# Stebbins and St. Michael Renewable Energy Project

*Alaska Village Electric Cooperative/*
*Stebbins Native Corporation*
*Renewable Energy Joint Venture*

2024 Program Review

Denver, Colorado

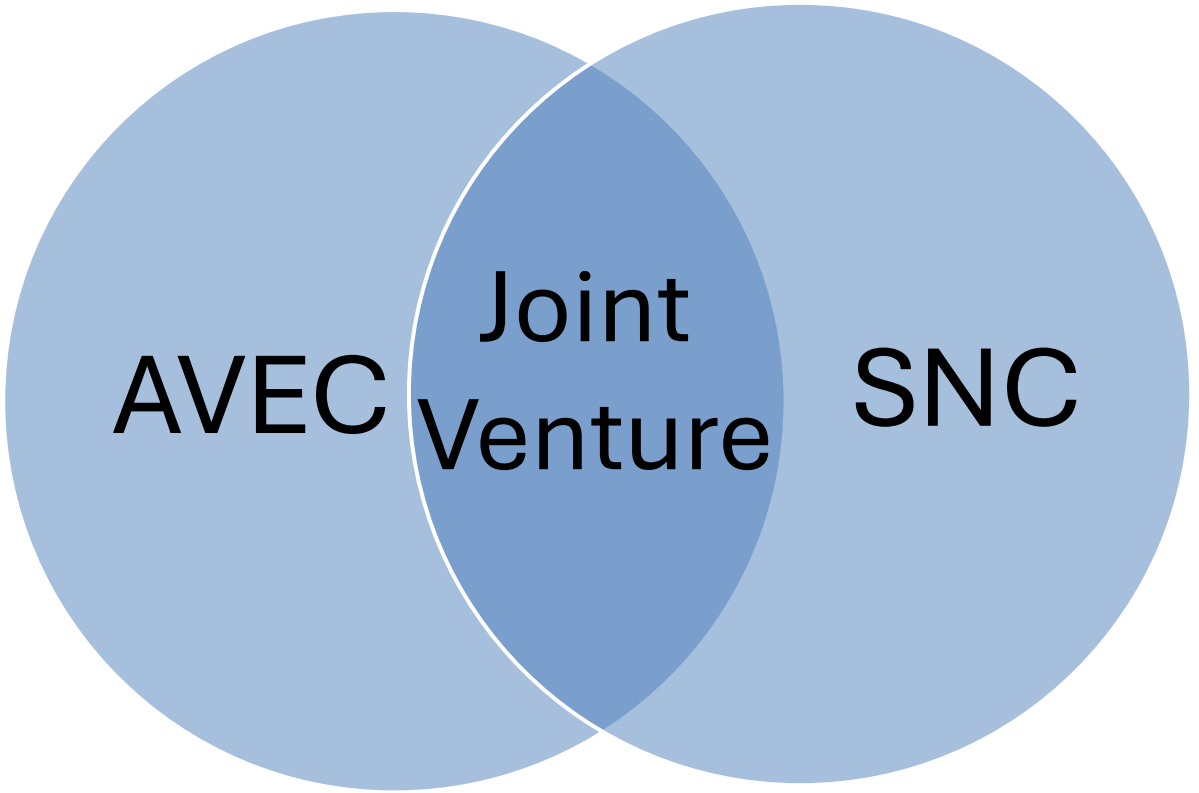
November 20, 2024

Onya Stein
Project Manager

Courtesy of STG, Incorporated

# Joint Venture

- Partnership between AVEC and SNC
  - To benefit the communities of Stebbins and St. Michael



# AVEC

*Established 1968, Member owned electric utility, Not for profit*

- 60 Rural Communities served, 31,000+ Residents
- 46 Power Plants, 161 Diesel Generators
- 9.3M gallons of diesel in 2023 ($48M)
- 555 miles of Distribution Lines
- 90+% Alaska Native
- Smallest: Anvik 58→ Largest: Bethel 6,154
- 88 FT Employees, 77 PT Employees
- 33 wind turbines serving 23 communities
- Solar (2 AVEC & 2 IPP) serving 5 communities
- Batteries (4 AVEC & 1 IPP) serving 10 communities
- 2023 Total Electricity Sold 126.4 MW

# Stebbins Native Corporation

*Established 1974, ANCSA village corporation*

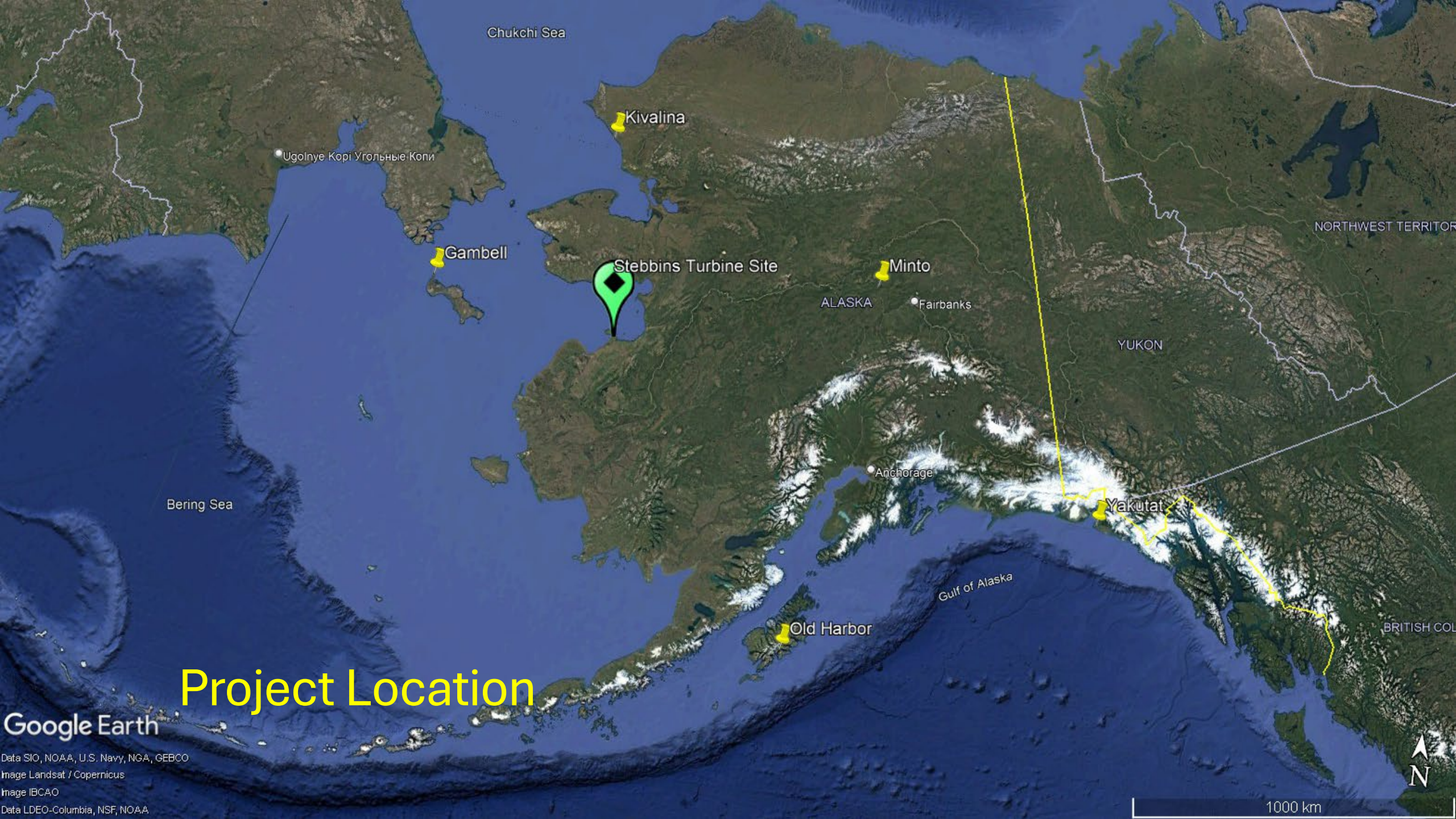
- John Nashoanak, President
- Thomas Kirk, Manager
- 501 Shareholders
- 80 Local employees during season
- 3 Subsidiaries: fuel, store, rock/gravel
- Partners in construction: Advanced Blasting, Tapraq Rock
- Own 100,000+ acres
- Landowner

# Project Overview

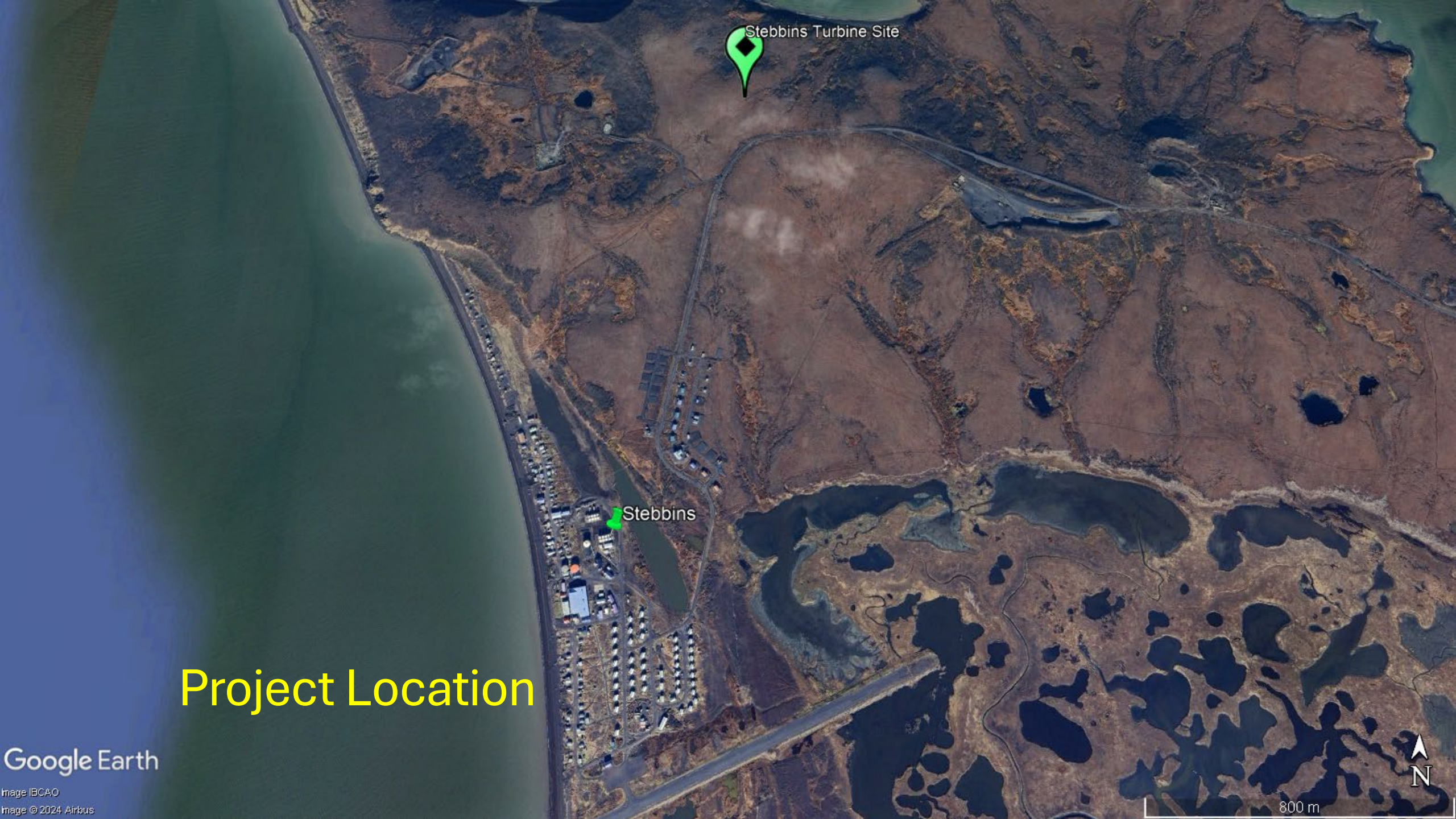
- Final stages of an energy vision for the area
- Installation of one Emergya Wind Technologies (EWT) wind turbine
  - 900 kW
  - 52 meter diameter rotor
  - 75 meter high tower
  - Direct drive
- Install wind to heat systems in Stebbins and St. Michael

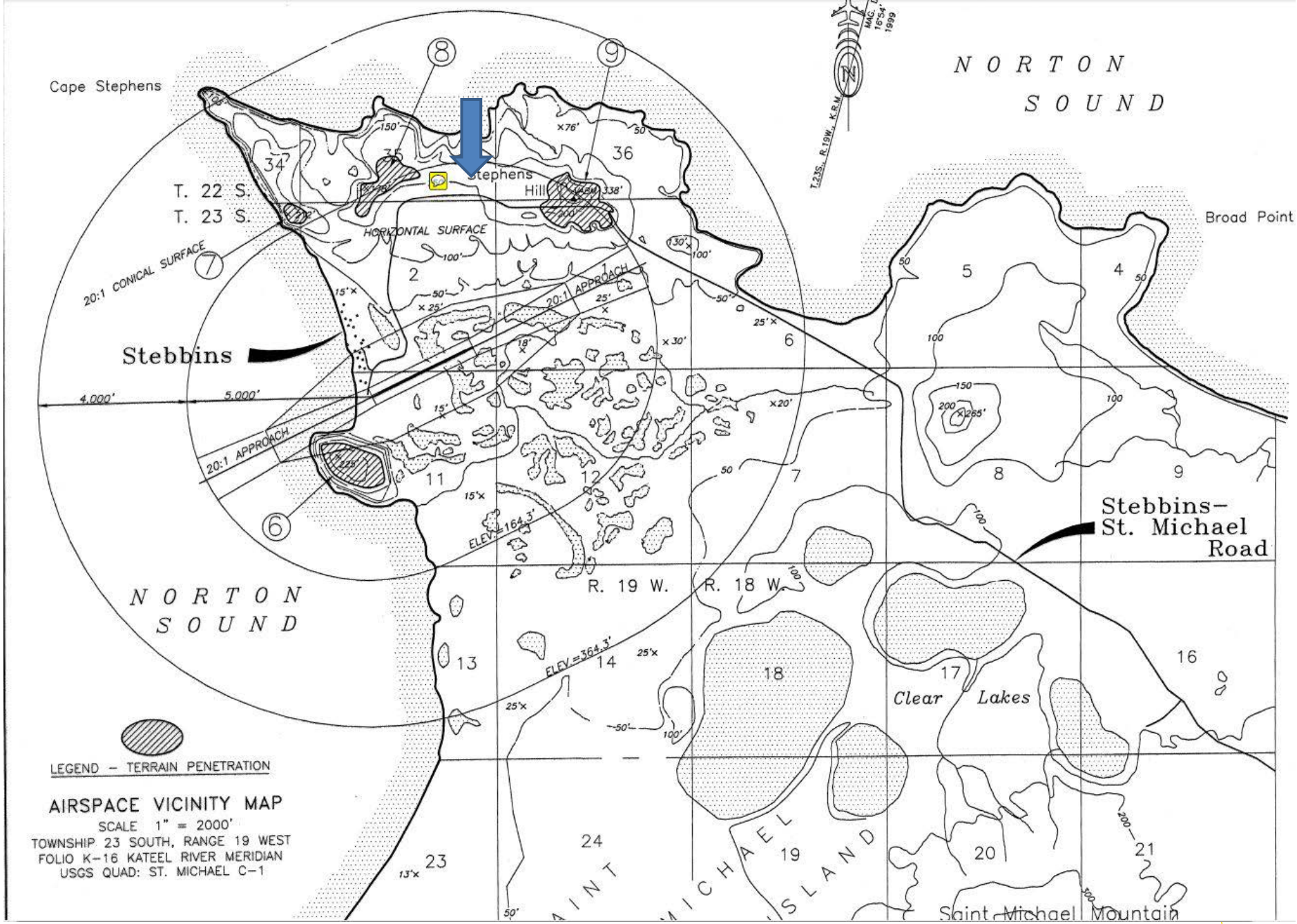
Image by EWT


~2,800
miles
Project Location
Chukchi Sea
NORTHWEST TERRITORIES
ALASKA
Fairbanks
YUKON
Canada
MANITOBA
ONTARIO
QUEBEC
Anchorage
SASKATCHEWAN
Gulf of Alaska
Winnipeg
Edmonton
MINNESOTA
BRITISH COLUMBIA
NORTH DAKOTA
Calgary
SOUTH DAKOTA
MONTANA
Vancouver
NEBRASKA
Seattle
WASHINGTON
WYOMING
United Stat
IDAHO
OREGON
COLORADO
UTAH
NEVADA
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image IBCAO
Image Landsat / Copernicus
Data LDEO-Columbia, NSF, NOAA
1100 km
N


Chukchi Sea
Kivalina
Ugolnye Kopi Угольные Копи
Gambell
Stebbins Turbine Site
Minto
ALASKA
Fairbanks
NORTHWEST TERRITOR
YUKON
Anchorage
Yakutat
Bering Sea
Gulf of Alaska
Old Harbor
BRITISH COL
Project Location
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
Image IBCAO
Data LDEO-Columbia, NSF, NOAA
N
1000 km


Stebbins Turbine Site
Stebbins
St Michael
Project Location
Google Earth
Image IBCAO
Image © 2024 Airbus
N
3 km


Stebbins Turbine Site
Stebbins
Project Location
Google Earth
Image IBCAO
Image © 2024 Airbus
N
800 m


Cape Stephens
NORTON SOUND
Stephens Hill
T. 22 S.
T. 23 S.
HORIZONTAL SURFACE
20:1 CONICAL SURFACE
20:1 APPROACH
Stebbins
4,000'
5,000'
ELEV. 164.3'
ELEV. 364.3'
Broad Point
Stebbins–St. Michael Road
R. 19 W.
R. 18 W.
Clear Lakes
Saint Michael Island
Saint Michael Mountain
LEGEND – TERRAIN PENETRATION
AIRSPACE VICINITY MAP
SCALE 1" = 2000'
TOWNSHIP 23 SOUTH, RANGE 19 WEST
FOLIO K–16 KATEEL RIVER MERIDIAN
USGS QUAD: ST. MICHAEL C–1


Stebbins, Alaska
Population: 631
Gas: $6.37
Heating Fuel $7.05
Electric $0.70/$0.25


St. Michael, Alaska
Population: 435
Electric $0.70/$0.25

# Stakeholders

# Project Objectives

- Install 900 kW turbine
- Generate ~2,529 MWh/year
- Produce 50% of total energy for two communities
- Save 104,700 gallons/year
- $365,403 savings first year
- $11.4M savings over 25 years

# Relevant Background Information

2010 Project Start → 2012 Tank Farm → 2013 Wind Study and Site Control → 2014 Power Plant & Standby → 2015 Intertie → 2016 SHPO Permit

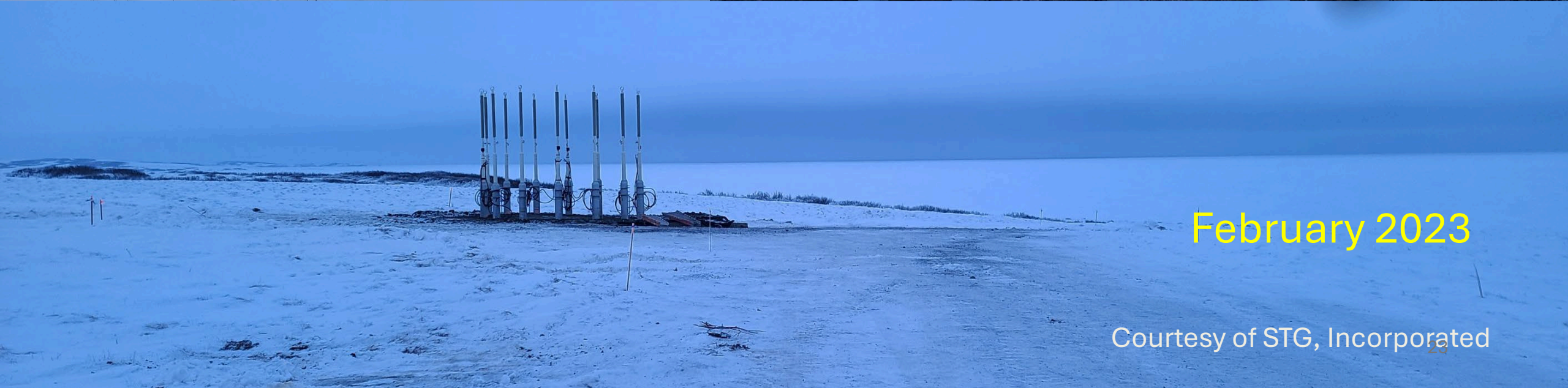
2017 Corps Permit → 2019 Turbine Purchase → 2020 Final Design → 2021 FAA Permit → 2022 Construction → 2023 Commissioning

# Let’s install a turbine.

| | |
|---|---|
| • Procure Turbine | 4Q2019 |
| • Mob to site | 3Q2022 / 2Q2023 |
| • Site improvements | 4Q2022 / 1Q2023 |
| • Turbine Foundation | 1Q2023 / 2Q2023 |
| • Turbine Delivery / Installation | 2Q2023 / 3Q2023 |
| • Start up / Commissioning | 3Q2023 / 4Q2023 |


September 2022
Courtesy of STG, Incorporated


January 2023



February 2023

Courtesy of STG, Incorporated


June 2023

Courtesy of STG, Incorporated

Courtesy of STG, Incorporated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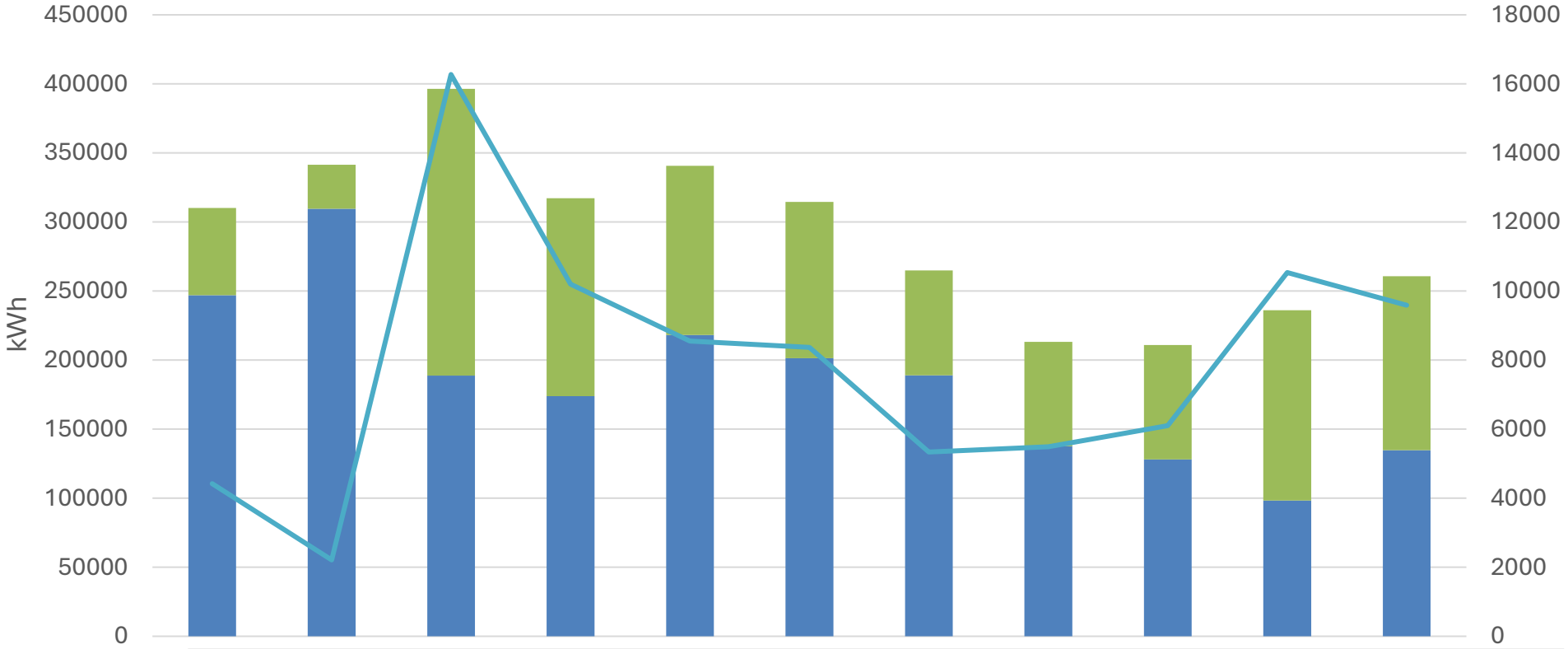
# Net Generation (kWh) since November 2023




| | Nov-23 | Dec-23 | Jan-24 | Feb-24 | Mar-24 | Apr-24 | May-24 | Jun-24 | Jul-24 | Aug-24 | Sep-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wind | 63159 | 31844 | 207634 | 143319 | 122484 | 113189 | 75926 | 75509 | 83004 | 137648 | 126115 |
| Diesel | 247030 | 309597 | 188744 | 173962 | 218172 | 201326 | 189002 | 137660 | 127985 | 98365 | 134669 |
| Gallons | 4417 | 2211 | 16272 | 10201 | 8553 | 8366 | 5339 | 5492 | 6103 | 10532 | 9590 |

# Activities to be Completed

- 12 months of turbine production monitoring
- Finish upgrades including boiler installations in Stebbins and St. Michael
  - RFP for installation
  - First barge 2025
  - Construction 2025

# Wind to Heat Upgrades Status

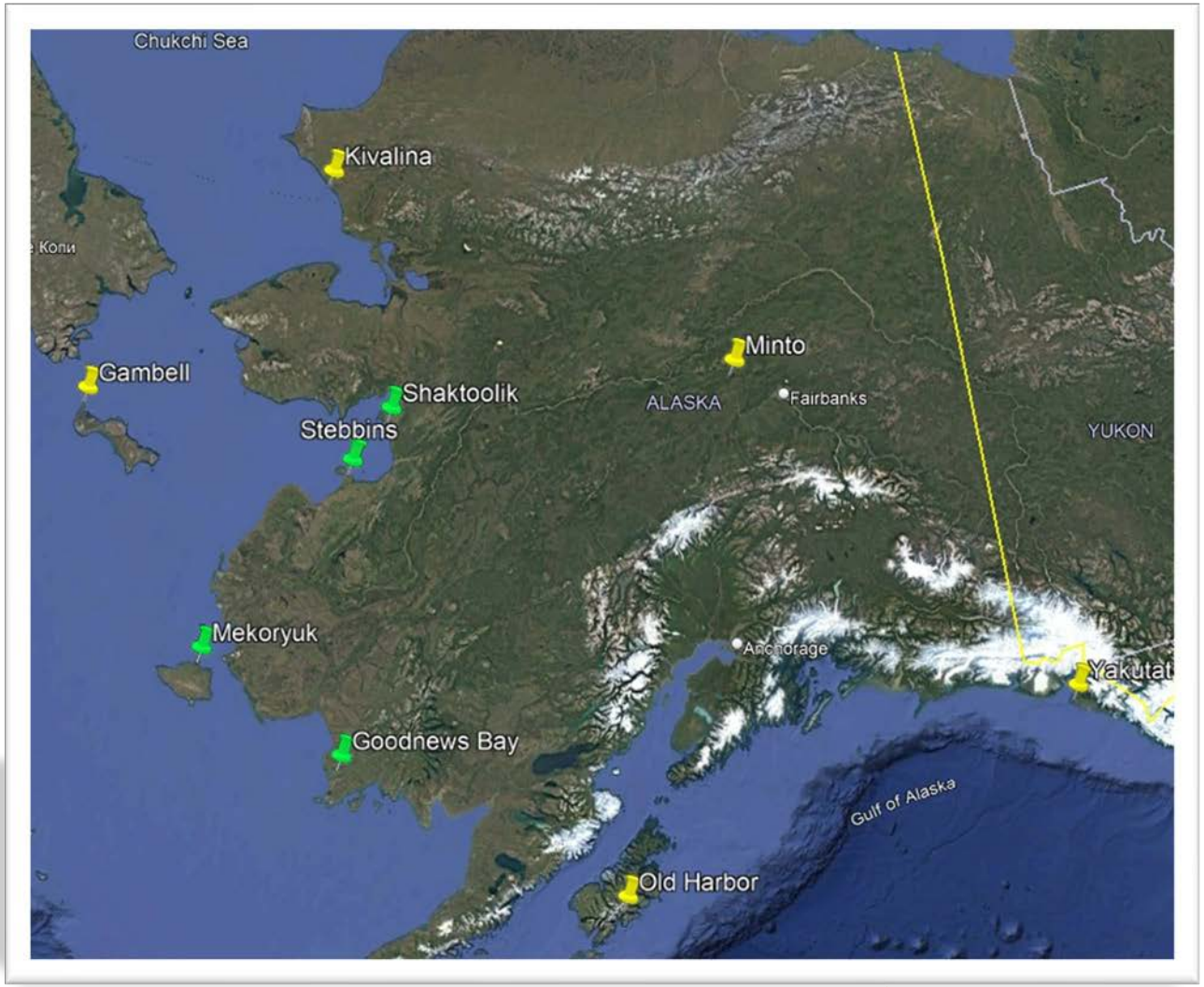
- Long lead items acquired, boilers are at AVEC headquarters
- RFP June 2024 for Stebbins and St. Michael
  - One response, too high
- AVEC to perform Stebbins
- Bid for St. Michael out soon

# Lessons Learned

- Poor weather impacts
- Sequence of Site Work
- Coordination with foreign entities
- Staffing availability
- Sufficient materials
- Troublesome equipment

# Other Projects

- Shaktoolik Battery Energy Storage System
- Goodnews Bay Renewable Energy Project
- Mekoryuk Repower



# RENEWABLE ENERGY?
## *I'm a big fan.*

Phil Pletnikoff, STG; Onya Stein, AVEC; David Cooper, HDL Engineering

*Thank you!*

*Questions?*

Onya Stein

Alaska Village Electric Cooperative

Project Manager

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