# Appendices

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## Appendix A: Assembly Ordinance and Planning Commission Resolution

**NORTH SLOPE BOROUGH**
**ORDINANCE SERIAL NO. 75-06-73**

**A ORDINANCE ADOPTING THE**
**NORTH SLOPE BOROUGH COMPREHENSIVE PLAN**

**WHEREAS,** the Planning Commission is charged under North Slope Borough Municipal Code of Ordinances (NSBMC) §2.12.160(A)(l) with the responsibility to prepare and recommend to the Assembly a Comprehensive Plan (Plan) for the systematic development of the Borough; 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 North Slope Borough Comprehensive Plan; and

**WHEREAS**, under NSBMC § 2.12.170(A) the Plan shall be a compilation of policy statements, goals, standards and maps for guiding the physical, social and economic development, both private and public of the Borough; and

**WHEREAS**, the Planning Commission is further charged under NSBMC § 2.12.170(C) to consider recommendations based upon workshops to be held in each North Slope Borough Community with the respective city council and Borough staff before presenting recommendations to the Assembly; and

**WHEREAS**, the Plan was developed with public involvement, including meetings in every community with leadership, public meetings in every community, and solicitation for comments; and

**WHEREAS**, the Plan is a compilation of policy statements, goals, standards and maps for guiding the physical, social and economic development, both private and public of the Borough which is based on recommendations from every community.

**WHEREAS,** the Planning Commission adopted Resolution 2019-01 on January 31, 2019, recommending the Assembly approve of the Plan; and

**WHEREAS,** the North Slope Borough Comprehensive Plan is found to be a sufficient guide to future development for the region over the next 20 years.

**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

Ordinance Serial No 75-06-73
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application to other persons and circumstances shall not be affected thereby.

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

**SECTION 4.** Adoption of North Slope Borough Comprehensive Plan. The North Slope Borough Assembly hereby adopts the North Slope Borough Comprehensive Plan, attached as Exhibit B, as recommended by the North Slope Borough Planning Commission.

**SECTION 5.** Attachments Incorporated by Reference. The Planning Commission Resolution 2019-01, attached as Exhibit A, and the North Slope Borough Comprehensive Plan, attached as Exhibit B, are hereby incorporated by reference.

INTRODUCED: February 5, 2019
ADOPTED: March 5, 2019

John Hopson, Jr., President
Date: 3·5·19

ATTEST:

Sheila Burke, Borough Clerk
Date: 3·5·19

Harry K. Brower, Mayor
Date: 3·5·19

North Slope Borough Planning Commission Resolution

# Exhibit A

**NORTH SLOPE BOROUGH PLANNING COMMISSION**
**RESOLUTION 2019-01**

**A RESOLUTION RECOMMENDING TO THE ASSEMBLY APPROVAL OF THE NORTH SLOPE BOROUGH COMPREHENSIVE PLAN**

**WHEREAS,** the Planning Commission is charged under North Slope Borough Municipal Code (NSBMC) § 2.12.160(A)(1) with the responsibility to prepare and recommend to the Assembly a Comprehensive Plan (Plan) consisting of maps and related texts for the systematic development of the Borough; and

**WHEREAS,** under NSBMC § 2.12.170(A) the Plan shall be a compilation of policy statements, goals, standards and maps for guiding the physical, social and economic development, both private and public of the Borough; and

**WHEREAS,** the Plan was developed with public involvement, including meetings in every community with leadership, public meetings in every community, and solicitation for comments; and

**WHEREAS,** the Plan is a compilation of policy statements, goals, standards and maps for guiding the physical, social and economic development, both private and public of the Borough which is based on recommendations from every community.

**NOW, THEREFORE, BE IT RESOLVED THAT:**

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

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

INTRODUCED: 1/31/19
ADOPTED: _____

Paul Bodfish Sr.
Paul Bodfish Sr., Chairman
Date: 01-31-2019

Caroline P. Cannon
Caroline Cannon, Clerk
Date: 1/31/19

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## Appendix B: Comprehensive Planning Outreach

# CLASSIFIEDS & LEGAL

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## NOTICE TO CREDITORS

IN THE SUPERIOR COURT FOR THE STATE OF ALASKA SECOND JUDICIAL DISTRICT IN UTQIAGVIK

IN THE MATTER OF THE ESTATE OF
Alma Rhoda Bodfish,
Deceased.
Date of Birth: 09/28/1954

Case No.: 2BA-18-00016PR

**NOTICE TO CREDITORS**

You are notified that Jennie Rose Bodfish, has been appointed Personal Representative of this estate. All persons having claims against the decedent are required to present their claim within four months after the date of the first publication of this notice or said claims will be forever barred.

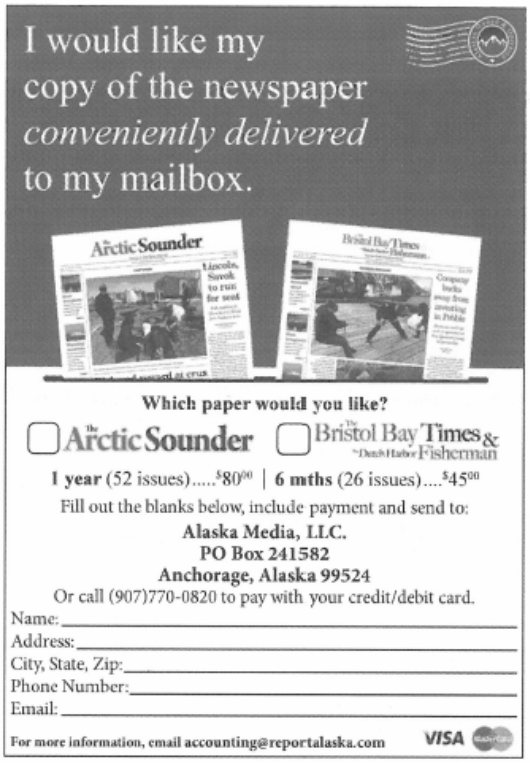
Dated this 8th day of November 2018.
Jennie Bodfish
PO Box 48
Wainwright, AK 99782

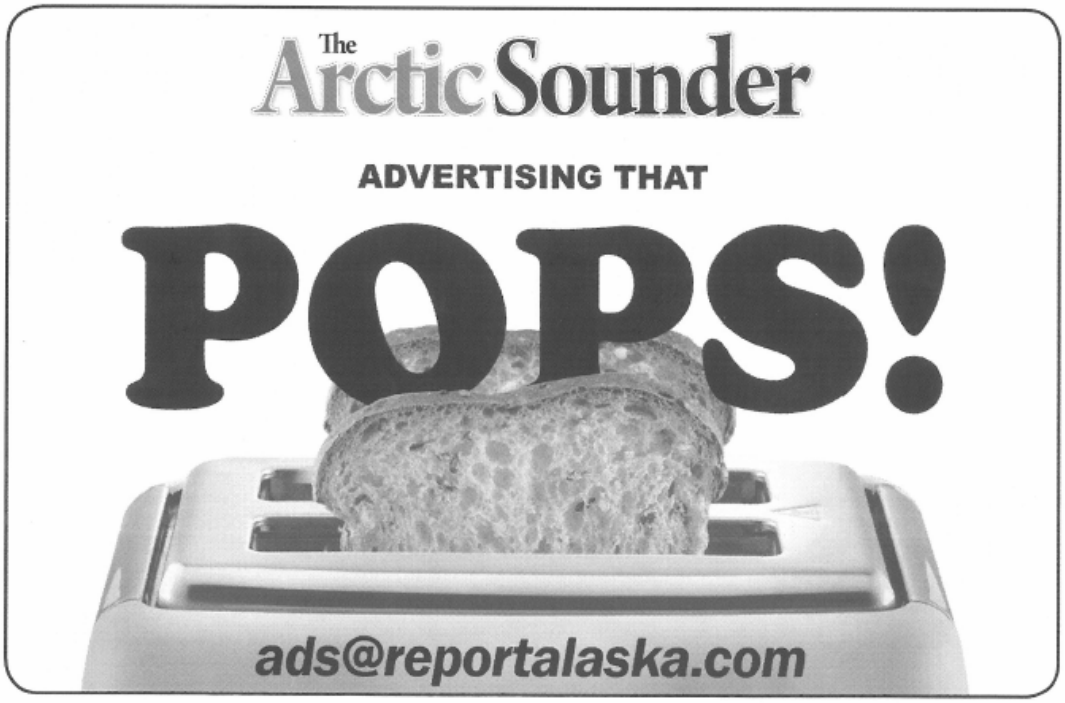
## PUBLIC NOTICE

North Slope Borough
Planning and Community Services Department
Gordon Brower, Director
P.O. Box 69
Utqiagvik, AK 99723
907-852-0320
Gordon.Brower@north-slope.org

**REQUEST FOR PUBLIC COMMENT ON THE NORTH SLOPE BOROUGH COMPREHENSIVE PLAN UPDATE**

The North Slope Borough Planning and Community Services Department invites comments on the draft 2019 North Slope Borough Comprehensive Plan. Hard copies will be available for review at village NSB liaison, corporation, city, and Tribal offices and school libraries. The draft Plan will also be available on the NSB website: www.north-slope.org/your-government/comprehensive-plan. For questions or to provide comments, please contact Erika Green at UMIAQ Environmental: 907-273-1813 or erika.green@uicumisq.com.



## Appendix C: Barrow High School Student Government SWOT Workshop

Barrow High School Student Government
Strengths, Weakness, Opportunities, Threats Workshop
April 24, 2018

A strengths, weaknesses, opportunities, and threats (SWOT) session was conducted on April 24, 2018 with nine Barrow High School students. The SWOT session was part of an outreach effort that the North Slope Borough Comprehensive Plan update process. Twelve students (9th-12th grade) from the Student Government participated in the hour long session as volunteers. Students had been previously briefed by the Student Government advisor about SWOTs and the process and were prepared to give feedback.

**Strengths:**

- Many opportunities within the community
- Designated adults to talk to (designated counselor)
- Range of good technology available (laptops given to students to use for school)
- Funding for NSBSD
- Small class sizes
- Drug/alcohol awareness
- Free breakfast and lunch
- Highly accessible school board
- Dual credit with Iḷisaġvik

**Weaknesses:**

- Lack of college readiness
- Infrastructure is old
- High percentage of teacher turnover
- New teachers (versus having stable and predictable teachers, e.g. Mr. Smith has taught 10th grade Geography for 20 years)
- Lack of variation in programs available to students (no educational clubs)
- Too sports driven
- Start time is too late and interferes with extra-curricular activities
- Social stratifications/Cliques (social atmosphere is in/out context)
- Lack of student involvement (not many students get involved in activities)
- Lack of communication with other schools within the district
- Too spiritual/need to separate religion from school-wide events
- Lack of advanced classes
- No programs for college readiness (no advanced placement courses offered)

**Opportunities:**

- Renovated hospital provides jobs (newer facility more inviting to work)
- State officials advocating on behalf of NSBSD
- Oil and gas funding increase
- MYAC/ AASG/ RAHI (student programs outside the district)
- Dual-credit with Iḷisaġvik
- Sports (provides opportunities outside school district realm)
- Student internships
- Iḷisaġvik summer camps
- Bridge program
- Local corporate donations to programs
- Strong connection to UA system

**Threats:**

- Lack of gun safety- no protocol
- Drug and alcohol abuse in community
- Oil is not sustainable
- Climate change/animal endangerment
- Slow progress of technology on North Slope (technology available to students)
- Not enough investment into educational programs/clubs
- Racial discrimination
- Low standards in NSBSD/low expectations from NSBSD is bringing those who work hard down
- Coastal erosion
- Lack of access to mental health services
- Easy access to drugs and alcohol/easy to import drugs and alcohol
- Low diversity in types of clubs to join
- U.S. Department of Education Secretary (Betsy DeVos' plan for public education is a perceived threat)
- Global war
- Diseases/viruses
- Not fostering a love of education in young students

## Appendix D: Public Facilities Capacities and Forecasts

Table 40: Water Generation, Treatment Capacity, and Forecast[392, 393]

| Village | Provider | Source | Treatment Method | Treatment Capacity (gallons per day) | Storage Capacity | Delivery Method Piped / Other | | Projected High Annual Demand for Plan Period | Comments | Recommended Upgrades | Funded Upgrades |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Anaktuvuk Pass | NSB | Well | chlorine treatment | 50,000 gpd (year round) | 300,000 gallons | UG Pipe | Tanks with Truck Haul | 6.5 mil gallons | adequate for service through plan period | Needs a secondary groundwater source & secondary water storage tank to ensure continued water supply. | 2nd well funded 2018 |
| Atqasuk | NSB | Fresh Water Lake | filtration | 93,000 gpd (seasonal) | 4 mil gallons | UG Pipe | Tanks with Truck Haul | 4 mil gallons | adequate for service through plan period | Need UG piping expansion for adding homes to existing piping. | None |
| Utqiaġvik | BUECI | Fresh Water Lake | filtration | 345,000 gpd (year round) | 1.5 mil gallons | UG Pipe, Utilidor | Tanks with Truck Haul | 127 mil gallons** | adequate for service through plan period | Recommendation to upgrade transit building / SCADA / expansion to College | SCADA upgrades design funded |
| Kaktovik | NSB | Fresh Water Lake | filtration | 93,000 gpd (seasonal) | 3.5 mil gallons | UG Pipe | Tanks with Truck Haul | 5 mil gallons | Looking at raw water well installation. | need upgrades to, or replacement of storage tanks so that they have 5 million - or need well for year round source | None |
| Nuiqsut | NSB | Fresh Water Lake | filtration | 200,000 gpd (seasonal) | 7.8 mil gallons | UG Pipe | Tanks with Truck Haul | 7.2 mil gallons | Adequate through plan period. Need to demolish old unused water tank. | Need UG piping expansion for adding homes. | UG piping designed, currently not funded for construction |
| Point Hope | NSB | Fresh Water Lake | filtration | 200,000 gpd (seasonal) | 9.6 mil gallons | UG Pipe | Tanks with Truck Haul | 11.4 mil gallons | Fresh water source is diminishing. NSB looking at raw water wells. | The water storage capability should be expanded by 2 million gallons and/or provide year round well(s). | none |

[392] Corkrean, Paul. Waste Water Level III. UIC Lands, LLC. Personnel communication.
[393] Holmes, Travis. Principal Engineer. UMIAQ Design & Municipal Services. Personal communication.

| Village | Provider | Source | Treatment Method | Treatment Capacity (gallons per day) | Storage Capacity | Delivery Method Piped / Other | | Projected High Annual Demand for Plan Period | Comments | Recommended Upgrades | Funded Upgrades |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Point Lay | NSB | River | filtration / RO | 93,000 gpd (seasonal) | 4.7 mil gallons | UG Pipe | Tanks with truck haul | 4.3 million gallons | Kokolik River provides village water, using a reverse osmosis treatment. Oldest water storage tank is approaching the end of its useful life. Often exceeds discharge parameters. | The NSB seeks to develop a new water source. Need repairs to fix line breaks and leaks. | System upgrades master plan funding in place - wells are feasible; need construction funding |
| Wainwright | NSB | | WWTP & sewage lagoon | 28,000 gpd | | UG gravity main | Truck haul & honey bucket | 40,400 gal/day | Often exceeds discharge parameters often | Water storage capability should be expanded by 2 million gallons, and/or year round well(s). The water treatment facility should be updated or replaced, as it is currently past its useful life | Water plant building design is complete; construction not funded |

* Based on population projected to end of plan period X 35 gpd/person daily average X 365 (excluding Utqiaġvik)
** Based on population projected to end of plan period X 53 gpd/person daily average X 365

Table 41: Wastewater and Sewage Treatment, Capacity, and Forecast

| Village | Provider | Treatment Method | Treatment Capacity | Delivery Method Piped / Other | | *Projected Avg Peak Demand | Comments | Required Upgrades | Funded Upgrades |
|---|---|---|---|---|---|---|---|---|---|
| Anaktuvuk Pass | NSB | WWTP & Sewage lagoon | 20,000 gallons per day | UG gravity main | Truck haul & honey bucket | 27,667 gallons per day | Lagoons and treatment plant were upgraded and now have adequate capacity | If expansion of Poker Hill subdivision takes place, UG system will need expansion | |
| Atqasuk | NSB | WWTP & sewage lagoon | 11,000 gallons per day | UG vacuum man | Truck haul & honey bucket | 17,460 gallons per day | Exceeds discharge parameters often The WWTP is undersized and will require upgrading to substantially increase the current treatment capacity. | Needs upgrades to treatment system and expansion of UG piping for additional homes. The vacuum main pipeline system will need to be expanded when connecting additional homes. | Design complete for home expansion pending construction funding |
| Utqiaġvik | BUECI | WWTP | 108 mil gallons per day | UG forced main & utilidor | Truck haul & honey bucket | 536,283 gallons per day** | Treatment plant can double capacity / lagoon available for back up | Parallel treatment trains as needed to meet capacity. Upgrade PS 5. | None |
| Kaktovik | NSB | WWTP & two cell Sewage lagoon | 11,000 gallons per day | UG pipe vacuum main | Truck haul & honey bucket | 22,790 gallons per day | Exceeds discharge parameters often | Needs upgrades to treatment system / need upgrades to effluent outfall. | Working on pilot project for fixed media upgrades to plant. Projected 40% increase in treatment capacity[394] |
| Nuiqsut | NSB | WWTP & sewage lagoon | 28,000 gallons per day | UG pipe vacuum main | Truck haul & honey bucket | 31,680 gallons per day | | Expansion of UG piping for additional homes | Design complete for home expansion pending construction funding |

| Village | Provider | Treatment Method | Treatment Capacity | Delivery Method Piped / Other | | *Projected Avg Peak Demand | Comments | Required Upgrades | Funded Upgrades |
|---|---|---|---|---|---|---|---|---|---|
| Point Hope | NSB | WWTP & sewage lagoon | 28,000 gallons per day | UG vacuum main | Truck haul & honey bucket | 50,000 gallons per day | Exceeds discharge parameters often / vac system recently upgraded | Expansion of UG piping for proposed NE subdivision | wastewater plant upgrade funded - pending results of Kaktovik pilot |
| Point Lay | NSB | WWTP & sewage trench | 11,000 gallons per day | UG gravity main | Truck haul & honey bucket | 18,938 gallons per day | Exceeds discharge parameters often | Need repairs to fix line breaks and leaks / need upgrades to sewage lagoon | Project to add truck haul and honey buckets to WWTP is under design, construction funding expected 2018 / lagoon upgrades funded |
| Wainwright | NSB | WWTP & sewage lagoon | 28,000 gallons per day | UG gravity main | Truck haul & honey bucket | 40,400 gallons per day | Exceeds discharge parameters often | Needs upgrades to treatment system | none |

* Based on projected population for plan period (high growth rate) X 35 gpd/persons X 1.6 peaking factor: Assumes all population on system

**Based on projected population for plan period (high growth rate) X 51 gpd/persons X 1.6 peaking factor: Assumes all population on system

Table 42: Landfill and Sewage Lagoon Capacity and Forecast

| Village | Provider | Class | Configuration Sewage / Solid Waste | | Adequacy of Sewage Lagoon | *Adequacy of Landfill | Comments | Required Upgrades | Funded Upgrades |
|---|---|---|---|---|---|---|---|---|---|
| Anaktuvuk Pass | NSB | III | 3 - lagoon | 1 - Cells<br>1 - Burncage | Newly expanded & projected to be adequate through plan period | Currently undersized. Anticipate landfill to be full in 2035+/- | | Landfill needs expansion | New sewage lagoons completed |
| Atqasuk | NSB | III | 1 - lagoon | 1 - Cell<br>1 - Burncage | Adequate through plan period. Regulatory non-compliant for primary and secondary cell | Adequate through plan period | | Lagoon needs partition into two cells to be compliant with ADEC regulations | Lagoon partition funded, pending design |
| Utqiaġvik | NSB | II | N/A | 3 - Cells<br>1 - TOS | N/A - Emergency back-up use only | Currently undersized for plan period** | | Landfill needs cell 4 completed | Cell 4 expansion funds expected in 2018 |
| Kaktovik | NSB | III | 2 - lagoons | 1 - Cell<br>1 - Burncage | Potentially adequate | Adequate through plan period | Snow melt threatens lagoon an uncontrolled and untreated onto tundra | Lagoon needs snow management configuration change with routine snow drift removal throughout winter and spring melt | Ongoing funding potential with airport project |
| Nuiqsut | NSB | III | 1 - Lagoon | 3 - Cells<br>1 - Burncage | Adequate through plan period. Regulatory non-compliant for primary and secondary cell | Adequate through plan period** | | Lagoon needs partition into two cells | Lagoon partition funding expected 2018 |
| Point Hope | NSB | III | Perc pit | 1 – Cell<br>1 - Burncage | Adequate through plan period | Adequate through plan period | | Landfill needs vertical expansion | New sewage lagoon funded |
| Point Lay | NSB | III | 1 - Trench | 3 - Cells<br>1 - Burncage | currently non-compliant | Adequate through plan period | An area has been designated for lagoon | Need lagoon | New sewage lagoon funded |
| Wainwright | NSB | III | 2 - lagoons | 1 - Cell<br>1 - Burncage | Adequate through plan period | remaining life through 2021 | Greywater lagoon at capacity routinely due to annual melt water | Close gray water lagoon / increase landfill capacity | Landfill expansion under design |

* Based on UMIAQ Design & Municipal Services forecasted landfill life from Areawide Landfill Re-permitting, 9/12/2017

**Per UMIAQ Design & Municipal Services and NSB staff discussions

Table 43: Power Generation and Demand Forecast

| Village | Provider | Source | Demand Capacity | 2040 Projected High Average Demand | 2040 Projected High Peak Demand | Comments | Required Upgrades | Funded Upgrades |
|---|---|---|---|---|---|---|---|---|
| Anaktuvuk Pass | NSB | Diesel Gen | 1,900kW | 672kW | 864kW | | Needs expansion for cooling capacity | Design for expansion |
| Atqasuk | NSB | Diesel Gen | 3,245kW | 606kW | 667kW | | | |
| Utqiaġvik | NSB | Natural Gas Gen | 20.5mW | 12mW | 12mW | | | |
| Kaktovik | NSB | Diesel Gen | 2670kW | Unknown | Unknown | | Needs expansion for cooling capacity | Expansion currently under construction |
| Nuiqsut | NSB | Natural Gas & Diesel Gen | 2,095kW NG / 2,270kW diesel | Unknown | Unknown | | Needs expansion for cooling capacity | Construction funding expected 2018 |
| Point Hope | NSB | Diesel Gen | 2,915kW | 955kW | 1128kW | Recently upgraded | | |
| Point Lay | NSB | Diesel Gen | 2,532kW | 656kW | 955kW | Recently upgraded | | |
| Wainwright | NSB | Diesel Gen | 1,900 kW | 1,182kW | 1,478kW | Existing power plan is old | Needs replacement | |

Table 44: Snow Fence Forecast

| Village | Snow Fence Systems Currently in Use | *Location | *Recommended Upgrades | Funded Upgrades |
|---|---|---|---|---|
| Anaktuvuk Pass | 3 | 1 north of town, 2 at landfill | 2011 PAR recommends snow fences added at various locations | Design for expansion |
| Atqasuk | 10 | All east of town | 2011 PAR recommends snow fences added to airstrip and apron | |
| Utqiaġvik | multiple | Gas fields, Cakeeater road, fresh water lake, TOS, east of town, east of Browerville, and at NARL | 2011 PAR recommends snow fences added at gas fields and various locations | |
| Kaktovik | 8 | East and west sides of town | 2011 PAR recommends snow fences added at infrastructure locations outside of town, particularly landfill, lagoon and airport | Expansion currently under construction |
| Nuiqsut | none | | 2011 PAR recommends snow fences added at infrastructure locations outside of town, particularly landfill road and airport | Construction funding expected 2018 |
| Point Hope | 2 | North of town | 2011 PAR recommends snow fences added at southside of town, and north of tank farm | |
| Point Lay | 3 | East of town, landfill | 2011 PAR recommends snow fences added at edges of town, and at landfill | |
| Wainwright | 8 | North and east of town, tank farm, and apron | 2011 PAR recommends snow fences added at landfill and southwest side of town | |

Table 45: Gravel Generation Capacity and Forecast[395, 396, 397, 398]

| Village | Provider | Source | Currently Stockpiled | Available in Situ | *Projected Demand Through Plan Period | Comments | Required Upgrades | Funded Upgrades |
|---|---|---|---|---|---|---|---|---|
| Anaktuvuk Pass | Nunamiut Corp / NSB | Nunamiut Corp land | minimal | More than adequate through plan period | Maintenance -4,200 cy/year Projects - unknown | Rock crusher sent this spring - need lease for stockpile area | Need new contract with local village corp / need new crusher | $2.7mil for crusher and stockpiling |
| Atqasuk | NSB | Utqiaġvik | 3,500 cy less recent usage | Unknown | Maintenance -2,000 cy/year Projects - unknown | Currently looking for local source / 3500 cu yds. delivered from BRW in 2017 | Need local source | 3,500 cy delivered |
| Utqiaġvik | SKW / UIC | Local pits | | Unknown | Maintenance - 6,cy/year Projects - | | Need better local material sources | |
| Kaktovik | ASRC site | Airport upgrade job | 63,000 cy less recent usage | Unknown | Maintenance - 6,000 cy/year Projects - unknown | Airport contractor provided approx. 63,000 cy | Need better local material sources | Airport contractor to mine and place 75,000 cy - ultimately 63,000 cy |
| Nuiqsut | NSB / Kuukpik | Local pits | 140,000 cy less current usage - see comment | adequate supply nearby through plan period | Maintenance - 500 cy/year Projects - unknown | 65,600 cy dedicated to Colville River Rd | | |
| Point Hope | NSB | Barge | | Unknown | Maintenance - 520 cy/year Projects - | Potential new source recently discovered next to landfill | Need local source / investigate new local source near landfill | |
| Point Lay | | | 100,000 cy (est) | Unknown | Maintenance - 3,000 cy/year Projects - | | Need local source | |
| Wainwright | NSB/OC | NSB - stockpile OC - New source | 17,000 cy or less | 400,000 cy (est) | Maintenance - 1,300 cy/year Projects - | | Local source needs development | |

[395] North Slope Borough. 2014. *Project Analysis Report: Areawide Gravel Resources.* Prepared for the North Slope Borough by UMIAQ. Feb. 14, 2014.
[396] Green, Ken. Project Administrator. North Slope Borough Capital Improvement Project Management Department. Personal communication.
[397] Fischer, Bernadette. Program Manager. North Slope Borough Capital Improvement Project Management Department. Personal communication.
[398] Frantz, Jack. Deputy Director. North Slope Borough Public Works Department. Personal communication.

Table 46: Energy Availability and Supply[399]

| Village | Provider | Diesel Capacity* | Jet A Capacity* | Gasoline Capacity* | Delivery Method - Diesel & Gas | Natural Gas Capacity | Delivery Method - Natural Gas | Comments |
|---|---|---|---|---|---|---|---|---|
| Anaktuvuk Pass | NSB | 181,000 gal | N/A | 37,000 gal | air | N/A | N/A | |
| Atqasuk | NSB | 580,000 gal | N/A | 70,000 gal | air/rollagon | N/A | N/A | |
| Utqiaġvik | SKW/Crowley /NSB | 750,000 gal - NSB | 270,000 gal-NSB | | Barge | Adequate to meet projected demand of 11 mmcfd | Pipeline / Dispenser | Electricity and home heating are mostly NG |
| Kaktovik | NSB | 1,035,000 gal | N/A | 60,000 gal | Barge | N/A | N/A | |
| Nuiqsut | NSB | 410,000 gal | N/A | 60,000 gal | air | Up to 500 mmcfd provided by Alpine, line capacity is 2.6mmcfd | Pipeline | Electricity and home heating are mostly NG |
| Point Hope | NSB | 1.1 mil gal | N/A | 150,000 gal | barge | N/A | N/A | |
| Point Lay | NSB | 838,000 gal | N/A | 30,000 gal | barge | N/A | N/A | |
| Wainwright | NSB | 855,000 gal | N/A | 178,000 gal | barge | N/A | N/A | |

[399] *Volumes taken from NSB Spill Prevention, Control, and Countermeasure (SPCC) Master Plan, except for Utqiabvik. Volumes are believed to be nominal.

Table 47: Energy Efficiencies

| Village | Metering Upgrades Potential | Weatherization Potential (Energy Audits) | Waste Heat Recovery Potential | Upgrades to Existing Systems Potential | Other Potential Energy Efficiencies | Comments | Required Upgrades |
|---|---|---|---|---|---|---|---|
| Anaktuvuk Pass | Current CIPM project: AW power distribution upgrades(includes metering upgrades) | high | high | high | Current CIPM project: AW LED Street Lighting upgrades | Upgrades to pp switchgear and controls. Design is in progress | add heat recovery to water system |
| Atqasuk | Current CIPM project: AW power distribution upgrades(includes metering upgrades) | high | high | high | Current CIPM project: AW LED Street Lighting upgrades | Heat recovery used in water system / vac system | |
| Utqiaġvik | | ongoing | high | ongoing | | No heat recovery | |
| Kaktovik | Current CIPM project: AW power distribution upgrades(includes metering upgrades) | high | high | high | Current CIPM project: AW LED Street Lighting upgrades | heat recover used at water plant - | upgrade project in design for public buildings |
| Nuiqsut | Current CIPM project: AW power distribution upgrades(includes metering upgrades) | high | high | high | Current CIPM project: AW LED Street Lighting upgrades | heat recovery used in public buildings | upgrade project to the washeteria / need heat recovery at water plant |
| Point Hope | Current CIPM project: AW power distribution upgrades(includes metering upgrades) | high | high | high | Current CIPM project: AW LED Street Lighting upgrades | heat recovery used in public buildings | |
| Point Lay | Current CIPM project: AW power distribution upgrades(includes metering upgrades) | high | high | high | Current CIPM project: AW LED Street Lighting upgrades | heat recovery used in water system | add heat recovery to wastewater treatment system |
| Wainwright | Current CIPM project: AW power distribution upgrades(includes metering upgrades) | high | high | high | Current CIPM project: AW LED Street Lighting upgrades | heat recovery used in water system & public works building | |

## Appendix E: Adaptation Strategies for Climate Change Impacts

Table 48: Adaptation Strategies for Climate Change Impacts

| Weather-related physical change | Potential impacts to the village | Adaptive Response Options |
|---|---|---|
| Warmer weather causes thinner lake, river and sea ice.<br><br>Thawing permafrost. Permafrost soils throughout the Arctic contain almost twice as much carbon as the atmosphere. Warming and thawing of these soils increases the release of carbon dioxide and methane through increased decomposition.<br><br>Thawing permafrost delivers organic-rich soils to lake bottoms where decomposition in the absence of oxygen releases additional methane in these water bodies.[400] | Flooding or damage to ice cellars result in food contamination and food insecurity. This forces families to eat non-traditional and less healthy/nutritious packaged "store bought" food flown in at great expense. | Each village establishes a communication system with residents traveling to hunt, fish and gather foods and travelers on the ice are required to carry emergency GPS tracking devices. Village Search & Rescue teams are properly equipped to rescue travelers in trouble. |
| | Hunters would have to spend greater financial resources and more time, encompassing greater hazards, to find riverine and terrestrial species—beyond the 10 to 15 miles ideal distance—and into unsafe sea ice conditions. | Permit stipulations for Oil &Gas or commercial tourism travel could require a subsistence mitigation fund which would provide funds to hunters to cover the costs to purchase adequate boats, fuel and equipment to find and harvest subsistence resources at the greater distance from their traditional migratory routes. |
| | Unknown ice thickness creates hazards for hunters and other winter travelers on snow machines. Traditional knowledge cannot be relied upon as the thinner ice conditions change seasonally and can be exacerbated yearly.<br><br>Warmer water in lakes and streams cause fish to die in nets, fish texture "softer" and drying of fish is more difficult. | Aerial "flyovers" of traditional routes with specialized equipment to measure the depth of ice and then posting and advertising to the village the safest route to take on the ice for hunting expeditions and for traveling to common destinations such as the nearby village. |

[400] Hassol, Susan Joy. Alaska Climate Impact Assessment. Impacts of a Warming Arctic. University of Alaska, Fairbanks, 2004. www.amap.no/documents/download/1058.

| Weather-related physical change | Potential impacts to the village | Adaptive Response Options |
|---|---|---|
| (continued)<br>Warmer weather causes thinner lake, river and sea ice.<br><br>Thawing permafrost. Permafrost soils throughout the Arctic contain almost twice as much carbon as the atmosphere. Warming and thawing of these soils increases the release of carbon dioxide and methane through increased decomposition.<br><br>Thawing permafrost delivers organic-rich soils to lake bottoms where decomposition in the absence of oxygen releases additional methane in these water bodies.[401] | Fresh water drains downward—loss of drinking water supply.<br><br>Village water lines break, causing loss of service.<br><br>Methane gas escapes from the permafrost and rises into the atmosphere, the drinking water in lakes, and in rivers which affects the riverine/marine life. | A village-specific adaptation plan would identify specific hazards associated with the thawing of permafrost in and near the village and would identify options for remedying impacts or avoiding these hazards. It would identify options and the costs and benefits of each option. It is noted that all fresh water lakes in the region are underlain by permafrost and, therefore all freshwater drinking supplies are vulnerable/susceptible to the draining of water and the release of methane.<br><br>A potential option may be to build a water reservoir with an impenetrable cover and then pump fresh water from nearby sources into this man-made lake. This would protect the drinking water source from the thawing permafrost and from the escaping methane. |
| | Thawing permafrost of the river banks can cause increased sedimentation of the river and stream beds. Boats cannot be launched in shallow streams and tributaries and hunters must travel greater distances to launch. | Villagers can build new boat launch pads and docks where water depth allows use of propellers, along with parking areas for the trucks and roads to the new launch areas. |

[401] Hassol, Susan Joy. Alaska Climate Impact Assessment. Impacts of a Warming Arctic. University of Alaska, Fairbanks, 2004. www.amap.no/documents/download/1058.

| Weather-related physical change | Potential impacts to the village | Adaptive Response Options |
|---|---|---|
| (continued)<br>Warmer weather causes thinner lake, river and sea ice.<br><br>Thawing permafrost. Permafrost soils throughout the Arctic contain almost twice as much carbon as the atmosphere. Warming and thawing of these soils increases the release of carbon dioxide and methane through increased decomposition.<br><br>Thawing permafrost delivers organic-rich soils to lake bottoms where decomposition in the absence of oxygen releases additional methane in these water bodies.[402] | Methane rising to tundra—changes "taste" of lichen, moss, etc. for caribou and other land animals | NSB Wildlife biologists and subsistence hunters should observe the behaviors of tundra-dependent animals to determine if this is a significant problem. If it is, it may be necessary for the NSB to experiment and "grow" lichen and moss seeds and spread them around a traditional caribou migratory route or create a new migratory route with the plant life that they find suitable. |
| | Less stable ground, subsidence and differential settlement of structures. Sanitation and health problems result from broken sewer and water lines within the villages. | Among other measures, the NSB could assist the villages in procuring gravel to shore up buildings, roads and other infrastructure. It may be fruitful to partner with research universities to create a new material that can be produced locally in each village that functions like or better than gravel. |
| | Flooding and structural failure of ice cellars. This can result in food contamination and, if ice cellars need to be abandoned, can lead to food insecurity as there is no room in village homes for storage of a freezer. This would lead families to be dependent on "store bought" food which lacks the nutrients of traditional, local foods. | Although culturally difficult to adjust to, it may be necessary for the village leaders to build a community or co-op ice cellar in a convenient location. The location should be convenient to hunters as well as to family members retrieving the foodstuff. |

[402] Hassol, Susan Joy. Alaska Climate Impact Assessment. Impacts of a Warming Arctic. University of Alaska, Fairbanks, 2004. www.amap.no/documents/download/1058.

| Weather-related physical change | Potential impacts to the village | Adaptive Response Options |
|---|---|---|
| Early snow melt. | Early snow melt on land exposes the mushy/marshy tundra and reduces the hunting season and tundra travel is too difficult. Early snow melt may alter subsistence species' migratory schedule and routes, causing hunters to travel greater distances to find the resource. | |
| | Early snowmelt results in reduced days for oil & gas industry to traverse frozen ground for exploration, development or transporting the resource to market. Limited season for ice roads. | |
| Increased inland rain. | Increased rain on snow events during winter cause a layer of ice to form over tundra vegetation preventing grazing by animals like caribou and muskoxen; this causes die-offs of these animals | |
| Warmer temperatures on the tundra. Caribou herds will face a variety of climate-related impacts resulting in changes in their migration routes, calving grounds, forage availability and drinking water sources as snow and river ice conditions change, permafrost thawing results in tundra subsidence and methane gas release into fresh water lakes, and warmer weather dries the tundra making it susceptible to wildfires. | Warmer weather inland causes drying of tundra which makes the land susceptible to lightning-caused fires which can spread for many miles. Warmer weather also causes lakes to dry up from evaporation, along with the thawing permafrost and resulting draining. | Increase fire-fighting capabilities for both wild fires and structures.<br><br>Protect drinking water lakes or develop new reservoirs with lining that protects against leaks and methane releases from underlying permafrost. |

| Weather-related physical change | Potential impacts to the village | Adaptive Response Options |
|---|---|---|
| (continued)<br>Warmer temperatures on the tundra. Caribou herds will face a variety of climate-related impacts resulting in changes in their migration routes, calving grounds, forage availability and drinking water sources as snow and river ice conditions change, permafrost thawing results in tundra subsidence and methane gas release into fresh water lakes, and warmer weather dries the tundra making it susceptible to wildfires. | Drier tundra soil cause berries to ripen early and spoil faster. Warmer weather increase insect harassment for berry harvesters. Intrusion of non-native species that may cause environmental harm; some species such as salmon species and cold-tolerant crab may increase in abundance in arctic waters. This may attract commercial fishing industries to the arctic seas which could diminish subsistence resources. | |
| | Tundra ecosystems could change to spruce/aspen forests and grasses could be incorporated into the tundra. Shrubs entering the tundra could attract moose while decreasing the lichen for caribou. | |
| | New plant species could attract new species of pests which could annoy caribou. | |
| | Declining or shifting wetlands could affect migratory or resident bird species. | |
| | Industrial development relying on ice roads for access to development sites could be stymied by a reduced supply of water to create the roads. | |

| Weather-related physical change | Potential impacts to the village | Adaptive Response Options |
|---|---|---|
| (continued)<br>Warmer temperatures on the tundra. Caribou herds will face a variety of climate-related impacts resulting in changes in their migration routes, calving grounds, forage availability and drinking water sources as snow and river ice conditions change, permafrost thawing results in tundra subsidence and methane gas release into fresh water lakes, and warmer weather dries the tundra making it susceptible to wildfires. | A drier tundra: Although rain will increase, evapotranspiration and water drainage from cracks in the permafrost will cause a drier tundra that will be susceptible to more numerous and intense tundra fires releasing carbon and contaminants like mercury into the atmosphere. | |
| | Villages do not have the trained staff or equipment to extinguish wildfires which threaten homes, traditional foods, food sources for wildlife and creates smoke which causes or exacerbates respiratory illness in humans and animals. Wildlife change their migratory routes in subsequent years due to the damage to their foodstuff and nesting/calving lands. | |
| | Slow recovery of vegetation or vegetative shifts after fires can profoundly affect wildlife. Lichens, a critical winter food for caribou, recover extremely slowly. Loss of food for caribou cause the herd to change routes which may be a greater distance from the village causing economic hardships (gas, equipment repair, time) and hazards (thinning ice) for subsistence hunters. | |

| Weather-related physical change | Potential impacts to the village | Adaptive Response Options |
|---|---|---|
| Acid Rain.<br>Toxins such as DDT, PCBs, dioxin, pesticides and heavy metals are carried by both air and ocean currents thousands of miles to the colder arctic ecosystem. The cold Arctic environment is a "sink" or settling area for these contaminants which circulate around the globe northward in air and ocean currents. They settle out in Arctic waters, sea ice, and land, where they remain for long periods and break down very slowly because of the colder climate. The effects of these toxins are magnified as they are ingested by animals rising up the food chain. This is causing a health crisis among the Inuit people in the Arctic Circle.<br><br>As a result, both land and sea dwelling animals ingest the toxins. On land the toxins are deposited into the plant life and eaten by Caribou, once source of food for the Inuit. In the water, the toxins are found in plankton, which fish in turn eat. These fish then become a source of food for seals and polar bears. | The North Slope is fortunate that major contaminant transport pathways tend to lead elsewhere, such as Canada and Greenland. The Slope receives some contaminants from Asia but levels are still relatively low. Consumers of subsistence-harvested foods from the North Slope are fortunate that the scientific analysis that the NSB Wildlife Management Department conducts have shown very low levels of POPs to be present in many of the subsistence foods that we eat and are below levels of public health concern.[403] Their studies demonstrate that subsistence foods are healthy foods. | The NSB Wildlife Management Department continues to monitor and analyze subsistence animals for human dietary health benefits as well as for potential impacts of consuming toxins.<br><br>Hunting and harvesting marine and riverine animals and air and terrestrial animals is an important part of the Iñupiaq lifestyle. It is not only an important part of their culture, passed down through the generations, but it also provides food.<br><br>Traditional subsistence foods provide relatively inexpensive and readily available nutrients, essential fatty acids, antioxidants, calories, protein, and many health benefits. Some of these benefits include protection from diabetes and cardiovascular disease, improved maternal nutrition and neonatal and infant brain development. Severely limiting the consumption of traditional foods may result in harm because reduction of the consumption of foods that have health benefits may increase the consumption of less healthy "store bought" foods. |

[403] North Slope Borough. 2006. *Northern Alaska Subsistence Food Research: Contaminant and Nutrient Ecology in Coastal Marine Mammals and Fish.* www.north-slope.org/assets/images/uploads/CIAP%20booklet.pdf.

| Weather-related physical change | Potential impacts to the village | Adaptive Response Options |
|---|---|---|
| (continued)<br>These toxins are called Persistent Organic Pollutants (POPs) because they are persistent: they travel long distances; they persist long after they are released at their source and move from air and water into spoil, plants, animals and humans; they magnify in living organisms and accumulate in fat, organs and muscles; they can reduce the animal's ability to conceive and carry offspring; they decrease the animal's ability to fight off disease; they can impair brain function; and a number of POPs are carcinogenic, causing cancers.<br><br>Migratory birds can have 100 times higher concentrations of POPs compared to birds that do not migrate.<br><br>In the Arctic, human exposure to toxins occur primarily through eating of subsistence foods. [404, 405, 406] | | |

[404] Hild, C. 2002. *Contaminants In Alaska: Is America's Arctic At Risk?* In The Status of Alaska's Oceans & Watersheds. Pp. 97-110.
[405] Alaska Adaptation Advisory Group to the Alaska Climate Change Sub-Cabinet. 2010. *Alaska's Climate Change Strategy: Addressing Impacts in Alaska.*
[406] Kraemer et al. 2005. The Potential Impact of Climate on Human Exposure to Contaminants in the Arctic. International Journal of Circumpolar Health Vol. 64, Section 5.

| Weather-related physical change | Potential impacts to the village | Adaptive Response Options |
|---|---|---|
| Higher levels of ultraviolet (UV) radiation.<br><br>Due to greenhouse gas effects of the stratospheric ozone temperatures, UB radiation in the Arctic is projected to remain elevated.[407] | Increased IV exposure can cause skin cancer, cataracts, and immune system disorders in humans.<br><br>Elevated UV can disrupt photosynthesis in plants and can have detrimental effects on the early life states of fish and amphibians.<br><br>Risks are greatest in the Spring when sensitive species are most vulnerable, and warming-related declines in snow and ice cover increase exposure for organisms normally protected by such cover. | |
| Multiple Impact Stresses. | Weather-influenced changes to the ecosystem cause overlapping stresses which amplify or exacerbate any one impact. | Vigilance and adaptation to changing conditions are required. Alaskan Native communities have for centuries adapted to scarcity and environmental variability and, thus, have developed deep cultural reservoirs of flexibility and adaptability; this tradition must continue. |

[407] Hassol, Susan Joy. *Alaska Climate Impact Assessment. Impacts of a Warming Arctic*. University of Alaska, Fairbanks, 2004. www.amap.no/documents/download/1058.

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## Appendix F: Public Review Comments

| No. | Commenter | Comment | Draft Page | Final Page | Action<br>*italics* are additions; ~~strikethroughs~~ are deletions |
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| 1 | Planning Team | Executive Summary is needed | NA | ES-1 | Executive summary is included. |
| 2 | NSB Planning Department | Clarification on the history of PET #4 | 9 | 9 | After a bleak period in the 1930s, the economic picture improved during World War II for the country and for the Arctic region. Native craft sales increased due to the influx of military personnel. Mineral exploration programs *within the* ~~and the~~ Naval Petroleum Reserve #4 *(PET 4), established by President Warren G. Harding in 1923 began* ~~(now NPR-A) opened~~ and in 1946, Iñupiat were hired as laborers with a flexible schedule that allowed for subsistence hunting. |
| | | | 11 | 11 | The proposal to create the North Slope Borough was opposed by the oil industry, challenging the borough's taxation powers as well as inclusion ~~PET 4 (now NPR-A)~~ *of the National Petroleum Reserve – Alaska (NPR-A)* within the borough. |
| 3 | Comp Planning Team | Iñupiaq translation for the vision statement is needed | 67 | 67 | Translation is now included. |
| 4 | NSB Planning | Reference that the list of impaired water bodies posted on the ADEC website is from EPA and was lasted updated in 2010 - 9 years ago. This list does not show impaired bodies that may have been discovered since 2010. | 90 | 90 | Water Quality. ~~A list of impaired waters is maintained by the ADEC, however no impaired waters are listed within the NSB.~~ The ADEC Alaska Monitoring and Assessment Program conducts aquatic resource surveys across Alaska to measure water quality based on a variety of indicators, including chemical contaminants, macroinvertebrate community structure, and water chemistry. *A list of impaired waters is maintained by the ADEC. There are not any impaired water bodies within the NSB included in the ADEC Catalog. However, the Catalog has not been updated since 2010.* ~~however no impaired waters are listed within the NSB.~~ |
| 5 | NSB Planning | Wood Bison were hunted to extinction 200 years ago and have only recently been re-introduced to Alaska. The current location of the re-introduced herd core range is the Lower Yukon/Innoko Rivers. While the eastern part of North Slope may have been part of the Wood Bison's historic range (based zoo archeological, paleontological, oral and written historical documentation), it is not a species that currently lives on the North Slope - nor will it based on ADF&G's management plan. | 93 | 93 | Wood bison has been removed from Table 12: NSB Endangered Species. |

<table>
<tr><th>No.</th><th>Commenter</th><th>Comment</th><th>Draft Page</th><th>Final Page</th><th>Action<br>*italics* are additions; ~~strikethroughs~~ are deletions</th></tr>
<tr><td>6</td><td>Bill Tracey</td><td>Subsistence. Subsistence has an unknown future – facing more hunters than ever before – climate change issues – industry and development in every direction, land and sea and air, ice conditions all adds up to uncertainty and then plug in regulations and what that can do to your average. NS family diet-wise village stores will have to where game food becomes short or unavailable.</td><td>115</td><td>115</td><td>Subsistence resources and users within the borough's area of influence are vulnerable to human activities, such as oil and gas exploration and development and an increased number of hunters, as well as long term changes, such as climate change affecting sea ice conditions as well as land vegetation (the effects of climate change are presented in Chapter 5).</td></tr>
<tr><td>7</td><td>NSB Administration</td><td>Update 2017-2018 Service Interruptions table</td><td>135</td><td>135</td><td>
<table>
<tr><th>Community</th><th>Annual Service Interruption Rate*</th><th>Interruption days more than 5**</th></tr>
<tr><td>Anaktuvuk Pass</td><td>~~9.1~~ 10%</td><td>~~25.0~~ 36%</td></tr>
<tr><td>Atqasuk</td><td>~~2.3~~ 5%</td><td>~~0.0~~ 25%</td></tr>
<tr><td>Kaktovik</td><td>~~8.0~~ 18%</td><td>~~10.0~~ 14%</td></tr>
<tr><td>Nuiqsut</td><td>~~7.0~~ 17%</td><td>~~5.0~~ 32%</td></tr>
<tr><td>Point Hope</td><td>~~11.0~~ 35% / 10%[1]</td><td>~~15.0~~ 22%</td></tr>
<tr><td>Point Lay</td><td>~~30.4~~ 26%</td><td>~~60.0~~ 67%</td></tr>
<tr><td>Utqiaġvik</td><td>3%</td><td>3%</td></tr>
<tr><td>Wainwright</td><td>~~10.5~~ 51% / 27%[2]</td><td>~~30.0~~ 25%</td></tr>
</table>
*An annual service interruption rate of 20% means that 2 out of 10 homes experienced service interruptions. It also means that 80% of the community did not experience any service interruptions.<br>**An interruption day s rating of 30% means that out of all the service interruptions, 30% experienced a service interruption of 5 days or more.<br>[1] These communities experienced major events which affected a large number of services for a short time. The major events skew the data, so the Service Interruption Rate is shown with and without those events. More detail on the events is provided in the following paragraphs.<br>[2] Many homes in Point Lay are going to tanked service. With those homes removed, the service interruption rate has dropped from previous years.<br><br>Point Hope's major event during 2017 – 2018 was a vacuum system failure in March 2018. Services were restored in one day. Since upgraded vacuum pumps have been installed, the vacuum system has been very reliable and the service interruption rate has dropped.<br>…
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| 7 | NSB Administration | [continued]<br>Update 2017-2018 Service Interruptions table | 135 | 135 | [continued]<br>*Wainwright's major event was a clogged sewer main caused by a large section of in-line heat trace which had come loose and blocked the main. Service was restored temporarily several times and the blockage was cleared within a week.*<br>*Planned repairs and maintenance activities which affect many services are not included in these rates. An example is a scheduled water main isolation to repair a leak. Residents are notified ahead of the short-term interruption. If such service interruptions were included in the rates, they would show that the infrastructure is in worse condition than it actually is.*<br>*Examining the rates on a quarterly basis shows that most interruptions happen during cold weather. Preventative maintenance efforts are underway to make service better-insulated, heated, and air-tight. These efforts will reduce the overall number of service interruptions in the future.* |
| 8 | Flora Ipalook | Individual homeowners during each hunting season, during each catch – people are using their driveways to cut, prepare, and store our foods. Another option would be to add gravel to the back of homes to provide space to "work" on the catch. This would eliminate using the front (driveway) of the home and eliminate dust from getting on the meats. Would also give space to build a meat rack and hang meat to dry. Nuiqsut's residential homes have the space in back of the homes to use this option. During winter months, this would also eliminate unnecessary ATVs/snowmachine traffic. | NA | 147 | Village comprehensive plans include a discussion on gravel needs specific to each community. This NSB Comprehensive Plan also includes the following statement: .Village residents have often expressed the need to purchase gravel for private use - to shore up driveways, pilings, or other construction needs. Unfortunately, due to the limitations of capital funding through general obligation bonds, the borough is unable to make its gravel available for private use. |
| 9 | Bill Tracey | SA-10. I know a lot of village residents that think that Prudhoe Bay and SA-10 is all oil companies. Need to spell out the difference, what is the borough and taxation. | 159 | 159 | Service Area 10 *is managed by the North Slope Borough and encompasses* ~~takes in~~ the area ~~lying~~ generally between the National Petroleum Reserve-Alaska and the Arctic National Wildlife Refuge and extends from the Beaufort Sea south to 70° latitude. After creating Service Area 10, the Borough Assembly made provision for a solid waste collection and disposal district and a sanitary waste collection and disposal district in the area. SA-10 encompasses approximately 3,000 square miles. *There is not a residential community in Deadhorse or the Prudhoe Bay region. Workers in the region reside there on a part-time, nonpermanent basis and travel to the region specifically for work in oil and gas industry. Few North Slope residents are employment in the Prudhoe Bay area.* |

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| 10 | Leslie S. Segevan | All North Slope villages need to construct evacuation roads to the mountains before the war in the middle reach North Slope. And before the roaring seas come in all the way to the mountains. This should be considered a top priority for all North Slope villages. Everyone's lives that live on the North Slope hangs in the balance in this decision. | NA | 181 | Village comprehensive plans include a discussion on evacuation roads. This statement has been added to this NSB Comprehensive Plan: *Many communities have expressed the desire for evacuation roads for emergency egress.* |
| 11 | NSB Planning | The line for Point Thomson in Table 25 lists Exxon as the owner and Mobil as status. It should be changed the owner to ExxonMobil and status to Private oilfield airstrip. | 190 | 190 | The Point Thomson landing strip is now listed as owned by Exxon Mobil and the status as private oilfield airstrip. |
| 12 | NSB Planning | The USCG is undertaking another Port Access Route Study for the Arctic Ocean Coast along the Coast of Alaska. The study is anticipated to be completed within 48 months. Federal Register notice was given on December 21, 2018, vol 83, No. 245, page 65701. | 199 | 199 | *The USCG is undertaking another Port Access Route Study for the Arctic Ocean coast in Alaska. The study is anticipated to be completed within the next two years.* |
| 13 | Bill Tracey | I'm excited to know that ASTAR is working closely with this plan and the NS that what it will take to move forward and for the NS to be in the driver seat to promote our communities needs to get the best benefit of any transportation project with a direct reflection for our communities. | 200 | 200 | …The project will identify potential infrastructure projects beneficial to the region. This multi-year effort that is still in its infancy. *The borough is a leader and key partner in the ASTAR effort.* |
| 14 | TNHA | Jim Fowler of Energy Audits of Alaska has a graphic showing this precise breakdown for Atqasuk [of electric energy requirements], a representative village within the NSB, based on an analysis done for the proposed intertie there. | 213 | NA | No change has been made. This regional plan is not meant to provide detailed energy use on specific villages. |
| 15 | TNHA | Misleading. This is true in limited cases, like LED lighting retrofits or controls programming, but the greatest energy-efficiency gains take considerable, coordinated inputs to achieve, and have substantial non-energy benefits, such as better thermal comfort, indoor environmental quality, enhanced durability, occupant productivity, etc. that should be included in every capital investment analysis. This is particularly true for deep retrofits on homes and buildings. | 213 | 213 | In the extreme climate of arctic Alaska, *some* energy efficiency improvements*, such as LED lighting retrofits and controls programming* can provide substantial benefit for a minimal amount of input. *The greatest energy efficiency gains take more considerable and coordinated effort to achieve.* |

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| 16 | TNHA | Clarify: Are these figures based on modeled or measured savings? Research has shown that energy models that are not calibrated to actual baseline energy consumption patterns tend to over-estimate savings, a significant barrier to investor confidence in energy-efficiency projects. Given that most of Interior Alaska heats with fuel from tanks, which makes tracking actual usage difficult, these numbers should be disclaimed as estimates unless factual evidence of these results can be obtained. | 214 | 214 | [Added references to the statement for clarification]<br>These programs have been particularly successful in the interior northern Alaska region, with an average of 43 percent reduction in energy use and a 29 percent reduction in home energy costs in those homes that have been retrofitted through weatherization programs.<br><br>*Cold Climate Housing Research Center. 2012. *Weatherization Assistance Program Outcomes.* www.cchrc.org/sites/default/files/docs/WX_final.pdf.<br>*Household energy savings are computer by using AKWarm, an AHFC-developed building energy modeling software which models expected energy consumption based on a home's construction, features, appliances, and results from tests conducted on the home by certified energy raters. Since 1997, at least six studies have been undertaken to evaluate the accuracy of AKWarm's residential energy assessment model and each have concluded that AKWarm produces a statistically accurate estimate of annual home energy. |
| 17 | TNHA | The weatherization program operated by the NSB public works department ceased operation June 30, 2018. It made use of some AHFC funds, but was mostly supported from the NSB general fund. About 200 homes have benefited from AHFC-funded low-income weatherization or RELI (a similar NSB initiative) since 2008. While several dozen public and commercial buildings received investment-grade energy audits in 2011-2012 through an AHFC grant program, the majority of the findings were not implemented and the audits are now out of date. | 214 | 214 | The North Slope Borough's Public Works Department ~~typically manages~~ *managed* program funds in the North Slope region. *The weatherization program ceased operation on June 30, 2018.* ~~*Many homes and commercial buildings, through NSB, have benefitted from these programs, however much of the available funding goes unrequested and unused.*~~ |
| 18 | TNHA | Context: The lower relative "normal" electrical demand of other homes in the community is likely a reflection of their inadequate ventilation systems. Most Arctic homes are under-ventilated, and occupants suffer poor indoor environmental quality (IEQ) and health problems as a result. The significant share of medical admissions related to respiratory illness in the region is well-documented, and unhealthy housing is recognized as a big driver. The increased electrical energy requirements of ventilation are justified by health outcomes for a | 215 | 215 | Monitoring of the prototype home in Anaktuvuk Pass has shown a marked decrease in heating fuel usage to approximately 27 percent of normal community average. ~~However, the average electrical demand was approximately 168 percent of the normal community average, and contribution from solar has not been dramatic.~~ |

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| 18 | TNHA | [continued]<br>population that spends over 90% of its time indoors.<br>Context: This is a six-panel test array (~1 kW) installed at a time when solar PV prices were over 70% higher than they are now. Its contribution was not meant to be dramatic. For comparison, the average American rooftop photovoltaic (PV) array installed in 2018 is closer to 6 kW. | 215 | 215 | |
| 19 | TNHA | Clarify: There is a difference between the consumer feedback devices and apps described here–which utilize meter data—and the actual "smart" meter hardware installed and monitored by the utility.<br>Clarify: This is different than the in-home "smart" meters described above.<br>Context: This is a commendable initiative, but it only captures electrical usage data, only 30-40% of the village's total energy load, as put forth earlier in this chapter. Heating fuel is the majority of energy demand in a village. An inexpensive interim solution would be for the NSB to standardize a format for reporting fuel delivery data in each village and then enforce the practice. Since the NSB provides the fuel at low or no cost to the village corporations, who charge fees to distribute it to end users, this should be a basic stipulation of the fuel agreements with these corps. This practice would give the NSB a start on benchmarking its building-level energy use with sufficient data resolution to target the highest users for efficiency retrofits. The NSB could leverage avoided cash flows based on real-world baseline data to seek grants and loans to retrofit their own buildings, and provide rebates to contractors to retrofit residences more affordably for homeowners.<br>At the end of the day, investment in energy monitoring and efficiency is a moral choice: every dollar wasted because energy isn't well managed is a dollar that can't be invested in public safety, education, health, housing, etc. | 215 | 215 | One way to advance energy efficiency is through better tracking of energy use, for example, smart meters can be utilized that teach energy efficiency and awareness through providing feedback on electrical energy usage *to the consumer and/or utility provider*. Studies have shown that an average of 20 percent can be saved on electric bills with these devises. A smart energy meter placed within households allows each individual to monitor energy usage and predict monthly electric cost. The smart meter can show energy use in real time and also warns when the power cost equalization (PCE) or NSB subsidy limit has been reached (600 kilowatt hour (kWh)), the point at which the cost dramatically increases. The average smart meter user *can* save~~s~~ 5 – 30 percent ~~off their electricity bill when using these meters~~.<br><br>Smart meters also come with two-way communication capability – allowing the utility to retrieve data remotely, as well as disconnect or limit customers' electrical consumption for non-payment. ~~A NSB CIPM program is in place to install a smart meter system area wide.~~<br>Existing smart meter systems are problematic in certain communities, and all are being evaluated so that, ultimately, a common system will be identified that will work for all communities. |

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| 20 | TNHA | This is debatable. While it is true that some capital upgrades have resulted in increased efficiencies, e.g. street lighting, the NSB does not appear to have made energy efficiency a priority. | 215 | 215 | All of the NSB communities have potential for energy efficiency upgrades. For the most part, these potentials have been recognized by NSB and, as funding becomes available, upgrade projects are initiated.<br><br>No change. The NSB prioritizes energy efficiency. A review of the capital program reveals that when and where possible, NSB seeks to increase efficiencies. For instance, power plant generators are maintained, replaced, and combined to maximize energy efficiencies and save fuel. |
| 21 | TNHA | This seems to contradict the statement on pg. 214 that "Many homes … throughout NSB, have benefited from these programs…" | 215 | 215 | In general, these upgrade projects tend to be related to NSB infrastructure, and not as targeted toward community housing, although there has been some energy audit and weatherization work. ~~Since these programs began, very few housing units in the region have participated in the AHFC Home Energy Rebate or Weatherization program.~~ |
| 22 | TNHA | Verify: was the Housing Solution Group rolled into the new Housing Department?<br>Expand: This is a good recommendation, but since audits are labor intensive, homes should first be targeted based on consumption; see comment on pg. 216. Weatherization could be provided directly at no cost to low-income homes while rebates for energy-efficiency upgrades could be provided to contractors to leverage the private market for home renovations in a manner that reduces energy cost to the NSB.<br>The NSB has the most to gain from weatherization. However, direct funding should be predicated on performance; if AkWarm models are used to estimate the amount of this funding, they should be calibrated to the actual utility history. See ANSI/BPI Standard 2400-S-2015. | 216 | 216 | ~~There are several organizations, both within and external to the NSB, that are purposed for providing funding, help in obtaining funding, and coordinating projects relating to energy efficiency upgrades. Specifically,~~ The NSB has its own ~~Housing Solutions Group and~~ Housing Department that is dedicated to areawide housing. *Additionally,* the Housing Solutions Group that ~~is~~ focused primarily on housing costs and design ~~and the~~ *is being rolled into the newly re-established Housing Department* ~~was just re-established this year~~. The NSB should take increased initiative for providing home energy audits and weatherization *by* ~~one or both of the housing groups within the NSB could pursue~~ pursuing funding and assistance sources ~~for these programs~~. NSB should also analyze *which types of homes should be targeted for upgrades as well as* the cost effectiveness of providing direct funding to individual homeowners for weatherization, should outside funding not be available or too cumbersome to acquire. |
| 23 | TNHA | Rephrase. If anything, thanks to stronger energy codes, material innovations, green appraisals and sales premiums, mainstream builders have taken lessons from energy-efficiency pioneers. | 216 | 216 | Annual energy costs are becoming more and more of the total cost of ownership, and *mainstream* ~~energy efficient designs are becoming more in line with other forms of construction~~ *homebuilders are increasingly incorporating energy-efficient designs as standard features.* |

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| 24 | TNHA | Clarify: Wind- and solar-generated electricity in excess of load may be converted to heat, but that is conceptually distinct from a CHP (cogeneration) system wherein BTUs are recovered as a byproduct of simultaneous power generation. Wind and solar do not generate heat and power simultaneously. Only that portion of a wind or solar plant's output that exceeds load can be converted to heat. | 224 | 224 | Wind generated energy ~~is a CHP system and~~ may be used ~~as~~ *for* power or heat, or both. |
| 25 | TNHA | Misleading: Research is not the barrier (that said, there is research available for review). Photovoltaic solar is a mature technology and has been one of the fastest growing sectors of the U.S. economy for several years. The Bureau of Labor Statistics predicted that solar installers will be the fastest-growing occupation from 2016-2026. UAF publishes a solar design manual for Alaska; a 5th edition was recently released. Commercial solar plants are going up in Alaska: GVEA commissioned a 563 kW utility-scale solar farm in Fairbanks in October 2018 at an installed cost under $2 per watt, and a 100 kW array was commissioned in Willow the month before that.<br>Misleading: solar is not a cogeneration system. | 224 | 224 | Solar generation is a possible source of alternative energy for all NSB communities, but there is very little research *pertaining to the North Slope Borough* available for review. Solar energy ~~is a CHP system and~~ may be used ~~as~~ *for* power or heat, or both. |
| 26 | TNHA | Expand: Solar costs have dropped by more than 70% since 2010. Known or not, the costs to install a system in 2009 are obsolete and have little bearing on a planning document with a 2019-2039 outlook.<br>Rephrase: The word "only" here suggests bias that solar PV is not economically viable. The capital cost of the present system is likely under $7,000 today. | 224 | 224 | ~~As~~ The cost of electricity ~~– to the NSB -~~ in Anaktuvuk Pass is approximately $1.05/kWh. The resulting cost savings from solar would be ~~approximately~~ *about* $80 per month. The cost to install *a* ~~the prototype~~ home solar system is not ~~known~~ *current*; *the data available is for the home built in Anaktuvuk Pass in 2009. Without more solar system data and installation costs available for the North Slope region, the true cost is difficult to determine due of high transportation costs.* ~~But~~ The $80 per month would ~~only~~ offset a capital investment of approximately $14,000 over a 25 year life. |

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| 27 | TNHA | Expand and clarify: Cost reductions should not be attributed to technological breakthroughs alone. The drop in the price of wind and solar power over the past decade, for example, was driven largely by government policies, such as the DOE SunShot Initiative, ARPA-E, ITC and PTC, and massive disruption in the global supply chain (e.g., early growth in the Chinese solar industry). The NSB should embrace strong policies that facilitate the integration of affordable energy alternatives. | 227 | 227 | New energy technologies are *constantly* being developed ~~constantly~~. ~~Any of~~ These developments could lead to sufficient ~~enough~~ changes in the costs associated with alternative energy production to make that production feasible. *Other factors can affect the cost, such as government policies and requirements.* |
| 28 | TNHA | Absolutely. Creation of an "Energy and Sustainability" unit within the administration of the public works department was floated in late 2017. This proposed unit was to focus on completing the NSB Regional Energy Plan, facility benchmarking, landfill waste diversion, alternative energy and public energy literacy. Current status unknown.<br><br>The NSB should follow the example of the NW Arctic Borough, the Muni of Anchorage, and the Fairbanks North Star Borough, all of which have appointed dedicated energy managers. This is usually an individual professionally trained in an engineering discipline who holds the AEE Certified Energy Manager credential. | 227 | 227 | NSB should expand the responsibilities of an existing department to foster and develop alternative energy solutions, or create a department solely dedicated to this purpose. The potential economic and environmental gains to be found in alternative energies, or lost potential for not following up alternative energies, are enormous when considering the annual costs associated with providing energy to the villages.<br><br>Comment acknowledged. No change. |
| 29 | TNHA | Expand: True CHP (e.g. a gas-fired plant in Utqiaġvik or Nuiqsut) has the benefit of increasing power reliability in the event of grid failure, as it enables each building equipped with it to operate as a de facto microgrid. The aging switchgear at BUECI, for example, is a threat to Utqiaġvik's grid reliability that CHP could hedge individual facilities against. | 227 | 227 | In some of the known alternative energy sources, the energy created may be used either to create power, or heat or both. Energies that are utilized in this way are referred to as CHP energy systems. There are many examples of CHP alternative energies, such as solar, wind, biomass, coal, and natural gas. This potential allows for a more efficient utilization of the energy, and a greater potential for cost effectively integrating into existing heat recovery systems. *CHP (e.g. a gas-fired plant in Utqiaġvik or Nuiqsut) has the benefit of increasing power reliability in the event of grid failure, as it enables each building equipped to operate as a de facto microgrid.* |
| 30 | TNHA | There are multiple problems with this statement: 1) Photovoltaic output peaks in April in northern latitudes due to clear, cold conditions and ground albedo (snow reflectivity); 2) while summer demand for heat is lower relative to winter, it is still | 227 | 227 | ~~Solar power is a source of CHP energy, which makes it attractive, but the primary energy, and the by-product are only available in the summer when the demand is lowest.~~ In NSB, there has not been adequate solar power research and application to show if there are cost effective applications ~~or not~~. *However, TNHA has installed solar thermal collectors* |

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| 30 | TNHA | [continued]<br>present in this climate region; 3) there is still ample community electric baseload year-round (wastewater processes, etc.) suited to solar generation; and 4) implementation of heat pumps could feasibly provide spring-summer-autumn space heating from PV with little to no reliance on diesel. TNHA has installed solar thermal collectors on 48 residential units across with logging sensors that indicate ample solar resource across the Slope. The conditions present in the NSB are not substantially different than dozens of location across Alaska where solar PV has been successfully integrated. If anything, they tend to be more favorable, due to highly subsidized electricity (NSB's Power & Light enterprise fund reported a loss of $18,475,939 in 2017 alone), long daylight hours and relatively constant loads. One area where more research is arguably needed is into the viability of bifacial PV modules, which can collect solar radiation from two directions, and therefore offer a production advantage at higher latitudes. | 227 | 227 | [continued]<br>*on 48 residential units with logging sensors that indicate ample solar resource across the North Slope. Examination of the data from these solar thermal collectors would provide the borough with a better understanding of the viability of solar power in the region.* |
| 31 | TNHA | Yes. Participation is crucial. | 228 | 228 | NSB should continue to monitor and participate in research and development of solar power systems, as it is likely that cost effective technologies currently exist.<br><br>Comment acknowledged. No change. |
| 32 | TNHA | Correct, and a reasonable attempt should be made to quantify these costs in the findings of this chapter. | 228 | 228 | The majority of the cost is borne by the borough *(information on borough subsidies is provided in Chapter 7: Public Facilities)* |
| 33 | TNHA | Expand: Fuel spills, fines and spill preparedness are additional costs rarely factored into fossil energy costs. The NSB has made headlines with its fuel spills, which are incredibly costly to clean up. Investment in clean energy is sound risk management. | 228 | 229 | • Dependence on fossil fuels and logistics of fuel delivery<br>The bulleted list was developed during Strengths, Weaknesses, Opportunities, and Threats (SWOT) workshops. Inclusion here is meant to remind the reader of the issues that were discussed by borough residents. All of these issues are explored within this Comprehensive Plan, albeit not all in the same chapter or section. No changes were made based on this comment. |
| 34 | TNHA | Clarify: This majority of savings accrue to the NSB, and these can be passed on to all residents in the form of increased funding for other services. | 229 | 229 | Findings - Home weatherization can reduce costs for homeowners *and the North Slope Borough* yet very few home audits have been performed. |

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| 35 | TNHA | Expand: Plus environmental risk of leaks, spills, etc. | 229 | 229 | Needs & Challenges - Limited availability of natural gas and infrastructure in most villages requires the use of diesel which must be transported to each village and increases *both* operational costs *and the risk of leaks and spills that cause significant environmental damage.* |
| 36 | TNHA | Energy performance contracting is one tool governments can utilize to overcome this. | 229 | 229 | Needs & Challenges - Lack of funding prevents necessary upgrades to increase efficiency in metering. As funds become available, upgrade projects are initiated.<br><br>This section is meant to be a brief summary of the chapter's contents. Types of contracting that may be more effective to accomplish certain objectives is outside of the scope of this section. No change. |
| 37 | TNHA | Expand: Investment in energy efficiency and weatherization tends to keep more dollars in the community by reducing energy burden on low-income households, freeing up budgets for local goods and services, and by creating local jobs. Energy efficiency is good economic development policy. | 229 | 229 | Needs & Challenges - Home weatherization is needed for many of the region's older housing stock to increase efficiency and reduce costs.<br><br>While it is true that energy efficiency and weatherization provides many benefits, including the ones provided in this comment, this section is meant to be a brief summary of the chapter's contents. No change. |
| 38 | TNHA | This should be the third objective, after planning and energy efficiency. | 230 | 230 | Goal 9, Objective 1. Develop alternative and redundant energy sources.<br><br>The objectives are not presented in priority order. No change. |
| 39 | TNHA | This should be the first objective, and it should specifically seek to complete the NSB Regional Energy Plan that was suspended in 2015. | 230 | 230 | Goal 9, Objective 2. Develop regional energy plans.<br><br>The objectives are not presented in priority order. No change. |
| 40 | TNHA | This should be the second objective, after regional energy planning. If energy efficiency were procured like a fuel, it would almost always be the lowest-cost alternative. Co-benefits such as improved thermal comfort, indoor air quality, and durability should be included in the analysis, where feasible. | 230 | 230 | Goal 9, Objective 3. Seek energy efficiency upgrades.<br><br>The objectives are not presented in priority order. No change. |
| 41 | TNHA | TNHA started construction on 24 homes in six North Slope villages on 3/29/13 which were completed by 11/20/15. | 235 | 235 | The NSB Census reported in 2015 that 48 housing units were under construction in Utqiaġvik but did not report any homes under construction in any other village. *However, the regional housing authority, Tagiugmiullu Nunamiullu Housing Authority (TNHA), reported constructing 24 homes in North Slope villages between 2013 and 2015.* |
| 42 | TNHA | These numbers reflect HUD homes constructed by TNHA in each village between 2013-2015. | 236 | 236 | Under construction (2015) homes added to Table 30: AKP: 4; ATQ 2; KAK: 5; NUI: 5; PIZ: 3; AIN: 5. |

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| 43 | Bill Tracey | Housing being one of our biggest concerns – can never say enough – many of today's homes are already and/or otherwise not suitable for habitation today and especially tomorrow. | 237 | 237 | North Slope residents are concerned about the condition of much of the region's housing stock, including overall condition and age, drafts and ventilation, and type of construction. *Residents are concerned that many homes on the North Slope are unsuitable for habitation today and that conditions will be exacerbated in the future without intervention.* |
| 44 | TNHA | Clarify: Is this with or without NSB subsidies? | 238 | 239 | Energy costs for single-family homes average $4,088 annually… [Footnote added for clarification]<br>* The AHFC Assessment methodology reports that energy cost data was obtained from the 2014 AHFC Assessment completed by the Cold Climate Housing Research Center and from the Alaska Retrofit Information System (ARIS) database. Neither of these sources indicate whether or not energy costs include NSB subsidies. This plan assumes that since the NSB was not included as a reference, the energy costs presented do not consider NSB subsidies. |
| 45 | TNHA | Expand: This section would benefit from discussion of heating index: energy usage intensity relative to heating-degree days. Normalized for area and climate, many if not most homes on the North Slope may be as energy intensive or less than their peers in more temperate regions. Even poorly-performing homes on the North Slope tend to be more tightly constructed and insulated than homes further south. | 238 | 239 | The extreme weather conditions are likely the reason for much of the increase [of energy costs], although the lack of energy efficient housing could also account for increased usage.<br><br>Outside the scope of this chapter. No change. |
| 46 | TNHA | Clarify: "Overcrowded housing is a manifestation of what would be unsheltered homelessness in other parts of the country." (This is quoted from prepared testimony to the Senate Committee on Indian Affairs 8/25/18 by Chris Kolerok, President/CEO of Bering Straits Regional Housing Authority.) | 238 | 239 | The rate of overcrowding is a frequently used indicator to assess housing affordability, economic health, and the quality of life within a community. A commonly accepted definition of overcrowding and one used by the United States Census Bureau is more than one person per room; severe overcrowding is defined as one and a half people per room. *In rural Alaska, however, homes often become overcrowded because they absorb friends or family members that would otherwise be homeless. As the president/CEO of the Bering Straits Regional Housing Authority, Christopher Klolerok, points out during a 2018 housing forum held in Savoonga, "…unsheltered homelessness would lead to death during the fierce winter weather. Rooted in a close-knit culture and deep familial links, many families prefer to house people in need, and live in severe overcrowding, rather than let individuals risk certain death if they are unsheltered… Overcrowded housing and the lack of housing are interchangeable conditions in rural Alaska. The lack of safe, sanitary and affordable housing threatens the survival of Native cultures and the villages and towns many Alaska Natives call home. For American Indians and Alaska Natives, overcrowded housing is a manifestation of what would be unsheltered homelessness in other parts of the country."* |

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| 47 | TNHA | TNHA no longer operates an Elder Housing Program. These five-plexes were purchased and are now managed by the NSB. | 242 | NA | ~~4. North Slope Elder Housing Program. TNHA, through a memorandum of understanding with the NSB, manages one bedroom elder housing five-plexes in several North Slope villages. Elder housing through TNHA is not offered in Utqiaġvik because the NSB Health Department offers senior apartments.~~ |
| | | | NA | 237 | *The North Slope Borough owns and manages one bedroom elder housing five-plexes in several North Slope villages. Elder housing through TNHA is not offered in Utqiaġvik because the NSB Health Department offers senior apartments. HUD originally constructed the five-plexes. Due to strict income restrictions, many North Slope residents did not qualify to rent an apartment, even though sometimes a residents' sole income was Native corporation dividends. The NSB subsequently purchased the five-plexes with TNHA providing management services. Since the reestablishment of the NSB Housing Department, the NSB has taken over management of the units.* |
| 48 | TNHA | Expand: A 2011 CCHRC/NREL monitoring study found electrical usage to be higher than the average Alaska home, at 1100 kWh monthly, but heating fuel usage was 73% lower than a typical rural home. | 242 | 243 | The [AKP] home was designed to utilize lightweight materials *and* energy efficient plumbing and heating systems to *significantly* reduce energy costs ~~by an estimated 40 percent~~. |
| 49 | TNHA | Expand: Homebuyer maintenance of these systems, which save the NSB hundreds of thousands of dollars per lot over a standard wastewater service connection, is essential to their proper operation. TNHA is currently planning a new occupant training regime to ensure their success. TNHA has also been in contact with the NSB about these systems; conversations with the planning department about diversion of the effluent that took place prior to their installation were suspended due to administrative turnover at the NSB. The effluent quality of the systems is designed to meet strict environmental regulations. | 243 | 244 | Additionally, some residents and the NSB are concerned the use of independent wastewater treatment systems, which discharge effluent is discharged directly onto tundra, often causing environmental issues like odor, erosion, and permafrost thaw.<br><br>Comment acknowledged. No change. |
| 50 | TNHA | Verify: As far as we're aware, the Housing Solutions Group is no longer active and/or has been folded into the NSB Housing Department. | 243 | 245 | The North Slope Borough created the Housing Solutions Group in 2011 after concerns *were* raised by both the NSB Assembly and citizens regarding short-term and long-term housing issues region-wide. The Housing Solutions Group provide~~s~~*d* financial and outreach services as well as collaboration and coordination with housing providers to assist residents in purchasing or constructing a home. |

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| 50 | TNHA | [continued] | 243 | 245 | [continued]<br>In a more recent response to the housing crisis, NSB resurrected the Housing Department in 2017. When the housing department closed a decade ago, its responsibilities were moved to TNHA. Now the two entities are coordinating the best way to align their funding and programs to have the most benefit for North Slope residents. *The functions and activities of the Housing Solutions Group are being transferred to the Housing Department to streamline housing activities within the borough.* |
| 51 | TNHA | Rephrase: This should be framed as a homelessness problem. Multi-generational households are often attributed to cultural values that prize family ties, but just because people aren't visible on the streets doesn't mean they're not technically homeless. | 244 | 245 | There is a housing shortage across the North Slope that often results in multiple generations and families residing in the same household and in overcrowded conditions.<br><br>A clarification on this issue has already been included. See comment #46. No change. |
| 52 | TNHA | Shipping materials alone is about $150,000 on average per village. TNHA's total development costs per square foot ranged from $448 (Nuiqsut) to $660 (Point Lay) in 2015 to build 24 homes. | 246 | 248 | The cost to construct even a modest home can cost *well* over $500,000. *TNHA reports the total development cost per square foot cost can range from $448 (in Nuiqsut) to $660 (in Point Lay) or even more; a 1,500 square foot home can cost between $672,000 to $990,000, depending on the village.* |
| 53 | TNHA | NAHASDA has largely accomplished what it was designed to in a sense: convey title to an increasing share of Native homeowners, as this chapter previously pointed out. But flat funding and inflation have resulted in fewer new homes to replace those that convey from TDHEs to residents. | 246 | 248 | Federal housing subsidies are inadequate for the need.<br><br>Comment acknowledged. No change. |
| 54 | TNHA | This is a key opportunity. TNHA is currently leading efforts to establish such a coalition. | 246 | 248 | The North Slope is one of the few regions in state that does not have a coalition established to address housing and homelessness issues.<br><br>Comment acknowledged. No change. |
| 55 | TNHA | Roles need to be properly defined by consensus among stakeholders. The NSB's unilateral decision to resume exercise of housing powers begat confusion. | 246 | 248 | Limited collaboration amongst organizations.<br><br>Comment acknowledged. No change. |
| 56 | TNHA | This creates a general sense of entitlement that harms other service organizations by creating expectations that are impossible to meet. | 246 | 248 | Over dependency on the North Slope Borough.<br><br>Comment acknowledged. No change. |

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| 57 | TNHA | There are many benefits to this, including increased standardization of equipment across the region. TNHA would welcome the adoption of simplified mechanical and building energy codes to start. | 246 | 248 | Building design standards for the Arctic are yet to be implemented and enforced.<br><br>Comment acknowledged. No change. |
| 58 | TNHA | Good suggestion. Prefabricated housing is expected to gain market share in the US in coming years as quality control standards and the skilled labor market become tighter. This will shift more of the workforce from the jobsite to factories. This could be an economic development opportunity in Utqiaġvik: for example, NARL hangars could be converted to factories where workers assemble raw materials year-round into prefabricated building components. | 246 | 248 | Construct modular homes on the North Slope that are easier to transport.<br><br>Comment acknowledged. No change. |
| 59 | TNHA | This is why "overcrowding" needs to be reframed as technical homelessness. | 247 | 249 | Alaska State Legislature perceives that there is not a homeless issue on the North Slope.<br><br>Comment acknowledged. No change. |
| 60 | TNHA | Findings: The low rate of housing availability contributes to the region's high rate of ~~overcrowding~~ *homelessness*, *which manifests as overcrowding* and puts a strain on many households. | 247 | 249 | Comment acknowledged. No change. See comment #46. |
| 61 | TNHA | Findings: Complex land ownership and the borough's remote location that contribute to the regions lack of housing availability and affordability as well as the high rates of *homelessness and* overcrowding. | 247 | 249 | Change accepted. |
| 62 | TNHA | This is probably the single most impactful thing that could happen to resolve some of these challenges. | 248 | 250 | Goal 3, Objective 1, 3.1.1. Establish a coalition to address housing and homelessness issues on the North Slope to coordinate programs and initiatives.<br>Comment acknowledged. No change. |
| 63 | TNHA | This should be undertaken as part of a broader energy management program to capture and fully leverage the cost savings; see comments on Chapter 10. | 249 | 250 | Goal 3, Objective 3, 3.3.1.Support programs that help with weatherization and sustainability measures to reduce home operating costs for water and energy usage.<br>Comment acknowledged. No change. |
| 64 | TNHA | Fully funding the IHBG and Census would be a more effective use of NSB lobbying muscle as long as there are eligible low- and moderate-income households going unserved in the region (and there are). See http://www.aahaak.org/advocacy.php. | 249 | 251 | Goal 3, Objective 4, 3.4.3. Advocate state congressional representatives in the United States to seek exceptions to the income limit for federal housing subsidies for rural Alaska.<br>Comment acknowledged. No change. |

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| 65 | TNHA | This should include an evaluation of the Housing First model for chronically unsheltered homeless individuals– data from Juneau support this approach. | 249 | 251 | Goal 3, Objective 5, 3.5.1. Investigate the costs and feasibility of establishing homeless shelters in Utqiaġvik and the villages.<br>Comment acknowledged. No change. |
| 66 | Iḷisaġvik College | Expand background on the college | 258 | 260 | The North Slope Borough is also home to Iḷisaġvik College, Alaska's only Tribal college. *The founders of the North Slope Borough were acutely aware of the importance of education to their dreams of sustained self-determination and local control for their people, looking towards the development of a post-secondary educational system that would allow residents to further their educational goals while remaining close to the culture and lifestyle that sustained them.*<br>*In 1986, the North Slope Borough created the North Slope Higher Education Center, a cooperative effort between the North Slope Borough and the University of Alaska Fairbanks. The North Slope Higher Education Center's Board and the North Slope Borough Assembly changed the institution's name to Arctic Sivunmun Iḷisaġvik College in 1991 to reflect its transformation into a community college. Arctic Sivunmun Iḷisaġvik College merged with the NSB Mayor's Workforce Development Program in 1993, adding facilities and resources to support the growing number of vocational education opportunities available at the college. In 1995, the North Slope Borough established by ordinance the Iḷisaġvik College Corporation, an independent, public, non-profit corporation with full power for governance of the college vested in the Board of Trustees. Iḷisaġvik achieved accreditation from the Northwest Commission on Colleges and Universities in 2003 and is authorized by the Alaska Commission on Postsecondary Education to operate in the state of Alaska. In 2005, it also became the first and today remains the only federally recognized tribal college in Alaska.* |
| 67 | Iḷisaġvik College | | 258 | 261 | Iḷisaġvik College serves all the North Slope Borough villages through online classes and in-person classes in Utqiaġvik. The college also has a statewide presence; in 2017, Iḷisaġvik reached 40 communities within Alaska through remote learning instruction. *During the 2017-2018 school year, Iḷisaġvik made 91 trips to North Slope communities, ensuring every village on the Slope is served and instated the first four-year degree program, a Bachelors in Business Administration.* |

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| 68 | Bill Tracey | I believe the RLC should have been explained and Iḷisaġvik could have had more depth in its role with the community and why it's important it be in the village setting. "Links" could be provided for more info. | NA | 262 | *An additional effort to expand educational opportunities on the North Slope is the Residential Learning Center. Students from North Slope villages will be able to seek educational opportunities in Utqiaġvik. The students will be housed at the former Top of the World Hotel on the corner of Agvik Street and Stevenson Street. In 2013, Pepes North of the Border restaurant was destroyed in a fire. The attached Top of the World Hotel was suffered significant smoke damage and was closed. ASRC, the hotel owner, donated the building for use as the Residential Learning Center. A design to renovate the former hotel has recently been finalized. The improved building will offer 28 dormitory rooms for two students each and two for one student each. It will also have living space for residential advisors, an office, kitchen facility, dining room, and sitting and study areas.* |
| 69 | Iḷisaġvik College | Clarification on new education facilities. | 259 | 262 | Future Education Facilities<br>~~Iḷisaġvik College has long sought a new campus in Utqiaġvik or Browerville.~~ *Over a decade ago, the Iḷisaġvik College Board of Trustees directed college leadership and staff to explore options for a new Iḷisaġvik College campus. The current facility was built as the Naval Arctic Research Laboratory, now over 70 years of age and was never meant to house a college campus. The current site is host to numerous environmental and logistical concerns; located three miles outside of town, students may be challenged in connecting with the community.* The facility that the college is housed in at NARL is over half a century old and requires significant renovations. Its isolated location northwest of Browerville does not allow it to integrate into the community. During severe storm events, the road to NARL can be overtaken by flooding or be washed out, further isolating the college from the community. *As such, Iḷisaġvik College has assembled a team to bring this project into fruition. The site selected by the Iḷisaġvik College Board of Trustees is south of the Samuel Simmonds Memorial Hospital.* ~~However, the cost of a new campus has been cost-prohibitive for the North Slope Borough.~~ |
| 70 | Iḷisaġvik College | Clarification on potential for a Deadhorse education facility. | 259 | 262 | Because on-site training, internships, and apprenticeships may *also* be more readily available in the Prudhoe Bay region ~~than in the villages or Utqiaġvik,~~ developing an educational / training center located in Deadhorse may present new opportunities for North Slope residents. |

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| 71 | Iḷisaġvik College | Include a statement about the need for new facilities as awareness and discussions on the arctic increase. | NA | 263 | *With the growth of national and international awareness and discussion regarding opportunities with Northern shipping and transportation, energy and defense, new facilities are needed to host these conversations about America's Arctic, in America's Arctic. The growth of essential infrastructure is necessary to meet the needs of the North Slope, Alaska, and our nation at large.* |
| 72 | NSB Planning | Reference to Armstrong Energy should be changed to Oil Search, who bought out Armstrong's interest in Nanushuk. | 282 | 286 | ~~Armstrong Energy~~ *Oil Search*'s Nanushuk project in the Pikka Unit is expected to produce 120,000 barrels per day. |
| 73 | ASNA | Update service information | 295 | 299 | In ~~August~~ *September* 2013, the new Samuel Simmonds Memorial Hospital officially opened. The 109,000 square foot structure is four times larger than the ~~1963~~ *1969* facility that it replaced. ~~Healthcare services at Samuel Simmonds Memorial Hospital include~~ *Samuel Simmonds Memorial Hospital is a licensed 14-bed critical access hospital, also certified as a Level IV Trauma Center. It features:*<br>*14* outpatient *exam rooms* ~~unit providing emergency, clinic and urgent care (15 outpatient and 4 emergency rooms)~~; *10 single inpatient rooms, including two labor and delivery rooms* ~~Inpatient unit providing care for newborn through elderly patients, including low-risk obstetrical services with two labor and delivery rooms~~; *Four emergency beds; Physical therapy; Computed tomography (CAT) scan; Eye clinic;* Case management; Specialty clinics offering access to specialists by referral;<br>"Screening for Life" Breast and Cervical Cancer Screening Program ~~(mammography is offered at the Wellness Center)~~; Diabetes education; Physical Therapy; Optometry; Pharmacy; Audiology and endoscopy services.<br>*SSMH also provides specialty outpatient clinics and services: Arthritis; Audiology; Cardiology; Diabetes; Ear, nose, and throat; Gynecology; Hepatitis; Neurology; Ophthalmology; Orthopedics; Pediatrics; Pediatric cardiology; Podiatry; Surgery; and Sleep.* ~~Meditation room.~~<br>Support services provided by the Hospital include: Central sterile supply; Medical records; Business office; Translation services; and ~~Eye care (currently being transferring from the NSB Health Department to ASNA); and~~ Morgue.<br>ASNA also administers a pre-maternal home at ~~274 Pisokak Street~~ *6196 Herman Street in Utqiaġvik*. ASNA would prefer that this facility be located adjacent to the hospital in the future. |

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| 74 | ASNA | Provide information on the health services agreement | NA | 300 | *Through a health services agreement, ASNA and NSB CHAP collaborate to manage healthcare delivery. SSMH clinicians provide medical oversight for the frontline care provided by the village health aides (excluding Anaktuvuk Pass and Point Hope). In addition, after initial Alaska Native Tribal Health Consortium (ANTHC) training, ASNA provides orientation, evaluation for certification, and preceptorships (one-on-one shadowing with a provider) for NSB CHAP. Scheduled medical and dental provider visit each village every year (excluding Point Hope and Anaktuvuk Pass).* |
| 75 | Bill Tracey | Heath. Many examples of efforts to man our clinics did not panned out over time. PAs at each site, health aides from afar, etc. It will take all of the above to make it work. | 296 | 300 | *There have been difficulties over the years keeping the village health clinic adequately staffed with community health aides. Many are hired from out of the area on a rotational basis. Others are community members. Without sufficient staffing resources, local health aides may feel the stress of providing service for an entire community.* |
| 76 | ASNA | | 298 | 303 | *The Pre-Maternal Home, located at 6196 Herman Street, is open for women and children referred by Samuel Simmonds Memorial Hospital. The Pre-Maternal Home serves as a temporary "home away from home" for pregnant women and their children. It is a five-bedroom house with five bathrooms and an office space, full kitchen, washer/dryer, and comfortable living space.* ~~The pre-maternal home opened in June 2013 and is located at 274 Pisokak Street in Utqiaġvik. It serves as a temporary home for pregnant mothers and their families that come to Utqiaġvik from North Slope outlying villages. Through grant support, the ASNA pre-maternal home was able to provide free educational classes for Arctic Slope residents, receive upgrades to the facility, and provide trainings and opportunities to women and children on prenatal care and nutritional information.~~ |
| 77 | NSB Planning Department | There needs to be a discussion here about the North Slope Borough's agreement and participation the Mutual Aid Program with the Oil Industry. The NSB is signatory to this agreement and they participate in Mutual Aid Drills that tests the ability for the oil industry to respond to large oil spills. | NA | 307 | *The North Slope Borough participates in a Mutual Aid Program in partnership with the oil and gas industry. The program includes field testing and training as well as oil spill scenarios to determine response and resource gaps. The exercises are held annually in Prudhoe Bay.* |
| 78 | Planning Team | Include a map of SA-10 contaminated sites. | NA | 310 | A map of SA-10 contaminated sites is included, Map 18. |
| 79 | Planning Team | Incomplete reference | 317 | 323 | Update reference. Pamplin, W. Lewis Jr. 1979. *Construction-Related Impacts of the Trans-Alaska Pipeline System on Terrestrial Wildlife Habitat*. Joint State / Federal Fish & Wildlife Advisory Team. Special Report No. 24. August. |

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| 80 | NSB Planning Department | Include the other official zoning maps to show the example of Barrow Zoning, Science Research and Village Districts. | 327 | 330 | *Maps 19 and 20 are official zoning maps for the Resource Development District and Utqiaġvik. The entirety of the North Slope's seven rural villages are within the Village Zoning District.*<br><br>Maps 24 - 32 now include the zoning districts for North Slope communities. The official Utqiaġvik Zoning Map is also included as Map 20. |
| 81 | NSB Planning Department | There is no label on the mineral dot to the far right on Map 33 – Future Regional Land Use. | 368 – 369 | 372 - 373 | A label has been added (now Map 37). |
| 82 | NSB Planning Department | Put legends on the NSB Land Use maps. | 362 - 365 | 367- 370 | Legends have been added to maps 34 - 36. |
| 83 | Mamie Pardue | With the recognition that more youth across the NSB, what kinds of activities or opportunities can be brought up to help them succeed in their futures? How do we build structures to ensure they have the space to express their interests and talents. Can anything be done immediately to job ready and successful once out of high school. We have more children now more than ever. The rise of youth is not slowing down. Having individuals would could help youth keep hunting/fishing, knowing our surroundings by land and boat is important. The NSB School District has been doing introductions to our NSB. Giving information about our culture. More of this could be taught to our youth as well. As the years go by, it seems time is not being spent on teaching our youth about living off the land. The importance of this needs to be addressed. Our villages are in need of keeping our youth busy so they are not doing drugs or drinking alcohol at young ages. | NA | NA | Village comprehensive plans include a discussion on recreation and school space needs specific to each community. This plan includes a discussion of the cultural curriculum used by the NSBSD as well as goals, objectives, and strategies to further youth involvement cultural and subsistence activities. |
| 84 | Roger Ahnupkona | I want you or North Slope Borough to loop up house 113 Coldvill Street to see my electric problem and the outside of the place is getting of about 4" down if you or your department can come over and take a time to look throughout the house 113 Coldvill Street. | NA | NA | This is outside the scope of this plan. However, the comment has been forwarded to the NSB Administration. |

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| 85 | Marjorie Long | 1. I'd like our rep – planning for Point Lay be involved with anything involved with Cully Corp.<br>2. Get more high schools involved with any NSB meetings in the future invite them.<br>3. Point Lay resident families are happy NSB houses are going to the community. But we should not get getting homes that are already 10-15 years old. They will have a lot of problems. So I'd like to see new homes for Point Lay residents.<br>4. Help renovate and make bigger store for Point Lay is growing.<br>5. Come to school and ask what our school needs. I know for fact classrooms are overloaded with kids need bigger classrooms. | NA | NA | Many of these issues are discussed to each community comprehensive plan. Additionally, these comments have been forwarded to the North Slope Borough Administration. |
| 86 | Kimberly Neakok | House Bill 216 passed in April 2014 recognizing the 20 indigenous languages as official languages for the state. More recently, this last April then legislation declared the decline of Native languages an emergency. My daughter was born in 2016 and the State of Alaska will not recognize her name on her birth certificate or state documents because it is spelled with an Iñupiaq atchanat. Names are significant and often hold great meaning to families. The special characters change the meaning of the word. I have written letters to senators, representatives, and spoken to Commissioner Johnson in person, but I am only one voice. I am asking as a borough, a collective voice, pressure the state to recognize the atchanat on birth certificates and state documents. | NA | NA | This is outside the scope of this plan. However, the comment has been forwarded to the NSB Administration. |
| 87 | | Page 24 NSB boundary. Older maps show boundary ends after AIN. Page 62 – 63. Map. Page 109. Need new map boundary lines. | NA | NA | The boundaries shown on the Vicinity map is the official NSB boundary. The boundary on Map 3 is the Area of Influence for the NSB – the compilation of all the village areas of influence as well as areas outside of the borough boundary, such as Hanna Shoal, Ambler Mining District, and offshore oil and gas leases. Activities in these areas impact, or influence, residents of the North Slope. |