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FINAL

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM
Environmental Health & Engineering

Akiak Water & Sewer Service
Preliminary Engineering Report

Prepared for: ANTHC DEHE
Delivery Order: #18-D-98460
Project# AN 16-089

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Acronyms and Abbreviations

ADEC	Alaska Department of Environmental Conservation
ANC	Akiak Native Community
ADLWD	Alaska Department of Labor and Workforce Development
AVCPRHA	Alaska Village Council Presidents Regional Housing Authority
City	City of Akiak
DCCED	Alaska Department of Commerce, Community and Economic Development
DCRA	Division of Community and Regional Affairs
° F	degree Fahrenheit
FY	Fiscal Year
gpd	gallons per day
gpcd	gallons per capita per day
gpm	gallons per minute
HDPE	high density polyethylene
IHS SDS	Indian Health Service Sanitation Deficiency System
kW	kilowatt
NEPA	National Environmental Policy Act
NPV	net present value
O&M	operation and maintenance
PER	Preliminary Engineering Report
PWS	Public Water System
ROW	right-of-way
R&R	repair and replacement
SHPO	State Historic Preservation Office
USACE	United States Army Corps of Engineers
USDA RD	United States Department of Agriculture Rural Development
WTP	water treatment plant

References

Alaska Department of Commerce, Community and Economic Development, Division of Community and Regional Affairs (DCRA). Accessed Jan 2018. *Community Database: Akiak <https://www.commerce.alaska.gov/dcra/DCRAExternal/community/Details/f35f3e25-97e9-423d-8a37-f06d15b4edbf>*

Alaska Department of Commerce, Community and Economic Development, Division of Community and Regional Affairs (DCRA). Accessed Jan 2018. *Community Profile Maps: Akiak <https://www.commerce.alaska.gov/web/dcra/PlanningLandManagement/CommunityProfileMaps.aspx>*

Alaska Department of Labor and Workforce Development, Research and Analysis Section. *Alaska Population Projections 2015 to 2045.* April 2016.

Thomas TK, Ritter T, Bruden D, Bruce M, Byrd K, Goldberger R, et al. Impact of providing in-home water services on the rates of infectious diseases: results from four communities in Western Alaska. Journal of Water Health. 2016. Accessed Feb 2018. *<http://dx.doi.org/10.2166/wh.2015.110>*

URS *City of Akiak Hazard Mitigation Plan.* Prepared for the City of Akiak, Alaska June 2013.

1.0 PROJECT PLANNING

1.1. INTRODUCTION

In October of 2017, the Alaska Native Tribal Health Consortium (ANTHC) contracted with LCG Lantech Inc under Delivery Order #18-D-98460 to prepare a Preliminary Engineering Report (PER) to assess sanitation alternatives for six existing unserved homes and eight additional subdivided lots within Akiak Subdivision on behalf of the community of Akiak.

The six existing homes in Akiak Subdivision are currently owner occupied. The owners and occupants of these homes currently utilize individual self-haul (honey bucket) methods for water and for sewer which presents significant challenges to maintain public health and to provide a suitable sanitation level of service and cleanliness for these owner-occupied homes.

The PER planning document is required of applicants requesting funding under the USDA RD Water and Waste Disposal program as required by 7 CFR 1780.33(c) and 1780(55). The PER describes the proposed project, analyzes alternatives, outlines project costs, and provides information vital to the underwriting and grant application process.

This PER planning document shall be developed in accordance with USDA RUS Bulletin 1780-2, Preliminary Engineering Reports for the Water and Waste Disposal Program.

1.2. LOCATION

Akiak is located on the west bank of the Kuskokwim River, 42 air miles northeast of Bethel, on the Yukon-Kuskokwim Delta. It lies at approximately 60.91222 North Latitude and -161.213890 West Longitude (Sec 32, T010N, R067W Seward Meridian). Akiak is in the Bethel Recording District. Community mapping for Akiak is included in Appendix A.

The Akiak airport has a gravel runway, measuring 3,196 feet long by 75 feet wide, at an elevation of 30 feet. The airport provides chartered or private air access year-round. Ravn Air and Grant Aviation offer passenger flight service. Snow machines, ATVs and skiffs are used extensively for local transportation to nearby villages. There are no docking facilities in Akiak.

The project planning area for this project is contained within three previously recorded plats. Akiak 2015 Subdivision (plat # 2017-08); Akiak 2011 Subdivision (plat 2012-23) and Akiak 2008 Subdivision (plat 2008-16). The lots to be served by water and sewer include Lots 7A through 10A of plat 2008-16; Lots 7B through 10B of plat 2012-23; and Lots 1 through 6 of plat 2017-08.

An overall site plan of the Akiak Subdivision project planning area, along with copies of each subdivision plat is contained in Appendix B for general reference.

1.3. ENVIRONMENTAL RESOURCES PRESENT

History and Culture

Akiak is a Yup'ik Eskimo community that relies strongly on fishing, hunting and wild harvest subsistence for both food sources and income. Akiak was originally known by its Yup'ik name, Ackiagmute, which had a population of 175 residents in 1880. The name Akiak (Akiaq in Central Yup'ik) means 'the other side', since the area was used as a crossing to the Yukon River basin during the winter for area eskimos. (DCCED/DCRA). The Akiak Post Office was established in

1916 and a Public Health Service hospital was built in the 1920's. The City was incorporated in 1970.

The 2010 census recorded 346 residents, with a median age of 25.8 years. The population is expected to remain steady with the largest percentage of the population being under 34 years of age. Approximately 93% of residents recognize as Alaska Native or Indian (AK Dept of Labor). Primary language is Central Yup'ik. The 2010 Census noted 98 existing housing units with 90 active households and 69 family households. Per the 2010 census the average household had 3.84 individuals. The most recent 2017 population estimate for Akiak is 394 (DCCED/DCRA webpage).

The City of Akiak is incorporated as a Second-Class City within the Bethel Census Area. The Akiak Native Community (ANC) is a Federally Recognized Tribe. The ANCSA Village Corporation is Kokarmuit Corporation and the ANCSA Regional Corporation is Calista Corporation. Akiak is part of the Yupiit School District.

Most of the year-round employment in Akiak is with local government (69%), trade/transportation/utilities (16%), financial/business services (6%), educational/health services (3%), natural resources/mining (2%) and Other (4%) (DCRA, 2016). Commercial fishing and BLM fire-fighting also provide seasonal income.

Climate and Weather

Akiak falls within the western transitional climate zone, which is characterized by tundra interspersed with boreal forests, and weather patterns of long, cold winters and shorter, warm summers. The area temperatures range from a winter low of -2 degrees Fahrenheit in January to a high of 62 F in July. The area receives an average of 16 inches of precipitation and 50 inches of snowfall annually.

Flood, Erosion and Seismic Hazards

The City experiences yearly erosion impact from spring thaw river ice breakup and ice jam flooding. The 2012 flood season removed a 150' portion of the original cemetery, including a portion of the fuel header embankment and one house. (Akiak HMP, 2013). The project area is located over 2100 LF from the main Kuskokwim River areas experiencing erosion and thus would not be subject to erosion from river ice erosion.

The US Army Corps of Engineers Flood Hazard Data notes the flood of record for Akiak was the ice jam flood of 1964 which reached an elevation of 35.2 mean sea level (MSL) (Alaskan Community Flood Hazard Data, USACE 2000). The six existing unserved homes within Akiak Subdivision were constructed by with finish floor (FF) elevations that are at or above the USACE recommended building elevation of 37.2 which is 2' above the flood of record elevation of 35.2 MSL. While the planned project area is within the flood of record floodplain, it is not subject to seasonal bank or ice breakup erosion.

Akiak is in a region that is less active seismically than other areas and there are no City records of any earthquake activity that resulted in damage or injuries. (Akiak HMP, 2013).

Vegetation and Wetlands

The proposed project area lies within upland growth consisting primarily of cottonwood, alder and some birch with shrub brush and grasses. The existing roads and housing in Akiak Subdivision are constructed on uplands. Prior agency permitting in Akiak done for the AVCPRHA FY2015 housing project indicated that the COE's preliminary jurisdictional determination (PJD), confirmed that jurisdictional wetlands were present in the project area which requires a USACE fill permit. Any future project alternative selected would qualify to be permitted under the current Corps General Permit (GP 2007-541-M1) for discharge of fill material into wetlands because the project would be considered a government initiated residential community development with less than a five-acre footprint, with individual house pads not exceeding 0.30 acre for each house and the total roadway length is less than 2000 feet.

Historic Sites

There are no known historic sites within the planned project area. This will be confirmed in the environmental review documentation.

Endangered Species and Critical Habitat

The Alaska Native Tribal Health Consortium (ANTHC) is conducting a preliminary environmental review (ER) associated with the proposed project in accordance with the National Environmental Policy Act (NEPA and any relevant State and local regulations. ANTHC will review USFWS and ADF&G databases to confirm there are no federally-listed endangered or threatened plant or animal species in the project area.

In general, much of the project areas that would be affected by implementation of the preferred project already has some existing development such as existing gravel roadways, residential housing and utilities present. Project will require the removal of some brush and shrubs for installation of utilities along with some gravel fill material for extension of existing gravel access roadways.

At this PER assessment level of development, there are no known significant environmental resources present within the proposed project planning area that would impact the design or construction of the selected alternative.

1.4. POPULATION TRENDS

The annual Akiak population growth has remained relatively steady for the last 20 years. From 1990 to 2000 the growth was 0.80%. From 2000 to 2010 it was 1.23%. Annual growth rate for the 20-year period from 1990 to 2010 was 1.07% using a linear fit approximation. The most recent Alaska population projection from 2015 to 2045 for the Bethel census area projects annual growth of 0.91% for 2015 to 2035 and 1.05% growth for 2015 to 2045. (Alaska Department of Labor and Workforce Development April 2016). The 2016 village population was estimated at 383 and the 2017 population is estimated at 394 residents per DCCED. For planning level purposes of this report, the historical 20-year annual growth rate of 1.07% was used to estimate growth for the period from 2010 to 2035. Akiak population is projected to be approximately 453 in 2035. See Chart 1.4.1 below.

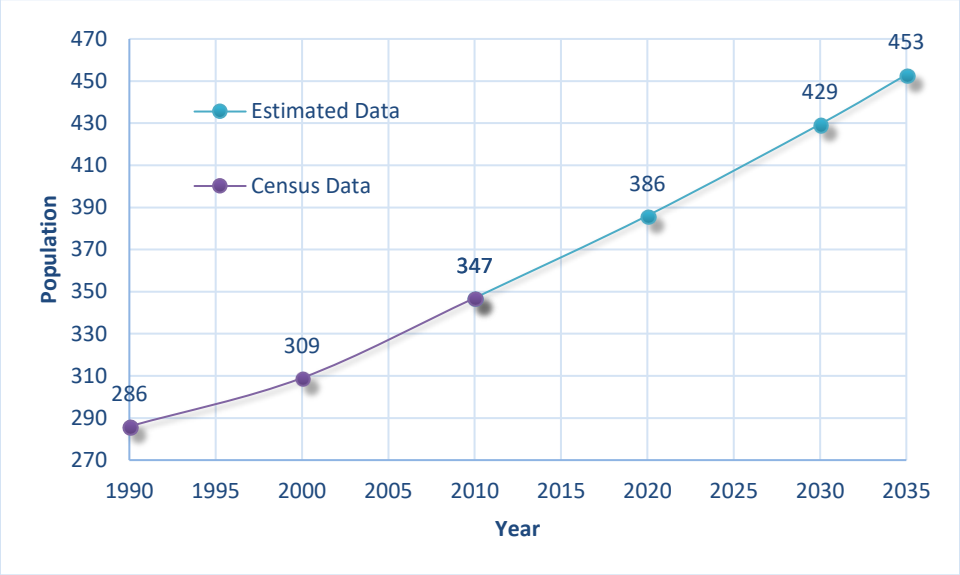


Chart 1.4.1 - Akiak Historic and Projected Population Trends

Sources:
1. US Census 2010 Alaska Department of Labor and Workforce Development,
2. Alaska Population Projections 2015-2045, Alaska Department of Labor and Workforce Development, Research and Analysis Section. April 2016.
3. State of Alaska DCCED/DCRA population data

1.5. COMMUNITY ENGAGEMENT

ANTHC representatives have engaged the Akiak Native Community, including the IRA Tribal Council, City of Akiak and village stakeholders in the project planning process and have the village endorsement in moving forward with the PER development phase. The need for the project has been evident since construction of new residential housing under the AVCPRHA regional housing program that added four homes in 2012 and two additional homes in 2016. ANTHC representatives have made prior visits to discuss sanitation infrastructure. ANTHC representatives are planning to visit the community again in the spring of 2018 to discuss the PER process along with other ongoing ANTHC and RUBA coordination activity.

2.0 EXISTING FACILITIES

2.1. LOCATION MAP

Community maps of the village of Akiak, along with existing overall site utility maps of both the existing water loops and existing sewer facilities, are included in Appendix C for general reference.

2.2. HISTORY

Previously up until the mid-1980's Akiak sanitation consisted primarily of self-haul methods including honey bucket haul along with some individual wells and septic systems. A new community well was established in 1985. A new Water Treatment Plant (WTP) and watering point was completed in 1986. A laundromat and restroom in a community building facility was added in 1986.

A community haul system was established in 1986 that provided truck haul to the school and some of the residents although many residents continued to utilize self-haul methods. Individual wells, septic systems and plumbing were installed in 14 HUD homes in 1997. The City provided septic pumping service as needed. Sewage disposal was by septic tanks, privies or honey buckets during this time.

In 2004-05 planning began to design and implement phased construction improvements to develop piped water loop mainlines and piped gravity sewer systems to serve approximately 69 existing homes. Piped water improvements (AN 98-B82; AN 99P39) were completed in 2008-09 and included installation of 6-inch arctic waterline mains (water loops 1 and loop 2). Sewer improvements completed in 2008 included 8-inch piped gravity sewer, 4-inch force main sewer and a new sewage lagoon. A 150,000 gallon water storage tank provides potable water storage from two community wells.

Water Treatment Plant facility upgrades were completed in 2009 (AN 06-ND2), that added new treatment systems and capacity improvements to improve existing water treatment efficiency and to meet the increased demand from the newly piped community.

In the fall of 2010, the Alaska Village Council Presidents Regional Housing Authority (AVCPRHA) completed a mainline extension of the existing piped water and sewer mains within Akiak Subdivision. This sanitation project added piped water and gravity sewer to serve eleven lots within Akiak Subdivision (Lots 1A to 6A and lots 11 to 15). A short segment (33 LF) of 2" force main and a packaged duplex lift station was included to connect the two 8" gravity sewer pipe segments. A total of nine new utility service connections to existing homes within Akiak Subdivision without sanitation services, was included in this 2010 project.

AVCPRHA's subsequent housing projects for FY 2011 (2012) and FY 2015 (2016) constructed another six new 4-bedroom housing units within Akiak Subdivision under their Home Mortgage Home (HMH) program. The six homes built by AVCPRHA, utilizing HUD funding, are native-owned and would be considered H-1 homes under the Indian Health Service SDS system. These homes were all provided with interior plumbing and fixtures at time of construction. Some minor interior plumbing would be required for service connections. AVCRPHA was not able to obtain grant funding to extend existing mainline water and sewer to serve these six homes. The residents of these six homes are currently utilizing self-haul (honey bucket) methods for general sanitation.

2.3. CONDITION OF EXISTING FACILITIES

The Akiak community water system is identified by the State of Alaska as Public Water System AK 2272005. The system is classified as a Class 2 ground water system with two wells and 64 service connections (58 residential and 6 government accounts).

Water Source

The community water source is from two wells (well 3 and well 5) which have production capacities of 60 gpm and 80 gpm respectively. The well raw water properties indicate the water is high in iron and manganese. Treatment brings the iron and manganese levels to below the State of Alaska MCL of 0.3 mg/L and 0.05 mg/L respectively. The old well 2 was capped as part of the 2008 water plant upgrades and is no longer in service.

Water Distribution

The existing water distribution system for Akiak consists of a 150,000-gallon water storage tank, water treatment plant, backwash lagoon and two circulating piped water loops. Loop 1 has approximately 8160 LF of 6-inch HDPE Arctic Pipe that serves 26 homes. Loop 2 has approximately 7520 LF of 6-inch HDPE Arctic Pipe that serves approximately 52 homes. The buried mainline water loops completed in 2008 are in good operational condition with significant usable design life remaining

The most recent water plant improvement project (AN 06-ND2) completed in 2008-2009 included plant treatment upgrades, new pressure filters, backwash pumps and a new chemical injection system to meet the demands of the new piped system. Per design criteria from project AN 06-ND2, the WTP has the capacity to serve up to 478 residents at 60 gpcd or 28,680 gpd for Average Daily Design Flow and a Maximum Daily Flow (2X Average Daily) of 57,360 gpd. The Average Design Hourly Flow is 1195 gph. The plant can handle a maximum peak hourly flow of 5975 gph (5X Design Hourly). Well production capacity is 60 gpm from well 3 and 80 gpm from well 5 with a water storage capacity of 150,000 gallons.

Wastewater Collection

The existing community wastewater collection and treatment system consists of a piped gravity sewer system, a 5.7-acre two cell sewage lagoon and 2000 feet of 4-inch lagoon force main with a lift station. The buried gravity sewer consists of 8-inch HDPE arctic pipe. Sewage force main inflow was designed to meet a maximum hourly inflow of 69 gpm at a design water usage of 60 gpcd. These facilities were completed in 2008 and are considered to be in good operational condition.

Akiak Subdivision Sewer and Water

The most recent sewer and water pipe extension within Akiak Subdivision was completed in November of 2010 to serve lots 1A to 6A and lots 11 to 15. The package station installed consisted of duplex 2.7 hp 3-phase grinder pumps configured to run on 230V single phase power. Each pump has a peak capacity of 65-gpm with a best efficiency point of 42.7 gpm. The pump manufacturer recommends 15 starts per hour or less for each pump (Flygt MP 3068-890). The lift station sump basin has approximately 123 gal of usable sump capacity. Thus, using 15 starts/hr x 123 gal gives 1848 gal/hr or 30.8 gpm for each pump. This equates to a net 61.6 GPM flow capacity for the existing duplex pump configuration.

Currently, nine (9) existing homes in Akiak Subdivision are being served with piped water and sewer from the 2010 utility extension. Per the 2010 census, the average household size was 3.84 residents, which at 60 gpcd would generate 230 gpd/home. At full buildout there may be up to 23 homes (9 existing houses plus the 6 unserved homes and the 8 future lots), that would generate a maximum daily flow (2X average daily demand) of 7.35 gpm, with a peak hourly flow of 18.4 gpm (5X average daily). The 23 future homes are easily served by the existing lift station. Using 70 homes as a comparison, the maximum daily flow would be 22 gpm with a peak hourly (5X average daily) flow of 56 gpm. Future platting development to extend Akiak 2015 Subdivision to the west for additional housing could still be handled by the existing lift station in Akiak Subdivision.

Solid Waste Landfill

The City operates a 2.7-acre Class III solid waste landfill, located on the east side of the community at the end of Unnamed Street. Landfill is located just northwest of the four undeveloped lots (lots 7B - 10B) in Akiak 2011 Subdivision and is 210 feet from the nearest house. This landfill was permitted by the Alaska Department of Environmental Conservation (ADEC) under Permit SW3A179-22 issued on June 2017 and valid until June 2022. The landfill is authorized to accept municipal waste, ash, construction and demolition (C&D) waste. Medical waste, asbestos containing material, used oils, polluted soils, hazardous waste, lead-acid batteries, PCBs, septage/sewage solids and bulk liquids are prohibited. The landfill is 2970 feet from the Kuskokwim River and over 2900 feet from the areas experiencing erosion. A copy of the solid waste permit is provided in Appendix C.

Water, Energy and Waste Audits

ANTHC completed an energy audit for the Akiak Water Plant in 2011. The audit identified nine items that had an estimated installed price of $18,480 (2011 Dollars) and an average annual energy savings of $8,861. In 2012, a heat recovery system was installed in Akiak. This system serves the tribal council building, water plant, and washeteria and is estimated to offset over 3,000 gallons of fuel in the water plant annually. In 2015-2016, ANTHC received funding to further implement the identified energy improvements and provide onsite operator training in the areas of boilers, fuel systems, water plant operations, and electric heat. The power utility does not charge the water utility for recovered heat.

2.4. FINANCIAL STATUS

The Akiak Native Community (ANC) IRA Tribal Council operates the water and sewer utility service in Akiak and is a member of the State of Alaska DCCED/DCRA RUBA Program. The City operates the local electrical utility. IRA finances are budgeted within the following categories: General Fund, Community Council, Public Safety, Water/Sewer and various Grant programs (BIA, EPA OVW, CTAS). City finances are budgeted within the following categories: Administration and Finance, Akiak Power Utility Income and Expenses, City Council, Gaming and Public Safety.

Financial information for the City of Akiak and the Akiak Native Community IRA is contained in Appendix D

An estimated utility budget for 2018 by the ANC IRA is included in Appendix D. A summary of the IRA estimated utility budget for 2018 is presented in Table 1 below.

Table 1 - ANC IRA Water and Sewer Estimated Budget 2018

Expense	FY 2018 Expense	Income / Revenue	FY 2018 Revenue
WTP Operators (2 staff) salaries	$53,972	$2 Token x 2 token/day x 365 days	$1,460
Lift Station Operator (40 hr/mo x12 mo)	$13,901	Yupit School District	$80,000
Workman's Comp $315/mo x 12 mo	$3,774	Rural Cap Inc.; $150/mo	$1,800
Contact Labor	$10,000	City of Akiak; $150/mo	$1,800
Travel/Training Expenses	$2,488	Akiak Clinic; $150/mo	$1,800
Electricity (8500 kW/mo x $0.60/kW x 12)	$61,200	Akiak Native Community; $150/mo	$1,800
Fuel Supplies	$6,120	Police Station; $105/mo	$1,260
Testing Fees	$3,204	58 households x $105/mo x 12mo	$73,080
Postage / Freight	$1,280		
Water / Lab Fees	$1,520		
Total Expenses	**$162,459**	**Total Income**	**$163,000**

The FY 2016 Budget for the City of Akiak is summarized in Table 2.

Table 2 - City of Akiak Budget Revenue and Expenses

Expense Category	FY 2016 Revenue	FY 2016 Expenses		
Administration and Finance	$220,177	$176,183		
Akiak Power Utility	$372,635	$363,738		
City Council	$0	$26,400		
Gaming	$266,398	$258,622		
Public Safety	$0	$17,551		
Grant FY 2016	$0	$0		
Total	**$859,210**	**$842,494**		

Financial information for the City of Akiak and the Akiak Native Community IRA is contained in Appendix D

3.0 NEED FOR PROJECT

3.1. HEALTH, SANITATION, AND SECURITY

There are currently no piped utilities to serve the existing six home sites or the eight additional lots within Akiak Subdivision. When originally constructed, all six homes were provided with interior plumbing and fixtures for water and sewer service. The interior house plumbing is still in usable condition at this time, with some interior plumbing that would be required as part of a future utility service connection. Residents living in these six existing homes must utilize self-haul (honey bucket or similar) methods for basic sanitation and waste handling as well as requiring the residents to provide self-storage of potable water for drinking and sanitation use.

This existing condition has significant public health and safety concerns for the residents and the community of Akiak. It is understood by many State and Federal health professionals and agencies that a lack of running water and indoor sanitation services increases the rates of disease and waterborne illness in rural communities as well as the costs of healthcare (Thomas et al, Journal of Water Health, 2016).

The community has identified a need to resolve these public health concerns and address the sanitation level of service for those residents living in homes without running water and sewer.

Providing water and sewer service to the unserved homes within Akiak Subdivision would improve community health and safety, increase sanitation service levels and enhance the quality of life for the entire community of Akiak.

3.2. AGING INFRASTRUCTURE

Aging infrastructure is not an issue in Akiak. As noted in Section 3.3, the existing WTP, the piped water loops and the piped sewer utility infrastructure are less than 10 years old and are in good condition with significant useful life remaining for those utilities. The Akiak Subdivision piped sewer and water utilities are less than 8 years old and are also in good condition.

3.3. REASONABLE GROWTH

For the 20-year period 1990 to 2010, the community has grown at an average rate of 1.07%. Current village population is approximately 384 per DCCED estimates as outlined in Section 2.3. The 2030 population is estimated at 429 assuming the previous 20-year average annual growth rate of 1.07%. The ANC would like to provide water and sewer service to the existing and future homes within Akiak Subdivision.

Extending the water and sewer mains to serve the six existing homes and the eight additional lots could potentially add up to 14 new customers to the existing utility customer base which is currently at approximately 59 customers. The extension alternative would generate additional utility revenue for the ANC to operate the water and sewer facility and could potentially help mitigate utility rate cost increases in the future.

4.0 ALTERNATIVES CONSIDERED

4.1. DESCRIPTION OF ALTERNATIVES

For purpose of this PER, four alternatives were considered to address the sanitation needs of the previously noted residential properties within Akiak Subdivision.

1. Extension of piped water and gravity sewer for 6 homes only.
2. Extension of piped water and gravity sewer for 6 homes plus 8 additional lots.
3. Extension of piped water and gravity sewer for 6 homes plus 8 additional lots using combination of gravity sewer and a duplex lift station with force main sewer.
4. No-Action alternative.

Alternative 1 – Extension of Piped Water and Gravity Sewer for six homes.

This option would consist of extending the existing water loop and gravity sewer to serve the six existing unserved houses in Akiak 2015 Subdivision. The circulated water main and sewer mains would consist of HDPE arctic pipe with Aluminum Spir-l-ok or HDPE outer jacket. The mains would be sized for development of the subdivision which would be 8-inch gravity sewer and 6-inch circulating water main buried 3 to 6 feet deep and backfilled with native fill.

The water portion for this alternative would continue the extension of Loop 2 in Akiak Subdivision from 2010 and would require about 465 ft of looped water (930 feet total) to connect the six unserved homes within Akiak Subdivision to the existing utility. The water service lines to each house would include a small circulation pump inside each house for circulation. Electric heat trace powered from the house panel would provide backup thaw protection for the service lines.

Since the estimated pipe head loss for the Alternative 1 water main extension is relatively small (1.7 feet or < 1psi) at normal flow, the existing plant distribution and circulation system would likely not require upsizing to handle the additional load. The existing water plant heat exchanger capacity would be confirmed during design and, if necessary, increased to handle the additional heating load.

The sewer portion for this alternative would require installation of 595 feet of 8-inch gravity sewer main and 4-inch services to each house. The sewer main extension would connect into the existing gravity sewer line in Dummocks Street. Locally available fill material would be added to provide minimum cover depth and to provide vehicle access for utility maintenance. Pipe cover depth would be 2.5 to 5 feet for the sewer extension. Additional fill, such as a 6-inch surface wear course, would be provided by AVCPRHA or others when the housing units are constructed. A preliminary plan of Alternative 1 is shown on Figures 2 and 3 in Appendix G.

Alternative 2 - Extension of Piped Water and Gravity Sewer for six homes plus eight lots.

Alternative 2 is similar to Alternative 1 but it further extends the water and sewer main lines to serve the remaining eight undeveloped lots within Akiak 2015 Subdivision.

The water option would consist of extending the existing water loop and gravity sewer to serve the six existing unserved houses in Akiak Subdivision plus eight lots for future residential housing. The water portion for this option would continue the extension of Loop 2 in Akiak Subdivision and would require about 825 LF of looped water (1,650 LF total) to connect the six unserved homes and the remaining four lots within Akiak Subdivision.

Since the estimated pipe head loss for Alternative 2 is relatively small (3' or 1.5 psi) at normal flow, the existing plant distribution and circulation system would have minimal or no changes to handle the additional load. The existing water plant heat exchanger capacity would be confirmed during design and, if necessary, increased to handle the additional heating load.

The sewer portion for this alternative would require installation of 1,205 feet of 8-inch gravity sewer main. The sewer extension would connect into the existing gravity sewer line in Dummocks Street. Locally available fill material would be used to extend Dummocks Street about 330 feet to help with minimum pipe cover depth and to provide access for utility maintenance. Surface course would be by others when the housing is built. Cover depth over the sewer pipe would range from 2.5 to 5 feet. The existing sewer along No Name Street would be extended 300 feet to serve the 4 lots. A preliminary plan of Alternative 2 is shown on Figures 4, 5 and 6 in Appendix G.

Alternative 3 – Extension of Piped Water and Combination Sewer for six existing homes plus eight lots.

This option would extend the existing water loop and gravity sewer to serve the six existing unserved houses in Akiak Subdivision plus the eight additional lots for future residential housing but would use a combination of gravity sewer and a packaged lift station with 2-inch force main to sewer four of the eight additional lots.

The water portion of this alternative would be the same as described above for Alternative 2.

The sewer portion for this alternative would require installation of 1,205 feet of 8-inch gravity sewer main but would also include 310 feet of 2-inch force main and a packaged lift station unit. This alternative would reverse the sewer grade for a portion of the sewer increase pipe cover depth and reduce the amount of fill material needed for obtaining minimum cover. Cover depth over the sewer pipe would range from 2.5 to 5 feet. The existing sewer along No Name Street would be extended 300 feet to serve the 4 lots.

A preliminary plan of Alternative 3 is shown on Figure 7 in Appendix G.

Alternative 4 – No-Action

The No-Action alternative would maintain the status quo and keep the existing conditions within Akiak Subdivision as is. The six unserved homes would continue to use self-haul for water and sewer sanitation. The No-Action alternative would not involve any capital expense, but it would not provide any health or sanitation improvements for the residents, nor would it address the sanitation deficiencies noted within Akiak Subdivision for the six existing unserved homes.

Operational Requirements and Responsibilities for Alternatives

The utility operator (ANC/IRA) would be responsible for operation and maintenance (O&M) of all piped water and sewer within public right-of-way (ROW). Piped water and gravity sewer piping (Alternatives 1 and 2) generally have low maintenance provided the utility operator maintains annual system checks and recommended maintenance practices. The packaged sewer lift station for Alternative 3 would require weekly monitoring and annual cleaning and pump maintenance inspections.

Individual residents would be responsible for maintaining on property service lines and interior house plumbing once the homes are connected. Service lines and interior plumbing generally have relatively low annual maintenance replacement costs as shown in Table 10 of Section 6.6.

4.2. DESIGN CRITERIA

Design criteria for the water and wastewater improvements community of Akiak is summarized as follows:

- Design Year Population 430 (2030)
- Mean Minimum Temperature -52° F
- Mean January Temperature (min/max) -2 / 19° F
- Mean July Temperature (min/max) 42 / 62° F
- 99% Design Temperature - minus 46°F
- Mean Annual Precipitation - 16 inches
- Mean Annual Snowfall – 65 inches
- Design Freezing Index - 3,500 ° F -days/year
- Design Thawing Index - 2,500 ° F -days/year
- Heating Degree Days – 13,000 ° F -days/year

WATER UTILITIES:

1. Materials of Construction - All materials for water systems shall be NSF 61 approved. Pipelines shall be HDPE arctic pipe with a minimum of 3 inches of insulation. All materials and design features shall be appropriate for arctic conditions.

2. Flow Capacity - The new water main extension shall be a circulating (looped) system with sufficient capacity to handle peak flows in the design year. For water distribution, the design shall avoid major pressure deviation from average operating pressures.

3. Maximum Pressure - Maximum pressures shall not exceed the pressure class for the pipes selected. Normal piping for water systems is rated for 160 psi. HDPE water piping shall be supplied as SDR 11, with a maximum pressure rating of 160 psi at 70 degrees F. For engineering and design purposes, 100 psi will be used for the maximum water pressure. Maximum pressure will typically only be a concern when evaluating fire flows or pressure testing.

4. Residual Pressure - Minimum residual pressures shall not be lower than 20 PSI.

5. Minimum Flow Velocity - Average flow velocity in new pipeline shall be sufficient to operate the circulated service lines for each house connection. The minimum velocity shall be between 1.5 and 2 feet per second. Final design should result in average design velocities in this range.

6. Separation Between Water Facilities and Sewer - In accordance with ADEC requirements, all new facilities shall be designed and constructed with a minimum horizontal separation between water and sewer pipelines of 10 feet and a minimum vertical separation of 1.5 feet. Deviation from this requirement shall be identified to ADEC with a request for a waiver.

7. Fire Flow Capacity - 2-hour duration at 500 gpm, minimum.

8. Hydrant Spacing - 500 feet per International Fire Code recommendations.

9. Water Consumption - Piped Water: 40 gpcd estimated (use 60 gpcd for design).

SEWER UTILITIES:

10. Sewer Flow Velocities. Gravity sewer design slopes and sizing shall be based on a minimum full flow velocity of 2 feet per second. Minimum pipe slope shall be 0.5%.

11. Arctic Pipe. Arctic pipe shall be Spir-l-lock jacketed arctic insulated pipe in accordance with the latest ANTHC/ARUC standard pipe specifications.

4.3. MAP

A preliminary design plan site layout and profile of Alternative 1 (Extension of existing mainline water and sewer utilities) is included in the Appendix B. The haul system would serve the same six homes and eight additional lots as shown for Alternative 1.

4.4. ENVIRONMENTAL IMPACTS

The improvements required for extension of the existing mainline piped utilities in Akiak Subdivision would require standard pipe trenching and excavation for utilities in addition to placement of fill materials for access road and driveway improvements.

The improvements required for implementation of a haul system would require some work inside the housing units and small gravel fill pad for an exterior waste storage tank that would be of minimal impact to the existing project area.

4.5. LAND REQUIREMENTS

The improvements required for Alternative 1 would be fully contained within platted subdivision and/or existing utility easements that were dedicated in prior platting actions within Akiak Subdivision. Water main extensions would all be within an existing 50-foot utility easement. Sewer main extensions would be within existing 40-foot easements within either Unamed Street or Dummocks Street. The latest Akiak plat (Plat 2017-8) depicts all existing utility easement references noted on the preliminary plans. A copy of Plat 2017-08 is contained in Appendix B.

All lots within Akiak Subdivision are owned by the Kokarmuit Corporation. No additional acquisitions of lands or easements would be necessary to implement either Alternative 1 or 2.

4.6. POTENTIAL CONSTRUCTION PROBLEMS

No significant construction problems were encountered in the ANTHC sanitation projects of 2004-2009 nor the 2010 utility extension project in Akiak Subdivision by AVCPRHA. No site impairments or conditions are known that would impact or significantly affect the cost of construction and operation of the proposed alternatives.

4.7. SUSTAINABILITY CONSIDERATIONS

Alternative 1 would add six new customers to the existing customer base and help to increase annual water and sewer utility revenue. The 6 existing homes, constructed in 2013 and 2016 are more energy efficient units that are in relatively close proximation to each other and have higher building envelope insulation, LED lighting and low flow fixtures to help with reducing annual water and energy usage. Energy efficient circulation pumps would be utilized to enhance circulation and improve freeze protection. Heat trace would be only used for emergency back-up to reduce monthly electrical usage.

Alternatives 2 and 3 have higher capital cost but would add eight lots for future housing that would expand the existing customer base of the utility and help to further reduce annual O&M costs.

O&M costs for piped systems are relatively fixed. Adding new customers within a desirable housing density as in Akiak Subdivision will limit the additional piping quantity required and help to reduce capital cost and O&M expense. Increasing the existing customer utility base will help stabilize the monthly utility rate (currently at $105/month for residential water/sewer) and make it less prone to rate increase. ANC/IRA is responsible for collecting rate payments from its customers to maintain the sustainability of the utility.

The existing IRA utility is a self-sustaining utility service per the current 2018 utility budget estimate summarized in Table 1 and shown in Appendix D. The additional revenue generated from adding six or more customers would further improve sustainability by spreading utility costs over a larger customer base and further stabilize current utility rates against future increases.

Water and Energy Efficiency

Waste heat energy recovery from the existing WTP would enhance the utilities overall energy efficiency by providing waste heat reuse for the proposed project while reducing annual fuel usage. All mainline and service piping in the proposed alternatives would consist of buried insulated arctic pipe to reduce heat loss. The 6 homes to be served by the proposed project are also in relatively close proximation to each other and have higher thermal insulation values and low flow fixtures to help reduce annual energy usage and fuel expense overall.

The three proposed project alternatives would improve water and energy efficiency by reducing per capita cost for piped utilities in Akiak while expanding the customer base.

Green Infrastructure

Waste heat energy recovery or reuse in the existing WTP system provides reuse potential for the existing utility system. In 2012, a heat recovery system was installed in Akiak. The system

currently serves the tribal council building, water plant, and washeteria. It is estimated to offset over 3,000 gallons of fuel in the water plant annually. Currently, the power utility does not charge the water utility for recovered heat.

Other

The utility extension alternatives would not require any new or additional operator training to incorporate the additional mainline utility extensions into the existing utility system.

4.8. COST ESTIMATES

Cost estimates for the alternatives described above are summarized in Table 3. The preliminary cost estimates included 12% for construction contingency 5% for project administration, 5% design engineering, 4% construction administration to account for this level of preliminary design documentation. A detailed summary cost estimate for each alternative is included in Appendix E.

Table 3 - Estimated Capital Cost of Alternatives

Alternative Description	Total Project Cost
Alternate 1—Piped Water & Gravity Sewer for 6 existing homes	$ 991,000.00
Alternate 2—Piped Water & Gravity Sewer for 6 existing homes + 8 lots	$ 1,984,000.00
Alternate 3—Piped Water & Combo Sewer for 6 exist homes + 8 lots	$ 2,095,000.00

The project cost estimates for the alternatives can be separated into Water elements and Sewer elements as summarized in Table 4.

Table 4 - Project Cost Breakdown by Water and Sewer

Alternative Description`	Total Water	Total Sewer
Alt 1—Piped Water & Gravity Sewer for 6 existing homes	$ 647,000	$ 344,000
Alt 2—Piped Water & Gravity Sewer for 6 exist homes + 8 lots	$ 1,201,000	$ 783,000
Alt 3—Piped Water & Combination Sewer for 6 homes + 8 lots	$ 1,201,000	$ 894,000

An estimate of annual O&M costs for the alternatives is summarized in Table 5.

Table 5 - Estimated O&M Costs

Alternative Description`	O&M Cost
Alternate 1—Water/Sewer for 6 exist homes only	$ 7,000
Alternate 2--Water/Sewer for 6 exist homes + 8 lots (gravity)	$ 10,700
Alternate 3--Water/Sewer for 6 exist + 8 lots (gravity + FM/Lift)	$ 12,000

Cost estimate details and O&M assumptions for each alternative is included in Appendix E.

5.0 SELECTION OF AN ALTERNATIVE

5.1. LIFE CYCLE COST ANALYSIS

A life cycle cost analysis was completed to compare the net present value (NPV) of each alternative considered. The life cycle analysis summarizes the cost of owning and operating an asset for its usable lifespan or for a chosen planning period. The planning period used for this analysis was 20 years. The NPV equation is summarized as:

$$NPV = C + USPW (O\&M) – SPPW (S)$$

where C is the capital cost and USPW (O&M) is the present worth of the uniform series of annual O&M costs and SPPW (S) is the single payment present worth of the salvage value.

Life Cycle costs for the Alternatives described prior are summarized in Table 6.

Table 6 - Estimated Life Cycle Costs

Alternative Description	Life Cycle Cost
Alternate 1—Piped Water & Gravity Sewer for 6 existing homes	$ 652,000.00
Alternate 2—Piped Water & Gravity Sewer for 6 existing homes + 8 lots	$ 1,168,000.00
Alternate 3—Piped Water & Combo Sewer for 6 exist homes + 8 lots	$ 1,226,000.00

A summary of the life cycle cost analysis is summarized in Appendix F.

5.2. NON-MONETARY FACTORS

Non-monetary factors considered in the selection of the preferred alternative included:

- Performance – Provides the most public health and safety for the community.
- Sustainability – Minimizing user fees for operation and maintenance of the utility to enhance sustainability.
- Adaptability – Alternatives fit with Akiak community expansion and development plans.
- Funding Viability – Likelihood of obtaining USDA RAVG construction grant funds based on sanitation need and agency criteria.
- Community/Homeowner Preference – buy-in from the resident community.

Each factor noted was assigned a point value from 1 (lowest favorability) to 4 (highest favorability) to determine the alternative that scored the highest total for the factors noted. The result is shown in Table 7.

Table 7 - Non-Monetary Factors Summary

Evaluation Criteria	Alternative 1	Alternative 2	Alternative 3
Performance	4	4	3
Sustainability	3	3	3
Adaptability	4	4	3
Funding Viability	4	1	1
ANC Preference	3	4	2
Total	**18**	**16**	**12**

6.0 PROPOSED PROJECT (RECOMMENDED ALTERNATIVE)

The recommended project is Alternative 1 - Piped Water & Gravity Sewer for 6 existing homes. Alternative 1 has the lowest capital cost, lowest life cycle cost and scores highest for non-monetary factors. Alternative 1 also meets the dire sanitation condition for the 6 existing homes. Alternative 1 also allows for future expansion within Akiak Subdivision by the community to meet short-term or long housing demands as needed due to growth. The lack of existing housing on the eight undeveloped lots in the other alternatives is considered a non-dire sanitation condition that would likely prevent grant funding.

However, including the water and sewer extension to the remaining four lots in Akiak 2015 subdivision may be considered as an additive bid alternative if other funding sources are identified. If the community is considering additional housing for Akiak under AVCPRHA's FY 2019 or FY2020 housing program there may be opportunity for AVCPRHA participation in serving those homes.

The advantages of combining the additional utility work to serve the remaining four lots in Akiak Subdivision with the recommended alternative (Alternative 1) is that it would provide cost savings by administering the work under one project instead of two separate construction project efforts. Mobilization cost savings could be up to $200,000 or more depending on equipment location and the mobilization effort required for the project. This approach would also allow those lots to be connected and served by the utility if new housing is being considered in Akiak for 2019 or 2020.

The cost of extending just the 6-inch water main only is $300,000. Including the four house water services would add $125,000. Including sewer main and service connections to those four lots adds another $145,000. Total cost (design, construction and admin) for water and sewer main with services to the remaining four undeveloped lots along Dummocks Street would total about $570,000. Depending on the availability of these other funding sources and the possible participation of AVCPRHA, this additive option may be worthy of further consideration by ANC.

6.1. PRELIMINARY PROJECT DESIGN

Water

The water portion for the recommended alternative would extend the looped (circulating) water main in Akiak Subdivision about 465 ft (930 feet total length) to connect the six unserved homes to the existing utility. Two fire hydrants would be included. The new circulating water main would consist of 6-inch diameter HDPE arctic pipe with Aluminum Spir-l-ok outer jacket buried 4 to 6 feet deep and backfilled with native fill. The water service lines to each house would consist of circulating ¾ or 1-inch HDPE pipe within 4 x 12 insulated arctic pipe. Small energy efficient circulation pumps would be installed in each house to enhance circulation of the water service and improve freeze protection. Electric heat trace powered from the house panel would provide backup thaw protection for the service lines.

The existing WTP has the capacity to serve 478 residents with a Peak Daily Flow (5X Average Daily) of 143,400 gpd and a maximum peak hourly flow of 5975 gph (5X Design Hourly). There are currently 58 homes (about 224 persons at 3.84 persons per household) and 6 commercial accounts being served. Well production capacity is 60 gpm from well 3 and 80 gpm from well 5 with a water storage capacity of 150,000 gallons. The 6 homes would add 1380 gpd at average

daily demand. No upgrades to the existing well supply, water treatment or storage facilities are required to implement the recommended alternative.

Since the estimated pipe head loss for the proposed project (Alternative 1) is relatively small (1.7 feet or < 1psi) at normal flow, the existing plant distribution and circulation system would likely not require any upsizing to handle the additional water demand. The capacity of the existing circulation system and the water plant heat exchanger would be confirmed during design and, if necessary, increased to handle the additional heating load.

A preliminary water plan of the recommended alternative is shown on Figure 2 in Appendix G.

Sewer

The sewer portion for the recommended alternative would require installation of 595 feet of 8-inch gravity sewer main and 4-inch services to each house. Sewer piping would be insulated HDPE pipe with Aluminum Spir-l-ok outer jacket buried 2.5 to 5 feet deep and backfilled with native fill. The sewer main extension would connect into the existing gravity sewer line in Dummocks Street. Two insulated sewer manholes would be required for the sewer main extension. Minimum pipe slope would be 0.5% for the 8-inch sewer. A small quantity of locally available fill material would be added to provide minimum cover depth. Pipe cover depth would be 2.5 to 5 feet for the sewer extension. Additional fill on the extended Dummocks Street, such as a 6-inch surface wear course, would be provided by AVCPRHA or others when the next housing units are constructed.

A preliminary sewer plan of the recommended Alternative 1 is shown on Figure 3 in Appendix G.

6.2. PROJECT SCHEDULE.

The preliminary project schedule is to complete Design Development and Final Design during 2018 and to complete any environmental documentation per the Environmental Review (ER) document. All required agency permits shall be obtained prior to beginning construction phase.

- Final construction documents ready for bid or force account by April 2019.
- Material Procurement period: April 2019 to June 2019.
- Construction July 2019 to Nov 2019.

Construction of the proposed project (Alternative 1) would ideally, depending on the availability of construction grant funding, be completed in a single construction season to save the added cost of remobilization, equipment and material storage and schedule extensions. The scope of the Alternative 1 project would lend it to being completed in a single season.

6.3. PERMIT REQUIREMENTS

Anticipated permits required for this project include, but not limited to, the following:

- United States Army Corps of Engineers (USACE) Permit under the Corps existing General Permit (GP 2007-541-M1) for discharge of roadway fill material into wetlands for residential and community development.
- ADEC Domestic Wastewater Plan Review per 18AAC 72.010; Approval to Construct and Approval to Operate

- Alaska Department of Environmental Conservation (ADEC) Nondomestic Wastewater Plan Review 18AAC 72.500; Application to Construct and Approval to Operate
- ADEC Storm water SWPPP approval in accordance with the Construction General Permit

Permitting services, including Agency coordination, required applications and final permit approval efforts will be done during Design Development and Final Design phases of the project.

6.4. SUSTAINABILITY CONSIDERATIONS

Water and Energy Efficiency

The proposed project would improve water and energy efficiency by expanding the existing utility customer base and helping to reduce the per capita costs for water and sewer while adding additional utility revenue. Expanding the utility service base would increase the sustainability of the existing IRA utility and would also help to reduce future utility rate costs by spreading annual O&M costs over a larger customer base.

Waste heat energy recovery from the existing WTP and piped system also improves energy efficiency by providing waste heat reuse for the proposed project and helping to reduce annual fuel usage. All mainline and service piping will be buried, insulated arctic pipe to reduce heat loss.

The 6 homes to be served by the proposed project are in relatively close proximation to each other and have higher thermal insulation and low flow fixtures to help with reducing annual water and energy usage overall. Energy efficient circulation pumps would be utilized to enhance circulation and improve freeze protection. Heat trace would be only used for emergency back-up to reduce monthly electrical usage.

Green Infrastructure

Waste heat energy recovery in the existing WTP system provides waste heat reuse for the proposed project. The heat recovery system currently serving the water treatment plant is estimated to offset over 3,000 gallons of fuel in the water plant annually. The power utility also does not charge the water utility for recovered heat.

Other

The proposed project does not require any new or additional operator training to incorporate the proposed project into the existing utility system.

6.5. TOTAL PROJECT COST ESTIMATE (ENGINEER'S OPINION OF PROBABLE COST)

The total estimated project cost of the proposed project (Alternative 1) is $991,000 as summarized below in Table 8. The preliminary cost estimate includes 12% for construction contingency, 5% for project administration, 5% for design engineering and 4% for construction administration to account for this level of preliminary design documentation. A detailed cost estimate breakdown of the recommended project (Alternative 1) is included in Appendix E.

Table 8 - Proposed Project Capital Costs

Category	Cost
Capital Cost Description	
Piped Water Improvements for 6 existing homes	$ 647,000.00
Piped Gravity Sewer Improvements for 6 existing homes	$ 344,000.00
Proposed Project Total Capital Cost	$ 991,000.00

6.6. ANNUAL OPERATING BUDGET

The recommended increase in the IRA operating budget to implement the proposed project is $7,000/year. This would be offset by an estimated $7,560 in new revenue per year for the utility. A description of the income, O&M costs, debt repayments and reserves considered is noted below. A breakdown of the estimated O&M costs for the recommended project is included in Appendix E

Income

The existing user fee for utility service (residential fee for water & sewer is $105/month) will be used to generate the revenue to offset the cost of the additional O&M for the project. Each of the six new customer users will pay the existing monthly rate of $105/month or $1260/year. This will generate a total of $7,560 in new revenue per year for the utility and offset the $7,000 in estimated O&M and R&R expense generated by the recommended project (Alternative 1). The 6 new utility customers would bring the total residential customers to 64 for ANC.

Annual O&M Costs

The annual O&M cost for Alternative 1 was estimated to be $7,000. This estimate includes annual O&M costs and short-lived asset R&R costs. A breakdown of annual O&M cost by utility service type is listed in Table 9. A summary of the assumptions and estimated costs for the O&M and R&R portion for the proposed project is included in Appendix E.

Table 9 - Proposed Project Annual O&M Costs

Category	Cost
Annual O&M Cost	
Piped Gravity Sewer Improvements for 6 existing homes	$ 850
Piped Water Improvements for 6 existing homes	$ 6,150
Total Annual O&M Cost	$ 7,000

Debt Repayments

The ANC IRA Council is intending to seek construction grant funding for the proposed project under the RAVG grant program. The ANC does not intend to take on any new loan obligations for this project.

Reserves

Debt Service Reserve

The ANC IRA Council has no loan obligations associated with the existing water and sewer utility.

Short-Lived Asset Reserve

Replacement costs for short-lived assets were estimated and included in the O&M cost estimate summary that is included in Appendix E. A summary of the estimated costs for homeowners and ANC IRA is shown in Table 10.

Table 10 – Summary of Short-Lived Assets

5 Year Replacement Assets	Unit	Quantity	Cost	Annual Budget
Homeowner				
Misc parts & fittings	EA	1	$100	$20
ANC IRA				
None				$0
			Homeowner	**$20**
			ANC IRA	**$0**
10 Year Replacement Assets	**Unit**	**Quantity**	**Cost**	**Annual Budget**
Homeowner				
House Circulation Pump	EA	1	$200	$20
Misc parts, valves & fittings	EA	1	$200	$20
ANC IRA				
Water Main Circulation Pump	EA	1	$1,500	$150
Distribution & Collection Parts	LS	1	$1,000	$100
			Homeowner	**$40**
			ANC IRA	**$150**
15 Year Replacement Assets	**Unit**	**Quantity**	**Cost**	**Annual Budget**
Homeowner				
Heat Trace replacement	LS	1	$1,950	$130
ANC IRA				
Distribution & Collection Parts	LS	1	$1,000	$100
			Homeowner	**$130**
			ANC IRA	**$100**
Total Annual Homeowner Contribution (5, 10 & 15 Year R&R)				**$190**
Total Annual ANC IRA Contribution (5, 10 & 15 Year R&R)				**$350**

7.0 CONCLUSIONS AND RECOMMENDATIONS

The existing sanitation condition for the unserved residents of Akiak Subdivision has significant public health and safety concerns for those residents and the entire community. Providing water and sewer service to the unserved homes within Akiak Subdivision would improve public health and safety, increase sanitation service levels and enhance the quality of life for the entire community of Akiak.

The recommended project is Alternative 1 -- Piped Water and Gravity Sewer Improvements for 6 existing homes. Alternative 1 has the lowest capital and O&M cost, the lowest life cycle cost and scores highest for non-monetary factors. Alternative 1 also meets the dire sanitation condition for the 6 existing homes that are currently unserved. The proposed project will also allow for future housing lots to be added by plat in Akiak Subdivision by the community to meet long range housing demands as needed.

It is recommended to confirm whether other funding sources can be identified that could augment the proposed project and provide additional value. Constructing the additional mainline piping to include the remaining four lots in Akiak 2015 Subdivision would save costs and allow for any planned housing to be served as well if the ANC is intending to construct new housing units within Akiak Subdivision under AVCPRHA's FY2019 or FY2020 housing program.

Combining the additional utility work with the recommended alternative (Alternative 1) would provide both cost savings and value to the community by administering the work under one project instead of two separate construction project efforts. Cost savings could range up to $200,000 or more depending on equipment location and the mobilization effort required.

END OF REPORT

APPENDICES

Appendix A: Project Area Community Mapping

Appendix B: Overall Site Plan, Akiak Subdivision Plats

Appendix C: Sanitation Facilities Information,

Appendix D: Community Financial Data

Appendix E: Capital and O&M Cost Estimates

Appendix F: Life Cycle Cost Analysis

Appendix G: Water and Sewer Alternatives 1, 2 and 3

Appendix H: Akiak Energy Audit Summary paragraph

APPENDIX A - PROJECT AREA COMMUNITY MAPPING

Community Map
AKIAK

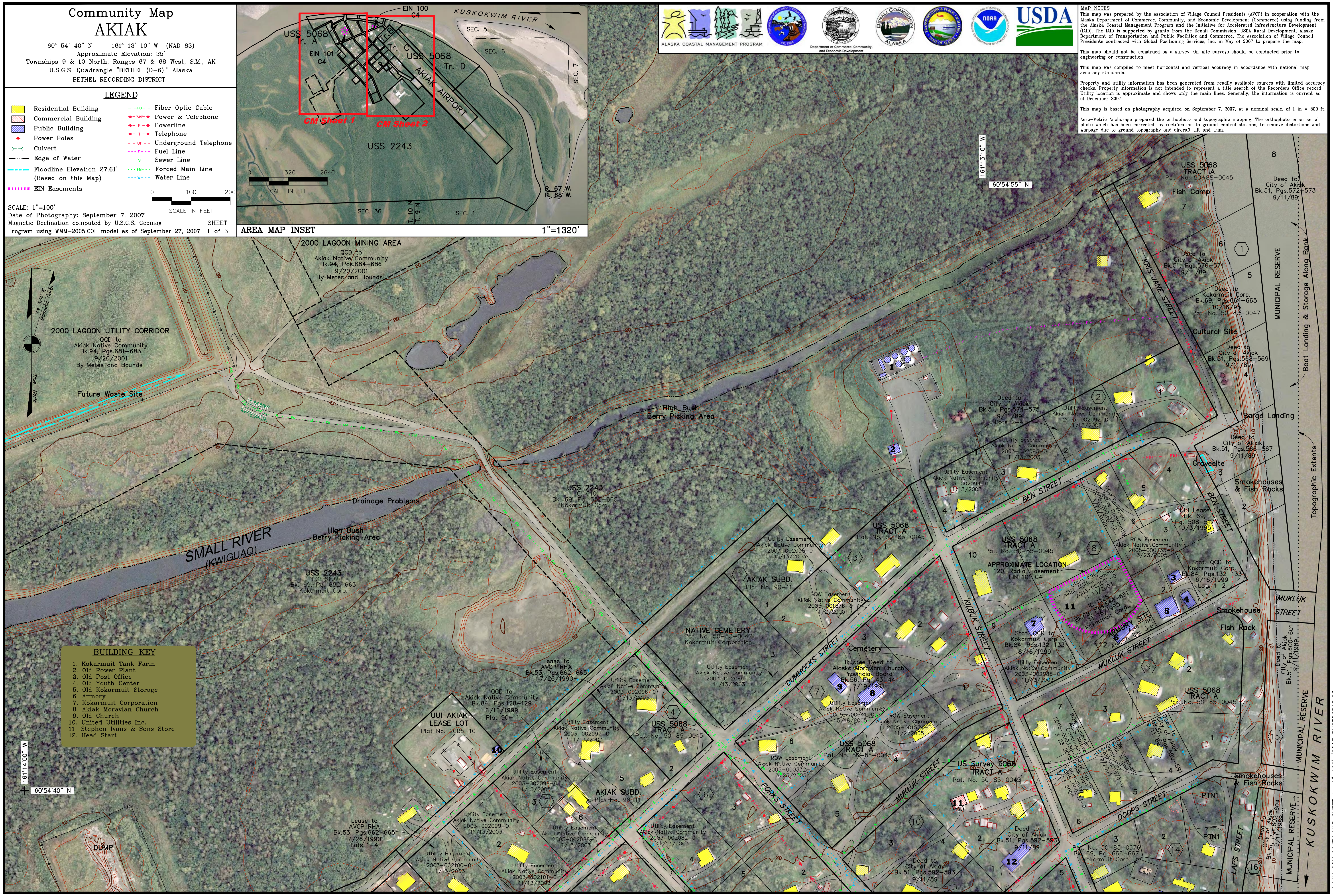
60° 54' 40" N 161° 13' 10" W (NAD 83)
Approximate Elevation: 25'
Townships 9 & 10 North, Ranges 67 & 68 West, S.M., AK
U.S.G.S. Quadrangle "BETHEL (D-6)," Alaska
BETHEL RECORDING DISTRICT

LEGEND

- Residential Building
- Commercial Building
- Public Building
- Power Poles
- Culvert
- Edge of Water
- Floodline Elevation 27.61' (Based on this Map)
- EIN Easements
- Fiber Optic Cable
- Power & Telephone
- Powerline
- Telephone
- Underground Telephone
- Fuel Line
- Sewer Line
- Forced Main Line
- Water Line

SCALE: 1"=100'
Date of Photography: September 7, 2007
Magnetic Declination computed by U.S.G.S. Geomag Program using WMM-2005.COF model as of September 27, 2007

SHEET 1 of 3



BUILDING KEY

1. Kokarmuit Tank Farm
2. Old Power Plant
3. Old Post Office
4. Old Youth Center
5. Old Kokarmuit Storage
6. Armory
7. Kokarmuit Corporation
8. Akiak Moravian Church
9. Old Church
10. United Utilities Inc.
11. Stephen Ivans & Sons Store
12. Head Start

ALASKA COASTAL MANAGEMENT PROGRAM

Department of Commerce, Community, and Economic Development

USDA

MAP NOTES

This map was prepared by the Association of Village Council Presidents (AVCP) in cooperation with the Alaska Department of Commerce, Community, and Economic Development (Commerce) using funding from the Alaska Coastal Management Program and the Initiative for Accelerated Infrastructure Development (IAID). The IAID is supported by grants from the Denali Commission, USDA Rural Development, Alaska Department of Transportation and Public Facilities and Commerce. The Association of Village Council Presidents contracted with Global Positioning Services, Inc. in May of 2007 to prepare the map.

This map should not be construed as a survey. On-site surveys should be conducted prior to engineering or construction.

This map was compiled to meet horizontal and vertical accuracy in accordance with national map accuracy standards.

Property and utility information has been generated from readily available sources with limited accuracy checks. Property information is not intended to represent a title search of the Recorders Office record. Utility location is approximate and shows only the main lines. Generally, the information is current as of December 2007.

This map is based on photography acquired on September 7, 2007, at a nominal scale, of 1 in = 800 ft.

Aero-Metric Anchorage prepared the orthophoto and topographic mapping. The orthophoto is an aerial photo which has been corrected, by rectification to ground control stations, to remove distortions and warpage due to ground topography and aircraft tilt and trim.

AKIAK COMMUNITY MAP SHEET 1 1"=100' (2007 PHOTOGRAPHY)

Community Map
AKIAK

60° 54' 40" N 161° 13' 10" W (NAD 83)
Approximate Elevation: 25'
Townships 9 & 10 North, Ranges 67 & 68 West, S.M., AK
U.S.G.S. Quadrangle "BETHEL (D-6)," Alaska
BETHEL RECORDING DISTRICT

LEGEND

- Residential Building
- Commercial Building
- Public Building
- AK DOT Monument "Runway 2+020 CL 1999"
- High Water Mark
- Power Poles
- Runway Marker
- Light Poles
- Floodline Elevation 27.61' (Based on this Map)
- Sewer Line
- Water Line
- Fiber Optic Cable
- Power & Telephone
- Underground Elec. & Tele.
- Powerline
- Telephone Line
- Underground Telephone
- Edge of Water

0 100 200
SCALE IN FEET

SCALE: 1"=100'
Date of Photography: September 7, 2007
Magnetic Declination computed by U.S.G.S. Geomag Program using WMM-2005.COF model as of September 27, 2007

SHEET 2 of 3

HORIZONTAL AND VERTICAL CONTROL
The horizontal control monument for the digital orthophoto was an NGS OPUS solution for GPS Inc. TBM "Base 1". The horizontal datum NAD 1983 coordinates for this TBM are North 60° 54' 19.0797" and West 161° 13' 38.3637". The vertical control monument was TBM "Base 1". The Geoid 96 elevation for this station is 27.24 feet.

The City of Akiak has been adjusted to this control using high-precision GPS methods and the adjusted coordinates and elevation for AK DOT Monument "Runway 2+020 CL 1999", were calculated to establish a local control reference. The NAD 1983 coordinates for this monument are North 60° 54' 22.1634" and West 161° 13' 24.2763" and the elevation is 27.76 feet.

This map projection is based upon NAD 83, ASP Zone 7 as expressed in US Survey Feet.

The contours were prepared at two (2) foot contour intervals with index contours every ten (10) feet.

FLOOD NOTES
The US Army Corps of Engineers (USACE) report "Alaska Communities Flood Hazard Data 1996", has a published flood of record which occured in 1984 with a flood elevation of 33.2' (27.61 feet based upon this maps vertical control). A flood gauge was placed on the Akiak Library (now residential) with the High Water Elevation at the 27.61 ft. mark.

BUILDING KEY

13. City of Akiak Power Utilities
14. Old High School, Now Corp. Building
15. Old Library
16. Youth Center
17. Old Elementary
18. Old High School Wood Shop
19. Edith Kawagley Memorial Clinic
20. Post Office
21. ANTHC Storage
22. Water Treatment Plant
23. Early Childhood Office
24. Yupiit School District Tank Farm
25. Yupiit School District School
26. Airport Maintenance Station
27. Akiak Native Community

AKIAK COMMUNITY MAP SHEET 2 1"=100' (2007 PHOTOGRAPHY)

Legend & Notes

- Erosion Area
- Periodic Floods
- EIN Easements

MAP NOTES

This map was prepared by the Association of Village Council Presidents (AVCP) in cooperation with the Alaska Department of Commerce, Community, and Economic Development (Commerce) using funding from the Alaska Coastal Management Program and the Initiative for Accelerated Infrastructure Development (IAID). The IAID is supported by grants from the Denali Commission, USDA Rural Development, Alaska Department of Transportation and Public Facilities and Commerce. The Association of Village Council Presidents contracted with Global Positioning Services, Inc. in May of 2007 to prepare the map.

14 3/4° E Magnetic North
True North

SEC. 29 I.C. 610 Kokarmuit Corp.
SEC. 32 I.C. 610 Kokarmuit Corp.
Kuimarvik
SEC. 5 I.C. 610 Kokarmuit Corp.
Salmon Fishing Area
Picnic Area
SEC. 29 I.C. 610 Kokarmuit Corp.
SEC. 32 I.C. 610 Kokarmuit Corp.
KUSKOKWIM RIVER
Cemetery Cultural Site
Barge Landing
Boat Storage & Landing
Barge Landing
Approximate Location 60' Wide Road Easement EIN 100 C4 Bk. 69, Pg. 640-645 10/16/95
US Survey 5068 TRACT B Pat. No. 50-85-0045
Fish Camp
Fish Camps Dog Area
SEC. 8 I.C. 610 Kokarmuit Corp.
SEC. 29 I.C. 610 Kokarmuit Corp.
US Survey 5068 TRACT A Pat. No. 50-85-0045
SEC. 5 I.C. 610 Kokarmuit Corp.
Driftwood Gathering Area
Fish Camp
SEC. 6 I.C. 610 Kokarmuit Corp.
SEC. 30 I.C. 610 Kokarmuit Corp.
Salmon Fishing Area
Approximate Location 120' Radial Easement EIN 101 C4 Bk. 69, Pg. 648 10/16/95
Water & Sewer Storage
PARCEL 1
USS 5068 TRACT D Pat. No. 50-85-0045
Driftwood Gathering Area
Driftwood Gathering Area
Cemetery
US Survey 5068 TRACT C Pat. No. 50-85-0045
(KUMARVIK)
Drainage Problems
Drainage Problems
2000 LAGOON MINING AREA
RECORD OF SURVEY AKIAK AIRPORT Plat No. 2000-11
Swimming Area
AKIAK SUBD. Plat No. 90-11
AKIAK SUBD. 2007 REPLAT
AKIAK SUBD. ADD. No. 1 Plat No. 2000-18
SMALL RIVER (KWIGIJAQ)
YUPIIT SCHOOL DISTRICT AKIAK 2007 SUBD. (UN RECORDED) SCHOOL SITE
2000 LAGOON UTILITY CORRIDOR
Community Dump
SEC. 7 I.C. 610 Kokarmuit Corp.
Future Waste
Drainage Problems
AKIAK CITY BOUNDARY
AKIAK CITY BOUNDARY
Berry Picking Area
Drainage Problems
PARCEL 2 Spcl. Warranty Deed to SOA DOT&PF Bk.79, Pgs.73-76 4/10/1998
Black Fish Trap Area
Berry Picking
Berry Picking
USS 2243 I.C. 610 Bk. 69, Pg. 652-663 Kokarmuit Corp.
Trapping Area Fox, Rabbit, Otter
Berry Picking Area
Berry Picking
R. 67 W.
R. 68 W.
T. 10 N.
T. 9 N.
SEC. 36 I.C. 610 Kokarmuit Corp.
SEC. 1 I.C. 610 Kokarmuit Corp.
SEC. 25 I.C. 610 Kokarmuit Corp.

AREA USE MAP
AKIAK

60° 54' 40" N 161° 13' 10" W (NAD 83)
Approximate Elevation: 25'
Townships 9 & 10 North, Ranges 67 & 68 West, S.M., AK
U.S.G.S. Quadrangle "BETHEL (D-6)," Alaska
BETHEL RECORDING DISTRICT

SEE SHEETS 1 AND 2 FOR DETAILED COMMUNITY MAP

0 400 800 1200
SCALE IN FEET

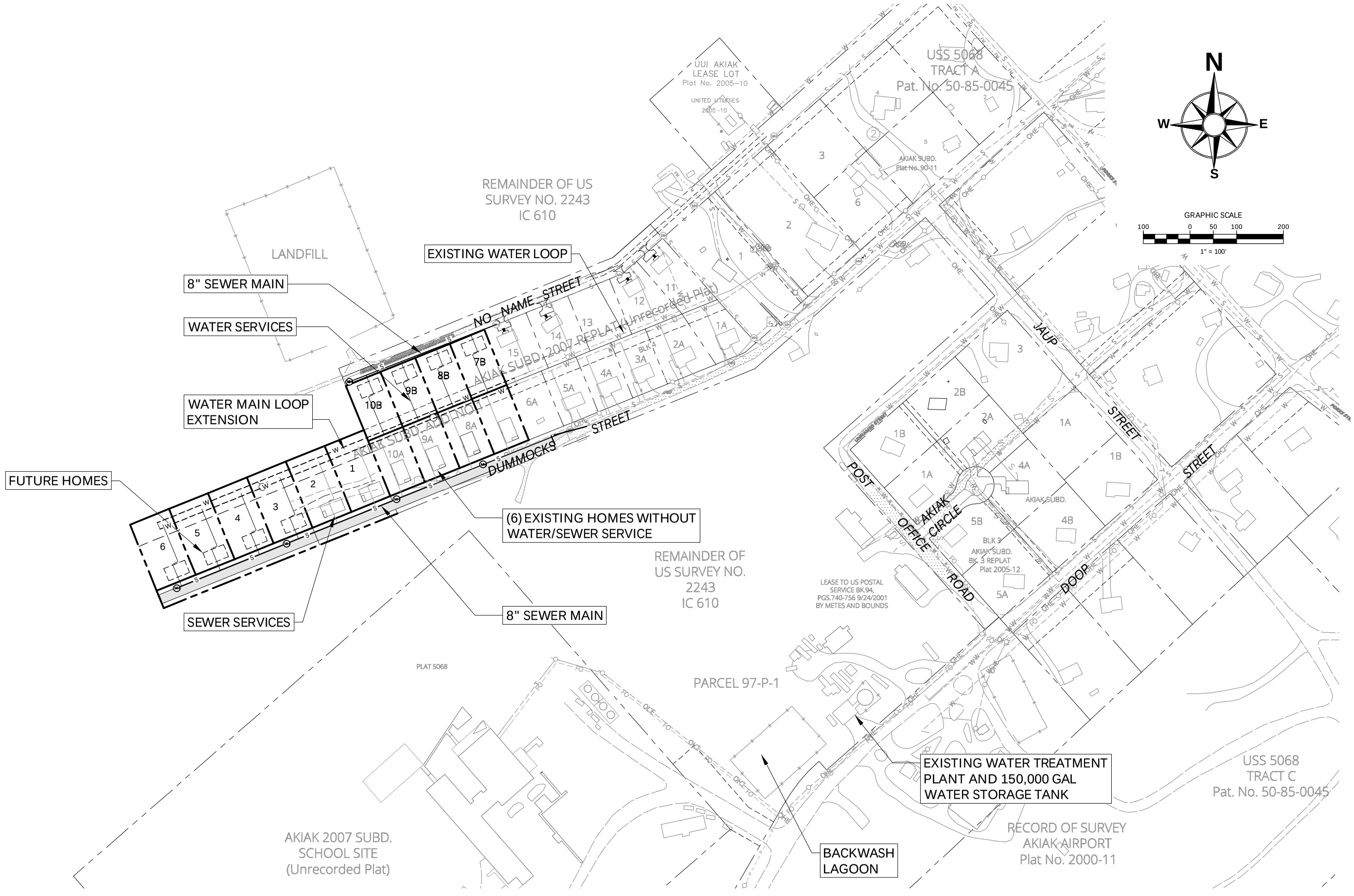
SCALE: 1"=400'
Date of Photography: September 7, 2007
Magnetic Declination computed by U.S.G.S. Geomag Program using WMM-2005.COF model as of September 27, 2007

SHEET 3 of 3

AKIAK AREA USE MAP SHEET 3 1"=400' (2007 PHOTOGRAPHY)

APPENDIX B – OVERALL SITE PLAN, AKIAK SUBDIVISION PLATS

30" x 21" BORDER



1 OVERALL SITE PLAN

1" ONE INCH

NO.	DATE	BY	REVISION

250 H Street
Anchorage, AK 99501
P: (907) 243-8985
F: (907) 243-5629
W: LCGAK.com

11/22/2017 3:34 PM

P:\901-9501\939 ANTHC IDIQ\939.35 Akiak PER\ Civil\DWG\939.35 DSI Akiak PER Design.dwg

LCG Lantech Inc
architecture · engineering · surveying
ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

PRELIMINARY ENGINEER REPORT
AKIAK WATER AND SEWER SERVICE

OVERALL SITE PLAN

SHEET SIZE:	22X34
DESIGNED BY:	DC
DRAWN BY:	CS
CHECKED BY:	DC/DM
DATE:	03.06.18
FILE NO.	939.35

ONE INCH 1"

FIGURE 1

LEGEND

- FOUND SECONDARY MONUMENT (2" ALUMINUM CAP ON 5/8" REBAR)
- FOUND SECONDARY MONUMENT (5/8" REBAR) GOOD CONDITION
- SET SECONDARY MONUMENT
- SURVEYED
- UNSURVEYED
- EASEMENT
- RIGHT-OF-WAY CENTERLINE
- TIE LINE
- XX°XX'XX" (R2) RECORD PER PLAT 2012-23
- XX°XX'XX" (R1) RECORD PER PLAT 2000-18
- XX°XX'XX" MEASURED
- (1) BLOCK NUMBER
- (A) POINT DESCRIPTION
- ROW RIGHT OF WAY

TAX CERTIFICATE

THIS SUBDIVISION LIES OUTSIDE ANY TAXING AUTHORITY AT THE TIME OF FILING.

LCMF L10 B4 2000 (A) — FOUND 2" ALUMINUM CAP ON 5/8" REBAR FLUSH, GOOD CONDITION

LCMF USS 2243 ROW LS6923 2000 (B) — FOUND 2" ALUMINUM CAP ON 5/8" REBAR FLUSH, GOOD CONDITION

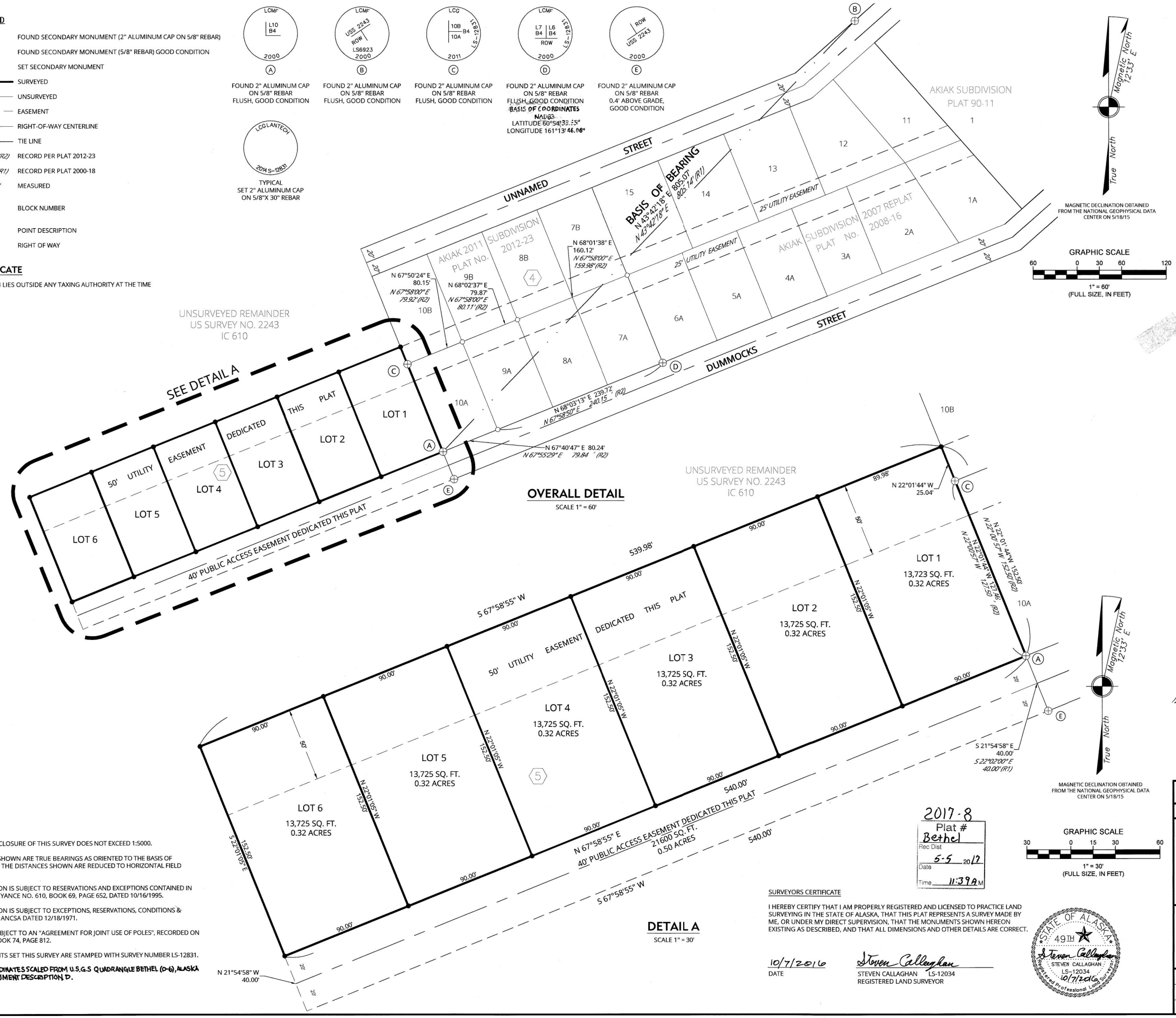
LCG 10B B4 10A LS-12831 2011 (C) — FOUND 2" ALUMINUM CAP ON 5/8" REBAR FLUSH, GOOD CONDITION

LCMF L7 B4 | L6 B4 ROW LS-12831 2000 (D) — FOUND 2" ALUMINUM CAP ON 5/8" REBAR FLUSH, GOOD CONDITION

BASIS OF COORDINATES NAD83
LATITUDE 60°54'33.55"
LONGITUDE 161°13'46.06"

ROW USS 2243 2000 (E) — FOUND 2" ALUMINUM CAP ON 5/8" REBAR 0.4' ABOVE GRADE, GOOD CONDITION

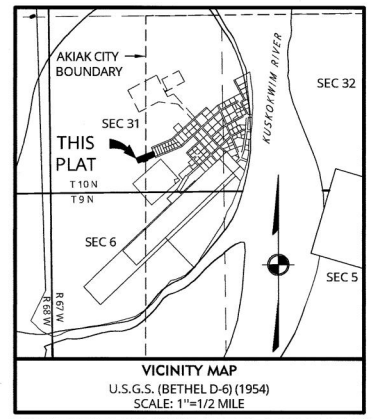
LCG LANTECH 2014 S-12831 — TYPICAL SET 2" ALUMINUM CAP ON 5/8"X 30" REBAR



OVERALL DETAIL

SCALE 1" = 60'

GRAPHIC SCALE
60 0 30 60 120
1" = 60'
(FULL SIZE, IN FEET)



CERTIFICATE OF OWNERSHIP AND DEDICATION

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THE KOKARMUIT CORPORATION IS THE OWNER OF AKIAK 2015 SUBDIVISION, AS SHOWN ON THIS PLAT. ON BEHALF OF THE KOKARMUIT CORPORATION, I APPROVE THIS SURVEY AND PLAT AND DEDICATE OR RESERVE FOR PUBLIC OR PRIVATE USE, AS NOTED, ALL EASEMENTS, PUBLIC UTILITY AREAS, AND RIGHTS-OF-WAY AS SHOWN AND DESCRIBED ON THIS PLAT.

I ALSO CERTIFY THAT THE LAND DEDICATED FOR PUBLIC USE DOES NOT CONTAIN CLAIMS UNDER SECTION 14(C)(1) & (2) OF THE ALASKA NATIVE CLAIM SETTLEMENT ACT.

Sy J.J.
SAM JACKSON, PRESIDENT
KOKARMUIT CORPORATION
P.O. BOX 147
AKIAK, AK 99552
DATE: 6/28/16

NOTARY'S ACKNOWLEDGMENT

SUBSCRIBED AND SWORN TO BEFORE ME THIS 28 DAY OF June, 2016.

BY: Sam Jackson
(PERSON APPEARING BEFORE NOTARY)

TITLE: President

Catherine Cedars
NOTARY PUBLIC FOR THE STATE OF ALASKA
MY COMMISSION EXPIRES: 10/21/17

OFFICIAL SEAL Catherine Cedars Notary Public - State of Alaska

ACCEPTANCE DEDICATION

THE MAYOR HEREBY ACCEPTS FOR PUBLIC USE AND FOR PUBLIC PURPOSES THE REAL PROPERTY DEDICATED TO THE PUBLIC BY THIS PLAT INCLUDING EASEMENTS, RIGHTS-OF-WAY, ALLEYS, AND ROADWAYS SHOWN ON THIS PLAT. THE ACCEPTANCE OF LANDS FOR PUBLIC USE OR PUBLIC PURPOSE DOES NOT OBLIGATE THE PUBLIC OR ANY GOVERNING BODY TO CONSTRUCT, OPERATE OR MAINTAIN IMPROVEMENTS.

Debra Jackson
DEBRA JACKSON, MAYOR
CITY OF AKIAK
P.O. BOX 52028
AKIAK, AK 99552

PLAT APPROVAL

THIS PLAT IS APPROVED BY THE COMMISSIONER OF THE DEPARTMENT OF NATURAL RESOURCES, OR THE COMMISSIONER'S DESIGNEE, IN ACCORDANCE WITH AS 40.15.

for Gerald Jennings
COMMISSIONER
April 27, 2017
DATE

BY APPROVAL OF THIS PLAT, THE COMMISSIONER OF THE DEPARTMENT OF NATURAL RESOURCES HEREBY ACCEPTS FOR PUBLIC USE AND PUBLIC PURPOSES THE REAL PROPERTY DEDICATED TO THE PUBLIC HEREON, INCLUDING EASEMENTS, RIGHTS-OF-WAYS, ALLEYS, AND ROADWAYS. THE ACCEPTANCE OF SUCH DEDICATED AREAS FOR PUBLIC USE AND PUBLIC PURPOSES DOES NOT OBLIGATE THE DEPARTMENT, ANY GOVERNING BODY, OR THE PUBLIC TO CONSTRUCT, OPERATE , MAINTAIN, OR MANAGE IMPROVEMENTS.

DETAIL A

SCALE 1" = 30'

MAGNETIC DECLINATION OBTAINED FROM THE NATIONAL GEOPHYSICAL DATA CENTER ON 5/18/15

GRAPHIC SCALE
30 0 15 30 60
1" = 30'
(FULL SIZE, IN FEET)

2017-8
Plat # Bethel
Rec Dist
5-5 2017
Date
Time 11:39A M

NOTES

1. THE ERROR OF CLOSURE OF THIS SURVEY DOES NOT EXCEED 1:5000.
2. ALL BEARINGS SHOWN ARE TRUE BEARINGS AS ORIENTED TO THE BASIS OF BEARINGS, AND THE DISTANCES SHOWN ARE REDUCED TO HORIZONTAL FIELD DISTANCES.
3. THIS SUBDIVISION IS SUBJECT TO RESERVATIONS AND EXCEPTIONS CONTAINED IN INTERIM CONVEYANCE NO. 610, BOOK 69, PAGE 652, DATED 10/16/1995.
4. THIS SUBDIVISION IS SUBJECT TO EXCEPTIONS, RESERVATIONS, CONDITIONS & PROVISIONS OF ANCSA DATED 12/18/1971.
5. THIS PLAT IS SUBJECT TO AN "AGREEMENT FOR JOINT USE OF POLES", RECORDED ON 3/11/1997 IN BOOK 74, PAGE 812.
6. THE MONUMENTS SET THIS SURVEY ARE STAMPED WITH SURVEY NUMBER LS-12831.
7. BASIS OF COORDINATES SCALED FROM U.S.G.S QUADRANGLE BETHEL (D-6), ALASKA 1954 SEE MONUMENT DESCRIPTION D.

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT I AM PROPERLY REGISTERED AND LICENSED TO PRACTICE LAND SURVEYING IN THE STATE OF ALASKA, THAT THIS PLAT REPRESENTS A SURVEY MADE BY ME, OR UNDER MY DIRECT SUPERVISION, THAT THE MONUMENTS SHOWN HEREON EXISTING AS DESCRIBED, AND THAT ALL DIMENSIONS AND OTHER DETAILS ARE CORRECT.

10/7/2016
DATE

Steven Callaghan
STEVEN CALLAGHAN LS-12034
REGISTERED LAND SURVEYOR

STATE OF ALASKA 49TH STEVEN CALLAGHAN LS-12034 10/7/2016 Registered Professional Land Surveyor

A PLAT OF AKIAK 2015 SUBDIVISION

CREATING LOTS 1-6, BLOCK 5

A SUBDIVISION OF A PORTION OF U.S. SURVEY No. 2243

LOCATED WITHIN:
SECTION 31, T10N, R67W
SEWARD MERIDIAN, ALASKA

CONTAINING 2.39 ACRES

AKIAK, ALASKA — BETHEL RECORDING DISTRICT

ICG Lantech Inc
architecture · engineering · surveying
250 H Street
Anchorage, AK 99501
P (907) 243-8985
F (907) 243-5629
www.lcgak.com

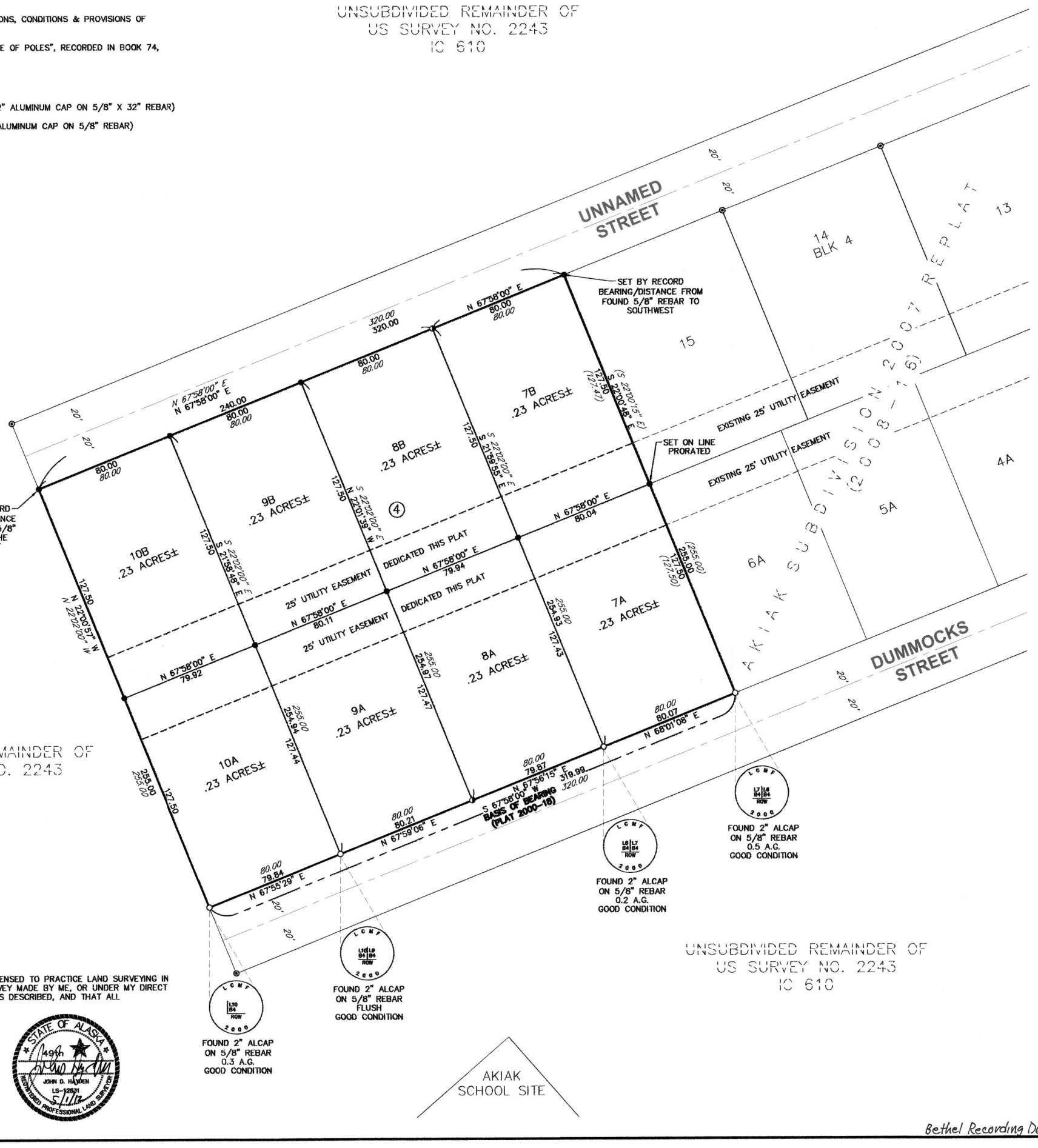
DRAWN DATE: 6/22/16	SCALE: AS NOTED	CERT. TO PLAT: 0209-2348610
DRAWN BY: MJH	CHECKED BY: JDH	FILE NO. 1000.05
SURVEY DATE: 11/20/14	SHEET NO. 1 OF 1	D.N.R. File No. PA 20150025

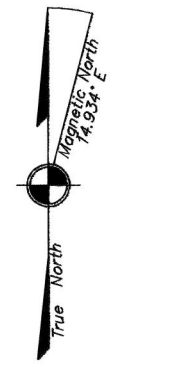
NOTES

1. THE ERROR OF CLOSURE OF THIS SURVEY DOES NOT EXCEED 1:5000.
2. ALL BEARINGS SHOWN ARE TRUE BEARINGS AS ORIENTED TO THE BASIS OF BEARINGS, AND THE DISTANCES SHOWN ARE REDUCED TO HORIZONTAL FIELD DISTANCES.
3. THIS SUBDIVISION IS SUBJECT TO RESERVATIONS AND EXCEPTIONS CONTAINED IN INTERIM CONVEYANCE NO. 610, BK 69, PG 652.
4. THIS SUBDIVISION IS SUBJECT TO EXCEPTIONS, RESERVATIONS, CONDITIONS & PROVISIONS OF ANCSA DATED 12/18/71.
5. THIS PLAT IS SUBJECT TO AN "AGREEMENT FOR JOINT USE OF POLES", RECORDED IN BOOK 74, PAGE 812.

LEGEND

- ● SECONDARY MONUMENT SET THIS SURVEY (SET 2" ALUMINUM CAP ON 5/8" X 32" REBAR)
- ○ SECONDARY MONUMENT RECOVERED (FOUND 2" ALUMINUM CAP ON 5/8" REBAR)
- ◑ FOUND 5/8" REBAR
- ◉ SEARCHED FOR NOT FOUND
- ——— SURVEYED
- - - - - - - UNSURVEYED
- ——— CENTERLINE RIGHT-OF-WAY
- XXXXXX" RECORD PER PLAT 2000-18
- (XXXXXX") RECORD PER PLAT 2008-16
- XX"XX'XX" MEASURED
- ④ BLOCK NUMBER
- LCG LS8 L7A B4 | B4 LS8 L7B B4 B4 2011 LS-12831 TYPICAL SET 2" ALCAP ON 5/8" X 32" REBAR





MAGNETIC DECLINATION OBTAINED FROM THE NATIONAL GEOPHYSICAL DATA CENTER ON 03/20/2011

GRAPHIC SCALE
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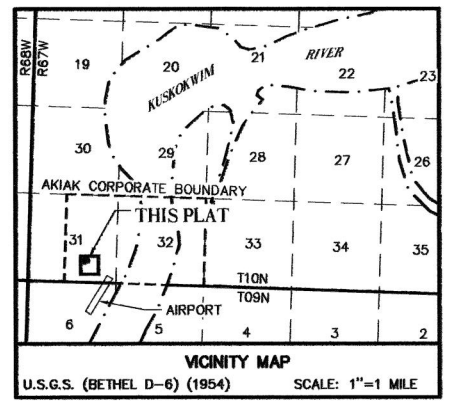
SCALE: 1" = 30'
(FULL SIZE, IN FEET)



VICINITY MAP
U.S.G.S. (BETHEL D-6) (1954) SCALE: 1"=1 MILE

CERTIFICATE OF OWNERSHIP AND DEDICATION

I, THE UNDERSIGNED, HEREBY CERTIFY THAT KOKARMUIT CORPORATION IS THE OWNER OF AKIAK 2011 SUBDIVISION, AS SHOWN ON THIS PLAT. I APPROVE THIS SURVEY AND PLAT AND DEDICATE OR RESERVE FOR PUBLIC OR PRIVATE USE, AS NOTED, ALL EASEMENTS, PUBLIC UTILITY AREAS, AND RIGHTS-OF-WAY AS SHOWN AND DESCRIBED ON THIS PLAT.

I ALSO CERTIFY THAT THE LAND DEDICATED FOR PUBLIC USE DOES NOT CONTAIN CLAIMS UNDER SECTION 14(C)(1) & (2) OF THE ALASKA NATIVE CLAIMS SETTLEMENT ACT.

Sam Jackson President — DATE: 4/26/12

IVAN IVAN, PRESIDENT
KOKARMUIT CORPORATION
P.O. BOX 52147
AKIAK, AK 99552

NOTARY'S ACKNOWLEDGMENT

SUBSCRIBED AND SWORN TO BEFORE ME THIS 4-26-12 DAY OF April, 2011.

BY: Sam Jackson
(PERSON APPEARING BEFORE NOTARY)

TITLE: Chairman

ERIC EVON NOTARY PUBLIC STATE OF ALASKA

NOTARY PUBLIC FOR THE STATE OF ALASKA
MY COMMISSION EXPIRES: 5-9-12

ACCEPTANCE OF DEDICATION

THE MAYOR HEREBY ACCEPTS FOR PUBLIC USE AND FOR PUBLIC PURPOSES THE REAL PROPERTY DEDICATED TO THE PUBLIC BY THIS PLAT INCLUDING EASEMENTS, RIGHTS-OF-WAY, ALLEYS, AND ROADWAYS SHOWN ON THIS PLAT. THE ACCEPTANCE OF LANDS FOR PUBLIC USE OR PUBLIC PURPOSE DOES NOT OBLIGATE THE PUBLIC OR ANY GOVERNING BODY TO CONSTRUCT, OPERATE OR MAINTAIN IMPROVEMENTS.

Debra Jackson

DEBRA JACKSON, MAYOR
CITY OF AKIAK
P.O. BOX 187
AKIAK, AK 99552

TAX CERTIFICATE

THIS SUBDIVISION LIES OUTSIDE ANY TAXING AUTHORITY AT THE TIME OF FILING.

PLAT APPROVAL

THIS PLAT IS APPROVED BY THE COMMISSIONER OF THE DEPARTMENT OF NATURAL RESOURCES, OR THE COMMISSIONER'S DESIGNEE, IN ACCORDANCE WITH AS 40.15.

Gerald Kraning — June 04, 2012
for COMMISSIONER — DATE

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT I AM PROPERLY REGISTERED AND LICENSED TO PRACTICE LAND SURVEYING IN THE STATE OF ALASKA, THAT THIS PLAT REPRESENTS A SURVEY MADE BY ME, OR UNDER MY DIRECT SUPERVISION, THAT THE MONUMENTS SHOWN HEREON EXIST AS DESCRIBED, AND THAT ALL DIMENSIONS AND OTHER DETAILS ARE CORRECT.

5/1/12
DATE

JOHN D. HAMDEN 12831-S
REGISTERED LAND SURVEYOR

STATE OF ALASKA JOHN D. HAMDEN LS-12831 5/1/12 REGISTERED PROFESSIONAL LAND SURVEYOR

2012-23
Plat # BETHEL
Rec Dist
6/12 2012
Date
Time 9:45 A.M.

AKIAK 2011 SUBDIVISION

CREATING LOTS 7A, 7B, 8A, 8B, 9A, 9B, 10A & 10B, BLOCK 4

A SUBDIVISION OF LOTS 7, 8, 9 & 10, BLOCK 4
AKIAK SUBDIVISION ADDITION NO. 1 (PLAT 2000-18)

LOCATED WITHIN
SECTION 31, TOWNSHIP 10 NORTH, RANGE 67 WEST
SEWARD MERIDIAN, ALASKA

CONTAINING 1.84 ACRES MORE OR LESS
BETHEL RECORDING DISTRICT AKIAK, ALASKA

LCG Inc. LARSEN CONSULTING GROUP
architecture · engineering · surveying
3710 Woodland Dr.
Suite 2100
Anchorage, AK. 99517
(907) 243-8985

DRAWN DATE: 10/19/11	SCALE: 1"=30'	CERT. TO PLAT: PNT1148533
DRAWN BY: BED	CHECKED BY: JDH	FILE NO. 741.45
SURVEY DATE: 03/2011	SHEET NO. 1 OF 1	D.N.R. File No. PA20110027

Bethel Recording District PLAT 2012-23

Xrefs/Images:
S:\635.01_AKIAK\IMAGE\BETHEL D-6.jpg
S:\635.01_AKIAK\IMAGE\BETHEL D-6.jpg
S:\635.01_AKIAK\IMAGE\BETHEL D-6.jpg

Plotted By: Owner
30 May 2007 8:45 am
Drawing Name: 24x36 1050 (DNR)
Layout:
Filename: S:\635.01_AKIAK\dwg\635.01_SBM_AKIAK.DWG

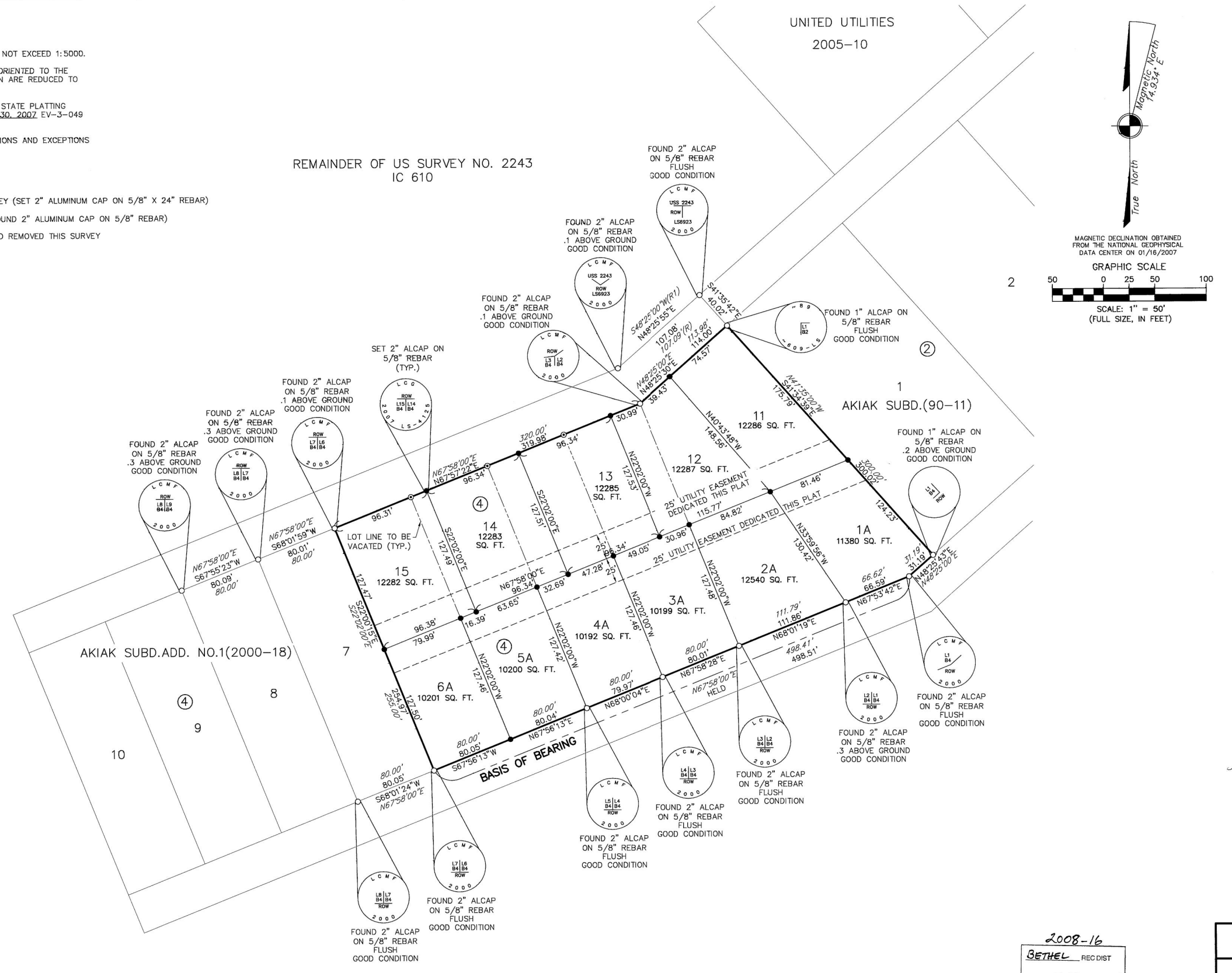
Survey 635

NOTES

1. THE ERROR OF CLOSURE OF THIS SURVEY DOES NOT EXCEED 1:5000.
2. ALL BEARINGS SHOWN ARE TRUE BEARINGS AS ORIENTED TO THE BASIS OF BEARINGS, AND THE DISTANCES SHOWN ARE REDUCED TO HORIZONTAL FIELD DISTANCES.
3. THIS VACATION/REPLAT IS IN COMPLIANCE WITH STATE PLATTING RESOLUTION NO. 2007-07 APPROVED APRIL 30, 2007 EV-3-049 AND AS29.40.120.-140
4. THIS SUBDIVISION IS SUBJECT TO THE RESERVATIONS AND EXCEPTIONS CONTAINED IN INTERIM CONVEYANCE NO 610.

LEGEND

- ● SECONDARY MONUMENT SET THIS SURVEY (SET 2" ALUMINUM CAP ON 5/8" X 24" REBAR)
- ○ SECONDARY MONUMENT RECOVERED (FOUND 2" ALUMINUM CAP ON 5/8" REBAR)
- ⊙ SECONDARY MONUMENT RECOVERED AND REMOVED THIS SURVEY
- ——— SURVEYED
- – – – – – UNSURVEYED
- ——–——– VACATED BY THIS PLAT
- xx'xx'xx" RECORD PER PLAT 2000-18
- XX'XX'XX" MEASURED
- ④ BLOCK NUMBER



MAGNETIC DECLINATION OBTAINED FROM THE NATIONAL GEOPHYSICAL DATA CENTER ON 01/16/2007

GRAPHIC SCALE
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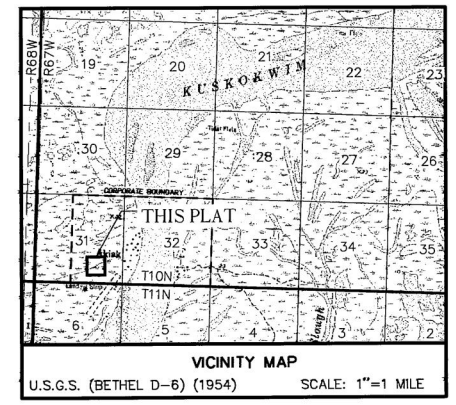
SCALE: 1" = 50'
(FULL SIZE, IN FEET)



VICINITY MAP
U.S.G.S. (BETHEL D-6) (1954) SCALE: 1"=1 MILE

CERTIFICATE OF OWNERSHIP AND DEDICATION

I, THE UNDERSIGNED, HEREBY CERTIFY THAT I AM THE OWNER OF AKIAK SUBDIVISION 2007 REPLAT, AS SHOWN ON THIS PLAT. I APPROVE THIS SURVEY AND PLAT AND DEDICATE OR RESERVE FOR PUBLIC OR PRIVATE USE, AS NOTED, ALL EASEMENTS, PUBLIC UTILITY AREAS, AND RIGHTS-OF-WAY AS SHOWN AND DESCRIBED ON THIS PLAT.

SAM JACKSON, PRESIDENT
KOKARMUIT CORPORATION
P.O. BOX 52147
AKIAK, AK 99552

DATE: 3-20-08

NOTARY'S ACKNOWLEDGMENT

SUBSCRIBED AND SWORN TO BEFORE ME THIS 20th DAY OF March, 2008

BY: Anna Phillip

TITLE: Postmaster

Anna Phillip
NOTARY PUBLIC FOR THE STATE OF ALASKA
MY COMMISSION EXPIRES: N/A

NOTARY'S ACKNOWLEDGMENT

SUBSCRIBED AND SWORN TO BEFORE ME THIS 20th DAY OF March, 2008

BY: Anna Phillip

TITLE: Postmaster

Anna Phillip
NOTARY PUBLIC FOR THE STATE OF ALASKA
MY COMMISSION EXPIRES: N/A

ACCEPTANCE OF DEDICATION

THE MAYOR HEREBY ACCEPTS FOR PUBLIC USE AND FOR PUBLIC PURPOSES THE REAL PROPERTY DEDICATED TO THE PUBLIC BY THIS PLAT INCLUDING EASEMENTS, RIGHTS-OF-WAY, ALLEYS, AND ROADWAYS SHOWN ON THIS PLAT. THE ACCEPTANCE OF LANDS FOR PUBLIC USE OR PUBLIC PURPOSE DOES NOT OBLIGATE THE PUBLIC OR ANY GOVERNING BODY TO CONSTRUCT, OPERATE OR MAINTAIN IMPROVEMENTS.

ANDREW JASPER, MAYOR
CITY OF AKIAK Delbert Shelton
P.O. BOX 187
AKIAK, AK 99552

TAX CERTIFICATE

THIS SUBDIVISION LIES OUTSIDE ANY TAXING AUTHORITY AT THE TIME OF FILING.

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT I AM PROPERLY REGISTERED AND LICENSED TO PRACTICE LAND SURVEYING IN THE STATE OF ALASKA, THAT THIS PLAT REPRESENTS A SURVEY MADE BY ME, OR UNDER MY DIRECT SUPERVISION, THAT THE MONUMENTS SHOWN HEREON EXIST AS DESCRIBED, AND THAT ALL DIMENSIONS AND OTHER DETAILS ARE CORREQT.

6/26/08
DATE

Ronald R. Mitchell
RONALD R. MITCHELL 4125-S
REGISTERED LAND SURVEYOR

STATE OF ALASKA 49th RONALD R. MITCHELL 4125-S REGISTERED PROFESSIONAL LAND SURVEYOR 6/26/08

2008-16
BETHEL REC DIST
DATE 7-8, 2008
TIME 10:42 AM
Requested By AS/DNR
Address

PLAT APPROVAL

THIS PLAT IS APPROVED BY THE COMMISSIONER OF THE DEPARTMENT OF NATURAL RESOURCES, OR THE COMMISSIONER'S DESIGNEE, IN ACCORDANCE WITH AS 40.15.

COMMISSIONER

7/01/08
DATE

A PLAT OF
AKIAK SUBDIVISION 2007 REPLAT
CREATING LOTS 1A-6A & LOTS 11-15, BLOCK 4

A SUBDIVISION AND REPLAT OF LOTS 1 THROUGH 6, BLOCK 4, AKIAK SUBDIVISION ADDITION NO. 1 (PLAT 2000-18)
LOCATED WITHIN
SECTION 31, TOWNSHIP 10 NORTH, RANGE 67 WEST
SEWARD MERIDIAN, ALASKA

CONTAINING 2.9 ACRES
BETHEL RECORDING DISTRICT AKIAK, ALASKA

LCG, Inc.
LARSEN CONSULTING GROUP
architecture · engineering · surveying
3710 Woodland Dr.
Suite 2100
Anchorage, AK. 99517
(907) 243-8995

DRAWN DATE: 03/16/07	SCALE: 1"=50'	CERT. TO PLAT:	PNT 80840
DRAWN BY: BED	CHECKED BY: RRM	FILE NO.	635.01
SURVEY DATE: 01/16/07	SHEET NO. 1 OF 1	D.N.R. File No.	PA20070008 EV-3-049

APPENDIX C–SANITATION FACILITIES AND COMMUNITY INFORMATION

SCOPE OF WORK

INSTALL TWO BURIED 6" HDPE ARCTIC PIPE CIRCULATING WATER LOOPS WITH THAW PORTS EVERY 400 FEET AND FIRE HYDRANTS AS NEEDED TO SERVE EXISTING AND FUTURE HOMES,COMMUNITY BUILDINGS, BUSINESSES,AND THE SCHOOL WITHIN THE EXISTING TOWNSITE. INSTALL BURIED CIRCULATING PIT ORIFICE-STYLE SERVICES AND RESIDENTIAL PLUMBING TO 69 ELIGIBLE HOMES.

NOTE: A COMPLETE NEW PIPED SEWER SYSTEM IS ALSO PROPOSED FOR AKIAK, IN A SEPARATE PLAN SET, WHICH IS AVAILABLE FROM ANTHC.

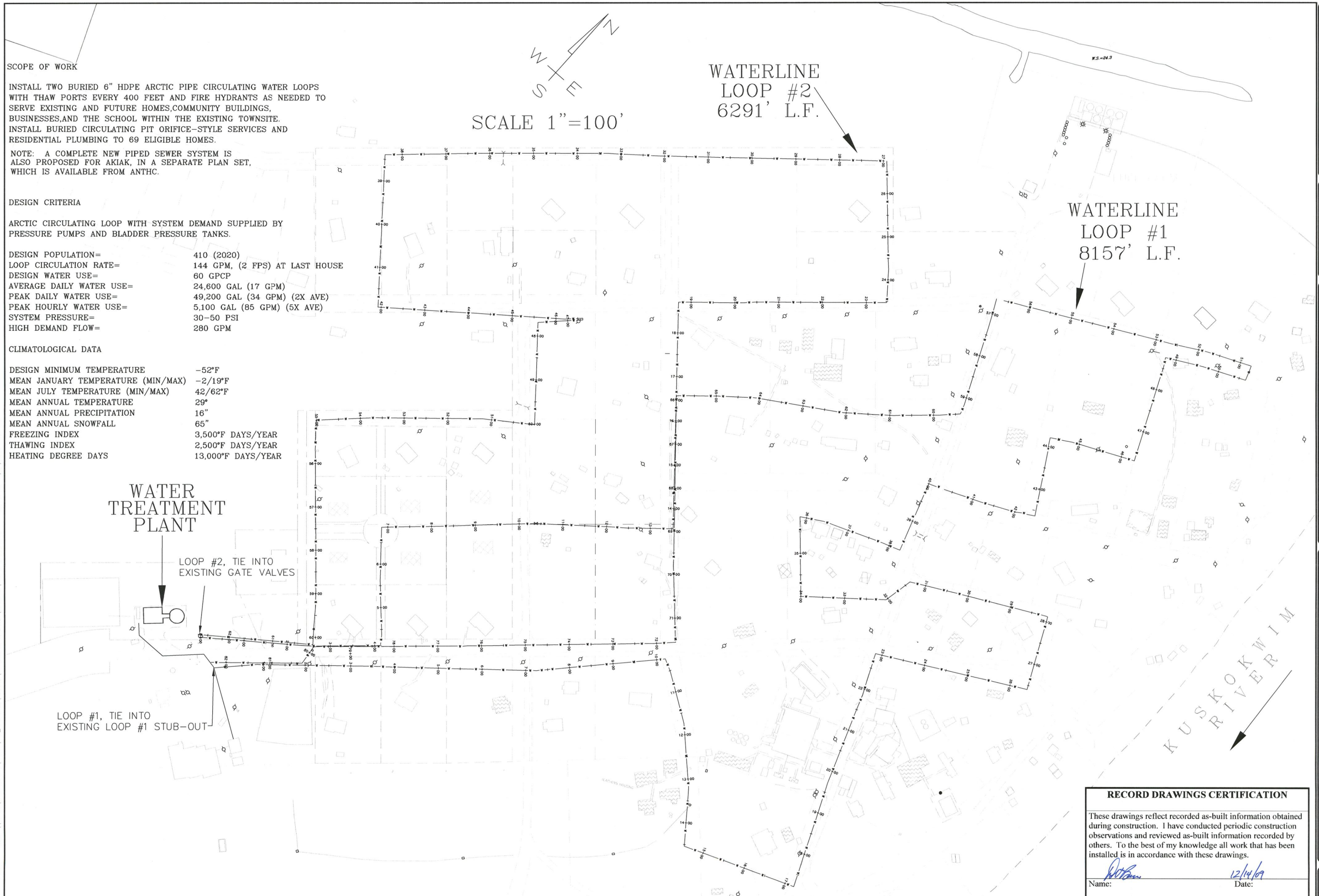
DESIGN CRITERIA

ARCTIC CIRCULATING LOOP WITH SYSTEM DEMAND SUPPLIED BY PRESSURE PUMPS AND BLADDER PRESSURE TANKS.

DESIGN POPULATION=	410 (2020)
LOOP CIRCULATION RATE=	144 GPM, (2 FPS) AT LAST HOUSE
DESIGN WATER USE=	60 GPCP
AVERAGE DAILY WATER USE=	24,600 GAL (17 GPM)
PEAK DAILY WATER USE=	49,200 GAL (34 GPM) (2X AVE)
PEAK HOURLY WATER USE=	5,100 GAL (85 GPM) (5X AVE)
SYSTEM PRESSURE=	30-50 PSI
HIGH DEMAND FLOW=	280 GPM

CLIMATOLOGICAL DATA

DESIGN MINIMUM TEMPERATURE	-52°F
MEAN JANUARY TEMPERATURE (MIN/MAX)	-2/19°F
MEAN JULY TEMPERATURE (MIN/MAX)	42/62°F
MEAN ANNUAL TEMPERATURE	29°
MEAN ANNUAL PRECIPITATION	16"
MEAN ANNUAL SNOWFALL	65"
FREEZING INDEX	3,500°F DAYS/YEAR
THAWING INDEX	2,500°F DAYS/YEAR
HEATING DEGREE DAYS	13,000°F DAYS/YEAR



RECORD DRAWINGS CERTIFICATION

These drawings reflect recorded as-built information obtained during construction. I have conducted periodic construction observations and reviewed as-built information recorded by others. To the best of my knowledge all work that has been installed is in accordance with these drawings.

Name: Date: 12/14/09

DATE	REVISIONS	INIT
11/12/09	RECORD DRAWING	PVIII

STATE OF ALASKA — DAN V. BOCCIA — CE-9704 — REGISTERED PROFESSIONAL ENGINEER — 12/14/09

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

DIVISION OF ENVIRONMENTAL HEALTH AND ENGINEERING
1901 Bragaw Street, Suite 200
ANCHORAGE, ALASKA, 99508-3440
(907) 729-3600

AKIAK, ALASKA

COMMUNITY WATERLINE SYSTEM LOOPS 1 & 2
WATER MAINS LOOPS 1 & 2 SCOPE OF WORK & DESIGN CRITERIA

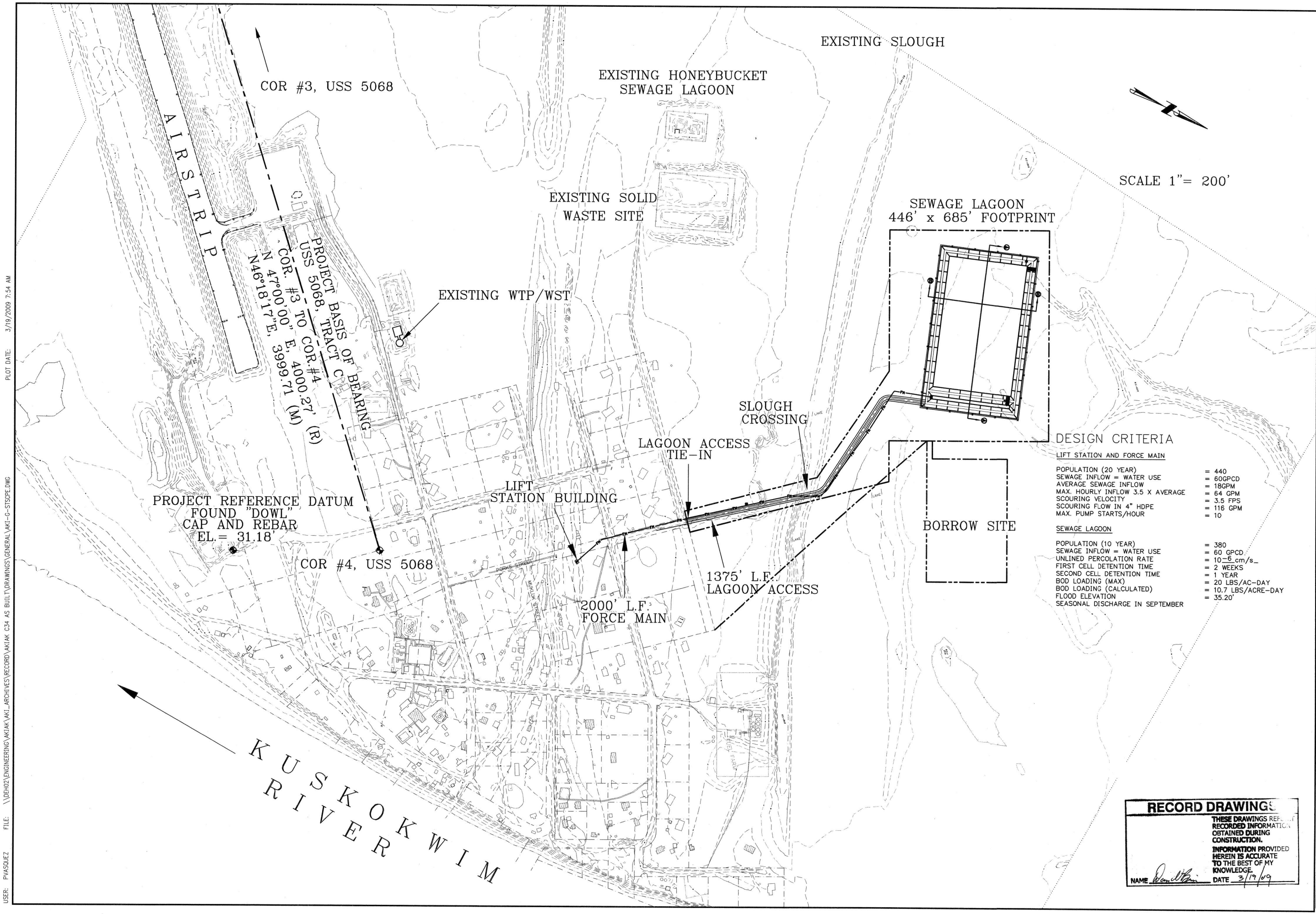
AN 98-B82, AN 99-P39

DATE: 11/12/09	PROJ MGR: MIKE MARCAURELE
DRAWN BY: PAUL VASQUEZ III	PROJ ENG: D. BOCCIA
CHECKED BY: M. MARCAURELE	TUS ENG: PAUL GABBERT
FILE: AKI-G-STSCOP	LAYOUT: D-1 SCOPE-DESIGN

D-1

SHEET 3 OF 18

USER: PVASQUEZ FILE: \\DEHQ1\ENGINEERING\AKIAK\AKI_ARCHIVES\RECORD\WATERLINE AS BUILT\GENERAL\AKI-G-STSCOP.DWG PLOT DATE: 11/24/2009 11:34 AM



DESIGN CRITERIA

LIFT STATION AND FORCE MAIN

POPULATION (20 YEAR)	= 440
SEWAGE INFLOW = WATER USE	= 60GPCD
AVERAGE SEWAGE INFLOW	= 18GPM
MAX. HOURLY INFLOW 3.5 X AVERAGE	= 64 GPM
SCOURING VELOCITY	= 3.5 FPS
SCOURING FLOW IN 4" HDPE	= 116 GPM
MAX. PUMP STARTS/HOUR	= 10

SEWAGE LAGOON

POPULATION (10 YEAR)	= 380
SEWAGE INFLOW = WATER USE	= 60 GPCD
UNLINED PERCOLATION RATE	= 10^{-6} cm/s
FIRST CELL DETENTION TIME	= 2 WEEKS
SECOND CELL DETENTION TIME	= 1 YEAR
BOD LOADING (MAX)	= 20 LBS/AC-DAY
BOD LOADING (CALCULATED)	= 10.7 LBS/ACRE-DAY
FLOOD ELEVATION	= 35.20'
SEASONAL DISCHARGE IN SEPTEMBER	

RECORD DRAWINGS

THESE DRAWINGS REFLECT RECORDED INFORMATION OBTAINED DURING CONSTRUCTION.

INFORMATION PROVIDED HEREIN IS ACCURATE TO THE BEST OF MY KNOWLEDGE.

NAME _____ DATE 3/19/09

DATE	REVISIONS	INIT
12/18/08	RECORD DRAWING	PVIII

STATE OF ALASKA — 43rd — DAN BOCCIA — OE-9784 — REGISTERED PROFESSIONAL ENGINEER

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

DIVISION OF ENVIRONMENTAL HEALTH AND ENGINEERING

1901 Bragaw Street, Suite 200
ANCHORAGE, ALASKA, 99508-3440
(907) 729-3600

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

AKIAK, ALASKA

GRAVITY SEWER, LIFT STATION, FORCE MAIN, LAGOON
LIFT STATION FORCE MAIN AND LAGOON DESIGN CRITERIA

AN-97-L76 AMD #2, AN-99-P39, AN-00-C34, AN-01Q28, AN-02-M98

DATE: 12/23/08	PROJ MGR: D. BOCCIA
DRAWN BY: PVIII	PROJ ENG: D. BOCCIA
CHECKED BY: M. MARCAURELE	TUS ENG: PAUL GABBERT
FILE: AK1-G-STSCPE	LAYOUT: G-101 LIFT STATION FORCE MAIN AND DESIGN CRITERIA

G-101

SHEET 3 OF 44

PLOT DATE: 3/19/2009 7:54 AM
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RECORD DRAWINGS

THESE DRAWINGS REFLECT RECORDED INFORMATION OBTAINED DURING CONSTRUCTION.

INFORMATION PROVIDED HEREIN IS ACCURATE TO THE BEST OF MY KNOWLEDGE.

NAME D. Boccia DATE 3/5/09

DATE	REVISIONS	INIT
12/23/08	RECORD DRAWING	PVIII

STATE OF ALASKA, 49th, DAN BOCCIA, CE-9784, REGISTERED PROFESSIONAL ENGINEER

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM
DIVISION OF ENVIRONMENTAL HEALTH AND ENGINEERING
1901 Bragaw Street, Suite 200
ANCHORAGE, ALASKA, 99508-3440
(907) 729-3600

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

AKIAK, ALASKA

GRAVITY SEWER, LIFT STATION, FORCE MAIN, LAGOON
SEWER SYSTEM LAYOUT

AN 97-L76 AMD #2, AN 99-P39, AN 00-C34, AN 01-Q28, AN 02-M98

DATE: 12/23/08	PROJ MGR: D. BOCCIA
DRAWN BY: PVIII	PROJ ENG: D. BOCCIA
CHECKED BY: M. MARCAURELE	TUS ENG: PAUL GABBERT
FILE: AKI-G-STSSWR	LAYOUT: D-3 SEWER SYSTEM LAYOUT

G-103

SHEET 5 OF 44

PROJECT BACKGROUND INFORMATION

THE AKIAK WATER TREATMENT PLANT WILL BE REHABILITATED AND UPGRADED TO SERVE THE NEWLY PIPED COMMUNITY. THE EXISTING SYSTEM IS A PACIFIC KEYSTONE MODEL ST-35 CONVENTIONAL WATER TREATMENT PACKAGED PLANT. THE ORIGINAL PLANT HAS NEVER PERFORMED EFFICIENTLY AND THE GRAVITY FILTER AIR BINDS DUE TO THE PROBLEM OF CO2 COMING OUT OF SOLUTION IN THE GRAVITY FILTER. THIS REHABILITATION WILL CORRECT SOME OF THE EFFICIENCY AND AIR BINDING PROBLEMS AND MEET THE INCREASED DEMAND OF THE NEWLY PIPED SYSTEM.

RECOMMENDED CONSTRUCTION SEQUENCE

THE AKIAK WTP MUST CONTINUE TO PRODUCE POTABLE WATER DURING ALL PHASES OF THE REHABILITATION PROCESS. THE FOLLOWING LIST IS THE SUGGESTED CONSTRUCTION SEQUENCE TO ACCOMPLISH THE MAJOR WORK AS QUICKLY AS POSSIBLE WITH MINIMAL DISTURBANCE TO THE OPERATION OF THE WTP.

1. CONSTRUCT THE NEW CHEMICAL INJECTION ROOM COMPLETE WITH ALL INJECTION PUMPS AND VATS READY TO FEED CHEMICALS.
2. ASSEMBLE THE NEW WTP RAW WATER FEED PIPING FROM THE REPLACEMENT RAW WATER HEAT EXCHANGER TO THE INLET ON THE EXISTING SKID COMPLETE WITH THE POTASSIUM PERMANGANATE INJECTION POINT AND STATIC MIXER.
3. SHUT DOWN WATER PRODUCTION TEMPORARILY TO INSTALL THE NEW WTP RAW WATER FEED PIPING AND SWITCH OVER THE POTASSIUM PERMANGANATE FEED.
4. RE-START WATER PRODUCTION WITHIN 4 HOURS OF SHUTDOWN.
5. DEMOLISH THE EXISTING INJECTION ROOM, RELOCATE INJECTION EQUIPMENT TO TEMPORARY LOCATION IN NEW CHEMICAL ROOM, AND PREPARE THE AREA FOR THE CONSTRUCTION OF THE NEW PRESSURE FILTER AND PIPING.
6. CONSTRUCT THE PRESSURE FILTER, AND ALL SUPPORTING EQUIPMENT AND PIPING INCLUDING THE NEW BLOWER AND CHLORINE (AND FUTURE FLUORIDE) INJECTION POINTS IN FILTERED WATER PIPING TO TANK.
7. CONSTRUCT NEW LT27 INJECTION QUILL ON EXISTING SKID AND INSTALL ALL SENSING APPARATUS FOR NEW CLEARWELL THAT CAN BE INSTALLED PRIOR TO REMOVAL OF SAND.
8. DEMOLISH EXISTING BACKWASH PUMP AND INSTALL NEW UNIT.
9. SHUT DOWN WATER PRODUCTION TEMPORARILY TO REMOVE THE SAND FROM THE PACKAGE PLANT FILTER, INSTALL THE NEW EQUIPMENT IN THE CLEAR WELL, CONNECT THE NEW EFFLUENT PUMP, CONNECT THE NEW BACKWASH PUMP AND MAKE THE FILTERED WATER LINK FROM THE NEW FILTER TO THE WST.
10. RE-START WATER PRODUCTION WITHIN 8 HOURS OF THE SHUTDOWN WITH THE NEW SYSTEM ONLINE.
11. COMPLETE REMAINING DEMO AND SWITCHOVER OF ALL REMAINING CHEMICAL FEEDS AND BEGIN FINE-TUNING PROCESS.

NOTES:

SOME EXISTING COMPONENTS HAVE BEEN RE-WIRED AND/OR DISABLED SINCE THE ORIGINAL CONSTRUCTION. THE INTENTION OF THIS UPGRADE IS TO PRODUCE A FULLY FUNCTIONAL WTP AND REPAIRS TO CONTROLS AND/OR OTHER EXISTING COMPONENTS DAMAGED OR DISCOVERED DURING CONSTRUCTION WILL BE MADE AS REQUIRED. THE FOLLOWING LIST DETAILS SOME KNOWN ITEMS REQUIRING CORRECTION WHICH WERE NOT ORIGINALLY INCLUDED IN THE SCOPE BUT WHICH SHOULD BE ADDRESSED WITH ANY REMAINING FUNDING FOR THE PROJECT:

1. 4-20 mA LOOP TO PS-1 SHOULD BE POWERED AT ALL TIMES.
2. PUMP #2 (CURRENTLY INSTALLED IN WELL #2) SHOULD BE MOVED TO WELL #5. WELL #5 SHOULD BE CONNECTED TO THE WTP AND WELL #2 SHOULD BE CAPPED.
3. INCREASE STRENGTH OF HYDROPNEUMATIC TANK SHELVING BY DOUBLING THE NUMBER OF SHELVING BRACKETS AND TYING THEM TOGETHER THROUGH A PIECE OF HORIZONTAL UNISTRUT ATTACHED TO THE GABLE WALL.
4. INSTALLATION OF A LABORATORY AREA ADJACENT TO THE WTP ENTRANCE WITH A 2'X 8' COUNTERTOP AND SINK PLUMBED TO ADJACENT FLOOR DRAIN INCLUDING STORAGE CABINETS ABOVE AND BELOW THE WORK AREA.

SCOPE OF WORK

1. THE CONVENTIONAL TREATMENT PLANT WILL BE MODIFIED AND COMPONENTS UPGRADED.
   - CONVERT PACKAGE PLANT GRAVITY FILTER TO CLEAR WELL
   - INSTALL PRESSURE FILTER
   - PROVIDE AUTOMATED DESLUDGING OF THE TUBE SETTLERS
   - REINFORCE FLOOR FOR NEW PRESSURE FILTER
   - INSTALL NEW BACKWASH PUMP WITH VFD
   - REPLACE KECKLEY VALVE ON ST-35 SKID – WITH CHECK VALVE
   - PROVIDE MOBILE WORK PLATFORM FOR SKID
   - DEMOLISH EXISTING CHEMICAL ROOM AND REPLACE
   - PROVIDE CHEMICAL STORAGE BUILDING
   - REPLACE CHEMICAL PUMPS
   - REPLACE EFFLUENT PUMP (P-4)
2. REPLACE EXISTING CONTROLLER ON THREE WAY WASTE HEAT CONTROL VALVE
3. PROVIDE A GLYCOL MAKE UP SYSTEM FOR THE HYDRONICS SYSTEM.
4. PROVIDE HOT WATER HEATER
5. REPLACE THE CHECK VALVES ON THE PRESSURE PUMPS (D-101)

PRESSURE FILTER DATA

- ESTIMATED PRESSURE FILTER RUN VOLUME 57,600 GALS
- ESTIMATED RUN DURATION 38 HOURS

GENERAL DESIGN CRITERIA

A POPULATION
1. CURRENT 378 (2005)
2. DESIGN (2026 – PROJECTED) 478

B NUMBER OF HOMES
1. 69 (YEAR 2000 OCCUPIED HOUSES)

C WATER USAGE
1. DESIGN WATER USE 60 GPCD
2. AVERAGE DAILY FLOW (DESIGN): 28,680 GPD
3. MAX. DAILY FLOW (2 X DESIGN): 57,360 GPD
4. AVERAGE HOURLY FLOW (DESIGN): 1,195 GPH
5. MAX. HOURLY FLOW (5 X DESIGN): 5,975 GPH

D WELL PRODUCTION CAPACITY AND WATER STORAGE

WELL 3: 60 GPM
WELL 5: 80 GPM (FUTURE CONNECTION)
WATER STORAGE: 150,000 GALLONS

E CLIMATOLOGICAL DATA

1. DESIGN MINIMUM TEMPERATURE	-52F
2. MEAN JANUARY TEMPERATURE	MIN/MAX -2F/19F
3. MEAN JULY TEMPERATURE	MIN/MAX 42F/62F
4. MEAN ANNUAL TEMPERATURE	29F
5. MEAN ANNUAL SNOWFALL	65 INCHES
6. FREEZING INDEX	3500 F DAYS
7. THAWING INDEX	2500 F DAYS
8. HEATING DEGREE DAYS	13,000 DAYS

F OPERATIONAL DESIGN PARAMETERS

WTP DESIGN FLOW RATE	25 GPM
BACKWASH FLOW RATE (126 PM/SF)	235 GPM
AIR SCOUR FLOW RATE (4-6 CMF/SF)	80 CFM

G. DIRECT FILTRATION CRITERIA

FILTER DIAMETER:	5 FEET
FILTER SURFACE AREA:	19.625 SF
LOADING RATE AT DESIGN FLOW RATE (25 GPM)	1.27 GPM/SF
MAXIMUM HYDRAULIC LOADING RATE	2.0 GPM/SF

FILTER MEDIA:

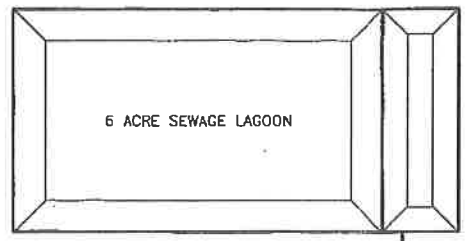
FREE BOARD	(18" DEEP)
ANTHRACITE	0.6-0.80 MM PARTICLE SIZE (14" DEEP)
GREENSAND PLUS	TM 0.35-0.40 MM PARTICLE SIZE (18" DEEP)
SUPPORT GARNET	#12 GARNET (4" ABOVE LATERALS)
SUPPORT GRAVEL	3/16-3/8 INCH (BOTTOM TO HEADER)

TREATMENT OBJECTIVES

Fe	≤	0.30 mg/L
Mu	≤	0.05 mg/L
As	≤	0.01 mg/L
$TTHM_x$	≤	80.00 mg/L
$HAA5_x$	≤	60.00 mg/L

RAW WATER PROPERTIES

PROPERTY	UNIT	MCL	WELL 2	WELL 3	WELL 5
SAMPLE DATE			9/97	10/03	10/03
IRON	MG/L	0.3	28.8	21	30
MANGANESE	MG/L	0.05	1.1	0.81	1.1
ARSENIC	MG/L	0.01		0.11	0.064
pH			6.7	6.7	6.8



2020 FOOT 4" HDPE ARCTIC FORCE MAIN

SEWER MAINS 14,500 FEET
8" HDPE GRAVITY SEWER LINE, SERVICES TO 69 HOMES

SEWAGE LIFT STATION

150,000 GALLON WST.
FLOOR ELEVATION: 38.2 FT

WATER TREATMENT PLANT.
FLOOR ELEVATION: 38.9 FT

BACKWASH LAGOON

WELL 2

WELL 5

WELL 3

WELL CONNECTION VAULT

WATER MAIN LOOP 2

6291 LF 6" HDPE ARCTIC PIPE 30-50 PSI

43 HOMES

HIGHEST FLOOR ELEVATION: 40.3 FT (HOUSE 107)

LOWEST FLOOR ELEVATION: 38.5 FT (HOUSE 38)

WATER MAIN LOOP 1

8157 LF 6" HDPE ARCTIC PIPE, 30-50 PSI

26 HOMES

HIGHEST FLOOR ELEVATION: 39.0 (HOUSE 51)

LOWEST FLOOR ELEVATION: 35.7 (HOUSE 35)

NOTE:

ALL CONSTRUCTION ACTIVITY FOR THIS PROJECT SHALL OCCUR ENTIRELY WITHIN DEDICATED UTILITY EASEMENT PARCEL 97-P-1 AS RECORDED IN THE BETHEL RECORDING DISTRICT, DOCUMENT NO. 2007-001332-0, DATED SEPTEMBER 21, 2007.

REVISIONS | DATE | INIT

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM
DIVISION OF ENVIRONMENTAL HEALTH AND ENGINEERING
1901 Bragaw Street, Suite 200
ANCHORAGE, ALASKA, 99508-3440
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AKIAK, ALASKA
WATER TREATMENT PLANT UPGRADES
SCOPE OF WORK
AN 06-ND2

DATE: 03/10/08
DRAWN BY: KEN SUN/PVIII/OM
CHECKED BY: KEN SUN
PROJ MGR: KEN SUN
PROJ ENG: KEN SUN
TUS ENG: ED LOHR
FILE: AKI-G-STGENERAL
LAYOUT: G-005 SCOPE OF WORK

G-005
SHEET 5 OF 40

PLOT DATE: 3/6/2008 10:24 AM
USER: SSMOTSINGER FILE: \\DEHP2\ENGINEERING\ANJAK\AKI_DESIGN\WATER TREATMENT PLANT UPGRADES\GENERAL\AKI-G-STGENERAL.DWG

Alaska Local and Regional Information

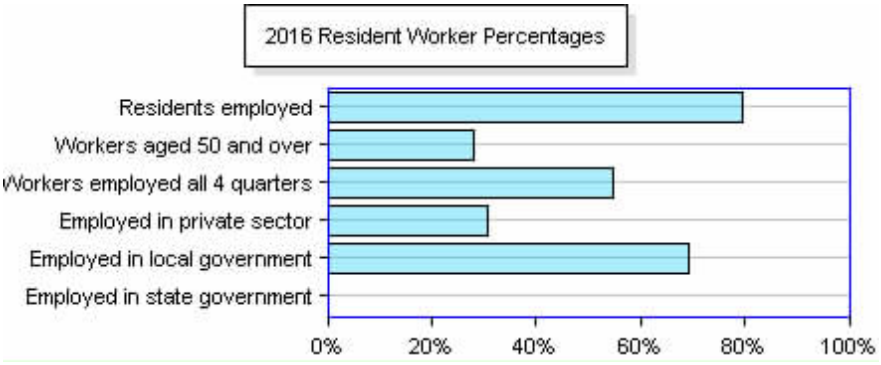
Please note: There is an important distinction between the local/regional employment data and our “standard” employment series. Most of these data reflect totals for area residents only. Total worker counts may be lower than expected in areas with a large number of nonresident workers. The Alaska Permanent Fund dividend file is used to determine the worker’s geographic residence. Only Alaska residents (as defined by PFD application) are included in these totals. Also note that federal employees, the military, and the self-employed are not included in these data.

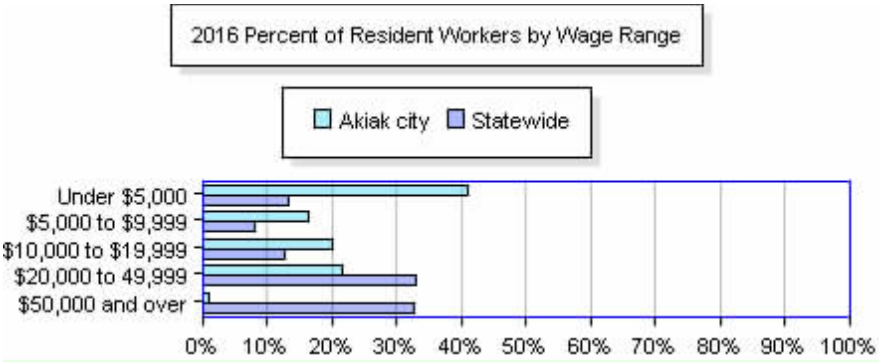
Akiak city

Akiak is an incorporated second class city and is located on the west bank of the Kuskokwim River, northeast of Bethel, on the Yukon-Kuskokwim Delta.

Worker Characteristics

	2016
Residents age 16 and over	245
Residents employed	195
Female workers	96
Male workers	99
Workers age 45 and over	60
Workers age 50 and over	55
Total wages	$2,402,575
Sector employed in	
Private	60
Local government	135
State government	0
Peak quarterly employment	170
Workers employed all 4 quarters	107
New hires	94
Unemployment insurance claimants	56





Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section. Last updated September 2016.

Occupations

2016 Top Occupations

Note: Values in this table represent resident workers only.

	Number of workers	Female	Male	Age 45 and over	Age 50 and over
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	16	4	12	5	5
Office Clerks, General	16	8	8	0	0
Chief Executives TOP JOB	13	5	8	7	6
Teacher Assistants	13	10	3	8	7
Gaming Service Workers, All Other	11	8	3	0	0
Gaming Change Persons and Booth Cashiers	11	2	9	6	6
Childcare Workers	9	8	1	1	1
Laborers and Freight, Stock, and Material Movers, Hand	8	0	8	1	1
Construction Managers TOP JOB	7	2	5	1	1
Retail Salespersons	6	4	2	0	0
Construction Laborers	6	1	5	1	0
Carpenters TOP JOB	5	0	5	2	2
Preschool Teachers, Except Special Education	5	5	0	4	4

means the occupation has been identified as an important occupation involved in the oil and gas industry. Read more.

means the occupation has been identified as an important occupation involved in the maritime industry. Read more.

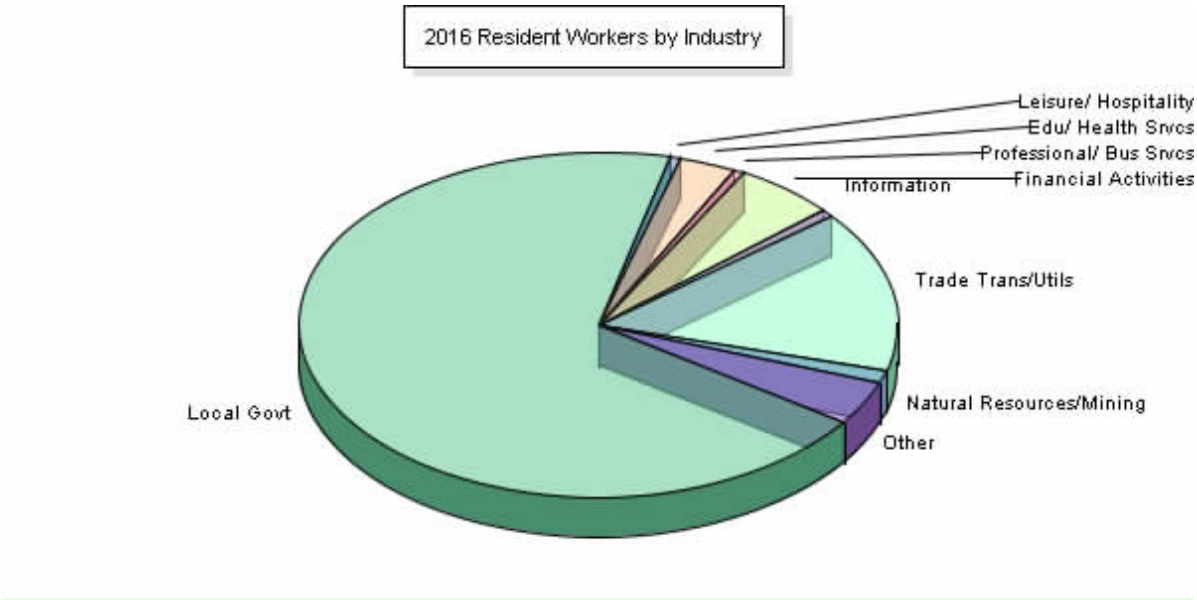
TOP JOB means the occupation is projected to have a high growth rate and numerous openings, and has an above average wage. Read more.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section. Last updated September 2016.

Industries

2016 Workers by Industry

	Number of workers	Percent of total employed	Female	Male	Age 45 and over	Age 50 and over
Natural Resources and Mining	2	1.0	0	2	0	0
Trade, Transportation and Utilities	30	15.4	13	17	5	5
Information	1	0.5	0	1	1	1
Financial Activities	11	5.6	1	10	3	2
Professional and Business Services	1	0.5	1	0	0	0
Educational and Health Services	6	3.1	6	0	0	0
Leisure and Hospitality	1	0.5	0	1	0	0
Local Government	135	69.2	68	67	45	41
Other	8	4.1	7	1	6	6

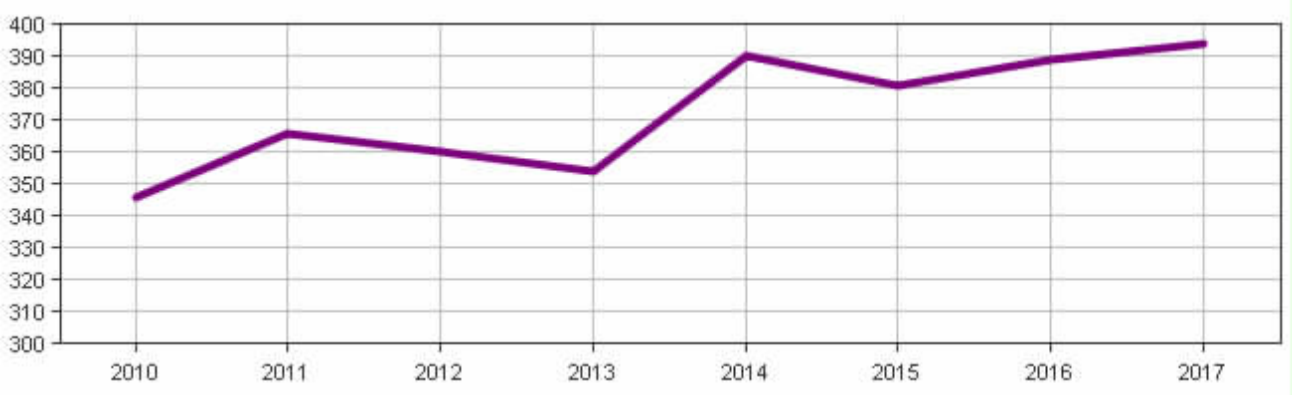


Number of Workers with Experience in Industry 2012–2016

Accomodation and food services	6	Management of companies and enterprises	2
Administration and support and waste management	15	Manufacturing	5
Agriculture, forestry, fishing and hunting	0	Mining	10
Arts, entertainment and recreation	0	Professional, scientific and technical services	3
Construction	4	Real estate and rental and leasing	33
Educational services	1	State government	4
Finance and insurance	0	Trade	74
Health care and social assistance	36	Transportation and warehousing	4
Information	2	Utilities	0

Population Estimates

Year	Population
2010	346
2011	366
2012	360
2013	354
2014	390
2015	381
2016	389
2017	394



Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section.

New Housing Units

The Alaska new housing unit survey provides an overview of new residential housing structures in selected communities throughout the state. Local governments and housing agencies are surveyed quarterly to obtain numbers of new single family, multifamily, and mobile home units.
Visit the housing information page.

New housing units for 2016: 2

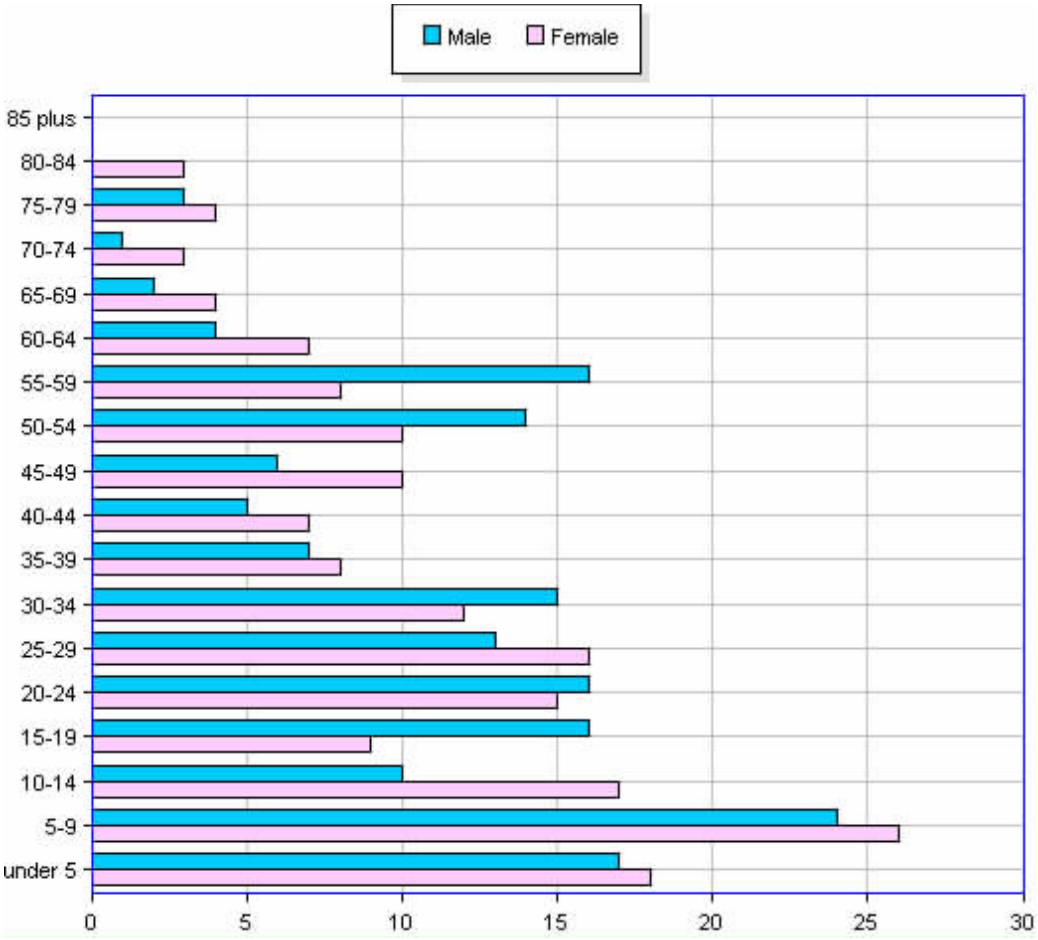
Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section. Last updated September 2016.

2010 Census

Age and Sex

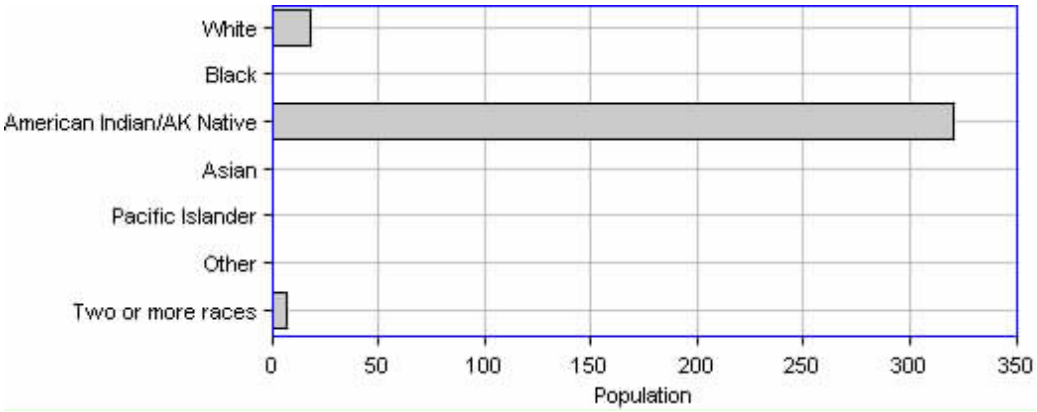
	Total	Male	Female
Total	346	169	177
Under 5 years	35	17	18
5 to 9 years	50	24	26
10 to 14 years	27	10	17
15 to 19 years	25	16	9
20 to 24 years	31	16	15
25 to 29 years	29	13	16
30 to 34 years	27	15	12
35 to 39 years	15	7	8
40 to 44 years	12	5	7
45 to 49 years	16	6	10
50 to 54 years	24	14	10
55 to 59 years	24	16	8
60 to 64 years	11	4	7
65 to 69 years	6	2	4
70 to 74 years	4	1	3
75 to 79 years	7	3	4
80 to 84 years	3	0	3
85 years and over	0	0	0

Median age		
Both	Male	Female
25.8	25.4	26.5



Race

	Number	Percent
White	18	5.2
Black	0	0.0
American Indian/AK Native	321	92.8
Asian	0	0.0
Pacific Islander	0	0.0
Other	0	0.0
Two or more races	7	2.0


White
Black
American Indian/AK Native
Asian
Pacific Islander
Other
Two or more races
0
50
100
150
200
250
300
350
Population

Household and Family Size

Average household size	3.84
Average family size	4.38

Vacancy Rates

Total housing units	98
Homeowner vacancy rate	0.0%
Rental vacancy rate	0.0%

To see more census data, visit our 2010 Census website.

Source: United States Census Bureau.

Alaska Population Projections

2015 to 2045

State of Alaska
Bill Walker, Governor

Department of Labor and Workforce Development
Heidi Drygas, Commissioner

Dan Robinson
Chief of Research and Analysis

Eddie Hunsinger
State Demographer

Eric Sandberg
Demographer

Liz Brooks
Research Analyst

Special thanks to David Howell

Published April 2016

Correction: Sentences on pages 5 and 24 of this report previously stated that the Southeast region is projected to lose population between 2015 and 2045. The Southeast region is projected to gain 260 people over the period. The text has been corrected. (May 2016.)

This publication was prepared by the Department of Labor and Workforce Development, Research and Analysis Section.

For more information, telephone Eddie Hunsinger (907) 269-4960 or e-mail eddie.hunsinger@alaska.gov.

Cover: A northern section of the Richardson Highway.
Photo by Flickr user Kevin Turinsky

Table 3.1
Alaska Population by Region, Borough, and Census Area, 2015 to 2045

	July 1, 2015 Estimate	July 1, 2020 Projection	July 1, 2025 Projection	July 1, 2030 Projection
Alaska	737,625	771,529	802,352	829,620
Anchorage / Mat-Su Region	399,086	423,107	445,773	466,780
Anchorage, Municipality of	298,908	309,692	318,629	325,533
Matanuska-Susitna Borough	100,178	113,415	127,144	141,247
Gulf Coast Region	81,111	83,703	85,819	87,404
Kenai Peninsula Borough	57,763	60,493	62,845	64,772
Kodiak Island Borough	13,819	13,971	14,053	14,061
Valdez-Cordova Census Area	9,529	9,239	8,921	8,571
Interior Region	112,818	116,478	119,402	121,504
Denali Borough	1,781	1,763	1,726	1,686
Fairbanks North Star Borough	98,645	102,237	105,139	107,276
Southeast Fairbanks Census Area	6,899	7,192	7,456	7,676
Yukon-Koyukuk Census Area	5,493	5,286	5,081	4,866
Northern Region	27,802	28,707	29,597	30,522
Nome Census Area	10,040	10,449	10,859	11,298
North Slope Borough	9,895	10,152	10,390	10,634
Northwest Arctic Borough	7,867	8,106	8,348	8,590
Southeast Region	74,395	75,600	76,272	76,411
Haines Borough	2,493	2,525	2,541	2,533
Hoonah-Angoon Census Area	2,178	2,164	2,133	2,086
Juneau, City and Borough of	33,277	34,115	34,719	35,073
Ketchikan Gateway Borough	13,778	13,934	14,000	13,969
Petersburg Borough	3,199	3,132	3,046	2,932
Prince of Wales-Hyder Census Area	6,446	6,596	6,699	6,769
Sitka, City and Borough of	8,929	8,920	8,851	8,718
Skagway Borough, Municipality of	1,040	1,111	1,165	1,222
Wrangell, City and Borough of	2,442	2,508	2,550	2,570
Yakutat, City and Borough of	613	595	568	539
Southwest Region	42,413	43,934	45,489	46,999
Aleutians East Borough	2,854	2,832	2,807	2,770
Aleutians West Census Area	5,649	5,637	5,616	5,584
* Bethel Census Area	18,153	18,942	19,738	20,553
Bristol Bay Borough	887	837	790	731
Dillingham Census Area	5,007	5,156	5,289	5,420
Kusilvak Census Area	8,195	8,843	9,541	10,225
Lake and Peninsula Borough	1,668	1,687	1,708	1,716

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

Table 3.1 (continued)
Alaska Population by Region, Borough, and Census Area, 2015 to 2045

	July 1, 2035 Projection	July 1, 2040 Projection	July 1, 2045 Projection
Alaska	854,104	877,134	899,825
Anchorage / Mat-Su Region	486,263	504,566	522,007
Anchorage, Municipality of	330,821	335,148	339,171
Matanuska-Susitna Borough	155,442	169,418	182,836
Gulf Coast Region	88,516	89,298	89,920
Kenai Peninsula Borough	66,271	67,450	68,423
Kodiak Island Borough	14,014	13,941	13,897
Valdez-Cordova Census Area	8,231	7,907	7,600
Interior Region	123,063	124,417	125,893
Denali Borough	1,627	1,573	1,508
Fairbanks North Star Borough	108,869	110,197	111,562
Southeast Fairbanks Census Area	7,885	8,110	8,374
Yukon-Koyukuk Census Area	4,682	4,537	4,449
Northern Region	31,568	32,843	34,402
Nome Census Area	11,782	12,370	13,079
North Slope Borough	10,937	11,311	11,765
Northwest Arctic Borough	8,849	9,162	9,558
Southeast Region	76,099	75,481	74,655
Haines Borough	2,499	2,435	2,360
Hoonah-Angoon Census Area	2,025	1,950	1,879
Juneau, City and Borough of	35,214	35,190	35,036
Ketchikan Gateway Borough	13,842	13,683	13,508
Petersburg Borough	2,807	2,690	2,571
Prince of Wales-Hyder Census Area	6,823	6,856	6,877
Sitka, City and Borough of	8,538	8,324	8,081
Skagway Borough, Municipality of	1,263	1,291	1,305
Wrangell, City and Borough of	2,583	2,586	2,592
Yakutat, City and Borough of	505	476	446
Southwest Region	48,595	50,529	52,948
Aleutians East Borough	2,728	2,676	2,621
Aleutians West Census Area	5,533	5,447	5,357
* Bethel Census Area	21,448	22,528	23,854
Bristol Bay Borough	675	626	581
Dillingham Census Area	5,556	5,747	5,984
Kusilvak Census Area	10,935	11,773	12,800
Lake and Peninsula Borough	1,720	1,732	1,751

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

Alaska: 2010

Population and Housing Unit Counts

Issued June 2012

CPH-2-3

U.S. Department of Commerce
Rebecca M. Blank,
Acting Secretary

Rebecca M. Blank,
Deputy Secretary

Economics and Statistics Administration
Vacant,
Under Secretary
for Economic Affairs

U.S. CENSUS BUREAU
Robert M. Groves,
Director

Table 8.

Population and Housing Units: 1990 to 2010; and Area Measurements and Density: 2010

[For information concerning historical counts and geographic change, see "User Notes." For information on confidentiality, nonsampling error, and definitions, see Appendixes]

State County/County Equivalent County Subdivision Place	Population			Housing units			Area measurements in square miles		Average per square mile of land	
	2010	2000	1990	2010	2000	1990	Total area	Land area	Population density	Housing unit density
Alaska	**710,231**	r **626,931**	**550,043**	**306,967**	r **260,963**	**232,608**	**665,384.04**	**570,640.95**	**1.2**	**0.5**
Aleutians East Borough	3,141	2,697	2,464	747	724	693	15,009.86	6,981.94	0.4	0.1
Aleutians East census subarea	3,141	2,697	2,464	747	724	693	15,009.86	6,981.94	0.4	0.1
Akutan city	1,027	713	589	44	38	34	18.88	13.83	74.3	3.2
Cold Bay city	108	88	148	82	98	73	71.67	53.21	2.0	1.5
False Pass city	35	64	(X)	40	40	(X)	68.12	26.98	1.3	1.5
King Cove city	938	792	677	229	207	195	29.91	25.68	36.5	8.9
Nelson Lagoon CDP	52	83	83	32	33	35	246.98	188.12	0.3	0.2
Sand Point city	976	952	878	290	282	272	29.20	7.70	126.8	37.7
Aleutians West Census Area	5,561	5,465	9,478	1,929	2,234	2,051	14,116.44	4,390.28	1.3	0.4
Aleutians West census subarea	5,561	5,465	9,478	1,929	2,234	2,051	14,116.44	4,390.28	1.3	0.4
Adak city	326	316	4,633	500	884	1,051	68.16	33.98	9.6	14.7
Atka city	61	92	73	43	41	26	36.12	8.74	7.0	4.9
Attu Station CDP	21	20	(X)	–	–	(X)	143.62	142.54	0.1	–
Nikolski CDP	18	39	35	23	28	26	132.78	132.05	0.1	0.2
St. George city	102	152	138	61	67	67	182.30	34.75	2.9	1.8
St. Paul city	479	532	763	190	214	177	295.46	40.31	11.9	4.7
Unalaska city	4,376	4,283	3,089	1,106	988	682	212.66	111.78	39.1	9.9
Anchorage Municipality	291,826	260,283	226,338	113,032	100,368	94,153	1,961.00	1,704.68	171.2	66.3
Anchorage census subarea	291,826	260,283	226,338	113,032	100,368	94,153	1,961.00	1,704.68	171.2	66.3
Anchorage municipality	291,826	260,283	226,338	113,032	100,368	94,153	1,961.00	1,704.68	171.2	66.3
Bethel Census Area	17,013	r 16,046	13,656	5,919	5,188	4,362	45,504.21	40,570.00	0.4	0.1
Aniak census subarea	1,450	r 1,622	1,529	724	682	649	19,279.52	19,037.87	0.1	–
Aniak city	501	572	540	214	203	175	8.80	6.42	78.0	33.3
Chuathbaluk city	118	119	97	41	43	33	5.19	3.47	34.0	11.8
Crooked Creek CDP	105	137	106	47	46	49	107.39	99.81	1.1	0.5
Lime Village CDP	29	r 46	42	27	r 25	17	78.68	76.49	0.4	0.4
Lower Kalskag city	282	267	291	82	79	73	1.72	1.22	231.1	67.2
Red Devil CDP	23	48	53	23	22	24	27.83	25.13	0.9	0.9
Sleetmute CDP	86	100	106	49	51	38	104.72	95.59	0.9	0.5
Stony River CDP	54	61	51	26	25	27	4.86	3.08	17.5	8.4
Upper Kalskag city	210	230	172	74	66	51	4.13	3.69	56.9	20.1
Lower Kuskokwim census subarea	15,563	14,424	12,127	5,195	4,506	3,713	26,224.69	21,532.14	0.7	0.2
Akiachak CDP	627	585	(X)	183	150	(X)	7.55	7.54	83.2	24.3
Akiak city	346	309	285	98	76	80	3.11	2.10	164.8	46.7
Atmautluak CDP	277	294	(X)	70	64	(X)	3.50	0.54	513.0	129.6
Bethel city	6,080	5,471	4,674	2,364	1,990	1,624	48.71	43.18	140.8	54.7
Chefornak city	418	394	320	99	82	79	6.40	5.72	73.1	17.3
Eek city	296	280	254	101	83	80	1.03	0.91	325.3	111.0
Goodnews Bay city	243	230	241	82	87	72	3.72	3.72	65.3	22.0
Kasigluk CDP	569	543	(X)	121	110	(X)	13.12	12.08	47.1	10.0
Kipnuk CDP	639	644	470	176	154	128	20.31	19.99	32.0	8.8
Kongiganak CDP	439	359	294	102	90	67	1.99	1.88	233.5	54.3
Kwethluk city	721	713	558	231	199	138	11.61	10.06	71.7	23.0
Kwigillingok CDP	321	338	278	106	78	78	23.83	23.74	13.5	4.5
Mekoryuk city	191	210	177	86	96	67	6.37	6.37	30.0	13.5
Mertarvik CDP	–	(X)	(X)	–	(X)	(X)	6.99	6.99	–	–
Napakiak city	354	353	318	114	101	105	5.02	4.41	80.3	25.9
Napaskiak city	405	390	328	135	95	99	3.98	3.63	111.6	37.2
Newtok CDP	354	321	(X)	72	67	(X)	1.44	1.33	266.2	54.1
Nightmute city	280	208	153	61	54	36	100.92	96.89	2.9	0.6
Nunapitchuk city	496	466	378	132	120	97	8.46	7.46	66.5	17.7
Oscarville CDP	70	61	57	30	20	21	2.76	2.56	27.3	11.7
Platinum city	61	41	64	31	26	45	45.12	45.07	1.4	0.7
Quinhagak city	669	555	501	187	153	136	5.33	4.37	153.1	42.8
Toksook Bay city	590	532	420	135	110	103	73.86	32.64	18.1	4.1
Tuluksak CDP	373	428	(X)	99	93	(X)	3.02	2.92	127.7	33.9
Tuntutuliak CDP	408	370	300	106	97	76	116.19	115.95	3.5	0.9
Tununak CDP	327	325	(X)	90	93	(X)	60.32	60.08	5.4	1.5
Bristol Bay Borough	997	1,258	1,410	969	979	596	887.56	503.84	2.0	1.9
Bristol Bay census subarea	997	1,258	1,410	969	979	596	887.56	503.84	2.0	1.9
King Salmon CDP	374	442	696	336	343	228	169.69	168.13	2.2	2.0
Naknek CDP	544	678	575	460	455	276	82.21	81.55	6.7	5.6
South Naknek CDP	79	137	136	130	137	90	96.42	93.99	0.8	1.4

Alaska Certified Water/Wastewater Operator Database

Home
Exam/Application Status
Exams Passed
Operator Search
> System Search
Library
Fee Payment
View My List/Library Checkout
My Profile

Regulated System Record

The current classification scoring system for the selected facility is shown below. You may also return to search results.

Facility Name: Akiak Community Water Treatment System
Community: Akiak
Owner/Employer: Akiak Community Water System
Type of Facility: Water Treatment
Classification Level: Class 2

Water treatment systems are classified according to a point rating system. Point values are recognized for each of the various components found in a treatment plant. Points are totaled once all components have been recognized. The total number of points determines the classification of the water treatment system. Click here to view the entire list of components for which points can be counted for water treatment. The specific components that have been recognized toward the classification of this water treatment system are as follows:

Score Category	Score
Size (Peak day design capacity, gallons per day) - 10,000 - 50,000	2
Water Supply Source - Groundwater	2
Pretreatment - Add-heat system to heat raw water	2
Oxidation - Hypochlorite solution	3
Oxidation - Potassium permanganate	4
Coagulation - Primary coagulant	5
Mixing - In-line static mixers	0
Flocculation - Hydraulic flocculator	4
Sedimentation - Tube settlers	2
Filtration - Granular media	8
Disinfection - Liquid and powdered hypochlorites	3
Sludge Treatment - Discharge to on-site pond, septic tank, or lagoon	2
Storage - Tank capacity between 50,000 and 999,999 gallons	2
Storage - Pressure tanks	0
Total	***39***

Total Score	System Classification
1-30	Class 1
31-55	Class 2
56-75	Class 3
>75	Class 4

Operators

Name	Role	Cert. Level	Expiration Date	CEU Req. Met
Nelson Owen	Primary	WT-1	12/31/2018	Yes
Calvin Charles	Backup			

For more information, please review the Water and Wastewater Operator Certification and Training Regulation (18 AAC 74).

Operator Certification Home Page

Department of Environmental Conservation
Division of Water
410 Willoughby Ave., Ste. 303, P.O. Box 111800, Juneau, AK 99811-1800
Phone: (907) 465-5180 || Fax: (907) 465-5177 || TDD: Alaska Relay: 1 (800) 770-8973

THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Environmental Conservation

DIVISION OF ENVIRONMENTAL HEALTH
Solid Waste Program

555 Cordova Street
Anchorage, AK 99501
Phone: 907.269.7467
Fax: 907.269.7510
www.dec.alaska.gov

Certified Mail # 7016 2070 0000 6898 9845
Return Receipt Requested

June 19, 2017

David Gilila
City of Akiak
P.O. Box 52028
Akiak, AK 99606

RE: Akiak Municipal Solid Waste Landfill
Solid Waste Permit No. **SW3A179-22**

Dear Mr. Gilila:

The Alaska Department of Environmental Conservation (ADEC) has completed its evaluation of the City of Akiak permit application dated, August 18, 2016, for the Class III Community Municipal Solid Waste Landfill at Akiak, Alaska. This permit is being issued in accordance with Alaska Statute (AS) 46.03; Title 18, Chapter 15 of the Alaska Administrative Code (18 AAC 15); and the Solid Waste Regulations (18 AAC 60). **Please review the conditions in the permit and ensure that they are understood.**

Any person who disagrees with this decision may request an adjudicatory hearing in accordance with 18 AAC 15.195 - 18 AAC 15.340 or an informal review by the Division Director in accordance with 18 AAC 15.185. **Informal review requests** must be delivered to the Division Director, Alaska Department of Environmental Conservation, 555 Cordova Street, Anchorage, AK 99501 within 15 days of the permit decision. **Adjudicatory hearing requests** must be delivered to the Commissioner of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801, within 30 days of the permit decision. If a hearing is not requested within 30 days, the right to appeal is waived. More information regarding submitting a request for an informal review or adjudicatory hearing may be found at www.dec.state.ak.us/commish/ReviewGuidance.htm. Even if an adjudicatory hearing has been requested and granted, all permit conditions remain in effect unless a stay has been granted.

Please contact Stephen Price at (907) 269-7467 or by email at stephen.price@alaska.gov if you have any questions or require any additional information.

Sincerely,

Robert J. Blankenburg, P.E.
Solid Waste & Pesticides Program Manager

Attachment: Permit #SW3A179-22, expiring on **June 19, 2022**

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
555 Cordova Street
Anchorage, AK 99501

SOLID WASTE DISPOSAL PERMIT

Permit No. **SW3A179-22**

Date Effective: June 19, 2017

Date Expires: June 19, 2022

The Alaska Department of Environmental Conservation (ADEC), under authority of Title 46 of the Alaska Statutes and Title 18 Chapter 60 of the Alaska Administrative Code (18 AAC 60), issues a solid waste disposal permit to:

City of Akiak
Akiak Landfill
P.O. Box 52028
Akiak, Alaska 99552

and designated representatives for the operation and maintenance of a Class III Community Municipal Solid Waste Landfill. This landfill is authorized to accept municipal waste, ash, and construction and demolition debris. This permit is subject to the conditions listed below.

The landfill is located at latitude 60.910109, longitude -161.231979 in Akiak, Alaska, approximately 1,900 feet north northwest of the Akiak Airport. The 2.15 acre site lies within Section 23, Township 10 North, Range 67 West, Seward Meridian.

The permit holder shall manage and operate the facility in accordance with:

- The Alaska Solid Waste Regulations - 18 AAC 60;
- ADEC Class III Landfill Permit Application, dated August 18, 2016; and,
- Additional permit application materials dated March 20, 2017.

In addition, the following conditions are required:

Specific Conditions:

1. Maintain clearly legible signs at the entrance to the landfill with the name of the landfill, landfill owner and operator, landfill hours, prohibited wastes, and emergency contact information.

2. Prohibit disposal of medical waste, asbestos containing materials, used oil, oily waste, polluted soil, hazardous waste, lead-acid batteries, polychlorinated biphenyls (PCBs), septage or sewage solids, and bulk liquids (greater than 1 gallon).

3. Separate special wastes such as electronics, lead acid batteries, fluorescent bulbs from normal household waste and store them in an enclosed area so that they will not be damaged. When possible, transport these wastes out of the community to proper recycling/disposal facilities.

4. Remove household hazardous waste, ammunition, gas canisters, large metals, large plastic or rubber items, and any other materials that might cause a hazard or black smoke, prior to lighting the burn box.

5. Any burning of solid waste at the landfill or in a designated burn area must be conducted as follows:

   a. Prevent Landfill Fires and Wildfires

      i. PROHIBIT BURNING OF WASTE ON THE GROUND or at the working face.

      ii. The permit holder is responsible for any fire that escapes the landfill perimeter and may be subject to associated penalties.

      iii. No burning may be conducted during any statewide or local burn ban (see map - dnr.alaska.gov/burn/fireareas) without approval from your Area DNR Division of Forestry (forestry.alaska.gov) office number 907-524-3010.

      iv. Clear brush, dead trees and dead vegetation within a 50-foot boundary surrounding the landfill.

      v. Maintain a firebreak 10 feet wide down to mineral soil around the burn unit and any staging area for hot ash.

   b. Operations

      i. Contain and control any burning of waste - All burning must be conducted in the constructed burn unit.

      ii. Only the operator (or designee) may ignite a fire at the landfill.

      iii. The operator (or designee) must be present AT ALL TIMES during any burning, from ignition through the end of the burn.

      iv. Fire suppression equipment must be available at the landfill (or burning area) during any burn.

      v. Only burn during favorable weather conditions with wind blowing away from the community. Do not burn in high winds that may blow ash or embers beyond the firebreak.

      vi. Do not allow waste to smolder or create black smoke.

      vii. Ensure that ash is completely cool before placing ash at the working face.

   c. Separate Waste Prior to Burning

      i. DO NOT BURN HOUSEHOLD HAZARDOUS WASTE, or other items that may create chemical hazards or do not readily burn.

      ii. Separate waste that should not be burned to the greatest extent practical before igniting the burn; dispose of non-burnable waste directly at the working face.

   d. Waste Storage

      i. Stage waste that is intended to be burned either in the inactive burn unit or at a location at least 25 feet from the burn unit.

      ii. Ensure that waste is kept as dry as possible through the use of a cover or dry storage facility.

6. Maintain a designated working face (dumping area) at the landfill. Consolidate and compact waste regularly to keep the working face manageable and reduce infiltration of water.

7. Cover waste with a minimum of 6-inches of soil at regular intervals as needed to control attraction of wild and domestic animals, windblown litter, fire, and odor. Cover any areas that do not receive waste for 90 days with at least 12 inches of soil material. Grade cover to prevent water from ponding.

8. Pick up litter or improperly disposed waste in and around the facility in a timely manner and place it into the active cell.

9. Do not dispose of waste in water. Remove any waste that is disposed in water and place it at the working face, or an appropriate dry area. Work to grade the surfaces of the landfill so water does not create ponds.

10. All snow must be removed from the disposal area before the spring thaw. Snow removed from the disposal area must be stored in an area that will prevent the melting snow from coming in contact with waste. Litter that remains after the snow melts must be picked up and properly disposed.

11. Maintain a designated area for disposal of animal carcasses. Dust carcasses with lime and cover, by the end of the day, with a minimum of 6-inches of soil to prevent attracting pets and wildlife.

12. Keep the designated salvage area orderly and prohibit any salvaging within the active cell. Materials in the salvage area that do not have any further salvage or recycle value should be placed at the working face and buried.

13. Remove refrigerant from vehicles, refrigerators, freezers and any other refrigerant-containing units prior to disposal or ship the items out of the community for proper disposal. Only a certified technician may remove refrigerants.

14. Complete a visual inspection of the landfill each month. **Complete the Visual Inspection Checklist in Appendix A of the permit each month and submit copies** (by email, fax or mail) **to the ADEC Solid Waste Program until further notice.** Retain the completed reports in the landfill operation record for at least 5 years.

15. Maintain a landfill operation record at the City of Akiak office containing the ADEC permit application, current ADEC solid waste disposal permit, operator training records, previous inspection reports, current operations plan, monthly visual monitoring records, and as-built drawings.

16. Encourage landfill operators and pertinent staff to attend solid waste trainings such as RALO to ensure best management practices.

17. The permit application materials cited above must accompany this permit document for the landfill permit to be valid.

General Conditions:

1. Access and inspection - The Permittee shall allow the Commissioner or his representative access to the permitted facilities at reasonable times to conduct scheduled or unscheduled inspections or tests to determine compliance with this permit, State laws, and regulations.

2. Information access - Except for information relating to confidential processes or methods of manufacture, all records and reports submitted in accordance with the terms of this permit shall be available for public inspection at the State of Alaska, Department of Environmental Conservation, 555 Cordova Street, Anchorage, AK 99501.

3. Civil and criminal liability - Nothing in this permit shall relieve the Permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond his control, including, but not limited to, accidents, equipment breakdowns, or labor disputes.

4. Availability - The Permittee shall post or maintain a copy of this permit available to the public at the disposal facility.

5. Adverse impact - The Permittee shall take all necessary means to minimize any adverse impacts to the receiving waters or lands resulting from noncompliance with any limitation specified in this permit, including any additional monitoring needed to determine the nature and impact of the noncomplying activity. The Permittee shall clean up and restore all areas adversely impacted by the noncompliance.

6. Cultural or paleontological resources - Should cultural or paleontological resources be discovered as a result of this activity, work which would disturb such resources is to be stopped, and the State Historic Preservation Office, Division of Parks and Outdoor Recreation, Department of Natural Resources, is to be notified immediately (907-269-8721).

7. Applications for renewal - In accordance with 18 AAC 15.100(d), applications for renewal or amendment of this permit must be made no later than 30 days before the expiration date of the permit or the planned effective date of the amendment.

8. Other legal obligations - The requirements, duties, and obligations set forth in this permit are in addition to any requirements, duties, or obligations contained in any permit that the Alaska Department of Environmental Conservation or the U.S. Environmental Protection Agency has issued or may issue to the Permittee. This permit does not relieve the Permittee from the duty to obtain any and all necessary permits and to comply with the requirements contained in any such permit or with applicable state and federal laws and regulations. All activities conducted by the Permittee pursuant to the terms of this permit and all plans implemented by the Permittee pursuant to the terms of this permit shall comply with all applicable state and federal laws and regulations.

9. Pollution prevention - In order to prevent and minimize present and future pollution, when making management decisions that affect waste generation, the Permittee shall consider the following order of priority options: waste source reduction; recycling of waste; waste treatment; and waste disposal.

This permit expires on **June 19, 2022** and may be revoked or amended in accordance with 18 AAC 60.260. The permit can be renewed if the facility will operate beyond this date. To avoid expiration of this permit, a renewal application must be submitted to ADEC at least 30 days before the expiration date, as set forth in 18 AAC 15.110.

Robert J. Blankenburg, P.E.
Solid Waste & Pesticides Program Manager

APPENDIX D – COMMUNITY FINANCIAL DATA

Akiak Native Community

Akiak IRA Council
P.O. Box 52127
Akiak, Alaska 99552
Phone: (907) 765-7112 Fax: (907) 765-7512

Water Treatment Plant Budget 2018

INCOME: $163000.00

WATER TREATMENT PLANT: $163000.00

$2.00/Token X 2 Tokens/Day X 365 Days/Year = $ 1460.00
Yupiit School District: (Agreement) per year = $80000.00
Rural Cap Inc: $150/month X 12 months= 1800.00
City of Akiak= $150/month X 12 months = $1800.00
Akiak Clinic: $150/month x 12 months = $1800.00
Akiak Native Community $150 X 12 months= $1800.00
Police Building $105 month X 12 months = $1260.00
$105/month X 58 Households X 12 months = $73080.00

EXPENSES: $162458.97

WTP OPERATOR: $53972.17
$16.00/Hour X 28 hrs/week X 52 weeks X 2 employees = $46592.00
$46592.00 X 15.84 % = $ 7380.17

Lift Station Operators: $13900.80
$25.00/Hour X 40 hours/month X 12 months = $12000.00
$12000 X 15.84% = $1900.80

WORKERS COMPENSATION: $ 3774.00
314.50/Month X 12 Months =:$ 3774.00

CONTRACT LABOR: $ 10000.00
$25.00/Hour X 33 Hours X 12 Month = $6000.00
$20.00/Hour X 5 Hours X 40 Days = $4000.00

TRAVEL: $ 2488.00
Per Diem: $226 X 4 Trips X 2 = $1808.00
Airfare: $120 X 4 Trips = $ 480.00
Training Fee: $ 50 X 4 Trainings = $200.00

ELECTRICITY: $61200.00
8500 kilowatts/month X $0.60/kilowatt X 12 Months = $61200

FUEL / SUPPLIES: $ 6120.00
$510.00 / Month X 12 Months = $6120.00

TESTING FEE: $ 3204.00
$40/Month X 12 Months = $480.00
120/Qtr X 4 Quarters = $480.00
Polymer $200 X 3 Buckets = $ 600.00
Glycol: $40.00/55 gallons X 2 = $80.00
Potassium: $ 143.00 X 6 Buckets = $1144.00
Chlorine: $42.00 X 10 Buckets = $420.00

Postage: $1280.00
$40.00 Month X 12 = $ 480.00
$800.00 Freight for Supplies

WATER LAB / FEES: $1520.00
$152.00/Month X 10 Months = $ 1520.00

MAINTENANCE REPAIR & REPLACE: $ 5000.00
$5000.00/ Year = $ 5000.00

TOTAL BUDGET:
Income: $163000.00
Expense: $ 162458.97
BALANCE: $541.03

This budget was passed this 15 **day of** Nov **, 2017 with a vote of** 5 **yes,** ~~0~~ **no,** ~~0~~ **abstain,** ~~0~~ **absent.**

IVAN IVAN, CHIEF

SAMMY G JACKSON I, SEC/TREAS

Budget Appropriations Ordinance

Ordinance No. _2015-07-04_____

AN ORDINANCE FOR THE CITY OF AKIAK PROVIDING FOR THE ESTABLISHMENT AND ADOPTION OF THE BUDGET FOR FISCAL YEAR 2016

BE IT ENACTED BY THE COUNCIL OF THE CITY OF AKIAK

Section 1. Classification.
This is a **Non-Code Ordinance**.

Section 2. General Provisions.
The attached document is the authorized budget of revenues and expenditures for the period July 1 through June 30 and is made a matter of public record.

Section 3. Effective Date.
This ordinance becomes effective upon its adoption by the city council.

First Reading: 6/30/2015
Public Hearing: 7/14/15

ADOPTED by a duly constituted quorum of the City Council of AKIAK, Alaska, this 14 day of July, 2015.

Mayor*

ATTEST:

City Clerk

Attachment: Authorized FY16 Revenues and Expenditures.

*or the Manager, if the Manager plan has been adopted.

Original *- To be kept by city.*

Copy *- To be returned to the Department of Commerce, Community, and Economic Development*

CITY OF AKIAK BUDGET AND MONTHLY FINANCIAL STATEMENT	Budgeted for FY2016	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Year to Date Amount	Balance
Prior Year Cash Balance	-													-	-
OUTSTANDING CITY DEBTS (as of 7/23/15)															
Kokarmuit (APU Account 2008)	638,132													-	638,132
Kokarmuit (Gaming Account)	1,687													-	1,687
Kokarmuit (City Admin Account)	20,204													-	20,204
Kokarmuit (2010 Clinic)	9,878													-	9,878
Kokarmuit (Heavy Equipment)	562													-	562
Kokarmuit (2011 Flood Preparation)	466													-	466
Kokarmuit (VPO)	150													-	150
Total Kokarmuit Debt	671,080													-	671,080
Amount budgeted in FY16 for Kokarmuit Debt (See Admin & Finances and APU Expenses)	80,136													-	80,136
IRS 941 Payroll Taxes 4th QTR 2011	10,517													-	10,517
IRS 941 Payroll Taxes 1st QTR 2012	10,625													-	10,625
IRS 941 Payroll Taxes 2nd QTR 2012	16,585													-	16,585
IRS 941 Payroll Taxes 3rd QTR 2012	15,812													-	15,812
IRS 941 Payroll Taxes 4th QTR 2012	15,032													-	15,032
IRS 941 Payroll Taxes 1st QTR 2013	5,353													-	5,353
IRS 941 Payroll Taxes 2nd QTR 2013	18,295													-	18,295
IRS 941 Payroll Taxes 3rd QTR 2013	18,974													-	18,974
IRS 941 Payroll Taxes 4th QTR 2013	20,265													-	20,265
IRS 941 Payroll Taxes 1st QTR 2014	2,355													-	2,355
RS 941 Payroll Taxes 2nd QTR 2014	5,803													-	5,803
RS 941 Payroll Taxes 3rd QTR 2014	4,391													-	4,391
RS 941 Payroll Taxes 1st QTR 2015	87													-	87
RS 941 Payroll Taxes 2nd QTR 2015	17,115													-	17,115
OTAL 941 Payroll Tax Liability	161,209	-	-	-	-	-	-	-	-	-	-	-	-	-	161,209
OTAL CITY OF AKIAK OUTSTANDING EBT	832,289	-	-	-	-	-	-	-	-	-	-	-	-	-	832,289
he retirement of the above IRS debts is not ncluded in the city's FY16 budget package.															

CITY OF AKIAK BUDGET AND MONTHLY FINANCIAL STATEMENT	Budgeted for FY2016	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Year to Date Amount	Balance
ADMINISTRATION AND FINANCE INCOME															
Gaming Administration Fee (10%)	26,640													-	26,640
APU Administration Fee (10%)	37,265													-	37,265
Community Revenue Sharing	108,648													-	108,648
Contributions														-	-
Shared Fisheries	135													-	135
Payment In Lieu Of Taxes	47,489													-	47,489
TOTAL ADMINISTRATION AND FINANCE INCOME	220,177	-	-	-	-	-	-	-	-	-	-	-	-	-	220,177
ADMINISTRATION AND FINANCE EXPENSES															
Salaries	96,200													-	96,200
Payroll Taxes	9,620													-	9,620
Workers Compensation Ins.														-	-
Travel (charters freight and subsistence POV, Per Diem)														-	-
Telephone/Internet														-	
Heating Fuel														-	
Accounts Payables (Kokarmiut Corp see Outstanding City Debts class above)	20,136														20,136
Building Repairs/Maintenance	2,000													-	2,000
Trash Hauling	1,800													-	1,800
Water and Sewer User Fee	1,260														1,260
Office Supplies	1,500														1,500
Janitorial Supplies	1,000													-	1,000
Land Fill	35,000													-	35,000
AMLJIA General, Auto and Property Liability Insurance	7,667													-	7,667
TOTAL ADMINISTRATION AND FINANCE EXPENSES	176,183	-	-	-	-	-	-	-	-	-	-	-	-	-	176,183
AKIAK POWER UTILITY INCOME															
Yupuit School District	216,000													-	216,000
PCE	120,000														120,000
Residential User Fees	36,635													-	36,635
TOTAL AKIAK POWER UTILITY INCOME	372,635	-	-	-	-	-	-	-	-	-	-	-	-	-	372,635
AKIAK POWER UTILITY EXPENSES															
Salaries	66,976													-	66,976
Payroll Taxes														-	-
Worker's Compensation Ins.														-	-
Telephone	4,500													-	4,500
Bank Charges/Credit Card Machine	900													-	900
Travel (charters, freight and subsistence, POV, Per Diem)	1,500													-	1,500
Accounts Payables (Kokarmuit Corporation debt retirement, see Outstanding City Debts class above.)	60,000													-	60,000
Oil Filters	3,000													-	3,000
Parts/Supplies	5,000													-	5,000
Insurance	7,667														
Repairs and Maintenance	5,000													-	5,000
Donations	500													-	500
Administration Fee (10%)	37,265													-	37,265
Diesel @ $2.449 gallons	171,430													-	171,430
TOTAL AKIAK POWER UTILITY EXPENSES	363,738	-	-	-	-	-	-	-	-	-	-	-	-	-	363,738

CITY OF AKIAK BUDGET AND MONTHLY FINANCIAL STATEMENT	Budgeted for FY2016	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Year to Date Amount	Balance
CITY COUNCIL EXPENSES															
Regular, Special, and Community Meeting Stipends	26,400													-	26,400
Payroll Taxes on Stipends														-	-
Per Diem														-	-
Lodging														-	-
Per Diem														-	-
Election Judges														-	-
TOTAL CITY COUNCIL EXPENSES	26,400	-	-			-	-	-	-	-	-	-		-	26,400
GAMING INCOME															
Gross Pull-Tab Sales	266,398													-	266,398
TOTAL GAMING INCOME	266,398	-	-			-	-	-	-	-	-	-		-	266,398
GAMING EXPENSES															
Salaries	130,520													-	130,520
Payroll Taxes	13,052													-	13,052
Workers Compensation Ins.														-	-
Travel (charters, freight and subsistence, POV)	3,910													-	3,910
Office Supplies	4,500													-	4,500
Pull-tab Supplies	57,000													-	57,000
Bank Fees	900													-	900
Equipment														-	-
Telephone/Internet	2,000													-	2,000
Rent	3,600													-	3,600
Trash Haul	2,400													-	2,400
Gaming Permit/License	100													-	100
Raffles	2,000													-	2,000
Administration Fee (10%)	26,640													-	26,640
Contributions	12,000													-	12,000
TOTAL GAMING EXPENSES	258,622	-	-	-	-	-	-	-	-	-	-	-	-	-	258,622
PUBLIC SAFETY EXPENSES															
Salaries	15,600													-	15,600
Payroll Taxes	1,560													-	1,560
Workers' Comp	391													-	391
MLJIA (Police Professional Liability)														-	-
Fuel Oil														-	-
Phone and Internet														-	-
TOTAL PUBLIC EXPENSES	17,551	-	-	-	-	-	-	-	-	-	-	-	-	-	17,551
SUMMARY															
TOTAL INCOME	859,210	-	-	-	-	-	-	-	-	-	-	-	-	-	859,210
TOTAL EXPENSES	842,494	-	-	-	-	-	-	-	-	-	-	-	-	-	842,494
ENDING BALANCE	16,716	-	-	-		-	-	-	-	-	-	-	-	-	16,716

CITY OF AKIAK BUDGET AND MONTHLY FINANCIAL STATEMENT	Budgeted for FY2016	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Year to Date Amount	Balance
GRANT FY 2016															
GRANT FY16 INCOME	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GRANT FY16 EXPENSES															
Wages & Salaries	-													-	-
Payroll Taxes	-													-	-
Worker's Compensation Insurance	-													-	-
Freight	-													-	-
Grant Administration	-													-	-
Gasoline	-													-	-
Diesel	-													-	-
Supplies Materials	-													-	-
Other	-													-	-
TOTAL GRANT FY14 EXPENSES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GRANT FY 2016															
GRANT FY16 INCOME	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GRANT FY16 EXPENSES															
Wages & Salaries	-													-	-
Payroll Taxes	-													-	-
Worker's Compensation Insurance	-													-	-
Freight	-													-	-
Grant Administration	-													-	-
Gasoline	-													-	-
Diesel	-													-	-
Supplies Materials	-													-	-
Other	-													-	-
TOTAL GRANT FY16 EXPENSES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

City of Akiak
P.O. Box 52028
Akiak, Alaska 99552
Telephone (907) 765-7112 Fax (907) 765-7114

MEMORANDUM

To: The Akiak City Council Members and City of Akiak Staff
From: David Gilila, Vice Mayor
Subject: Call for Special Meeting on Tuesday July 14, 2015 at 2 pm at the Akiak City office to Review and Approve the FY 16 City Annual Operating Budget for July 1 2015 to June 30, 2016.
Date: July 13, 2015

This memorandum will serve as a call for a Special Meeting of the Akiak City Council on Tuesdayy, July 14, 2015 to review and approve the FY 16 City Operating Budget for July 1, 2015 to June 30, 2016.

Akiak City Council Special Meeting

July 14 2015

1. Call to Order
2. Roll Call
3. Invocation
4. Special Order of Business
   a. Review and approve the FY 16 City Operating Budget for July 1, 2015 to June 30, 2016.
5. Adjournment

City of Akiak
P.O. Box 52028
Akiak, Alaska 99552
Telephone (907) 765-7411 Fax (907) 765-7414

FY 16 City of Akiak Gaming Budget
July 1, 2015 to June 30, 2016

Total FY 16 Gaming Budget $266,289.00

1. Personnel		$143,572.00
A. Gaming Manager @ $17/hr x 6 hrs/day x 5 days/wk x 52 wks	$26,520.00	
B. Gaming Assistant @ $15/hr x 5 hrs/day x 5 days/wk x 52 wks	$19,500.00	
C. Pull Tab Operators @ $13/hr x 5 hrs/day x 5 days/wk x 52 wks X 5 people	$84,500.00	
D. Payroll Taxes	$13,052.00	
2. Travel		$3,910.00
A. Aki/Bet/Aki @ $190 x 6 Trips	$1,140.00	
B. Subsistence @ $60 per Trip x 12 Trips	$720.00	
C. POV ($150 x 6=$900.00 / $75 x 12= $900.00)	$1,800.00	
D. Cab Fares	$250.00	
3. Supplies		$61,500.00
A. Pull Tabs	$57,000.00	
B. Office Supplies	$4,500.00	
4. Facility Expenses		$14,167.00
A Telephone/Internet	$2,000.00	
B Insurance	$7,667.00	
C Trash Hauling @ $200/month x 12 months	$2,400.00	
D. Permit/License	$100.00	
E Raffles	$2,000.00	
5. Other Expenses		$43,140.00
A Contributions	$12,000.00	
B Bank Fees	$900.00	
C Rent	~~$36,00.00~~ $3,600	
D 10% Administration Fee	$26,640.00	

FY 16 Projected Revenues

1 Gaming @ $22,199.83 x 12 months	$266,398.00

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FY 16 Akiak Power Utilities Budget
July 1, 2015 to June 30, 2016

Total FY 16 APU Budget $370,435.60

1. Personnel		$73,673.60
A. APU Clerk @ $18/hr x 6 hrs/day x 5 days/wk x 52 wks	$28,080.00	
B. Power Plant Operators @ $21/hr x 4 hrs/day x 7 days/wk x 26 wks x 2 people	$30,576.00	
C. On-Call Operator @ $16/hr x 4 hrs/day x 5 days/wk x 26 wks	$8,320.60	
2. Power Plant Parts & Supplies		$28,067.00
A. Oil Filter	$3,000.00	
B. Parts & Supplies	$5,000.00	
C. Repairs/Maintenance	$5,000.00	
D. Travel (POV)	$1,500.00	
E. Telephone/Internet	$4,500.00	
F. Insurance	$7,667.00	
G. Bank Fees	$900.00	
H. Donations	$500.00	
3. Fuel Purchase 70,000 gallons fuel @ $2.44900		$171,430.00
4. Accounts Payables (Kokarmuit Corporation)		$60,000.00
5. 10% Administration Fee		$37,265.00

FY 16 Projected Revenues

$372,635.00

1. YSD @ $18,000/mo. X 12 months	$216,000.00
2. Individual Homes	36,635.00
3. PCE @ $10,000/mo x 12 months	120,000.00

City of Akiak
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FY 16 State Revenue Sharing Budget
July 1, 2015 to June 30, 2016

Total FY 16 SRS Budget		$219,743.20
I. Administration		$105,820.00
A. City Administrator @ $22/hr. x 6 hrs/day x 5 days/wk. x 52 wks.	$34,320.00	
B. Administrative Ass't @ $21/hr x 4 hrs/day x 5 days/wk x 52 wks	$21,840.00	
C. Bookkeeper @ $20/hr x 4 hrs/day x 5 days/wk x 52 wks	$20,800.00	
D. Janitor @ $13/hr x 2 hrs/day x 5 days/wk x 52 wks	$6,760.00	
E. Administrative Clerk @ $12/hr x 4 hrs/day x 5 days/wk x 52 wks	$12,480.00	
F. Payroll Taxes	$9,620.60	
II. City Council Stipends		$26,400.00
A. Regular Meeting Stipends @ $200/mtg x 8 people x 12 months	$19,200.00	
B. Special Meeting Stipends @ $150/mtg x 8 people x 3 meetings	$3,600.00	
C. Committee Meetings @ $150/mtg x people x 3 meetings	$3,600.00	
III. Facility Expenses		$5,060.00
A. Maintenance	$2,000.00	
B. Trash Hauling @ $150/month x 12 months	$1,800.00	
C. Water @ Sewer @ $105/month x 12 months	$1,260.00	
IV. Office Supplies		$1,500.00
V. Janitorial Supplies		$1,000.00
VI. Public Safety		$17,160.00
A. VPO @ $15/hr x 4 hrs/day x 5 days/wk x 52 weeks	$15,600.00	
B. Payroll Taxes	$1,560.00	
VII. Insurance		$7,667.00
VIII. Accounts Payables (Kokarmuit Corporation)		$20,136.20
IX. Land Fill		$35,000.00

FY 16 Projected Revenues

		$220,177.46
1. State Revenue Sharing FY 15 $113,175.00 less 4%	$108,648.00	
2. PILT	47,489.46	
3. Fisheries	135.00	
4. APU 10% Administration Fee	37,265.00	
5. Gaming 10% Administration Fee	26,640.00	

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FY 16 Projected Revenues
July 1, 2015 to June 30, 2016

I. City of Akiak Administration		$220,177.46
1. State Revenue Sharing FY 15 $113,175.00 less 4%	$108,648.00	
2. PILT	47,489.46	
3. Fisheries	135.00	
4. AFU 10% Administration Fee	37,265.00	
5. Gaming 10% Administration Fee	26,640.00	
II. Akiak Power Utilities		$372,635.00
1. YSD @ $18,000/mo x 12 months	$216,000.00	
2. Individual Homes	36,635.00	
3. PCE @ $10,000/mo x 12 months	120,000.00	
III. Akiak City Gaming		$266,398.00
1. $22,199.83/mo x 12 months		

AKIAK IRA BUDGET AND MONTHLY FINANCIAL STATEMENT	Budgeted for FY15	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	Year to Date Amount	Balance
Prior Year Cash Balance														-	-
GENERAL FUND INCOME															
General Fundraising	38,000													-	38,000
Donations & Refunds														-	-
Rental Income														-	-
TOTAL GENERAL FUND INCOME	38,000	-	-	-	-	-	-	-	-	-	-	-	-	-	38,000
GENERAL FUND EXPENSES															
Payroll Expenses	13,000													-	13,000
Payroll Taxes	1,400													-	1,400
Workers' Compensation	1,000													-	1,000
Liability Insurance														-	-
Supplies (office and janitorial)	7,800													-	7,800
Advertising Fees	150													-	150
Electricity														-	-
Rent	1,000													-	1,000
Heating Fuel / Gas	200													-	200
Per Diem														-	-
Travel & Training Expense	41,000													-	41,000
Registration and Training Fees	2,000													-	2,000
Professional Services	1,500													-	1,500
Postage & Freight	6,300													-	6,300
Equiment & Supplies (Vehicles)														-	-
Casual/Contract Labor	10,300													-	10,300
Donations/Contributions	3,100													-	3,100
Bank Service Charges	300													-	300
Community Events & Activities	33,000													-	33,000
Stipends	2,675													-	2,675
Equiment Purchases														-	-
Building Supplies														-	-
Building Repair & Maintenance														-	-
TOTAL GENERAL FUND EXPENSES	124,725	-	-	-	-	-	-	-	-	-	-	-	-	-	124,725
AKIAK NATIVE COMMUNITY COUNCIL EXPENSES															
Council Stipends	93,876													-	93,876
Payroll Taxes														-	-
Travel & Training Expense														-	-
Per Diem														-	-
Registration and Training Fees														-	-
AKIAK NATIVE COMMUNITY COUNCIL EXPENSES	93,876	-	-	-	-	-	-	-	-	-	-	-	-	-	93,876

TPO PUBLIC SAFETY EXPENSES															
Payroll Expenses	48,000													-	48,000
Payroll Taxes	5,200													-	5,200
Contract Labor	300													-	300
Workers' Compensation	2,000													-	2,000
Professional Consulting	200													-	200
Liability Insurance														-	-
Supplies (office and janitorial)														-	-
Travel & Training Expense	3,900													-	3,900
Per Diem	4,300													-	4,300
Registration and Training Fees	300													-	300
TOTAL PUBLIC SAFETY EXPENSES	64,200	-	-	-	-	-	-	-	-	-	-	-	-	-	64,200
WATER AND SEWER INCOME	140,000	10,400	11,018	11,636	33,925	15,439	7,801	24,525	6,442	16,248	8,693	10,931	11,538	168,596	(28,596)
WATER AND SEWER EXPENSES															
Payroll Expenses	46,592	2,132	2,356	3,351	2,028	2,170	2,145	3,135	2,541	2,145	3,455	2,906	2,279	30,643	15,949
Payroll Taxes	7,380	237	262	373	226	241	239	349	283	239	375	315	247	3,386	3,994
Lift Station Payroll Expenses	12,000	1,525	1,750	2,745	1,550	1,700	1,625	1,775	1,625	1,800	3,675	2,050	1,700	23,520	(11,520)
Payroll Taxes	1,901	159	184	288	162	179	170	184	169	189	399	222	184	2,489	(588)
Workers' Compensation	3,774													-	3,774
Electricity	25,200													-	25,200
Heating Fuel / Gas	30										35			35	(5)
Per Diem	1,808		325						248		191	253		1,016	792
Travel & Training Expense	480		190				372		190		240	187		1,179	(699)
Registration and Training Fees	200						530	800						1,330	(1,130)
Repair and Replacement Contribution	5,000													-	5,000
Postage & Freight	1,280					49		49						98	1,182
Equiment & Supplies (Vehicles)	10,080	24	880	18	67	70	73	12		2,819		809	99	4,871	5,209
Casual/Contract Labor	10,000			225	200		160					400		985	9,015
Water Lab / Fees	1,520						83							83	1,437
Water Tests & Chemical Expenses	3,204				51	2,407								2,458	746
Building Repair & Maintenance	5,000													-	5,000
TOTALWATER AND SEWER EXPENSES	135,449	4,077	5,947	7,000	4,284	6,816	5,397	6,304	5,056	7,192	8,369	7,142	4,509	72,093	63,356
TOTAL INCOME	710,926	10,400	11,018	11,636	33,925	15,439	7,801	24,525	6,442	16,248	8,693	10,931	11,538	168,596	542,330
TOTAL EXPENSES	939,897	4,077	5,947	7,000	4,284	6,816	5,397	6,304	5,056	7,192	8,369	7,142	4,509	72,093	867,804
DIFFERENCE	(228,970)	6,323	5,071	4,636	29,641	8,623	2,404	18,221	1,387	9,056	324	3,789	7,029	96,503	(325,473)

APPENDIX E – CAPITAL AND O&M COST ESTIMATES

Cost Estimate

Prepared By: LCG
Date: 3/6/2018

PRELIMINARY ENGINEERING REPORT (PER) FOR AKIAK WATER AND SEWER IMPROVEMENTS
Preliminary Engineers Estimate
Alternative 1--Extension of Piped Water & Gravity Sewer for 6 homes

ITEM NO.	ITEM	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	GENERAL REQUIREMENTS, MOB/DEMOB	LS	1	30%	$116,955.00
2	TRAFFIC CONTROL & PUBLIC RELATIONS	LS	1	$2,000.00	$2,000.00
3	CONSTRUCTION SURVEYING	LS	1	$8,000.00	$8,000.00
4	EROSION/POLLUTION CONTROL	LS	1	$3,000.00	$3,000.00
5	FURNISH/INSTALL NATIVE FILL (COVER & TRANSITION)	CY	70	$95.00	
6	FURNISH/INSTALL OTHER FILL--ASSUME NONE (NIC)	CY	0	$80.00	$0.00
7	FURNISH AND INSTALL 6" X 12" PIPE, HDPE ARCTIC INSULATED WATER MAIN	LF	932	$175.00	$163,100.00
8	FURNISH AND INSTALL 4" X 12" HDPE ARCTIC INSULATED WATER SERVICE PIPING TO INCLUDE 1" SUPPLY & RETURN LINES AND 3/4" HEAT TRACE PIPE W/ 5W/FT HEAT TRACE.	LF	600	$250.00	$150,000.00
9	FURNISH AND INSTALL 1" WATER SERVICE CONNECTIONS AT MAIN, INCLUDING PIT ORIFACES, VALVES, HEAT TRACE, SADDLES AND INSULATION	EACH	6	$1,750.00	$10,500.00
10	FURNISH AND INSTALL 90-DEG BANDED ELBOW FITTING & CONNECTION COLLAR RING FOR HOME CONNECTION OF WATER SERVICE (ALL INCLUDED)	EACH	6	$3,000.00	$18,000.00
11	TIE-IN NEW 6 X 12 WATER MAIN TO EXISTING WATER MAIN, (ALL INCLUDED).	LS	1	$3,750.00	$3,750.00
12	MAINTENANCE OF WATER SERVICE	LS	1	$2,500.00	$2,500.00
13	INSTALL NEW FIRE HYDRANT ASSEMBLY, INCLUDES BOLLARDS, VALVE, TEE, CONNECT	EACH	1	$10,000.00	$10,000.00
14	FURNISH AND INSTALL 6" GATE VALVE AND VALVE BOX	EACH	3	$3,000.00	$9,000.00
15	FURNISH & INSTALL 8" X 15" ARCTIC SEWER MAIN	LF	595	$185.00	
16	FURNISH & INSTALL 4" X 12" ARCTIC SEWER SERVICE LINES (6 Lots)	LF	300	$150.00	
17	FURNISH AND INSTALL 90-DEG BANDED CROSS FITTING & CONNECTION COLLAR RING FOR HOME CONNECTION OF SEWER SERVICE (ALL INCLUDED)	EACH	6	$3,000.00	
18	FURNISH & INSTALL INSULATED ARCTIC SEWER MANHOLES, INCL INSULATION, JOINT STRAPS, EDPM PIPE CONNECTORS, FROST COVER, SEALANT, LOOPS	EACH	2	$7,500.00	
19	INSTALL SEWER SERVICE CONNECTIONS TO NEW MAIN	EACH	6	$2,000.00	
20	WATER LINE THAW PORT (DOUBLE CLEANOUT), INCLUDING PIPE BOLLARDS	EACH	2	$5,000	$10,000.00

PROJECT CONSTRUCTION	$506,805.00
CONTINGENCY AT 12%	$60,816.60
PROJECT CONSTRUCTION TOTAL	**$567,621.60**
ADMINISTRATION (5%)	$28,381.08
ENGINEERING (5%)	$28,381.08
CONSTRUCTION ADMINISTRATION (4%)	$22,704.86
ADMIN/ENGINEERING/CONST MGMT TOTAL	$79,467.02
TOTAL PROJECT COST	**$647,088.62**

Cost Estimate

Prepared By: LCG
Date: 3/6/2018

PRELIMINARY ENGINEERING REPORT (PER) FOR AKIAK WATER AND SEWER IMPROVEMENTS
Preliminary Engineers Estimate
Alternative 2--Extension of Piped Water & Gravity Sewer for 6 homes plus 8 lots

ITEM NO.	ITEM	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	GENERAL REQUIREMENTS, MOB/DEMOB	LS	1	30%	$358,530.00
2	TRAFFIC CONTROL & PUBLIC RELATIONS	LS	1	$4,000.00	$4,000.00
3	CONSTRUCTION SURVEYING	LS	1	$16,000.00	$16,000.00
4	EROSION/POLLUTION CONTROL	LS	1	$6,000.00	$6,000.00
5	FURNISH/INSTALL NATIVE FILL (COVER & TRANSITION)	CY	500	$95.00	$47,500.00
6	FURNISH/INSTALL OTHER FILL--ASSUME NONE (NIC)	CY	0	$80.00	$0.00
7	FURNISH AND INSTALL 6" X 12" PIPE, HDPE ARCTIC INSULATED WATER MAIN	LF	1,653	$175.00	$289,275.00
8	FURNISH AND INSTALL 4" X 12" HDPE ARCTIC INSULATED WATER SERVICE PIPING TO INCLUDE 1" SUPPLY & RETURN LINES AND 3/4" HEAT TRACE PIPE W/ 5W/FT HEAT TRACE.	LF	1,400	$200.00	$280,000.00
9	FURNISH AND INSTALL 1" HOUSE WATER SERVICE CONNECTIONS AT MAIN, INCLUDING PIT ORIFICES, VALVES, HEAT TRACE, SADDLES AND INSULATION	EACH	14	$1,750.00	$24,500.00
10	FURNISH AND INSTALL 90-DEG BANDED ELBOW FITTING & CONNECTION COLLAR RING FOR HOME CONNECTION OF WATER SERVICE (ALL INCLUDED)	EACH	14	$3,000.00	$42,000.00
11	TIE-IN NEW 6 X 12 WATER MAIN TO EXISTING WATER MAIN, (ALL INCLUDED).	LS	1	$7,500.00	$7,500.00
12	MAINTENANCE OF WATER SERVICE	LS	1	$5,000.00	$5,000.00
13	INSTALL NEW FIRE HYDRANT ASSEMBLY, INCLUDES BOLLARDS, VALVE, TEE, CONNECT	EACH	2	$10,000.00	$20,000.00
14	FURNISH AND INSTALL 6" GATE VALVE AND VALVE BOX	EACH	3	$3,000.00	$9,000.00
15	WATER LINE THAW PORT (DOUBLE CLEANOUT), INCLUDING PIPE BOLLARDS	EACH	4	$5,000	$20,000.00
16	FURNISH & INSTALL 8" X 15" ARCTIC SEWER MAIN	LF	1205	$185.00	$222,925.00
17	FURNISH & INSTALL 4" X 12" ARCTIC SEWER SERVICE LINES (to 14 Lots)	LF	676	$150.00	$101,400.00
18	FURNISH AND INSTALL 90-DEG BANDED CROSS FITTING & CONNECTION COLLAR RING FOR HOME CONNECTION OF SEWER SERVICE (ALL INCLUDED)	EACH	14	$3,000.00	$42,000.00
19	FURNISH & INSTALL INSULATED ARCTIC SEWER MANHOLES, INCL INSULATION, JOINT STRAPS, EDPM PIPE CONNECTORS, FROST COVER, SEALANT, LOOPS ETC	EACH	4	$7,500.00	$30,000.00
20	INSTALL SEWER SERVICE CONNECTIONS TO NEW MAIN	EACH	14	$2,000.00	$28,000.00

PROJECT CONSTRUCTION SUBTOTAL	$1,553,630.00
CONTINGENCY AT 12%	$186,435.60
PROJECT CONSTRUCTION TOTAL	**$1,740,065.60**
ADMINISTRATION (5%)	$87,003.28
ENGINEERING (5%)	$87,003.28
CONSTRUCTION MANAGEMENT (4%)	$69,602.62
ADMIN/ENGINEERING/CONST MGMT TOTAL	$243,609.18
TOTAL PROJECT COST	**$1,983,674.78**

Cost Estimate

Prepared By: LCG
Date: 3/6/2018

PRELIMINARY ENGINEERING REPORT (PER) FOR AKIAK WATER AND SEWER IMPROVEMENTS
Preliminary Engineers Estimate
Alternative 3--Extension of Piped Water & Combination Sewer for 6 existing homes plus 8 lots

ITEM NO.	ITEM	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	GENERAL REQUIREMENTS, MOB/DEMOB	LS	1	30%	$378,645.00
2	TRAFFIC CONTROL & PUBLIC RELATIONS	LS	1	$4,000.00	$4,000.00
3	CONSTRUCTION SURVEYING	LS	1	$16,000.00	$16,000.00
4	EROSION/POLLUTION CONTROL	LS	1	$6,000.00	$6,000.00
5	FURNISH/INSTALL NATIVE FILL (COVER + TRANSITION)	CY	290	$95.00	$27,550.00
6	FURNISH/INSTALL OTHER FILL--ASSUME NONE (NIC)	CY	0	$80.00	$0.00
7	FURNISH AND INSTALL 6" X 12" PIPE, HDPE ARCTIC INSULATED WATER MAIN	LF	1,653	$175.00	$289,275.00
8	FURNISH AND INSTALL 4" X 12" HDPE ARCTIC INSULATED WATER SERVICE PIPING TO INCLUDE 1" SUPPLY & RETURN LINES AND 3/4" HEAT TRACE PIPE W/ 5W/FT HEAT TRACE.	LF	1,400	$200.00	$280,000.00
9	FURNISH AND INSTALL 1" HOUSE WATER SERVICE CONNECTIONS AT MAIN, INCLUDING PIT ORIFICES, VALVES, HEAT TRACE, SADDLES AND INSULATION	EACH	14	$1,750.00	$24,500.00
10	FURNISH AND INSTALL 90-DEG BANDED ELBOW FITTING & CONNECTION COLLAR RING FOR HOME CONNECTION OF WATER SERVICE (ALL INCLUDED)	EACH	14	$3,000.00	$42,000.00
11	TIE-IN NEW 6 X 12 WATER MAIN TO EXISTING WATER MAIN, (ALL INCLUDED).	LS	1	$7,500.00	$7,500.00
12	MAINTENANCE OF WATER SERVICE	LS	1	$5,000.00	$5,000.00
13	INSTALL NEW FIRE HYDRANT ASSEMBLY, INCLUDES BOLLARDS, VALVE, TEE, CONNECT	EACH	2	$10,000.00	$20,000.00
14	FURNISH AND INSTALL 6" GATE VALVE AND VALVE BOX	EACH	3	$3,000.00	$9,000.00
15	WATER LINE THAW PORT (DOUBLE CLEANOUT), INCLUDING PIPE BOLLARDS	EACH	4	$5,000	$20,000.00
16	FURNISH & INSTALL 8" X 15" ARCTIC SEWER MAIN	LF	1205	$185.00	$222,925.00
17	FURNISH & INSTALL 4" X 12" ARCTIC SEWER SERVICE LINES (to 14 Lots)	LF	676	$150.00	$101,400.00
18	FURNISH AND INSTALL 90-DEG BANDED CROSS FITTING & CONNECTION COLLAR RING FOR HOME CONNECTION OF SEWER SERVICE (ALL INCLUDED)	EACH	14	$3,000.00	$42,000.00
19	FURNISH & INSTALL INSULATED ARCTIC SEWER MANHOLES, INCL INSULATION, JOINT STRAPS, EDPM PIPE CONNECTORS, FROST COVER, SEALANT, LOOPS ETC	EACH	4	$7,500.00	$30,000.00
20	INSTALL SEWER SERVICE CONNECTIONS TO NEW MAIN	EACH	14	$2,000.00	$28,000.00
21	FURNISH & INSTALL PACKAGED, INSULATED DUPLEX LIFT STATION AND CONTROL PANEL	EACH	1	$37,500.00	$37,500.00
22	INSTALL/CONNECT ELECTRICAL POWER FEED TO PANEL	LS	1	$3,000.00	$3,000.00
23	FURNISH & INSTALL 2" X 8" FORCE MAIN SEWER	LF	310	$150.00	$46,500.00

PROJECT CONSTRUCTION SUBTOTAL	$1,640,795.00
CONTINGENCY AT 12%	$196,895.40
PROJECT CONSTRUCTION TOTAL	**$1,837,690.40**
ADMINISTRATION (5%)	$91,884.52

Cost Estimate

Prepared By: LCG
Date: 3/6/2018

ENGINEERING (5%)	$91,884.52
CONSTRUCTION MANAGEMENT (4%)	$73,507.62
ADMIN/ENGINEERING/CONST MGMT TOTAL	$257,276.66
TOTAL PROJECT COST	**$2,094,967.06**

O M and R R Cost Estimate
Akiak Water and Sewer Service

System

The water system alternatives will consist of a piped water system extension to an existing loop. The proposed gravity sewer will be extensions to existing sewer pipe. will have pump stations. All mains will be buried, and the existing water system is a circulating system. Each house service will have a small water circ pump. The IRA operates the water utility & WTP. Assume only some added heat energy costs or minor upgrades will need to be made to the water main circ pump and heat exchanger for water extension.

Data & Assumptions

Total Population (2017 DCCED estimate)	394	persons	
Avg number of persons per household	3.84		
Number of existing homes to be served by this project	6	homes	
Approximate number of residents to be served by this project	23	persons	
Water consumption per capita	60	gpcd	
Wastewater generation per capita	60	gpcd	
Average Daily Demand (Water) per house (3.84 persons/hm x 60 gpcd)	230	gal	
Increased Water Demand (6 hms)--3.84 persons/house x 60 gpcd x 6 hms	1380	gal	
Existing water treatment supplies cost	$1	/1000 gal	
	2650	BTU/hr	for 6 homes + services
	4400	BTU/hr	for 6 homes + 8 lots + s
Raw water heat addition for loop 2 extension (5 F)	40	BTU/gal	
Water distribution booster pump size	2	hp	assume no hp increase
Booster pump flow rate	50	gpm	
Size increase of water loop #2 circ pump	0.5	hp	
Size of water service line circulation pump	0.06	hp	Grundfos Alpha 15-55

Number of community sewer pump stations	1	
Number of pumps on each pump station	2	
Lift station pump size (alternative 3)	2.7	
Lift station pump flow rate	60	

Other Assumptions

Administrative cost per service connection	$15	per month	
WTP operator burdened labor rate	$20	per hour	
WTP operator additional O&M labor (for extension of Loop 2)	2	hrs/wk	
Electricity cost for residences ($/kWh)	0.22	$/kWh	
Electricity commericial rate for WTP and lift stations	0.41	$/kWh	
Heating oil	$5.00	gal	
Purchase price of water main circulation pumps (2)	$1,500	each	
Estimated useful life of water main circulation pumps	10	years	
Water service circulation pump	$200	each	
Estimated life of service line circ pump	10	years	
Community sewer lift station maintenance--Alt 3	$300	cost/year	
FOB price new packaged lift station (duplex, 230V Ph 3/1 convert)--Alt 3	$27,500	FOB Anch matl price	
Estimated life of packaged lift station grinder pumps--Alt 3	15	years	
Lift Station grinder pump replacement cost (R&R) $2500 each	$5,000		use $350/year for R&R
Individual grinder pump replacement cost	$2,500		

Operation and Maintenance and Repair and Replace Estimate Summary
Akiak Water and Sewer Service

O&M and R&R Costs for PER Alternatives (note: existing WTP O&M/R&R are NIC--assumed to be funded separately)

					Annual Cost	Average Monthly Cost
General						
Alt 1--Administration (Utility mgmt, billings @ $20/hr x 4 hrs/mo)		$80	/month		$960	$80
				Alt 1 Subtotal	$960	$60
Alt 2, 3--Administration (Utility mgmt, billings @ $20/hr x 8 hrs/mo)				Alt 2 & 3 total	$1,920	
Existing WTP - Additional Costs to Operate WTP w/added users per Alts 1-3						
Alt 1--Increased Wtr Demand (6 hms)--3.84 pop/hm x 60 gpcd x 6 hms		1380	gpd			
Alt 2, 3--Increased Wtr Demand (14 hms)--3.84 x 60 gpcd x 14 hms		3225	gpd			
					Annual Cost	Average Monthly Cost
Additional Heating Demand	Raw water heat addition	40	BTU/gallon/day		$1,110	$93
Alt 2, 3--$2600/yr						
Additional Electrical Demand						
Alt 2, 3--$200/yr	WTP well pump	0.5	kWh/day		$108	$9
Alt 2, 3--$865/yr	Water loop circ pump ($0.60 kWhr)	3	kWh/day		$648	$54
Alt 2, 3--$225/yr	Water distribution booster pump	0.6	kWh/day		$132	$11
Alt 2, 3--$300/yr	Water treatment supplies	$1	day		$240	$20
Alt 2, 3--$1630/yr	Additional WTP operator labor time	$20	week		$960	$80
Alt 2, 3--$360/yr	Water Main circ pump R&R	$200	/yr		$204	$17
				Alt 1 Subtotal	$3,402	$284
				Alt 2, 3 Subtotal	$6,180	
Piped Water System (circulating)						
Water Main Length--Alt 1		930	feet			
Water Main Length--Alt 2 & 3		1650	feet			
Water service line length (100 LF avg length of 6 services)		600	feet			
Water Service line electric heat tape power rating		5	watts/ft			
Heating Duration--Assume 75% of calender year or 274 days (6576 hrs)		6576	hrs			
Heat loss for Alt 1--950 LF main plus 6 services		3100	BTU/hr			
Heat loss for Alt 2 & 3--1650 LF main plus 6 services		4570	BTU/hr			
No. 2 fuel oil 140,000 BTU/gal at $5/gal. Assume 85% efficiency		$42	per 1 million BTU			
					Annual Cost	Average Monthly Cost
Heating Demand	Alt 1--930 LF of Water main + 6 services	20.4	Million BTU		$856	$71.35
	Alt 2 & 3--1650 LF of Water main + 6 services	30	Million BTU		$1,262	$105.18
Electrical Demand	Vater service circ pumps (1 kWhr/day-ea hm)	6	kWh/day (avg)		$480	$40
0.22/kWh residential after PCE	Service line heat tape (emergency use only)	0	kWh/day		$0	$0
Other Costs	Water service misc R&R	$60	per yr		$60	$5
	Circulation pump R&R	$20	per yr		$20	$2
	Service Heat Trace & T-stat R&R	$130	per yr		$130	$11
				Alt 1 Subtotal	$1,546	$129
				Alt 2, 3 Subtotal	$1,802	$150

Operation and Maintenance and Repair and Replace Estimate Summary
Akiak Water and Sewer Service

Buried Gravity Sewer & Force Mains

Gravity sewer main length-- Alt 1	595	LF
Gravity sewer main length-- Alt 2	1205	LF
Gravity sewer main length-- Alt 3	1205	LF
Force main length (2" dia) --Alt 3	310	LF
Force main electric heat tape	5	watt/ft

				Annual Cost	Average Monthly Cost
Heating Demand					
	No heat req'd for gravity sewer or Alt 3 lift sta	0	BTU/ft/day	$0	$0
Electrical Demand					
0.22/kWh residential after PCE	Alt 3--Lift station duplex control panel; t-stat	2	kWh/day (avg)	$158	$13
0.60/kWh commercial rate	Alt 3--Service line heat tape (emergency only)	0	kWh/day	$0	$0
	Alt 3--Lift sta 420W elec heat pad--60 days/yr	10	kWh/day (avg)	$246	$123
	Alt 3--Force main heat tape usage--60 days/yr	20	kWh/day (avg)	$492	$246
Other Costs					
	Alt 1, 2, 3--Gravity Sewer general maint	$250	per yr	$250	$21
	Alt 3--Lift station general O&M maintenance	$300	year	$300	$25
	Alt 3--Lift Sta Sewer Pump misc R&R	$350	per yr	$350	$29
			Subtotal Cost	$1,797	$457

	Total + 10%	Rounded
Alt 1--Total O&M Annual	$6,158	$7,000
Alt 2--Total O&M Annual	$10,152	$10,700
Alt 3--Total O&M Annual	$11,698.96	$12,000

APPENDIX F – LIFE CYCLE COST ANALYSIS

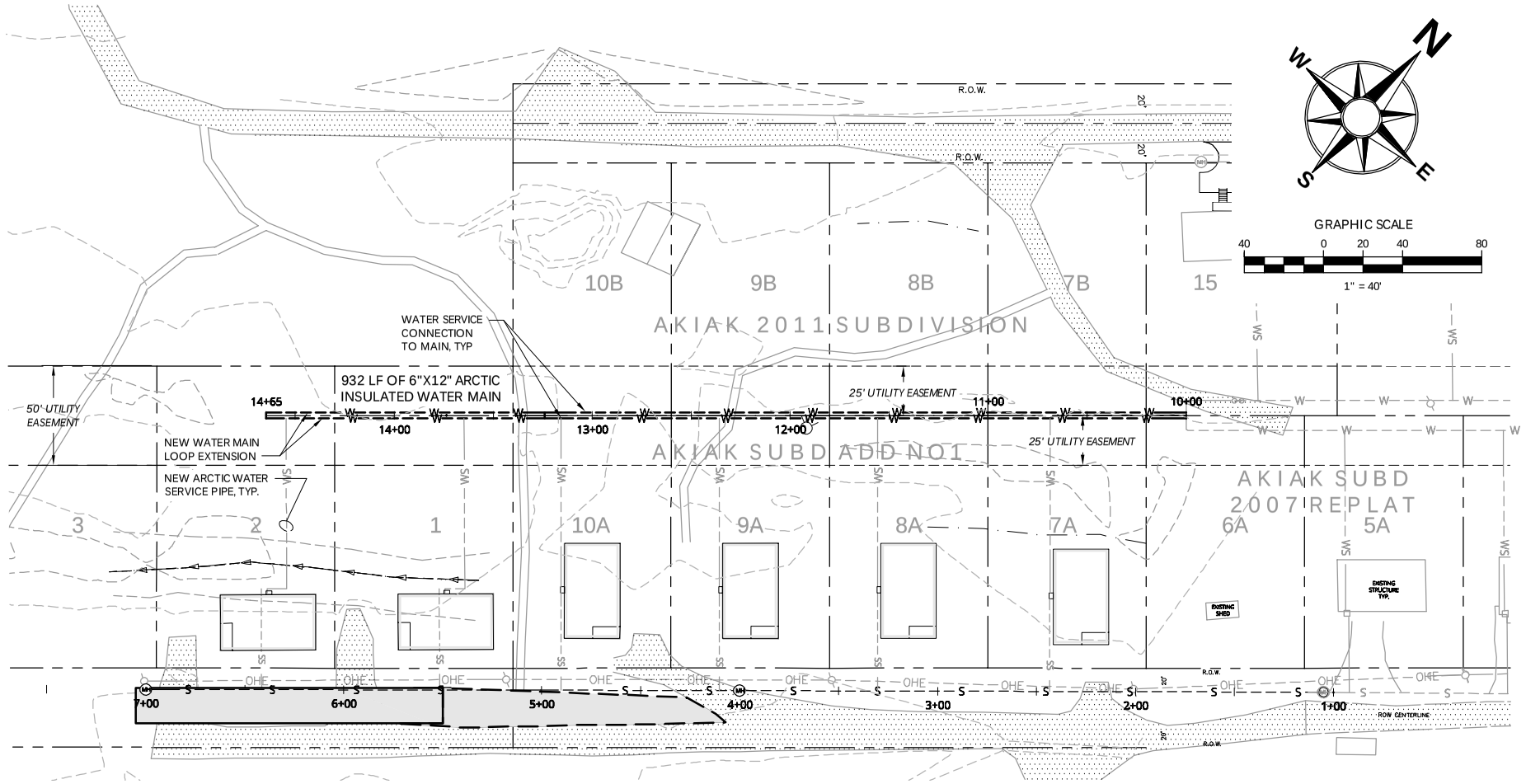
Life Cycle Cost Analysis

Cost Parameters	Akiak Water and Sewer Improvements PER			
	Extension of Existing Water and Sewer Utilities			
	Alternative 1	Alternative 2	Alternative 3	
Capital Cost ©	$991,000	$1,984,000	$2,095,000	
Annual O& M Cost	$7,000	$10,700	$12,000	
Number of Households	6	14	14	
Monthly O&M Cost/Household	$97	$64	$71	
Project Life (years)	20	20	20	
OMB Real Interest Rate Projection (%)	0.20	0.20	0.20	
Life Cycle Cost (C+USPW(O&M))	$1,128,103	$2,121,103	$2,232,103	
Life Cycle Cost/Household	$188,017	$151,507.33	$159,435.90	
Estimated Salvage Value	50%	50%	50%	
Salvage Value at End of Project Life (SPPW)	$495,500	$992,000	$1,047,500	
Net Life Cycle Cost (NPV)	$652,012	$1,167,961	$1,225,635	

OMB 'Real' Intrest Rates (Nov 2017)	
3-year	-0.8
5-year	-0.6
7-year	-0.3
10-year	-0.1
20-year	0.2
30-year	0.6

OMB Circular A-94 Appendix C
(https://www.whitehouse.gov/wp-content/uploads/2017/11/M-18-09-revised.pdf)

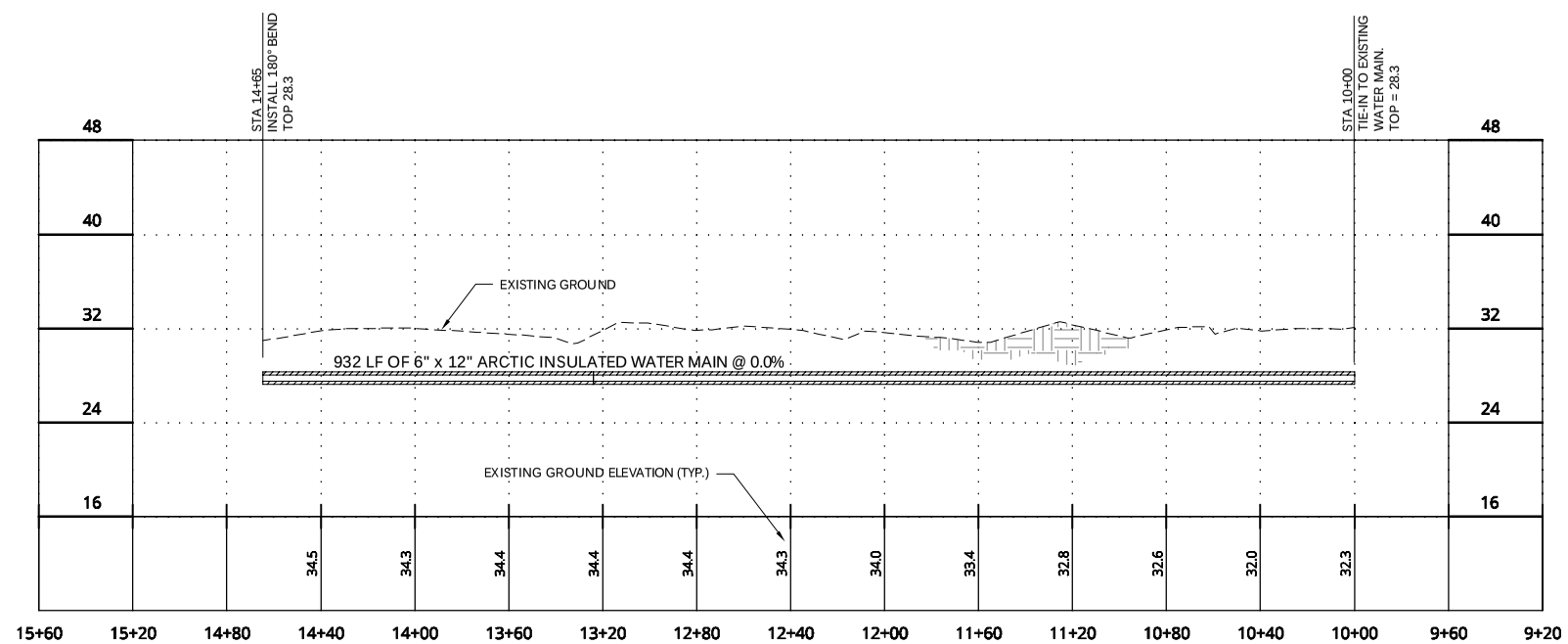
APPENDIX G – WATER AND SEWER ALTERNATIVES 1, 2 AND 3



1 WATER PLAN

NOTES

1. CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITY LOCATIONS AND INVERTS AND SHALL NOTIFY THE ENGINEER IF ANY DISCREPANCIES ARE FOUND.



2 WATER PROFILE

SCALE: 1"= 40' HORIZONTAL
SCALE: 1"= 8' VERTICAL

1" ONE INCH

NO.	DATE	BY	REVISION

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250 H Street
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ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

PRELIMINARY ENGINEER REPORT
AKIAK WATER AND SEWER SERVICE

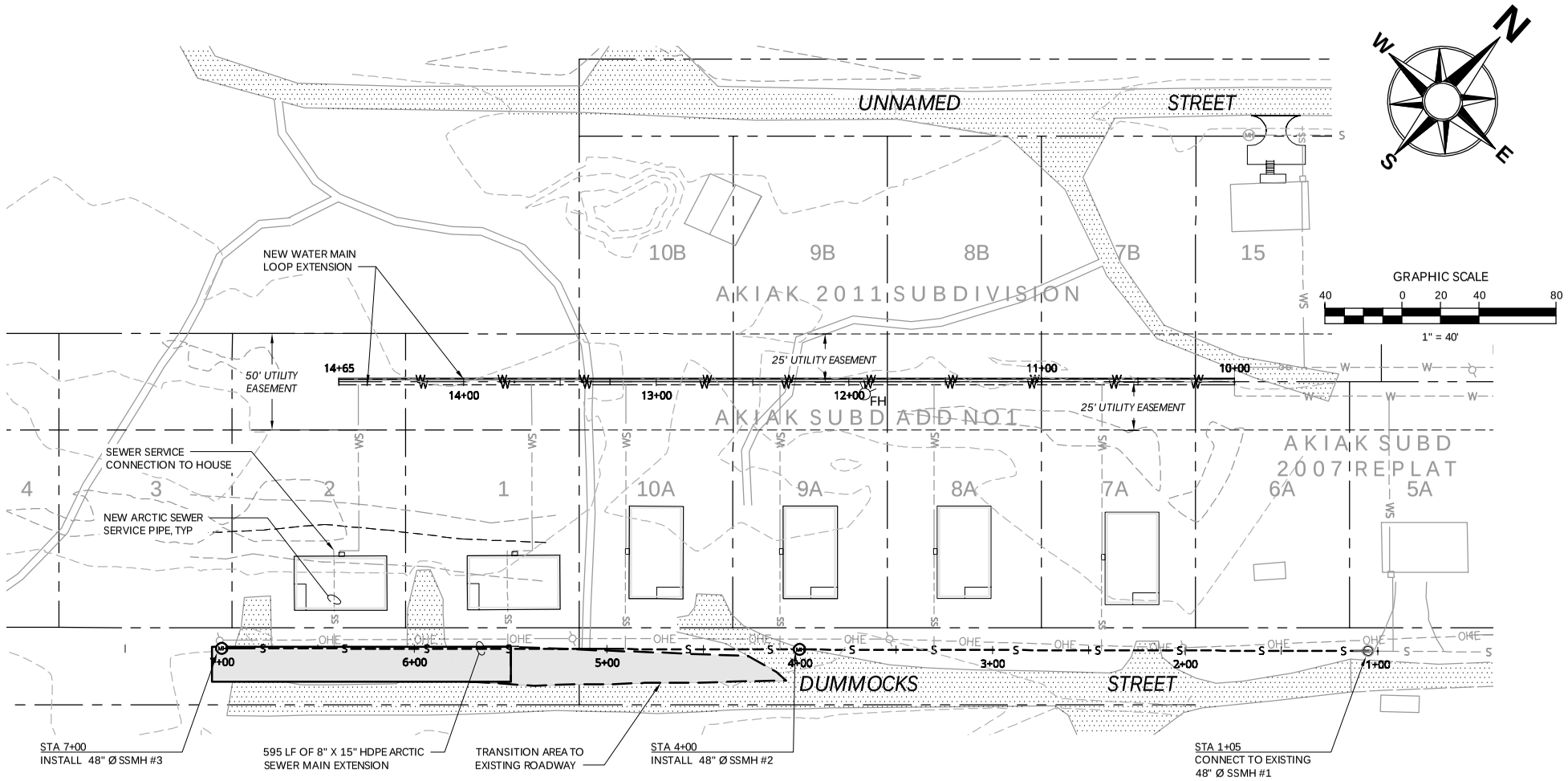
ALTERNATIVE 1
PIPED WATER FOR 6 HOMES

P:\901-950\939 ANTHC IDIQ\939.35 Akiak PER\ Civil\DWG\939.35 DSI Akiak PER Design ALT1.dwg

SHEET SIZE:	22X34
DESIGNED BY:	DC
DRAWN BY:	CS
CHECKED BY:	DC/DM
DATE:	03.06.18
FILE NO.	939.35

1" ONE INCH

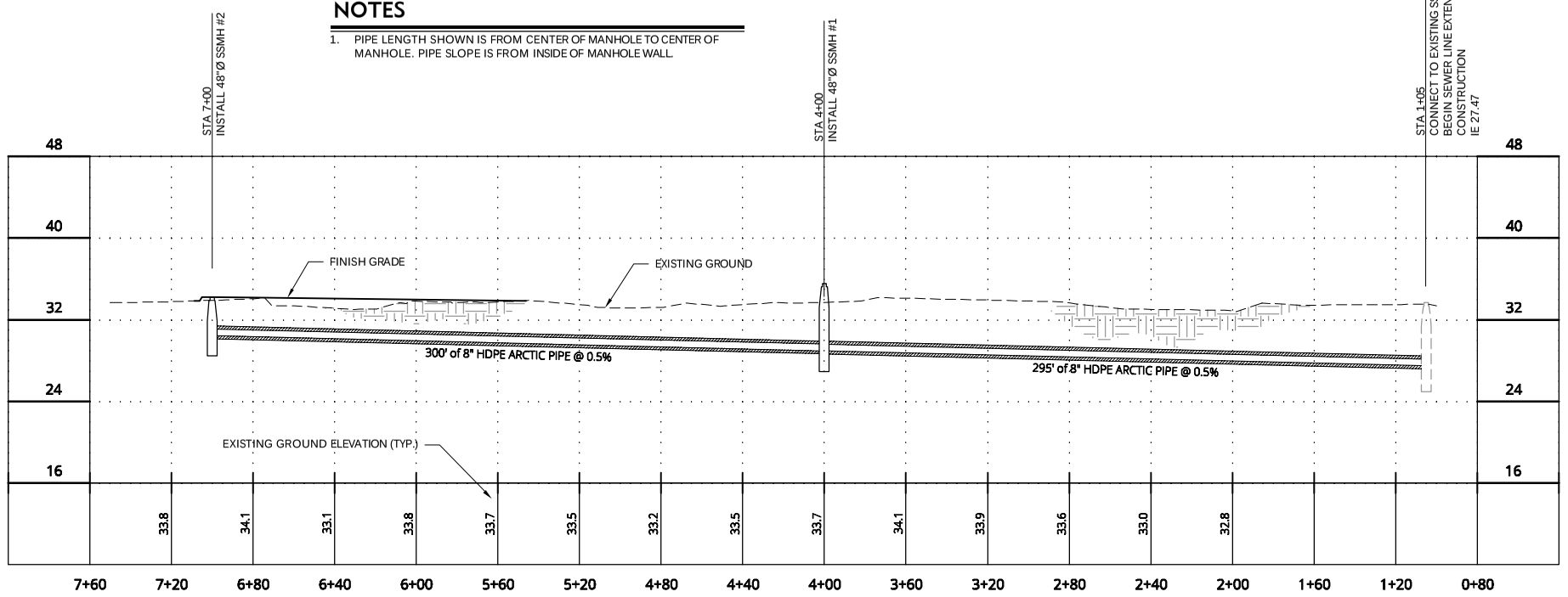
FIGURE 2



1 SANITARY SEWER PLAN

NOTES

1. PIPE LENGTH SHOWN IS FROM CENTER OF MANHOLE TO CENTER OF MANHOLE. PIPE SLOPE IS FROM INSIDE OF MANHOLE WALL.



2 SANITARY SEWER PROFILE

SCALE: 1"= 40' HORIZONTAL
SCALE: 1"= 8' VERTICAL

1" ONE INCH

NO.	DATE	BY	REVISION

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ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

PRELIMINARY ENGINEER REPORT
AKIAK WATER AND SEWER SERVICE

ALTERNATIVE 1
PIPED GRAVITY SEWER FOR 6 HOMES

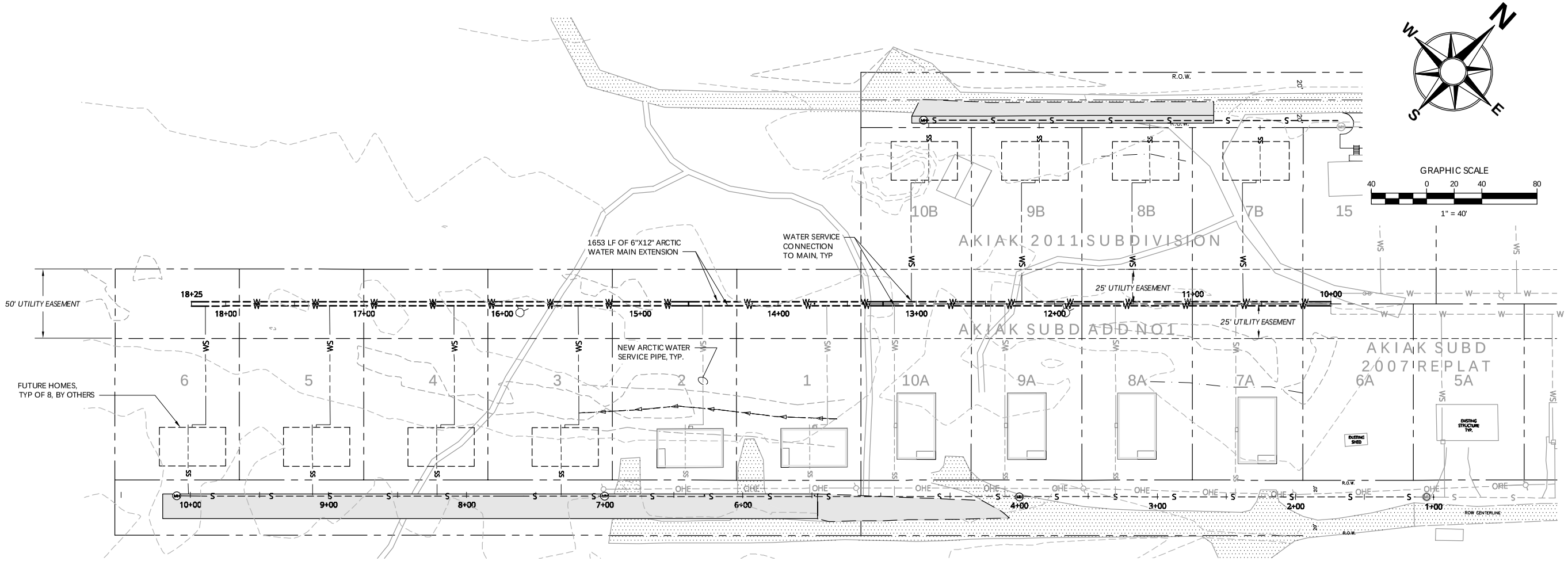
SHEET SIZE:	22X34
DESIGNED BY:	DC
DRAWN BY:	CS
CHECKED BY:	DC/DM
DATE:	03.06.18
FILE NO.	939.35

FIGURE 3

P:\901-950\939 ANTHC IDIQ\939.35 Akiak PER\ Civil\DWG\939.35 DSI Akiak PER Design ALT1.dwg

1" ONE INCH

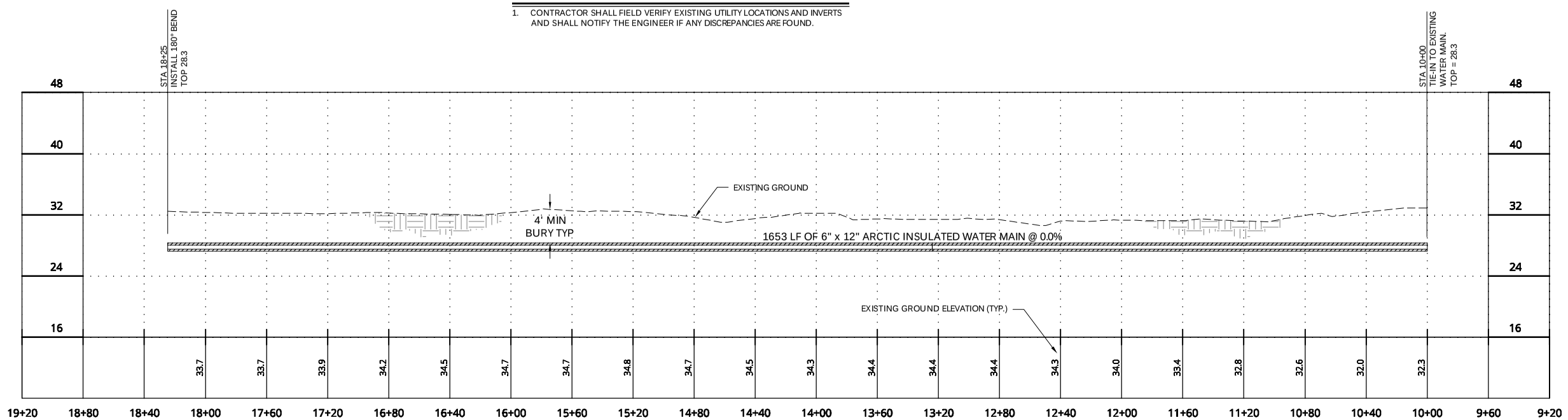
30" x 21" BORDER



1 WATER PLAN

NOTES

1. CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITY LOCATIONS AND INVERTS AND SHALL NOTIFY THE ENGINEER IF ANY DISCREPANCIES ARE FOUND.



2 WATER PROFILE

SCALE: 1"= 40' HORIZONTAL
SCALE: 1"= 8' VERTICAL

1" ONE INCH

NO.	DATE	BY	REVISION

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ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

PRELIMINARY ENGINEER REPORT
AKIAK WATER AND SEWER SERVICE

ALTERNATIVE 2
PIPED WATER FOR 6 HOMES + 8 LOTS

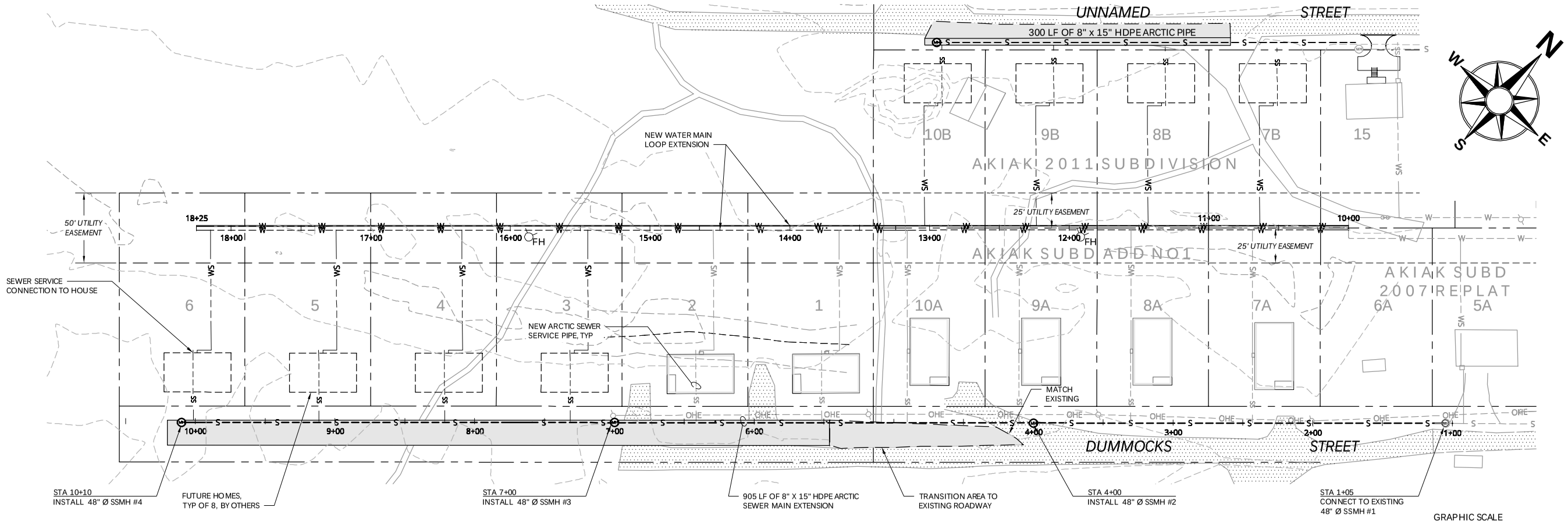
P:\901-950\939 ANTHC IDIQ\939.35 Akiak PER\ Civil\DWG\939.35 DSI Akiak PER Design ALT2.dwg

1" ONE INCH

SHEET SIZE:	22X34
DESIGNED BY:	DC
DRAWN BY:	CS
CHECKED BY:	DC/DM
DATE:	03.06.18
FILE NO.	939.35

FIGURE 4

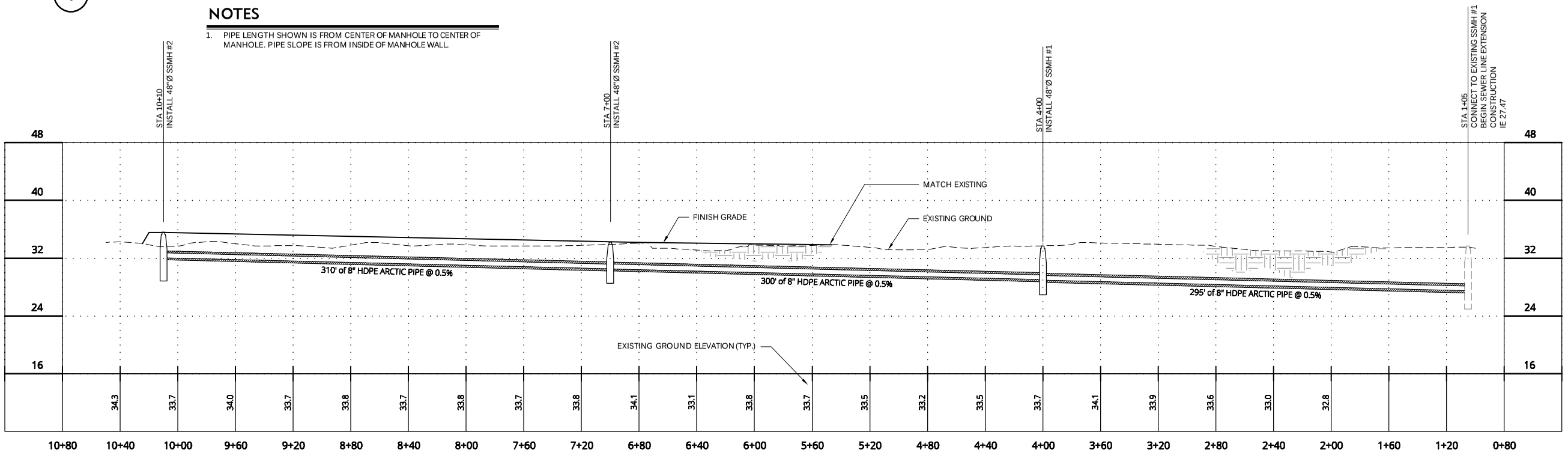
30" x 21" BORDER



1 SANITARY SEWER PLAN

NOTES

1. PIPE LENGTH SHOWN IS FROM CENTER OF MANHOLE TO CENTER OF MANHOLE. PIPE SLOPE IS FROM INSIDE OF MANHOLE WALL.



2 SANITARY SEWER PROFILE

SCALE: 1"= 40' HORIZONTAL
SCALE: 1"= 8' VERTICAL

1" ONE INCH

NO.	DATE	BY	REVISION

2/13/2018 3:54 PM

250 H Street
Anchorage, AK 99501
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F: (907) 243-5629
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ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

PRELIMINARY ENGINEER REPORT
AKIAK WATER AND SEWER SERVICE

ALTERNATIVE 2
PIPED GRAVITY SEWER FOR 6 HOMES +4 LOTS

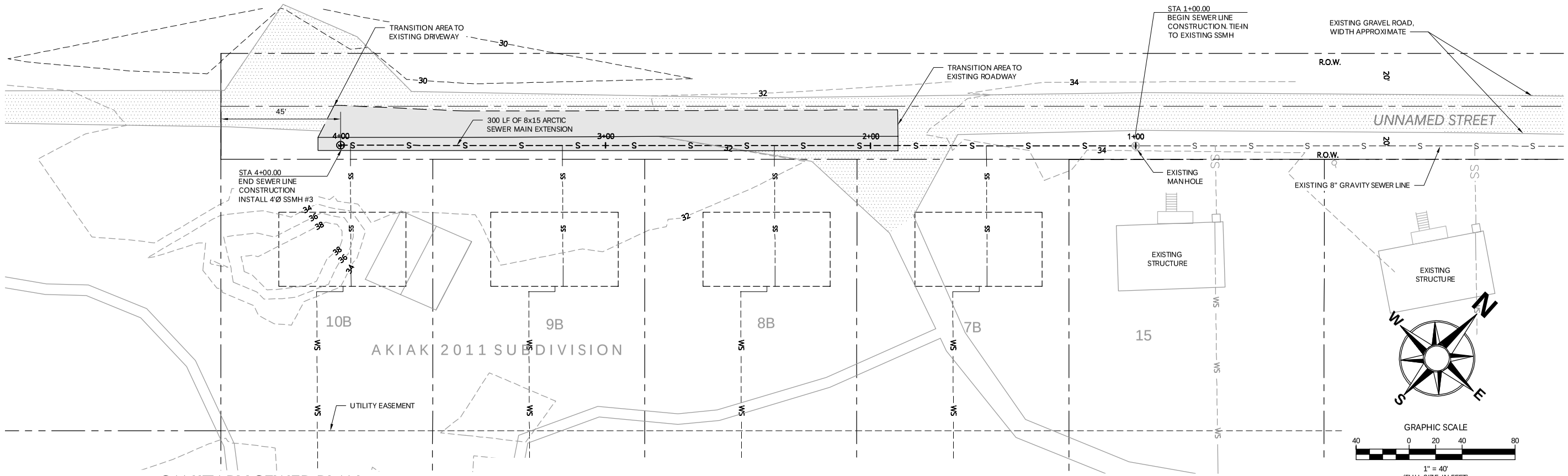
SHEET SIZE:	22X34
DESIGNED BY:	DC
DRAWN BY:	CS
CHECKED BY:	DC/DM
DATE:	03.06.18
FILE NO.	939.35

FIGURE 5

P:\901-950\939 ANTHC IDIQ\939.35 Akiak PER\ Civil\DWG\939.35 DSI Akiak PER Design ALT2.dwg

ONE INCH 1"

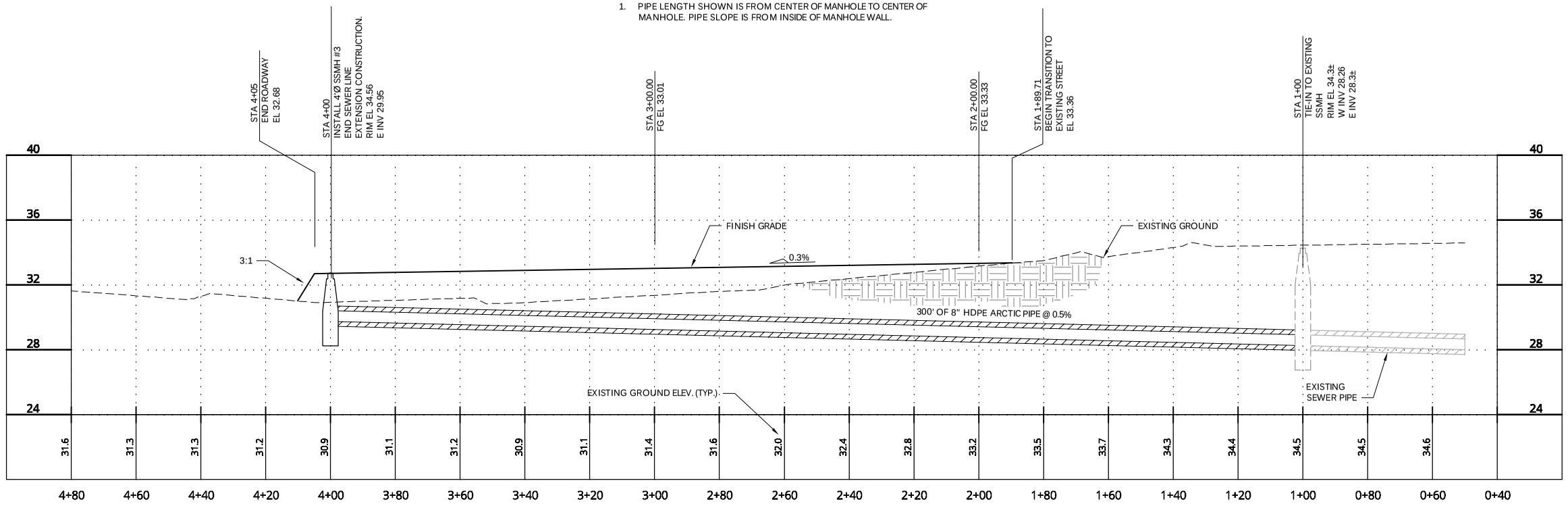
30" x 21" BORDER



1 SANITARY SEWER PLAN

NOTES

1. PIPE LENGTH SHOWN IS FROM CENTER OF MANHOLE TO CENTER OF MANHOLE. PIPE SLOPE IS FROM INSIDE OF MANHOLE WALL.



2 SANITARY SEWER PROFILE

SCALE: 1"= 20' HORIZONTAL
SCALE: 1"= 4' VERTICAL

1" ONE INCH

NO.	DATE	BY	REVISION

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P:\901-950\939 ANTHC IDIQ\939.35 Akiak PER\ CivilDWG\939.35_DSI_Akiak PER Design 2011 ALT2.dwg

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

PRELIMINARY ENGINEER REPORT
AKIAK WATER AND SEWER SERVICE

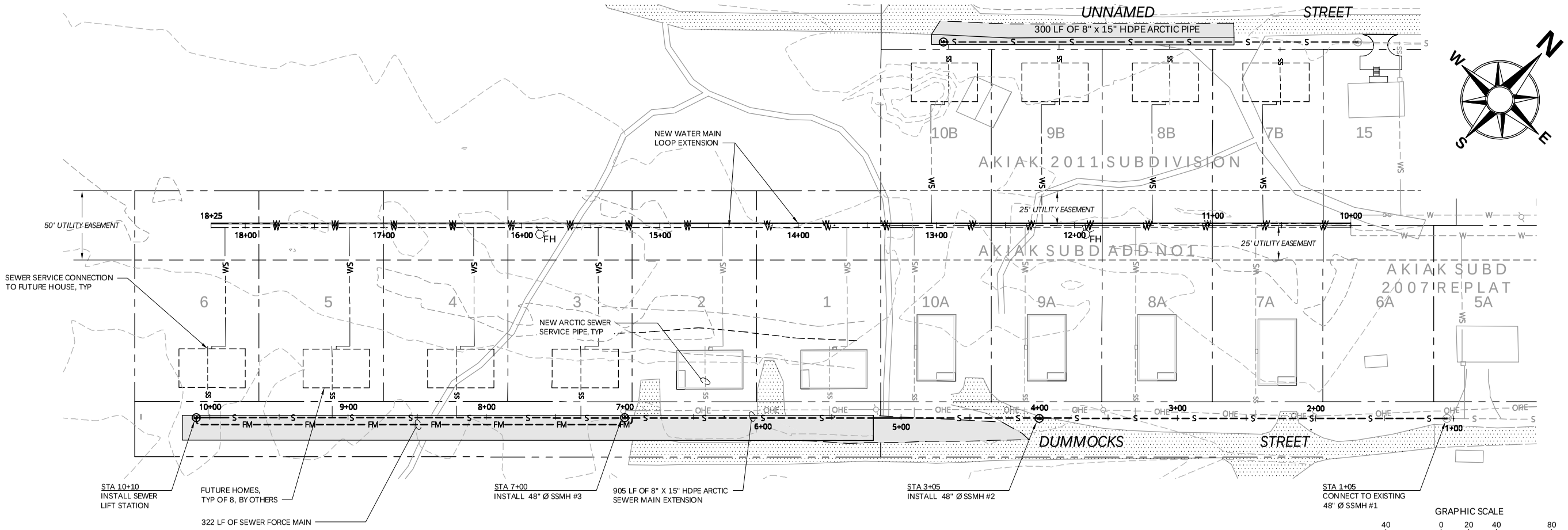
ALTERNATIVE 2
PIPED GRAVITY SEWER FOR 4 LOTS

SHEET SIZE:	22X34
DESIGNED BY:	DC
DRAWN BY:	CS
CHECKED BY:	DC/DM
DATE:	03.06.18
FILE NO.	939.35

FIGURE 6

1" ONE INCH

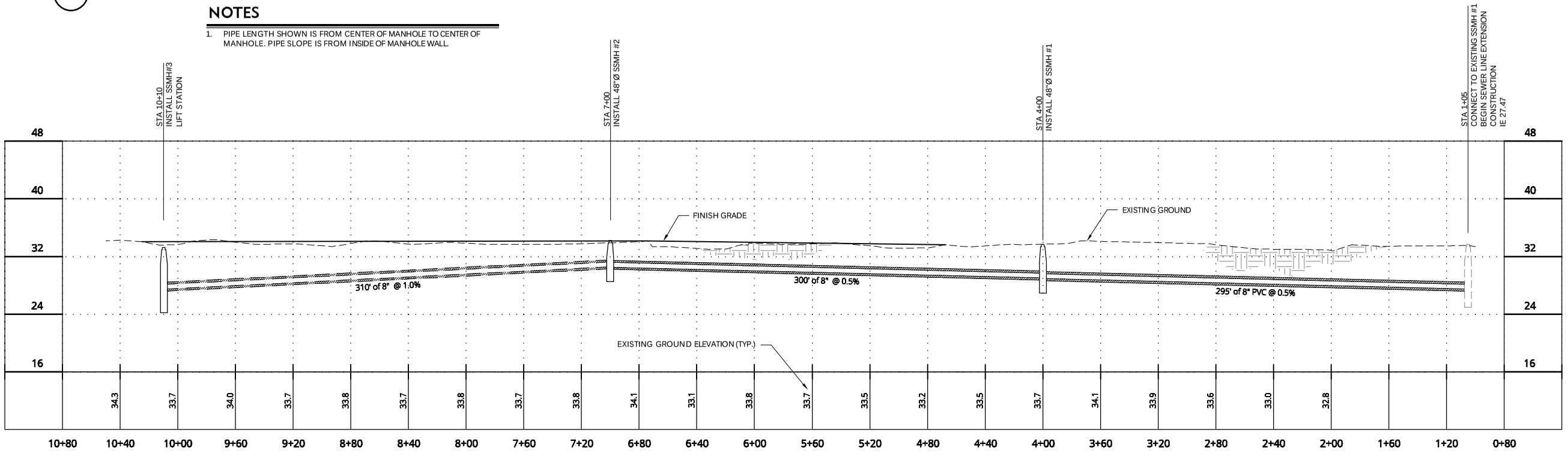
30" x 21" BORDER



1 SANITARY SEWER PLAN

NOTES

1. PIPE LENGTH SHOWN IS FROM CENTER OF MANHOLE TO CENTER OF MANHOLE. PIPE SLOPE IS FROM INSIDE OF MANHOLE WALL.



2 SANITARY SEWER PROFILE

SCALE: 1"= 40' HORIZONTAL
SCALE: 1"= 8' VERTICAL

1" ONE INCH

NO.	DATE	BY	REVISION

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ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

PRELIMINARY ENGINEER REPORT
AKIAK WATER AND SEWER SERVICE

ALTERNATIVE 3
PIPED WATER AND COMBINATION SEWER SYSTEM

P:\1901-950\939 ANTHC IDIQ\939.35 Akiak PER\ Civil\DWG\939.35 DSI Akiak PER Design ALT3.dwg

1" ONE INCH

SHEET SIZE:	22X34
DESIGNED BY:	DC
DRAWN BY:	CS
CHECKED BY:	DC/DM
DATE:	03.06.18
FILE NO.	939.35

FIGURE 7

APPENDIX H–AKIAK ENERGY AUDIT SUMMARY PARAGRAPH

Akiak Energy Audit Summary

In 2011, ANTHC completed an energy audit for the Akiak Water Plant. This audit identified nine items that had an estimated installed price of $18,480 (2011 Dollars) and an average annual energy savings of $8,861. In 2015-2016, ANTHC received funding to implement the identified energy improvements and provide onsite operator training in the areas of boilers, fuel systems, water plant operations, and electric heat.

In 2012, heat recovery was installed in Akiak by contractors. This system serves the tribal council building, water plant, and washeteria. It's estimated to offset over 3,000 gallons of fuel in the water plant annually. Currently, the power utility does not charge the water utility for recovered heat.

The ANTHC-Rural Energy Initiative (REI) does not currently have any future projects or identified projects for Akiak.

On the utility side, additional consideration should be given to the extra pumping and heating needed for an additional 1,650 LF of water main. Assuming relatively conservative numbers, it could increase the heat needed by 6,000 BTU/hr or over 300 gallons of fuel oil based on three quarters of years' operation.

On the homeowner side, consideration should be given to minimizing homeowner expense. Installing well insulated flexible connections, circulation pumps, and only using electric heat tape for emergency purposes would all benefit the end user.