

Whitman Lake Hydroelectric Project

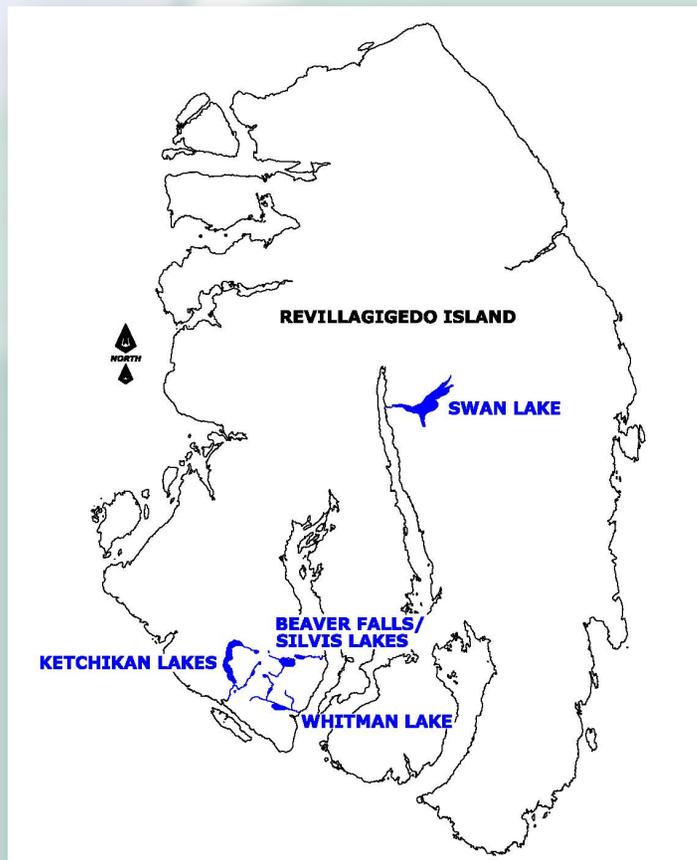
Ketchikan Public Utilities



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Senior Project Engineer

KPU Electrical System

Generation Resources



Hydroelectric Generation

Beaver Falls/ Silvis Project 7.1 MW

Ketchikan Lakes Project 4.2 MW

SEAPA (Swan Lake/Tyee) 24 MW

Total 35.3 MW

Diesel Generation 26 MW

KPU Electrical System

Generation Resources



Ketchikan Lakes Hydroelectric Project

- Constructed: 1912/1923/1957
- Capacity: 4.2 MW
- Average Generation: 22,500 MWh

KPU Electrical System

Generation Resources



Beaver Falls/Silvis Hydroelectric Project

- Constructed: 1947/1954/1969
- Capacity: 7.1 MW
- Average Generation: 56,000 MWh

KPU Electrical System

Generation Resources (SEAPA)



Swan Lake

Constructed: 1984

Capacity: 22.5 MW

Ave Generation: 75,000 MWh



Swan-Tye Intertie

Constructed: 2009

Tye Capacity: 22.5 MW

Ktn Generation: 16,000 MWh
(2010)

Ketchikan's Need for Power

Generation

Average Annual Generation

Ketchikan Lakes Project	22,500 MW-hr
Beaver Falls/Silvis Project	56,000 MW-hr
Swan Lake (SEAPA)	76,500 MW-hr
Total	<hr/> 155,000 MW-hr

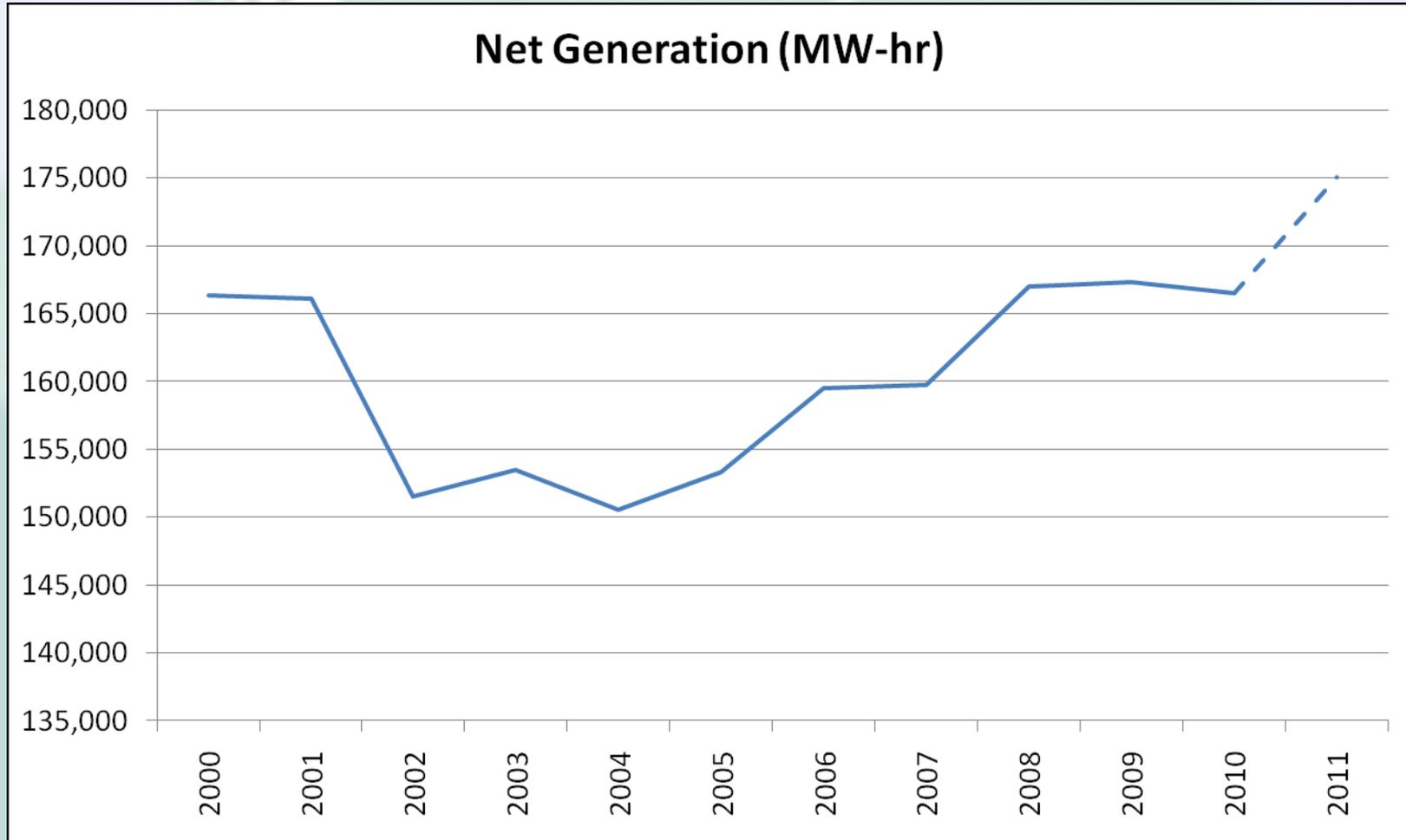
Tyee Lake (SEAPA)

2010 KPU Usage	16,000 MW-hr
Available for Future Load Growth (includes Wrangell & Petersburg)	31,400 MW-hr

Whitman Lake (KPU)

16,000 MW-hr

Ketchikan's Need for Power Generation

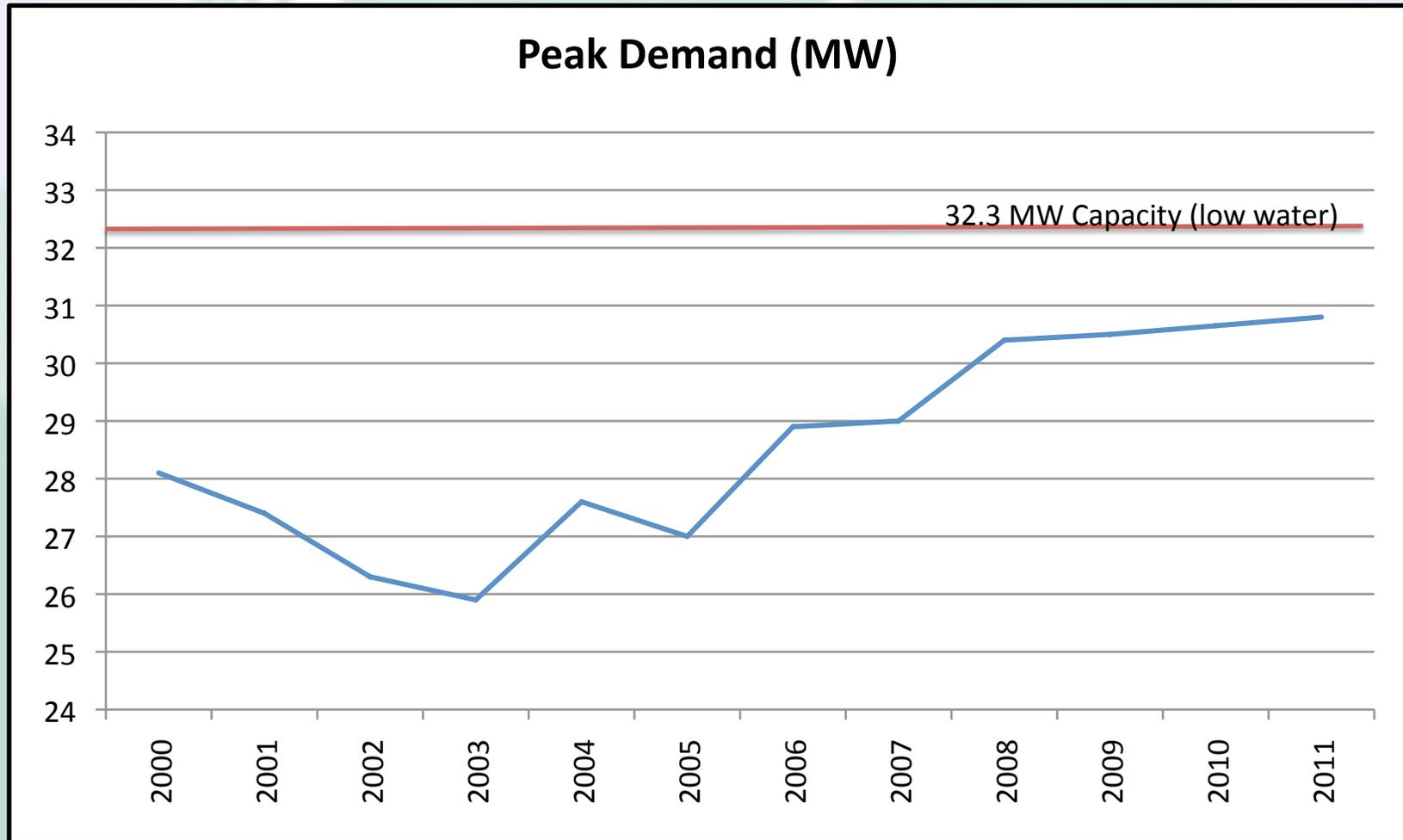


Ketchikan's Need for Power Capacity

	Full Reservoir	Low Water
KPU Hydro	13 MW	8.3 MW
SEAPA Hydro	24 MW	24 MW
Hydro Total	37 MW	32.3 MW

- Ketchikan experienced a peak load of **30.8** megawatts on February 28, 2011
- Previous peak load **30.5** megawatts on December 14, 2009
- Both occurred during a period of low water, which limited hydro generation

Ketchikan's Need for Power Capacity



Ketchikan's Need for Power

Anticipated Load Growth

- Over the past three years, the KPU system has experienced a load growth of 3% to 5% (normalized by HDD)
- New projects:
 - KGB Pool
 - AMHS Admin & Yard
 - Fire Station
 - USCG
 - ASD
 - Fish Processors
 - Others...
- SEAPA estimates that energy from Tye Lake and Swan Lake projects will be fully subscribed by 2015

Whitman Lake Hydro Project

Project Location



Whitman Lake Hydro Project

Historic Use of Whitman Lake

- 1912** A timber crib dam was constructed to supply power to the New England Fish Company's (NEFCO's) cold storage plant in Ketchikan
- 1927** The timber crib dam was replaced with a 39-foot concrete gravity arch dam
- 1957** KPU purchased the dam and facilities from NEFCO and retired the project
- 1963** The original powerhouse was burned by the Ketchikan Volunteer Fire Department as a fire control exercise
- 1979** The Whitman Lake Hatchery was established by SSRAA at the former powerhouse site, using the dam and reservoir to provide water supply

Whitman Lake Hydro Project

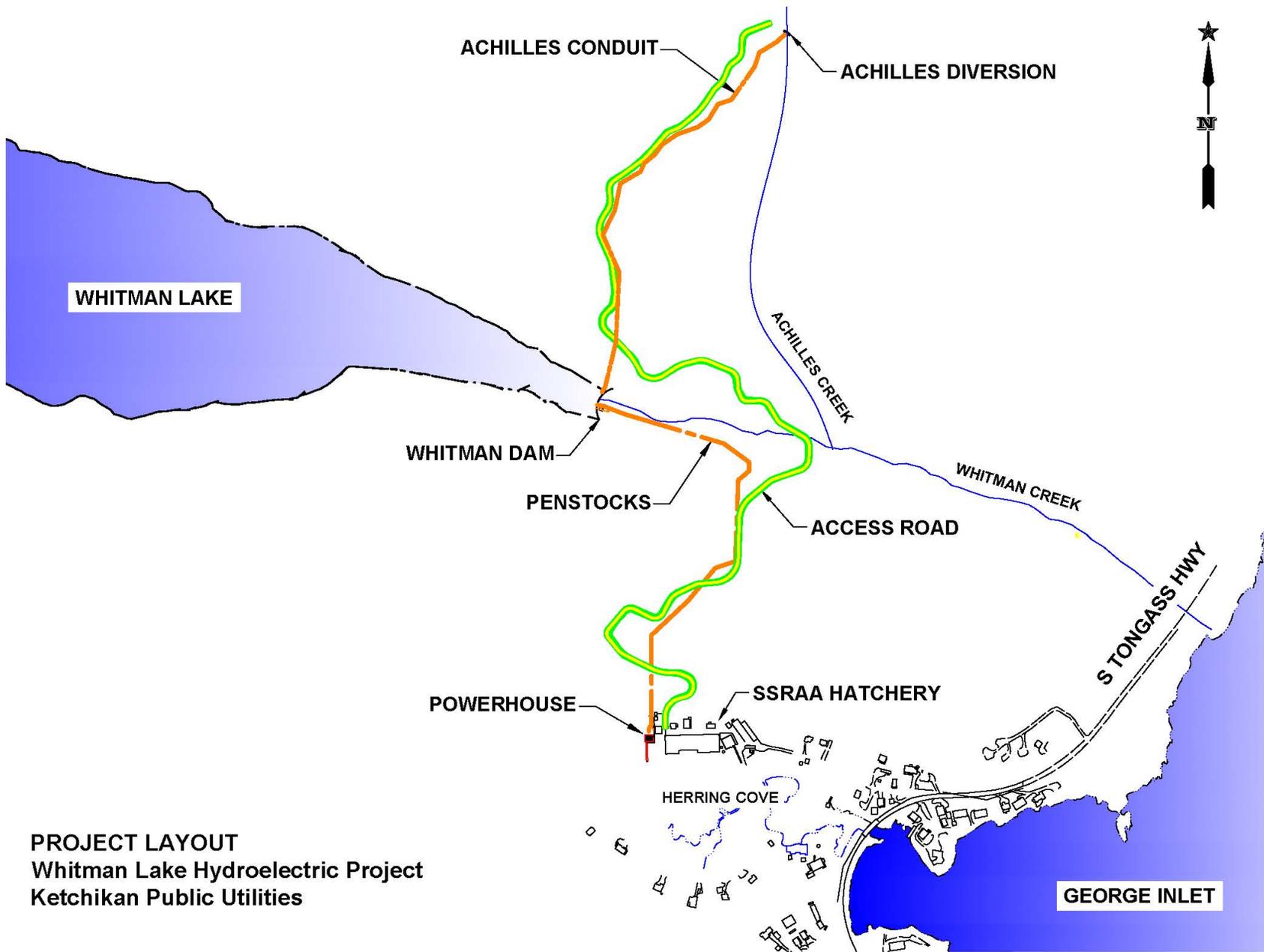
Licensing History

- 1997** KPU initiated studies to determine the feasibility of installing hydro generation at Whitman Lake (also Connell and Carlanna lakes)

- 2004** KPU applied for a Federal Energy Regulatory Commission (FERC) license to construct the Whitman Lake Hydro Project

- 2009** FERC issued project license

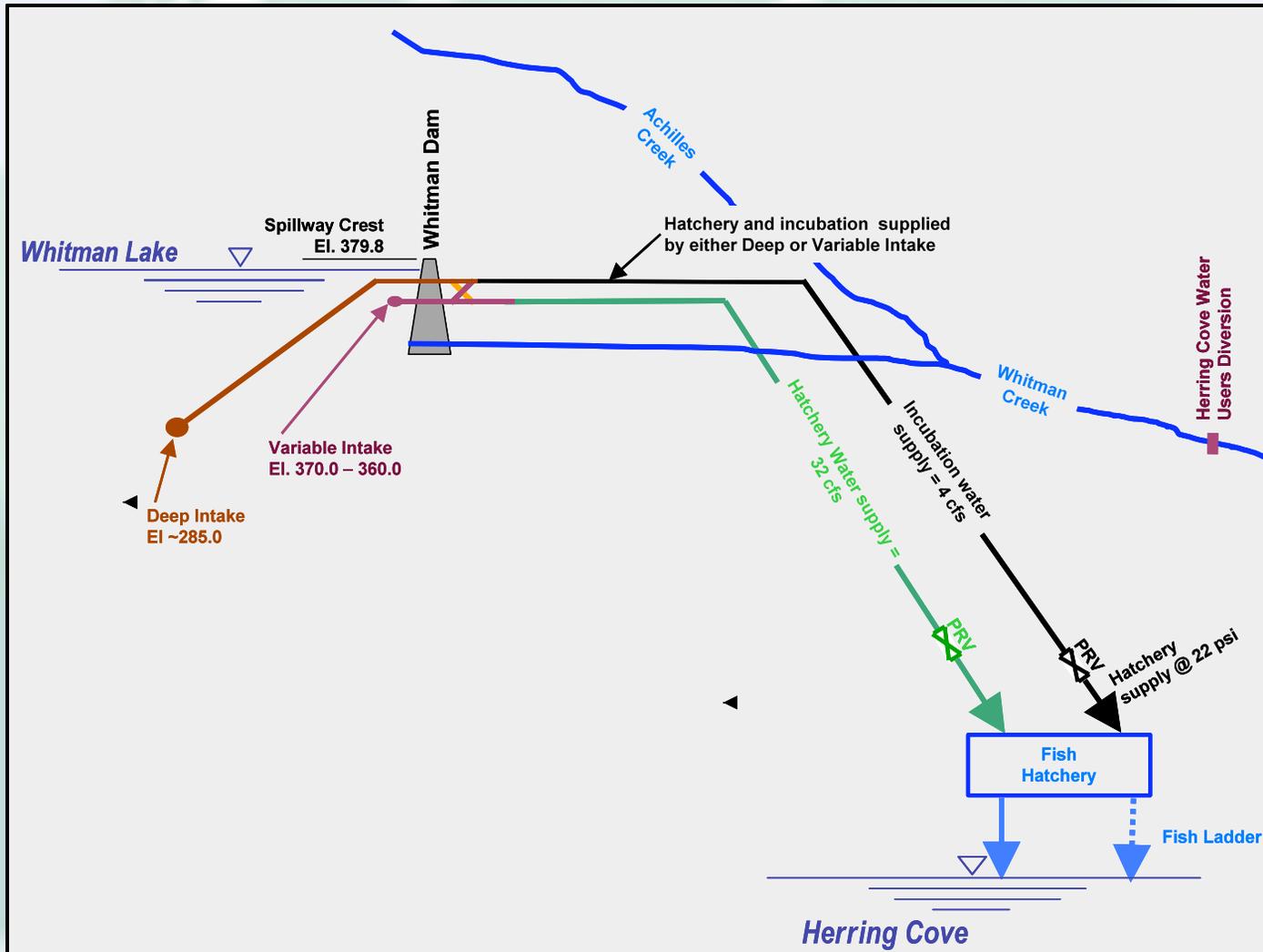
- 2010** FERC issued extension of time to commence construction
 - Construction must begin by March 16, 2013
 - Construction must be completed by March 16, 2016



PROJECT LAYOUT
 Whitman Lake Hydroelectric Project
 Ketchikan Public Utilities

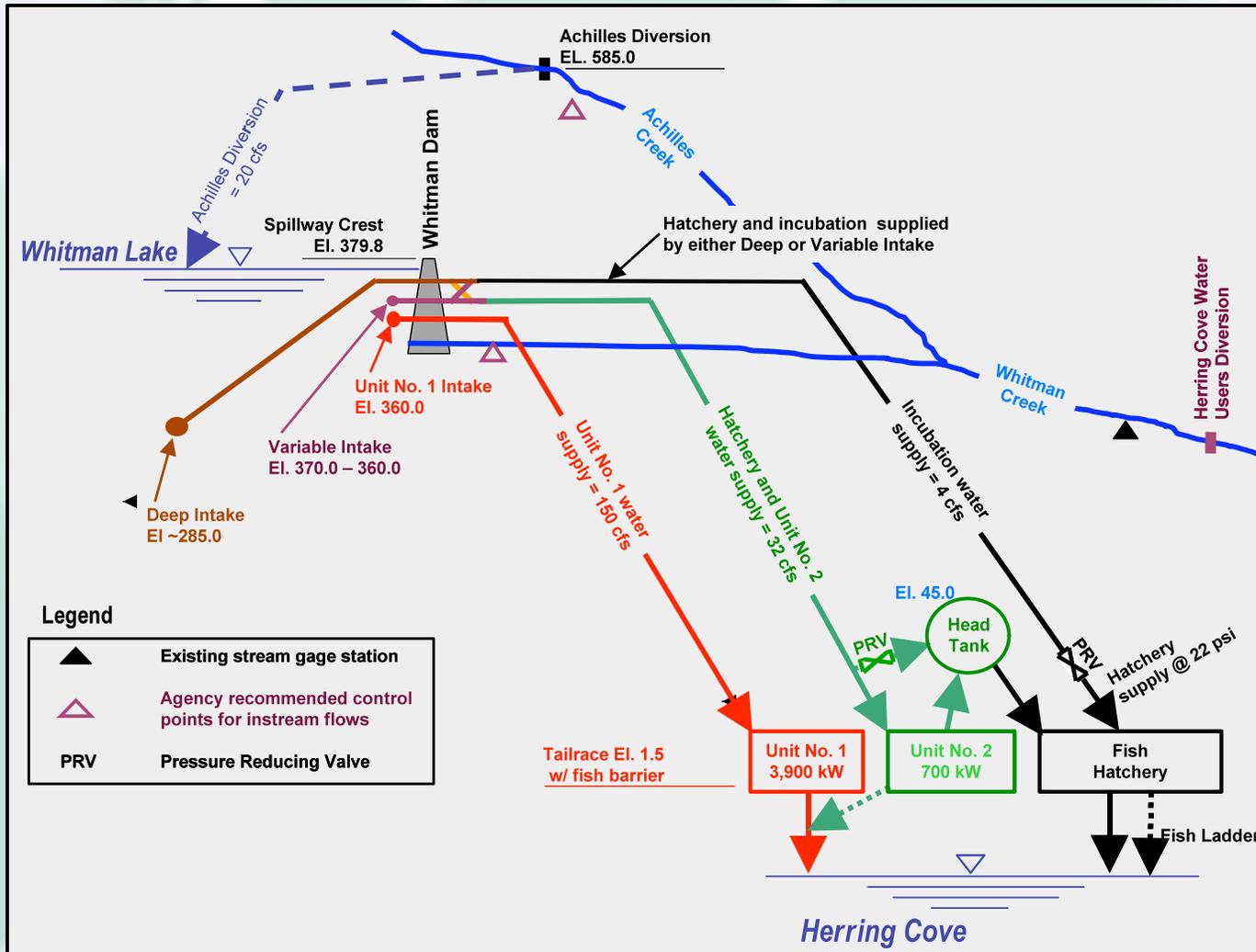
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Existing Configuration



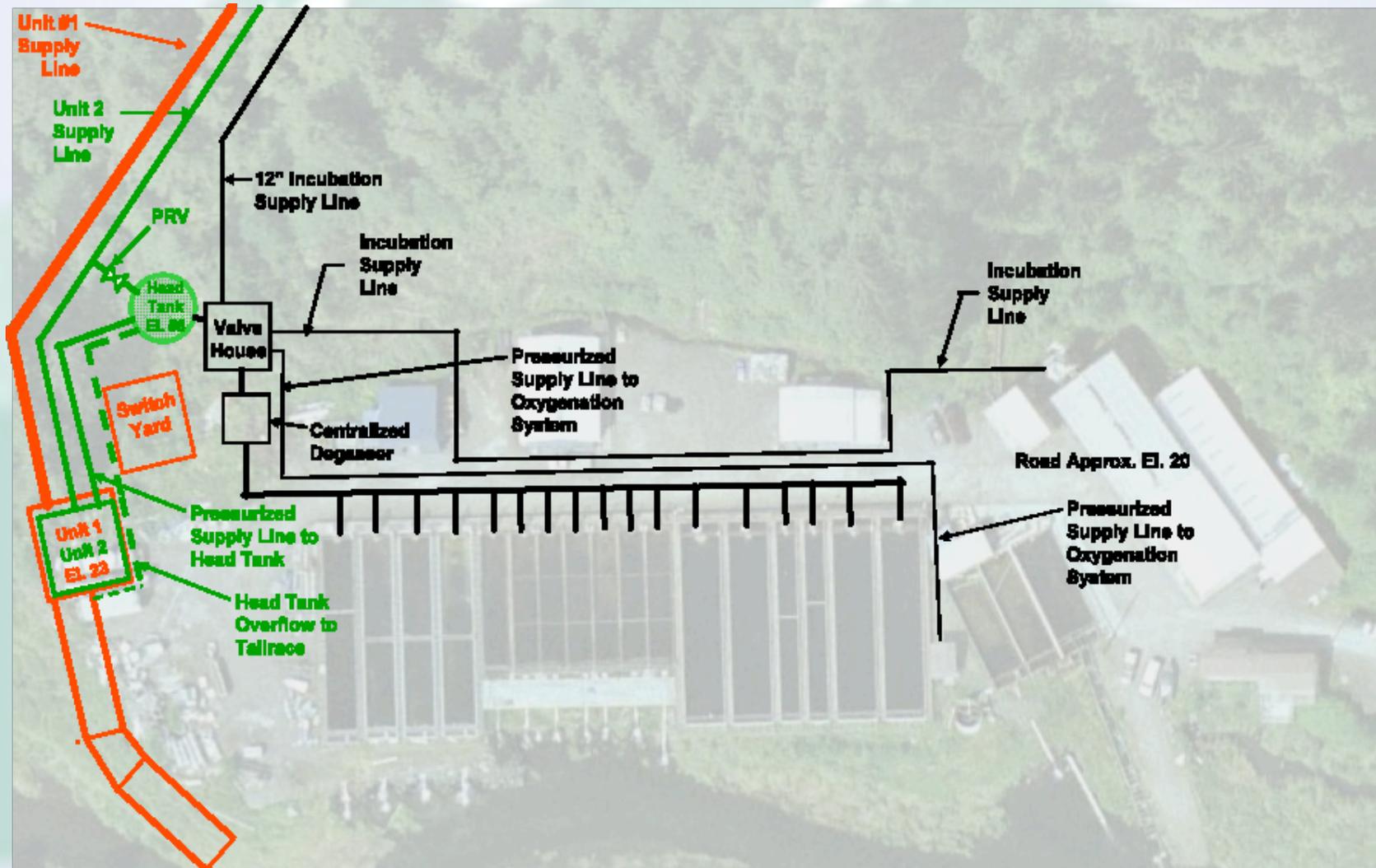
Whitman Lake Hydro Project

Future Configuration



Whitman Lake Hydro Project

Hatchery modifications



Whitman Lake Hydro Project

SSRAA Economic Impact (2007 Data)

	Total Output	Employment	Labor Income
Commercial harvest of SSRAA salmon	\$8 million	110	\$3.6 million
Seafood processing of SSRAA salmon	30 million	215	4.9 million
Sport harvest of SSRAA salmon	3 million	45	1.0 million
SSRAA operations	5 million	50	1.9 million
Total economic output from SSRAA activity	\$46 million	420	\$11.5 million

Whitman Lake Hydro Project

Project Benefits

- Annual displacement of 1,100,000 gallons of diesel fuel, which equates to \$3,960,000 at \$3.60/gallon
- Increased capacity to support new construction and customer conversions from oil to electric heat
- New water supply infrastructure for Whitman Lake Hatchery
- More steady and reliable source of water for the KGB Mountain Point Water Utility through improved water management in the Whitman Creek watershed
- Long-term source of clean, renewable and inexpensive energy

Whitman Lake Hydro Project

Cost Estimate

Item	Estimated Cost
Direct Construction Cost	\$16,770,000
Structures, Waterways, Electrical Equipment, etc.	
Indirect Construction Cost	\$7,390,000
Engineering, Hatchery, Contingencies	
Total Engineering and Construction Cost	\$24,160,000
Financing Costs & Contingency	\$3,000,000
Design costs funded from KPU reserves & AEA grant	(\$2,450,000)
Legislative construction grants	(\$9,725,000)
Amount of Bond Issue	\$15,000,000
Total First-Year Annual Cost	\$1,750,000
Added Hydro Generation (kWh)	16,000,000
First-Year Cost of Power (\$/kWh)	\$0.109

Whitman Lake Hydro Project

Schedule

Vote on Bond Issue	October 4, 2011
Award Turbine/Generator Contract	November 3, 2011
Award Construction Contract	May 1, 2012
Commissioning and start-up	2014

