

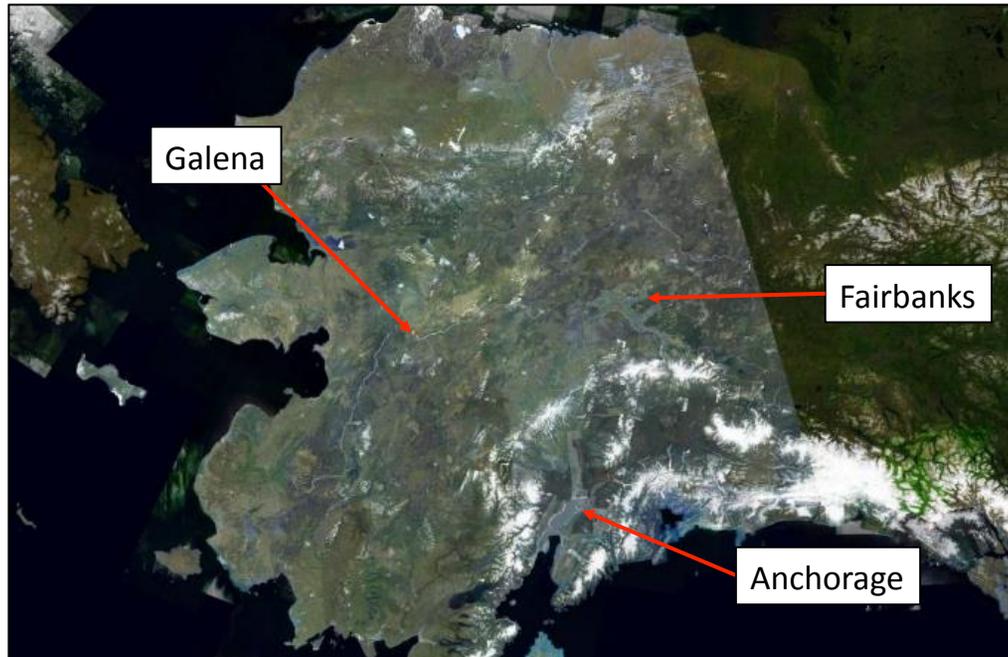
Galena Biomass Project



TIM KALKE
GENERAL MANAGER

Presentation Agenda

- Project History
- Wood Fuel Supply
- Heating System



Project History

Former Galena Air Base

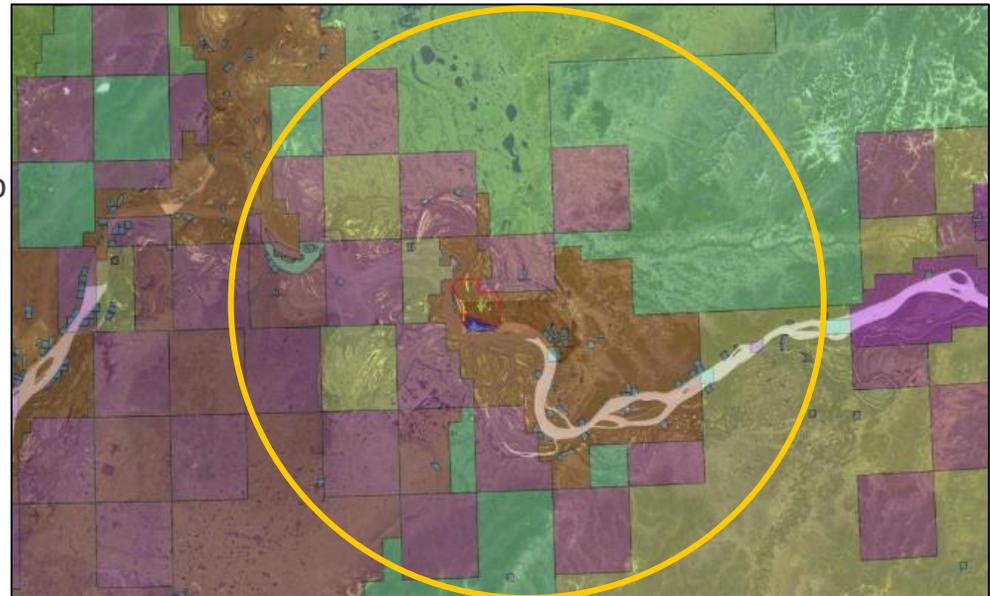
- Ownership transition to City of Galena
- Rural Energy Issues
 - Inefficient and aging infrastructure
 - Old steam distribution system consumed ~230,000 gallons annually
 - Expensive diesel fuel
- Alaska Energy Authority – Renewable Energy Fund Grant



Project History

Former Galena Air Base

- Project Feasibility Studies
- Gana-A 'Yoo, Limited Forest Stewardship Plan
- ★ Steam Utilidor Assessment
- Forest Inventory of Galena Working Circle
- Engineering Design



Project History

Timber Harvest Entity

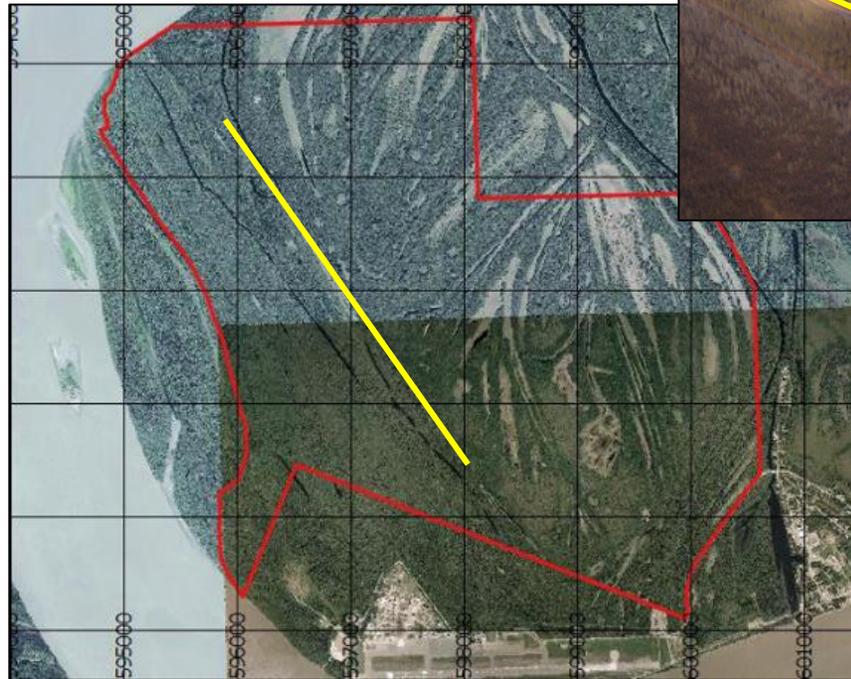
- The City of Galena, Galena City School District (GCSD) and Louden Tribal Council (LTC) created a local non-profit organization, **Sustainable Energy for Galena, Alaska (SEGA)** tasked with providing wood fuel supply
- Gana-A 'Yoo, Limited, the City of Galena and SEGA entered into a 20-year Timber Sale Agreement



Wood Fuel Supply

SEGA – Organized in Fall 2014

- 20-year contract
- 4720 acres
- Predominantly deciduous species
- Mixed conifer and hardwood
- Winter Timber Harvest & Chip Processing
 - (4 successful seasons)
 - Harvest 25 acres/year





Wood Fuel Supply

Hitachi ZX200 with Waratah 622B processor



Wood Fuel Supply

Log bunks positioned in harvest unit area, ~2-3 cords per bunk



Wood Fuel Supply

John Deere 748G-III Skidder



Wood Fuel Supply

Log-landings positioned on temporary trail



Wood Fuel Supply

Peterbilt self-loading log truck



Wood Fuel Supply

One season of passive drying has resulted in an average of 32% Moisture Content (MC_{wb})



Wood Fuel Supply

Bandit M1400 knife-chipper



Wood Fuel Supply

Bulk Chip Storage, 2-3 weeks of fuel when full



Heating System

Day-bin, 4-5 days worth of fuel when full



Heating System

Automated auger, conveyor belt and metering-bin feed system



Heating System

Burn-box rear feed system and front access door



Heating System

Former Galena Air Base

- 2016 Summer Construction Season
- Installed heat distribution and new domestic water line
- Converted existing diesel boilers for hot-water/glycol, installed 4.5 MMBtu Messersmith burn-box with Hurst Boiler and performed several additional support tasks



Heating System

Convert from a steam to hot water heat distribution system



Heating System

Above-grade segment of distribution lines, some segments are below-grade



Results

Est. 16.5 billion Btu Heat Requirement

Annual averages:

- Oil used – 40,000 gallons (g)
- Wood used - 1600 green tons (gt)
- Oil displaced - 195,000 g
- Oil displaced **due to biomass** – 95,000 g
- New money introduced to local economy - \$415,000

Previous Steam system used 230,000 g/year

System improvements alone provide 100,000 g savings.

- Cost of Oil - \$5.50/g
- Cost of Wood - \$259/gt

Sustainable Energy for Galena, Alaska

