BARROW
COMPREHENSIVE PLAN

ADOPTED MARCH 3, 2015

NSB ASSEMBLY ORDINANCE #75-06-64

NSB PLANNING COMMISSION RESOLUTION #2014-19

CITY OF BARROW RESOLUTION #34-2014

BARROW ZONING COMMISSION RESOLUTION #2014-04

NATIVE VILLAGE OF BARROW RESOLUTION #2014-12

UKPEAGVIK INUPIAT CORPORATION RESOLUTION #2014-92

Prepared by

Community Planning Division
North Slope Borough Department of Planning & Community Services

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### Abbreviations and Acronyms

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<th>Description</th>
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<tbody>
<tr>
<td>°F</td>
<td>degrees Fahrenheit</td>
</tr>
<tr>
<td>AC</td>
<td>Alaska Commercial Company</td>
</tr>
<tr>
<td>ACTP</td>
<td>Arctic Coast Trading Post</td>
</tr>
<tr>
<td>ADEC</td>
<td>Alaska Department of Environmental Conservation</td>
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<tr>
<td>ADOT</td>
<td>Alaska Department of Transportation</td>
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<tr>
<td>ADOTPF</td>
<td>Alaska Department of Transportation and Public Facilities</td>
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<tr>
<td>AHFC</td>
<td>Alaska Housing Finance Corporation</td>
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<tr>
<td>ADLWD</td>
<td>Alaska Department of Labor and Workforce Development</td>
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<td>AKILF</td>
<td>Alaska In-Lieu Fee</td>
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<tr>
<td>AMI</td>
<td>Area Median Income</td>
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<tr>
<td>ANCSA</td>
<td>Alaska Native Claims Settlement Act</td>
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<tr>
<td>ANILCA</td>
<td>Alaska National Interest Lands Conservation Act</td>
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<tr>
<td>ARDOR</td>
<td>Alaska Regional Development Organization</td>
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<tr>
<td>ARM</td>
<td>Atmospheric Radiation Measurement</td>
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<tr>
<td>ASNA</td>
<td>Arctic Slope Native Association</td>
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<tr>
<td>ASRC</td>
<td>Arctic Slope Regional Corporation</td>
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<tr>
<td>ASTAC</td>
<td>Arctic Slope Telephone Association Cooperative</td>
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<tr>
<td>ATV</td>
<td>All-Terrain Vehicle</td>
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<tr>
<td>AWIC</td>
<td>Arctic Women in Crisis</td>
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<tr>
<td>BARC</td>
<td>Barrow Arctic Research Center</td>
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<td>BEDC</td>
<td>Barrow Economic Development Committee</td>
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<td>BEO</td>
<td>Barrow Environmental Observatory</td>
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<td>BHS</td>
<td>Barrow High School</td>
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<td>BIA</td>
<td>Bureau of Indian Affairs</td>
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<td>BLM</td>
<td>Bureau of Land Management</td>
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<td>BUECI</td>
<td>Barrow Utilities and Electric Cooperative, Inc.</td>
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<tr>
<td>BUS</td>
<td>Barrow Utilidor System</td>
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<tr>
<td>ccf</td>
<td>Hundred cubic feet</td>
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<tr>
<td>CCHRC</td>
<td>Cold Climate Housing Research Center</td>
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<tr>
<td>CEDC</td>
<td>Comprehensive Economic Development Center</td>
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<td>CFR</td>
<td>Code of Federal Regulations</td>
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<td>CO2</td>
<td>NSBSD Central Office 2</td>
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<tr>
<td>CIPM</td>
<td>Capital Improvement Program Management</td>
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<td>CY</td>
<td>Cubic yard</td>
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<td>CYS</td>
<td>Children and Youth Services</td>
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<td>D.A.R.E</td>
<td>Drug Abuse Resistance Education</td>
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<td>DERP</td>
<td>Defense Environmental Restoration Program</td>
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<td>DEW</td>
<td>Distant Early Warning</td>
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<td>DoD</td>
<td>Department of Defense</td>
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<td>DOE</td>
<td>Department of Energy</td>
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<td>DOTPF</td>
<td>Alaska Department of Transportation and Public Facilities</td>
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<td>EDA</td>
<td>Economic Development Administration</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
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<td>ESA</td>
<td>Endangered Species Act</td>
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<td>FAA</td>
<td>Federal Aviation Administration</td>
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<td>Federal</td>
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<td>FMR</td>
<td>Fair Market Rental</td>
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<td>FTE</td>
<td>Full-time employee</td>
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<td>HDPE</td>
<td>High Density Polyethylene</td>
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<td>HUD</td>
<td>Department of Housing and Urban Development</td>
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<td>ICAS</td>
<td>Iñupiat Community of the Arctic Slope</td>
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<td>IHS</td>
<td>Indian Health Service</td>
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<td>Indian Reorganization Act</td>
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<td>Internal Revenue Service</td>
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<td>Indian Reservation Roads</td>
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<td>IWC</td>
<td>International Whaling Commission</td>
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<tr>
<td>kW</td>
<td>Kilowatt</td>
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<td>kWH</td>
<td>Kilowatt Hour</td>
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<tr>
<td>MBR</td>
<td>Membrane Bioreactor</td>
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<td>MSW</td>
<td>Municipal Solid Waste</td>
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<tr>
<td>MW</td>
<td>Megawatt</td>
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<tr>
<td>NARL</td>
<td>Naval Arctic Research Laboratory</td>
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<tr>
<td>NAHASDA</td>
<td>Native American Housing Assistance and Self-Determination Act</td>
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<tr>
<td>Navy</td>
<td>U.S. Navy</td>
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<tr>
<td>NED</td>
<td>National Economic Development</td>
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<tr>
<td>NOAA</td>
<td>National Oceanic &amp; Atmospheric Administration</td>
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<td>NPR-A</td>
<td>National Petroleum Reserve – Alaska</td>
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<tr>
<td>NSB</td>
<td>North Slope Borough</td>
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<td>NSBMC</td>
<td>North Slope Borough Municipal Code</td>
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<td>NSBSD</td>
<td>North Slope Borough School District</td>
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<td>NSBEP&amp;CR</td>
<td>North Slope Borough Economic Profile and Census Report</td>
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<td>NSSRR</td>
<td>North Slope Subsistence Rural Region</td>
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<tr>
<td>N.T.S.</td>
<td>Not to Scale</td>
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<td>NVB</td>
<td>Native Village of Barrow</td>
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<td>NWS</td>
<td>National Weather Service</td>
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<td>PAR</td>
<td>Project Analysis Report</td>
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<tr>
<td>PFD</td>
<td>Permanent Fund Dividend</td>
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<td>PDF</td>
<td>Planar Deformation Features</td>
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<td>pp/pd</td>
<td>Per Person Per Day</td>
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<tr>
<td>PVT</td>
<td>Private</td>
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<tr>
<td>ROW</td>
<td>Right of Way</td>
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<tr>
<td>SOA</td>
<td>State of Alaska</td>
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<tr>
<td>SHR</td>
<td>Shareholder</td>
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<tr>
<td>SRB</td>
<td>Stephen R. Braund and Associates</td>
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<tr>
<td>SWOT</td>
<td>Strengths, Weaknesses, Opportunities and Threats</td>
</tr>
<tr>
<td>TDHE</td>
<td>Tribally Designated Housing Entity</td>
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</table>
TNHA  Tagiugmiullu Nunamiullu Housing Authority
TOS   Thermal Oxidation System
UIC   Ukpeaġvik Iñupiat Corporation
U.S.  United States
USACE U.S. Army Corps of Engineers
USAF  U.S. Air Force
USCG  U.S. Coast Guard
USDOI U.S. Department of the Interior
USDOT U.S. Department of Transportation
USFWS U.S. Fish and Wildlife Service
USGS  U.S. Geological Survey
VHF   Very High Frequency
WWTP  Wastewater Treatment Plant
1.0 INTRODUCTION

Barrow is the northernmost community in the United States, at the base of the Point Barrow peninsula and is bordered by the Chukchi and Beaufort seas of the Arctic Ocean. It is a small rural community 320 miles above the Arctic Circle and within the North Slope Borough (NSB), the largest municipality in the United States.

Barrow is facing issues common to many small towns across the United States, such as aging infrastructure and government revenues that do not keep pace with need. However, Barrow is truly unlike other communities. Its remote location makes access and transportation logistically difficult and expensive. It is considered to be one of the coldest and driest places in the United States, with an annual average temperature of about 12 degrees Fahrenheit (°F) and less than five inches of annual precipitation. Barrow is also the borough seat of government where diverse issues converge, among them Native Inupiat subsistence rights, oil and gas development activity and study of climate change in the Arctic.

1.1 Purpose of the Barrow Comprehensive Plan

The Barrow Comprehensive Plan is a long-range document intended to guide the physical and economic growth and development of Barrow and its Area of Influence (Figure 1) over the next 20 years, through 2035. The plan is a consolidated, cohesive and coordinated approach to community planning that can guide decision making for preservation, investment and development of future community resources and infrastructure. Community residents, major landowners, public officials and government staff among others have participated in the comprehensive planning process.

Upon adoption, the plan will become the primary land use policy document for Barrow and thus provide guidance on a variety of planning issues that are critical to the future of the community. It also contains a vision statement for the future and goals, objectives and strategies that are designed to implement that vision. The plan should be reviewed annually and updated as needed to reflect changing conditions and monitor implementation.

1.2 Basis for Comprehensive Planning

The authority for comprehensive planning in Alaska is provided by Title 29 of the Alaska Statutes. As a home rule borough, the NSB is responsible for planning, platting, land use regulation, and development of a Borough-wide comprehensive plan.

Alaska Statute 29.40.030 states:

(a) The comprehensive plan is a compilation of policy statements, goals, standards, and maps for guiding the physical, social, and economic development, both private and public, of the first or second class borough, and may include, but is not limited to, the following:

(1) statements of policies, goals, and standards;

(2) a land use plan;
(3) a community facilities plan;

(4) a transportation plan; and

(5) recommendations for implementation of the comprehensive plan.

(b) With the recommendations of the planning commission, the assembly shall adopt by ordinance a comprehensive plan. The assembly shall, after receiving the recommendations of the planning commission, periodically undertake an overall review of the comprehensive plan and update the plan as necessary.

1.3 Barrow Governance

Barrow has four primary governing bodies. There are two regional governments, the NSB (non-tribal) and Iñupiat Community of the Arctic Slope (ICAS, tribal); and two local governments, the City of Barrow (non-tribal) and Native Village of Barrow (NVB, tribal).

Regional Governance. The NSB is the regional government and political subdivision of the State of Alaska (SOA) and was incorporated in 1972. The NSB has a mayor and seven-member assembly and is a strong mayoral form of government. The NSB has taxation authority of oil and gas infrastructure. The majority of funding for government services are from this tax source.

ICAS is the regional tribal government for all the North Slope villages. It was established in 1974 and is one of only two regional sovereign tribal governments in Alaska recognized by the United States government.

Local Governance. The City of Barrow was incorporated in 1958 as a first class city and political subdivision of the SOA. The City of Barrow has a seven-member council that is elected by the voters. Six council members are elected to specific seats (A through E) and the Mayor is elected at large.

The Native Village of Barrow Iñupiat Traditional Government (NVB), is the governing body for tribal matters and is a sovereign government recognized by the U.S. NVB has a seven-member council and provides services to its members related to health, safety, education and preservation of the Iñupiat culture.
DISCLAIMER
For informational purposes only. Umiaq makes no expressed or implied warranties of merchantability or fitness with regards to character and function of this printed map. All attempts have been made to identify discrepancies among data sources and are provided as is. The user is cautioned against using this map for detailed analysis or interpretations.
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The NSB municipal code (NSBMC) outlines the process for developing the borough-wide comprehensive plan and the contents of the plan in §2.12.170: “The Comprehensive Plan…shall be a compilation of policy statements, goals, standards and maps for guiding the physical, social and economic development, both private and public, of the Borough, and may include, but is not limited to, the following: statements of policies, goals, standards, a land use plan, a community facilities plan, a transportation plan and recommendations for plan implementation.” The NSBMC also calls for the Planning Commission to consider amendments to the comprehensive plan from time to time (§19.30.050), undertake an overall review of the plan at least once every two years (§2.12.170), and review and report to the Assembly the location, design, construction, demolition or disposition of any public building, facility, collector or arterial street, park, greenbelt, playground or other public facility based on the comprehensive plan and the capital improvements program (§19.30.050).

The NSBMC states in §19.30.020 that the Barrow Zoning Commission is responsible for implementing the comprehensive plan for Barrow: “…The purpose of the Zoning Commission is to implement the Comprehensive Development Plan for Barrow and aid in fire prevention and the delivery of emergency medical services…” In §19.30.060, the NSBMC also requires that the Barrow Zoning Commission shall “develop, adopt and recommend to the Assembly a Comprehensive Plan for Barrow.”

Within the NSB, the Department of Planning and Community Services is responsible for updating and maintaining the Borough Comprehensive Plan and supporting community-level decision making in social, economic and development issues. The Department’s Community Planning Division oversees development and updates of the Borough-wide Comprehensive Plan and village comprehensive plans.

The Community Planning Division is also responsible for capital planning and developing the NSB Six-Year Capital Improvement Plan. The purpose of the Six-Year Plan is to plan for adequate capital facilities to serve anticipated growth and development in the current year and the next five years. It provides information for decision makers about the timing and costs of constructing capital facilities.

1.4 Comprehensive Planning Process

The framework for the plan was determined through a series of interviews with stakeholders from a wide variety of organizations to capture different perspectives. The process to develop this plan focused on gathering local knowledge and community input. (Figure 2 depicts a flow chart that illustrates the planning process). The planning process included the following tasks:

1. Gather data and input through a series of stakeholder interviews within the community to identify common community issues, needs and goals.

2. Develop conceptual plans based on stakeholder prioritization of community facility needs and future development and redevelopment.

3. Develop a draft vision statement that reflects values and aspirations for the future.
4. Provide the conceptual plans, vision statement and goals to stakeholders for review, modification and refinement.

5. Present the conceptual plans, vision statement and goals to Barrow residents for their perspective and input.

6. Present the final draft to the City of Barrow, Native Village of Barrow, Ukpeaġvik Iñupiat Corporation, Barrow Zoning Commission and NSB Planning Commission for review and recommendation for approval.

7. Present the final plan to the NSB Mayor and Assembly for review and approval.

Stakeholder Meetings. Stakeholders were asked to identify major issues that they believe Barrow is facing or would face in the future. Stakeholders identified challenges and issues in Barrow as well as strengths and positive attributes about the community. The issues outlined in the following list were determined to be of primary importance to the future of the community. The list is not in priority order.

Housing
- Create housing opportunities, both market-rate and affordable to meet current need and accommodate future growth; and
- Provide provisions for the homeless population.

Planning for Growth
- Locate affordable gravel to support development;
- Maximize the use of existing infrastructure through infill development where possible and expand roads and utilities to accommodate new development when necessary;
- Identify potential rezoning opportunities to better accommodate anticipated community growth;
• Study the potential for renewal, especially at community sites with functionally and
technically outdated infrastructure and make recommendations for replacement,
relocation, repurposing or demolition; and
• Identify possible solutions for the NSB police station facility, whose lease is set to expire
in the near future.

Maintaining Traditional Rights and Values
• Maintain Native subsistence rights; and
• Preserve Native ownership and control of lands.

Social Services
• Reestablish adult substance abuse treatment in the community potentially including an
adult detox facility and juvenile justice and treatment, possibly as a component of police
functions;
• Reinstitute daycare services to support employment;
• Consider alternatives for displaced children, including expanding foster care; and
• Create recreational facilities and educational programs to promote healthy family living
and activities and community festivals such as Kivgiq.

Economic Development
• Expand tourism opportunities, including the need for additional visitor accommodations;
and
• Encourage additional commercial enterprises, such as restaurants and coffee shops.

Land Use
• Create a harbor for barge unloading and small boat and U.S. Coast Guard (USCG)
activities;
• Manage U.S. Army Corps of Engineers (USACE) wetlands provisions as they affect
development; and
• Manage coastal erosion in a cost-effective manner.

Government
• Encourage flexibility in responding to current issues and challenges through participatory
policy creation or modification.

Public Meetings and Workshops. To solicit input from Barrow residents, four community meetings
and four workshops were held on July 7 and 8, 2014 at the City of Barrow City Council Chambers.
The public meetings and workshops provided an opportunity for interested residents to view a
model of the Barrow community with several different development and redevelopment
possibilities.

Residents were also invited to provide input on plan contents through Strengths, Weaknesses,
Opportunities and Threats (SWOT) workshops. Through the workshop, focused attention was
given to those issues identified by residents to enhance, protect, exploit or mitigate for the
beneficial growth of Barrow. The strengths, weaknesses, opportunities and threats presented here are an amalgamation of the four workshops; only the five issues that were most often mentioned within each category are included in this section; all public input during the SWOT exercises are provided in Appendix A.

Strengths identified by Barrow residents were:

S1: Traditional family and multi-generational knowledge and sharing;
S2: Iñupiat values;
S3: Iḷisaġvik College and its responsiveness to the changing needs of employers and the community;
S4: Tourism, specifically wildlife and birding as a tourist attraction; and
S5: Teamwork and a willingness to work together.

Weaknesses identified by Barrow residents were:

W1: A lack of activities for youth and families;
W2: Lack of housing availability, including a lack of housing contractors;
W3: Lack of freight and transportation competition and options and the high cost of having materials delivered to Barrow;
W4: The cost of maintaining aging infrastructure and planning for needed infrastructure; and
W5. The NSB permitting process does not always adequately require for oil and gas development to provide additional infrastructure to residents; potential revisions to the NSBMC may be needed.

Opportunities identified by Barrow residents were:

O1: Foster new economic development and training opportunities including both mainstream businesses, such as a hardware store, and traditional ones such as reindeer herding and tanning. Establish a Chamber of Commerce;
O2: Provide recreational activities for families and youth, including a snow park, shooting range, paddle boat and skate park;
O3: Fiber optics and other technological advancements that are becoming or may become available in the arctic;
O4: Renewable energy; and
O5: Increased maritime traffic through the Northwest Passage.

Threats identified by Barrow residents were:

T1: Coastal erosion;
T2: Climate Change;
T3: Potential environmental, cultural and health impacts of increased oil and gas activity;
T4: Issues related to increased maritime activity, including a breach of the international boundary, biological agents entering the community and international visitors without the ability to enforce customs regulations; and
T5: Lack of housing.

1.5 Barrow Vision Statement

Identifying and establishing a community vision is an important part of the process of creating goals and objectives. The following vision statement was devised during the comprehensive planning process and guided the development of goals and objectives that implement this plan.

Barrow is and will continue to be a village that fosters and values a strong sense of community through diversity, an active subsistence lifestyle, multi-generational traditional knowledge and traditional Iñupiat values while also embracing new technological advancements and contemporary knowledge. Residents and community leaders will guide community growth and development in a coordinated, cost effective, efficient and environmentally sensitive manner that respects and protects local wildlife habitats and the area’s abundant natural resources. Barrow’s education system will prepare its youth through training opportunities and college programs tailored to meet the employment needs of the local community, science research and industry. There will be a diversity of safe and affordable housing opportunities and well-maintained and reliable utilities and other public infrastructure and community facilities. Residents will have a variety of recreational opportunities, especially for families and youth that facilitate healthy living and an active lifestyle. Community cooperation, transparency and resident involvement will provide a high quality of life.

1.6 Community Goals

In a broad sense, goals are general statements concerning an aspect of community’s desired physical, social and economic environment. They establish priorities for a community and help
leaders make decisions that affect the future of the community and quality of life for its residents. The goals prioritize the need for orderly, cost-effective and sustainable development for Barrow. Objectives are more specific approaches to achieving community goals. The strategies encourage specific courses of action for the community to undertake to achieve its goals and objectives. Goals, objectives and strategies are presented in Chapter 18.

**Goal 1:** Protect the community’s natural resources.

**Goal 2:** Protect existing infrastructure from flooding, erosion and other natural disasters.

**Goal 3:** Minimize construction of facilities and other land uses in hazard prone zones.

**Goal 4:** Protect the health and welfare of the Barrow community through safe and efficient management of contaminated sites and hazardous waste.

**Goal 5:** Ensure effective community emergency preparedness.

**Goal 6:** Use community demographics to plan for future needs.

**Goal 7:** Understand the complexities of the housing issues in Barrow and coordinate planning activities.

**Goal 8:** Ensure an adequate supply of housing to meet the needs of current and future Barrow residents.

**Goal 9:** Facilitate availability of a variety of housing types and prices to provide current and future Barrow residents with greater choice in both rental and ownership opportunities.

**Goal 10:** Improve the condition of housing stock in Barrow to ensure safe and sanitary living conditions.

**Goal 11:** Guide development toward a cohesive, cost-effective and orderly development of the community.

**Goal 12:** Provide reliable utility service to Barrow residents.

**Goal 13:** Provide emergency services to ensure the safety and welfare of Barrow residents.

**Goal 14:** Provide medical services to ensure the health and wellbeing of Barrow and North Slope Borough residents.

**Goal 15:** Maintain and improve Barrow’s transportation system to consistently provide mobility for people and goods in a safe and efficient manner.

**Goal 16:** Offer a variety of recreational opportunities to meet the needs of Barrow residents, especially for families and the youth.
Goal 17: Facilitate adequate communication and telecommunications systems for Barrow residents and businesses.

Goal 18: Barrow has a strong and diversified local economy that provides employment opportunities for residents.

Goal 19: Continue to develop coordinated educational and training opportunities.

Goal 20: Protect and enhance traditional, historical, cultural and subsistence resources and activities.

Goal 21: Guide development toward a cohesive, cost effective and orderly development of the community.

1.7 Community Planning Challenges and Options

Issues raised during stakeholder interviews and subsequent research form the basis for four future development perspectives or Options. All the Options are described in detail in Chapter 17, including diagrams depicting the Options. General descriptions of the challenges and Options are provided below.

1. Option 1 - Status Quo. A community map of Barrow in 2035 was prepared to show a potential development scenario. The Status Quo Option is a scenario in which each entity seeks a location for its facility to meet its specific service needs based on what is available and conducted independently from other community and organizational interests.

2. Option 2 - Renewal Option. Under Option 2, the age, changing functionality and land status of Barrow, focusing particularly on old Barrow were examined.

Perspectives, in part, include the changing nature of transportation through an ever increasing vehicular oriented community. Several older members of the community reminisced about when there were few vehicles in Barrow. Elsie Itta (born in 1952) talked about as a child crossing a challenging creek flowing out of Lower Isatkoak Lagoon to visit the Brower’s before Browerville existed. Elsie’s husband, Edward, also spoke of growing up in Barrow. He stated, “I grew up without running water. We burned whale blubber for heat.” Morrie Lemen, Jr. spoke of 1968 when there were less than 400 residents in Barrow and the long trip to the Naval Arctic Research Laboratory (NARL) to see a movie. Gordon Brower talked about his first kiss in the Home of the Whalers gym – now the roller rink at the old Ipalook School. Allen Nesteby also spoke of times when there were very few vehicles in Barrow.

The hospital has now moved and the old facility is vacant except for nurse housing and support buildings. The Greist Center, the dental wing of the old hospital, is now closed and its original services have been moved to the new hospital or the Wellness
Center. The weather station has now moved and the weather station housing is vacant.

Many restricted properties in old Barrow are now vacant and encumbered in multigenerational ownership issues. Some properties are burned or otherwise dilapidated and dot the landscape with charred remains.

Most recently, Pepe’s North of the Border Restaurant was completely destroyed by a fire that also rendered the Top of the World Hotel unoccupiable.

The Alaska Department of Transportation and Public Facilities (DOTPF) has completed a new master plan for the Wiley Post – Will Rogers Memorial Airport to accommodate community growth and changing technology of the aircraft serving Barrow.

The old Bureau of Indian Affairs (BIA) School has long moved and has been replaced by the Ipalook Elementary School, Barrow High School, and Hopson Middle School. The NSBSD Central Office 2 (CO2) continues to house school district administration space and teacher housing in building elements that were poorly constructed in the BIA era that now absorb increasing maintenance dollars.

The Renewal Option intends to restimulate old Barrow and capitalize on the existing roads and utilities infrastructure investment and key locational value in the community.

3. **Option 3 - New Town Center.** Growth beyond Barrow and current Browerville was examined. Option 3 recognizes the new hospital as a driving force of community development.

Evaluation of the current housing indicates a shortage of approximately 267 houses and another 248 houses by 2035 without oil and gas development. New residential development is most likely to advance toward the east end of the airport and in Browerville. Access around the airport to a south side industrial area could serve as a draw for development as roads are expanded. Infrastructure is expensive; development is needed to amortize its cost.

Stakeholder input and perspectives regarding Options 1 thru 3 led to the development of Option 4 that combines the other Options.

4. **Option 4 - Consolidated Option.** A combination of Options 1, 2 and 3 provides another perspective to accommodate growth in a meaningful way to 2035 and beyond by incorporating the hospital’s new location and extending development toward the east end of the airport while considering the revitalization of old Barrow and the benefits of infill development.

The goal is to have a substantial consensus for Option 4 as a “Guiding Community Planning Option” to assist orderly and cost effective development through the year 2035 and beyond.
Option 4 forms the basis of the Implementation Plan and provides a platform from which stakeholders can be involved in planning for community growth, such as the NSB Public Works Department planning for new roads and Barrow Utilities and Electric Cooperative, Inc. (BUECI) planning for utility expansion.
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2.0 COMMUNITY OVERVIEW

2.1 Population and Community

2.1.1 Setting

Barrow is the northernmost community in the U.S., uniquely situated on a point of land that is bordered by the Chukchi and Beaufort Seas of the Arctic Ocean. The landscape surrounding Barrow is characterized by tundra spotted with lakes and permafrost soils underlying almost the entire region.

Figure 3 Barrow, Alaska

Barrow's climate is cold and dry, classified as a polar desert. Winter weather can be extremely dangerous because of the combination of exceedingly cold temperatures and wind, while summers are cool even at their warmest. Weather observations are available for Barrow dating
back to the late nineteenth century. A National Weather Service (NWS) office and a National Oceanic and Atmospheric Administration (NOAA) Earth System Research Laboratory operate in Barrow. The U.S. Department of Energy (DOE) has a climate observation site in Barrow as part of its Atmospheric Radiation Measurement (ARM) Climate Research Facility.

The educational facilities servicing Barrow include Ipalook Elementary School, Hopson Middle School, Barrow High School, Kiita Learning Community alternative high school and Iḷisaġvik College. During the academic year Barrow High School swimming pool, weight room and gymnasium are available for public use during the evenings and on weekends. Residents are also permitted to use the City of Barrow’s recreation center, Piuraaqvik.

The majority of Barrow homes are heated by natural gas from nearby Barrow gas fields. Most homes also have modern water and sewer systems. Barrow Utilities and Electric Cooperative, Inc. (BUECI) is a member-owned cooperative that provides electricity, natural gas and water/sewer services. Water is also delivered by truck for those homes not connected to the water and sewer system. The NSB provides trash pick-up and disposal.

As the Borough seat of government, Barrow functions as the regional center for many health and social services. The public facilities include Samuel Simmonds Memorial Hospital, a senior citizen center, Arctic Women in Crisis (AWIC) women’s shelter, Children and Youth Services (CYS) center and Tuzzy Consortium Library. The NSB also provides public safety and fire protection.

Communications in Barrow include telephone, mail, internet, cable television and a public radio station (KBRW). The community also has three hotels, six restaurants, a dry cleaner, fur shop and a bank. Barrow has one large grocery store, Alaska Commercial Company (AC) and three smaller convenience stores, Arctic Coast Trading Post (ACTP), Arctic Grocery and AC Quick Stop.

Barrow is a “damp” community, meaning that the sale of alcohol is banned but limited amounts may be imported for personal use. Alcohol is shipped to Barrow by holders of city-issued permits that have been approved by the NSB Police Department following a background check.

Diesel, propane, marine gas, aviation fuel and all grades of auto gas are available.

Daily passenger jet service serves Barrow from Anchorage and Fairbanks. Freight arrives via air cargo year-round and via barge during the summer months.

2.1.2 People

The majority of Barrow residents are Iñupiat, an indigenous Inuit ethnic group. Iñupiat translates as “the real people.” The Iñupiat have thrived for thousands of years in the Arctic and have relied on their intimate knowledge of the environment and the values of sharing and cooperation. Iñupiat subsistence hunting, fishing and whaling traditions remain an integral way of life in Barrow.

Barrow is the most diverse community in the NSB. Thirty-five percent of Barrow’s population is comprised of Caucasians, Asians, South Pacific Islanders, Hispanics and African Americans.
Some of these are long-term (more than ten years) residents of Barrow, while others are short-term residents, sometimes living in Barrow three years or less.

The population of Barrow has changed significantly over the last 25 years. The overall population grew during the 1990s. Beginning in 2001 the population began to decline. The population decline continued until in 2008 when it began to increase again. The current population for Barrow, based on the 2010 North Slope Borough Economic Profile and Census Report (NSBEP&CR), is 4,974 people.

Of Barrow’s 4,974 residents, approximately 65% are Iñupiat Eskimo, an increase from approximately 50% in 1998. Subsistence hunting, fishing and whaling are very important to the local culture and economy. Many residents who work full-time or part-time continue to hunt and fish for much of their food. They rely upon subsistence food sources because transporting food to the city is very expensive and because it has been a way of life for generations. Whale, seal, polar bear, walrus, waterfowl, caribou, and fish are harvested from the coast or nearby rivers and lakes.

In 2010, approximately one-quarter of the working population of 1,790 was employed in the private sector. Only a few of those were working for oil companies at Prudhoe Bay. The NSB and NSBSD are Barrow’s primary employers. As the borough seat of government, a large percentage of its employment is the government sector: twenty-six percent of the workforce is employed by the North Slope Borough and a total of 43% is employed by the government, including the NSB, NSBSD, City of Barrow, State of Alaska and federal agencies. The regional corporation and native village corporation and their subsidiaries are major employers as well: Arctic Slope Regional Corporation (ASRC) and Ukpeaġvik Iñupiat Corporation (UIC), are both Alaska Native corporations headquartered in Barrow and employ over 10% of the workforce in Barrow. Additionally, Native arts and crafts provide cash income for some residents. There are also some jobs associated with tourism, such as hotel staff.

### 2.1.3 Community History

The city derived its name from Point Barrow, which was named after Sir John Barrow of the British Admiralty by Frederick William Beechey in 1825. The location has been home to the Iñupiat for more than 15,000 years. Barrow’s original Iñupiat name is Ukpeaġvik or "place where snowy owls are hunted".

The portion of Barrow located to northeast of the Tasigarroq and Lower Isatkoak lagoons is called Igluqpauraq, later it was also named Browerville after Charles D. Brower, a New York native and Yankee Whaler that settled in Barrow to work at the Rescue Aid Station. He married a local Iñupiaq woman, Asiaggataq, and raised a large family in Barrow.

An important historic site in the Barrow area is the Birnirk archaeological site which contains 16 dwelling mounds of a culture believed to have existed from 500 to 900 A.D. The archaeological findings are considered a key link between the prehistoric cultures of Alaska and Canada.
In 1881, the United States Army established a meteorological and magnetic research station in Barrow. Magnetic research continues today by the United States Department of Interior (USDOI) at another location close to Point Barrow.

In 1888, a Presbyterian church was built at Barrow. A U.S. post office was opened in 1901.

The Cape Smythe Whaling and Trading Station, a historic site, is located in Browerville. Cape Smythe was built as a whaling station in 1893 and is reportedly the oldest frame-construction building in the Arctic.

In 1935, the famous humorist Will Rogers and pilot Wiley Post made an unplanned stop at Walakpa Bay 15 miles south of Barrow while en route to Barrow. As they took off again, their airplane stalled and plunged into a river, killing them both. There are two memorials in the Barrow area: the crash site near Walakpa Bay and another near the airport at the corner of Momeganna and Ahkovak Streets that was dedicated on August 15, 1982. The airport was also renamed the Wiley Post – Will Rogers Memorial Airport.

In 1940, the NVB Iñupiat Traditional Government organized as a federally recognized Native American tribe. NVB wrote a constitution and by-laws under the provisions of the Indian Reorganization Act (IRA) of 1934.

During the 1940s and 1950s, the military played an influential role in the area. Construction of the Distant Early Warning (DEW) Line, a system of radar and communication stations stretching from Western Alaska across the Canadian Arctic to Greenland to provide early warning of any sea-and-land invasion. In addition, oil and gas exploration in the National Petroleum Reserve – Alaska (NPR-A) brought new people to the region. During the same time, the Naval Arctic Research Laboratory (NARL) was built near Barrow to provide a laboratory for scientific study of the arctic environment. South of NARL is a natural gas field that serves the Barrow community and was originally developed by the NARL staff. For many years, this gas field was the only hydro-carbon producing field within the NPR-A.

The Barrow Gas Field is also the only known location of an impact crater (meteor strike) in Alaska, known as the Avak crater. The impact took place between 95 million and 3 million years ago. The Avak structure was first recognized from seismic and gravity surveys in the NPR-A by the U.S. Navy during 1943 to 1953. The Avak structure provides the structural trap for the natural gas in the adjacent South Barrow and East Barrow Gas Fields. These fields have accumulated about 37 billion cubic feet of natural gas.

Barrow was incorporated as a First Class City in 1958.

Residents of the North Slope cast the lone vote in opposition to passage of the Alaska Native Claims Settlement Act (ANCSA), which passed in December 1971. UIC, a for-profit village corporation, was set up by the Iñupiat shareholders of Barrow as a result of the Act.

In 1972, the NSB was established. With millions of dollars in new revenues from property taxes on the oil and gas industry, the NSB created sanitation facilities, water and electrical utilities,
roads, fire departments and health and educational services in Barrow and the villages of the North Slope.
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3.0 NATURAL ENVIRONMENT

3.1 Geography

The predominant land type in Barrow is tundra, which is low lying, characterized by hundreds of lakes, swampy areas and drained thaw-lake basins. The tundra is formed over a continuous region of deep permafrost. According to the U.S. Census Bureau, the City of Barrow has a total area of 21 square miles; 18 square miles which is land and the remaining three square miles are water.

3.2 Soils

Undisturbed permafrost is generally found outside the developed areas of Barrow, approximately 1,000 feet inland from the beach. Undisturbed permafrost areas have tundra vegetation covering ice-rich frozen soils. The permafrost layer may be up to several hundred feet deep. The median depth of bedrock measured in the Barrow quadrangle is approximately 72 feet. The surface is comprised of marine/coastal sand and gravel with some bedrock exposures.

3.3 Wetlands

The areas in and around the City of Barrow are rich in wetland resources. When planning future development, careful siting can minimize impacts to higher value wetland areas, where disruptions may adversely affect the habitat of sensitive and important wildlife species, or functions benefitting the community such as water purification, flood protection, shoreline stabilization, or groundwater recharge and streamflow maintenance. Focusing wetland development in areas that minimize these disruptions and impacts has the added benefit of reducing the financial costs of mitigation, which for a high value area may be on the order of 800% when compared with a lower value area.

The wetland classifications described in Table 1 are found in and around the City of Barrow.
Table 1 National Wetlands Inventory Classifications

<table>
<thead>
<tr>
<th>NWI Classification</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>E2EM1P</td>
<td>Estuarine Intertidal Emergent Persistent Irregularly Flooded</td>
</tr>
<tr>
<td>E2US/EM1P</td>
<td>Estuarine Intertidal Unconsolidated Shore / Estuarine Intertidal Emergent Persistent Irregularly Flooded</td>
</tr>
<tr>
<td>M1UBL</td>
<td>Marine Subtidal Unconsolidated Bottom Subtidal</td>
</tr>
<tr>
<td>PEM1/SS1B</td>
<td>Palustrine Emergent Persistent / Palustrine Scrub-Shrub Broad-Leaved Deciduous Saturated</td>
</tr>
<tr>
<td>PEM1/SS1E</td>
<td>Palustrine Emergent Persistent / Palustrine Scrub-Shrub Broad-Leaved Deciduous Seasonally Flooded/Saturated</td>
</tr>
<tr>
<td>PEM1/UBH</td>
<td>Palustrine Unconsolidated Bottom Permanently Flooded</td>
</tr>
<tr>
<td>PEM1B</td>
<td>Palustrine Emergent Persistent Saturated</td>
</tr>
<tr>
<td>PEM1E</td>
<td>Palustrine Emergent Persistent Seasonally Flooded/Saturated</td>
</tr>
<tr>
<td>PEM1F; PUBH</td>
<td>Palustrine Emergent Persistent Semipermanently Flooded; Palustrine Unconsolidated Bottom Permanently Flooded</td>
</tr>
<tr>
<td>PEM2/UBH</td>
<td>Palustrine Emergent Non-Persistent / Palustrine Unconsolidated Bottom Permanently Flooded</td>
</tr>
<tr>
<td>PEM2H</td>
<td>Palustrine Emergent Non-Persistent Permanently Flooded</td>
</tr>
<tr>
<td>PUB/EM2H</td>
<td>Palustrine Unconsolidated Bottom / Palustrine Emergent Non-Persistent Permanently Flooded</td>
</tr>
</tbody>
</table>

Environmentally sensitive/important areas, such as PEM1/SS1B around the Upper Isatkoak Lagoon, or less common areas such as those classified as PEM1/UBH, PEM1E or PUBH are likely of higher value (see Figure 5). Development in these areas may require higher mitigation compensation rates, adding additional costs to development projects. The Army Corps of Engineers (USACE) determines mitigation/compensation rates, approves proposed developments on a case-by-case basis and has the authority to block development of certain parcels.

There are three mechanisms available for providing compensatory mitigation, listed in order of the USACE preference: (1) mitigation banks; (2) in-lieu fee for mitigation; and (3) permittee-responsible mitigation. In general, the required compensatory mitigation should be within the same watershed as the affected site. Hence, choosing a common wetland classification site over a rare one, facilitates finding a mitigation site within the same watershed.

As of March 2014, no Alaska District Approved Mitigation Banks are available that serve arctic areas, including the City of Barrow. Currently The Conservation Fund is the sole in-lieu fee sponsor serving Arctic Alaska and the Barrow area. The Conservation Fund Alaska In-Lieu Fee (AKILF) Compensatory Mitigation Program Instrument outlines the typical cost per credit by
physical setting and wetlands category. Table 2 reflects the current costs for credits that are subject to change at any time and without notice.

Table 2  Current Mitigation Land Type Valuations

<table>
<thead>
<tr>
<th>Arctic Service Area</th>
<th>Slope/Flat Depressional Wetlands</th>
<th>Riverine/ Lacustrine Wetlands</th>
<th>Estuarine/ Marine Wetlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban (Barrow and Prudhoe Bay)</td>
<td>$22,000</td>
<td>$33,000</td>
<td>$44,000</td>
</tr>
<tr>
<td>Rural (all other towns and villages on the North Slope)</td>
<td>$11,000</td>
<td>$22,000</td>
<td>$33,000</td>
</tr>
<tr>
<td>Remote</td>
<td>$5,500</td>
<td>$11,000</td>
<td>$22,000</td>
</tr>
</tbody>
</table>

Development activities and potential impacts to wetland areas should focus on those areas of lower environmental sensitivity and those that are in greater abundance. Focusing development in these areas will improve the likelihood for project approval, lower costs and preserve the most important areas of the local ecology. Wildlife, the plants they depend on and Barrow residents all benefit.
For informational purposes only. Umiaq makes no expressed or implied warranties of merchantability or fitness with regards to character and function of this printed map. All attempts have been made to identify discrepancies among data sources and are provided as is. The user is cautioned against using this map for detailed analysis or interpretations.
3.4 Vegetation

The dominant vegetation type in the area surrounding Barrow is wet graminoid tundra. The next most dominant land cover types are dry meadow, moist meadow dominated by Carex grass and emergent aquatic vegetation dominated by Carex grass.

The actual vegetation types within the Barrow developed areas are difficult to characterize and are considered a disturbed landscape due to the construction of gravel roads and building pads that alter the natural function of the tundra and wetlands.

3.5 Climate

Temperatures in Barrow are moderated by the surrounding topography and proximity to marine waters. The flat and treeless tundra stretches for several hundred miles to the south. There are no natural wind barriers or protected valleys where dense cold air can settle as commonly happens in the Interior between the Brooks and the Alaska ranges. Nevertheless, Barrow has the lowest average temperatures of any city in Alaska. Temperatures often remain below freezing from early October through late May with February typically being the coldest month, averaging -14 °F. July is usually the warmest month of the year, with an average high of 47 °F. The sea is usually ice-free in late July and remains that way until late October.

Barrow averages less than five inches of rainfall equivalent1 annually and is considered a polar desert. Snow that does accumulate in Barrow usually blows in from other locations. Whiteout conditions from blowing snow and extremely cold wind chills are common during the winter months. Temperatures can fall below freezing any day of the year. Each year, on November 18 or 19, the sun sets and remains below the horizon for about 65 days. It rises again on January 22 or 23. On May 10 or 11 each year, the sun rises and does not set again until about August 1 or 2. There are 82 days of continuous daylight during the summer months.

3.6 Wildlife, Birds and Fish

3.6.1 Wildlife

Barrow area wildlife is indicative of the species found across much of the North Slope. Table 3 lists the species commonly found in the Barrow area.

Polar bears are listed as a threatened species by the U.S Endangered Species Act. In 2008, the U.S. Fish and Wildlife Service determined that the polar bear is likely to become an endangered species and faces the threat of extinction within the foreseeable future. Polar bears became the first species to be added to the endangered species list due solely to the threat to their habitat from global climate change. The habitat includes the coastal areas within the North Slope, including the Barrow area. However, the polar bear critical habitat excludes the Barrow townsite.

In 1973 the bowhead whale was listed as endangered under the U.S. Endangered Species Act. Both the pacific walrus and bowhead whale are protected under the Marine Mammal Protection Act. The pacific walrus is also a candidate species; the U.S. Fish and Wildlife Service (FWS)

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1 Twelve inches of snow contains approximately equal water content to one inch of rain.
has determined that there is a sufficient threat to the walrus’s biological status to potentially be included as a threatened or endangered species under the Endangered Species Act but there are other higher priority listings.

### Table 3  Common Wildlife Species in Barrow Area

<table>
<thead>
<tr>
<th>Wildlife Type</th>
<th>Species</th>
<th>Habitat Type</th>
<th>Habitat Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pinnipeds</td>
<td>ringed seal, bearded seal, spotted seal, pacific walrus**</td>
<td>marine</td>
<td>feeding, breeding, hunting</td>
</tr>
<tr>
<td>Whales</td>
<td>bowhead*, beluga</td>
<td>marine</td>
<td>feeding, breeding</td>
</tr>
<tr>
<td>Other</td>
<td>musk ox, caribou, Arctic fox, squirrel, lemming, vole, brown bear, wolf, polar bear*, wolverine</td>
<td>tundra (and marine in the case of the polar bear)</td>
<td>feeding, breeding, hunting</td>
</tr>
</tbody>
</table>

*Listed as a Threatened or Endangered species under the Endangered Species Act (ESA)

**Listed as a candidate species under the ESA

### 3.6.2 Birds

Much of the Barrow area and surrounding lands are considered high-density nesting and staging habitat for shorebirds and passerine birds. The lakes, freshwater ponds and freshwater emergent wetlands are used for breeding by tundra swans and molting and staging waterfowl. Both the spectacled eider and Steller’s eider are listed as threatened under the Endangered Species Act. The yellow-billed loon is a candidate species under the ESA. Bird species found in the Barrow area are listed in Table 4. Figure 6 depicts eider use areas in the vicinity of Barrow.

### Table 4  Common Bird Species in Barrow Area

<table>
<thead>
<tr>
<th>Bird Type</th>
<th>Species</th>
<th>Habitat Type</th>
<th>Habitat Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ducks</td>
<td>northern pintail, American wigeon, greater scaup, oldsquaw, common eider, king eider, spectacled eider*, Steller’s eider*</td>
<td>estuarine and marine wetlands, lakes</td>
<td>breeding, molting, staging</td>
</tr>
<tr>
<td>Seabirds</td>
<td>pomarine, parasitic and long-tailed jagers, glaucus and Sabine’s gulls, Arctic tern, black guillemot, shearwaters, murre</td>
<td>freshwater emergent wetlands</td>
<td>nesting, feeding</td>
</tr>
<tr>
<td>Shorebirds</td>
<td>pectoral and semi-plumated sandpipers, lesser golden plovers, red-necked and red phalaropes, ruddy turnstones, long-billed dowitchers, Baird’s, stilts and buff-breasted sandpipers, dunlin, black-bellied and semi-palmated plovers, wandering tattlers, snipes, whimbrels, yellow-billed loon**</td>
<td>freshwater emergent wetlands, estuarine and marine wetlands</td>
<td>nesting, feeding</td>
</tr>
<tr>
<td>Geese</td>
<td>Canada geese, black brant, greater white-fronted geese, lesser snow geese</td>
<td>estuarine and marine wetlands</td>
<td>feeding</td>
</tr>
</tbody>
</table>

*Listed as a Threatened or Endangered species under the ESA

**Listed as a candidate species under the ESA
3.6.3 Fish

The most common fish species in the Barrow area waters include broad whitefish, least cisco, Arctic grayling, burbot and lake trout. All five species of Pacific salmon have been observed in the Alaskan and Canadian Arctic but are relatively rare by contrast to the more abundant species. The most abundant fish of the Arctic region are listed in Table 5.

The presence of anadromous populations of sockeye salmon, broad whitefish, and least cisco have been documented in Ikroavik Lake and Avak Creek. No other anadromous fish or essential fish habitat areas are identified in the Barrow area.

Table 5  Common Fish Species in Alaskan Arctic

<table>
<thead>
<tr>
<th>Type of Fish</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anadromous Fishes</td>
<td>Arctic cisco, Arctic char (Dolly Varden), least cisco, broad whitefish, humpback whitefish, rainbow smelt, chum salmon, pink salmon, sockeye salmon, chinook salmon, coho salmon</td>
</tr>
<tr>
<td>Freshwater Fishes</td>
<td>lake whitefish, inconnu, ninespine stickleback, Arctic grayling, round whitefish, slimy sculpin, northern pike, burbot</td>
</tr>
<tr>
<td>Marine Fishes</td>
<td>Arctic cod, Arctic flounder, fourhorn sculpin, Pacific herring</td>
</tr>
</tbody>
</table>
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4.0 HAZARDS

4.1 Impacts of Climate Change

Temperatures across Alaska have increased over the past 50 years by an average of 3.4 °F. Winter warming has been even greater, rising by an average of 6.3 °F (EPA 2014). These temperature increases are twice the national average over the same time period. Projections indicate that average annual temperatures in Alaska will increase an additional 3.5 to 7 °F by 2050 (U.S. Global Change Research Program 2009).

The associated impact of this change is evident in Barrow and across the Arctic. The extent of sea ice is declining throughout the Arctic. Some sea ice persists from year to year and is known as perennial sea ice. Other sea ice melts during the warmer season and then refreezes as temperatures decrease. The extent of perennial sea ice has been measured and documented for decades and its extent has been declining. The melting rate is impacted by warmer temperatures and extended above-freezing periods. Sea currents and wind also diminish the ice by moving the ice out of the Arctic basin. Figure 7 depicts the average Arctic sea ice extent from 1979 to 2014 based on data from the National Snow and Ice Data Center and provided by the EPA (Arctic Sea Ice News and Analysis 2014).

Figure 7 Average Arctic Sea Ice Extent 1979 to 2014

The diminishing extent of the Arctic sea ice has led to potential new economic activities such as oil and gas exploration and alternate shipping routes through the Northwest Passage that may reduce travel time between Asia and Europe. Connecting new Arctic ports to existing ones could mean more opportunities for invasive species to enter the Arctic and other northern ports. Diminished sea ice may cause loss of critical habitat for a variety of ice-dependent species, including walruses, spotted seals and polar bears. The changes in sea ice and warmer water can
also affect the timing and location of plankton blooms, which can in turn affect the areas where commercial fisheries thrive. Coastal shorelines and human development along them are protected by land fast ice (sea ice that has frozen along the shoreline). With less land fast ice, coastal areas are subject to increased flooding and erosion caused by storms, wind and waves (U.S. Global Change Research Program 2009; U.S. Arctic Research Commission 2003; National Research Council 2011; Intergovernmental Panel on Climate Change 2007).

Increasing temperatures, often attributed to climate change, are threatening ice cellars in Barrow and many other North Slope villages that are commonly used to store traditionally harvested subsistence food, such as whale and caribou meat. Ice cellars have been in use in Barrow and across the arctic for thousands of years. Some ice cellars are failing, threatening both food security and food safety. (Brubaker et al 2010)

4.2 Flooding and Storm Surges

Coastal storms occur with regularity and have been the major contributors to shoreline damage. Factors occurring in nature that contribute to the high rate of erosional damage along the shoreline in Barrow are storms, resulting storm surges and diminishing shore protection from a shrinking polar ice pack. The coastline is in a northeast and southwest orientation, making it susceptible to storms from both the north and west. Winter storms caused by low pressure systems in the upper atmosphere bring high winds and wave action. Over the years, several studies have been conducted to address the past and future storm damage and continued threat. Although less documented, the loss of polar sea ice is leaving the shoreline vulnerable to the storms and surge for a greater period of time during each year. In generations past, ice was packed into the shoreline creating an ice shelf one-half mile wide. This ice pack was present from fall until late spring. More recently, there is open sea later into the fall and earlier in the spring. If this trend continues, it is anticipated that waves and storm surges will increase in size and strength, causing increasingly more damage.

Local traditional knowledge on seasonal shorefast sea ice indicates that as the sea ice attaches to the shore, the beach is protected against storm surge events that might otherwise cause coastal flooding. Recent fall storm surge events that occur when there is no shorefast ice verifies that flooding will occur without shorefast ice in the Barrow area.

4.2.1 October 3, 1963 Storm

Episodic erosion can result in more extensive losses with large storms. In addition to storm action produced by the wind and wave damage, is the accompanying storm surge. A 10-year storm event can produce an estimated sea level surge of 7.3 feet with a maximum wave height of 5.8 feet. (North Slope Borough 1987). A storm in October of 1963 produced a storm surge that flooded Stevenson Road, isolating Naval Arctic Research Laboratory (NARL) from Browerville and Barrow for several days. The October 1963 storm was the worst storm in Barrow area recorded by the US Weather Bureau and estimated in the Bluff and Shoreline Protection Study for Barrow to be a 100-year event. During this storm event, an average of 14 feet of bluff eroded and as much as 35 feet in some areas. (U.S. Army Corps of Engineers (2007b). The USACE estimated in this same assessment that Barrow and the adjacent bluffs experienced as much erosion during this one storm as they have over the past five decades.
What made the storm of October 3, 1963 unique is the manner and speed in which it hit Barrow, giving little warning to the residents of Barrow. This storm originated over the northern coast of Siberia and began migrating toward the northern coast of Alaska, gathering wind speeds of 40 mph and gusts over 60 mph. The storm’s low pressure continued to worsen and by the time it reached Barrow, the wind had changed to a west-northwesterly direction with wind speeds reaching 75-80 mph.

The winds caused a storm surge and extensive wave action (Brunner 2004). The storm surge reportedly was as high as 12 feet (Hume and Schalk 1967). The storm system traveled up to 44 mph, close to the speed of the surge itself. The storm peaked in the afternoon when the majority of the damage occurred. The storm “moved over 200,000 cubic yards of sediments, which is equivalent to 20 years’ normal transport” (Hume and Schalk 1967: 86). The combined strength of the winds and storm surge caused significant erosion to the coastal environment. South of Barrow, the bluffs were eroded up to 10 feet, exposing ice rich areas and, in some areas, causing bluffs to collapse.

The flooding was more extensive in and near the NARL than Barrow itself. NARL was cut off from Barrow for several days without a safe route into town. Reportedly, the fresh water source was contaminated; six buildings were lost and the remaining ones had significant structural damage. The NARL airstrip, which was the primary airstrip in use at the time, was also significantly damaged (Hume and Schalk 1967). In Barrow, 32 homes were damaged with 15 of those totally destroyed and 250,000 gallons of fuel were lost as well as three small airplanes (Hume and Schalk 1967). Amazingly, there was no loss of human life. The extent of the 1963 storm surges is depicted in Figure 8.
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1963 Floodline as depicted by Hume and Schalk in their paper "Shoreline Processes near Barrow, Alaska: A Comparison of the Normal and Catastrophic." AND digitized from the following reference:

4.3 Erosion

Erosion does not occur at an even rate along the shoreline of the Chukchi Sea. The coast is characterized by bluffs 30 feet tall fronted with narrow beaches. Over the years, the bluffs have become more susceptible to erosion because the beaches fronting them have become narrower and less protected from storm and wave action. Along the shoreline toward the north, the bluffs decrease in height until they flatten out into wider beaches at elevations of the adjacent tundra. Annual bluff erosion is estimated to be occurring at a rate of 1.02 feet per year, based on aerial photography analysis for the period 1948 to 2003 (U.S. Army Corps of Engineers 2007a).

There are some areas along the shoreline that have been identified as areas prone to higher erosion rates ("hot spots"). In part, the areas identified as hot spots are critical because they front densely populated areas of Barrow and are located in areas that have not been stabilized. In addition, the USACE reports indicate that if the present net rate of erosion of 2.2 feet per year continues in the hot spots (as documented for the period 1984 to 2003), a significant number of buildings and infrastructure will be lost. Figure 9 and Figure 10 illustrate the “hot spot” areas within Zones 1 and 2, respectively, and the estimated erosion lines for 2025 and 2035. If these areas, specifically the areas identified as “hot spots” are not mitigated against the erosion or the structures are not relocated, a total of 31 buildings along with the associated roads and utilities could be impacted or lost.

4.3.1 Mitigation

The NSB has funded erosion mitigation for many years. Some of the specific mitigation techniques used by the NSB and others over the years include:

- Offshore dredging with beach nourishment;
- Construction of sacrificial berms;
- Shoreline road maintenance; and
- Construction/use of HESCO Concertainers.

More than $28 million has been spent by the NSB over a decade to place 100,000 cubic yards (CY) of gravel on the beach. Flood waters have overtopped Stevenson Street multiple times since 2000, with prolonged disruption of access to NARL, leaving residents and Ilisagvik students stranded and without access to emergency medical services for several days (State of Alaska Department of Transportation and Public Facilities 2012). During a storm in 2000, floodwater overtopped Stevenson Street, washing out four sections of the road to NARL. The NSB spent over $330,000 dollars to repair the road during this incident. Historically the road needs repairs such as this every three years.

Other mitigation measures have been incorporated with varying degrees of success: large supersacks placed along the beach bank slopes; surplus wooden utilidors filled with material to create a seawall; old tar barrels laid along the upper beach slope; and placement of geotextile tubes along berm bases (U.S. Army Corps of Engineers 2007b). Based on the USACE 2007
Erosion Information Paper, an average amount of 15,000 cubic yards of material is placed along the shoreline annually to protect the community.

The USACE Coastal Storm Damage Reduction Technical Report dated July 2010 has estimated average annual damage at approximately $1.2 million. This amount is estimated, in part, by calculating the cost to repair the damaging effects of storms on roads, structures, protective berms and utilities. The report also states that ten structural measures and five non-structural measures were considered to reduce erosion and flood damages. These possible preventive measures were pared down to five basic alternatives with scale variations:

- Rock revetments;
- Beach nourishment;
- Joining the National Flood Insurance Program;
- Elevating and relocating buildings; and
- Lagoon filling.

The report then generated 16 cost estimates for alternatives to compare with the estimated effectiveness in reducing storm damage. In all cases, the costs of implementing all alternatives far exceed the National Economic Development (NED) benefits, resulting in a negative NED benefit.

4.3.2 At Risk

Much of the existing infrastructure is in danger of being lost due to the diminishing shoreline and increased flooding. Not all of the at-risk infrastructure can be addressed here, but a few larger impacts are noted. In Barrow, Stevenson Street is the main road access to points north of Barrow and Browerville and is at risk of damage due to erosion. Flooding and damage occurs most years and costs the NSB thousands of dollars in repairs. On many occasions, access to NARL is cut off, sometimes for days at a time, as well as areas north of NARL used for subsistence activities. There are fuel and electric utilities parallel to Stevenson Street that are also at risk.

The South Salt Lagoon is also at risk due to continued erosion. The lagoon has been used for years as a sewage dumping site. If the lagoon were to be breached, contaminates would threaten wildlife and subsistence activities. In addition, the South and Middle lagoons are integral components of the existing sewage treatment process. To compromise either would impact the treatment systems and cause the loss of process functionality, potentially leaving the community without sewage treatment facilities.

The old Barrow Landfill located at the South Salt Lagoon is at risk and, although closed and capped now, breaching would allow large amounts of solid waste to be carried into the sea.

Sections of the utilidor system along Agvik Street (specifically Pump Station [PS] 4) could be breached and flooded with encroaching water. Associated damage would include loss of utility service, freezing damage and impacts to many residents.
POTENTIAL EROSION
Shoreline was digitized from 2012 satellite imagery and is subject to interpretation. Historic erosion along the bluff is divided into two "hot spots", identified as most critical fronting the most densely populated area. A net shoreline erosion rate of 2.2 ft. per year, "Coastal Storm Damage Reduction Technical report", USACE, July 2010

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YEAR 2012
YEAR 2025
YEAR 2035
Pumpstations

BARROW, ALASKA
POTENTIAL EROSION
ZONE 1

Scale:
0 150 300 450 600 Feet

Figure:
9

Title:
BARROW, ALASKA
POTENTIAL EROSION
ZONE 1
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POTENTIAL EROSION
Shoreline was digitized from 2012 satellite imagery and is subject to interpretation. Historic erosion along the bluff is divided into two "hot spots", identified as most critical fronting the most densely populated area. A net shoreline erosion rate of 2.2 ft. per year, "Coastal Storm Damage Reduction Technical report", USACE, July 2010

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Barrow Comprehensive Plan

Title: BARROW, ALASKA
POTENTIAL EROSION
ZONE 2

Scale: 1 inch = 300 feet
Figure: 10
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4.3.3 Community Cultural and Social Impacts

There are impacts to social and cultural conditions from increased storms, flooding and erosion. Storms and erosion impacts cause flooding in lower elevations, impacting access to fishing and hunting sites, boat launching, and recreational activities. Increased erosion of archeological sites could expose burial sites and historic artifacts, some that date back more than 4,000 years.

4.3.4 Appropriate Responses

Recognizing and controlling the impacts of erosion can be categorized into three possible responses:

- Prevention. The most appropriate response is prevention. The City of Barrow and the NSB should consider not constructing new facilities within a 50-year flood hazard zone. If construction of a facility is necessary, then design should be incorporated to allow for ease in relocation if it were to become necessary.

- Mitigation. Some facilities threatened by erosion are important components to the infrastructure system and the cost benefit to spend funds to protect them may be necessary.

- Abandonment. In some cases, it becomes a losing battle to continue to spend capital funds to save a property or facility. Either physically relocating vulnerable facilities or abandoning them altogether in favor of a new facility farther from erosion danger may become a better financial choice.

4.4 Permafrost Thaw

4.4.1 Permafrost Characteristics

Permafrost is rock or solid soils that have remained continuously below 32 degrees for two or more years. In the Barrow area, permafrost is known to extend to depths of 1,000 feet (McCarthy 1994). The layer above the permafrost thaws during summer months and refreezes again in winter. This layer is called the “active layer” and it typically varies in depth, up to 1.5 to 2.0 feet depending on vegetative cover in undisturbed soils. In areas of disturbance, the active layered depth can be greater.

Ice-rich permafrost is a soil that is comprised of a significant amount of water as part of the soil matrix. While some permafrost is "thaw stable," ice-rich permafrost is not. This type of soil, which in undisturbed conditions may be stable, does not have the ability to support surface loads when the active layer is thawed because of its very high water content.

4.4.2 Permafrost Thaw

Subsurface failures cause significant damage to both surface infrastructure development and the underlying and adjacent permafrost. The thermal gain in the development area exceeds the insulating property of the tundra and permafrost below. Where there is damage to the vegetative layer or compaction of the top soils and vegetation mat, its insulating capabilities are diminished.
causing more subsurface thawing to the permafrost layers. In addition, permafrost is less permeable than unfrozen soils and limits the flow of subsurface water. In areas of lakes and the ocean, warmer temperatures of the water can infiltrate and thaw adjacent permafrost layers.

Permafrost is very sensitive to any surface changes that alter the existing insulating characteristics of the surface vegetation or tundra. Any kind of surface construction such as buildings and roads on this type of permafrost will modify the surface vegetation’s insulating properties. If proper engineering techniques to replace the tundra’s insulating characteristics are not implemented, developments are subject to damage or overall failure.

The presence of permafrost also impacts surface drainage and can impede surface drainage patterns. The permafrost impedes active flows within the active layer from any deeper regional subsurface flows. In areas of added snow drifts such as along snow fences, plugged streams and culverts can seriously impact surface erosion and drainage patterns. Also related, a report addressing failure modes of thawing permafrost bluffs along the Chukchi Sea Coast in 2009 provided preliminary analysis that increasing temperatures are resulting in accelerating thawing of permafrost and even linked it to coastal erosion. (Collins et al 2009).

4.5 Contamination/Hazardous Waste

Contaminated Sites. ADEC defines a contaminated site as “a location where hazardous substances, including petroleum products, have been improperly disposed.” Existing contaminated sites have the potential to threaten public health or the environment and can cause economic hardship to people and communities. ADEC identified 32 contaminated sites in the Barrow area (Figure 11). These sites include former landfills and dump sites, NARL facilities and DEW Line facilities. All the contaminated sites are listed in Table 6. More information on these sites including closure details and cleanup chronology can be found on the ADEC Contaminated Sites Program website.

Legacy Wells. Between 1944 and 1982, the U.S. Navy and the U.S. Geological Survey (USGS) conducted a program of exploratory and scientific drilling of 136 oil wells on Alaska’s North Slope in the National Petroleum Reserve in Alaska (NPR-A). The Bureau of Land Management (BLM), given the responsibility of managing the NPR-A in 1976, became responsible for assessing, plugging and cleaning up the wells.

The NPR-A 2013 Legacy Wells Summary Report indicates that 68 wells require no additional BLM action; 18 wells are currently in use by USGS; and 50 wells currently require BLM remediation (citation). In 2013, the federal government allocated an additional $50 million to address well remediation within the NPR-A. In response, the BLM is planning to address the highest priority wells first and those that are clustered to maximize spending. There are several clusters of wells: the Umiat cluster that includes six wells; the Barrow cluster that includes seven wells; and a Simpson Peninsula cluster of seven wells.

The new infusion of federal funds for cleaning up the legacy wells will likely require staging areas for equipment, supplies and short and/or long term storage for contaminated materials. Because there is a cluster of wells in the Barrow area and because it is the largest community strategically
located along the coast, Barrow will likely see some of this remediation and staging activities. There are several laydown areas that may be used for this work, including the gravel pads south of the airport and at NARL.

Table 6 Contaminated Sites, Barrow Area

<table>
<thead>
<tr>
<th>No.</th>
<th>ADEC Hazard ID</th>
<th>Site Name</th>
<th>Location</th>
<th>Status</th>
<th>ADEC File ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>163</td>
<td>Brower Property</td>
<td>4211 Karluk Street, Barrow, AK 99723</td>
<td>Cleanup Complete</td>
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<td>2</td>
<td>193</td>
<td>Skull Cliff LORAN DEW Line / DERP</td>
<td>23 Miles SW of Barrow</td>
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<tr>
<td>3</td>
<td>556</td>
<td>NARL - Powerhouse Fuel Spill</td>
<td>5.5 Miles NE of Barrow</td>
<td>3</td>
<td>556</td>
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<td>4</td>
<td>557</td>
<td>NARL - Airstrip Fuel Spill</td>
<td>Near Airstrip, Barrow, AK 99723</td>
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<td>5</td>
<td>558</td>
<td>NARL - Bulk Fuel Tank Farm</td>
<td>North Salt Lagoon</td>
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<td>558</td>
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<td>6</td>
<td>559</td>
<td>NARL - Middle Salt Lagoon</td>
<td>Middle Salt Lagoon, Barrow, AK 99723</td>
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<td>310.38.008</td>
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<tr>
<td>7</td>
<td>566</td>
<td>NARL - Naval Arctic Research Lab</td>
<td>5.5 Miles NE of Barrow, Barrow, AK 99723</td>
<td>Open</td>
<td>310.38.008</td>
</tr>
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<td>8</td>
<td>567</td>
<td>NARL - Old Waste Disposal Area</td>
<td>0.5 Mile South of NARL, Barrow, AK 99723</td>
<td>Cleanup Complete - Institutional Controls</td>
<td>310.38.015</td>
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<td>NARL - Former Dry Cleaning Facility</td>
<td>NARL Facility, Barrow, AK 99723</td>
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<td>569</td>
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<td>12</td>
<td>763</td>
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<td>768</td>
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<td>1602</td>
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<td>21</td>
<td>3232</td>
<td>Barrow Gas Station Tank Farm</td>
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Source: ADEC 2014
CONTAMINATED SITE STATUS

- Active
- Cleanup Complete
- Cleanup Complete - Institutional Controls
- Informational

EXISTING ROADS

BARROW BOUNDARY

SOURCES:
Alaska Department of Environmental Conservation - Contaminated Sites Program

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CONTAMINATED SITES

0 0.25 0.5 0.75 1 Miles

Figure: 11
5.0 POPULATION

5.1 Changes in Population

Barrow’s population growth had been remarkably robust until the early 2000s, when the population declined. The community experienced overall positive sustained population growth for over 70 years. The positive growth contributed to Barrow becoming the largest population center of all North Slope communities.

5.1.1 Declining Population 2001-2007

The decline in population appeared to be based on two primary factors:

- declining revenue to the NSB from the property taxes collected from the oil and gas industry for real property improvements in the Prudhoe Bay/Deadhorse area and Kuparuk and its surrounding fields; and

- a significant decline in major capital improvement project expenditures in North Slope communities funded by the NSB due to reduced revenue.

The reduction in population appears to have been a combination of non-Native people leaving Barrow because of the loss of job opportunities and a statewide trend of rural residents moving to the urban centers of Alaska. This is partially evidenced by the increase of Barrow's percentage of Iñupiat population that accounted 61% of the total population in 2003 to about 65% in 2010.

5.1.2 Growing Population 2008 – Present

The turnaround in population was likely due to:

- increased activity by the oil and gas industry in exploration of the Chukchi Sea; and

- new legal determinations on the value of the properties in the Prudhoe Bay/Deadhorse area and Kuparuk and its surrounding fields that resulted in additional revenue to the NSB.

There appears to be a strong relationship between the tax revenue coming into the NSB coffers, the growth of the NSB capital budget and the overall growth of the Barrow population. Since 2006, the NSB revenue has grown about 7% annually while the number of NSB full-time employees (FTEs) has grown by about 5%. The Barrow population has averaged slightly over 1% growth since 2008.

Disputed Population Numbers. The SOA and the NSB frequently disagree on the census counts developed by the State. The NSB has been able to routinely refute the SOA’s count by showing that NSB communities, including Barrow, had a larger population than accounted for by the State by conducting its own census. The undercount was significant in 2010. The SOA indicated 762 fewer Barrow residents than the NSB’s 2010 census. Some of this difference can be attributed to the State’s reliance on the federal decennial census and applications for the Alaska Permanent Fund Dividend (PFD). These two sources for estimating population fail to account for people that:
• did not participate in the federal census (a historic and chronic issue in rural Alaska), and

• are not eligible for a PFD because of either length of time required to be considered an Alaska resident or status as a convicted felon, that are nonetheless residents.

This dispute between the SOA and the NSB is usually resolved by compromising on the final population count but the State rarely revises the original number in official records.

The reason this is important is because population drives funding for many services provided by the State of Alaska and the federal government. The difference of 762 residents can result in a significant underfunding of programs and therefore a diminished capacity to provide adequate services.

5.1.3 Poverty

According to the U.S. Department of Health and Social Services, approximately 17.7% of Barrow residents are living at or below the poverty level. The 2013 guidelines for determining poverty in Alaska are listed below in Table 7.

Table 7 2013 Guidelines for Determining Poverty Level

<table>
<thead>
<tr>
<th>Persons in Family/Household</th>
<th>Poverty Guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>For families/households with more than 8 persons, add $5,030 for each additional person.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>$14,350</td>
</tr>
<tr>
<td>2</td>
<td>$19,380</td>
</tr>
<tr>
<td>3</td>
<td>$24,410</td>
</tr>
<tr>
<td>4</td>
<td>$29,440</td>
</tr>
<tr>
<td>5</td>
<td>$34,470</td>
</tr>
<tr>
<td>6</td>
<td>$39,500</td>
</tr>
<tr>
<td>7</td>
<td>$44,530</td>
</tr>
<tr>
<td>8</td>
<td>$49,560</td>
</tr>
</tbody>
</table>

5.1.4 Diversity

Barrow’s population is the largest of any of the North Slope communities and has the most complex racial mix. While Barrow remains racially an Iñupiat-dominant community, Barrow is also home to other Alaska Natives, Native Americans, Caucasians, Pacific Islanders, African Americans and several Asian communities, the largest being Filipino. Despite its isolation from the Alaskan road system and its remoteness, Barrow is remarkably diverse. Table 8 outlines the 2010 census ethnic/racial breakdown for Barrow.
Table 8  2010 U.S. Census Ethnic/Racial Breakdown

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Total (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iñupiat</td>
<td>65.1</td>
</tr>
<tr>
<td>Caucasian</td>
<td>15.8</td>
</tr>
<tr>
<td>Athabascan</td>
<td>0.3</td>
</tr>
<tr>
<td>Tlingit</td>
<td>0.1</td>
</tr>
<tr>
<td>Haida</td>
<td>0.1</td>
</tr>
<tr>
<td>Yup'ik</td>
<td>0.4</td>
</tr>
<tr>
<td>American Indian</td>
<td>0.5</td>
</tr>
<tr>
<td>Asian Indian</td>
<td>0.2</td>
</tr>
<tr>
<td>Filipino</td>
<td>7.6</td>
</tr>
<tr>
<td>Thai</td>
<td>0.4</td>
</tr>
<tr>
<td>Hawaiian</td>
<td>0.3</td>
</tr>
<tr>
<td>Korean</td>
<td>0.2</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>2.4</td>
</tr>
<tr>
<td>African American</td>
<td>1.1</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>0.1</td>
</tr>
<tr>
<td>Other</td>
<td>5.5</td>
</tr>
</tbody>
</table>

5.2 Implications Based on Population Projections

Population projections for Barrow are needed to determine the level of services and infrastructure needed to sustain the community for the next 20 years. There are two sets of population projections based on oil and gas industry activity:

1. Without oil and gas industry development on the Chukchi Sea leases; and

2. With oil and gas industry development on the Chukchi Sea leases. The population projection with oil and gas industry activity was developed using basic information that the NSB has collected for past population growth.

5.2.1 Barrow Population Without Oil and Gas Development

Table 9  2010 Population Details Without Oil and Gas Development

<table>
<thead>
<tr>
<th>Population</th>
<th>Age Group</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Ratio of Male to Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>0-4</td>
<td>395</td>
<td>206</td>
<td>189</td>
<td>1.09</td>
</tr>
<tr>
<td>Primary school</td>
<td>5-9</td>
<td>327</td>
<td>171</td>
<td>156</td>
<td>1.10</td>
</tr>
<tr>
<td>Secondary school</td>
<td>10-19</td>
<td>625</td>
<td>326</td>
<td>299</td>
<td>1.09</td>
</tr>
<tr>
<td>Adults</td>
<td>20-49</td>
<td>2,221</td>
<td>1159</td>
<td>1062</td>
<td>1.09</td>
</tr>
<tr>
<td>Retiring adults</td>
<td>50-64</td>
<td>1,194</td>
<td>623</td>
<td>571</td>
<td>1.09</td>
</tr>
<tr>
<td>Seniors</td>
<td>65-90+</td>
<td>211</td>
<td>110</td>
<td>101</td>
<td>1.09</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>4,973</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 10 2015 Population Details Without Oil and Gas Development

<table>
<thead>
<tr>
<th>Population</th>
<th>Age Group</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Change from 2010</th>
<th>Ratio of Male to Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>0-4</td>
<td>476</td>
<td>242</td>
<td>234</td>
<td>+1.14</td>
<td>1.03</td>
</tr>
<tr>
<td>Primary school</td>
<td>5-9</td>
<td>383</td>
<td>195</td>
<td>189</td>
<td>+1.11</td>
<td>1.03</td>
</tr>
<tr>
<td>Secondary school</td>
<td>10-19</td>
<td>585</td>
<td>307</td>
<td>278</td>
<td>-0.89</td>
<td>1.11</td>
</tr>
<tr>
<td>Adults</td>
<td>20-49</td>
<td>2,202</td>
<td>1,422</td>
<td>780</td>
<td>-0.94</td>
<td>1.82</td>
</tr>
<tr>
<td>Retiring adults</td>
<td>50-64</td>
<td>1,298</td>
<td>930</td>
<td>369</td>
<td>+1.03</td>
<td>2.52</td>
</tr>
<tr>
<td>Seniors</td>
<td>65-90+</td>
<td>284</td>
<td>158</td>
<td>126</td>
<td>+1.28</td>
<td>1.25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>5,228</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 11 2020 Population Details Without Oil and Gas Development

<table>
<thead>
<tr>
<th>Population</th>
<th>Age Group</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Change from 2015</th>
<th>Ratio of Male to Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>0-4</td>
<td>458</td>
<td>233</td>
<td>226</td>
<td>-0.91</td>
<td>1.03</td>
</tr>
<tr>
<td>Primary school</td>
<td>5-9</td>
<td>472</td>
<td>238</td>
<td>233</td>
<td>+1.17</td>
<td>1.02</td>
</tr>
<tr>
<td>Secondary school</td>
<td>10-19</td>
<td>675</td>
<td>348</td>
<td>327</td>
<td>+1.10</td>
<td>1.06</td>
</tr>
<tr>
<td>Adults</td>
<td>20-49</td>
<td>2,197</td>
<td>1,423</td>
<td>774</td>
<td>-0.95</td>
<td>1.84</td>
</tr>
<tr>
<td>Retiring adults</td>
<td>50-64</td>
<td>1,279</td>
<td>924</td>
<td>354</td>
<td>-0.93</td>
<td>2.61</td>
</tr>
<tr>
<td>Seniors</td>
<td>65-90+</td>
<td>414</td>
<td>236</td>
<td>179</td>
<td>+1.39</td>
<td>1.32</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td>5,495</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 12 2025 Population Details Without Oil and Gas Development

<table>
<thead>
<tr>
<th>Population</th>
<th>Age Group</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Change from 2020</th>
<th>Ratio of Male to Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>0-4</td>
<td>437</td>
<td>220</td>
<td>217</td>
<td>-0.90</td>
<td>1.01</td>
</tr>
<tr>
<td>Primary school</td>
<td>5-9</td>
<td>456</td>
<td>229</td>
<td>227</td>
<td>-0.91</td>
<td>1.99</td>
</tr>
<tr>
<td>Secondary school</td>
<td>10-19</td>
<td>840</td>
<td>455</td>
<td>384</td>
<td>+1.17</td>
<td>1.18</td>
</tr>
<tr>
<td>Adults</td>
<td>20-49</td>
<td>2,293</td>
<td>1,548</td>
<td>746</td>
<td>-0.99</td>
<td>2.08</td>
</tr>
<tr>
<td>Retiring adults</td>
<td>50-64</td>
<td>1,196</td>
<td>818</td>
<td>378</td>
<td>-0.88</td>
<td>2.17</td>
</tr>
<tr>
<td>Seniors</td>
<td>65-90+</td>
<td>553</td>
<td>293</td>
<td>260</td>
<td>+1.26</td>
<td>1.13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>5,775</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 13  2030 Population Details Without Oil and Gas Development

<table>
<thead>
<tr>
<th>Population</th>
<th>Age Group</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Change from 2025</th>
<th>Ratio of Male to Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>0-4</td>
<td>457</td>
<td>231</td>
<td>226</td>
<td>-0.99</td>
<td>1.02</td>
</tr>
<tr>
<td>Primary school</td>
<td>5-9</td>
<td>433</td>
<td>218</td>
<td>215</td>
<td>-0.90</td>
<td>1.02</td>
</tr>
<tr>
<td>Secondary school</td>
<td>10-19</td>
<td>930</td>
<td>473</td>
<td>457</td>
<td>+1.05</td>
<td>1.04</td>
</tr>
<tr>
<td>Adults</td>
<td>20-49</td>
<td>2446</td>
<td>1,571</td>
<td>875</td>
<td>+1.01</td>
<td>1.79</td>
</tr>
<tr>
<td>Retiring adults</td>
<td>50-64</td>
<td>1,151</td>
<td>890</td>
<td>260</td>
<td>-0.91</td>
<td>3.42</td>
</tr>
<tr>
<td>Seniors</td>
<td>65-90+</td>
<td>653</td>
<td>346</td>
<td>306</td>
<td>+1.12</td>
<td>1.13</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>6,070</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 14  2035 Population Details Without Oil and Gas Development

<table>
<thead>
<tr>
<th>Population</th>
<th>Age Group</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Change from 2030</th>
<th>Ratio of Male to Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>0-4</td>
<td>528</td>
<td>266</td>
<td>261</td>
<td>+1.11</td>
<td>1.02</td>
</tr>
<tr>
<td>Primary school</td>
<td>5-9</td>
<td>452</td>
<td>227</td>
<td>225</td>
<td>+1.00</td>
<td>1.01</td>
</tr>
<tr>
<td>Secondary school</td>
<td>10-19</td>
<td>883</td>
<td>448</td>
<td>435</td>
<td>-0.91</td>
<td>1.03</td>
</tr>
<tr>
<td>Adults</td>
<td>20-49</td>
<td>2,626</td>
<td>1,681</td>
<td>945</td>
<td>+1.03</td>
<td>1.78</td>
</tr>
<tr>
<td>Retiring adults</td>
<td>50-64</td>
<td>1,233</td>
<td>930</td>
<td>303</td>
<td>+1.03</td>
<td>3.07</td>
</tr>
<tr>
<td>Seniors</td>
<td>65-90+</td>
<td>658</td>
<td>345</td>
<td>313</td>
<td>-0.97</td>
<td>1.10</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>6,379</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

While the overall population for Barrow continues to grow, certain age cohorts are projected to decline while other age cohorts are projected to increase. For example, the Adults and Retiring Adults cohorts show an overall decline in both scenarios. One reason may be the lack of employment opportunities and conveniences that one can have in an urban community. For the Retiring Adults, the decrease could be that living in a community like Barrow with a high cost of living is simply too expensive for someone on a fixed income. The rise in the seniors’ age cohort could be attributed to seniors moving back to Barrow to live with their family.
### 5.2.2 Barrow Population With Oil and Gas Industry Development

#### Table 15 2010 Population Details With Oil and Gas Development

<table>
<thead>
<tr>
<th>Population</th>
<th>Age Group</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Ratio of Male to Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>0-4</td>
<td>395</td>
<td>202</td>
<td>193</td>
<td>1.05</td>
</tr>
<tr>
<td>Primary school</td>
<td>5-9</td>
<td>327</td>
<td>167</td>
<td>160</td>
<td>1.05</td>
</tr>
<tr>
<td>Secondary school</td>
<td>10-19</td>
<td>625</td>
<td>325</td>
<td>300</td>
<td>1.08</td>
</tr>
<tr>
<td>Adults</td>
<td>20-49</td>
<td>2,221</td>
<td>1431</td>
<td>790</td>
<td>1.81</td>
</tr>
<tr>
<td>Retiring adults</td>
<td>50-64</td>
<td>1,194</td>
<td>867</td>
<td>327</td>
<td>2.65</td>
</tr>
<tr>
<td>Seniors</td>
<td>65-90+</td>
<td>211</td>
<td>119</td>
<td>92</td>
<td>1.29</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4,974</td>
<td>3,111</td>
<td>1,862</td>
<td></td>
</tr>
</tbody>
</table>

#### Table 16 2015 Population Details With Oil and Gas Development

<table>
<thead>
<tr>
<th>Population</th>
<th>Age Group</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Change from 2010</th>
<th>Ratio of Male to Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>0-4</td>
<td>485</td>
<td>246</td>
<td>239</td>
<td>+1.14</td>
<td>1.03</td>
</tr>
<tr>
<td>Primary school</td>
<td>5-9</td>
<td>391</td>
<td>199</td>
<td>192</td>
<td>+1.11</td>
<td>1.03</td>
</tr>
<tr>
<td>Secondary school</td>
<td>10-19</td>
<td>596</td>
<td>313</td>
<td>283</td>
<td>-0.89</td>
<td>1.11</td>
</tr>
<tr>
<td>Adults</td>
<td>20-49</td>
<td>2,246</td>
<td>1450</td>
<td>796</td>
<td>-0.94</td>
<td>1.82</td>
</tr>
<tr>
<td>Retiring adults</td>
<td>50-64</td>
<td>1,324</td>
<td>948</td>
<td>376</td>
<td>+1.03</td>
<td>2.52</td>
</tr>
<tr>
<td>Seniors</td>
<td>65-90+</td>
<td>289</td>
<td>161</td>
<td>128</td>
<td>+1.28</td>
<td>1.25</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5,331</td>
<td>3,317</td>
<td>2,014</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Table 17 2020 Population Details With Oil and Gas Development

<table>
<thead>
<tr>
<th>Population</th>
<th>Age Group</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Change from 2015</th>
<th>Ratio of Male to Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>0-4</td>
<td>516</td>
<td>262</td>
<td>254</td>
<td>-0.91</td>
<td>1.03</td>
</tr>
<tr>
<td>Primary school</td>
<td>5-9</td>
<td>531</td>
<td>268</td>
<td>262</td>
<td>+1.17</td>
<td>1.02</td>
</tr>
<tr>
<td>Secondary school</td>
<td>10-19</td>
<td>760</td>
<td>391</td>
<td>368</td>
<td>+1.10</td>
<td>1.06</td>
</tr>
<tr>
<td>Adults</td>
<td>20-49</td>
<td>2,471</td>
<td>1601</td>
<td>870</td>
<td>-0.95</td>
<td>1.84</td>
</tr>
<tr>
<td>Retiring adults</td>
<td>50-64</td>
<td>1,438</td>
<td>1040</td>
<td>398</td>
<td>-0.93</td>
<td>2.61</td>
</tr>
<tr>
<td>Seniors</td>
<td>65-90+</td>
<td>466</td>
<td>265</td>
<td>201</td>
<td>+1.39</td>
<td>1.32</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>6,181</td>
<td>3,827</td>
<td>2,353</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 18  2025 Population Details With Oil and Gas Development

<table>
<thead>
<tr>
<th>Population</th>
<th>Age Group</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Change from 2020</th>
<th>Ratio of Male to Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>0-4</td>
<td>504</td>
<td>254</td>
<td>250</td>
<td>-0.90</td>
<td>1.01</td>
</tr>
<tr>
<td>Primary school</td>
<td>5-9</td>
<td>526</td>
<td>264</td>
<td>262</td>
<td>-0.91</td>
<td>1.99</td>
</tr>
<tr>
<td>Secondary school</td>
<td>10-19</td>
<td>968</td>
<td>525</td>
<td>443</td>
<td>+1.17</td>
<td>1.18</td>
</tr>
<tr>
<td>Adults</td>
<td>20-49</td>
<td>2,644</td>
<td>1,784</td>
<td>860</td>
<td>-0.99</td>
<td>2.08</td>
</tr>
<tr>
<td>Retiring adults</td>
<td>50-64</td>
<td>1,379</td>
<td>943</td>
<td>435</td>
<td>-0.88</td>
<td>2.17</td>
</tr>
<tr>
<td>Seniors</td>
<td>65-90+</td>
<td>638</td>
<td>338</td>
<td>300</td>
<td>+1.26</td>
<td>1.13</td>
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<tr>
<td>Total</td>
<td></td>
<td>6,658</td>
<td>4,108</td>
<td>2,550</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 19  2030 Population Details With Oil and Gas Development

<table>
<thead>
<tr>
<th>Population</th>
<th>Age Group</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Change from 2025</th>
<th>Ratio of Male to Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>0-4</td>
<td>530</td>
<td>268</td>
<td>262</td>
<td>-0.99</td>
<td>1.02</td>
</tr>
<tr>
<td>Primary school</td>
<td>5-9</td>
<td>502</td>
<td>253</td>
<td>249</td>
<td>-0.90</td>
<td>1.02</td>
</tr>
<tr>
<td>Secondary school</td>
<td>10-19</td>
<td>1,078</td>
<td>548</td>
<td>530</td>
<td>+1.05</td>
<td>1.04</td>
</tr>
<tr>
<td>Adults</td>
<td>20-49</td>
<td>2,834</td>
<td>1,820</td>
<td>1,014</td>
<td>+1.01</td>
<td>1.79</td>
</tr>
<tr>
<td>Retiring adults</td>
<td>50-64</td>
<td>1,333</td>
<td>1,031</td>
<td>302</td>
<td>-0.91</td>
<td>3.42</td>
</tr>
<tr>
<td>Seniors</td>
<td>65-90+</td>
<td>756</td>
<td>401</td>
<td>355</td>
<td>-1.12</td>
<td>1.13</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>7,033</td>
<td>4,231</td>
<td>2,712</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 20  2035 Population Details With Oil and Gas Development

<table>
<thead>
<tr>
<th>Population</th>
<th>Age Group</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Change from 2030</th>
<th>Ratio of Male to Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>0-4</td>
<td>612</td>
<td>309</td>
<td>303</td>
<td>+1.11</td>
<td>1.02</td>
</tr>
<tr>
<td>Primary school</td>
<td>5-9</td>
<td>524</td>
<td>264</td>
<td>261</td>
<td>+1.00</td>
<td>1.01</td>
</tr>
<tr>
<td>Secondary school</td>
<td>10-19</td>
<td>1,024</td>
<td>519</td>
<td>505</td>
<td>-0.91</td>
<td>1.03</td>
</tr>
<tr>
<td>Adults</td>
<td>20-49</td>
<td>3,046</td>
<td>1,950</td>
<td>1,096</td>
<td>+1.03</td>
<td>1.78</td>
</tr>
<tr>
<td>Retiring adults</td>
<td>50-64</td>
<td>1,430</td>
<td>1,079</td>
<td>352</td>
<td>+1.03</td>
<td>3.07</td>
</tr>
<tr>
<td>Seniors</td>
<td>65-90+</td>
<td>763</td>
<td>400</td>
<td>363</td>
<td>-0.97</td>
<td>1.10</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>7,400</td>
<td>4,521</td>
<td>2,880</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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6.0 HOUSING

The community of Barrow, like many other communities across the North Slope and throughout Alaska, struggles with housing issues – safe, sanitary, available and affordable housing for residents. Barrow is experiencing a shortage of housing of all types. The lack of affordable housing is exacerbated by the lack of rental housing and homeownership opportunities.

Housing is a complex issue in Barrow and across the entire North Slope. It is the convergence of many factors including land ownership and Barrow’s remote location that contribute to the lack of availability, lack of affordability and overcrowded conditions. The population is expected to grow by 1,203 people by the year 2035 without oil and gas development and by 2,224 people with oil and gas development, an increase of 23% and 42% respectively. With this anticipated increase, the complexity of housing issues should be addressed to comfortably accommodate both the current and future populations.

This section of the Comprehensive Plan identifies and describes the current housing issues and those related to the projected growth. It does not substitute the need for a holistic housing study that investigates housing issues in depth and provides an array of potential solutions.

6.1 Existing Housing Conditions

According to the NSB 2010 Economic Profile and Census Report (NSBEP&CR), there are 1,644 total dwelling units in Barrow of which 1,507 are occupied, a 91.7% occupancy rate. The majority of Barrow residents, 61%, live in single family homes while 7% live in mobile homes or trailers. The remaining 32% of residents live in buildings with two or more dwelling units. Forty-three percent of families own their home and of those, 51% own their home free of a loan obligation or mortgage (North Slope Borough 2010).

Housing construction was a thriving industry in Barrow during the 1980s. Nearly 38% of the total housing stock was constructed between 1980 and 1989. The estimated 597 residential units built during the 1980s accounts for more than all the housing stock constructed prior to 1980 (34%) and more than has been built in the last nearly 25 years (28%) (U.S. Census Bureau 2010). More recently, approximately 43 housing units have been constructed in Barrow since 2010 - one duplex and 41 single family homes (Moore 2014).

Natural gas fuels approximately 93% of all households in Barrow. The nearby Barrow Gas Fields make heating homes in Barrow one of the least expensive areas in the state. Nearly all (94.4%) Barrow homes have running water and 85.6% of homes are connected to the utilidor water and sewer system. Of the homes that are not connected to the utilidor system, they either rely on holding tanks (7.5%) or honey buckets (6.2%) (North Slope Borough 2010).

6.2 Overcrowding

The rate of overcrowding is a frequently used indicator to assess housing affordability, economic health and the quality of life within a community. A commonly accepted definition of overcrowding and one used by the United States Census Bureau is more than one person per room; severe overcrowding is defined as one and a half people per room. The 2008-2012 American Community.
Survey 5-Year Estimates indicate that 13% of households in Barrow are overcrowded, 4% of which are severely overcrowded. By comparison, the combined national average for overcrowding and severe overcrowding is 3.2% (U.S Census Bureau 2012). At community meetings, residents voiced concern about the lack of housing availability for rent or purchase and the prevalence of two and three generations living together in one home.

6.3 Vacancy

Vacant housing units are integral to a healthy housing market because they help maintain stable prices. Without a sufficient number of vacant units, competition creates upward pressure on both rental and for sale housing prices. The 2010 NSBEP&CR indicates that there were 137 or 8.3% vacant dwelling units in Barrow2. The 2010 U.S Decennial Census indicates that vacant housing rates within Barrow were higher, with an estimated 274 vacant housing units and an overall vacancy rate of 17.6%.3 Of the total housing units in Barrow, the U.S Census indicated that 5.3% were reserved for seasonal, occasional or recreational use; 6.6% were other vacancies; 5.2% were available for rent; and .1% were for sale. By comparison, the State of Alaska reportedly had less than half (2.2%) the rental housing availability of Barrow and the U.S. percentage of vacant rentals was 3.1. The proportion of available rental housing units to total number of rental units in Barrow, known as the rental vacancy rate, was 9.7%; the homeowner vacancy rate was .4%. In comparison, the rental vacancy rate in the U.S was 9.2% and the homeowner vacancy rate was 2.4%4. Those familiar with Barrow are cognizant of the difficulty in finding rental housing yet the Census numbers indicate adequate rental housing availability and a healthy rental market.

The high occurrence of overcrowding and the low homeowner vacancy rate are indicators that housing options are limited. Yet, the 2010 NSBEP&CR rental vacancy rate of 5.2% indicates that there should be rental housing available. Contradicting the rental vacancy rates is the long waiting lists for TNHA Low-Rent Housing and TNHA Fair Market Rental Programs, which has over 300 people on the waiting list for both programs (Tagiugmiullu Nunamiullu Housing Authority 2014b). NVB also maintains a waiting list for their home construction and home renovation programs. Those waiting lists are also long and corroborate that finding opportunities for homeownership is difficult (Okakok 2014). Additionally, the homeownership rate in Barrow is below the national average, at 41.1% and 65.1% respectively. Homeownership is also lower in Barrow than Alaska as a whole, which is at 63.1%.

6.4 Condition

Housing condition is also an issue in Barrow. There are some residential properties in Barrow that are clearly not suitable for occupancy for a variety of reasons, including significant structural

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2 The NSBEP&CR relied on residents to indicate to field workers which housing units were vacant and which were occupied.
3 The U.S. Census Bureau considers a housing unit vacant if no one is living in it at the time of interview, unless its occupants are only temporarily absent or have a usual residence elsewhere. New units not yet occupied are classified as vacant if the home has all exterior windows and doors and flooring. Vacant units are excluded if they are exposed to the elements, such as the roof, walls, windows or doors no longer protect the interior or if there is positive evidence that the unit is to be demolished / condemned. Also excluded are quarters being used entirely for nonresidential purposes. (https://www.census.gov/housing/hvs/files/qtr413/q413def.html)
4 The proportions of the homeowner inventory or rental inventory that is vacant and "for sale" or "for rent."
damage from fires or poor maintenance that may require major renovations or demolition. In addition to being a safety hazard, these unlivable houses do not take advantage of being within an already developed area. In 2012, to simply connect a single home to the water and sewer system in Browerville cost an estimated average of $123,000; to develop a new subdivision that includes roads, water and sewer connections, natural gas and electricity cost an average of $302,000 per home. Developing a subdivision on Cakeeater Road ranged from $350,000 to $436,000 per home for utilities and road access (North Slope Borough 2012). Additionally, 2012 data from the NSB Assessing Division indicates that of the 1,332 residential lots within Barrow and Browerville, there are potentially 292 available for infill development (North Slope Borough 2012). Not taking full advantage of properties that have existing utility connections and road access could potentially lead to significant funding expenditures to develop that infrastructure elsewhere.

6.5 Housing Values

Because Barrow does not have for-profit realty services and many home sales are informal, it is difficult to determine housing values. However, the 2008-2012 American Community Survey 5-Year Estimates indicate that the median home value was $183,000; the cost to construct a home is much greater. In Alaska, building materials cost more in rural areas than urban ones and more in northern Alaska than southern Alaska, primarily due to added transportation expenses. The lack of roads to Barrow and other North Slope villages requires that construction materials be transported via barge or airplane (or by personal vehicle on informal ice roads via Prudhoe Bay). The Alaska Housing Finance Corporation (AHFC) releases a Construction Cost Survey annually which provides the cost of a "market basket" of construction materials for communities throughout Alaska. The market basket represents approximately 30% of the materials used in the construction of a sample home that is just under 2,000 square feet. In 2013, the market basket of materials ranged from a low of $23,854 in Anchorage to a high of $51,041 in Barrow (Alaska Housing Finance Corporation 2013). Because the market basket only accounts for 30% of the materials needed to construct the sample home, the total cost of materials in Barrow would cost $170,136 compared to $79,513 in Anchorage. Labor and land costs could easily bring the total cost of home construction to $300,000 to $350,000 or more.

6.6 Current Housing Activities

The NVB is currently building 20 homes in Barrow, some of which are already constructed and others that are either in the planning or construction phases. The program includes nine two-bedroom homes, three three-bedroom homes, and eight four-bedroom homes. The total contract including materials and construction for the twenty homes is $7.18 million, an average of $369,000 per home. Material costs for each home are $107,980 for the two-bedroom; 832 square foot home; $164,564 for the three-bedroom, 1,260 square foot home; and $191,561 for the four-bedroom, 1,576 square foot home. Total labor cost for 20 homes will be approximately $4.11 million, or an average of $205,500 per home. The NVB also purchased lots from UIC for $23,500 each, all with road access. At this time, none of the homes will have municipal water and sewer connections. Instead, they will rely on holding tanks until services are extended (Okakok 2014).
6.7 Affordable Housing

The U.S. Department of Housing and Urban Development (HUD) defines affordable as housing that costs no more than 30% of a household's monthly income. The average household income estimated by the NSBEP&CR in 2010 was $76,395 (North Slope Borough 2010). Based on HUD’s 30% affordability threshold, the average family would spend no more than $22,919 annually or $1,910 per month on housing. In Barrow in 2010, the average monthly mortgage payment was $1,066 and the average monthly rent was $799. The NSBEP&CR does not provide information on the percentage of households that are housing cost burdened. However, the 2008-2012 American Community Survey 5-Year Estimates indicate that 14% of Barrow renters and 8% of Barrow homeowners pay more than 30% of their income in housing costs. Interestingly, over 21% of those homeowners without a mortgage are housing cost-burdened, meaning they pay more than 30% of their income on housing.

Although housing affordability is complex, a general rule of thumb is that a family can comfortably afford a house up to three times their gross annual household income. A Barrow household earning the median household income of $76,395 should be able to afford a house that cost approximately $290,000. However, the Construction Cost Survey 2013 reveals that a household in Barrow can afford the construction materials and perhaps land for a moderately sized home but will not have enough within their budget to construct the home. The figures provided by the NVB further substantiate that a three bedroom home would cost nearly $400,000. There are very few existing homes available for purchase while housing construction costs often exceed what a typical household can afford. The combined effect of these two factors puts homeownership out of reach of many Barrow residents.

As of February 2014, there were 137 individuals/families on the TNHA Low-Rent Housing Program waiting list and 172 individuals/families on the TNHA Fair Market Rental Program waiting list for a one-, two-, three-, and four-bedroom home or apartment. For both waiting lists, one and two bedroom units are the greatest in demand. The vast majority of names have been added to the list between 2011 and 2013 (Tagiugmiullu Nunamiullu Housing Authority 2014b). TNHA’s programs that are restricted by income use the HUD income limits to qualify potential program participants for subsidized housing. A family of four would need to earn no more than $63,050 annually to be considered Low Income (80% of the Area Median Income) (HUD FY 2014 Income Limits Documentation System 2014).
Table 21  Housing Affordability

<table>
<thead>
<tr>
<th>Income Range</th>
<th>Number of Barrow Households</th>
<th>Percent of Barrow Households</th>
<th>30% of Household Income Available for Monthly for Rent/ Mortgage</th>
<th>Approximate Home Mortgage Affordability*</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0-15,000</td>
<td>38</td>
<td>5%</td>
<td>up to $375</td>
<td>$0 - $60,390</td>
</tr>
<tr>
<td>$15,001 - 29,999</td>
<td>63</td>
<td>9%</td>
<td>$375 $750</td>
<td>$60,391 - $120,776</td>
</tr>
<tr>
<td>$30,000 - 39,999</td>
<td>62</td>
<td>8%</td>
<td>$750 $1,000</td>
<td>$120,777 - $161,036</td>
</tr>
<tr>
<td>$40,000 - 49,999</td>
<td>46</td>
<td>6%</td>
<td>$1,000 $1,250</td>
<td>$161,037 - $201,296</td>
</tr>
<tr>
<td>$50,000 - 59,999</td>
<td>50</td>
<td>7%</td>
<td>$1,250 $1,500</td>
<td>$201,297 - $241,566</td>
</tr>
<tr>
<td>$60,000 - 69,999</td>
<td>46</td>
<td>6%</td>
<td>$1,500 $1,750</td>
<td>$241,557 - $288,817</td>
</tr>
<tr>
<td>$70,000 - 79,999</td>
<td>60</td>
<td>8%</td>
<td>$1,750 $2,000</td>
<td>$288,818 - $322,076</td>
</tr>
<tr>
<td>$80,000 - 89,999</td>
<td>48</td>
<td>7%</td>
<td>$2,000 $2,250</td>
<td>$322,077 - $362,337</td>
</tr>
<tr>
<td>$90,000 - 99,999</td>
<td>34</td>
<td>5%</td>
<td>$2,250 $2,500</td>
<td>$362,338 - $402,597</td>
</tr>
<tr>
<td>$100,000 - 124,999</td>
<td>107</td>
<td>15%</td>
<td>$2,500 $3,125</td>
<td>$402,598 - $503,247</td>
</tr>
<tr>
<td>$125,000 - 149,999</td>
<td>62</td>
<td>8%</td>
<td>$3,125 $3,750</td>
<td>$503,248 - $603,897</td>
</tr>
<tr>
<td>$150,000 +</td>
<td>118</td>
<td>16%</td>
<td>$3,750 and up</td>
<td>$603,898 +</td>
</tr>
</tbody>
</table>

*assumes 5% downpayment, 36% debt-to-income ratio, 5% interest rate and 30 year mortgage.  Source: calculator.net

6.8 Platted Subdivisions

There are several subdivisions in Browerville that have been platted that are without roads or utilities that are likely areas of future expansion. The first is generally bordered by existing Ahgeak Street and Sakeagak Street and where Uula Street and Sakeagak Street extensions would intersect. This subdivision has 243 lots that could be developed in the future; 24 of those have existing road access. The remaining platted subdivisions for future development are off Cakeeater Road between Laura Madison Street and past Kaleak Street. This area would have approximately 397 parcels; 81 of those have existing road access. Unless they have been otherwise conveyed, all the undeveloped parcels in these subdivisions are owned by Barrow’s native village corporation, UIC.

6.9 Housing Roles

6.9.1 North Slope Borough

The NSB has historically played a large role in housing in Barrow. However, in 2004, the NSB turned the management of 99 of its housing units borough-wide over to TNHA through a memorandum of understanding (Kooley 2014). Sixty of these units are in Barrow. The NSB still retains ownership of these properties that, in Barrow, include the twelve 12-plexes located on Herman Street and Karluk Street between Ahkovak Street and C Avenue5.

5 The twelfth 12-plex located at 5220 Karluk Street is the TNHA Maintenance and Operations building that was never used as housing. There are eight housing units in 5155 Herman Street, not twelve.
The Borough retains use of several of the 12-plexes for non-housing purposes: 5200 Karluk Street is the NSB Health and Social Services Department administrative building and 5115 is AWIC. Buildings B and C at 5125 and 5135 Herman Street are both abated shells and do not have a current use. TNHA manages six of the 12-plexes and the NSBSD manages two. Of the original eleven 12-plexes and 128 housing units, there are 80 currently available for housing. The Borough has retained the right to request housing for out-of-town permanent hires for hard to fill positions. The NSB lease with UIC for the 12-plexes expires in the year 2027.

The NSB also owns residential property that is used by Health Department: 5306 and 5328 are single family homes between Karluk Street and Laura Madison Street that are used by the NSB Health Department as itinerant housing. 4470 North Star Street is the location of AWIC before it was relocated to 5125 Herman Street. It is currently used for infant daycare. The NSB building that houses the Public Works and CIPM departments located 1689 Okpik Street, was formerly a 29-unit apartment building that was converted for office use in 2006. The repurposing of apartment buildings and homes into other uses throughout Barrow and Browerville has removed approximately 112 units from the housing market.

The North Slope Borough has a need for housing for off-slope hires. These include pilots and police officers, among others.

6.9.2 North Slope Borough School District

The NSBSD owns and rents housing for teachers. In Barrow, the NSBSD directly controls 59 housing units as follows: eight units at 5155 Herman Street (12-plex); 12 units at 5250 Karluk Street (12-plex Building G); and 39 units that are part of the NSBSD CO2 administrative complex. The NSBSD also rents 38 units from private homeowners within the community. Because housing is important to acquiring and retaining qualified teaching staff, the NSBSD is always actively seeking teacher housing. Some Barrow residents have indicated that the cost and availability of rental housing for residents is greatly affected by the NSBSD's ability to pay more. Some feel like residents are in competition with the school district for housing.

6.9.3 North Slope Borough Housing Solutions Group

NSB Mayor Charlotte Brower created the Housing Solutions Group after entering office in 2011 in response to concerns raised by both the NSB Assembly and citizens regarding short term and long-term housing issues in Barrow and all the North Slope villages. After over a year of research and planning, the focus on the Housing Solutions Group in the near term is to assist individuals and families in overcrowded housing conditions and to assist renters in purchasing a home. Specifically, the Group is providing technical assistance for all North Slope residents in three areas: financing, land purchase, and home construction. Over the long term, the Housing Solutions Group will be playing a role in community planning and development in an effort to address the variety of housing issues including the potential need for staff housing for the development of industry-related infrastructure.
6.9.4 Tagiugmiullu Nunamiullu Housing Authority

TNHA is a TDHE, established in 1974 by State statute to address housing needs of Tribal citizens and other residents of the North Slope. The TDHE designation allows TNHA to receive federal grant funds and provide housing assistance under Native American Housing Assistance and Self-Determination Act (NAHASDA). The passage of this 1996 legislation reorganized housing assistance provided by HUD by replacing separate housing assistance program with one block grant program.

TNHA currently has four housing programs:

1. **TNHA Fair Market Rental (FMR) Program.** Rent schedules are established and subject to change with market values. These rentals are available to all Barrow residents subject to availability.

2. **TNHA Low-Rent Housing Program.** Provides affordable housing to qualified low-income Alaska Native/Indian families at a cost within their means. Non-Indian families may receive this assistance if they are “essential to the well-being of Indian families” in the community. HUD defined annual income limits for a family of four in 2014 are: $63,050 at Low (80%) of the Area Median Income (AMI); $39,400 for Very Low (50% AMI); and $23,650 Extremely Low (30% AMI).

3. **TNHA Mutual Help NAHASDA Lease-Purchase Homeownership Program.** Provides homeownership opportunities for qualified lower income Alaska Native/Indian families at a cost within their means.

4. **North Slope Elder Housing Program.** TNHA, through a memorandum of understanding with the NSB, manages one bedroom elder housing five-plexes in several North Slope villages. Elder housing through TNHA is not offered in Barrow because the NSB Health Department offers senior apartments.

In order to address the need for affordable, sustainable, energy efficient homes, the Cold Climate Housing Research Center (CCHRC), in partnership with the TNHA, designed a prototype home for construction in Anaktuvuk Pass. CCHRC is a nonprofit corporation that facilitates the use of energy-efficient and cost-effective building technologies for the circumpolar regions. The home was designed to utilize lightweight materials, energy efficient plumbing and heating systems to reduce energy costs by an estimated 40%. The Anaktuvuk Pass home was constructed in 2009. TNHA plans to build a total of forty-two homes across the North Slope. Indian Housing funds were used to construct the CCHRC homes in the villages; TNHA cannot use Indian Housing funds to construct new homes in Barrow so they are currently looking for funding and land to construct several of these homes in Barrow.

Currently, TNHA manages a total of 589 housing units throughout the North Slope and 217 in Barrow alone. Within Barrow, TNHA manages rental properties for NSB; five of eleven 12-plexes are managed by TNHA: buildings A, H, F, E, and I located at 5210, 5230, 5240 Karluk Street and 5105 and 5145 Herman Street, respectively. These 12-plexes are on UIC land that is leased to the NSB. In turn, the NSB has provided the rental units to TNHA for management. TNHA also
manages other rental properties: the 32-unit apartment building at 3421 Boxer Street located next to the vet clinic; the 29-unit apartment building behind Barrow High School at 1961 Takpuk Street; and approximately 96 single family homes or attached homes.

All the 12-plex units and the 32-unit apartment complex are rented at market rate. The 29-unit apartment complex and the majority of single family and attached homes are part of TNHA’s Low Rent Housing Program. Because the funds for this program come from HUD’s Indian Housing Block Grant Program only Native Americans or Native Alaskans are eligible for assistance.

TNHA is interested in constructing additional housing but is limited by land availability. Much of the land that is available for new housing construction is located along Cakeeater Road. TNHA is hesitant to build many homes in this area because of the distance to services, such as the grocery stores, and the lack of reliable public transportation (Kooley 2014).

6.9.5 Native Village of Barrow

Like TNHA, the NVB is a TDHE that administers a NAHASDA program. The NVB has three housing programs: new construction, housing renovations and emergency repairs. The new construction program assists village members with constructing new homes for homeownership. There are approximately 39 people on the waiting list and some families wait ten years or longer to purchase new homes. Approximately four new homes are constructed each year.

There are also nine people on the waiting list for housing renovations. The need and extent of renovations vary by house. NVB offers transitional housing for those whose home is undergoing renovations. The emergency repair program is on a first-come first-serve basis. Many of the homes that have been repaired by NVB were deteriorated, often with little to no insulation, dated electric systems and single pane windows (Okakok 2014). This assistance positively contributes to maintaining the current housing stock so that families are safe and healthy.

All of the NVB programs are designed for those that make 80% or less of the AMI as defined by U.S. HUD. Under those guidelines, a family of four can earn no more than $60,100 to qualify. Additionally, homeowners do not pay more than 30% of their income for housing regardless of the cost of a newly constructed home or renovation.

NVB also has a Realty Department that provides assistance with housing-related issues in Barrow. These include: Barrow townsite restricted lands; U.S. Bureau of Land Management (BLM) Native allotment lands; probate and pending probate for heirs of landowners; lease agreements on both restricted and unrestricted lands; and revocable use permits on Native allotments and restricted parcels.

6.9.6 Arctic Slope Native Association

Like many entities in Barrow, ASNA has a significant need for staff housing. To support hospital staff, ASNA currently has 78 housing units, 44 of which are located at the old hospital location; the remaining are rentals within the community. As ASNA’s role in health care expands especially with the new hospital, so will staffing and related housing needs. ASNA projects a need of 100 additional housing units.
6.9.7 Ukpeaġvik Iñupiat Corporation

ANCSA became law on December 18, 1971. The intent of ANCSA was to settle land claims by Alaska’s indigenous population. ANCSA divided land into 13 regional corporations, twelve of which are land-based, and approximately 200 village corporations. The regional corporation for the North Slope is ASRC. There are eight village corporations within the NSB. UIC is the village corporation for Barrow. UIC has a Homesite Lot and Property Sale Program that offers land for home construction and sale of existing homes to UIC shareholders and descendants of shareholders. There are approximately 731 UIC shareholders that have rural lots in three rural subdivisions that lack road access or utility service: Nunavak Bay, East Barrow Gas Field and Walakpa. Because these homes lack road access, shareholders are unable to build homes because of the inaccessibility of public safety and fire protection services. These lots are used for subsistence purposes. In late 2012, UIC announced that it had developed a new 332 homesite lot subdivision plan so that shareholders who had originally received lots in more remote subdivisions may have an opportunity to build homes within Browerville (UIC 2012).

Per UIC’s right-of-first-refusal option, a parcel owner may not transfer any interest of his or her lot without first consulting with UIC and offering the interest in writing to UIC with the only exception for immediate family members. In 2012, UIC approved a total of 27 land sales, gift deeds and mortgages and exercised their right of first refusal in five sales. In 2013, UIC approved a total of 41 land sales, gift deeds and mortgages and exercised their right of first refusal in three sales (UIC 2014).

UIC has been viewed by some Barrow residents as reluctant to sell lots, contributing to the housing crisis. UIC’s mission is to provide social and economic resources to over 2,500 Iñupiat shareholders and their descendants. Perhaps it is with this in mind that UIC has met with NSB staff and other interested entities to discuss the housing situation and has been receptive to the idea of land exchanges as well as negotiations that allow unrestricted ownership for public and private development that benefit the needs of the community as a whole in exchange for shareholder lot development that sustains the indigenous culture. While UIC’s Board of Directors have not released an official position on its land policy, UIC must function as both a profitable corporation for its shareholders and one that advances the social interests including preserving the indigenous lifestyle of its shareholders. Figure 47 depicts the UIC corporate boundary.

6.10 Housing Needs

This analysis of the need and demand for housing, both present and in the future, relies on population projects presented in Chapter 5. Barrow’s anticipated population growth will result in more households and an increased demand for housing of all types. There are several characteristics that provide insight into a household’s housing choices that include age of household head, size of household and income. However, much of the data needed to examine those relationships to establish solid housing projections are not readily available at the community level. This information would also provide insight into demand for specific types of housing (e.g., single-family housing, duplexes or apartments) and could be collected at the next NSB Census to contribute to a more accurate picture of future housing demand. Lacking this
data, current and future housing need and demand has been determined based on housing
vacancy and overcrowding rates.

6.10.1 Current Housing Need

Housing vacancies are essential to a healthy housing market and a 5% vacancy rate is often
considered a fair balance between a tenant and landlord interests or homebuyer and homeowner
interests. The vacancy rate is also useful in identifying current housing demand and the number
of additional housing units required to reach healthy rental and for sale markets. The current
percentage of homeowner vacancy is 0.4. Increasing this to a 5% vacancy rate would require
approximately 27 additional housing units. Assuming the rental market is as tight as the for sale
market (contrary to the NSB Census and U.S. Census but consistent with resident observation),
Barrow needs an additional 38 rental housing units to reach a 5% vacancy rate.

In addition to reaching healthy rental and for sale vacancy rates, alleviating overcrowded housing
conditions is necessary to a strong housing market. To relieve overcrowded and severely
overcrowded conditions, one housing unit per incidence of overcrowding and two per incidence
of severe overcrowding would need to be added to the current housing market. This would total
203 additional units.

The total number of additional units to assuage overcrowded conditions and raise the vacancy
rate to a healthy level is 268 or a total housing stock of 1,548 occupiable housing units, an
increase of 20% of what currently exists.

6.10.2 Future Housing Need

To meet future demand, Barrow will need approximately 37 additional housing units per additional
100 people. Beyond the immediate need for 268 housing units, the population increase to 5,495
in 2020 will require an additional 191 units. If demand is continually met, the Barrow community
will still need an additional 211 units beyond the 191 needed in 2020 and the 267 needed
immediately, to accommodate a projected population of 6,070 in 2030. An estimated 515 units
will be needed beyond the 268 already needed, for a total of an additional 783 units by 2035.

Based on the existing housing type distribution, by 2035 Barrow will need approximately 479
single family homes (61% of the new units); 90 duplex units (12%); 141 apartment units, condos,
or other multiplex units (18%), and 73 other housing units, including mobile homes (9%). These
projections assume a 5% vacancy rate and an average of 2.7 persons per household. Given the
demand for one and two bedroom apartments through TNHA and the transient nature of many
newcomers to Barrow, there could be a greater demand for smaller units than illustrated here.

With oil and gas development, housing demand would be much greater. Based on population
projections presented with oil and gas development in Chapter 5, there will be 6,181 residents in
Barrow in 2020, increasing the need for housing by 443 units if current needs have been
addressed. In 2030, the population is projected to increase to 7,033 and the need for housing at
755 units above the current need. In 2035 the population is projected to be 7,400 with a need for
an addition 889 housing units beyond the current need. With oil and gas development, Barrow
would need an additional 1,157 housing units beyond the current amount by 2035, nearly double
the supply. Based on the existing housing type distribution, there will be a need for 708 single family homes, 133 duplex units, 208 apartment units and 108 other units, including mobile homes.

6.10.3 Infill

There is potential to encourage infill within the existing Barrow utilidor system area to minimize the expense of expanding infrastructure. There are approximately 292 lots available within Barrow and Browerville for development. Additionally, fully utilizing already developed areas preserves vulnerable eider nesting areas. A study of potential infill opportunities would be a worthwhile exercise to determine the status of each parcel and possible incentives for development.
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7.0 PUBLIC FACILITIES AND SERVICES

The available utilities in Barrow include water, sewer, electricity, telephone, natural gas, and solid waste disposal. The primary providers are listed in Table 22. There are still some homes that are not serviced with buried utilities so their water needs are provided by private potable water carriers, and sewage pumping services provided by truck by the NSB.

Table 22 Major Utility Providers in Barrow

<table>
<thead>
<tr>
<th>Utility</th>
<th>Utility Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>BUECI</td>
</tr>
<tr>
<td>Sewer</td>
<td>BUECI</td>
</tr>
<tr>
<td>Electric Service</td>
<td>BUECI</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>BUECI</td>
</tr>
<tr>
<td>Telephone</td>
<td>ASTAC</td>
</tr>
<tr>
<td>Data</td>
<td>ASTAC</td>
</tr>
<tr>
<td>Solid Waste Disposal</td>
<td>NSB</td>
</tr>
</tbody>
</table>

Source: Barrow Airport Master Plan, 2013
ASTAC = Arctic Slope Telephone Association Cooperative  
BUECI = Barrow Utilities & Electric Cooperative, Inc.

Barrow Utilities & Electric Cooperative, Inc. (BUECI) is a member owned cooperative created in 1964. It provides the majority of Barrow with water, sewer and electric service. It operates under an elected nine member board of directors and has an average of 55 full-time employees. Although most of the facilities are owned by the NSB, the coop operates the facilities. The NSB subsidizes all capital infrastructure improvements to the facilities by including upgrade projects in the NSB capital planning program.

Figure 12 BUECI Office
7.1 Water

Water is pumped from Lower Isatkoak Lagoon Reservoir into the BUECI water treatment plant. Once in the plant, the water is treated using a highly efficient two stage filtration process. In the first stage, the raw untreated water is filtered through a microfilter, consisting of 48 filters, processing 300 gallons per minute. Each filter has a pore size 0.2 microns, which is about 200 times finer than a human hair. This filtration process does not require chemical pretreatment. Every 30 minutes the filters are backwashed with high pressure air and water to flush accumulated buildup from the membranes (Barrow Utilities and Electric Co-op 2014). Figure 13 and Figure 14 depict the water utilities for Barrow and Browerville, respectively.

The second stage of the filtration process is completed using a nanofiltration system. The nanofiltration process is a three-stage, 12-filter process that removes molecular size contaminants such as minerals, salts, solids, potentially pathogenic bacteria and other impurities (Barrow Utilities and Electric Co-op 2014). As an 85% efficient system, for every 100 gallons of water processed, 85 gallons of potable water is produced with the remaining 15 gallons rejected. The rejected water is stored in the raw water storage tank which is used to flush the Barrow Utilidor System (BUS). The raw water is phased through heat exchangers until a certain temperature is reached to help maintain warmer temperatures in the utilidor.

The water system distributes potable water throughout the community. The water in Barrow is distributed using a circulating water piping network. Portions of the system are direct buried, a portion is contained in the BUS and a portion is located on above ground supports connecting Barrow to Browerville on the Dam Road between Lower and Upper Isatkoak Lagoons. For the portions of the system that are direct buried and prevalent to freezing, a small circulation pump is located at residences and commercial buildings structures to keep water from freezing. The pump is located in a "service barrel" outside the structures and powered by a control panel situated adjacent to the building. The control panel is visible from the road so that operations and service personnel can easily determine if the unit is operating correctly. Even a short lapse of operations can cause the water to stop circulating and freeze.

BUECI has a water storage capacity of 1.5 million gallons of water and the water treatment plant can process up to 345,000 gallons per day. Based on employee interviews, the plant is currently processing 290,000 gallons per day with current limitations. During interviews with BUECI personnel in March 2014, the water meter reading for a 24 hour period (midnight to midnight) of water pumped into the distribution system at the water processing plant was recorded at 277,000 gallons. In calculating the water usage per capita for Barrow in 2014, the population count is 5,176 based on demographics prepared for this comprehensive plan. Considering just the water pumped, the per capita water use is 53 gallons per person per day (pp/pd).
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7.1.1 Annual Water Pumping Rates

The annual water pumping rate currently is about 80,000,000 gallons per year. The following volumes were reported during personnel interviews with BUECI staff for this plan:

- December 16 – January 15, 2014 5,699,900 gallons
- January 16 – February 15, 2014 6,438,300 gallons
- February 16 – March 15, 2014 6,011,500 gallons

For planning purposes, to calculate an annual maximum average pumping capacity, if in one month the plant pumps 6,500,000 gallons, then a reasonable assumption is that 78,000,000 gallons can be pumped in one year. If the current water treatment plant is run at the capacity rate of 345,000 gallons per day, then 124,200,000 gallons can be processed in one year. This is adequate to meet future needs well past 2025 and into 2035.

7.1.2 Surface Water Hauling

Buried water lines distribute most of the water used in Barrow, but there are still homes and businesses in the community that depend on surface water hauls. The water is hauled by a private commercial business by truck and stored in above ground tanks located at homes and businesses. Currently in Barrow and Browerville there is one private water hauler. UIC also purchases potable water from BUECI and hauls to the UIC storage tank located in NARL for use there. For loading of water, the water haulers pull trucks under an overhead insulated water line located near the BUECI office. The following are statistics learned during personnel interviews with haulers and BUECI personnel:

- From January 16, 2014 through February 15, there were 418,500 gallons sold; of this volume, 308,900 gallons were sold to the private hauler.
- The private hauler reported deliveries to 225 customers/households.
- For the same time period, 109,600 gallons were sold to UIC for delivery to NARL.
- The daily rate of surface potable water sold is 13,950 gallons per day (418,500 gallons in 30 days).

7.1.3 Water Saving Changes

Originally, the water inlet was located in Lower Isatkoak Lagoon and all water was pumped into the lagoon. Once the inlet pump was relocated to Upper Isatkoak Lagoon, all water was routed for water treatment from the upper location and the lower inlet was used only occasionally for raw water needs. Recently, this was modified to allow raw water pumping at the lower inlet site. The water is pumped into tank storage and ultimately bypasses the water treatment plant. This water is stored in a raw water tank and used to flush the utilidor system. Before this change, treated water was used to flush the BUS system. By incorporating this change, the potable water available for public use was increased by over 156,000 gallons per day.
There are also upcoming modifications planned for utility upgrades in the next few years. Plans include expansion and upgrades for pump houses, new heat exchangers for flushing water and a new line to handle expansions.

7.1.4 Anomalies in Calculation of Usage Rates

Typically, people who have their water hauled and stored in tanks demonstrate more conservative with water use than those connected to the distribution system. In addition, there are facilities in Barrow such as the high school and the hospital that draw much more water than homes. This makes it difficult to calculate the per capita water use rates with any precision. The usage rate of 53 gallons pp/pd is a lower estimate for distribution system users, while it is high for those on a surface water haul schedule. Due to limited actual data for analysis, the methodology and results are for planning purposes only. There are characteristics of the end users and usage history that are not known and the individual breakdowns are not available for inclusion in this plan analysis.

7.1.5 Forecast Summary - With and Without Oil and Gas Development

Based on Barrow demand calculations and for planning purposes, typical demand is calculated at 53 gallons pp/pd. Table 23 (without oil and gas development) and Table 24 (with oil and gas development) present the estimated usage rate utilizing the population forecast calculated for this plan. As shown, the community of Barrow is estimated to use just over 103,578,200 gallons in 2014, with an increase to just over 125,742,848 in 2025, to over 125,742,200 in 2035. If the current water treatment plant is run at the capacity rate of 345,000 gallons per day, then 124,200,000 gallons can be processed in one year. This is adequate to meet future needs well past 2025 and into 2035. Based on projected population estimates expected with oil and gas development, water treatment capacity would begin to become an issue before 2025.

Table 23 Barrow Water Usage – Without Oil and Gas Development

<table>
<thead>
<tr>
<th>Forecast Year</th>
<th>Population Count (each)</th>
<th>Daily Usage (gallons pp/pd)</th>
<th>Proposed Usage (gallons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>5,176</td>
<td>279,504</td>
<td>100,621,440</td>
</tr>
<tr>
<td>2025</td>
<td>5,661</td>
<td>305,694</td>
<td>110,049,840</td>
</tr>
<tr>
<td>2035</td>
<td>6,379</td>
<td>344,466</td>
<td>124,007,760</td>
</tr>
</tbody>
</table>

Table 24 Barrow Water Usage – With Oil and Gas Development

<table>
<thead>
<tr>
<th>Forecast Year</th>
<th>Population Count (each)</th>
<th>Daily Usage (gallons pp/pd)</th>
<th>Proposed Usage (gallons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>5,176</td>
<td>279,504</td>
<td>100,621,440</td>
</tr>
<tr>
<td>2025</td>
<td>6,658</td>
<td>359,532</td>
<td>129,431,520</td>
</tr>
<tr>
<td>2035</td>
<td>7,400</td>
<td>399,600</td>
<td>143,856,000</td>
</tr>
</tbody>
</table>
When discussing future community needs, modifications to the existing system is one answer to the increased future demands. For example, current filtration water treatment is 85% efficient. Improvements to this might yield larger treatment capacities. Another way to prepare for a larger population and increased water demand is to consider a redundant water source.

### 7.1.6 Redundant Water Source

In Barrow, there is currently only one water source and water treatment facility. If the current system was to become incapacitated or the source contaminated, the community would be without a reliable water source. If water were to be discontinued in the distribution system for any reason, the system itself would be prone to freezing, causing damage and system shutdown. In this situation, the entire community would face freezing damage and failure of the distribution system to dispense water to homes.

An alternative water source could provide an emergency water supply. In addition, an alternative water source could also be developed to allow water production simultaneously from two locations, increasing the water capacity to meet the needs of a larger population and community expansion. Although investigations into probable water source locations have not been completed at this time, an alternative location that might be considered is Ikroavik Lake located south of Barrow. This location does not currently have road access.

### 7.2 Power

The power plant is operated by BUECI and generates the power for the community of Barrow. The power plant is located near the water treatment plant on the BUECI campus. The electric utilities are depicted in Figure 15 (Barrow) and Figure 16 (Browerville). There are seven generators in the power plant with maximum production capacity of 20.5 megawatts (MW). To achieve this maximum capacity the plant would run at 100%. Typically, the turbines are run at 90%. The generators are natural-gas fired but can be operated on diesel if the natural gas supply were to be cut off in an emergency situation. Table 25 lists the existing power generated for Barrow.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Make/Model</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Solar Turbine Centaur</td>
<td>2.5 MW</td>
</tr>
<tr>
<td>2</td>
<td>Solar Turbine Centaur</td>
<td>2.5 MW</td>
</tr>
<tr>
<td>3</td>
<td>Solar Turbine Centaur</td>
<td>2.5 MW</td>
</tr>
<tr>
<td>4</td>
<td>Solar Turbine Taurus</td>
<td>4.75 MW</td>
</tr>
<tr>
<td>5</td>
<td>Solar Turbine Taurus</td>
<td>5.3 MW</td>
</tr>
<tr>
<td>6</td>
<td>Caterpillar 3608</td>
<td>1.5 MW</td>
</tr>
<tr>
<td>7</td>
<td>Caterpillar 3608</td>
<td>1.5 MW</td>
</tr>
</tbody>
</table>
At this time there are no known deficiencies and all seven engines are in good working order. The turbines are under a constant maintenance schedule and all of the turbines are running in peak condition. The two Caterpillar 3608 generators are not normally used and have not been used for about four years other than for testing. They are maintained on standby and can be used as backup if the need arises. During the winter season the two larger Taurus turbines are run in tandem to meet peak demands. In the summer months one of the large Taurus turbines is run with one of the smaller Centaurs, because the peak demands are lower in summer than in winter.

During personnel interviews, it was learned that on January 17, 2014, the peak power output was recorded at 8.465 MW. In establishing a daily usage rate per person, the peak amount is divided by the population to obtain the daily peak usage rate per person is 1.63 kilowatts (kW).

The Barrow power plant has evolved over the years to meet the power demands of the community. The existing power plant facility itself was originally built in 1981 and underwent interior modifications and building expansion in 1994 and 1999 to its current configuration. The NSB Barrow 6-Year Capital Plan discusses the upgrades that are necessary to the older section of the generator building (power plant) in 2013 (14 years past its life span) and modifications to the later building additions as needing upgrades as soon as 2018.

### 7.2.1 Forecast Summary - With and Without Oil and Gas Development

Table 26 and Table 27 list the power usage of the community for the scenarios assuming with oil and gas development and without oil and gas development, respectively. To forecast future peak use with future anticipated population growth, a rate of 1.63 kW pp/pd is used. This rate of usage was calculated from the measured peak usage in January 2014 and a population count of 5,176 as established in this plan. For average winter load calculations, the Taurus turbines load share and produce 8.4 MW. This analysis uses 8.4 MW, which is 90% of the total maximum of the two Taurus turbines producing the expected 8.4 MW load share. With a population of 5,176, this calculates to an average rate of 1.62 kW pp/pd.

#### Table 26  Barrow Power Usage – Without Oil and Gas Development

<table>
<thead>
<tr>
<th>Forecast Year</th>
<th>Population Count (each)</th>
<th>Daily Peak Usage (MW/PD)</th>
<th>Average Winter Usage (MW/PD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>5,176</td>
<td>8.437</td>
<td>8.385</td>
</tr>
<tr>
<td>2025</td>
<td>5,775</td>
<td>9.413</td>
<td>9.356</td>
</tr>
<tr>
<td>2035</td>
<td>6,379</td>
<td>10.398</td>
<td>10.334</td>
</tr>
</tbody>
</table>

#### Table 27  Barrow Power Usage – With Oil and Gas Development

<table>
<thead>
<tr>
<th>Forecast Year</th>
<th>Population Count (each)</th>
<th>Daily Peak Usage (MW/PD)</th>
<th>Average Winter Usage (MW/PD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>5,176</td>
<td>8.437</td>
<td>8.385</td>
</tr>
<tr>
<td>2025</td>
<td>6,658</td>
<td>10.853</td>
<td>10.786</td>
</tr>
<tr>
<td>2035</td>
<td>7,400</td>
<td>12.062</td>
<td>11.988</td>
</tr>
</tbody>
</table>
I (Wainwright)

Chukchi Sea

Middle Salt Lagoon

South Salt Lagoon

North Meadow Lake

South Meadow Lake

Lower Isiiskoak Lagoon

Upper Isiiskoak Lagoon

Feeder 1

Feeder 2

Feeder 3

Feeder 4

Feeder 5

Light Pole

Utility Pole

North

South

Salt Lagoon

Meadow

NSB GIS: Electric lines & Utility Poles

Sources:

Barrow Comprehensive Plan

1,000 Feet

0 500 1,000 2,000 5000 Feet

Scale: 2,000

For informational purposes only.

DISCLAIMER

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6/1/2011
To be able to supply the additional power requirements of the community, the existing capacity at the power plant seems to be capable of meeting the proposed future output necessary to meet both the with and without oil and gas development scenarios. The current capacity of the power plant is 20.5 MW. 90 percent of 20.5 MW is 18.45 MW, well above the anticipated requirements of the anticipated community growth.

### 7.2.2 Redundant Power Systems

The existing power system in Barrow is currently the only system available to provide power to the community. If the current system were to become incapacitated, the community would be without power for heating or lighting. For example, if a fire destroyed the power plant’s ability to provide power, water systems and homes would freeze. The distribution system would freeze and the system would shut down. In this situation, the entire community would be struggling to heat and dispense water to homes.

An alternative power source would allow a backup energy generation system that could provide alternative power. In addition, an alternative power plant located in a well situated location would provide power to a growing area base in addition to a back-up power source. A general rule of thumb learned during BUECI interviews is that power is most efficiently distributed over a five-mile radius around the initial power source. If a site were located for a second plant, such as closer to NARL or east of the runway, the second plant could help dispense power to areas of Barrow that are expecting growth. This would also alleviate the issue of over-capacitated feeder lines and associated issues. Although an investigation into probable alternative power source locations has not been completed at this time, two alternative locations that were discussed during scoping meetings with stakeholders are: 1) The existing WWTP by the intersection of Laura Madison and Cakeeater Road; and 2) the area south of the airport.

### 7.2.3 Feeder Lines

Although the power plant has the capacity to meet the expected power requirements, the feeder lines are not adequate to meet any new additional power expansion in Barrow today. There are five existing feeder lines (Figure 15, Barrow; Figure 16, Browerville). According to interviews with utility personnel, all five feeder lines are operating at maximum capacity.

- **Feeder 1** – (yellow) Supplies the downtown area of Barrow.
- **Feeder 2** – (green) Supplies Barrow High, Barrow City Hall, Fred Ipalook Elementary School, and the southern portion of Browerville.
- **Feeder 3** – (red) Supplies the southern portion of Barrow, Barrow Airport area and area south of airport.
- **Feeder 4** – (blue) Supplies an arterial down Laura Madison, Cakeeater Road and on to NARL.
- **Feeder 5** – (orange) Supplies the northern portion of Browerville.
On the Barrow side of the community, feeders 1, 2, and 3 distribute the power to different portions of the city. For example, Feeder 3 carries power from the plant to the area south of the airport. Without increasing capacity of Feeder 3, lines are unable to support any new development in the area south of the airport. This is an issue that should be addressed to allow for growth in the community.

7.3 Natural Gas

Between 1944 and 1952, the U.S. Navy conducted exploration within the NPR-A which led to the discovery of natural gas south of Barrow. The South Barrow Gasfield was developed in 1949 to support federal complexes in Barrow, namely the Naval Arctic Research Laboratory (NARL). Then in 1965, the program was expanded to supply the Barrow community with gas in addition to the federal facilities. Additional test wells by the U.S. Navy resulted in the discovery of the East Barrow Gasfield in the mid-1970s. In 1976, management authority of the NPR-A was transferred to the U.S. Geological Survey (USGS). Wells at a third field, Walakpa, were initially drilled by the U.S. Navy and USGS during the mid to late 1970s. Then, in 1984, the federal government, under the Barrow Gas Fields Transfer Act, conveyed entitlement of 19 existing wells and subsurface resources to the North Slope Borough for community use (North Slope Borough 2014a).

7.3.1 Drilling Program

During the first half of 2011, the South Barrow Gasfield produced 1,115,000 cubic feet of gas per day (Coffman 2014). In 2013, gas production began dwindling; additional well drilling in Walakpa made up for much of the declining productivity of South Barrow. The Walakpa Gasfield is located southwest of Barrow. A drill program for the Barrow community began in the early 1990s, resulting in the construction of eight wells, infield pipelines, a gathering facility, a field generation facility and 16 mile aboveground transmission lines connecting the gasfield to BUECI. During the winter of 2011, five horizontal wells were drilled: Savik 1 and Savik 2 at East Barrow and Walakpa wells 11, 12, and 13 in Walakpa (Petroleum News 2013). Figure 17 depicts gas pipelines in Barrow and Browerville and location of gas wells. Production at the East Field continues today through an upgraded six inch aboveground transmission pipeline to the gas handling facility at South Field.

There were concerns about aging infrastructure so the drilling program included upgrades to pipelines and well houses, increasing both the production pressures and the amount of gas that can be safely delivered. The 2011 program upgraded the six inch pipeline from East Field and established new well houses on all the wells drilled under this program. The wells in both East Barrow and Walakpa are connected with six-inch diameter pipe terminating at the gas handling processing facility located at the South Barrow Gasfield.

7.3.2 Existing Pipelines

Currently, the gas is distributed through the community by steel and high density polyethylene (HDPE) pipe. The existing six-inch pipe leaves the gas handling facility in South Gasfield, follows Cakeeater Road to the southeast corner of the population center, west of Kaleak Street, north on Uula Street, past Samuel Simmonds Memorial Hospital, west on Yugit Street, following existing infrastructure across the Lower Isatkoak Lagoon dam to ultimately tie into the BUECI facility.
From the facility, gas is used for power generation and is routed to the distribution facility on the Lower Isatkoak Lagoon.

### 7.3.3 Alternative Pipeline Routes

A study is being conducted by the NSB to investigate alternative routing of the natural gas pipeline. The reasoning for the alternative route is to allow a redundant route to provide for natural gas for the community in the event of damage to the main line. In addition, there are pigging and inspection procedures that are required as part of pipeline maintenance and U.S. Department of Transportation (USDOT) regulatory requirements. With only one line, gas would have to be shut down at certain intervals to allow the testing to be completed. With two lines, one can be shut down while the other continues to supply gas to the community.

There are three alternative lines being considered:

- **Base Route** - Same as the existing route currently supplying Barrow. This does not really cover a redundancy of the line because if there were an explosion to one line and the redundant line was adjacent, both would be damaged.

- **Alternate 1** - Beach Route. Similar as the Base Route, following a route through the populated portion of Browerville and Barrow and the final portion along Stevenson Street, which is susceptible to erosion.

- **Alternate 2** - Cross-Country Route. This route proceeds from the South Gas Field gathering center west across the tundra, turning north along an existing gravel road south of the airport. From there the route travels around the west end of the runway into Barrow terminating at the BUECI facility. This route would help expand gas distribution into an area south of the airport that currently does not have gas provided.

- **Alternative 3** - Existing BLM Route. This route follows an abandoned in-place pipeline, turning northwest after crossing a stream on Isatkoak Lagoon and running around the west end of the runway.

The rate for natural gas charged to residents in Barrow is $18.05 for a basic charge per month. If a customer uses between 0 to 55 hundred cubic feet (ccf) there is no additional charge. If greater than 56 ccf is used an additional $0.2882 per ccf is levied. The bulk of the power generation to produce electricity is fueled by natural gas. The electric service rates are also reasonable, with single-phase service basic charge of $14.55 and an additional $0.0961 per kilowatt hour (kWH). Three-phase is basic $89.67 with an additional charge of $0.0956 per kWH.

Capital contributions by the North Slope Borough have greatly subsidized natural gas production and deliverability, providing an inexpensive and efficient way to heat and light the community. While future demand can be predicted based on projected population growth, without adequate and scheduled well testing, it is difficult to project how much gas remains and what the deliverability may be to meet the anticipated demand. One of the best guards against future natural gas shortages is incorporating conservation measures whenever practicable in facilities and by consumers.
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7.4 Barrow Utilidor System

There are many services that are distributed in Barrow with the use of a subsurface utilidor. Utilidors are common in cold climates where direct buried lines are prone to freezing when buried below the frostline. In Barrow, the frostline is deep enough that freezing sewer and water lines is a concern. The existing BUS began operation in 1984 when buried utilities were first introduced to Barrow. BUS is large enough to house the following utilities:

- Potable Water
- Sewer Lines
- Telephone Lines
- TV Cable Lines
- Fiber Optic and NSB Communication Lines
- Electric Services Lines.

The BUS system is a wooden structure, six feet wide at the base, six feet high, tapering to five feet on the top. The air temperatures are regulated using waste heat to keep the services from freezing. Maintenance of the services is easier because of greater accessibility and avoids disruption that is associated with recurring construction, repair and upgrading of cables and pipes placed in a direct bury. In Barrow, the utilidor is a combined length of 3.2 miles. Figure 18 depicts the existing BUS.
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7.5 Wastewater

BUECI operates the wastewater collection and treatment system. The wastewater flows are gravity fed to pump stations located throughout the town, collected using sewage lines, both direct buried and located in utilidors and a section of above-ground pipe that connects Barrow and Browerville. The sewer conveyance lines are a forced main system, operated with use of six total pump stations located throughout Barrow and Browerville. Figure 19 and Figure 20 depict the pump stations and sewer collection lines (marked with arrows indicating flow) for Barrow and Browerville, respectively. Minor mains feed sewage into the individual pump stations, with PS3 as the last pump station before traveling to the waste water treatment plant.

The Wastewater Treatment Plant (WWTP) uses an activated sludge membrane bioreactor (MBR) treatment process and is capable of processing up to 300,000 gallons of wastewater per day (North Slope Borough 2013). The sewage is collected from the pump stations; the sewage is pumped to the South Salt Lagoon which is considered a facultative lagoon system. A facultative sewage system is a settlement system separating the sludge into anaerobic layers located on the bottom of the lagoon and aerobic layers located on or near the top of the lagoon. Algae growing on the top layer, processes oxygen from direct sunlight, and consumes carbon dioxide given off of bacteria in the lower layers. The process oxidizes wastes as they migrate up.

In order to prevent overflow, water is pumped from the South Salt Lagoon to the Middle Salt Lagoon. From there it is eventually discharged into the ocean. Before final discharge, the water is tested for pH, dissolved oxygen content, fecal coliform, and total suspended solids to ensure compliance and to meet limits of the ADEC discharge permit.

7.5.1 Per Capita Wastewater Rates

Based on BUECI employee interviews conducted in late March 2014, the typical rates of wastewater flow into the wastewater treatment plant fluctuated from 216,000 gallons per day to 265,000 gallons per day. In calculating the per capita wastewater rate for Barrow in 2014, the population count established for this report is 5,176. Considering just the flow reaching the treatment plant daily, the daily per capita amount is 51 gallons pp/pd.

7.5.2 Annual Wastewater Pumping Rates

Currently, the annual wastewater flow rate into the wastewater treatment plant is about 87,840,000 gallons per year. The average wastewater flow for the first twenty days in March was 243,500 gallons. If calculated out for the year, the annual rate into the plant is 87,840,000 gallons per year. For planning purposes, to calculate an annual maximum average pumping capacity, if the maximum quantity that can be processed in the facility is 300,000 gallons per day, then a reasonable assumption is that 108,000,000 gallons can be processed in one year.
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7.5.3 Forecast Summary – With and Without Oil and Gas Development

Based on Barrow wastewater calculations, typical daily wastewater generation per capita is 51 gallons. Table 28 and Table 29 list estimated wastewater generation for Barrow for the scenarios assuming with oil and gas development and without oil and gas development.

If the current waste water treatment plant is run at the capacity rate of 300,000 gallons per day, then 108,000,000 gallons can be processed in one year. This is adequate to meet future needs past 2025, but will reach capacity in 2026. In 2026, the population is estimated to reach 5,833 with anticipated wastewater generation rate of 108,581,295 gallons per year. This is 500,000 gallons more than maximum capacity of the current plant.

Table 28 Barrow Wastewater Generation/Treatment - Without Oil and Gas Development

<table>
<thead>
<tr>
<th>Forecast Year</th>
<th>Population Count (each)</th>
<th>Daily Usage (gallons per day)</th>
<th>Anticipated Usage (gallons per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>5,176</td>
<td>263,976</td>
<td>96,351,240</td>
</tr>
<tr>
<td>2025</td>
<td>5,661</td>
<td>288,711</td>
<td>105,379,515</td>
</tr>
<tr>
<td>2035</td>
<td>6,379</td>
<td>325,329</td>
<td>118,745,085</td>
</tr>
</tbody>
</table>

Table 29 Barrow Wastewater Generation/Treatment - With Oil and Gas Development

<table>
<thead>
<tr>
<th>Forecast Year</th>
<th>Population Count (each)</th>
<th>Daily Usage (gallons per day)</th>
<th>Anticipated Usage (gallons per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>5,176</td>
<td>263,976</td>
<td>96,351,240</td>
</tr>
<tr>
<td>2025</td>
<td>6,658</td>
<td>339,558</td>
<td>123,938,670</td>
</tr>
<tr>
<td>2035</td>
<td>7,400</td>
<td>377,400</td>
<td>137,751,000</td>
</tr>
</tbody>
</table>

Based on the projected population estimates expected with oil and gas development, wastewater treatment would begin to become an issue before 2025. In 2018, the population is estimated to reach 5,826 with anticipated wastewater generation rate of 108,450,990 gallons per year. This is 500,000 gallons for the maximum capacity of the current plant.

The WWTP is currently operating on one of two treatment trains. Plans are underway to modify the current plant to operate on full capacity using both treatment trains. If this is accomplished, the plant capacity could be doubled. If the plant was able to process 600,000 gallons per day, the annual capacity would increase to 216,000,000 gallons per year. This increase in capacity will maintain the wastewater flows for the increased ten-year population growth (2025) without oil and gas development; and the 20-year population growth with oil and gas development.

7.6 Gravel

In the Barrow area, gravel material for construction is limited. There are two active commercial material source mining pits used to supply the gravel needs for non-airport construction and maintenance needs:
• SKW operates a pit on land owned by the City of Barrow and located at the southwest end of the airport. This pit is reaching the end of its useful life. Although it is still mined, it will not be able to be the sole provider for large gravel needs. Expansion is possible and estimated yield has been discussed as high as one million cubic yards (CY). The soils are classified as gravel, producing sandy gravel and gravelly sand.

• UIC operates a pit four miles southeast of Barrow located off of Eastfield Road near the landfill. The soils here are generally sandier/siltier than the material in the SKW pit and are poorly graded sand with silt and gravel.

Gravel needs for community use includes landfill cover, road and culvert maintenance and infrastructure parking area maintenance as well as for private use and capital projects. Large scale development, such as the new Samuel Simmonds Memorial Hospital or new Top of the World Hotel create additional demands for gravel.

During the construction of the airport, the material was mined from the Alaska Department of Transportation (ADOT) pit located between the runway and the SKW material pit on state land. Expansion of this pit is limited as minimal materials remain within the State property. Also, there is a petroleum pipeline that is located along the south boundary of the pit. Emaiksoun Road limits expansion from the east.

As part of the Barrow Airport Master Plan, two new material sites were investigated as possible new sources for construction materials (Figure 21). Ninety-five borings were drilled in and adjacent to the two material sites to depths of 20 to 50 feet. The West Material Source is located on state land adjacent to their existing material pit. Another source, East Material Source, is south and east of the runway. A portion of the northern area that was explored is located on state land, but the majority of the exploration area was conducted on land with surface rights owned by UIC with BLM subsurface rights. General conditions found seem favorable to a sizeable material source that could produce gravelly sands and sandy gravels. There are upper layers of rich organic overburden and organic silts from 3-19 feet. In places, large ice lenses were found.

Barrow is a growing community and will require gravel to support the future development. The construction and maintenance needs will drive the need for well-graded construction material, while providing a material that is cost efficient. One to two years is needed to obtain a permit for a new material source, depending on environmental issues. The easiest and quickest sources of additional material are expansions of the UIC and SKW/City of Barrow pits. However, these pit expansions may produce limited material that is of lesser quality. While difficult, an assessment of future needs for private use, capital projects, maintenance and potential industry demand is needed. Additionally, expansion of existing pits should be considered where practical and feasible, along with a careful evaluation of new material sources that could economically be developed to serve the community.

7.7 Solid Waste

The NSB Barrow landfill is an ADEC permitted Class II Municipal Solid Waste (MSW) Landfill. The landfill is permitted to accept municipal solid waste, non-radioactive materials, inert wastes,
Barrow Comprehensive Plan

construction and demolition debris, ash, and sludge. The NSB provides refuse service to commercial businesses and households. Trash bins located throughout the community are picked up by refuse trucks and dumped.

The current landfill site was placed on land purchased from UIC in 2003. It is located about four miles southeast of Barrow and is accessed from Eastfield Road. The new Barrow landfill was opened in 2008 and permitted in 2009. This landfill will ultimately have eleven cells when completely constructed. Currently, the first cell is full of debris and the second cell is opening and already receiving waste.

The containment cells have an average storage volume capacity of about 81,000 CY per cell for waste and cover material. The maximum storage capacity of the first cell was about 95,000 CY. The first cell filled more quickly than originally estimated. In part, this happened because the early estimates assumed that 60% of the waste stream destined for the landfill was combustible, thus reducing the waste weights by 85% (North Slope Borough 2009).
City of Barrow owned SKW Gravel Pit

ADOT Gravel Pit

Chukchi Sea

Tasigarrok Lagoon

Lower Isatkoak Lagoon

Upper Isatkoak Lagoon

Upper Salt Lagoon

South Salt Lagoon

Middle Salt Lagoon

Barrow

Atqasuk

Wainwright

Chukchi Sea

Beaufort Sea

Browerville

Existing Gravel Pits

Material Source Extents (approximate)

Parcel A
US Survey 4227

Parcel C
US Survey 4227

UIC Land

UIC Lands

City of Barrow

ADOT Gravel Pit

City of Barrow owned SKW Gravel Pit

Barrow Comprehensive Plan

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7.7.1 Thermal Oxidation System

The NSB operates a thermal oxidation system (TOS) incinerator facility for municipal waste in Barrow. The facility is located near the old Barrow Landfill on the Middle Salt Lagoon on Stevenson Street. Currently, the TOS facility is not operational and has not been operating steadily for over a year. During the time that it has not been operational, the waste is directly landfilled in the Barrow landfill without incineration. The TOS facility incinerators do not produce electricity, but emit directly to a stack exit. It was designed to process 30 tons per day of municipal waste and is currently permitted to process up to 20 tons per day of domestic and commercial waste (State of Alaska Department of Transportation & Public Facilities 2014).

There are plans to repair the controls in the TOS facility this year to return it to service by late 2014. Once the repairs are complete, the NSB will begin incinerating its refuse before depositing directly in the landfill. Incinerating the waste before landfilling will reduce the overall waste footprint. A 30% reduction is used in the analysis of this plan.

7.7.2 Estimated Landfill Rates

Based on studies completed in 2009 in support of the NSB MSW Permit Application to ADEC in May 2009, the landfill is estimated to receive 6.28 tons per day of solid waste, or 2,300 CY per year. At the time of the permit application submittal, the landfill life for the new Barrow landfill was estimated at 45 years, with an estimated closure date in 2052. The estimated population growth rate used in the MSW permit was just under 1% per year.

In the MSW permit application, the estimated per capita waste generated daily was 6.2 pounds per day; and this is the rate used for this report.

Using estimated growth rates as part of this plan without oil and gas development:

- In 2035, a total of 17.9 tons of garbage will be generated in one day.
- Or an accumulative tonnage of 41,350 tons of solid waste between 2014 and 2020.
- Or an accumulative cubic yardage of 348,626 CY without incineration before landfilling.

Using estimated growth rates as part of this plan with oil and gas development:

- In 2035, a total of 22.9 tons of garbage will be generated in one day.
- Or an accumulative tonnage of 42,056 tons of solid waste between 2014 and 2020.

Or an accumulative cubic yardage of 386,204 CY without incineration before landfilling.

7.7.1 Forecast Summary - With and Without Oil and Gas Development

The MSW permit application calculated landfill life at 45 years or estimated closure in 2052. The application estimated population growth rate at the time of application (May 2009) at just under 1.0%. Because the population growth rate is lower in the MSW application than what is projected
in this plan, the total accumulative amounts shown for this plan reflect the plan estimated growth rates for each scenario are presented in Table 30 and Table 31.

Table 30  Barrow Solid Waste - Without Oil and Gas Development

<table>
<thead>
<tr>
<th>Year</th>
<th>Pop.</th>
<th>Pounds/Day</th>
<th>Tons/Year</th>
<th>Cumulative Tonnage</th>
<th>Cumulative Yardage (CY)</th>
<th>Cumulative 30% Burn Reduction (CY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>5,176</td>
<td>32,091</td>
<td>5,857</td>
<td>5,857</td>
<td>14,642</td>
<td>10,249</td>
</tr>
<tr>
<td>2015</td>
<td>5,228</td>
<td>32,414</td>
<td>5,915</td>
<td>11,772</td>
<td>29,430</td>
<td>20,601</td>
</tr>
<tr>
<td>2020</td>
<td>5,495</td>
<td>34,069</td>
<td>6,218</td>
<td>41,350</td>
<td>103,374</td>
<td>72,362</td>
</tr>
<tr>
<td>2025</td>
<td>5,775</td>
<td>35,805</td>
<td>6,534</td>
<td>72,437</td>
<td>181,094</td>
<td>126,766</td>
</tr>
<tr>
<td>2030</td>
<td>6,070</td>
<td>37,634</td>
<td>6,868</td>
<td>105,110</td>
<td>262,774</td>
<td>183,942</td>
</tr>
<tr>
<td>2035</td>
<td>6,379</td>
<td>39,550</td>
<td>7,218</td>
<td>139,451</td>
<td>348,626</td>
<td>244,039</td>
</tr>
</tbody>
</table>

Table 31  Barrow Solid Waste - With Oil and Gas Development

<table>
<thead>
<tr>
<th>Year</th>
<th>Pop.</th>
<th>Pounds/Day</th>
<th>Tons/Year</th>
<th>Cumulative Tonnage</th>
<th>Cumulative Yardage (CY)</th>
<th>Cumulative 30% Burn Reduction (CY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>5,176</td>
<td>32,091</td>
<td>5,857</td>
<td>5,5857</td>
<td>14,462</td>
<td>10,249</td>
</tr>
<tr>
<td>2015</td>
<td>5,332</td>
<td>33,058</td>
<td>6,033</td>
<td>11,890</td>
<td>29,725</td>
<td>20,807</td>
</tr>
<tr>
<td>2020</td>
<td>6,181</td>
<td>38,322</td>
<td>6,994</td>
<td>42,056</td>
<td>105,139</td>
<td>73,597</td>
</tr>
<tr>
<td>2025</td>
<td>6,658</td>
<td>41,280</td>
<td>7,534</td>
<td>77,025</td>
<td>192,561</td>
<td>134,793</td>
</tr>
<tr>
<td>2030</td>
<td>7,033</td>
<td>43,605</td>
<td>7,958</td>
<td>114,692</td>
<td>286,731</td>
<td>200,711</td>
</tr>
<tr>
<td>2035</td>
<td>7,400</td>
<td>45,880</td>
<td>8,373</td>
<td>154,481</td>
<td>386,204</td>
<td>270,343</td>
</tr>
</tbody>
</table>

Oil and gas development may generate waste on a project basis rather than simply on population. These data also highlight the possibility that a service area for operation of a landfill, wastewater and industrial water facility should perhaps be considered.
8.0 EMERGENCY SERVICES

Emergency services include police, fire, search & rescue and risk management. These services are provided by the NSB.

8.1 NSB Police Department

The Police Department’s primary responsibility is providing police services within the NSB. The Department’s headquarters are in Barrow, as are the jail and 24-hour dispatch center. The Department also has offices and staff in each of the seven villages and Prudhoe Bay.

The Field Operations Division staff includes uniformed police officers, detectives, correctional officers and a Drug Abuse Resistance Education (D.A.R.E.) officer that respond to service calls, conduct criminal investigations, engage in proactive patrols and oversee the housing and care of inmates. The Detective Unit focuses on offenses involving the importation and sale of drugs and alcohol. The Corrections Unit staff run the NSB’s jail facility. The Dispatch Unit facilitates calls for assistance for police, fire and search and rescue personnel.

The Police Station is located at 1068 Kiogak Street on a leased parcel at the intersection of Agvik and Kiogak Streets. The building was constructed in 1980 and, with the exception of a roof replacement in 2010, has seen only minor repairs over the years. Staff report that the facility is too small, the current layout does not fit their programmatic needs and requires constant repair. The police station lease will expire in 2018.

On a separate adjacent parcel is a Quonset hut, at the intersection of Kiogak and Aivik Streets. This facility is used by the Police Department for offices, storage of supplies and equipment – from ammunition to office supplies and serves as a vehicle repair bay for police specific equipment that are not serviced by the borough Public Works Department. This property is leased on a month-to-month basis. Neither facility complies with current zoning regulations.

As an effort to address the building’s deteriorating condition, in 2009 a project analysis report was drafted but not finalized. The draft report indicated that a new 117,965 square feet justice center that included a police station, jail and juvenile substance abuse facility was projected to cost $134.15 million. The jail and juvenile substance abuse facility were proposed to serve Barrow as well as the villages. An alternative presented in the draft report specified that a replacement of only the police station would cost $43.4 million and would provide 33,270 square feet of space. Neither estimate included the cost of land acquisition, site development or utility costs. The draft project analysis report indicated that it was a joint effort with Alaska Department of Corrections, Alaska Court System, Alaska Department of Health and Social Services Division of Juvenile Justice and NSB with a high level of support from all agencies.

An updated cost estimate that identifies potential sites would be beneficial to determine alternatives for the police department and its functions. A relocation project of this magnitude would entail many different funding sources, engaging a variety of stakeholders and procuring significant resources.
8.2 NSB Fire Department

The Fire Department responds to fires and other emergencies in all the North Slope communities; its headquarters are in Barrow. Staff includes medical professionals for critical care air ambulance and medevac services, instruction at Ilisaġvik College and fire prevention and safety programs for school children.

8.2.1 Fire Station #1

There are two fire stations in Barrow. The first, known as Fire Station #1, is at 1040 Kiogak Street near the intersection with Cunningham Street / Nachik Street. It is the older of the two fire stations in Barrow. A substantial addition was constructed in 1995 and has 6,848 total square feet of space that includes four equipment bays, several offices and a training room. Fire Station #1 is on the site of the old weather station and is also a potential location for a Barrow Consolidated Office Space Facility.

The Fire Department has received general obligation bond funds to purchase a quint fire apparatus that serves the dual purpose of an engine and a ladder truck. It is intended to be stored at Fire Station #1 in Barrow. Retrofitting the equipment bays may be needed to station the apparatus at this facility.

8.2.2 Fire Station #2

Barrow Fire Station #2 is at 4374 Laura Madison Street near the intersection with Okakok Street in Browerville. Fire Station #2 is 14,496 square feet and has three equipment bays and administrative offices. It was constructed in 1995. There is very little to no expansion possibility for this Station.

8.2.3 Proposed Future Fire Station #3

A third station has been proposed that would be constructed where a future extension of Laura Madison Street would intersect with Cakeeater Road. The Fire Department foresees a need for this third fire station combined with a training center. The training center would be intended to function as a regional facility that offers training for village volunteers as well as those in Barrow.

The potential advantages of the proposed Laura Madison/Cakeeater site are that it is located in a less urban area and be able to operate training exercises without negatively affecting nearby residents and would be well-positioned to provide services to NARL.

8.3 NSB Search and Rescue Department

The Search and Rescue Department provides medevac, search and rescue and other emergency services. The Department currently operates four aircraft that are capable of day, night, visual or instrument meteorological flight conditions and utilized for both search and rescue missions and medevac roles. There are two helicopters equipped for enhanced night vision operations and two fixed-wing aircraft capable of operating in icing conditions and high altitudes.
The existing Search and Rescue facility is at 1797A Okpik Street near the intersection with Ahkovak Street. The 13,706 square feet facility was constructed in 1984 with some major upgrades in 1995. It has an aircraft hangar bay and utility, maintenance and storage areas on the first floor. The second floor has a conference room and administrative offices. Search and Rescue also has the adjacent Fuel Truck Building at 1797B Okpik Street. An addition to the existing Search and Rescue facility was funded this year through general obligation bonds.

### 8.4 NSB Risk Management Division

Among its many duties, the staff at the Risk Management Division of the Administration and Finance Department is responsible for disaster coordination and emergency preparedness and response, such as power outages during severe winter storms. Risk Management stores supplies and equipment for immediate deployment in the case of an emergency.

The Risk Management Office is at 1795 Okpik Street above the Shipping and Receiving Warehouse and adjacent to the Search and Rescue building. Staff at Risk Management has stated that there is not sufficient storage space for supplies and equipment, reducing their effectiveness during an emergency. The NSB is in the process of retrofitting the existing Risk Management office to better fit its needs, including a back-up diesel generator and several conference rooms. This retrofit will enable Risk Management to have an effective Emergency Operations Center. However, the Risk Management Division's need for storage space for emergency preparedness equipment and supplies remains unmet.
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9.0 HEALTH AND SOCIAL SERVICES

9.1 General Health

Barrow is the regional center for most North Slope Borough Health Services. The primary providers include Arctic Slope Native Association (ASNA), NSB Health Department, NVB and the State of Alaska Department of Health and Social Services. Additionally Polar Care is the only private health care provider. It is owned and staffed by a nurse practitioner. Many of the health care services are being assumed by ASNA. The NSB is the only entity that can provide for non-tribal community members through arrangements with ASNA.

The State of Alaska Department of Health and Social Services has a small office in Barrow. Its primary role is providing service to displaced children, including coordination with the NSB Child and Youth Services (CYS) and with NVB for foster care or other types of placement.

Point Hope and Anaktuvuk Pass are the two NSB villages that are geographically located such that services from other regions are more practical and that are responsive to those village's needs.

Figure 22 Samuel Simmonds Memorial Hospital
In 2012, the NSB completed a Baseline Community Health Analysis Report which includes a Barrow Health Profile Report to provide the community with information on basic health measures at the village level to guide community health promotion and planning efforts. This report indicated the following in terms of Barrow’s general health:

- A large majority of Barrow adults report or were reported to have at least good health. Slightly more than half of Barrow adults (51% of household heads and 53% of all adult household members) had very good to excellent health and 17% of household heads (13% of all adults) reported fair or poor general health. These estimates are fairly similar to current estimates of overall health among adults in national surveys.

- Self-reported general health varied significantly by ethnicity. Except in the over-65 years of age group, Caucasian household heads were most likely to report very good to excellent health and were the only group to report better general health than their statewide counterparts. A high percentage of residents aged 65 years and older of other ethnicities reported very good to excellent health, although this represented a very small group.

- As noted in the North Slope Borough Health Profile, reported general health status of adults living in Barrow was significantly better than in other villages as a whole. This was true when comparing all ethnic groups combined and when comparing Iñupiat adults only.

9.2 Physical Healthcare Services

9.2.1 Samuel Simmonds Memorial Hospital

Physical health care services for the North Slope are centered in Barrow and are primarily operated by ASNA at the new Samuel Simmonds Memorial Hospital. ASNA is a not-for-profit organization with accreditation from the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), a non-governmental organization that ensures that member organizations meet quality standards.

The Indian Health Service (IHS) works with Alaska Native Tribes and Tribal organizations to provide comprehensive health services to Native Alaskans. Samuel Simmonds Memorial Hospital is an IHS-funded, tribally managed hospital. Control of Samuel Simmonds Memorial Hospital was transferred from the IHS to ASNA in 1986. Personnel from the Alaska Native Medical Center (ANMC) in Anchorage provide specialty clinics at Samuel Simmonds Memorial Hospital. The specialty and tertiary referral location for the Barrow service area is ANMC.

In August 2013, the new Samuel Simmonds Memorial Hospital officially opened. The 109,000 square foot structure is four times larger than the 1963 facility it replaces. Healthcare services at Samuel Simmonds Memorial Hospital include:

- Outpatient unit providing emergency, clinic and urgent care (15 outpatient and 4 emergency rooms);
- Inpatient unit providing care for newborn through elderly patients, including low-risk obstetrical services with two labor and delivery rooms;
• Case management;
• Specialty clinics offering access to specialists by referral;
• “Screening for Life” Breast and Cervical Cancer Screening Program (mammography is offered at the Wellness Center);
• Diabetes education;
• Physical Therapy;
• Optometry;
• Pharmacy
• Audiology and endoscopy services; and
• Meditation room.

Support services provided by the Hospital include:
• Central sterile supply;
• Medical records;
• Business office;
• Translation services;
• Eye care (currently being transferring from the NSB Health Department to ASNA); and
• The morgue.

ASNA also administers a prematernal home at 274 Pisokak Street. ASNA would see this facility located adjacent to the hospital in the future.

The NSB Health Department has expressed interest in ASNA taking over the several of its programs: the Community Health Aide Program (CHAP), Public Health Nursing and Women Infant Care (WIC). The Public Health Nursing, WIC and CHAP programs are all located in the Wellness Center.
9.3 Social Services – Adult Programs

9.3.1 Substance Abuse and Treatment

According to the 2012 NSB Baseline Community Health Analysis Report, 6% of Iñupiat households reported to “often” be affected by alcohol and drug problems. This is nearly twice as much as other ethnic groups. While this percentage seems low, conversely, 61% of Barrow households reported the health of the community had “often” been hurt by alcohol and drugs in the past year. The report did not indicate any speculation on the percentage disparities of the household and community impacts (North Slope Borough 2012).

The NSB Health Department provides only outpatient substance abuse assessment and treatment services through Integrated Behavioral Health Program at the Matsutani Community Resource Center. Integrated Behavioral Health also provides referral services to adults and youth who may require inpatient substance abuse services. Together with the NSB Assembly, the Health Department offers treatment scholarships to those who require inpatient services. This scholarship is a once in a lifetime opportunity for adults. If a scholarship is offered to a minor, the scholarship can also be offered again in adulthood. Patients are often referred to the Lakeside-Milam’s 28 day residential treatment program in Washington.

Barrow does not currently have any formal detoxification facility or services available. Barrow residents appearing to require detoxification from alcohol or drugs are taken to the Samuel Simmonds Memorial Hospital for medical monitoring and/or evaluation. Those that do not require medical evaluation are typically taken to the Barrow Police Department jail provided they are not a danger to others or themselves due to intoxication.

The Wellness Center once served as a Barrow substance treatment center and detox facility but was closed in 2006 due to the declining North Slope Borough budget. There are no current plans to reopen a substance treatment center and/or detox facility in Barrow. The Alaska Federation of Natives (AFN), the largest statewide Native organization in Alaska, is highlighting the importance
of substance abuse treatment centers in regional communities to expand the treatment options for Alaska Native individuals and families (Alaska Federation of Natives 2014). Additionally, the NSB Health Department reported a number of concerns with sending those in need of treatment to residential programs out of the Barrow area, such as the one in Washington, because the programs are expensive. The typical 28 day duration is too short to be effective and the centers are deficient in cultural relevance. The Health Department supports reinstituting a treatment program in Barrow to serve not only Barrow residents but all North Slope village residents. Over the next twenty years, the NSB Health Department anticipates a need for a thirty-bed facility with fifteen of those reserved for village use and an additional five to ten bed detox facility.

9.3.2 Assisted Living

Assisted living is provided by the NSB Health Department at the Senior Center facility at 5452 North Star Street. There are twelve beds at this facility, three of which are for respite. An additional seven beds are available at a 12-plex at 5155 Herman Street. The NSB Health Department reported that 5 - 10 elders per month are requesting assisted living accommodations. The NSB Health Department believes that there is an unmet need for an additional 20 units now and an additional 30 units by 2035.

Hope Community Resources, a non-profit organization, has an elders care assisted living program. This is an apartment style facility that provides assistance with daily living activities that often includes preparing meals, housekeeping, medication assistance and laundry. There is currently a wait list of six individuals.

9.3.3 Homemaker’s Program

The Homemakers Program is administered by the NVB. Homemakers assist elders and people with disabilities who have chronic medical conditions that limit their ability to live independently by providing meal preparation, light house cleaning and personal assistance with dressing and bathing. The program is administered out of the Wellness Center.

9.3.4 Independent Living

There is currently a waiting list for the 29 unit Senior Center facility for independent living located at 5452 North Star Street. The NSB Health Department believes that there is a current unmet need for an additional 20 units now and an additional 50 units needed by 2035.

9.3.5 Mental Health

Hope Community Resources offers mental health assistance through a facility with six beds. The NSB Health Department believes that there is currently a need for a 20 bed facility, growing to as large as 30 beds by the year 2035. There is also a mental health day program that is administered out of the 12-plex at 5155 Herman Street.
9.3.6 Arctic Women in Crisis

AWIC offers emergency shelter and counseling services for victims of domestic violence and sexual assault. It also provides accommodation for homeless women. The current women’s shelter is located in a 12-plex complex in Browerville.

Over the next 20 years, it is possible that a new AWIC facility would be needed. The Health Department indicated that locating a new AWIC facility near the police station would be beneficial to the program and its clients.

9.3.7 Homeless Shelter

Barrow does not currently have a dedicated homeless shelter. The NVB administers a housing assistance program that places tribal members in local hotels on a temporary basis. This program is provided through a grant from HUD and NAHASDA that is only available to federally recognized tribes and housing authorities. The maximum amount of assistance available is $5,000 per year, per person, every other year. On average, NVB assists 20 individuals per year with securing temporary housing. They also maintain a list of “couch surfers.” These are individuals going back and forth between friends and family because they do not have a home of their own. The North Slope Borough provided a $200,000 grant to NVB for assistance in locating a suitable homeless shelter facility. NVB is also working with ASRC and UIC to address the need for a homeless shelter in Barrow.

9.3.8 The Gathering Place

The Gathering Place is a day program for adults impacted by severe and persistent mental illness. It is located in Browerville and offers counseling services, case management and assistance with state and local resources.

9.3.9 Itinerant and Transient Housing

The NSB Health Department operates itinerant housing for traveling health care workers. There are several itinerant housing facilities: 5115 Herman Street, 5306 Laura Madison Street, and 5328 Laura Madison Street. UIC is planning on developing an extended stay hotel in the vicinity of the new hospital that could supplement or replace current facilities.

9.4 Social Services – Children’s Programs

9.4.1 Daycare

Childcare services for 42 children were offered at the current Kiita Learning Community alternative high school at 5245 Karluk Street until 2006. Both Ilisagvik College and the NSB Health Department operated the daycare. Unfortunately due to declining revenue in the NSB budget and a program that rarely covered its own costs, the daycare was closed.

Mayor Brower has recognized the urgent need for childcare services within Barrow and all of the North Slope communities. Per her direction, a project analysis report (PAR) was prepared by WHPacific, #18-041 and dated 9-20-13. The report calls for a facility for 249 children and
Barrow Comprehensive Plan

concludes that “the need is urgent and requires near, mid- and short-term facility investments to bring childcare center services online as quickly as possible.” Focused on one daycare facility, it did not evaluate the possibility of two daycare facilities in Barrow, although the NSB Health Department has indicated that one larger facility would be preferable. Some municipalities in Alaska, such as the Municipality of Anchorage that regulate daycare centers within its jurisdiction, recommend that daycares remain small; they function better and have a warmer and more intimate atmosphere if the number of children does not exceed 100 (Municipality of Anchorage 2007). Planning options discussed in this plan suggest two facilities: one in Barrow and another in Browerville to allow easy access to centers of employment and reduce traffic congestion near the daycares.

The NSB Health Department operates an infant daycare program in the former AWIC building at 4470 North Star Street.

9.4.2 Children and Youth Services

The North Slope Borough Children and Youth Services Division (CYS) of the Health Department provides emergency shelter to children ages 18 years and younger. CYS has a 14 bed facility for displaced children when family or foster placement is not available. Counselors are available 24 hours a day, seven days a week to assist children and their families.

The current CYS facility is a Level 2 Emergency Stabilization and Assessment facility. A Level 2 facility provides behavioral rehabilitation services and temporary residential care for children that may be in danger in their current situation, require temporary placement or an assessment of their needs. The NSB Health Department indicates that CYS could be licensed as a Level 3 Residential Treatment program. The Level 3 designation requires that 24-hour behavioral rehabilitation treatment for children with emotional and behavioral disorders. (State of Alaska Department of Health and Social Services 2008). CYS takes placements from NVB, the NSB Health Department and the State of Alaska.

The CYS facility is located at 2000 Ahkovak Street, at the intersection with Okpik Street. Although there will be a need for additional space by 2035, the lot size and configuration limits the ability to expand the facility or provide an outdoor playground.

9.4.3 Foster Care

The NVB Social Services Department provides tribal foster care services. NVB is the federally recognized tribal organization for Barrow and has exclusive jurisdiction over all Indian Child Welfare Act cases in Barrow. NVB strives to ensure Iñupiat children are placed with extended families or local Iñupiat families when reunification with their parents is not possible. There is a stringent tribal foster care application process that all potential Tribally Licensed Foster Parents must pass before NVB children can be placed in their home. NVB indicates that the need for displaced children is desperate; perhaps as many as 60 children are in need of foster care. NVB actively seeks to improve foster care opportunities to place displaced children in suitable and safe homes. NVB has conducted a study titled “Child and Family Services Plan 2012-2014” to guide their efforts for displaced children. NVB Social Services Department can also investigate reports.
of harm to NVB children through a memorandum of agreement with the State of Alaska Office of Children’s Services.

9.4.4 Substance Abuse and Treatment

Currently there is not a program or facility for substance abuse or treatment for minors. The potential for a substance abuse and treatment facility for minors was addressed in a 2009 draft PAR for a new police station/justice center. The project cost was estimated to be approximately $35 million. The NSB Health Department supports both a program and facility. The Health Department also notes that extremely overcrowded housing is a factor in drug exposure for young children and that juvenile drug use is on the rise.

When minors commit crimes, they are released to their parents because housing minors with adults at the jail is prohibited. The Health Department has indicated that there is a need for a culturally relevant program that serves minors with substance abuse issues that are involved in criminal activity.

9.5 Veterinary Services

The North Slope Borough Health and Social Services Department operates the veterinary clinic in Barrow. Services offered by the veterinary clinic include animal control, pet adoptions, rabies control, animal vaccinations and limited veterinary services including spaying and neutering and treatment for sick or injured animals. The veterinary clinic has a full-time veterinarian on staff.
10.0 TRANSPORTATION

10.1 Barrow Airport

The Wiley Post / Will Rogers Memorial Airport (Barrow Airport) provides access to many villages in the northwest Arctic, including Atqasuk, Wainwright, Point Lay, and Nuiqsut residents can easily access the larger cities of Fairbanks and Anchorage. Passengers, cargo, and mail destined for these communities are routed through Barrow. Multiple air carriers provide scheduled incoming and outgoing service with Era Aviation (rebranded as Ravn Air in 2014) and Alaska Airlines being the primary passenger carriers. In 2012, there were 43,673 passenger enplanements (State of Alaska Department of Transportation & Public Facilities 2014). Northern Air Cargo schedules daily weekday cargo deliveries to Barrow.

The Barrow airport was originally constructed in 1964. Over the years, there have been many improvements, including extending the runway and expanding the apron. Currently, the airport has a single, paved runway that is 7,100 feet long and 150 feet wide. At the end of the runway are aircraft turnarounds (“elephant ears”) to allow large aircraft to turn around in preparation for take-off. Three 75-foot-wide taxiways connect the apron, which covers approximately 620,000 square feet, to the runway (State of Alaska Department of Transportation & Public Facilities 2014). Current configuration and features of the airport are depicted in Figure 25.

Leasing space at the airport is in demand. In 2012, six entities inquired about leasing airport property (State of Alaska Department of Transportation & Public Facilities 2014). Most activity is in the center of the apron, where the primary passenger carriers Alaska Airlines and Era Aviation operate their terminals. Transient aircraft park in the tie-down area of the apron. The NSB Search and Rescue Department and medevac facility is located on a leased property on the northeast end of the apron. The NSB operates two helicopters, a twin-engine airplane, and a jet-engine airplane for these services. It also provides rescue services slope-wide to and from all villages and will provide medevac services to Barrow, Fairbanks, and Anchorage.

Figure 24 Alaska Airlines

The Barrow Airport plays a large role in the support of regional oil and gas exploration and development. Royal Dutch Shell has chartered a Boeing 737-400 to transfer crews from Anchorage to Barrow, used the airport to transport crew to offshore exploratory drilling platforms, and staged helicopters in Barrow to support crew changes and search-and-rescue operations. Oil and gas activity may increase travel through Barrow; ConocoPhillips and Statoil have both indicated they will use...
Wainwright as a base of operations for assessing Chukchi Sea leases (State of Alaska Department of Transportation & Public Facilities 2014). During 2012, USCG provided 24-hour search-and-rescue availability from the Barrow Airport to support Beaufort Sea and Chukchi Sea activities.

Figure 25 Barrow Airport Site Features

There is a dramatic increase in aircraft for scientific research during the summer. Helicopter operations are highest in summer. During research activities such as wildlife surveys and aerial photography, aircraft often operate from the Barrow Airport for a couple of weeks at a time. The USCG is considering Barrow as a seasonal base of operations to monitor arctic marine traffic and offshore oil and gas exploration.

Barrow residents are less likely to own private aircraft than residents in many other Alaska villages. Only 11 private aircrafts were registered with the Federal Aviation Administration (FAA) in 2013.

Priorities for the Barrow Airport include improved passenger terminal, baggage claim, vehicle access and cold storage building for sand and urea (North Slope Borough 2005b).

North of NARL, near North Salt Lagoon, there is an abandoned corrugated metal U.S. Navy airstrip that is used in September and October for whale haul-out and butchering. This airstrip was constructed in the mid-1900s to service the U.S. Navy Point Barrow Camp.
10.2 Community Roads

The City of Barrow has approximately 52 miles of roads, none of which are paved. The largest major streets are 25 feet wide and minor streets are less than 20 feet wide. Road rights-of-way (ROW) are mostly 60 feet wide, but several in western Barrow are 50 feet wide (Native Village of Barrow 2010). Many of Barrow’s roads, including high use roads such as Eben Hopson Street, Stevenson Street, and Ahkovak Street are listed on the BIA Indian Reservation Road (IRR) Inventory. All public roads are maintained by the NSB.

Typical arctic construction methods are used to build roads in Barrow. Arctic construction is necessary to preserve frozen layers beneath the road sections. The road design involves using geotextile fabric and insulation in conjunction with free draining gravel and culverts to equalize drainage. To maintain integrity during freeze-thaw cycles, embankment depth and amount of insulation is determined by soil type and underlying permafrost conditions. Utilities in Barrow are buried in the road system, with maintenance trenching done in winter months.

During winter, road surfaces are frozen and stable. Warmer seasons cause a variety of issues including mud, potholes, roadway rutting or wash boarding, and airborne dust. Typically roads are graded in the spring and gravel placement may be required. Airborne dust is problematic, causing respiratory problems such as bronchitis, asthma, and a high incidence of sinus infection (North Slope Borough 2005a). Dust is also blown onto drying subsistence foods, at times causing them to be inedible.

Community roads are travelled by automobiles, pickup trucks, all-terrain vehicles, and snow machines. Road watering trucks, large waste and auto loading trucks, gravel and soil hauling trucks, large fork-lifts, pay loaders, and heavy equipment are all found on roads in Barrow.

The community of Barrow has a public bus that stops at various locations including the hospital, residential neighborhoods, retail stores, and the college. The Senior Center provides an on-call van service to elders and the disabled seven days per week.

10.2.1 Traffic Flow and Community Centers

The City of Barrow has several main community centers which determine traffic flow. These include the City Center of Barrow, the suburb of Browerville, NARL/Barrow Arctic Research Center (BARC) area and the area south of the airport. The DEW Line station, about five miles northwest of Barrow, is sometimes thought of as a community center but is not included in this discussion because the station is self-sufficient, utilizing delivery systems and full lodging services. Recognizing these community centers and reinforcing them through future planning efforts creates the opportunity for cohesiveness for community growth.

Barrow. The City Center of Barrow includes the airport, police station, village and regional native corporation headquarters, Piuraaġvik Recreational Center, Fred Ipaloook Elementary and Barrow High schools, the court, hotels, businesses including the bank, government agency facilities, utility offices and production facilities, and residences.
Most travel in Barrow is concentrated in the central business district in the north and west. Main travel routes are Eben Hopson Street from the U.S. Post Office to Kiogak Street, Stevenson Street along the coast from the Elson Lagoon boat ramp to the gravel pit just south of the Airport, and Laura Madison Street, which has recently been extended to meet with Cakeeater Road. Ahkovak Street runs north-south in front of the airport, curving west at Ipalook School to connect with Laura Madison and Stevenson Street. Alaska Commercial Company (locally known as Stuaqpuk or AC), Barrow's largest grocery and general store is at the intersection of Laura Madison and Ahkovak Streets. Figure 26 depicts the current road layout in Barrow.

Traffic flows through the main business district along Stevenson Street to Eben Hopson, providing connection to Browerville. Momegana and Kiogak streets run almost parallel and connect to Ahkovak Street and the airport. Momegana Street is a well-travelled road that continues onto Eben Hopson Street.

Congestion along Ahkovak Street is a concern for Barrow residents, especially when flights are arriving. This road is owned by the SOA and is noted as one of the worst during breakup (Native Village of Barrow 2010).

Browerville. Browerville is a suburb of Barrow located north of Isatkoak Lagoon. Browerville includes the hospital, Stuaqpuk, the gas station, Kiita Learning Community and Eben Hopson Middle schools, Native Village of Barrow offices, Inupiaq Community of the Arctic Slope, the Iñupiat Heritage Center, Tuzzy Consortium Library, government offices, businesses including two auto parts stores and residences. Solid waste disposal is located a few miles east of Browerville.

In Browerville, traffic flow is concentrated along Laura Madison, Eben Hopson, and Stevenson streets. Figure 27 depicts the current road layout in Browerville.

Transportation priorities in Browerville include the Yugit Street Extension and Cakeeater subdivision roads. Extending Yugit Street will create a direct route from Ahkovak Street to the hospital. Design has been completed for this extension. Some Cakeeater subdivisions do not have roads constructed for access in Barrow. One is located adjacent to Cakeeater Road on the north and Qaiyaan Street on the west. The second is located in the vicinity of Nunavak Bay. Both of these subdivisions are priority for roadway construction so landowners can access their home sites.

Samuel Simmonds Memorial Hospital has become a new center point of community activity. As Barrow grows, more space will be needed for institutional, commercial and residential development. The area around the hospital offers a significant future growth opportunity.

Naval Arctic Research Laboratory/Barrow Arctic Research Center. The Naval Arctic Research Laboratory (NARL) facility was originally established during World War II. Over many years, the scope of research at NARL expanded far beyond the original military interest, and included inter-agency and university collaboration. At its height, NARL consisted of nearly 200 buildings, an airstrip, and an antenna field. After the U.S. Navy ended its support for research in 1980, the parcel was divided. “NARL” is used to describe the group of former laboratory and support buildings clustered along the coast between Imikpuk Lake and Middle Salt Lagoon. NARL area
includes Ilisaġvik College, a hotel and other business offices and residences. The Barrow High School football field is located a short distance north of NARL on Stevenson Street.

The Barrow Arctic Research Center (BARC) and Barrow Environmental Observatory (BEO) are located just to the southeast of NARL. BARC facilities are used year-round by scientists from all over the world. The Tom Gordon Expressway/Uivaqsaagiaq Road is an alternative to Stevenson Street, will begin at the Laura Madison/Cakeeater Road intersection and follow the south shore of the Middle Salt Lagoon, ending at the BARC. Figure 28 depicts the road layout for Tom Gordon Expressway/Uivaqsaagiaq. ADOT and the NSB have received final design drawings, and are currently waiting for funding to construct the road, which has been listed as the top priority in the Native Village of Barrow Long Range Transportation Plan (2010).

South of the Airport, Property directly south of the airport is primarily industrial in nature; many uses are geared toward aviation activities. There are opportunities to dedicate much of the undeveloped property to oil and gas related activities, including man camps. There is also the possibility of a Coast Guard presence south of the airport. Additional industrial development in this area directs transient oil and gas operations away from the local community.

There has been some interest in residential housing in this area but access and the cost to extent infrastructure to this area make this type of development unlikely over the next twenty years. Improved ingress / egress and fire and other public safety enhancements would need to be put into place before residences are constructed there.
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10.2.2 ATV and Snowmachine Trails

In Barrow there is abundant use of snowmachines and all-terrain vehicles (ATVs) for transportation. In an informal survey conducted for the 2010 Long Range Transportation Plan for Barrow, there are more than 1,000 more snowmachines and ATVs in Barrow than there are cars. Summer ATV trails and winter snowmachine trails link surrounding villages to Barrow and provide routes for subsistence activities. Some years, winter ice roads provide access from Barrow to Deadhorse. When frozen, the Beaufort Sea also provides access to Deadhorse (Native Village of Barrow 2010).

10.3 Marine

Because there are no year round roads into Barrow, residents are dependent on marine and air travel. Economic development drives much of the current maritime activity in and around Barrow.

Marine traffic has increased in recent years due to a relatively ice-free Arctic. Higher air and water temperatures have caused permanent ice cover to diminish to low levels seasonally, and scientists predict this trend will continue (U.S. Coast Guard 2013).

Barrow is the staging ground for Chukchi and Western Beaufort Sea offshore oil and gas development. Thirty percent of the world’s undiscovered natural gas and natural gas liquids are estimated to occur in the Outer Continental Shelf and Circum-arctic region. Increased offshore exploration can be expected to increase with receding sea ice. Since 2005, there has been over three and a half billion dollars of commercial investments in Chukchi and Beaufort Sea offshore
leases. In previous years, Royal Dutch Shell has held offshore exploration activities in the Arctic. Commercial exploratory efforts are expected to expand during the next decade (U.S. Coast Guard 2013).

10.3.1 Barging

Cargo barges deliver supplies to Barrow during ice-free months in the summer. Barges leave from Seattle on or about July 1 of each year and carry about 3,000 to 5,000 tons, which is estimated to be 75% business usage and 25% individual goods. Barges offload onto the Chukchi Sea beach, approximately four miles north of Barrow, just north of the NARL facility.

Due to undeveloped shore-based infrastructure, unloading the barges in Barrow can be a risky and time-consuming task. Once in Barrow, if conditions permit, the line haul barge is put on the beach stern first and secured with lines to heavy pieces of equipment that serve as deadheads. A landing craft is put alongside the line haul, and cargo is swung by crane to the landing craft, where it is unloaded by rubber tired loaders. Although this is the quickest way to unload, sea and wind conditions have to be calm and consistent to unload the barge in this manner, and equipment available to hold the barge on the beach. If the haul barge cannot be landed on the beach, a lightering operation occurs in which the line haul barge anchors approximately one half-mile offshore. The landing craft lays alongside the line haul, and cargo is swung by crane from the line haul to the landing craft. Once the landing craft is loaded, it proceeds to the beach landing site and drops a ramp on the beach. Once secured, rubber tired loaders are used to drive onto the landing craft, pick up containers or flats and carry them onto a beach staging area.

Local municipal and Native governments have become acutely aware for the need for a Barrow Safe Harbor and Staging area. A barge docking facility has been suggested, and a Project Analysis Report was prepared in the early 2000s for a single launch and floating dock along the short channel between Elson Lagoon and North Salt Lagoon. At the time, the rough cost estimated by the NSB Public Works Department was five to eight million dollars (Native Village of Barrow 2010). As with many resource development projects, there is potential for conflict between subsistence activities and industrial needs. Development of a Safe Harbor and Staging area could help mitigate conflict by providing benefits to both industry and residents of Barrow.

10.3.2 U.S. Coast Guard Presence

The USCG’s Arctic Strategic Plan, published in 2013, describes the anticipated presence of the USCG in the Arctic in upcoming years (U.S. Coast Guard 2013).

Shipping between two destinations outside of the Arctic is increasing dramatically. One million tons of marine cargo transited through an Arctic route in 2012. The USCG expects maritime activity in the Arctic to continue to evolve from exploration and scientific research to resource extraction and commercial shipping. In the short time between 2008 and 2012, traffic moving through the Bering Strait increased 118%. Therefore, the USCG is preparing a Bering Strait Port Access Study. According to the USCG Arctic Strategic Plan, “An oceanic trade route across the Arctic from the North Atlantic to the North Pacific would represent a transformational shift in maritime trade, akin to the opening of the Panama Canal in the early 20th century.”
A reduction in sea ice and declining onshore oil production creates incentives for further exploration offshore. This will stretch current search and rescue capabilities. Maritime governance and USCG oversight can be expected to ramp up to respond to high risk activities. The USCG plans to help protect the health of the marine environment, preserve living marine resources, and safeguard the Nation’s Exclusive Economic Zone, which extends approximately 200 miles offshore. To support these goals, the USCG may forward-deploy small boats, cutters, and communication assets during the summer season to Barrow. This is expected to be similar to the 2012 Operation Arctic Shield, which was the largest USCG Arctic force package in history.

The USCG also calls for icebreaking capacity, noting that the U.S. will need to make a strategic investment in icebreakers to enable access to the high latitudes over the long term.

### 10.3.3 Marine Tourism

Arctic tourism is rising rapidly; it is estimated that one million adventure tourists visited the Arctic in 2013 (U.S. Coast Guard 2013). Higher-risk activities such as adventure and eco-tourism often involve transportation via passenger vessel. In past years, small inflatable boats have been used to bring passengers ashore from cruise ships. The cruise industry schedules tours through the Northwest Passage and into the U.S. Arctic.

### 10.3.4 Subsistence Boating

The ocean and rivers near Barrow provide transportation for many subsistence activities. Inupiat people living in coastal villages have been hunting the Bowhead whale for thousands of years, and as the International Whaling Commission (IWC) has acknowledged, “whaling, more than any activity, fundamentally underlies the total way of life of these communities.” Skin boats are commonly used in spring whaling. Conventional boats are used during fall whaling, as well as for other subsistence pursuits, such as caribou, seal, or walrus hunting, and fishing the rivers with Chukchi and Beaufort seas access. Residents from Nuiqsut can travel to Barrow via passenger vessel. At least one Barrow resident used an airboat on the frozen Beaufort Sea to deliver summer cabin supplies in May before the ice is gone from the Beaufort Sea (Native Village of Barrow 2010).

The existing boat launch at the end of Niksiuraq Road is limited by the condition of the road, which is continually requiring maintenance due to storm surges and erosion. Currently, residents launch boats from several different locations on the shores of Elson Lagoon and North Salt Lagoon. A new boat launch, dock and breakwater have been constructed in the northeast corner of the North Salt Lagoon and has been operating since the summer of 2014. The dock was constructed with NPR-A grant funds and is owned and maintained by the City of Barrow.

### 10.3.5 Future Port Authority and Facility

Because of its strategic location at the northernmost point in the United States with access to the Chukchi and Beaufort Seas as well as the Arctic Ocean, Barrow is well positioned to serve as a hub for Arctic multi-modal transportation. Industry, government, and private user groups have publically stated that a port along the Arctic Coast of Alaska is needed with increasing immediacy due to greater use of the Northwest Passage.
The North Slope Borough has recognized that the increased traffic is both an opportunity and a risk for North Slope residents. The NSB Assembly adopted ordinance 2014-01 for the creation of a port authority in July 2014. North Slope voters approved the formation of the port authority; the election was on October 7, 2014. The purpose of the port authority is to protect subsistence resources and enable residents, tribal corporations and local businesses to take advantage of new economic opportunities through planning, financing and operating and maintaining facilities and related activities (North Slope Borough 2014b).

A Barrow port would support a variety of users, ensure safe access and harbor, support efficient shipping and trans-shipment of goods and provide the infrastructure necessary to serve and promote not only traditional pursuits but industries that include tourism, research, oil exploration and development. This concept is still in its infancy; substantial engineering and geotechnical research and analysis would be needed to determine potential locations for the port based on bathymetry, sediment transport patterns, shore protection, gravel resources, etc. and infrastructure needs, such as fuel storage, utilities and road connections (UMIAQ 2010). Figures 29 and 30 are renderings of potential port sites, Elson Lagoon and the Middle Salt Lagoon.

**Figure 29 Rendering of a Potential Port at Elson Lagoon**
Figure 30  Rendering of a Potential Port at Middle Salt Lagoon
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11.0 RECREATIONAL FACILITIES

A common theme shared by many stakeholder participants during comprehensive planning processes was the need for recreational facilities serving all ages where families could go to find a variety of activities. The City of Barrow manages the greatest share of recreational needs in Barrow. These facilities include Piuraaqvik, roller rink and baseball fields. The NSBSD manages the football field.

11.1 Piuraaqvik ("A Place to Play")

The Piuraaqvik Recreation Center was originally constructed in 1984. A renovation was completed in 2010; an expansion began in 2011. Currently, another $13 million is needed to complete the work. The new gymnasium will seat approximately 700 people and have a fold down stage and movie screen for movie night events. When the entire facility is complete, it will have five interchangeable program spaces to provide aerobics, weight training, exercise equipment and dance lessons. Additional recreational and cultural activities held at Piuraaqvik include flag football, bocce, soccer, basketball, racquetball, rock wall climbing, volleyball, weight lifting, dance, kick-boxing, aerobics, Eskimo dancing, whaling celebrations and Christmas games. Newer activities include laser tag, archery, and air rifle training.

11.2 Roller Rink

The roller rink is in the former BIA “Home of the Whalers” Gym. This facility offers roller skating, soccer, "open-mic" nights and special events such as Piuraaqiatna (Spring Festival) and Easter egg hunts. Several residents and stakeholder expressed interest in preserving the former gymnasium.

Figure 31 City of Barrow Roller Rink
11.3 Football Field

The Cathy Parker Field was built in 2007 and is located along Stevenson Street west of Imikpuk Lake and north of NARL along the Chukchi Sea coastline. It was named after a Florida woman who raised $500,000 to ship 60 tons of blue artificial turf to Barrow to build the Whalers a football field (Gillis 2011).

11.4 Playgrounds

There are four outdoor playgrounds in Barrow. Two are located in Browerville and two in Barrow. The Barrow playgrounds are located near Eben Hopson and Egasak streets and in A Block. In Browerville, there is one on Ahkovak Street near the fire station and one near Utiqtuq Street. The playgrounds are used primarily during the summer months. There is one indoor playground at Ipalook Elementary School, but it is not available for public use. An indoor playground available for public use would be a welcome addition to the community.

11.5 Aquatics

There is not an aquatics center in Barrow but there is an indoor pool at Barrow High School that is available for public use during non-school hours. During the summer months, the BHS pool is open for community use and is operated as part of the City of Barrow Recreation Department programs. The first pool in the NSB built in 1978 was in Kaktovik. It was built to teach people to swim, specifically whalers in case they were knocked out of umiaqs. The possibilities surrounding water activities can be greatly expanded to provide for family recreation.
12.0 COMMUNICATIONS

12.1 Mail Delivery

Barrow is served by a single United States Post Office. There is no door-to-door mail delivery service. The mail arrives via an air carrier from Anchorage or Fairbanks. The post office retail office is open during regular business hours.

Passengers, cargo, and bypass mail destined for Wainwright, Point Lay and Atqasuk are routed through Barrow. Roughly 8.7 million pounds of mail flows into Barrow annually. Most of that mail stays in Barrow, while approximately 1.8 million pounds continues to outlying villages. (State of Alaska Department of Transportation & Public Facilities 2014)

12.2 Telecommunications

GCI and Arctic Slope Telephone Association Cooperative (ASTAC) offer telecommunications service in Barrow. Both offer cellular service, internet and local and long distance landline telephone service. GCI also offers cable television.

12.3 Radio Communications

Community residents frequently use very high frequency (VHF) radios to communicate with one another, as well as with community hunters that may be out of range of cell phone service.

12.4 Fiber Optics

Planning is underway for a fiber optic line from Tokyo, Japan to London, England with branch lines connecting six Alaskan villages, including Barrow, Wainwright and Point Hope. Deadhorse will also be included. The fiber optic connection will eliminate the need for transmitting data through satellites and increase internet speeds and reliability. The system is estimated to be operational in 2016.
13.0 ECONOMY

13.1 Economy

Barrow’s economic viability is heavily dependent on government employment and contracting. The local workforce reflects this reality, despite the growing presence of ASRC and UIC as employers in the community.

13.2 Tribal Efforts to Address Economic Development

In 2013, NVB developed a Comprehensive Economic Development Center (CEDC) for Barrow. This effort included the formation of the Barrow Economic Development Council (BEDC) which is comprised of representatives from NVB, UMIAQ (a UIC subsidiary), City of Barrow, Ilisaġvik College, UIC Lands, NSB Planning Department, Alaska Growth Capital (an ASRC Subsidiary that funds business efforts) and several small business owners. The purpose of BEDC is to mentor the NVB and its membership in the economic development process while that also incorporates subsistence activities. The CEDC is focused on economic benefits for its Tribal members and does not express an economic view for the entire Barrow population.

CEDC identified the following economic development goals and objectives:

**Transportation.** One of the major concerns was the need for expanded road service to lots that are landlocked by the membership, preventing access to them.

- **Goal:** The community will possess well maintained roads for all the membership.
  - Objective 1: Expand, improve and maintain local roads.
  - Objective 2: NVB will continue to seek BIA funding to support the NSB in the development of roads.

**Housing.** The need for housing and housing maintenance is a high priority for the membership. The housing priority is single family homes, rehabilitation of existing homes, apartments and/or condominiums, and the need to have enough room for visitors from the outer villages.

- **Goal:** All residents will have access to safe and affordable housing.
  - Objective 1: Increase housing stock in the area.
  - Objective 2: Utilize a comprehensive approach to implement housing projects.
  - Objective 3: To the extent feasible help homes to become energy efficient.
  - Objective 4: Increase the availability of qualified labor force in the community.
Workforce, Education and Training. Supporting Ilisaġvik College was a priority vote by the BECD committee. The focus on skill development and childcare is based on the membership meeting and surveys, that identified higher education, vocational training and employment opportunities as priorities.

- **Goal 1:** Economic development and employment opportunities earnings will grow through education and job skill training.
  - **Objective 1:** Support Ilisaġvik College in building their capacity to deliver integrated and coordinated training programs that incorporate business needs and students interests.
  - **Objective 2:** Encourage mentoring opportunities for youth training and leadership programs.

- **Goal 2:** Childcare will be available to working membership parents.
  - **Objective 1:** Seek solutions to the historical high cost of opening and operating a daycare center.

Quality of Life. A high concern for the membership was the ability to preserve and pass on language and values along with the preservation of subsistence activities.

- **Goal:** Maintain traditional lifestyles and values in order to foster community wellness in the region.
  - **Objective 1:** Assist organizations in heritage projects.

- **Goal:** Increase elder health and longevity through expansion of elder services.
  - **Objective 1:** Expand health, legal, and housing services for elders.

Health Community. Focus on Families, Individuals and Eliminating Substance Abuse.

- **Goal 1:** Create a happy and healthy community.
  - **Objective 1:** Provide parenting classes.
  - **Objective 2:** Expand the foster care and other child services programs.
  - **Objective 3:** Reduce teen pregnancy.
  - **Objective 4:** Support public health initiatives.
  - **Objective 5:** Expand tribal court services.

- **Goal 2:** Leaders will establish a healthy community through example and actions.
  - **Objective 1:** Offer leadership training to all tribal council members.
Goal 3: Increase healthy family lifestyles and productivity of the workforce by decreasing substance abuse.

- Objective 1: Increase the quality and the availability of services for substance abuse prevention and treatment.
- Objective 2: Seek to train Iñupiat Counselors.
- Objective 3: Seek to train Iñupiat Public Safety Officers.

Natural Resources. The protection of the environment and the subsistence way of life was identified as a high priority of the membership. Focus on Fish & Wildlife.

- Goal: Successfully and thoughtfully manage the natural resources.
  - Objective 1: Identify and develop fishing stocks.
  - Objective 2: Identify and develop industries for land mammals.

Business Development. In order to build sustainability for its membership, NVB identified that steps are needed to ensure employment for its members. They identified tribal enterprise along with the development of local and small business start-ups as its priorities.

- Goal 1: Successfully move into enterprise to provide employment opportunities for the membership.
  - Objective 1: Obtain the ability from the USDOI to move into tribal enterprise by obtaining approval of the Section 17.
  - Objective 2: Apply for and obtain 8(a) status.

Priority List. In discussions and assessments of community needs, it was determined that two categories exist under business development for-profit and not-for-profit. A total of ten for-profit and three non-profit development projects were identified.

Through membership participation the BECD committee identified the following top business project priorities in the Comprehensive Economic Development Strategy process.

For Profit:

- Commercial Kitchen.
- Butchery/Tannery.
- Tourism.
- Sewing Co-op.
- Shop for Small Engine Repair or Self Service Repair.
• Arctic Community Greenhouse.
• Sewing/Craft Café.
• Laundromat/Washeteria.
• Native Store.

Non-Profit:
• Arctic Survival Program.
• Snow Park.
• Chamber of Commerce.

Business Starts
• Goal: Increase employment and income through business start-up.
  o Objective 1: Explore feasibility of community kitchens as a business to support feasible business start-ups such as fish/mammal production.
  o Objective 2: Explore feasibility of native store, butcher/tannery, Movie Theater, bowling alley, sewing co-op, self-repair and small engine shop, local fish and land mammal development, arctic community greenhouse, sewing/craft cafe and Laundromat.
  o Objective 3: Work with Ilisagvik College and other entities to enhance and develop new training opportunities for small business management that would include classes that addresses specialized business applications for Barrow.
  o Objective 4: Encourage the use of the Internet and other technologies for business marketing, growth, and development.
  o Objective 5: Determine the feasibility of non-profit activities that support businesses and a healthy community.

Tourism Development
• Goal 1: Strengthen the local community through tourism development.
  o Objective 1: Expand tourism activities.
  o Objective 2: Identify and develop feasible Eco-tourism activities.
  o Objective 3: Research tourist preferences for the top-of-the-world (why they came, did they see what they wanted to see, complaints, compliments, what would make them recommend others to visit, etc.).
Objective 4: Develop a website promoting tourism.

To assist in the development and expansion of small businesses, the Native Village of Barrow employs a part-time position made possible from the U.S. Economic Development Administration (EDA) grant to implement the following in year two:

- Organize community and BECD meetings.
- With input from the community identify and disseminate information about business development opportunities.
- Move forward with the existing Economic Development Committee in addressing the economic needs of the community and then periodically re-evaluate the plan to see if the community needs are being met.
- Contact financial institutions to move into partnerships and explore funding opportunities for small business and tribal enterprise.
- Move forward with plans and strategies developed during year one for the potential development of small business and tribal enterprise and implement those plans and strategies in year two.
- Continue working with the Alaska Economic Development Representative and EDA Regional staff in project development.
13.3 **Tourism**

As the most easily assessable of North Slope communities, Barrow is the primary destination of tourists interested in visiting the Arctic. Hotel accommodations in Barrow include the King Eider Hotel, located at 1752 Ahkovak Street with nineteen rooms and the Airport Inn, located at 1815 Momegana Street with a total of sixteen rooms. The Top of The World Hotel, owned by ASRC, had seventy rooms. The restaurant adjoining the hotel, Pepe’s North of the Border, caught fire on August 31, 2013 and was completely destroyed; the hotel was so damaged that it is currently unusable.

**Figure 32 King Eider Hotel**

ASRC has constructed a new hotel next to the post office on Eben Hopson Street named Top of the World Hotel. A grand opening was celebrated in April 2014. The three story, 40,000 square feet building will offer seventy guest rooms, a restaurant, gift shop, three multi-purpose rooms and a workout room. (Tundra Tours Hotel 2014). As part of this project, ASRC is repurposing the former’s Brower Café and Cape Smythe Whaling and Trading Station building and the building immediately adjacent, the former location of A&D Auto Repair, into an artesian work studio where tourists can see local artisans at work. Given its close proximity to the new hotel and on the Arctic Ocean, it is anticipated to be a popular destination for tourists. There is also speculation that UIC is interested in constructing an extended stay hotel next to the new hospital located on Uula Street near Yugit Street. There are several locally owned and operated tour companies in Barrow as well as those that operate out of Fairbanks or Anchorage that offer packages tours of Barrow.

**Figure 33 Top of the World Hotel**
The primary tourist attractions include: the Arctic Ocean and Point Barrow; polar bear viewing; bird watching, including snowy owls; learning about the North Slope’s traditional culture at the Iñupiat Heritage Center and during the Nalukataq spring whaling festival and blanket toss; visiting the Will Rogers/Wiley Post memorial crash site located 13 miles southwest of Barrow; visiting the whale bone arches and skin boats frames near the former Cape Smythe Whaling and Trading Station; and the Birnirk archaeological site.

Alaskan Arctic waters are not a popular cruise destination but there is at least one cruise line, Hapag-Lloyd Cruises that includes stops in Barrow and Point Hope as part of their Northwest Passage cruise. Because neither community has a deep water port that can support a docking cruise ship, passengers are ferried to shore via smaller boats. While this type of tourism is by no means a significant contributor to the local economy of Barrow, the Bering Strait is seeing an increase in cruise ship traffic that is expected to continue that may eventually mean more cruise-related tourism in Barrow (Committee on the Marine Transportation System 2013) However, because there are no customs or border security along the remote Arctic coastline, allowing cruise ships access to these arctic communities is an increasing concern. Securing the U.S. Arctic maritime border is increasingly important to the USCG (U.S. Coast Guard 2013).

13.4 Other Economic Development Efforts

Unlike most areas of Alaska, the North Slope does not have an Alaska Regional Development Organization (ARDOR). ARDORs in other parts of Alaska are used to encourage business growth and development. The program has been used successfully in many rural locations to spur community development and employment. Urban areas like Anchorage use its ARDOR as the main economic development strategy to recruit for businesses to Anchorage. One successful recruitment effort was the air cargo business, such as UPS and FedEx. Barrow may have a similar opportunity with fiber optic connection proposed by Quintillion; an ARDOR would examine ways to take advantage of this opportunity focusing specifically on economic development for the North Slope.

13.5 Employment

According to the Alaska Department of Labor and Workforce Development (ADLWD), from 2008 through 2012 Barrow local employment ranged from 72% to 74%. Between 67% and 69% of the local residents were employed on a full time basis. The 2010 NSBEP&CR estimates are close to those of ADLWD; approximately 63% of the 1,790 people in Barrow’s labor force are employed full-time.

The 2010 NSBEP&CR indicates that 31.9% of the workforce has twelve months of employment, 82% of which have a full time permanent job. Employment status between 2003 and 2010 remained consistent for permanent full-time (52% and 54% respectively), seasonal (11% and 8%), part-time (6% and 5%) and retired (7% and 7%) statuses. The only marked difference between 2003 and 2010 employment statuses was those that were unemployed, which increased from 16% in 2003 to 25% in 2010.
13.5.1 Private Sector

The private sector employs approximately 45 percent of Barrow workers. The private sector employees are primarily with ASRC and UIC and their subsidiaries. The SOA also reports that there are 138 current business licenses register in Barrow, a robust population of small business owners.

13.5.2 Government

The NSB and NSBSD are the largest employers in the community, employing approximately 48 percent of all Barrow Workers. The City of Barrow and the Federal Government each employ about 2 percent of the Barrow Workforce. The State of Alaska employs approximately 1 percent.
14.0 EDUCATION

The primary operator of the educational system on the North Slope and in Barrow is the North Slope Borough School District (NSBSD). NSBSD operates eleven schools across the North Slope for preschool through twelfth grade, four of which are in Barrow.

Ilisaġvik offers higher education opportunities for Barrow and the North Slope village residents. The common goal for all educational programs, especially at high school and college levels, is to prepare students to participate in the job market, tailoring many programs to meet the needs of employers of the North Slope.

Figure 34 North Slope Borough School District Administration Building

14.1 Ipalook Elementary School

Ipalook Elementary is a public school located at 2070 Ahkovak Street and operated by the North Slope Borough School District. The current enrollment is approximately 690 students with an estimated capacity of 1,245 to 1,470 students. Included in Ipalook is kindergarten through fifth grades and pre-kindergarten classes, K3 and K4.

Without oil and gas development, the projected Barrow population for 2035 is 6,379 – a 23% increase. The Ipalook population could increase an additional 138 students to approximately 739 total students by 2035 assuming the same distribution within age cohorts as 2014. This estimated student population increase could easily be accommodated within the current school facility.

With oil and gas development, the projected Barrow population for 2035 is 7,400 – a 43% increase. The Ipalook population could increase by 258 students to approximately 859 students by 2035, again assuming the same distribution within age cohorts as 2014. The projected increase in school enrollment could be accommodated within the existing facility.
14.2 Hopson Middle School

Hopson Middle School is a public middle school located at 6501 Transit Street. It has a current enrollment of approximately 249 students in sixth, seventh and eighth grades with a facility capacity of approximately 500 to 600 students.

Without oil and gas development, the projected Barrow population in 2035 is 6,379 – a 23% increase. The Hopson Middle School population could increase by 57 to total 306 students by 2035 assuming the same distribution within age cohorts as 2014. The projected increase in school enrollment could be accommodated within the existing facility.

With oil and gas development the projected Barrow population for 2035 is 7,400 – a 43% increase. The Hopson Middle School population could increase by 107 students to a total of 356 students in 2035 assuming the same distribution within age cohorts as 2014. The projected increase in school enrollment could be accommodated within the existing facility.

14.3 Barrow High School

Barrow High School is a public school located at 1684 Okpik Street and operated by the North Slope Borough School District. Current enrollment is approximately 201 students in grades ninth through twelfth with an estimated capacity of 675 to 810 students.

Without oil and gas development, the projected Barrow population in 2035 is 6,379 – a 23% increase. The Barrow High School population could increase by 46 students for a total of 247 students by 2035 assuming the same distribution within age cohorts as 2014. The existing high school twelfth grade classes are much smaller than those for the current kindergarten classes, suggesting that student enrollment may be higher than this analysis predicts.

With oil and gas development the projected Barrow population for 2035 is 7,400 – a 43% increase. The Barrow High School population could increase by 86 student for a total of 287 students assuming the same distribution within age cohorts as 2014. This student population could be accommodated within the existing high school facility.

Two project analysis reports are included in the NSBSD’s 6 Year Capital Plan that relate to the high school facility. The first is the feasibility of a 16,000 square feet multipurpose room addition. The location of Barrow High School makes an addition difficult; the facility is surrounded by the Lower Isatkoak Lagoon on its east side, the 29-plex apartment building to the north, Takpuk Street and the cemetery to the west; and Okpik
Street and residences to the south. The addition would be intended to serve the community for large events, such as Kivgiq, as well as high school students. Utilizing schools, especially high schools, as community centers outside regular school hours is an increasingly common practice. There will likely be a need for additional parking and parent drop-off space in the future, making planning additions for this site even more difficult.

The second PAR addressed renovations to the high school, including the pool. The NSB administration has expressed a desire for greater community use of educational facilities after hours. In addition many community members have expressed a desire for a facility or facilities that could provide activities for families, especially during the long winter months. While the PAR that addresses the multipurpose room addition does consider community use of the facility, the PAR that addresses renovations does not. Potentially shared program space with Ilisagvik College and/or the City of Barrow’s recreation center, Piuraaqvik, may facilitate greater use of the facility and its resources, including evening classroom use for college students, vocational education classroom space and community use of the pool for public events and classes.

### 14.4 Kiita Learning Community

Currently the Kiita Community Learning Program is located in the repurposed Browerville daycare at the corner of Karluk Street and C Avenue. It has reportedly been highly successful in capturing students who might not have otherwise graduated from high school and as a result, many have achieved a higher level of success and become contributing community members. The School District has estimated that the Kiita Program could expand to as many as 70 students by 2035 (Cowan 2014).

Mayor Charlotte Brower directed that Kiita move out of its current facility to provide needed space to reinstitute a daycare in Barrow. A study to locate a new home for Kiita focused on a site at the corner of Herman and Ahkovak streets, block 9, lots 1 and 2. The structure on one of these sites is the Nelson Building. There are additional locations that may also be suitable, including the CO2 site. The best way to reestablish the Browerville daycare and relocate Kiita has yet to be resolved.

### 14.5 Residential Learning Center

The concept of a Residential Learning Center is still in development. The facility would provide an opportunity for village students to receive short term intensified educational experiences utilizing Barrow resources at the high school and potentially Ilisagvik College. There is an estimated need for 50 students.

There are a number of models for this program being studied for potential implementation. One model provides dormitory space only in combination with utilization of current classrooms at local schools. Dormitory space would need to be located separately from those for Ilisagvik College (Cowan 2014).

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6 There are several schools in Alaska that have shared facility space including Nikiski High School in the Kenai Peninsula Borough School District and West High in Anchorage.
14.6 Administration

The North Slope Borough School District houses administrative duties in two different buildings: Central Administration, located at 829 Aivik Street and Central Administration 2 (CO2) at 1849 Momeganna Street. The Administrative Offices is approximately 7,600 square feet and CO2 is approximately 30,000 square feet without the roller rink. Approximately 45,000 square feet are needed for the School District’s administrative functions.

14.7 Bus Barn

The NSBSD Bus Barn is located on Okpik Street is across from Barrow High School and adjoins the former NSBSD bus barn now being utilized by the Fuel Division of Public Works. Warehouse. The School District warehouse is currently housed on the CO2 site in buildings 1849H and 1849K with a total of 12,456 square feet.

14.8 Ilisaġvik College - “A Place to Learn”

Ilisaġvik College is located at 100 Stevenson Street within NARL. It is currently the only federally recognized Tribal College in Alaska and serves approximately 1,268 students. The College offers post-secondary academic, vocational and technical education designed to align with the borough and Alaska’s workforce needs.

Issues at this location are antiquated building technology and facilities constantly requiring fixes, distance and weather related issues affecting transport of students from Barrow and Browerville and space organizations suitable for effective delivery of education. Currently, Ilisaġvik is housed in 14 buildings from NARL to Browerville.

The Ilisaġvik College administration has expressed a desire to move closer to Barrow into a new facility that is designed for higher education use. A Space Program Study was developed that delineated facility and space needs for the College’s programs and provided relocation options for the College. The College currently occupies 22,030 square feet of vocational education space at NARL in four buildings. The study recommended a facility totaling 26,827 square feet.
15.0 SUBSISTENCE

15.1 Definitions of Subsistence

There are many different understandings of the meaning of subsistence that often differ based on cultural upbringing.

Subsistence implies the use of natural resources for physical needs; for many, subsistence harvest activities also have a spiritual and cultural importance through a connection to the land and traditional knowledge passed down through generations. Subsistence is not only a way of life, but also the joy of living from the gifts that the Creator provides.

The NSBMC §19.20.020 defines subsistence as:

“An activity performed in support of the basic beliefs and nutritional needs of the residents of the Borough and includes hunting, whaling, fishing, trapping, camping, food gathering and other traditional and cultural activities.”

The State of Alaska statute §16.05.940(33) defines subsistence uses as:

“...the noncommercial, customary and traditional uses of wild, renewable resources by a resident domiciled in a rural area of the state for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation, for the making and selling of handicraft articles out of nonedible by-products of fish and wildlife resources taken for personal or family consumption, and for the customary trade, barter, or sharing for personal or family consumption; in this paragraph, "family" means persons related by blood, marriage, or adoption, and a person living in the household on a permanent basis.”

Subsistence, as it is practiced in Barrow and across the North Slope, is more similar to the NSB definition than it is to the state definition.

15.2 Village Area of Influence

Barrow is on the coast of the Arctic Ocean, specifically the Chukchi Sea to the west and the Beaufort Sea to the east. Barrow’s unique geographical location provides for an expansive area for marine mammal harvesting. According to a 2012 Pew Environment Group summary of marine subsistence uses as prepared by Stephen R. Braund & Associates, Barrow subsistence users travel as far as 90 miles north of Barrow and approximately 60 miles off the Beaufort and Chukchi sea coastlines. The marine mammals cited as taken for subsistence purposes in the report included beluga whales, bowhead whales, polar bears, seals (bearded and ringed) and walruses.
The subsistence hunting area also extends to inland areas south of Barrow. The subsistence traditional use area spans from Barrow to Peard Bay to the southwest and Smith Bay to the southeast. Many subsistence users have cabins where caribou, brown bear, wolf, wolverine, ground squirrel and various species of fish and waterfowl are harvested. Figure 37 depicts the Barrow Area of Influence.

The area of influence is an aggregation of traditional subsistence uses. The area of influence depicted in Figure 37 is not maximum extents that hunters will go for subsistence activities; it is a typical hunting range based on past hunting and fishing use. The area of influence can also be used to determine community stakeholders that may need to be consulted prior to activity that may affect their traditional use of the land.

The village area of influence boundary changes over time as traditional subsistence land use patterns change based on the availability of animals and fish.

**Figure 36 Whaling in Barrow**
For informational purposes only. Umiaq makes no expressed or implied warranties of merchantability or fitness with regards to character and function of this printed map. All attempts have been made to identify discrepancies among data sources and are provided as is. The user is cautioned against using this map for detailed analysis or interpretations.
15.3 Barrow Subsistence Harvest

Subsistence users in Barrow rely upon a vast array of terrestrial and marine mammals, fish and waterfowl. According to the NSB 2010 Economic Profile and Census Report (NSBEP&CR), nearly 95% of Barrow’s Iñupiat households use subsistence foods and nearly 60% of Barrow’s Iñupiat households receive at least half of the household diet from subsistence foods (North Slope Borough 2010). While caribou, fish, geese and ducks are part of the subsistence diet; the bowhead whale is the foundation of the Iñupiat people.

Sharing the Harvest. Community sharing is an important cultural value in Barrow and across the North Slope. One Iñupiat tradition indicative of the importance of sharing the harvest is for a young hunter to give his or her first harvest to an elder in the community that is no longer able to hunt or fish. The bountiful subsistence harvest is shared widely with people across the North Slope. The tradition is prehistoric and one way the different groups of Iñupiat ensured their collective survival.

Whaling preparation is a year around event. The coastal villages of Kaktovik, Nuiqsut, Barrow and Wainwright begin the fall whale hunt from late September through mid-October. Hunters then turn inland to traditional hunting sites for fox, wolverine and wolf, often used for making hunting gear and ceremonial parkas. Polar bear hunting also occurs from November to January. Crews begin repairing or making new boat frames and cleaning ice cellars in preparation for the spring whaling season. In March, women begin sewing the bearded seal skins for skin boats, called umiaqs. Skin sewing is very important; the whaling crews depends on careful stitching to ensure their boats stay afloat during the hunt. Whaling season begins again in the spring, typically ending in May. After Nalukataq, a festival in June that celebrates a successful whale harvest, whaling captains and subsistence hunters begin hunting a variety of marine mammals, including bearded seal, ringed seal and walrus. Caribou hunting is year-round but mostly takes place from June through September or as weather conditions allow. Caribou tendon is made into thread to sew bearded seal skins for the skin boats. The process begins again, a traditional practice of the Iñupiat people for hundreds of years.

The Alaska Eskimo Whaling Commission (AEWC) reports that there were 36 registered whaling crews in Barrow for the 2013 spring whaling season. A single bowhead whale harvested in the spring, typically feeds the entire community five times throughout the year:

- Initial captain’s open house when the whale is caught;
- The Apuğauti - a feast on the beach held by the whaling captain’s wives to welcome the returning whalers after the whaling season is over;
- The Nalukataq - the whaling festival held in June after the successful spring whaling season ends;
- Thanksgiving church feast; and
- Christmas church feast.
15.4 Barrow Subsistence Harvest Areas

The community of Barrow is situated to allow for hunting of both marine and terrestrial animals. Marine mammals include bowhead whale, ringed and bearded seal and walrus. Birds, such as eider ducks and geese, are also common targets for subsistence hunters. Hunters also harvest fish in local rivers and lakes and in Elson Lagoon. Other resources include moose, ptarmigan, and furbearing animals such as wolf and wolverine. But the most common subsistence harvest is caribou, which crosses the tundra throughout the year.

Figure 38 illustrates historic subsistence routes as originally documented by the Inupiat of the Arctic Slope and ASRC with Arctic Environmental Information and Data Center at the University of Alaska in 1974-75.
Sources:
Satellite Imagery: Alaska Mapped BDL Layer
Routes & Trails: Digitized from Native Land Use Map and clipped to the Barrow Area of Influence
Arctic Environmental Information and Data Center University of Alaska 1974-75

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Date: 7/29/2014

Figure: 38
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The former Minerals Management Service (now the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE)) within the U.S. Department of Interior commissioned a study of regional subsistence patterns of three North Slope communities. The maps and data contained here are a result of the report, Subsistence Mapping of Nuiqsut, Kaktovik and Barrow published in April 2010 by Stephen R. Braund & Associates.

Subsistence Harvests – Data indicates that Barrow residents primarily utilize marine mammals, caribou, fur bearing animals, birds and fish. These harvests are important to maintain and sustain the Inupiat way of life. Figure 39 depicts the consolidated harvest areas in the Barrow, Alaska vicinity.

Figure 39 Barrow Comparative Use Areas and Harvest Sites, All Resources
Caribou (tutu). Caribou is by far the most common harvest for subsistence hunters residing in Barrow. The data gathered by Stephen Braund and Associates indicates that Barrow residents travel significant distances inland to hunt caribou, most commonly to the Meade, Topagoruk and Chipp rivers; around Pittalukruak Lake and Alaktak River; along the coast between Peard Bay and Dease Inlet; and inland from Barrow to the Inaru and Meade rivers (Stephen R. Braund & Associates 2010). While caribou are harvested throughout the year, the most activity takes place in July, August and September as the herds head toward the coastline seeking cooler weather and fewer mosquitoes. The intensity of caribou harvest is shown in Figure 40.

Figure 40 Barrow Comparative Use Areas and Harvest Sites, Caribou
**Bowhead Whale (aġviq).** The subsistence hunt for bowhead whales is by far the most celebrated within coastal North Slope communities, including Barrow. The hunters organize into whaling crews that function as a team in harvesting bowhead whales. Each whale taken is a victory for both the crew and community as a whole.

Whales are harvested twice a year: during the spring and fall hunting seasons. The spring hunt is typically west of Point Barrow and closer to the shore; the fall hunt is west and east of Point Barrow and is generally a greater distance from shore. During the spring hunt that typically takes place in April and May, the whale crews use traditional seal skin boats, known as umiaqs, and pull harvested whales onto the sea ice. During the fall hunt that typically takes place during September, October and November, crews use power driven aluminum boats to hunt in open water.

The data regarding bowhead subsistence use by Barrow residents was derived from data Stephen R. Braund and Associates with collection of from a variety of sources dating back to 1979. Data indicate that Barrow residents will go as far as 70 miles offshore to hunt for bowhead whales. The intensity of the bowhead whale harvest is illustrated in Figure 41.

**Figure 41 Barrow Comparative Use Areas and Harvest Sites, Bowhead**

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[Diagram of Barrow Comparative Use Areas and Harvest Sites, Bowhead]
Fish. Barrow residents typically fish for Arctic cisco (qaaktaq), Arctic char/Dolly Varden (paikluk/igalukpik), broad whitefish (aanaakliq) and Burbot (tittaaliq). Residents indicate that Arctic cisco is mostly found near Nuiqsut and in Kuyanak Bay. August is reportedly when many Barrow subsistence harvesters fish for Arctic cisco but can be successfully fished throughout the fall. The most common places to fish for Arctic char/Dolly Varden is Elson Lagoon and along the Meade, Inaru, and Chipp rivers during the summer months. Compared to other fish species, broad whitefish make up a greater amount of a yearly harvest. Residents most commonly reported harvesting broad whitefish during the summer and fall months on the Chipp, Inaru, Meade, Alaktak and Miguakiak rivers and near Pittalukruak, Tusikvoak and Sungovoak lakes. Burbot are often harvested in nets by those wanting broad whitefish so subsistence use areas and the harvesting months are similar.

Figure 42 indicates that Barrow residents will travel significant distances inland to harvest fish.

**Figure 42 Barrow Comparative Use Areas and Harvest Sites, Fish**
Birds. Barrow residents harvest several different species of geese including white-fronted geese (niɡliq), Canada geese (iqsraqutiļik), brants (niɡliŋŋaq) and snow geese (kaŋuk). Barrow residents hunt geese along the coast from Barrow south past Walakpa Bay and at Peard Bay; around Avak Creek; and around Inaru, Meade, Topagoruk, Chipp rivers, Piasuk, and Miguakiaq rivers. Some also travel to near Lake Sungovoak and Ekalgruak Lake. May and June are the most common months to harvest geese. Barrow residents also commonly hunt eiders, primary king (qiŋalik) and common (amauligruaq) eiders. Eiders are typically harvested during the same months as bowhead whales and are most often found offshore along the spit to Point Barrow, or in the western portion of Elson Lagoon.

Figure 43, below illustrates subsistence harvest areas for all wildfowl as provided by Stephen R. Braund and Associates.

Figure 43 Barrow Comparative Use Areas and Harvest Sites, Wildfowl
Seals. Barrow residents typically harvest two types of seals: ringed seals (natchiq) and bearded seals (ugruk). Ringed seals are not harvested in large quantities. The ringed seals are most commonly harvested while hunting for bearded seals and found close to shore between Walakpa Bay to the west and Tapkaluk Islands to the east. While ringed seals are harvested all year, the majority are taken between June and August. Bearded seals are prized for meat, seal oil and skin, which is used for constructing skin boats (umiaqs) used for subsistence whaling. The success of bearded seal harvest is largely dependent on sea ice pack; because the bearded seal follows the ice pack north past Barrow each year, poor ice conditions can make hunting difficult. Like ringed seals, bearded seals are primarily hunted during the summer months, from June through August. Figure 44 depicts the extent of subsistence areas for harvesting seals.

Figure 44 Barrow Comparative Use Areas and Harvest Sites, Seal
**Walrus.** Walrus (aiviq) are generally hunted in concert with bearded seals during the summer months and near the ice pack.

**Figure 45 Barrow Comparative Use Areas and Harvest Sites, Walrus**

![Map E - 7: Barrow Comparative Use Areas and Harvest Sites, Walrus](image)

*Map E - 7: Barrow Comparative Use Areas and Harvest Sites, Walrus*

**Sources:**
- Last 10 Years: Stephens R. Board and Associates (SRB&A) 2010
- 1987-1989 Harvest Sites: SIBA and SIBER 1992a
- Lifetime Use Areas: Pedersen 1979

*Other areas may have been used for resource harvesting.
Some areas shown on this map may have been used while respondents visited or lived in other communities.*
Wolves and Wolverines. Wolf (amağuq) and wolverine (qavvik) hunting requires long distance travel during the cold winter months. As a result, Barrow residents are less likely to hunt these animals that may be found closer to home. However, some residents reportedly travel long distances to regularly hunt wolves and wolverines. Hunting can occur anytime from October through June; peaking in March. Figure 46 illustrates the subsistence harvest area for wolves and wolverine by Barrow residents.

Figure 46 Barrow Comparative Use Areas and Harvest Sites, Furbearers
16.0 LAND USE AND ZONING

16.1 Land Ownership

The following section briefly describes the land ownership of Barrow and its vicinity. Barrow Zoning Districts are presented in Figure 48.

16.1.1 Federal Government

U.S Air Force, Department of Defense. Approximately 4.5 miles northeast of Barrow, close to the Chukchi Sea beach frontage, is a U.S. Air Force (USAF) DEW Line site. The USAF currently maintains a ROW from BLM on 1,512 acres of land. The USAF is in the process of remediating environmental hazards there to relinquish the ROW because it no longer actively uses the land for DEW Line purposes.

U.S Navy, Department of Defense. The U.S. Navy owns land that is located approximately about four miles northeast of Barrow and southeast of NARL. The future Tom Gordon Expressway / Uivaqsaagiaq Road that will connect Cakeeater Road to BARC will run through U.S Navy property.

U.S. National Oceanic and Atmospheric Administration (NOAA). NOAA owns property approximately five miles northeast of Barrow that is directly adjacent to land owned by USGS. NOAA operates the Earth System Research Laboratory (ESRL) that was established in 1973. ESRL measure the properties of the atmosphere related to air quality, ozone layer and greenhouse gases, especially as they related to climate changes. Located on the same site is the Atmospheric Radiation Measurement (ARM) Program that was created in 1989 by the U.S. Department of Energy (DOE). The Barrow facility was established in 1997. Barrow was chosen because the arctic has been identified as one of the most sensitive regions to climate changes on Earth. This facility provides data about cloud and radiative processes at high latitudes.

U.S Geological Survey. USGS owns property that is approximately 4.75 miles northeast of Barrow that abuts NOAA and U.S. Navy property.

U.S. Federal Aviation Administration. The FAA flight standards station is located on the north side of the Wiley-Post Memorial Airport runway.

U.S. Bureau of Land Management, National Petroleum Reserve – Alaska. Land that is located immediately south of the City of Barrow falls within the NPR-A, under the jurisdiction of the BLM.

16.1.2 Native Corporations

Ukpeaġvik Iñupiat Corporation (UIC), the village Native Corporation established under ANSCA, is the primary landowner in Barrow. UIC has selected and received 175,620 acres under ANCSA sections 14(a), 12(b) and the NARL Transfer Agreement. UIC’s land holdings are bound by Point Barrow and the Beaufort Sea to the north, the Chukchi Sea to the west; and extend south to the farthest end of Sukok Lake and Lake Sungovoak; and east to Iko Bay and the northernmost portion of Lake Tusikvoak, as depicted in Figure 47. UIC has 7,177 acres remaining to select to
receive its full ANSCA land entitlement. In Barrow, ASRC owns the subsurface estate to over 175,000 acres of land beneath UIC surface estate.

One of the primary real estate holdings by UIC is NARL. The Barrow Arctic Research Consortium (BARC) has brought new life to NARL. Connecting Browerville to NARL via the planned Uivaqsaagiaq Road will likely further the revitalization.

The NSB Wildlife Management Department is currently located in Building 360 with Ilisagvik College at NARL. However, a project analysis report is underway to identify sites for a new facility for the Department. Potential sites include an addition to the BARC building and on an existing gravel pad northeast of its current location that would require demolition or relocation of existing buildings.

UIC is also developing a housing manufacturing plant at NARL to assist in remedying the housing crisis. Utilizing industrial hut 36 and outfitting it accordingly, UIC is currently developing a strategy to build traditional stick built homes in manageable sections inside the hut. Once each section is complete, the home will be transported to homesites within Barrow and potentially across the North Slope for onsite assembly.

Ilisagvik College, currently located within NARL, is investigating sites for a new campus. UIC believes that keeping the College at NARL, perhaps in a new facility, would be beneficial for the students because of the potential for student training opportunities. Similarly, UIC would like to incorporate a future NSB Residential Learning Center facility at NARL to take advantage of some of the same vocational training opportunities as Ilisagvik students, including the proposed housing manufacturing plant, a future three bay garage for light and heavy duty mechanics and welding training, BARC programs and UIC Science Logistical Support Services, already based at NARL. The siting for the College and the concept for the Residential Learning Center are still in their infancy and NARL one possible location for these facilities.

**Figure 47 UIC Corporate Boundary**
Figure: BARROW ZONING DISTRICTS

Barrow Comprehensive Plan
16.1.3 North Slope Borough

The NSB provides electricity, water, sewer, public health, public safety, fire protection and landfill services. The NSB owns the land under the public facilities that support these services to the community. Under the Barrow Gas Field Transfer Act, the NSB shares ownership of the Barrow Gas Fields subsurface estate with the federal government.

16.1.4 City of Barrow

The City of Barrow has limited land ownership within Barrow. The City owns land that is occupied by City Hall, the community recreation center, Piuraaġvik, boat launching ramp, Emaiksoun Cemetery and two historic cemeteries in Browerville. The City has also developed a subdivision named Block A with land that it received under its ANCSA 14(c)(3) entitlement. It has title to west of Block A that received title to under ANCSA 14(c)(3) and several tracts between the Wiley-Post Memorial Airport and Nunavak Bay. The City of Barrow owns over 200 acres of land, mostly zoned industrial. Additional land acquisition is underway.

16.1.5 Native Restricted Land

There are two types of protected (restricted) land for Native Alaskans: native allotments and townsite lots. Restricted land is inalienable; the property owner cannot lease, sell or convey the land, or any inherited interest in the land, without first obtaining approval from the Bureau of Indian Affairs (BIA). Generally speaking, restricted land is also not subject to state or local laws, including taxation and land use regulations, such as zoning. Native restricted land will remain tax-exempt unless changed by the United States Congress or the restrictions are removed with expressed approval by the BIA. (Kawerak Land Management Services 2014; Case, D. 2007).

Generally, restricted lots were distributed via two federal statutes: the Alaska Native Allotment Act of 1906 and the 1926 Alaska Native Townsite Act. The Alaska Native Allotment Act of 1906 authorized the Secretary of the Interior to grant individual Alaska Natives ownership of up to 160 acres of vacant, non-mineral and unappropriated land. The majority of Native allotments are near villages and along rivers, streams, lakes and coastal waters. There are only two Native allotments within ten miles of Barrow and approximately 185 within the Barrow Area of Influence (see Figure 37). In 1971, one of the provisions in the Alaska Native Claims Settlement Act (ANSCA) repealed the authority to grant Native allotments, with the expectation of those applications that had already been submitted. Native allotment land is still being conveyed by the Bureau of Land Management (BLM). (Kawerak Land Management Services 2014; U.S. Department of the Interior 2013).

The 1926 Alaska Native Townsite Act was passed by the United States Congress for the purpose of conveying public lands to Native Alaskans for homes within villages. All townsite acts were repealed by the passage of the Federal Land Use Policy and Management Act (FLPMA) in 1976 but lots that were already designed as Native restricted under the Act did not lose their status. There are at least 200 restricted lots within Barrow.

As the tribal government for Barrow, the Native Village of Barrow Realty Department is the primary entity that coordinates with the BIA in managing Native restricted properties.
Unlike other forms of property which are subject to the probate jurisdiction of state or Tribal courts, Native restricted property is completely within the U.S. Interior Department’s jurisdiction. Because some restricted landowners do not always have wills that specify beneficiaries, heirs in common inherit the land, often for several generations. Some property may have multiple owners and each with each passing generation, the portions of property interest become smaller and smaller, causing the property to become fractionalized. Even without probate issues, it may be difficult to reach a consensus amongst multiple property owners, rendering a property virtually useless. Many organizations in Barrow, the NSB included, are interested in resolving probates for restricted townsite lots to take better advantage of the property and have taken steps toward resolving property ownership issues.

Native restricted land can become unrestricted. Once the restricted status is removed, the land can be taxed and it can be sold without BIA approval or oversight. For example, if a restricted property is willed to a non-native, it will be conveyed to that person in an unrestricted status. Natives that chose to leave a restricted property to a non-Native can opt to leave it as a life estate. The non-Native heir would use the property during his or her lifetime; when he passes away, the property is transferred to the second choice named in the owner’s will, thus returning it to restricted status. (Maniilaq Association Probates and Estate Services 2014). Property can also be sold to a non-Native, which removes the property’s restricted status.

There are several land use concerns with Native restricted property. If a structure on a restricted property becomes a safety hazard for the community, local land use regulations cannot require that property owners mitigate the property to remove the risk. This, coupled with fractionalization that comes with many owners, land and structures on it are often not maintained.

**16.1.6 Other Institutional Landowners**

The NSBSD, BUECI and the Presbyterian Church own lands on which their facilities are located.

Local municipal governments are the NSB (a home rule borough) and the City of Barrow (a first class city). Both governments have planning and zoning powers under Alaska State law. The NSB is the only entity that exercises planning and zoning powers with Barrow-specific zoning districts and zoning commission.

The City of Barrow is made up of two district areas – the original town site of Barrow and Browerville. The original town site is primarily the oldest part of Barrow; however the Cape Smythe Whaling Rescue Aid Station, located in Browerville, is one of the oldest structures in the community. Browerville is where the majority of newer development of Barrow has occurred, expanding over five large subdivision additions.

**16.2 Zoning**

Within Barrow there are four distinct zoning districts specifically designed to accommodate Barrow’s unique land use practices. These districts are the Barrow Mixed Use District (MU), Barrow Suburban District (S), Barrow Industrial District (I) and Barrow Reserve District (R).
The MU District is found primarily within the City of Barrow original townsite and allows a variety of uses, ranging from commercial to religious to multi and single family residential. Land that is zoned MU is allowed the most dense development of residential land in the NSB. The MU district also has the greatest number of restricted lots which has resulted in significant challenges to develop or redevelop the land after the original owner has died. Consensus among the many heirs is rare and the most likely reason the greatest development potential for additional accessible residential land will go unfulfilled.

The S District is intended to be a low density quiet residential area, encouraging development that reflects the traditional Iñupiat settlement pattern of individual family home sites. The S District is the low density alternative to the MU District, with single-family homes on large lots that have large spaces between houses and ample storage area for vehicles, boats and subsistence equipment.

The I District is intended to provide areas for airports and storage and warehousing of materials and goods in bulk. These uses which are generally not compatible with residential and commercial uses because of safety conflicts including aircraft, heavy truck and equipment traffic which is often segregated from pedestrian, residential and business traffic.

The R District is intended to provide protection for environmental resources, local subsistence and recreational opportunities and to hold lands for future infrastructure such as roads, sewer, water and power. The primary objective of the R District is protection of the environmental resources, especially watersheds, for the benefit of all residents.

Crossing the corporate limits of Barrow is the Scientific Research District (SRD). The SRD is specific to the Barrow Environmental Observatory (BEO), 7,466 acres of land reserved by UIC for scientific research purposes. Scientific land use in this area dates back to 1948 and has one of the longest records of continuous research use in the Arctic.

Outside of the corporate limits of Barrow is the Conservation District (C). Lands zoned for Conservation are intended to be kept in a natural state. Many Barrow residents depend on subsistence foods which flourish in a natural and clean environment.

16.3 Land Issues

16.3.1 North Slope Subsistence Rural Region Designation

Members of one of the tribal organization raised the concern that because Barrow’s population is approaching 5,000 people, residents might be exempt from the North Slope Region federal designation as a Subsistence Rural Region. Under the authority of the Alaska National Interest Lands Conservation Act (ANILCA) regulations established rural subsistence use on federal lands. The following regulation governs such designations:

“§242.15 Rural determination process.

(a) The Board shall determine if an area or community in Alaska is rural. In determining whether a specific area of Alaska is rural, the Board shall use the following guidelines:
(1) A community or area with a population of 2,500 or less shall be deemed to be rural unless such a community or area possesses significant characteristics of a non-rural nature, or is considered to be socially and economically a part of an urbanized area.

(2) Communities or areas with populations above 2,500 but not more than 7,000 will be determined to be rural or non-rural.

(3) A community with a population of more than 7,000 shall be presumed non-rural, unless such a community or area possesses significant characteristics of a rural nature.

(4) Population data from the most recent census conducted by the United States Bureau of Census as updated by the Alaska Department of Labor shall be utilized in this process.

(5) Community or area characteristics shall be considered in evaluating a community's rural or non-rural status. The characteristics may include, but are not limited to:

   (i) Use of fish and wildlife;

   (ii) Development and diversity of the economy;

   (iii) Community infrastructure;

   (iv) Transportation; and

   (v) Educational institutions.

(6) Communities or areas which are economically, socially, and communally integrated shall be considered in the aggregate.

(b) The (Federal Subsistence) Board shall periodically review rural determinations. Rural determinations shall be reviewed on a 10-year cycle, commencing with the publication of the year 2000 U.S. census. Rural determinations may be reviewed out-of-cycle in special circumstances. Once the Board makes a determination that a community has changed from rural to non-rural, a waiting period of 5 years shall be required before the non-rural determination becomes effective.*

Barrow's population would need to exceed 7,000 residents for the community to lose its presumptive designation as part of the North Slope Subsistence Rural Region (NSSRR). The current projections with oil and gas development occurring in the Chukchi Sea, the Barrow community would reach 7,000 residents in about 2030. Even if the number of residents exceeds 7,000 people, the community can petition the Federal Subsistence Board to retain its status as part of the NSSRR. This issue may not need to be addressed for another 20 years.
16.3.2 Historic Buildings and Structures

Birnirk Archeological Site. National Historic Landmarks are considered to have exceptional national significance quality in illustrating or interpreting the heritage of the United States. Properties are designated by the Secretary of the Interior. Currently, there are just over 2,500 historic places with this national distinction, including the Birnirk archeological site in Barrow. The Birnirk site, composed 16 mounds located near the beach, was added to the list of National Historic Landmarks in 1962. This site is associated with the Birnirk and Thule cultures, precursors to the modern day Eskimo culture.

The National Register of Historic Places is an inventory maintained by U.S. National Park Service that have been determined to be worthy of preservation based on historic or cultural significance. The National Register of Historic Places is one effort by the National Park Service’s to coordinate and support preservation of historic and archeological resources. There are several buildings and other structures in the Barrow vicinity on the National Register of Historic Places. Birnirk archeological site is on both the National Historic Landmarks designation and the National Register of Historic Places (U.S. Department of the Interior 1962; U.S. Department of the Interior 1966).

Point Barrow Refuge Station. According to the nomination for inclusion on the National Register of Historic Places inventory, the significance of the Point Barrow Refuge Station (later known as the Cape Smythe Whaling and Trading Station) is that it is “both the oldest - as well as most significant – American-built frame structure standing along the vast reaches of the Arctic Ocean between the Seward Peninsula and Demarcation Point at the Canadian Border - the northernmost outpost of the United States. The building, its management, and related events, played a significant role in commerce, whaling, fur trading, exploration, and development of the region. After 1896 this building epitomizes the extensive, colorful and important exploits of the redoubtable Charley Brower (and later of his son Tom) in association with about all of the pioneer explorers, whalers, scientists, missionaries, politicians, entrepreneurs and adventurers who visited the region.” It was added to the inventory of historic places in December 1980; the photo below is from the initial nomination in September 1980 (U.S. Department of the Interior 1980a).

Figure 49 Point Barrow Refuge Station
Photo courtesy of National Park Service, photo by Doug Reger. Date: 1979
Will Rogers – Wiley Post Memorial Site. This memorial site is located at the site of the fatal plane crash, approximately 13 miles south of Barrow, is included on the National Register of Historic Places. The first memorial was constructed in 1938 by public subscription of thousands of Americans and under the organized efforts of friends and admirers in Oklahoma and Texas (U.S. Department of the Interior 1980b). The second monument was constructed by a lone admirer of Will Rogers in 1953. The original memorial was moved to higher ground in 1973 and now sits next to the second memorial. The crash site was included in the historic places inventory in April 1980.

Utkeagvik Presbyterian Church Manse. The manse is the residence for the pastor of Utkeagvik Presbyterian Church, built in 1929. Dr. Henry W. Greist, who lived in Barrow from 1921-1925 and again from 1929-1936 was the church pastor as well as a physician for the community and the Manse served as both his home and an outpatient clinic. The Manse was added to the historic places inventory in October 1983 (U.S. Department of the Interior 1983).
There are other sites in Barrow that either have the potential to be nominated for inclusion on the National Register of Historic Places or worthy of preservation without a National Register of Historic Places designation. These include:

- The current NSB Administration Building;
- The weather balloon launching building on the old Weather Station site;
- Three homes near Top of The World Hotel which were reportedly built with lumber salvaged from stranded in the ice whaling ships complete with old brass fittings;
- The former Ipalook School gymnasium that is currently used as a roller rink;
- The Presbyterian Church that was established in 1898; and
- Some elements of NARL including the main structure, possibly the old theater building, some residential Quonset huts, one or more of the industrial Quonset huts and the elevated utilidor.

16.3.3 Current Land Use

The majority of property located in the original Barrow townsit is a mix of commercial, industrial, institutional and residential development. There are a significant number of properties that appear to be abandoned due to fire, structural failure or are no longer occupied. Browerville is primarily residential, but also includes large institutional and commercial development.

Residential Uses. The majority of residences are concentrated in Browerville. There are many homes in the older section of Barrow but are mixed with offices, hotels, restaurants and other uses.
Commercial Uses. Commercial enterprises have sprung up all around Barrow and Browerville due to the permissive zoning laws in Barrow and limited space to develop around existing commercial development. Current commercial development efforts involve redevelopment of previously zoned Suburban residential land or Mixed Use land.

Industrial Uses. Most industrial activities are located around the Barrow airport, along the beach in northern Browerville or at the BUECI business complex.

Institutional Uses. The primarily institutional facilities are used for health care, museum/library, Ilisaġvik College and government offices. These facilities are dispersed throughout Barrow and Browerville.

Land use in Barrow and its vicinity is illustrated in the following figures:

- Figure 53: Barrow Land Use
- Figure 54: Browerville Land Use
- Figure 55: South Barrow Land Use
- Figure 56: UIC NARL Land Use

16.3.4 Future Land Use

Residential. Barrow, like all other NSB villages, has a shortage of available land for residential homes. UIC, as the primary landowner in Barrow, has indicated it intends to make more land available for residential use. It will be largely through UIC’s efforts that residential land becomes available.

Public Infrastructure. The City of Barrow has expressed interested in building a community freezer but has not located suitable land for this use.

ANCSA 14(c)(3). UIC has not completed its 14(c) requirements in transferring land to the local municipality.
Barrow Comprehensive Plan

CHUKCHI SEA

PARCELS & ROWs
CORPORATION (COR)
CITY (CTY)
FEDERAL (FED)

HOUSING AUTHORITY (HAS)
NATIVE RESTRICTED (NAT)
NORTH SLOPE BOROUGH (NSB)

SHAREHOLDER (SHR)
STATE OF ALASKA (SOA)
PRIVATE (PVT)
RELIGIOUS (REL)

Scale: 0 300 600 Feet

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DISCLAIMER

SOURCES:
Satellite Imagery: July/August 2012
NSB - GIS - Land Use & Parcels
*Land use was attributed from 2014 NSB Assessor's data.

Figure: 53

BARROW LAND USE
Barrow Comprehensive Plan

Barge Offloading

UIC NARL

UIC LANDS

BARC

USGS

NOAA

CMDL

US Navy

Science Research District

North Salt Lagoon

Imikpuk Lake

Middle Salt Lagoon

COR

NSB

BARROW BOUNDARY

FEDERAL LANDS

SCIENCE RESEARCH DISTRICT (SRD)

PARCELS & ROWs

CORPORATION (COR)

NORTH SLOPE BOROUGH (NSB)

Sources:
- Satellite Imagery: July/August 2012
- NSB - GIS - Land Use & Parcels
- Land Use was attributed from 2014 NSB Assessor's data.

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17.0 COMMUNITY PLANNING CHALLENGES AND OPTIONS

Four future development perspectives (options) were created that incorporated different potential scenarios. This section presents diagrams of the four planning options for discussion and comparison. The majority of the discussion focuses on Option 4, Consolidated. Option 4 incorporates the best aspects of Options 1, 2, and 3.

17.1 Options 1, 2 and 3

- Figure 57 Option 1: Status Quo
  This scenario shows what the Barrow community might look like if each entity or organization sought a location for its facility to meet its specific service needs based on sites available and conducted independently from other community and organizational interests.

- Figure 58 Option 2: Renewal
  This future development scenario focuses on the renewal of Barrow’s original townsite by capitalizing on existing infrastructure.

- Figure 59 Option 3: New Town Center
  This scenario looks at future growth as it expands further into undeveloped areas of Barrow with a focus on the new Samuel Simmonds Memorial Hospital as a driving force of community development.
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17.2 Option 4 - Consolidated Plan

After reviewing the best features of Options 1 through 3, Option 4 was created. Several figures are included to depict the overall Option 4 configuration and details in specific areas (Areas A through G) as listed below. Locations of Areas A through G are delineated in Figure 60.

- Figure 60 Option 4, Consolidated Plan
- Figure 61 Detail Plan Area A, Central District
- Figure 62 Detail Plan Area B, Iḷisaġvik / NSBSD / BUECI
- Figure 63 Detail Plan Area C, State /NSB / NSBSD / City of Barrow
- Figure 64 Detail Plan Area D, Health Care / Housing / Commercial
- Figure 65 Detail Plan Area D, Health Care / Housing / Commercial, continued
- Figure 66 Detail Plan Area E, State / NSB / NSBSD
- Figure 67 Detail Plan Area F, BUECI / NSB
- Figure 68 Detail Plan Area G, NSB / NSBSD
- Figure 69 Detail Plan, NARL

1. Area A

The NSB has been considering constructing a consolidated office space for NSB employees. The Barrow Consolidated Office Space project analysis report (PAR) dated March 5, 2014 has been completed. The report indicates that a site of 3.2 acres is needed. While the report does not identify a location for the facility, NSB planning team members indicated that a desired location is the former Weather Service site. Option 4 depicts this site choice.

This site is approximately 8.6 acres and is currently occupied by six small structures and eight lesser structures, the former weather balloon launch structure and Fire Station #1 which occupies approximately one-half acre. With the exception of Fire Station #1 these facilities are unoccupied. A dead end extension of Okpik Street projects into the property. NSB Assessing data indicates that the property is owned by UIC. It is unclear, however, if UIC has completed acquisition of this property.

Fire Station #1 may need additional space for expansion as the south airport industrial area is developed. The Fire Department's administrative offices could be relocated from the Browerville Station to an expanded Fire Station #1 to bring staff closer into the NSB central administration that would be located within the consolidated facility.

The former weather balloon launch facility is a visual icon in the community and has been mentioned as a potential site for historic preservation consideration. This facility has tourism potential if repurposed, perhaps as a restaurant or weather museum.

If Okpik Street were carried through the property, the land south of Okpik could support new housing. This portion of the property is approximately 1.24 acres and could potentially support 12 units of housing or more, depending on resident preferences. Extending Okpik Street would consume 0.83 acres of the site. If Fire Station #1 was expanded, it would be
best positioned on the site facing Kongosak Street; the remaining portion of the site would be approximately 5.3 acres, potentially leaving sufficient space on the property for both the NSB Consolidated Offices and a new daycare center, conveniently located near the workplace of parents.

The site holds a lot of potential for the community and should be master planned from a community needs perspective to maximize its potential.

2. **Area B shows two sub areas.**

   - **Sub Area 1**

   Sub Area 1 is a primary renewal area consisting of a combination of the former hospital site, former BIA school site, BUECI, NSB Administrative Building, National Guard site and two privately owned residential lots.

   Many community stakeholders have indicated that this part of Barrow has many structures that have exceeded their useful lives, outlived their original functional purposes and are absorbing high maintenance dollars. This area is also one of the most valuable contiguous pieces of real estate in Barrow and Browerville and is a viable candidate for renewal.

   The site has two facilities that have potential historic value: the former “Home of the Whalers” gymnasium, now the roller rink and the NSB Administrative Building. The site also has other facilities that should remain in their current location: the power plant, water treatment plant, water tanks and the water distribution facility.

   Some stakeholders indicated that this property should be maintained for educational purposes. Option 4 examines the opportunities of this property from multiple uses and perspectives, primarily educational uses and facilities while also considering shared facility potential.

   1) The NSBSD could benefit by consolidating its spread-out administrative functions into a single NSBSD consolidated facility on this site. The District's current central office structure is 7,596 square feet; total dispersed space is closer to 40,000 square feet, including central district office, CO2 and the three schools.

   2) Some community members have expressed interest in having the former “Home of the Whalers” gymnasium preserved and restored.

   3) The School District has been confronted with displacement of its successful Kiita Learning Community program for a daycare facility. Kiita could be relocated on this site and utilize a restored old Home of the Whalers Gymnasium.

   4) The School District has been charged with developing a Residential Learning Center program for students from outlying villages. A facility for this program on this site would be beneficial because of its close proximity to the High School. It could also share a restored Home of the Whalers Gymnasium.
5) Ilisaġvik College is investigating potential sites for a new facility.

6) A NSB Consolidated Office facility would allow repurposing the current NSB Administrative Building, potentially as a historic structure.

7) The Samuel Simmonds Memorial Hospital has moved. The medical staff housing is still used.

8) There is a common thread between the School District, Ilisaġvik, the proposed Residential Learning Center and Kiita. Vocational education prepares students to participate in job opportunities on the North Slope and this common thread potentially links these entities. Co-location of educational facilities on a contiguous site may provide otherwise overlooked shared facility opportunities.

9) The proposed NVB walkway could connect the High School to educational facilities proposed for this site.

10) The contiguous site could provide northern design opportunities with potential warm linkages between educational facilities.

11) The current medical staff housing at the former hospital site has dormitory potential for Ilisaġvik College and / or the Residential Learning Center. Ilisaġvik’s space plan identifies a need for student / family housing at 23,447 square feet; ASNA medical staff housing is approximately 40,000 square feet.

12) The NSB Administrative Building was purportedly designed as a museum. If a consolidated NSB office facility is constructed, the Administrative Building could be repurposed into classrooms, a lecture hall and library facility for Ilisaġvik College students and faculty. The former hospital and Greist Center could be demolished and replaced with a new Ilisaġvik administration facility with adequate parking. Academics, administration, a kitchen and cafeteria (54,685 square feet), a new vocational educational complex identified as classrooms and labs (3,521 square feet), shop (26,827 square feet) and support space (2,916 square feet) could be accommodated on this site.

13) The former hospital site offers close access to the best recreational spaces in Barrow. The recreation needs of Ilisaġvik students could best be planned using the high school and Piuraaġvik facilities. Future use of a restored “Home of the Whalers” gymnasium could provide additional recreational space.

The necessary components to implement this development scenario include:

1) Resolve land ownership issues. Potential requests for ownership from the Bureau of Indian Affairs may be required.

2) Demolish the Greist Center, former hospital, warehouse and shop structures.
3) Replace medical staff housing in-kind.

4) Replace warehouse and shop functions.

5) Relocate the National Guard building.

6) Relocate BUECI office to make room for site accessibility.

7) Purchase the two residential properties on Momegana Street.

8) Construct new teacher housing (see discussion for Area C regarding multifamily housing east of Block A).

9) Construct the NSB Consolidated Office facility.

10) Remove existing teacher housing. Contractors could relocate and repurpose this housing or demolish it.

11) Demolish structures surrounding the former “Home of the Whalers” gymnasium.

12) School District warehouse functions would need to be replaced. If the Public Works shops are replaced, there would be an interim opportunity to move this function into one of the current Public Works’ shops until new accommodations can be arranged. Alternatively, the School District maintenance facility could be expanded to include warehouse functions.

Recommendations

Should the NSB pursue this renewal option, a joint educational programming effort including NSBSD and Ilisaġvik College should be conducted to maximize joint educational opportunities. Undertaking a master plan for this area is recommended.

- Sub Area 2

Barrow High School is land locked on its north side by the 29-plex apartment building, on the south side by Okpik Street, on the east side by the City and the west side by Takpuk Street.

3. **Area C has three sub areas.**

- Sub Area 1

Sub Area 1 is a potentially contiguous site that combines Ipalook Elementary School, Barrow City Hall, City of Barrow-owned Tupikpuk (ice hockey facility), softball field, Piuraaġvik, Barrow High School, a segment of Okpik Street, the CYS facility, KBRW, the North Slope Borough School District maintenance facility and an area currently occupied by the School District bus barn and Public Works Fuel Division.
Option 4 examines opportunities of this potentially contiguous site from multiple perspectives:

1) Many members of the Barrow community expressed the need evening and weekend activities, especially for family recreation.

2) Barrow High School, as currently configured, is not meeting community needs as well as it could.

3) The ASD in its two high school PARs has attempted to respond to these issues.

The BHS Multipurpose Room Addition PAR, dated January 2010, proposed a 16,711 square feet addition. However, the PAR did not address additional parking needs, where the multipurpose room addition would fit on this congested site or how this addition would affect functional flow and defensible space planning for the school.

The Major Facility Upgrades PAR, January 2010, examines the replacement of the existing swimming pool and related equipment without considering its potential for community use.

Neither PAR included an analysis of vocational education opportunities or a potential Residential Learning Center.

4) The City of Barrow has expressed a desire to move the football field to its Piuraaqvik site.

5) The City of Barrow has consistently looked for revenue opportunities to support its daily operations.

6) The NSB Health Department has indicated that the CYS facility is too small to meet current and projected community needs, there is little space for expansion and it lacks an outdoor area for children to play.

7) The State of Alaska in its Barrow Airport Master Plan indicates that realigning Ahkovak Street north from Kiogak Street to Okpik Street may be needed to provide additional parking at facilities on the north side of the airport. The realignment would provide direct access to one side of this potentially contiguous site.

8) Moving Ahkovak Street creates significant opportunities which include folding a portion of Okpik Street into this site because it would no longer need to provide access to the NSB maintenance facility and KBRW. (The buried utilidor under Okpik Street would need to remain as well as access to it).

9) Combining the replacement of the School District Bus Barn and Public Works Fuel Division structures and relocation of CYS, this site becomes unrestricted and can easily resolve school bus and parent loading / unloading areas as well as parking for larger community events.
10) The proximity of the City of Barrow facilities and Barrow High School provide an opportunity for a warm walkway connection. The potential use for these facilities becomes considerable for community events. Facility space would include three gymnasiums, the proposed school district multipurpose room, an aquatics facility in lieu of replacing the existing pool and equipment (see item 11), potential night classes, football, ice skating, exercise classes, handball, baseball/softball, etc. Providing space for childcare while parents are engaged in other activities would also be beneficial. The City could add retail space to increase revenue, such as food service.

11) The City of Barrow and the School District could create a high school pool that would accommodate not only school events but community activities as well.

12) The City’s facilities help to provide the High School with opportunities that generally speaking are only available at large High Schools.

The necessary components to implement this development scenario include:

1) Public Works needs shop replacement facilities.

2) The School District needs a new bus barn near the Public Works shop replacement facilities.

3) The State of Alaska needs to realign Ogrook Street in the near term.

4) The Public Works building would need to be relocated and repurposed, potentially to a 29-unit apartment complex.

5) The expanded CYS facility would be relocated to the north side of Ipalook Elementary School.

6) Update both PARs for Barrow High School.

Recommendations

To maximize opportunities on this site, it is recommended that the City of Barrow and the School District coordinate the programming and master planning for this site.

- Sub Area 2

Sub Area 2 is the City owned block of land northeast of Block A. This site is ideal for multifamily housing and could accommodate displaced teacher housing from the CO2 site (approximately 33 units), Search and Rescue pilot housing needs (six units), BUECI housing needs, Health Department itinerant needs and still have additional capacity for tribal housing. Some residents indicated that this location connects subsistence trails and may be more appropriate for tribal housing. A mix of housing might be beneficial. This site would support 80 to 100 units of townhouse-style three bedroom single car garage
units. Because the City owns the property, they could take the lead by acquiring leases to secure financing. School District staff has discussed an attempt to integrate teacher housing throughout the community. Constructing multi-family housing initially for teachers would not require that it always be reserved for teachers.

- **Sub Area 3**

Sub Area 3 includes the north side airport lease land that specifically includes potential for a new Alaska Airlines terminal and NSB Search and Rescue facility. A potential location for a new terminal is on Ahkovak Street near Takpuk Street.

**Recommendations**

The Barrow community needs to express their preference regarding the terminal location.

4. **Area D**

Area D extends from Soya Street to the extension of Okpik Street and is bordered on the southwest by Upper Isatkoak Lagoon and on the northeast by heavy wetlands. This is an area for a potential town center being driven by the new hospital location, potential access between the airport and the hospital, the quantity of buildable ground and the direction of new housing development. The potential of this site extends far beyond 2035 due to its significant size.

Option 4 examines opportunities of this site from multiple perspectives:

1) Because the new hospital has been established, a long term care facility (perhaps similar to those in Nome and Kotzebue) is a likely within the timeframe of this comprehensive plan.

2) ASNA and the NSB Health Department envision this area as a future health center that, in addition to long term care facilities, would include mental health, substance abuse, assisted living and prematernal facilities.

3) UIC is considering constructing an extended stay hotel in the area near the hospital.

4) Housing development is expanding into this section of Browerville. Mixed use areas would allow small businesses a potentially more affordable location to start a business.

5) As healthcare and housing develop in this area, a daycare facility nearby would benefit residents.

6) There has been interest expressed by residents that a mall-type facility to potentially include a washeteria, bowling alley, movie theater and food court, be developed. This area is a logical location for such a facility.
7) This location near the hospital is an ideal to meet ASNA’s housing needs for medical staff (estimated at 100 units).

8) There has been discussion about developing a traditional community facility that could accommodate up to 3000 participants. The goal is a cultural gathering place that could host major local, regional or international events in a non-gymnasium environment.

The necessary components to implement this development scenario include:

1) Roads and utility extensions must be extended for further development.

2) Additional discussion is needed to ensure that all the healthcare components that are envisioned by the NSB Health Department and ASNA are discussed as a joint effort.

Recommendations

A joint effort by ASNA and the NSB Health Department is needed to clarify provider’s roles and further determine needed healthcare facilities. A joint master plan should follow.

5. Area E

Area E is preferred by the Police and Public Works Departments for a new Police Station and Justice Center and new Public Works Shops. The School District’s bus barn, warehouse needs and a relocated National Guard building could also be accommodated in this area.

Recommendations

1) A PAR should be prepared for NSB Public Works facility needs at this location that include a replacement of the DMS Storage Shop #3429, Heavy Equipment Shop II #3427, Heavy Equipment Shop Warehouse #3425, Light Duty Service Shop #3431 and Mechanical Building (former bus barn) #1685. The PAR would need to interpret demographic projections through 2035 as they will likely require more equipment storage and maintenance bays, perhaps including wash bays as well.

2) A PAR should be prepared to address both school district bus barn and warehouse needs.

3) Should Area B renewal be pursued, the National Guard Building proposed relocation will need to be addressed with the National Guard.
6. **Area F**

Area F is preferred by the NSB Fire Department for Fire Station #3 and a training facility. It is also the area selected by BUECI as a placeholder for a redundant generator and water treatment facilities.

**Recommendations**

1) A PAR should be conducted to determine Fire Station #3 and training center needs and location.

2) A study of BUECI redundancy opportunities needs to be conducted.

7. **Area G**

Area G illustrates a proposed site for an adolescent substance abuse location, jail, adolescent detox center, police station and future AWIC facility. This location meets the locational needs of the Police Department: it is centrally located to service the community with minimum response times and it has multiple travel options in case of road blockages.

The Police Department choose the location depicted in Area E. However, Area E requires the construction of Okpik and Uula streets with utility extensions before the Police Station could begin construction. The current Police Station lease is nearing its expiration in 2018. It is likely that the NSB will have to negotiate a short term extension to accommodate development in either area E or G. Because Area G already has roads and utilities, it would provide for faster replacement.

The Health Department requested that if a new AWIC facility were to be developed, that it be located close to the Police Station.

**Recommendations**

1) The police station PAR should be updated and include a detox center and the potential for both State and Tribal courts.

2) The NSB Health Department, State Court and NVB should be included in the planning process.

8. **NARL**

NARL is a long term asset of Barrow. Although its structures are largely dated, Building 360, the current location of Ilisagvik College and the NSB Wildlife Department, has served many purposes since UIC acquired the property from the U.S. Navy in 1986. This structure was state of the art for its time and remains a viable structure with potential for expansion. There was discussion of historical significance of some of the structures at NARL during
the NSB Planning Commission Meeting held on October 30, 2014; Building 360 may fit into this category as well as some Quonset huts and the elevated utilidor and former theater. The former theater could become a small museum recording the history of NARL. UIC’s plans call for demolition of the majority of the Quonset huts. Perhaps some professional photography could add to a display for tourism along with archival photos and story boards to preserve NARL’s history.

1) UIC’s plan calls for construction of a housing manufacturing plant. Considering the critical need for housing in the Barrow community, a site to assemble housing components may be an excellent use of the NARL site.

2) UIC’s proposal to establish new housing at NARL would provide needed housing for both the staff at the NSB Wildlife Department and scientific groups.

3) Commercial lease buildings could well serve both the private/oil industry and potentially State and Federal agencies.

4) A proposed science complex would include expanded science logistical support services; a science dormitory to free up residential homes for local residents; science warehousing; leasable science office and administration space; and new shops for mechanic work; warehousing and commercial lease buildings.

5) A final component of UIC’s plan is to retain Ilisagvik College in a new campus at NARL. This Comprehensive Plan illustrates three other optional locations for Ilisagvik College. Each option has advantages and disadvantages. Ilisagvik is currently examining all of their options. The new NARL access road which is an extension of Laura Madison should be an advantage to all functions as they are developed at NARL.

6) UIC’s proposed plans are a good addition to the future of the community and provide pieces of community infrastructure that are and will become important to Barrow’s development going forward to 2035 with or without oil and gas development.
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FIGURE 69

use legend

- SINGLE FAMILY HOUSING
- COMMERCIAL / INSTITUTIONAL
- ILISAGVIK COLLEGE
- VOCATION RELATED ACTIVITIES
- UIC SCIENCE COMPLEX
- HOUSING MANUFACTURING PLANT
- LIGHT / HEAVY DUTY SHOP
- NEW WILDLIFE FACILITY
- UKPIK NEST 2
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18.0 GOALS, OBJECTIVES AND STRATEGIES

The goals and supporting objectives and strategies are intended to reflect the values of Barrow residents. The goals and objectives were developed during issue identification and drafting the comprehensive plan. They were refined based on resident input during the strengths, weaknesses, opportunities and threats identified during community meeting in Barrow.

- Goals are broad statements that describe long-term desired outcomes.
- Objectives provide more specific information of what can be done to achieve a goal.
- Strategies describe specific steps to implement each objective.

Each goal and related objectives and strategies are presented in separate tables. The format allows the community to track progress in implementing strategies by updating the tables during a five year review and update cycle.
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### 18.1 Natural Environment

#### Table 32  Goal 1: Protect the community’s natural resources.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use updated and comprehensive data about the natural environment to support informed decision-making.</td>
<td>Identify and map sensitive natural environments such as wetlands and vegetation and critical habitats / nesting areas of threatened and endangered species.</td>
<td>NSB Wildlife Department; NSB Planning Department.</td>
</tr>
<tr>
<td>Investigate the feasibility of obtaining a soil survey and mapping services from the USDA Natural Resources Conservation Service.</td>
<td></td>
<td>NSB Planning Department; NSB Wildlife Department; U.S. Department of Agriculture.</td>
</tr>
<tr>
<td>Create an inventory of abandoned/unused infrastructure that could be potentially be removed, such as power lines and poles that may hamper use of the natural environment by threatened and endangered species.</td>
<td></td>
<td>NSB Public Works; NSB Planning Department.</td>
</tr>
<tr>
<td>Create an inventory of culverts that may need to be increased in size to prevent tundra damage.</td>
<td></td>
<td>NSB Public Works; NSB Planning Department.</td>
</tr>
<tr>
<td>Seek research on the effect of invasive species as the Arctic experiences increased maritime traffic.</td>
<td></td>
<td>NSB Wildlife Department; NSB Planning Department.</td>
</tr>
<tr>
<td>Use regulatory measures to protect natural environment when and where possible.</td>
<td>Review NSBMC Titles 18 and 19 to determine if subdivision and zoning regulations provide incentives for development on already disturbed land and land that is less environmentally sensitive.</td>
<td>NSB Planning Department</td>
</tr>
<tr>
<td>Develop a wetlands compensatory mitigation banking program to support the creation, ongoing management and enforcement of land set aside for conservation and subsistence use.</td>
<td></td>
<td>NSB Planning Department; U.S. Environmental Protection Agency; U.S. Army Corps of Engineers</td>
</tr>
<tr>
<td>Develop regulations to protect tundra from development and ATV damage.</td>
<td></td>
<td>NSB Planning Department; NSB Wildlife Department; UIC.</td>
</tr>
<tr>
<td>Consider eider nesting areas and other threatened, endangered or candidate species when siting roads, extension of electrical utilities aboveground or focusing future development.</td>
<td></td>
<td>NSB Planning Department; NSB Wildlife Department; UIC.</td>
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<td>Objectives</td>
<td>Strategies / Policies</td>
<td>Implementing Entities</td>
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<tr>
<td>Use policy measures to protect natural environment when and where possible.</td>
<td>Protect tundra near snow fences by more effectively channeling water during breakup.</td>
<td>NSB Public Works</td>
</tr>
<tr>
<td></td>
<td>Prioritize culvert replacement to prevent tundra damage and prevent residential flooding.</td>
<td>NSB Public Works</td>
</tr>
<tr>
<td></td>
<td>Protect natural drainageways and wetlands as valuable water retention areas and, where possible, find ways to restore and enhance these areas.</td>
<td>NSB Public Works; NSB Planning Department</td>
</tr>
<tr>
<td>Enhance coordination between stakeholders on activities related to the natural environment and resources of the Barrow area.</td>
<td>Include the numerous stakeholders and research when making land use decisions.</td>
<td>NSB, NVB, UIC, ICAS, City of Barrow, state and federal agencies.</td>
</tr>
<tr>
<td></td>
<td>Create or support an awareness program to educate residents and visitors about the fragile environment and preserving habitats of threatened and endangered species with specific ways that residents, industry and other can help.</td>
<td>NSB Mayor’s Office; NSBSD; NSB Wildlife Department.</td>
</tr>
</tbody>
</table>
### 18.2 Hazards

#### Table 33  Goal 2: Protect existing infrastructure from flooding, erosion and other natural disasters.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seek proactive ways to protect the community’s critical infrastructure.</td>
<td>Establish policies and procedures to protect the community’s water source, the Upper Isatkoak Lagoon.</td>
<td>NSB Public Works</td>
</tr>
<tr>
<td></td>
<td>Establish policies and procedures to protect both the Middle and South Salt lagoons from excessive erosion and subsequent breaching that would contaminate the shoreline and subsistence areas with solid waste and wastewater.</td>
<td>NSB Public Works</td>
</tr>
<tr>
<td></td>
<td>Include hazard mitigation considerations in water and wastewater treatment, solid waste and natural gas policies and procedures.</td>
<td>NSB Public Works</td>
</tr>
<tr>
<td>Relocate or provide additional protective measure for existing infrastructure.</td>
<td>Consider relocation of the NSB Public Works shops that are being threatened by erosion along Stevenson Street.</td>
<td>NSB Public Works</td>
</tr>
<tr>
<td></td>
<td>Evaluate the cost and benefit of relocating or otherwise protecting critical infrastructure from erosion, especially utilidor systems and sewer pump stations.</td>
<td>NSB Public Works</td>
</tr>
</tbody>
</table>

#### Table 34  Goal 3: Minimize construction of facilities and other land uses in hazard prone zones.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
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</thead>
<tbody>
<tr>
<td>Integrate regulatory and policy requirements with hazard avoidance measures.</td>
<td>Review the NSB zoning and subdivision regulations to avoid construction of facilities in known hazard areas and assure consistency of definitions and zoning maps. Revise if necessary.</td>
<td>NSB Planning Department; NSB Public Works.</td>
</tr>
<tr>
<td></td>
<td>Review regulations regarding permitting construction in hazard zones and adopt regulations if necessary to ensure appropriate design and siting to minimize risk from hazards.</td>
<td>NSB Planning Department; NSB Public Works.</td>
</tr>
<tr>
<td></td>
<td>Develop criteria for evaluating and funding future capital facilities regarding location and hazard vulnerability.</td>
<td>NSB Planning Department; NSB Public Works; NSB CIPM</td>
</tr>
<tr>
<td>Utilize natural features to control development that could result in increasing hazard susceptibility.</td>
<td>Consider erosion and drainage patterns when siting, constructing and maintaining culverts and snow fences.</td>
<td>NSB Planning Department; NSB Public Works; NSB CIPM</td>
</tr>
<tr>
<td></td>
<td>Locate critical public facilities, such as police and fire stations and emergency operation centers, in safe locations that are not likely to be affected by hazards.</td>
<td>NSB Planning Department; NSB Public Works; NSB CIPM</td>
</tr>
</tbody>
</table>
Table 35  Goal 4: Protect the health and welfare of the Barrow community through safe and efficient management of contaminated sites and hazardous waste.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitate remediation of contaminated sites.</td>
<td>Develop plans to remediate contaminated waste disposal sites within the Barrow Area of Influence.</td>
<td>NSB Mayor’s Office; NSB Planning Department; NSB Public Works; ADEC; EPA; state and federal agencies</td>
</tr>
<tr>
<td></td>
<td>Plan for future remediation activities, including delineating potential staging areas and logistical needs.</td>
<td>NSB Mayor’s Office; NSB Planning Department; NSB Public Works; UIC; ADEC; EPA; BLM; state and federal agencies</td>
</tr>
<tr>
<td></td>
<td>Work with the Restoration Advisory Board (RAB) to facilitate the clean-up of former military sites within the Barrow Area of Influence.</td>
<td>NSB Public Works; Department of Defense; ADEC</td>
</tr>
<tr>
<td>Promote safe handling and disposal of hazardous and toxic waste.</td>
<td>Keep a current inventory of locations where hazardous materials might pose a danger to the public, including storage and transportation areas.</td>
<td>NSB Public Works</td>
</tr>
<tr>
<td></td>
<td>Provide information about proper disposal of hazardous or toxic waste to Barrow residents.</td>
<td>NSB Public Works, NSBSD, City and tribal governments.</td>
</tr>
</tbody>
</table>
Table 36  Goal 5: Ensure effective community emergency preparedness.

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<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
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<tbody>
<tr>
<td>Use updated and comprehensive data about the hazards to support informed decision-making.</td>
<td>Identify and map hazard zones within the Barrow Area of Influence. Continue to revise and compile mapping of vulnerable areas using municipal, state and federal data. As additional surveying and other data collection are produced for infrastructure improvements, integrate this information into the mapping system. Require digital mapping files for all infrastructure and development projects.</td>
<td>NSB Planning Department</td>
</tr>
<tr>
<td>Coordinate hazard vulnerability assessments.</td>
<td>Create an erosion mitigation plan and corresponding shoreline protection program. Update and maintain the North Slope Borough Emergency Operations Plan to ensure essential governance and public safety services are available during a disaster.</td>
<td>NSB Administration and Finance; NSB Risk Management; NSB Planning Department; NSB Risk Management</td>
</tr>
<tr>
<td>Coordinate hazard vulnerability assessments. (continued)</td>
<td>Create a Barrow preparedness plan that provides contingencies for disasters, both natural and man-made that includes continually updated and accurate information regarding natural hazard risks and past events. Map the location and track the stability of ice cellars.</td>
<td>NSB Risk Management; NSB Wildlife, NSB Planning</td>
</tr>
<tr>
<td>Ensure resources are available for training, facilities and projects related to hazard mitigation and emergency preparedness.</td>
<td>Review budget to ensure that hazard reduction projects and tasks are funded and can be executed on a regular basis. Offer ongoing responder training and exercises for emergency service providers and risk management staff. Provide support as needed for retrofitting the Risk Management Office to also serve as an effective Emergency Operations Center. Provide facility space as needed to store materials and equipment intended for response to community emergencies.</td>
<td>NSB Administration and Finance; NSB Mayor’s Office; NSB Administration and Finance; NSB Administration and Finance</td>
</tr>
<tr>
<td>Objectives</td>
<td>Strategies / Policies</td>
<td>Implementing Entities</td>
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<tr>
<td>Coordinate related activities among North Slope Borough departments and other governmental agencies.</td>
<td>Coordinate public facility planning with public safety providers (police, fire, search and rescue) to ensure capability to respond to hazard-related situations. Assess impacts of capital facility locations on emergency response capabilities.</td>
<td>NSB Fire Department, NSB Police Department; NSB Search and Rescue Department; NSB Risk Management Office, NSB Public Works; NSB CIPM; City of Barrow; other local, state and federal entities</td>
</tr>
<tr>
<td></td>
<td>Support the development of Tom Gordon Expressway / Ulivqsaagiaq Road and utilities along this roadway as an alternative to Stevenson Street to provide reliable access and services to NARL.</td>
<td>NSB Fire Department, NSB Police Department; NSB Search and Rescue Department; NSB Risk Management Office, NSB Public Works; NSB CIPM; other local, state and federal entities</td>
</tr>
<tr>
<td></td>
<td>Interconnect service networks, such as roads and pipelines and allow more than one route to any point so that they are less vulnerable to local failures because individual sections can be isolated as necessary.</td>
<td>NSB Public Works; NSB CIPM</td>
</tr>
<tr>
<td>Strengthen public awareness and preparedness</td>
<td>Continue to disseminate information, such as family disaster supply kit contents, to residents and business about disaster preparedness to protect both people and assets.</td>
<td>NSB Risk Management</td>
</tr>
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</table>
### 18.3 Population

Table 37  **Goal 6: Use community demographics to plan for future needs.**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
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</thead>
<tbody>
<tr>
<td>Ensure that demographics accurately reflect the Barrow community.</td>
<td>Evaluate trends in population changes, including how changes relate to the borough budget, with and without oil and gas development.</td>
<td>NSB Mayor’s Office; NSB Administration and Finance; City of Barrow</td>
</tr>
<tr>
<td></td>
<td>Provide educational information to Barrow residents about the importance of participating in the U.S. Census.</td>
<td>NSB Mayor’s Office; NSB Administration and Finance; City of Barrow</td>
</tr>
</tbody>
</table>
18.4 Housing

Table 38  Goal 7: Understand the complexities of the housing issues in Barrow and coordinate planning activities.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
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</thead>
<tbody>
<tr>
<td>Assess current and future housing needs in Barrow.</td>
<td>Commission an in-depth comprehensive housing study on the multitude of housing issues that have led to the current deficiency.</td>
<td>NSB Mayor’s Office; NSB Administration and Finance; NSB Planning Department; City of Barrow; TNHA; NSBSD; NVB; ICAS</td>
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<td></td>
<td>Undertake a lot by lot infill study, especially of Barrow and older portions of Browerville to determine ownership status.</td>
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<td>Document ongoing housing needs and incorporate into a short and long-term housing strategy.</td>
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<td>Track housing prices and rents with increases / decreases in wages.</td>
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<tr>
<td></td>
<td>Ensure ongoing research of new funding opportunities, strategies for creating affordable housing.</td>
<td></td>
</tr>
<tr>
<td>Access resources collaboratively as a community.</td>
<td>Establish a mechanism to advocate for ongoing state, federal and private funding support for housing.</td>
<td>NSB Mayor’s Office; TNHA; City of Barrow; NVB</td>
</tr>
<tr>
<td>Increase awareness of housing and affordable housing issues.</td>
<td>Encourage a higher level of publicity regarding housing loans and other programs.</td>
<td>NSB Mayor’s Office; TNHA; City of Barrow; NVB</td>
</tr>
<tr>
<td></td>
<td>Support efforts to provide continuing education for elected and appointed officials and community leaders regarding the need for and benefit of sufficient, safe and affordable housing.</td>
<td>NSB Mayor’s Office; TNHA; City of Barrow; NVB</td>
</tr>
<tr>
<td></td>
<td>Promote financial literacy programs offered by lenders and non-profits that help prepare residents for future homeownership.</td>
<td>NSB Mayor’s Office; TNHA; City of Barrow; NVB</td>
</tr>
<tr>
<td>Promote coordination to remedy the housing crisis</td>
<td>Analyze existing housing programs within different entities in Barrow to determine gaps and duplicative efforts.</td>
<td>NSB Mayor’s Office; TNHA; City of Barrow; NVB</td>
</tr>
<tr>
<td></td>
<td>Develop cooperative agreements between landowners, the City of Barrow, NVB, TNHA, NSB and funding agencies to coordinate construction funding and logistics.</td>
<td>NSB Mayor’s Office; NSB Administration and Finance; City of Barrow; NVB; TNHA; UIC</td>
</tr>
<tr>
<td></td>
<td>Coordinate efforts to offer developable land from large landowners in Barrow.</td>
<td>NSB Mayor’s Office; NSB Planning Department; City of Barrow; UIC</td>
</tr>
</tbody>
</table>
### Table 39  Goal 8: Ensure an adequate supply of housing to meet the needs of current and future Barrow residents.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure that sufficient and appropriately zoned land is available for residential development for current and future residents over the next 20 years and beyond.</td>
<td>Utilize the NSB Census, U.S. Decennial Census, American Community Survey (ACS), building permits and other available data to monitor both the Barrow population and housing starts to determine if current demand is being met and the extent of the surplus or deficiency.</td>
<td>NSB Planning Department; NSB Mayor’s Office; NSB Administration and Finance, Assessing Division; TNHA; NVB.</td>
</tr>
<tr>
<td></td>
<td>Develop a standard methodology for projecting future population growth with housing needs at specific points in time to evaluate future need. Review the projections regularly and consider when prioritizing community needs and funding.</td>
<td>NSB Mayor’s Office; NSB Administration and Finance, Assessing Division, NSB Planning Department; TNHA; NVB.</td>
</tr>
<tr>
<td></td>
<td>Evaluate the NSB subdivision and zoning regulations and recommend changes where necessary to ensure that a sufficient amount of land is appropriately zoned and available for a variety of housing types and densities, including mixed-use development.</td>
<td>NSB Planning Department; NSB Law Department.</td>
</tr>
<tr>
<td></td>
<td>Coordinate with local landowners to identify land availability for residential development for both shareholders and non-shareholders.</td>
<td>NSB Mayor’s Office; NSB Planning Department; UIC; large landowners.</td>
</tr>
<tr>
<td></td>
<td>Rezone land near higher traffic intersections from lower-density to higher-density residential and mixed use for multi-family housing and provide a transition into less dense residential development.</td>
<td>NSB Planning Department; NSB Law Department.</td>
</tr>
<tr>
<td></td>
<td>Explicitly allow for accessory structures, including homes, on a single lot in the NSB municipal code.</td>
<td>NSB Planning Department; NSB Law Department.</td>
</tr>
<tr>
<td>Support both short and long-term housing options for itinerant workers and off-slope employee recruitments to ease housing constraints on existing residents.</td>
<td>Support UIC in developing an extended stay hotel.</td>
<td>Barrow community</td>
</tr>
<tr>
<td></td>
<td>Employers that hire off-slope workers, such as teachers and medical professionals, should coordinate efforts in locating and developing housing for those moving to Barrow.</td>
<td>ASNA; NSBSD; NSB; other employers that routinely hire off-slope workers.</td>
</tr>
<tr>
<td>Consider the needs of many different populations when planning for housing.</td>
<td>Encourage the distribution throughout the community of housing types through regulations and programs that accommodate special population groups such as the elderly, physically challenged, large families and single room occupants.</td>
<td>NSB Mayor’s Office, NSB Health Department, NSB Planning Department, TNHA, NVB.</td>
</tr>
</tbody>
</table>
### Table 40  Goal 9: Facilitate availability of a variety of housing types and prices to provide current and future Barrow residents with greater choice in both rental and ownership opportunities.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop strategies for development / redevelopment that incorporate an integrated mix of residential dwelling types to address affordability.</td>
<td>Encourage higher density housing and development / redevelopment where appropriate through incentives (such as reduced setbacks and parking requirements).</td>
<td>NSB Planning Department; NSB Law Department</td>
</tr>
<tr>
<td>Seek ways to reduce costs of constructing housing to facilitate greater affordability.</td>
<td>Set up a recycled building material program for demolished structures.</td>
<td>NSB Public Works; NSB CIPM</td>
</tr>
<tr>
<td></td>
<td>Work with Cold Climate Housing Research Center (CCHRC) to build affordable and energy efficient homes.</td>
<td>NSB Mayor’s Office; TNHA</td>
</tr>
<tr>
<td></td>
<td>Develop a workforce of Barrow residents that can form a cooperative to construct homes in Barrow, using sweat equity.</td>
<td>City of Barrow; NVB; NSB; TNHA</td>
</tr>
<tr>
<td></td>
<td>Assemble manufactured / modular housing in Barrow to save shipping costs of assembled homes with assembly line construction and large staging areas.</td>
<td>UIC</td>
</tr>
<tr>
<td></td>
<td>Research the feasibility of ordering, delivering and assembling kit houses.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Streamline an approach to providing multiple housing to reduce costs and time.</td>
<td>NSB Mayor’s Office; TNHA, NVB</td>
</tr>
<tr>
<td></td>
<td>Explore funding opportunities for tribal housing authorities, elder housing and low-income housing, such as federal and state grants and assistance from the oil and gas industry.</td>
<td></td>
</tr>
</tbody>
</table>
Table 41  Goal 10: Improve the condition of housing stock in Barrow to ensure safe and sanitary living conditions.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demolish unoccupied and unsafe homes.</td>
<td>Implement a program that facilitates demolishing homes or structures that are not suitable for occupancy.</td>
<td>NSB Administration and Finance</td>
</tr>
<tr>
<td></td>
<td>Adopt ordinances that require property owners to demolish and clean up abandoned and derelict structures.</td>
<td>NSB Planning Department; NSB Law Department</td>
</tr>
<tr>
<td>Improve conditions of existing homes.</td>
<td>Provide assistance to homeowners to renovate homes that are so deteriorated that they are not suitable for occupancy.</td>
<td>TNHA; NVB; NSB Administration and Finance.</td>
</tr>
</tbody>
</table>

Table 42  Goal 11: Guide development toward a cohesive, cost-effective and orderly development of the community.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperatively develop roads and utilities to support new and expanded housing development.</td>
<td>Create a development phasing plan that includes potential financing for the construction of roads and utilities in Barrow.</td>
<td>NSB Mayor’s Office; NSB Planning Department; NSB Public Works, NSB CIPM; UIC, NVB</td>
</tr>
<tr>
<td></td>
<td>Investigate funding opportunities for additional road and utility development from Bureau of Indian Affairs, State of Alaska, Denali Commission, Housing and Urban Development (HUD) and federal transportation funds.</td>
<td>NSB Grants Division; UIC, NVB</td>
</tr>
<tr>
<td></td>
<td>Focus new subdivision and platting efforts to those areas that cost the least to build (i.e. wetlands mitigation) and close to existing development.</td>
<td>NSB Planning Department</td>
</tr>
<tr>
<td>Encourage residential infill development.</td>
<td>Identify vacant and underutilized residential properties with road access and utilities that have the potential for redevelopment.</td>
<td>NSB Planning Department, NVB Realty</td>
</tr>
<tr>
<td></td>
<td>Create a program that provides assistance in resolving probate issues for vacant residential restricted lots.</td>
<td>NSB Mayor’s Office, NVB, ICAS</td>
</tr>
</tbody>
</table>
## 18.5 Public Facilities and Services

**Table 43  Goal 12: Provide reliable utility service to Barrow residents.**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide redundant back-up services to prevent interruptions in service and downtimes for major repairs.</td>
<td>Identify and investigate the potential of designating an alternate water source for community use.</td>
<td>NSB Public Works; BUECI</td>
</tr>
<tr>
<td></td>
<td>Plan for redundant water and wastewater treatment plants and power plant.</td>
<td>NSB Public Works; BUECI</td>
</tr>
<tr>
<td></td>
<td>Provide an alternative routing of the natural gas pipeline in the event of damage to the main line.</td>
<td>NSB Public Works</td>
</tr>
<tr>
<td>Ensure sufficient capacity for current and future residents and industry.</td>
<td>Increase feeder capacity to accommodate growth, especially south of the airport.</td>
<td>NSB Public Works; BUECI</td>
</tr>
<tr>
<td></td>
<td>Increase capacity of WWTP by operating on full capacity using both treatment trains.</td>
<td>NSB Public Works; BUECI</td>
</tr>
<tr>
<td></td>
<td>Repair thermal oxidation system (TOS) incinerator facility for municipal waste to reduce waste in landfill.</td>
<td>NSB Public Works</td>
</tr>
<tr>
<td></td>
<td>Consider establishing an industry service area for operation of a landfill, wastewater and water facility.</td>
<td>NSB Public Works; BUECI</td>
</tr>
<tr>
<td></td>
<td>Commission an in-depth and comprehensive study of the costs of drilling and developing the gasfields as well as deliverability and reserves to ensure that community growth can be sustained.</td>
<td>NSB Public Works; BUECI</td>
</tr>
<tr>
<td></td>
<td>Investigate and incorporate conservation measures whenever practicable in facilities and by consumers.</td>
<td>NSB Public Works; BUECI</td>
</tr>
<tr>
<td>Objectives</td>
<td>Strategies / Policies</td>
<td>Implementing Entities</td>
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<td>----------------------------------------------------------------------------</td>
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<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Continue to develop gravel resources and other sources of energy.</td>
<td>Research past material use and analyze potential demand to determine future needs.</td>
<td>NSB CIPM; NSB Public Works; NSB Planning.</td>
</tr>
<tr>
<td></td>
<td>Expand existing material sources as practical and feasible.</td>
<td>UIC, City of Barrow, ASRC/SKW</td>
</tr>
<tr>
<td></td>
<td>Continue to investigate gravel sources to support future development.</td>
<td>NSB Public Works; NSB CIPM; NSB Planning; ASRC/SKW; UIC</td>
</tr>
<tr>
<td></td>
<td>Consider regulatory changes to facilitate expansion or development of a material pit,</td>
<td>NSB Planning</td>
</tr>
<tr>
<td></td>
<td>such as creating or modifying existing zoning to more easily facilitate this type of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>development.</td>
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<tr>
<td></td>
<td>Support ASRC in development of gasoline and oil storage facilities.</td>
<td>Barrow Community</td>
</tr>
</tbody>
</table>
### 18.6 Emergency Services

**Table 44  Goal 13: Provide emergency services to ensure the safety and welfare of Barrow residents.**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide adequate facilities for emergency service personnel and equipment.</td>
<td>Construct a third fire station to better serve Cakeeater Road residents, the new Samuel Simmonds Memorial Hospital and NARL.</td>
<td>NSB Fire Department</td>
</tr>
<tr>
<td></td>
<td>Develop a Fire Training Center, potentially housed within a third fire station facility, to offer training for volunteer fire fighters from all villages.</td>
<td>NSB Fire Department</td>
</tr>
<tr>
<td></td>
<td>Retrofit the fire station in Barrow to accommodate more equipment and eventually serve the area south side of the airport.</td>
<td>NSB Fire Department</td>
</tr>
<tr>
<td></td>
<td>Construct a facility appropriate to house current and future aircraft for search and rescue operations.</td>
<td>NSB Search and Rescue Department</td>
</tr>
<tr>
<td></td>
<td>Seek a new location for the Police Department before the current lease expires.</td>
<td>NSB Police Department</td>
</tr>
<tr>
<td>Facilitate increased response time during emergencies.</td>
<td>Construct the extension of Uula Street in Browerville and Okpik Street in Barrow for a direct connection between the new Samuel Simmonds Memorial Hospital and the Search and Rescue facility.</td>
<td>NSB Mayor’s Office; NSB Public Works</td>
</tr>
</tbody>
</table>
18.7 Health and Social Services

Table 45  Goal 14: Provide medical services to ensure the health and wellbeing of Barrow and North Slope Borough residents.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan for future health and social service needs</td>
<td>Create a master plan for healthcare services and facilities, including future uses of facilities that will no longer be used for health-related services, such as the Wellness Center.</td>
<td>ASNA; NSB Health Department; NSB Mayor’s Office; NSB Administration and Finance; NVB</td>
</tr>
<tr>
<td>Evaluation the need for establishing or expanding the following facilities and associated programs: long-term care facility; hospital staff housing; senior housing addition; mental health facility; homeless shelter; expanded CYS facility; adult and adolescent detox and substance abuse treatment center.</td>
<td>ASNA; NSB Health Department; NSB Mayor’s Office; NSB Administration and Finance; NVB</td>
<td></td>
</tr>
<tr>
<td>Reestablish childcare services in Barrow to facilitate greater participation in the local workforce.</td>
<td>NSB Mayor’s Office</td>
<td></td>
</tr>
</tbody>
</table>
## 18.8 Transportation

### Table 46: Goal 15: Maintain and improve Barrow’s transportation system to consistently provide mobility for people and goods in a safe and efficient manner.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborate to plan for future growth and development.</td>
<td>Set and maintain a schedule to review the NSB Comprehensive Transportation Plan and the Native Village of Barrow Long Range Transportation Plan every two years and update as needed.</td>
<td>NSB Planning Department; NVB; City of Barrow</td>
</tr>
<tr>
<td></td>
<td>Establish a phased roads and utilities development plan to provide for future development.</td>
<td>NSB Mayor’s Office; NSB Planning Department; NVB; ICAS; NSB Public Works; BUECI</td>
</tr>
<tr>
<td></td>
<td>Prioritize transportation projects that receive funding from sources other than the NSB.</td>
<td>NSB Mayor’s Office; NSB Planning Department; NVB; ICAS; City of Barrow</td>
</tr>
<tr>
<td></td>
<td>Collect and analyze data to provide support to non-Borough transportation-related funding requests.</td>
<td>NSB Mayor’s Office; NVB; ICAS, City of Barrow</td>
</tr>
<tr>
<td></td>
<td>Develop cooperative agreements between major landowners, the City of Barrow, NSB, NVB, ICAS and funding agencies to coordinate funding and logistics.</td>
<td>NSB Mayor’s Office; NVB; ICAS; City of Barrow</td>
</tr>
<tr>
<td></td>
<td>Support and facilitate ICAS and NVB participation in the BIA transportation program.</td>
<td>NSB; NVB; ICAS; City of Barrow; UIC</td>
</tr>
<tr>
<td></td>
<td>Consider future transportation needs that may include: developing a safer connection at the east end of airport property to the south side of the airport; road connections between the hospital and the Search &amp; Rescue facility; docking/port facility; and industry airport needs.</td>
<td>NSB Mayor’s Office; Planning Department; NSB Public Works Department; NVB; City of Barrow</td>
</tr>
<tr>
<td></td>
<td>Create a priority system for capital funding that more highly considers projects that can reduce maintenance costs or extend the life of existing assets.</td>
<td>NSB Planning Department</td>
</tr>
<tr>
<td>Objectives</td>
<td>Strategies / Policies</td>
<td>Implementing Entities</td>
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<td>---------------------------------------------------------------------------</td>
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<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Promote and participate in public review for proposed transportation or</td>
<td>Actively solicit resident comments regarding future transportation plan and projects.</td>
<td>NSB Mayor’s Office; NSB Planning Department; NVB; ICAS; City of Barrow; UIC</td>
</tr>
<tr>
<td>utility corridors, plans or routes undertaken by the NSB, state and/or</td>
<td>Coordinate with ADOT regarding development plans and projects in Barrow.</td>
<td></td>
</tr>
<tr>
<td>federal government within Barrow.</td>
<td>Engage ADOT and Alaska Airlines about potential locations for a new Alaska Airlines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Terminal.</td>
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<td></td>
<td>Support the realignment of Ogrook Street as proposed in the ADOT Airport Master Plan</td>
<td></td>
</tr>
<tr>
<td></td>
<td>update.</td>
<td></td>
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<tr>
<td></td>
<td>Continue to support the development of the Tom Gordon Expressway / Uivaqsaagiaq Road.</td>
<td></td>
</tr>
</tbody>
</table>
### 18.9 Recreational Facilities

Table 47  **Goal 16:** Offer a variety of recreational opportunities to meet the needs of Barrow residents, especially for families and youth.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan collaboratively for future recreational opportunities for Barrow residents.</td>
<td>Investigate combined resource opportunities to meet multigenerational recreational activities through linking Barrow High School and Piuraaqvik facilities.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Explore the possibility of combining aquatic uses at Barrow High School and Piuraaqvik for public use.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Explore the development of a public indoor playground space similar to Ipalook Elementary School.</td>
<td>City of Barrow; NSBSD</td>
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<tr>
<td></td>
<td></td>
<td>City of Barrow</td>
</tr>
</tbody>
</table>

### 18.10 Communications

Table 48  **Goal 17:** Facilitate adequate communication and telecommunications systems for Barrow residents and businesses.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintain and upgrade communication services.</td>
<td>Support and maintain bypass mail.</td>
<td>NSB Mayor’s Office; U.S. Postal Service</td>
</tr>
<tr>
<td></td>
<td>Support the extension of fiber optics into Barrow and coordinate land use planning and permitting when needed.</td>
<td>NSB Mayor’s Office; NSB Planning Department</td>
</tr>
</tbody>
</table>
## 18.11 Economy

Table 49  **Goal 18**: Ensure that Barrow has a strong and diversified local economy that provides employment opportunities for residents.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foster economic development activities that are culturally relevant.</td>
<td>Support a UIC vision for a Traditional Center that would host communitywide events and larger meetings that can be accommodated currently. Support ASRC in its development of an artesian work studio adjacent to the Top of the World Hotel to support local artists.</td>
<td>UIC; NSB; NVB; ICAS; City of Barrow</td>
</tr>
<tr>
<td>Foster economic development activities that expand services for residents.</td>
<td>Support the NVB Comprehensive Economic Development Strategy. Consider the development of an Alaska Regional Development Organization (ARDOR) to facilitate greater economic development potential. Explore the feasibility of expanded commercial enterprises, especially those that are of interest to residents, such as a movie theater, bowling alley, additional restaurants / food service, culturally relevant community services (i.e. a butchery / tannery or sewing cooperative), small engine repair or self-service repair shop, arctic community greenhouse, washeteria, native store, commercial kitchen.</td>
<td></td>
</tr>
<tr>
<td>Support tourism development.</td>
<td>Support NVB and ASRC in eco-tourism development</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collaborate with NSB Wildlife Management Department and BARC on eco-tourism and arctic science opportunities to attract tourists.</td>
<td></td>
</tr>
</tbody>
</table>
### 18.12 Education

Table 50  **Goal 19:** Continue to develop coordinated educational and training opportunities.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborate on establishing joint uses of facilities to maximize resources.</td>
<td>Explore shared educational space between Barrow High School and Ilisaġvik College, such as vocational education.</td>
<td>NSBSD; Ilisaġvik College</td>
</tr>
<tr>
<td></td>
<td>Locate a new site for Kiita Learning Community so that the current facility can be returned to daycare.</td>
<td>NSBSD</td>
</tr>
<tr>
<td></td>
<td>Study alternative sites for relocating Ilisaġvik College.</td>
<td>Ilisaġvik College</td>
</tr>
<tr>
<td></td>
<td>Revisit two out-of-date PARs for Barrow High School that address a multi-purpose room addition and school renovations.</td>
<td>NSB Mayor’s Office; NSB Planning Department; NSB CIPM Department</td>
</tr>
<tr>
<td></td>
<td>Explore the feasibility of decongesting the Barrow High School site through the realignment of Ogrook as proposed by ADOT and relocating / repurposing facilities to better accommodate educational functions.</td>
<td>NSBSD; NSB Mayor’s Office; ADOT; NSB Public Works Department; NSB CIPM Department</td>
</tr>
<tr>
<td></td>
<td>Explore consolidating NSBSD administrative offices.</td>
<td>NSBSD</td>
</tr>
<tr>
<td>Facilitate better learning opportunities for all students across the North Slope.</td>
<td>Establish a Residential Learning Center to serve all the North Slope villages.</td>
<td>NSB Mayor’s Office; NSBSD</td>
</tr>
</tbody>
</table>
### 18.13 Subsistence

**Table 51  Goal 20: Protect and enhance traditional, historical, cultural and subsistence resources and activities.**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitate preservation of the Inupiaq language through improving Native language fluency.</td>
<td>Establish a daycare center that includes an Inupiaq language immersion program.</td>
<td>NSBSD; NSB Mayor’s Office; IHLC.</td>
</tr>
<tr>
<td></td>
<td>Encourage native speakers to speak Inupiaq at home, especially to children.</td>
<td>IHLC</td>
</tr>
<tr>
<td></td>
<td>Expand the Inupiaq Immersion Program.</td>
<td>NSBSD</td>
</tr>
<tr>
<td></td>
<td>Continue and expand the use of the Rosetta Stone program for language preservation and develop Native language education programs for adults.</td>
<td>IHLC</td>
</tr>
<tr>
<td>Protect and preserve areas where traditional hunting, fishing and gathering occurs.</td>
<td>Document access routes and areas where traditional sources of subsistence foods are gathered.</td>
<td>IHLC</td>
</tr>
<tr>
<td></td>
<td>Create lessons for children to learn about traditional subsistence culture in school that is specific to Barrow.</td>
<td>NSBSD</td>
</tr>
<tr>
<td></td>
<td>Encourage modification of the NSBMC to further protect subsistence lands.</td>
<td>NSB Planning Department; NSB Law Department; IHLC</td>
</tr>
<tr>
<td>Protect structures that are an important part of Barrow’s history</td>
<td>Work with property owners to nominate the Presbyterian Church and other historically significant buildings for inclusion on the National Registry of Historic Places.</td>
<td>NSB Mayor’s Office; IHLC</td>
</tr>
</tbody>
</table>
### 18.14 Land Use and Zoning

Table 52  **Goal 21**: Guide development toward a cohesive, cost effective and orderly development of the community.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies / Policies</th>
<th>Implementing Entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redevelop areas with existing utilities</td>
<td>Utilize future development opportunities to update and renew older portions of the community that have declined into underutilization.</td>
<td>NSB Mayor’s Office; NSB Planning Department; NVB.</td>
</tr>
<tr>
<td></td>
<td>Research property ownership issues of restricted lots to facilitate the redevelopment of abandoned properties to maximize use of the existing utilities.</td>
<td>NSB Planning Department; NVB; ICAS; NSB Public Works Department</td>
</tr>
<tr>
<td></td>
<td>Identify and evaluate the development feasibility for unused or underutilized properties that are already connected to the water and sewer system. Identify vacant and underutilized properties, structures and areas that have the potential for redevelopment.</td>
<td>NSB Planning Department; NSB Public Works Department</td>
</tr>
<tr>
<td></td>
<td>Create a program that specifically addresses unoccupiable structures and vacant restricted lots to increase the housing stock that facilitates resolution of probate issues.</td>
<td>NSB Mayor’s Office; NSB Planning Department; NSB Assessing Division</td>
</tr>
<tr>
<td></td>
<td>Establish policies that maximize valuable infrastructure current and proposed.</td>
<td>NSB Planning Department; NSB Law Department</td>
</tr>
<tr>
<td>Encourage community collaboration on future development.</td>
<td>Encourage interagency cooperative efforts through combined agency master planning</td>
<td>NSB; NVB; ICAS; City of Barrow; NSBSD; Ilisagvik College; TNHA; UIC; ASNA</td>
</tr>
<tr>
<td></td>
<td>Establish multi-lateral stakeholder groups to resolve property ownership and agency transfers of property ownership.</td>
<td>NSB Mayor’s Office</td>
</tr>
<tr>
<td></td>
<td>Consider consolidating NSB Administrative Offices to maximize efficiency and free up facilities for other uses.</td>
<td>NSB Wildlife Department</td>
</tr>
<tr>
<td></td>
<td>Relocate the NSB Wildlife Management Department to facilitate improved coordination and research opportunities with BARC.</td>
<td>NSB Wildlife Department</td>
</tr>
</tbody>
</table>
19.0 IMPLEMENTATION AND PLAN REVISION

19.1 Implementing the Comprehensive Plan

The purpose of this implementation chapter is to provide direction and a process for implementing the plan and for continued community planning. The plan is the community’s guide for all stakeholders, including residents and local governmental entities, in making decisions regarding land use and revitalization of old Barrow, economic development, capital facilities and infrastructure improvements, among others.

Plan implementation includes the following tools:

- Subdivision regulations and the zoning ordinance, NSBMC Titles 18 and 19. Ideally, zoning and subdivision ordinances implement the vision and goals of a comprehensive plan.
- The NSB 6 Year Plan and NSB Repair and Replacement Schedule can guide essential infrastructure investments in transportation, water and sewer facilities and other improvements;
- NSB Planning Commission, Barrow Zoning Commission and Assembly and City of Barrow City Council; and
- Partnerships among NVB, UIC, NSBSD, ASNA, TNHA, other stakeholder groups, citizens and the borough government.

The most important method of implementing any plan, including the Barrow Comprehensive Plan, is a day-to-day commitment by elected and appointed officials, NSB and City staff members and Barrow residents. The comprehensive plan should be referenced in planning studies and planning staff reports as well as informal discussion situations.

Additionally, this and any comprehensive plan must be evaluated to ensure that its goals and strategies continue to reflect changing community needs and attitudes. Barrow’s comprehensive plan will likely require modifications and refinements to be kept current. Some strategies may be unworkable given changing circumstances and new solutions may emerge. These should be incorporated when conducting a regular plan review and update. The review and update could also include recent accomplishments, implementation obstacles and identification and recommendations for action over the next review period including reassessing priorities.

19.2 Capital Project Planning

19.2.1 Potential Capital Project Needs

The Community Planning Options presented in Chapter 17 provide a path for future development. Additionally, Appendix B provides a sequencing of capital projects to implement the preferred future development scenario. This section provides anticipated capital needs in Barrow outside of the future development scenario presented in this plan. The anticipated capital needs are based on the NSB 6 Year Plan projections, stakeholder meetings and research.
<table>
<thead>
<tr>
<th>Project Type</th>
<th>1 - 5 Years</th>
<th>6 – 10 Years</th>
<th>11 – 20 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education</strong></td>
<td>Ipalook School upgrades</td>
<td>Barrow High School major renovations and addition</td>
<td>NSBSD Central Office renovation or consolidation of office space</td>
</tr>
<tr>
<td></td>
<td>Hopson Middle School upgrades</td>
<td>New Iliisagvik Campus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>New Kiita facility or relocation</td>
<td>Residential learning center</td>
<td>Additional teacher housing and renovation of existing housing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Erosion and Flooding</strong></td>
<td>Coastal erosion mitigation that may include pump station 4 protection; tower installation in existing manhole to raise access; revetment construction; fill Tasigrook Lagoon to protect Upper Isatkoak Lagoon</td>
<td>Additional coastal erosion mitigation measures as needed</td>
<td>Additional coastal erosion mitigation measures as needed</td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td>Continued maintenance and construction of new water and sewer system as needed</td>
<td>Continued maintenance and construction of new water and sewer system as needed</td>
<td>Continued maintenance and construction of new water and sewer system as needed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Redundant water source analysis</td>
<td>Redundant water treatment plant and distribution system</td>
</tr>
<tr>
<td><strong>Sewer</strong></td>
<td>Continued maintenance and construction of new sewer collection lines</td>
<td>Continued maintenance and construction of new sewer collection lines</td>
<td>Continued maintenance and construction of new sewer collection lines</td>
</tr>
<tr>
<td><strong>Energy</strong></td>
<td>Evaluation of expanded capacity of distribution / feeder lines</td>
<td>Expansion of distribution / feeder lines as needed</td>
<td>Expansion of distribution / feeder lines as needed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Redundant power source analysis</td>
<td>Redundant power plant</td>
</tr>
<tr>
<td><strong>Roads</strong></td>
<td>Construction of Tom Gordon Expressway / Uivaqsaagiaq Road</td>
<td>Road expansions for new residential development</td>
<td>Road expansions for new residential development</td>
</tr>
<tr>
<td></td>
<td>Yugit Street extension</td>
<td>Nunavaak Road upgrade</td>
<td>Ahkovak Street relocation in front of airport</td>
</tr>
<tr>
<td></td>
<td>Laura Madison Road extension</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transit</strong></td>
<td>Improved transit system including expanded service and GPS notification</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Housing</strong></td>
<td>Residential housing development</td>
<td>Residential housing development</td>
<td>Residential housing development</td>
</tr>
<tr>
<td></td>
<td>Hospital staff housing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 19.2.2 Potential Funding Sources for Capital Projects

General obligation bonds have historically been the primary funding source for North Slope Borough capital projects. As NSB funding and bond capabilities decline, it becomes increasingly important that the Barrow community identify other sources of funding for capital projects. The funding that would be needed to implement the capital projects identified in this plan are greater than the North Slope Borough capital program can absorb. Capital project funding would also need to be secured from federal and state sources. Many of these funding sources are

<table>
<thead>
<tr>
<th>Recreation Facilities</th>
<th>Expanded recreation opportunities for youth and families</th>
<th>Expanded recreation opportunities for youth and families</th>
<th>Expanded recreation opportunities for youth and families</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Gas</td>
<td>Walakpa Gas Field Generators</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Redundant gas supply line analysis and construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel</td>
<td>Marine header and pipeline relocation analysis and construction</td>
<td>Fuel Farm relocation to access gravel resources underneath.</td>
<td></td>
</tr>
<tr>
<td>Facilities</td>
<td>New NSB Wildlife Department facility</td>
<td>NSB Consolidated Admin Facility</td>
<td>Inupiat Heritage Center expansion and renovation</td>
</tr>
<tr>
<td></td>
<td>Daycare facilities</td>
<td>Coast Guard facility</td>
<td>Justice center / jail facility</td>
</tr>
<tr>
<td></td>
<td>New BUS Warm Storage building</td>
<td>Port development analysis</td>
<td>Port development</td>
</tr>
<tr>
<td></td>
<td>Shop II Wash Bay Building</td>
<td>CYS replacement or expansion</td>
<td>Substance abuse treatment center</td>
</tr>
<tr>
<td></td>
<td>12-plex housing upgrades and renovations</td>
<td></td>
<td>Mental health facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Homeless Shelter</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Long term care facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Traditional center that would accommodate several hundred people.</td>
</tr>
<tr>
<td>Emergency Services</td>
<td>NSB Police Department facility repairs/upgrade</td>
<td>New NSB Police Station</td>
<td>New Cakeeater Road fire station and regional fire training center</td>
</tr>
<tr>
<td></td>
<td>Search and Rescue hangar expansion and upgrade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landfill</td>
<td>Thermal oxidation system upgrade</td>
<td>Development a new landfill cell</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Development a new landfill cell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td>Fiber optic land connections</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airport</td>
<td></td>
<td></td>
<td>New or expansion of terminal</td>
</tr>
</tbody>
</table>

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255
competitive. Demonstrating support for specific capital projects through a comprehensive plan such as this one demonstrates to potential funders that the community has completed a thorough process to identify future improvements.
20.0 REFERENCES


North Slope Borough (2014b). North Slope Borough Ordinance Serial No. 2014-01: An Ordinance for the Creation of the North Slope Borough Port Authority under the Municipal Port Authority Act Statute §29.35.600-29.35.730.


State of Alaska Department of Transportation and Public Facilities (2012) and North Slope Borough CIPM Department. Final Environmental Assessment and Section 4(f) Evaluation for Uivaqsaaq Road. Federal Project Number HPRM-0002(210)/SDP-0002(209); State Project Number 76970/76972. March 2012.


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21.0 APPENDICES

21.1 Appendix A: Strengths, Weaknesses, Opportunities & Threats Workshops

On July 7 and 8, 2014, Barrow residents were invited to the City of Barrow Council Chambers to participate in a public information meeting for the Barrow Comprehensive Plan. In addition to providing updates on the plan and presenting a model of potential future development scenarios, four Strengths, Weaknesses, Opportunities and Threats (SWOT) workshops were held to better understand the issues that matter most to the Barrow residents. Below is the lists created at each of the four SWOT exercises.

SWOT Workshop July 7, 2014 at 3pm

Strengths
- Cleaning up older sections of Barrow and urban renewal
- Traditional family / multi-generational knowledge and sharing
- Oil and gas revenue
- Community will volunteer in all emergencies
- Wide range of traditional and institutional knowledge
- Tribal sovereignty - able to exercise power, land use
- RAB (Restoration Advisory Board) and longevity planning
- Elder knowledge
- Protection of traditional sites and ongoing program development
- Iñupiat values
- Iñupiat language

Weaknesses
- Development encroaches on wildlife
- Lack of communication between multiple agencies regarding restricted properties
- There has been a change to traditional subsistence routes due to land use expansion
- Lack of housing
- Lack of communication
- Lack of youth activities
- Lack of emergency preparedness - no infrastructure and need more equipment for new threats - marine, fire oil spill, S&R
- Actual plan is not well defined for emergency response
- Lack of infrastructure implemented by industry
- Permit process weak (possible NSBMC revision)
- Difficult to monitor boundaries that we place on the permits approved - industry misleads actual work planned
- Funding sources
- Aging infrastructure/facilities areawide
- Lack of retention of training - scarcity of trained individuals
- Planning and capacity for need infrastructure
- Need to include publicity for this comprehensive plan
- Emergency planning committee - members don't recognize importance of roles (homeland security and biological threats)
- No shallow water harbor
- No spill response
- No customs / harbor master
- Historical trauma

Opportunities
- Landowners have opportunity to relocate (erosion)
- Change to traditional routes
- Public trails
- Work together - multiple organizations
- Northwest passage
- Youth activities
- Strong community response
- Increased international arctic coordination
- Oil and gas development will increase consumer goods, reduce cost
- Revise Title 18 and 19
- Strengthen tribal sovereignty for land development
- Opportunity to build / expand training opportunities
- Renewable energy
- Opportunity to plan and discuss risks
- Better technology is available for new additions and expansion
- Restoration Advisory Board - increased opportunity for planning and increases to land availability
- Transporting goods with increased maritime traffic
- Shallow water harbor
- Centralized educational facilities
- Correcting historical trauma

Threats
- Beach erosion
- Climate change/infrastructure
- Increased industry
- Road construction
- Northwest passage - not prepared for increased traffic
- Emergency response
- Offshore development
- Road connection to the rest of Alaska and increased traffic
- Health risks from exposure to oil and gas development activities
- International visitors without customs
• Emergencies such as breach of international boundary, biological agents being introduced into the community

SWOT Workshop July 7, 2014 at 7pm

Strengths
• Opportunity to communicate with potential industry with each other, encourages teamwork
• Willingness to work together
• Inupiat values
• New technology available
• Natural gas reserve

Weaknesses
• AC's non-complete clause
• Lack of available land
• UIC - first right of refusal
• Lack of private business
• High cost of materials/freight
• Lack of stakeholder interaction
• Lack of youth activities - bowling alley, mall, movie theater, water park, off-road track
• High cost of liability (parents can assume risk) hinders business opportunities
• Snow machines trails run thru residential areas
• Lack of housing - residential, industry
• Public transportation with gaps

Opportunities
• Private business can be encouraged
• Room for youth activities can be part of the plan
• Support economic diversity
• Open communication can reduce costs and improve efficiency
• New facilities can be built-snow, skate, biking, trails, shooting range, track/field, archery, shooting range, group trails
• Culturally influenced tourism
• Blending of traditional and cultural w new transplant residents
• Renewable energy

Threats
• Coastal erosion
• Liability risks
• Lack of housing
SWOT Workshop July 8, 2014 at 3pm

**Strengths**
- Top of the world location
- Birding / wildlife as a tourism attraction
- Ilisagvik
- No road access
- Barrow is land of opportunity, especially financially
- Inupiaq culture / family / friends focus
- Tourism

**Weaknesses**
- 4 wheeler tundra damage (regular trails are worn out; new routes are being established)
- Lack of freight / transportation options (competition)
- Lack of cohesion at the airport
- Lack of commercial / industrial buildings
- Lack of detox and rehab center
- Lack of juvenile and adult detention center
- Dust (roads)
- SBS closing
- No outside road connections
- Lack of requirements for infrastructure including internet and power through permitting process with oil and gas development
- Internet access
- Housing
- Limited commerce into barrow
- Cost of maintaining assets and infrastructure
- Lack of housing contractor
- Fragmented tourism infrastructure
- No customs or federal presence, especially USCG

**Opportunities**
- Better subsistence access (2 bridges)
- City of Barrow land south of airport developed for industrial use
- City of Barrow shooting range
- Combined recreational activity center (indoors)
- Tourism
- Chamber of Commerce
- Economic development potential for reindeer herding, tanning, canning
- Revenue from alcohol sales in Barrow
- Road hardening and/or asphalt
- New economic opportunities such as hardware store
- Fiber optics
• Housing expansion
• Better communication and working together with State of Alaska and industry especially in planning stages
• Natural gas infrastructure planning with gas line combining efforts for local communities
• NSB revenue from increases oil and gas activity and local employment

Threats
• Alcohol abuse issues from city run liquor store
• Lack of competition (airlines, freight, AC)
• Alaska airlines changes may not benefit residents
• Potential of road access
• Increased oil and gas activity - cultural / environmental impact
• Revenue impact if oil and gas activity decreases

SWOT Workshop July 8, 2014 at 7pm

Strengths
• Resourcefulness of people
• Willingness of residents to be trained and employed
• Responsiveness of Ilisagvik to change programs to meet employer needs
• Subsistence activity
• Traditional knowledge
• Iñupiat values
• Natural gas auto conversion kits available

Weaknesses
• Cost of liability
• Lack of recycling
• No scrap metal disposal
• High cost of freight
• Unemployment - especially for youth
• Homeless people a growing population
• Public comment too short
• Lack of meeting locations
• Lack of places to learn cultural diversity - for youth to learn about traditional ways
• Lack of supplemental water source
• Too many chemicals in drinking water
• Lack of public transportation
• Lack of housing

Opportunities
• Paddle boat - Recreational summer indoor/outdoor activities
• Turn snow piles into snow part
- Dirt bike/skate part
- If new water source identified would free up current water source for activities
- Back haul scrap metals and recycling
- New opportunities for jobs and training
- Build homeless shelter
- Marketing can be improved through this process
- Door prizes (gas card)
- Iñupiaq language learning center/cultural activities
- KBRW radio show for obtaining comment from public
- Greater advertise meeting for community events - advertise boards needed
- Find resources - sequence plans in a logical order - water - roads - power
- Supplemental water supply
- Increase public transportation with GPS
- CNG
- 4G fiber optics

**Threats**
- Erosion
- Oil spill
- Cruise ships
- Climate change
- Contamination of water supply
- Lack of housing
21.2 Appendix B: Adoption Ordinance and Resolutions

- North Slope Borough Assembly Ordinance
- North Slope Borough Planning Commission Resolution
- Barrow City Council Resolution
- Barrow Zoning Commission Resolution
- Native Village of Barrow Resolution
- Ukpeagvik Inupiat Corporation Resolution
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NORTH SLOPE BOROUGH
ORDINANCE SERIAL NO. 75-06-64

AN ORDINANCE ADOPTING THE UPDATED
COMPREHENSIVE PLAN FOR BARROW, ALASKA

WHEREAS, pursuant to North Slope Borough Municipal Code of
Ordinances (NSBMC) § 2.12.160(a)(1), the Planning Commission is charged with
preparing a Comprehensive Plan consisting of maps and related texts, for the systematic
development of the North Slope Borough (Borough) and making recommendations to the
Assembly; and

WHEREAS, starting in 2014, members of the general public, Ilisagvik
College, North Slope Borough School District, Ukpeagvik Inupiat Corporation, City of
Barrow, Native Village of Barrow, the Barrow Zoning Commission, Arctic Slope
Regional Corporation, and other stakeholders residing within the community of Barrow
collaborated with the Borough to create the goals for outlining the Comprehensive Plan
for Barrow; and

WHEREAS, the Borough tasked Bezek Durst & Seiser (BDS) and Umiaq
LLC with assisting in the development of the Barrow Comprehensive Plan that met the
requirements set forth under NSBMC § 2.12.170; and

WHEREAS, after a presentation to the Barrow Zoning Commission on
August 14, 2014, the Barrow Zoning Commission adopted Resolution 2014-04
recommending the approval of the Barrow Comprehensive Plan on October 9, 2014; and

WHEREAS, after a presentation to the Native Village of Barrow on
August 18, 2014, the Native Village of Barrow adopted Resolution 2014-12
recommending the approval of the Barrow Comprehensive Plan on September 15, 2014; and

WHEREAS, after a presentation to the City of Barrow on July 24, 2014,
the City of Barrow adopted Resolution 34-2014 recommending the approval of the
Barrow Comprehensive Plan on October 23, 2014; and

WHEREAS, after a receiving a presentation of the Barrow
Comprehensive Plan on October 30, 2014, the Planning Commission adopted Resolution
2014-19 recommending the approval of the Barrow Comprehensive Plan on November
20, 2014; and

WHEREAS, pursuant to NSBMC § 2.12.160(a)(2), the Planning
Commission is charged with preparing and recommending to the Assembly a zoning
ordinance to implement the Comprehensive Plans.

Appendix B: North Slope Borough Assembly Ordinance

NORTH SLOPE BOROUGH
ORDINANCE SERIAL NO. 75-06-64

AN ORDINANCE ADOPTING THE UPDATED
COMPREHENSIVE PLAN FOR BARROW, ALASKA

WHEREAS, pursuant to North Slope Borough Municipal Code of
Ordinances (NSBMC) § 2.12.160(a)(1), the Planning Commission is charged with
preparing a Comprehensive Plan consisting of maps and related texts, for the systematic
development of the North Slope Borough (Borough) and making recommendations to the
Assembly; and

WHEREAS, starting in 2014, members of the general public, Ilisagvik
College, North Slope Borough School District, Ukpeagvik Inupiat Corporation, City of
Barrow, Native Village of Barrow, the Barrow Zoning Commission, Arctic Slope
Regional Corporation, and other stakeholders residing within the community of Barrow
collaborated with the Borough to create the goals for outlining the Comprehensive Plan
for Barrow; and

WHEREAS, the Borough tasked Bezek Durst & Seiser (BDS) and Umiaq
LLC with assisting in the development of the Barrow Comprehensive Plan that met the
requirements set forth under NSBMC § 2.12.170; and

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the City of Barrow adopted Resolution 34-2014 recommending the approval of the
Barrow Comprehensive Plan on October 23, 2014; and

WHEREAS, after a receiving a presentation of the Barrow
Comprehensive Plan on October 30, 2014, the Planning Commission adopted Resolution
2014-19 recommending the approval of the Barrow Comprehensive Plan on November
20, 2014; and

WHEREAS, pursuant to NSBMC § 2.12.160(a)(2), the Planning
Commission is charged with preparing and recommending to the Assembly a zoning
ordinance to implement the Comprehensive Plans.
NOW, THEREFORE, BE IT ENACTED:

SECTION 1. Classification. This ordinance is a non-code ordinance.

SECTION 2. Severability. If any provision of this ordinance or any application thereof to any person or circumstance is held invalid, the remainder of this ordinance and the application to other persons and circumstances shall not be affected thereby.

SECTION 3. Effectiveness. This code ordinance shall become effective upon adoption.

SECTION 4. Adoption of Comprehensive Plan. The Barrow Comprehensive Plan is hereby enacted as referenced in Exhibit B.


INTRODUCED: February 04, 2015
ADOPTED: March 03, 2015

Forrest D. Olemaun, President
Date: 3-3-15

ATTEST:
Sheila H. Burke
Sheila H. Burke, Borough Clerk
Date: 3/3/2015

Charlotte E. Brower, Mayor
Date: 3/3/15
Appendix B: North Slope Borough Planning Commission Resolution

NORTH SLOPE BOROUGH PLANNING COMMISSION
RESOLUTION 2014-19

A RESOLUTION RECOMMENDING TO THE ASSEMBLY
APPROVAL OF THE BARROW COMPREHENSIVE PLAN
2015-2035

WHEREAS, the Planning Commission is charged under North Slope Borough Code of Ordinances 2.12.160 (a) with the responsibility to prepare and recommend to the Assembly a comprehensive plan (Plan) for the systematic development of the Borough; and

WHEREAS, the Planning Commission is further charged under North Slope Borough Code of Ordinances 18.20.020 to establish one or more districts using approved Village Comprehensive Plans as a guideline; and

WHEREAS, the Planning Commission is further charged under North Slope Borough Code of Ordinances 19.40.060 (A) (2) to ensure that the incorporated villages accommodate uses in accordance with both the Borough Comprehensive Plan and Comprehensive Development Plan for the community; and

WHEREAS, the Planning Commission is further charged under North Slope Borough Code of Ordinances 19.70.020 to follow policies intended to guide the approval of development and uses in the village districts consistently with the relevant adopted Village Comprehensive Plan, and

WHEREAS, the common goals of local control and self-determination, the protection of the land, water and subsistence resources, mitigation of the impacts which may occur as a result of oil and gas development, the maximization of economic benefits and employment opportunities for Barrow today and into the future are fully shared by all of the organizations working together on this project; and

WHEREAS, the Barrow Comprehensive Plan was developed with significant public involvement, including public meetings in Barrow, numerous meetings with stakeholders, and website solicitation for comments; and

WHEREAS, the Barrow Zoning Commission has reviewed the Plan and supports its recommendation by the Planning Commission under Barrow Zoning Resolution 2014-04; and

WHEREAS, The Native Village of Barrow has reviewed the Plan and supports its recommendation by the Planning Commission under Native Village of Barrow Resolution 2014-12; and

WHEREAS, The City of Barrow has reviewed the Plan and supports its recommendation by the Planning Commission under City of Barrow Resolution 34-2014; and
WHEREAS, Ukpeaqvik Iñupiat Corporation, the primary landowner implicated in the new development areas considered under the Plan, has reviewed this Plan and support its recommendation by the Planning Commission under UIC Resolution 2014-92; and

WHEREAS, the Barrow Comprehensive Plan was found to be sufficient to guide the future development of Barrow for the next 20 years.

NOW, THEREFORE, BE IT RESOLVED THAT:

The North Slope Borough Planning Commission adopts the Barrow Comprehensive Plan and recommends its approval to the North Slope Borough Mayor and the North Slope Borough Assembly.

THAT a copy of this Resolution be forwarded to the North Slope Borough Clerk.

INTRODUCED: November 20, 2014
ADOPTED: November 20, 2014

Paul Bodfish, Chairman
Date: 11/20/14

Daisy Sage, Clerk
Date: 11/20/14
RESOLUTION 34-2014

A RESOLUTION OF THE BARROW CITY COUNCIL FORMALLY SUPPORTING 2015-2035 BARROW COMPREHENSIVE PLAN DEVELOPED BY THE NORTH SLOPE BOROUGH

WHEREAS, the North Slope Borough Planning and Community Services Department has prepared a Final Draft Version of the Barrow Comprehensive Plan 2015-2035 dated August 2014 in consultation with BDS, Inc. and UMIAQ, LLC; and

WHEREAS, the Barrow Comprehensive Plan is a long-range planning document, the intent of which, is to assist the Barrow community in preparing for and managing its resources and providing for its residents over the next 20 years; and

WHEREAS, the City of Barrow is an integral partner in facilitating a planned and coordinated future for the residents of the City of Barrow; and

WHEREAS, the City of Barrow as a First Class City is charged with specific powers that relate directly to land use in Barrow that include but are not limited to recreation facilities and playgrounds, cemeteries, docks and harbors, as well as, the removal of abandoned vehicles and nuisances; and

WHEREAS, the City of Barrow seeks to proactively plan for future development in a coordinated manner utilizing a unified strategy for achieving goals on behalf of the community of Barrow; and

WHEREAS, the City of Barrow has reviewed the Final Draft Barrow Comprehensive Plan and has determined that it is an appropriate and effective guide for future development of Barrow for the next 20 years; and

WHEREAS, the Barrow City Council indicates that the Final Draft Barrow Comprehensive Plan should provide additionally for and include the following items:

1. Plan shall be further developed to address all the comments listed in Bezek Durst Seiser Letter to the North Slope Borough Community Development Planner dated September 23, 2014 from the following stakeholders; City of Barrow, Barrow Zoning Commission, and Ukpeagvik Inupiat Corporation;
2. Plan will include as an attachment under new Appendix C - The City of Barrow 5-Year Strategic Plan dated September 15, 2014.

NOW, THEREFORE, BE IT RESOLVED, that the Barrow City Council formally endorses and approves of the Final Draft 2015 - 2035 Barrow Comprehensive Plan developed by the North Slope Borough with the inclusion of the elements listed above.

PASSED AND APPROVED UNANIMOUSLY BY THE BARROW CITY COUNCIL ON THIS 23rd DAY OF OCTOBER, 2014.

Attest:

Bob Harcharek, Mayor

Lele Samuelu, City Clerk
Appendix B: Barrow Zoning Commission Resolution

NORTH SLOPE BOROUGH BARROW ZONING COMMISSION
RESOLUTION SERIAL NO. 2014-04

A RESOLUTION ADOPTING AND RECOMMENDING
THE NORTH SLOPE BOROUGH PLANNING
COMMISSION AND ASSEMBLY APPROVE THE 2014
BARROW COMPREHENSIVE PLAN

WHEREAS, the Barrow Zoning Commission is charged under North Slope
Borough Municipal Code (NSBMC) § 19.30.060 (a) with adopting and recommending to the
North Slope Borough Assembly a Comprehensive Plan for Barrow; and

WHEREAS, the Barrow Zoning Commission is further charged under the
NSBMC § 19.30.020 with implementing the Comprehensive Development plan for Barrow;
and

WHEREAS, the Barrow Zoning Commission is further charged under
NSBMC § 19.30.060 with making recommendations to the Administrator and Assembly
regarding rezonings, conditional uses, and other planning issues within Title 19 that rely upon
the guidance of the Barrow Comprehensive Plan; and

WHEREAS, the Barrow Zoning Commission seeks to proactively plan for
future development in Barrow in a coordinated manner utilizing a unified strategy for
achieving goals on behalf of the community of Barrow; and

WHEREAS, the North Slope Borough, through its Department of
Community Planning and Development (Planning Department), developed a Barrow
Comprehensive Plan for the years 2014 to 2035, utilizing the services of Umiaq, LLC and
Bezek Durst Seiser, Inc. (BDS); and

WHEREAS, a final draft Comprehensive Plan for Barrow was submitted to
interested parties on August 2014 and comments on the Plan were received until September
23, 2014; and

WHEREAS, on September 23, 2014, BDS submitted a letter to the Planning
Department outlining requested modifications to the Barrow Comprehensive Plan, dated
August 2014; and

WHEREAS, the Barrow Zoning Commission has reviewed the Barrow
Comprehensive Plan, along with the submitted comments, and determines it is an appropriate
and effective guide for future development in Barrow until 2035.

NOW, THEREFORE, BE IT RESOLVED THAT:
The Barrow Zoning Commission adopts the 2014 Barrow Comprehensive Plan, submitted by the North Slope Borough in August 2014 and modified by comments listed in the letter submitted by Bezek-Durst Seiser, Inc. on September 23, 2014, and recommends that the North Slope Borough Planning Commission and Assembly approve the Plan by ordinance.

INTRODUCED: October 9, 2014
ADOPTED: October 9, 2014

[Signature]
Chairman
Date: 10/9/2014

ATTEST:

[Signature]
Clerk
Date: 10/9/2014
Appendix B: Native Village of Barrow Resolution

NATIVE VILLAGE OF BARROW
Iñupiat Traditional Government

RESOLUTION 2014-12

A RESOLUTION OF THE NATIVE VILLAGE OF BARROW REGARDING THE 2014 BARROW COMPREHENSIVE PLAN DEVELOPED BY THE NORTH SLOPE BOROUGH FOR THE PERIOD 2015-2035

WHEREAS, the Native Village of Barrow is the federally listed and recognized tribal entity for the community of Barrow, and

WHEREAS, the Native Village of Barrow maintains consultation privileges as the respective tribe for the community of Barrow; and

WHEREAS, the common goals of local control and self-determination, the protection of the land, water and subsistence resources, mitigation of the negative impacts which may occur as a result of oil and gas development, the maximization of economic benefits and employment opportunities for Barrow today and into the future is fully shared by the tribal organization; and

WHEREAS, the Native Village of Barrow Tribal Council received a presentation of the Barrow Comprehensive Plan FINAL DRAFT by representatives of the North Slope Borough Planning Department and their consultants BDS Inc. and Umiaq LLC on August 18, 2014; and

WHEREAS, The Native Village of Barrow Tribal Council has reviewed the 2014 Barrow Comprehensive Plan document labeled FINAL DRAFT dated August 2014, as prepared by BDS Inc. and UMIAQ, LLC; and

WHEREAS, The 2014 Barrow Comprehensive Plan was found to be sufficient to guide the future development of Barrow for the next 20 years;

Exhibit language for modifying the body of the resolution that may be entertained during the Council's deliberation process of the original draft resolution language

WHEREAS, as an amendment, The Native Village of Barrow Tribal Council indicates as conditional approval that the Barrow Comprehensive Plan also provide for the following items;

- List amendment items here

THEREFORE BE IT RESOLVED; that the Native Village of Barrow, as represented by the Tribal Council, recommends approval of the 2014 Barrow Comprehensive Plan by the North Slope Borough.

Adopted this 15th day, of September 2014.

APPROVED

Thomas Olemaun, President

Fannie Suvlu, Secretary
WHEREAS, Ukpeagvik Inupiat Corporation (UIC) is a for-profit village corporation created and established under the Alaska Native Claims Settlement Act of 1971; and

WHEREAS, UIC represents approximately 2,900 shareholders of record, many of which reside in the City of Barrow; and

WHEREAS, the common goals of local control and self-determination, the protection of the land, water and subsistence resources, mitigation of the negative impacts which may occur as a result of oil and gas development, the maximization of economic benefits and employment opportunities for Barrow today and into the future is fully shared by all Barrow stakeholders; and

WHEREAS, the North Slope Borough Planning and Community Services Department has prepared a Barrow Comprehensive Plan 2014 – 2035 dated August 2014 in consultation with BDS, Inc. and UMIAQ, LLC; and

WHEREAS, the Barrow Comprehensive Plan is a long-range document that assists the Barrow community in preparing for and managing its resources and providing for its residents over the next 20 years; and

WHEREAS, UIC is the primary landowner for new development and redevelopment areas within the community; and

WHEREAS, UIC seeks to proactively plan for future development in a coordinated manner utilizing a unified strategy for achieving goals on behalf of the community of Barrow; and

WHEREAS, the UIC is an integral partner in facilitating a planned and coordinated future for the residents of the City of Barrow; and

WHEREAS, the UIC has reviewed the Barrow Comprehensive Plan and has determined that it is an appropriate and effective guide for future development of Barrow for the next 20 years; and
WHEREAS, as an amendment UIC indicates that the Barrow Comprehensive Plan should also include the following items:

1. The draft Comprehensive Plan includes a brief narrative on contaminated sites. Given new federal funding for clean-up of contaminated wells, some further discussion should be included on the need for a contaminated sites remediation staging area and legacy wells within the NPR-A and Barrow Area of Influence.

2. The need for additional gravel resources in Barrow and across the North Slope is undeniable. To adequately plan for future development, the plan should more thoroughly consider how much gravel will be needed for future development. Two potential recommendations to facilitate gravel exploration and mining are 1) establishing a Mining Zoning District and 2) allowing mining by-right in the Conservation and/or Reserve Districts for community use.

3. A new master plan has been approved for the Wiley Post / Will Rogers Memorial Airport that will allow access to the airport from the south. The Barrow Comprehensive Plan should expound on potential development south of the airport, including the need for additional industrial facilities to support oil and gas development and the potential for an expanded United States Coast Guard presence. The Barrow Comprehensive Plan should also include in general how gas, electric, water, and sewer utilities will be served to the south airport industrial area including plans for all future necessary easements. UIC strongly suggests that an alternative Walakpa natural gas supply line should come up through the Emiksoun Road route. This alternative gas line will serve as the community’s redundant natural gas supply line.

4. The Plan includes land use maps for Barrow, Browerville and South Barrow. Another should be included that illustrates land use at NARL.

NOW THEREFORE BE IT RESOLVED, that Ukpeagvik Inupiat Corporation supports the adoption of the Barrow Comprehensive Plan.

AND BE IT FURTHER RESOLVED, that Ukpeagvik Inupiat Corporation strongly urges that the draft Barrow Comprehensive Plan be amended to include the four items detailed above.

Duly Approved this 26th day of October, 2014, in Anchorage, Alaska, at a Special Meeting of the Ukpeagvik Inupiat Corporation Board of Directors.

Price E. Brower, Chairman

ATTEST:

Richard Ungarook Sr., Corporate Secretary

Page 2 of 2

Ukpeagvik Inupiat Corporation
### 21.3 Appendix C: Barrow 2035 by Agency/Department

This is a beginning list of projects to be sequenced/prioritized

<table>
<thead>
<tr>
<th>Infrastructure Projected Impacts</th>
<th>Priority</th>
<th>Target Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infrastructure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Consolidated Office Facility</td>
<td>1</td>
<td>2018</td>
<td>A Draft PAR projects needs thru 2020. It estimates facility size at 72,000 GSF (3 stories) on a site of 3.2 acres.</td>
</tr>
<tr>
<td>Repurposed NSB Admin Building #1274</td>
<td>2</td>
<td>2018</td>
<td>The Comprehensive Plan selected planning option sees repurposing this facility for Ilisagvik College use along with the Nurses quarters on the old hospital site. Funding for Ilisagvik is assumed separate from NSB.</td>
</tr>
<tr>
<td>Repurposed CIPM/Public Works Building</td>
<td>3</td>
<td>2018</td>
<td>This facility would be relocated to decongest the Barrow High School site and make room for Barrow High School expansions , parking and student drop off both parent and bus.</td>
</tr>
<tr>
<td>Repurposed Planning and Community Services Building #0251</td>
<td>4</td>
<td>2017</td>
<td>The Health Department would consider this building to be repurposed for a Homeless Center once the NSB consolidated facility is completed. NVB recently stated that it is establishing a homeless center.</td>
</tr>
<tr>
<td>Shipping and Receiving Warehouse# 179S</td>
<td>5</td>
<td>2018</td>
<td>This facility will remain for its current purposes. It currently has a project to include an emergency response center.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>NSB Health and Social Services</strong></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Children’s services</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Re-establish Browerville Daycare #1 - 44 children</td>
<td>1</td>
<td>2018</td>
<td>As replacing the KITTA program in a new facility will take a period of time for design and construction, consideration should be given to building the first of two additional day cares and letting KITTA stay in the Browerville day care structure until it can be more ideally sited. The end time frames are potentially the same under both scenarios with the later having a less disruptive result with better community placement for KITTA.</td>
</tr>
<tr>
<td>New Daycare #2 - 125 Children</td>
<td>2</td>
<td>2018</td>
<td>A PAR has been completed. It calls for a single day care for 249 children. The Comprehensive Plan suggests dividing this into two facilities to provide greater accessibility to different community centers.</td>
</tr>
<tr>
<td>New Daycare #3 - 125 Children</td>
<td>3</td>
<td>2020</td>
<td>See item 2 above</td>
</tr>
<tr>
<td>Children and Youth Services</td>
<td>4</td>
<td>2017</td>
<td>The Health Department states that this facility has two issues - size, and location. Assume that the facility doubles in bed count and assume a new facility. The current facility is 5,802 SF.</td>
</tr>
<tr>
<td>ITTC, Iñupiat Teens Taking Control</td>
<td>5</td>
<td>2020</td>
<td>This is the old Matsutani building and although it is beyond its useful life its current function is not replaced in this Comp Plan.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Adult Services</strong></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Maternal Home</td>
<td>1</td>
<td>2025</td>
<td>This facility is currently run by ASNA. It is at 274 Pisokak. ASNA would ultimately like to reestablish this facility near the new hospital. The current facility appears to be +/-1,600 SF and could be returned to housing.</td>
</tr>
<tr>
<td>Substance Abuse Treatment Center</td>
<td>2</td>
<td>2019</td>
<td>The past Adult Substance Abuse Treatment Facility is now the Wellness Center. Health has indicated that a new center is needed.</td>
</tr>
<tr>
<td>Detox Facility</td>
<td>3</td>
<td>2020</td>
<td>This does not appear to be in the Justice Center PAR for adults. Although the Justice center PAR provides for Juveniles it does not appear to provide for adults. Should detox be a function managed by the Police and staffed by the Health Department.</td>
</tr>
<tr>
<td>Mental Health</td>
<td>4</td>
<td>2025</td>
<td>The Health Department sees this as a congregate facility vs. group homes. The Health Department sees it located near the new Hospital. Currently six persons are served with a need for 30 persons by 2035.</td>
</tr>
</tbody>
</table>
## 21.3 Appendix C: Barrow 2035 by Agency/Department (continued)

This is a beginning list of projects to be sequenced/prioritized.

<table>
<thead>
<tr>
<th>Infrastructure Projected Impacts</th>
<th>Priority</th>
<th>Target Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5</strong> AWIC</td>
<td></td>
<td></td>
<td>A New Facility specifically designed for this purpose is projected at a location near the new Police Station. The 12 Plex it is currently housed in would be returned to standard housing.</td>
</tr>
<tr>
<td><strong>6</strong> Homeless Center</td>
<td></td>
<td></td>
<td>Assumes some homeless may be families with children. The Health Department projects a need for 40 people by 2035. NVB reported that it is working on a Homeless shelter. When the NSB Consolidated facility is completed a number of facilities will be available for repurposing. The current Planning Department offices at 251 Pisokak might be repurposable as a homeless Center. It is 6,156 SF. This analysis makes this assumption.</td>
</tr>
<tr>
<td><strong>7</strong> Dental Care</td>
<td></td>
<td></td>
<td>Located at new hospital and provided by ASNA</td>
</tr>
<tr>
<td><strong>8</strong> Eye Care</td>
<td></td>
<td></td>
<td>Currently being transferred to new Hospital. Service to be provided by ASNA</td>
</tr>
<tr>
<td><strong>9</strong> Wellness Center</td>
<td></td>
<td></td>
<td>Currently Public Health Nursing and the CHAP program are located in this Facility. These services may be transferred to ASNA in the future which would bring the use of this facility into question. As it has a kitchen it may also be a candidate for a Homeless Center.</td>
</tr>
<tr>
<td><strong>10</strong> Administration</td>
<td></td>
<td></td>
<td>Assume this function to be included in the NSB Consolidated Office facility.</td>
</tr>
</tbody>
</table>

**Senior Services**

<p>| | | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>1</strong> Long Term Care/Skilled Nursing</td>
<td></td>
<td></td>
<td>This assumes that the long term care facility will be attached to the Hospital. It also assumes that ASNA would run it. Several other Rural Communities in Alaska have gone this way due to sharing staff with the hospital. Kotzebue has 18 beds connected to its hospital and the facility size is approximately 15,000 SF. Using this background information 30 beds in Barrow would require a +/- 25,000 SF facility. Kotzebue has double occupancy rooms.</td>
</tr>
<tr>
<td><strong>2</strong> Assisted Living</td>
<td></td>
<td></td>
<td>The current need is +/- 18. Need projected by 2035 at 50 beds</td>
</tr>
<tr>
<td><strong>3</strong> Independent living</td>
<td></td>
<td></td>
<td>The current need is 20 beds going to 50 beds by 2035</td>
</tr>
</tbody>
</table>

**Repurposed structures (housing/other)**

<p>| | | | |</p>
<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> 12 Plex # 4370</td>
<td></td>
<td></td>
<td>To be given to TNHA for repurposing as housing</td>
</tr>
<tr>
<td><strong>2</strong> 12 Plex # 5200</td>
<td></td>
<td></td>
<td>To be given to TNHA for repurposing as housing</td>
</tr>
<tr>
<td><strong>3</strong> 12 Plex # 5125 currently AWIC</td>
<td></td>
<td></td>
<td>To be given to TNHA for repurposing as housing</td>
</tr>
<tr>
<td><strong>4</strong> Existing CYS Facility # 2000</td>
<td></td>
<td></td>
<td>This facility could possibly be relocated and expanded on a new site.</td>
</tr>
</tbody>
</table>

**Public Works Department**

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> New Storage/Shop (Note: Items 1,2,3 and 4 may all be one facility)</td>
<td></td>
<td></td>
<td>This is replacement for the current facility building # 3429</td>
</tr>
<tr>
<td><strong>2</strong> New and expanded Heavy Equipment Shop and Warehouse</td>
<td></td>
<td></td>
<td>This is replacement for the current facilities building #’s 3427 and 3425</td>
</tr>
<tr>
<td><strong>3</strong> New and expanded Light Duty Service Shop</td>
<td></td>
<td></td>
<td>This is replacement for the current facility building # 3431</td>
</tr>
<tr>
<td><strong>4</strong> New Mechanical Building/Fuel Division replacing old Bus Barn # 1685/1683.2</td>
<td></td>
<td></td>
<td>This is replacement for the current facility building # 1685</td>
</tr>
<tr>
<td><strong>5</strong> Administration</td>
<td></td>
<td></td>
<td>Assume the Public Works administration is to be located in the new NSB Consolidated Facility.</td>
</tr>
<tr>
<td><strong>6</strong> Demolish/Interim Repurpose (erosion) DMS Storage/Shop # 3429</td>
<td>2035</td>
<td>As Public works shops are replaced the old facilities could be used by various NSB agencies for interim uses such as storage until such time that erosion causes demolition. Or one of the shops may make a satellite Public works equipment storage facility.</td>
<td></td>
</tr>
<tr>
<td><strong>7</strong> Demolish/Interim Repurpose (erosion) DMS Heavy Equipment Shop # 3427</td>
<td>2035</td>
<td>Same as Item 6</td>
<td></td>
</tr>
<tr>
<td><strong>8</strong> Demolish/Interim Repurpose (erosion) DMS Heavy Equipment Shop Warehouse # 3425</td>
<td>2035</td>
<td>Same as Item 6</td>
<td></td>
</tr>
<tr>
<td><strong>9</strong> Demolish/Interim Repurpose (erosion) DMS Light Duty Service Shop # 3431</td>
<td>2035</td>
<td>Same as Item 6</td>
<td></td>
</tr>
</tbody>
</table>
## 21.3 Appendix C: Barrow 2035 by Agency/Department

This is a beginning list of projects to be sequenced/prioritized

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<th>Infrastructure Projected Impacts</th>
<th>Priority</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Demolish Mechanical Building # 1685</td>
<td>10</td>
<td>2035</td>
<td></td>
</tr>
<tr>
<td>Perhaps repurpose. Public Works Building # 1689</td>
<td>11</td>
<td>2035</td>
<td>Assume worst case-relocate &amp; repurpose back to housing</td>
</tr>
<tr>
<td>Shop III # xxx1.1</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expanded Thermal Oxidation Facility Capacity</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Landfill Cells</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road/ utility expansions</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Okpik St. to Uula St. extension with extension of Uula St. to Okpik St.</td>
<td>1.0</td>
<td>2017</td>
<td>Includes significant crossing at the upper end of the Upper Isatkoak Lagoon.</td>
</tr>
<tr>
<td>2. Ahmaogak St. ext. to Okpik St. ext.</td>
<td>2.0</td>
<td>2019</td>
<td></td>
</tr>
<tr>
<td>3. Residential streets</td>
<td>3.0</td>
<td>2020</td>
<td>These streets are needed to support currently platted and proposed new residential lots. The following streets are included: Qaiyaan (4,000Lf), Kignak (4,400LF), S nim (2,300), Solomon (2,300LF), Aiken (2,300LF), Kaleak (2,300LF). Proposed streets A thru G (3,600LF). All of these streets require sewer, water, power and gas.</td>
</tr>
<tr>
<td>4. Ogrook/Ahhkovak Street repositioning</td>
<td>4.0</td>
<td>2020</td>
<td>Funded by the State of Alaska DOT.</td>
</tr>
<tr>
<td>5. Uula St. from Okpik St. ext. around east and south sides of Airport</td>
<td>5.0</td>
<td>2025</td>
<td>This road project would primarily serve the proposed industrial area on the south side of the airport and could possibly be funded by those interests.</td>
</tr>
<tr>
<td>6. Okpik St. from Uula St. to Cakeeater road</td>
<td>6.0</td>
<td>2026</td>
<td>This road could have significance in sharing right of way for a gas line feeder to the south side of the airport.</td>
</tr>
<tr>
<td>7. Uula St. from Boxer to Stevenson St.</td>
<td>7.0</td>
<td>2030</td>
<td></td>
</tr>
<tr>
<td>8. Residential Roads</td>
<td>8.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Residential Roads</td>
<td>9.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erosion Mitigation / coastal revetment</td>
<td>16</td>
<td>2017</td>
<td>This issue is just now going into a study and Design Phase. The cost would most probably be spread over several years.</td>
</tr>
<tr>
<td>Lower Isatkoak Lagoon Filling</td>
<td>17</td>
<td>2017</td>
<td>An earlier COE study suggested this as part of a mitigation solution.</td>
</tr>
</tbody>
</table>

### Search and Rescue

<table>
<thead>
<tr>
<th>Search and Rescue</th>
<th>Priority</th>
<th>Target Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Facility planned for North side of airport</td>
<td>1</td>
<td>2015</td>
<td>A PAR is completed and Option 3 in that PAR was selected which is for an entirely new facility on the north side of the airport.</td>
</tr>
<tr>
<td>Repurpose Search and Rescue building # 1797A</td>
<td>2</td>
<td>2017</td>
<td>Risk Management would like to take over this facility when Search and Rescue get their new Facility. Risk Management needs a fast response storage space for supplies and equipment for emergency preparedness.</td>
</tr>
</tbody>
</table>

### Fire

<table>
<thead>
<tr>
<th>Fire</th>
<th>Priority</th>
<th>Target Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Station #1 replacement and expansion</td>
<td>1</td>
<td>2018</td>
<td>This replacement / expansion will allow the new NSB Consolidated Facility to have the prominent site location if located on the old weather station site. Additionally it would allow the Fire station to better accommodate new equipment and possibly relocate the Fire Departments Administration functions adjoining the NSB Consolidated Facility.</td>
</tr>
<tr>
<td>New Fire Station # 3 combined with Training Center</td>
<td>2</td>
<td>2020</td>
<td>This facility will serve Cakeeater and NARL</td>
</tr>
</tbody>
</table>
## 21.3 Appendix C: Barrow 2035 by Agency/Department

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### Police

<table>
<thead>
<tr>
<th></th>
<th>Priority</th>
<th>Target Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Justice Center</td>
<td>1</td>
<td>2018</td>
<td>Same as item 1</td>
</tr>
<tr>
<td>Police Station</td>
<td>2</td>
<td>2018</td>
<td>Same as item 1</td>
</tr>
<tr>
<td>Jail</td>
<td>3</td>
<td>2025</td>
<td>Same as item 1</td>
</tr>
<tr>
<td>Adolescent Substance Abuse Center</td>
<td>4</td>
<td>2025</td>
<td>Same as item 1</td>
</tr>
<tr>
<td>Demolition of current Police Station and Quonset.</td>
<td>5</td>
<td>2019</td>
<td>It is assumed that the old police station would be demolished after replacement</td>
</tr>
</tbody>
</table>

### Wildlife Management

<table>
<thead>
<tr>
<th></th>
<th>Priority</th>
<th>Target Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Facility</td>
<td>1</td>
<td>2017</td>
<td>New Facility adjacent to BARC @ NARL currently in design.</td>
</tr>
</tbody>
</table>

### BUECI

<table>
<thead>
<tr>
<th></th>
<th>Priority</th>
<th>Target Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Power Plant Bldg. #129SG</td>
<td>1</td>
<td>2025</td>
<td>A new redundant power plant is proposed. Should anything happen to the existing plant the community would be in dire straights. Also considering demographic projections the community will be out of capacity by 2035. A redundant facility should be planned for community safety. BUECI said its generators are constantly upgraded and renewed such that generators are always on a new life cycle. This does not account for new technology. Also the condition of the existing facility and its foundations is unknown.</td>
</tr>
<tr>
<td>Relocation of BUECI Office Bldg.</td>
<td>2</td>
<td>2025</td>
<td>This line item goes with repurposing the combined CO2/Old Hospital/BUECI sites - see Community Plan Option 4</td>
</tr>
<tr>
<td>New Redundant Power Plant</td>
<td>3</td>
<td>2025</td>
<td>A new redundant power plant is proposed. Should anything happen to the existing plant the community would be in dire straights. Also considering demographic projections the community will be out of capacity by 2035. A redundant facility should be planned for community safety. BUECI said its generators are constantly upgraded and renewed such that generators are always on a new life cycle. This does not account for new technology. Also the condition of the existing facility and its foundations is unknown.</td>
</tr>
<tr>
<td>New Distribution Lines</td>
<td>4</td>
<td>2025</td>
<td>Growth will require new distribution lines.</td>
</tr>
<tr>
<td>Redundant water source identification and development</td>
<td>5</td>
<td>2025</td>
<td>The issue of redundancy in the interest of Community Safety was heavily discussed with the thought that a redundant water source would add to Community safety should something happen to contaminate the current water source.</td>
</tr>
<tr>
<td>Redundant water treatment facility</td>
<td>6</td>
<td>2025</td>
<td>Demographic projections and water usage analysis indicate that capacity will be reached in 2035. Therefore, an approach may be to create a Redundant Water Treatment Facility.</td>
</tr>
<tr>
<td>Redundant water distribution facility</td>
<td>7</td>
<td>2025</td>
<td>Same as item 7</td>
</tr>
<tr>
<td>New Water distribution</td>
<td>8</td>
<td>2025</td>
<td>Demographic growth and current unmet housing needs will require additional water distribution.</td>
</tr>
<tr>
<td>Workout Bldg. #1295E</td>
<td>9</td>
<td>2025</td>
<td>See item 2. Note: this building does not appear to be accounted for in the six year plan.</td>
</tr>
<tr>
<td>Tool Room</td>
<td>10</td>
<td>2025</td>
<td>This may be the TSP building identified in the six year plan as BABS04.</td>
</tr>
<tr>
<td>Storage</td>
<td>11</td>
<td>2025</td>
<td>This building is not accounted for in the six year plan.</td>
</tr>
<tr>
<td>Expanded Sewer pump stations</td>
<td>12</td>
<td>2025</td>
<td>Same as item 9</td>
</tr>
<tr>
<td>New Wastewater Treatment Capacity</td>
<td>13</td>
<td>2025</td>
<td>Same as item 9</td>
</tr>
<tr>
<td>New Sewer Collection Lines</td>
<td>14</td>
<td>2025</td>
<td>Same as item 9</td>
</tr>
</tbody>
</table>

### Natural Gas / Gas Fields

#### East

<table>
<thead>
<tr>
<th></th>
<th>Priority</th>
<th>Target Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>1</td>
<td>2025</td>
<td></td>
</tr>
</tbody>
</table>

#### South

<table>
<thead>
<tr>
<th></th>
<th>Priority</th>
<th>Target Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>1</td>
<td>2025</td>
<td></td>
</tr>
</tbody>
</table>

### Supply Line from Gas Fields

<table>
<thead>
<tr>
<th></th>
<th>Priority</th>
<th>Target Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>New redundant gas supply line</td>
<td>1</td>
<td>2015</td>
<td></td>
</tr>
</tbody>
</table>
## 21.3 Appendix C: Barrow 2035 by Agency/Department

This is a beginning list of projects to be sequenced/prioritized

<table>
<thead>
<tr>
<th>Infrastructure Projected Impacts</th>
<th>Priority</th>
<th>Target Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NSBSD</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 New Consolidated Central Offices</td>
<td>2020</td>
<td></td>
<td>CIPM reported that a current PAR is not for consolidation of NSBSD offices in general but for renovations to the CO2 main structure building number 1849. This PAR was scheduled for completion in April 2014. In interviews over time with the SD there has been discussion of a more universal consolidation including offices in the Districts Central Facility building number 0829.</td>
</tr>
<tr>
<td>2 New Residential Learning Center</td>
<td>2020</td>
<td></td>
<td>The School District has stated that there are several concepts being explored. One of those concepts would only include housing and utilize Barrow High School and Illigagvik educational spaces.</td>
</tr>
<tr>
<td>3 Renovations and Additions Barrow High School</td>
<td>2020</td>
<td>For this analysis we have combined the SD Six Year Plan PAR’s for both Major Renovations and Multi Purpose room addition. The perspective is that a complete look at the function of the high school as a community facility (including community recreational uses) would be beneficial with a single project that is Phased. As a residential Learning Center is now a part of the greater picture it could also be studied in a new PAR.</td>
<td></td>
</tr>
<tr>
<td>4 New Kiita school</td>
<td>2020</td>
<td>The Kiita school currently occupies the old Browerville Day Care. The Mayor has indicated that she wants the Day Care Facility to return to its original purpose. The current facility occupies 10,021 SF and serves 50 students. The District projects the need thru 2035 at 70 students. Current PAR efforts are for an interim solution. That solution could be studied further based on opportunities described in the Comp Plan.</td>
<td></td>
</tr>
<tr>
<td>5 New Bus Barn</td>
<td>2018</td>
<td>This facility could be co located with new Public Works shops and can include SD warehousing.</td>
<td></td>
</tr>
<tr>
<td>6 New Warehouse</td>
<td>2018</td>
<td>Should the CO2 site be renewed this facility would either be relocated or replaced.</td>
<td></td>
</tr>
<tr>
<td>7 Repurposed School District Administration Building # 0829</td>
<td>2021</td>
<td>Repurpose use to be identified such as ICAS central office relocation</td>
<td></td>
</tr>
<tr>
<td>8 Relocated Duplex # 18949N</td>
<td>2019</td>
<td>To clear the CO2 site for alternative uses and renewal teacher housing should be replaced. Housing on the CO2 site could be put out to bid for removal. This could at the bidders choice be either demolished or relocated and restored. New multi family housing for teachers, Search and Rescue, BUECI and residents at large would have to be constructed first. The city owns a site that could accommodate from 80 to 100 units of multi family housing that is conveniently located east of Block A. A Developer/City with lease agreements in hand could secure financing to construct such a project. A feasible completion date would be 2018.</td>
<td></td>
</tr>
<tr>
<td>9 Relocated six Plex # 1849L</td>
<td>2019</td>
<td>see Item 8 remarks</td>
<td></td>
</tr>
<tr>
<td>10 Demolished CO2 Offices #1849 except for old Gym Old gym to be restored as historical facility and Roller Rink function retained.</td>
<td>2019</td>
<td>Note this facility in the six year plan is called out as 36,738 GSF. Approximately 29,000sf of the facility would be demolished and the old gym +/- 7,000sf would be restored.</td>
<td></td>
</tr>
<tr>
<td>11 Relocated CO2 10 Plex # 1849A</td>
<td>2019</td>
<td>see item 8 remarks</td>
<td></td>
</tr>
<tr>
<td>12 Relocated CO 2 Duplex # 1849J</td>
<td>2019</td>
<td>see item 8 remarks</td>
<td></td>
</tr>
<tr>
<td>13 Relocated CO2 Duplex # 1849P</td>
<td>2019</td>
<td>see item 8 remarks</td>
<td></td>
</tr>
<tr>
<td>14 Relocated/Demolished and replaced CO2 Warehouse # 1849H</td>
<td>2019</td>
<td>see item 8 remarks</td>
<td></td>
</tr>
<tr>
<td>15 Relocated CO2 Duplex # 1849K</td>
<td>2019</td>
<td>see item 8 remarks</td>
<td></td>
</tr>
<tr>
<td>16 Relocated CO2 Four Plex 3 1849C</td>
<td>2019</td>
<td>see item 8 remarks</td>
<td></td>
</tr>
<tr>
<td>17 Relocated/Repurposed CO2 Grants # 1849D.1</td>
<td>2019</td>
<td>see item 8 remarks</td>
<td></td>
</tr>
<tr>
<td>18 Relocated/repurposed CO2 Grants # 1849D.2</td>
<td>2019</td>
<td>see item 8 remarks</td>
<td></td>
</tr>
<tr>
<td>19 Relocated CO2 Duplex # 1849R</td>
<td>2019</td>
<td>see item 8 remarks</td>
<td></td>
</tr>
<tr>
<td>20 Relocated CO2 Single Family # 1849I</td>
<td>2019</td>
<td>see item 8 remarks</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix C: Barrow 2035 by Agency/Department

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<tr>
<th>Infrastructure Projected Impacts</th>
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<th>Target Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 Relocated CO2 Single Family #1849G</td>
<td>2019</td>
<td></td>
<td>see item 8 remarks</td>
</tr>
<tr>
<td>22 Relocated CO2 Duplex #1849B</td>
<td>2019</td>
<td></td>
<td>see item 8 remarks</td>
</tr>
<tr>
<td>23 Relocated CO2 Single Family #1849M</td>
<td>2019</td>
<td></td>
<td>see item 8 remarks</td>
</tr>
<tr>
<td>24 Demolished CO2 Utilidors #1849J</td>
<td>2019</td>
<td></td>
<td>Demolishing and replacing the SD bus barn and adjoining facility(s) will make room for Barrow High School expansion, parking and better parent &amp; bus drop-off. Should a new Alaska Airlines terminals be constructed across from the High School and Ahkovak St. be relocated high school parking could serve as overflow parking for the Terminal as well.</td>
</tr>
<tr>
<td>25 Demolish School District / Bus Barn # 1683.1</td>
<td>2019</td>
<td></td>
<td>Demolishing and replacing the SD bus barn and adjoining facility(s) will make room for Barrow High School expansion, parking and better parent &amp; bus drop-off. Should a new Alaska Airlines terminals be constructed across from the High School and Ahkovak St. be relocated high school parking could serve as overflow parking for the Terminal as well.</td>
</tr>
</tbody>
</table>

### Ilisagvik College

| 1 New Campus | 2021 | The space projects a site size of 8 acres - Rise Alaska January 24, 2012 Space Program Study. The Comp Plan identifies four alternative sites. |
| 2 Ilisagvik Browerville Center # 4493 |  | This facility may become obsolete when the new campus is in place. |

### IHLC Museum (Inupiat History, Language and Culture) and Tuzzy Library

| 1 New PAR in progress |  | The NSB Six Year Plan indicates that an addition is being planned. If Ilisagvik were to move to a the new campus that included the Tuzzy library function would this current plan be relevant? The current facility is 26,966SF. |
| 2 Tuzzy Library |  | Ilisagvik indicated that they just spent considerable dollars to upgrade this facility. The question is how does this function impact new campus plans? If new campus includes a library function will Tuzzy space become available for Museum expansion. |

### ICAS

| 1 ICAS Administrative Offices |  | ICAS wishes to move its offices into Barrow. There will be a number of structures up for repurposing should the NSB Consolidated Facility and or NSBSD Consolidated Facility be constructed. |

### NVB

| 1 Home Construction |  | NVB is pursuing the construction of 20 homes per Year using tribal funding sources. |
| 2 IRR |  | NVB is able to access tribal moneys (IRR) for roads. They have contributed to local road projects in the past and will continue to do so. |
| 3 Foster Care |  | NVB manages foster care for displaced Native children. More housing is needed to facilitate this option. The estimate by 2035 is 40 to 60 children. Should foster care not become more viable then an orphanage would be an alternative. |
| 4 Repurposing Facilities |  | NVB might have opportunities for repurposed spaces when consolidated facilities are constructed. |

### ASNA

| 1 Long Term Care |  | Long Term Care/ Nursing Facility is a highly likely adjunct to the hospital and likely will need to share hospital staff and therefore be managed by ASNA. This is the case in similar size Facilities in Nome an Kotzebue. |
| 2 Pre Nataal Facility - ASNA runs the current facility |  | ASNA has indicated a desire to center health related services and facilities around the new Hospital. The NSB Health Department concurs. |
## 21.3 Appendix C: Barrow 2035 by Agency/Department

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<tr>
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<th>Target Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3 Nurses/Staff Housing</strong></td>
<td></td>
<td></td>
<td>Currently ASNA controls 84 housing units. They project their need thru 2035 at 100 units. The Nurses housing adjacent to the old hospital is relatively new but no longer in the most advantageous location. ASNA occupies housing throughout the community in addition to Nurses quarters at the old Hospital site. In order to relinquish the Nurses housing at the old Hospital site ASNA will need that housing replaced at the New Hospital site.</td>
</tr>
<tr>
<td><strong>4 Status of old hospital site</strong></td>
<td></td>
<td></td>
<td>The condition of the old Hospital is unknown. ASNA plans on maintaining control of the old hospital site but expressed a willingness to work with other Stakeholders regarding this site. ASNA has submitted paperwork to gain control of the old hospital site.</td>
</tr>
<tr>
<td><strong>5 Other Health Facilities</strong></td>
<td></td>
<td></td>
<td>There is a current trend to have ASNA assume and more of the services that are currently provided thru NSB Health Department.</td>
</tr>
</tbody>
</table>

### TNHA

| 1 New Housing |          |             | Between NVB, TNHA and most recently UIC 800 to 900 housing units need to be developed thru 2035. A number of repurposed structures are likely to be freed up for return to housing. This element of the Comp Plan will require further study. |

### City of Barrow

| 1 Football Field |          |             | The City has expressed an interest in relocating the football field adjacent to Piuraagvik. |
| 2 Boat Harbor    |          |             | Should UIC build a port, the Cities boat harbor could be affected. |
| 3 Block A Housing|          |             | The City owns a large parcel of property East of Block A. One use for this property would be multi family housing. It is estimated that the site could accommodate 80 to 100 units. It is ideally located to serve a combination of users inclusive of teachers, search and rescue pilots, BUECI staff and tribal members at large. |
| 4 Retail         |          |             | The City in the past has looked for revenue sources to underwrite its programs. Should the City and School district study their joined sites there may be a possibility for retail space on these joined sites. |

### UIC

<p>| 1 Gravel Resource Development |          |             | Reference 2.6.6 in this Comp Plan. |
| 2 Extended Stay Facility      |          |             | UIC envisions an extended stay facility in the vicinity of the new Hospital. This could free up some community housing from itinerant use. |
| 3 Port/ Harbor               |          |             | UIC has visions of a port in either the North Salt Lagoon or Elson Lagoon. UIC plans on initiating studies for a port and the NSB has proposed a Port Authority to accommodate this vision. |
| 4 Logistics Area -NARL       |          |             | A possible repurposing of some areas of NARL. |
| 5 Pre-Fab Housing Plant-NARL  |          |             | Given the large projection of needed housing units over the next 20 years UIC is planning on implementing a pre fab housing manufacturing facility at NARL. |
| 6 Ilisagvik College Option-NARL |          |             | UIC is interested in seeing Ilisagvik college stay at NARL. NARL is one of several options that the Comp Plan has documented for Ilisagvik. |
| 7 Residential Learning Center Option-NARL |          |             | UIC is interested in accommodating the proposed Residential Learning Center at NARL. This is one of several Options for this proposed function captured in the Comp Plan. |
| 8 Residential Housing-NARL    |          |             | UIC has stated its intentions to remove older structures at NARL and to build new housing there that will be open to all residents seeking to purchase /lease housing. |</p>
<table>
<thead>
<tr>
<th>Infrastructure Projected Impacts</th>
<th>Priority</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>9</strong> Revitalization Building 360-NARL</td>
<td></td>
<td>Several tenants have indicated a desire to exit this structure due to age and technology. UIC indicates that this structure will continue in use and it is presumed that upgrades are in the future.</td>
</tr>
<tr>
<td><strong>10</strong> Traditional Center</td>
<td></td>
<td>UIC has expressed interest in building a Traditional Center for upwards to 300 people. They indicated that this would not be a gym type space.</td>
</tr>
<tr>
<td><strong>11</strong> Shell Oil Camp</td>
<td></td>
<td>UIC is building a pad in anticipation of oil development on the south side of the airport.</td>
</tr>
<tr>
<td><strong>12</strong> USCG Camp</td>
<td></td>
<td>See Shell Camp. UIC is planning its pad for both Shell and the USCG. Various stakeholders put the shell camp size at 400 persons and he USCG camp as a seasonal 50 persons.</td>
</tr>
<tr>
<td><strong>13</strong> Multi-Family Housing</td>
<td></td>
<td>UIC has not in the recent past build houses but their current stated interest in a housing manufacturing plant at NARL would suggest that is about to change. It is assumed that they will also pursue multi-family housing.</td>
</tr>
<tr>
<td><strong>14</strong> Commercial/Retail Mall</td>
<td></td>
<td>The community has asked for development of retail space in a Mall? Type structure including a food court, movie theater, bowling alley and small specialty shops.</td>
</tr>
</tbody>
</table>

**ASRC**

<table>
<thead>
<tr>
<th>ASRC</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Resolution of damaged old Top of The World Hotel</td>
<td></td>
<td>ASRC pointed out that the current fuel farm sits on the remaining gravel resource and likely will need to be moved and expanded. No new site is known at this time.</td>
</tr>
<tr>
<td><strong>2</strong> New Fuel Farm</td>
<td></td>
<td>ASRC is planning on relocating it’s current gas station and adding one more. Locations to be determined.</td>
</tr>
<tr>
<td><strong>3</strong> Relocate Existing Gas Station</td>
<td></td>
<td>ASRC has competed construction of a new Hotel In Browerville. They are also converting the old Brower Café to a tourist artist shop with additional artist studios in adjacent structures.</td>
</tr>
<tr>
<td><strong>4</strong> New Second Gas Station</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5</strong> Arts Colony</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6</strong> New Top of the World hotel</td>
<td></td>
<td>Unknown. ASRC is another stakeholder that could answer the desire for a mall.</td>
</tr>
<tr>
<td><strong>7</strong> Commercial/Retail Mall</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**State of Alaska**

<table>
<thead>
<tr>
<th>State of Alaska</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Airport</td>
<td></td>
<td>Airport planning for oil impacts and new aircraft is completed. DOTPF has stated that no new airport properties are needed. The States Master plan includes moving Ogrook/Ahkovak St. street between Kiqagak street to Okpik street North on a narrow bank of land it controls to ease traffic congestion on that street. UIC has indicated that Alaska Airlines wants a new terminal.</td>
</tr>
</tbody>
</table>

**National Guard**

<table>
<thead>
<tr>
<th>National Guard</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Relocation Existing Facility</td>
<td></td>
<td>To free up the CO2 site for repurposing of this valuable property this facility needs to be relocated.</td>
</tr>
</tbody>
</table>

**Coast Guard**

<table>
<thead>
<tr>
<th>Coast Guard</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Camp-Oil Development</td>
<td></td>
<td>see remarks under UIC</td>
</tr>
<tr>
<td><strong>2</strong> Hanger</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Navy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Unknown</td>
<td></td>
<td></td>
<td>The Navy sold the NARL site to UIC some years back. The Navy still owns 500 acres north and east of the Middle Salt Lagoon and south of Imikpuk Lake. It was reported that UIC was trying to acquire this property. This property could be important to Barrow beyond 2035 for housing. The Navy maintains control of the old NARL airstrip that runs parallel to the North Salt Lagoon and a Hanger structure that is at the North end. Given increased interest in the Northwest Passage Navy plans in the area could change. The City of Barrow has been discussing the acquisition of the hangar and runway with the Department of the Navy for the past five years.</td>
</tr>
<tr>
<td>1 Unknown</td>
<td></td>
<td></td>
<td>The Air Force also has a hanger at the North end of the old NARL airstrip. The air force indicated that the US is far behind other countries along the Northwest Passage. Although there is no identifiable air force impact presently the importance of the Northwest Passage would indicate possible Air force presence in Barrow in the future.</td>
</tr>
<tr>
<td><strong>Alaska Airlines</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 New Terminal</td>
<td></td>
<td></td>
<td>UIC indicated that there is discussion of putting it on the Southside of the airport meaning that literally everyone would require land transportation to reach even Barrow proper. Currently that means around the west end of the airport. The question is would it not be better to expand the terminal on the north side and move Ogrook/Ahkovak street north?? The Comp Plan is suggesting a new terminal location on the north side across from the High School. This area appears to be designated for tie down which could happen in other locations.</td>
</tr>
<tr>
<td>2 Unknown</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ARMY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Unknown</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NOAA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Unknown</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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City of Barrow
5 Year Strategic Plan

September 15, 2014
21.4 Appendix D: City of Barrow 5 Year Strategic Plan (continued)

Dear Citizens:

The City of Barrow Administration have prepared the attached 5 Year Strategic Plan. The document contains goals, objectives and strategies for the City of Barrow to pursue in the coming years.

The key elements of the City of Barrow 5 Year Strategic Plan are its goals, objectives, and strategies. Goals are general achievements that the City wishes to accomplish in the future. Objectives are specific and achievable statements in support of a goal. Strategies are task-oriented events that lead to an assignment and timeframe.

The goals, objectives and strategies in this document are recommendations subject to the public input at the October 3, 2014 Barrow City Council Meeting. This document will be part of the Barrow Comprehensive Plan, and attached as an addendum.
City of Barrow

MISSION STATEMENT

The City of Barrow is dedicated to providing the highest achievable standard of public service to all who live, visit, or work in Barrow by:

1) Promoting parks, trails, and recreational facilities and programs;
2) Developing more diverse economic activities, capitalizing on Barrow’s location as a regional hub for transportation, education, healthcare, government services, telecommunications and potential hydrocarbon development;
3) Protecting, enhancing and preserving cultural and subsistence resources;
4) Diligently performing cemetery maintenance and burial functions with the highest duty of care for the bereaved, the deceased, and the community;
5) Protecting free and enjoyable access to oceans, waves and beaches for all people, through conservation, activism, research and education; and
6) Providing exemplary customer and public service.
21.4 Appendix D: City of Barrow 5 Year Strategic Plan (continued)

**CITY MAYOR**
Bob Harcharek  

**CITY COUNCIL**

**Seat A**  
Frederick Brower  
Term: 10/2013 - 10/2016

**Seat B**  
Fannie Suvlu  
Term: 10/2013 - 10/2016

**Seat C**  
Rebecca Brower  
Term: 10/2012 – 10/2015

**Seat D**  
Vincent Paul Nageak III  
Term: 10/2012 - 10/2015

**Seat E**  
George Olemaun  
Term: 10/2011 - 10/2014

**Seat F**  
Qaiyaan Harcharek  
Term: 10/2011 – 10/2014
21.4 Appendix D: City of Barrow 5 Year Strategic Plan (continued)

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## 21.4 Appendix D: City of Barrow 5 Year Strategic Plan (continued)

### Goal 1: Increase Non-Grant Funded Revenues

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies/Policies</th>
<th>Implementing Department</th>
<th>Position Responsible</th>
<th>Implementation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop alternative means of generating revenue from alcohol sales</td>
<td>Acquire or renovate a facility to be converted into an alcohol sales facility</td>
<td>City Mayor’s Office, Finance Department</td>
<td>Project Manager, Finance Director, Mayor</td>
<td>September 1, 2015</td>
</tr>
<tr>
<td>Perform a property and sales tax analysis for potential earnings and facilitate rate increases</td>
<td>Compare with Economic Impact Assistance from NSB</td>
<td>Finance Department</td>
<td>Finance Director</td>
<td>July 1, 2015</td>
</tr>
<tr>
<td>Provide municipal run recreation activity fees</td>
<td>Develop an appropriate fee schedule for City sponsored recreation activities and rentals of City Facilities</td>
<td>Finance Department, Recreation Department</td>
<td>Finance Director, Recreation Director, Grants Administrator, Mayor</td>
<td>January 1, 2015</td>
</tr>
</tbody>
</table>
| Development and promotion of current land assets to supplement all city activities | • New lease agreements  
• Land sales  
• Capital Improvement Projects                                            | Mayor’s Office                                | Mayor, Special Assistant to the Mayor             | January 1, 2015       |
| Increase donations from local, State and national organizations for City sponsored community activities | Submit donation letters to local agencies, oil companies and national granting entities | Mayor’s Office, Recreation Department, Finance Department | Mayor, Finance Director, Recreation Director | January 1, 2015       |
## 21.4 Appendix D: City of Barrow 5 Year Strategic Plan (continued)

### Goal 2: Increase Funding for Capital Improvements

<table>
<thead>
<tr>
<th>Objectives</th>
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<th>Implementing Department</th>
<th>Position Responsible</th>
<th>Implementation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure funding to acquire or renovate an alcohol sales facility</td>
<td>• Apply for local, state, and federal funding opportunities to help construct the facility</td>
<td>City Mayor's Office, Finance Department</td>
<td>Project Manager, Finance Director, Grants Administrator</td>
<td>September 1, 2015</td>
</tr>
</tbody>
</table>
| Secure funding to construct Phase III, the final construction phase, of the Piuraaqvik Addition | • PR Campaign for Piuraaqvik Addition  
• Secure grant funding, major donor, and foundation funding | Finance Department, Mayor’s Office | Finance Director, Grants Administrator, Project Manager | April 1, 2016         |
| Secure funding to construct a Municipal run recreation shooting range     | Apply for FNRA grant funding                                                        | Finance Department, Recreation Department | Finance Director, Grants Administrator, Project Manager | April 1, 2015         |
| Secure funding to upgrade facilities at Piuraaqvik to provide a movie theater | Apply for local, state, and federal grant funding opportunities to secure funding | Finance Department, Recreation Department | Finance Director, Recreation Director, Grants Administrator | September 1, 2015    |
| Secure funding to conduct a feasibility study for a Sports Complex        | Apply for local, state, and federal grant funding opportunities to help fund the study | Finance Department                      | Finance Director, Grants Administrator, Project Manager | June 1, 2019          |
21.4 Appendix D: City of Barrow 5 Year Strategic Plan (continued)

Goal 3: Increase Economic Development

<table>
<thead>
<tr>
<th>Objectives</th>
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<th>Implementing Department</th>
<th>Position Responsible</th>
<th>Implementation Date</th>
</tr>
</thead>
</table>
| Create economic development opportunities for residents of Barrow | • Research strategies for attracting new industries and investment  
• Develop activities for Barrow to increase its viability as a hub for the NSB  
• Support local residents with training programs through the Eben Hopson Memorial Scholarship Program  
• Work with local agencies to develop a Chamber of Commerce  
• Develop strategies to promote tourism activities  
• Support regional businesses | Finance Department, Administration Department | Finance Director, Mayor, Special Assistant to the Mayor | September 1, 2016 |

Goal 4: Enhance the Quality of Life for Barrow Residents

<table>
<thead>
<tr>
<th>Objectives</th>
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<th>Implementing Department</th>
<th>Position Responsible</th>
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</tr>
</thead>
</table>
| Increase healthy community efforts | • Partner with local organizations such as NVB, NSB, ASNA, and ICAS to develop and implement healthy community initiatives  
• Provide activities that promote healthy lifestyles and support public health initiatives  
• Provide activities for youth | Recreation Department | Recreation Director | July 1, 2015 |
| Launch a program to beautify Barrow | • Collaborate with local entities to beautify Barrow  
• Impound Abandoned Vehicles  
• Provide trash clean-up crew services during the summer months | Maintenance Department | Maintenance Supervisor | July 1, 2015 |
Goal 5: Increase Recreation Opportunities for All User Groups

<table>
<thead>
<tr>
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<th>Implementing Department</th>
<th>Position Responsible</th>
<th>Implementation Date</th>
</tr>
</thead>
</table>
| Develop recreational opportunities and facilities to meet future needs    | • Coordinate with NSBSD and Ilisagvik College to provide increased recreational activities  
• Promote regional recreation events and competitions                        | Recreation Department                   | Recreation Director         | December 30, 2016   |
|                                                                           | • Complete Piuraagvik Recreation Center Addition                                    |                                          |                            |                     |

Goal 6: Develop Quality and Affordable Housing

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies/Policies</th>
<th>Implementing Department</th>
<th>Position Responsible</th>
<th>Implementation Date</th>
</tr>
</thead>
</table>
| Assist local agencies to provide housing for local residents             | • Coordinate with TNHA, NSB, NVB, and other various local agencies to provide housing opportunities to local residents  
• Encourage areas for multi-family housing                                | Mayor’s Office                                                                     | Mayor, Special Assistant to the Mayor, Finance Director | September 1, 2016   |
21.4 Appendix D: City of Barrow 5 Year Strategic Plan (continued)

Goal 7: Guide the Use of Land to Provide Community Growth

<table>
<thead>
<tr>
<th>Objectives</th>
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<th>Implementing Department</th>
<th>Position Responsible</th>
<th>Implementation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop a management plan for all city properties</td>
<td>• Establish guidelines for managing city cemeteries</td>
<td>Mayor’s Office, Maintenance Department</td>
<td>Maintenance Supervisor, Mayor</td>
<td>July 1, 2016</td>
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<td></td>
<td>• Promote development of vacant lots</td>
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Goal 8: Preserve Barrow’s Cultural and Subsistence Resources

<table>
<thead>
<tr>
<th>Objectives</th>
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<th>Implementing Department</th>
<th>Position Responsible</th>
<th>Implementation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify means to strengthen and preserve the Inupiaq culture</td>
<td>• Support efforts of the Heritage Center</td>
<td>Mayor’s Office</td>
<td>Mayor, Special Assistant to the Mayor</td>
<td>July 1, 2015</td>
</tr>
<tr>
<td></td>
<td>• Protect subsistence use areas</td>
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<td></td>
<td>• Support local arts and crafts</td>
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<td></td>
<td>• Participate in planning meetings to help guide</td>
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<td>development away from areas that will have an</td>
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<td></td>
<td>adverse impact.</td>
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</tbody>
</table>
Appendix E: BDS Letter to North Slope Borough

September 23, 2014

Robert Shears, Community Development Planner
North Slope Borough
Department of Planning & Community Services
1250A Eben Hopson Street
Barrow, AK 99723

RE: Barrow Comprehensive Plan Comments

Dear Bob,

The following changes have been suggested from the City of Barrow, Barrow Zoning Commission and Ukpeaġvik Iñupiat Corporation. The page numbers provided here are from the final draft (not necessarily the page number cited from the commenters). Italicized text indicates the suggested changes.

City of Barrow Requested Revisions

1. Including the City of Barrow logo has been requested. (the City’s logo along with other community stakeholders will be added before the plan is finalized)

2. Add the City of Barrow in the Acknowledgements, including the Mayor, City Council members, finance director and grants administrator. (This is already done. We apologize for the oversight)

3. Page 100, Section 7.6 Gravel, first bullet.
The plan currently reads: “SKW operates a pit located at the southwest end of the airport.” The City of Barrow is requesting that it read: “SKW operates a pit on land owned by the City of Barrow and located at the southwest end of the airport.”

4. Page 100.
The City of Barrow is suggesting to change the second bullet under 7.6 Gravel from “UIC operates a pit four miles south of Barrow located off of Eastfield Road near the landfill” to “UIC operates a pit four miles southeast of Barrow located off of Eastfield Road near the landfill. The City is suggesting the same
change in the second paragraph, second sentence that currently reads “It is located about four miles south of Barrow and is accessed from Eastfield Road” and would be changed to “It is located about four miles southeast of Barrow and is accessed from Eastfield Road.”

5. Page 104, Figure 21.
   The City is requesting that City-owned property be indicated on the map. [Adding landfill locations to this map may provide additional clarity].

6. Page 131, Section 10.3.4 Subsistence Boating.
   The City suggests adding text to the second paragraph, third sentence. It currently reads: “A new boat launch, dock, and breakwater are being constructed in the northeast corner of the North Salt Lagoon and are expected to be completed in the summer of 2014.” The City changes would be: “A new boat launch, dock, and breakwater have been constructed in the northeast corner of the North Salt Lagoon and has been operating since summer of 2014. The dock was constructed with NPR-A grant funds and is owned and maintained by the City of Barrow.”

7. Page 135, Section 11.0 Recreational Facilities.
   Remove football field from the last sentence because it erroneously states that it is managed by the City of Barrow. Replace with “The City of Barrow manages the greatest share of recreational needs in Barrow, including Piuraagvik, the roller rink and baseball fields. The NSBSD manages the football field.”

   The City suggests changing “The Piuraagvik Recreation Center was originally constructed in 1984 and is currently undergoing a renovation and expansion” to “The Piuraagvik Recreation Center was originally constructed in 1984. A renovation was completed in 2010; an expansion began in 2011. Currently, another $13 million is needed to complete the work.”

   The City suggests changes to playground information. The suggested changes had already been made for the final draft.

10. Page 135, Section 11.5 Aquatics.
    The City suggests changing “there is not an aquatics center in Barrow but there is a pool available for public use during non-school hours” to “there is not an aquatics center in Barrow but there is an indoor pool at the Barrow High School that is available for public use during non-school hours. During the summer months, the BHS pool is open for the community use and is operated as part of the City of Barrow Recreation Department Programs.”

11. Page 171, 16.1.4 City of Barrow.
The text currently reads “The City of Barrow owns over 50 acres of land.” The City has requested that this changed to “The City of Barrow owns over 200 acres of land mostly zoned as industrial. Additional land acquisition is underway.”

12. Page 198, 17.2 Option 4 - Consolidated Plan, 3. Area C has three sub areas.
Currently, the text reads: “Sub Area 1 is a potentially contiguous site that combines Ipalook Elementary School, Piuraagvik, Barrow High School, a segment of Okpik Street, the CYS facility, KBRW, the North Slope Borough School District maintenance facility and an area currently occupied by the School District bus barn and Public Works Fuel Division.” The City suggests changing this text to: “Sub Area 1 is a potentially contiguous site that combines Ipalook Elementary School, Barrow City Hall, City of Barrow-owned Tupikpuk (ice hockey facility), softball field, Piuraagvik, Barrow High School, a segment of Okpik Street, the CYS facility, KBRW, the North Slope Borough School District maintenance facility and an area currently occupied by the School District bus barn and Public Works Fuel Division.”

13. The City suggests that it be added as an implementing entity to the following strategies:
- Page 228: Objective “Enhance coordination between stakeholders on activities related to the natural environment and resources of the Barrow area” and strategy “Include the numerous stakeholders and research when making land use decisions.”
- Page 231: Objective: “Coordinate related activities among North Slope Borough departments and other governmental agencies” and strategy “Coordinate public facility planning with public safety providers (police, fire, search and rescue) to ensure capability to respond to hazard-related situations. Assess impacts of capital facility locations on emergency response capabilities.”
- Page 232: Objective “Ensure that demographics accurately reflect the Barrow community” and strategies 1) “Evaluate trends in population changes, including how changes relate to the borough budget, with and without oil and gas development” and 2) “Provide educational information to Barrow residents about the importance of participating in the U.S. Census.”
- Page 233: Goal 7 “Understand the complexities of the housing Issues in Barrow and coordinate planning activities.” Add the City of Barrow to every under this goal.
- Page 240: Strategies 1) “Set and maintain a schedule to review the NSB Comprehensive Transportation Plan and the Native Village of Barrow Long Range Transportation Plan every two years and update as needed”; 2) “Prioritize transportation projects that receive funding from sources other than the NSB”; 3) “Consider future transportation needs that may include: developing a safer connection at the east end of airport property to the south side of the airport; road
connections between the hospital and the Search & Rescue facility; docking/port facility; industry airport needs.”

- Page 271, Navy.
  The City of Barrow suggests adding the following text to the Remarks column under the Navy heading: “The City of Barrow has been discussing the acquisition of the hangar and runway with the Department of Navy for the past five years.”

- The City has requested that its Capital Recreation Plan be included in the Appendix of the Barrow Comprehensive Plan.

Barrow Zoning Commission Requested Revisions

1. Pages 86 - 87, 7.3 Natural Gas.
   Energy is profiled as relatively inexpensive due to the NSB subsidies. For real energy costs, try using amortized costs that include NSB exploration drilling and development.

2. Page 89, Figure 17, Gas Utilities.
   Add producing wells not shown: East Barrow Gas Field well #14; Walakpa wells #3, 4, 5, 6, 7, 8, 9, 10; South Barrow Gas Field, various wells. Otherwise there is undue emphasis on recent wells.

   The land ownership is not correct. The NSB shares subsurface rights with the federal government, not with ASRC and UIC (except for a weird situation in the three townships outside the map area that are owned by ASRC).

4. Missing in this study (and maybe it is a standalone document yet to be made).
   Someone has told the document authors that we “have enough” natural gas. This may not be a valid assumption. The rest of the document does a great job of forecasting demand of things like water (gallons), power (mw), sewer, etc. But it does not do this for gas. Going forward, how can we sustain any growth?
   a) Deliverability. How much gas is produced per day, per year in the scenarios?
   b) Reserves. How much gas do we have? How long will it last given the scenarios?
   c) Conservation. What happens if we conserve more? Less? Mid-range?

Ukpeaġvik Iñupiat Corporation Suggested Revisions (tenative)

1. The draft Comprehensive Plan includes a brief narrative on contaminated sites. Given new federal funding for clean-up of contaminated wells, some further discussion should be included on the need for
a contaminated sites remediation staging area and legacy wells within the NPR-A and Barrow Area of Influence.

2. The need for additional gravel resources in Barrow and across the North Slope is undeniable. To adequately plan for future development, the plan should more thoroughly consider how much gravel will be needed for future development. Two potential recommendations to facilitate gravel exploration and mining are 1) establishing a Mining Zoning District and 2) allowing mining by-right in the Conservation and/or Reserve Districts for community use.

3. A new master plan has been approved for the Wiley Post / Will Rogers Memorial Airport that will allow access to the airport from the south. The draft Comprehensive Plan should expound on potential development south of the airport, including the need for additional industrial facilities to support oil and gas development and the potential for an expanded United States Coast Guard presence.

4. The Plan includes land use maps for Barrow, Browerville and South Barrow. Another should be included that illustrates land use at NARL.

Native Village of Barrow - no suggested changes

Sincerely,

Victor Valenote, AIA, LEED AP
Principal
Bezek Durst Seiser

cc: Bob Bezek, BDS
    Erika Green, UMIAQ