatchewan primarily to higher birthrates associated with a generally younger population.<sup>47</sup> Recent information published by the Government of the Northwest Territories on the effects of diamond mining on communities notes relatively static populations.<sup>48,49</sup> However, both of these reports are focused at a more regional level that may obscure more localized population changes.

Considering all factors, it appears likely the Project would cause a small overall increase in population compared to future scenarios without the Project:

- The most noticeable increases would be expected in Iliamna and Newhalen as these areas would be most likely to attract new residents to provide services to the Project.

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<sup>44</sup> Local employment numbers are discussed in more detail in Section 3.4.2.

<sup>45</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 4: Environmental Consequences. Page 4.3-5.

<sup>46</sup> Alaska Department of Labor and Workforce Development, Research and Analysis Section

<sup>47</sup> Community Vitality Monitoring Partnership Process. 2013. The Socioeconomic impacts of the modern era of uranium mining on northern Saskatchewan. Page 20.

<sup>48</sup> Government of the Northwest Territories. 2016. Communities and Diamonds annual report.

- Other villages in the area may also see smaller increases, primarily as a result of slowing existing outmigration patterns.

Any changes in population, however, are expected to be constrained by the limited availability of land and housing in the villages.

Many residents valued that their villages included family and long-time friends. Some indicated that they would welcome some of these individuals moving back or fewer moving out. However, they felt that an influx of “outsiders” with no previous connection to the village would not be as welcome. Newcomers might change the village social setting and family networks. It appears that for most villages, the increase in population would include people from the villages moving back or fewer leaving. The exception might be Iliamna and Newhalen where proximity to the mine site might prompt new businesses, unrelated to the community, to locate. These new businesses may, in turn, attract new residents.

### 3.2.3 Mitigation and Enhancement Opportunities

Population changes are difficult to predict and can be affected by a number of different factors and pressures. While Project-related jobs may reduce out-migration, constraints on the local availability of housing and land may limit the degree to which in-migration can contribute to population growth. However, since population changes can affect the socioeconomic environment in a number of ways, including housing, education, health care, infrastructure, culture, and social cohesion, it will be important to monitor population changes and understand the drivers of any changes in population.

InterGroup recommends that a Project Monitoring, Compliance, and Implementation Committee be established and that the committee have the resources to collect and report on a number of socioeconomic indicators including population changes in the Lakes Area Villages and the remainder of the Borough. This information could help the Borough address pressures on local housing, education, health care and other infrastructure.

InterGroup also recommends that all Borough villages be designated as pick-up points, where employees are transported free of charge to the Project to encourage workers to stay in their home villages. Similarly, ensuring a number of worker pick-up points outside the region, such as Anchorage or Kenai, could help reduce the incentive for outsiders to relocate.

Finally, the Project should consider prohibiting daily commuting between the Project site and local communities to prevent workers from relocating to villages closer to the Project site. The prohibition may be relaxed upon recommendation by the Borough and communities.

## 3.3 TRANSPORTATION

Transportation is a key area for potential effects of the Project on the Lakes Area Villages specifically and the Borough as a whole. The development of any of the proposed transportation corridors would represent a substantial change for village residents. Currently, the absence of transportation infrastructure between most villages affects multiple facets of life, including cost of living and subsistence resource use.

### 3.3.1 Current and Potential Future Environment without the Project

Transportation and traffic includes surface transportation (e.g., roads and trails), water-based travel, and air transportation. Travel to other villages and areas for subsistence resource use would be reached either by established trail systems, by water, or by air.

#### Surface Transportation

Generally, surface transportation is limited to roads within a community and trails that connect villages to resource use activities and other villages. Trails can be land-based or ice-based during the winter.

In the Borough, road infrastructure is limited to community roads, except for the road connecting Iliamna and Newhalen and two regional roads. One regional road in the Borough connects Iliamna with the Newhalen River. Since there is currently no bridge over the Newhalen River, the villages of Iliamna and Nondalton are not connected by a road. During open water, people will boat across the river. In the winter, people will drive trucks or snow machines across. The other regional road extends from Williamsport to Pile Bay, which extends from Williamsport on the Cook Inlet to Pile Bay on Iliamna Lake.

Table 3.3-1 provides details about the community roads for Lakes Area Villages that could be affected by project construction and operations.

**Table 3.3-1: Community Roads<sup>50</sup>**

| Community        | Miles of Local Roads | Annual Average Daily Traffic Count (cars per day) <sup>51</sup> |
|------------------|----------------------|---|
| Iliamna/Newhalen | 12                   | 424   |
| Nondalton        | 3                    | 50-60   |
| Kokhanok         | 3                    | 75  |
| Pedro Bay        | 5                    | N/A   |

Village residents will also travel off-road and across Lake Iliamna to reach other villages or subsistence resource use areas. According to the draft EIS, these areas are easier to access in

<sup>50</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 3: Affected Environment. Page 3.12-1.

<sup>51</sup> For AADT, The Iliamna/Newhalen counts are for the busiest road, while AADT for Newhalen and Kokhanok were for all local roads. Counts for Pedro Bay were unavailable.

the winter, when the tundra, rivers, and lakes are frozen.<sup>52</sup> Residents from all the Lakes Area Villages on Lake Iliamna use the lake for winter travel by snow machine during those years when the lake freezes.

Winter trails are presented on the maps included in Attachment A. There are snow machine travel routes along the shoreline of the entire lake, trails beginning in Kokhanok on the south side of the lake and extending to multiple points on the north shore, and trails extending from Igiugig to the north shore.

### Open Water Travel

Since all but two of the Lakes Area Villages are not connected by road, travel on open water is one method for traveling to other villages and transporting goods. The primary waterways in the area are Lake Iliamna and the Newhalen River. Table 3.3-2 presents the dock facilities in the Lakes Area Villages.

**Table 3.3-2: Dock Facilities<sup>53</sup>**

| <b>Community</b> | <b>Dock Facilities</b>  |
|------------------|---|
| Port Alsworth    | No public dock. Light cargo can be forwarded to village from landing at Sixmile Lake.   |
| Iliamna          | Public dock and barge landing   |
| Newhalen         | No dock facilities. Inbound cargo is lightered or piped ashore.   |
| Nondalton        | No dock facilities. Inbound cargo is forwarded to a landing at Sixmile Lake opposite the village and shuttled across by small boat. |
| Igiugig          | Boat ramp and barge landing   |
| Kokhanok         | No dock facilities. Inbound cargo is lightered or piped ashore.   |
| Pedro Bay        | Boat landing and barge landing  |

Barge services are offered by Crowley Maritime, IDC, Igiugig Transport, and Iliamna Transportation Company. Crowley Maritime provides service from Seattle and Anchorage to its terminal at Naknek before delivering dry cargo and bulk diesel to the Lakes Area Villages, but low water levels on the Kvichak River has interrupted service in recent years. IDC, Igiugig

<sup>52</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 3: Affected Environment. Page 3.12-3.

<sup>53</sup> Kevin Waring and Associates. 2010. Transportation – Bristol Bay Drainages. Chapter 9 of the Pebble Project Environmental Baseline Document, 2004 through 2008 (with updates in 2010). P. 19-5.

Transport, and Iliamna Transportation Company operate barge services between the Pile Bay landing and the Lakes Area Villages.<sup>54</sup>

### Air Transportation

All Lakes Area Villages have airports. Transporting passengers and cargo is common within the Borough since road infrastructure is limited. There are scheduled flights to Iliamna, which is a regional hub, along with King Salmon. While King Salmon is not located in the Borough, it is a service center for villages in the Borough and goods and passengers often pass through on their way to a Borough village. Other air travel and transportation is done via charters as multiple air taxis and charter companies fly to Borough villages. Port Alsworth is the hub for two air charter companies that frequently fly in the Borough. Table 3.3-3 presents information about the airports in the Lakes Area Villages.

**Table 3.3-3: Airports in Lakes Area Villages<sup>55</sup>**

| <b>Airport</b>                 | <b>Owner</b>              | <b>Use</b> | <b>Average Annual Operations<sup>56</sup></b> | <b>Runway Surface</b>        | <b>Runway Lighting</b> | <b>Based Aircraft</b> |
|--------------------------------|---------------------------|------------|---|------------------------------|------------------------|-----------------------|
| <b>Iliamna Airport (ILI)</b>   | ADOT&PF Southcoast Region | Public     | 15,330  | Asphalt/<br>Grooved<br>Water | MIRL                   | 29                    |
| <b>Kokhanok Airport (9K2)</b>  | ADOT&PF SR Region         | Public     | -   | Gravel                       | MIRL                   | -                     |
| <b>Nondalton Airport (5NN)</b> | ADOT&PF Southcoast Region | Public     | 1,248   | Gravel                       | MIRL                   | -                     |
| <b>Pedro Bay Airport (4K0)</b> | ADOT&PF Southcoast Region | Public     | 1,040   | Gravel                       | MIRL                   | -                     |
| <b>Igiugig Airport (IGO)</b>   | ADOT&PF Southcoast Region | Public     | 8,030   | Gravel                       | MIRL                   | -                     |

<sup>54</sup> Kevin Waring and Associates. 2010. Transportation – Bristol Bay Drainages. Chapter 9 of the Pebble Project Environmental Baseline Document, 2004 through 2008 (with updates in 2010). p. 19-6.

<sup>55</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 3: Affected Environment. Page 3.12-5.

<sup>56</sup> An operation is either a takeoff or a landing.

| <b>Airport</b>              | <b>Owner</b>     | <b>Use</b> | <b>Average Annual Operations<sup>56</sup></b> | <b>Runway Surface</b> | <b>Runway Lighting</b> | <b>Based Aircraft</b> |
|-----------------------------|------------------|------------|---|-----------------------|------------------------|-----------------------|
| Port Alsworth Airport (TPO) | Glen Alsworth Sr | Private    | 1,300   | Dirt/Gravel           | -                      | 19                    |

### 3.3.2 Potential Effects of the Project on the Borough

Changes to transportation and traffic around the Lakes Area Villages due to the Project will drive changes to other areas discussed in this report. This section will provide a description of the Project's proposed transportation corridors and infrastructure, how these could affect travel by village residents and organizations, and cross-references to other sections of the report (e.g., cost of living, housing) that will be affected by Project effects on transportation and traffic.

The Project has the potential to affect transportation and traffic in the Borough through the use of pre-existing infrastructure and the development of transportation infrastructure and corridors where none previously existed. The precise nature of the effect will depend on the alternative recommended for the Project by the Army Corps of Engineers. The three alternatives are presented on Map 2.1-1.

The use of existing infrastructure relates primarily to the airports in Kokhanok and Iliamna. Pebble Limited Partnership currently plans to fly employees at the mine site to Iliamna from where they will be bused. Employees at the port site will be flown to Kokhanok from where they will be bused to the port. Of the two airports, Iliamna is expected to see the largest increase in air traffic.<sup>57</sup> The Iliamna Airport is not expected to require upgrades to accommodate additional air traffic, while the Kokhanok Airport would likely require improved lighting and navigation, along with air radio service to accommodate the anticipated cargo flights. Upgrades are expected to occur within the airport's current footprint. The increased air traffic is not expected to have noticeable effects on transportation and traffic in the Borough.<sup>58</sup>

Project effects of transportation and traffic in the Borough are anticipated to come primarily from the development of new infrastructure and the establishment of a regular ferry across Iliamna Lake.

The development of roads to support the Project operations is a substantial change to the Lakes Area Villages, which are not connected by roads (except for Iliamna and Newhalen). The new roads proposed in any of the Project alternatives would affect the ability of village residents to

<sup>57</sup> RFI 027 Project Logistics and Employment for Socioeconomics and Transportation.

<sup>58</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 4: Environmental Consequences. Pages 4.12-4—4.12-5.

travel safely. Notably, the roads proposed in Alternative 1 (Map 2.1-1) would cross through subsistence resource use areas used by residents of Iliamna, Newhalen, and Nondalton on the north side of Lake Iliamna and through resource use areas used by residents of Kokhanok on the south side of Lake Iliamna (see Attachment B). Since these areas are used for subsistence resource use, village residents likely travel through them. Project operations will require up to 39 truck round trips daily throughout the life of the Project.<sup>59</sup> Pebble Limited Partnership is expected to limit the use of the road for personal vehicles to certain time of the day or escorted convoys. These measures will reduce the chance of collisions between smaller off-road vehicles and personal trucks and Project traffic.

Ferry traffic would also pose a safety risk to village residents as they travel between communities and to subsistence resource use areas. The primary safety concern is during winter if the lake freezes. Pebble Limited Partnership currently proposes using an ice-breaking ferry year-round to make one roundtrip each day.<sup>60</sup> As shown in the maps contained in Attachment A, village residents use the lake to travel along the shoreline and between the north and south shores. An ice-breaking ferry would create open water in the winter and change ice conditions that residents are already familiar with. Open water and new ice conditions would make winter travel routes on the lake unsafe.

While the road and transportation corridor may create issues for the villages, it also has the potential to decrease the cost of living in the villages by allowing cheaper transport of goods to individuals and organizations in the Lakes Area Villages. In addition, if boat transport to the Kenai Peninsula is established, village residents may also have a less expensive way to reach the Kenai road system.

Other sections of this report where the effects of road development are discussed are:

- **Housing (Section 3.5):** Housing costs may lower as a result of lower transport costs.
- **Fuel and Energy (Section 3.6):** Fuel and energy costs may decrease as a result of lower transport costs.
- **Community Health and Well-being (Section 3.7):** Changes to the ability to engage in subsistence resource use because either areas traditionally used are no longer accessible or new areas are opened up can affect community health and well-being.
- **Competition for Subsistence Resource Use (Section 3.8):** Areas traditionally used for subsistence resource harvesting may no longer be accessible or new areas may be more easily accessible to Borough residents because of the new roads. Access will depend on the

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<sup>59</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 4: Environmental Consequences. Pages 4.12-3.

<sup>60</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 4: Environmental Consequences. Pages 4.12-6.

Access Management Plan described below. The ferry may affect fish populations in Lake Iliamna.

### 3.3.3 Mitigation and Enhancement

Mitigation and enhancement measures related to new transportation infrastructure's effects on housing, fuel and energy, community health and well-being, and competition for subsistence resource use are described in those sections. Measures to ensure safe travel and Borough use of new transportation infrastructure in the Borough are described below.

To promote safe travel, InterGroup recommends that PLP

- Establish designated road crossings from residents driving off-road vehicles and mark the crossings well;
- Mark open water and ice roads during the winter;
- Mark the ferry route during open water season near shore and provide each village with mapping showing the ferry route; and
- Mark and groom land-based alternative travel routes in the winter to encourage village residents to not risk ice-based travel near the ferry route.

These measures should help prevent collisions between Project traffic and personal traffic and help prevent snow machines from going through thin ice or into open water.

InterGroup also recommends establishing an Access Management Plan in collaboration with PLP, and potentially in collaboration with Alaska Peninsula Corporation, other private landowners, and the Alaska Department of Natural Resources. The Access Management Plan would govern public access to the transportation infrastructure including the road, port, and ferry. Public access would be limited to Borough residents to achieve the following objectives:

- Prevent non-Borough residents from engaging in resource harvesting activities.
- Decrease the cost of living in the region through cheaper transport of goods to residents, businesses, and community organizations.
- Facilitate inter-village travel.
- If boat transport to Kenai is developed, to facilitate inexpensive access to the Kenai Peninsula and its road system.

A mechanism for reporting non-compliance with the access described in the Access Management Plan should be developed.

## 3.4 EMPLOYMENT AND INCOME CHANGES

### 3.4.1 Current and Potential Future Environment without the Project

Table 3.4-1 summarizes the 2016 employment and unemployment figures for the Lakes Area Villages, the rest of the Borough, the Borough as a whole and the state of Alaska. The data show that the percentage of residents age 16 and over who were employed in the Lakes Area Villages

was approximately 70%. This is somewhat higher than the rest of the Borough (67%), the Borough as a whole (69%), and the state of Alaska (60%).<sup>61</sup>

These data and the data in Table 3.4-2 should be interpreted with caution. Employment data from the Alaska Department of Labor and Workforce Development exclude federal employees and individuals who are self-employed. The exclusion of federal employees will not have a large impact on employment data for Lakes Area Villages except for Port Alsworth, which is the headquarters for Lake Clark National Park. The exclusion of self-employed individuals will affect the entire Borough because commercial fishers are considered self-employed and a substantial number of Borough residents have crew licences or are permit holders. In addition, these employment numbers include both permanent and seasonal employment.

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<sup>61</sup> Percentage of residents 16 years of age and over was calculated by InterGroup based on Alaska Department of Labor and Workforce Development data.

**Table 3.4-1: Employment and Unemployment, 2016<sup>62</sup>**

|                                  | Residents<br>age 16 and<br>over | Residents<br>employed | Unemployment<br>insurance<br>claimants | Percentage of<br>residents employed<br>age 16 and over |
|----------------------------------|---------------------------------|-----------------------|--|--|
| Port Alsworth                    | 132                             | 80                    | 4                                      | 61%  |
| Nondalton                        | 131                             | 79                    | 24                                     | 60%  |
| Iliamna                          | 144                             | 109                   | 21                                     | 76%  |
| Newhalen                         | 59                              | 48                    | 16                                     | 81%  |
| Igiugig                          | 42                              | 35                    | 2                                      | 83%  |
| Kokhanok                         | 111                             | 85                    | 12                                     | 77%  |
| Pedro Bay                        | 26                              | 16                    | 1                                      | 62%  |
| Lakes Area Villages total        | 645                             | 452                   | 80                                     | 70%  |
| Rest of Borough                  | 505                             | 340                   | 61                                     | 67%  |
| Total Lake and Peninsula Borough | 1,150                           | 792                   | 141                                    | 69%  |
| Alaska                           | 506,890                         | 304,556               | 38,054                                 | 60%  |

<sup>62</sup> Alaska Department of Labor and Workforce Development, Division of Research and Analysis (ADOLWD DRA). 2016. Alaska Local and Regional Information. Available at: <http://live.laborstats.alaska.gov/alari/> [accessed 7May 2018]

Table 3.4-2 summarizes the 2016 wage data for the Lakes Area Villages, the rest of the Borough, the Borough as a whole and the state of Alaska. The data show that the average wages per employed resident in 2016 was slightly higher for the Lakes Area Villages (\$24,351) compared to the rest of the Borough (\$22,478) and the Borough as a whole (\$23,547) but lower than for the state of Alaska as a whole (\$42,994).<sup>63</sup>

**Table 3.4-2: Wage Data, 2016<sup>64</sup>**

|                                  | Total wages      | Average wages per employed resident |
|----------------------------------|------------------|-------------------------------------|
| Port Alsworth                    | \$2,362,775      | \$29,535                            |
| Nondalton                        | \$1,182,396      | \$14,967                            |
| Iliamna                          | \$3,352,307      | \$30,755                            |
| Newhalen                         | \$1,191,013      | \$24,813                            |
| Igiugig                          | \$959,869        | \$27,425                            |
| Kokhanok                         | \$1,225,407      | \$14,417                            |
| Pedro Bay                        | \$732,681        | \$45,793                            |
| Lakes Area Villages total        | \$11,006,448     | \$24,351                            |
| Rest of Borough                  | \$7,642,398      | \$22,478                            |
| Total Lake and Peninsula Borough | \$18,648,846     | \$23,547                            |
| Alaska                           | \$13,094,184,783 | \$42,994                            |

<sup>63</sup> Average wages per employed resident were calculated based on the total wage data and the number of employed residents age 16 or over from Table 3.2-1.

<sup>64</sup> Alaska Department of Labor and Workforce Development, Division of Research and Analysis (ADOLWD DRA). 2016. Alaska Local and Regional Information. Available at: <http://live.laborstats.alaska.gov/alari/> [accessed 5 May 2019]

In the Borough, a majority of employed residents work in the same community they live in. Table 3.4-3 summarizes the location of work for residents from 2012 to 2016. Over 95% of employed residents of the Borough work within the Borough.

**Table 3.4-3: Workplace Locations for Residents, 2012-2016<sup>65</sup>**

|                                  | Worked within home community | Worked within home borough | Worked in different borough | Worked outside Alaska |
|----------------------------------|------------------------------|----------------------------|-----------------------------|-----------------------|
| Total Lake and Peninsula Borough | 80.8%                        | 96.6%                      | 3.4%                        | 0.0%                  |
| Alaska                           | 70.1%                        | 92.7%                      | 6.9%                        | 0.4%                  |

<sup>65</sup> U.S. Census Bureau (USCB); American Community Survey (ACS), 2012-2016 5-Year Estimates. Available at: <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml> [accessed 8 May 2019]. Percentages calculated by the McDowell Group. 2018 Socioeconomics: Bristol Bay Drainages.

Table 3.4-4 presents the top industries by count of workers for 2016. Local government; Trade, transportation and utilities; and Educational and health services reported the largest number of workers in the Lakes Area Villages. The natural resources and mining industries reported the sixth highest number of workers for 2016. The top three industries by count of workers were the same for the rest of the borough, the borough as a whole, and the state of Alaska.

**Table 3.4-4: Top Industries by Count of Workers, 2016<sup>66</sup>**

|                                  | Local<br>Government | Trade,<br>Transportati<br>on and<br>Utilities | Educational<br>and Health<br>Services | Professional<br>and Business<br>Services | Leisure and<br>Hospitality | Natural<br>Resources<br>and Mining | Construction |
|----------------------------------|---------------------|---|---------------------------------------|--|----------------------------|------------------------------------|--------------|
| Port Alsworth                    | 26                  | 21  | 8                                     | 1  | 19                         | 1                                  | 1            |
| Nondalton                        | 55                  | 6   | 7                                     | 3  | 1                          | 4                                  |              |
| Iliamna                          | 54                  | 10  | 11                                    | 18                                       | 3                          | 3                                  | 4            |
| Newhalen                         | 30                  | 3   | 5                                     | 8  | 1                          |                                    | 3            |
| Igiugig                          | 23                  |   | 3                                     | 2  |                            |                                    |              |
| Kokhanok                         | 75                  | 4   | 5                                     |  |                            | 1                                  |              |
| Pedro Bay                        | 12                  |   | 3                                     |  |                            | 1                                  |              |
| Lakes Area Villages total        | 275                 | 44  | 42                                    | 32                                       | 24                         | 10                                 | 8            |
| Rest of Borough                  | 231                 | 21  | 38                                    | 8  | 4                          | 1                                  | 20           |
| Total Lake and Peninsula Borough | 506                 | 65  | 80                                    | 40                                       | 28                         | 11                                 | 28           |
| Alaska                           | 44,613              | 63,143  | 45,947                                | 26,146                                   | 30,783                     | 13,084                             | 18,333       |

Commercial fishing is also an important part of the Borough's economy. Figure 3.4-1 shows the total number of permit holders for the Borough as a whole for the years 2000 through 2016. There has been a general decline in the number of permit holders from 225 in the year 2000 to 123 permit holders in 2016.

<sup>66</sup> Alaska Department of Labor and Workforce Development, Division of Research and Analysis (ADOLWD DRA). 2018. Alaska Local and Regional Information. Available at: <http://live.laborstats.alaska.gov/alari/> [accessed 7 May 2019]

Figure 3.4-1: Lake and Peninsula Borough Commercial Fishing Permit Holders, 2000 to 2016<sup>67</sup>



Data for commercial salmon permits fished is for the Lakes Area Villages by village is presented in Table 3.4-5. The number of commercial salmon permits fished has decreased in all Lakes Area Villages between 1980-1983 and 2009-2012 except for Newhalen.

<sup>67</sup> Commercial Fisheries Entry Commission (CFEC). 2018. Fishery Statistics – Participation and Earnings. Alaska Department of Fish and Game. Available at: [https://www.cfec.state.ak.us/fishery\\_statistics/permits.htm](https://www.cfec.state.ak.us/fishery_statistics/permits.htm) [accessed 7 May 2019]

**Table 3.4-5: Commercial Salmon Permits Fished, 1980-1983 to 2009-2012<sup>68,69</sup>**

| Community     | 1980-1983 | 2009-2012 |
|---------------|-----------|-----------|
| Port Alsworth | 4         | 3         |
| Nondalton     | 25        | 2         |
| Iliamna       | 35        | 13        |
| Newhalen      | 2         | 9         |
| Igiugig       | 8         | 2         |
| Kokhanok      | 10        | 8         |
| Pedro Bay     | 6         | 3         |

Figure 3.4-2 shows the estimated gross earnings from commercial fishing for the years 2000 through 2016. Gross earnings have fluctuated in this period from a low of approximately \$5.7 million in 2002 to a high of \$20.6 million in 2011. The average estimated gross earnings over this period was approximately \$10.5 million per year.

<sup>68</sup> Loeffler and Schmidt, 2017. Village Income and Mineral Exploration: A Case Study of the Pebble Exploration Project. University of Alaska Anchorage, Institute of Social and Economic Research. Page 12.

<sup>69</sup> Since the number of permits each year varies, four-year averages are used.

**Figure 3.4-2: Lake and Peninsula Borough Commercial Fishing Estimated Gross Earnings (\$ millions). 2000 to 2016<sup>70</sup>**



### 3.4.2 Potential Effects of the Project on the Borough

If the Project proceeds, it is anticipated it will create a number of construction and operations jobs and business opportunities. However, the degree to which these opportunities will benefit Borough residents depends on a number of factors including job qualifications and educational requirements, work rotation schedules, availability of transportation to and from the work site.

The draft Project EIS notes the Project would create an estimated 2,000 jobs during the construction phase and 850 direct jobs during the operations phase. While PLP has stated it has an objective to maximize local hiring opportunities, the majority of workers are anticipated to be from Anchorage, larger communities in the Kenai Peninsula Borough, and out of state. Pebble Limited Partnership has estimated that during the operations phase 250 employees would come from the surrounding communities with 50 of those coming from communities connected to the Project by road. The draft EIS concludes that in general terms, developments like the proposed

<sup>70</sup> Commercial Fisheries Entry Commission (CFEC). 2018. Fishery Statistics – Participation and Earnings. Alaska Department of Fish and Game. Available at: [https://www.cfec.state.ak.us/fishery\\_statistics/permits.htm](https://www.cfec.state.ak.us/fishery_statistics/permits.htm) [accessed 7 May 2019]

Project provide economic benefits in the form of increased and steady income and that employment created by the Project would likely be attractive to qualified residents.<sup>71</sup>

Borough residents noted concerns during public meetings conducted for this report about other potential project effects, including:

- Increased employment opportunities from the Project could lead to local wage inflation and make it more difficult for the Borough and local employers to hire and retain qualified staff.
- Project employment could change the ability of residents to participate in community life and subsistence resource use. Increased income from Project employment may also help improve the ability to participate in subsistence resource use by allowing residents to purchase better equipment.
- Increased income could lead to increases in drug and alcohol use, gambling and other types of undesirable spending.

The draft EIS notes that during the exploratory phase, income earned by residents close to the mine site was greater than that earned for commercial fishing.

A review of employment and income outcomes from other northern mining projects indicates the following:

- A case study of the Red Dog Mine indicated that in 2013, of an estimated 610 employees, 57% were NANA shareholders. The review also found that for many villages, Red Dog jobs were an important proportion of total employment.<sup>72</sup>
- A review of the socioeconomic effects of uranium mining in northern Saskatchewan (Canada) found that the number of northerners directly employed in the mining sector increased from approximately 200 in 1981 to over 800 in 2011. However, the overall participation rates and employment rates in the north did not increase, as a result of population growth over the same period.<sup>73</sup>
- In the Northwest Territories (Canada), employment rates in small local communities were observed to increase after the start-up of diamond mines in the Territory. Employment rates in the Territory overall remained relatively stable.<sup>74</sup>

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<sup>71</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 4: Environmental Consequences. Page 4.3-6.

<sup>72</sup> Loeffler, 2015. Mining and sustainable communities. Economic Development Journal. Spring 2015, Volume 14. Number 2. Page 25.

<sup>73</sup> Community Vitality Monitoring Partnership Process. 2013. The Socio-economic impacts of the modern era of uranium mining on northern Saskatchewan. Summarized from page 136.

<sup>74</sup> Government of the Northwest Territories. 2017 Communities and Diamonds Socio-economic agreements annual report. Page 29

### 3.4.3 Mitigation and Enhancement

InterGroup recommends the Borough consider requiring the following types of mitigation and enhancement measures as part of the conditions of the Major Project Permit:

- To the extent allowed by law, establish hiring and procurement preferences for Borough residents and local businesses. Local employees should have a career ladder to be able to use work experience, on-the-job training, Project-funded education, or other means to climb to higher pay grades and greater levels of responsibility.
- Ensure all Borough villages are designated pick-up points, where employees are transported free of charge to the Project.
- Provide support for vocational education and other education and training opportunities described in Section 3.5 for all village residents.
- Provide flexible work rotations and/or job sharing to maximize local employment opportunities and allow local workers to participate in seasonal subsistence activities.
- Monitor employment and local business outcomes to ensure targets are being met and develop responses to improve outcomes in the event targets are not being met.
- Monitor local employment and unemployment rates, and local wage inflation to understand the effects of project employment for other businesses and employers.

## 3.5 EDUCATION

### 3.5.1 Current and Potential School Enrollment without the Project

Of the seven Lakes Area Village, Port Alsworth, Nondalton, Newhalen, Igiugig, and Kokhanok currently have schools.<sup>75</sup> Students living in Iliamna attend school in Newhalen since the communities are close and connected by a road. The School in Pedro Bay closed following the 2010-2011 school year as Alaska state law cuts off funding for schools with fewer than 10 students enrolled.<sup>76</sup>

Table 3.5-1 presents school enrollment information from the 2000-2001 to 2017-2018 school years for Lakes Area Villages, along with enrollment data for schools in the rest of the Borough, the total for all schools in the Borough, and the totals for the State of Alaska.

School enrollment decreased for the Lakes Area Villages combined, going from 262 students in the 2000-2001 school year to 208 in the 2017-2018 school year. The average annual growth rate for student enrollment over this time was -1.3%. Student enrollment for the entire Borough

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<sup>75</sup> Lake and Peninsula School District. n.d. Schools. Available at: <https://www.lpsd.com/schools.html> [accessed February 3, 2018].

<sup>76</sup> Chapter 17. Financing of Public Schools (AS14.17.250)

also decreased during the same period of time, but at a greater average annual rate of -2.4%.  
Meanwhile, student enrollment for the State of Alaska has remained steady.

**Table 3.5-1: School Enrollment Changes from 2000-2001 to 2017-2018<sup>77,78</sup>**

|                                  | 2000-2001 | 2017-2018 | Average growth rate<br>2000-2001 to<br>2017-2018 |
|----------------------------------|-----------|-----------|--|
| Port Alsworth                    | 28        | 62        | 4.5%   |
| Nondalton                        | 73        | 26        | -5.6%  |
| Newhalen/Iliamna                 | 69        | 67        | -0.2%  |
| Igiugig                          | 18        | 19        | 0.3%   |
| Kokhanok                         | 61        | 34        | -3.2%  |
| Pedro Bay                        | 13        | 0         | N/A  |
| Lakes Area Villages Total        | 262       | 208       | -1.3%  |
| Rest of Borough                  | 266       | 135       | -3.7%  |
| Total Lake and Peninsula Borough | 528       | 343       | -2.4%  |
| Alaska                           | 133,356   | 133,381   | 0.0%   |

While overall student enrollment has declined, there has been increased student enrollment in Port Alsworth, with school enrollment in the village increasing at an average annual rate of 4.5%. School enrollment in Newhalen and Igiugig have remained fairly steady since 2000-2001. Among the Lakes Area Villages that still have schools, two have experienced a marked decrease in student enrollment were Nondalton (-5.6%) and Kokhanok (-3.2%).

Schools are a key component in the sustainability of rural communities as they help stabilize population levels. The effects of closing a school can ripple through a community, causing declining services, fewer economic opportunities, population decline, and increased cost of living.<sup>79</sup> The Borough has witnessed the effects of school closures in recent history, including closures in Ivanof Bay and Pedro Bay, both of which have seen their population decrease since

<sup>77</sup> Alaska Department of Education and Early Development (ADEED). 2018. Statistics and Reports. Available at: <https://education.alaska.gov/data-center> [accessed 7 May 2019]

<sup>78</sup> Iliamna does not have school in the village. Students from Iliamna attend school in Newhalen. The school in Pedro Bay closed following the 2010-2011 school year.

<sup>79</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 3: Affected Environment. Page 3.3-6. And Letter

the closure.<sup>80</sup> After the school in Ivanof Bay closed in 2010, the town was vacated within a few years. The population of Pedro Bay substantially decreased in the years after the school closed. The school in Egegik closed in 2015 and the school in Chignik Lagoon may close in October 2019. It is relatively easy to reopen a school if it has been closed for an academic year or potentially two, but when schools are closed for longer periods of time, reopening it can become difficult as much of the equipment and furniture in a school has been redistributed throughout the Borough schools that have remained open.

Future student enrollments are difficult to predict because they rely on interrelated factors, including overall population growth and the age distribution of a community's population. Based on the population projections that assume growth will continue to be concentrated in Port Alsworth, Iliamna, and Newhalen:

- In Port Alsworth, student enrollment is expected to continue increasing at a higher rate than other Lakes Area Villages.
- In Newhalen (and Iliamna), student enrollment is expected to continue increasing at a steady rate.
- In Igiugig and Kokhanok, student enrollment is expected to remain steady.
- In Nondalton, student enrollment is expected to continue decreasing as the population is also anticipated to either decrease or grow slowly.

### **Educational Attainment**

Table 3.5-2 presents educational attainment rates for the Lakes Area Villages, the Borough total, and Alaska. In all the Lakes Area Villages, the majority of the population ages 25 and older have at least a high school diploma or equivalent. In all the villages, except for Port Alsworth, the largest proportion of residents either have a high school diploma (including equivalents) or some college with no degree. In Port Alsworth, the largest proportion of residents ages 25 and older hold a bachelor's degree.

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<sup>80</sup> Lake and Peninsula Borough. 2018. Lake and Borough Comments on Preliminary Draft of Section 3.3 – Socioeconomics. Letter dated December 11, 2018.

**Table 3.5-2: Educational Attainment Rates, Five-year Averages<sup>81</sup>**

|                                  | Population 25 and Older |         | Less than 9th Grade |         | 9th to 12th Grade, No Diploma |         | High School Graduate (Includes Equivalency) |         | Some College, No Degree |         | Associate Degree |         | Bachelor's Degree |         | Graduate or Professional Degree |         |
|----------------------------------|-------------------------|---------|---------------------|---------|-------------------------------|---------|---|---------|-------------------------|---------|------------------|---------|-------------------|---------|---------------------------------|---------|
|                                  | Total                   | Percent | Total               | Percent | Total                         | Percent | Total                                       | Percent | Total                   | Percent | Total            | Percent | Total             | Percent | Total                           | Percent |
| Port Alsworth                    | 75                      | 100.0%  | 0                   | 0.0%    | 2                             | 2.7%    | 9   | 12.0%   | 18                      | 24.0%   | 14               | 18.7%   | 25                | 33.3%   | 7                               | 9.3%    |
| Nondalton                        | 102                     | 100.0%  | 9                   | 8.8%    | 9                             | 8.8%    | 53  | 52.0%   | 24                      | 23.5%   | 3                | 2.9%    | 2                 | 2.0%    | 2                               | 2.0%    |
| Iliamna                          | 54                      | 100.0%  | 2                   | 3.7%    | 3                             | 5.6%    | 17  | 31.5%   | 21                      | 38.9%   | 3                | 5.6%    | 2                 | 3.7%    | 6                               | 11.1%   |
| Newhalen                         | 68                      | 100.0%  | 3                   | 4.4%    | 2                             | 2.9%    | 31  | 45.6%   | 15                      | 22.1%   | 5                | 7.4%    | 10                | 14.7%   | 2                               | 2.9%    |
| Igiugig                          | 34                      | 100.0%  | 5                   | 14.7%   | 0                             | 0.0%    | 9   | 26.5%   | 15                      | 44.1%   | 1                | 2.9%    | 4                 | 11.8%   | 0                               | 0.0%    |
| Kokhanok                         | 81                      | 100.0%  | 7                   | 8.6%    | 8                             | 9.9%    | 43  | 53.1%   | 14                      | 17.3%   | 2                | 2.5%    | 4                 | 4.9%    | 3                               | 3.7%    |
| Pedro Bay                        | 13                      | 100.0%  | 1                   | 7.7%    | 0                             | 0.0%    | 3   | 23.1%   | 7                       | 53.8%   | 0                | 0.0%    | 2                 | 15.4%   | 0                               | 0.0%    |
| Lakes Area Villages Total        | 427                     | 100.0%  | 27                  | 6.3%    | 24                            | 5.6%    | 165   | 38.6%   | 114                     | 26.7%   | 28               | 6.6%    | 49                | 11.5%   | 20                              | 4.7%    |
| Rest of Borough Total            | 408                     | 100.0%  | 25                  | 6.1%    | 38                            | 9.3%    | 190   | 46.6%   | 116                     | 28.4%   | 4                | 1.0%    | 14                | 3.4%    | 21                              | 5.1%    |
| Total Lake and Peninsula Borough | 835                     | 100.0%  | 52                  | 6.2%    | 62                            | 7.4%    | 355   | 42.5%   | 230                     | 27.5%   | 32               | 3.8%    | 63                | 7.5%    | 41                              | 4.9%    |
| Alaska                           | 470,699                 | 100.0%  | 12,849              | 2.7%    | 23,183                        | 4.9%    | 130,511                                     | 27.7%   | 129,498                 | 27.5%   | 39,133           | 8.3%    | 86,551            | 18.4%   | 48,974                          | 10.4%   |

### 3.5.2 Potential Effects of the Project on the Borough

There are four areas in which the project could affect Borough schools: enrollment numbers, educational attainment rates, programming, and capital projects, which are described below.

#### School Enrollment

School enrollment is dependent on a variety of factors, as discussed above. The primary aspect of the Project that could affect school enrollment is population growth. This is not anticipated to occur during the construction phase. The construction phase of large resource developments is much shorter than the operations phase and typically requires a much larger workforce. According to current employment estimates by PLP, this trend holds true for the project.<sup>82</sup> Since construction-phase employment is temporary and depends on seasonality and the specific phase of construction, the workforce is not expected to affect population levels in the Borough. In addition to the seasonal and temporary nature of the construction workforce, PLP's use of a work camp for construction-phase employees will eliminate interactions between the workforce and local communities, preventing workers from establishing ties to those communities that could persuade them to establish roots in the Lakes Area Villages.

The operations phase for the Project is much longer than the construction phase. Although the workforce is smaller than the construction-phase workforce, at 850 employees, it is still a substantial workforce. Population growth in the Lakes Area Villages linked to the operations-phase workforce is not expected to be the result of large-scale in-migration as the workforce relocates to local communities. If there is population growth tied to operational employment in

<sup>81</sup> U.S. Census Bureau (USCB); American Community Survey (ACS), 2012-2016 5-Year Estimates. Available at: <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml> [accessed May 7, 2019]

<sup>82</sup> The construction workforce is expected to be 2,000 workers and the operations workforce is expected to be 850 workers.

the Lakes Area Villages, it is expected to be the result of previous residents returning to the villages to take advantage of employment opportunities and a reduction in projected out-migration (See Section 3.4 more details on population changes).

Constraints that would limit a large-scale influx of residents are described in Section 3.1. Without a large-scale in-migration, any population growth related to the Project would be substantively smaller and likely limited to former residents who still have ties to the villages and reducing the current rate of outmigration. The Project could potentially stabilize current downward trends in school enrollment in villages like Nondalton and Kokhanok.

If the predictions in the draft EIS are accurate regarding in which communities population growth is expected, an increase in school enrollment could be beneficial in helping communities like Kokhanok, Newhalen and Iliamna, and Nondalton maintain enrollment.

### **Educational Attainment Rates**

Based on a review of the case studies, the project has the potential to affect educational attainment rates throughout the Borough if certain conditions are met, which include the implementation of hiring preferences and the implementation of educational incentives. Direct attribution to the project, however, would be difficult.

- In northern Saskatchewan, where the uranium industry has been active since the 1970s, educational attainment rates have improved, although they have not reached parity with provincial rates. Apprenticeships and trades certificates increased four-fold between 1981 and 2006. The increased educational attainment rates are at least partly attributed to joint initiatives between industry and government to improve post-secondary education enrollment and outcomes.<sup>83</sup>
- In the Northwest Territories, educational attainment rates have also improved, but those are likely due to changes to education delivery in the Territory, such as grade extensions to smaller communities. Mining companies, however, have offered a variety of incentives to graduate from high school and pursue post-secondary education and training opportunities. The diamond mines have varying commitments to support apprenticeships and have generally been successful with apprentices often gaining their red seals.
- In the Northwest Arctic Borough, graduation rates have noticeably increased in the 30 years since the Red Dog Mine began operations. At the time the mine opened, that region of Alaska had many fewer high school graduates than rural areas in Alaska generally. Now the region has caught up and that borough has significantly higher graduation rates than comparable rural regions of Alaska. The mine has worked closely with the school district on a variety of

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<sup>83</sup> InterGroup Consultants. 2013. The Socio-economic Impacts of the 'Modern Era' of Uranium Mining on Northern Saskatchewan.

mechanisms to motivate students including internships, job shadowing, and funding for vocational training within the region.<sup>84</sup>

Depending on the types of employment targeted, educational attainment rates for post-secondary degrees could increase as students may decide to pursue technical and professional employment on the Project. Pursuing one of these positions may be attractive to current students because the life of the mine is at least 20 years and the jobs are generally high-paying and students could remain in the community where they grew up.

### Capital Expenditures

Capital expenditures are driven by population growth and programming. If there are more students than a school can hold, an expansion or new build would be required. From discussions in the Borough, the only school in the Lakes Area Villages that does not currently have the physical capacity for more students is in Newhalen. Since Iliamna and Newhalen are expected to experience the most population growth if the Project proceeds, the school in Newhalen may require an expansion. The other schools in the Lakes Area Villages currently have the physical capacity for increased enrollment.

### School Programming

In addition to the potential educational boost provided by mine-related employment and vocational training, the project would also pay significant tax revenue to the Borough. This increase in revenue could allow the School District to offer additional services and better fund the services it currently offers.

### 3.5.3 Mitigation and Enhancement Opportunities

To mitigate the effects of the anticipated increased enrollment in the Newhalen School, PLP should provide the necessary funding for a school expansion, including capital and operational costs (e.g., additional teaching and administrative staff).

A mine with a minimum life span of 20 years for operations presents a potential opportunity for interested Borough residents to gain well-paid and consistent employment. One of the challenges in maximizing opportunities on a resource development project is the education and training requirements for many of the positions. According to preliminary employment estimates from PLP, most of the 850 positions at the site or for its ferry and port operations will require some degree of training, including apprenticeships and undergraduate degrees. The Borough has the ability to increase vocational training by itself using tax revenues from the Project. However, filling the Project workforce with as many Borough residents as possible will take a concerted effort on the part of PLP, the Borough, and likely the Government of Alaska and other organizations to train as many individuals as possible. We recommend that the Borough work with these groups to integrate educational and vocational initiatives into its education program.

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<sup>84</sup> Loeffler, 2015. Mining and Sustainable Economies in Economic Development Journal, Vol. 14 No. 2.

To facilitate training and employment opportunities for Borough residents, the Borough and the Lake and Peninsula School District should consider:

- Working with PLP and educational partners to offer more vocational training in Borough schools. During community sessions, residents expressed a desire to see more of this sort of training offered to village residents. They wanted the training to be general enough that skills learned could be used in the community, as well as on the Project.
- Establishing as part of the Monitoring, Compliance and Implementation Committee, a working group similar to the former Multi-party Training Plan in Saskatchewan. The Multi-party Training Plan in Saskatchewan was a multi-stakeholder group including industry, educational institutions, the federal government, and provincial government. As a group, they established objectives for training Residents of Saskatchewan's North to take advantage of employment opportunities available in primarily the uranium mines in the region. Every five years, they would evaluate their objectives and either recommit or establish new ones.
- Once the Project is operational, similar to operational mines in Alaska and other jurisdictions, PLP should institute policies to facilitate education, such as summer student programs, job shadowing, and apprentice to journeyman ratios.

## 3.6 HOUSING

### 3.6.1 Current and Potential Future Environment without the Project

The draft EIS notes that the housing stock in the Borough consists primarily of single-family detached homes. Most housing units are owner-occupied with approximately one-third being rental properties.<sup>85</sup> Table 3.6-1 summarizes the five-year average (2012 to 2016) numbers of housing units and media values of owner-occupied units.

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<sup>85</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 3: Affected Environment. Page 3.3-12.

**Table 3.6-1: Housing Unit Status, 2012-2016 Five-year Averages<sup>86</sup>**

|                                  | Total<br>Housing<br>Units | Occupied<br>Housing<br>units | Vacant<br>Housing<br>units | Median Value of<br>owner-occupied<br>units |
|----------------------------------|---------------------------|------------------------------|----------------------------|--|
| Port Alsworth                    | 85                        | 47                           | 38                         | \$333,300                                  |
| Nondalton                        | 115                       | 68                           | 47                         | \$137,500                                  |
| Iliamna                          | 60                        | 27                           | 33                         | \$325,000                                  |
| Newhalen                         | 52                        | 42                           | 10                         | \$137,500                                  |
| Igiugig                          | 24                        | 19                           | 5                          | \$175,000                                  |
| Kokhanok                         | 63                        | 48                           | 15                         | \$87,000                                   |
| Pedro Bay                        | 23                        | 7                            | 16                         | \$137,500                                  |
| Lake and Peninsula Borough Total | 1,451                     | 468                          | 983                        | \$143,800                                  |
| State of Alaska Total            | 309,171                   | 250,235                      | 58,936                     | \$257,100                                  |

The Census Data indicates a high percentage of vacant housing units in many communities. The reason for this may vary, depending on the community. In some cases, it may be due to a population decline. In some cases, the community includes lodges or other seasonal housing that would have been temporarily vacant during the late fall or early spring when the survey is conducted. In addition, the survey has a high margin of error.<sup>87</sup>

### 3.6.2 Potential Effects on the Borough

Population growth could lead to a need for more housing. The availability of land and utility services could limit the ability to build or expand housing. New housing could put additional demands on utilities and services such as water treatment and electricity service.

Improved transportation connections could lower the cost of building new housing; however, new housing may contribute to or worsen divisions between lower income and higher income residents. If older homes are vacated and still in good condition, there may be a favorable market to lower income residents in the Borough.

### 3.6.3 Mitigation and Enhancement

The need for new housing to accommodate increased population may be different in different villages. The response may depend on the wishes of the village to accommodate more people.

<sup>86</sup> U.S. Census Bureau (USCB); American Community Survey (ACS), 2012-2016 5-Year Estimates. Available at: <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml> [accessed 9 May 2018]

<sup>87</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 3: Affected Environment. Page 3.3-12.

Therefore, the mitigation may involve working with the village or city council, landowner, and housing authorities to develop more housing for that village if appropriate.

InterGroup recommends monitoring the availability and condition of housing as part of the overall monitoring and compliance framework established in the Large Project Permit.

The Borough should ensure that the Access Management Plan developed with PLP for the use of the transportation network specifically permit the use of those networks to ship housing building materials.

### **3.7 FUEL AND ENERGY**

#### **3.7.1 Current and Potential Future Environment without the Project**

Fuel and energy costs contribute to the high cost of living in the Lakes Area Villages. Table 3.7-1 summarizes the primary sources of home heating for 2012 through 2016. Fuel oil is the primary fuel used for heating homes in the Borough. By comparison, only about 30% of all homes in Alaska use heating fuel with natural gas being the most common heating fuel for other parts of the State of Alaska.

**Table 3.7-1: Primary Home Heating Sources Five-year Averages, 2012-2016<sup>88</sup>**

|   | Fuel Oil     | Electricity | Wood         | Other Fuels |
|---|--------------|-------------|--------------|-------------|
| Port Alsworth                           | 59.6%        | 2.1%        | 25.5%        | 12.8%       |
| Nondalton                               | 86.8%        | 1.5%        | 11.8%        | 0.0%        |
| Iliamna                                 | 96.3%        | 0.0%        | 3.7%         | 0.0%        |
| Newhalen                                | 83.3%        | 0.0%        | 11.9%        | 4.8%        |
| Igiugig                                 | 89.5%        | 0.0%        | 10.5%        | 0.0%        |
| Kokhanok                                | 79.2%        | 2.1%        | 18.8%        | 0.0%        |
| Pedro Bay                               | 85.7%        | 0.0%        | 14.3%        | 0.0%        |
| <b>Total Lake and Peninsula Borough</b> | <b>85.0%</b> | <b>1.5%</b> | <b>10.5%</b> | <b>3.0%</b> |
| Alaska (State Level)                    | 29.7%        | 11.8%       | 6.4%         | 52.1%       |

Iliamna, Newhalen, and Nondalton are connected together and served by a single electric utility, I-N-N Electrical Cooperative (Iliamna-Newhalen, Nondalton). That utility generates the majority of its electricity from the Tazimina Hydro project. The remaining lake communities are served by their own stand-alone utility and primarily generate electricity from diesel fuel. See Table 3.7-2.

<sup>88</sup> U.S. Census Bureau (USCB); American Community Survey (ACS), 2012-2016 5-Year Estimates. Available at: <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml> [accessed 9 May 2019]

(a) Specified owner-occupied units, a subgroup of owner-occupied homes, are either one-family homes that are detached from any other house or a one-family house attached to one or more houses on less than 10 acres with no business on the property.

**Table 3.7-2: Primary Electricity Generation Sources<sup>89</sup>**

|               | Primary<br>Generation<br>Source | Generation utility            |
|---------------|---------------------------------|-------------------------------|
| Port Alsworth | Diesel                          | Tanalien Electric Cooperative |
| Nondalton     | Hydroelectric                   | I-N-N Electrical Cooperative  |
| Iliamna       | Hydroelectric                   | I-N-N Electrical Cooperative  |
| Newhalen      | Hydroelectric                   | I-N-N Electrical Cooperative  |
| Igiugig       | Diesel                          | Igiugig Electric Company      |
| Kokhanok      | Diesel                          | Kokhanok Village Council      |
| Pedro Bay     | Diesel                          | Pedro Bay Village Council     |

In 2016, the Alaska Fuel Price report indicated that heating fuel prices in Nondalton and Kokhanok were substantially higher than prices in Homer, but somewhat lower than the statewide average of the 100 communities included in the survey as illustrated in Table 3.7-3.

**Table 3.7-3: Heating Fuel and Gasoline Prices, July 2016<sup>90</sup>**

|                | Heating Fuel #1 | Gasoline |
|----------------|-----------------|----------|
| Nondalton      | \$4.43          | \$4.98   |
| Kokhanok       | \$7.00          | \$7.00   |
| Homer          | \$2.39          | \$2.75   |
| Survey Average | \$4.64          | \$5.09   |

### 3.7.2 Potential Effects on the Borough

The Project could improve transportation connections making it cheaper to deliver fuels including oil, gas, and propane to the in-vicinity communities. Depending on the transportation option chosen, the Project could provide natural gas connections to Iliamna, Newhalen, and Nondalton, as well as Kokhanok (Alternative 1) and Pedro Bay (Alternatives 2 and 3). This could provide access to lower cost heating fuel for buildings and perhaps for electricity generation. The Project

<sup>89</sup> McDowell Group 2018: Socioeconomics – Bristol Bay Drainages Updated Detailed Cumulative Baseline Data

<sup>90</sup> Alaska Fuel Price Report: July 2016. Department of Commerce, Community and Economic Development. Available at: [https://www.commerce.alaska.gov/web/Portals/4/pub/Fuel\\_Price\\_Report\\_July\\_2016.pdf](https://www.commerce.alaska.gov/web/Portals/4/pub/Fuel_Price_Report_July_2016.pdf) [accessed 23 April 2019].

could also allow communities and individuals to purchase bulk fuel along with the Project or sell lower-cost fuel directly to villages.

During public meetings conducted for this report, some residents noted that the opportunities for lower cost fuels would likely not be equally distributed across the Borough. There was some concern expressed that this could create differences in the cost of living in different villages and could lead to impacts to population and local economies. Residents were also concerned about relying on Project infrastructure.

### **3.7.3 Mitigation and Enhancement**

InterGroup recommends that the Borough work with PLP to maximize opportunities to lower energy costs. This would include specifically addressing transportation for fuels as part of the Access Management Plan recommended for the Project. It also may require that studies be funded to determine the economic and technical feasibility of different energy options. InterGroup also recommends that monitoring of local fuel prices be undertaken to determine if the Project is having an effect on differences in fuel prices in the Lakes Area Villages.

## **3.8 COMMUNITY HEALTH AND WELL-BEING**

### **3.8.1 Current and potential future environment without the Project**

#### **Health Care Services**

The majority of Lakes Area Villages have a health clinic that provides basic medical services to residents. Health care services in these villages are provided by the Southcentral Foundation. Table 3.8-1 presents the number of health clinics, health aides, ambulances, and emergency medical technicians in each village.

**Table 3.8-1: Health Care Infrastructure for Lakes Area Villages<sup>91,92</sup>**

| <b>Community</b>     | <b>Health Clinic</b>               | <b>Number of Health Aids</b> | <b>Number of Ambulances</b> | <b>Number of EMTs</b> |
|----------------------|------------------------------------|------------------------------|-----------------------------|-----------------------|
| <b>Port Alsworth</b> | N/A                                | N/A                          | N/A                         | N/A                   |
| <b>Nondalton</b>     | Nondalton Community Health Clinic  | 2                            | 1                           | 5                     |
| <b>Iliamna</b>       | Nilavena Subregional Health Center | 1                            | 2                           | 3                     |
| <b>Newhalen</b>      | Newhalen Health Clinic             | 2                            | 1                           | 3                     |
| <b>Igiugig</b>       | Igiugig Village Clinic             | 2                            | 1                           | 0                     |
| <b>Kokhanok</b>      | Kokhanok Health Clinic             | 2                            | 0                           | 10                    |
| <b>Pedro Bay</b>     | Pedro Bay Health Clinic            | 1                            | 1                           | 1                     |

The population of the entire Borough reports lower or similar access to health plans, medical care or doctors as the population of Alaska as a whole, while also reporting higher medical costs compared to Alaska.<sup>93</sup>

### Community Well-being

Health goes beyond the simple absence of disease. A full understanding of community health also requires consideration of a community's social, physical and economic environments, as well as individual factors that contribute to overall health (i.e., a more holistic approach). Table 3.8-2 describes some of the well-documented relationships between the social, economic, environmental and individual factors that can affect health.

<sup>91</sup> Southcentral Foundation. 2018. Contact and Feedback. Available at: <https://www.southcentralfoundation.com/contact/> [accessed 11 February 2019]

<sup>92</sup> McDowell Group. 2018. Human Health Cumulative Baseline Data: Bristol Bay Drainages (2010-2018). Prepared for the Pebble Partnership.

<sup>93</sup> McDowell Group. 2018. Human Health Cumulative Baseline Data: Bristol Bay Data: Bristol Bay Drainages (2010-2018). Prepared for the Pebble Partnership. Pages 21-22.

**Table 3.8-2: Factors Contributing to Health**

| <b>Factor</b>               | <b>Link to Health</b>   |
|-----------------------------|---|
| <b>Education</b>            | <ul style="list-style-type: none"> <li>• Improves opportunities to access employment and income</li> <li>• Provides one with a sense of control over life's circumstances</li> <li>• Increased understanding of information related to maintaining health</li> </ul>  |
| <b>Income</b>               | <ul style="list-style-type: none"> <li>• Higher income is linked to improved living conditions</li> <li>• Higher income increases ability to access resources</li> <li>• Stressors such as job strain, financial problems, and marital problems are more common among lower income individuals</li> </ul>   |
| <b>Social Networks</b>      | <ul style="list-style-type: none"> <li>• Social support networks act as supports when family, friends, and community contribute to problem solving, dealing with adversity, and sense of control over life's circumstances</li> <li>• Social supports act as a buffer against health problems</li> </ul>  |
| <b>Physical Environment</b> | <ul style="list-style-type: none"> <li>• Exposure to contaminants through air, water, soil, and food can result in a variety of adverse health effects</li> <li>• Quality of housing (including the density of dwelling requiring major repairs, average number of persons per room, and indoor air quality) are linked to overall health</li> <li>• Distance to services (e.g., distance to nearest hospital)</li> <li>• Personal security (e.g., incidents of personal and property crime)</li> </ul> |
| <b>Individual</b>           | <ul style="list-style-type: none"> <li>• Genetic factors</li> <li>• Personal practices/behaviours (e.g., diet, exercise, smoking, use of alcohol)</li> <li>• Coping skills</li> </ul>   |

The current conditions of the factors presented in Table 3.8-2 are described in other sections of this report and are therefore not repeated here. Other sections where factors contributing to community health and well-being are:

- Education is discussed in Section 3.5;
- Income is discussed in Section 3.4;

- Housing is discussed in Section 3.6; and
- Health care services and safety infrastructure are discussed in Section 3.8.

### **3.8.2 Potential Effects on the Borough**

#### **Health Care Services**

The main driver of change from the Project to health care in the Lakes Area Villages is population. If the population increases, access to health care may change as demand for it also increases. The Project workforce in both construction and operations, however, is not expected to have a direct impact on health care in the Lakes Area Villages. According to the draft EIS, the mine site would have on-site medical facilities and staff trained in emergency response and first aid.<sup>94</sup> The presence of health care and emergency response facilities and personnel on-site would prevent the Project workforce from placing additional demands on the health care services in the Lakes Area Villages, and particularly in Iliamna and Newhalen. The Project may also provide some health care resources that the villages may call upon in case of emergencies.

#### **Community Health and Well-being**

There are multiple areas where the Project could affect community health and well-being, including:

- Changes to diet driven by changes to subsistence resource use;
- Changes to community cohesion caused by changes to subsistence resource use;
- Easier access to drugs and alcohol due to the transient workforce and increased disposable income; and
- Decreased levels of public safety due to population increases, transient workforce, and increased levels of substance abuse.

#### **Subsistence Resource Use**

The Project would change the ability of Borough residents to engage in subsistence resource use activities. As described in Section 3.9, this could have positive or negative effects depending on the individual. Additional income from project employment could allow Borough residents to buy new and better equipment, such as ATVs and boats, which would make subsistence resource use activities easier. This in turn could increase the amount of fish and game harvested and consumed as part of residents' diets. It is beneficial if more people are eating subsistence foods in recommended amounts. Traditionally, Indigenous diets have been high in animal proteins, low in fat or high in marine sources of fat. There is some evidence that traditional diets supply a

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<sup>94</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement.

healthier pattern of fats and a greater amount of vitamins and minerals than current consumption patterns that are based on western foods.<sup>95</sup>

Conversely, if Borough residents are participating to a higher degree in the wage economy, they may not be able to participate to the same degree in subsistence resource use activities. Reducing time spent hunting and fishing could decrease the amount of fish and game harvested. Changes in the amount of fish and game harvested could ripple through the community as family members and friends who had traditionally relied on an individual for fish and game may no longer have access to the same amount of subsistence foods.

As discussed in Section 3.9, sharing is an important aspect of subsistence resource use and is one important facet in maintaining community cohesion. If subsistence resource use decreases as a result of the Project, community cohesion would be adversely affected.

### **Substance Abuse**

Large resource development projects have the potential to facilitate the increased presence of drugs and alcohol in communities and increase the potential for drug and alcohol addiction.

Resource development companies and their contractors typically have policies in place to prevent the transportation of banned substances to project sites. These policies include baggage searches for individuals coming to the site and controlled access for storage areas and transportation facilities for shipping consumables and other supplies. PLP plans to have similar policies, which means that the first pathway is not anticipated to be a major concern.<sup>96</sup>

The presence of more disposable income has been documented as a concern in communities affected by resource extraction projects, such as Fort Nelson in northeast British Columbia.<sup>97</sup> Other studies support this conclusion. One study regarding new mining activities in proximity to remote communities showed that a combination of new income and lack of financial experience could result in the misuse of alcohol and binge drinking among young male workers.<sup>98</sup> In northern Saskatchewan, community members directly linked the high wages paid by the uranium mining industry and improved access to alcohol and drugs to substance abuse in the region.<sup>99</sup> The NWT, which monitors RCMP statistics as part of the socioeconomic agreements for the diamond mines, notes that there has been an upward trend in drug-related offences in

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<sup>95</sup> Linda Earle. 2013. Traditional Aboriginal Diets and Health. Prepared for the National Collaborating Centre for Aboriginal Health.

<sup>96</sup> PLP. 2019. Pebble Limited Partnership [PLP] comments on the InterGroup Socioeconomic and Fiscal Impact Assessment for the Pebble Project. Letter to Nathan Hill, Borough Manager, dated May 29, 2019.

<sup>97</sup> Amnesty International. 2018. Out of Sight, Out of Mind: Gender, Indigenous Rights, and Energy Development in Northeast British Columbia, Canada.

<sup>98</sup> Gibson and Klink. 2007. Canada's Resilient North: The Impacts of Mining on Aboriginal Communities. Pimatisiwin: In a Journal of Aboriginal and Indigenous Community Health 3 (10). Pages 115-139.

<sup>99</sup> InterGroup Consultants. 2013. The Socio-economic Impacts of the 'Modern Era' of Uranium Mining on Northern Saskatchewan.

Yellowknife and small local communities during the period of mine activity. The monitoring report notes that it is difficult to draw a direct connection between mining activities and the increase in drug-related offences.<sup>100</sup>

The presence of the Project could potentially have positive effects on drug and alcohol use in communities. The presence of a major employer that tests for alcohol and drugs and maintains a zero-tolerance policy for those caught with alcohol or drugs, may help increase sobriety and decrease alcohol and drug use in employees and in their home communities. In addition, the economic opportunity presented by the Project can decrease hopelessness among those who wanted to but were formerly unable to work. This can also decrease reliance on alcohol and drugs.

Despite experience in northern Saskatchewan, it is difficult to accurately predict effects that are dependent on personal choices; however, the project may create conditions that exacerbate an individual worker's tendencies towards substance abuse. The Project may also create conditions that reduce drug and alcohol use among the workforce and in communities.

### **Public Safety**

Two aspects of the Project could affect public safety in the Lakes Area Villages: the presence of a temporary workforce with no ties to the communities or increased substance abuse.

Effects tied to the transient workforce would be primarily in those communities (Iliamna, Newhalen, Kokhanok, and Pedro Bay), which will be connected to the transportation corridor depending on the selected alternative. The presence of a temporary workforce without established ties to the community, especially during the construction phase, could present a safety risk. Worker interaction between local community residents and transient workers has occurred on other resource development projects. Construction workforces tend to be young, male, and some individuals could lean towards negative spending.

Some aspects of the project will reduce the chance of adverse worker interaction. The project will have a work camp and will bus workers from the community airports directly to the construction camps, where they will remain for the full duration of their shift. This will limit opportunities for interaction between workers and community members and reduce the chance of adverse worker interactions occurring. In addition, the Project is expected to maintain a zero-tolerance policy for those caught with drugs and alcohol.

Public safety could also be affected if there were an increase in substance abuse by village residents as a result of increased disposable income and negative spending. As noted above, community members in northern Saskatchewan have linked employment in mining and its high

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<sup>100</sup> Government of Northwest Territories. 2017. Communities and Diamonds. Page 52

wages with improved access to alcohol and drugs to substance abuse in the region.<sup>101</sup> Alcohol and drugs could help fuel violent interactions among village residents.

### 3.8.3 Mitigation and Enhancement

Community health and well-being will need to be included in the Project Compliance and Implementation Committee. Health-related monitoring should be based on a combination of quantitative and qualitative data. For the quantitative data, Southcentral Foundation should be involved to determine which health indicators should be monitored. Qualitative information can be collected through a variety of means. One method used on hydroelectric projects in northern Manitoba is surveys with workers and their family members. These surveys are scheduled to occur near the end of construction because the operational workforce for a hydroelectric generating station is substantively smaller than the construction workforce. Although the operational workforce for a mine is also typically much smaller than the construction workforce, it is substantially larger than the operational workforce for a hydroelectric generating station. For this reason, surveys could be conducted at regular intervals throughout construction and operations. Crime statistics can also be monitored for changes in public safety.

InterGroup recommends the following mitigation and enhancement:

- Work with the Project to have their on-site medical services augment health care provided by Southcentral Foundation in the Lakes Area Villages.
- The communities should have the option of hosting a village public safety officer to reduce public safety concerns. This may require the community to build new housing for the officer.
- To minimize the chances for Borough residents to engage in socially irresponsible spending, PLP should offer life skills courses, including money management, to all employees.
- The Borough should consider providing counselling for Borough residents and their families for substance abuse.
- To minimize opportunities for adverse worker interaction, PLP should develop a code of conduct with input from the Borough. Penalties for not adhering to the code of conduct should include termination of job.
- Establish safety and emergency response protocols for the transportation corridor to ensure an appropriate and timely response to adverse events. Village and Project resources should be integrated to ensure that the division of responsibilities is known and to broaden the capabilities for the Project and the villages.
- Mitigation tied to subsistence resource use will also affect community health and well-being. These measures are described below.

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<sup>101</sup> InterGroup Consultants. 2013. The Socio-economic Impacts of the 'Modern Era' of Uranium Mining on Northern Saskatchewan.

### 3.9 COMPETITION FOR SUBSISTENCE RESOURCES

The existing environment is based on information provided by PLP. The characterization should be considered with caution as the subsistence resource use studies were originally conducted between 2005 and 2010.<sup>102</sup>

#### 3.9.1 Current and Future Potential Environment without the Project

Subsistence resource use is a fundamental aspect to life of the Lakes Area Villages. As one participant in the US Army Corps of Engineering hearing in Newhalen noted: "I'm a commercial fisherman. My kids are commercial fishermen. We subsist by choice. We subsist by choice."<sup>103</sup> A similar sentiment was noted during the Alaska Department of Fish and Game's 2005 survey in Port Alsworth, where participants stated that they enjoy spending time on the land with their children and are looking forward to their children participating in subsistence activities.<sup>104</sup> Subsistence resource use supports kinship and community ties and it helps compensate for the high cost of living for village residents. Based on previous studies, a high proportion of households in the Lakes Area Villages participate in subsistence resource use:

- In Port Alsworth, the total pounds per capita of harvests dropped between 1983 and 2004, but the composition of residents' harvest has not materially changed.<sup>105</sup>
- In Nondalton, harvest rates in 2004 were lower than in previous years. Villagers noted poor or unusual weather and changes in animal populations (e.g., changes in the size and location of caribou herds).
- In Iliamna, residents have participated in subsistence harvest at similar rates since 2004.
- In Newhalen, residents have participated in subsistence harvest activities at similar rates across study years.
- In Igiugig, overall harvest rates have remained relatively unchanged but salmon use decreased and the harvest of large land mammals increased.

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<sup>102</sup> Stephen R. Braund and Associates. 2011. Chapter 23: Subsistence Uses and Traditional Knowledge Bristol Bay Drainages. In Pebble Project Environmental Baseline Document, 2004 through 2008, Prepared for Pebble Limited Partnership. Page 23-1.

<sup>103</sup> Pebble Project: Draft Environmental Impact Statement Public Hearing. Newhalen, Alaska. March 27, 2019. Vol. 1, Page 55

<sup>104</sup> Stephen R. Braund and Associates. 2010. Chapter 23 – Appendix I: Subsistence Uses and Traditional Knowledge Study – Port Alsworth, Alaska. In Pebble Project Environmental Baseline Document, 2004 through 2008, Prepared for the Pebble Limited Partnership. Page 1.

<sup>105</sup> Stephen R. Braund and Associates. 2010. Chapter 23 – Appendix I: Subsistence Uses and Traditional Knowledge Study – Port Alsworth, Alaska. In Pebble Project Environmental Baseline Document, 2004 through 2008, Prepared for the Pebble Limited Partnership. Page 1.

- In Kokhanok, the harvest in 2005 was lower than in previous years. Village residents noted that this was due to changes in moose and caribou populations.
- In Pedro Bay, residents have participated in subsistence harvest activities at similar rates across study years.

Table 3.9-1 describes the rates of household participation for the Lakes Area Villages except for Port Alsworth because data were unavailable. In most Lakes Area Villages, salmon is the species the largest proportion of households use. Most households in the Lakes Area Villages will try to harvest to salmon. Most households in the Lakes Areas Villages also used plants and tried to harvest them as well. Other popular species that more than three quarters of Lakes Area Villages use are non-salmon fish and large land mammals.

Table 3.9-1: Rates of Household Participation in Subsistence Resource Use<sup>106,107</sup>

|                      | Nondalton, 2004 |                |         | Iliamna, 2004 |                |         | Newhalen, 2004 |                |         |
|----------------------|-----------------|----------------|---------|---------------|----------------|---------|----------------|----------------|---------|
|                      | Use             | Try to Harvest | Harvest | Use           | Try to Harvest | Harvest | Use            | Try to Harvest | Harvest |
| All Resources        | 100             | 97             | 97      | 100           | 100            | 100     | 100            | 100            | 100     |
| Salmon               | 92              | 87             | 87      | 100           | 100            | 100     | 100            | 92             | 92      |
| Non-salmon Fish      | 82              | 76             | 76      | 92            | 77             | 77      | 88             | 88             | 88      |
| Large Land Mammals   | 84              | 45             | 26      | 77            | 54             | 15      | 92             | 52             | 44      |
| Small Land Mammals   | 58              | 50             | 50      | 31            | 31             | 23      | 32             | 28             | 28      |
| Marine Mammals       | 8               | 3              | 0       | 31            | 31             | 23      | 52             | 32             | 24      |
| Migratory Birds      | 42              | 40             | 40      | 39            | 31             | 31      | 60             | 48             | 48      |
| Upland Game Birds    | 45              | 42             | 42      | 23            | 23             | 23      | 32             | 28             | 28      |
| Bird Eggs            | 13              | 0              | 0       | 46            | 39             | 39      | 88             | 80             | 80      |
| Marine Invertebrates | 13              | 8              | 8       | 46            | 23             | 23      | 56             | 36             | 36      |
| Vegetation           | 97              | 92             | 92      | 85            | 85             | 85      | 92             | 92             | 92      |

|                      | Igiugig, 2005 |                |         | Kokhanok, 2005 |                |         | Pedro Bay, 2004 |                |         |
|----------------------|---------------|----------------|---------|----------------|----------------|---------|-----------------|----------------|---------|
|                      | Use           | Try to Harvest | Harvest | Use            | Try to Harvest | Harvest | Use             | Try to Harvest | Harvest |
| All Resources        | 100           | 100            | 100     | 100            | 100            | 97      | 100             | 100            | 100     |
| Salmon               | 100           | 92             | 92      | 97             | 89             | 83      | 100             | 89             | 83      |
| Non-salmon Fish      | 100           | 83             | 83      | 74             | 66             | 66      | 89              | 61             | 61      |
| Large Land Mammals   | 100           | 75             | 58      | 89             | 63             | 46      | 78              | 72             | 22      |
| Small Land Mammals   | 50            | 42             | 33      | 43             | 40             | 37      | 11              | 6              | 6       |
| Marine Mammals       | 67            | 33             | 33      | 40             | 23             | 11      | 0               | 11             | 0       |
| Migratory Birds      | 83            | 58             | 58      | 63             | 49             | 43      | 11              | 11             | 11      |
| Upland Game Birds    | 50            | 42             | 42      | 66             | 57             | 54      | 56              | 61             | 50      |
| Bird Eggs            | 83            | 75             | 67      | 83             | 77             | 77      | 72              | 39             | 39      |
| Marine Invertebrates | 17            | 0              | 0       | 9              | 9              | 9       | 28              | 0              | 0       |
| Vegetation           | 100           | 100            | 100     | 97             | 97             | 97      | 100             | 100            | 100     |

<sup>106</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 4: Environmental Consequences. Pages 3.9-10 – 3.9-26.

<sup>107</sup> Data used in this table should be interpreted with caution as some of it is 15 years old.

Subsistence resource use can also be important in maintaining a sense of family and community. Going out on the land facilitates knowledge transfer among generations and ensures that methods and areas and culture are shared. Sharing resources reinforces ties that extend beyond immediate family. According to studies conducted by the Alaska Department of Fish and Game Division of Subsistence, in Alaska Native communities there is a trend that 30% of households produce 70% of a community's subsistence harvest, which reinforces that sharing is important to these communities.<sup>108</sup>

Overlapping areas of subsistence resource use are shown by community in Attachment B. Based on the information presented in these maps, high usage areas for each community are:

- Iliamna: Residents use the areas north and west of Lake Iliamna from Lake Clark to the Kaktuli and Stuyahok rivers. Chulitna River and the islands in Iliamna Lake are also high usage areas.<sup>109</sup> Residents also use the Upper and Lower Talarik creeks.
- Newhalen: Harvest areas extend from Lime Village to Naknek, and from Tikchik Lakes to the eastern edges of Lake Clark and Iliamna Lake, with some use in Cook Inlet. The primary areas of overlapping use are near the Newhalen, Kvichak, Nushagak, and Mulchatna river drainages.
- Pedro Bay: Use is concentrated near the east end of Lake Iliamna. Near the community, there are multiple overlapping usage areas. Residents of Pedro Bay also use the Upper and Lower Talarik creeks and the Chulitna, Mulchatna, and Nushagak rivers.
- Nondalton: Use areas include from the headwaters of the Mulchatna River and towards the Kaktuli River system; south to Iliamna, to the headwaters of Upper Talarik Creek, and to the eastern end of Little Lake Clark. Sixmile Lake, Newhalen River, and Lake Clark are used for fishing.
- Igiugig: Residents use the areas closest to the community most. Use occurs around most of Lake Iliamna, and along the Kvichak River to Naknek.
- Kokhanok: Residents use the areas close to the community along the Iliamna Lake shoreline towards Big Mountain. Residents also travel for subsistence use, going as far north as the Chulitna River, and west from Nondalton and Newhalen to the upper Kaktuli River, Kaskanak Creek, and the Kvichak and Alagnak rivers. Residents use Gibraltar River and Lake and the islands near Kokhanok and Intricate, Leon, and Kokhanok bays.

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<sup>108</sup> Wolfe et al. 2010. The "Super-Household" in Alaska Native Subsistence Economies. Report to the National Science Foundation. ARC 0352611.

<sup>109</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 3: Affected Environment. Page 3.9-10.

### 3.9.2 Potential Effects on the Borough

The Project and associated transportation infrastructure occur in high resource use areas for Iliamna, Newhalen, Nondalton, and Kokhanok (See Attachment B). Pathways of Project effects to subsistence resource use include:

- Changes to the abundance and distribution of harvested resources, such as big game and fish. Changes to the abundance and distribution of resources can occur due to habitat loss, individual mortality, and behavioural disturbances from increased human activity.
- Changes to participation in the wage economy. Wages from working on the project could allow Borough residents to invest in equipment for subsistence resource use, making efforts more efficient. Working a two-week on/two-week off shift may prevent resource users from participating in resource use activities because they are away from home for an extended time.
- Changes in the quality of activities, due to real and perceived changes to the environment.
- Changes to access to areas traditionally used for subsistence resource use activities due to the presence of Project infrastructure and Project activities.
- Changes to competition for subsistence resources due to increased population or the presence of the project workforce.

#### Distribution and Abundance of Resources

Project activities and infrastructure, including the roads, ports, and ferry are anticipated to affect the distribution of fish and wildlife harvested by residents of the Lakes Area Villages through the destruction of habitat, increased human activity, and fugitive dust deposits in the vicinity of Project facilities and infrastructure. These effects are expected to begin during the construction phase and continue through Project operations.

The mine site would destroy habitat and result in fish mortality in the upper portion of the North Fork and the upper portion of the South Fork, and Koktuli rivers; however, the draft EIS notes that these areas are not productive habitat for fish.<sup>110</sup> The mine site does occur in high usage areas for large mammals. Large mammals, such as moose and caribou, would be displaced for the mine site and be forced to move into other areas.

Along the transportation corridor, areas close to the Upper Talarik Creek, Gibraltar Lake, and Gibraltar River would experience the displacement of land mammals. In particular, moose would be displaced. However, according to the draft EIS, while fish and game will be displaced, no effects on the population level are expected, which means harvest levels could remain the same.

The resulting displacement and individual animal mortality would have the following effects on subsistence resource use:

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<sup>110</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement Chapter 4: Environmental Consequences. Page 4.9-2.

- Lakes Area Village residents who harvest displaced species will need to travel to other areas to engage in subsistence resource use activities. This may not always be possible due to increased travel times and increased cost. In addition, usage areas are often “handed down” from generation to generation with family members building up knowledge about harvesting in a certain area. Harvest success may diminish if resource users harvest in a new area. Harvest success could also decrease due to increased pressures in areas not affected by the project.

### Participation in the Wage Economy

Participation in the wage economy could affect subsistence resource use by allowing Borough residents to invest in gear used for harvesting or keeping them away from their home communities for long enough that they cannot participating in harvesting activities during their time off. This effect will likely depend on the individual. In northern Saskatchewan, worker rotation has resulted in a possible decline in subsistence resource use activities (referred to as traditional activities in Canada).<sup>111</sup> Other case studies consulted in characterizing project effects were either unable to draw connections between employment and resource use activities (the diamond mines in NWT) or did not comment on changes in activity levels (Red Dog Mine).

### Quality of Experience

Throughout InterGroup’s engagement with the Borough and the Lakes Area Villages, residents expressed distrust for PLP, the State government, and the U.S. Army Corps of Engineers. Residents did not trust the predictions made by the federal government regarding potential Project effects, did not trust PLP’s Project design or that mitigation would be effectively implemented if the project went ahead. Residents were also wary that if the project is developed, that PLP’s compliance with licence conditions would not be enforced.

If the Project were developed, it would be the first large-scale resource extraction project in the region. The novelty of the Project in the region makes the uncertainty around the Project understandable.

The presence of the Project and Lakes Areas Village residents’ uncertainty about its operations and effects could translate into reduced engagement in subsistence resource use. If resource users doubt predictions related to Project effects and the effectiveness of mitigation, they may stop resource harvesting activities. A reduction in subsistence resource use activities could have a negative effect on healthy diet (see Section 6.8) and community cohesion.

### Changes to Access

The Project footprint (mine site and transportation infrastructure) will change access to certain areas for subsistence resource users. Borough residents will no longer be able to access the mine site and the transportation corridor for subsistence resource use activities. Resource users from

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<sup>111</sup> InterGroup Consultants. 2005. The Impact on Families and Communities of the Fly in/out Work Rotation System in Uranium Mines in Northern Saskatchewan. Prepared for the Community Vitality Monitoring Partnership Steering Committee. Page 5.

Iliamna, Newhalen, and Kokhanok would likely be the most affected (see the location of effects above).<sup>112</sup>

The loss of access to traditional sites would result in changes to subsistence resource use. The nature of the change will likely depend on the individual. Residents with the means to travel elsewhere are anticipated to shift their activities to other locations, although they may incur additional costs. Residents who rely on areas close to communities and may not have the means to travel further for hunting, trapping, and fishing, may stop engaging in subsistence resource use. As noted above, a reduction in subsistence resource use activities could have a negative effect on healthy diet (see Section 6.8) and community cohesion.

### Changes to Competition for Subsistence Resources

Competition for subsistence resources could change as a result from population increases and the presence of the Project workforce. As described in Section 3.2, the population of the Lakes Area Villages is expected to increase as a result of the project. These individuals are expected to be those with ties to the region (e.g., people who moved away for employment). While population growth could place additional pressure on fish and wildlife populations, the pre-existing connections between people expected to move to the Borough and the Lakes Area Villages should mitigate negative effects. Returning residents would already be part of the community and share an understanding with other village residents of the appropriate conditions for harvesting resources.

The Project workforce is not expected to substantively increase pressure on subsistence resources. From the moment they are picked up at the pick-up point closest to their home community to the moment they return to the pick-up point, they are required to adhere to Project regulation. The project will not allow hunting or fishing by employees during their rotation. The prohibition against resource use activities while on-rotation means that an employee would need to return to their home community, pick up their gear, and return to the Borough to fish or hunt. The likelihood of a substantial number of employees decided to return to the Borough to hunt or fish is small. Their return to the Borough would also be limited by the resources available in the villages to support visitors.

### 3.9.3 Mitigation and Enhancement

InterGroup recommends that a Project Monitoring, Compliance, and Implementation Committee be established and that the committee have the resources to collect and report on a number of areas important to Borough residents. For subsistence resource use, a subcommittee or working group should be established that involved resource users. Resource users should be involved in developing monitoring, implementing monitoring, and interpreting the results. Organizations involved in biophysical monitoring should be required to consult with the Subsistence Resource Use Working Group and should involve them in interpreting and communicating their results.

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<sup>112</sup> U.S. Army Corps of Engineers. 2019. Pebble Project EIS. Draft Environmental Impact Statement. Chapter 4: Environmental Consequences. Page 4-9.3.

Other recommendations for mitigation include:

- Environmental monitoring results should be communicated to Borough residents in plain language.
- Workers should not be allowed to hunt or fish during their work rotation.
- PLP should provide funding to subsistence resource users who have to travel further as a result of the Project (for example subsidizing their fuel costs).
- The Borough should consider using payment in lieu of taxes funds for cultural programming. Programming could include language programs or fish camps. Each village would decide what kind of cultural programming would be most appropriate for the community.
- The Borough should consider using payment in lieu of taxes funds to facilitate access to harvested foods. One example is a community fish and game distribution system.

## 4.0 FISCAL IMPACT ASSESSMENT

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Chapter 9.08 of the Lake and Peninsula Borough Municipal Code requires that a Fiscal Impact Assessment be prepared showing expected costs to the Lake and Peninsula Borough from the proposed Project, including direct and indirect costs. The schedule of expected costs must be compared with expected direct and indirect revenue from taxes or other sources to prepare a schedule of net fiscal impacts by year to the Lake and Peninsula Borough and any local government within the Borough. Section 09.08.060 paragraph C indicates that the Borough may impose an obligation on the Project to make payments to the Borough to make up the difference between expected costs and revenue for any year in which expected revenues do not equal or exceed costs.

This section summarizes the potential fiscal implications to the Borough from the proposed Project.

### 4.1 CURRENT BOROUGH REVENUES AND EXPENSES

Table 4.1-1 summarizes the Borough's actual 2017 fiscal year revenues and expenses. In 2017, the Borough's largest sources of revenues were the Raw Fish Sales and Use Tax, and State Community Revenue Sharing and Teacher Housing rents. Revenues from the Raw Fish Sales and Use Tax can be highly variable year over year.

In 2017, the Borough's largest expenses were transfers to the school district, administration, and debt service.

**Table 4.1-1: Lake and Peninsula Borough 2017 Fiscal Year  
 Revenues and Expenses<sup>113</sup>**

| <b>Revenues</b>                  | <b>2017 Actual</b> |
|----------------------------------|--------------------|
| Raw fish Sales and Use Tax       | 1,638,335          |
| Bed Tax                          | 108,896            |
| Penalties and Interest           | 819                |
| Federal Payment in Lieu of Taxes | 279,210            |
| Licenses and Permits             | 6,150              |
| Professional Guides              | 30,948             |
| Development Permits              | 400                |
| Teacher Housing Rents            | 339,438            |
| Land Lease                       | 56,445             |
| Interest (investments)           | 35,844             |
| Market Gain/(Loss) (Investments) | 267,773            |
| Other Local Revenue              | 14,127             |
| Payment in Lieu of Development   | 100,000            |
| State Community Revenue Share    | 363,251            |
| State Fisheries Business Tax     | 102,637            |
| Electric and Telephone Coop      | 793                |
| Transfer from School Endowment   | 675,654            |
| <b>Total</b>                     | <b>4,020,720</b>   |
| <b>Expenses</b>                  |                    |
| Assembly                         | 210,144            |
| Planning Commission              | 39,278             |
| Administration                   | 946,375            |
| Elections                        | 1,593              |
| Borough Fisheries                | 49,500             |
| Board of Fish                    | 9,303              |
| Managers Contingency             | 10,000             |
| State Revenue Sharing            | 90,300             |
| Borough Revenue Sharing          | 175,000            |
| Shared Fisheries Business Tax    | 28,000             |
| Debt Service                     | 498,600            |
| Transfer to permanent fund       | 327,667            |
| Chignik Dock                     | 100,000            |
| Transfer to school district      | 1,347,423          |
| Transfer to Vo-Tech Program      | 54,000             |
| Transfer to pre-school           | 100,000            |
| <b>Total</b>                     | <b>3,987,183</b>   |
| <b>Net Surplus</b>               | <b>33,537</b>      |

## 4.2 POTENTIAL EFFECTS OF THE PROJECT ON BOROUGH FINANCES

The draft EIS notes the Project would be subject to severance taxes on resource extraction by the Borough. The Project could generate \$29 million annually in severance taxes during the operations phase. This compares to the 2019 estimated total revenue from external sources of approximately \$5 million for fiscal year 2019.<sup>114</sup> However, there is some uncertainty about whether the State would permit the Borough to collect severance taxes or a payment in lieu of taxes of that magnitude. The level of revenue the Borough could reasonably expect will require further analysis and legal review.

The Project is expected to impose additional costs in the Borough in the following areas:

- **Additional staff and administration costs:** The Project is a major undertaking in the Borough. During the research phase for this report we heard that the Project is already increasing administrative burden on Borough staff and Assembly members. If the Project proceeds, it is likely that the Borough will require additional staff resources in order to respond to the administrative requirements imposed by the Project. Administrative requirements will likely involve not only liaising with PLP and villages, but also with relevant organizations such as Southcentral Foundation and Bristol Bay Native Association.
- **Additional legal and consultant costs:** It is likely the Project will require the Borough to incur additional legal and consultant costs to develop agreements and participate in monitoring activities.
- **Additional school costs:** The Project is anticipated to result in a small increase to population during the operations phase. This would be expected to increase the financial support necessary from the Borough to maintain current programming levels. There may also be costs related to expanding school infrastructure and hiring more staff. The Borough could use funding from the severance tax or payment in lieu of taxes to stabilize school district funding, allowing the school district to raise teacher wages, provide new programming (e.g., vocational education), and reinstate programs that have been cut over the past decade.
- **Additional village infrastructure and service costs:** There is a range of infrastructure and services that will be added or augmented that will increase Borough expenditures. In connection with public safety, if village public safety officers are hired, there will be additional costs related to salary and potentially housing for the officer if required. There may be additional costs related to fuel and energy, including a feasibility study for tapping the gas supply for the project, additional studies on reducing energy costs, and capital costs for gas generators or a distribution system.

---

<sup>113</sup> Summarized from the Borough's May 12, 2018 Assembly Meeting Package. Available at: <http://www.lakeandpen.com/common/pages/DisplayFile.aspx?itemId=13407929> [accessed 8 May 2019]

<sup>114</sup> U.S. Army Corps of Engineers. 2019 Pebble Project EIS. Draft Environmental Impact Statement. Chapter 4: Environmental Consequences. Page 4.3-7.

- **Additional indirect costs:** Some programming, such as cultural programming and programs to maintain access to subsistence resources, could be paid for by the Borough.

The Borough may negotiate a payment in lieu of taxes (PILT) with the proponent that could address the timing of costs and revenues related to the Project. The PILT could be structured to ensure sufficient revenues to reimburse the Borough for direct and in-direct costs of the Project, as well as to provide additional revenue to improve services in the Borough.

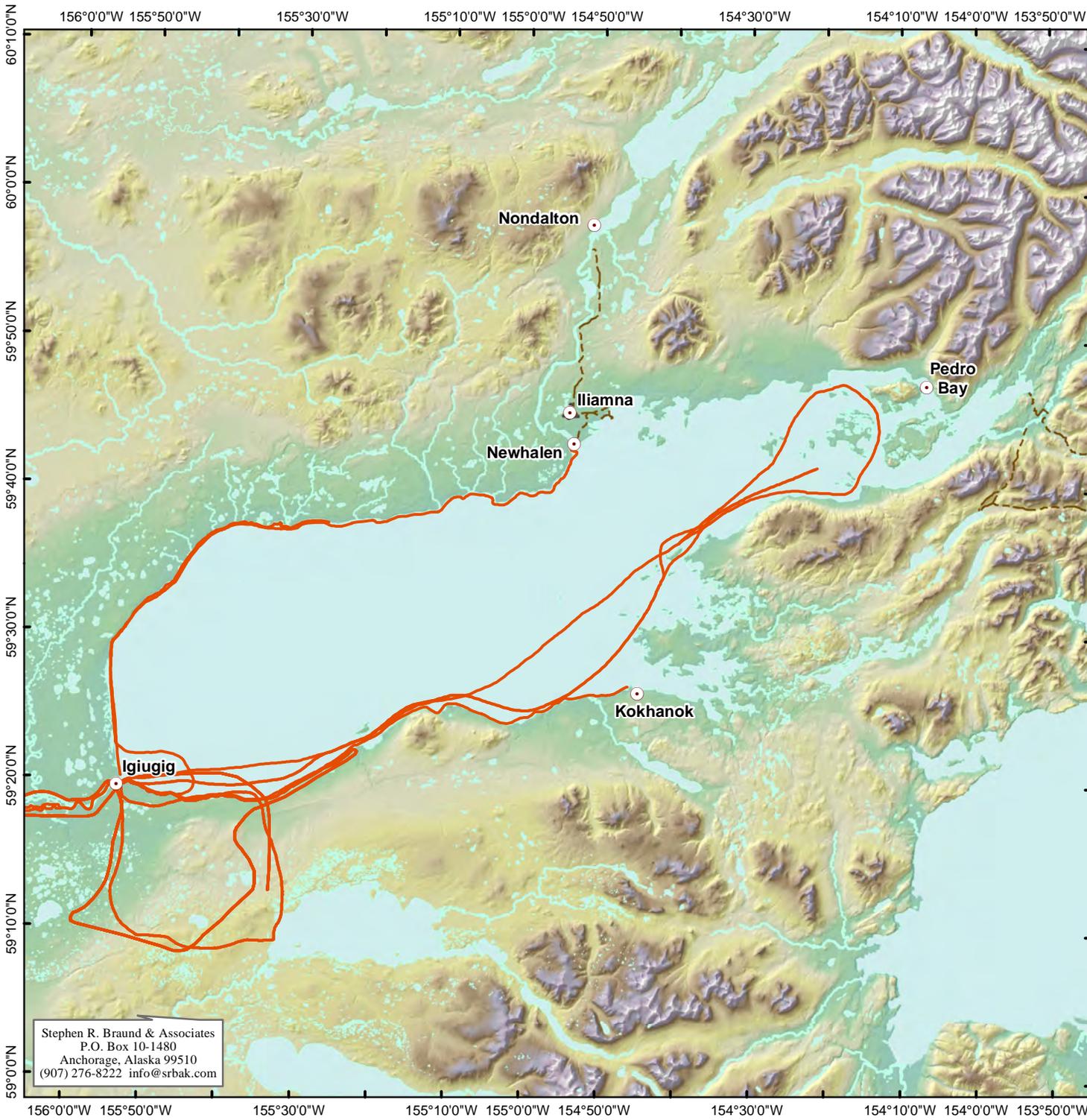
During community meetings held during the preparation of this report, a number of considerations were identified related to such an agreement:

- Payments should be structured to provide revenue stability and avoid variations due to production volumes or commodity prices as much as possible.
- Payments should be reviewed and possibly re-structured from time to time. Residents expressed concern that locking in a payment structure on a one-time basis may leave dollars on the table if production volumes increase or the value of the commodity increases.
- Payments should be structured to start flowing during the construction phase, since some negative effects of the project occur during construction and revenues could be used to support training programs that could help maximize potential employment benefits of the Project. If it is not feasible to structure PILT payments to begin during the construction phase, PLP should provide impact funds to cover these costs.
- Residents expressed concern that a PILT could create a boom/bust situation where the Borough loses project revenue when the project ceases operating. Some residents suggested using revenues to establish a trust or permanent fund that could provide ongoing revenues in perpetuity.



## ATTACHMENT A: Partial Winter Uses of Lake Iliamna





Stephen R. Braund & Associates  
 P.O. Box 10-1480  
 Anchorage, Alaska 99510  
 (907) 276-8222 info@srbak.com



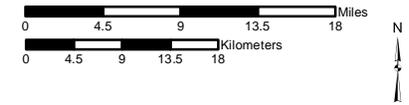
## Igiugig: Partial Winter Use of Iliamna Lake

Snowmachine Travel Routes

**Source:**  
 Pebble Project EBD (PLP 2012)

\*Note: Other winter subsistence use areas for additional resources (e.g., fish) may also occur.

Road or trail

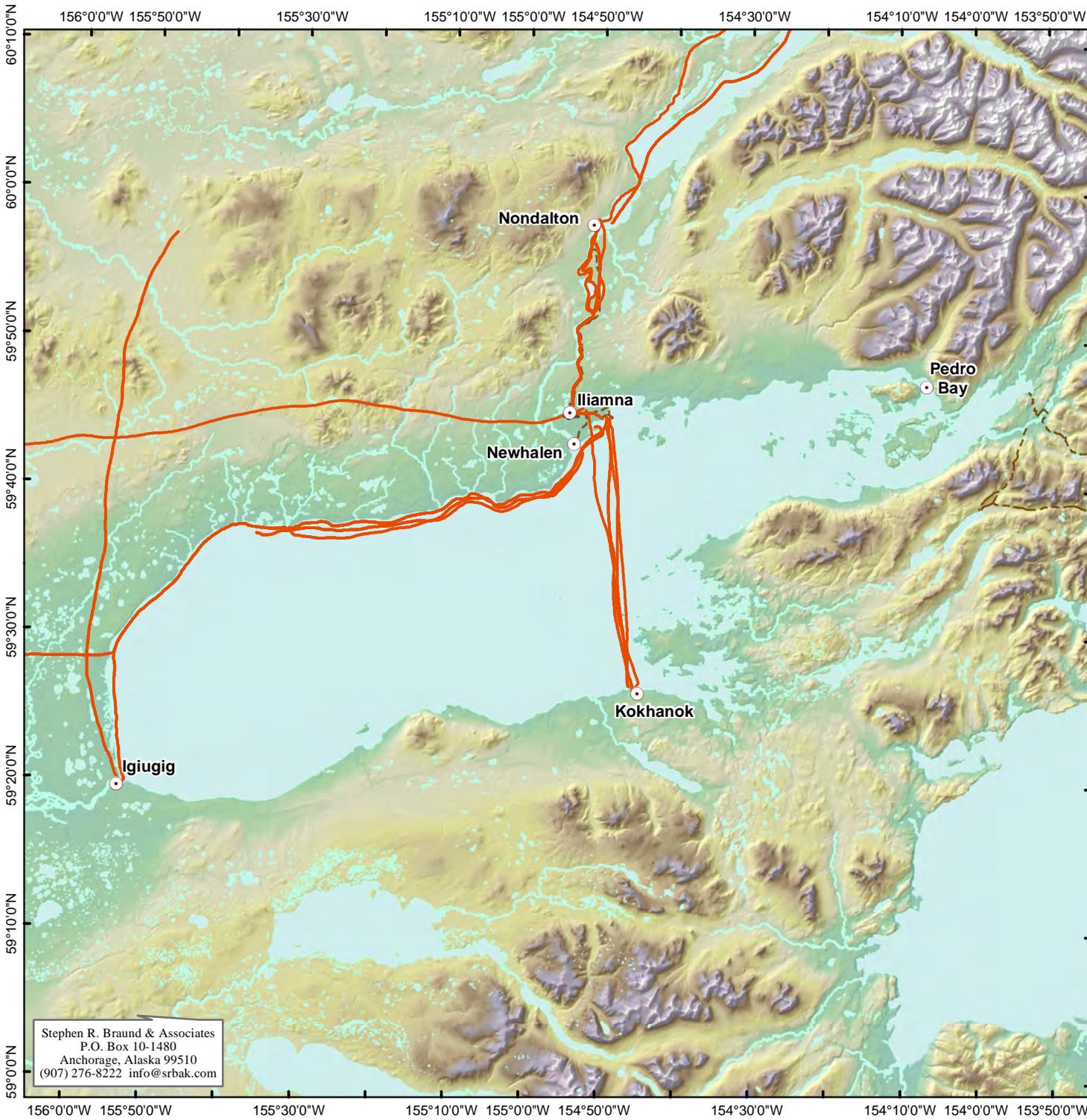


Alaska State Plane Zone 5 (units feet)  
 1983 North American Datum

Scale 1:702,500

Date: 10/3/2018

Author: SRB&A



Stephen R. Braund & Associates  
 P.O. Box 10-1480  
 Anchorage, Alaska 99510  
 (907) 276-8222 info@srbak.com



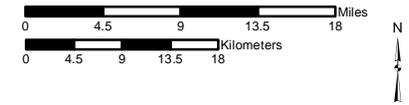
## Iliamna: Partial Winter Use of Iliamna Lake

Snowmachine Travel Routes

**Source:**  
 Pebble Project EBD (PLP 2012)

\*Note: Other winter subsistence use areas for additional resources (e.g., fish) may also occur.

Road or trail

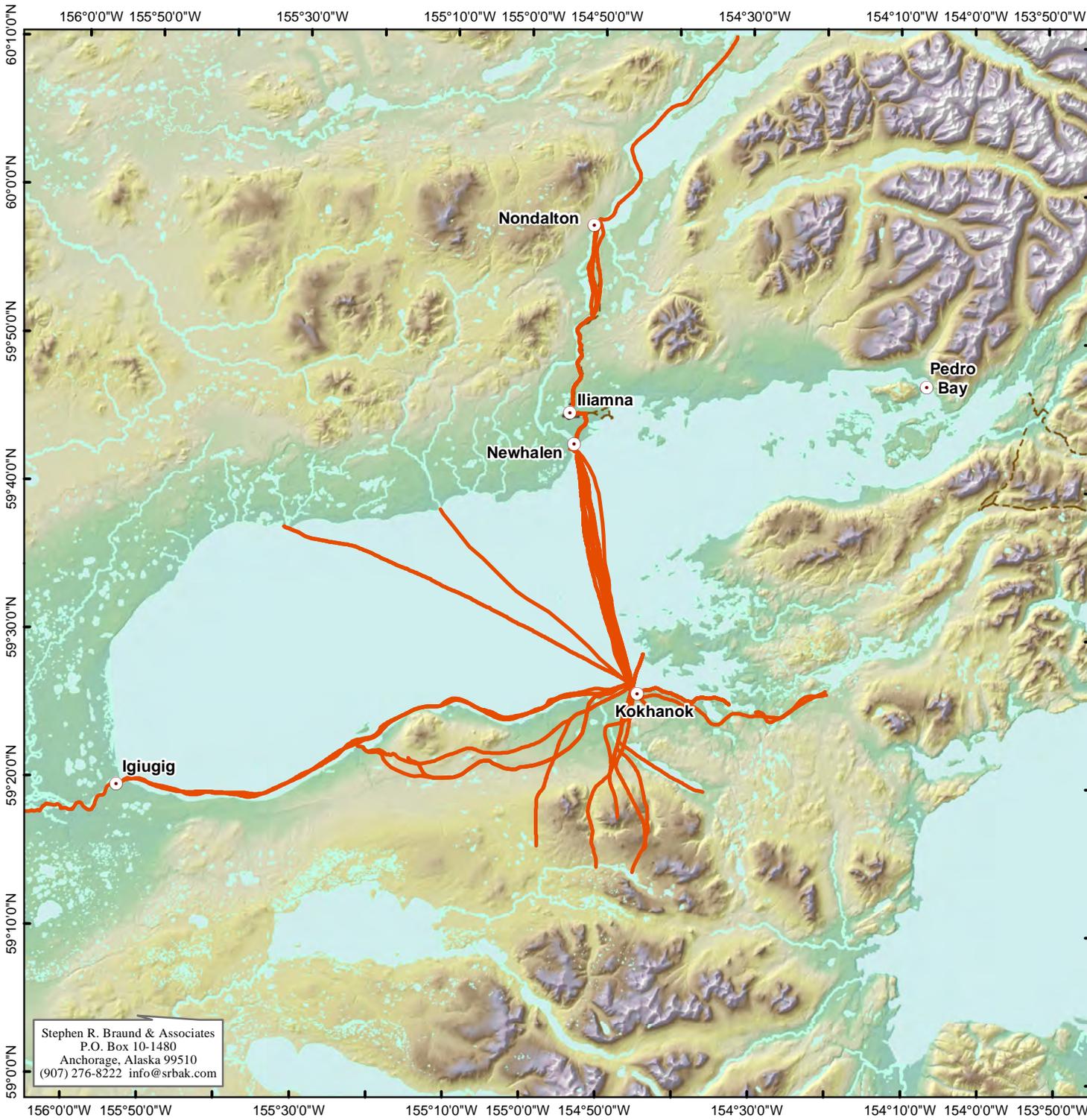


Alaska State Plane Zone 5 (units feet)  
 1983 North American Datum

Scale 1:702,500

Date: 10/3/2018

Author: SRB&A



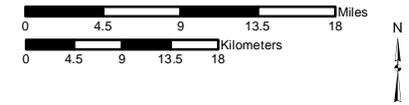
## Kokhanok: Partial Winter Use of Iliamna Lake

— Snowmachine Travel Routes

**Source:**  
Pebble Project EBD (PLP 2012)

\*Note: Other winter subsistence use areas for additional resources (e.g., fish) may also occur.

  
Road or trail



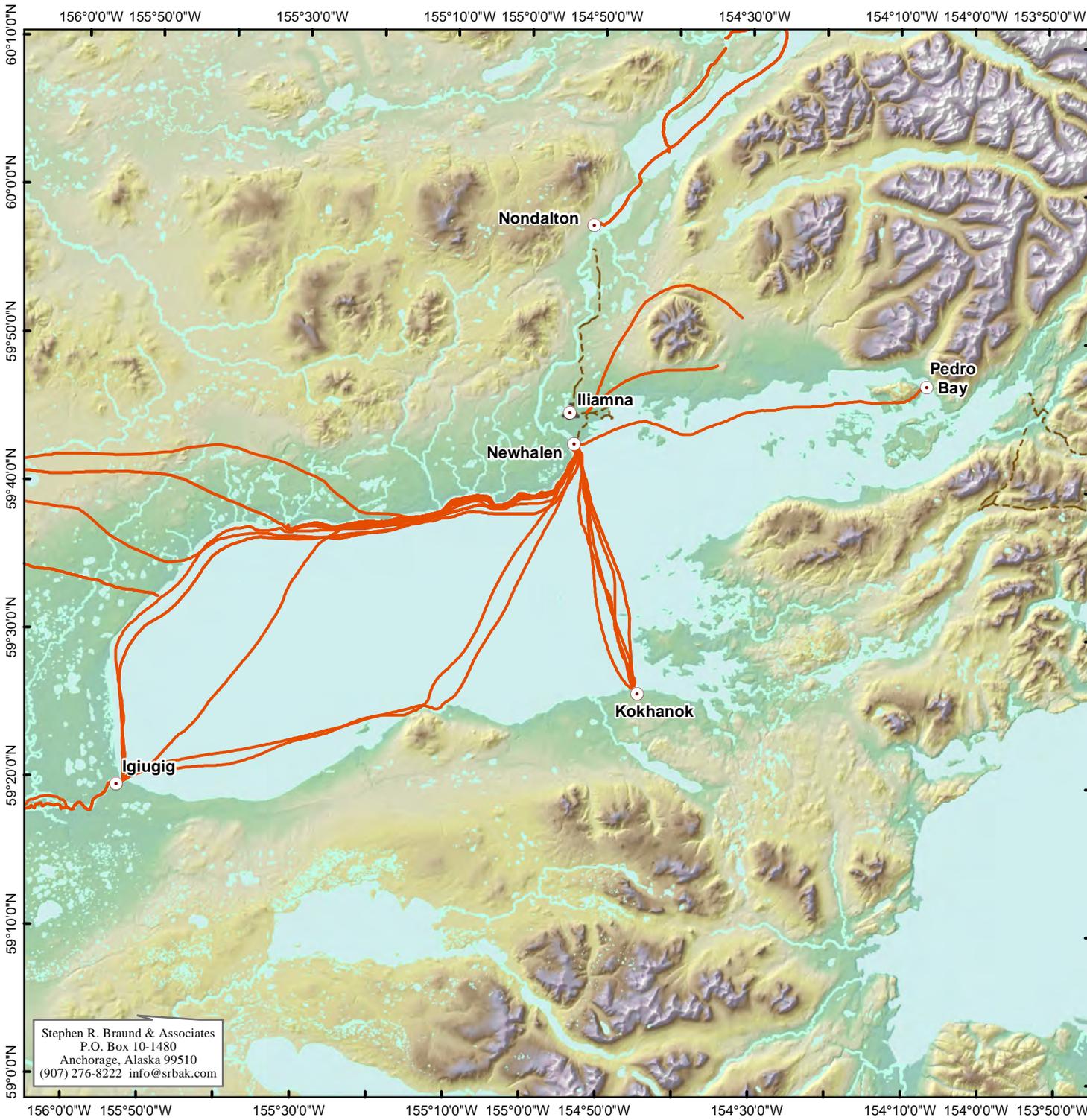
Alaska State Plane Zone 5 (units feet)  
1983 North American Datum

Scale 1:702,500

Date: 10/3/2018

Author: SRB&A

Stephen R. Braund & Associates  
P.O. Box 10-1480  
Anchorage, Alaska 99510  
(907) 276-8222 info@srbak.com



## Newhalen: Partial Winter Use of Iliamna Lake

— Snowmachine Travel Routes

**Source:**  
Pebble Project EBD (PLP 2012)

\*Note: Other winter subsistence use areas for additional resources (e.g., fish) may also occur.

— Road or trail



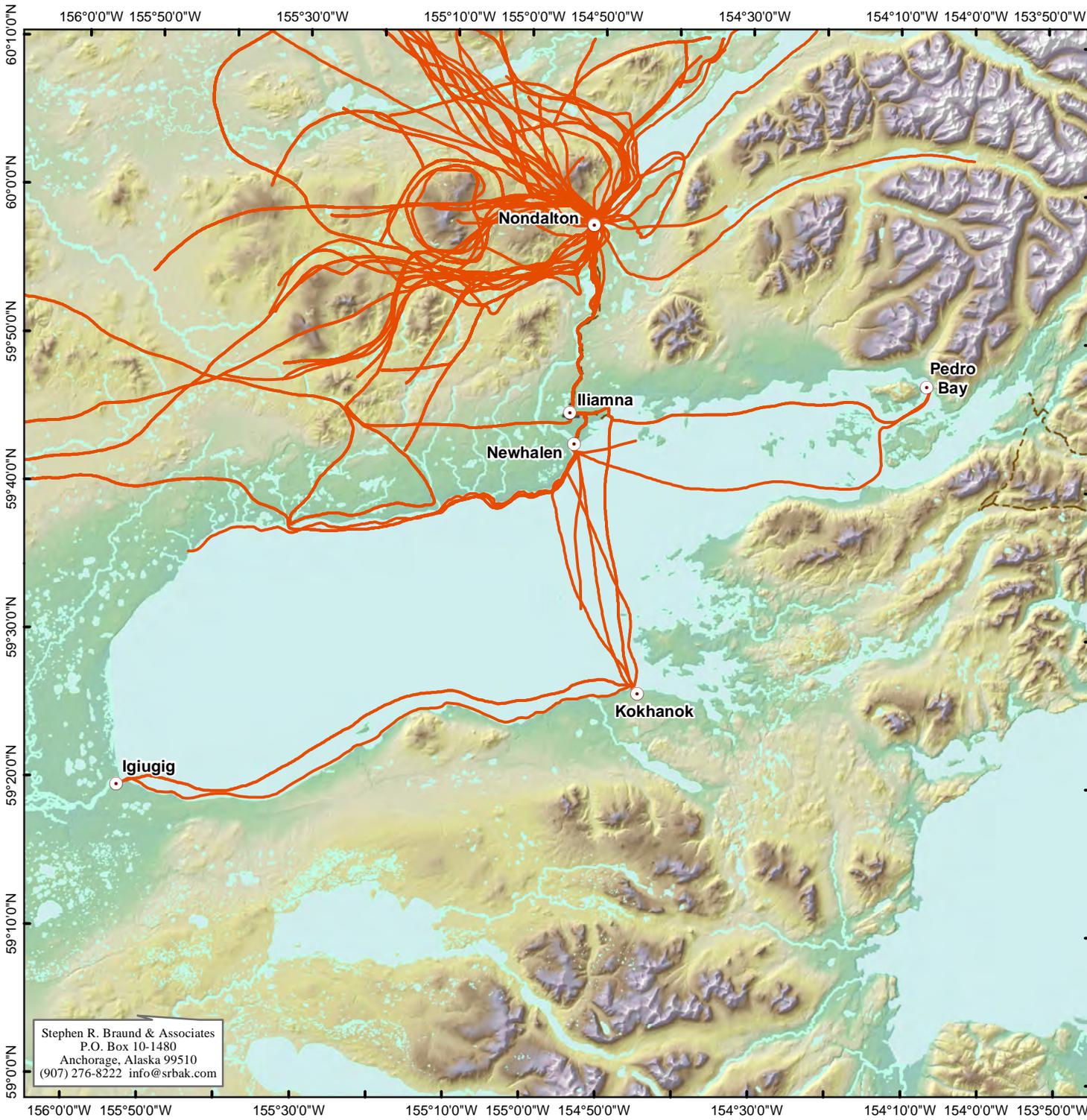
Alaska State Plane Zone 5 (units feet)  
1983 North American Datum

Scale: 1:702,500

Date: 10/3/2018

Author: SRB&A

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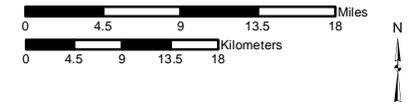
## Nondalton: Partial Winter Use of Iliamna Lake

— Snowmachine Travel Routes

**Source:**  
 Pebble Project EBD (PLP 2012)

\*Note: Other winter subsistence use areas for additional resources (e.g., fish) may also occur.

  
 Road or trail

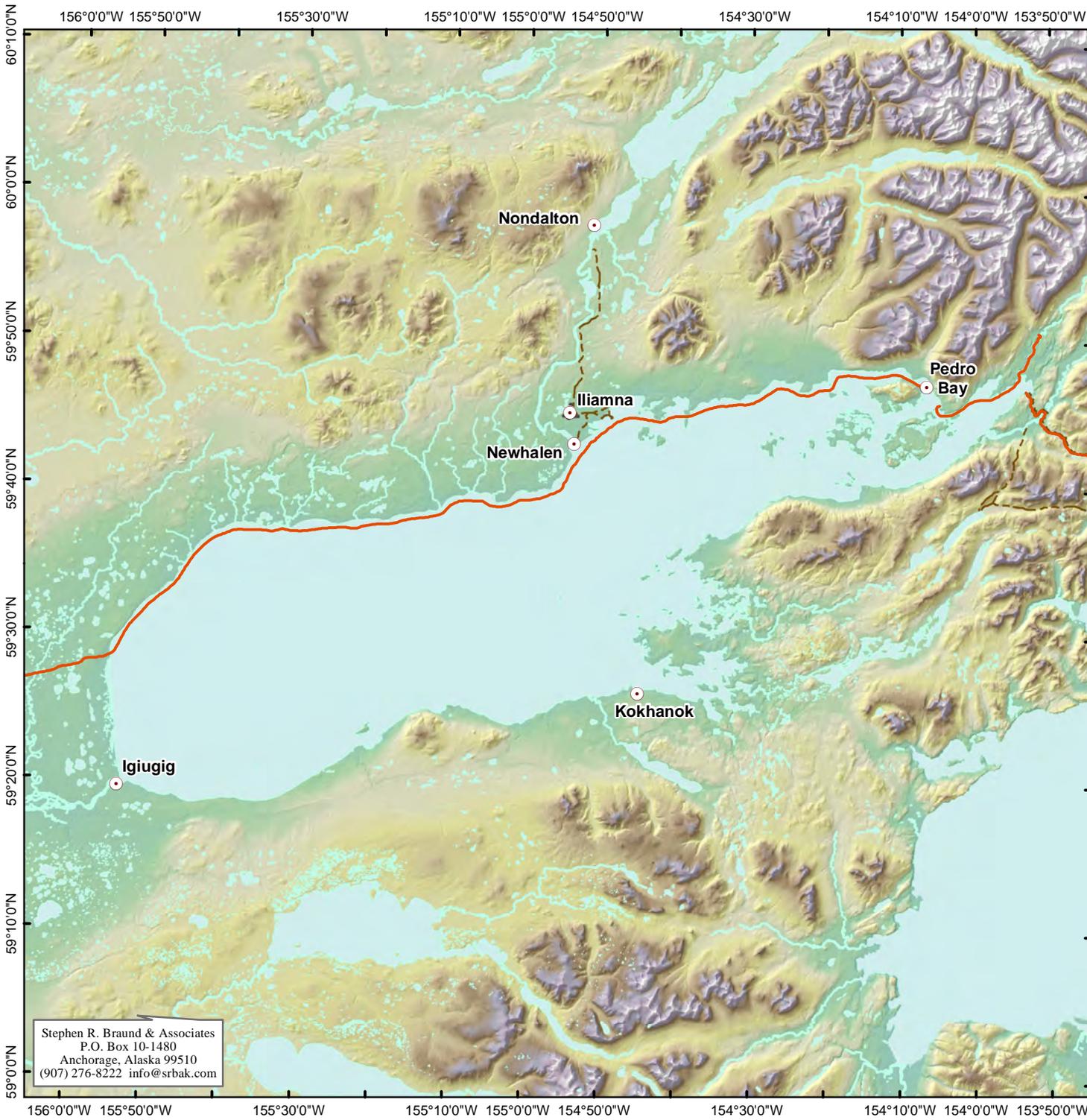


Alaska State Plane Zone 5 (units feet)  
 1983 North American Datum

Scale 1:702,500

Date: 10/3/2018

Author: SRB&A



Stephen R. Braund & Associates  
 P.O. Box 10-1480  
 Anchorage, Alaska 99510  
 (907) 276-8222 info@srbak.com



## Pedro Bay: Partial Winter Use of Iliamna Lake

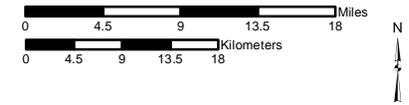
Snowmachine Travel Routes

**Source:**

Pebble Project EBD (PLP 2012)

\*Note: Other winter subsistence use areas for additional resources (e.g., fish) may also occur.

Road or trail



Alaska State Plane Zone 5 (units feet)  
 1983 North American Datum

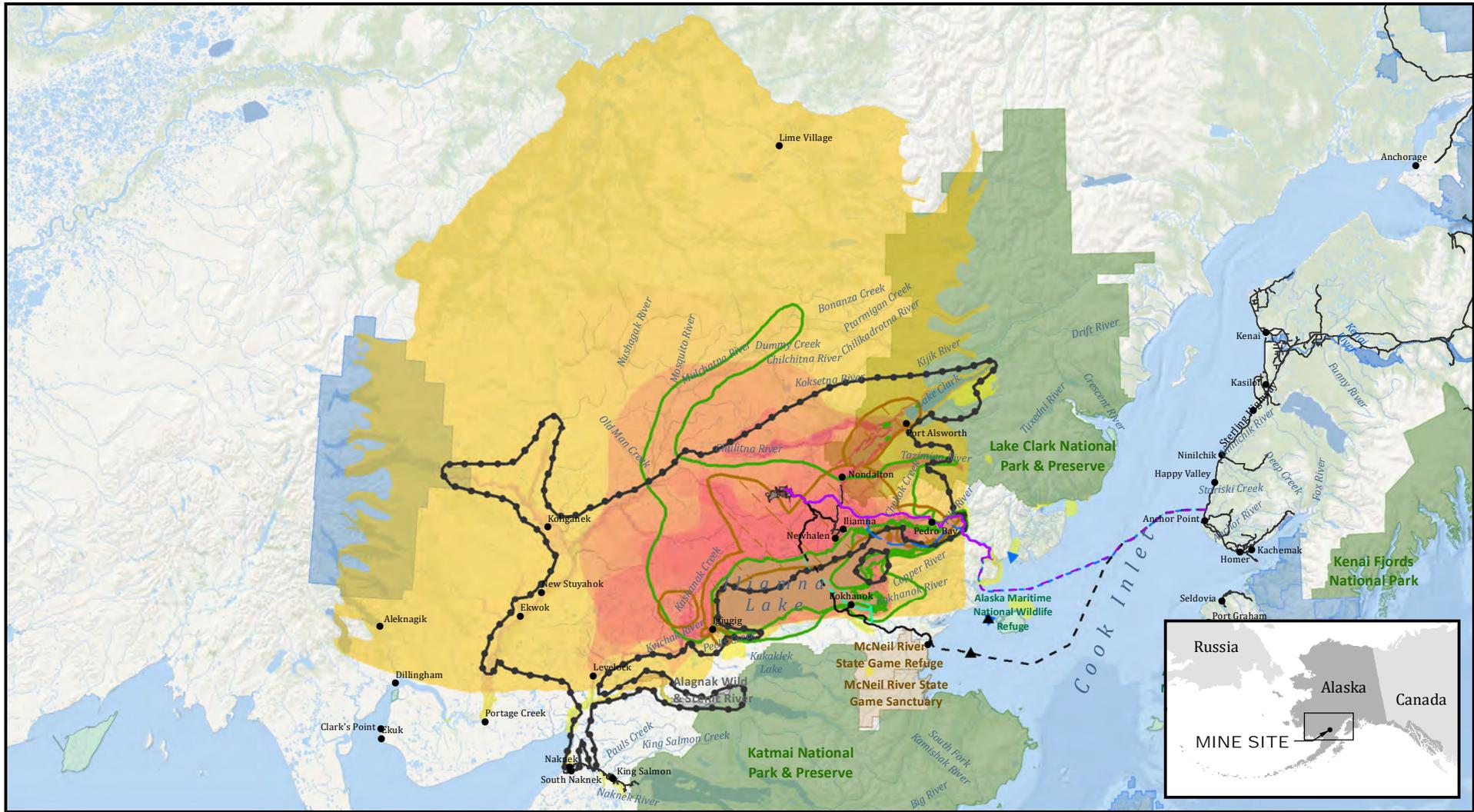
Scale 1:702,500

Date: 10/3/2018

Author: SRB&A

## ATTACHMENT B: Subsistence Resource Use Area Maps

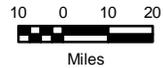




Sources: Pebble; USGS; ADNR  
 Subsistence use areas by  
 Stephen R. Braund & Associates



**US Army Corps  
 of Engineers**



**Administrative Boundaries**

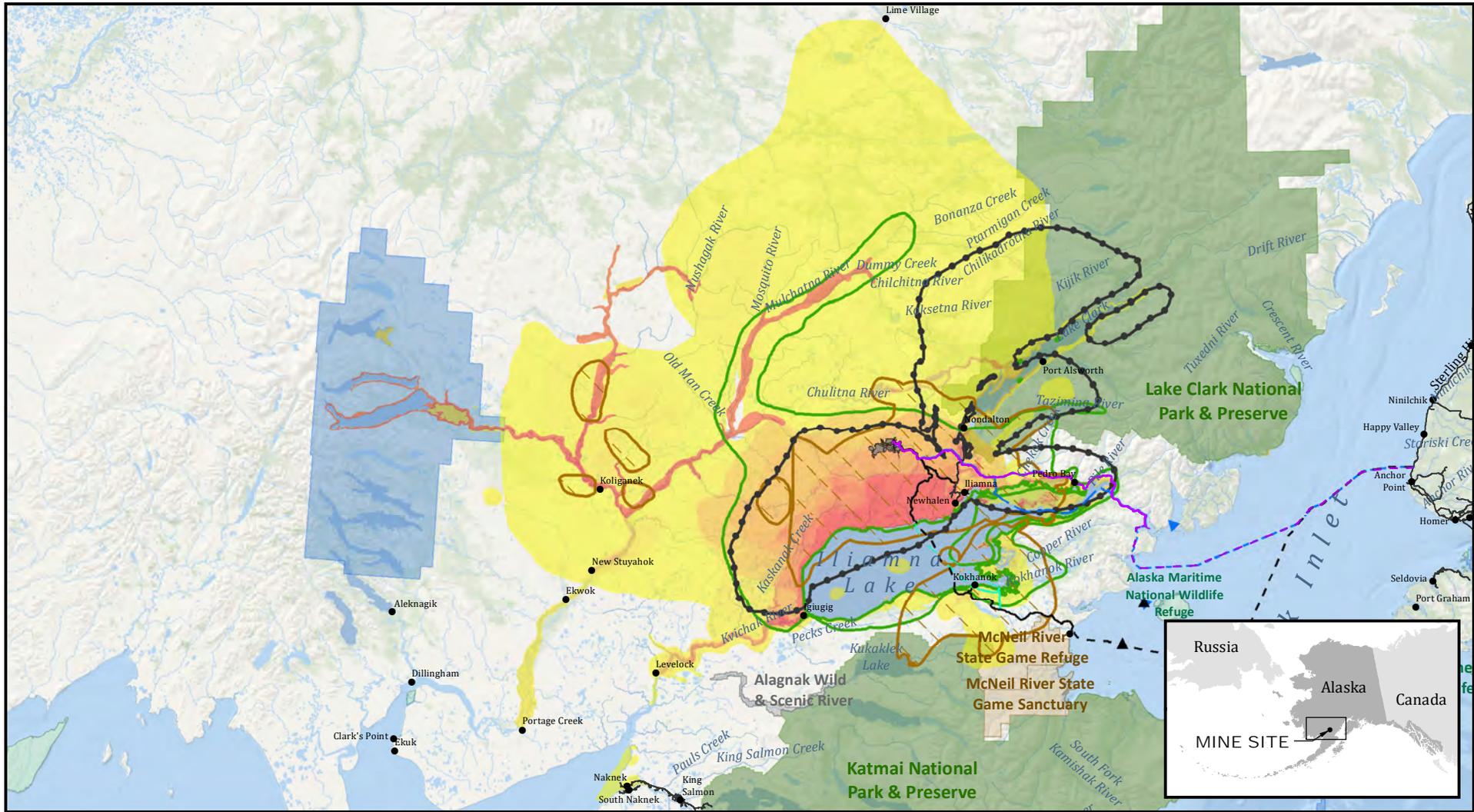
- Wild and Scenic River
- State Game Refuge/Sanctuary
- Alaska State Park
- National Wildlife Refuge

- National Park
- City/Town
- Roads
- River/Stream
- Lake/Pond

- Large Land Mammals, 1980-2002 (Holen et al., 2005)
- All Resources, 2004 (Fall et al., 2006)
- All Resources, 1960-82 (Wright, Morris, and Schroeder, 1985)
- Overlapping Subsistence Use Areas All Resources 1996/97 - 2005/06 (SRB&A 2018)

- Alternative 1
- Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 3

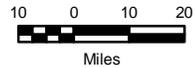
**SUBSISTENCE USE AREAS, ALL RESOURCES - ILIAMNA**



Sources: Pebble; USGS; ADNR  
 Subsistence use areas by  
 Stephen R. Braund & Associates



**US Army Corps  
 of Engineers**



**Administrative Boundaries**

- Wild and Scenic River
- State Game Refuge/Sanctuary
- Alaska State Park
- National Wildlife Refuge

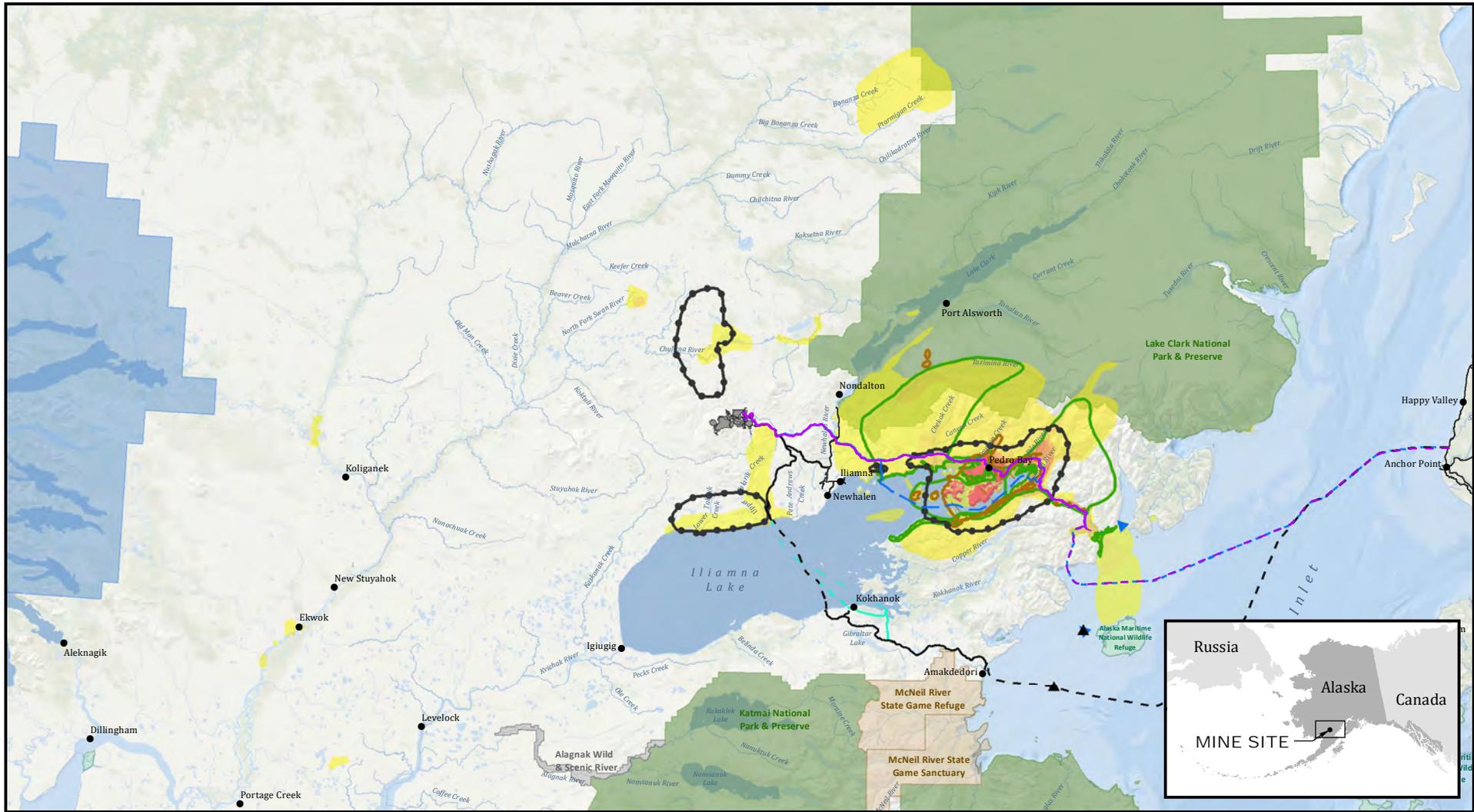
- National Park
- City/Town
- Roads
- River/Stream
- Lake/Pond

- Large Land Mammals, 1980-2002 (Holen et al., 2005)
- All Resources, 2004 (Fall et al., 2006)
- All Resources, 1960-82 (Wright, Morris, and Schroeder, 1985)
- Overlapping Subsistence Use Areas All Resources 1996/97 - 2005/06 (SRB&A 2018)

- Alternative 1
- Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 3

**SUBSISTENCE USE AREAS, ALL RESOURCES - NEWHALEN**

**FIGURE 3.9-5**



Sources: Pebble; USGS; ADNR  
 Subsistence use areas by  
 Stephen R. Braund & Associates



**US Army Corps  
 of Engineers**



10 0 10 20



Miles

**Administrative Boundaries**

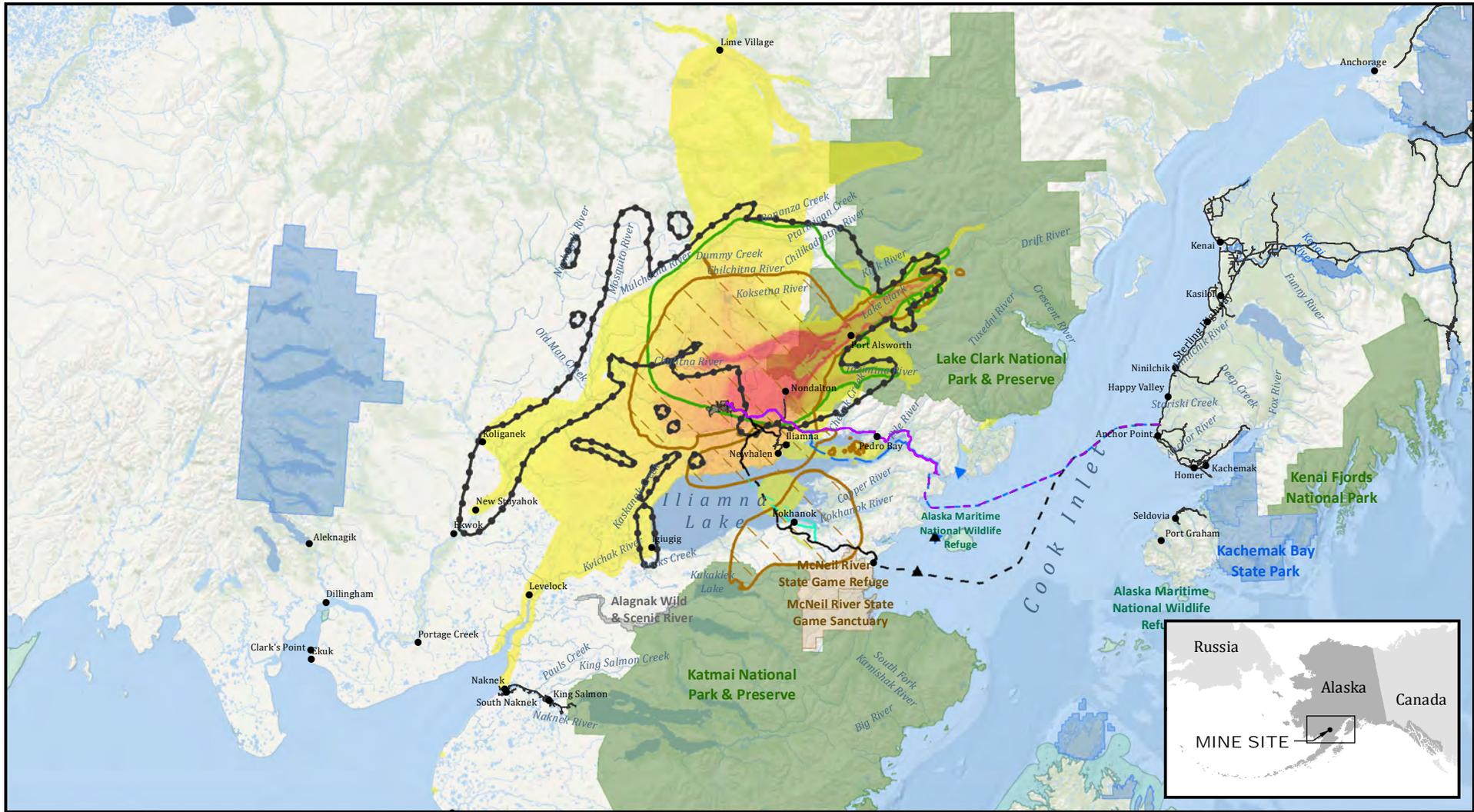
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- National Wildlife Refuge

- National Park
- City/Town
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- Lake/Pond

- Large Land Mammals, 1980-2002 (Holen et al., 2005)
- All Resources, 2004 (Fall et al., 2006)
- All Resources, 1960-82 (Wright, Morris, and Schroeder, 1985)
- Overlapping Subsistence Use Areas All Resources 1996-2005 (SRB&A 2018)

- Alternative 1
- Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 3

**SUBSISTENCE USE AREAS, ALL RESOURCES - PEDRO BAY**



Sources: Pebble; USGS; ADNR  
 Subsistence use areas by  
 Stephen R. Braund & Associates



**Administrative Boundaries**

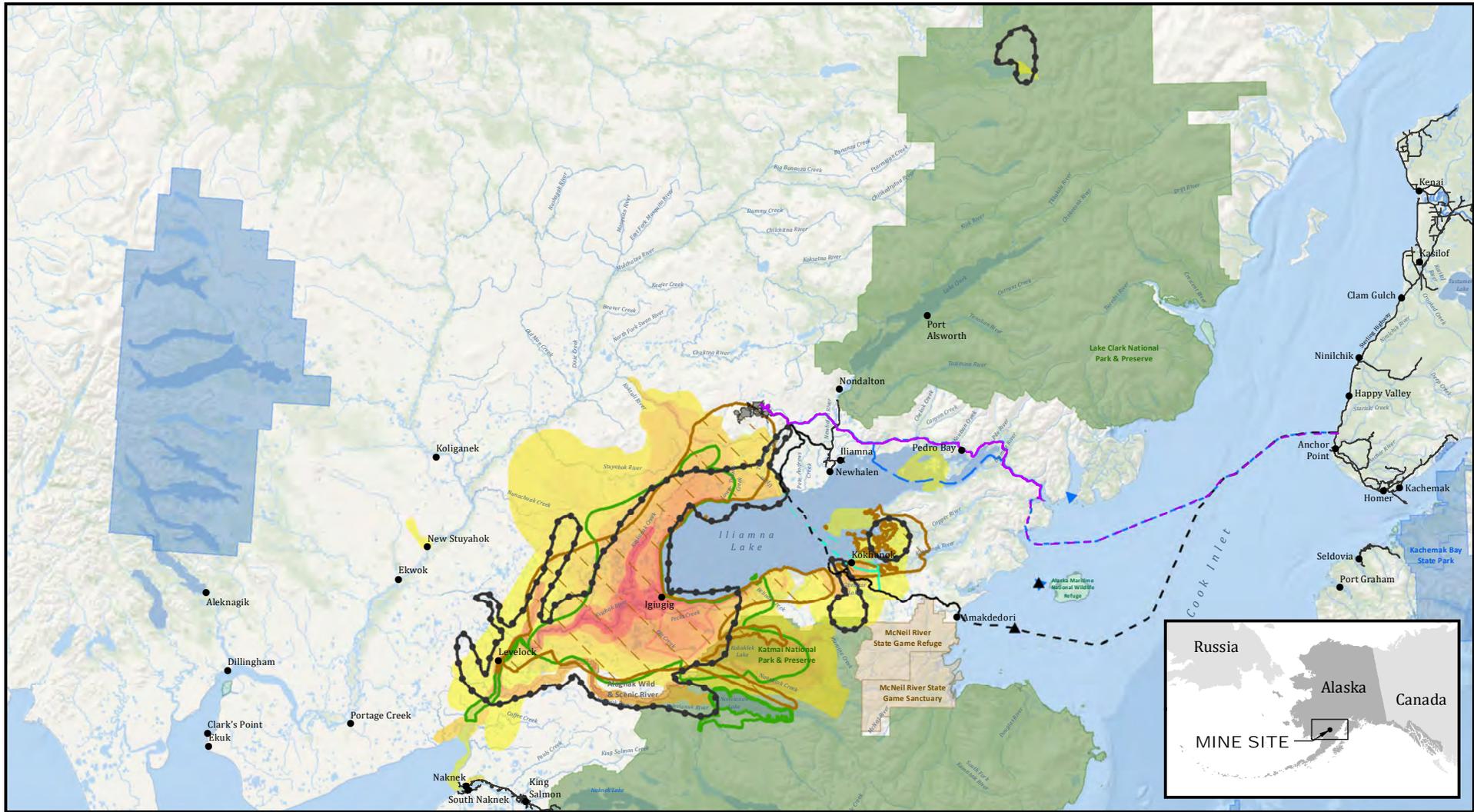
- Wild and Scenic River
- State Game Refuge/Sanctuary
- Alaska State Park
- National Wildlife Refuge

- National Park
- City/Town
- Roads
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- All Resources, 2004 (Fall et al., 2006)
- All Resources, 1960-82 (Wright, Morris, and Schroeder, 1985)
- Overlapping Subsistence Use Areas All Resources 1996/97 - 2005/06 (SRB&A 2018)

- Alternative 1
- Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 3

**SUBSISTENCE USE AREAS, ALL RESOURCES - NONDALTON**



Sources: Pebble; USGS; ADNR  
 Subsistence use areas by  
 Stephen R. Braund & Associates



**Administrative Boundaries**

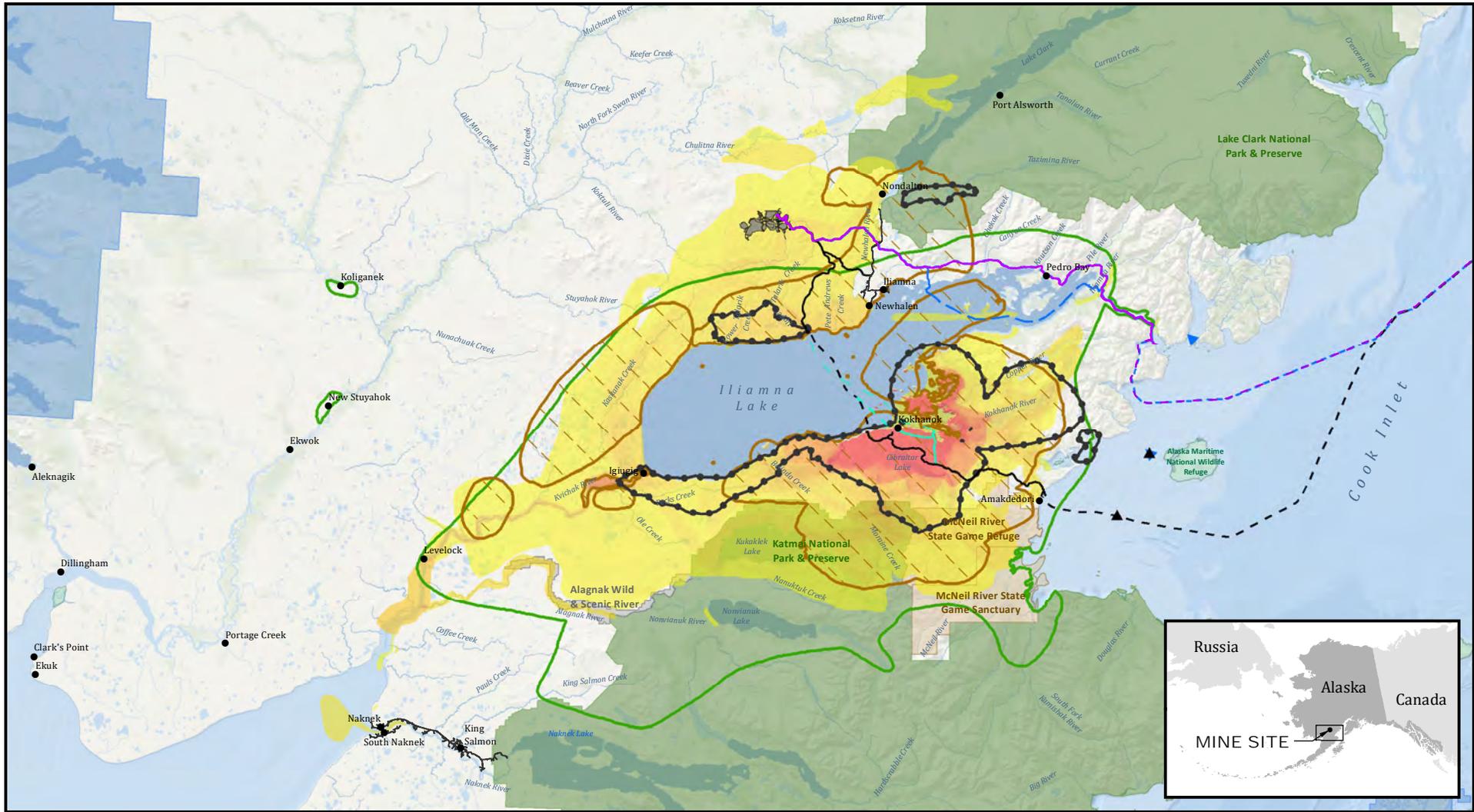
- Wild and Scenic River
- State Game Refuge/Sanctuary
- Alaska State Park
- National Wildlife Refuge

- National Park
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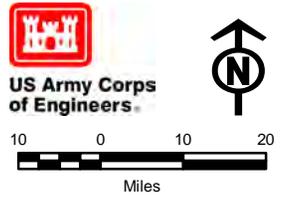
- Large Land Mammals, 1980-2002 (Holen et al., 2005)
- All Resources, 2005 (Krieg et al., 2009)
- All Resources, 1960-82 (Wright, Morris, and Schroeder, 1985)
- Overlapping Subsistence Use Areas All Resources 1996/97 - 2005/06 (SRB&A 2018)

- Alternative 1
- Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 3

**SUBSISTENCE USE AREAS, ALL RESOURCES - IGIUGIG**



Sources: Pebble; USGS; ADNR  
 Subsistence use areas by  
 Stephen R. Braund & Associates



- |                                  |               |  |                                      |
|----------------------------------|---------------|--|--------------------------------------|
| <b>Administrative Boundaries</b> | National Park | Large Land Mammals, 1980-2002 (Holen et al., 2005)                     | Alternative 1                        |
| Wild and Scenic River            | City/Town     | All Resources, 2005 (Krieg et al., 2009)                               | Kokhanok East Ferry Terminal Variant |
| State Game Refuge/Sanctuary      | Roads         | All Resources, 1960-82 (Wright, Morris, and Schroeder, 1985)           | Alternative 2                        |
| Alaska State Park                | River/Stream  | Overlapping Subsistence Use Areas All Resources 1996-2005 (SRB&A 2018) | Alternative 3                        |
| National Wildlife Refuge         | Lake/Pond     |  |                                      |

**SUBSISTENCE USE AREAS, ALL RESOURCES - KOKHANOK**



InterGroup

C O N S U L T A N T S

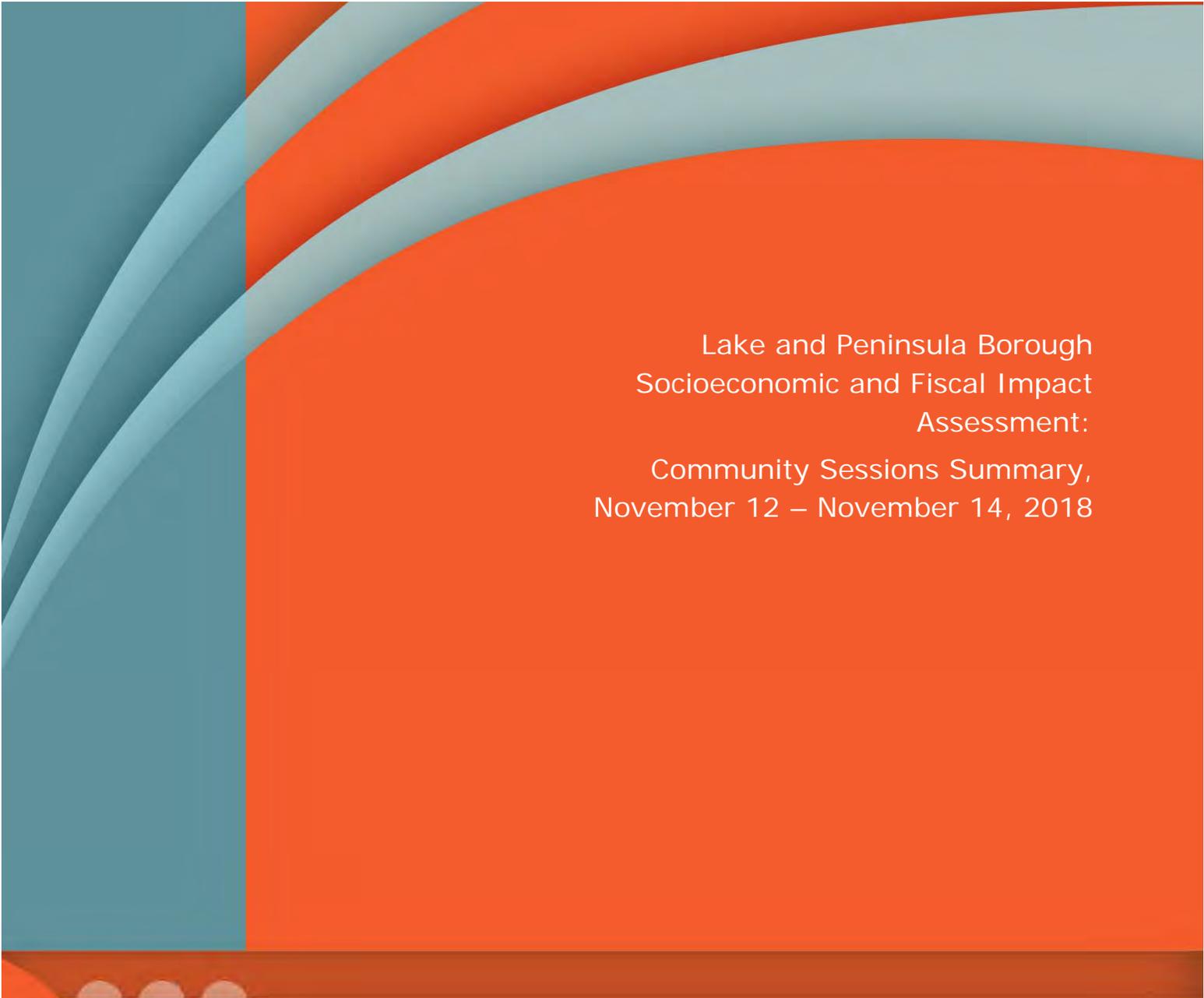
300-259 Portage Avenue  
Winnipeg, MB Canada R3B 2A9

[www.intergroup.ca](http://www.intergroup.ca)



APPENDIX B:  
Community Session Summaries,  
November 12 – November 14, 2018





Lake and Peninsula Borough  
Socioeconomic and Fiscal Impact  
Assessment:  
Community Sessions Summary,  
November 12 – November 14, 2018



InterGroup

CONSULTANTS

Prepared for the Lake and Peninsula Borough

November 2018

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## 1.0 INTRODUCTION

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The Lake and Peninsula Borough hired InterGroup Consultants Ltd. (InterGroup) to help prepare a socioeconomic and fiscal impact assessment report related to the Pebble Project. This type of report is required under Chapter 9.08 of the Lake and Peninsula Borough Municipal Code. The report will look at different aspects of how the Pebble Project could affect people and communities including education, housing, fuel and energy, health care, subsistence resources and transportation.

The purpose of the report is to help the Borough understand how the Pebble Project might affect people and communities if it proceeds and what concerns residents have about the Pebble Project. The report will identify potential impacts and benefits of the Pebble Project and allow the Borough to make plans for how to address them. This might include negotiating with Pebble for funding for programs or infrastructure to help minimize impacts and/or agreements on employment and purchasing policies that could enhance the economic benefits of the Pebble Project to the people in the Borough.

The report will also be useful to help document anticipated impacts and benefits in the event the Pebble Project proceeds. This will help the Borough monitor the effects of the Project, and respond or adapt to different circumstances as they unfold.

### 1.1 COMMUNITY SESSIONS

As a first step towards completing the report, InterGroup held community sessions in six of the Lakes Area Villages from November 12, 2018 through November 14, 2018. The purpose of these sessions was to gain a better understanding of each village; listen to concerns residents have about the Pebble Project; and understand how people think the Pebble Project might affect them and the communities where they live.

LAKE AND PENINSULA BOROUGH SOCIOECONOMIC AND FISCAL IMPACT ASSESSMENT: COMMUNITY SESSIONS SUMMARY, NOVEMBER 12 – NOVEMBER 14, 2018

DRAFT @ NOVEMBER 2018



*Community Session in Kokhanok*

Table 1 provides the date, location, and approximate attendance (excluding InterGroup and Borough representatives) for each session. InterGroup also presented a high-level summary of the community sessions and responded to questions from Assembly members at an Assembly dinner on November 15, 2018 in Anchorage. The invitation letter sent to each village is included in Appendix A.

**Table 1: Community Sessions**

| Date                                | Community Session Location                    | Approximate Attendance |
|-------------------------------------|---|------------------------|
| <b>Monday, November 12, 2018</b>    | Community Building, Nondalton                 | 15                     |
| <b>Monday, November 12, 2018</b>    | Community Building/Fire Hall, Port Alsworth   | 13                     |
| <b>Tuesday, November 13, 2018</b>   | Hangar, Igiugig                               | 23                     |
| <b>Tuesday, November 13, 2018</b>   | Old School, Kokhanok                          | 10                     |
| <b>Wednesday, November 13, 2018</b> | Carl N. Jensen Gathering Hall, Pedro Bay      | 5                      |
| <b>Wednesday, November 13, 2018</b> | Newhalen School Library, Newhalen and Iliamna | 15                     |

Map 1 shows the villages visited during the community sessions in relationship to the location of the proposed Pebble Project.



# In-vicinity Communities

- Kenai Peninsula Borough
- Lake & Peninsula Borough
- National Parks and Preserve
- Pebble Project
- Communities
- Roads
- Rivers
- Water

N  
1:500,000

Date: November 8, 2018  
Coordinate System: WGS 1984 World Mercator  
Projection: Mercator  
Author: D.Szot



LAKE AND PENINSULA BOROUGH SOCIOECONOMIC AND  
FISCAL IMPACT ASSESSMENT: COMMUNITY SESSIONS  
SUMMARY, NOVEMBER 12 – NOVEMBER 14, 2018

DRAFT @ NOVEMBER 2018

InterGroup focused on three questions in the community sessions:

- What do we need to know about your community to help understand how the Pebble Project might affect you?
- What are your interests and concerns related to the Pebble Project?
- Who should we make sure we talk to as part of our research?

To help spark conversation, InterGroup brought along planning maps for each village and a larger regional map, along with two posters that explained the purpose of the sessions and comment forms. The regional map is included as Map 1. The posters and comment form are included in Appendix B.

Participation in the sessions was voluntary. Community members who spoke with InterGroup were informed that InterGroup would make notes from our conversations with people in the villages, but would not attribute specific statements to anyone in any of our reports to the Borough. InterGroup also received six completed comment forms.

InterGroup would like to thank everyone who attended a community session and the community sponsors who helped organize the sessions.



*Set up for Community Session in Nondalton*

## 2.0 WHAT WE HEARD

---

Below is a summary of what InterGroup heard during the community sessions. The summary is organized by the topic areas outlined in Chapter 9.08 of the Lake and Peninsula Borough Municipal Code. The comments are not direct quotes from any individual conversation. We have tried to summarize the comments we heard most often but it is recognized that a variety of perspectives were shared and we may not have captured all comments from the community sessions.

### 2.1 POPULATION

- Residents expressed concern about people moving into the area and placing strain on village infrastructure (housing, health care) and the resources (fish, wildlife) that support subsistence resource use.
- Residents were also concerned about people moving away, especially if either their way of life or ability to engage in subsistence resource use change as a result of the Pebble Project.

### 2.2 EMPLOYMENT

- Residents noted that it can be difficult to find employees for local businesses and community projects. Some residents expressed concern that if the Pebble Project were to proceed, the competition for local labour could become intense.
- Residents would like to see individuals from the Borough who are employed on the Pebble Project move beyond unskilled and semi-skilled labour to more skilled, technical, and management positions.

### 2.3 INCOME

- Residents would like to be able to access higher-paying and more senior positions. In particular, several people noted they wanted to make sure more skilled, technical, and management positions were available to local residents.
- Residents noted the importance of commercial fishing, sport fishing and hunting and the subsistence economy to the region. They expressed concern that the Pebble Project may reduce or damage the ability to earn monetary or non-monetary income through commercial fishing, sport fishing and hunting and the subsistence economy.

## 2.4 EDUCATION

- We heard from many residents that schools are very important to their communities. Residents are proud of their schools and their students and want to make sure they can continue to provide quality education in the villages.
- Many people noted that students and youth need to be involved in conversations about the Pebble Project because they will experience many of the effects of the Pebble Project if it proceeds.
- Some residents expressed concern that schools in Iliamna and Newhalen in particular may start to have capacity issues if the local population increases as a result of the Project.



*School in Nondalton*

- Village residents would like to see training start early to maximize local employment opportunities. They would like to see village residents learn skills that would facilitate employment beyond the Pebble Project and would like village residents to train for more skilled and technical positions.
- Residents expressed concern about identifying people for training opportunities in a timely manner. They suggested that youth today need information about potential employment opportunities.
- Residents suggested that the Pebble Partnership provide funding to the Lake and Peninsula School District to support specialized training programs and scholarships for students.
- Residents suggested establishing a vocational school in the Borough. Some residents thought that the school building in Pedro Bay would be a potential option.
- To take advantage of many of the employment opportunities on the Project, village residents would need a driver's licence and there is no driver's education in the Lakes Area Villages. Driver training was suggested as one type of transferable skill that could begin to be taught soon.



*School Volleyball Tournament in Port Alsworth*

## 2.5 HOUSING

- Residents noted that there are existing housing shortages in some of the villages. It has been difficult to develop new housing in many villages.
- In Iliamna and Newhalen, residents were particularly concerned about housing shortages because the villages are closest in proximity to the Project site.



*Igiugig*

## 2.6 FUEL AND ENERGY

- Pebble Project infrastructure could potentially reduce fuel costs if villages could use the access routes (road and/or ferry) to transport fuel.
- However, some village residents noted that fuel prices have increased when Pebble is completing exploration work in the region.
- Residents noted that if villages could tap the natural gas pipeline that would be built for the Pebble Project it may reduce heating and electrical generation costs. There were concerns about the feasibility of developing and building a gas distribution system within villages.

## 2.7 HEALTH CARE

- Some people expressed concern the Pebble Project workforce could strain health care resources in the Borough. It may make accessing services at clinics more difficult for residents.
- Some health care workers noted they are not equipped to address emergency medical issues like major transportation crashes or chemical spills. They noted they would need additional equipment and training to be able to respond to these types of health emergencies.
- Some people noted that subsistence resource use not only helps save money, but also provides residents with a source of healthy food. Residents noted that there is a low incidence of diabetes in the Borough. Some residents expressed concern that the Pebble Project may reduce the consumption of subsistence resources and negatively affect nutrition and health in the area.
- Residents expressed concern about health issues tied to dust from Pebble Project construction and operation, such as respiratory issues and allergies.
- Some residents were worried that the project could affect family and community cohesion. For example, if workers have to stay at a camp while working it would take them away from their families and communities for extended periods.
- If there's an influx of workers from outside the Borough, there may be an increase in drugs and alcohol use in the community.

## 2.8 SUBSISTENCE RESOURCE USE

### Culture and Way of Life

- Many residents noted that subsistence resource use is central to the culture and way of life in the Borough. If there are changes to subsistence resource use, that will change how cultural knowledge is transmitted from generation to generation.
- Village residents enjoy their current way of life and subsistence resource use. Many residents expressed concern the Project would fundamentally change their communities if it proceeds.
- Residents often stated there is a spiritual value to eating meat that you harvested. Everything harvested from the land and water is a medicine.
- Subsistence resource use offsets high food costs, but also develops and sustains kinship and community bonds and cultural identity

### Fish and Water

- We heard that salmon is a key species for residents. Damage to the salmon stocks would fundamentally threaten the way of life for many village residents.
- Igiugig residents noted that they worried their location at the lake outlet, downstream of the Project site, means pollution effects from throughout the area would affect them. They noted they are gatekeepers for 10 million salmon.
- There are village residents who still haul water from the lake because they think it tastes better than treated water. There were concerns the water would no longer be safe to drink if the Project goes ahead.



*Artwork in Carl N. Jensen Gathering Place in Pedro Bay*

### **Noise**

- Village residents were worried that noise from exploration and construction, including blasting, helicopters, and truck traffic would frighten away caribou and moose near the Pebble Project site.

### **Habitat Fragmentation**

- The proposed road infrastructure on the north side of Lake Iliamna would pass through areas that residents identified as important for harvesting caribou and moose.
- Some residents were concerned the proposed ferry crossing would create open water in the winter that would affect freshwater seal populations and fish that over-winter in the lake.

### **Increased Competition and Access**

- If there is an increased influx of population, competition for resources may increase and become too great for the sustainability of key species.
- The proposed access routes could make it easier for outsiders to harvest resources, which could affect the sustainability of key species.

### **Important Areas**

- Village residents pointed out areas on the map that were important for their subsistence resource use activities, including Kaskanak Creek, Groundhog Mountain, the north shore of Lake Iliamna east of Newhalen stretching north to the Pebble Project site.
- The site of the Pebble Project was described by village residents as their backyard and has been an important area for harvesting resources for generations.

## 2.9 POST-CLOSURE IMPACTS

- If the Pebble Project is built, residents would like to ensure that infrastructure, such as access routes, would be useful to residents after project decommissioning and closure. Some residents were concerned that a ferry route would be impossible for the Borough to maintain after the Project ceases operations.
- A village resident noted that a project can leave an area better than it was before project development, but that it takes coordination among developers, government, and communities.



*Pedro Bay*

## 2.10 OTHER ISSUES AND CONCERNS

### 2.10.1 Transportation Infrastructure and Access

Map 2 presents the access options under consideration for the Pebble Project. This map was presented at the community sessions for discussion.

#### Roads

- Residents want to know who would be able to use the roads: the public at large, village residents, shareholders.
- Residents were interested in being able to use the roads for transporting building supplies, fuel, and groceries, because it could help lower costs.
- There was concern that the new access routes would open the area to future resource development.
- Village residents expressed both support and opposition to the proposed access routes. Support was typically tied to decreased fuel and supply costs and easier movement between villages. Opposition was usually because increased road traffic and access could affect wildlife.
- The road between Newhalen and Iliamna may require upgrades and maintenance if the villages are used as a staging area for Pebble Project activities.
- Zoning may need to change in Iliamna and Newhalen to prevent large vehicles from passing through residential areas.

#### Ferry

- We heard that the lake is an important transportation route between villages and that in the winter it is often used as a crossing.
- Open water in winter would eliminate the most efficient travel route between the northeast and southwest ends of Lake Iliamna, which could isolate villages from one another by limiting travel or needing to make use of longer, land-based routes necessary.
- Residents noted that the ferry area would need to be well marked to prevent collisions. There were also concerns that the ice may be too thin for snowmobile traffic.
- Open water in the winter could attract the fresh water seals from the northeast end of Lake Iliamna. Ferry traffic could then pose a risk to the seal population.
- Year-round ferry traffic could affect the salmon populations in Lake Iliamna.
- In Iliamna and Newhalen, residents were concerned that project-related barges could block access to the lake by village residents and businesses.



Sources: AECOM; Pebble; USGS; ADNR



**Options**

- South Access Route (Road and Ferry) - ACC-001, 006, 010, 013
- North Access Route (Road Only) - ACC-002, 014, 017
- North Access Route (Road and Ferry) - ACC-003, 008, 009
- West Access Route - ACC-004
- Bristol Bay Access Route - ACC-005
- Kokhanok East Ferry Terminal - ACC-011

**PEBBLE MINE EIS**

- Knoll Head/Iniskin Bay Port Site - ACC-015
- Fortification Bluff/Rocky Point Port Site - ACC-016
- ▲ Amakdedori Offshore Lightering - ACC-022
- ▲ Iniskin Offshore Lightering - ACC-023
- South Pipeline - POW-007
- North Pipeline - POW-010

**Other Features**

- Proposed Mine Footprint
- ∩ Existing Roads
- Borough Boundary
- Bureau of Land Management
- Native Patent or IC; Native Selected
- State Patent or TA; State Selected

- State Game Refuge/Sanctuary
- National Wildlife Refuge
- National Park

**ACCESS OPTIONS**

**FIGURE 1**

### **2.10.2 Community Cohesion and Equitable Distribution of Benefits**

- Residents noted that the Pebble Project had the potential to create rifts between communities and within communities.
- Residents commented that economic inequalities were already becoming apparent since some villages have been in a better location to take advantage of employment and business opportunities related to exploration.
- Many residents expressed the view that the Borough should ensure any benefits derived from the Pebble Project are distributed fairly.

### **2.10.3 Transparency**

- Residents asked about what aspects of InterGroup's work would be available to them.
- Residents expressed frustration that results from environmental studies completed for the Pebble Project were not readily available.
- Residents were concerned that Pebble Project focused on engagement with Native Corporations because they felt that the Native Corporations were not sharing information with them. Other village residents noted that many shareholders no longer live in the villages but were making decisions for the people who still live in the villages.
- Residents expressed interest in participating in monitoring activities and information sharing if the Pebble Project is built.

### **2.10.4 Meeting/Project Fatigue**

- We heard there have been so many meetings related to the Pebble Project that village residents were no longer sure of the purpose of each meeting. They also expressed frustration that there did not often appear to be tangible results from participating in meetings.
- Village administrators noted that they were spending more and more time reading material about the Pebble Project and attending community sessions. Participating in events is taking people away from other obligations.

### **2.10.5 Accidents and Spills**

- Residents were worried about the result of catastrophic accidents and spills and how they would affect the water and salmon.
- Residents were interested in learning more about Pebble Project's spill response plans and emergency response plans.
- Residents were concerned that the frequency of shipments of fuel, concentrate, and other hazardous materials increases the chance that there could be spills.

### 2.10.6 Other

- Some residents of Nondalton expressed interest in building a bridge, while others were opposed to the bridge. One of the residents who was opposed was worried that the community would no longer be considered a subsistence community if the bridge was built.
- No project of this scale has been proposed for this area, which makes the Pebble Project a first for the Borough. This creates uncertainty, which will need to be managed.
- Newhalen and Iliamna expressed interest in having a Village Public Safety Officer to help address potential public safety concerns related to the Project.
- Residents wanted to know why it was necessary to hire outside consultants to complete this work for the Borough.
- The timing and notification for future meetings should be reconsidered. It is difficult for residents to attend meetings scheduled during the day. Evening may be better for attendance.
- One resident noted a concern about losing their exemption for buying tabs for their vehicles if there's a large increase in traffic in Newhalen and Iliamna.
- Residents expressed interest in having a senior assisted living facility in the Borough so elders can remain in their community closer to family and friends.

LAKE AND PENINSULA BOROUGH SOCIOECONOMIC AND  
FISCAL IMPACT ASSESSMENT: COMMUNITY SESSIONS  
SUMMARY, NOVEMBER 12 – NOVEMBER 14, 2018

DRAFT @ NOVEMBER 2018

## APPENDIX A: Community Session Invitation Letter

November 6, 2018

To the Village of \_\_\_\_\_.

The Borough will be in \_\_\_\_\_ on \_\_\_\_\_ to listen to your thoughts on how the proposed Pebble Project may affect life in your village.

The U.S. Army Corps of Engineers is preparing an Environmental Impact Statement on the proposed Pebble Mine. The Corps, and the state agencies have responsibilities to evaluate the proposed mine's effect on water, air, fish, and other parts of the environment. The Borough is preparing a separate report that evaluates the proposed projects effect on people, communities, and economics of village life.

Ten years ago, the Borough passed a large project ordinance. This ordinance allows the Borough to regulate the proposed mine's effect on our villages. To do that, we have hired a contractor, InterGroup Consultants, to help us with that task. They are preparing a report for us that will look at how the Pebble Project could affect people and communities including education, housing, fuel and energy, health care, subsistence resources and transportation.

This contractor does not work for Pebble. They work for us – for you and the borough. Their work is not part of the Corps's Environmental Impact Statement. Should the mine be allowed, we expect that the report will help us capture any positive benefits and minimize the negative effects from the project.

We hope that anyone in the village who is interested can meet us at \_\_\_\_\_. We will be there from approximately \_\_\_\_\_ to \_\_\_\_\_.

I have attached an explanation from the consultant that provides more information.

Sincerely,

Nathan Hill  
Manager

Attachment

Socioeconomic and Fiscal Impact Assessment of the Pebble Project  
Scoping Workshops in the Villages in the Lake and Peninsula Borough  
Week of November 12, 2018

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Background:

The Lake and Peninsula Borough hired InterGroup Consultants Ltd. (InterGroup) to help prepare a socio-economic and fiscal impact assessment report related to the Pebble Project. This type of report is required under Chapter 9.08 of the Lake and Peninsula Borough Municipal Code. The report will look at different aspects of how the Pebble Project could affect people and communities including education, housing, fuel and energy, health care, subsistence resources and transportation.

The purpose of the report is to help the Borough understand how the Pebble Project might affect people and communities if it proceeds and what concerns residents have about the Pebble Project. The report will identify potential impacts and benefits of the Pebble Project and allow the Borough to make plans for how to address them. This might include negotiating with Pebble for funding for programs or infrastructure to help minimize impacts; and/or agreements on employment and purchasing policies that could enhance the economic benefits of the Pebble Project to the people in the Borough.

The report will also be useful to help document anticipated impacts and benefits in the event the Pebble Project proceeds. This will help the Borough monitor the effects of the Project, and respond or adapt to different circumstances as they unfold.

InterGroup's Experience:

InterGroup is an independent consulting firm that specializes in understanding how projects affect people and communities. InterGroup has helped negotiate agreements between communities and developers to minimize adverse effects of developments and maximize project benefits for local people.

Andrew McLaren and Jennifer Olson from InterGroup will be travelling to the villages around Lake Iliamna the week of November 12<sup>th</sup> to meet with local residents and get a firsthand introduction to the communities.

Purpose of Scoping Sessions:

A half-day session is planned for each community. Ideally the session will start with a guided walk around the community with a community leader to help provide context to Andrew and Jennifer. This would be followed by an informal public conversation at a community centre or other public location.

The format will be informal and flexible to respect the needs and interests of each village. Some basic questions will be asked at each session:

- What do we need to know about your community to help understand how the Pebble Project might affect you?
- What are your interests and concerns related to the Pebble Project?
- Who should we make sure we talk to as part of our research?

Participation in the sessions is voluntary. People are free to come and go as they please. InterGroup will make notes from our conversations with people in the villages, but we will not attribute specific statements to anyone in any of our reports to the Borough.

Next Steps

The scoping sessions are just the beginning of the work InterGroup will be doing. There will likely be follow-up conversations and visits to the villages early in 2019.

LAKE AND PENINSULA BOROUGH SOCIOECONOMIC AND  
FISCAL IMPACT ASSESSMENT: COMMUNITY SESSIONS  
SUMMARY, NOVEMBER 12 – NOVEMBER 14, 2018

DRAFT @ NOVEMBER 2018

## APPENDIX B: Community Session Materials

## Socioeconomic and Fiscal Impact Assessment of the Pebble Project

The Lake and Peninsula Borough hired InterGroup Consultants Ltd. to prepare a socioeconomic and fiscal impact assessment report related to the Pebble Project as required under Chapter 9.08 of the Lake and Peninsula Borough Municipal Code.

InterGroup Consultants Ltd. is an independent consulting firm that specializes in understanding how projects affect people and communities.

The report will help the Borough:

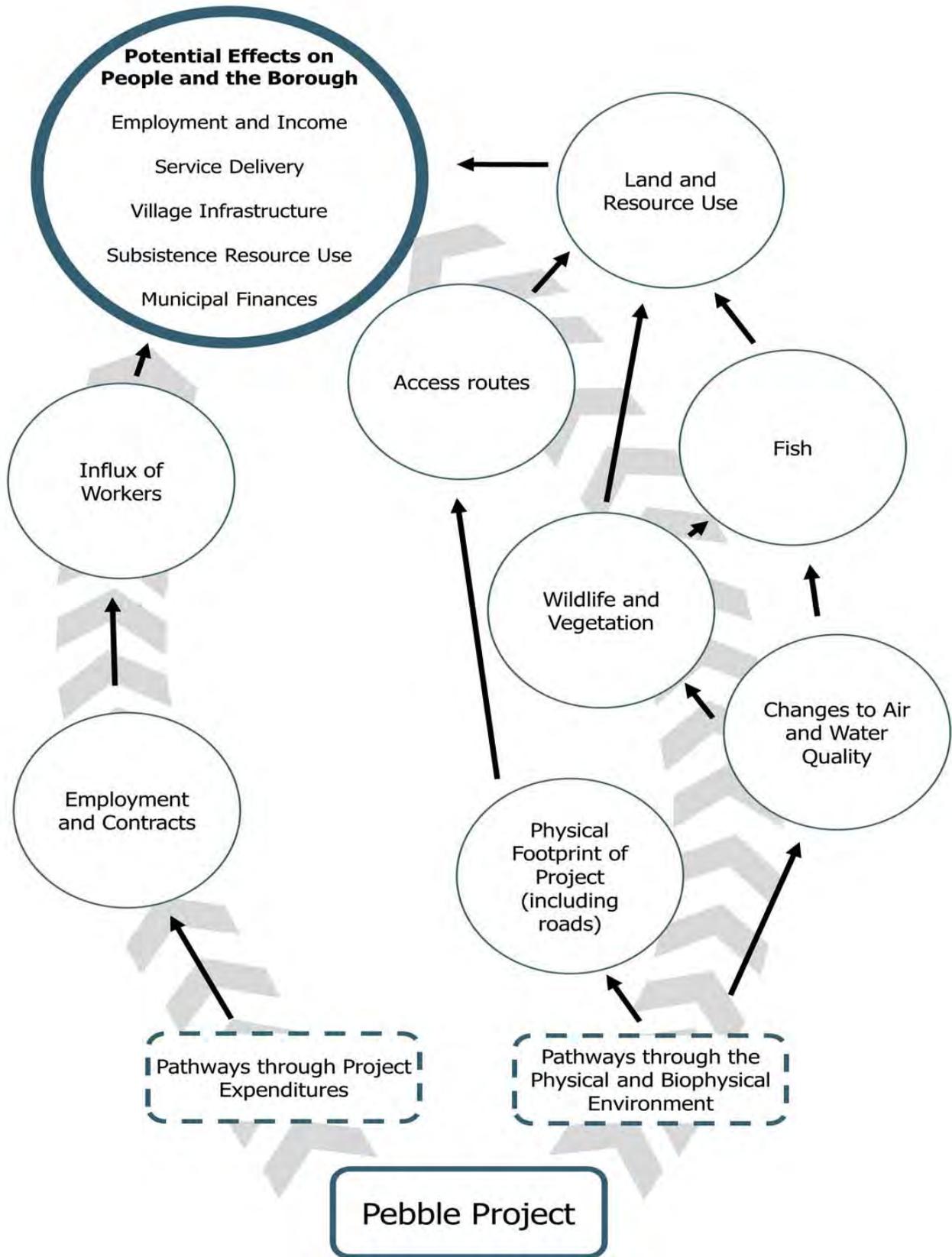
- Understand how the Pebble Project might affect people and communities if it proceeds;
- Identify concerns residents have about the Pebble Project; and
- Develop plans or agreements that help reduce the potential impacts of the Project and increase potential benefits.

We're here to listen to you.

- What do we need to know about your community to help understand how the Pebble Project might affect you?
- What are your interests and concerns related to the Pebble Project?
- Who should we make sure we talk to as part of our research?

These meetings are a first chance to introduce InterGroup to the villages. We plan to have further conversations with people in the coming months.

We appreciate you sharing your perspectives with us. We won't attribute any comments or concerns we hear today to specific individuals in any documents we provide the Borough.



SOCIOECONOMIC AND FISCAL IMPACT ASSESSMENT FOR THE PEBBLE PROJECT  
COMMENT FORM

NOVEMBER 2018

**Background Information**

**Where do you live?**

**How old are you?**            <18 years    18-24    25-34    35-44    45-54    55-64    65+

**Gender?**                      Male            Female            Prefer not to answer

If the Pebble Project goes ahead, do you have any concerns about how it might affect you, your family or your community? Please explain.

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Is there anything you would like us to know about your community as we try to understand the potential effects of the Pebble Project on people?

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If there are specific topics you would like us to follow-up on you with, please provide your contact information (providing this information is voluntary and we will not distribute your contact information):

Name: \_\_\_\_\_

Telephone: \_\_\_\_\_

Email: \_\_\_\_\_

Preferred method to contact you: \_\_\_\_\_

Topic(s) you'd like to discuss: \_\_\_\_\_

Feel free to email your comments or questions to [jolson@intergroup.ca](mailto:jolson@intergroup.ca)



500-280 Smith Street  
Winnipeg, MB R3C 1K2  
[www.intergroup.ca](http://www.intergroup.ca)

APPENDIX C:  
Preliminary Results Presentation  
Socioeconomic and Fiscal Impact  
Assessment for the Pebble Project Draft –  
March 2019





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Socioeconomic and Fiscal Impact Assessment for the Pebble Project  
Draft – March 2019



## *Introduction*

The Lake and Peninsula Borough hired InterGroup Consultants Ltd. to prepare a socioeconomic and fiscal impact assessment report for the Pebble Project. The Pebble Project requires a Large Project Permit from the Borough under Chapter 9.08 of the Lake and Peninsula Borough Municipal Code.

The report is different from the environmental impact statement. It will summarize how the project could affect people and communities if it proceeds. It will help the Borough develop plans and agreements to reduce potential negative impacts of the project and increase potential benefits. The Borough can do this by proposing mitigation and enhancement measures as part of the permit or through its ability to administer taxes.



## *Introduction*

InterGroup visited the Lakes Area Villages in November 2018 and has reviewed information available from Pebble and other public sources.

This presentation provides an overview of InterGroup’s initial findings on how the Pebble Project might affect people and communities if it proceeds and some thoughts on plans and actions the Borough should plan to undertake.

The purpose of these community sessions is to test these findings and recommendations with people in the Borough and help identify gaps we should fill or changes we should make.



## *Introduction*

The Pebble Project could affect people and communities in a number of different ways. People will also experience the project differently depending on where they live, work and travel. Some people may consider certain changes to be positive while others may view the same change as negative.

The presentation discusses the following topic areas:

Population

Transportation and Traffic

Employment and Income

Education

Housing

Fuel and Energy

Subsistence  
Resource Use

Community Health and  
Well-being



## *Population Changes*

### Why do population changes matter?

- Population changes affect the need for housing, education, and other services.
- Population changes due to new people moving to the Borough can also affect community cohesion and family and community relationships.

### How could the project affect population?

- Increases in local job opportunities on the project or with related businesses could help keep current residents in the Borough who might normally otherwise feel like they need to leave to look for work in other places.
- Local job opportunities could encourage former residents to move back home.
- Job and business opportunities might attract new residents to move to the Borough, particularly in villages closest to the project site.
- Reduced cost of living from lower transportation and energy costs could help retain or attract residents.
- Borough residents working on the project may move to larger population centers for the services and amenities available there.
- Considering all factors, there will likely be an overall increase in population. The largest gain would be in Iliamna and Newhalen because new businesses that might service the project will likely locate there. Other villages around the lake would likely see a smaller increase, mostly through people deciding to stay or attracting people with connections to the village back home.



Lake and Peninsula Borough Socioeconomic and Fiscal Impact Assessment – Preliminary Results

*Population Changes*

Population changes from 2000 to 2017

|                                  | 2000    | 2005    | 2010    | 2015    | 2017    | Average growth rate<br>2000 to 2017 |
|----------------------------------|---------|---------|---------|---------|---------|-------------------------------------|
| Port Alsworth                    | 104     | 111     | 159     | 211     | 238     | 5.0%                                |
| Nondalton                        | 221     | 188     | 164     | 152     | 144     | -2.5%                               |
| Iliamna                          | 102     | 93      | 109     | 94      | 100     | -0.1%                               |
| Newhalen                         | 160     | 187     | 190     | 207     | 230     | 2.2%                                |
| Igiugig                          | 53      | 44      | 50      | 48      | 57      | 0.4%                                |
| Kokhanok                         | 174     | 170     | 170     | 140     | 173     | 0.0%                                |
| Pedro Bay                        | 50      | 71      | 42      | 47      | 32      | -2.6%                               |
| Lakes Area Villages total        | 864     | 864     | 884     | 899     | 974     | 0.7%                                |
| Rest of Borough                  | 959     | 783     | 747     | 778     | 747     | -1.5%                               |
| Total Lake and Peninsula Borough | 1,823   | 1,647   | 1,631   | 1,677   | 1,721   | -0.3%                               |
| Alaska (State Level)             | 628,346 | 667,146 | 714,015 | 737,467 | 737,080 | 0.9%                                |

Source Alaska Department of Labor and Workforce Development



## *Population Changes*

### Mitigation and enhancement

- Monitor population trends at the village and Borough level to identify where housing, education, and other services might need to be expanded.
- Ensure that all Borough villages are designated pick-up points for project employment to encourage people to stay in the Borough.
- Ensure that there are convenient pick-up points outside the Borough to minimize the need for non-local workers to relocate to the Borough.
- Do not allow daily commuting between the project site and local communities to prevent workers from relocating to villages closer to the project site.

### What do you think?

- How do you feel about potential population changes?
- If the project goes ahead, do you think population growth in your village should be encouraged or managed to the extent possible?



## *Transportation and Traffic*

### Why are transportation and traffic important?

- Changes to transportation and traffic can drive changes to population, fuel and energy costs, housing, services, and subsistence resource use.

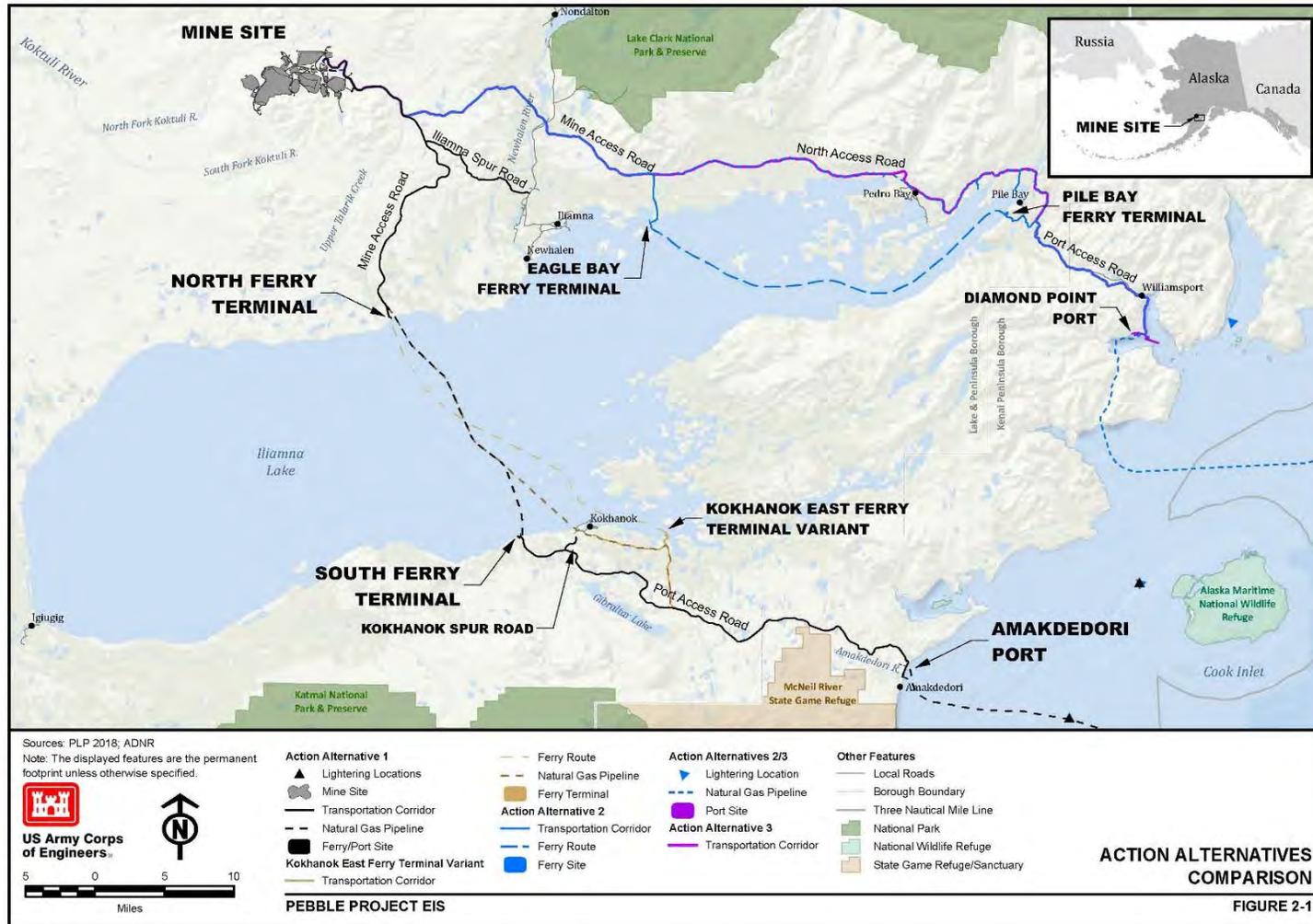
### How could the project affect transportation and traffic?

- Changes will depend on the alternative selected and the village.
- The ferry route would change ice conditions on Lake Iliamna in the winter and residents may need to rely more on land-based travel.
- Village residents and the Borough may be able to use the roads built for the project or the ferry to transport goods or access areas for resource harvesting (for example, hunting or gathering plants).
- New roads and the right-of-way could increase access to certain areas, which can be considered as a positive or negative effect.
- Ferry traffic could affect fish and wildlife.
- Increased traffic (ferry and road) may affect safe travel between villages.



Lake and Peninsula Borough Socioeconomic and Fiscal Impact Assessment – Preliminary Results

*Transportation and Traffic*



Source: Draft EIS



## *Transportation and Traffic*

### Mitigation and Enhancement

- Mark open water and ice roads in the winter, the ferry route, and road crossings for safe travel. Where necessary, groom and mark land-based alternative travel routes in winter for safe travel.
- Do not allow individuals from outside the Borough to use the road or ferry for personal use, such as sightseeing, hunting, and fishing.
- Allow Borough residents to use new transportation infrastructure, such as the road and ferry route, to transport goods to help reduce cost of living.
- Allow Borough schools and residents to use the road to get to the port if it creates a less expensive way to reach the road system in Homer.

### What do you think?

- Are there any other aspects of village life that changes to transportation and traffic could affect?
- Do you see increased access as a benefit? Why or why not?



## *Employment and Income*

### Why are employment and income important?

- Employment and wage income are important parts of the mixed economy in the Borough. They help support residents and communities.

### How could the project affect employment and income?

- According to the environmental impact statement, the Pebble Project would create a number of construction and operation jobs – approximately 2,000 jobs during construction and 850 jobs during operations. This may create new employment opportunities and greater income for Borough residents.
- The project may increase competition for local employees and inflate wages.
- Project employment could positively and negatively change the ability of residents to participate in community life and subsistence resource use activities.
- Increased income could lead to increases in drug and alcohol use or irresponsible spending.



## Mitigation and Enhancement

- Hiring preferences to maximize employment opportunities for Borough residents.
- Ensure that all Borough villages are designated pick-up points for project employment to maximize employment opportunities for Borough residents.
- Preferences for using local businesses to maximize opportunities for them and encourage the development of new businesses.
- Provide support (financial or in-kind) for vocational education for all village residents and K-12 education to maximize opportunities for Borough residents to gain project employment, including employment in higher skilled and management positions.
- Flexible work rotations, schedules and job sharing to maximize local employment opportunities and allow residents to participate in seasonal subsistence resource use. Job sharing may also help villages and the Borough retain workers.
- Offering life skills courses, including money management to help reduce the risk of irresponsible spending.
- Monitoring employment and local business outcomes to ensure targets are being met for local employment. Monitoring results can trigger changes if targets are not being met.
- Monitoring employment and unemployment rates and local wage inflation to understand the effects of project employment for other businesses and employers to have an adequate labor supply.



## *Employment and Income*

### What do you think?

- What else could the Borough be doing to maximize employment and income opportunities?
- Are there supports needed to encourage local businesses that could take advantage of project-related opportunities?
- Are there other steps that could be taken to maximize benefits for all residents of the Borough?
- What else could make working for the Borough and local businesses more attractive?



## Why is education important?

- Schools are important to many elements of village life – without schools village populations tend to shrink for a variety of reasons (families move away, the school is often a major employer).
- A good education system is important to the villages.
- The project could provide training and education opportunities for Borough residents.

## How could the project affect education?

- There could be more students because of project-related population growth, which means that schools may need additional staff or, in some instances (for example, in Newhalen), require an expansion.
- There could be training and education programs put in place for students and Borough residents to take advantage of employment on the project, with the Borough and villages, or with local businesses.
- Money from the payment in lieu of taxes could allow schools to expand services in general.



## Mitigation and Enhancement

- The project could work with the Lake and Peninsula School District and other educational partners to start training and education programs for students and adult village residents. This would help maximize employment.
- The Lake and Peninsula School District could use money from a payment in lieu of taxes to expand programming or complete capital projects to improve the level of service in the Borough.

## What do you think?

- Are there other ways the project could affect schools in the Lakes Area Villages?
- Are there other ways for all schools in the Borough to take advantage of project-related opportunities?
- Are there other partners that the Borough should be looking to work with?



## Why is housing important?

- Housing is a basic need. Overcrowded housing can negatively affect individual and community health and well-being.

## How could the project affect housing?

- Population growth could lead to a need for more housing. The availability of land and utility services (for example, water, waste treatment, and electricity) could limit the ability to build or expand housing in the Borough.
- New housing could place additional demands on utilities and services such as water treatment and distribution, wastewater treatment, electricity.
- Improved transportation connections might lower the cost of building new housing.
- The ability to afford new housing may worsen pre-existing divisions in a village or create new ones.



## Mitigation and enhancement

- Work with the villages to monitor condition and availability of housing in the Borough.
- Ensure transportation for workers is convenient from many locations outside the Borough (for example, offer flights from Anchorage and Kenai) to minimize incentives for non-local workers to relocate to the Borough and increase pressure on housing availability.
- Use funds from the payment in lieu of taxes to upgrade village infrastructure (for example, wastewater treatment plants in Newhalen and Kokhanok) to support the development of new housing if required.
- Work with necessary partners (for example, BBNA and native village corporations) to help long-time residents access new housing to help maintain community cohesion.

## What do you think?

- How do you think the Project might affect local housing?
- What do you think the Borough should do to plan for housing needs?



## *Fuel and Energy*

### Why are fuel and energy important?

- Fuel and energy prices are a key factor affecting the cost of living in the Borough.

### How could the project affect fuel and energy?

- The project could improve transportation connections making it cheaper to deliver fuel, such as oil, gas, and propane, to communities in the Borough.
- Depending on the alternative chosen, the project could provide natural gas connections to Iliamna, Newhalen, Nondalton (all alternatives), Kokhanok (Alternative 1), and Pedro Bay (Alternatives 2 and 3). These connections could help provide lower cost fuel for heating and electricity generation.
- These benefits might result in differences in cost of living between communities connected to the transportation network and those that are not directly connected to it.



## *Fuel and Energy*

### Mitigation and enhancement

- Develop agreements to ensure maximum benefits for the Borough in terms of accessing lower cost fuel source and lower cost transportation.
- Monitor fuel and energy prices to determine if the cost of fuel and energy are reducing the cost of living in the Borough and whether it is creating differences between villages in the Borough.

### What do you think?

- How do you think the Project might affect fuel and energy costs in the Borough?
- What do you think the Borough should do to maximize the benefits for all Borough residents?



## *Community Health and Well-being*

### Why is community health and well-being important?

- Health care is an essential service. It is challenging to provide health care services especially in smaller communities.
- Health is more than the absence of disease. Understanding health requires thinking about a community's social, physical, and economic environments, along with individual factors. The project has the potential to affect all of these environments.

### How could the project affect community health and well-being?

- If the population grows, it could put more demands on health care services.
- If there is an accident on the proposed road or ferry route, health care practitioners and facilities in nearby villages may not have the resources necessary to respond.
- Project employment may change the ability of Borough residents to engage in subsistence resource use activities, which could have positive and negative effects on their diets.
- The transient population from the project and/or increased income may result in drugs and alcohol being more easily accessed in the Borough.
- Environmental changes (for example, changes to water quality and accidents) could have a negative effect on the health of Borough residents.
- There may be a greater need for a public safety officer in the villages as a result from population increases, the transient population, and potentially easier access to drugs and alcohol.



## *Community Health and Well-being*

### Mitigation and Enhancement

- Community health and well-being, including health care could be included in the monitoring program. Indicators and monitoring methods can be determined in collaboration with Southcentral Foundation.
- Southcentral Foundation could work with the project and on-site health care to add to health care services in the Borough.
- Safety and emergency response protocols for the transportation corridor could ensure an appropriate and timely response to accidents.
- Provide financial support for a village public safety officer to reduce public safety concerns.
- Programs to support subsistence resource use to maintain access to nutritious, healthy local foods.
- Provide life skills courses, including money management, for Borough residents working on the project.
- Provide access to counselling for village residents and their families for alcohol and drug use.
- Code of conduct for employees developed with input from the Borough to alleviate public safety concerns.
- Mitigation and enhancement measures for environmental changes (for example, dust suppression and spill management plans).



## *Community Health and Well-being*

### What do you think?

- Are there other changes to community health and well-being that you are concerned about?
- Are there other measures that could be taken to reduce negative changes and increase positive ones?
- How could potential benefits be maximized for all Borough residents?



## *Competition for Subsistence Resources*

### Why is subsistence resource use important?

- Subsistence resource use is an important part of the mixed economy in the Borough that helps reduce some pressures from the high cost of living.
- Subsistence resource use has an important cultural component that helps maintain kinship and community bonds.

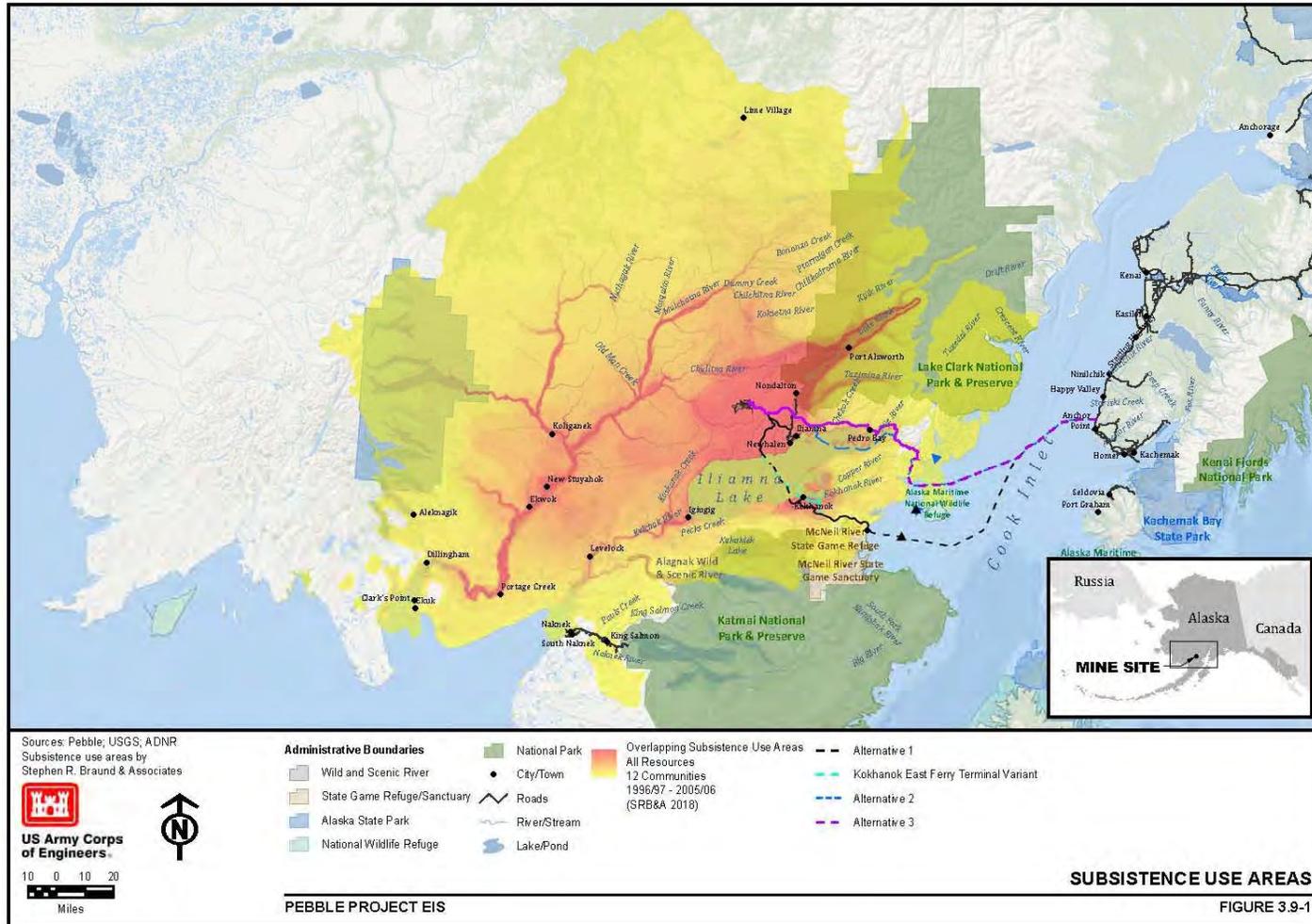
### How could the project affect subsistence resource use?

- Changes will depend on the alternative chosen and the village.
- The abundance and distribution of wildlife and fish could change, making residents travel to different locations.
- Areas previously used for subsistence resource use may no longer be accessible or new areas may be more easily accessible.
- Wood resources may diminish due to easier access.
- Depending on the proximity to the project, the experience may change.
- Some residents who work on the project may no longer be able to engage in subsistence resource use activities.



Lake and Peninsula Borough Socioeconomic and Fiscal Impact Assessment – Preliminary Results

# Competition for Subsistence Resource Use



Source: Draft EIS



## *Competition for Subsistence Resource Use*

### Mitigation and Enhancement

- Mitigation and monitoring for fish and wildlife should help reduce negative effects to subsistence resource use. Monitoring should be done in collaboration with the Borough. Monitoring results will need to be shared.
- Workers would not be allowed to hunt or fish during their work rotation to reduce competition for fish, wildlife, and plants.
- The project could provide support for cultural programming to promote the social and cultural aspects of subsistence resource use.
- The project could provide support to access to different areas to facilitate travel to new, more distant areas for resource harvesting.
- Subsistence resource use should be included in the overall monitoring program and resource users should be involved.

### What do you think?

- Is there anything about subsistence resource use and the project that concerns you that hasn't been mentioned yet?
- Are there other programs that could be implemented to support subsistence resource use?



## *Preliminary Recommendations*

- **Project Monitoring Committee(s)**
  - Topics monitored should be employment and business, environmental, and socio-economics
  - Monitoring committees should include representation from the Borough and Lakes Area Villages
  - Each committee should clearly communicate monitoring results to the public
  - Committees should meet on a regular schedule
- **Access Management Plan**
- **Through a payment in lieu of taxes provide support**
  - Increased government and school services as determined by the Borough. These could include training and education programs, capital projects, and programs to support continued subsistence resource use activities.



## *Next Steps*

March 2019

- Present preliminary findings and recommendations to the Lakes Area Villages and the Borough Assembly

April 2019

- Prepare draft report

May 2019

- Present final draft report to the Borough Assembly
- Finalize report and submit to the Borough



Thank you!



InterGroup

CONSULTANTS

300-259 Portage Avenue

Winnipeg, MB R3B 2A9

[www.intergroup.ca](http://www.intergroup.ca)