

# **Kaktovik Comprehensive Development Plan**

**April 2015**



**Department of Planning and  
Community Services**



**North Slope Borough  
Charlotte Brower, Mayor**



**NORTH SLOPE BOROUGH  
ORDINANCE SERIAL NO. 75-06-65**

**AN ORDINANCE ADOPTING THE KAKTOVIK  
COMPREHENSIVE DEVELOPMENT PLAN**

**WHEREAS**, the Planning Commission is charged under North Slope Borough Code of Ordinances (NSBMC) § 2.12.160(a) and 2.12.160(a)(1) 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 NSBMC § 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 NSBMC § 19.040.060 (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 NSBMC § 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 and other developments, the maximization of economic benefits and employment opportunities for Kaktovik today and into the future are fully shared by all of the organizations working together on this project; and

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

**WHEREAS**, the Native Village of Kaktovik adopted Resolution 14-08, on September 30, 2014, recommending approval of the Plan as developed by the North Slope Borough; and

**WHEREAS**, the City of Kaktovik adopted Resolution 14-04 on November 11, 2014, recommending approval of the Plan as developed by the North Slope Borough; and

**WHEREAS**, the Kaktovik Inupiat Corporation, the primary landowner implicated in the new development areas, adopted Resolution 2014-13, on September 30, 2014, recommending approval of the Plan as developed by the North Slope Borough; and

**WHEREAS**, the Planning Commission adopted Resolution 2014-21 on December 18, 2014, recommending the Assembly approve of the Plan; and

**WHEREAS**, the Kaktovik Comprehensive Development Plan is found to be a sufficient guide to future development in Kaktovik for the next 20 years; and

**WHEREAS**, under 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 North Slope Borough Assembly hereby adopts the Kaktovik Comprehensive Development Plan, attached as Exhibit B, as recommended by the Native Village of Kaktovik, the City of Kaktovik, the Kaktovik Inupiat Corporation and the North Slope Borough Planning Commission.

**SECTION 5. Attachments Incorporated by Reference.** Planning Commission Resolution 2014-21, attached as Exhibit A, and the Kaktovik Comprehensive Development Plan, attached as Exhibit B, are hereby incorporated by reference.

INTRODUCED: March 3, 2015  
ADOPTED: April 7, 2015



Forrest D. Olemaun, President

Date: 4-7-15

ATTEST:

Sheila H. Burke

Sheila H. Burke, Borough Clerk

Date: 4-7-15

Charlotte E. Brower

Charlotte E. Brower, Mayor

Date: April 7, 2015



# Kaktovik Comprehensive Development Plan

April 2015

City of Kaktovik Resolution #14-04, November 11, 2014

North Slope Borough Planning Commission Resolution #2014-21, December 18, 2014

Assembly Ordinance # 75-06-65, April 7, 2015

Prepared by the

Community Planning and Real Estate Division  
Department of Planning & Community Services



North Slope Borough  
Charlotte Brower, Mayor

**NORTH SLOPE BOROUGH**  
Assembly

Forrest Olemaun, President (Barrow)

Mike Aamodt, Vice President (Barrow)

Herbert Kinneeveauk Jr. (Point Hope & Point Lay)

John Hopson Jr., (Wainwright & Atqasuk)

Doreen Lampe (Barrow)

Vernon Edwardsen (Barrow)

Duane Hopson, Sr. (Nuiqsut, Kaktovik, Anaktuvuk Pass, & Deadhorse)

**Planning Commission**

Paul Bodfish, Chair (Atqasuk)

Lawrence Burris, (Anaktuvuk Pass)

Richard Glenn (Barrow)

Daisy Sage (Pt. Hope)

Eli Nukapigak (Nuiqsut)

Matthew Rexford (Kaktovik)

Willard Neakok (Point Lay)

Raymond Aguvluk (Wainwright)

**Kaktovik City Council**

Nora Jane Burns, Mayor

Fenton Rexford

Matthew Rexford

George Kaleak Sr.

Joseph Kaleak

Margaret Kayotuk

Ida Angasan

**Department of Planning & Community Services**

Rhoda Ahmaogak, Director

Gordon Brower, Deputy Director

**Community Planning and Real Estate Division**

Matt Dunn, Division Manager    Susana Montana, Community Planner

## **Kaktovik Comprehensive Development Plan Acknowledgements**

Many individuals and organizations participated in the several-year effort to develop the Kaktovik Comprehensive Development Plan. The community review organizations deserve a special thank you for their efforts in providing information for the plan: City of Kaktovik, Native Village of Kaktovik, Kaktovik Iñupiat Corporation, Harold Kaveolook School Advisory Committee, North Slope Borough School District, North Slope Borough Departments, Ilisagvik College, and North Slope Borough Commission on History, Language & Culture.

The North Slope Borough Department of Planning and Community Services provided leadership for development of the plan, including Planning Director Rhoda Ahmaogak, Gordon Brower, Fred Parady, Mari Moore, Matt Dunn, Bob Shears, Susana Montana, and Erika Green.

WHPacific, Inc. completed initial work on the plan, including facilitation of public meetings and completion of maps and draft chapters. Glenn Gray and Associates provided assistance for the final production of the plan. All photos courtesy of Glenn Gray and Associates unless otherwise noted.

## Kaktovik Comprehensive Development Plan

### List of Abbreviations

ADF&G	Alaska Department of Fish and Game
AEA	Alaska Energy Authority
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
ANWR	Arctic National Wildlife Refuge
ASRC	Arctic Slope Regional Corporation
ATV	All-Terrain Vehicle
BAT	Best Available Technology
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CAH	Central Arctic Herd
CCHRC	Cold Climate Housing Research Center
CIP	Capital Improvement Plan
DCCED	Alaska Department of Commerce, Community and Economic Development
DEW	Distant Early Warning
DoD	Department of Defense
EIS	Environmental Impact Statement
F	Fahrenheit
FAA	Federal Aviation Administration
HUD	Department of Housing and Urban Development
ICAS	Iñupiaq Community of the Arctic Slope
IRA	Indian Reorganization Act
KIC	Kaktovik Iñupiat Corporation
kWh	Kilowatt hour
lbs	Pounds
LLC	Limited Liability Company
MMS	Minerals Management Service
NPR-A	National Petroleum Reserve – Alaska
n.d.	No date
NEPA	National Environmental Policy Act
NSB	North Slope Borough
NSBMC	North Slope Borough Code
NSSI	North Slope Science Initiative
PAR	Project Analysis Request
PCE	Power Cost Equalization

PCH	Porcupine Caribou Herd
TNHA	Tagiugmiullu Nunamiullu Housing Authority
TCH	Teshkepuk Caribou Herd
USACE	U.S. Army Corps of Engineers (or Corps)
USFWS	U.S. Fish and Wildlife Service
USPS	U.S. Postal Service

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## Chapter 1: Introduction

The 2015 Kaktovik Comprehensive Development Plan (Comprehensive Plan or Plan) updates the last plan, which was approved in 2005. This introduction to the plan provides information about comprehensive planning as well as a background about the City of Kaktovik (City). It begins with a discussion about comprehensive planning and continues with an introduction to the governing bodies of the community and region. The vision statement for the community is then provided followed by a summary of how the plan is organized.

### 1.1 Comprehensive Planning

#### 1.1.1 Purpose of the Comprehensive Development Plan

The Kaktovik Comprehensive Plan provides general guidance for land use decisions within the community and in its core subsistence use areas, also known as the Kaktovik Area of Influence. In addition, the Plan provides useful information about the community and identifies community assets and goals, which can be referenced when applying for grants. Specifically, the intent of the Plan is to:

- Guide the sustainable growth and development of the community;
- Portray current strengths, weaknesses, opportunities, and constraints of the community;
- Describe what the community wants to happen in the future;
- Prioritize the list of future needs;
- Explain how the plan will be implemented; and
- Provide the basis for land use regulations, investments in infrastructure and future land use policy decisions.

While the Plan looks to the future over a 20-year timeframe, it should be reviewed annually and updated on a regular basis, ideally every 5 years. Future plan revisions should monitor growth, evaluate development and public programs, and measure how well the previous plan has met its goals, objectives and implementation actions. The review and revision of the Plan ensures the goals and objectives respond to changing circumstances within the village and the surrounding area.



View of the community from the airport road

Ultimately, the Plan will help conserve valued resources and uses and encourage development that meets the needs of the present population of Kaktovik without compromising options for future generations.

Map 1 illustrates the planning area established for this plan, which largely coincides with the community’s core subsistence use area also known as the community’s Area of Influence as shown in Map 2.<sup>1</sup> It includes the entire island and subsistence lands to the south, east and west. The planning area boundary was established based on input from the public meetings.

**Map 1: Kaktovik Planning Area**

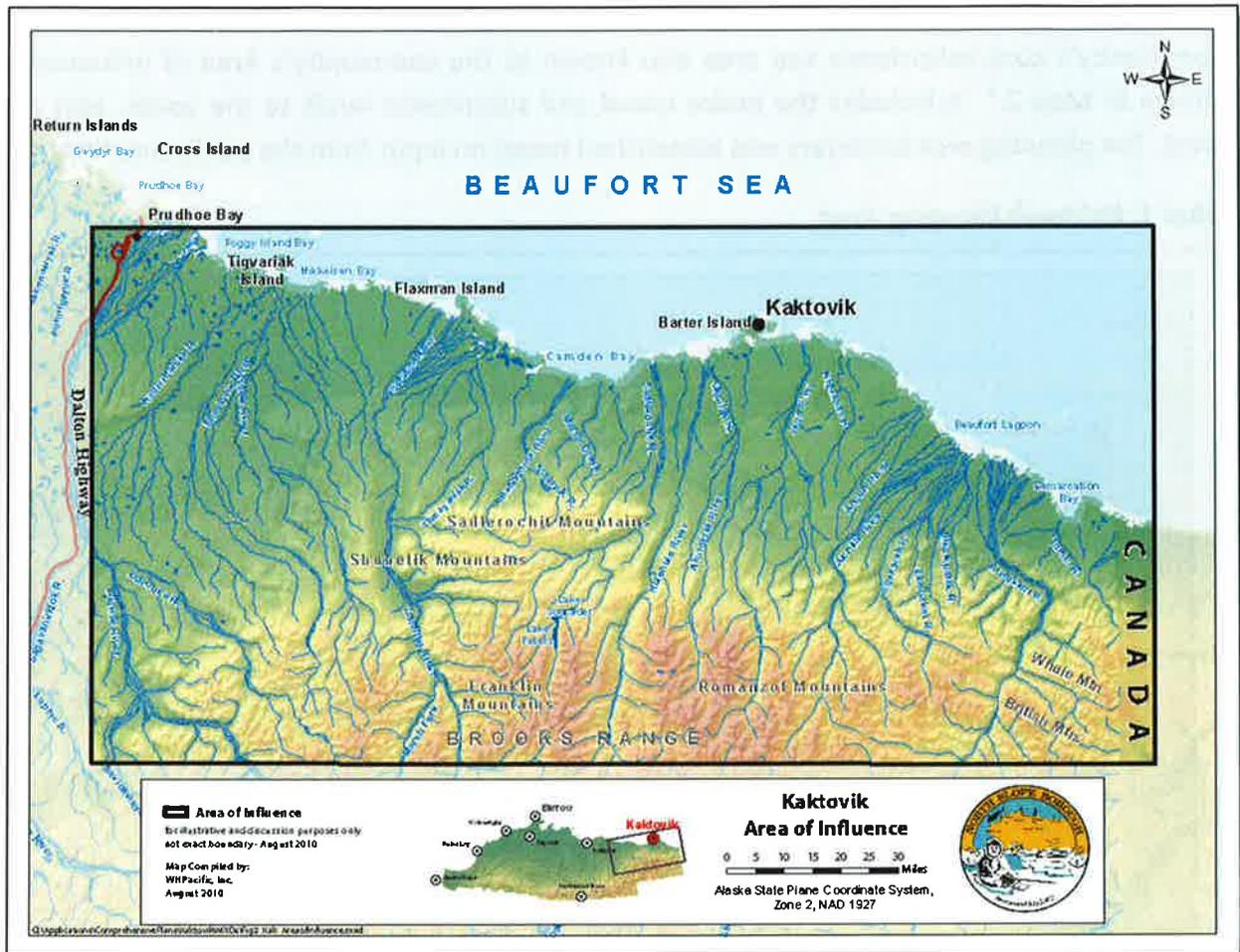


<sup>1</sup> Kaktovik residents also conduct some subsistence activities in the vicinity of Teshekpuk Lake and as far east as the Mackenzie River Delta in Canada.

### 1.1.2 Governance

**City of Kaktovik:** The City of Kaktovik is a second-class city within the North Slope Borough. The City incorporated in 1971, and the 7-person City Council provides local governance. The City is

**Map 2: Kaktovik Area of Influence**



managed by the Mayor, who is also a member of the Council. The City Council meets the second Tuesday of each month. There are no local taxes.

**North Slope Borough (NSB or Borough):** The NSB is a home rule borough which means it retains all power not specifically restricted by its charter or by state law. The Borough provides many services for Kaktovik and retains planning and zoning authority for the City. The NSB generally levies a property tax of 18.5 mills, with authority for up to 20.0 mills.

The NSB Department of Planning and Community Services (Department) administers the planning and zoning and subdivision ordinances in Titles 18 and 19 of the Borough code. The

Department strives to provide a balanced and orderly community development process and to encourage economic development throughout the Borough (NSBMC § 19.05.040). It issues administrative permits through the authority of Title 19 and approves subdivisions through Title 18.

One person from each community is appointed by the Mayor and confirmed by the Assembly to serve on the Borough Planning Commission (NSBMC § 2.12.010). The Planning Commission is responsible for preparing the Borough's Comprehensive Plan and recommending its approval to the Assembly. In addition, the Planning Commission:

- Makes recommendations to the Assembly on amendments to Title 19 and zoning amendments (outside of Barrow);
- Reviews the annual capital improvements program and submits a recommendation to the Assembly;
- Makes recommendations to the Assembly on public improvements;
- Decides on preliminary plats for subdivisions under Title 18; and
- Hears and decides conditional use permits and appeals of decisions of the Department.

**Native Village of Kaktovik:** The Native Village of Kaktovik is a federally recognized tribe governed by a 7-person council. It was established under authority of the Indian Reorganization Act (IRA) of 1934. The Native Village of Kaktovik is a member of the Iñupiat Community of the Arctic Slope (ICAS), the regional Native tribal government that is also recognized by the federal government.

### **1.1.3 Basis for Comprehensive Planning**

Title 29 of the Alaska Statutes provides the authority for comprehensive planning in Alaska. As a home rule borough, the NSB is responsible for planning, platting, land use regulation, and development of a Borough-wide comprehensive plan. This section provides a brief discussion of the basis for comprehensive planning. More information about zoning and land use regulation may be found in Chapter 3, Section 3.2 on page 59.

As a home rule borough, the NSB is responsible for developing a comprehensive plan and for establishing and implementing land use planning and zoning. "The comprehensive plan is a compilation of policy statements, goals, standards and maps for guiding the physical, social, and economic development . . ." (AS 29.40.030). The NSB municipal code outlines the process for developing the Borough-wide comprehensive plan and the contents of the plan (NSBMC §2.12.170).

The Department implements land use regulation for the Borough. Its goals include update and maintenance of the Borough's Comprehensive Plan and empowerment of community-level

decision-making in social, economic and development issues. The Department's Community Planning Division oversees development of the Borough's Comprehensive Plan and updates the village comprehensive development plans. The Community Planning Division also coordinates development of 6-year Capital Improvement Plans (CIP) for NSB villages. These plans prioritize improvements for community facilities.

## 1.2 Kaktovik Village Vision Statement

Development of comprehensive plans often begin with a vision statement, that is, a statement of what the community will look like in the future. Kaktovik residents developed the following vision statement for this Comprehensive Plan.

*Kaktovik is a healthy community where residents value their strong family ties, traditional Inupiat values and healthy subsistence living.*

*Residents are good stewards of the environment and protect the waters, lands, and air quality from any degradation or damage so that wildlife is healthy and sustainable and all who live in and visit Kaktovik can continue to enjoy its abundant natural resources, clean waters and air, and a healthy subsistence lifestyle.*

*Residents pass on traditional knowledge of weather, landforms, biotic and subsistence resources and hunting methods to new generations and embrace compatible modern technologies and contemporary knowledge that help residents maintain a healthy, safe and affordable community.*

*Village leadership promotes a diverse economy supporting local businesses and clean industries that provide resident employment flexible enough to support seasonal subsistence activities.*

*Adequate safe, sanitary, and affordable housing is provided along with quality infrastructure and convenient community facilities.*



Kaktovik residents attending a hearing on offshore oil and gas

*Residents promote a healthy lifestyle, an involved citizenry, sharing of resources and knowledge, and community cooperation in decision making to ensure that orderly, well understood*

*conservation and development occurs in the village and its environs to assure a healthy and sustainable community for generations to come.*

### **1.3 Goals of the Plan**

The Kaktovik Comprehensive Development Plan includes the following 7 goals.

- **Goal 1:** Protect and enhance subsistence resources and activities.
- **Goal 2:** Establish future land use designations within the village to ensure a balance of housing, commerce, services and facilities to support strong families, traditional values, and sustainable wildlife resources.
- **Goal 3:** Support the provision of adequate housing in quantity and quality.
- **Goal 4:** Facilitate economic development activities in appropriate locations that meet the day-to-day needs of residents and visitors and that provide employment opportunities for current and future generations.
- **Goal 5:** Maintain public infrastructure, community facilities and services, and transportation systems.
- **Goal 6:** Protect historical and cultural resources.
- **Goal 7:** Foster meaningful intergovernmental cooperation.

Chapter 4 provides more details about these goals, including objectives for meeting each goal and implementing actions that will achieve those objectives.

### **1.4 Organization of the Plan**

This Plan contains a wealth of information about Kaktovik, but it is not necessary to read the plan from front to back. Instead, readers may wish to focus on those sections of the plan that meet their interest. Chapters 1 – 4 provide introductory material and a context for the goals, objectives and strategies, which are included in Chapter 5 along with a discussion of how the plan will be implemented. The references at the end of the plan identify studies, reports and other sources of information, and the appendices provide useful additional information. The chapters of the plan and appendices are organized as follows:

The plan is organized into 5 chapters described below.

- **Chapter 1:** This chapter provides the introduction to the plan, including the basis for comprehensive planning.

- **Chapter 2:** This chapter provides background about the community including the people, the natural environment, the economy, public services, and the importance of the subsistence way of life.
- **Chapter 3:** This chapter provides information about land ownership, land use regulation, and current and anticipated future land use.
- **Chapter 4:** This chapter includes the goals of the plan, related objectives and actions that will help meet those objectives.
- **Chapter 5:** The Plan concludes with an overview of how it will be implemented.
- **References:** This section of the Plan provides a list of references that were used to develop the document.
- **Appendix A:** Public Involvement in the Village Planning Process



View from the airport road in winter

## Chapter 2: Community Overview

### 2.1 Setting

Kaktovik is located on Barter Island, one of the larger barrier islands in the Beaufort Sea. The village is situated on approximately 1 square mile of land (or 630 acres) and water on the northeastern shore on the Kaktovik Lagoon between the Okpilak and Jago rivers. There have been some discussions about extending the current city boundary to incorporate the new airport within the City which would increase this area by 1.27 square miles, adding roughly 815 acres.<sup>2</sup> Kaktovik is the easternmost village in the NSB, 70 miles west of the Canadian border, 120 miles east of Deadhorse, 310 miles east of Barrow, and 382 miles north of Fairbanks (Kaktovik 1991).



Aerial photo courtesy of the IHLC.

northeastern shore on the Kaktovik Lagoon between the Okpilak and Jago rivers. There have been some discussions about extending the current city boundary to incorporate the new airport within the City which would increase this area by 1.27 square miles, adding roughly 815 acres.<sup>2</sup> Kaktovik is the easternmost village in the NSB, 70 miles west of the Canadian border, 120 miles east of Deadhorse, 310 miles east of Barrow, and 382 miles north of Fairbanks (Kaktovik 1991).

Kaktovik lies on the northern boundary of the 19.5-million acre Arctic National Wildlife Refuge (ANWR or Refuge). Coastal waters south, east and west of the island lie within the Refuge as well as a 40-acre parcel on the island's southern peninsula that is in the process of being conveyed to the Native Village Corporation, the Kaktovik Iñupiat Corporation (KIC). The geographic coordinates for Kaktovik are 70° 08' North and 143° 38' West (Sec. 13, T09N, R33E, Umiat Meridian). The village is located in the NSB and included in the area served by the Arctic Slope Regional Corporation.

As a result of its proximity to the ANWR and oil and gas resources, many visitors travel to the community and its traditional land use areas. These visitors include government representatives, researchers, filmmakers, industry representatives, and backcountry recreational users and tourists attracted to opportunities to view polar bears.

### 2.2 The People

Kaktovik, traditionally known as *Qaaktugvik*, is the ancestral homeland of the *Qaaktugvigmiut*, the People of Kaktovik. The residents value their families, education, work ethic, and strong cultural ties. Respect for traditional Iñupiaq values provides guidance for everyday living. These values include knowledge of



Early whaling photo courtesy of IHLC

<sup>2</sup> Extension of the city boundary to may also be necessary in order to secure funding extending utilities to the new subdivision.

language, sharing, respect for others, cooperation, respect for elders, love for children, hard work, knowledge of family tree, avoidance of conflict and conflict resolution, respect for nature, spirituality, humor, family roles, hunter success, domestic skills, humility, and responsibility to tribe (Alaska Native Knowledge Network 2013).

The Iñupiat people consider subsistence to be more than just a “way of life.” To many people on the North Slope, subsistence is their life; it defines the essence of who they are, and it provides a connection between their history, culture and spirit. The Iñupiaq value of sharing is often expressed through the distribution of subsistence resources among family members, elders, those who cannot hunt or fish, and other community members. For Kaktovik residents, subsistence is the difference between thriving and starvation, and it is an essential means of continuing the traditional lifestyle.

The area for subsistence gathering occurs over vast distances of the NSB land and offshore waters. The area within ANWR makes up a significant portion of the onshore Kaktovik traditional and contemporary hunting, fishing and gathering grounds for food. Other significant land and water areas used by residents for subsistence activities include the:

- Coastline and deltas along the Beaufort Sea from Deadhorse to Demarcation Bay at the Canadian border;
- Headwaters and tributaries of the Hulahula, Jago and Sadlerochit rivers;
- Arctic Plain from the Dalton Highway east to the Sagavanirktok River; and
- Barrier Islands, spits and marine waters extending 50 to 60 miles into the Beaufort Sea and Arctic Ocean (Stephen R. Braund & Associates 2010).

For the purpose of this Plan, *subsistence* means the traditional hunting, fishing and harvesting of resources for food, clothing, tools and other traditional cultural uses. More detailed information about subsistence is provided in Section 2.11 on page 44.



Blanket toss photo courtesy of IHLC

### 2.3 Community History

The pre-history of the *Qaaktuġvigmiut*, the ancestors of today’s Iñupiat residents of Kaktovik, dates back hundreds of years. The ancient Qaaktuġvik site was first inhabited by the Utuqqaq, “people from farthest away”, believed to be the Thule Iñupiat from Greenland. Hundreds of years ago Iñupiat from Barrow warred with the Utuqqaq and forced them out of the area. Barter Island, *Iñuuniġviat Qaaktuġvigmiut*, was a major trade and cultural exchange center and was especially important as a gathering place for Alaskan Iñupiat and Canadian Inuit. Barter

Island is a 4-mile wide tundra plateau between the Arey and Kaktovik lagoons. The island is separated from the mainland in summer by a quarter of a mile of shallow lagoon and connected by sea ice in the winter.

Commercial whaling flourished in the Beaufort Sea during the 1890's and early 1900's, and Kaktovik was a well-known stopover for whalers on their way east to Herschel Island and the Mackenzie River region (NSB 1977). In 1923, a trading post was established near the present village site, which marked the beginning of Kaktovik as a permanent settlement. The trading post capitalized on the region's rich fur resources.

The village settlement was moved three times by the U.S. Air Force to accommodate military operations. In 1947, the U.S. Air Force arrived on the island to establish the Barter Island Long Range Radar Station, a Distant Early Warning (DEW) Line network station in Kaktovik. The first phase of this installation involved construction of a 5,000-foot long airstrip and hanger on the area occupied by the village. Citing Public Land Order 715 (Reserving Public Lands for the Use of the Department of the Air Force for Military Purposes), the Air Force seized the village site for the airstrip. The village was told to move 1,650 yards west to a new village site on the north side of the island. While the people were in the process of moving their belongings, military contractors bulldozed over 50 traditional sod homes and driftwood structures southward into the lagoon. Many ice cellars had to be abandoned and new ones were dug at the relocated village site. The new village was located on a slowly eroding section of beach and in the landing pattern of the new landing strip. The village site was relocated again in 1953 because of changes in the DEW Line layout and new road construction. This third village site was further west and set back from the beach. The village remained at this location until 1964 when, again, a move was ordered by the Air Force to accommodate its expanding facilities. This time, however, village leadership approved of the move to the current village location.

The current 630-acre village site is located on the east shore of Barter Island facing Kaktovik Lagoon. The new location eliminated threats from shoreline erosion and brought the houses away from the airport approach for landing. Additionally, it is closer to the drinking water supply, on firmer ground, and can accommodate village expansion.



The village adopted the official name of Kaktovik in 1964. A new village townsite plat was surveyed in 1964 and recorded in 1966. The current city limits include the 1964 townsite, portions of the 1974 addition of the Kaktovik Subdivision, and an area surrounding the Fresh

Water Lake southwest of the townsite. Kaktovik incorporated as a fourth class city in March 1971 and was reclassified as a second class city in September 1971. In 2013, the Kaktovik Community Foundation, a nonprofit corporation, was established to enhance the quality of life for Kaktovik residents.

## **2.4 The Natural Environment**

This section describes the natural environment of the community and surrounding area. It includes a discussion of geography, soils, climate, vegetation, and wildlife.

### **2.4.1 Geography**

Barter Island is approximately 6 square miles (3,800 acres) in area and is relatively flat, with its highest point reaching 55 feet above sea level. The village is mostly built at 20 feet or more above sea level. The existing airport located adjacent to the community is about 2 feet above mean sea level, and some development near the Kaktovik Lagoon is also lower than 20 feet. Sometimes during the late summer and fall, storm surges with high waves cause flooding in low areas along the Kaktovik Lagoon. There has also been some erosion in this area (Alaska Consultants Inc. 1983).

### **2.4.2 Soils**

Kaktovik sits on ice rich, saturated, silty soils topped by a thin, peaty tundra mat supporting a variety of tundra vegetation. The island is composed of mixtures and layers of marine and alluvial clay, silt, sand, and gravel. However, the top layer sits on continuous permafrost which extends several hundred feet below the Island's surface. The active layer of permafrost melts in the summer. The presence of permafrost increases development costs and must be taken into account in the design of structures and other facilities.

The original village of Kaktovik, currently the site of the community's airport, was a gravel spit subject to severe flooding during major storm events and continual erosion along the seaward edges. In the past, gravel was dredged from the Kaktovik Lagoon near the landfill, but future dredging from this site is not practical and remaining material is of questionable quality. Currently, the only known gravel source in the area is on the mainland under Arctic Slope Regional Corporation ownership. This material produces building-quality gravel but with a high ice content.

In 2006, the U.S. Army Corps of Engineers (USACE) completed a study examining erosion issues in 7 Alaska communities, including Kaktovik. This study concluded that erosion is not expected to cause failure of the community within the foreseeable future (hundreds of years), and there is no reasonable need for Kaktovik to relocate. However, erosion is affecting the airport and 4 sites eligible for listing on the National Register of Historic Places. Since one of those sites is in

danger of being lost to erosion, USACE completed a study to more closely examine and catalog the area (U.S. Army Corps of Engineers 2006a). Erosion thus presents ongoing risks for the community. It should also be noted that after the USACE report was published, community representatives reported the coast eroded about 300 yards inland during a storm.

### 2.4.3 Climate

Kaktovik experiences long cold winters, short cool summers, low precipitation, and persistent strong winds. The Beaufort Sea



Winter storms require prompt removal of drifting snow

modifies Kaktovik's climate so that it is warmer in the winter and cooler in the summer than what would normally be expected for this latitude. July and August are the only months with daily minimum temperatures averaging above freezing, and although temperatures have reached 78° Fahrenheit (F), it is rare for Kaktovik to experience extended periods of warm weather. Average annual temperatures are 10°F, although between 2007 and 2010, the average temperature was 15°F, indicating a

warming trend. Seasonally, temperatures average below 0°F from December through April, and February is the coldest month with an average temperature of -20.5°F. In addition to the cold temperatures, Kaktovik experiences almost constant strong winds.

Kaktovik qualifies as a polar desert because it receives so little precipitation. The total annual precipitation averages 6.41 inches, and close to one third of that falls during July and August. The average annual snowfall is about 35 inches per year, and due to persistent strong winds during the winter months, snow drifting can be problematic (Alaska Consultants Inc. 1983). Around buildings, snowdrifts can cause serious problems with accessibility and the blockage of emergency exits. Snowdrifts also increase the wear and tear on buildings, as well as the maintenance costs and increased snow plowing costs. There are several snow fences around the community which help to reduce snow drifting.

Unlike some of the other villages in the NSB which receive the warm currents from the Chukchi Sea, Kaktovik's eastern location on the Beaufort Sea causes it to be solely influenced by

currents from more northern and colder Arctic waters. This results in shore-fast ocean ice for more than 9 months a year.

**Climate Change:** Climate change is occurring much more rapidly in the Arctic than in the rest of the world. The annual temperatures in Alaska have increased by 3.6°F, and winter temperatures have increased by 5°F since the 1950s (Arctic Council 2004).

Evidence of climate change exists in and around Kaktovik, including failed ice cellars, shallower lakes and areas where the ground has collapsed. These conditions have been attributed to thawing permafrost from higher temperatures. Failure of ice cellars from rising temperatures and increased flooding is resulting in a lack of enough places for safe handling and storing of subsistence harvest materials.

In addition, climate change has other impacts that will affect Kaktovik.

- A later freeze up has been associated with increased erosion from coastal storms.
- Ocean acidification is occurring faster in Arctic waters than in other areas.
- A reduced sea ice cover is affecting ice dependent species such as ice seals and polar bears and causes greater erosion from storms.
- Thawing permafrost releases methane gas which in turn speeds up climate change.
- General drying trends could lead to more tundra wildfires.
- Vegetation composition is changing with more brush cover than in the past.
- The changing climate impacts the distribution and numbers of fish and wildlife which in turn impacts subsistence hunting, fishing and gathering (NSB 2005).

The North Slope Science Initiative (NSSI) is monitoring North Slope lakes to determine if climate warming is affecting local fresh water supplies for wildlife and humans. Residents are concerned that the lakes in the Kaktovik area are shallower than they were in 1980 and that vegetation in the lakes appear to be expanding which could be due to warmer water. It is suspected that permafrost underlying the lakes thaw and crack and water percolates down, resulting in a loss of drinking water supply. There is also a concern that methane escaping from the thawing permafrost under lakes may alter the composition of the potable water.

#### 2.4.4 Vegetation

The primary vegetation type in this area is tundra. A variety of berries grow on the tundra, including salmon berries, blue berries, black berries, and cranberries. A variety of



Photo courtesy of IHLC

mushrooms grow here as well, including hedgehog and puffballs. Rhubarb, Masu (a potato type root) and Ayuu (known as Labrador tea) also grow in the tundra. Plant species including sedges, grasses, lichens, and ferns which provide major forage for large herds of herbivores.

#### 2.4.5 Wildlife

A variety of fish, birds and mammals inhabit the Kaktovik region with their habitats ranging from offshore waters of the Beaufort Sea to the Coastal Plain on the mainland. Coastal habitats include rivers, deltas, coastal lakes, and wetlands. These habitats support the resources that have allowed the *Qaaktugvigmiut* to survive and flourish. While this section provides a brief overview of wildlife resources important for subsistence, Section 2.11 provides more details about subsistence use of these resources.

**Fish:** Marine, freshwater and anadromous fish populate the waters near Kaktovik. Marine fish include Arctic cod, saffron cod, capelin, Pacific herring, Arctic flounder, fourhorn sculpin, and wolffish. Marine invertebrates include jellyfish, squid, shrimp, and opilio and tanner crab. Freshwater fish include Arctic grayling, lake trout, blackfish, northern pike, sucker, round whitefish, burbot, and ninespine stickleback. Anadromous fish (i.e., fish that spend time in freshwater and saltwater) include Dolly Varden/Arctic char, broad whitefish, humpback whitefish, least cisco, Arctic cisco, Bering cisco, sheefish, rainbow smelt, and salmon.

**Birds:** Birds are the most abundant wildlife type in the mid-Beaufort Sea area. The tundra provides critical breeding, feeding and molting habitat for many different species of migratory birds. For example, the majority of the world's geese and many species of other migratory birds nest in the Arctic. Birds are very sensitive to stress during critical life stages including nesting and molting. Seabirds include cormorants, kittiwakes, murre, guillemots, gulls, pomarine, and parasitic and yellow-tailed jaegers. Waterfowl include tundra swan, sandhill cranes, red-throated and yellow-billed loons, brants, snow geese, oldsquaw, eiders, mallards, and willow ptarmigans. Shorebirds include the red phalarope, northern phalarope, oldsquaw, arctic tern, western and buff-breasted sandpipers, kittiwakes and stilts. Raptors include hawks, gyrfalcons, peregrine falcons, golden eagles, and snowy owl. Gray-headed and boreal chickadees, crows, common ravens, rufous hummingbirds, snow buntings, surfbirds, arctic warblers, bluethroats, northern wheatears, yellow wagtails, and smith's longspurs also nest in the area.

**Bowhead Whale (*Balaena mysticetus*):** The bowhead whale is an extremely important subsistence species for the people of the North Slope. Bowhead whale migration is tied to the



Historic photo of Dall sheep hunters  
courtesy of IHLC

ice pack, and they migrate north along the eastern Chukchi Sea during the spring as they head toward the Beaufort Sea to summer in Canadian waters. They begin their return migration in September to winter in the Bering Sea. Bowhead whales may live to be more than 211 years old (Rozell 2001). They weigh a ton at birth, grow to 60 feet and can weigh more than 120,000 pounds as adults. Females produce a single 9-12 foot calf every 2 -3 years. Populations of this species were seriously depleted by 1915, but the whales currently have recovered and sustain a healthy subsistence hunt.

Bowheads feed on plankton using specialized plates called baleen. One of the two primary feeding areas in the Alaska Beaufort Sea is located between Barter Island and the Canadian border.

**Beluga Whale (*Delphinapterus leucas*):** Beluga whales provide an important source of subsistence food for NSB residents, and they are the most abundant whale in the Beaufort Sea. They inhabit the waters around Kaktovik, including the lagoon. Four distinct stocks of beluga whales occur in western Alaska and the Beaufort Sea. Research conducted since the original resource inventories reveals that belugas travel much greater distances than originally thought (Suydam et al. 2001; Suydam 2003). Radio-collared belugas averaged 59 km per day, and some travel more than 2,000 km from Kasegaluk Lagoon. A few of the tagged whales traveled under almost complete ice cover over 1,100 km of the coastline. Males grow between 11 and 15 feet and weigh up to 3,300 pounds. Females grow between 9 and 13 feet and weigh up to 2,600 pounds. They are associated with pack ice and migrate from the Canadian Beaufort Sea westward as the fall progresses.

**Ringed Seal (*Phoca hispida*):** This species is the most widespread marine mammal in the Arctic and is one of the most important marine mammals used for subsistence. These seals are associated with ice year round. It is the only pinniped that can be considered an Arctic species. In early April, females excavate a snow cave, bear young and suckle them 4-6 weeks until break up. Most breed again within 3 weeks of pupping. Molting occurs during May and June when they haul out on fast ice and pack ice. They are a major prey of polar bears. Ringed seals are very sensitive to disturbance, especially when in enclosed bodies of water.

**Bearded Seal (*Erignatus barbatus*):** This species is a preferred subsistence species because it provides 3.5 times the yield of ringed seals. Also known as ugruk, the skins of this seal are used to cover umiaks which are used during spring bowhead whaling by some NSB communities. These seals are associated with ice year round.

**Polar Bears (*Ursus maritimus*):** Polar bears spend most of their life offshore, and they den both onshore and offshore. The highest concentration of denning areas is between the Colville River

and Barter Island. Polar bears prefer den sites in cut banks of rivers near the coast where snow accumulates as well as steep valleys, ravines and bluffs. Two subpopulations occur in Alaska.

In addition to their ordinary diet, polar bears feed on unused portions of whale carcasses that are deposited at a “bone pile” a few miles from the village during Kaktovik’s subsistence fall whale harvest season. Other factors that draw the bears to the area include the presence of seals (the polar bears’ major food) and the absence of nearby Arctic Ocean sea ice (the polar bear’s normal hunting grounds) causing a landward shift in polar bear distributions.



Polar bears congregate near the airport in fall and early winter

Studies show that, on average, 25 bears are present around Barter Island on any given September day. An increase in tourists and visitors has contributed to a small polar bear viewing industry, raising concerns regarding potential bear-human conflicts. As a result, the U.S. Fish and Wildlife Service (USFWS) expanded their work with the community to exchange information and address mutual concerns. The village earned a USFWS-funded Tribal Wildlife Grant to develop a community bear-human safety plan (2007-2010) which recommended establishing authorized village patrols to deter (non-lethally haze) bears from the village, minimizing attractants in and around the village, and developing educational materials for visitors and residents. The agency has requested that the whaling “bone pile” be moved from the current location at the end of the runway to a barrier island. Polar bear viewing is enjoyed by residents and visitors. Residents are keenly aware of the seasonal habits and survival needs of the bears; they are the best monitors of the bears’ activities and, therefore, are the best guides for both residents and visitors. Bear viewing in a safe and environmentally-sensitive manner is critical both for the health and well-being of the bear population and for the safety and enjoyment of humans. Bear viewing activities and facilities should be coordinated and managed by the local Polar Bear Committee in coordination with village leadership, the NSB Wildlife Management Department and the USFWS.

**Brown Bears (*Ursus Arctos*):** Brown bears use upland areas, river corridors, barrier island beaches, wetlands, and exposed coasts. They have been seen on Barter Island since a dump site was established at the Dew Line site, and they may also have occurred on the island in the

distant past. They congregate at streams to feed on fish and generally avoid human contact. They have been found foraging at the Kaktovik bone pile.

**Caribou (*Rangifer tarandus*):** Caribou occupy the lichen and moss-rich Arctic Coastal Plain, and during the summer, they travel in large herds to calve, feed and escape mosquitoes. To take advantage of seasonally available forage, caribou migrate between their calving areas and summer and winter ranges. Winter diet consists predominantly of lichens with a shift to vascular plants in spring.

There are 4 major herds on the North Slope, including the Teshekpuk Lake Herd, Central Arctic Herd, Western Arctic Herd, and Porcupine Caribou Herd. Only the Central Arctic Herd and the Porcupine Herd, however, are located within the Kaktovik Area of Influence. The migration patterns of these two herds are described below.



Caribou skin hanging to dry

- **Porcupine Caribou Herd (PCH):** The population of the Porcupine Caribou Herd was estimated to be 197,228 in 2013. It occupies an area the size of Wyoming in ANWR and the Yukon Territory. The herd winters in the southern part of the range, and begin migrating north during April. The females give birth to calves in the calving area of the Arctic Coastal Plain, and the rest of the herd joins them there. Sometime in late June or early July, the caribou seek insect relief along the coast and in the uplands. By mid-July, members of the herd migrate south to their fall and winter grounds.
- **Central Arctic Herd (CAH):** In 2013, 70,000 CAH caribou were counted, although this number may have included members of other herds. The CAH is usually found near the Arctic coast between the Colville and Canning Rivers, its range extends from the northern foothills of the Brooks Range to the Beaufort Sea, and from the Ikpikpuk River eastward to the Hulahula River. Pregnant cows arrive on the Coastal Plain in early May through early June, and calving occurs between the last week of May and the second week of June. Other caribou arrive by early July. The summer range extends from Fish Creek just west of the Colville River and eastward along the coast to the Katakaturuk River. The southern fall migration occurs between mid-August and early November, primarily along the Itkillik, Kuparuk, Sagavanirktok, and Ivishak river valleys. While its winter range changes over time, the herd typically uses windswept upland areas or areas of lighter snow cover where caribou can dig through the snow to feed on lichens, reindeer moss and dried sedges. On the north side of the range, the

CAH is usually found east of the Dalton Highway in the area of the upper Sagavanirktok River foothills and some as far east as the Canning River. Since the mid 1990's, many CAH have wintered on the south side of the range from Chandalar Shelf to as far east as Arctic Village. Movement within the North Slope between the summer and winter ranges is inconsistent, but predominantly north-south along river corridors through mountain passes.

## 2.5 Hazards and Emergency Management

The *City of Kaktovik Local All Hazard Mitigation Plan* identified weather, erosion, and storm surges as high hazards, and flood, wildfire, and earthquakes as low hazards (NSB 2005). For the purposes of this discussion, flooding and storm surges have been combined into a single section. Unless otherwise noted, information for natural hazards was obtained from the 2005 *All Hazard Mitigation Plan*.

### 2.5.1 Weather

Weather is considered a high risk for Kaktovik. While related to erosion and flooding, those risks are discussed separately below. Adverse weather conditions sometimes lead to search and rescue missions. The community currently lacks a suitable space to mobilize search and rescue efforts.

**Cold:** Extreme cold, periods where the temperature stays below -40° F, can occur for days or sometimes weeks in Kaktovik. This type of event can endanger human safety as well as lead to congealed fuel and freezing water and sewer lines.

**Winds:** High winds occur frequently during coastal storms and can damage utilities and buildings, but they are considered a moderate risk.

**Thunderstorms:** While thunderstorms used to be a rare occurrence, residents report that they have occurred more often with 6 storms occurring between 2000 and 2004.

**Snow:** With an average annual snowfall of 35 inches, heavy snow storms are a rare occurrence. Snow drifts, however, are a problem.

**Winter Storms:** Winter storms can be hazardous. For example, a storm that occurred in early 2005 led to a disaster declaration by the governor. The storm involved winds up to 70 miles per hour, air temperatures as low as 40 degrees below zero and snow drifts as high as 30 feet.

**Ice Hazards:** Ice hazards present near Kaktovik have implications for structures and activities that take place on the ice or on the adjacent shoreline. Some ice hazards that occur on the shore line or in marine waters are described in the following bullets.

- **Ice Storms:** Freezing rain can damage power lines. Although ice storms occur an average of two times a year in Kaktovik, they rarely result in damage.
- **Shear Zone:** The point at which shore ice meets multi-year ice is called the shear zone or “stamukhi zone.” The shear zone is unstable throughout the ice season due to offshore ice movement against the shorefast ice.
- **Ice Ridging:** Ridging occurs from forces at the shear zone when large ice masses collide. This hazard leads to ridges and piles of ice. Little ridging occurs inside the barrier islands or out to the 33-foot contour.
- **Ice Gouging:** When offshore ice bodies ground themselves, a phenomenon known as ice gouging occurs where the ice scrapes deep trenches on the shore bottom. The known maximum depth where ice gouging has occurred in the Beaufort Sea is the 328-foot isobath.
- **Strudel Scour:** During the spring at some river deltas, streams overflow the shorefast ice and drain below the marine ice through cracks or seal breathing holes. The force of the water creates a circular water force that drills through the sediments below the shorefast ice.
- **Ivu:** Ice override events, known as Ivus, have occurred in the past in the NSB and are likely to occur in the future. Under certain conditions, ice sheets can move quickly towards shore and pileup along the shoreline. This phenomenon, called an ivu by Iñupiaq people, can occur without warning. Ivus are considered a low to moderate risk in Kaktovik.

### 2.5.2 Erosion

Erosion has been a problem in some areas on Barter Island, especially from storms during the 4-5 months when the ocean is not frozen. Erosion and/or accretion (nourishment) can occur, however, when sea ice is pushed by winds onto the beach. At the July 2014 meeting on the Plan, residents reported that erosion is occurring in and around local creeks.

The USACE *Alaska Village Erosion Technical Assistance Program* study explained how a few erosion protection measures have already been taken in order to address erosion in Kaktovik. The NSB constructed a timber crib wall in the 1980s to stabilize the area along the frontage within the lagoon (Pipsuk Bight). Also, along the seaward edge of the airstrip, a geo-grid material was filled with gravel and used for erosion protection. However, erosion appears to be continuing in this area.

A 1998 USACE study found that bluffs near the Long Range Radar Site are eroding between 5-8 feet a year. In addition, erosion uncovered a decommissioned landfill for the DEW Line site in

2000. In order to reduce the amount of wave energy at this site, the USACE designed and constructed a gravel bag revetment (U.S. Army Corps of Engineers 2006).

Additional studies regarding the effects of erosion and its long-range impacts would benefit the community in its capability to plan for the future.

### **2.5.3 Flooding and Storm Surges**

In Kaktovik, the greatest flooding risk is from coastal waters although snowmelt causes accumulation of some water at the east end of the community. During June 2004, at least one home was within 4 inches of being flooded from melting snow. Because the community is not located adjacent to rivers, riverine flooding is not a problem.

Low pressure systems that develop in the Gulf of Alaska or the Bering Sea can result in coastal storms near Kaktovik between the fall and spring. Storm surges pose a serious threat to the community. They occur when there is a combination of a low pressure system, strong winds and a long fetch (long distance of ice free ocean).

While storm surges may not pose a serious risk when the ocean is frozen, trends of later freeze up and earlier break up increase the threat of this hazard. A 1957 storm resulted in flooding with 4,400 barrels of fuel being washed away. The highest recorded flood occurred in 1964,<sup>3</sup> and other notable storm surges occurred in August 1972, September 1986, and August 2000. Minor flooding of the current airport occurred in 2002, 2003, and 2004.

Large storm surges result in flooding, especially at the airport area located adjacent to the community due to its low elevation. The greatest potential for flooding occurs between late July and early September when there is no ice cover and the winds blow onshore from the west. Once the sea freezes, shorefast ice or pack ice dampens the effects of storms and flooding. Occasionally, however, there will be cracking and flooding of the ice during a mid-winter storm causing storm surges and flooding (Hattenburg Dilley & Linnell, LLC and SWCA Environmental Consultants 2009).

In addition to flooding as a result of storm surges, the community of Kaktovik is also subject to snowmelt floods. The east end of the community experiences large amounts of water accumulation during spring break-up. Homes on Pipsuk Road, Barter, Kaktovik, Hula Hula, and First streets can become surrounded by water during this time of year (Hattenburg Dilley & Linnell, LLC and SWCA Environmental Consultants 2009).

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<sup>3</sup> A high water marker was put on a utility pole about 18 inches above the ground (NSB 2005).

#### **2.5.4 Wildfire**

Wildfires include all fires that do not involve structures in the undeveloped areas surrounding the community. Currently, the risk of wildfire is low for Kaktovik and limited to the snow-free months of June through September. While there are a few instances of small wildfires in the NSB, including a fire on the Jago River in 2014, the only large tundra fire occurred in June 2007 near the Anaktuvuk River. This fire covered over 400 square miles of tundra and released over 2.3 million tons of carbon. While wildfires have not been a problem for Kaktovik, this situation could change if climate trends continue. Throughout the Arctic, wildfires have been increasing as a result of drying tundra soils (Mack et al. 2011).

#### **2.5.5 Permafrost Thaw**

While permafrost soils in their frozen state are not a hazard, thawing permafrost can lead to coastal erosion, slumping riverbanks, lake drainage, and failures to buildings and other structures. All permafrost soils are subject to thermal degradation, and ice rich fine-grained soil is the most problematic. Thawing permafrost can result in new lakes where ground has slumped and in some cases drain existing lakes. Although a rare occurrence in Kaktovik, residents report ground subsidence due to thawing permafrost has occurred since 2000, and floors of some buildings are uneven. If warming trends continue as predicted, permafrost thaw will be a continuing problem.

#### **2.5.6 Environmental Hazards**

The Alaska Department of Environmental Conservation identified 21 potentially contaminated sites in Kaktovik (URS 2005). These sites include former landfills and dump sites, the tank farm terminal and DEW Line facilities.

#### **2.5.7 Emergency Management**

In addition to the All Hazards Mitigation Plan, the three-volume Emergency Operations Plan (North Slope Borough 2008) applies to each community in the Borough. Also, individual emergency response plans will eventually be prepared for each community.

### **2.6 Population**

The majority of the people who settled on Barter Island during the 1940s and 1950s arrived from other coastal settlements, including those from Alaska and Canadian Iñupiat settlements to the east. While the 2010 U.S. Census estimated Kaktovik's population to be 239, the NSB 2010 Census found 308 residents in the village during the same April 2010 period. The NSB found that the U.S. Census undercounted Kaktovik population by 69 persons or 22%.

In 2010 Kaktovik had a relatively young population with 33.7% of its residents under the age of 16 compared to 26.4% for Alaska as a whole (2010 NSB Census and U.S. Census 2013). The median age was 33. Most residents (85.9%) identify as Inupiat (2010 NSB Census).

### 2.6.1 Population Trends

The rural population of Alaska is estimated to have declined by 3.6% from 144,084 in 2000 to 138,898 in 2008 (Alaska Department of Commerce, Community and Economic Development 2009). During that same period, the NSB received a disproportionate decline of 841 people, a 9.2% decline. For the rural areas of the state as a whole, natural increases in population have not been able to offset the out-migration to urban areas. The State of Alaska predicts there will be a 0.5% decrease in population in the NSB between 2010 and 2035 from 9,478 to 9,431 people (Alaska Department of Labor and Workforce Development 2012).

Using the 2010 NSB Census population of 308 residents as a base, NSB planners projected population growth over the next 20 years, based on past trends and potential growth factors. Low, moderate and high growth rates were determined for 5-, 10- and 20-year periods.

- **Low Growth Scenario:** This scenario was based on the assumption that outmigration increases, energy costs rise substantially and subsistence activity declines, along with a reduction in government and construction jobs resulting in an overall population *decline* of 0.5% per year.
- **Moderate Growth Scenario:** The moderate growth scenario is based on a marginal but stable growth rate of 0.5% growth rate per year. It assumes a balanced in- and out-migration rate, a small but stable natural increase (more births than deaths), increased short-term jobs in areas of temporary construction, and small but stable government and tourism-related jobs.
- **High Growth Scenario:** This scenario assumes there is employment growth related to increased tourism and nearby oil and gas exploration and development. It also assumes continuation of abundant subsistence resources and harvests. The high growth scenario uses a 0.1% annual growth rate. This scenario assumes that worker housing and office and supply facilities for oil and gas development at Point Thomson and ANWR *do not occur* in the village. If the village were to host a base camp for nearby oil and gas companies, a very high 3% annual growth rate could be expected to occur, and a new analysis of needed facilities, housing and community services would be required.

**Table 1: 5-, 10- and 20-Year Population Projections**

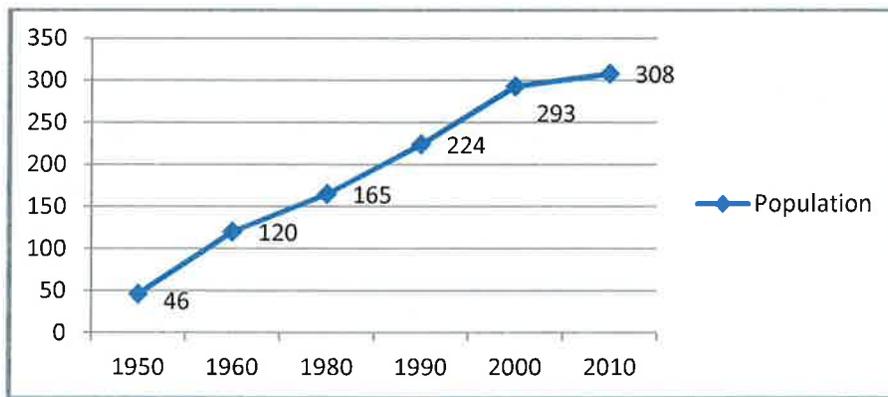
Growth Assumptions	Base Year 2010	5-Year Forecast to 2015	10-Year Forecast to 2020	20-Year Forecast to 2030
High Growth with oil & gas (+3%)	308	355	409	546
High Growth (+1%)	308	323	338	368
Moderate Growth (.5%)	308	318	328	348
Low rate/ Pop. Loss (-0.5%)	308	298	288	268

Source: North Slope Borough

Population changes occur through natural increase (more births than deaths) and migration (people moving in or out). The U.S. Census Bureau did not count residents in Kaktovik in the 1970 census. However, during the 30-year period between the 1980 Census and the 2010 NSB Census, Kaktovik experienced an increase of 128 residents representing about a 3% annual population growth over this period. During the 2000 to 2009 period, there were 48 births and 14 deaths in the village for a net increase of 34 residents. From 2000 to 2010, Kaktovik population declined by an estimated 7 persons, indicating that the growth spurt for the village has ended.

Already high energy costs could rise appreciably with an increase in fuel costs, which could contribute to residents leaving Kaktovik. Conversion from oil-based fuels to wind, solar, and/or wave energy systems would lower costs and could assure a diverse and more dependable electric energy system.

**Figure 1: Kaktovik Population Trends**



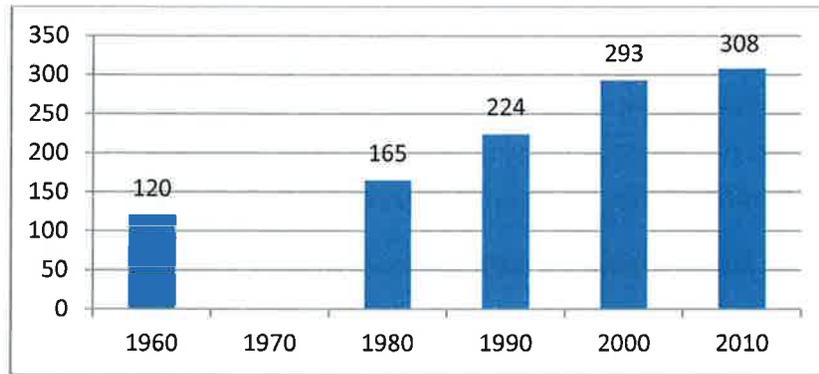
Source: U.S. Census Bureau (1960 -2000 and 2010 NSB Census)

### 2.6.2 Births and Deaths

The strongest component of population growth in Kaktovik is natural increase, that is, more births than deaths. Births have risen steadily in Kaktovik from 5 in 2000 to 11 in 2008 and in

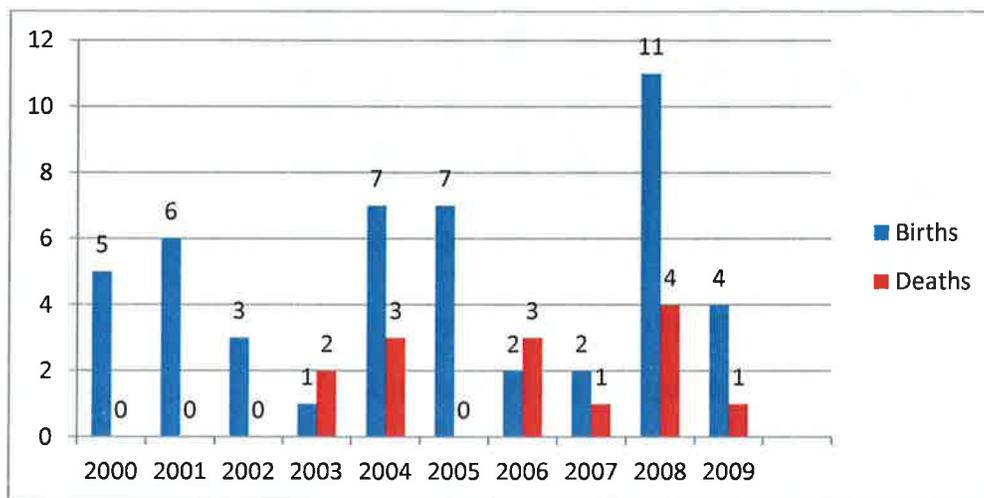
each year have exceeded deaths. Deaths in the village ranged from 2 in the year 2004 to 4 in 2008. Growth over the past decade has been associated with a positive natural increase and a total of 34 more births than deaths during the 2000 to 2009 time period when data are available from the Alaska Bureau of Vital Statistics.

**Figure 2: Kaktovik Population Trends over Time**



Source: U.S. Census Bureau (1960 -2010) and NSB 2010.<sup>4</sup>

**Figure 3: Kaktovik Births and Deaths 2000-2009**



Source: State of Alaska Bureau of Vital Statistics

### 2.6.3 In-Migration and Out-Migration in Kaktovik

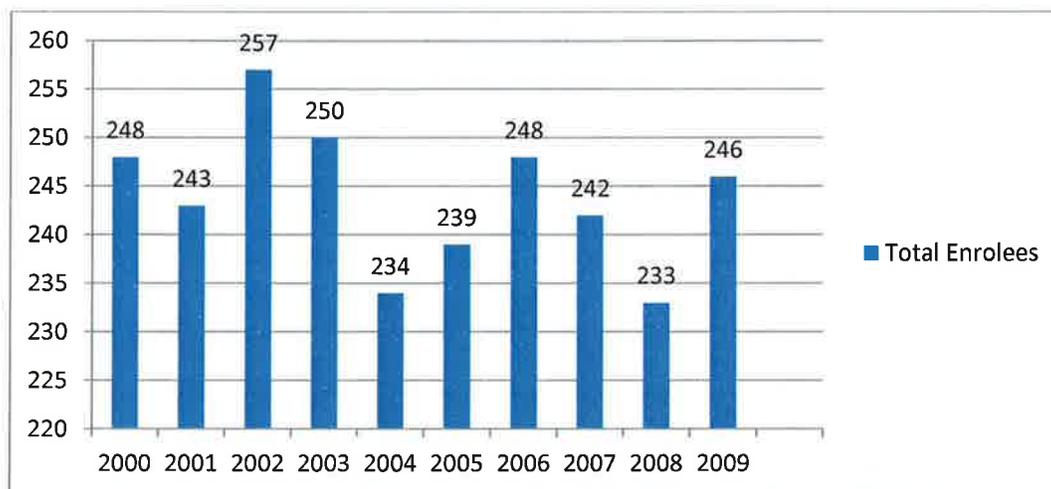
Data are not collected on new residents or existing residents moving in or out of the village which are referred to as in-migration and out-migration. Out-migration is usually related to high school graduates leaving to attend college, workers seeking employment opportunities elsewhere, or persons leaving to live close to other family members or loved ones. In-migration

<sup>4</sup> A census was not conducted in Kaktovik in 1970.

is related to new residents moving to the village to live with family members or for employment.

One potential indicator of in- and out-migration in Kaktovik may be the number of persons who qualify for the annual Alaska Permanent Fund dividend. The Permanent Fund program tracks the dividend recipients by their mailing addresses. Figure 4 shows the number of residents who are registered with the Permanent Fund dividend program with a mailing address in Kaktovik during the 2000 to 2009 time period. In 2000, 248 persons with Kaktovik mailing addresses were registered for Permanent Fund dividends and in 2009, 246 persons were registered, representing a decline of 2 persons living in the village and qualifying for the dividend over that nine-year period. It appears that in- and out-migration has stabilized in the past decade.

**Figure 4: Permanent Fund Enrollment with Kaktovik Addresses 2000-2009**



Source: State of Alaska Permanent Fund Dividend Program

## 2.6.4 Implications Based on Population Projections

Given the population projection noted above, there are several implications for housing and infrastructure needs in the planning horizon of 5, 10 and 20 years. The needs examined include housing, water, sewer, landfill and power.

## 2.7 Housing

A major concern in Kaktovik is the lack of adequate and affordable housing. According to the 2010 U.S. Census, there were 72 households in Kaktovik, and 87 housing



units with 15 of them vacant.<sup>5</sup> One of the vacant units was for seasonal use only and another was rented but not occupied. Of the 72 occupied units, 41 (56.9%) were owner occupied and 31 (43.1%) were renter occupied.

The U.S. Census also produces 5-year estimates of housing and other community statistics through the American FactFinder program. Curiously, the most recent housing estimates are significantly different than the 2010 Census. For the 2007-2011 time period, the American FactFinder estimated a total of 133 housing units with 109 of them occupied. There were an estimated 123 detached units, 7 attached units and 3 mobile homes. Out of the 109 occupied units, 14 (12.8%) lacked complete plumbing facilities, 6 (5.5%) lacked complete kitchen facilities, and 3 (2.8%) did not have telephone service. Most of the units were heated by fuel oil or kerosene (97.2%) for home heating but 3 units used electricity (2.8%) for heat.

Kaktovik does not have licensed contractors or skilled tradespersons who can assist residents in building new housing or in maintaining or repairing home systems. Skilled carpenters, electricians, plumbers and other tradespersons must be flown in to the village for new construction, weatherization, or when repairs are needed. The regional non-profit housing authority serving Kaktovik is the Tagiugmiullu Nunamiullu Housing Authority (TNHA). The TNHA has found that flying in tradesmen is too costly to adequately maintain or repair their rental housing stock in the villages. As a result, they no longer wish to operate rental housing and are selling their rental units to the current occupants of those homes, if they wish to purchase them. If tenants do not wish to purchase the unit they are living in, they must vacate the unit and it will be offered by TNHA to other residents who seek to purchase it (Kooley 2010 pers. comm.). Depending upon the condition of the unit, the sale price is discounted 10, 20 or 30% and TNHA will enter into a lease-purchase agreement with the tenants at 4.5% interest rate and at terms that will assure that the purchaser pays no more for the mortgage than they have been paying for rent. In this fashion, existing renting households who rely on dividend income and subsistence gathering can still afford to purchase their home. The only caveat is that the tenant must be current on their rent in order to qualify for the lease-purchase agreement. All home repairs and upgrades will be the responsibility of the home owner.

Although TNHA is selling their stock of single-family rental units, a 5-unit housing unit was built for Elders in the village. A portion of the funding for that development came from the U.S. Department of Housing and Urban Development (HUD) that placed income limits on senior households occupying those units. Native Elders who are Arctic Slope Regional Corporation (ASRC) and Kaktovik Iñupiat Corporation (KIC) shareholders earn an annual income from dividends that often exceeds the HUD income eligibility criteria for senior housing. TNHA is

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<sup>5</sup> According to the 2000 U.S. Census, there were 95 housing units with 6 of them vacant.

working with the NSB to pay off the original grants and thereby allow for more village elders in need of housing to qualify for residency within the new senior housing units (Panigeo 2010 pers. comm.)

TNHA partnered with the Cold Climate Housing Research Center (CCHRC) to design and build low-cost energy efficient homes within the Borough. A pilot project resulted in construction of a 700 square foot prototype home that was built in the inland village of Anaktuvuk Pass in 2009. That home features a culturally-sensitive design and uses lightweight and energy-efficient building materials which reduce shipping costs, and it uses a local building force to keep costs low. The result is a home built for its environment that cost significantly less to construct than a stick-frame construction counterpart. The total cost of the home, including design, was \$309,763, however, that price does not include use of Borough equipment and labor for the prototype.<sup>6</sup>

The success of the Sustainable Northern Shelter Project has led to continued work between TNHA and CCHRC to build an additional 36 homes in six villages throughout the North Slope, including homes in Kaktovik that were under construction in 2014. Homes in each village are customized to adapt to that community's specific environmental conditions.

### **2.7.1 Future Housing Needs**

The typical HUD definition of an overcrowded dwelling is one in which more than one person per habitable room resides in the house. Habitable rooms per housing unit include the bedrooms, living room, kitchen and dining room, and exclude the bathroom. The U.S. Census Bureau sampled Kaktovik households in 2000 and found that 6 of the 63 households surveyed had more than one person per habitable room in the home; this indicates that 9% of those households surveyed were living in overcrowded conditions.<sup>7</sup> Applying this 9% overcrowded status to the total number of households in the village in 2000 (89) would indicate that 8 dwelling units would be needed to relieve overcrowding. If the 6 vacant units were brought back on the market and occupied, then 2 new housing units would be needed to eliminate overcrowding in Kaktovik, based on the 2000 Census counts. Over the next 20-year outlook of this Plan, 19 new homes would be needed under the high growth scenario of 1% annual population increase.

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<sup>6</sup> These costs are substantially less than a bid received by TNHA for \$1,034,000 to rebuild a house damaged by fire in Nuiqsut.

<sup>7</sup> The 2000 Census numbers are used for projecting future housing needs because the estimated housing figures in the 2007-2011 American FactFinder appear to be erroneous. They are much higher than the 2000 and 2010 Census numbers. The 2010 Census does not provide details needed to project future housing needs.

Providing clear title to lands and lots within the area already served by water, sewer, power, roads and utilities will enable partnerships like TNHA and CCHRC to build energy-efficient homes in the village.

Currently there are some vacant lots within the village area served by water, sewer and roads that could be developed with housing. By reviewing residential occupancy trends within the existing utility grids of Kaktovik, it may be possible to identify available properties that are suitable for redevelopment or higher density residential development (duplexes) in lieu of development beyond the boundaries of established utility grids. More efficient use of land within existing utility grids for housing would represent considerable savings for homeowners.

As previously noted, current overcrowding conditions in Kaktovik would require 8 new housing units to relieve this overcrowding. The 6 vacant homes identified in the 2010 U.S. Census could be rehabilitated and 2 new TNHA energy-efficient homes could be constructed within the core area of the village where water, sewer, power and other utilities exist. Assuming the current housing need is satisfied in this manner, the moderate growth scenario (0.5%) would generate a need for 6 more homes by 2020 and another 6 homes by 2030 (12 total new homes needed by 2030 to accommodate moderate growth). This assumes a housing occupancy rate of 3.44 persons per household, which was the 2010 rate (NSB Census).

If the high growth scenario (1%) occurs, Kaktovik would need approximately 9 additional homes by 2020 and another 14 homes by 2030 (19 total new homes needed by 2030).

If the high growth (with oil & gas development) scenario occurs (3%), Kaktovik would need 13 new homes by 2015 and another 54 homes by 2030. This scenario would require substantial increases in the capacity of all community facilities and services.

If the low growth scenario occurs, Kaktovik will not need any additional homes. However, housing rehabilitation will be needed in any scenario to assure safe, sanitary and energy-efficient housing for existing residents.

## **2.8 Public Facilities and Services**

The NSB provides all utilities for Kaktovik. A number of public, commercial and government facilities exist in the community including two stores, a water treatment plant, a fuel farm, the Marsh Creek Hotel, the Waldo Arms Hotel and guide service, the Harold Kaveolook School, the Kaktovik Presbyterian Church, the Tom Gordon Health Clinic, and the post office (see Map 3). Buildings in the community are heated with fuel oil. The NSB provides all utilities in Kaktovik.

### 2.8.1 Water and Sewer

A buried water and sewer distribution system for the village was completed in 2003. According to the NSB Public Works Department, the water and sewer system has 15 to 25 years of usable life with maintenance and some repairs (NSB Public Works 2010a). Any new construction will need to be connected to the system. For example, service and main lines will need to be constructed for the new KIC subdivision. For future housing needs, in-fill development where water and sewer lines already exist is encouraged to help alleviate the costs of constructing additional water and sewer lines.

A Project Analysis Report (PAR) will look at alternative water and sewer distribution systems. This will include above ground and truck haul alternatives, and will consider all villages. It is considered unlikely that the PAR will recommend abandoning the below ground water and sewer distribution system in Kaktovik. Kaktovik has a VAC system, and has not experienced similar substantial failures as in Point Lay or Wainwright.

**Water:** The freshwater sources on Barter Island include small thaw lakes and ponds, a few deep stream channels, and a lake that is located about 0.7 miles from the community called Fresh Water Lake. The lake is 9 feet deep and freezes to a depth of about 6 feet during the winter (Alaska Consultants Inc. 1983).

Water is pumped in the summer months into a treatment plant and then into two warmed storage tanks for winter use, one tank has a capacity of 1,000,000 gallons and the other 500,000 gallons. From these tanks, potable water is distributed to the homes through a buried pipeline system.

The U.S. Department of Defense/Air Force Division owns the land near the village's fresh water lake. The City is concerned that land use activities near the freshwater lake could contaminate the village's sole drinking water source and has sought a prohibition of development, storage of materials or other activities near the lake.

While the NSB formerly operated community washaterias, it no longer provides this service, and the washateria building is slated for demolition to accommodate an expansion of the school gymnasium. Many homes do not have washers and dryers, however, so community laundry facilities are still needed.

Water use for Kaktovik is estimated at 35 gallons per person per day. For the moderate growth scenario, in 2015 Kaktovik will use an estimated 3,380,000 gallons of water per year and in 2030 the community will use an estimated 3,667,000 gallons per year. The current water treatment, storage and distribution system has a life expectancy of about 15 to 25 years with regular maintenance and occasional repairs (NSB Public Works 2010.a pers. comm.).

Residents are concerned that the community's current fresh water supply is shrinking due to climate change (i.e., thawing permafrost causes water to percolate downward into the soil, in addition to greater evaporation due to earlier thawing). The Fresh Water Lake may also be getting shallower due to sediment build up. The Water Plant operators monitor Fresh Water Lake characteristics as part of annual pumping, and their observations will be important to determine long-term trends.

Community members have also expressed concern over potential contamination to the drinking water source from the new airport (dust and exhaust) and new development in the area.

Due to the limited number of freshwater sources on the island to service Kaktovik, options to select alternative lakes are limited. If the water source is shrinking, then possible options may include dredging and/or strategic location of snow fences to enhance snowmelt recovery. This situation should be monitored closely, and a bathymetric volume calculation (depth times surface area) would be useful as a baseline.

**Sewer System:** Wastewater is collected through a buried pipe system and returned to a treatment system after which it is discharged in the area of Kaktovik Lagoon located southeast of town (NSB Public Works 2010a pers. comm.). Sewage disposal per capita is estimated at 31.5 gallons a day, which would translate into an additional demand of about 115,000 gallons annually in 5 years and an additional 421,600 gallons annually in 20 years or a total 20-year increase of about 21,000 gallons a year.

**Snow Management:** Strong winds on Barter Island present a number of challenges for the community to address drifting snow. Snow fences need regular maintenance, and they have also been found to lead to degradation of the tundra. During snow storms, snow removal must be conducted continually to clear snow drifts. Snow removal also can damage infrastructure such as the sea wall between A Street and First. Also, snow storage has resulted in road wash outs and damage to utilities when weather warms.

### 2.8.2 Energy

Kaktovik is dependent on importation of petroleum products for home heating and fuel, and residents are concerned about the rising costs of utilities. In recent years, Kaktovik's energy usage has outpaced its population growth. As the demand for energy grows, there is concern that the current diesel-powered generators will be insufficient.

The 2014 prices for various utilities can be found in Table 2. In recent years, energy costs have increased significantly throughout the state. Particularly hard hit are remote communities such as Kaktovik. In addition to increased costs, Borough officials report that there has been a

disproportionate increase in energy consumption, given the minor population increases. Borough officials are studying why there has been such an increase in energy use and what is needed to ensure the local energy needs are met.

Kaktovik was one of the 184 Alaskan communities that participated in the Alaska Energy Authority's (AEA) Power Cost Equalization (PCE) program in 2009. The goal of the program is to provide economic assistance to customers in rural areas of Alaska where the kilowatt-hour charge for electricity can be 3 to 5 times higher than the charge in more urban areas of the state. In Kaktovik, residential electricity costs a flat rate of \$15 for up to 100 kWh, for 101 to 600 kWh the cost is 15 cents per kWh, and 35 cents per kWh for use over 600 kWh. Elders and disabled residents only pay full costs when usage exceeds 600 kWh.



**Table 2: 2014 Utility Costs**

Utility	End User Cost
<b>Fuel</b>	
Residential heating fuel	\$3.00/gallon
Commercial heating fuel	\$9.00/gallon
Gasoline - Residential	\$6.50/gallon
Gasoline - Commercial	\$9.00/gallon
Propane – Residential	\$4.00/pound
Propane – Commercial	\$13.00/pound
<b>Electricity</b>	
0-600 kWh	\$0.15
601 – 99,999 kWh	\$0.35
<b>Water/Sewer (commercial and residential)</b>	
General Public	\$69/month
Seniors	\$14/month
Over 3,000 gallons	\$0.08/gallon

Source: KIC (September 5, 2014)

**Power Plant:** The Borough operates the local utility through the Power and Light System which includes a small power plant located west of the community. This facility generates electricity using diesel fuel and transmits electricity to the community by above-ground utility lines. The community has a 2,400/4,160-volt distribution system with a 2,670 kWh generation capacity. The diesel fuel-powered electric power plant is relatively new and will likely be sufficient for the next 15 to 25 years assuming normal maintenance and upgrades (NSB Public Works. 2010a. Pers. Com.).



**Fuel Storage:** The community has multiple fuel storage locations scattered throughout the area. All fuel storage tanks are connected above ground. Heating fuel is distributed via pipeline and truck depending on whether the recipient is commercial or residential. KIC contracts with the Borough Public Works Department for operation and maintenance.

**Alternative Energy and Conservation Measures:** There is community interest in exploring alternative energy generation systems, including gas, wind, solar and wave energy systems. An analysis of data from an experimental wind generator installed in 2009 near the water

treatment facility indicates the wind resource in Kaktovik is outstanding (Vaught 2010). The community hopes it will be possible in the future to use natural gas for generating electricity and heating their homes. Two other communities in the Borough, Nuiqsut and Barrow, generate power from nearby natural gas fields. An evaluation of relative long-term costs and benefits should be conducted to determine feasibility of alternative energy sources (e.g., natural gas, wind, solar, wave-powered electric energy, and hydrogen gas). In addition, thermal efficiency should be promoted in new and renovated structures, particularly housing, to reduce energy consumption.

### **2.8.3 Solid Waste and Recycling**

The landfill is about 60% full although it is scheduled to be closed in conjunction with the airport relocation (NSB Public Works. 2010a. Pers. Com.). The new, landfill is located on the southern end of Barter Island and sized to accommodate the anticipated demand for the 20-year period of this plan, based on the moderate growth scenario. The access road begins on the western side of the road for the new airport and continues down to the northwest corner of the relocated landfill.

Solid waste disposal in a remote Alaskan village such as Kaktovik is estimated at 5 pounds of refuse per person per day (Smith 1996). At this rate, for the moderate growth scenario in 2015, Kaktovik will generate about 562,100 pounds of garbage per year and by 2030 the community will produce roughly 605,900 pounds of garbage per year. In addition to the increased amount of waste generated by the growing population, solid waste will be generated through construction projects and refuse from additional businesses and public services.

### **2.8.4 Transportation**

Located on an island, Kaktovik has a limited road system with no connection to the mainland. Residents rely on aircraft for transportation of goods and people and on a yearly barge for fuel and supplies. Cost for flights and airfreight are extremely high, and during a July 2014 meeting on this plan, residents stated that it costs more to fly from Kaktovik to Barrow than it does from Kaktovik to Anchorage.

The Native Village of Kaktovik completed the most recent Indian Reservation Roads (IRR) Long-Range Transportation Planning document in 2009 (Kaktovik Village) and it is currently under revision (Rexford, pers. Comm. 2014). The Plan describes the local surface transportation system and presents community transportation needs.

**Roads:** There are about 10 miles of gravel roadways in Kaktovik ranging in width from 10 to 20 feet. Kaktovik residents travel on these roads between their homes, public facilities, the airport,

and landfill. The current airstrip is located on United States Air Force property. The 2005 average daily traffic counts measured for 3 main community roads ranged from 214 to 598.

Residents cite concern that dust from the local roads in summer is a hazard to some vulnerable residents' health. Currently, dust stabilizing material is being sprayed on the roads to mitigate this hazard, however, the dust remains an issue.

**Future Road Priorities:** Kaktovik's future road transportation priorities include new roads, existing community road upgrades, improved ocean access, and erosion control. The community has expressed a need for 3 small connections between existing roadways totaling 0.26 miles, including an extension of 5th Avenue between Barter Avenue and Kaktovik, an L-shaped link between Hula Hula and the road opposite the Presbyterian Church, and a route that extends Hula Hula through to Fresh Water Lake Road and north to Barter Avenue. Approximately 2 miles of roadway upgrades are necessary to raise the level of eroding roadways on the south side of town. A U.S. Bureau of Indian Affairs (BIA) project to construct 1.7 miles of new subdivision roads was completed in 2012.

The waters at the western end of Bernard Harbor where whalers haul the whales have silted up. Whalers have to haul the whales a greater distance around the spits to the traditional haul-out spot near the airport. It is possible that a new haul-out area located near deeper water further west of the northern coast will be needed in the future. A new haul-out area would require a gravel road along the coastline to haul the butchered meat and muktuk to the village. The new haul-out area and bone yard would need to be of sufficient distance from the village core to avoid bear-human conflicts.

There is also some local interest in constructing a bridge to the mainland to provide year-round subsistence access. In the long term, a bridge could provide a link to a potential road to the Dalton Highway. If this scenario were supported by the community, construction of a road approximately 7 miles long on Barter Island and a bridge approximately 785 feet long would be needed to access the mainland (ASCG Inc. 2005). An alternative in the Airport Master Plan Environmental Impact Statement included a bridge to the mainland, but the Federal Aviation Administration (FAA) rejected this option because of cost and environmental impacts to the high-value wetlands.

New roads will need to be constructed to provide access to the proposed airport and landfill relocation sites. A new 0.4 mile road needs to be constructed to connect the new airport to the current landfill access road, and the existing road to the current landfill will need to be extended 1.1 miles south to reach the new landfill site.

The Bureau of Land Management (BLM) designated a trail from the townsite on the island to the mainland; portions of this trail also pass through Air Force land. This trail will have to be relocated in conjunction with the airport relocation. A road to the northwestern portion of the island is desired to access subsistence resources there, but this road would have to pass through Air Force lands.

**Off-Road Travel:** Kaktovik residents travel great distances with established routes between the community and Prudhoe Bay, the Mackenzie Delta, and the rivers in ANWR (Hattenburg Dilley & Linnell, LLC and SWCA Environmental Consultants 2009). It is possible these routes provide a basis for a Bureau of Land Management RS2477 access right of way claim.

**Current Airport:** The current airport is located between 2 and 4 feet above mean sea level and is subject to erosion and frequent flooding from storm surges (Hattenburg Dilley & Linnell, LLC and SWCA Environmental Consultants. 2009).

The Barter Island airport is owned by the United States Department of Defense (DoD) and is operated and maintained by the NSB under a joint use agreement. The gravel runway is 4,818 feet by 150 feet and is capable of handling a fully loaded C-130 aircraft with a gross weight of 140,000 pounds. The runway is connected to a 100-foot-wide gravel taxiway leading to a gravel apron. The apron varies in elevation from 5.5 feet to 8.4 feet above mean sea level, and approximately 20% of the apron is above the 100 year flood elevation. The airport access road is gravel and is approximately 3,700 feet in length and 24 feet wide. The elevation dips to as low as two feet above mean sea level, which is below the 100-year flood level. According to community leaders, the runway has flooded approximately every two years in the past two decades.

The electrical components in the airport lighting system experienced significant corrosion problems from contact with saltwater during floods. The floods also result in ice deposition and seawall destruction. This damage to the airport prevents air service and consequently impacts critical community access to healthcare and supplies.



Kaktovik polar bears pose an unusual air traffic hazard



A polar bear investigates a boat beached near the airport

Because there is no road to the mainland and only one airline serves Kaktovik, it is expensive to travel into and out of Kaktovik. Due to the poor condition of the runway, pilots frequently incur damage to their planes and they pass on the costs of repairs to all passengers in the form of higher ticket rates. This makes goods and services more expensive. Residents expressed concerns that when planes are full with passengers, mail and supplies are a lower priority and are delayed in getting to Kaktovik. The new airport is expected to alleviate some of the issues that have caused the runway to be closed in the past, such as flooding and coastal fog.

**New Airport:** A new airport located at the southern end of the island was being constructed at the time this plan was written. The cost to relocate the airport is estimated to be \$40-50 million (Hattenburg Dilley & Linnell, LLC and SWCA Environmental Consultants 2009) (see Map 4). Construction of the new airport involved a new access road to the landfill. Other airport priorities include snow removal equipment such as a roller and grader, a gravel stockpile for maintenance, a shelter for passengers waiting for flights, and toilet facilities. At a July 2014 meeting on the comprehensive plan, one resident suggested installation of a live cam at the new airport to provide real-time observations that would likely reduce flight cancellations.

The FAA selected Option 2 in its environmental assessment which includes the construction of a runway, runway safety area, an apron, airport access road, a relocated landfill and sewage lagoon, an access road to the relocated landfill and sewage lagoon, and closure of the existing airport, landfill and sewage lagoon. The Borough purchased the land for the new airport from KIC. Residents at a July 2013 public meeting on the Comprehensive Plan noted that most residents would have preferred locating the airport on the mainland.

**Existing Marine Facilities:** Kaktovik is located on the Beaufort Sea, but there is no public boat ramp available. During strong east winds, boats stored on the beach of Kaktovik Lagoon are often pushed upland and damaged. Kaktovik residents use waterways to hunt whale and seal and to fish. Due to the bowhead whale migration timing and the specific routes followed by the whales, Kaktovik residents hunt whale only in the fall. Some Kaktovik residents travel by boat to Canada to see relatives. Kaktovik receives late summer or early fall shipments via a barge, which is beached at a location near the community in front of the existing tank farm. Materials are offloaded on the beach and transported to their final locations in the community.

The current whale haulout area has a shack that is used to shelter residents and supplies for the butchering activities. It also houses visitors watching these activities. A nearby toilet facility would be a welcome amenity for whale crews and visitors.

**Boat Launch:** The village does not have a formal boat ramp or dock; they launch boats into the Kaktovik Lagoon from a spot abutting the landing strip. Residents report that the current launching location is too shallow and should be relocated (ASCG 2005). The community would

like to secure ownership of a boat launch site or a long-term lease from the Air Force to build a formal boat launch/docking facility with parking for trucks and trailers and bathroom facilities.

### **2.8.5 Recreational Facilities**

Recreational facilities are limited. There is a small playground near the school and an indoor gym with a basketball half-court. Barter Island is used by visitors traveling to or from ANWR for recreational opportunities such as river rafting and backpacking. Formal camping and sanitary facilities for visitors in the community are needed.

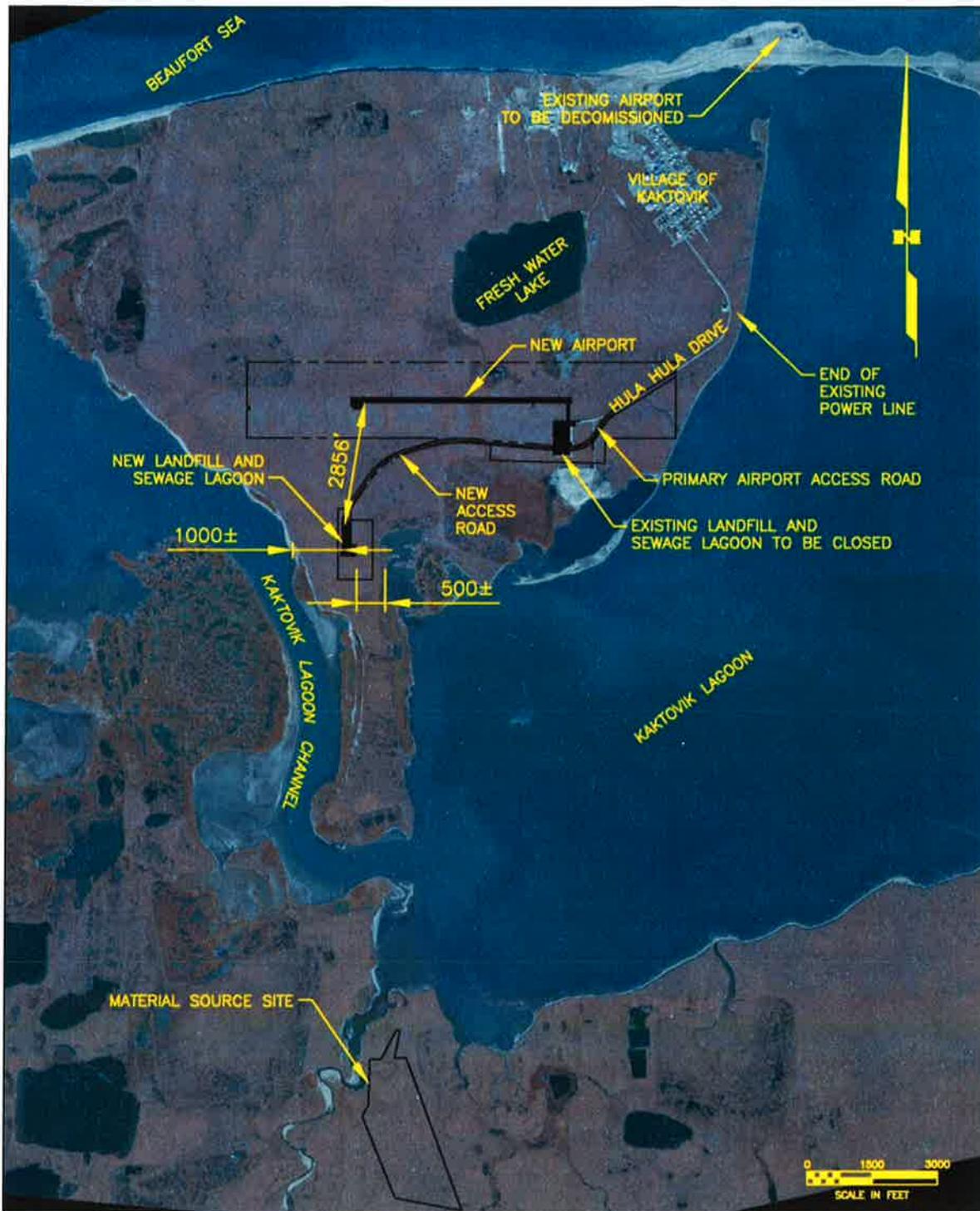
In addition to the infrastructure needs based on the population analysis, future infrastructure needs were also identified primarily at local meetings and discussions with community leaders and NSB personnel as well as from previous CIP submittals (see Table 14 in Chapter 5). The infrastructure needs are listed by short-term (within 5 years), medium-term need (within 10 years) and long-term (within 20 years) needs or desired projects, based on current or likely funding, community and Borough support, and design life of the facility.

The school gym is not a regulation court and therefore cannot host competitions with other schools. The construction of a new full-court facility has had a Project Analysis Report completed and is in the current six-year capital plan. Many residents, young and old, do not get enough exercise in the winter, and it is feared that this lack of exercise will make residents vulnerable to health problems such as diabetes or heart disease. An indoor track should be considered to enable the village to promote exercise and other healthy habits. Additional recreational programs and facilities for youth, including ball fields and an ice rink, are desired as well as day-care facilities (which are being considered across the North Slope in the Mayor's Child Care Initiative).

### **2.8.6 Mail Delivery**

Mail delivery is now generally shipped by truck to Prudhoe Bay and then flown to Kaktovik; this had increased delivery times and impacted the quality of fresh food items. Within Alaska, the bypass mail program subsidizes air cargo deliveries to remote communities through a program that allows air cargo to be shipped at the same rate as third class mail. Reduction of, or an ending to, the federal bypass mail system would significantly affect the cost of living in Kaktovik. Even if the bypass program survives in the long-term future, the U.S. Postal Service is aggressively seeking ways to reduce program costs.

Map 4: Location of new airport, landfill and sewage lagoon



Source: NSB Army Corps of Engineers permit application

## **2.8.7 Telecommunications**

Residents perceive that technology in Kaktovik is not keeping pace with the rest of the country. Cell phone and internet services are considered inadequate in the community.

## **2.9 Economy**

### **2.9.1 Mixed Economy**

As indicated in the following bullets, Kaktovik residents depend on a mixed economy composed of subsistence activities, wage work, dividends, and other payments.

- Harvesting local food and fiber resources
- Bartering food for services
- Sharing food and services with elders and those who cannot participate in harvest activities and the community at-large.
- KIC Village Native Corporation and ASRC Regional Native Corporation dividends
- Alaska Permanent Fund dividends
- Wage labor

Subsistence activities are necessary for food, clothing and trade as well as cultural identity and spiritual sustenance.

According to 2003 NSB census data, over 93% of Kaktovik Iñupiat households used subsistence foods; 76% depended on subsistence foods for over half of their diet; and 19% of households depended on subsistence foods for all of their diet. In 2010, two-thirds of surveyed households depended on subsistence foods for over half of their diet and only one household depended on subsistence food for its diet. Sharing of the harvest is an important objective in subsistence lifestyles, and 90% of households shared their harvests with others in the community (NSB 2010). In 2010, Kaktovik had a high dependency ratio: 34.4% of the population was under the age of 16 and 65 years or older. Both groups are dependent upon able adults for subsistence hunting and sharing. The 2010 U.S. Census found that 13.6% of Kaktovik residents had an income below the federally-designated poverty level, placing further stress and importance on the need for subsistence hunting, fishing and gathering by residents.

It is important to understand the connection between wage income and subsistence; the high cost of fuel and equipment requires cash income. Subsistence activities require substantial cash to purchase costly supplies for transportation, subsistence harvest and preparation and storage of food. Cash from dividends and local employment provide the means to purchase tools, equipment and supplies which make traditional subsistence harvest activities more time-

efficient. Families use cash to purchase the all-terrain vehicles, snow machines, boats, fuel, rifles, harpoons, ammunition, nets, sheds, fish wheels, traps, knives, rope, baskets, tubs, freezers, and other tools of the trade. Often, a hunter must work in wage employment during the weekday and hunt and fish in the evenings or on the weekends; this emphasizes the need for a speedy land or water craft to make efficient use of this limited time for hunting and harvesting. The 2010 NSB Census revealed that the average Inupiat subsistence household spent \$5,360 on supplies and tools for this activity.

Subsistence activities are not oriented toward sales, profits or commercial accumulation of cash, but instead are focused on meeting nutritional and clothing needs. In addition to human food, harvests supply clothing, food for dogs, and handicrafts for sale. The combination of wage employment, dividend income, and subsistence activities sustains the community and provides the economic basis for the subsistence way of life so highly valued in the village.

### 2.9.2 Employment

As mentioned above, Kaktovik's mixed economy includes both wage earners and subsistence users, and cash is needed to support the subsistence way of life.

For the period 2007-2011, an estimated 45.5% of Kaktovik residents 16 years old and over were in the labor force and 4.1% of the labor force was unemployed (U.S. Census 2013a).<sup>8</sup> The median income for workers (part-time and full-time) was \$13,000, and the per capita income was \$21,214 (\$31,944 for the entire state). The median family income was \$71,250 compared to \$80,178 for the state as a whole. The disparity between Alaska as a whole and Kaktovik wages is significant when considering the high cost of living in Kaktovik.

**Employment Trends:** The three factors that impact population change are births, deaths and migration (both in and out), with migration generally having the greatest potential impact. While a survey of migration has not been conducted, migration into and out of Kaktovik is likely influenced by the local economy and the number of employment opportunities as well as educational opportunities outside of the village.

**Employment Composition:** Due to its isolation, economic and employment opportunities are limited in Kaktovik. The Borough and NSB School District provide most of the local employment, and the Village Corporation, KIC, and City government also provide some employment opportunities for Kaktovik residents. There is also intermittent construction or skilled labor jobs with the oil industry, private construction firms, the Arctic Slope Regional Corporation and its subsidiaries, and summer jobs related to tourism. In 2003, about 19% of Kaktovik

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<sup>8</sup> These figures reflect the 2007-2011 5-year estimates. There are likely more residents who would welcome employment but are not currently actively seeking work due to the lack of employment opportunities.

households were involved with craft sales, and most of them made under \$500 per year (NSB 2003). This data was not reported in the 2010 NSB Census.

For the period 2007-2011, the estimated 127 workers were employed in the following industries: Public administration (34); educational services and health care (34); retail trade (25); transportation, warehousing and utilities (13); arts, entertainment, recreation, accommodation, and food services (12); construction (7); and professional, scientific, management, administrative, and waste management (2).

In 2013, 14 active business licenses were listed for Kaktovik, including Arctic Chalet Tours, Kaktovik Arctic Adventures, Kaktovik Arctic Tours, Kaktovik Iñupiat Corporation, Kaktovik Senior Housing, Kaktovik Tours, Kikiktak Store, Polarart Productions, Sims Store Enterprise, Tookak Ventures and Equipment Rental, and Waldo Arms Hotel (Alaska Division of Corporations, Business and Professional Licensing 2013).<sup>9</sup>

**Future Employment:** Potential economic influences include tourism, oil and gas exploration and development, temporary construction jobs, government employment, energy costs and the abundance of subsistence resources.

### 2.9.3 Tourism

Small-scale tourism provides some income to the local economy from visitor stop overs on their way to and from ANWR and for local viewing of polar bears. Tourism provides both opportunities as well as impacts. Residents are increasing their skills and securing licenses, permits and equipment and facilities to accommodate visitors seeking eco-tourism experiences. For example, 3 residents have secured captain licenses and can guide visitors through local waters to see marine wildlife, including polar bears. Polar bear viewing is a popular tourist activity



Tourist kiosk at the airport



Some businesses had more than one license listed in the DCCED database.

between August and October when the whale carcasses are hauled to the boneyard located at the eastern edge of the airport. This tourism activity could be expanded with some investments in facilities. The 2 hotels in the village are fully occupied during the bear viewing season. Tourists often have to compete for rooms during this short season with out-of-town workers. Some residents have advocated that oil

company employees, scientists and NSB staff avoid overnight visits during the bear viewing season.

During the tourist season, truck rentals are scarce and a taxi service or other vehicle rental service is needed to transport visitors to various destinations on the island. Servicing the bear-viewing visitors offers employment for residents in guiding, retail sales of arts and crafts, food service and other support activities. Although currently a short season, this sector can be expanded to offer cash income to residents. It should be noted that tourists use credit and debit cards more often than carry cash so more ATM machines may be needed in the village.

While residents welcome the revenue tourism generates, they want visitors to respect their way of life and culture. There is concern about tourists camping behind the airport hangar without proper sanitary facilities, not following polar bear viewing guidelines, and trespassing on KIC land. Kaktovik residents support establishment of formal campgrounds with sanitation and waste disposal facilities to accommodate visitors. They would also like improved boat docking facilities and safe hiking and snow machine trails around the village and to the mainland. These facilities should be designed so they do not disturb or block movement of fish and wildlife. Expanded eco-tourism destinations and tours, together with a museum constructed in the community, could prove an additional means to expand tourism.<sup>10</sup> There may be a need for further regulation regarding polar bear tourism.



#### 2.9.4 Oil and Gas

ExxonMobil and its partners (BP, Chevron, and ConocoPhillips) launched a \$1.3 billion effort to start production at the Point Thomson Project, located about 75 miles west of Kaktovik. This project is scheduled to begin production by the end of winter 2015-2016 (U.S. Army Corps of Engineers 2012). This development could potentially provide some employment opportunities for Kaktovik residents. ExxonMobil Production Co. drilled and cased the first development well for the Point Thomson project in 2010. A 60-mile ice road provides seasonal access from the site to the Prudhoe Bay road system which enables the transport of heavy equipment and materials to the site. The opening of ANWR to oil exploration and drilling could also result in employment opportunities for residents.

#### 2.9.5 Construction

Short-term construction jobs such as local housing projects will also contribute to the economy. The Tagiugmiullu Nunamiullu Housing Authority (TNHA) may build up to 6 homes in each of the Borough's villages; this effort would involve local residents in the construction of energy-

<sup>10</sup> Resources for tribal tourism include a handbook (Mt. Sanford Tribal Consortium 2003) as well as information provided by the American Indian and Alaska Native Tourism Association (<http://www.aianta.org/>).

efficient homes. Anticipated state and federal government spending reductions, however, could reduce temporary construction jobs in the future.

### 2.9.6 Government

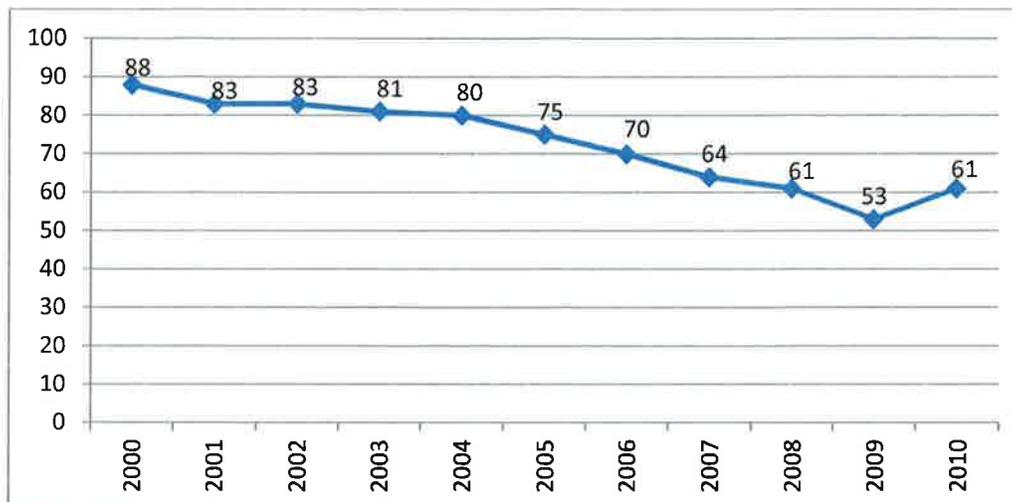
Currently, government jobs contribute greatly to Kaktovik's economy. The NSB School District employed 20 residents in 2010 and the Borough employed 36 residents. Funding for these positions is primarily dependent on Borough budgets which could decrease with declining oil revenues.

### 2.10 Education

The Harold Kaveolook School provides a K-12 curriculum which served 88 students in 2000 and 56 students in 2010. This trend represents a loss of 32 students over the decade, a 31 % decline in enrollment (see Figure 5) (NSB School District 2009). However, due to the bump in births in 2008, the school principal anticipates that the rate of school enrollment will increase. The enrollment for SY2012-2013 was 51.



This decline in enrollment follows statewide trends in rural areas including the NSB. School populations in rural Alaska have declined much more than the overall population. Since 2000, hub and rural schools have experienced losses while boarding, correspondence, and urban schools have seen increases in enrollment. This suggests that rural Alaska can anticipate continued school enrollment decline (Alaska Department of Commerce, Community and Economic Development 2009).

**Figure 5: Harold Kaveolook School Enrollment Trends**

## 2.11 Subsistence

Subsistence is important for the people of Kaktovik for both food and cultural sustenance. It is a common and traditional practice for residents to share their subsistence resources with others within and outside the community. The sharing of subsistence resources with family members, elders, those who cannot hunt or fish, and other community members is a key Iñupiaq value and a source of pride and identity by people who give and receive those gifts.

During development of this Comprehensive Plan, community members identified harvesting traditions as an important means to strengthen family ties and values.<sup>11</sup> Subsistence hunting, fishing and gathering of food and fiber resources are part of the heart and soul of the community and each member of the community. The identity of the people of Kaktovik extends far from the boundaries of the community; the place they occupy includes the vast land named *Inuuniagviat Qaaqtuvigmiut* that today includes ANWR and adjacent land and waters (see Map 2 on page 3). This area, sometimes called the village's subsistence area or Area of Influence, includes the land and water that is essential to the survival of the community (U.S. Fish and Wildlife Service 1982).

Statements on the community's website copied below provide an understanding of the importance of subsistence (Kaktovik 2010).

<sup>11</sup> The initial consultant facilitated a "SWOT exercise" to identify strengths, weaknesses, opportunities, and treats for the community.

*“The Kaktovikmiut have always looked to the land and all its creatures for both physical and spiritual sustenance. The animals found in this area are plentiful, but we never take more than we need to survive. Each year after a hunt we celebrate the animals as they give themselves to us so that we may provide for ourselves and our families.*

*A common term used for our dependence here on the wildlife is subsistence. This idea separates us from other people who often hunt for sport. The people of Kaktovik prefer another word when talking about hunting animals: harvesting. Although the land here is usually frozen solid and the climate too harsh to farm, we still see ourselves as harvesters of the land. Just as farmers work the land to grow crops for food, we work harmoniously with the animals here to provide for our people. According to the Subsistence Division of the Alaska Department of Fish and Game, Kaktovik harvests more animals off the land per capita than any other village in the state of Alaska.*

*During the summer months, fish, birds and berries are important food sources for the Kaktovikmiut. Walrus and seal are also harvested. During the fall the people of Kaktovik hunt the bowhead whale, and we have festivals to celebrate the event, along with the safe return of our hunters from the sea.*

*Caribou, musk oxen and sheep play an important part in the subsistence lifestyle of the Iñupiat. Here in Kaktovik we hunt the Porcupine and Central Arctic caribou herds, and less frequently the Teshekpuk herd to the west. Hunting musk oxen is permitted in a limited drawing hunt, which allows fifteen musk oxen to be taken by residents. Increasingly more moose are moving into this region and are harvested from time to time as well.*

*A little known fact about the Kaktovikmiut is that we are the only indigenous people in the world to hunt both the bowhead whale as well as Dall sheep. Our unique placement here, where the land and sea are so close, allows us to be truly bimodal in this regard.*

*Federal law permits Alaskan natives to hunt polar bear. During an especially harsh winter polar bears may frequently wander into town in search of food. They are usually desperate and hungry and can do much damage to the village-- tearing open storage lockers, freezers and doors, stalking residents and even killing our dogs. While nuisance bears are killed, the Kaktovikmiut generally do not regard polar bears as a meat source.*

*Throughout the year all manner of animal come and go from this place. With very few exceptions, most all of the bears, whales, seals, walrus, birds and caribou leave at one*

*time or another. The one living thing that most consistently makes its home here year round is us: the Kaktovikmiut."*

This discussion on subsistence continues with a discussion of the definitions of subsistence, the Kaktovik Area of Influence, the community's subsistence harvest, and subsistence vulnerabilities.

### **2.11.1 Definitions of Subsistence**

There are a number of legal definitions of "subsistence" and many different understandings of what the term means. Some people do not like the term because it does not adequately describe the Iñupiaq way of life. As explained by the community of Kaktovik:

" . . . Subsistence is certainly not an adequate or meaningful word here either, or at least not as it is normally defined and used outside the context of aboriginal resource use. In fact, the more we look at it, think about it, the more insult we feel by its application to our lives. We are not peasants. We do not subsist; we thrive here, live our lives with great relish (Kaktovik 1991)."



Historic photo courtesy of IHLC

While subsistence implies the use of natural resources for physical needs, it does not convey the spiritual and cultural importance of harvest activities. It is a connection to the land and to the heritage of the Iñupiat through the gift of traditional knowledge passed down through generations. It is also a way of life.

Subsistence is defined in NSB land use regulations 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 (NSBMC § 19.20.020)."

The federal Alaska National Interest Lands Conservation Act (ANILCA) defines subsistence uses as:

" . . . the customary and traditional uses by rural Alaska residents of wild, renewable resources 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 byproducts of fish and wildlife resources taken for personal or family

consumption; for barter, or sharing for personal or family consumption; and for customary trade (Section 803).”

ANILCA includes a subsistence priority by applying 3 criteria: 1) Customary and direct dependence upon the populations as the mainstay of livelihood, 2) local residency, and 3) availability of alternative resources (Section 804). ANILCA also requires that an evaluation be completed for impacts of land use on subsistence (Section 810) and that that reasonable access be provided for subsistence on public lands (Section 811).

The State of Alaska 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 (AS 16.05.940(33)).”

### **2.11.2 Area of Influence**

Kaktovik subsistence patterns are determined not only by the seasonality of the resources but by the village's geographical position and periodic access limitations. The Beaufort Sea coast has shorefast ice for at least 10 months of the year due to the currents. Marine mammals are not as numerous in winter as in the Chukchi Sea, nor are they present as long in the summer. Some species such as walrus are rare even then. The village does not have direct access to a navigable river because the waters are too shallow for boating, therefore summer activities are coastal oriented. A 1990 study found that 68% of Kaktovik’s subsistence use is on federal land, 30% on state land, and 2% on private land (Impact Assessment, Inc. 1990).

The traditional subsistence range of the *Kaktovikmiut*, or their Area of Influence, covers a 23,100 square-mile area (10,500 square miles of land area and 12,600 square miles of marine waters) generally bounded by the following areas:

- South to the headwaters and including the tributaries of the Hulahula, Jago and Sadlerochit rivers;
- West to the Sagavanirktok River and Dalton Highway;
- East to Demarcation Bay; and
- North about 60 miles in the Beaufort Sea (Stephen R. Braund & Associates 2010; NSB 2000). It also includes an area around Teshekpuk Lake.

A 1983–1984 study reported the land use area of Kaktovik subsistence users from Kaktovik (Coffing and Pederson 1985). Subsistence hunters and fishers used the area from the Brooks Range headwaters of the Hulahula River to offshore areas to the north and from the Shaviovik River and Foggy Island to the west and to the east including lands in Canada (Jacobson and Wentworth 1982).

The mainland area south of Barter Island in ANWR is critical for subsistence activities. Residents travel by boat in the sea and rivers in the summer months and by snow machine in the winter months. Main subsistence areas include a summer coastal zone extending from Foggy Island to Demarcation Bay and inland areas, such as along the Hulahula River and into the Brooks Range when snow cover permits access by snow machine.

A hunter can cover 200 miles a day in a snow machine compared to a third of that distance with a dog sled team. The frozen tundra and rivers accommodate snow machine travel for 8 months of the year (October through May). When river water travel is available (typically June - about a month after break-up - until October), a motorboat can accommodate a crew, gas and provisions for a 2 or 3 week hunting and fishing excursion.

For trips longer than one day, residents use camps and cabins. During spring, summer and fall, residents may spend extended periods at these sites (Stephen R. Braund & Associates 2010).<sup>12</sup>

### **2.11.3 Kaktovik's Subsistence Harvest**

Hunting, fishing and gathering of food and plants are essential subsistence activities, especially among Iñupiaq households where the subsistence way of life remains an important source of food. Kaktovik's primary subsistence resources are caribou, sheep, bowhead whale, fish, and waterfowl. Seal, polar bear and furbearers are also important. While Kaktovik residents are dependent on subsistence resources at all income levels, the decline of the economy in rural communities makes the contribution of subsistence even more important for those at lower income levels.

Many studies document the customary and traditional use of subsistence resources by Kaktovik residents including: Brower et al. 2000, Caufield and Pedersen 1981, Chance 1966, Coffing and Pedersen 1985, Craig 1987, George and Fuller 1997, ADFG 2000, Haynes and Pedersen 1989, Impact Assessment, Inc. 1990b, Jacobson and Wentworth 1982, MMS 2003, MMS 2001, MMS 1998, MMS 1996, MMS 1990, MMS 1986, MMS 1983, MMS 1998, MMS 1996, MMS 1990, MMS 1986, MMS 1983, Nielson 1977, Patterson 1974, Pedersen 1995b, Pedersen 1990, Pedersen 1979, Pedersen and Linn 2005, Pedersen and Coffing 1984, Pedersen and Coffing 1985,

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<sup>12</sup> Map 109 indicates location of camps and cabins (Stephen R. Braund & Associates 2010).

Pedersen et al. 1991, Pedersen et al. 2000, and Stephen R. Braund & Associates 2010, Wentworth 1979.

A 2010 NSB survey found that almost three quarters of Iñupiat families in Kaktovik received half or more of their food from subsistence resources, and a majority of households shared subsistence resources (North Slope Borough 2004). A 2003 NSB survey revealed that about 20% of Kaktovik households receive income from craft sales. A 1987-1988 study found that 98% of the Kaktovik households harvested wild resources (Pedersen 1990). An earlier study by Pedersen (1984) found that harvest of caribou by Kaktovik hunters was highly variable between 1981 and 1983. A 1985 study recognized that subsistence use extends to a much larger area than was depicted on earlier maps (Pederson et al. 1985).

**Subsistence Harvests:** A survey for the period between December 1, 1994 and November 30, 1995 found that the majority of edible pounds harvested by Kaktovik residents were marine mammals (61%), followed by terrestrial mammals (26%), fish (11%), and birds (2%) (Brower et al, 2000). Important species harvested during this period are outlined in Table 3.

**Table 3: Important Subsistence Species December 1, 1994 – November 30, 1995**

Category	Percent of edible pounds Harvested	Species Harvested
Marine Mammals	61	Bowhead whale, bearded seal, ringed seal, spotted seal, walrus, polar bear and beluga whale
Birds	2	Common eider, King eider, common loon, oldsquaw, ptarmigan, brant, and Canada goose.
Fish	11	Arctic cisco, Dolly Varden, sculpin, Arctic cod, Arctic flounder, grayling, and chum salmon.
Terrestrial Mammals	26	Caribou, Dall sheep, musk ox, moose, brown bear and furbearers (wolf, wolverine and foxes).

Source: NSB 2000a

**Major Subsistence Activities:** Kaktovik residents participate in a wide variety of subsistence activities as summarized in the following bullets. Unless otherwise noted, the source of this information is from a 2010 subsistence mapping study which identified use areas and practices

(Stephen R. Braund & Associates 2010). That study produced maps that show the geographic extent of subsistence activities as well as concentration of use.

- **Bowhead Whales:** Whaling is an important part of the village culture, and preparation for whaling occurs throughout the year. Oral traditions recall whaling in the last century when commercial whalers also used the area. Kaktovik whaling occurs in the fall in offshore areas between 15-30 miles from shore, between Camden Bay and Tapkaurak Lagoon. Increased risks of meat spoilage and safety occur when travelling further than this area. Crews use aluminum boats. In addition to regular crew members, whaling crews include a steersman and harpooner. Whaling begins in July, and the vast majority of harvests occur in September.
- **Bearded Seal:** Also known as ugruk, bearded seals are the most common seal harvested by Kaktovik residents. Hunting occurs between Prudhoe Bay and Demarcation Bay with a maximum distance of 30 miles from the shore. Hunting occurs between March and September with the majority of effort during July and August.
- **Ringed Seal:** Hunting for ringed seal occurs simultaneously with hunting of bearded seal in the same areas. Almost all hunting is done during day trips. Hunting occurs between March and September with the majority of harvests occurring July – September.
- **Walrus:** Since walrus are not commonly seen near Kaktovik, harvests are rare. Harvests occur primarily north of Barter Island from June to October.
- **Caribou:** Harvest of caribou occurs along the coast during the summer by boat and inland during the winter by snow machine. Residents often hunt caribou with immediate and extended family members. Over half of hunting efforts involve day trips. While caribou hunting occurs year round, most occur during July and August when caribou are in their prime condition.
- **Wolf and Wolverine:** Hunting for wolfs and wolverines is a common practice for Kaktovik residents. The harvest occurs October through May in much the same area as caribou hunting.
- **Moose:** Subsistence moose hunting occurs occasionally in the areas around the Sadlerochit, Hulahula and Okpilak rivers. It occurs only during the winter and spring.
- **Broad Whitefish:** Although not as important as Arctic cisco or Arctic char, Kaktovik residents occasionally harvest broad whitefish along the coast between Mikkelsen Bay and Shingle Point. While mostly a coastal activity, some inland ice fishing occurs. Most harvests occur during July and August, although some fishing occurs during all other months except May.
- **Burbot:** Although not an important subsistence species for Kaktovik, some harvests occur for burbot while fishing for other species. Fish are caught between Mikkelsen Bay and the Aichilik River. Harvests occur between June and October.

- **Arctic Cisco:** Fishing for Arctic cisco occurs during the summer migration of the fish along the coast from the Mackenzie River to the Colville River. Over half of the trips last over 2 weeks. Fishing occurs June – September with the majority of use occurring July and August. Boats provide the greatest access to fishing areas, but areas are also accessed by 4-wheelers, foot and cars or trucks.
- **Arctic Char/Dolly Varden:** Harvests of these fish are common and often coincide with Arctic cisco fishing, although Arctic char and Dolly Varden are harvested in inland areas as well as along the coast. The majority of harvests occur during July and August, although they are harvested all year long, including during the winter through the ice. More than half of subsistence fishing involves use of boats with 25% use of snow machines to access fishing areas.
- **Geese:** Hunting for geese is a popular activity for Kaktovik residents, and species targeted include brant, white-fronted, Canada, and lesser snow geese. Coastal use areas range from Prudhoe Bay to the Mackenzie Delta, and residents also travel to inland rivers. Hunting occurs between April and October with the majority of harvests in May, June and September. Snow machines provide access to harvest areas in the spring and boats during the summer and fall.
- **Eider:** Kaktovik residents hunt eiders opportunistically, but these birds are not as important as geese. Hunting generally occurs in the same areas during the same time period as geese hunting (April to October with the majority of hunting effort during May and June).

Kaktovik has good winter access to Dall sheep in the Brooks Range, and the Porcupine caribou herd upon which the village depends has so far escaped recent hunting restrictions of other North Slope herds. These two resources thus make up for the less numerous marine mammals (Wentworth 1979).

**Seasons:** Kaktovik subsistence patterns are determined by the seasonality of the resources as well as residents' ability to travel by boat (57% of annual travel) during open water seasons or by snow machine (43% of annual travel) in winter (NSB 1989). Table 4 illustrates the major subsistence harvests by month in 2010.

A 1995 study by the NSB surveyed all 73 households for the winter, spring and summer seasons and 70 households for the fall season (Brower et al. 2000a). For the 4 seasons, between 62% and 87% of the harvest instances resulted in sharing. Caribou represented the most frequently harvested terrestrial species (78 animals). During a 6-year period in the 1980s, an average annual harvest of 126 caribou were taken (between 43-172), in 1992 136 caribou were harvested, and in the year beginning July 1 1992 an estimated 158 caribou were taken by Kaktovik residents.

A seasonal description of subsistence harvest activities follows (see Table 4).

- **Spring:** The long daylight hours of April and May and sufficient snow cover are good conditions for snow machine travel and hunting expeditions to the mainland, particularly in ANWR. Fishing at ice holes in the Hulahula and other rivers continues until early April. Sheep might be taken in May. Furbearer hunting continues until May as well. Ground squirrels and marmots are hunted from early April when they come out of their holes. Ptarmigan, though hunted all year, are most easily taken when they congregate in large flocks in the spring. The first migratory waterfowl are taken along the coast in late spring and early summer, especially at traditional sites like Nuvuaq where seals, fox and fish can be taken in various seasons. Caribou are not taken during the late spring/early summer calving period (Wentworth 1979).
- **Summer:** Waterfowl arrive as soon as there is open water. Tent camps are set up in the Camden Bay area. As the season progresses and snow cover disappears, residents hunt closer to the village on the mainland and around Arey Island. Eggs are gathered on several of the barrier islands. Seals are taken and walrus may be taken when encountered on a seal hunt. Griffin Point is a primary subsistence area where caribou, seals and fish are taken (Wentworth 1979). During June, subsistence activities decrease because the snow cover disappears on the mainland prohibiting snow machine travel and the sea and rivers waters remain frozen prohibiting boat travel.

In early July, when the waters open up, residents travel by boat in the shallow waters along the coast and river delta regions and set nets in Kaktovik Lagoon and other sites from Camden Bay to Jago Spit for Arctic char. Cisco and pink salmon are caught in nets later in the summer, and occasionally beluga whales are taken. Caribou season opens in July and they are taken along the coast and in the lower 7 miles of the Canning River where boating is possible. Grayling and whitefish are taken in the Canning Delta, which is one of the most important fishing areas for Kaktovik. A particularly good caribou hunting area is at Konganevik Point.

- **Fall:** In late August whaling begins. Crews may travel 50-60 miles out to sea at the beginning of the season, but later, when the whales migrate closer to shore, they can be harvested nearer to the village. Whaling may continue for several weeks. After whaling and freeze-up, inland travel is again possible and snow machine trips are made along the Hulahula River and into the mountains. Various camps along the river provide a base for access to good ice fishing for grayling and Dolly Varden/Arctic char and hunting for caribou and sheep in late October-early November. Kongakut River fishing sites are used for Dolly Varden/Arctic char fishing. Grayling fishing is done in nearly all the major

rivers and especially along the Canning and Kuparuk Rivers where whitefish and ling cod are also taken (Jacobson 1979).

- **Winter:** Sheep and caribou hunting decline in December due to lack of daylight. Trapping continues and wolves and wolverines are taken in the mountains. Foxes are trapped along the coast. By late January hunters begin to return to the ANWR and to the Brooks Range foothills and mountains. Trips become more frequent in March with increasing daylight. Winter fishing at the Hulahula River fish camps is best from late February to April. Some caribou remain on the coast and are taken in late winter. Some sheep hunting may be done in late winter. Lake trout are taken at places in the mountains, and ling cod can be obtained along inland portions of rivers (Wentworth 1979).

**Table 4: 2010 Major Subsistence Resource Hunting Season Harvests for Kaktovik<sup>13</sup>**

Resource	Winter					Spring		Summer			Fall	
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Bowhead Whale									L	M	H	L
Seal					L	L	M	M	H	H	H	M
Caribou	L	L	L	L	L	L	L	L	H	H	H	M
Moose	M	M	M	M	M	H				M	H	M
Wolf, wolverine	H	H	H	H	H	H	L					M
Duck, Geese, Eider, Eggs					M	M	H	H	M	M	L	L
Ptarmigan	L	L	L	L	H	H	H	L	L	L	L	L
Arctic Cisco, Salmon								L	H	H	M	
Arctic Char/ Dolly Varden	M	M	M	M	M	M	L	M	H	H	M	L
Arctic Char	L	L	L	M	H	H	H	H	H	H	M	L
Burbot								L	H	H	H	M
Blank=	No harvest activity					L=		Low harvest activity				
M=	Medium harvest activity					H=		Highest harvest activity				

#### 2.11.4 Subsistence Vulnerabilities

Subsistence resources and users within the community's Area of Influence are vulnerable to a number of activities as well as climate change. Disturbance to subsistence resources can alter animal migration patterns and cause hunters to travel greater distances which increases their

<sup>13</sup> Subsistence Mapping of Nuiqsut, Kaktovik and Barrow, April 2010 MMS-MP\_Final Report\_Apr2010, Stephen R. Braund & Associates.

exposure to hazards. Some of the activities with the potential to affect subsistence are summarized in the following bullets.

- **Commercial Recreation:** Community members believe federal hunting and access laws related to lands in ANWR can impact subsistence. Restricted seasonal access and limits on hunting camps could reduce impacts. Also, NSB residents have expressed a need to educate outside hunters about impacts to subsistence when lead caribou are shot. Residents report that when this happens, the caribou migration patterns are altered.
- **Oil and Gas Activities:** Onshore and offshore oil and gas activities could impact subsistence. According to scientists from the North Slope Science Initiative, residents are particularly worried about impacts from noise discharged into the marine environment during seismic operations, exploration, development, and production. In addition, reduced lake levels from ice road construction activities can alter wildlife ecosystems and migratory patterns. Looking to the future, residents have also expressed concern that loss of wage income as a result of decreased oil development may reduce the ability to afford modern hunting equipment.
- **Noise:** In addition to the impact of noise-generating impacts on marine mammals, low-flying aircraft can harass wildlife as well as subsistence hunters. Onshore activities can also produce noise that impact wildlife.
- **Scientific Studies:** Statements by Kaktovik hunters indicate they have been negatively impacted by scientific research efforts, particularly related to the studies conducted in ANWR. While residents welcome research, they want scientists to respect their way of life. The community cautions against duplicative research and techniques that could damage wildlife. In addition, they would like to see greater opportunities for local involvement in planning and conducting of studies and reporting of study findings.
- **Climate Change:** Some residents are concerned about the long-term effects of climate change on food security.
  - Later freeze-up can limit snow machine access to the tundra for caribou hunts, and accelerated thawing of the permafrost can change vegetation patterns which in turn may affect the species composition and location.
  - The release of methane gases as permafrost soils thaw could increase the rate of warming.
  - Warmer summers may result in a greater number of mosquitoes or other pests that harass caribou and may alter the timing and location of their migrations.
  - Drier summers may also reduce lake water levels and alter fish habitat.
  - Thawing permafrost has caused the flooding and collapse of some ice cellars which are necessary for food storage. Thawing permafrost may so result in lowering or drainage of lakes.

- Changes in sea ice patterns are impacting access to hunting, fishing and gathering. The annual average amount of sea ice in the Arctic has dropped by about 8% over the past 30 years, which is a total of 386,100 square miles of sea ice (NSB 2005). This decrease in sea ice is believed to impact the availability of subsistence resources.

The *Kaktovikmuit* have a tremendous capacity to adapt to change evidenced through their response to commercial whaling, fur trading, reindeer herding, military installations, oil development, and technology changes. Through all of these changes, the *Kaktovikmuit* have retained their hunting, fishing, gathering and sharing skills and social networks. In the face of new circumstances and vulnerabilities, it is expected that existing and future village elders will continue to share with their youth their knowledge of traditional tools and equipment, the variability of ecosystems and weather, wildlife harvesting skills, and environmental stewardship to facilitate the community's adaptation to climate and economic change for generations to come.

While the *Kaktovikmuit* are adaptable, maintaining healthy subsistence resources is vital to sustaining the local population. If the availability of wildlife for subsistence declines, residents of Kaktovik would experience extreme hardship and could potentially see a decline in the population of the community due to out-migration of households. Maintaining a clean and healthy wildlife habitat is the key to sustaining the local population.

## 2.12 Cultural Resources

There are cultural and archeological resources in the community and surrounding region. These resources are vulnerable to development. For example, ice cellars and other artifacts are located at the airport site adjacent to the current community. Community members believe these historic and cultural resources should be protected, restored and showcased for educational and tourism purposes.



Photo courtesy of IHLC

Community residents have also expressed concern about the impacts of a declining number of residents who are fluent in Iñupiaq. They fear the language will be lost if more young people do not learn how to speak it.

The land of the current airport is owned by the Department of Defense (DoD). When the airport is re-located, it is recommended that the DoD decommission the landing strip for aviation purposes and transfer ownership of the land to the City or KIC for the purpose of

historic preservation of the original village settlement and as a wetland mitigation bank, since the sea will be taking over that land over time.

## Chapter 3: Land Use and Zoning

This chapter begins with a discussion of land ownership in the community and surrounding area. It continues with information about current and future land use.

### 3.1 Land Ownership

This section summarizes land ownership in the City, on Barter Island and in the region. The city limits of Kaktovik encompass approximately one square mile (0.8 square miles of land and 0.2 square miles of water), an area which includes the townsite and a freshwater lake. Much of the 1,280 acres of land transferred to the City from the KIC Village Corporation under provisions in 14(c)(3) of ANCSA are either fully developed or in unbuildable wetlands. A 2000 agreement between KIC and the City provides details of land ownership in the city (Kaktovik Iñupiat Corporation and City of Kaktovik 2000).



Historic photo of Kaktovik courtesy of IHLC

In addition to the City, there are multiple land owners in the region, including the U.S. Air Force, U.S. Fish and Wildlife Service, KIC, ASRC, and the NSB.

#### 3.1.1 U.S Air Force, Department of Defense (DoD)

The U.S. Air Force has occupied portions of the island since 1947. In 1951, Public Land Order Number 715 reserved about 8,900 acres on Barter Island as public land for the use by the U.S. Air Force to establish the Barter Island Distant Early Warning (DEW) Line Station. The station was part of a series of radar facilities built along the Arctic coast to detect incoming Soviet bombers. All but about 615 acres of the original withdrawal have been relinquished by the Department of Defense. Currently, the DoD owns the land where the former airport was located, the DEW Line Station and land near the village's fresh water lake.

#### 3.1.2 U.S. Fish and Wildlife Service

Barter Island is located at the northern edge of ANWR which is managed by the U.S. Fish and Wildlife Service (USFWS). The 19.5-million acre refuge extends to the northern coast and

continues inland across the coastal plain to the Brooks Range.<sup>14</sup> It encompasses most of the traditional Kaktovik Iñupiat homeland (*Inuuniagvat Qaaqtuvigmiut*) (ASCG Inc. 2002) [see Map 1 on page 2]. Kaktovik residents depend on ANWR for hunting, trapping, fishing and berry picking, and there are numerous Native allotments within its boundaries.

The original 8.9 million-acre ANWR was established in 1960 to protect “its unique wildlife, wilderness, and recreation values” (USFWS 2013). In 1980, the Alaska National Interest Lands Conservation Act (ANILCA) renamed the refuge as the Arctic National Wildlife Refuge and enlarged it to over 19 million acres. ANILCA added 4 additional purposes for the refuge:

- 1) Conserve fish and wildlife populations and habitats in their natural diversity;
- 2) fulfill the international fish and wildlife treaty obligations of the United States;
- 3) provide the opportunity for continued subsistence uses by local residents; and
- 4) ensure water quality and necessary water quantity within the Refuge.

ANILCA designated 8 million acres as wilderness areas and designated 3 three wild rivers which are protected by the Wilderness and Wild and Scenic River acts. The wilderness area covers most of the northwest quadrant of the Refuge. The 3 wild river corridors in ANWR are the Ivishak, Wind and Sheenjek rivers.

Other federal laws that govern the use and management of refuges include in part, the National Wildlife Refuge System Administration Act, National Environmental Policy Act (NEPA) and the Endangered Species Act. The regulations for national wildlife refuges are located in Title 50 of the Code of Federal Regulations.

Section 1002 of ANILCA identified a 100-mile wide, 1.5 million acre area in the northernmost portion of the ANWR as an area for which Congress needed additional information before it could make land use designations. This area, commonly known as the 1002 Area, contains known oil and gas resources, but Section 1003 of ANILCA prohibits oil and gas activities without an act of Congress.

### **3.1.3 Native Corporations**

In 1971, Congress passed the Alaska Native Claims Settlement Act (ANCSA), which revoked various land reserves set aside for Alaska Natives by legislative or executive action, and instead authorized the transfer of \$962.5 million and approximately 44 million acres of land to Native

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<sup>14</sup> As a result of the U.S. Supreme Court case known as the Dinkum Sands case, the federal government retained ownership of coastal waters within the boundary of ANWR, including the lagoon adjacent to the community (521 U.S. 1 (1997)).

village and regional corporations created by the act. These corporations are owned by Native shareholders from the corporations' respective geographical areas.

The Kaktovik Iñupiat Corporation (KIC) is the local Native village corporation for Kaktovik and is entitled to 92,160 acres as stated in ANCSA Section 12(a). KIC also owns 5,207 acres of land within the ANWR boundary per patent number 50-77-0046 and has additional land selections that are in the process of being approved for conveyance by the BLM. During development of the Comprehensive Plan, community members expressed concerns about federal restrictions to future development opportunities on KIC lands located within ANWR. Because KIC's lands are within the original boundaries of ANWR, they are subject to Section 22(g) of ANCSA which states that refuge lands conveyed to Native corporations must "remain subject to the laws and regulations governing the use and development of such Refuge."

Under provisions of Section 14(c)(3) of ANCSA, KIC has transferred 1,280 acres to the City of Kaktovik consisting of the improved land on which the Native village is located and areas for community expansion.

### **3.1.4 North Slope Borough**

The NSB owns land in Kaktovik associated with its public works facilities. These facilities include the school, health clinic, fire station, air field, power generation, water and sewer, fire station, landfill, and the public works building.

## **3.2 Zoning and Land Use Regulation**

The NSB regulates development under its zoning and land use regulations in Title 19 of the Borough code. Zoning provides an important tool for community planning. Zoning districts provide for different kinds of uses and developments. All areas within the Borough have been assigned to a zoning district as depicted on the official zoning map. In addition to districts that apply only to Barrow, there are 5 different zoning districts: Village, conservation, scientific research, resource development, and transportation corridor. The Assembly must approve any changes to the official zoning map after review by the Planning Commission.

Chapter 19.40 describes the purpose of each zoning district and which activities require an administrative approval, a development permit, or a conditional development.<sup>15</sup> Chapter 19.70 specifies development standards which are included in 5 categories: Village district polices, economic development polices, offshore development polices, coastal management and area-

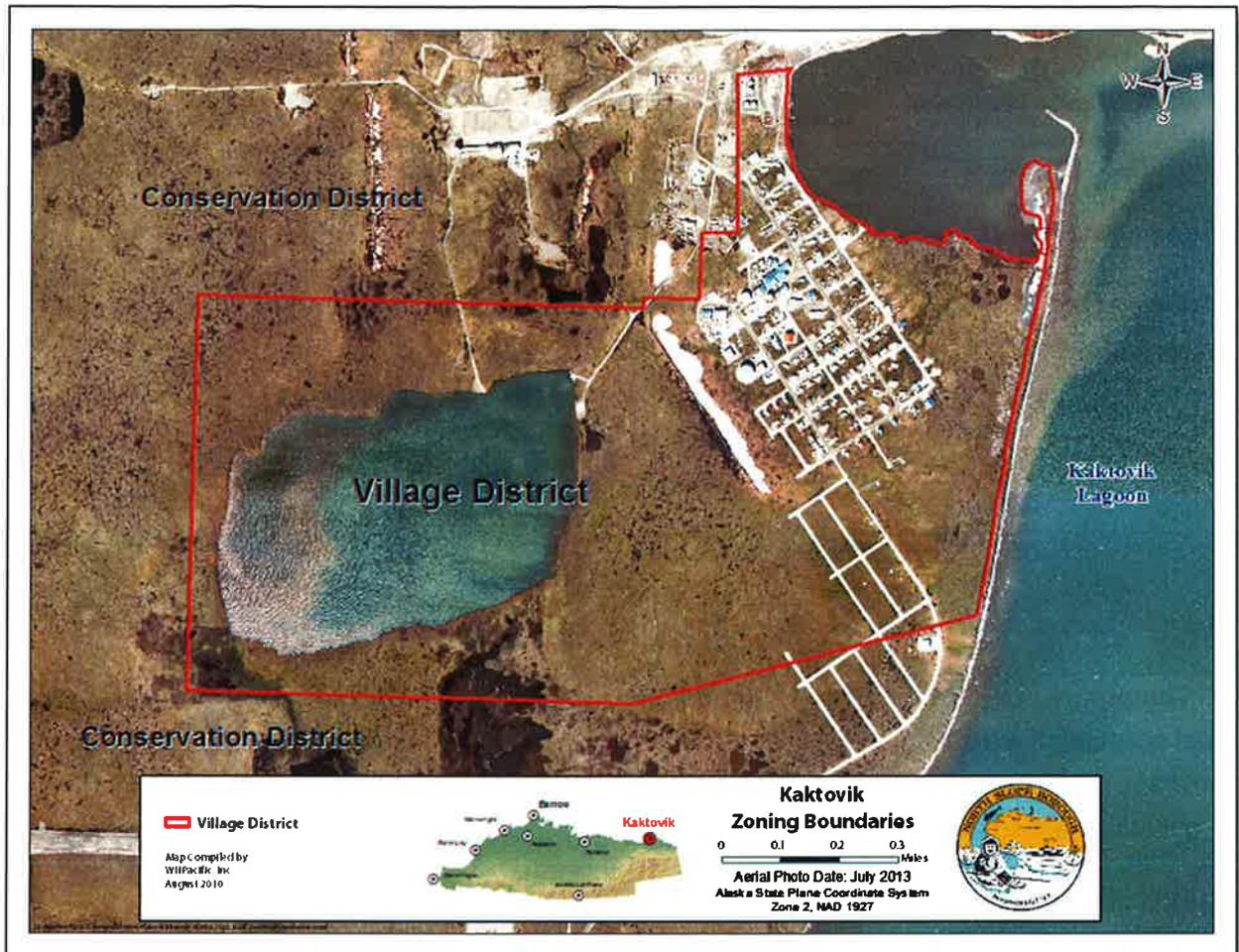
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<sup>15</sup> Activities listed as a conditional development require approval by the NSB Planning Commission.

wide policies, and transportation corridor policies.<sup>16</sup> Provisions in Title 19 address implementation enforcement related to traditional land uses.

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<sup>16</sup> Although the Alaska Coastal Management Program was terminated in 2011, the NSB's enforceable policies were incorporated into Title 19 and apply during the NSB permit reviews.

**Map 5: Kaktovik Zoning Boundaries**

**Village District (§ 19.40.060):** Currently, all areas within the Kaktovik city limits are zoned as a Village District, and the remainder of Barter Island is located within the Conservation District (see Map 5). Table 5 describes uses that are allowed in these two districts.<sup>17</sup>

Section 19.70.020 requires that projects within the Village District meet the following policies:

- (A) Development and uses will not be allowed which grossly violate lines on the rate or amount of growth adopted by a village as a part of its Comprehensive Development Plan;
- (B) Development and uses in a village are required to be consistent with the relevant adopted village Comprehensive Development Plan;
- (C) Development and uses are encouraged which provide or materially contribute to lower-cost fuel or power; and

<sup>17</sup> The Village District is described in the NSB Zoning Regulations Section 19.40.060, and the Conservation District is described in Section 19.40.70.

- (D) Development and uses are encouraged which provide local employment in the villages.

**Table 5: Uses Allowed in the Village and Conservation Districts by Permit Type**

<b>Village District (§19.70.020)</b>		
<b>Administrative Approval<sup>18</sup></b>	<b>Development Permit<sup>19</sup></b>	<b>Conditional Use Permit<sup>20</sup></b>
Placement of fill in accordance with a Corps general permit.	Public facilities, commercial development & any use or structure within the watershed for the community's drinking water.	Resource extraction & any projects elevated to the Planning Commission. <sup>21</sup>
<b>Conservation District (§19.70.070)</b>		
<b>Administrative Approval</b>	<b>Development Permit</b>	<b>Conditional Use Permit</b>
1) Temporary use (including fuel storage) of existing gravel airstrips in support of pre-exploration activities; 2) Archaeological surveys; 3) Tundra travel; and 4) Minor alterations to existing development.	1) Commercial recreation; 2) Ice roads and ice pads; 3) Exploration, prospecting or limited development in anticipation of resource extraction; and 4) Offshore development in compliance with the policies of § 19.70.040.	All development elevated by the Land Administrator under § 19.50.020.

**Conservation District (§ 19.40.070):** The Conservation District includes the current and new airport, the DEW Line facilities, the landfill and undeveloped areas of the island. This district is intended to conserve the natural ecosystem for all the various plants and animals upon which

<sup>18</sup> No public notice is required for an administrative approval.

<sup>19</sup> The Planning Department may issue development permits after a public notice and review.

<sup>20</sup> The NSB Planning Commission must issue all conditional use permits.

<sup>21</sup> Administrator may elevate a permit decision to the Planning or Zoning Commission if: the proposed activity would have significant or negative impacts, conflict with adopted Borough policies, or issues were raised during the review that merit consideration by the Planning Commission (NSBMC § 19.50.020).

Borough residents depend for subsistence. Subject to this overall intent, it can accommodate limited resource exploration and development, but major resource development project areas must be rezoned to the Resource Development District. The DEW Line facilities were developed prior to the adoption of the first NSB zoning regulations in 1984 and, therefore, are legal, nonconforming uses that have been “grandfathered” into Title 19. The airport and landfill have also been “grandfathered” as legal, nonconforming uses.

In addition to policies related to individual districts, Title 19 also requires projects to be evaluated by additional policies, including Economic Development Policies (§ 19.70.030), Offshore Development Policies (§ 19.70.040), Coastal Management Policies (§ 19.70.050), and Transportation Corridor Policies (§ 19.70.050). It should be noted that NSB’s Coastal Management Policies remain in effect under the cited section of the municipal code even though the statewide program has ended.

There may be additional state and federal permits required for proposed projects. It is important to note that NSB land use regulations do not apply to Native allotments.

### **3.3 Current Land Use**

Kaktovik residents live in an area on Barter Island of less than 1 square mile. The residential uses are located southwest of the Kaktovik Lagoon. Government offices, public facilities and businesses are located primarily in the western section of the community. Map 5 shows the current City limits which are the same as the Village Zoning District boundary, and Map 6 shows current land use. Table 6 defines the land uses currently within the Village District. While these land use labels reflect common zoning districts in more developed areas of the country, they are not used in the NSB Title 19 and are presented here to distinguish between different types of current land uses.

### **3.4 Future Land Use**

The community completed a planning process to address future land uses when KIC conveyed land to the City under provisions of 14(c)(3) of ANCSA.<sup>22</sup> Examples of proposed uses identified during the 14(c)(3) process, but not yet completed, include a public use road around the island and a buffer zone around Fresh Water Lake. Due to the presence of the DEW Line Station and its management by the U.S. Air Force, coordinating land use activities is difficult.

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<sup>22</sup> Section 14(c)(3) of the Alaska Native Claims Settlement Act [ANCSA] (43 U.S.C. § 1613(c)(3)) requires each village corporation to convey land for present and future public land uses to the municipal corporation in the village or to the state in trust.

**Table 6: Current Land Uses**

Land Use	Description
Residential	Single-family and multi-unit housing
Commercial	Grocery stores, repair shops, hotels, bed & breakfast establishments, fuel distribution centers, churches, bingo halls, recreation facilities, senior and youth centers, day care centers and other public services
Industrial	Public facilities such as public works shops, water and sewage treatment plants, telecommunications facilities, warehouse and storage yards, the airport, cemetery, gravel pits, fuel tank farms, landfills, resource development areas, and similar uses
Mixed Use	Residential uses and small-scale commercial uses that are compatible with residential areas, such as small grocery stores, day care facilities, post office yet <i>exclude</i> industrial and resource development uses

There is a need for more land for municipal development purposes, such as affordable housing, cultural resource preservation, recreation facilities, trails and roads, tourism facilities, and boat facilities. Two possible sources for additional land include the airport site located adjacent to town for cultural resource preservation, boat facilities and wetlands preservation, and the DEW Line site currently owned by the U.S. Air Force for industrial and mixed use development. The new airport is expected to open in 2017.

As part of developing the Comprehensive Plan, future land use was discussed at public meetings and at a leadership workshop. Participants drew on maps the desired locations of future development such as housing and businesses. Based on these discussions and land use limitations, such as ANWR boundaries or steep terrain, 3 future land use maps were created. Future land use designations show land use types that Kaktovik has determined to be the most desirable for a particular area. It is noted that these future land use designations are suggestions that can be further discussed and analyzed by the community prior to moving forward.

**Future Land Use Map 1:** This map focuses on the core area of the village (See Map 7). It illustrates 3 types of land use: Residential, mixed use and industrial. Under this scenario, the DEW Line Station would be considered an industrial area with the exception of a small portion of the center of that area which would be considered for mixed use. That mixed use area would encompass the currently developed area of the DEW Line Station.

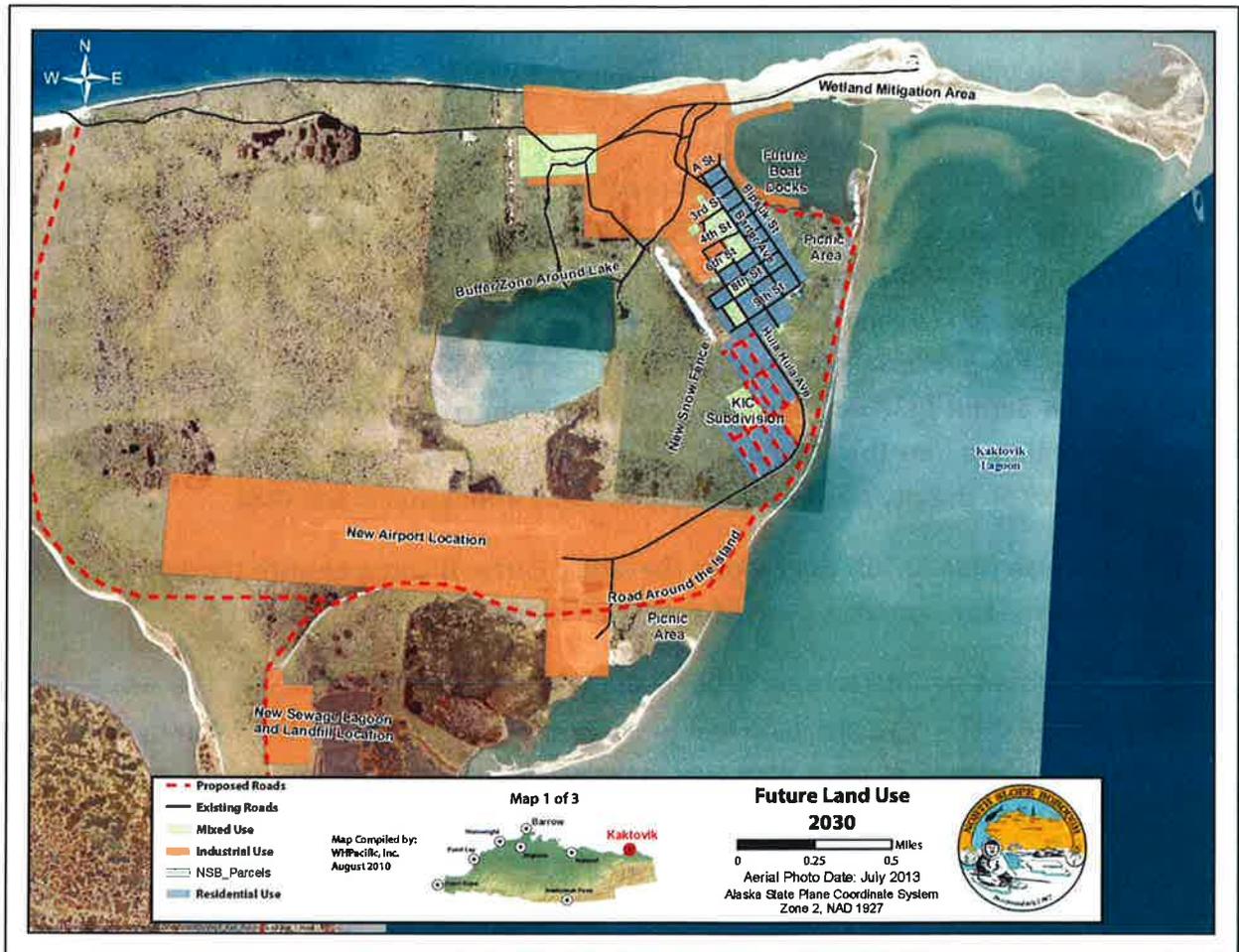
Undeveloped areas west of Barter Avenue would be considered a mixed use area which would accommodate higher density housing as well as small-scale businesses that serve the community. Seasonal tourism-related uses, such as tour operations, communications services, food establishments, and bed and breakfast establishments would be allowed in the residential areas as well.

Map 6 Current Land Use



The KIC subdivision addition is recommended for housing development with the provision that if utilities are extended to the home lots, a minimum of two dwelling units should be built on each lot. This would make most efficient use of public utilities.

**Map 7: Future Land Use Map 1**



Note: The roads in the KIC subdivision have been completed, and the final route of the proposed road around the island will need to be adjusted to avoid sensitive areas, including grave sites and cultural or historic sites.

The parcel of the KIC subdivision located at the curve of Hula Hula Avenue is recommended for commercial use due to the heavy traffic anticipated for this part of the road. Heavy trucks traveling to the landfill, airport-related traffic and winter snow machine traffic traveling to the mainland would generate noise, dust and fumes which may make that parcel unsuitable for housing. A neighborhood store or similar small-scale business could take advantage of the road access and customer traffic of this location.

The current airport site in the near-term is recommended to be considered for commercial use, particularly for eco-tourism tours, boat facilities, and cultural exhibits and activities related to the original village site. In the long-term, the land may be suitable as a wetlands mitigation bank resource.

The new airport and landfill area are recommended to be considered industrial areas to accommodate the heavy industrial uses associated with those facilities. These areas could be rezoned as the Village District if the city boundaries of Kaktovik are extended to include these areas.

Most importantly, the area around the Fresh Water Lake is proposed to be considered for drinking water protection to act as a buffer zone. Any land use activities or materials placed within the drinking water protection area should require special attention during permitting by the Department or Planning Commission. Proposed developments in this area merit ample opportunities for public involvement and adequate conditions of approval or stipulations placed on the permit that would assure protection from contamination for the City's drinking water. In addition, during the 2014 review of the plan, concern was expressed about impacts of the new airport on the city's water source, specifically from exhaust and dust.

**Future Land Use Map 2:** This map shows the larger Barter Island area with the same land uses shown in Future Land Use Map 1 with the addition of two elements (See Map 8).

1. A proposed perimeter road around the island to provide access to the winter snow machine trail to the mainland and to provide summer access to the western side of the island, particularly to a proposed new whale haul-out facility in the northwestern portion of the island.
2. A road to the mainland, a bridge across the lagoon, and a road leading to an ice road that leads to the Dalton Highway.

**Future Land Use Map 3:** This map shows a proposed future road located along the coastline and extending to the Dalton Highway at Prudhoe Bay (see map 9). This road is labeled "Discussed Road" because a consensus has not been reached regarding the need or desire for such a road. The road could either be an ice road providing seasonal access or a gravel road providing year-round access to the Dalton Highway.

A planning area was established for the Kaktovik Comprehensive Plan for use in identifying issues and opportunities and in developing management strategies. The planning area includes the community, infrastructure outside the community such as the landfill, airport, winter

subsistence trails, and land typically used by residents for hunting and subsistence purposes. This area also involves key subsistence use areas.<sup>23</sup>

In addition to the goals in the NSB Comprehensive Plan, the community came together to create this Plan as a tool to help manage local land use, to protect subsistence resources and their habitats, and to sustain and celebrate the Iñupiaq culture.

As mentioned in section 3.2, areas within the Kaktovik city boundaries have been zoned as a Village District by the NSB. Some of the community's facilities lie within a Conservation District, such as the airport and landfill. These areas should be considered for rezoning to reflect their current use. The future land use map can act as a guide to identify appropriate zoning boundaries and future uses.

During development of this Comprehensive Plan, the community identified a number of land use goals that are included in the overall goals for the community identified in Chapter 4. The land use goals emphasize the importance of protecting subsistence resources and activities, providing adequate housing, promoting local economic development opportunities, maintaining public infrastructure, and protecting historical and cultural activities. These goals and the accompanying future land use maps are intended to help direct a pattern of land use that will allow Kaktovik to continue sustainable development and maintain traditional way of life into the future

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<sup>23</sup> Subsistence use by Kaktovik residents occurs as far west as Teshekpuk Lake and as far east as the Mackenzie River Delta. Areas in Canada are outside the scope of the Comprehensive Plan.

Map 8: Future Land Use Map 2



Map 9: Future Land Use Map 3



## Chapter 4: Goals, Objectives and Strategies

This chapter outlines the goals, objectives and strategies to implement the Comprehensive Plan. The goals and supporting objectives are intended to reflect the values of the community and to address issues identified by community residents.

The goals and objectives were developed in response to the strengths, weaknesses, opportunities and threats expressed by the community in meetings hosted by the NSB Planning Department during development of this Plan.

Each goal and the related objectives and strategies are presented in separate tables. This format will allow the City to track progress in implementing strategies by periodically updating the tables.

**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 that will be taken to reach an objective.

### Comprehensive Plan Goals

- Goal 1:** Protect and enhance subsistence resources and activities.
- Goal 2:** Establish future land use designations within the village to ensure a balance of housing, commerce, services, and facilities to support strong families, traditional values and sustainable wildlife resources.
- Goal 3:** Support the provision of adequate housing in quantity and quality.
- Goal 4:** Facilitate economic development activities in appropriate locations that meet the day-to-day needs of residents and visitors and that provide employment opportunities for current and future generations.
- Goal 5:** Maintain public infrastructure, community facilities and services, and transportation systems.
- Goal 6:** Protect historical and cultural resources.
- Goal 7:** Foster meaningful intergovernmental cooperation.

The tables identify who may be involved in the implementation of each strategy, including village residents, village leadership, NSB departments, the NSB Assembly, and other entities. Village leadership participating in the formation of the goals, objectives and strategies include members of the City Council, the Native Village of Kaktovik Tribal Council, elders, hunters, NSB School District on-site personnel, NSB staff providing services in the village, and the Kaktovik

Iñupiat Corporation Board Members. However, in reference to the following Implementation Actions, village leadership refers to the City Council (City) and the Native Village of Kaktovik Tribal Council (Tribe).

When addressing persistent issues, the community may wish to pursue conflict resolution methods, including mediation or meeting facilitation, to bring parties together to find solutions. These techniques would be especially useful in addressing land use issues involving various land managers for areas adjacent to the community.

#### 4.1 Goal 1 – Protect and Enhance Subsistence Resources and Activities

This goal, along with the associated objectives and strategies, addresses subsistence uses and resources which are critical to the way of life in Kaktovik.

**Table 7: Goal 1 - Protect and Enhance Subsistence Resources and Activities**

Objectives	Strategies	Implementing Entities
1. Preserve the land, air quality, wildlife, and waters and protect them from pollution or overuse.	a. Encourage applicants for new or expanded development within the Kaktovik Area of Influence to enter into written agreements with the appropriate entity that specify avoidance procedures and mitigation measures for potential adverse impacts from the proposed development to village resources (e.g., water, wildlife, vegetation, soil, and human health).	Applicants, Tribe, City, NSB, Kaktovik Whaling Captains Association
	b. Through NSB permit stipulations, consider requiring applicants to provide appropriate resources to a subsistence mitigation fund, or a similar program, to mitigate impacts such as displacement of wildlife and the resulting hardships to residents forced to travel greater distances, at greater hazard, for subsistence resources.	NSB Planning Department
	c. Community leaders will work with the NSB, Air Force and other landowners to remediate hazardous waste sites; remove abandoned structures, drums, tanks, and debris; and protect community water sources from air and land pollutants.	Village leaders, NSB, Air Force, USFWS

Objectives	Strategies	Implementing Entities
<p>2. Ensure trapping, hunting, and fishing rights are available for Kaktovik residents now and for future generations.</p>	<p>a. Coordinate with federal and state officials and participate in the process for future updates to the ANWR Comprehensive Conservation Plan and EIS as well as other federal and state planning processes to ensure that access to traditional subsistence resources and activities is not restricted.</p>	<p>City, Tribe, NSB, USFWS and other federal and state agencies</p>
	<p>b. Encourage NSB Wildlife Management Department staff to coordinate with village leadership to ensure that NSB and local hunters' voices are expressed at federal (particularly the USFWS) and state (particularly the ADF&amp;G) agency meetings to support the continued hunting of subsistence wildlife within the Area of Influence.</p>	<p>NSB Wildlife Management Department, NSB Fish and Game Management Committee, City, Tribe</p>
	<p>c. Monitor and comment on proposed federal and state agency changes to hunting regulations that may be applied to residents such as the number, price and length of permits/licenses, bag limits, access regulations, or other new restrictions or lessening of restrictions that may occur as a result of changes to wildlife population numbers or behaviors.</p>	<p>City, Tribe, NSB Wildlife Management Department, NSB Fish and Game Management Committee, federal Subsistence Advisory Council</p>
	<p>d. Coordinate with the Air Force to seek public easements or ownership of land for an access road along the northern coast of Barter Island to the northwest area of the island for subsistence activities, including a whale haul-out area when the Bernard Harbor is too shallow.</p>	<p>City, Tribe, NSB, Air Force</p>
<p>3. Monitor and avoid or minimize negative impacts to air, land and water caused by tourism, sport hunting, scientific research, or development activities within the Area of Influence that</p>	<p>a. Applicants for new or expanded development within the Kaktovik Area of Influence will be encouraged to enter into written agreements with Kaktovik leadership, the NSB, or the appropriate entity, to specify avoidance procedures and mitigation measures for potential adverse impacts from</p>	<p>City, Tribe, NSB Department of Planning and Community Services</p>

Objectives	Strategies	Implementing Entities
<p>may disturb wildlife, particularly during sensitive or critical periods (e.g., migration, calving, breeding, nesting, or harvesting).</p>	<p>the proposed development to village resources, particularly to water, wildlife, vegetation, erosion, and human health.</p>	
	<p>b. Kaktovik residents, leadership and NSB officials will support efforts to protect polar bear denning and resting areas.</p>	<p>City, Tribe and NSB</p>
	<p>c. Continue to monitor and protect polar bears through the local polar bear committee to deter (non-lethally haze) bears from the village, minimize attractants in and around the village, and develop educational materials for visitors. Attain funding to establish a dedicated work force for polar bear patrols.</p>	<p>Kaktovik Polar Bear Committee, USFWS</p>
	<p>d. The local Polar Bear Committee will be encouraged to continue to educate visitors on polar bear viewing to ensure their activities do not disturb polar bears. Kaktovik leaders will encourage residents to apply for permits and licenses to serve as guides.</p>	<p>City, Tribe, Kaktovik Polar Bear Committee</p>
	<p>e. Collaborate with appropriate agencies to develop and widely distribute information on safe and “good neighbor” hiking and camping etiquette for visitors (researchers, paddlers and hikers). Education should specify that August through September is no longer a safe time to camp on the barrier islands.</p>	<p>City, Tribe, NSB Wildlife Management Department, KIC</p>
	<p>f. Collaborate to ensure commercial tour operators operating in the area hold valid NSB Commercial Recreation Land Use Permits which will be used to monitor activities to ensure compliance with permit stipulations.</p>	<p>City, Tribe, NSB Department of Planning and Community Services</p>
	<p>g. Ensure that permit stipulations for new and expanding industrial activities require that any security measures and procedures employed by the operation do not restrict access to wildlife by Kaktovik subsistence users.</p>	<p>Department of Planning and Community Services</p>

Objectives	Strategies	Implementing Entities
	h. Ensure that permit stipulations for new and expanding industrial activity minimize the footprint of the industrial and support uses to minimize displacement of wildlife. Industry will be encouraged to co-locate or share facilities, such as roads and pipeline corridors, to minimize impact on subsistence land and waters.	Department of Planning and Community Services
4. Regulate use of helicopters and low-flying aircraft within the Area of Influence to avoid or minimize disturbance to wildlife. <sup>24</sup>	a. Land use permits can stipulate that pilots minimize disturbance to wildlife. Residents will be encouraged to report to the NSB Planning and Wildlife Management departments on the use of helicopters and low-flying aircraft within the Village Area of Influence when it is disruptive to subsistence activities so that permit conditions can be enforced.	NSB Department of Planning and Community Services, Wildlife Management Department
	b. NSB land use permit stipulations for industry, scientific or sport hunting travel over subsistence lands and waters may be used to minimize the number and frequency of flights during wildlife migratory, nesting, brooding, denning or fledging periods in order to avoid harassment of wildlife and hunters.	NSB Department of Planning and Community Services
	c. Permit stipulations may require that pilots communicate with a village-designated Kaktovik resident/coordinator, such as the Village Liaison or Fire Chief, to inform them of the schedule and routes of upcoming flights	NSB Department of Planning and Community Services, City

<sup>24</sup> Researchers, oil companies and commercial hunters use helicopters and low-flying aircraft which may disturb wildlife in the Kaktovik Area of Influence. This air traffic creates noise and shadows that frighten wildlife, causing them scatter, create stress, and deplete their energy. These disturbances cause the caribou to avoid traditional migratory routes which then cause resident hunters to travel farther, at greater hazard and costs, to harvest their food.

Objectives	Strategies	Implementing Entities
	as well as the number and color of the aircraft. The coordinator will communicate this information by VHF radio to subsistence users known to be in the area(s) of those flights. Any complaint of harassment to wildlife or hunters will be communicated to the village representative who will communicate this to the NSB permit code enforcement team for its follow up. <sup>25</sup>	
	d. The NSB may prohibit permittees from using helicopters for the purpose of identifying river fish for sport fishing.	NSB Department of Planning and Community Services
	e. Community leaders will encourage the NSB to work with state and federal agencies to develop a borough-wide system to track aircraft.	City, Tribe and NSB
5. Support coordinated scientific research in the Village and Area of Influence so that these actions minimize disturbance to area wildlife, land and waters.	a. Village leadership will seek to participate on community or scientific panels reviewing and establishing protocols for biological research taking place within the Kaktovik Area of Influence.	City, Tribe, NSB Fish and Game Management Committee
	b. Permit stipulations may require research applicants to advise community leadership of permitted field research activities prior to their commencement.	NSB Department of Planning and Community Services
	c. The NSB Planning Department may require research applicants to provide results and findings of scientific research (e.g., on a public website) and share relevant information with village leadership and the Wildlife Management Department, such as research about wildlife, their habitat and human health and well-being.	NSB Department of Planning and Community Services, NSB Wildlife Management Department, City, Tribe
	d. When changing conditions warrant, the Planning Department is encouraged to	NSB Department of Planning and

<sup>25</sup> Note: This strategy does not mention use of helicopters for sports hunting since it is illegal to do so.

Objectives	Strategies	Implementing Entities
	formulate adaptive land and resource management practices, measures and permit stipulations to assure proper stewardship of land, water and wildlife resources.	Community Services
6. Protect and enhance storage for subsistence foods and items used for harvests.	a. Village leadership and NSB grant-writing staff are encouraged to investigate the feasibility of creating new ice cellars for personal or cooperative use by residents, such as the one constructed in 2014 with help of the Kaktovik Community Foundation.	City, Tribe, NSB Grants Division staff, Kaktovik Community Foundation
	b. NSB staff is encouraged to assist village leadership in investigating methods and obtaining funding to protect remaining ice cellars from damage due to thawing of permafrost, erosion or flooding.	NSB, City, Tribe, Kaktovik Community Foundation
	c. Village leadership and NSB grant-writing staff are encouraged to investigate the feasibility of developing a boat docking area and facilities for storage of subsistence equipment such as sleds, boats, blinds, camp equipment, and snow machines.	City, Tribe, NSB Grants Division, USFWS, Kaktovik Whaling Captains Association
	d. Village leadership will continue to provide a whale haul out spot and sheltered meat butchering and meat preparation facility, along with appropriate sanitation facilities. Investigate improvements to the haul out area such as the one in Barrow that has metal grates for the sand to fall through.	City, Tribe, Kaktovik Whaling Captains Association
7. Require stringent review and monitoring of offshore oil and gas exploration and development, particularly any activity which lies within or near the Kaktovik whaling zone.	a. Village leadership will encourage the NSB Planning Department staff to assist Kaktovik leadership in reviewing and commenting on environmental studies and permit applications for any industrial activity proposed on or near the waters within the Kaktovik Area of Influence.	NSB Department of Planning and Community Services
	b. Industrial developments proposed for waterbodies within the Kaktovik Area of Influence will adhere to NSB-adopted best	NSB Department of Planning and

Objectives	Strategies	Implementing Entities
	available technologies (BATs) and best management practices (BMPs) included as permit stipulations to prevent, avoid and, if necessary, remediate contamination to resources or any disturbance to wildlife as of result of that activity.	Community Services

#### 4.2 Goal 2 – Establish Future Land Use Designations

The full text of Goal 2 is to establish future land use designations within the village to ensure a balance of housing, commerce, services and facilities to support families, strong traditional values, and sustainable wildlife resources. These land use designations do not amend the village’s zoning designations, but they provide a guide for a rezoning to implement these recommendations as well as for future development.

Kaktovik residents want greater influence over the way the land is used within their community and within their Area of Influence. Identifying future land use is an important step to securing the physical and economic well-being of the community.

**Table 8: Goal 2 - Establish Future Land Use Designations**

Objectives	Strategies	Implementing Entities
8. Protect the water quality of the village's drinking water source, the freshwater lake, and evaluate the long-term supply capacity of the lake.	a. Create an adequate buffer around the freshwater lake to prevent development or contamination, damage or degradation of the village's drinking water supply. The Planning Department is encouraged to carefully review proposals for structures or materials placed in the buffer area, to conduct a public hearing in the village for any such proposals and to require appropriate stipulations.	NSB Department of Planning and Community Services, Planning Commission, Assembly
9. Designate adequate land within the village, and particularly where water, sewer and roads already exist, for additional residential and community-serving commercial land uses.	a. The NSB, in cooperation with the City of Kaktovik and its residents, is encouraged to promote in-fill development on vacant or underused lots where utilities exist by allowing a mixture of uses, higher densities, lower parking requirements and flexible setbacks, where appropriate.	NSB Department of Planning and Community Services, Planning Commission, Assembly
	b. The NSB is encouraged to ensure that new development maximizes the use of existing infrastructure and minimizes inefficient development. The NSB may require applicants who propose to develop land outside of utility service areas to pay for extending the utilities to their property.	NSB Department of Planning and Community Services
	c. The City of Kaktovik and its residents will identify land areas and waters within the Area of Influence that are critically important subsistence areas that merit special attention during permitting to balance multiple uses while maintaining subsistence access.	City, NSB Department of Planning and Community Services, Planning Commission, Assembly
	d. The NSB, in cooperation with the City of Kaktovik and its residents, will consider ways to implement the Future Land Use Maps, including lands appropriate for industrial activities and public infrastructure, accommodating airport facilities, landfill and materials reuse centers, indoor and outdoor	NSB Department of Planning and Community Services, Planning Commission, Assembly

Objectives	Strategies	Implementing Entities
	storage spaces, renewable energy systems, and similar industrial uses.	
10. Facilitate the establishment of community-serving businesses and services.	a. Under the guidance found within Title 19, the NSB will be encouraged to provide flexible standards for the following community uses: Greenhouses; sale or barter of locally grown or hunted foods; a cultural center/museum (or multi-purpose building); an appliance and vehicle repair shop; day care facility; tourism-related facilities; and services such as lodging, restaurants and tours.	NSB Department of Planning and Community Services, Planning Commission, Assembly, Kaktovik Community Foundation
11. Designate land in appropriate locations for wind energy systems and other renewable energy electric power generation, storage and distribution systems to encourages energy independence.	a. The NSB, in cooperation with the City of Kaktovik and its residents, will work together to promote individual wind and solar energy systems for homes, businesses and community facilities.	NSB Department of Planning and Community Services, Planning Commission, Assembly
12. Protect and enhance food storage ice cellars. <sup>26</sup>	a. Village leadership will work with NSB grant-writing staff to investigate the feasibility of assisting households in rehabilitating or repairing damaged or failing ice cellars or in creating new ice cellars for individual or village cooperative use.	City, Tribe, Grants Division, Kaktovik Community Foundation.
	b. The NSB is encouraged to establish building setback standards to protect existing ice cellars from damage related to new construction in close proximity to the cellars.	NSB Dept. of Planning & Community Services, Planning Commission, Assembly

<sup>26</sup> Warmer temperatures have caused cracks in the permafrost and deeper thawing of the ground surrounding ice cellars. The cracks and thawing have allowed water from nearby ponds and surface waters to seep into and flood ice cellars. This warming of the ice cellars can cause meat to spoil and the fat from the muktuk to separate from the skin, wasting food. The failure of ice cellars can impact human health by causing food insecurity and food safety issues.

Objectives	Strategies	Implementing Entities
	c. Village leadership will investigate solutions to thawing ice cellars. It will work with NSB staff to seek grant funding to investigate the feasibility of installing thermo-siphon equipment on existing and new ice cellars and other measures to address the problem. If deemed feasible, grants or other funding would be sought to prolong the life of traditional ice cellars for residents' use. <sup>27</sup>	City, Tribe, NSB Grants Division

### 4.3 Goal 3 – Support the Provision of Adequate Housing

As explained in Chapter 3, there is inadequate housing in Kaktovik to serve the current population. This goal and its associated objectives and strategies address this issue.

**Table 9: Goal 3 - Support the Provision of Adequate Housing in Quantity and Quality**

Objectives	Strategies	Implementing Entities
13. Support efforts by the Village, Tagiugmiullu Nunamiullu Housing Authority (TNHA), other non-profit organizations, and private parties to provide safe, sanitary, affordable and energy-efficient housing of all types within the Village.	a. The City of Kaktovik will work with the NSB to identify lots within the existing utility grid that are vacant, contain dilapidated structures, or are underdeveloped and could be redeveloped for housing. They will assist in efforts to clear titles for these housing opportunity lots.	City, NSB Department of Planning & Community Services
	b. The City of Kaktovik will work with NSB staff to encourage redevelopment of unused structures to housing in areas served by water, sewer and other utilities.	NSB Department of Planning & Community Services, Planning Commission, Assembly
	c. Village leaders and homeowners in Kaktovik will encourage TNHA and other developers to develop new, affordable, energy-efficient housing using the latest construction methods for sustainable, cold-climate homes. In addition to low-income housing, there is a need for programs to	City, Tribe, TNHA

<sup>27</sup> In 2014, the Kaktovik Community Foundation worked with the community on a new prototype for ice cellars.

Objectives	Strategies	Implementing Entities
	promote home ownership by young people and residents with middle-range incomes.	
	d. Village leadership will work with NSB grant-writers to seek funds for retrofit insulation methods, passive ventilation systems (Qingok) and other alternative building techniques to reduce energy consumption in existing homes.	City, Tribe, NSB Grants Division
	e. Work with the NSB to ensure there is an ample supply of gravel available for use by residents in new construction and upgrades to pads and driveways.	Community leadership, KIC, and NSB
	f. Village leadership will work with the NSB and TNHA to define the term “adequate housing.” <sup>28</sup>	Village leadership, NSB, TNHA
14. Develop cooperative agreements to expand roads and utilities to new lands as they are developed to meet identified need with priority for higher density (duplex to triplex) housing construction or designated essential community facilities.	a. Lands in platted subdivisions that are not served by a water distribution system, sewer system or roads may be developed with individual water and sanitary sewer systems maintained by each land owner. If water, sewer and roads are to be extended to a new lot or subdivision, the land should be developed at a minimum density of two dwelling units per lot. The NSB will schedule connections as funding allows.	City, Tribe, NSB Department of Planning & Community Services

<sup>28</sup> At the July 2014 public meeting, residents thought the NSB definition of adequate housing should be amended to provide more living space per person (e.g., two people per room excluding bath, kitchen, living room, and garage).

#### 4.4 Goal 4 – Facilitate Economic Development Activities

This full text of Goal 4 is to facilitate economic development activities in appropriate locations that meet the day-to-day needs of residents and visitors and that provide employment opportunities for current and future generations.

**Table 10: Goal 4 - Facilitate Economic Development Activities**

Objectives	Strategies	Implementing Entities
15. Designate land and provide adequate infrastructure in appropriate locations for additional community-serving commercial activities to support year-round, long-term or full-time seasonal job opportunities and convenience goods and services for residents.	a. The City of Kaktovik will work with the NSB in a public process to encourage tourism-related activities (lodging, campgrounds, visitor related transportation services, trails, sanitary and shower facilities, food service, tours/excursions, arts and crafts); wind energy systems; building-related energy conservation and weatherization efforts; and other community-serving businesses (day care facilities, shops, restaurants, telecommunications, etc.).	NSB Department of Planning & Community Services, Planning Commission, Assembly
	b. Village leadership will work with the NSB and the Air Force to secure ownership or a long-term lease of the airport site located near the community for the purpose of providing, in the short-term, community facilities such as a trail/road to the whale haul out site, a formal boat launch with truck and trailer parking area and toilet facilities, and a heritage village to showcase the area of the original settlement. These facilities would complement and support local tourism businesses. In addition, the current airport should be considered for retaining as an optional landing strip in the event the new airport is not operable. However, in the long-term, as erosion and sea level rise overtakes the former landing strip, this land may be suitable as a wetlands mitigation bank.	City, Tribe, NSB, Air Force
	c. Kaktovik leadership will seek funds for training, apprentice programs and funds to	City, Tribe

Objectives	Strategies	Implementing Entities
	support start-up businesses that can be sustained by the community, such as the building weatherization program, other energy conservation projects, renewable power sources, greenhouse agriculture, telecommunication, and tourism activities.	
	d. Village leadership will work with the NSB, the NSB School District and Ilisagvik College to seek to provide incentives for local residents to enroll in construction trade training and certification programs so the village will have local trades (trained electrician, plumber, carpenter, building mechanic and vehicle mechanic).	City, Tribe, NSB School District, Ilisagvik College, Department of Planning & Community Services, Planning Commission, Assembly
	e. Kaktovik leadership will encourage the USFWS to support interested residents in obtaining commercial recreational and educational guide authorizations and special use permits to operate within ANWR.	City, Tribe, USFWS
	f. Work with the NSB and Congressional delegation to explore opportunities to reduce freight costs, expand barge service (e.g., shuttle barges from Prudhoe Bay), and addition of Kaktovik to the bypass mail system.	Community leaders, NSB, Congressional Delegation
16. Provide flexibility in the implementation of land use regulations and permitting to encourage locally-owned and operated businesses, including construction trades, vehicle and machine repair services and tourism-related businesses.	a. Village leadership will work with the NSB and other government agencies to encourage the development and expansion of locally-owned eco-tourism activities and operations (e.g., expediting business licenses and land use permits and improving infrastructure such as signage for visitors).	City, Tribe, NSB, USFWS
	b. Village leadership will work with the NSB to provide safe polar bear viewing experiences for residents and visitors which are sensitive to the needs and habits of the bears and to e. Village leadership and the NSB will continue to support the local Polar	City, Tribe, NSB, Local Polar Bear Committee

Objectives	Strategies	Implementing Entities
	Bear Committee, for local bear patrols and support for safe and sensitive polar bear viewing.	
	c. Village leadership will work with the NSB and USFWS to ensure there are local economic development opportunities related to tourism, including polar bear viewing.	Village leadership, NSB, USFWS
17. Economic development activities should avoid use of areas and resources important for subsistence activities whenever possible. Businesses should avoid, to the greatest extent possible, any development or non-subsistence activity that could alter or disturb wildlife habitat or migratory patterns.	a. The Kaktovik leadership will work with the NSB and state and federal agencies to identify lands and waters within the Kaktovik Area of Influence that need additional protection and to support conservation strategies in concert with multiple use measures for those areas.	City, Tribe, Department of Planning & Community Services, Planning Commission, Assembly
	b. Ecotourism or hunting guide businesses operated by local residents will be encouraged to coordinate with local hunters in the area they propose to tour to ensure that their operations do not conflict with subsistence activities.	Local businesses, subsistence hunters

#### 4.5 Goal 5 – Maintain Efficient Public Infrastructure

The full text of Goal 5 is to maintain public infrastructure, community facilities and services, and transportation systems. Public infrastructure is necessary to establish a healthy, vibrant community.

**Table 11: Goal 5 - Maintain Efficient Public Infrastructure**

Objectives	Strategies	Implementing Entities
18. Continue to maintain and improve water, sewer, electric power, communication, and transportation infrastructure in good operating condition, seek to increase their energy	a. The Kaktovik Leadership will work with the NSB to identify roads, utilities and community facilities that may be vulnerable to damage caused by climate-related impacts including thawing permafrost, storm surge, erosion, and flooding. Updates to the Kaktovik Local All Hazard Mitigation Plan should include	NSB

Objectives	Strategies	Implementing Entities
efficiency over time, and improve public safety and health services.	updated analyses of the threat posed by these impacts to the current location of facilities, or to the entire village over the next 20 years or more. Updates to the plan should also identify appropriate responses, including developing a plan to respond to coastal erosion.	
	b. Village leadership will work with the NSB to design and locate new community facilities to be resilient to climate and natural hazards and to be functional after a disaster event.	City, Tribe, NSB
	c. As allowed under Title 19, the Kaktovik leadership will work with the NSB will to restrict development on flood- or erosion-prone or vulnerable slopes and bluffs and will investigate means to identify those areas and establish appropriate setbacks or other controls.	Department of Planning & Community Services, Planning Commission, Assembly
	d. The NSB is encouraged to include permit stipulations that require new structures to be designed and engineered to minimize and/or accommodate foundation settlement due to melting permafrost.	Department of Planning & Community Services, NSB Capital Improvement Program (CIPM)
	e. Village leadership will encourage the NSB to evaluate the 20-year capacity of the freshwater lake as the village’s drinking water supply with particular attention paid to seepage, presence of methane gas due to thawing permafrost, and saltwater intrusion from the sea and will recommend appropriate action.	NSB Department of Public Works
	f. Village leadership will work with the NSB to install signage at Freshwater Lake to protect drinking water (e.g., “do not litter” and “no dogs allowed in water”) and prepare a long-term plan for assuring safe and affordable drinking water supply, treatment and distribution.	NSB Department of Public Works

Objectives	Strategies	Implementing Entities
	g. Village leadership will seek federal grants to secure rights-of-way and to design and develop a pedestrian/ATV/snow machine trail network around the island and leading to the mainland in winter. The leadership will work with the NSB to do a feasibility study for a seasonal ice road connecting the community to the Dalton Highway. There is also a need to obtain an easement around the cemetery to connect with the existing spur road.	City, Tribe
	h. The NSB will continue to provide dust control during summer months to avoid dust contribution to respiratory problems in residents, particularly elders and young children. Village leadership will work with the NSB to use non-toxic palliatives and other alternatives (e.g., use of lagoon water, pave roads).	NSB Department of Public Works
	i. The NSB will coordinate with the Air Force to remove contaminated materials and buried debris associated with the DEW Line Station function.	NSB Department of Public Works
	j. The City will work with the NSB to explore options for construction of restrooms and a heated shelter at the new airport.	NSB Department of Public Works
	k. The City will work with the NSB to explore opportunities to improve internet speeds (e.g., increasing broadband speeds, linking Kaktovik to cross-Arctic fiber optic cables or adding a separate broadband connection to the school).	City, NSB, School District
	l. Continue to improve local utilities, including power grid. Work with the NSB to ensure annual inspections of power grid and completion of a new infrastructure audit.	City, NSB

Objectives	Strategies	Implementing Entities
	m. Encourage NSB to allocate FEMA funds from the 2005 storm to Kaktovik improvements.	City, NSB
	n. Construct visitor facilities, including a designated campground, restrooms and shower and laundry facilities.	City, NSB
	o. Village leadership will work with the NSB to find funding for a new building for coordinating search and rescue operations.	City, NSB
	p. Encourage the NSB to develop a lighting plan that saves energy while providing adequate lumens for bear protection. This plan should address needs for increased lighting at facilities such as the health clinic.	City, NSB
	q. Village leadership will work with the NSB and USPS to explore options to retain post office staff (e.g., subsidies for position).	Village leadership, NSB, USPS
	r. Work with the NSB to secure a second police officer and to expand coverage to evening hours when they are needed.	Village leadership, NSB
	s. Village leadership will work with NSB to upgrade and expand the water treatment plant (it is exceeding its capability a number of times each month) and the sewer system.	Village leadership, NSB
	t. Village leadership will work with NSB to discuss options for extending services to the new KIC subdivision.	Village leadership, NSB
	u. City will work with NSB to improve snow management, including regular repair of snow fences, construction of new fence (e.g., around KIC subdivision and on the road to the new airport), location of snow piles in areas where snow melt will not cause erosion, and maintenance of culverts.	City, NSB Public Works
	v. Village leadership will work with the NSB to implement regular schedules for ensuring local utilities are working, ensure a new power grid audit is completed (last one done	Village leadership, NSB Public Works

Objectives	Strategies	Implementing Entities
	<p>in 2006), and investigate feasibility of stationing a lineman in the community.</p> <p>w. Village leadership will work with the NSB to address health care issues (e.g., doctor visits need to be longer, elders need priority care, and students need better turn around for required physicals) and investigate feasibility of making Fairbanks the health care hub.<sup>29</sup></p>	<p>Village leadership, NSB Department of Health and Social Services.</p>
<p>19. Facilitate research, design and operation of local energy sources such as wind, natural gas, methane, hydrogen, and solar power and protect the location of those sites.</p>	<p>a. The City will work with NSB to investigate the feasibility of alternative energy sources and systems for the village which could include wind energy, summer solar energy, and summer ocean wave energy systems. In 2015, the NSB was developing a Borough-wide energy plan.</p>	<p>City, NSB</p>
<p>20. Develop facilities that provide opportunities for sustaining culture and improving health.</p>	<p>a. Kaktovik leadership will work with the NSB Grants Division to seek funding for an indoor walking/running track, trails, outdoor playground equipment (e.g., in area between school and Waldo Arms Hotel), ball fields and other facilities that provide residents with recreational opportunities, provided that the City and other local entities operate and maintain those facilities and services.</p> <p>b. The City will support community gatherings, cultural activities, whaling activities and active recreation by seeking funding to provide places to gather. These may include an open field, outdoor recreation area, cultural facility, community kitchen, traditional trading center, or community center or gym. These areas need to be defined and preserved and have appropriate support facilities such as wind screens, sanitary facilities and electric power.</p>	<p>City, Tribe, NSB Grants Division</p> <p>City</p>

<sup>29</sup> At the July 2014 public meeting, residents said that it is much more expensive to fly to Barrow than to Fairbanks.

Objectives	Strategies	Implementing Entities
	c. The Kaktovik leadership will work together with NSB staff, funding agencies and appropriate health professionals to conduct and maintain health studies documenting current health conditions and outdoor and indoor air quality.	City, Tribe, NSB staff
	d. The Kaktovik leadership will work with the NSB to ensure that applicants for new or expanded industrial development within the Village Area of Influence will conduct a Health Impact Assessment, acceptable to the NSB Health Department, to identify potential impacts of the proposed new development on village residents. The assessment will identify appropriate mitigation measures that can be incorporated into the project design and operating procedures.	NSB Department of Planning and Community Services

#### 4.6 Goal 6 - Protect Historical and Cultural Resources

Village residents have been forcibly relocated 3 times by the Air Force to make land available for the DEW Line and other facilities. The current landing strip is the site of the original village settlement and remains of sod homes and ice cellars remain along the edges of the landing strip. If the landing strip is relocated, the historic sites and artifacts should be revealed, protected and showcased for residents and visitors to learn of traditional culture and lifestyles.

**Table 12: Goal 6 - Protect Historical and Cultural Resources**

Objectives	Strategies	Implementing Entities
21. Adopt and widely distribute guidelines and signage for visitors to instruct them on how to avoid disturbance to wildlife, cultural resources, and local residents.	a. Kaktovik leadership will collaborate on identifying a design for signage and maps for visitors to orient themselves to the Village, environs and tourist destinations. Once a design is established, the City will install and maintain the signs and maps.	City, Tribe
	b. The City of Kaktovik and NSB will install bi-lingual Iñupiaq and English signage in public	City, NSB

Objectives	Strategies	Implementing Entities
	spaces throughout the community to encourage the learning and use of the Native Iñupiaq language as a means of preserving the language and the cultural values it expresses. The City will work to replace numbered streets with Iñupiaq names.	
22. Continue to ensure that important cultural and traditional resources and activities located within development areas are avoided and protected, or are properly mitigated if disturbed or damaged.	a. Community leadership will collaborate with the NSB and the Air Force to mitigate past damage to historic village settlements and will strive to restore, preserve and showcase historic sites and artifacts. This could be accomplished through construction of a museum/multi-purpose building to house artifacts currently housed in out of country museums.	City, Tribe, Air Force, Kaktovik Community Foundation
	b. Community leadership will work with the NSB to require Traditional Land Use Inventory review and clearance for resource development and scientific research projects within the Village Area of Influence. Conditions of permit approval will address instances when resources are found within the proposed development area.	NSB Department of Planning and Community Services

#### 4.7 Goal 7 – Foster Meaningful Intergovernmental Cooperation

As stated in the Kaktovik document *In this Place: A Guide for Those Who Would Work in the County of the Kaktovikmiut*, residents want to participate “in whatever happens here. That is our greatest need, and we repeat it, our need to participate and to be certain that things will happen as they should happen here” (Kaktovik 1991). Residents want meaningful participation in reviewing development proposals, identifying potential impacts and designing and monitoring mitigation measures.

**Table 13: Goal 7 - Foster Meaningful Intergovernmental Cooperation**

Objectives	Strategies	Implementing Entities
<p>23. Promote formal and informal intergovernmental cooperation and agreements among the City, Native Village of Kaktovik, Kaktovik Iñupiat Corporation (KIC), NSB and the state and federal governments (particularly the USFWS) for accomplishing common goals, providing a service or solving a mutual problem.</p>	<p>a. The village leadership will coordinate with government agencies conducting business in Kaktovik to accomplish government-to-government consultations as required by Alaska Administrative Order No. 186 and Presidential Executive Order 13175.<sup>30</sup></p>	<p>NSB, state and federal agencies, KIC</p>
	<p>b. The Village leadership will work with the NSB and federal and state agencies to identify and address any adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law.</p>	<p>City, Tribe, NSB, KIC</p>
	<p>c. The Kaktovik village leadership will work with the NSB, federal and state agencies, and project applicants for new or significant expansion of an existing development to implement the following actions:</p> <p>(A) Provide detailed information to residents in a form and manner understandable by residents pertaining to proposed projects or planned actions affecting local resources at the earliest possible time in advance of final decision making;</p> <p>(B) Provide adequate time for local review, consideration and comment by community leadership on the proposed development or action; and</p> <p>(C) Schedule a follow-up community meeting with a representative of the industry or agency to inform the community if, and specifically how, their comments were considered in the final project design or agency action.</p>	<p>City, Tribe, NSB, KIC</p>

<sup>30</sup> Administrative Order No. 186 was signed by Governor Tony Knowles, September 29, 2000. President Clinton signed Executive order 13175 on November 15, 2000.

Objectives	Strategies	Implementing Entities
	d. Village leadership will work together with NSB staff to provide training and support to ensure that meaningful engagement, review and comment occurs with federal and state agencies. This training should include, but not be limited to, 1) making sure representatives from each of the various political subdivisions in Kaktovik leadership understand regulatory agencies' roles and functions, and 2) understanding how best to coordinate community comment on permit applications.	City, Tribe, NSB
	e. Village leadership will work together with the NSB to ensure that village leaders participate to the greatest extent feasible in the timely review and update of plans for land use, cultural resources, and wildlife and in the review and comment on land use permit applications.	City, Tribe, NSB
	f. Village leadership will work together with the NSB to promote relevant government agencies and industry representatives to collaborate on the adoption of "best available technology" (BATs) and "best management practices" (BMPs) to minimize adverse impacts of industry to valued resources within the Kaktovik Area of Influence. These entities will be encouraged to adopt standards, guidelines and mitigation measures to remediate disturbance or damage to these resources.	City, Tribe, NSB Department of Planning and Community Services
	g. Village leadership will work with the NSB and USFWS to address issues such as installation of a new boat ramp adjacent to the community and the use of waters and lands within ANWR.	Village leadership, NSB, USFWS
	h. The City will add a new page to the City's website that identifies who the local	City

Objectives	Strategies	Implementing Entities
	representatives are to various organizations and committees.	
24. Encourage a better general understanding of land use planning and related public processes by residents in order to facilitate intergovernmental cooperation.	a. Village leadership will encourage residents, including youth, to attend meetings where governance, land use planning and land use permitting are discussed. Village leadership will provide outreach and training for village youth to learn and practice leadership skills.	City, Tribe
	b. The Department of Planning and Community Services will be encouraged to provide information for the community and its high school students to understand land use, planning, and the relationship of federal, state and local regulatory agencies to their community’s current and future health and well-being.	NSB Department of Planning and Community Services, NSB School District

## Chapter 5: Implementation and Plan Revision

### 5.1 Implementing the Comprehensive Development Plan

The Kaktovik Comprehensive Plan is intended to be a living document. Because situations change, the tables in Chapter 4 have been designed to be stand-alone documents that can be updated to reflect current priorities and opportunities. The City Council may wish to update the tables each year as part of its process to develop an annual work plan and priorities for capital projects.

The plan is a guide provides direction for the village leadership when collaborating with the Borough, state and federal agencies, and other organizations. For example, individual requests for rezoning for development proposals can be evaluated against the future land use maps in Chapter 4. Such proposals may include housing subdivisions, transportation projects, recreational facilities, sanitation facilities or other infrastructure. The designations in the future land use maps can also be reviewed when Title 19 is updated to determine if amendments are warranted to the types of zoning districts and the actual designations on the official zoning map, such as the creation of mixed use districts, residential districts, industrial districts within the Village District and the creation of preservation zones such as the water supply buffer zone, erosion hazard zones and/or a cultural resource protection zone at the former landing strip.



Photo courtesy of the IHLC

### 5.2 Capital Project Planning

During development of this Plan, community residents and NSB staff identified a number of capital projects that would improve the quality of life in Kaktovik. While some of these projects may be suitable for inclusion in revisions to the NSB Capital Improvement Plan (CIP), others may be funded through other sources.

#### 5.2.1 Potential Capital Project Needs

Although population growth is expected to be low over the next 20 years, there are a number of capital projects that the community currently desires or will need over this period. Those projects are identified in Table 14 with actions listed under a 5-, 10-, and 20-year timeline.

These projects are not prioritized, and costs for their completion have not been estimated. That process can take place during the collaboration with the City Council, Tribal Council and NSB as appropriate during the 6-year capital planning process. For the purposes of this Plan, the list identifies general categories of projects that the community may be requested during the 20-year time period of this plan.

**Table 14: Potential Capital Project Needs Over a 5-, 10- and 20-Year Period**

Type	1 - 5 Year Period	6 - 10 Year Period	11 - 20 Year Period
Erosion and Flooding	Analyze infrastructure and vulnerabilities of community facilities due to flooding, erosion and thawing permafrost.	Design and build measures to protect from flooding and erosion.	Monitor impacts of climate change and develop and implement adaptation measures.
	Analyze snowmelt floods and implement flood control measures for east side homes on Pipsuk, Barter, Kaktovik, Hula Hula and First streets.		
Water	Adopt a buffer zone around the freshwater lake within which no development or activity that could contaminate the village's fresh water supply would be permitted.	Extend water lines to new KIC subdivision to eliminate current overcrowding and accommodate growth.	Analyze long-term village water supply, treatment and distribution needs to accommodate growth. Upgrade facilities as necessary. NSB needs to complete a study of alternative drinking water sources, such as wells.
Sewer	Evaluate system capacity upgrades to accommodate new growth.	Extend sewer lines to new KIC subdivision.	
Energy	Upgrade power plant as needed.	Evaluate alternate energy sources such as natural gas.	If feasible, construct a natural gas well to provide natural gas energy to the village
	Evaluate wind generator installed near the water treatment facility to determine feasibility of expanding wind energy generation.		

Type	1 - 5 Year Period	6 - 10 Year Period	11 - 20 Year Period
Roads	Conduct a feasibility study for a bridge to the mainland to access KIC property and subsistence resources. Evaluate the feasibility of an ice or gravel road to Prudhoe Bay. Construct a guard rail on Peetuksuk Road.	Replace roads and trails disturbed by new airport. Construct a bridge to the mainland and an ice or gravel road to the Dalton Highway if feasible.	Develop a northern coastline road to access the northwestern portion of the island for subsistence activities including whale haul-out if the Bernard Harbor is too shallow.
Transit		Replace existing senior van.	
Snow Mgmt.	Site snow piles in areas that will not impact culvert functions and drainage.		
Street Lights	Replace dim lights with brighter ones so villagers can better see bears and wolves in town.		
Airport	Repair soft spot on the runway of the airport near town.	Construct a heated airport terminal or shelter at new airport. Construct restrooms.	
New Boat Ramp		Construct a formal boat ramp/dock in the lagoon.	
Housing	Identify suitable lots for housing in areas already served by utilities. Clear the title to the lots identified as suitable housing. Assist TNHA and Cold Climate Housing Research Center (CCHRC) in building new energy-efficient homes in the village core area. Rehabilitate vacant housing in the village core area.	Build housing in KIC subdivision when utilities are provided.	
Snow Fence	Repair snow fences.	Install additional snow fence for KIC subdivision and road to new airport.	
Recreation	Enlarge the gym to	Provide picnic areas along	Construct a playground,

Type	1 - 5 Year Period	6 - 10 Year Period	11 - 20 Year Period
Facilities	accommodate a full basketball court.	the shore.	ball fields and ice rink.
Community Building		Upgrade the community building.	
Ice Cellars	Construct ice cellars and expand, repair and protect existing ones.		
Heritage Village	Seek ownership of the former airstrip land to recover, restore, preserve, and showcase the historic village settlement and its ruins and artifacts.	Establish the Heritage Village with educational facilities, exhibits, toilet facilities, and food service. Include local wildlife exhibits in the exhibits.	
Day Care Facility	Build a day care center for working parents or license day care homes as home occupations in existing homes.		

### 5.2.2 Potential Funding Sources for Capital Projects

Funding for capital projects identified in this plan would likely come from federal, state or NSB resources. Federal programs provide a significant funding source for capital improvements, but current concerns about the federal deficit threaten future funding. Most borough and state funding comes from oil and gas activities. The amount of oil developed, price of oil and taxes influence the amount of state and local funding available for capital improvements. Bonds are the primary funding source for NSB capital projects. As NSB funding and bond capabilities decline, it will become increasingly important that Kaktovik seeks other funding for capital projects. Many of these funding sources are highly competitive and require community support. This comprehensive plan will help demonstrate to funders that the community has completed a thorough process to identify future improvements.

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## **Kaktovik Comprehensive Development Plan Appendix A:**

### **Public Involvement in the Village Planning Process**

This Kaktovik Comprehensive Development Plan was developed through collaborative efforts of residents and village leadership, NSB Planning and Community Services Department staff, and other NSB employees providing services in the village. Local village leadership included the Mayor and City Council Members, the Native Village of Kaktovik Tribal Council President and Council Members, the President and Board Members of the Kaktovik Iñupiat Corporation (KIC), and the NSB Planning Commissioner representing Kaktovik.

The planning process began in 2009, and the NSB brought a draft to the community for review during the last week of October 2013. Another draft was brought to the City Council for its review on January 14, 2014. The NSB began a formal 30-day review of the plan on July 23 which coincided with a presentation to the City Council and a public meeting in Kaktovik. The Planning Commission received an update at its November 20, 2014 meeting in Barrow, and it passed Resolution 2014-21 supporting the plan at its December 18, 2014 meeting in Kaktovik. Summaries of key public meetings for this plan follow.

#### **Community Workshop Summaries**

**June 5, 2009:** About 45 people attended this two-and-a-half-hour meeting/workshop, where planners discussed the purpose of the Comprehensive Plan, the type of information typically included in comprehensive plans, and how this Plan is intended to be used. Workshop participants completed three different visioning exercises, during which they drew pictures of activities they like to do in Kaktovik, wrote down elements of their vision for Kaktovik in 20 years from now, and identified future land use needs.

**October 16, 2009 SWOT Analysis:** About 40 people attended a three-hour meeting/workshop on October 16, 2009, where community members wrote down Kaktovik's strengths, weaknesses, opportunities, and threats (SWOT) and presented their ideas to the group.

#### **Strengths:**

- Subsistence living in and around the area
- Knowledgeable local hunters

- Strong families and traditional values
- Facilities to meet local needs like two stores, health clinic, offices, fire hall, school
- Fall whaling
- Polar bear viewing
- Settled 14(c)3 land transfer<sup>31</sup>
- Skilled artists

**Weaknesses:**

- Arctic National Wildlife Refuge (ANWR) regulations restrict summer hunting activities
- Lack of local guides
- Tourists setting up camping facilities at the airport
- Housing shortage
- Lack of jobs
- Losing local culture and language
- Roads dusty in summer
- Cultural resources not adequately identified or protected
- Lack of facilities for youth
- High transportation costs which contribute to the high costs of fuel and goods
- Tourism and others take precedent over freight deliveries
- Lack of involvement in outside decisions impacting residents
- Polar bear viewing guidelines not followed by tourists

**Opportunities:**

- Local guides
- Expand tourism market
- Alternative energy development
- Local business expansion
- Iñupiat owned and operated airline
- Economic opportunities relating to ANWR and scientific studies
- Jobs related to Point Thomson oil development
- Museum
- Arts and crafts

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<sup>31</sup> Section 14(c)(3) of the Alaska Native Claims Settlement Act [ANCSA] (43 U.S.C. § 1613(c)(3)) requires each village corporation to convey land for present and future public land uses to the municipal corporation in the village or to the state in trust.

**Threats:**

- Climate change resulting in changes to wildlife behavior and island erosion
- Permafrost melting
- ANWR designated Wilderness Area
- Oil exploration impacting whaling
- People leaving due to lack of local opportunities
- Losing traditional culture
- Increased transportation costs leading to increased costs of goods and fuel
- Runway flooding

**April 20, 2010 Leadership Plan Review Workshop:** Local leaders from the City, Native Village and Kaktovik Iñupiat Corporation (KIC) were invited along with NSB Planning staff to participate in a draft plan workshop in Fairbanks. Participants included the Mayor and Vice Mayor, four KIC representatives, Native Village representative, the Kaktovik Planning Commissioner and Assemblyman. Planners reviewed the previous workshop results, lead participants through a discussion of issues, goals, policies, current and future land use maps and a review of the draft Plan. Corrections and additions were incorporated into the final draft Plan which was provided to the local leaders for review.

Kaktovik residents' issues for consideration in this Plan were developed through public input, comments at the workshops, targeted interviews, review of past planning efforts, and research, including consideration of the guidance and principles contained in the 1980 document entitled *In This Place: A Guide for Those Who Would Work in the Country of The Kaktovikmiut, An Unfinished and On-Going Work of the People of Kaktovik, Alaska*. Identifying the issues helps to focus the Plan on the concerns of the people of Kaktovik.

The Kaktovik Comprehensive Plan Update is consistent with several recommendations of the 2005 North Slope Borough Comprehensive Plan. It is consistent with the following policies related to Village planning and development.

- Develop community comprehensive plans to address existing and future growth and development needs. [Policy 2.2.1.14, p. 2-18]
- Establish means for communities to assume greater land use control, as well as corresponding fiscal responsibilities. [Policy 2.2.1.12, p. 2-18]
- Determine which communities desire zoning and enforcement mechanisms by conducting a survey in each village. [Policy 2.2.1.13, p. 2-18]

- Develop land use zones that encourage use of existing facilities and infrastructure in villages that desire zoning. [Policy 2.2.1.14, p. 2-18]
- Document housing needs for each village and incorporate into village comprehensive plans or the Borough Comprehensive Plan. [Policy 2.2.7.101, p. 2-47]
- Emphasize compactness in community development during project planning to minimize operations and maintenance costs of community infrastructure. [Policy 2.2.1.14, p. 2-18]
- Document sensitive subsistence use areas to avoid development in critical areas. [Policy 2.2.3.38, p. 2-27]
- Consider maintaining important subsistence areas as Conservation Districts, or rezone as Subsistence Districts. [Policy 2.2.1.17 and 18, p. 2-19]
- Include villages in the notification and decision making process before permits are issued. [Policy 2.2.20, p. 2-21]
- Review development plans for opportunities to decrease inefficient development. [Policy 2.2.1.26, p. 2-21]
- Encourage land uses that maximize the use of existing infrastructure. [Policy 2.2.1.26, p. 2-21]
- Create a land use, development phasing, and improvement financing plan for the construction of roads and utilities in the Borough communities. [Policy 2.2.1.11, p. 2-16]
- Develop cooperative agreements between the Borough, cities, tribes, and the corporation to expand roads and utilities to support housing construction. [Policy 2.2.7.101, p. 2-46]
- Require those developing outside of current utility service areas to pay their fair share for extending service.” [Policy 2.2.1.15, p. 2-21] “Require developers to pay their fair share for extending utilities and building roads. [Policy 2.2.1.11, p. 2-16]
- Identify important cultural and traditional resources and activities in the vicinity of proposed resource development and incorporate into planning for impact avoidance and mitigation. [Policy 2.2.4.49, p. 2-31]
- Economic development activities within villages should avoid or minimize uses of areas and resources important to subsistence and traditional activities. [Policy 2.2.4.58, p. 2-33]
- Identify and map hazard zones in each village.” [Policy 2.2.5.59, p. 2-34]
- Develop alternative energy sources for Borough communities, such as coal, natural gas and wind power. [Policy 2.2.7.97, p. 2-4]

**Kaktovik City Council**  
**Special Meeting on the Comprehensive Plan**  
**July 23, 2014**

Mayor Nora Jane Burns opened the workshop at 1:00 pm and Council Member Ida Angasan led the participants in an opening invocation. Bob Shears then gave a background about the Borough's comprehensive planning process and the purpose of the plan. He explained the process as follows.

- Comments will be accepted through the next 30 days.
- A final draft plan will be provided to the City Council, Native Village of Kaktovik Council and KIC Board for their review.
- Once satisfied with the draft, the City Council will pass a resolution adopting the plan, and KIC and the Native Village of Kaktovik will be encouraged to pass resolutions endorsing the plan.
- The Borough Planning Commission will consider the plan, and when satisfied, it will pass a resolution recommended the Assembly adopt it.
- The Assembly will consider the plan and when satisfied pass an ordinance adopting the plan and incorporating it into the Borough's Comprehensive Plan

Bob then introduced consultant Glenn Gray who provided a short PowerPoint presentation about the purpose and organization of the plan. He mentioned that the Area of Influence map may need to be amended to be the same as the one referenced in Title 19. Next, Glenn led the group in a review of the goals, objectives and strategies in Chapter 4 of the plan. Council members provided a number of suggested edits and additions to the plan grouped by topic in the following bullets.

- **Airport**
  - A soft spot on the runway of the existing airport needs to be hardened.
  - A shelter and restroom is needed at the current and new airports.
- **Infrastructure and Utilities:**
  - The community needs a search and rescue building.
  - Snow fences need repair, and they are damaging the tundra.

- Sewer and water lines are breaking. The NSB is studying the feasibility of vacuum systems.
- Water treatment plant is exceeding its capability a number of times each month.
- P. 84 Add 19(b) – develop a lighting plan that saves energy yet protects residents from polar bears.
- Public works needs a public announcement system.
- Identify need to bring services to new KIC subdivision.
- **Roads**
  - Identify the need to develop an easement for a road around the cemetery to connect with the existing spur road.
  - Need a guard rail on Peetuksuk Road
  - P. 86 21(b) City will rename numbered streets with Iñupiaq place names.
- **Snow Removal:** Snow piles are causing drainage and erosion piles – snow needs to be piled in other areas.
- **Hazards and Emergencies:**
  - Erosion is occurring in and around local creeks.
  - The community needs an emergency response plan and an evacuation plan.
- **Land Ownership:**
  - Need to confirm that the U.S. Fish and Wildlife Service has authority over lagoon and shoreline.
- **Polar bear management**
  - Fish and Wildlife Service has requested that the bone pile be moved to a barrier island
  - Need to improve storage systems for whale meat.
- **Maps:**
  - Map 7 – need to depict roads in subdivision as being complete and reroute the proposed route around the outside of the island to avoid grave sites.
- **Communications**
  - Upgrading internet speed.
- **Heritage Center/Museum**
  - Table 10 - add museum/Multipurpose center (see also p. 77 item 10).
- **Goals, Objectives and Strategies:**
  - Goal 4.2 should be reworded (remove “strong” before families).
  - Table 7 – Add committees (Caribou, Polar Bear Committee, federal Subsistence Committee, and Kaktovik Whaling Captains Association.
  - On page 70, add a strategy to address hazardous waste issues and abandoned structures drums and tanks. Remediate contaminated soils.
  - Need signs at Freshwater Lake to protect drinking water sources (e.g., do not deposit litter and keep dogs out of area).
  - P. 78 Item 12 also mitigates polar bear problem

- On page 79, identify the need to provide new housing for young people and for people with middle-range incomes.
- P. 81 Strategy 16(a) – not applicable, delete (Title 19 does not provide restrictions for mixed use.
- P. 81 Strategy 16(b) add “federal agencies” to the coordinating group when encouraging economic development, including Fish and Wildlife Service
- On page 84, mention the need to improve playground facilities and add a picnic area to the playground between the school and Waldo Arms hotel.
- ASNA needs to implement a lunch delivery program for elders when school is not in session (e.g., Meals on Wheels program).
- Objective 18 or – add a strategy to upgrade LEDs to higher lumens for protection from polar bears.
- Strategy 19b – Install new lights at clinic entrance, perhaps with motion detectors.
- Objective 19 - Mention current efforts to develop a Borough-wide energy plan.
- P. 87 Strategies a-c – Add KIC to implementing agencies.
- P. 91. Add a need for the Borough to complete a study of alternative drinking water sources such as wells for the 11-20 year period.
- Mention need for a study to expand the sewer and wastewater treatment systems.
- P. 33 update current fuel costs from KIC.
- **Other:**
  - Mention the new community foundation in the plan.
  - Discuss plans to move Kaktovik artifacts from Canada to the University of Alaska Fairbanks and the need to repatriate them Kaktovik once a heritage center or museum is built.
  - Need designated camping area with public shower/laundry.
  - April 26 is Children’s Day
  - Upgrade energy generation to reduce emissions. Evaluate use of hydrogen gas and LNG as an energy source.
  - P. 93. Add current efforts to develop ice cellar with thermistors.
  - U.S. Fish and Wildlife Service has concerns about liability for local guide activities.

The two-hour meeting was scheduled to conclude at 2:00pm, but the Council decided to extend it an additional hour to cover the plan in more detail.

## Kaktovik Public Meeting on the Kaktovik Comprehensive Plan

July 23, 2014

### Attendees:

Nora Jane Burns      [norajane.burns@yahoo.com](mailto:norajane.burns@yahoo.com)  
Eunice Sims  
Carla Sims Kayotuk      [cjskayotuk@msn.com](mailto:cjskayotuk@msn.com)  
Maggie Going  
Mark Ologak  
Jen Smith      [jenandartsmith@gmail.com](mailto:jenandartsmith@gmail.com)  
Evelyn Reitan      [anguyak@gmail.com](mailto:anguyak@gmail.com)  
James Lampe Jr.      [avamik.sr@hotmail.com](mailto:avamik.sr@hotmail.com)  
Alicia Soloman      [Alicia.solomonkic@gmail.com](mailto:Alicia.solomonkic@gmail.com)  
George T. Kaleak Sr.  
Wayne Kayotuk  
Susan Gordon  
Ethel Akpik      [ethel.akpik@asrc.com](mailto:ethel.akpik@asrc.com)  
Ida Angasan  
Marie Kaveolook  
Carolyn Kulukhon      [c.kulukhon@yahoo.com](mailto:c.kulukhon@yahoo.com)  
Angel Burris, City Clerk

Council Member Ida Angasan led the participants in an opening invocation. Bob Shears opened the meeting by giving background about the Borough's comprehensive planning process and the purpose of the plan. Bob introduced consultant Glenn Gray who gave an overview of the plan. He encouraged participants to ask questions or make comments during the presentation. The following bullets summarize comments by topic.

- **Caribou:**
  - Place more emphasis on Porcupine Herd and less on Teshekpuk/Western herds.
  - Need to educate visiting hunters about the need not to disturb the lead caribou during migrations.
- **Aircraft**
  - Need aircraft monitoring system.
  - Flight costs are high (Costs more to fly to Kaktovik from Barrow than from Anchorage to Kaktovik).
- **Airport:**

- Recognize that many/most residents wanted airport on the mainland.
- **New Airport**
  - Need dust control (pave) needs to be continuous to protect drinking water source
  - Air pollution to people and lake (drinking water)
  - Need shelter and restroom at airport
  - Need live cam so flights aren't cancelled when weather is above minimums
- **Existing Airport**
  - Runway is soft in some areas
  - Clean up metal debris on runway near bone pile
- **Roads**
  - Need a road to the Dalton Highway
  - Ice road might be possible
    - Borough should do a feasibility study
- **Utilities**
  - Continue power grid improvements (18)
  - Need annual inspection of power grid and infrastructure audit (4 years out of date)
  - After the big storm of 2005, over a half of the wiring was replaced, and work was done on transformers. Participants said the funds reimbursed by FEMA should be targeted for Kaktovik to replace funding that was expended from capital funds.
  - Implement cycles for ensuring everything is working
    - A power grid audit has not been done since 2006
  - Lineman needed to be stationed in Kaktovik
- **Public Safety**
  - Extend hours to night when officers are needed
  - Supply 2 officers (currently only one)
    -
- **Artifacts:**
  - Identify efforts to move Kaktovik artifacts from Canada to UAF (contact Chris Wooley from ExxonMobil)
- **Housing:**
  - Need to define adequate housing in the plan. NSB has a definition, but participants thought locals need more space.
    - 2 people per room (excluding bath, kitchen L.R. and garage).
- **Drainage problems**
  - Snow fences accumulate snow.
  - Snow piles add to runoff and erosion damage, need to locate at bottom of village but be aware they could provide a hiding place for bears.

- Styrofoam placed on culverts to keep them from freezing up were not removed and added to drainage problems.
- **Hazards:**
  - Earlier this summer, there was a wild fire on the Jago River.
  - Erosion at cliff and in front of old Dew Line dump site. Also, a house was destroyed on other side of island (owned by one of the meeting participant's grandfather)
- **Research:** Lack of communication regarding research.
- **Landownership**
  - Confirm who owns freshwater lake.
- **Freight:**
  - Costs are too high
  - Bypass mail does not apply to Kaktovik.
  - Need more barges - Only one per summer. Could use shuttle barges or ferry from Prudhoe Bay.
- **Health Care.**
  - Doctor visits need to be better and longer
    - Elders need priority care (over visitors)
    - Students need physical for school activities
  - Health hub should be in Fairbanks, not Barrow
- **Other:**
  - Need to determine if visitors have cleaned up tin city (camping area used by tourists east of the village on the mainland).
  - Difficult to keep a postmaster – need benefits.
  - Lagoon water can be used for dust control.
  - Need a boat ramp – add to CIP list.
  - Need to know who the local reps are (e.g., TNHA.)
  - Post on city website.
  - Polar Bear patrol needs a dedicated work force.
  - Whale haul out area - need one like Barrow has with metal grates so sand falls through.
  - Vehicles have been towed from Prudhoe Bay - During construction at Service Area 10, Borough has established a special parking area across from Service Area 10.

**Kaktovik Comprehensive Development Plan  
Appendix B:**

**Resolutions Supporting Adoption of the Comprehensive Plan**

**City of Kaktovik Resolution #14-04**

**Native Village of Kaktovik Resolution #14-08**

**Kaktovik Iñupiat Corporation #2014-13**

**North Slope Borough Planning Commission # 2014-21**

**A RESOLUTION OF THE CITY OF KAKTOVIK ENDORSING THE KAKTOVIK 2014  
COMPREHENSIVE PLAN**

**Resolution 14-04**

**WHEREAS**, the City of Kaktovik is a second class city within the North Slope Borough; and

**WHEREAS**, the North Slope Borough and its consultants have worked with the community since 2006 to develop the comprehensive plan; and

**WHEREAS**, the process to develop the plan involved a collaborative effort of the City of Kaktovik, the Native Village of Kaktovik, and the Kaktovik Iñupiat Corporation; and

**WHEREAS**, the comprehensive plan furthers the common goals of local control and self-determination; the protection of the land, water and subsistence resources; and mitigation of the negative impacts which may occur as a result of development; and

**WHEREAS**, the comprehensive plan provides a vision for the future, identifies current and projected future land uses, and addresses issues important to the community; and

**WHEREAS**, the comprehensive plan establishes goals, objectives and strategies to improve the quality of life; and

**WHEREAS**, The City of Kaktovik Council has reviewed the 2014 Kaktovik Comprehensive Plan document labeled Final Draft dated September 2014, as prepared by the North Slope Borough and Glenn Gray and Associates and with the City of Kaktovik recommended changes or improvements; and

**WHEREAS**, the North Slope Borough and Glenn Gray and Associates presented drafts of the plan to the community in November 2013, January 2014 and July 2014, and held a public meeting on the plan on July 23, 2014, with a final draft presented September 9<sup>th</sup>, 2014.

**THEREFORE BE IT RESOLVED**, the City of Kaktovik endorses the 2014 Comprehensive Plan and recommends approval of the Plan by the North Slope Borough Assembly.

**PASSED AND APPROVED BY THE KAKTOVIK CITY COUNCIL THIS 11<sup>th</sup> DAY OF NOVEMBER 2014.**

ATTEST:

  
L. Angel Akootchook, City Clerk

  
Nora Jane Burns, Mayor





**Resolution 14-08**

**A RESOLUTION OF THE NATIVE VILLAGE OF KAKTOVIK ENDORSING THE 2014 KAKTOVIK COMPREHENSIVE PLAN**

WHEREAS, the Native Village of Kaktovik is a federally-recognized tribe representing the community of Kaktovik; and

WHEREAS, the North Slope Borough and its consultants have worked with the community since 2006 to develop the comprehensive plan; and

WHEREAS, the process to develop the plan involved a collaborative effort of the City of Kaktovik, the Native Village of Kaktovik, and the Kaktovik Inupiat Corporation; and

WHEREAS, the comprehensive plan furthers the common goals of local control and self-determination; the protection of the land, water and subsistence resources; and mitigation of the negative impacts which may occur as a result of development; and

WHEREAS, the comprehensive plan provides a vision for the future, identifies current and projected future land uses, and address issues important to the community; and

WHEREAS, the comprehensive plan establishes goals, objectives and strategies to improve the quality of life; and

WHEREAS, the Native Village of Kaktovik Council has reviewed the 2014 Comprehensive Development Plan document labeled Final Draft dated September 2014, as prepared by the North Slope Borough and Glenn Gray and Associates; and

WHEREAS, the North Slope Borough and Glenn Gray and Associates presented drafts of the plan to the community in November 2013, January 2014 and July 2014, and held a public meeting on the plan on July 23, 2014; and

WHEREAS, under amendment, the Native Village of Kaktovik Tribal Council indicates as conditional approval that the Kaktovik Comprehensive Plan also provide for the following items;

- To continue to evaluate Formerly Used Defense Sites within our jurisdiction; and

**Native Village of Kaktovik**

P.O. Box 52 • Kaktovik, AK 99747 • Phone # (907) 640-2042 or 2043 • Fax # (907) 640-2044 • E-mail: nvkaktovik@starband.net

- Cultural Resource restoration should be in the forefront between the Department of Defense & Kaktovik and when need be with technical assistance by the North Slope Borough and other local entities.

THEREFORE BE IT RESOLVED, the Native Village of Kaktovik endorses the 2014 Comprehensive Plan and recommends approval of the Plan by the North Slope Borough Assembly.

PASSED AND APPROVED BY THE NATIVE VILLAGE OF KAKTOVIK COUNCIL THIS 30TH DAY OF SEPTEMBER 2014.

ATTEST:

  
Edward Rexford, Sr. - President

  
Ida Angasan, Secretary/Treasurer

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**A RESOLUTION OF THE KAKTOVIK INUPIAT CORPORATION ENDORSING THE  
2014 KAKTOVIK COMPREHENSIVE PLAN  
Resolution 2014-33**

WHEREAS, the Kaktovik Inupiat Corporation is the village Native corporation for the community of Kaktovik; and

WHEREAS, the North Slope Borough and its consultants have worked with the community since 2006 to develop the comprehensive plan; and

WHEREAS, the process to develop the plan involved a collaborative effort of the City of Kaktovik, the Native Village of Kaktovik, and the Kaktovik Inupiat Corporation; and

WHEREAS, the comprehensive plan furthers the common goals of local control and self-determination; the protection of the land, water and subsistence resources; and mitigation of the negative impacts which may occur as a result of development; and

WHEREAS, the comprehensive plan provides a vision for the future, identifies current and projected future land uses, and addresses issues important to the community; and

WHEREAS, the comprehensive plan establishes goals, objectives and strategies to improve the quality of life; and

WHEREAS, the Kaktovik Inupiat Corporation Board of Directors has reviewed the 2014 Kaktovik Comprehensive Development Plan document labeled Final Draft dated September 2014, as prepared by the North Slope Borough and Glenn Gray and Associates; and

WHEREAS, the North Slope Borough and Glenn Gray and Associates presented drafts of the plan to the community in November 2013, January 2014 and July 2014, and held a public meeting on the plan on July 23, 2014.

THEREFORE BE IT RESOLVED, the Kaktovik Inupiat Corporation endorses the 2014 Comprehensive Plan and recommends approval of the Plan by the North Slope Borough Assembly.

PASSED AND APPROVED BY THE KAKTOVIK INUPIAT CORPORATION BOARD THIS 30<sup>th</sup> DAY OF Sept., 2014

  
\_\_\_\_\_  
President, Philip Tikluk Jr.

ATTEST:  
  
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Corporate Secretary, Fannia Sapiu