

Wainwright Comprehensive Plan

North Slope Borough

June 2014



Prepared for the North Slope Borough by:



UMIAQ

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List of Abbreviations

ADEC	Alaska Department of Environmental Conservation
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
BMT	Best Management Practices
CAH	Central Arctic Herd
CCHRC	Cold Climate Housing Research Center
CIP	Capital Improvement Plan
CY	Cubic Yard
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	Iñupiat Community of the Arctic Slope
IRA	Indian Reorganization Act
IRR	Indian Reservation Roads Program
kWh	Kilowatt hour
lbs	Pounds
LLC	Limited Liability Company
MMS	Minerals Management Service

n.d.	No date
NEPA	National Environmental Policy Act
NPR-A	National Petroleum Reserve – Alaska
NSB	North Slope Borough
NSBC	North Slope Borough Code
NSSI	North Slope Science Initiative
OC	Olgoonik Corporation
PAR	Project Analysis Report
PCE	Power Cost Equalization
PCH	Porcupine Caribou Herd
PP/PD	Per Person/Per Day
RELI	Residential and Employment Living Improvement Program
TCH	Teshkepuk Caribou Herd
TNHA	Tagiugmiullu Nunamiullu Housing Authority
USACOE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WAH	Western Arctic Herd

1.0 INTRODUCTION

1.1 Wainwright Comprehensive Planning

1.1.1 Purpose of the Wainwright Comprehensive Plan

The Wainwright comprehensive plan is a long-range document intended to guide the growth and development of Wainwright. Community residents, major landowners, public officials, and staff have participated in the planning process. The plan describes what Wainwright is like today, both strengths and weaknesses, and what the community wants to plan for in the future. It forms the basis for land use regulations and future policy decisions.

Wainwright is a community virtually at the center of new oil and gas development and production offshore in the Chukchi Sea. Major oil companies like Shell, ConocoPhillips and Statoil have all invested heavily in leases they have acquired some 80 miles offshore from Wainwright. Wainwright itself has seen major activity in its community to host the workers doing the exploration work for these companies. Most of the construction has been without a plan in place to guide logical and orderly development of the community.

The governing councils of Wainwright (both City and Tribe), the North Slope Borough (NSB) Administration, the Planning Commission, the NSB Assembly, and Olgoonik Corporation will be able to use the Wainwright comprehensive plan in making decisions associated with permits, plats, and rezoning for the community. The plan provides anticipated potential growth and forecast needs for land use, infrastructure and services, and economic development. The plan will support logical and orderly land management strategies for land in and around Wainwright that will implement identified and needed capital projects, and also support applications for federal and state grant funds.

The Wainwright Comprehensive Plan is not a static document, frozen in time. During one of the scoping meetings for this plan, a tribal council member recommended a system to evaluate progress before the 20 year planning interval was up. The suggested idea was that every five years a progress report be developed and shared with the community. Upon further review, the community believes that a review every two years would ensure this comprehensive plan is being followed and kept up to date. The five year progress report would be a NSB review and would look at the progress made based on assumptions in the comprehensive plan as well as what adjustments should be made to those assumptions to keep the comprehensive plan relevant.

Two planning scenarios were developed for this plan. The first scenario envisions Wainwright's development as a community for the next 20 years without oil and gas production occurring offshore in the Chukchi Sea. The second scenario envisions the next 20 years with the development of with oil and gas production occurring offshore. A later, third scenario was added to envision the next 20 years for Wainwright with exploration and development (not production) for offshore oil and gas occurring. This would be an intermediate step that would lead to production.

1.1.1.1 Wainwright Community Development needs for the next 20 years

The Wainwright Comprehensive Plan Team met with Wainwright community members on August 27 and 28, 2013 at the Community Center to discuss what they perceived to be the strengths, weaknesses, opportunities, and threats to Wainwright in the next 20 years. By identifying these issues, focused attention can be given to those issues identified to enhance, protect, exploit or mitigate as appropriate for the beneficial growth of Wainwright.

The strengths identified by the community were

- S1.** The subsistence lifestyle, sharing and the traditional understanding of wildlife and bird preservation;
- S2.** Respect for animal, sea mammals, the sea and the land;
- S3.** Conflict avoidance;
- S4.** The ability of Wainwright to speak with one voice;
- S5.** Conservation planning for traditional land use areas; and
- S6.** The scenic location of Wainwright.

The weaknesses identified by the community were

- W1.** The lack of housing;
- W2.** The lack of training for work;
- W3.** The lack of community medical personnel;
- W4.** Too few street lights;
- W5.** Scarcity of gravel to use for building infrastructure
- W6.** Lack of adequate power; and
- W7.** Incomplete land transfer of 14(C)(3) lands.

The opportunities identified by the community were

- O1.** The possibility of establishing new businesses ranging from Day Care to High Speed Internet;
- O2.** Building new housing;
- O3.** Training for jobs;
- O4.** Establishing a Wainwright-based Arts and Crafts Center;
- O5.** Upgrading the water and sewer services in Wainwright;

- O6.** Disaster preparedness;
- O7.** Satellite campus for Ilisagvik; and
- O8.** Wind Power generation.

The threats identified by the community were

- T1.** Lack of job opportunities for young adults;
- T2.** Influx of insensitive visitors and workers could lead to corruption of the culture that the community is striving to preserve;
- T3.** Erosion of the coastline next to town;
- T4.** Oil and gas development;
- T5.** Loss of ice cellars;
- T6.** Pollution of the lagoon;
- T7.** Industrial consumption of all utilities

The comprehensive plan should plan for the future of the community, balancing the benefits against the burdens of future growth. It should also provide direction for how to develop the community in a way that focuses on dealing with known issues and taking advantage of known opportunities that will be positive for the community.

Below is a list of community goals to focus on for the healthy growth of Wainwright until 2035:

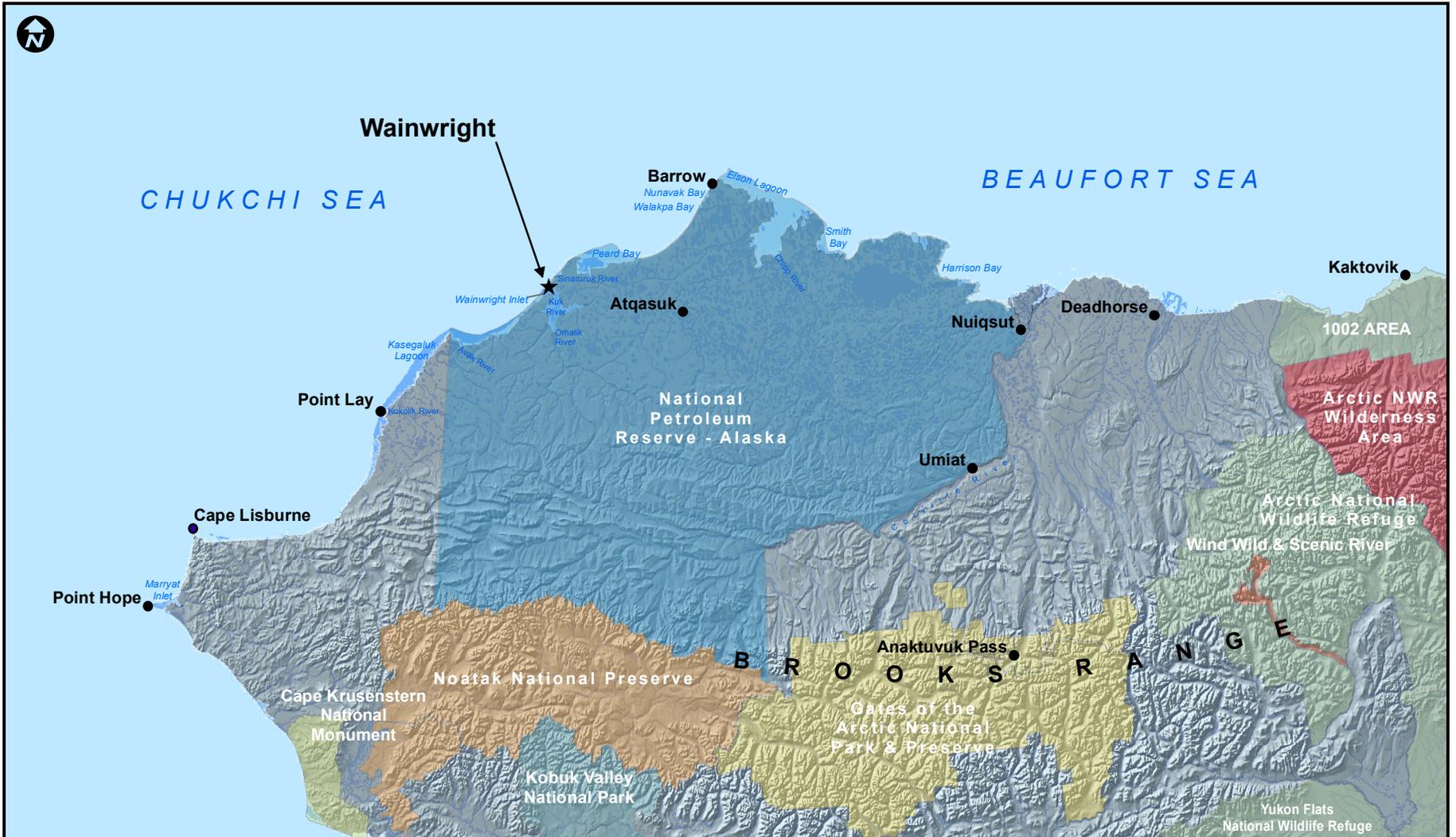
- Protect and enhance traditional, historical, cultural, and subsistence resources and activities.
- Establish future land use decisions within Wainwright to ensure a balance of housing, commerce, services, transportation and facilities to support vibrant economy, strong families, and traditional values.
- Support the development of suitable housing, new facilities and transportation.
- Facilitate development activities in appropriate locations that reduce or eliminate conflicting land uses and that provide economic opportunities for residents and future generations.
- Build meaningful governmental and industry cooperation.
- Enhance educational and cultural pursuits.

1.1.2 Wainwright Governance

The community of Wainwright has a city government, a tribal government and representation on the NSB Assembly for the Borough government. The City of Wainwright was incorporated in 1962 as a second class city under and political subdivision of the State of Alaska. Wainwright has a council of seven members elected by the voters at large, with one council member serving as mayor.

The tribal government, Wainwright Traditional Council, is the governing body for tribal matters and is a sovereign government recognized by the United States of America.

The North Slope Borough is the regional government and political subdivision of the State of Alaska.



- | | |
|--|--|
|  NATIONAL PETROLEUM RESERVE |  NATIONAL PARK & PRESERVE |
|  NATIONAL PARK |  NATIONAL PRESERVE |
|  NATIONAL WILDLIFE REFUGE |  NATIONAL WILD & SCENIC RIVER |
|  NATIONAL MONUMENT |  NATIONAL WILDERNESS AREA |



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1.1.3 Basis for Comprehensive Planning

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

As a Home Rule Borough, the NSB is responsible for developing a comprehensive plan and for establishing and implementing land use planning and zoning. NSB code outlines the process for developing the Borough-wide comprehensive plan and the contents of the plan (2.12.170).

The Department of Planning and Community Services is responsible for updating and maintaining the Borough's Comprehensive Plan and supports 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 plans.

The Community Planning Division also plans for and participates in development of the Six-Year Capital Improvement Plans (CIP) for each of the villages. These plans prioritize improvements for community facilities.

1.2 Wainwright Village Vision Statement

Wainwright is a dynamic community where residents value their strong family ties, traditional Iñupiat values, and vigorous subsistence lifestyle.

Wainwright leadership promotes a growing, diverse and sustainable economy supporting local businesses and responsible industries that provide resident employment flexible enough to support subsistence activities. The leaders also support exercising all municipal and tribal governmental powers available to reinforce its efforts to maintain a traditional Iñupiat community that is a safe place to live.

1.3 Goals of the Plan

The primary goal of this plan is to define an orderly and logical approach to address growth in Wainwright in a way that promotes the positive elements of Wainwright and discourages the development of negative impacts. To that end, the goals for Wainwright defined by residents to be discussed in this plan are:

- Goal 1: Protect and enhance traditional, historical, cultural and subsistence resources and activities.
- Goal 2: Establish future land use decisions within the Village to ensure a balance of housing, commerce, services, transportation and facilities to support vibrant economy, strong families, and traditional values.
- Goal 3: Support the development of suitable housing, new facilities and transportation.
- Goal 4: Facilitate development activities in appropriate locations that reduce or eliminate conflicting land uses and that provide economic opportunities for residents and future generations.

- Goal 5: Build meaningful governmental and industry cooperation.
- Goal 6: Enhance educational and cultural pursuits.

1.4 Organization of the Plan

This Plan contains a wealth of information about Wainwright. 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 Wainwright including the people, the natural environment, hazards, population, housing public services, the economy 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.

2.0 COMMUNITY OVERVIEW

2.1 Population and Community

2.1.1 Setting

Location. Wainwright sits on a wave-eroded coastal bluff of a narrow peninsula which separates Wainwright Inlet from the Chukchi Sea. Three miles northeast of the Kuk River estuary, Wainwright is about 70 miles southwest of Barrow.

Climate. The climate is arctic. Temperatures range from -56 to 80 °F. Precipitation is light, averaging 5 inches annually, with 12 inches of snow. The Chukchi Sea is generally ice-free from mid-July through September.

2.1.2 The People

Most Wainwright inhabitants are Iñupiat Eskimos who practice a subsistence lifestyle. Their ancestors were the Utukamiut (people of the Utukok River) and Kukmiut (people of the Kuk River).

2.1.3 Community

History. In 1826 the Wainwright Lagoon was named by Capt. F.W. Beechey for his officer, Lt. John Wainwright. An 1853 map indicates the name of the village as "Olrona." Its Inupiat name was "Olgoonik." The region around Wainwright was traditionally well-populated, though the present village was not established until 1904, when the Alaska Native Service built a school and instituted medical and other services. The site was reportedly chosen by the captain of the ship delivering school construction materials, because sea-ice conditions were favorable for landing. A post office was established in 1916, and a city was formed in 1962. Coal was mined at several nearby sites for village use; the closest was about 7 miles away. Today, though, most houses are heated by fuel oil. A U.S. Air Force Distance Early Warning (DEW) Station was constructed nearby in the early 1950's.¹

Population and Economy. Wainwright is the third largest village in the North Slope Borough, and in 2010 had a population of 546 and work force of 221. 94% of the residents are Iñupiat Eskimo. Wainwright has a larger private sector than most villages: 38.2% of the work force is employed by private businesses, primarily the village and regional corporations. The Borough employs 29.3% of the work force and the School District provides jobs for another 22.1%. Wainwright's subsistence hunting revolves primarily around whales and caribou. Local arts and crafts include carved ivory figurines and jewelry, baleen boats, whale bone carvings, clocks, knitted caps, and gloves.²

Quality of Life. The North Slope Borough delivers electricity and piped water/wastewater services, and hauls residential trash.

A health clinic, staffed by community health aides, is open daily and handles emergencies around the clock. Other public facilities include the public safety office, fire station, vehicle maintenance facility and teacher housing.

Wainwright's children attend Alak School from pre-school to grade 12. The community also offers adult basic education and vocational education. The school has a swimming pool and gymnasium which are also used by the public.

OC, Wainwright's village corporation, sells groceries, clothing, first-aid supplies, hardware and sporting goods through the community store. Fuel in town includes marine gas, diesel, propane, unleaded, regular and supreme. City law prohibits the possession, sale or importation of alcohol.

Wainwright has a hotel, restaurant and several recreational activities. In the spring, the community gathers for Nalukataq, the feast after a successful whaling season. At this and other occasions, Eskimo dances are performed by the villagers. Recreational activities include boating, snow machining and smelt fishing in the spring.

Wainwright is served by scheduled and chartered air service from Barrow. Freight arrives by cargo plane and barge. Communications include phones, mail, public radio, VHF radio, internet email, Facebook, and cable TV.³



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Title: WAINWRIGHT, ALASKA
VICINITY MAP



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2.2 The Natural Environment

2.2.1 Geography

Wainwright is on a narrow peninsula which separates Wainwright Inlet from the Chukchi Sea. The Kuk River is a 35 mile long stream that flows north to the Wainwright Inlet roughly 6 miles southeast of Wainwright. The Kuk River has the second largest watershed area, 4,275.0 square miles. The Chukchi Sea and Kuk River are open from mid-July through September.

Wainwright is located within the Arctic Coastal Plain - a flat, lake-dotted, tundra-covered lowland. The Wainwright quadrangle is generally drained by tributaries to the Kuk River, a broad estuary discharging to the sea via the Wainwright Inlet.⁴

2.2.2 Soils, Wetlands & Vegetation

According to the USGS survey (1983) the upper foot or so of soil is composed of windblown silts topped by a thin peaty tundra mat that supports a variety of vegetation. In the vicinity of Wainwright can be found permanently frozen mixtures and lenses of marine and alluvial clay, silt, sand, and gravel. This permafrost layer is continuous in the Wainwright area and may be several hundred feet deep. Surface geological desists include coal, marine sand, bedrock, and coastal sand and gravel.

Based on the Circumpolar Arctic Vegetation Map (CAVM Team, 2003), the location of Wainwright is described as sedge, moss, dwarf-shrub wetland. These wetland complexes are dominated by sedges, grasses, and mosses, but include dwarf shrubs. Common shrub vegetation in the Wainwright area includes salmonberries, cranberries, and willow.

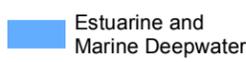
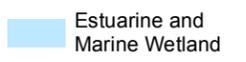
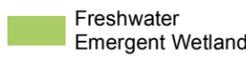
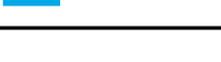
2.2.3 Climate

The climate in Wainwright is arctic with temperatures ranging from -56 to 80 degrees Fahrenheit. Precipitation averages 5 inches annually, with 12 inches of snow⁵. Extremely strong winds are common during winter months. Fog is prevalent during summer months.

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USFWS: National Wetlands Inventory
AKDNR: Alaska Place Names

- | | | | |
|---|--------------------------------|---|-----------------------------------|
|  | Estuarine and Marine Deepwater |  | Freshwater Forested/Shrub Wetland |
|  | Estuarine and Marine Wetland |  | Freshwater Pond |
|  | Freshwater Emergent Wetland |  | Lake |
| | |  | Riverine |



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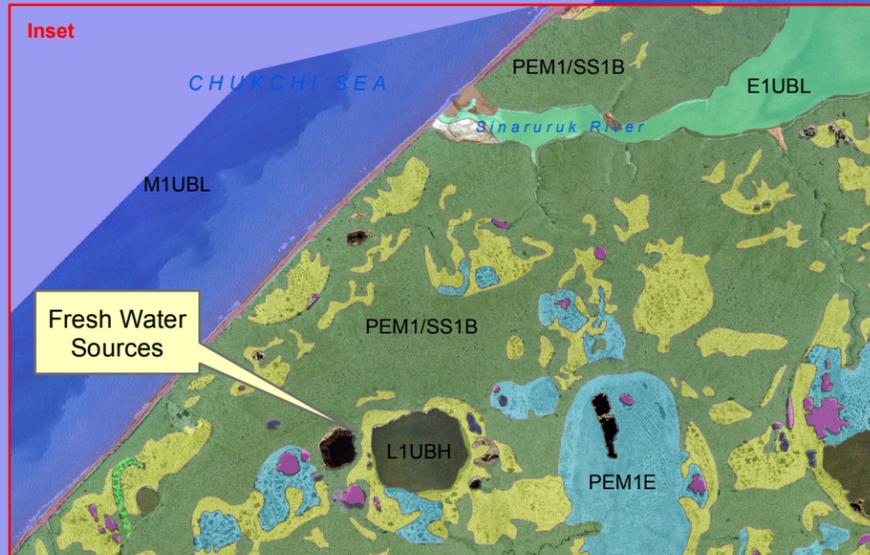
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 E1UBL	 M2USP	 PEM1E	 Parcels
 E2EM1P	 PEM1/SS1B	 PEM2H	
 E2USP	 PEM1/SS1E	 PUBH	
 M1UBL	 PEM1/UBF		

Slight color variation may occur throughout figure due to using transparency of wetland layer over aerial image.

USFWS: National Wetlands Inventory
AKDNR: Alaska Place Names

Imagery:
Acquired July 9th, 2010 - Kodiak Mapping/NSB
Alaska Mapped BDL WMS



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NWI WETLANDS MAP**

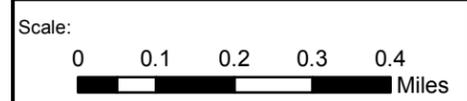


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2.2.4 Wildlife, Birds & Fish

Wetland and upland habitats in the Wainwright vicinity support caribou, muskox, arctic fox, red fox, wolf, and arctic ground squirrel.

Avian populations from the North American Flyways travel through Wainwright semiannually on their way to and from northern nesting grounds (U.S. Fish and Wildlife Service, 2008). Wainwright area wetlands support the resident avian populations and provide nesting grounds for several species. Common bird species around Wainwright include pacific black brant, white-fronted goose, eiders (both common and King), snow goose, and ptarmigan.

The Kuk River and its tributaries (Kungok River and Ivisaruk River) provide water and habitat for spawning, rearing, and migration of anadromous fish populations including chum salmon, pink salmon, Bering cisco, least cisco, and rainbow smelt.

2.3 Hazards

2.3.1 Health Care

In 2012, the North Slope Borough completed a Baseline Community Health Analysis Report which includes a Wainwright Health Profile report to provide communities with information on some basic health measures at the village level to guide community health promotion and planning efforts. This report indicated the following:

- A majority of Wainwright adults report or were reported to be in at least good general health. Looking at both all adults and Inupiat only, those living in Wainwright were less likely to report very good or excellent health, and more likely to report fair or poor health that were adults in other North Slope communities overall.
- The prevalence of chronic health problems among Wainwright household heads and other adults was similar to that in other North Slope communities. Only the prevalence of high blood pressure among Wainwright adults was significantly lower than in other North Slope communities overall.
- Smoking rates were high among household heads and other adults in Wainwright, similar to other North Slope communities overall. Only 35% support a tobacco tax to fund prevention programs.
- The prevalence of being overweight and obese was high among Wainwright household heads, similar to other North Slope communities overall.
- Almost three in five Wainwright household heads reported getting 30 minutes of moderate physical activity at least 5 days a week, a significantly higher proportion than in the other North Slope communities overall.

Following the completion of the report, the North Slope Borough held an interagency meeting followed by a community health forum February 6, 2013 to: 1) present the findings of Baseline report, 2) use the information to start changes needed to address health priorities and 3) discuss with one another how to start change and exchange diverse ideas. The outcome of the forum was to address the following:

1. Healthy activities; physical fitness
2. Social problems, i.e.: drugs/alcohol abuse, smoking
3. Eating healthy: subsistence foods, healthy store-bought foods
4. Access to health care/health-specific concerns

During the Wainwright Community Leaders Retreat and community meetings, the community has expressed the concern that their proximity to health care services and the unpredictability of the weather and travel to a place that has reasonable health care is a potential hazard to the community of Wainwright. There is a long history in Wainwright as well as other NSB communities of close knit communities contracting disease virus' and germs making many sick. There was concern about the chemicals left behind by the military in the environment making people sick. Cancer deaths in Wainwright are high and early detection is almost non-existent because of their lack of access to health care in their community. Respiratory issues were also raised. There is anecdotal information that the prevalence of smoking among North Slope residents affects respiratory health of its citizens. In 2007, there was an outbreak of Respiratory Syncytial Virus (RSV) that affected 53 children on the North Slope, 29 of which required mechanical ventilation and medevac to Anchorage. RSV is the most common of serious respiratory infection in infants and young children. It is communicated from person to person by respiratory secretions made by close contact with infected persons or contaminated objects. Fever, runny nose, cough, and sometimes wheezing are typical symptoms of RSV.

2.3.2 Weather

Wainwright has a dry, polar climate, much like the climate that dominates the arctic coastal plain. Short, cool, summers and long, cold winters.

The residents of Wainwright said the weather is becoming highly unpredictable, causing ice to thaw sooner than expected. There is no more multi-year ice seen on the ocean on a regular basis. With lots of new ice and frequent thaws come many near misses where the people break through ice that would otherwise be solid. The multi-year ice provides fresh water when out on the ice – the loss of this type of ice means the loss of fresh water when traveling on the sea ice.

One elder said he believe that climate change began in 1969. The sea ice stayed in Barrow all summer that year and they had a foot of snow on the ground all summer.

The table below lists climatic data pertaining to Wainwright obtained from the Western Regional Climate Center.

Table 1 Wainwright Climate Data

Average Annual Max. Temperature (F)	17.4
Average Annual Min. Temperature (F)	4.8
Average Annual Total Precipitation (in.)	6.35
Average Annual Total Snow Fall (in.)	4.4
Average Annual Snow Depth (in.)	5
Average Annual Prevailing Wind Direction	East
Average Annual Wind Speed (mph)	12

Recorded temperature extremes are -56 degrees F (1964) and 80 degrees F (1955). The maximum daily temperature rises above freezing on 123 days per year, and the minimum daily temperature dips to below freezing 296 days per year. Wind gusts have been recorded at speeds of up to 60 mph.

The sun sets on November 21st or 22nd, and it remains below the horizon for about 60 days until the sun rises again around January 18 or 19th. Beginning around May 12th or 13th the sun remains continuously above the horizon for about 70 days until around July 29 or 30th.

Climate change is real and substantial for the people of Wainwright, who believe that accidents and emergencies will become more frequent because of climate change.

2.3.3 Erosion

Erosion of the shoreline of the Chukchi Sea has been taking place in Wainwright for over four decades. Public testimony in Wainwright indicated that some houses in the community have been moved as many as three times since 1965 to avoid Chukchi Sea erosion of the coastal bluffs. Some from Wainwright said that they believe coastal erosion accelerated when the beach in front of Wainwright was mined for gravel in 1967. The disappearance of ice cellars next to the coast as well as the loss of high coast bluffs were also reported by residents.

A 500 foot seawall was constructed of large rock in 2013 central to the community, protecting 25% of its most critical infrastructure, however, erosion will remain an issue in future planning.

2.3.4 Flooding and Storm Surges

While Wainwright does not participate in the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program, there is documented flooding in the area. At breakup the waters of the Kuk and Ivisaruk Rivers will pond on top of the ice of the Kuk River Estuary.⁶ The community is at a high enough elevation to avoid flood risks from the Kuk River. Community residents confirmed there is flooding south of Wainwright. The rivers inland are flooding seasonally in areas not seen before. Inland flooding extending to 50 miles is damaging the residents' subsistence cabins due to flooding in recent years.

2.3.5 Permafrost Thaw

Anecdotal information about permafrost thawing in the Wainwright can be found in the public comments received about ice cellars thawing. In public meetings held on August 27-28, 2013, in Wainwright the concern for ice cellars was expressed. Many comments were about the recent loss of ice cellars to permafrost melt. There was general agreement that about half of all the ice cellars in Wainwright have been lost in the last 30 years. Another instance of the thawing permafrost was that one of the elder's homes had broken in half as a result of the permafrost thawing underneath its foundation.

Additionally, there are not many areas that would be considered suitable for new ice cellars and of those locations not all are approved for construction of an ice cellar. Areas that are available for ice cellar construction are not desirable locations. Ice cellars are an essential element for storing subsistence harvests year-round. Without an ice cellar a new whaling crew cannot be formed. This is detrimental to up and coming whalers and younger generations of whalers who would like to continue the traditions of their community.

A USGS paper on failure modes of thawing permafrost bluffs on the Chukchi Sea Coast in 2013 provided a preliminary analysis that increasing temperatures are resulting accelerated thawing of the permafrost and coastal erosion. This appears to confirm community concerns about the permafrost thawing in the Wainwright area.

2.3.6 Environmental Hazards

Contamination/Hazardous Waste. ADEC defines a contaminated site as “a location where hazardous substances, including petroleum products, have been improperly disposed.” Existing contaminated sites have the potential to threaten public health or environment and can cause economic hardship to people and communities. ADEC identified 15 contaminated sites in the Wainwright area. Reference Figure 5. These sites include former landfills and dump sites, the tank farm, and DEW Line facilities. Refer to Table 2. More information on these sites including closure details and cleanup chronology can be found on the ADEC Contaminated Sites Program website.

Table 2 ADEC Contaminated Sites in the Wainwright Area

#	ADEC Hazard ID	Site Name	Location	Status	ADEC File ID
1	744	Wainwright DEW Line/LIZ-3/Fuel Spills	Kuk River on the, Wainwright, AK 99782	Open	360.38.002
2	745	Wainwright DEW Line/LIZ-3/VehicleStorage	Kuk River on the, Wainwright, AK 99782	Cleanup Complete	360.38.002
3	746	Wainwright DEW Line/LIZ-3/Airstrip	Kuk River on the, Wainwright, AK 99782	Cleanup Complete	360.38.002
4	764	Wainwright DEW Line/LIZ-3	Kuk River on the, Wainwright, AK 99782	Open	360.38.002
5	775	Icy Cape Dewline DERP FUDS	50 Miles NE of Wainwright, Wainwright, AK 99782	Cleanup Complete	320.38.001
6	796	Wainwright DEW Line/LIZ-3/Garage	Kuk River on the, Wainwright, AK 99782	Open	360.38.002
7	797	Wainwright DEW Line/LIZ-3/Drum Storage	Kuk River on the, Wainwright, AK 99782	Cleanup Complete	360.38.002
8	798	Wainwright DEW Line/LIZ-3/Landfill LF005	Kuk River on the, Wainwright, AK 99782	Open	360.38.002
9	1387	NSB Wainwright Tank Farm	North of city, Wainwright, AK 99782	Open	360.38.001
10	1597	NSB Wainwright Alak School former tank farm	School Street, Wainwright, AK 99782	Open	360.38.003
11	2471	AKARNG Wainwright FSA	Church Road, Wainwright, AK 99782	Cleanup Complete	360.38.007
12	2643	NSB Wainwright Washeteria	Corner of Main Street & Airport Road, Wainwright, AK 99782	Open	360.38.006
13	4306	NSB Wainwright Old BIA Tank Farm and Day Tank	SE corner of Kuk Rd & Ahloaksageak Rd, Wainwright, AK 99782	Open	360.38.004
14	25245	Wainwright DEW Line/LIZ-3/Landfill LF006	Kuk River on the Chuckchi Sea, Wainwright, AK 99782	Open	360.38.002
15	25758	Icy Cape Former DEW Line Station Landfills A, B, and C	50 Miles NE of Wainwright, Wainwright, AK 99782	Open	320.38.009

Source: ADEC 2013

During public scoping meetings and conversations with NSB officials, several locations were identified as potentially having contamination related to either the Barrow Airport construction in the 1970's or barrels that were buried by the USAF off the military reservation. Further investigation of the sites below is recommended in order to identify the extent and status of contamination. See Figure 5 for locations.

- Hazardous/contaminated waste storage site north of the former sewage lagoon
- Hazardous/contaminated waste storage within the current landfill, and
- Buried drums containing glycol near the the northwest coast of the old DEW Line reservation.



-  Active
-  Cleanup Complete

Sites are labeled by Hazard ID



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IMAGERY:
ACQUIRED JULY 9TH, 2010 - KODIAK MAPPING/NSB
ALASKA MAPPED BDL WMS
SPAR/CONTAMINATED SITES FEATURE SERVICE:
ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION -
CONTAMINATED SITES PROGRAM

Title: WAINWRIGHT, ALASKA CONTAMINATED SITES

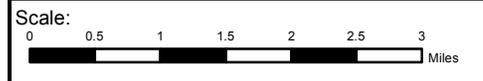


Figure: 5

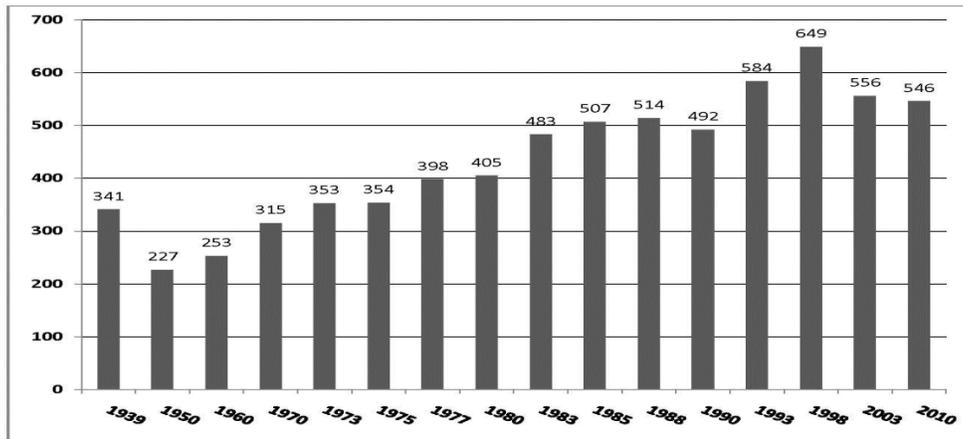


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2.4 Population

The State of Alaska has population records for Wainwright going back to 1939 – which recorded 341 people living there. Since 1950, the State of Alaska has recorded consistent population of Wainwright every 10 years.

Figure 6 Historic Population of Wainwright



2.4.1 Changes in Population

From 1950 to 1998, populations from Wainwright grew from 227 people to 649 people, an average annual growth of just over eight people a year. Then from 1998 to 2010, Wainwright's population declined from 649 to a total of 546 people, an average loss of over eight people a year. This loss of population was consistent with a State-wide trend identified by the State of Alaska with residents from rural areas moving to the urban communities in Alaska.⁷

Table 3 Changes in Wainwright's Population

	Wainwright 2003	Wainwright 2010
Population in 2003 and 2010	556	546
Population Growth Since 1998	(-14.3%)	(-15.1%)
Population Growth Since 1990	13%	12%
Population Growth Since 1980	37.3%	36%
Percent Female	45.9%	49.1%
Percent Inupiat	93.6%	94.6%
Percent Caucasian	6.4%	5.4%
Percent Other Minorities	0.6%	n/a
Number of Persons 0-4	45	55
Percent of Persons 0-4	10.0%	12.0%
Number of Persons 17 or younger	207	164
Percent of Persons 17 or younger	37.3%	35.7%
Number of Persons 16-64	259	282
Percent of Persons 16-64	55.7%	61.4%
Number of Persons 65 and older	40	31
Percent of Persons 65 and older	6.0%	6.7%
Median Age of Females	24	26
Median Age of Males	26	26
Median Age-Total Population	25	26
Size of Labor Force	243	251
Rate of Unemployment	18.9%	26.3%
Rate of Perceived Underemployment*	26.7%	12.3%
Rate of Underemployment**	9.9%	39.8%
Total Number of Households	158	158
Total Number of Households Surveyed	141	134
Average Number of People per Household	3.53	3.46
Percent of Households in Census	89.0%	85.9%
Percent of Total Population in Sample	89.2%	84.2%
Percent of Persons with High School Diploma or Higher Education	44.6%	35.9%
Number of Fluent Inupiaq Speakers	154	65

* From Question "Does household member feel underemployed?"

** Persons with some employment working less than 40 weeks.

Changes in Wainwright's population were not affected by the fact that the community had a higher birth rate during the late 2000's than the community had in the late 1990's. The net migration out of Wainwright was real and substantial through 2010.⁸

The racial makeup of Wainwright shifted towards becoming more Iñupiat and less Caucasian in the early 2000's. This change can probably be attributed to the large influx of construction workers in the late 1990's to work on a variety of capital improvement projects for Wainwright.

Wainwright is trending towards becoming more female. The rate of growth in the female population increased in the late 1990's through 2010. The male population has maintained a constant percentage during the same time period.

The age ranges found in Wainwright are changed during the years 1998 – 2010. There were declines in the age group 10-29 year olds and 30-49 year olds. There was an increase in the age group 45 – 64 year olds.

The final significant trend is the number of fluent Iñupiaq speakers in Wainwright. The trend is strongly downward, with the possibility the language could be unknown in the community in 30 years.

2.4.2 Implications Based on Population Projections

The Wainwright population is aging faster than in the past and the core groups that usually take on new leadership roles and jobs in the community are declining. This may make filling key jobs and leadership positions more difficult without resorting to hiring people from outside of Wainwright.

Wainwright has experienced an average growth rate of 1.9% from 1950 through 2010. This was characterized by a high of 6.4% for the years 1980 through 1983, and a low of -2.9% for 5 years (1998 through 2003), leading to a net loss of population of 93 people from the high population of 649 people in 1998.

Projected population without Oil and Gas Development in the Chukchi Sea. For the purposes of planning for adequate facilities and infrastructure for Wainwright 20 years into the future, a 3% growth rate was assumed. This yields a planning population of 670 people by 2035. This assumes uniform population growth and could accommodate problems in infrastructural development like the leaks experienced with the installation of underground waterlines in a permafrost environment.

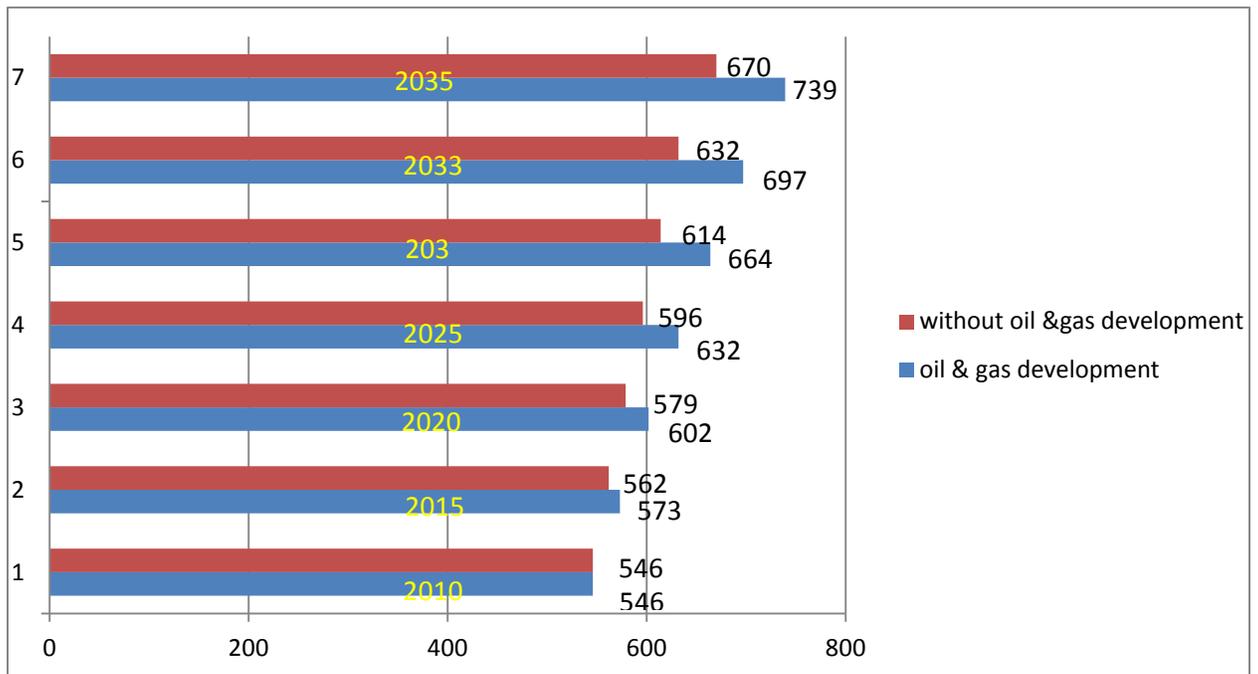
Projected population with Oil and Gas Development in the Chukchi Sea. The development of oil and gas facilities offshore of Wainwright complicates the planning assumptions for population growth in Wainwright for the next 20 years. This assumption was broken down into two subsections – the exploration and construction phase and the production phase.

- *Exploration and Construction Phase* - Under the Exploration and Construction Phase, Wainwright would experience a significant influx of workers, approximately 50-100 people.⁹ This would put the Wainwright past the level of the population that was last

experienced in 1998 – about 670 people by 2023. This would place significant constraints on the public facilities and infrastructure for Wainwright.

- *Production Phase* – the Production Phase would bring more gradual growth to Wainwright. There would be a decline in the population present in Wainwright from the Exploration and Construction Phase to about 630 people with gradual growth to 739 people by 2035. This does not assume the people brought in for production facilities if they are not residing in Wainwright, but does assume there will be a resident service population for the oil and gas production facilities.

Figure 7 Projected Population of Wainwright



2.5 Housing

2.5.1 Existing Housing Conditions

Most people in Wainwright live in single-family homes. In 2010, over half of Wainwright residents own their homes free of a loan obligation or mortgage; a 75% increase since 2003. Over a quarter (26.4%) of families rent their homes from someone else, the Borough, or TNHA.

The median monthly rent for a home or apartment in Wainwright is \$500; the average mortgage cost is \$347 (\$150 for the median amount) in 2010. All homes have running water and a few receive water by truck (9 percent). 92% of homes are connected to the village sewer system, the rest rely on holding tanks. People rely mostly on diesel oil for heat. The median monthly charge for heating a home or apartment is \$200. The median monthly expense for electricity is \$180; water is \$69.

The shortage of housing was a concern raised by Wainwright residents. The last house building boom was in the 1980's when the Blackstock homes were built in Wainwright. That was about 30 - 40 single family homes. Only individual homes have been built since then. Olgoonik Corporation will sell TNHA 5 lots for 5-7 houses to be built on this year.

Some of the major challenges to building homes were the cost to build and the cost of utility connections. The cost of a simple three bedroom single family home could be as much as \$350,000 - \$400,000 when construction is complete. This is based on expensive building materials that must be flown in or barged in from other places. Recycling materials salvaged from demolished buildings could help lower the cost of materials.

One elder indicated a way around this predicament would be to build sod homes. They worked for people for thousands of years. The Cold Climate Housing Research Center (CCHRC) has engaged in a long term research project to revive sod home technology by updating the materials to allow for year round use in Anaktuvuk Pass. The CCHRC also has pilot homes in Atkasuk and Point Lay that are based on the current piling-foundation approach used in most North Slope communities.

The 2010 NSB census data indicates that the number of residents residing in a single family home in Wainwright has, on average, increased since 1998. This supports the comments that most single family homes house multiple generations of family members and overcrowded.

2.5.2 Future Housing Needs

It is assumed that all houses in Wainwright that can be occupied are occupied. In 2010, Wainwright had 462 residents living in single family houses, 225 lived in households of five or more people.

To accommodate the expected natural growth of the community, without oil and gas development, housing for 78 - 93 more people will be needed by 2035. That would equate to about 16 additional single family houses to accommodate a family of six.

To accommodate the expected growth of the community, with oil and gas development, housing for 129 - 155 more people will be needed by 2035. That would equate to about 26 additional single family houses to accommodate a family of six.

Another alternative would be to build multi-family apartments to accommodate 16 -26 families with 3 - 4 bedrooms per unit, depending upon which scenario comes to pass. The cost per dwelling is less for apartment construction than for single family dwelling construction.

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|---|-------------------|---|-------------------------|---|-----------------|
|  | NSB |  | NATIVE RESTRICTED (NAT) |  | RELIGIOUS (REL) |
|  | CORPORATION (COR) |  | HOUSING AUTHORITY (HAS) |  | FEDERAL (FED) |
|  | CITY (CTY) |  | PRIVATE (PVT) | | |

IMAGERY: ACQUIRED JULY 9TH, 2010
KODIAK MAPPING / NORTH SLOPE BOROUGH

Wainwright structures were assigned owner type from NSB Assessor's data.
Some structures owner type were edited based on current observations.



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Title:
**WAINWRIGHT, ALASKA
HOUSING & STRUCTURES**



Figure:
8



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2.6 Public Facilities and Services

2.6.1 Water

Existing Conditions – Water Supply. The water facilities in Wainwright are owned and operated by the NSB. Wainwright has four water tank reservoirs. Tank 1 is decommissioned. The three remaining tanks have a total capacity just less than 8,000,000 gallons. The tanks are filled during the summer months using a 6 inch High Density Polyethylene (HDPE) pipe placed on grade from the water treatment plant to the Fresh Water Lakes located east of the landfill. In optimum operating conditions, 230,000 gallons can be pumped in one day, and pumping typically occurs from spring thaw around June to freeze-up in September. After the water is transported from the fresh water lakes, the water is pumped through the Water Treatment Plant. In the plant, water is pre-heated, filtered, strained, cleansed and treated chemically, before being pumped for storage in the reservoir tanks or pumped into buried water mains.

Comments raised during scoping suggested that micro filters are not able to keep up with levels of turbidity in the water. NSB PW employees reported that the micro filters were just replaced in 2013 after being in operation for 15 years. Although daily cleaning is required, the filters are operating well and do a thorough cleaning of the water.

The water treatment plant can treat up to 250,000 gallons per day. After treatment, the water is stored into the storage tanks, eventually distributed throughout the community in buried, forced water mains. There are two buried force main systems that supply water throughout the community.

Water main leaks have caused the usage rates in Wainwright to exceed the storage capacities causing some water shortages. During an interview in September 2013 with NSB Public Works personnel,

- over a million gallons of water was lost in August 2013, due to leaks; and
- 8,000,000 gallons was used in Wainwright in the past 12 months.

The Public Works group will continue to pump into the storage tanks until the weather begins to drop below freezing.

The smaller of the two fresh water lakes, called Fresh Water Lake 1, is owned by the NSB, deeded to them from OC and dedicated for public use. The second, larger lake (Fresh Water Lake 2) is owned by the OC, and by verbal agreement, water is pumped for use in the village. The pump is moved interchangeably between lakes depending on wind conditions and water quality. Certain wind directions can sometimes stir up sediment in one or the other of the lakes resulting in a higher content of suspended sediment. In cases such as this, the water with best quality is pumped.

The water depth in Fresh Water Lake 2 is measured several times a year by NSB PW employees and is documented. NSB Public Works department reported that water depth averages between 6.5 feet to 8 feet in depth year around. During long periods of low precipitation the level is lower but has not dropped below 6.5 feet in depth. Annual monitoring

has shown that both lake levels maintain at the current levels and replenishment rates are steady enough to meet current pumping demands.

Comments raised by residents during scoping specified a good water source east of the DEW line site. If future development brings new roads and increased access to portions nearer the DEW line site, this water source may be considered as either an alternative water source or even a replacement source. It is limited today due to lack of access.

An addition to the Water Treatment Plant is currently under design, with construction scheduled for 2015. The new plant will not be modifying the membrane treatment process in any way, so the new plant will not affect the total treatment capacity, which will still remain at 250,000 gallons of water per day.



- WATER DISTRIBUTION
- Service Connection
- FIRE HYDRANT W/VALVE
- Parcels and ROW

Water Distribution as digitized from record CAD drawings from 1999.

Imagery: July 9th, 2010 Kodiak Mapping / NSB



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Title: **WAINWRIGHT, ALASKA WATER DISTRIBUTION**

Scale: Feet

Figure: **9**



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Forecast Summary- With and Without Oil and Gas Development. Based on village demand calculations, typical demand vary from 28-30 gallons per day per person. During typical peak flow periods the usage rate can increase to 46 gallons per day per person. For planning purposes, a rate of 35 gallons per day per person is utilized. The table below summarizes the estimated usage rate utilizing the population forecast calculated for this comprehensive plan. As shown, the community of Wainwright will use just over 7,000,000 gallons in 2013, with an increase to just over 7,500,000 in 2023, to over 8,000,000 in 2033.

Table 4 Water Usage Table – Wainwright, Without O&G Development

Forecast Year	Population Count (Ea.)	Daily Usage (Gal/PP/PD)	Proposed Usage Gal/Per Year
2013	554	19,390	7,007,350
2023	588	20,580	7,511,700
2035	670	23,450	8,559,250

Note: Similarly, the water usage using the population increases estimated with the oil and gas development scenario, water requirements in 2023 are just under 8,000,000 gallons needed per year, and just under 9,000,000 gallons needed in 2033.

Table 5 Water Usage Table – Wainwright, With O&G Development

Forecast Year	Population Count (Ea.)	Daily Usage (Gal/PP/PD)	Proposed Usage Gal/Per Year
2013	559	19,565	7,141,225
2023	617	21,595	7,882,175
2035	739	25,865	9,440,725

When discussing future community needs, increased storage capacity is one answer to the increased demand. But in addition to building new tanks, pumping plans could be developed to maximize pumping capacity during the summer months in order to “top off” tanks before freezing conditions begin. Pumping at 230,000 gallons per day, only 13 days would be required to fill the larger 3,000,000 gallon tank.

Even more critical to managing water usage in Wainwright is to solve the water main leaking issues that plague the community. Alternatives to direct bury water distribution is being reviewed and analyzed in a Project Analysis Report (PAR) under contract through the NSB with UMIAQ, LLC. to be completed in late 2013 or early 2014.

2.6.2 Wastewater

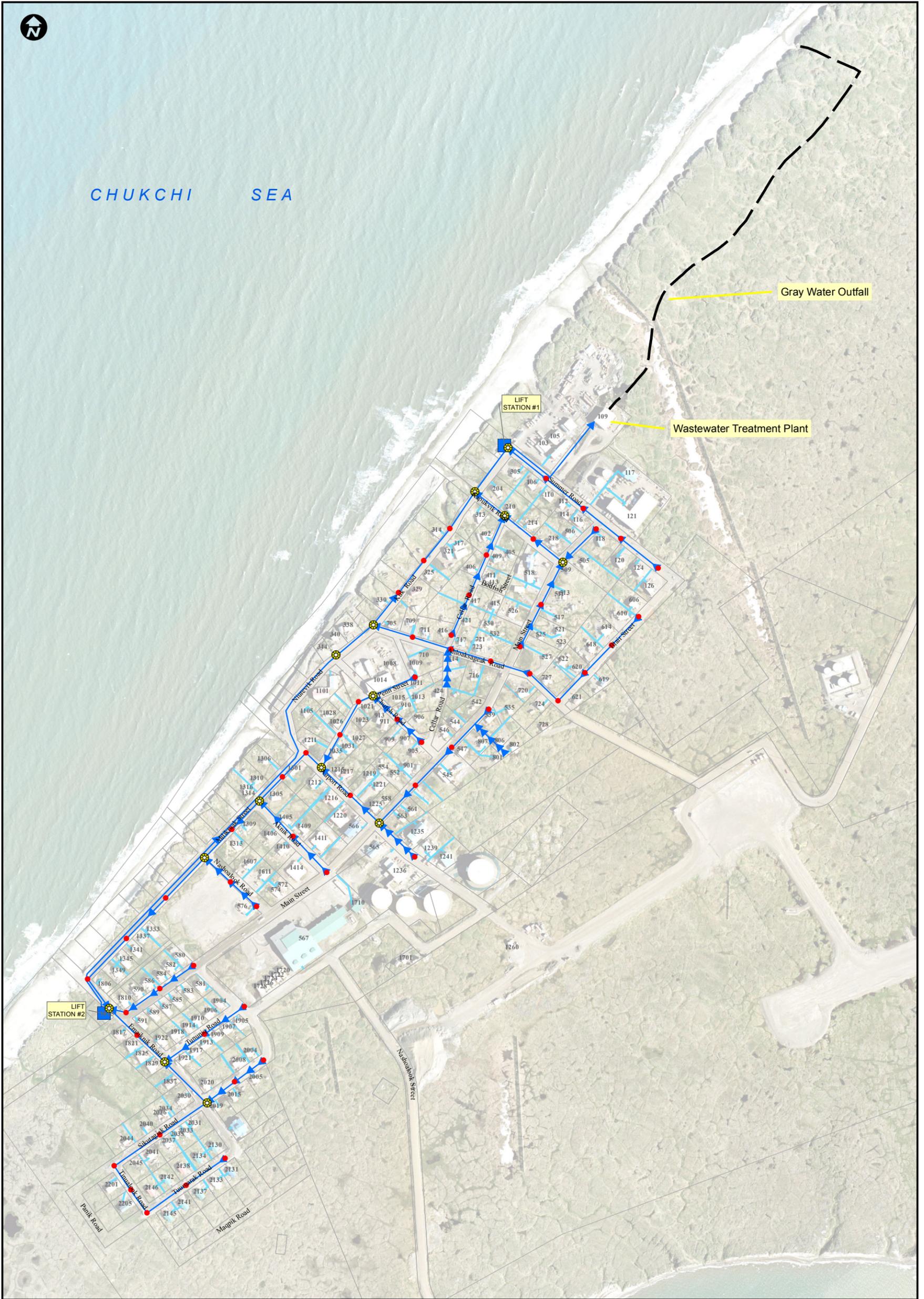
Existing Conditions – Waste Water System. The NSB owns and maintains the wastewater treatment system in the community of Wainwright. Wainwright has a 6,120 square foot sewer treatment plant, built in 2000, located on the eastern edge of town, tucked behind the NSB Public Works complex. There is a 10,000 gallon insulated sewage tank inside the building and system and can be independently powered by 100 KW generator located in the mechanical room in the building. The maximum capacity of the system is 28,000 gallons per day. Today, the volume of wastewater into the plant is averaging 19,000 gallons per day. Raw sewage is pumped into the tank after a screening process eliminates foreign materials and particles other than sewage such as rags, and plastic toys. The total suspended solids (TSS) are settled out, processed again with a final clarification process, and resulting gray water is chemically treated (disinfection) before being pumped out into the Chukchi Sea. The remaining sludge is bagged and disposed of at the landfill.

The sewage flows into the treatment plant building are contained in buried sewage lines. The buried sewer line is at average depths between 8-12 feet, and is 8 inches in diameter. The sewer force main is operational with two lift stations, one located on the western edge of town and the other on the eastern side. Minor mains feed sewage into the western lift station using gravity, which then provides the “lift” needed to force sewage back to the eastern lift station, collecting some minor mains as it goes. After leaving the eastern lift station, the sewage flows into the sewage treatment plant.

There are eight “honey bucket” homes in Wainwright that are not connected to the buried sewer system. There are also 12 homes that utilize individual septic tank systems. The NSB provides pumping and hauling services to these homes for sewage transfer to the sewage lagoon located at the landfill.

The Village of Wainwright is plagued by sewer line breaks, many in locations that break over and over, causing consistent problems for many homes. Permanent repairs need to be addressed. NSB Public Works is researching alternatives to the direct bury issue. A PAR is being researched and studied to determine a method that will address the issue.

The final PAR is scheduled for release in early 2014, and once the preferred alternative is decided a capitol project should result.



- Service Connection
- ▶▶▶▶ WASTEWATER COLLECTION
- OUTFALL
- Parcels and ROW

Water Distribution as digitized from record CAD drawings from 1999.

Imagery: July 9th, 2010 Kodiak Mapping / NSB



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Title: **WAINWRIGHT, ALASKA WASTEWATER COLLECTION**

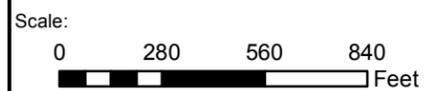


Figure: **10**



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Forecast Summary- With and Without Oil and Gas Development. Based on village generation calculations, the typical user generates 35 gallons of wastewater per person per day. The tables below summarize the estimated treatment plant capacity and the wastewater amounts expected with the future projected population growth rates, in both the without oil and gas development and with oil and gas development scenarios.

Table 6 Wastewater Generation/Treatment – Wainwright, Without O&G Development

Forecast Year	Population Count (Ea.)	Daily Generation (Gal/PP/PD)	Treatment Plant Capacity
2013	554	19,390	28,000
2023	588	20,580	28,000
2035	670	23,450	28,000

Table 7 Wastewater Generation/Treatment – Wainwright, With O&G Development

Forecast Year	Population Count (Ea.)	Daily Generation (Gal/PP/PD)	Treatment Plant Capacity
2013	559	19,565	28,000
2023	617	21,595	28,000
2035	739	25,865	28,000

Based on the population growth analysis completed for this comprehensive plan, the current wastewater treatment plant capacity will be adequate for the 20 year window (2033 and beyond). The facility itself was constructed in 2000, and based on the Six Year plan, had a building assessment life of 30 years for the pumps, controls, process skids and containment tanks. Electrical lighting components had an estimated life of 25 years with an anticipated electrical components needing replacement in 2015 (Estimated cost estimated at \$503,000)^{10,11}.

2.6.3 Energy

Existing Conditions – Power Supply. The Wainwright Power Plant was originally constructed in 1988 and underwent interior improvements in 2001. The facility is owned and operated by the NSB. The building is located back behind the NSB Public Works Complex off of Summer Road. The Wainwright power plant currently operates using the five generator units listed below:

Table 8 Power Generator Table – Wainwright, Existing

Unit	Make/Model	Capacity	Serial Number	Installed
1	Caterpillar 3508	430 KW	70Z00641	1988
2	Caterpillar 3508	430 KW	70Z00643	1988
3	Caterpillar 3508	430 KW	70Z00642	1988
4	Caterpillar 3512	910 KW	67Z1942	2002
5	Caterpillar 3512	910 KW	67Z1904	2002

At this time there are no known deficiencies and all five engines are in good working order. The normal peak winter load during the winter season of 2012-2013 was 1,100kW, and the average winter load is 850-900kW. To be able to supply this, two generators are run concurrently: (1) 910kW and (1) 450kW.¹²

The Wainwright Power Plant has evolved over the years to meet the power demands of the community. The existing power plant facility itself was originally built in 1988, and underwent improvements in 2001 to its current configuration. As the facility is considered for meeting long term demands in the community, a project analysis report is underway exploring recommendations to upgrade the system. Possibilities being considered are:

- (1) Renovation and additions to the existing facility;
- (2) Construction of a new power plant on two potentially undeveloped sites; and
- (3) Construction of a new power plant on the currently occupied by the existing Public Works Vehicle Storage Building.¹³

In addition to improvements at the existing power plant, newer technologies with alternative power sources are being considered. Micro turbines are being analyzed in another PAR, but the idea or possible benefit is not completely vetted at this time. The research into micro turbines and the possible benefits and/or use in Wainwright will be better understood this spring, where it will be further discussed during the PRC process.

Forecast Summary- With and Without Oil and Gas Development. For purposes of forecasting future peak use with future anticipated population growth, a rate of 2kW per person /per day is used. This rate of usage was calculated from the measured peak usage in winter 2012, and a population count of 546. For average winter load calculations, we have used 900kW, and the population of 546, for a rate of 1.6kW per person/per day. The following tables reflect the power usage of the community based on both the without oil and gas development and with oil and gas development scenarios:

Table 9 Power Usage Table – Wainwright, Without O&G Development

Forecast Year	Population Count (Ea.)	Daily Peak Usage (kW/PP/PD)	Average Winter Usage (kW/PP/PD)
2013	554	1,108	913
2023	588	1,176	941
2035	670	1,340	1,072

Table 10 Power Usage Table – Wainwright, With O&G Development

Forecast Year	Population Count (Ea.)	Daily Peak Usage (kW/PP/PD)	Average Winter Usage (kW/PP/PD)
2013	559	1,118	894
2023	617	1,234	987
2035	739	1,478	1,182

To be able to supply the additional power requirements of the community, two of the larger 950kW generators can be run simultaneously to provide a total 1900kW of power. Even running at 80%, a total of 1520kW can be generated. This will easily meet and exceed any estimated peak generated requirements that will be needed for both scenarios. Realizing that there are only two 950kW generators, and that they would be required to be shut down periodically for overhaul and maintenance, coordination between seasons and power requirements will be necessary.

2.6.4 Wind Generation

A wind generation system is currently under study for Wainwright and not yet finalized. A draft feasibility or concept development report (CDR) study was completed in December of 2011. The project is 90% grant funded project through the Alaska Energy Authority (AEA). NSB is meeting the 10% grant match. The project is being completed in four phases, currently in the conceptual design phase or Phase 2. Once the conceptual design is complete, the final design (Phase 3) will begin with construction (Phase 4) expected in 2015. The proposed location of the new wind generation tower is shown on Figure 2 and not yet approved.

2.6.5 Solid Waste

Existing Conditions – Landfill/Solid Waste. Wainwright's landfill is a Class III Material Storage Waste Landfill (MSWLF) and is owned and operated by the NSB. See Figure 8. A Class III Landfill is a landfill that accepts less than five tons of Municipal waste, based on an annual average.¹⁴ The landfill site is located 2.0 miles from the village and consists of both sewage lagoons and a solid waste landfill. The landfill is located on 68 acres, platted as Track 8 (Plat 85-8). The existing fenced landfill is 9.8 acres. The property boundary is shown on Figure 8. The existing landfill was constructed in Wainwright in 1985, and serves as the disposal site for municipal solid wastes, septage, and dried sewage solids for Wainwright.

The landfill consists of the landfill area for solid wastes, and two sewage lagoons. The smaller of the two lagoons (West Honey Bucket Lagoon) is the primary holding cell, and receives the raw sewage deposits. The second, larger cell, (East Honey Bucket Lagoon) is the secondary cell, and is the last holding cell before discharge onto the tundra. Sludge bags from the Wastewater Treatment Plant are buried north of cell one.

Prior to 2006, there was a burn cage used at the site for reducing some waste to ash prior to disposal. The cage has not been used in recent time, and open burning is only allowed with a burn cage. Wastes are stockpiled, and pushed into the working face of the landfill. A 30% reduction in waste volume is achieved during burning, prolonging the life of the landfill.¹⁵

Based on studies completed in 2011 in support of the NSB Area wide Permit Application to Alaska Department of Environmental Conservation (ADEC) in June 2011, the landfill is estimated to receive less than 0.83 tons per day of solid waste. At the time of the permit application submittal, the landfill life for Wainwright was estimated at 13 years, with an estimated closure date of July 2024. The anticipated closure was based on a population growth rate of 0.18%.¹⁶

The following statistics are taken from the landfill logs and solid waste production studies for 2011-2012 in Wainwright.

- Waste into the landfill on average total of 0.83 tons per day.
- This converts to 929 cubic yards of solid waste/ year.
- Reflects an annual growth rate of 3.0 pounds per person per day.¹⁷

Using annual population growth rates estimated as part of this plan, without oil development:

- In 20 years a total of 0.94 tons of garbage will be generated per day.
- Or an accumulative tonnage of 7,622 tons of solid waste.
- Converted this is 1,119 cumulative cubic yards of trash.

In twenty years with the project population growth associated with oil and gas development:

- 1.10 tons of solid waste will be generated per day, or
- a total accumulation of solid waste of 7,950 tons.

The following charts illustrate an estimate fill rate for the landfill, one utilizing projected population growth with oil and gas development and the other without.

Table 11 Solid Waste Without Oil and Gas Development

Year	Pop.	Tons/day	Tons/Year	Cumulative tonnage	Yds/ Yr (CY)	Cumulative yardage (CY)	Cumulative 30% Burn Red. (CY)
2010	546	0.81	296	296	912	912	638
2015	562	0.84	305	1787	939	5,498	3,489
2020	579	0.86	314	3322	967	10,220	7,154
2025	596	0.89	324	4902	995	15,084	10,559
2030	614	0.91	333	6530	1,026	20,091	14,064
2035	670	1.00	364	7622	1,119	23,452	16,416

Table 12 Solid Waste With Oil and Gas Development

Year	Pop.	Tons/day	Tons/Year	Cumulative tonnage	Yds/ Yr (CY)	Cumulative yardage (CY)	Cum 30% Burn Red. (CY)
2010	546	0.81	296	296	912	912	821
2015	573	0.85	311	1793	957	5,517	3,862
2020	602	0.90	327	3364	1,005	10,350	7,245
2025	632	0.94	343	5014	1,056	15,428	10,799
2030	664	0.99	360	6747	1,109	20,759	14,531
2035	739	1.10	401	7950	1,234	24,461	17,123

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

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 Tract 8 - Landfill Boundary
 Remaining Area
 Approximately 0.64 Acres / 28,000 sq. ft.
 As determined from July 2012 satellite imagery.

Landfill boundary is approximate.
 The boundary was rubbersheeted
 and digitized from 2007 LCMF
 CAD Drawing.
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Title: **WAINWRIGHT, ALASKA LANDFILL**



Figure: **11**



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Forecast Summary- With and Without Oil and Gas Development. Although only milestones are reflected in the usage graphs, every year is accounted for in yearly accumulation trash amounts. The per capita rate used is 3.0 pounds of trash generated per person per day. When converting between tons and yardage and square footage used in calculating volume, 650 pounds/cubic yard is used. Based on aerial photography taken in 2012, there is 28,000 square feet of unused landfill area in the existing landfill.

Typically, depths of trash fill in the existing landfill are five feet in depth. This makes the useable volume still remaining in the landfill at 140,000 cubic feet of space, or 5,200 cubic yards of space. Without oil and gas development, accumulation rates have the landfill full in 2018. With accumulations rates projected with oil and gas development, the landfill will be full in 2017.

It should be noted with the Wainwright Seawall project underway in the summer of 2013, the construction debris may have been greater than the amounts reflected in this comparison. A more detailed analysis and further study of the trash accumulation rates at the Wainwright Landfill is recommended.

Future Landfill Expansion - Community Perspective. During scoping, the community voiced concern over the existing landfill location, and the close proximity to the shore line. The concern is that the landfill will eventually be exposed due to shoreline erosion. The historical rate of erosion on shoreline in question is not documented for use in this report, but erosion is evident. Aerial photography taken in 1991 and 2010 was overlain to compare shoreline erosion patterns. During this 19 year period it appears that approximately 35-40 feet of shoreline is eroded away on shoreline near the landfill. This is a rate of 1.8 -2.0 feet per year, without consideration of damage that might be expected in an 100 year event. Currently, the shore line bluff is 550 feet from the landfill fence line. At an erosion rate of 2.0 feet a year, you might expect the landfill exposed in 275 years.

Public comments received included closing the existing landfill once it is full, and relocate the new landfill inland. The current landfill tract (owned by the NSB) is large enough to open new cells for landfill expansion. The cost of relocation will be more expensive than opening new cells at the existing site. Further analysis is recommended to investigate shoreline protections to mitigate erosion or to relocate structures away from the shoreline.

2.6.6 Service Area Potential – North Slope Borough (NSB).

When considering future growth and expansion in the community of Wainwright, the ability of utility and maintenance systems to grow and support the growth is critical. All of the services in Wainwright are currently owned, operated and provided by the NSB. These services include wastewater services, water services, solid waste processing and collection, power generation, snow removal, road maintenance, fire protection and associated infrastructure, such as buildings and equipment. Consideration should be given to setting up a service area, separate from the City of Wainwright and similar to the service area (SA-10) in the Prudhoe Bay area. Such a service area could ensure the planned, orderly development of necessary utility services.

With oil and gas development, the growth rates will likely be drastically higher over the 20 year window. Expanding and increasing existing utilities in Wainwright will be required, and likely should be built and operated separately from the municipal utilities themselves. The question is, how soon? The longer the planning interval, the better managed a capital plan can be developed to adjust and grow to meet the demand. Encompassing a window of many years (10-20) is more manageable than discovering an immediate need and having to find funding, complete design and then ultimate construction in 2-6 years.

Development of a Service Area would allow the NSB to provide quality refuse collection and disposal services, water service, and sewer service to any industrial users that may be operating out of the area. The infrastructure costs required for expansion of facilities to accommodate the increased usage can be mitigated through collection of fees for various services. The services would provide local jobs, provide safe conditions for employees and the environment, and protect the fiscal and infrastructure development of the NSB.

Issues to be considered should include the concerns of industrial user impacts on the existing municipal services. The industrial usage requirements for water, sewer, waste treatment and power need to be quantified, and carefully considered against the capacity of existing facilities. The combined replacement value of the existing utility infrastructure is estimated at \$59 million. A breakdown of the capital assets that may be impacted with providing industrial users and their infrastructure estimated values included in this discussion are located in Appendix A.

The existing landfill is a municipal landfill, for municipal waste only. Industrial users would require waste separation, segregation of operations and special permitting for the industrial conditions that would need to be addressed. A separate industrial landfill accepting only industrial waste could be sited and constructed. The siting of an industrial landfill has separate conditions from a municipal landfill. Both types cannot be located within 5000 feet of the airport, and with the industrial type, the Bureau of Land Management (BLM) will not permit landfills on BLM land.

Additional analysis will be required to consider the full impacts of industrial services in Wainwright. For example, "What and where would the point of profitability be obtained?" "What new infrastructure would be needed?" In the Prudhoe Bay/Deadhorse area, the user base is concentrated in a smaller area, with onshore development. In the Wainwright area, development will probably be offshore based. There are some lease tracts onshore purchased by Nordaq south of Wainwright that are in the planning stages of for possible future development.

The services and rates would likely be fashioned after the SA-10, however the costs to run the SA-10 have not always been fully recouped. The industrial user base in Deadhorse has evened out over many years, with a consistent number of users. This is because production personnel needed to maintain the current oil company infrastructure is much lower than personnel needed during exploration and development phases.

In Wainwright, the personnel estimated for exploration phase of the work will far exceed the numbers of personnel needed for production phase. Current estimates from Shell and

ConocoPhillips show that personnel needed in the exploration phases will spike drastically in 5-7 years, with a lower number later for the production phases. (8-20 years and beyond). Two of the services that will need immediate expansion to meet the expansion in 5-7 years will be the wastewater treatment plant and the landfill. Without the oil and gas development, the existing facility capacities wastewater and landfill will be adequate for a longer window of time. If the service area concept is considered, capital funding should be made available immediately to allow for analysis of the existing facilities, design and ultimate construction of expansions necessary.

2.6.7 Gravel

Subsurface soil conditions in the vicinity of Wainwright typically consist of icy, silty sand, permeated with ice lenses, ice wedges and permafrost. The needs for non-frost susceptible borrow material in Wainwright has always exceeded the availability of sources near the village. The low-lying, marshy, topography near Wainwright limits the available upland sources. Between 1980 and 1983, several exploratory geotechnical investigations for upland, offshore and inland water gravel sources were conducted. These studies did not reveal an adequate upland source in close proximity to the community. Subsequent discussions have identified the potential sources as shown on Figure 12. Studies of these areas would be useful.

The first dredging projects for Wainwright occurred during the early 1980's. These projects were located in a small lagoon near the Wainwright DEW line station on Tutolivik Bar in 1982 and 1983. The 1982/1983 program produced an extensive aggregate stockpile, although most was used to construct the Wainwright Airport. The continuing needs for construction grade gravel led to a second dredging season at this location in the early 1990's (producing approximately 600,000 CY of material.) Over the past ten years an additional 10,000 cubic yards has been mined, and based on the last quantity estimate prepared for OC, 40,000 cubic yards still remain available for mining. The old dredge is still located here and has fallen into a state of disrepair. Removal has been recommended because of liability issues.¹⁸

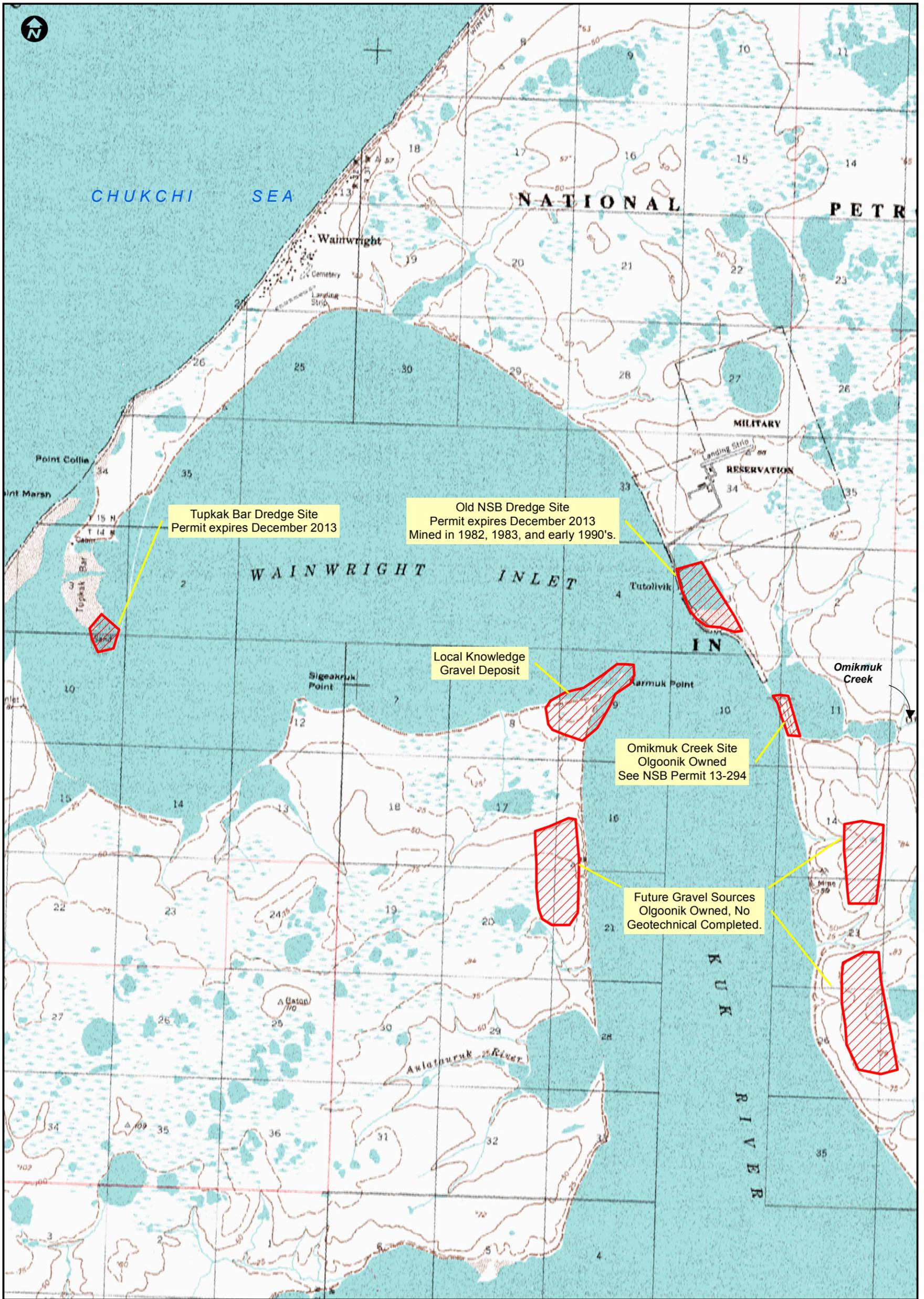
A stockpiling operation extracted 150,000 CY of material from the Wainwright Inlet, near the Tupkak Bar in the mid 90's. The Tupkak Bar site provided non-frost susceptible material (Poorly graded sand with gravel (SP)) with a high sand content. The sand content resulted from digging a basin on the west side of Tupkak Bar. In 2008, OC was contracted by the NSB to mine an additional 70,000 cubic yards from Tupkak Bar and to investigate possible offshore sources of material. OES dredged just off of the Wainwright shoreline in search of suitable aggregate to mix with local fines to provide material suitable for maintenance and construction projects in Wainwright. This basin is mined out, with only a few thousand cubic yards estimated remaining. Although Olgoonik obtained the necessary NSB permit for this site, it does expire end of December 2013. Community members stated concerns that the mining at this location should be discontinued because of impacts to fish replenishment and reproduction.

Wainwright is a growing community and will require substantial gravel to support its future development. The construction and maintenance of current and future capital improvement projects in Wainwright requires a renewed supply of gravelly material. NSB stockpiles have been

depleted, other than a small organic material pile used for layering landfill cover, located inside the landfill.

OC has acquired permitting necessary for a new material source on a bar west of the outfall of Omikmuk Creek. The site is permitted to allow extraction to begin in summer 2013 extending through May 15, 2015. Early estimates have the amount of suitable gravel available here at 400,000 cubic yards.

In addition, OC has identified some material sources sites on the Kuk River that may be good sources for gravel. A preliminary investigation was completed by Olgoonik, but additional, more complete geotechnical exploration is required. Olgoonik owns the surface rights for these sites and has an agreement with Arctic Slope Regional Corporation for the subsurface rights. See attached graphic for sites of all material sources.^{19,20}



Gravel Sources

Olgoonik

Basemap
USGS TOPO DRG - BDL WMS Extras:
Alaska Mapped/GINA

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Title:
WAINWRIGHT, ALASKA
GRAVEL SOURCES

Scale:
0 0.25 0.5 0.75 1
Miles

Figure:
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2.6.8 Transportation

2.6.8.1 Community Roads

Wainwright consists of approximately 10 miles of developed gravel roads. There are no roads linking Wainwright with other NSB Communities. Transportation between NSB communities is primarily by air carrier, and less frequently by snow machine or boat. Attached as Figure 12 is a road map that depicts existing Wainwright roadways.

Prior to construction, platted right-of-ways are dedicated to the NSB under the provisions of the NSB Subdivision Regulations (NSBMC Title 18). Although all roads are located within a platted right-of-way, not all platted right-of-ways have been developed with roads.

Most of the roads in Wainwright are maintained by the NSB. There are some private roads such as the road between the boat ramp and the spill response yard on the Lagoon. There are also private roads built off of the Freshwater Lake roads heading towards the beach and dewline. The NSB maintains the Freshwater Lake Road seasonally to support the water pumping operation.

These roads are built using typical arctic construction methods, employing geotextile fabrics & insulation in conjunction with gravel and drainage culverts. Insulation and embankment depth is determined for each road is based on soil type and permafrost conditions. The road design incorporates components needed to minimize subsidence of roadways due to permafrost melting. Water and sewer utilities are buried throughout the existing road system. Trenching to repair utilities is generally done in the winter months when the gravel is frozen and stable.

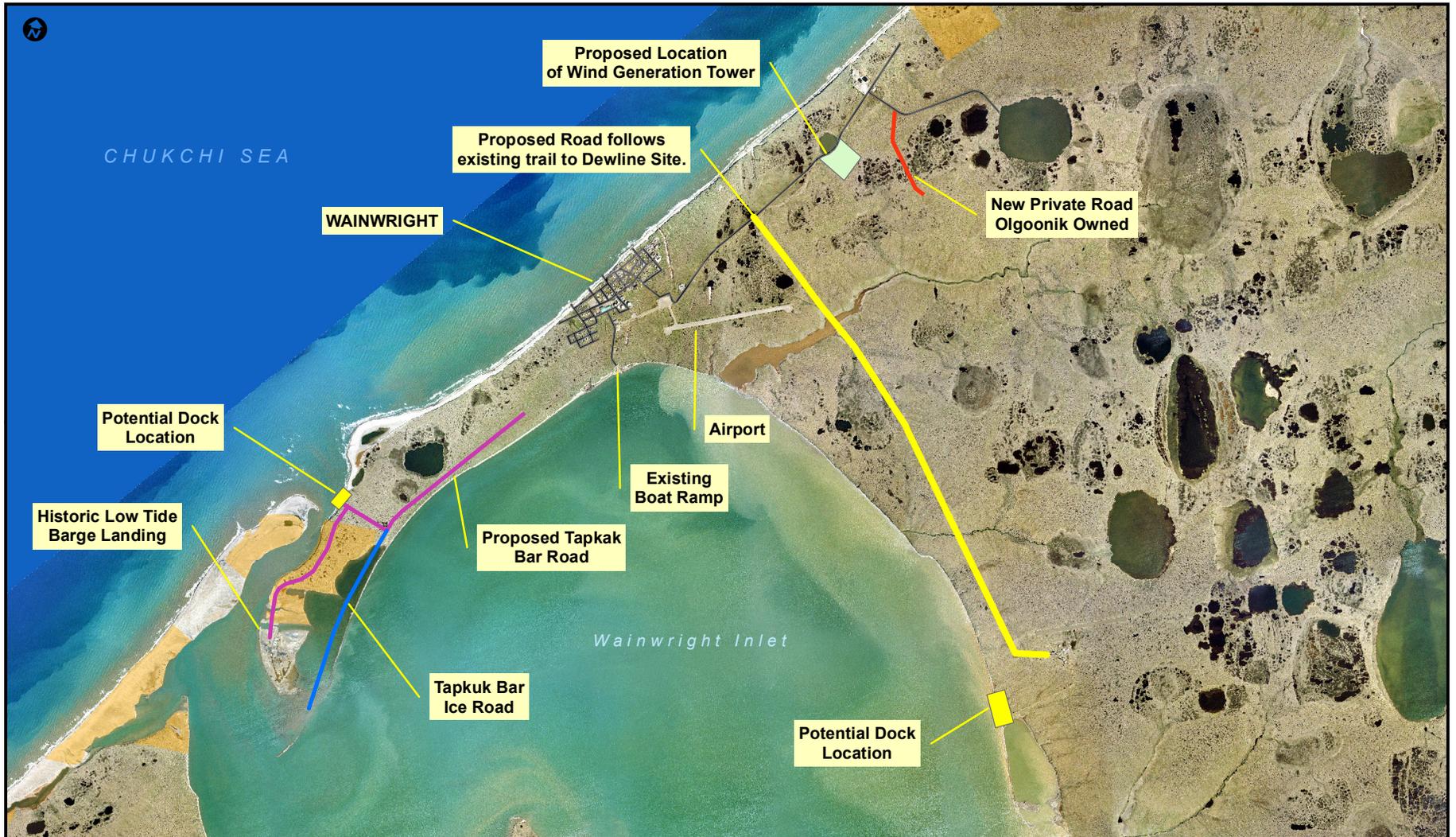
Road surfaces are stable in the winter due to hard freezing of gravel. In the Spring and throughout the Summer these gravel roads may be plagued with various issues associated with thawing gravel that can include rutting, wash boarding, potholes and dust. These conditions typically require spring grading, and gravel placement to maintain for vehicle traffic. Watering the roads in the summer months is generally needed to keep dust from becoming airborne.

A circulation traffic pattern has developed in a fairly logical fashion in most sections of town. The circulation system serves its primary function of linking residential areas with the school, the stores, the airstrip, the inlet and the landfill.

Historically, NSB has been the primary road developer. In recent years Tribal governments, like the Wainwright Traditional Council and the Inupiat Community of the Arctic Slope, have developed tribal transportation programs with funding from the Federal Highway Administration.

Road development within existing and future platted ROW is an essential component to solving the Community Housing shortage. The “High Ground” referred to locally to the north and south has been identified as prime subdivision development areas.

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- Proposed Road
- Wind Generation Tower Location (Proposed)
- Existing Roads and ROW's
- Private Road - Olgoonik Owned
- Native Allotments

IMAGERY:
ACQUIRED JULY 9th, 2010 - KODIAK MAPPING/NSB



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Title: WAINWRIGHT, ALASKA
EXISTING TRANSPORTATION
AND PROPOSED DEVELOPMENT MAP



Figure: 13



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2.6.8.2 Airport

The NSB owns and maintains the Wainwright Airport. The gravel runway is 4,494 feet long and 110 feet wide. The Runway is connected to a 280 foot x 475 foot parking apron by a 80 foot x 570 foot taxiway, located on the west end of the runway. The instrument runway (non-precision) is located on a geodetic bearing of 04-22, placed to accommodate the prevailing wind, which accommodates 95.65% of wind coverage.

The navigational aids operating at the airport include runway end identification lights (REILs), a precision approach path indicator (PAPI) system, Automatic Surface Observation System (ASOS) which includes a weather cam recording “on the ground” weather conditions. There is a rotating beacon, an externally lit wind cone, mounted on a 40 foot tall, steel tip pole, surrounded by a segmented circle of 55 gallon, orange drums.

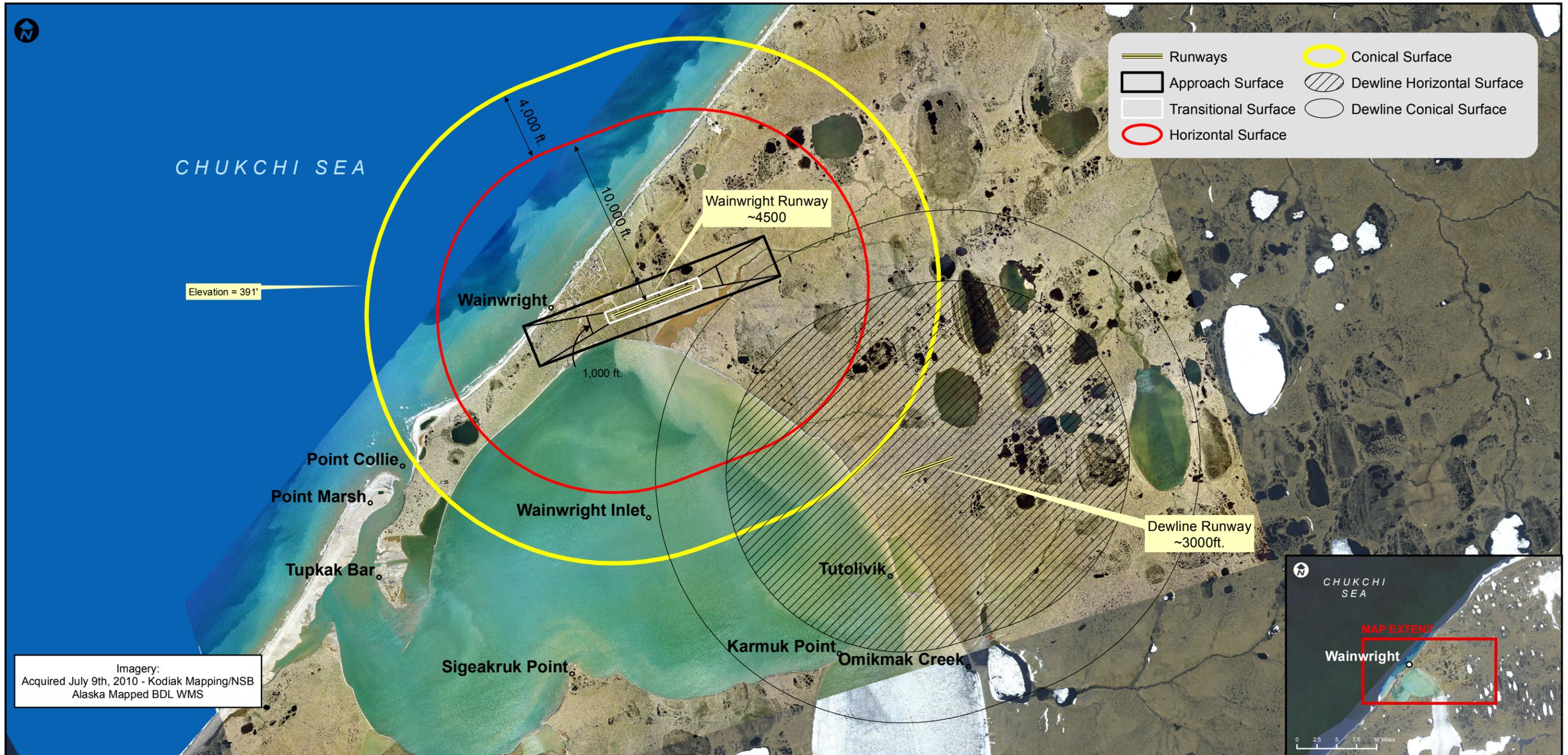
Construction at the airport that was ongoing during the summer and fall of 2013 and will replace the medium intensity runway lights (MIRL), medium intensity taxiway lights (MITL) and the apron lighting. The fencing around the apron is in disrepair, with some areas broken, damaged and falling down. The two gates onto the apron are either inoperable or missing.

Air carriers that use the runway have expressed safety concerns regarding seasonal soft spots and rutting, particularly during heavy rains. The airport is occasionally closed due to the soft surface, especially during breakup. Significant erosion is occurring on the apron side slopes, PAPI pads and to a lesser extent, the edge of the runway safety area. During spring break-up, areas on the runway and the aircraft turnaround around areas on either end of the runway soften enough that aircraft cannot safely turn. The runway needs to be resurfaced and the NSB has allocated funding for surfacing replacement work to begin in 2014.²¹

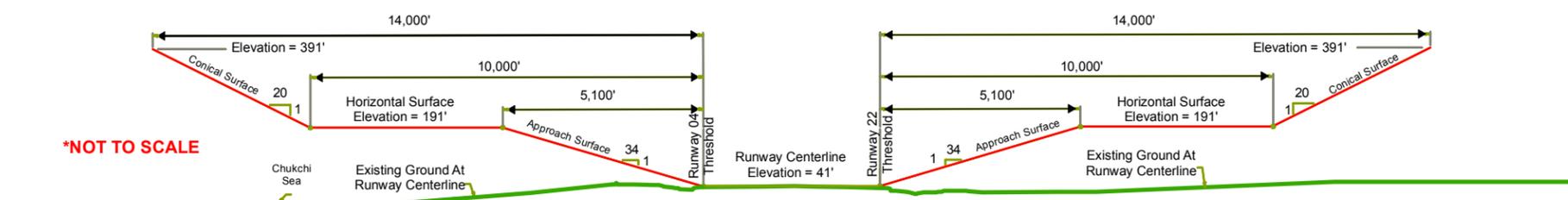
Design Criteria. The Wainwright Airport is designed to accommodate B-I type aircraft, which is a classification of aircraft based on wingspan and tail height. B-I aircraft falls into wingspan less than 49 feet and a tail height of 20 feet. With an increase of runway infrastructure this classification can be upgraded. For instance, by increasing the Runway Safety Area (RSA), the airport could accommodate B-II aircraft with a wingspan of 79 feet and tail heights of less than 30 feet. Currently the runway width is wide enough to accommodate the B-II aircraft, the shortcoming to infrastructure is only on the RSA.^{22,23}

Part 77 Airport Approach Surfaces. In 2009, the NSB completed a Third Party Survey System (TPSS) 405 Survey of the Wainwright Airport. This was done to develop instrument approach and departure minimums and procedures. The goal is to have visual minimums reduced from one mile to ½ mile. The resulting revised Airport Layout Plan (ALP) is still in draft, and will be reviewed by the FAA once submitted. An approach analysis must also be completed before minimums can be revised. This review can typically take two years to complete.

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Imagery:
Acquired July 9th, 2010 - Kodiak Mapping/NSB
Alaska Mapped BDL WMS



WAINWRIGHT RUNWAY PROFILE VIEW



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Title:
WAINWRIGHT, ALASKA AIRSPACE



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The Runway Protection Zone (RPZ) extends on both ends of the runway, beginning at the runway threshold, for 1000 feet on a 34:1 transitional surface. The runway transitional surface is adjacent to the same horizontal surface extending for 10,000 feet, followed by the 4000 foot transitional surface at 20:1.²⁴

Wainwright Enplanements. In 2012, there were a total of 3,531 total enplanements in Wainwright, both scheduled and unscheduled. Enplanement is defined as the total number of passengers boarding an aircraft. Unscheduled flights primarily consist of charter and any flight that is not regularly scheduled air carrier service. The primary scheduled carrier into Wainwright is ERA Aviation.

Table 13 Annual Enplanements in Wainwright

Year	Scheduled	Unscheduled	Total
2012	3,011	520	3,531
2011	3,170	468	3,638
2010	3,423	706	4,129
2009	3,213	557	3,770
2008	3,140	407	3,547

The FAA compiles this enplanement data every full calendar year to determine Airport Improvement program (AIP) entitlements for the following fiscal year. For example, the calendar year ending 2012 calendar year (January - December) determines the AIP allotment for that airport in Fiscal Year 2014 entitlement funds. The carriers that are included in this count are certificated air carriers only, not smaller, privately owned aircraft.²⁵

DEW Line Airport. The USAF Defensive Early Warning (DEW) Site is located three miles south east of the existing Wainwright airport, and includes a small 3600 runway. The DEW Line site was constructed in 1953 and occupies approximately 1,518 acres of land. 14 acres of the reservation has been conveyed to Olgoonik, that includes the runway and associated airport tarmac areas. The land was originally a USAF military reservation. Olgoonik Corporation (OC) has worked with the USAF to clean the site of contamination issues, and has disassembled many of the previous structures located there. Two large buildings remain, one of which is the Radome building. The original 3000 foot long runway remains.

Figure 15 Wainwright Radome



Both OC and village residents have considered the site for conceptual industrial development, both oil and gas, and non-oil and gas. When planning for development of the runway type, size and design aircraft, there will need to be an analysis of physical improvements required for infrastructure development, (runway width and length), airspace required for runway type, (utility, non-precision, precision, certificated), and the required airspace needed to safely accommodate approaches and take-offs.

The land that the current Wainwright Airport is located was originally a land transfer agreement between the North Slope Borough, Olgoonik and the State of Alaska. The airport was originally a state owned and maintained airport, transferring to the NSB in March of 1983. Stipulations within the transfer agreement contain a reverter clause that requires the land revert back to the State of Alaska if the property is no longer used as an airport.

During community scoping meetings for the comprehensive plan, public comments were received that were in favor of industrial users concentrating the industrial growth and their increased airport uses to the DEW Line site, and not allow them use of the Wainwright Airport. It was felt that the increased noise and traffic impacts would have negative impacts to the community due to the close proximity of the airport to town. Further study would be recommended to investigate and fully analyze any changes to airport configurations, to fully

understand the concerns and impacts of airport development at either DEW line airport or Wainwright Airport.

As discussions continued during this scoping process, the community has unified their voice in strong support of relocating the existing airport to the DEW line site. The community feels that the existing airport is hemming the community in, limiting new growth. If the public airport were to be relocated, a feasibility study is required to consider and resolve the following issues:

- Acquisition, platting of the new airport land
- Land Transfer Agreement Revision for existing airport.
- FAA Coordination and Planning. (Airport Master Plan)
- Resolution with FAA of Grant Obligations at Old Airport
- Relocation Costs and project funding.
- NSB Ownership and Maintenance
- Transference/Coordination with Olgoonik
- Conclusion of any Contamination Issues

The DEW line site and associated runway is located 3 miles from the village of Wainwright. When considering new airport and industrial development, this site would provide a buffer between industrial development and the community, mitigating noise and traffic impacts. An access road would be required, and is shown on conceptual rendering that are part of an overall development plan by OC. If the airport were maintained by the NSB, the access road maintenance responsibility would be, as well. There will be an increase in maintenance operations with a new three mile road, such as snow clearing, grading of rutting issues and upkeep of surface material. A new road would open up areas for future industrial lot development, either in support of oil and gas, or of industrial and aviation support type businesses.

Substantial capital projects have been completed at the Wainwright Airport. The benefits to the airport improvements would be lost if the airport is relocated. There is a NSB capital project scheduled for 2014 to resurface the runway. Immediate discussions should be started with the NSB to begin any planning necessary for upcoming projects, future funding issues and all issues/decisions associated with a new airport location.

Over the years, some improvements were funded by FAA AIP federal dollars at the existing airport. In addition, many were funded by the NSB using General Obligation bond funding, totaling almost \$11 million. There could be impacts to FAA grant dollars already spent on past improvements on the Wainwright airport, resulting in the NSB having to reimburse the FAA.

Lastly, the land transfer agreement signed in 1983 transferred land from state lands to the NSB specifically for use as an airport. If the land is no longer used as an airport, the agreement states that the land rescinds back to the State of Alaska. This would need to be addressed and resolved.

2.6.8.3 Marine Ports

There is currently no constructed port for Wainwright. The current boating activities are limited due to shallowness of launching areas. There is a community boat launch next to the spill response yard south of the community on Wainwright Inlet. Launching whaling boats, personal boats and the response vessels is treacherous and potentially life-threatening during stormy weather at this location.

OC has indicated a desire to construct some type of bulkhead facility north of Wainwright to provide commercial shipping reasonable docking. OC has also stated they would like to construct a bulkhead dock at the entrance channel to Wainwright Inlet. Community leaders and residents would like to see a docking facility at the entrance of the inlet with a road from the community built to access such a facility. Such infrastructure would make it easier to access the ocean by boats in bad weather; this would provide a quicker response to search and rescue or potential oil spill responses. Furthermore, the OC development plans also include a boat ramp south of the old DEW Line site.

Wainwright is the nearest village to the Chukchi Sea OCS leases and is located on Wainwright Inlet, which is capable of sheltering shallow- to medium-draft vessels. The Chukchi Sea is ice-free from mid-July through September. The close proximity of oil and gas prospects, a protected bay and an airport with passenger and cargo services gives Wainwright the capability for logistics support for industrial activities. OC has been supporting oil industry activities since 2007. They are investing in equipment, infrastructure and training programs to meet industry needs with operations at an abandoned distance early warning (DEW) radar site.²⁶ There is interest in developing a port authority in Wainwright to address boat launching and docking infrastructure and to develop a revenue stream.

2.6.9 Recreational Facilities

The current recreational facilities used by Wainwright residents include the Alak School gymnasium and the Robert James Community Center. The gymnasium is only available to the residents during the school year and is utilized during the evenings by students and adults. The Robert James Community Center is used to provide recreational activities for the youth. The City of Wainwright has just completed a new playground for additional youth recreation with new playground equipment.

2.6.10 Mail Delivery

Wainwright is served by a single post office with box service only. The mail arrives by air carrier from Barrow. There is no mail delivery service. Currently, the post office is only open one day a week until a permanent post master can be hired.

2.6.11 Communications

2.6.11.1 Telecommunications

Wainwright telephone service is by ASTAC. There is cellular telephone service in Wainwright, but that service is not the latest technology available to other residents of the United States.

2.6.11.2 Radio Communications

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

2.7 Economy

2.7.1 Economy

The economy of Wainwright is dependent on government spending as well as oil and gas exploration in 2013. Over the long term, government has been the driving economic force in Wainwright, primarily from the NSB. 64.5% of the income that Wainwright residents earned in 2010 came from government sources.²⁷

The second most common source of wage income is from ASRC and OC, contributing to 26.1% of the total wages earned by Wainwright residents.

The final source of income worth noting is the dividends that are paid by both ASRC and village corporations to shareholders living in Wainwright. In 2009, the amount of money received by Wainwright residents was \$3,160,404, the second largest source of funds after wage income.

2.7.2 Employment

The labor force comprises all individuals 16 years of age and over who are employed or available to work. In Wainwright the labor force dropped 29.7% between 1998 and 2003; in 2010 there were 280 people in the labor force, an increase of 8.1% from seven years ago. The proportion of the labor force to the total population has also grown from 57.4% to 60.3% in 2010. The national employment-population ratio is slightly under 58%. Over 40 % of the labor force is between the ages of 16 and 26; over 30 % are 45-59. Unemployment in Wainwright almost doubled from 17.7% in 2003 to 31.9% in 2010. Iñupiat men were more likely to be unemployed than non-Iñupiat residents and women.

This is consistent with community concerns about training for jobs and underscores the need. Training and employment should be factors considered in all economic opportunities coming to Wainwright.

2.7.3 Oil and Gas

Of the Wainwright population actively employed in 2010, 0.5% were employed in the oil and gas industry. This is significantly less than other employment sectors in Wainwright. If oil and gas is developed and produced from the Chukchi lease offshore of Wainwright, there will be a significant opportunity to engage the industry about both short term and long term employment

of Wainwright residents in the exploration, development and production phases of oil and gas. While there will likely be short term employment for Wainwright residents in the exploration and development of oil and gas; the more valuable long term employment in production has been elusive, as shown by the NSB 2010 Economic Profiles and Census.

It can be argued that training and employment of Wainwright residents can mitigate impacts to the community and satisfy potential Environmental Justice issues that might emerge with the development.²⁷

2.7.4 Construction

Construction comprises 11% of the 2010 employment for Wainwright. That number has likely increased since then due to the increased support to Shell Oil and ConocoPhillips shore facilities. This number does not include construction for public entities or for either ASRC or OC.²⁸

2.7.5 Government

As it is with other places in Alaska, government employs a significant number of people in Wainwright. In 2010, 51.4% of the employed population worked for either the NSB or the North Slope Borough School District (NSDSD). These jobs are valued by local residents because they provide a consistent source of employment and income, something lack in construction or in the exploration or development of oil and gas.

2.7.6 Education

Wainwright Alak School provides a K-12 curriculum which served about 150 students in the 2012 academic year. The attendance rates over the last 10 years have fluctuated, ranging from 158 to 149 students.

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.²⁹ Following the statewide trend, the NSBSD is experiencing a decline in student enrollment.

2.8 Subsistence

2.8.1 Definitions of Subsistence

There are a number of definitions of “subsistence” and many different understandings of its meaning. What is clear is that the term means different things to people based on their cultural upbringing.

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 the

way the Iñupiat passed down traditional knowledge through generations. It is not only a way of life, but also the joy of living from the gifts that the creator provides.

The NSB Land Use Regulations define subsistence as,

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

The State of Alaska 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)).”

The important message here is that subsistence, as it is used in Wainwright, is more similar to the NSB definition than it is to the one from the State of Alaska.

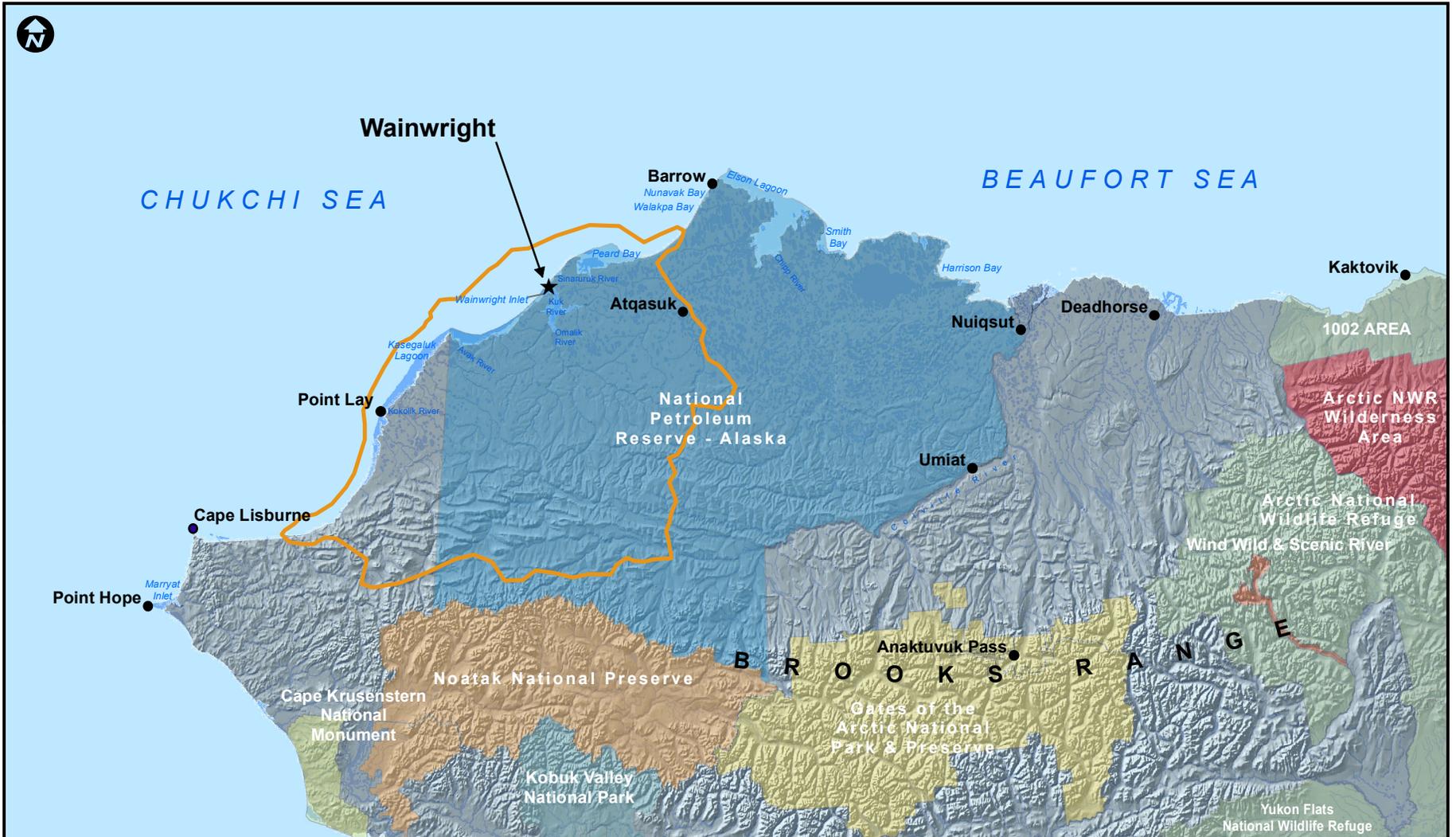
2.8.2 Village Area of Influence

The Village Area of Influence is shown below, based on the information contained in the Wainwright Traditional Use Area Conservation Plan Map Book, developed by the Wainwright Traditional Council Nunakput Qaunagilugu Iñuggun Piqqagivlugu, finalized August 18, 2008. The area is considered the traditional land use area used the people of Wainwright. The primary purpose of identifying the area of influence is so that permitting activities in this area consult with the appropriate Wainwright entities prior to settling on the final permit stipulations.

Wainwright subsistence areas and patterns are determined not only by the seasonality of resources but by the village’s geographical position and periodic access limitations. The Chukchi Sea coast has shore fast ice for at least six months of the year. The village has direct access to a navigable river but sometimes the waters are too shallow for boating.

It is recognized that the area of influence overlaps adjacent villages, as fits within cultural values for sharing and subsistence. The area of influence is not intended to be exclusive, but rather describes the area within which key subsistence resources for Wainwright are harvested and family traditional uses occur.

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WAINWRIGHT AREA OF INFLUENCE	NATIONAL PARK & PRESERVE
NATIONAL PETROLEUM RESERVE	NATIONAL PRESERVE
NATIONAL PARK	NATIONAL WILD & SCENIC RIVER
NATIONAL WILDLIFE REFUGE	NATIONAL WILDERNESS AREA
NATIONAL MONUMENT	

**Wainwright Area of Influence was digitized from the Traditional Use Area Conservation Plan Map Book as produced by the Wainwright Traditional Council and The Nature Conservancy, Aug. 18, 2008.



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Title: WAINWRIGHT, ALASKA
AREA OF INFLUENCE

Scale: 0 25 50 75 100 125 Miles

Figure: 16

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2.8.3 Wainwright Subsistence Harvest

The Wainwright Traditional Council took a forward-thinking action to define and develop a management strategy for subsistence use of the land in and around Wainwright. In 2008, the Wainwright Traditional Council working with the USEPA and the Nature Conservancy, developed the Wainwright Traditional Use Conservation Plan (TUACP). Listed from the plan below are the Guiding Principles and Conclusions.

Guiding Principles - The Iñupiat people of Wainwright will maintain a deep connection to the land that has been used by our ancestors for thousands of years. This relationship to the land has a critical importance to the survival of our Native culture. The TUACP will help others to:

- Recognize and respect the importance of subsistence, and how it is tied to the health, culture, society, and economies of Arctic communities and its peoples.
- Understand and respect the history of stewardship and self-governance of North Slope land, water, plants, and animals by Native Peoples.
- The Wainwright Traditional Council is a federally recognized Tribe and exercises its inherent right to negotiate with local, State, and federal agencies (Bureau of Land Management) on a government-to-government relationship.
- Acknowledge the extensive traditional knowledge about the environment held by the Iñupiat peoples living in the Arctic.
- Management of Arctic resources shall sustain diverse and abundant wildlife and ecosystems in perpetuity, while providing for cultural, social and economic development that supports a healthy, secure and sustainable quality of life.
- Whether it is oil development or hard rock mineral development, the Iñupiat people of Wainwright will review all proposals in a timely manner to analyze, comment and submit recommendations.
- Data will be collected using valid methods and ethical guidelines created and agreed upon by the TUACP committee. This is to ensure accuracy and authenticity of the information gathered.
- As traditional use areas are documented on the maps, the original Inupiat place name should be used before the English name that was given by the westerners that did not speak or understand Inupiat. For the benefit of agencies and developers, English names should be placed in parenthesis.
- Within the thousands of miles of the traditional use area, there are areas that should be designated as special areas. Such areas may include old burial sites, caribou migration corridors, traditional hunting camp sites, food gathering sites (berry picking or medicinal plant sites), cultural ceremonial sites, fish-bearing lakes, fishing sites, polar bear and brown bear den areas, and marine mammal and migratory bird areas.
- In areas where habitat is sensitive and critical for wildlife or high intensity areas, a limit or restriction should be placed on motorized transportation that can harm the habitat or disturb the normal patterns of the wildlife (such equipment as all-terrain vehicles (ATV), rollogons, and aircrafts, etc.).

- In the case of a special traditional use area including a heavily used caribou migration route in the path of the pipeline, the use of underground pipes should be considered for the width of the migration path.
- When Traditional Ecological Knowledge (TEK) and conventional science data is gathered while conducting the project, credit will always be given to those providing information and will be cited in the final draft.

The plan indicates that the Wainwright Traditional Council will work towards developing capacity in the area of wildlife and wildlife habitat management, including capacity for using Geographic Information Systems (GIS). It is important to generate these jobs that local people can obtain through training in the community.

- A habitat and wildlife monitoring program will be implemented into the plan to guarantee accountability by agency or resource developers.
- A precautionary approach should be used when either development or management of lands is considered, especially in areas where habitat for wildlife is highly sensitive to disturbance.

The TUACP report's maps illustrate that there is a core area around the village of Wainwright that is highly significant for both successful subsistence hunting and for the viability of several sensitive species. This core area coincides closely with the Deferral Area delineated by the BLM. Because of its significance, this area is suitable for long-term conservation management. Following are specific conclusions:

- The villagers of Wainwright have been hunting in this, their Traditional Use Area, for many generations.
- Certain places within the Traditional Use Area are consistently and heavily used by the villagers to hunt and harvest wildlife and for travel.
- By consolidating the heavily used areas for hunting and harvesting caribou, fish, waterfowl, and marine mammals, we can denote a core subsistence area.
- Core areas alone are not sufficient to meet all the needs of subsistence users; the entire Traditional Use Area has been—and is—used for subsistence, and new areas may take on increased importance under a changing climate.
- Several sensitive species also use the Wainwright Traditional Use Area, including two species listed as “threatened” under the Endangered Species Act and several identified on BLM’s sensitive species list.
- There is a great deal of overlap among the core subsistence areas, areas used by sensitive species, and the Deferral Area, suggesting that the Deferral Area encompasses a landscape that is highly significant for both subsistence and species diversity and that this is an area deserving of long-term conservation management.
- Maintenance of subsistence and biological values depends not only on how land and wildlife is managed in the Wainwright Traditional Area but also in areas beyond its boundaries that are important for migration, overwintering, or other parts of species’ life cycles.

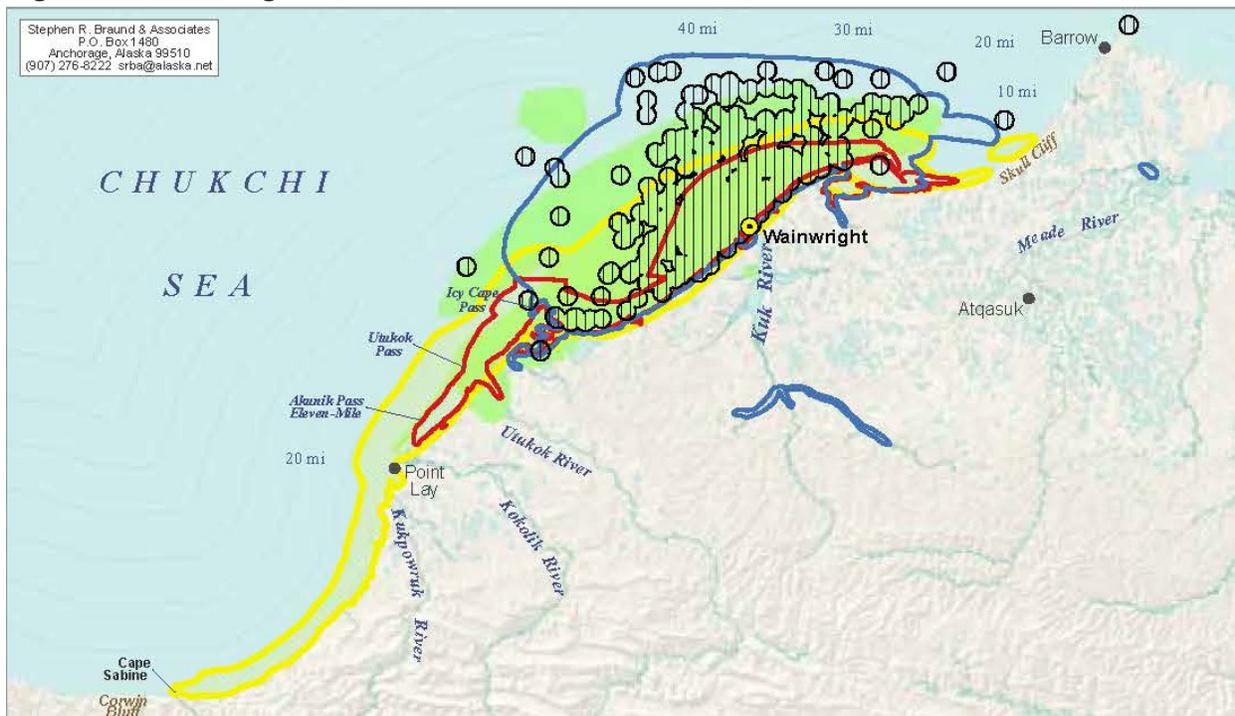
- Industrial development and climate change pose potential impacts to the subsistence and biodiversity values of the area through changes in habitat and land use.³⁰

2.8.4 Wainwright Subsistence Harvest Areas

Subsistence Harvests – Data indicates that Wainwright residents primarily utilize marine mammals, caribou, and fish, in terms of pounds per person harvested. Other resources are also utilized by the community, but had lower harvest levels in terms of pounds per person.

Marine Mammals. In October 2012, the Pew Trust published a summary of marine subsistence uses by Wainwright residents that was derived from data Stephen Braund has collected from a variety of sources dating back to 1979. It shows that Wainwright residents will go as far as 50 miles offshore to hunt for marine mammals. These mammals include Beluga whales, Bowhead whales, Polar Bears, Seals, and Walrus. The various use areas are shown on the map below.

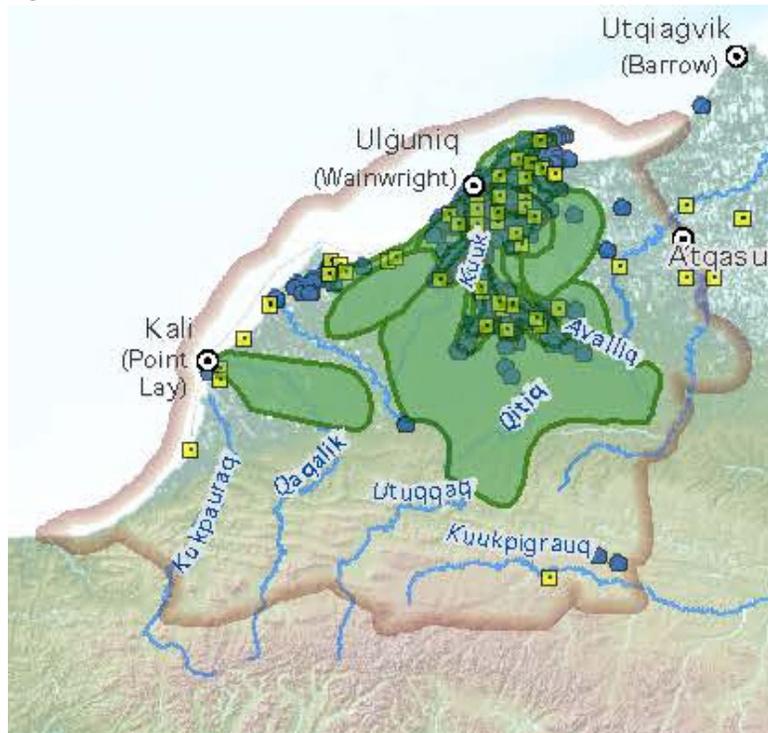
Figure 17 Wainwright, Alaska Consolidated Harvest Areas



Marine mammal hunting areas

Caribou. Caribou is also an important subsistence species for Wainwright residents. Below is a map from the Wainwright Traditional Land Use Map Book that shows the hunting areas (shaded green) for caribou in and around Wainwright.

Figure 18 Wainwright, Alaska Caribou Harvest Areas



Fish. Fish are an important contribution to the subsistence species for Wainwright residents. Below is a map from the Wainwright Traditional Land Use Map Book that shows the fishing areas (shaded green) for several types of fish in and around Wainwright.

Figure 19 Wainwright, Alaska Fish Harvest Areas



The Sharing Project - A research project from the University of Alaska, Alaska Department of Fish and Game, Arizona State University and the Bureau of Ocean Energy Management evaluated the impact of Alaska Native sharing their subsistence harvests in the communities of Wainwright, Kaktovik and Venetie during 2009 and 2010. There was a focus on seven core species – Beluga Whale, Bearded Seal, Bowhead Whale, Caribou, Smelt, Geese and Ducks. The project reported that Wainwright is highly connected to other communities.

- Finding 1: Most households participate in some aspect of subsistence harvest.
 - 76% hunted for bearded seal, caribou, geese or ducks, or fished for smelt.
 - Another 21% participated in some aspect of bowhead or beluga whale hunting
 - 86% received food from sharing.
 - 84% said they shared food with others (households got 305 pounds from sharing, on average).
 - Only 6% did not hunt any core species or participate in whaling, and only 1.3% were completely disconnected from subsistence.
- Finding 2: Social relations account for most of the food flows into Wainwright households
 - 404,082+ pounds of subsistence food flowed into Wainwright households in the study year.
 - Only 25% of that food came from households hunting or fishing alone.
 - 75% of subsistence food flows came from social relationships: cooperative hunting, sharing, shares for helping, etc.
- Finding 3: Subsistence flows into Wainwright households vary widely
 - Several households had more than 10,000 pounds of subsistence in-flows.
 - Other households had less than 100 pounds.
 - 30% of households harvested 76% of all the subsistence food that is hunted and fished.
 - This harvest pattern very similar to other rural Alaska communities.
- Finding 4: Whaling is a community level effort, and distributes food widely in the community
 - Wainwright landed two bowhead whales in spring 2009, and one bowhead in fall 2009.
 - 100 households, captains, crew members, and organizations contributed to eight whale crews.

- 74 crew members from 53 households received crew/towing shares.
- On average, Wainwright households each received 285 pounds of bowhead in 2009.
- Finding 5: Wainwright truly has a “mixed” economy; having a source of cash is important for subsistence activities
 - 85% of households relied on a combination of subsistence harvesting and cash income.
 - In the top third of harvesting households...
 - All reported at least some cash income,
 - All but three reported income from jobs
 - Half were also in the top third for incomes
 - Cash is important, but not the only factor
 - Larger and older households tended to have high harvests
 - Well-equipped households had higher harvests
- Finding 6: Some households reported high levels of food Insecurity
 - Used standard food security questions developed by USDA and modified for subsistence by ADF&G
 - The findings raise questions about household well-being and people’s vulnerability during social, economic, or ecological changes

The importance of subsistence to the survival of the people of Wainwright cannot be emphasized enough. It is clearly a highly interdependent system that supports Wainwright and many other communities.³¹

2.9 Youth Involvement

Projections without Development. The twelve issues identified in the 2008 Wainwright Comprehensive Plan that concern alcohol and drugs have the potential of becoming bigger issues if not addressed. To address alcohol and drugs, a community plan with involvement by the NSB, NSBSD, City of Wainwright, Wainwright Traditional Council, OC, Inupiaq Community of the Arctic Slope (ICAS) and Wainwright residents and youth involved is recommended to be developed.

Expansion of the current programs provided within the community by the NSB, City of Wainwright, Arctic Slope Regional Corporation and OC will help minimize the alcohol and drug concerns as well as address job and training opportunities and address the community’s concern of the issue of lack of opportunities and lack of a recreational facility for young adults.

Continuation and expansion of Ilisagvik College education classes and programs will also increase youth involvement and help address the other current issues addressed above.

Daycare is a current concern by community members. The Mayor's Child Care initiative is working to address these concerns.

Projections with Development. The issues and concern of alcohol and drug and other issues stated above will only escalate if not addressed. Participation by industry through financial assistance to address youth involvement issues could help alleviate the above.

Through planning by the educational institutes, ANCSA corporations and local government with industry involvement, training and job opportunities for young adults to remain or return to the community can provide long term careers for youth.

2.10 Cultural Resources

There are historic cultural resources sites in the area of Wainwright. Cultural resource sites may be archeological sites of great importance or everyday sites used for subsistence purposes. IHLC maintains a database of land uses for traditional and cultural purposes, either in the present or past. The location of these sites is maintained as confidential information and clearances are required from IHLC for any development work outside of the Village zoning district for Wainwright.

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3.0 LAND USE AND ZONING

3.1 Land Ownership

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

Five miles southwest from Wainwright along the shore of the Kuk Lagoon is the formerly used USAF DEW line site. The USAF currently maintains a right-of-way from BLM for 1512 acres of land. The USAF is in the process of remediating environmental hazards there to relinquish the right-of-way since it longer actively uses the land for DEW line purposes.

3.1.2 U.S. Bureau of Land Management (BLM) National Petroleum Reserve-Alaska (NPR-A)

Land surrounding Wainwright falls within NPR-A.

3.1.3 Native Corporations

Major land owner in Wainwright is Olgoonik Corporation (OC). OC is the village corporation established by the Alaska Native Claims Settlement Act of 1971. OC owns the surface estate to over 175,000 acres of land surrounding Wainwright.

Arctic Slope Regional Corporations owns the subsurface estate to over 160,000 acres of land beneath Olgoonik Corporation surface estate.

3.1.4 North Slope Borough

The North Slope Borough provides public services of electricity, water, sewer, public health, public safety, fire protection and landfill. The NSB owns the land under the public facilities that support these services to the community and as well as operates and owns the airport lands.

3.1.5 City of Wainwright

The City of Wainwright has limited land ownership of land within Wainwright. The City owns land for its governmental office, the Robert James Community Center, the boat launching ramp and the City of Wainwright playground equipment is located upon. The City of Wainwright still has rights to OC lands through ANCSA 14(c)(3) provisions.

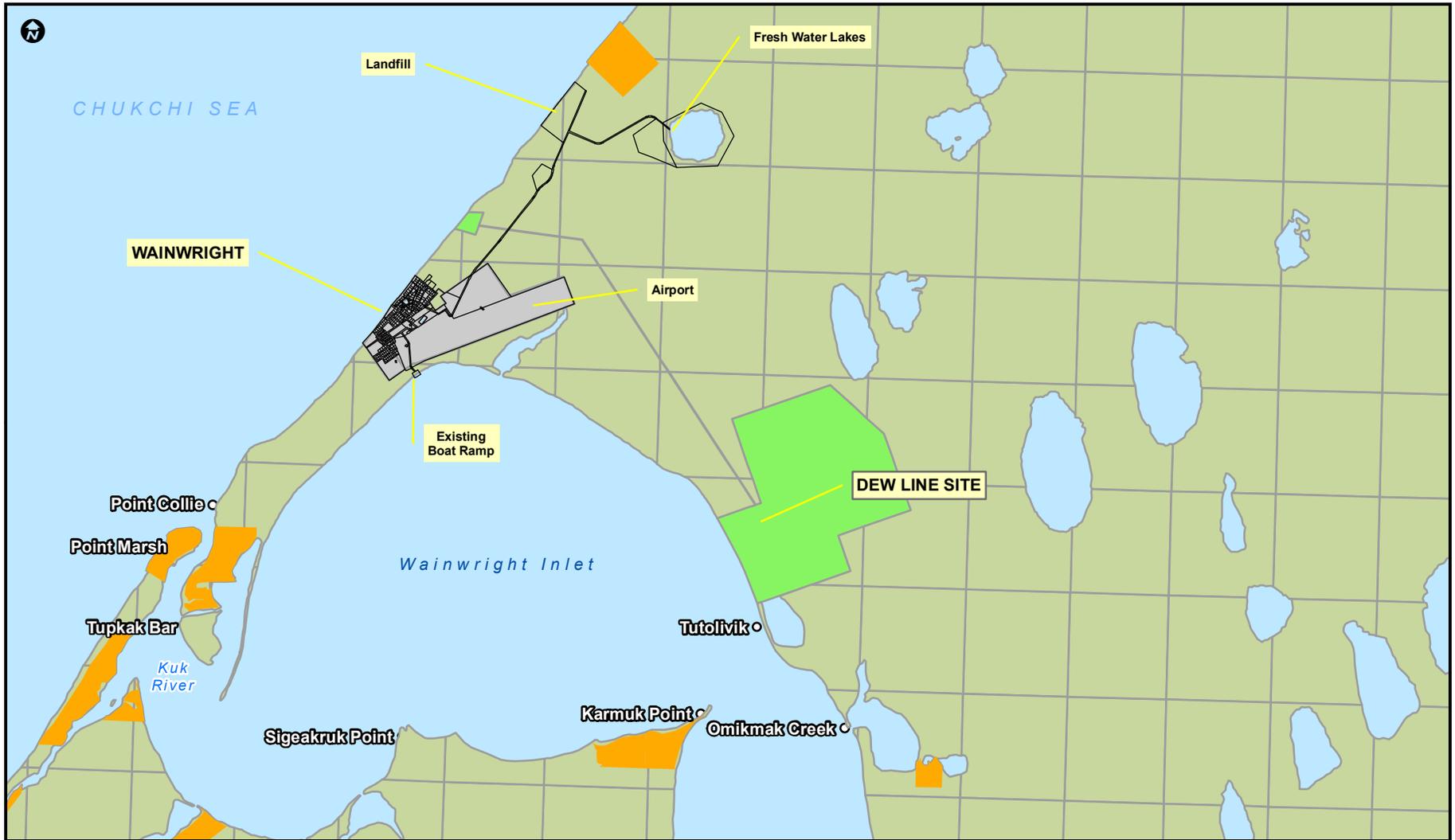
3.1.6 Tribal Trust Lands

The Wainwright Traditional Council is the tribal government for Wainwright. Trust service of native allotments and tribal restricted deed lands is handled by the Inupiat Community of the Arctic Slope. There are two Native allotments in close proximity of Wainwright.

3.1.7 Other Institutional Land Owners

The North Slope Borough School District, Wainwright Cooperative Association, and two churches own lands in which their facilities are located upon within USS 4418.

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- ANCSA
- Native Allotments
- Private
- Townsite
- Military Withdrawal

DATA:
 Native Allotments - BLM SDMS 10/2013
 General Land Status - ASRC 10/2013



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Title: **WAINWRIGHT, ALASKA
 GENERAL LAND STATUS MAP**



Figure: **20**

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3.2 Zoning and Land Use

Wainwright is zoned Village District by the NSB, which is to reinforce with traditional values and lifestyles of a village and are in accordance with the Borough Comprehensive Plan, Village Comprehensive Development Plan and with the desires of the residents of the village.

Outside the Village District, lands are classified as a Conservation District. This classification is intended to conserve the land in a natural state. Borough residents depend for subsistence foods which flourish in a natural environment. Oil and gas resource exploration may occur in the Conservation District on a limited scale, but major resource development projects must apply for rezoning to the Resource Development District and submit a master plan for the development.

Local municipal governments are the NSB (a home rule borough) and the City of Wainwright (a second class city).

3.2.1 Current Land Use

The City of Wainwright is contained within United States Survey (USS) 4418. USS 4418 consists of residential lands, commercial lands for a handful of businesses, cemeteries, lands for public facilities (water plant, public safety, school facilities, health care, fire department, airport and fuel storage). Adjacent to USS 4418 on the north boundaries, small tracts of land consist of the sewage facility and power plant).

The community of Wainwright has approximately 9 miles of roads, one which leads to a sewage lagoon, landfill and two fresh water land supplies for the community.

The USAF is in the process of remediating environmental hazardous materials from Dewline site. Anticipated completion is expected within two years.

3.2.2 Future Land Use

Residential – Wainwright has a shortage of land for residential homes

Public Infrastructure – The City of Wainwright would like to build a community freezer building but does not have land to build upon.

ANCSA 14(c)(3) – OC has not fulfilled its 14(c) requirements in transferring land to the local municipality. Attempts in the past to accomplish 14(c) transfer has clouded title to some of the lands utilized for public purposes in Wainwright.

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- | | | |
|---|---|---|
|  NSB |  NATIVE RESTRICTED (NAT) |  RELIGIOUS (REL) |
|  CORPORATION (COR) |  HOUSING AUTHORITY (HAS) |  FEDERAL (FED) |
|  CITY (CTY) |  PRIVATE (PVT) |  ROW |
| |  CEMETERY | |

Land Use is based on NSB Assessor's data and edited with current observations.
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 Imagery: Bing Maps- © 2012 DigitalGlobe State of Michigan



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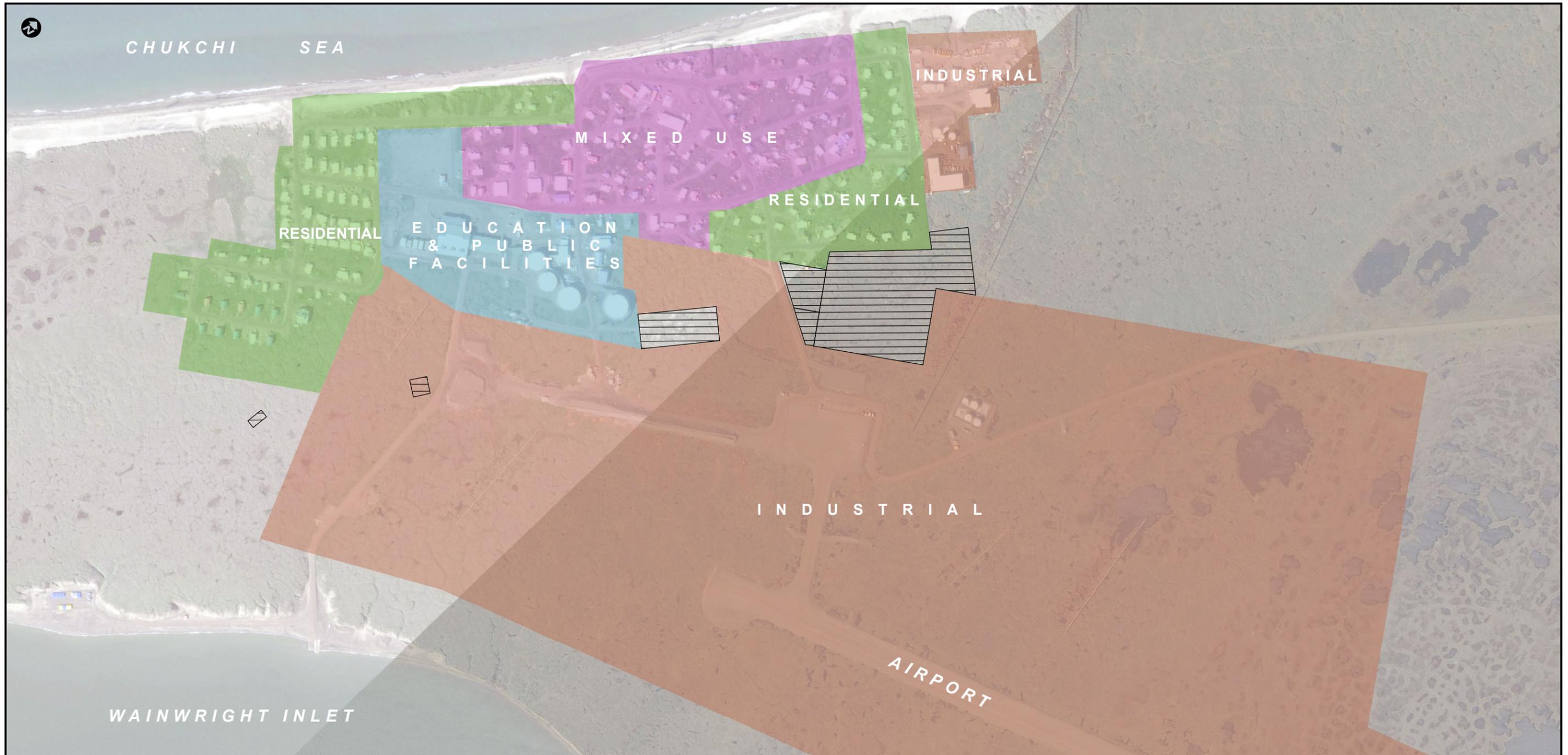
Title: **WAINWRIGHT, ALASKA
 CURRENT LAND USE**



Figure: **21**



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- | | | |
|---|---|--|
|  EDUCATION & PUBLIC FACILITIES |  MIXED USE |  CEMETERY |
|  INDUSTRIAL |  RESIDENTIAL | |

Imagery:
Bing Maps- © 2012 DigitalGlobe State of Michigan

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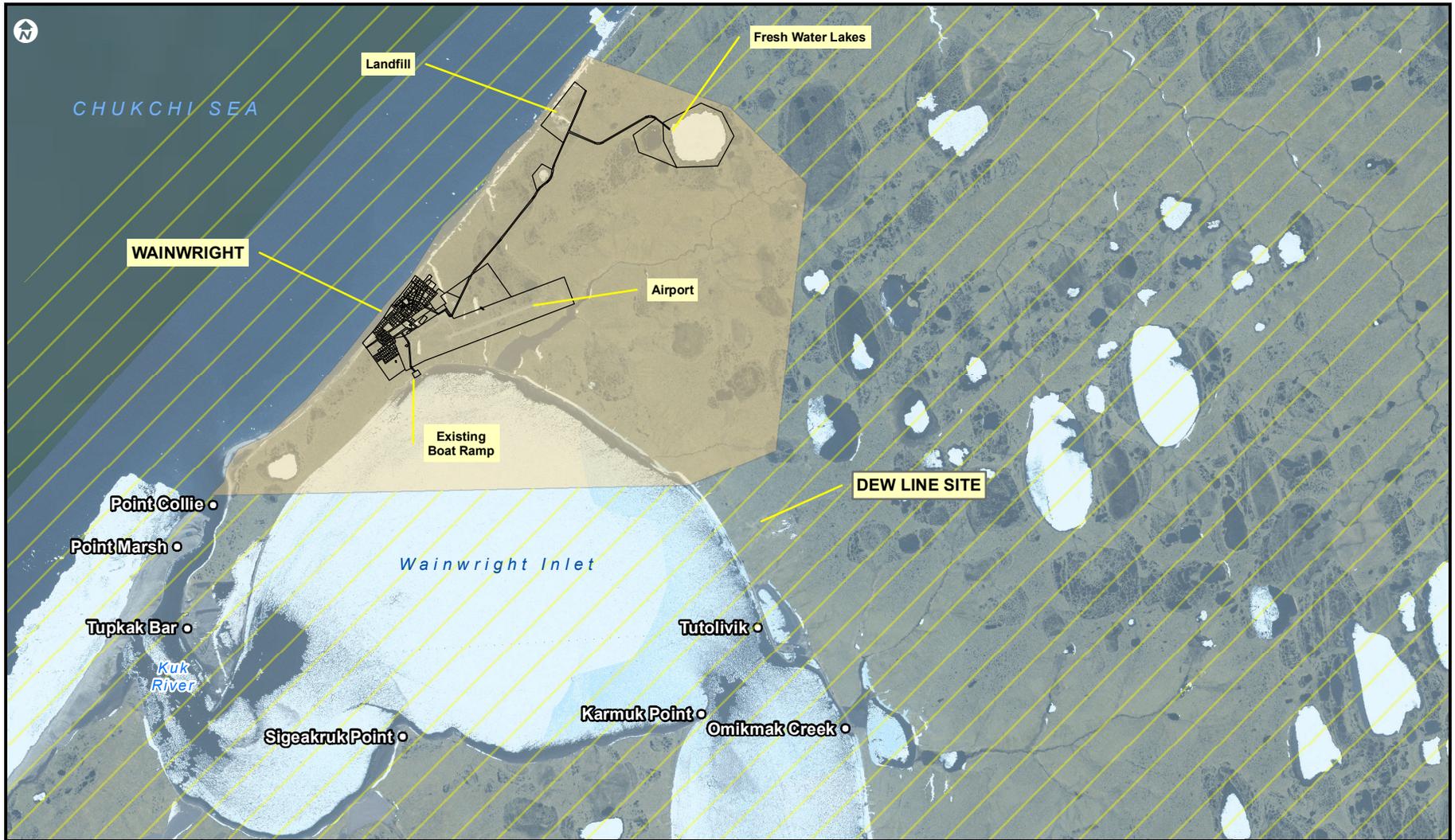
Title:
**WAINWRIGHT, ALASKA
FUTURE LAND USE**

Scale:
0 250 500 750 1,000
Feet

Figure:
22



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Conservation District
 Village District

Parcels

IMAGERY:
ALASKA MAPPED BDL WMS



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Title: **WAINWRIGHT, ALASKA ZONING MAP**

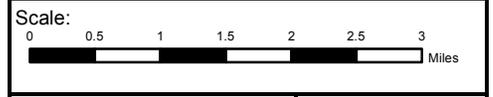


Figure: **23**



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4.0 GOALS OBJECTIVES, AND STRATEGIES

The goals and supporting objectives are intended to reflect the values of Wainwright residents.

The goals and objectives were developed in response to the strengths, weaknesses, opportunities and threats identified at community meetings and later verified at Wainwright Leadership Roundtable..

- 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.

Each goal and related objectives and strategies are presented in separate tables. This format will allow the community to track progress in implementing strategies by updating the tables during a 5 year review and update cycle built into this plan.

- Goal 1: Protect and enhance traditional, historical, cultural and subsistence resources and activities.**
- Goal 2: Establish future land use decisions within the Village to ensure a balance of housing, commerce, services, transportation and facilities to support vibrant economy, strong families, and traditional values.**
- Goal 3: Support the development of suitable housing, new facilities and transportation.**
- Goal 4: Facilitate development activities in appropriate locations that reduce or eliminate conflicting land uses and that provide economic opportunities for residents and future generations.**
- Goal 5: Build meaningful governmental and industry cooperation.**
- Goal 6: Enhance educational and cultural pursuits.**

Table 14 Goal 1 - Protect and enhance traditional, historical, cultural and subsistence resources and activities.

Objectives	Strategies	Implementing Entities
Create or establish a common facility for cultural activities	Begin planning for a cultural center that can host traditional cravers, native craft workers, Umiq boat building, and skin sewing as well as traditional dance groups.	City, Borough, and Tribe
	Day care center with Iñupiat language immersion program.	Borough and the School District
Conservation planning for traditional land use areas	Implement the traditional land use plan developed by the Wainwright Traditional Council.	Borough, the City, the Tribe and Olgoonik Corporation
	Develop and implement land use regulations for Wainwright administered in Wainwright.	Borough and City
	Continue to support the moratorium on commercial fishing in the Chukchi Sea.	Tribe, City, Borough and State of Alaska
	Identify and remediate all contaminated waste disposal sites in the Wainwright Area of Influence.	Federal government, State of Alaska and Borough
Protect and preserve areas where traditional hunting, fishing and gathering occurs	Document and protect areas where traditional sources of subsistence foods are gathered.	Borough, the Tribe and Olgoonik Corporation
	Create lessons for children to learn about traditional subsistence culture in school, specific to Wainwright.	Borough and the School District
	Document and protect areas where traditional sources of subsistence foods are gathered.	Borough, the Tribe and Olgoonik Corporation

Table 15 Goal 2 - Establish future land use decisions within the Village to ensure a balance of housing, commerce, services, transportation and facilities to support vibrant economy, strong families, and traditional values.

Objectives	Strategies	Implementing Entities
Establish a local health care presence that provides essential health care for all people in the Wainwright area.	Staff the local health clinic with a nurse practitioner and/or physician assistant that can provide a broad range of primary health care. This could be a clinic that provides service to the community and the oil and gas industry.	Borough and Industry
	Staff the local health clinic with a dental therapist and itinerant optometrist to provide basic dental and vision services.	Borough and Industry
Conduct a feasibility study to relocate the airport to the old DEW Line site.	Evaluate the possibility of creating a 737 capable airport that can handle industry cargo flights as well as passenger flights	Borough, Olgoonik Corporation, Industry and FAA
	Relocation of the airport will make more suitable land available for the community development of Wainwright without impacting undisturbed land. This strategy is contingent upon the State of Alaska relinquishing its ownership claim to the land.	State of Alaska and Borough
	Goods transported through by-pass mail will be available sooner if transported directly from Fairbanks instead of through Barrow from Fairbanks	Borough, State of Alaska and US Postal Service
Establish a local dock/moorage that can accommodate large vessels and small boats	A docking facility at Tupkak Bar would facilitate barge loading and unloading better than the current system of locating a transfer site on the beach in front of Wainwright.	City and Olgoonik Corporation
	Establishing a dock facility would allow the City to create a port authority funded by docking fees.	City and Borough
	Creation of a separate boat launching facility would allow whaling crews to launch the boats safely. It would also allow spill response crews to launch their vessels efficiently and safely.	City, Borough, Olgoonik Corporation and Industry
Create a new land management system for Wainwright that allows coordinated administration with the Borough of uniquely Wainwright land management regulations.	Local control will allow decisions to be immediate and address local concerns effectively. The local authority could also effectively develop of industry support facilities.	City and Borough

Table 16 Goal 3 - Support the development of suitable housing, new facilities and transportation.

Objectives	Strategies	Implementing Entities
Develop an affordable housing program that can utilize locally available building materials and labor	Set up a recycled building materials program for each building that is demolished in Wainwright.	Borough
	Work with the Cold Climate Research Center to develop and build energy efficient homes that can use locally available materials.	Borough and TNHA
	Develop a workforce of Wainwright residents that can form a cooperative to construct homes in Wainwright, using principles similar to those used by Habitat for Humanity.	City, Tribe, Borough and TNHA
Make land available to build new homes and businesses	Complete the 14(C)(3) process with the City for its municipal entitlement.	City, Tribe and Olgoonik Corporation
	Start a shareholder lot program by subdividing land and distributing to Olgoonik shareholders.	Olgoonik Corporation
Plan new transportation networks that rely on traditional Iñupiat transportation modes	Work identifying all transportation routes, regardless if a road or airport exists	City, Tribe and Borough
	Identify high priority roads that will serve community needs and submit those to the Alaska Department of Transportation for the State transportation funding needs list.	City, Tribe and Borough
	Request funding to flag winter transportation routes to aid snow machine travelers	City, Tribe and Borough
	Update the Indian Reservation Roads inventory for Wainwright to ensure all roads are identified.	Tribe, Borough and Bureau of Indian Affairs
	Seek funding assistance from the State of Alaska for local marine docks and boat launches.	City, Borough and State of Alaska

Table 17 Goal 4 - Facilitate development activities in appropriate locations that reduce or eliminate conflicting land uses and that provide economic opportunities for residents and future generations.

Objectives	Strategies	Implementing Entities
Develop a multiple use facility that could house city hall, community cultural and recreation center and a post office facility	Work with the agencies identified to agree on building a multiple use facility	City and Borough
	Identify sources of funding for a multiple use facility and seek design and construction funding.	City, Borough, State of Alaska and US Postal Service
Develop lighted roads	Determine the cost, design and funding source for a street lighting project.	Borough
	Determine the entity responsible for paying electric bills related to street lighting.	City, Tribe and Borough
Locate a training facility for working in the oil and gas industry	Work with Ilisagvik to develop a satellite training facility in Wainwright specifically focused on training for oil and gas careers.	Ilisagvik, School District, Borough, State of Alaska and Industry
	Work with oil and gas industry to develop a satellite training facility in Wainwright specifically focused on training for oil and gas careers	Industry and Olgoonik Corporation

Table 18 Goal 5 - Build meaningful governmental and industry cooperation.

Objectives	Strategies	Implementing Entities
Develop apprentice-type training programs that provide post-secondary job opportunities for Wainwright and NSB residents	Work with Ilisagvik to develop a line of training programs that result in industry-recognized credentials and employment opportunities in the oil and gas industry.	Ilisagvik, School District, Borough, State of Alaska and Industry
	Identify other on-line training opportunities that would lead to certificated or credentialed training for support industry work like hotel/restaurant management, logistics coordination, and marine transportation	Ilisagvik, School District, Borough and local businesses
Establish a Joint Government (City, Tribe and Borough) and Industry Working Group that would meet on a regular basis in Wainwright	The working group would have the authority to engage in planning efforts to facilitate oil and gas development that is cultural sensitive and beneficial to both groups.	City, Tribe, Borough, Olgoonik Corporation and Industry
	The working group would also have the authority to immediately work on conflict resolution when conflict arises.	City, Tribe, Borough, Olgoonik Corporation and Industry
Work with the US Postal Service to improve mail delivery service to Wainwright	Establish a higher and better level of post service in Wainwright that has daily service and can process by-pass mail within three days of departure from Anchorage or Fairbanks.	City, Borough, Alaska Congressional Delegation and US Postal Service
Expand fiber optic communications when available	Improve communications with the rest of the world by using the fiber optic connection anticipated for Wainwright.	City, Borough and ASTAC
	Explore new business opportunities available to Wainwright based on new high speed fiber optic internet service.	City, Borough, Olgoonik Corporation and Industry

Table 19 Goal 6 - Enhance educational and cultural pursuits.

Objectives	Strategies	Implementing Entities
Create a center for learning in Wainwright	Locate a satellite campus or relocate Ilisagvik Tribal College in Wainwright	Ilisagvik, School District and Borough
Establish a center for cultural pursuits	Provide a shop where local artisans can work on carvings, baleen etching, skin sewing, and other native arts.	City and Borough
	Set aside space for local dance groups to practice dancing, drumming and signing	City, Tribe and Borough
	Reserve space for local whaling crews prepare their boats for whaling and seal hunting.	City and Borough
Incorporate land use designations that protect important subsistence use areas from mining and other development activities	Document and protect areas where traditional sources of subsistence foods are gathered.	Borough, the Tribe and Olgoonik Corporation
	Create specific land use zoning districts that prioritize and protect subsistence harvest areas.	City, Tribe and Borough
	Establish a series of monitoring programs in cooperation with the Borough Wildlife staff that ensures responsible management of subsistence resources.	City, Tribe, Borough and State of Alaska
Create a stronger Iñupiat language component in the school starting with the pre-Kindergarten programs	Institute Iñupiat language in pre-Kindergarten curriculum early, based on successful immersion models used elsewhere. Carry out the immersion through primary and secondary school curriculum.	Borough and School District
Create a service area to develop necessary regulated utilities	Coordinate development of a business plan and regulatory blueprint	City, Olgoonik Corporation, and Borough

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5.0 IMPLEMENTATION AND PLAN REVISION

5.1 Implementing the Comprehensive Plan

The Wainwright Comprehensive Plan will serve as a map for how Wainwright will need to grow in a way that is beneficial for the community. The plan will be implemented primarily through the Borough Capital Project Planning process but will also guide City and Tribal efforts to seek State and Federal funds, as well as other sources that can help provide funding for these planned improvements in Wainwright over the next 30 years.

5.2 Capital Project Planning

5.2.1 Potential Capital Project Needs

During the meetings with Wainwright community members several capital projects were mentioned as community priorities. These are

- A new boat ramp;
- A new recreation center where cultural activities can be held;
- Addition of a wind generator to augment or replace current power generation; and
- A road out to Tupkak Bar.

Reviewing requests for funding to the NPRA Impact Mitigation Fund, the following project funding requests were made

- A new boat ramp;
- Project analysis and design for a new community building;
- Heating system replacement for the community center and fuel tank replacement;
- Fencing around the cemetery;
- Construction of a city park; and
- Armory building relocation and associated plumbing and electrical.

During the review conducted for this plan, the following capital projects were identified as essential

- A feasibility plan for a new airport location;
- Expansion of the current landfill;
- Exploration for new gravel sources to accommodate future capital project construction projects; and
- An expansion of the current power plant is underway.

5.2.1.1 Wetlands Mitigation Bank

One of the greatest challenges to all land owners on the North Slope that need to develop land is the cost to mitigate wetlands impacts. Under its authority to regulate development for compliance with the Clean Water Act, the US Army Corps of Engineers (USCOE) implemented new regulations in 2008 requiring all developers of wetlands to offset or mitigate their impacts.

The USCOE requires all proposals to development wetlands to address ways to avoid and/or minimize negative impacts to the wetlands. Avoidance can be site or route project in upland areas; or establish buffers around identified wetlands. Minimization can be project modifications that incorporate erosion control; or timed to reduce wetland impact (winter construction). Other methods for mitigation include reducing the size of a development; construction of containment levees or sedimentation basins; use of specialized equipment to reduce wetland impact; or providing culverts for drainage.

Federal regulations do not take into account that wetlands may be the only type of land owned by many Alaska Native Corporations – leaving minimization of impacts to wetlands as the only option. All unavoidable impacts to wetlands are subject to compensatory mitigation. The mitigations mechanism available are purchasing mitigation bank credits; purchase in-lieu fee program credits; permittee-responsible mitigation under watershed approach; on-site and/or in-kind permittee-responsible mitigation; and off-site and/or out-of-kind permittee-responsible mitigation.

The cost for development of new facilities in and around Wainwright would likely be in the millions of dollars under the most frequently used mechanism - purchase in-lieu fee program credits. The most attractive mechanism to manage mitigation is the use of a wetlands mitigation bank. As of February 2014 no mitigation banks (land set aside for habitat conservation in perpetuity) exist in the NSB. Currently, mitigation credits bought for project occurring in the Wainwright area and other areas of the Borough are going towards the conservation of lands in south central Alaska.

5.2.2 Potential Funding Sources for Capital Projects

There are several sources that the community of Wainwright can explore to fund its capital projects. Below are the traditional sources that have been used in the past

- The North Slope Borough – this source has been the main source of funding for many of the capital project for Wainwright for the last 30+ years.
- The State of Alaska – typically this has been the best source for school construction funding, but request for surface transportation money (roads) can be requested. Because the amount of money available to the State has been decreasing for the last several years, only roads that are of a critical nature in rural Alaska have been funded.
- The Indian Reservation Roads Program – this is a source of funding that is available to the Wainwright Traditional Council. While the amount of money available can be very small, combined with other sources of funding it is possible to fund capital projects for roads.
- The NPRA Impact Mitigation Fund – this has been a somewhat stable source of funding for Wainwright, however it is a program subject to funding by Congress and may not be as stable in the future.

- The Denali Commission – the source of funding has a lot of competition for what little money the federal government provides. Again, it is a program subject to funding by Congress and may not be as stable in the future.
- The Alaska Congressional Delegation – in the past the Congressional delegation has been helpful in getting funding for rural Alaska projects by Ear-Marking funding bills. Recent changes in Congress have discouraged the Ear Marking, but it is used by some Congressional delegates.

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6.0 REFERENCES

1. State of Alaska, Division of Community and Regional Affairs, Community Database.
2. Information from the North Slope Borough
3. Information from the North Slope Borough
4. U.S. Geological Survey, 1983
5. State of Alaska, Division of Community and Regional Affairs, Community Database.
6. Mortenson, 1986
7. Alaska Department of Labor, Rural Population Report, 2009
8. Alaska Department of Labor, Rural Population Report, 2009
9. Based on conversations with Shell Oil and ConocoPhillips, August 2013.
10. NSB 6-Year Capital Plan(Wainwright)
11. Interviews: Mark Maillard, NSB Public Works Water/Sewer Systems Coordinator.
12. Reference Document: DRAFT Project Analysis Report, NSB Wainwright Power Plant Upgrades, September 3, 2013
13. Reference Document: DRAFT Project Analysis Report, NSB Wainwright Power Plant Upgrades, September 3, 2013
14. (1) Alaska Statute 18.AAC. 60.300 Purpose, scope, and applicability: Classes of Landfills
15. (2) Reference MSW Permit Application, NSB Area wide Class III Landfills, June 14, 2011.
16. (3) Reference MSW Permit Application, NSB Area wide Class III Landfills, June 14, 2011.
17. (4) Reference MSW Permit Application, NSB Area wide Class III Landfills, June 14, 2011.
18. Interview with John Ford and Theresa Clark, Olgoonik, September 2013.
19. Wainwright Gravel Exploration Report, Expenditures, Plans by OES, Inc. Dated October 21, 2008
20. Wainwright Gravel Exploration Phase II by OES, Inc. Dated June 29, 2009
21. Interview: Tom Nicolos, NSB Airport Manager
22. Interview: Ken Green, NSB Project Administrator, CIPM
23. http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/
24. http://www.faa.gov/air_traffic/publications/ATPubs/AIM/aim.pdf
25. FAA Part 139 Airport Certification Classes of Airports
26. Alaska Deep-Draft Arctic Port System Study, State of Alaska, March 2013
27. The North Slope Borough Economic Profiles and Census Report 2010

28. The North Slope Borough Economic Profiles and Census Report 2010
29. Alaska Department of Commerce, Community and Economic Development 2009
30. Taken from the Wainwright Traditional Use Area Conservation Plan Map Book, Wainwright Traditional Council, Nunakput Qaunagilugu Iñuggun Piqpagivlugu, developed in cooperation with the Nature Conservancy – August 18, 2008
31. The Sharing Project. Prepared by S. Burnsilver, G. Kofinas and J. Magdanz; Bureau of Ocean Energy

Appendix A Utility Infrastructure Replacement Costs

The summary of the community buildings, infrastructure and capital assets of possible community services that are considered for use by industrial users are listed in the table below. The figures used in this discussion are from the NSB 6-Year Capital Plan. Many of the facilities are scheduled for renewal or replacement in the following six years. School District facilities and buildings are not included.

Table A-1 Service Facilities in Wainwright

Building Number	Asset Value	Community Service	Remaining Life Span
N/A	\$6,000,000 (Est)	New Landfill	4-5
XXX1	\$363,165	Search and Rescue	-38
XXX2	\$638,076	Fuel Station	-6
1220	\$4,476,955	Fire Station	-17
0121	\$16,081,850	Vehicle Maintenance Shop	1
0117	\$7,035,109	Power Plant	-18
XXX3	\$223,667	Lift Station Building	2
0109	\$6,871,503	Sewage Treatment Plant	2
1236	\$4,211,712	Water Treatment Plant	0
1236.1	\$2,243,098	Water Treatment Bldg. Addn.	0
1236.2	\$465,977	Water Treatment Bldg. Shop	-16
1235	\$6,905,045	Health Clinic	3
1239	\$2,230,549	Police Department	2
1241	\$1,515,370	Housing Maintenance Shop	-18
TOTAL ASSET	\$59,262,076		

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**NORTH SLOPE BOROUGH
ORDINANCE SERIAL NO. 75-06-63**

**AN ORDINANCE ADOPTING THE UPDATED
VILLAGE COMPREHENSIVE PLAN FOR
WAINWRIGHT, ALASKA**

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

WHEREAS, starting in 2013, Olgoonik Corporation, the Wainwright Traditional Council, and the City of Wainwright (the Wainwright Trilateral Committee) created the goals to move forward on a Comprehensive Plan for Wainwright; and

WHEREAS, the Borough tasked UMIAQ, LLC and Olgoonik Development, LLC with assisting in the development of the Wainwright Comprehensive Plan that met the requirements set forth under NSBMC § 2.12.170; and

WHEREAS, after significant public involvement, including multiple meetings within the city of Wainwright, the Wainwright Trilateral Committee adopted a joint resolution recommending the approval of the Wainwright Comprehensive Plan on January 14, 2014; and

WHEREAS, the Planning Commission adopted Resolution 2014-05 on April 24, 2014, a Resolution recommending the Assembly approve of the Wainwright Comprehensive Plan; 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.

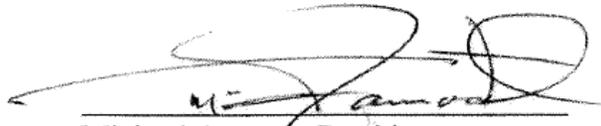
Ordinance Serial No. 75-06-63
Page 2 of 2

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

SECTION 5. Attachments Incorporated by Reference. Planning Resolution 2014-05, attached as Exhibit A, and the Wainwright Comprehensive Plan, attached as Exhibit B, are hereby incorporated by reference.

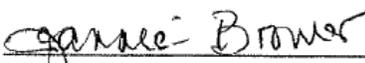
INTRODUCED: May 6, 2014

ADOPTED: June 3, 2014

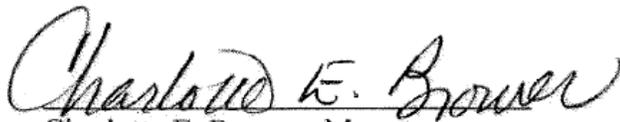


Michael Aamodt, President
Date: 6-3-2014

ATTEST:



Jeanie Brower, Borough Clerk
Date: _____



Charlotte E. Brower, Mayor
Date: 6/4/14

**NORTH SLOPE BOROUGH PLANNING COMMISSION
RESOLUTION 2014-05**

**A RESOLUTION RECOMMENDING TO THE ASSEMBLY
APPROVAL OF THE WAINWRIGHT COMPREHENSIVE PLAN**

WHEREAS, the Planning Commission is charged under North Slope Borough Code of Ordinances 2.12.160 (a) and 2.12.160 (a) (1) with the responsibility to prepare and recommend to the Assembly a comprehensive plan for the systematic development of the Borough; and

WHEREAS, the Planning Commission is further charged under North Slope Borough Code of Ordinances 19.040.060 (A) (2) to ensure that the Village District accommodates uses in accordance with both the Borough Comprehensive Plan and Comprehensive Development Plan for the village; and

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

WHEREAS, the Planning Commission is further charged under North Slope Borough Code of Ordinances 19.70.020 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, in 2013, Olgoonik Corporation, the Wainwright Traditional Council, and the City of Wainwright, who together constitute the Wainwright Trilateral Committee, by resolution agreed that there is a need to ensure that the proper balance is struck between the protection of Wainwright's land, water and subsistence resources and oil and gas development; and

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

WHEREAS, the Wainwright Comprehensive Plan was developed with significant public involvement, including several public meetings in Wainwright and numerous opportunities for public comments; and

WHEREAS, the Wainwright Trilateral Committee has previously agreed to consult and work cooperatively to coordinate and focus their efforts through a unified strategy for achieving these goals on behalf of the community of Wainwright; and

WHEREAS, the Wainwright Trilateral Committee has reviewed the Wainwright Comprehensive Plan and prepared by UMIAQ, LLC and Olgoonik Development, LLC; and

WHEREAS, the Wainwright Comprehensive Plan was found to be sufficient to guide the future development of Wainwright for the next 20 years; and

WHEREAS, the Wainwright Trilateral Committee on January 14, 2014 adopted a Joint Resolution of Olgoonik Corporation, the Wainwright Traditional Council, and the City of Wainwright recommending approval of the Wainwright Comprehensive Plan as developed by the North Slope Borough,

NOW, THEREFORE BE IT RESOLVED:

THAT the North Slope Borough Planning Commission adopted the plan on April 24th, 2014 and recommends to the North Slope Borough Mayor and the North Slope Borough Assembly the approval of the Wainwright Comprehensive Plan.

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

INTRODUCED: *April 24 2014*
ADOPTED: *April 24 2014*

Daisy Sage
Daisy Sage, Clerk

Date: *5-14-14*

Paul Bodfish Sr.

Paul Bodfish Sr., Chairman

Date: *5-14-14*



Wainwright Traditional Council
Nunakput Qaunagilugu IŦuggun Piqpagivlugu



WAINWRIGHT TRILATERAL COMMITTEE

RESLUTION 2014-01

A JOINT RESOLUTION OF OLGOONIK CORPORATION, THE WAINWRIGHT TRADITIONAL COUNCIL, THE CITY OF WAINWRIGHT REGARDING THE 2013 WAINWRIGHT COMPREHENSIVE PLAN DEVELOPED BY THE NORTH SLOPE BOROUGH

WHEREAS, Olgoonik Corporation is the village corporation for Wainwright established in accordance with the provisions of the Alaska Native Claims Settlement Act of 1971 (ANCSA); and

WHEREAS, Olgoonik is owner and trustee of approximately 175,000 acres of surface estate land in the National Petroleum Reserve – Alaska and that is situated along Alaska’s Chukchi coast; and

WHEREAS, the Wainwright Traditional Council is the federally listed and recognized tribal entity for the village of Wainwright, and

WHEREAS, the City of Wainwright is a second class city, established under Title 29 of the Alaska State Statutes for the purposes of delivering and facilitating public service to the resident of Wainwright; and

WHEREAS, both the Wainwright Traditional Council and Olgoonik Corporation maintain consultation privileges as the respective tribe and ANCSA village corporation for the community of Wainwright; and

WHEREAS, in 2013, Olgoonik Corporation, the Wainwright Traditional Council, and the City of Wainwright, by resolution agreed that there is a need to ensure that the proper balance is struck between the protection of Wainwright’s land, water and subsistence resources and oil and gas development; and

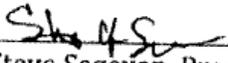
WHEREAS, the common goals of local control and self-determination, the protection of the land, water and subsistence resources, mitigation of the negative impacts which may occur as a result of oil and gas development, the maximization of economic benefits and employment opportunities for Wainwright today and into the future are fully shared by the organizations: and

WHEREAS, Olgoonik Corporation, the Wainwright Traditional Council, and the City of Wainwright have previously agreed to consult and work cooperatively to coordinate and focus their efforts through a unified strategy for achieving these goals on behalf of the community of Wainwright; and

WHEREAS, Olgoonik Corporation, the Wainwright Traditional Council, and the City of Wainwright have reviewed the 2013 Wainwright Comprehensive Plan dated December 2013 and prepared by UMIAQ, LLC and Olgoonik Development, LLC; and

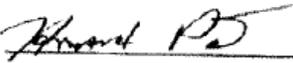
WHEREAS, the 2013 Wainwright Comprehensive Plan was found to be sufficient to guide the future development of Wainwright for the next 20 years; and

THEREFORE BE IT RESOLVED; that the community of Wainwright, as represented by the Trilateral Committee, recommends approval of the 2013 Wainwright Comprehensive Plan by the North Slope Borough.



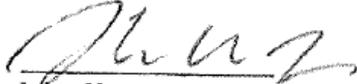
Steve Segevan, President
Olgoonik Corporation

Date 2-10-14



President
Wainwright Traditional Council

Date 2/10/14



John Hopson, Mayor
City of Wainwright

Date 2/11/2014