

SHUNGNAK FUEL PIPELINE PROJECT FINAL REPORT

1. PROJECT DESCRIPTION

A. Location & Population

This project is located in SHUNGNAK, Alaska, a village of 264 persons located on the west bank of the Kobuk River about 150 miles east of Kotzebue.

B. Project Participants

The participants for this facility upgrade are:

- Alaska Village Electric Cooperative
- Shungnak Native Store
- Northwest Arctic Borough School District (NWABSD)

C. Project Justification & History

Fuel for heating and power generation is delivered to Shungnak either by barge or by aircraft. Historically, barge deliveries have been sporadic due of low water conditions in the Kobuk River. When it is not possible to deliver fuel by barge, it is flown into the Shungnak airport, where it is trans-loaded into a fuel truck for delivery to the bulk fuel tank farms in the community.

The community airport is located on the bluff overlooking the Kobuk River. The airport is located approximately one-half mile southwest of the community center. Access to the airport is by gravel road.

Fuel hauling from the airport to the bulk fuel farms in the community is limited to summer operations due to the snow and ice conditions, which make the airport road impassible for tank truck use in the winter. Thus the need existed for a fuel cargo line from the airport to the community's fuel farms.

The existing barge off-loading pipeline from the river to the AVEC and Store tank farms is in poor condition. The pipeline is a mix of threaded aboveground and buried piping. Thus, the need existed for an upgraded marine cargo line.

D. Project Description and Components

The project consisted of three separate pipelines. The primary pipeline is a new aircraft off-loading pipeline from the airport apron to the AVEC tank farm. The second pipeline is a transfer pipeline from the AVEC tank farm to the Store tank farm. The third is a pipeline extension to the existing barge off-loading pipeline of the NWABSD.

Component	Quantity	Description	Notes
Pipeline - Airport to AVEC Tank Farm	2,900 LF 100 LF	B/G - 3"Sch 80 steel; coated A/G - 3"Sch 80 steel; coated;	A/G-Skid mounted on timber sleepers
Pipeline-Transfer fm AVEC to Store	350 LF	B/G - 3"Sch 80 steel; coated	
Barge Off-loading Pipeline	850 LF	B/G - 3"Sch 80 steel; coated	Connection to NWABSD pipeline

The aircraft off-load pipeline is located on ADOT property within a right-of-way lease with ADOT. Operations and maintenance of the pipeline is the responsibility of AVEC.

The barge off-load pipeline crosses the Back Street right-of-way and the NW Arctic School District property. A right-of-way lease exists between the School District and AVEC. Operations and maintenance of the pipeline is the responsibility of AVEC.

2. PROJECT DEVELOPMENT APPROACH & TIMELINE SNAPSHOT

- A. **Funding:** This new aircraft cargo pipeline and marine cargo line upgrade project was funded with grants by the Denali Commission. AVEC provided cash matches as shown in the table in section 3A. The Denali grants are defined in table below:

Funding Document	Component	Date
0023-DC-2001-15	Base	March 26, 2001
0049-DC-2001-15	Adjustment #1	April 22, 2002

- B. **Design:** The design was performed by the consulting firm of LCMF, Inc. of Anchorage, AK. They were retained in February 2002 to develop a Conceptual Design Report for the permanent co-located bulk fuel facility upgrade.

Design Phase	Milestone	Date
Business Plan	None Required	NA
CDR (Abbreviated)	Contract & NTP	May 11, 2001
Final Design & Const Docs	Construction Documents	January 17, 2002

C. **Construction:** The CM firm STG was contracted to perform procurement and construction management tasks for the construction phase for the temporary facility. Because of the limited access to Shungnak and the late date for construction start, a considerable amount of permanent materials were transported by air cargo to the site. The site construction supervisor was mobilized August 8, 2002. All labor to perform the construction tasks was hired locally with the exception of the certified welders. Milestones associated with the Construction of the project are provided in table following.

Construction Phase	Milestone	Date
Pre-construction	Material Procurement cmplt	May 8, 2002
	Air Delivery	Aug 15, 2002
Construction	Site Prep; piping; testing	Aug 8-Sept 30, 2002
	Substantial Completion	October 1, 2002
Turnover & Commission	AVEC Acceptance	October 10, 2002

D. Project Time - Design:

Start: May 11, 2001 (CDR NTP)
 Complete: January 17, 2002 (Const Drawings)

Total Project Time: 189 cal days (6.1 mo.)

Project Time - Construct:

Start: August 8, 2002
 Complete: September 19, 2002

Total Project Time: 42 cal days (1.3 mo.)

Total Project Time - Design & Construct: (Actual – not elapsed)

Start: May 11, 2001 (CDR NTP)
 Complete: March 31, 2005 (Final Report)

Total Actual Project Time: 1,420 cal days (3.9 yr.)

3. PROJECT FUNDING, DEVELOPMENT COSTS, AND UNITS

A. Funding

Funding was provided by Denali Commission grants in lump sum amounts, with no designation for allocations to project development components (i.e. design, construction). Grant funding and AVEC cash matches are shown in the following table:

Date	Denali Funding Award	Denali	AVEC	Other	Total
3/26/2001	0023-DC-2001-15 Base	\$139,500	\$15,500	\$0	\$155,000
4/22/2002	0049-DC2002-12 Amendment #1	\$471,935	0	\$0	\$471,935
Total Funding		\$611,435	\$15,500	\$0	\$626,935
		97.5%	2.5%	0.0%	

B. Development Costs

Project development costs were tracked for each of the categories shown in the table below, though the funding grants were awarded in lump sum amounts. There were no funding amounts (budgets) for each major cost category and thus no variance of actual cost vs. budget for the project. The percent of total project cost for each category of project cost is shown

Component	Funding Budget	Actual Funding	Actual Project Cost	Funding Budget Variance	% of Actual Funding	% of Final Cost
Business Plan	NA	NA	NA	NA	NA	NA
Planning & Design (LCMF)	\$77,665	\$77,665	\$78,474	(\$809)	101%	13.2%
Construction	\$388,977	\$388,977	\$279,883	\$109,094	72%	47.2%
Const. Mgmt (STG)	\$97,249	\$97,249	\$47,136	\$50,113	48%	8.0%
AVEC Direct Costs	\$61,889	\$38,729	\$3,426	\$35,303	9%	0.6%
AVEC Consultants	\$0	\$0	\$9,158	(\$9,158)	0%	1.5%
Project Mgmt (AVEC)	\$24,315	\$24,315	\$16,344	\$7,971	67%	2.8%
Other	\$0			\$0	0%	0.0%
TOTAL	\$650,095	\$626,935	\$434,421	\$192,514	69%	100%

Project Cost Summary Analysis:

The project **costs underran the available funding** by \$192,514 (69%) as appropriated to this project. Thus, the finding adjustment based on the underrun is:

	Denali	AVEC	Other	Total Cost
FINAL COST ALLOCATION TO FUNDING	\$423,680	\$10,741	\$0	\$434,421

Final Unit Costs & Percentages

It is useful to compare unit costs and percentages of cost against the total project cost for like components of like projects. The following table illustrates some salient unit prices and percentages.

COMPLETED AMOUNTS		Const Cost	Project Cost	Gal Storage
		\$339,603	\$434,421	0
COMPLETED PERCENTS AND UNIT COSTS				
Item	Item Cost	%	%	\$/Gal
Business Plan	NA	NA	NA	NA
Design				
CDR	8,753	1.3%	1.2%	NA
Design Dev	69,721	10.7%	9.6%	NA
DESIGN TOTAL	\$78,474	12.1%	10.8%	NA
Construction				
Field Direct Costs	279,883	43.1%	38.5%	NA
AVEC Direct Costs	12,584	1.9%	1.7%	NA
Const Admin	47,136	7.3%	6.5%	NA
CONSTRUCTION TOTAL	\$339,603	52.3%	46.8%	NA
Program Management				
AVEC & Consultants	\$16,344	2.5%	2.3%	NA
PROG MGMT TOTAL	\$16,344	2.5%	2.3%	NA
GRAND TOTALS	\$434,421			NA
		% Const Cost	% Project	\$/Gal Storage
AVEC Cash Match	\$10,741.00	3.2%	2.5%	NA
Denali Commission Cost Benchmark for Bulk Fuel Facilities				NA
Completed Project (\$/gal)				NA
Variance (fm median-\$/gal)				NA
% Variance (under)				NA

4. Local Hire & Training

a. Local Hire

A major objective of AVEC, its Construction Management Contractor, and the Denali Commission is to utilize local residents in the execution of the project development to the maximum extent possible. Because of the short duration of the work (42 days) and technical aspects of it, Shungnak did not accomplish this goal well in any of the three categories: 1) Persons Hired; 2) Local Economy Payroll; and 3) Percentage of total Work Hours.

	Employees		Payroll \$\$		Work Hours	
	Number	%	Payroll \$\$	%	Hours	%
Total	6	100%	\$45,510	100%	597	100%
Local	2	33%	\$7,845	17%	392	66%
Non-Local	4	67%	\$37,665	83%	205	34%

b. Job Training

A second objective of AVEC, its Construction Management Contractor, and the Denali Commission is to train local residents of the community in job skills that can be utilized on the project within the village. For this project, pipe welding skills were required, providing an opportunity for training. There was some on the job training for welders' helper for the local laborers, but no formal program because of the short duration (42 days).

Village	Project Type	Training			Resulting Const Jobs
		No.	Trades	Location	
TRAINING TO DATE					
SHUNGNAK	Bulk Fuel Storage	0	Small Pipe Welding	Anchorage	None