Lake Dorothy
The Cost of Generation

Tim McLeod

President

Alaska Electric Light and Power

Challenges to developing new hydro resources

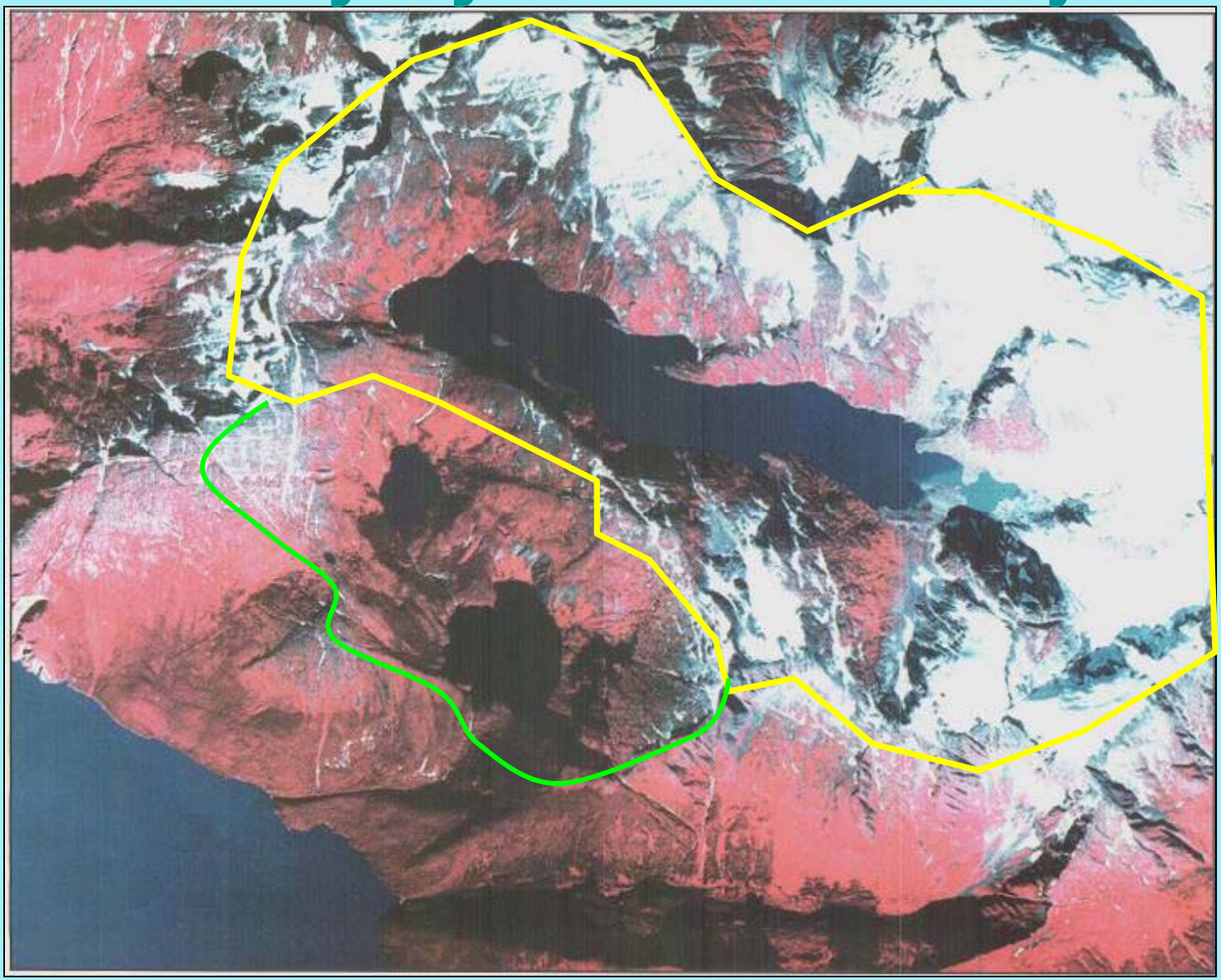
- Timing
- Permitting
- Design
- Financing
- Construction
- Customer acceptance
- Regulatory approval


Annex Lakes
Annex Creek Powerhouse
Turner Lake
Juneau
Taku Inlet
Thane
Lake Dorothy Powerhouse
Lake Dorothy
Submarine cable
Long Lake
Stephens Passage
Snettisham Powerhouse
Crater Lake
Admiralty Island
Avalanche zone

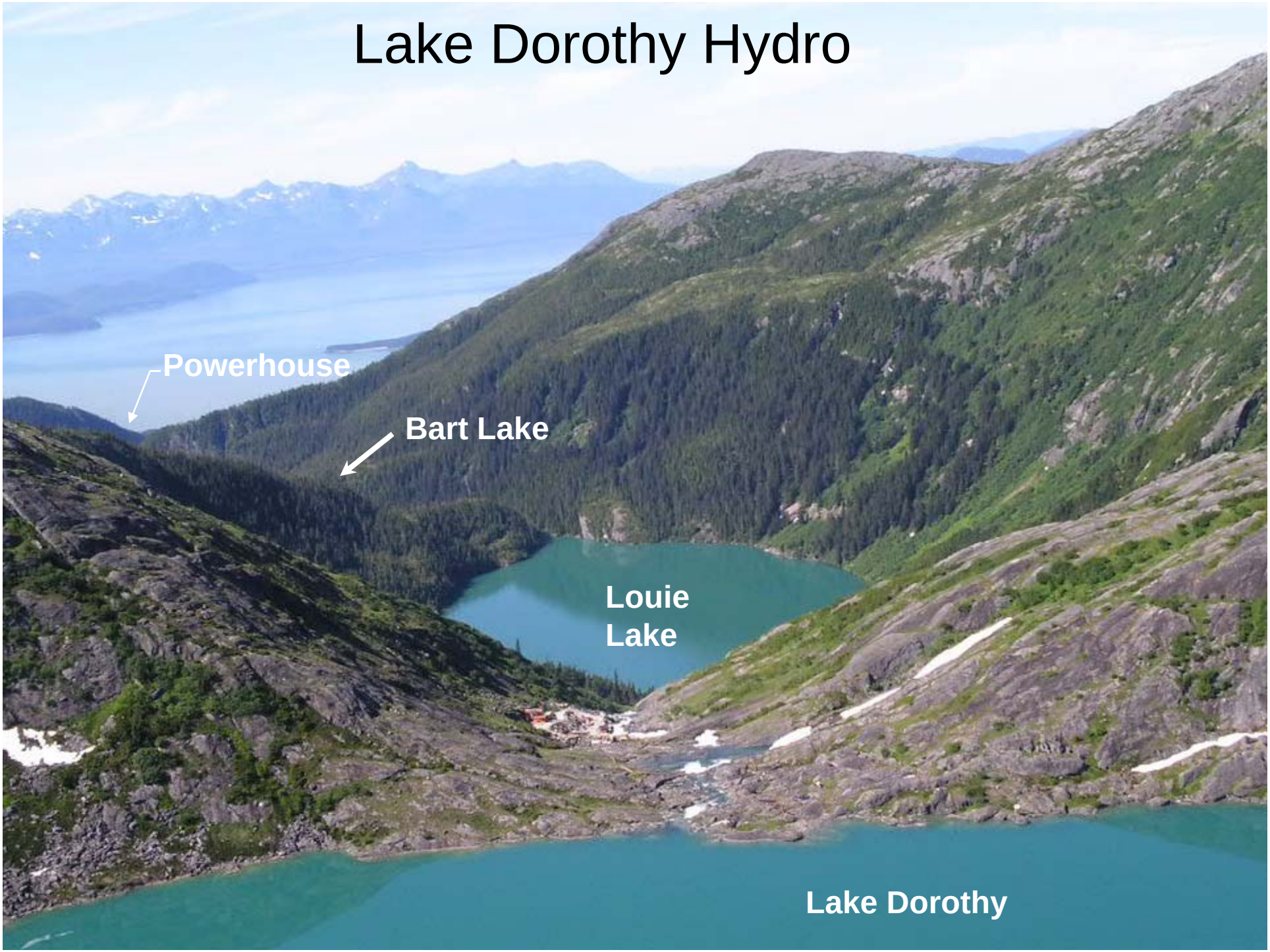
Lake Dorothy Hydroelectric Project Site

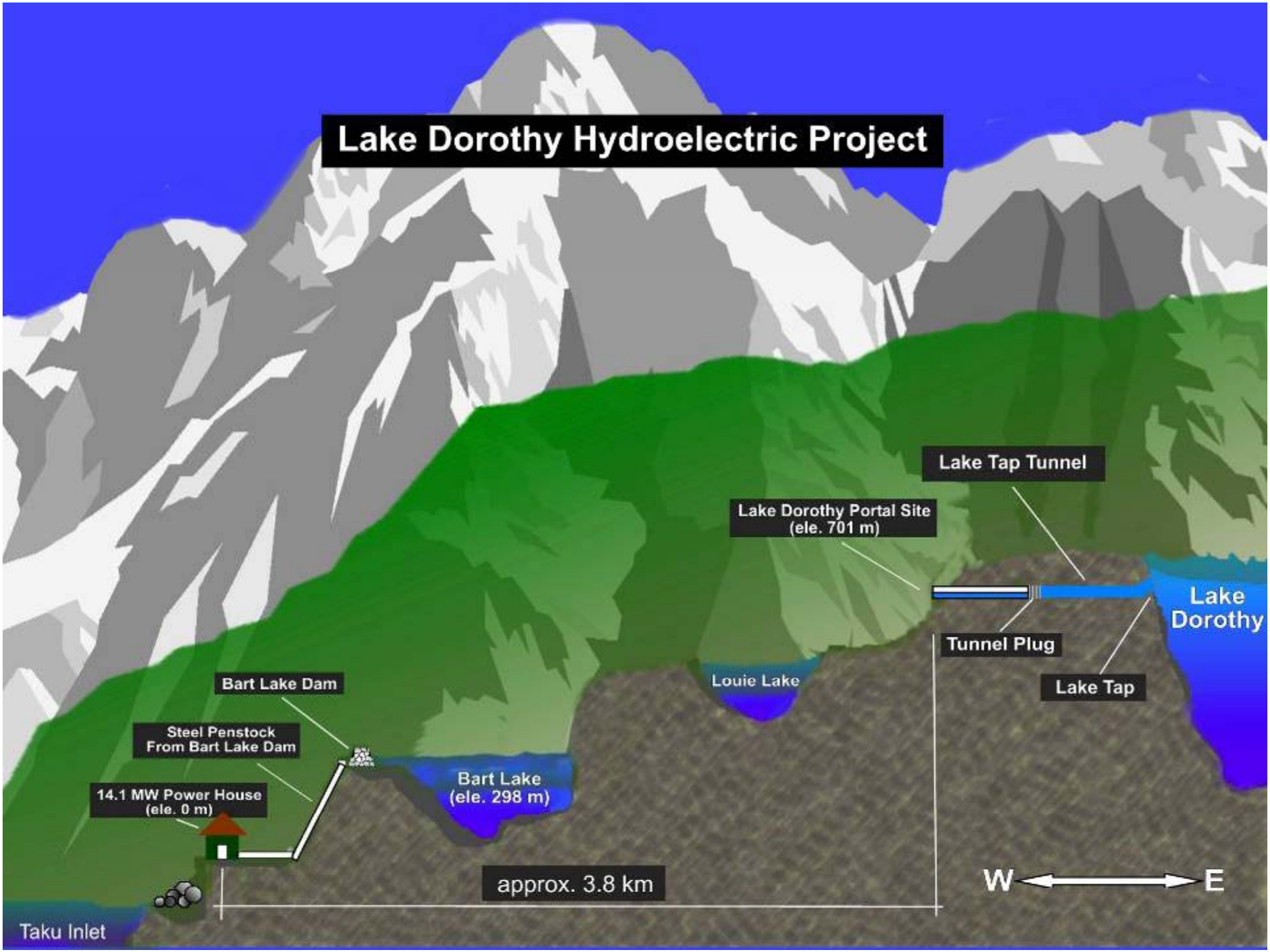
AEL&P

Lake Dorothy Hydroelectric Project Site



Lake Dorothy Hydro




Lake Dorothy Hydroelectric Project
Lake Tap Tunnel
Lake Dorothy Portal Site
(ele. 701 m)
Lake
Dorothy
Tunnel Plug
Lake Tap
Louie Lake
Bart Lake Dam
Steel Penstock
From Bart Lake Dam
Bart Lake
(ele. 298 m)
14.1 MW Power House
(ele. 0 m)
approx. 3.8 km
W
E
Taku Inlet

Project history

- **1996** – 1st Preliminary permit submitted
- **1999** – 2nd Preliminary permit submitted with revised scope
- **2001** - Draft License Application and Preliminary Draft Environmental Assessment filed with FERC and agencies
- **2002** – Final license application and draft environmental assessment Filed
- **2002** - FERC issued final environment assessment (EA)for agency and public comment.
- December 24, **2003** – FERC License Order Issued
- May **2006** – With final design complete, financing in place construction began
- **August 2009 – Project on line**

Phase I Development

- Power Tunnel and Lake Tap
- Bart Lake Diversion Dam.
- 1.8 Mile Access Road from Powerhouse Site at Tidewater to Bart Lake
- 8400’of 60” Diameter Penstock from Bart Lake to Powerhouse Site.
- Powerhouse/Turbine/Generator
- Shop and Maintenance Crew Quarters
- Substation and switch yard
- 3.5 miles of overhead transmission line
- 15 MW
- 75 GWH

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Lake Dorothy Lake Tap & Tunneling Project

Lake Dorothy

Lake Dorothy Portal on July 25, 2009

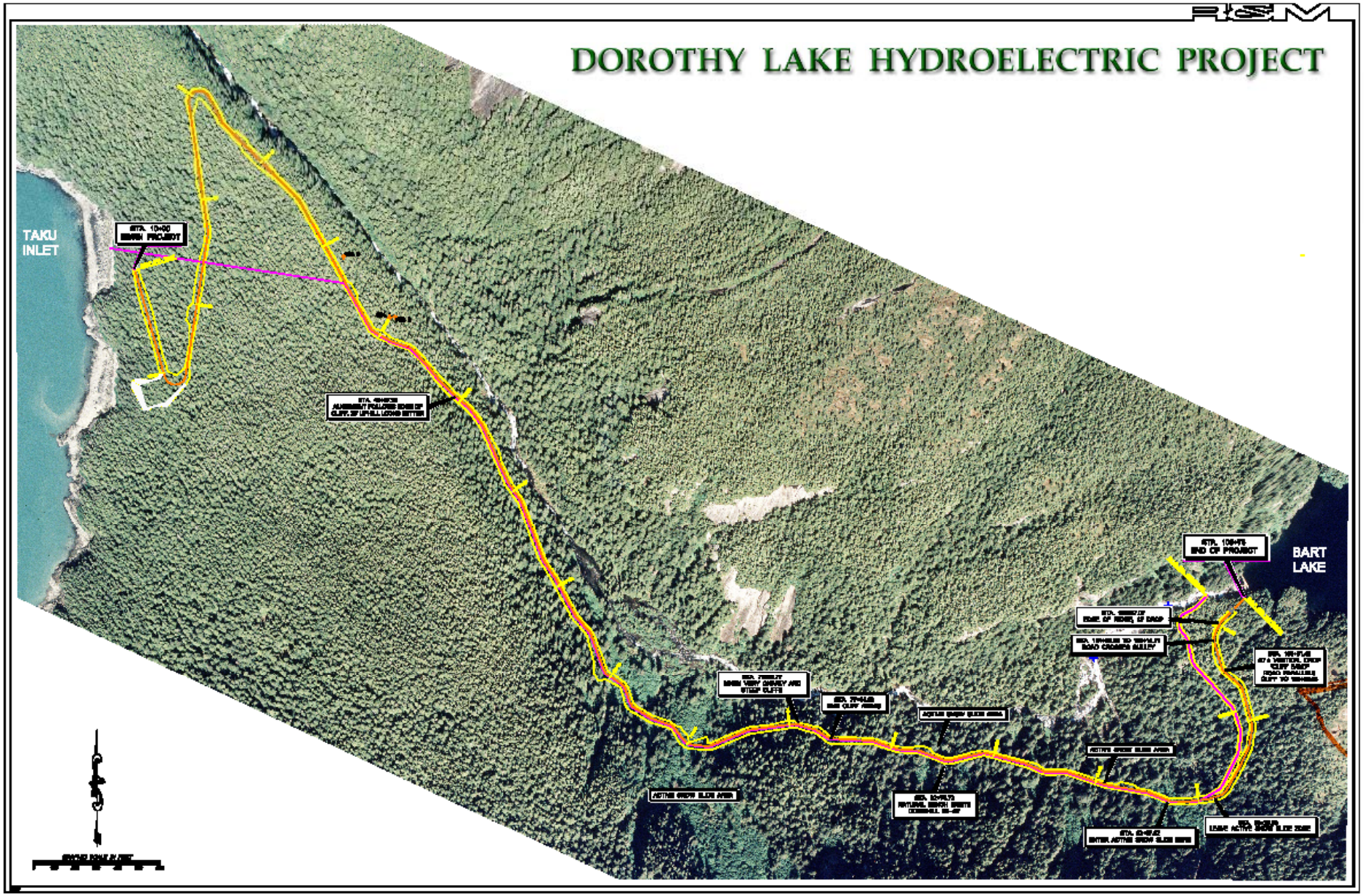
Tunnel Plug – June 27, 2008

Tapping the Lake – August 19, 2008

The Trigger Man

A Look Inside the Portal on July 28, 2009

Access Road and Penstock


DOROTHY LAKE HYDROELECTRIC PROJECT
TAKU INLET
BART LAKE

Access Road Construction – 2007 (working from tidewater to Bart Lake)

An On-The-Ground Look of the Access Road – August 2008

May 4, 2009 – 1st Shipment of Penstock Pipe Arrives

The Valve Vault – August 18, 2008

Note: MK174, Baker Disassembly Joint, 60” Valve and MK173 in Place

Penstock Trench Work – June 21, 2008

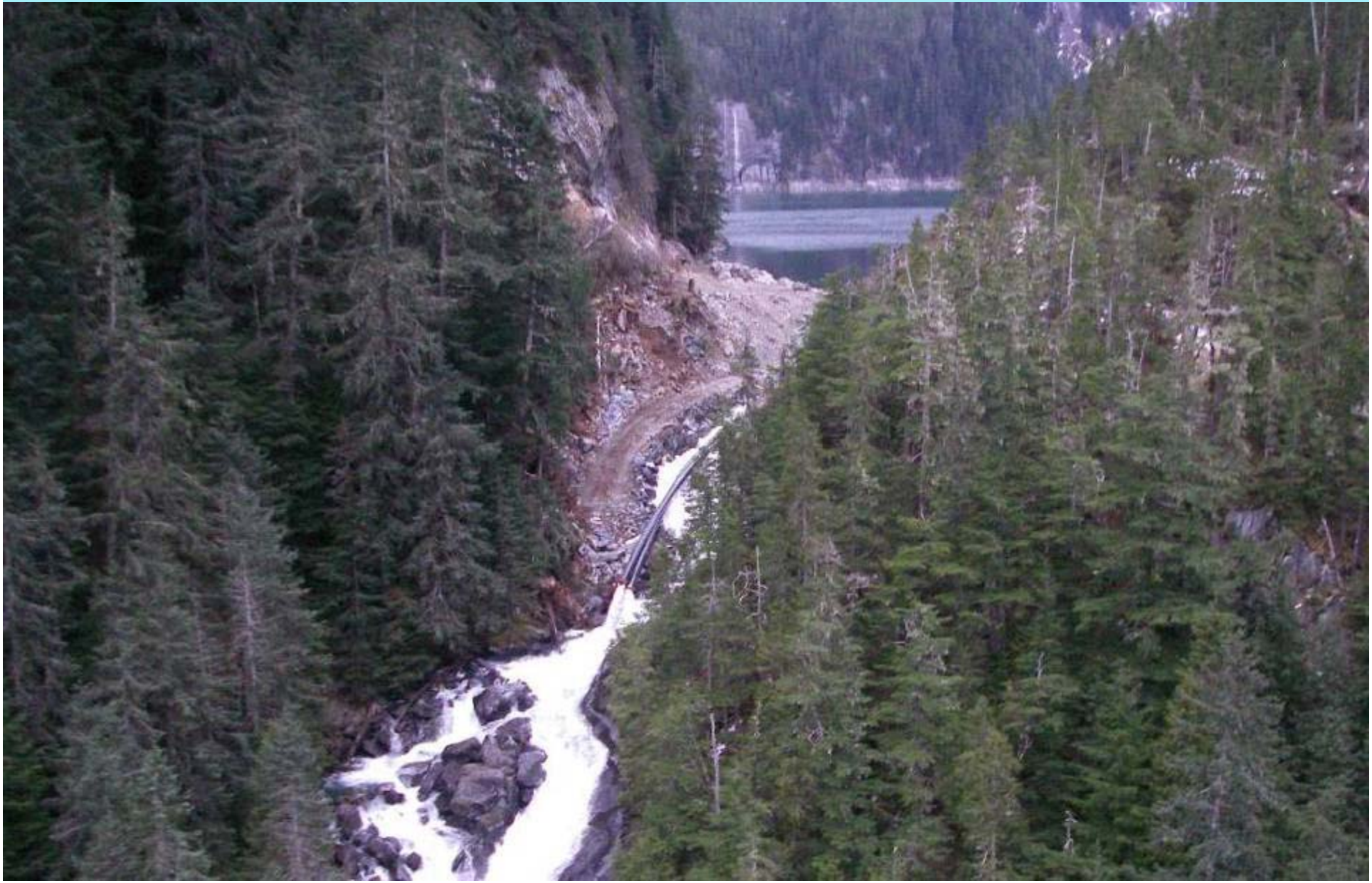
Penstock Install Along Road – October 16, 2008

(Installing MK167)

View of the Penstock Pipe Staged along the Access Road

- Bart Lake Dam

Installed Siphons – November 10, 2008



Bart Lake – November 18, 2008

May 28, 2009 – Pouring the Last of the Bart Lake Dam Face Slabs

Bart Lake Dam - August 2009

Powerhouse Foundation and Building Erection

Powerhouse Site – March 25, 2008

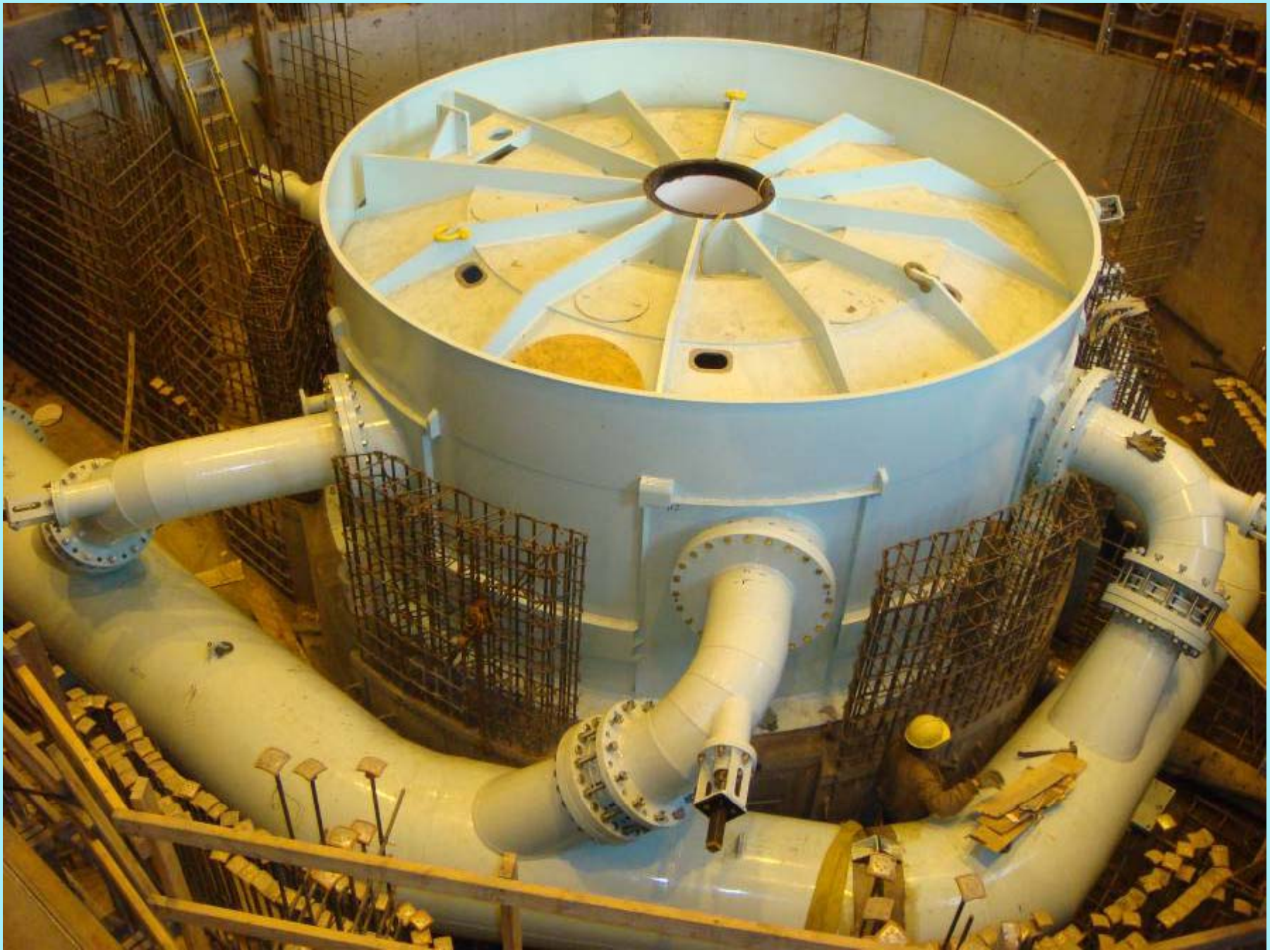
Powerhouse Site – June 25, 2008

Powerhouse Site – August 23, 2008

Powerhouse Site – October 18, 2008

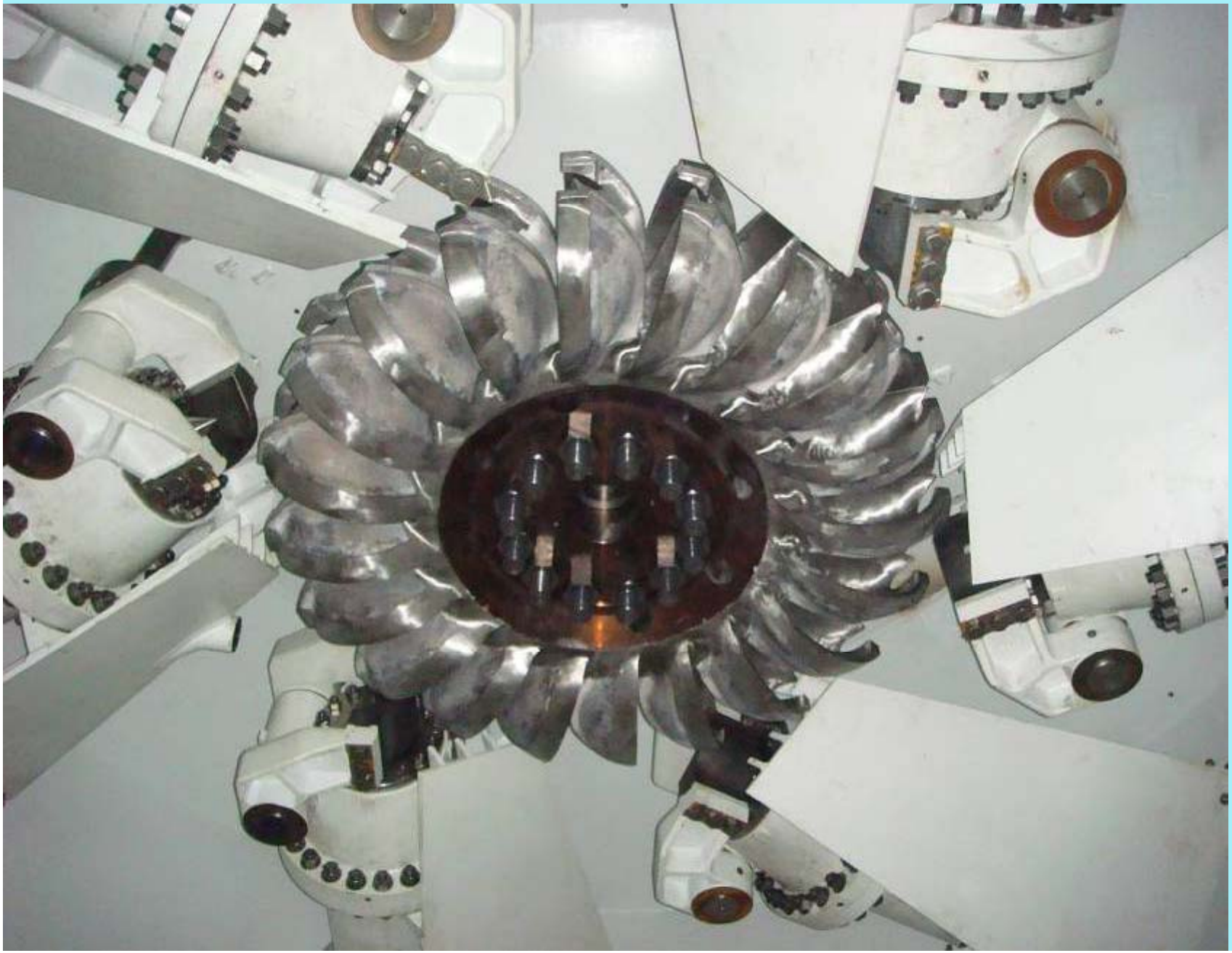
Turbine & Generator

Turbine Set, Manifold Set, Branch Pipes Installed – Feb. 19, 2009



15.3 MW Bart Lake Generator Final Assembly & Test at Factory

June 24, 2009 – The Runner is “Home”



August 31, 2009 – Commercially Operational!!!

Bart Lake Substation
&
Transmission Line

The Bart Lake Substation Complete & Back Energized from Snettisham T-line - October 27, 2008

T-Line Structure Site Clearing – August 1, 2008

Snapshot of Blast Along T-Line

Typical Structure Sites

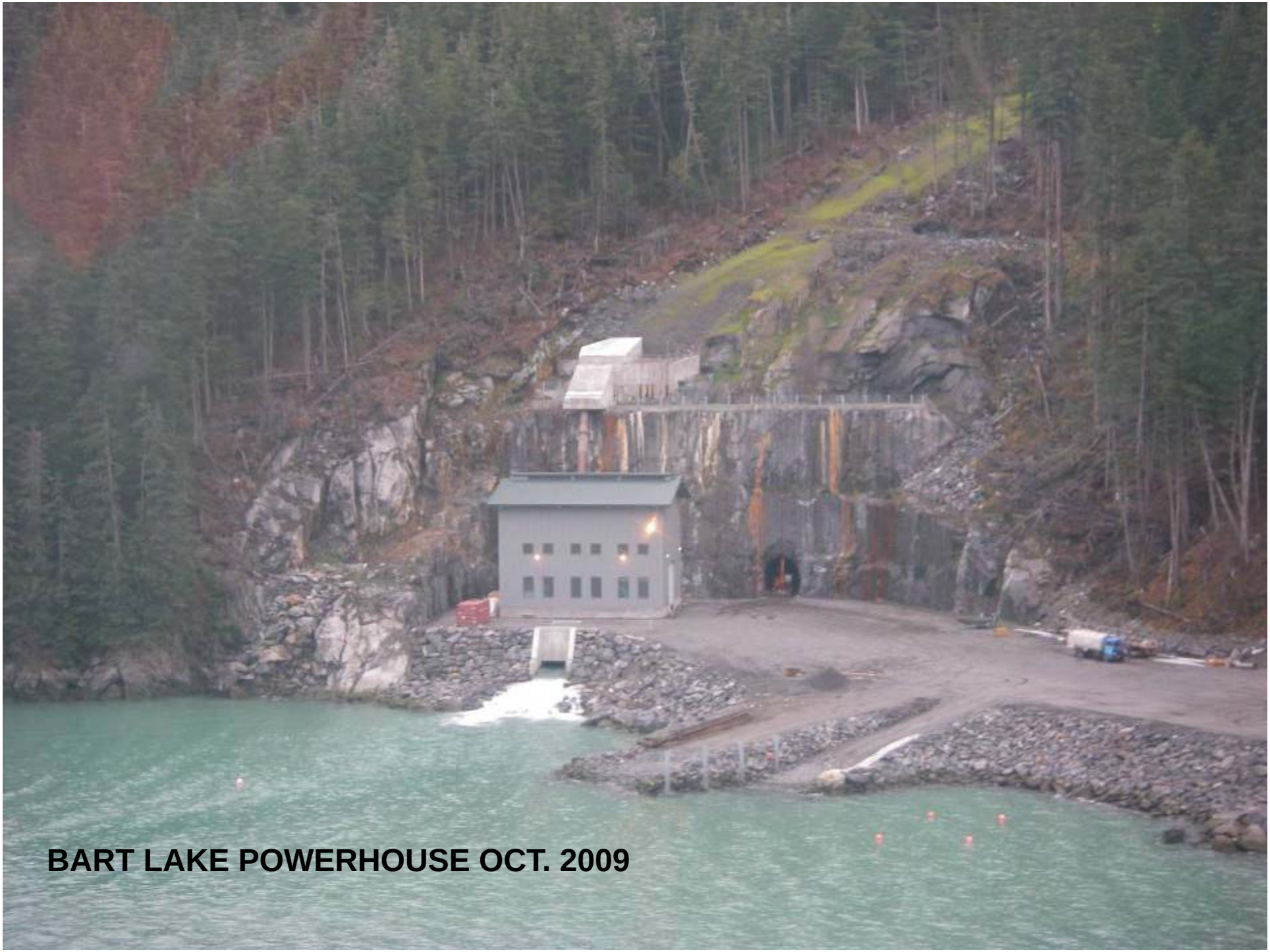
The Bell 214 Getting Ready to Lift a Pole from the Barge

Heavy Lifts Moving Equipment and Poles

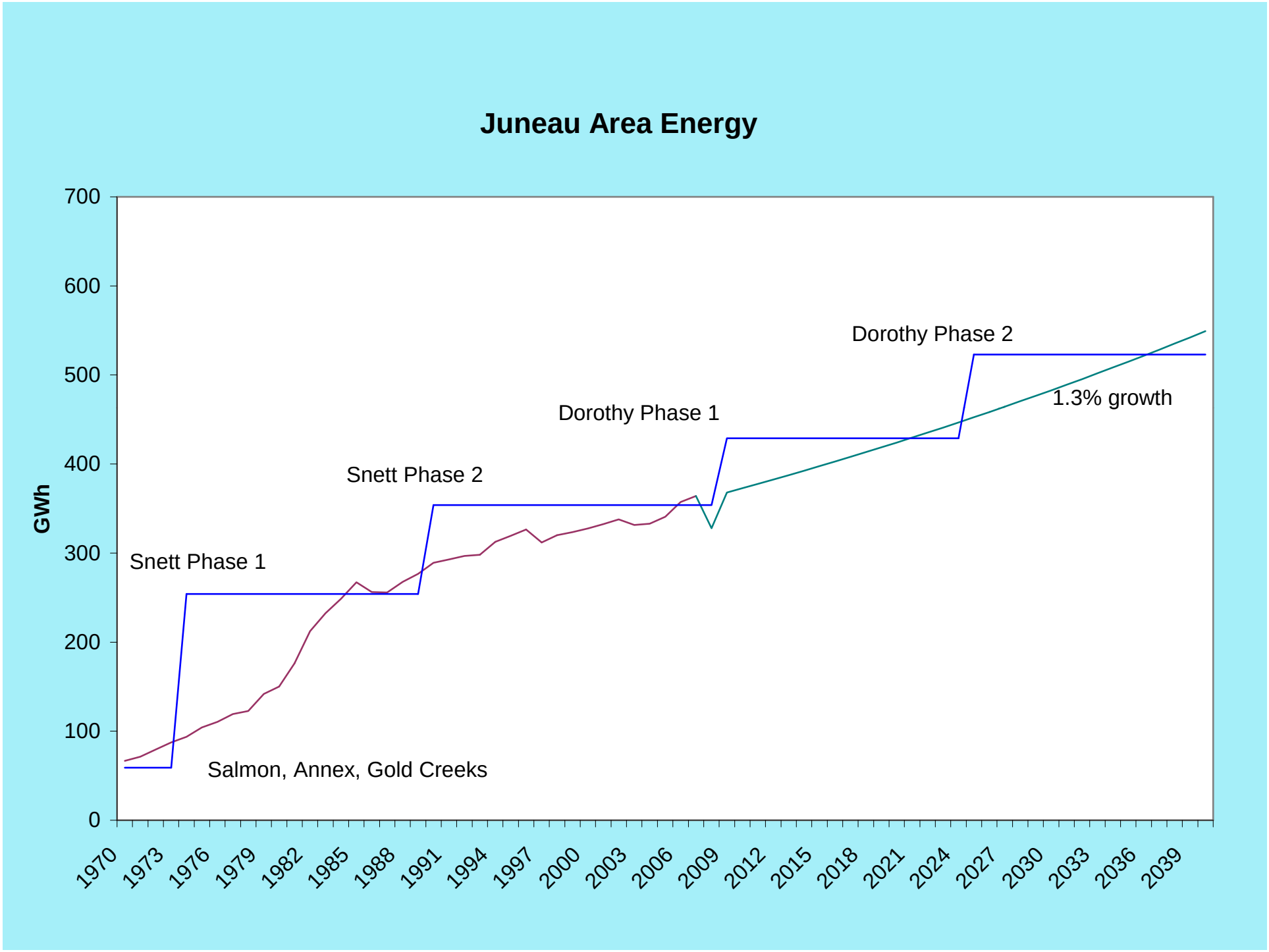
Flying in a Crossarm and Crews Working on Assembly

High Time for the Lineman

Lake Dorothy Breaker - East Terminal - Lower Yard Complete



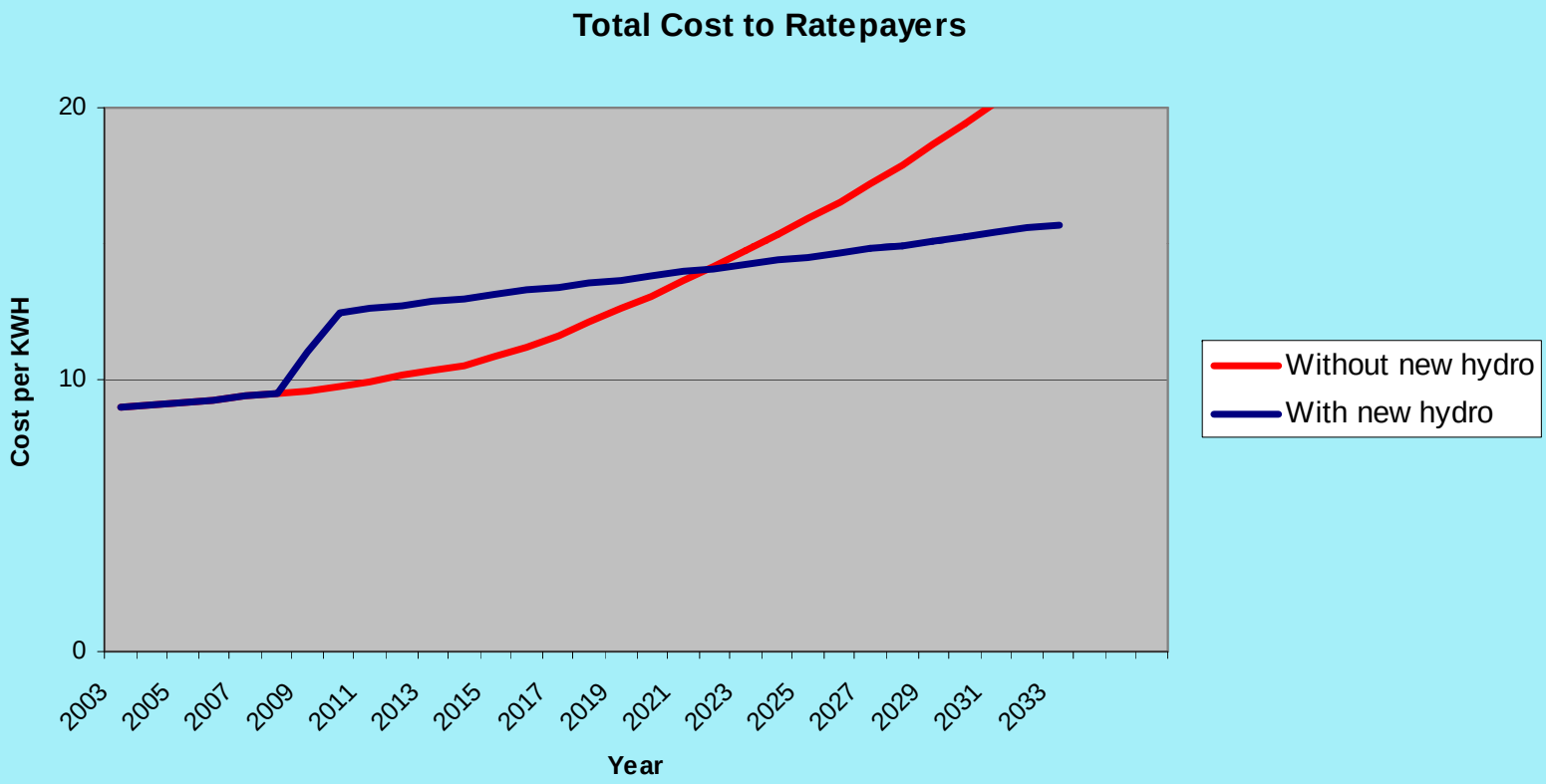
BART LAKE POWERHOUSE OCT. 2009


Juneau Area Energy
GWh
700
600
500
400
300
200
100
0
1970
1973
1976
1979
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
2021
2024
2027
2030
2033
2036
2039
Dorothy Phase 2
1.3% growth
Dorothy Phase 1
Snett Phase 2
Snett Phase 1
Salmon, Annex, Gold Creeks

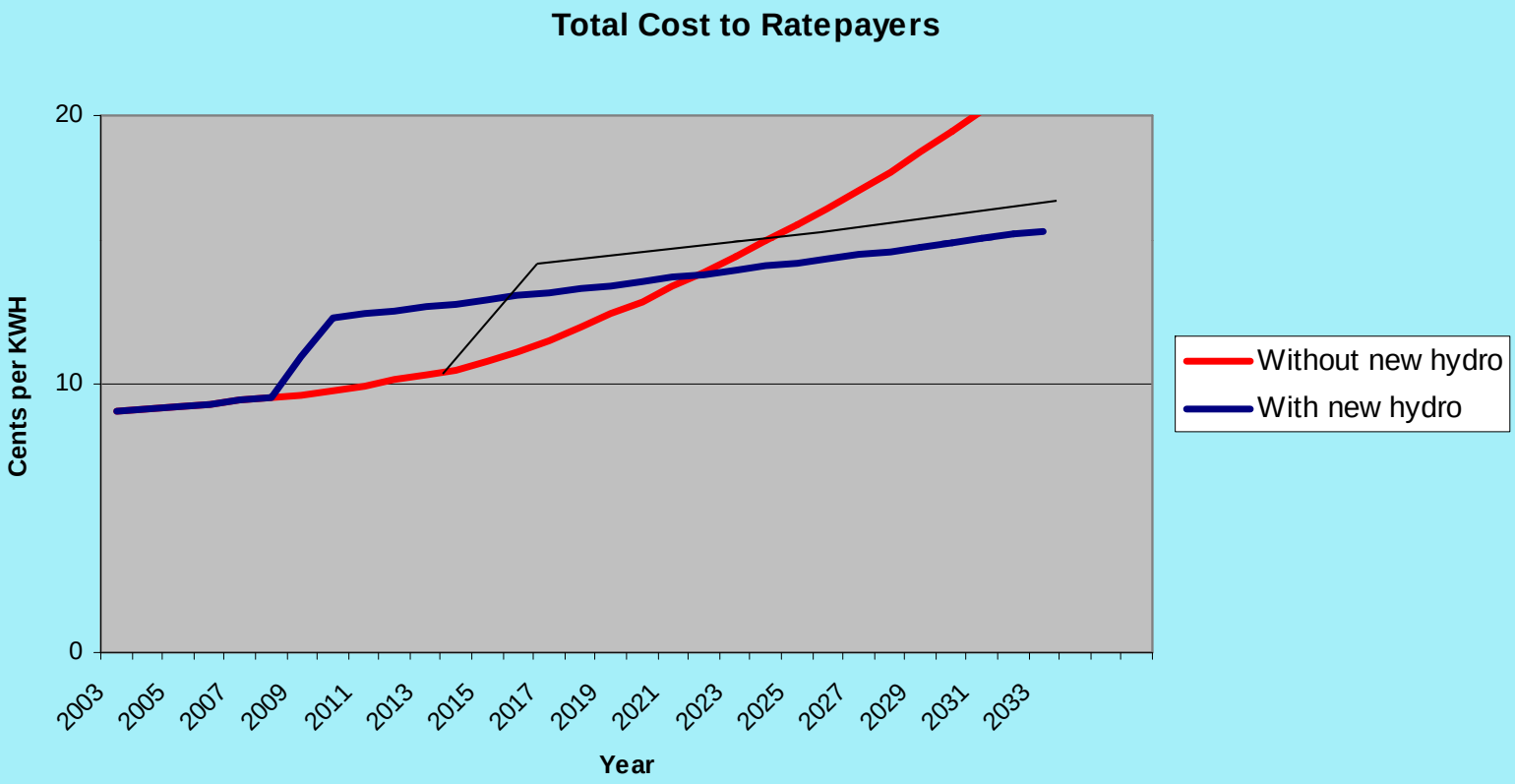
“Hydro projects inflate until you build them”

Scott Willis, AELP

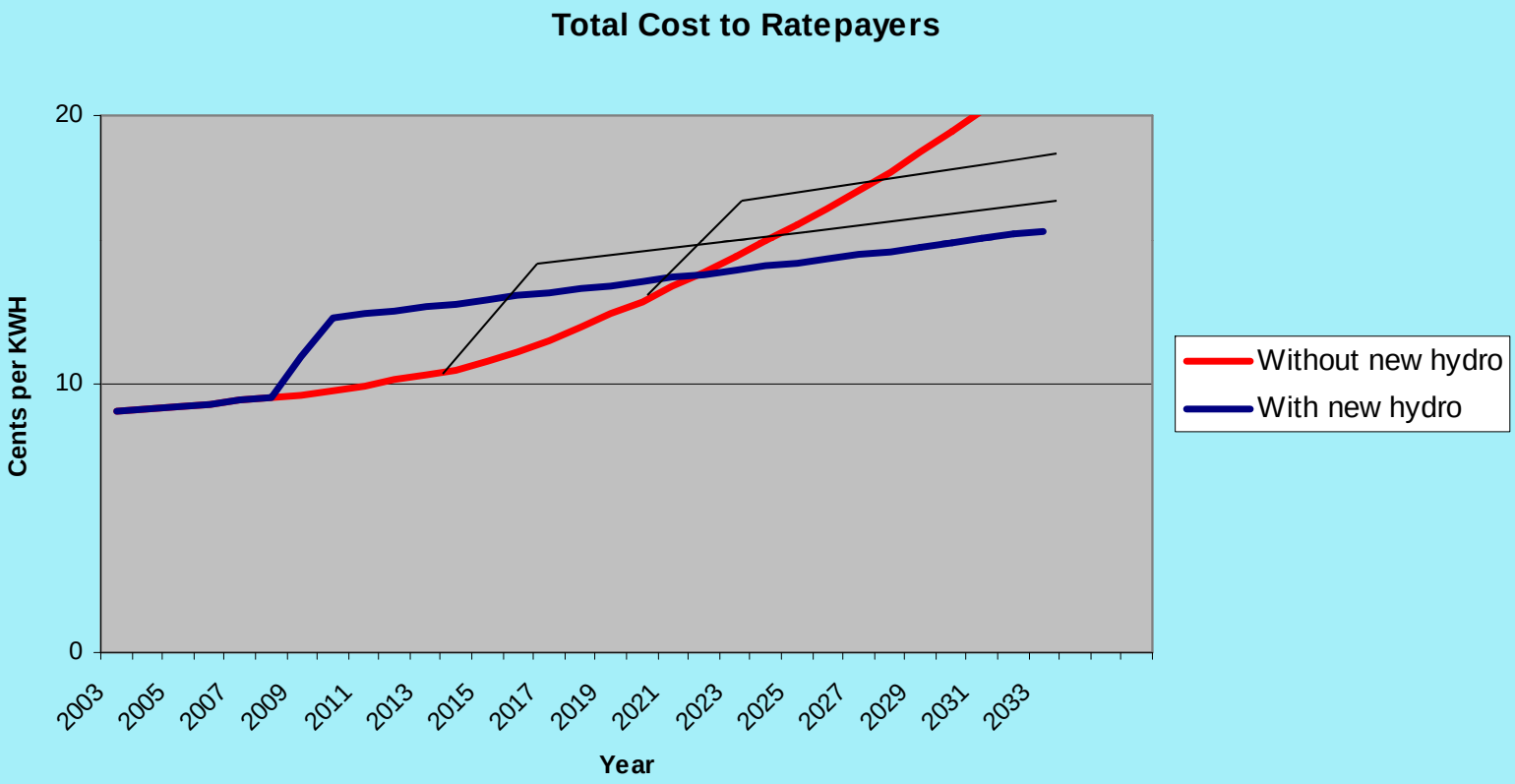
Rate impact illustration



Rate impact illustration delayed construction



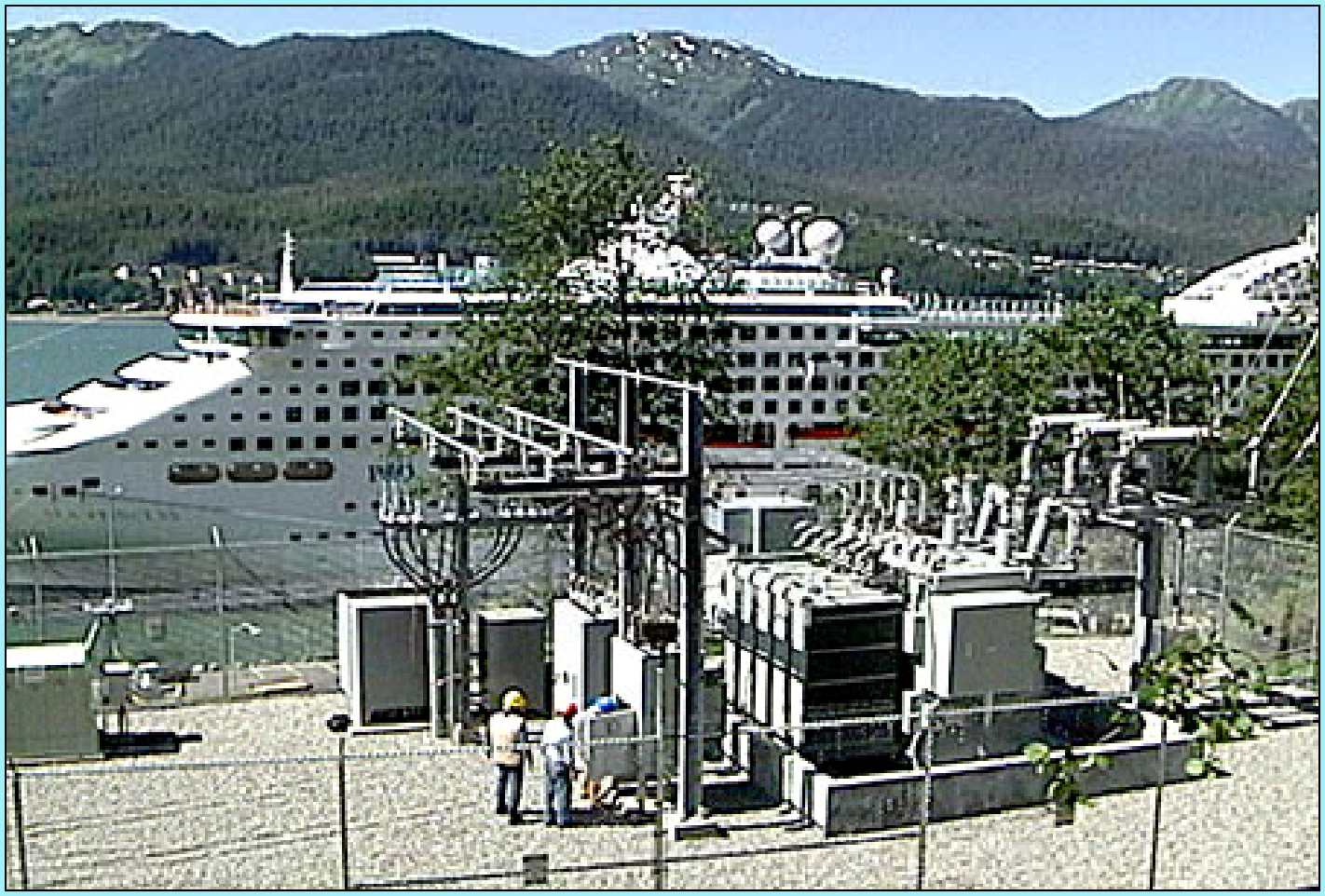
Rate impact illustration delayed construction



The Importance of Surplus Hydro Energy

- Provides the lowest energy rates over time
- Available for load growth
- Provides rate stability
- Enables incentive rates
- Avoid diesel use during dry years

The importance of surplus energy sales



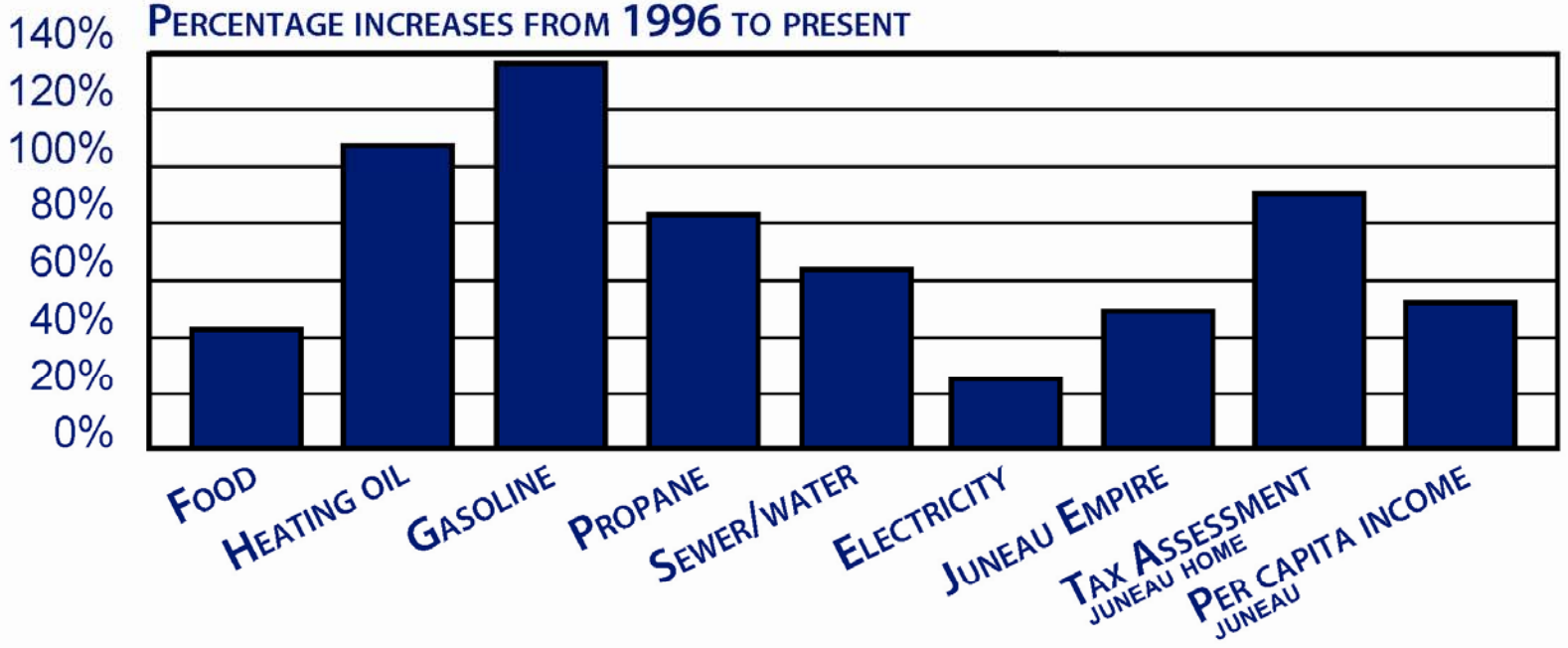
Surplus sales benefit others

Princess Cruises Shore Power Facility

Hydro project comparison
In 2009 dollars
Inflation based on Handy – Whitman Index

Project	Completion Year	Actual Cost	Actual Cost (2009 $)	$/MWh (2009 $)
Terror Lake (IDC)	1984	$ 234,000,000	$ 470,758,213	$ 4,024
Falls Creek	2009	$ 8,200,000	$ 8,200,000	$ 2,563
Solomon Gulch	1981	$ 69,000,000	$ 119,055,219	$ 2,560
Snettisham 1 (Long Lake)	1973	$ 88,000,000	$ 416,037,600	$ 2,134
Swan Lake (IDC)	1984	$ 96,171,483	$ 165,937,927	$ 2,074
Tyee (IDC)	1984	$ 128,691,456	$ 258,899,828	$ 1,992
Bradley Lake (IDC)	1991	$ 328,000,000	$ 565,943,650	$ 1,530
Snettisham 2 (Crater Lake)	1989	$ 65,000,000	$ 113,815,000	$ 1,084
Kasidaya	2008	$ 11,200,000	$ 11,536,000	$ 1,049
Lake Dorothy	2009	$ 78,520,419	$ 78,520,419	$ 1,047
Black Bear	1995	$ 11,000,000	$ 16,353,679	$ 737
Goat Lake	1997	$ 10,100,000	$ 14,737,583	$ 733
South Fork	2005	$ 3,700,000	$ 4,428,478	$ 692

Price increase in Juneau over the past 15 years



Source: UAF Cooperative Extension Service food Cost Survey, www.uaf.edu/ces/fcs.

Food cost based on family of 4, children 6-11. Survey measures same commodity amounts each year since 1996 for many Alaska locations. December data was used through 2009. Juneau's current electricity price based on peak season rate, including 18.5% interim rate adjustment.