PERMITTING, LICENSING, AND ENVIRONMENTAL ISSUE RESOLUTION FOR THE SUSITNA-WATANA HYDRO

WAYNE DYOK, H2O ECOPOWER

The Challenges of Dams in Cold Climates
Design, Construction, Permitting and Environmental Issues
Fall 2017 Workshops and Field Tours
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Here comes another one.

First the balls then the club.
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PROJECT HIGHLIGHTS

Susitna-River Mile 184
87 River Miles from Talkeetna
22-32 River Miles upstream from Devils Canyon
42-Mile Reservoir
Average Width of One Mile
~50 Percent of Railbelt’s Energy Demand
(2800 GWH of annual energy)
Dam Height: 705 Feet
Estimated Cost: $5.6 Billion
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PROJECT COST RANGE

- **Minimum** $4.461 Billion
- **5th percentile** $5.040 Billion
- **Base Estimate** $5.655 Billion
- **50th percentile** $5.654 Billion
- **95th percentile** $6.247 Billion
- **Maximum** $6.803 Billion
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PERMITTING, LICENSING AND ENVIRONMENTAL ISSUES

- Technical Issues and Risks
  - Seismic Stability, Safety, Cost

- Social Risks
  - Deliver Net Benefits, Social Opportunities, and Avoid/Mitigate Environmental Effects

- Environmental Issues and Risks
  - Impacts but Potential for Environmental Enhancement

- Economic and Financial Issues and Risks
  - Natural Gas Prices, Capital Cost, and Financing (Bond Rate)
PERMITTING, LICENSING AND ENVIRONMENTAL ISSUES

- Communications and Consultation – FERC Process
- Governance – Communications Protocol
- Demonstrated Need and Strategic Fit – Decision Document
- Siting and Design – Engineering and Feasibility Study
- Environmental and Social Impact Assessment – FERC approved studies
- Integrated Project Management
- Hydrological Resources – Over 60 years of Flow Data
PERMITTING, LICENSING AND ENVIRONMENTAL ISSUES

- Infrastructure Safety - #1 Priority
- Financial Viability – Continuous Evaluation
- Project Benefits – Lower Cost Energy
- Economic Viability – System Evaluations
- Procurement
- Project Affected Communities and Livelihood – Subsistence Assessment/Health Impact
- Resettlement – Not Applicable
PERMITTING, LICENSING AND ENVIRONMENTAL ISSUES

- Indigenous Peoples – Key Consideration
- Labor and Working Conditions
- Cultural Heritage – Under Evaluation
- Public Health - HIA
- Biodiversity and Invasive Species – Northern Pike
- Erosion and Sedimentation
- Water Quality
- Reservoir Planning
- Downstream Flow Regimes
PERMITTING, LICENSING AND ENVIRONMENTAL ISSUES

Tagged Chinook Salmon and Devils Canyon
Only one salmon species has been documented within 30 miles of the project site.

<table>
<thead>
<tr>
<th>Year</th>
<th>Tagged Salmon</th>
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<tbody>
<tr>
<td>2012</td>
<td>352</td>
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<td>2013</td>
<td>603</td>
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- **Curry**: 23, 18, 11
- **Devils Canyon**: 12, 3, 2
- **Above Devils Canyon**: 6, 0, 1

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2013 Coho Salmon Spawning Distribution by Basin

- **Yentna River Basin**: 45%
- **Chulitna River Basin**: 15%
- **Deshka River Basin**: 10%
- **Talkeetna River Basin**: 5%
- **Lower Susitna River & Other Tributaries**: 20%
- **Middle Susitna River below Devils Canyon**: 5%
- **Susitna River Above Devils Canyon**: 0%

2012-2014: 1,635 tagged Coho
- 93-97% Spawn in Tributaries
- 2.8-6% Spawn in Mainstem Lower Susitna River
- <0.5% Spawn in Mainstem Middle Susitna River

(Merizon 2010) Data Source: LGL (2014)
Historic Middle River Sockeye Salmon Spawning Distribution

- Mainstem: 60%
- Slough 21: 15%
- Slough 11: 20%
- Slough 8A: 4%

Middle River Upstream of Curry Station (0.6-1.7%)

Yentna River Basin ≈30-78%

Chulitna & Talkeetna River Basins Combined ≈21-70%

Sources: Barrett (1974); ADF&G (1981); ADF&G (1982); Barrett (1984); Barrett (1985); Hoffman (1985); Thompson (1986)

Sockeye Salmon Spawning 1974, 1981-85

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FA 128 minimum daily coho juvenile habitat, 1985

- **Existing conditions**
- **ILF-1**

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<th>Date</th>
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**Habitat Area (sq ft)**

- 500,000
- 450,000
- 400,000
- 350,000
- 300,000
- 250,000
- 200,000
- 150,000
- 100,000
- 50,000
- 0
This reasonable and stepwise approach is both consistent with the approved study plan and with accepted practices for completing and integrating aquatic and physical process models within the context of a hydroelectric licensing case” (FERC ISR SPD 2017)