

Collaboration in Downstream Warning Processes Involving Special Communication Issues

**Boundary Project
FERC No. 2144**

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Seattle City Light



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Background

- **Boundary Hydroelectric Project is on the Pend Oreille River in Washington State**
- **1050 MW project completed in 1967 – provides 30-40% of Seattle's energy**
- **Concrete arch dam of variable radius with 340 ft height, 740 ft crest length**
- **7-low level sluice gates incorporated for rapid draw down due to mining below the reservoir**

Drivers that require “special” communications

- Existing developments impacted by your project
- A nexus between the EAP process and communication protocols

Bridging perceived barriers

- International boundaries
- When FERC rules do not apply
- Accentuates the importance of a regular functional exercise
- Collaboration with private enterprise

Special considerations during license development

- 2 License articles dedicated to mine safety
 - Water tightness for existing mines
 - Low level outlets for rapid drawdown

Dam Failure Detection Systems



Gallery High-Inflow Alarm



Hard Wire

Boundary Control Room



Dispatchers Console at SCC



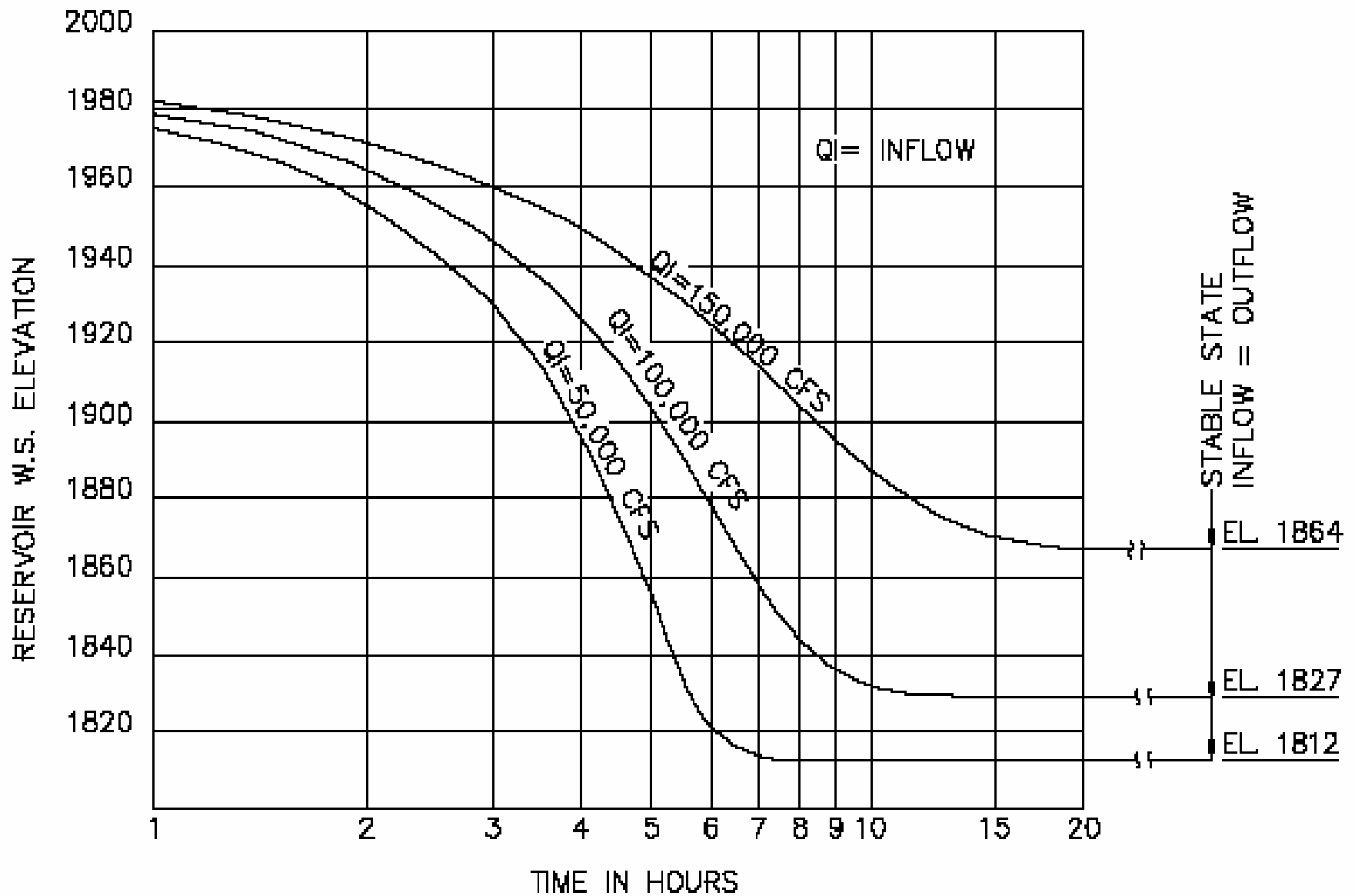
Wave Travel Time for Sunny Day

Location	Flood Warning Time (1)	Apprx. Bank Elev Feet	Peak Warning Time	Peak Flow (Sunny Day)	Peak Elevation (Sunny Day)	Peak Flow (Flood - PMF)	Peak Elevation (Flood - PMF)
Pend Oreille River at International	0 min	2003	0 min	3,200,000	1,931	4,400,000	0
Seven Mile Dam	6 min	1727	7 min	3,600,000	1,744	4,600,000	1754
Waneta Dam	9 min	1521	18 min	3,150,000	1,556	3,800,000	1596
Trail, B.C.	24 min	1361	1 hr 18 min	74,300	1,371	680,000	1421
Columbia River International Boundary	12 min	1345	42 min	1,400,000	1,371	2,700,000	1402
Northport, WA	36 min	1316	1 hr 36 min	900,000	1,325	2,250,000	1355

(1) Assumes 12 minutes between dam failure and initial notification

How Much Time??

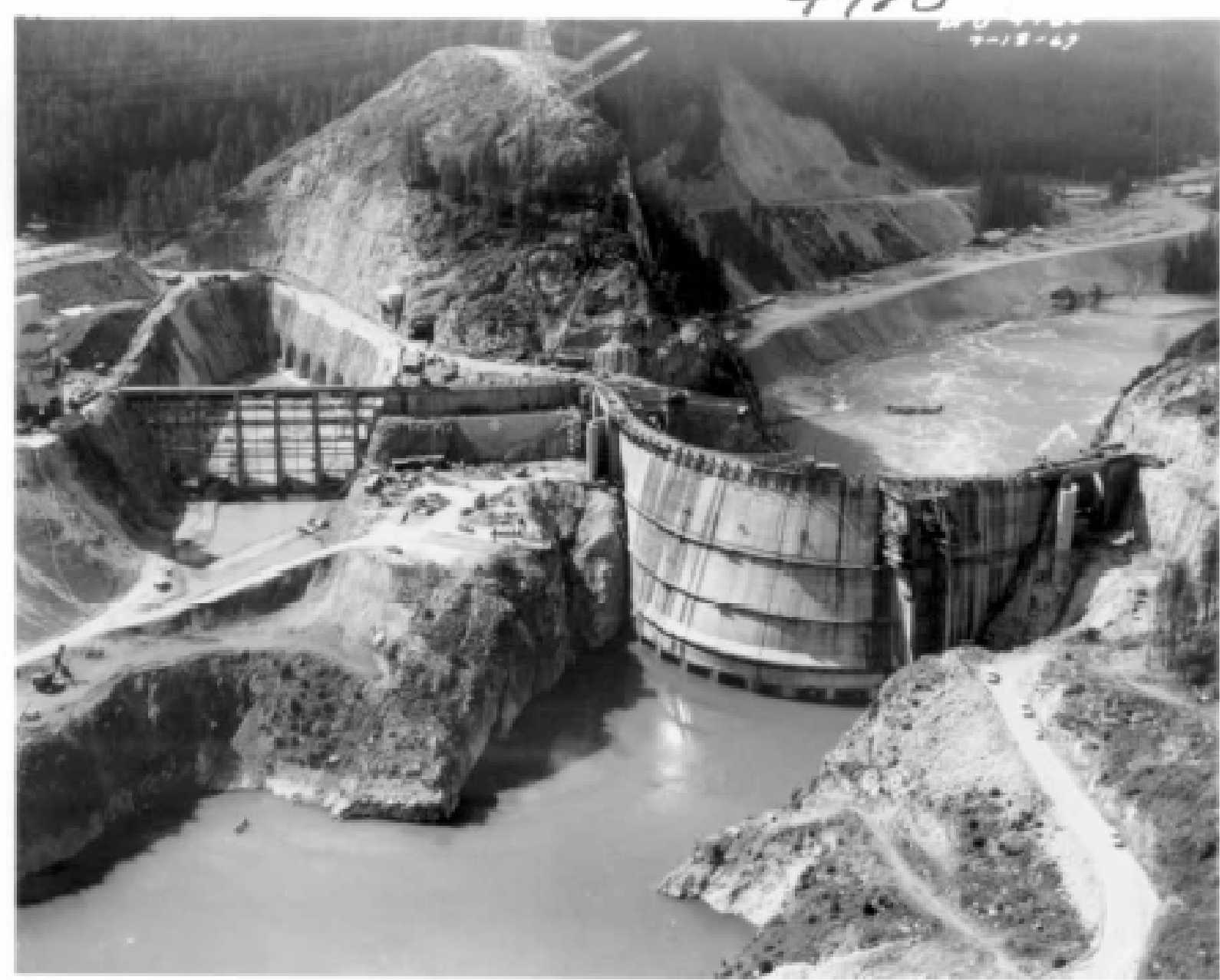
- 6 Minutes to Seven Mile Dam
- 9 Minutes to Waneta Dam
- 24 Minutes to Trail, B.C.
- 12 Minutes to Columbia River
- 36 Minutes to Northport, WA



RESERVOIR EVACUATION CURVES
 (MAX. DISCHARGE 300,000 CFS.)

7-13-67

7-13-67



7/13/67

BPD #4985

Forebay and upstream face of the Dam.



Seven Mile Dam has been modified to ensure that it can safely and reliably route the Boundary Dam emergency releases



Waneta Dam's maximum spillway capacity is less than the maximum emergency discharge capacity of Boundary Dam



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A History of Collaboration

- License articles address “Rapid drawdown scheme” for mine safety
- Working group identified operational parameters for large water releases



