Chakachamna Hydropower

Eric Yould
TDX Power

NHA
Juneau, Alaska
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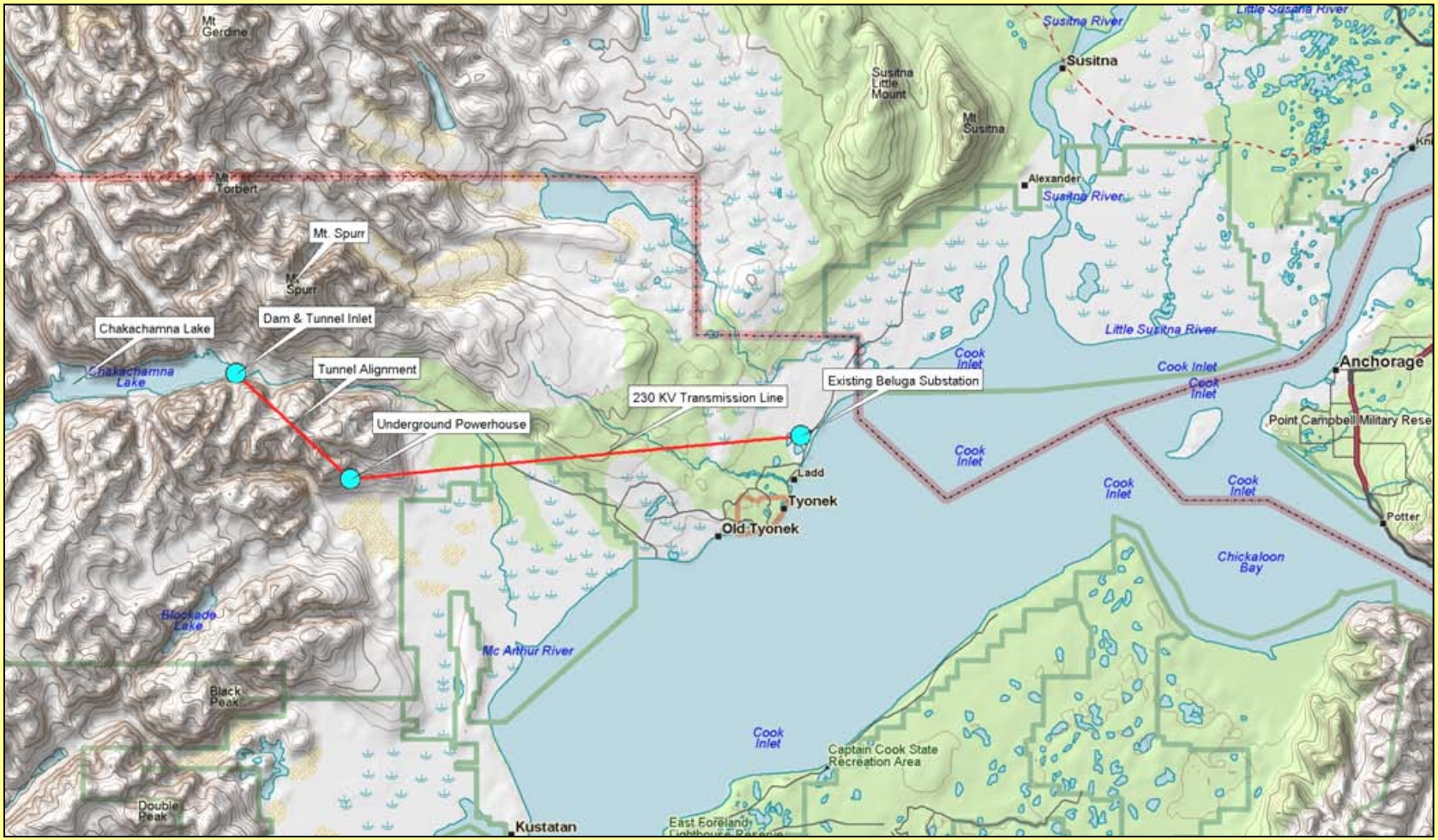
Potential Major Alaska Hydropower Projects

Project Name	River System	Installed Capacity (Megawatts)	Energy (Million KWH/yr)
Holy Cross	Yukon	2,800	12,300
Ruby	Yukon	1,460	6,400
Rampart	Yukon	6,000	34,200
Porcupine	Porcupine	530	2,320
Woodchopper	Yukon	2,160	14,200
Yukon-Taiya	Yukon	3,200	21,000
Susitna	Susitna	1,500	7,000
Chakachamna	Chakachatna	330	1,600
Wood Canyon	Copper	3,600	21,900
Stikine	Stikine	2,260	9,900

Note: Railbelt energy demand 5,000 million KWH/yr

Chakachamna Project Location



Chakachamna Hydropower Investigations

▪ Department of Interior	Late 1940s	Reconnaissance
▪ U.S. Army Corps of Engineers	1970s	Reconnaissance
▪ Alaska Power Authority	Early 1980s	Pre-feasibility
▪ TDX Power	2006	FERC permit

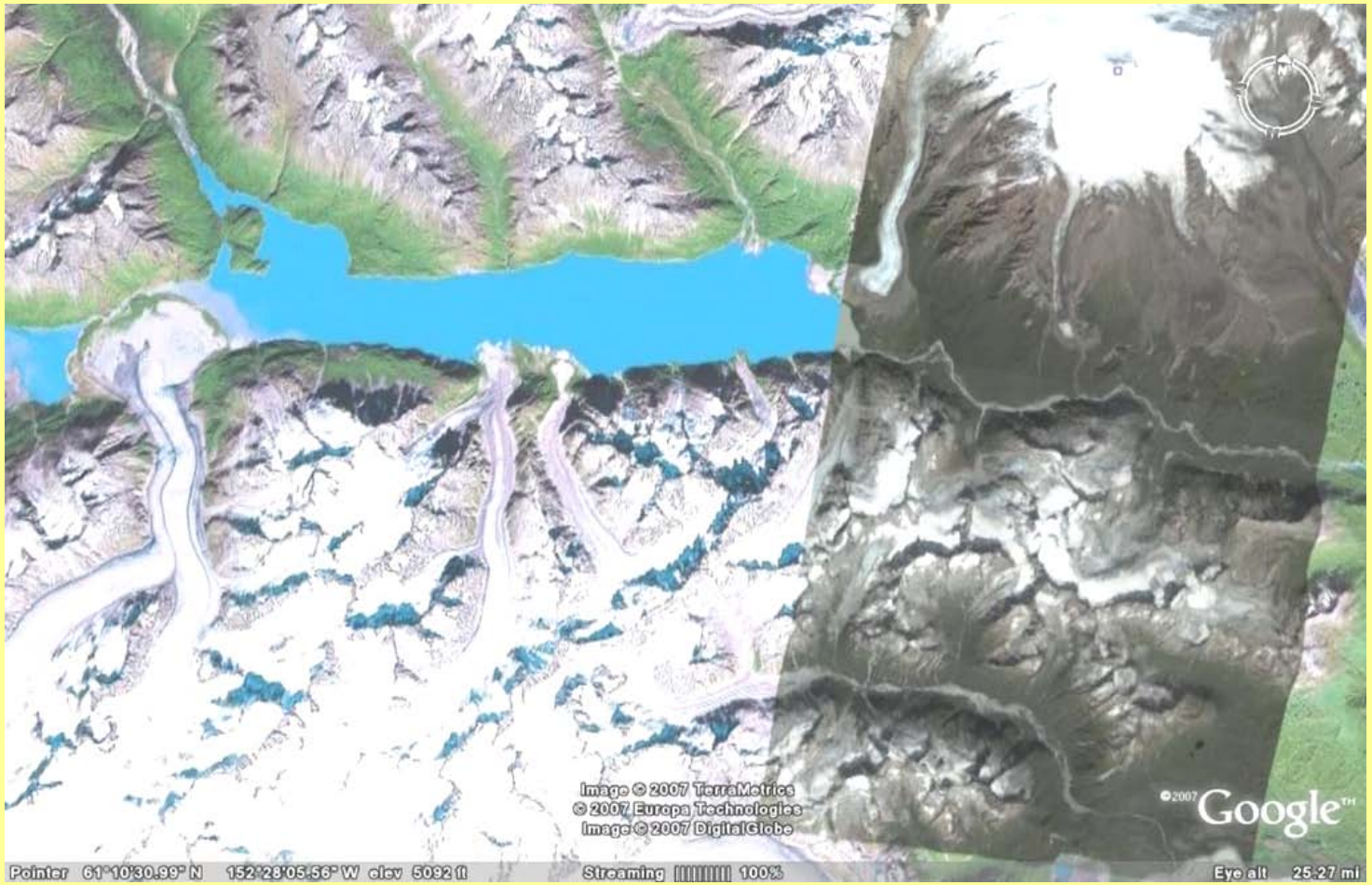
Development Options

- In-basin development
- Intr-basin diversion
- Maximum Hydro
- Balanced Option

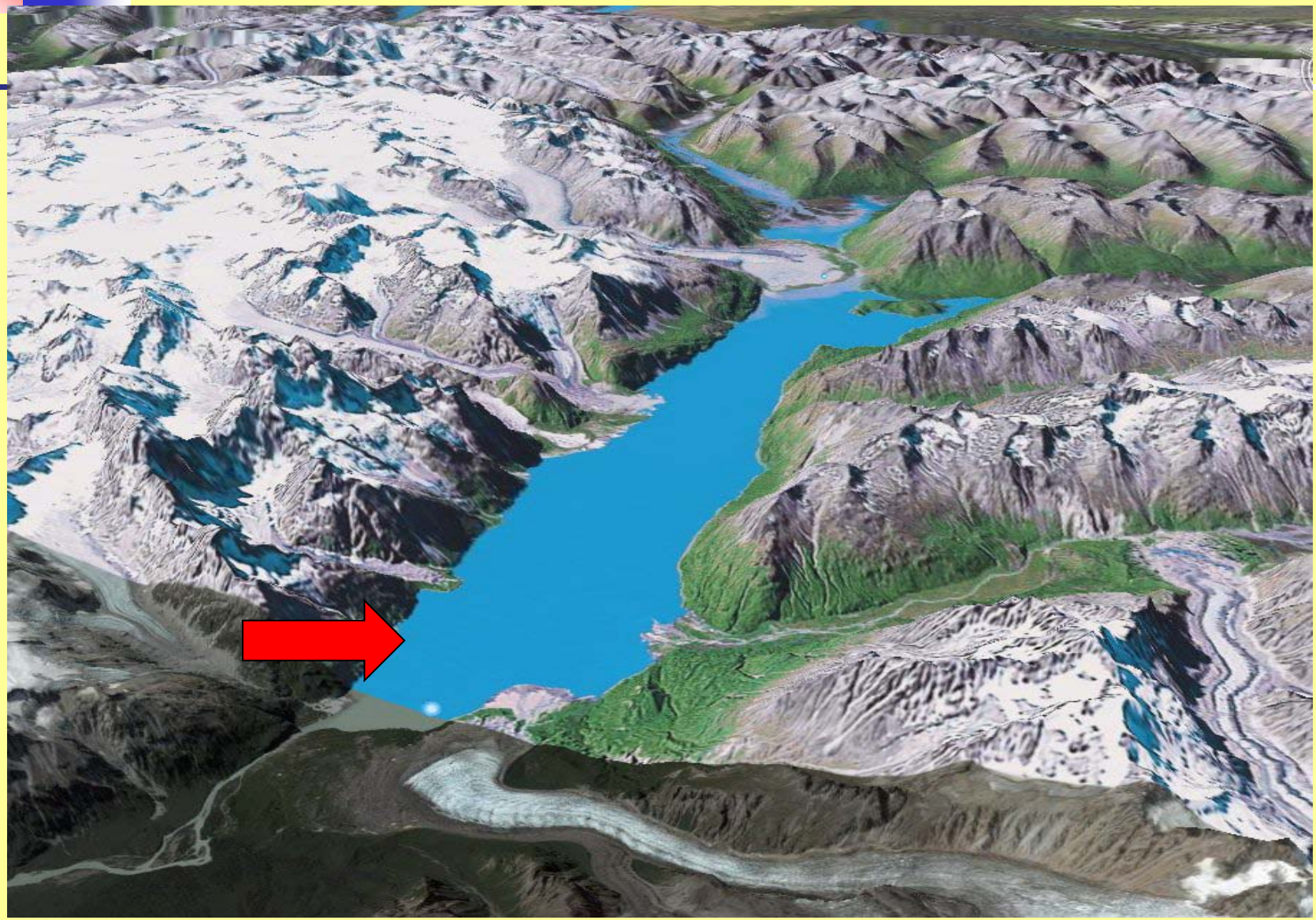
Chakachamna Hydropower

- High head lake tap – 12 mile power tunnel
- No dam
- 330 MW creating 1.6 billion KWH annually
- Total cost of project in 2008 dollars = $1.7 billion
- Project is 40 miles from Chugach T-line at Beluga

Chakachamna Aerial View



Chakachamna Intake Site



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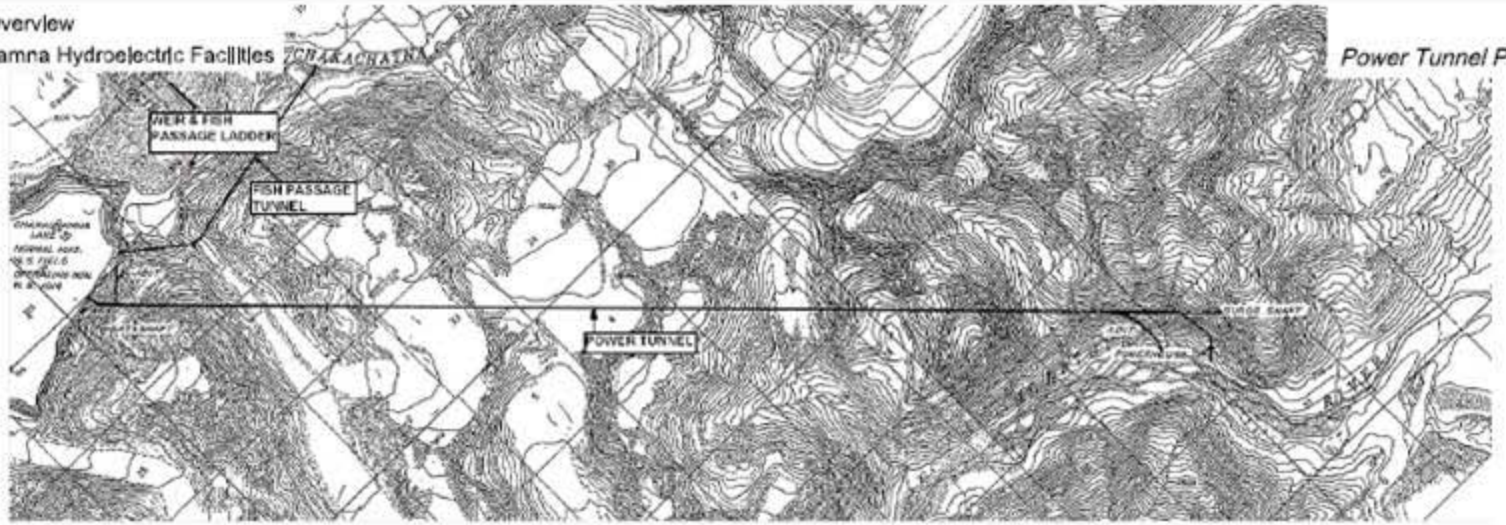
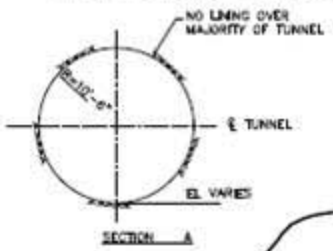
Facility Overview

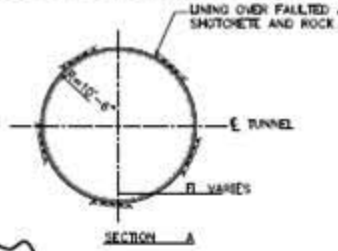
Chakachamna Hydroelectric Facilities

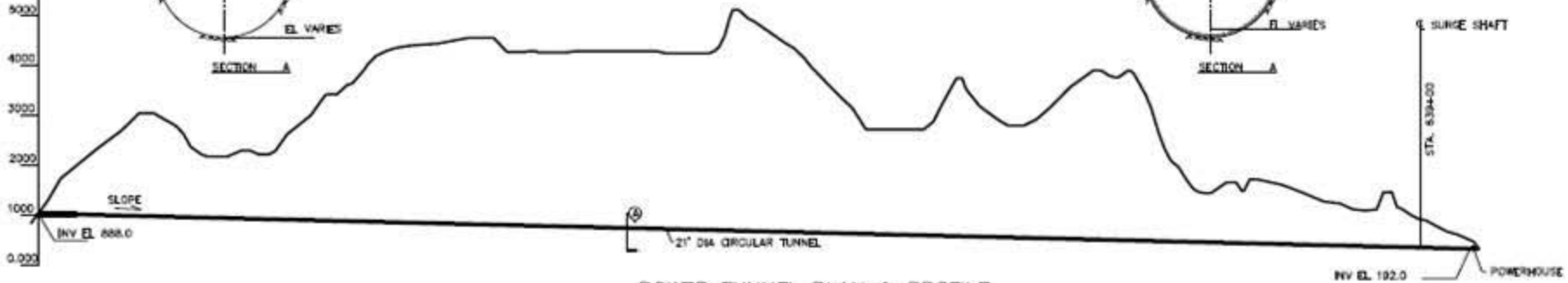
Figure 3.3-1
Power Tunnel Plan and Profile





NOTES :–
(1) TOPOGRAPHY IS FROM USGS QUADRANGLE MAPS
(2) CONTOUR INTERVAL IS 100 FEET
(3) VERTICAL DATUM IS MEAN SEA LEVEL
(4) HORIZONTAL GRID IS UNIVERSAL TRANSVERSE MERCATOR PROJECTION, 1927 NORTH AMERICAN DATUM.

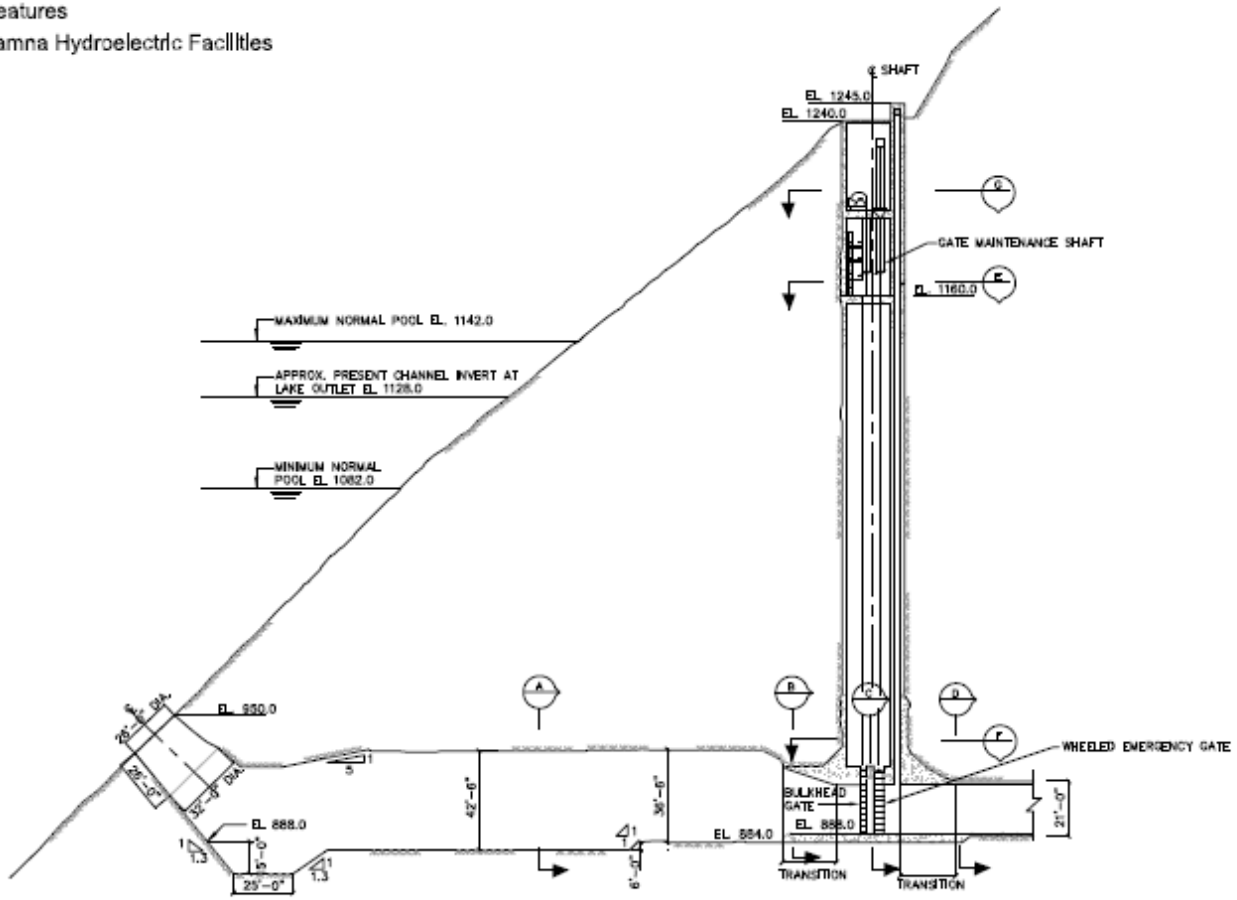




POWER TUNNEL PLAN & PROFILE
NTS

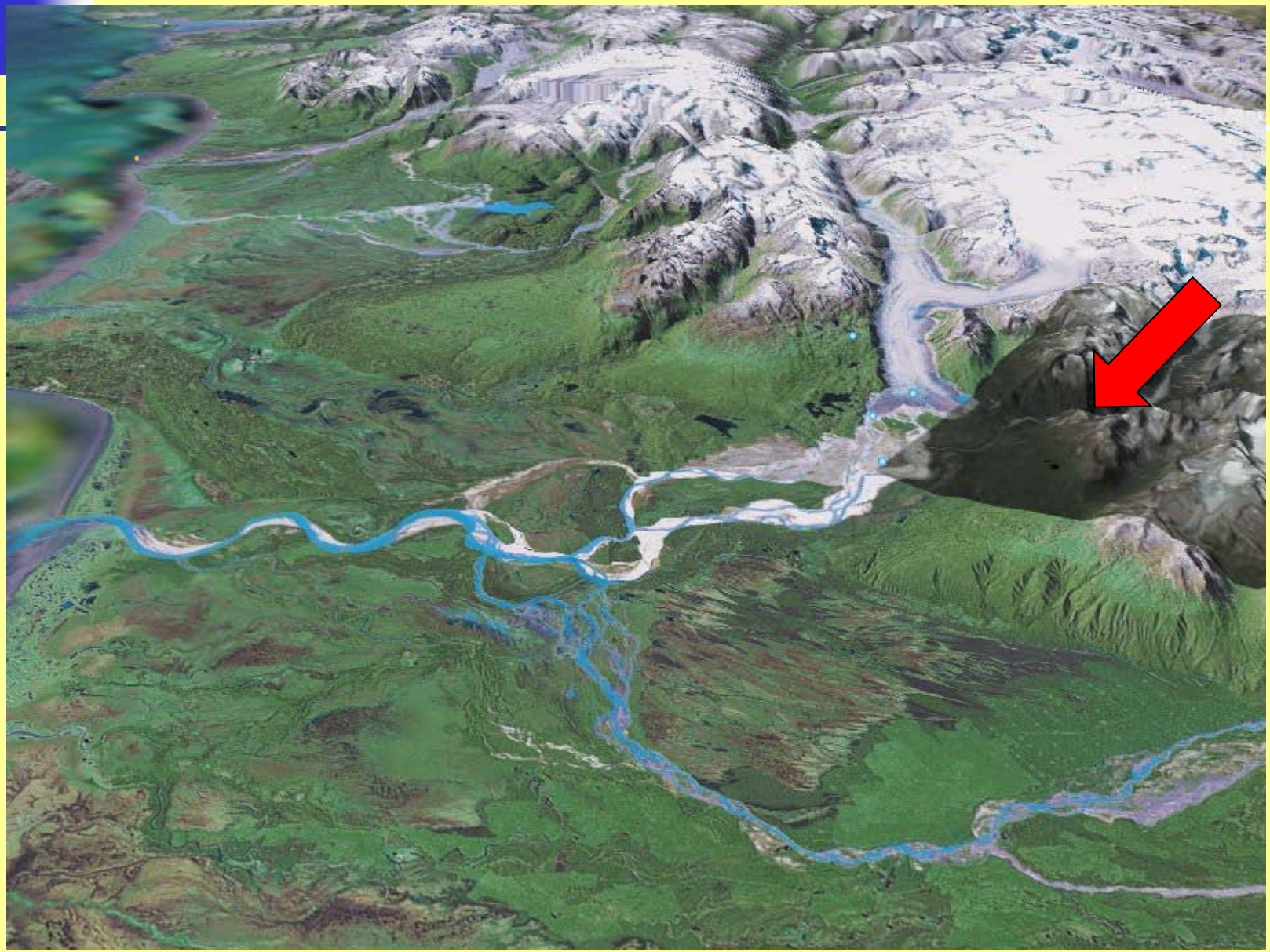
MWH

Figure 3.3-2
Intake and Gate Shaft Section



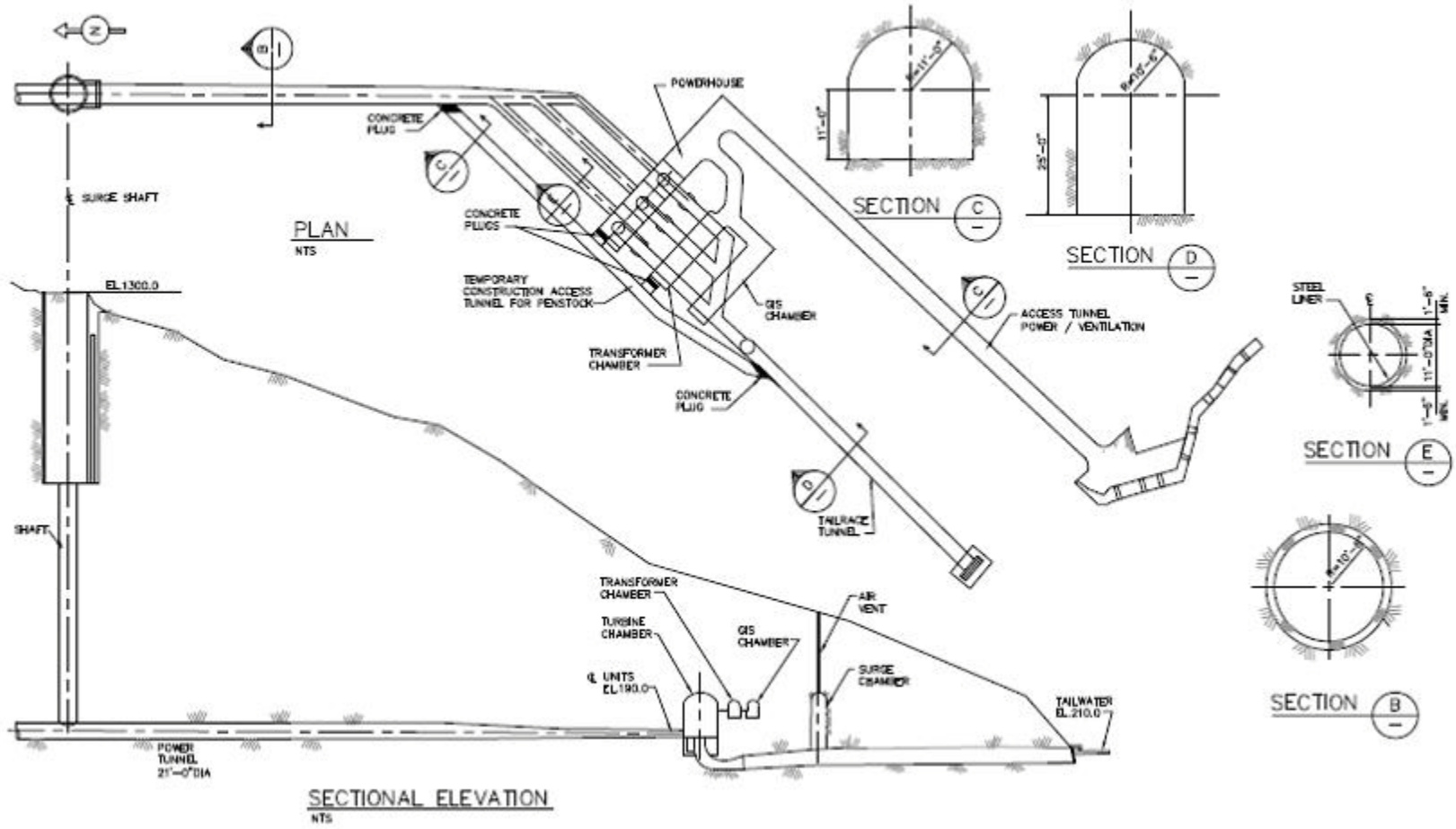
INTAKE AND GATE SHAFT SECTION
NTS

McArthur River Valley Power Plant Site



Project Features
Chakachamna Hydroelectric Facilities

Figure 3.3-4
Powerhouse Plan and Sections



MWH

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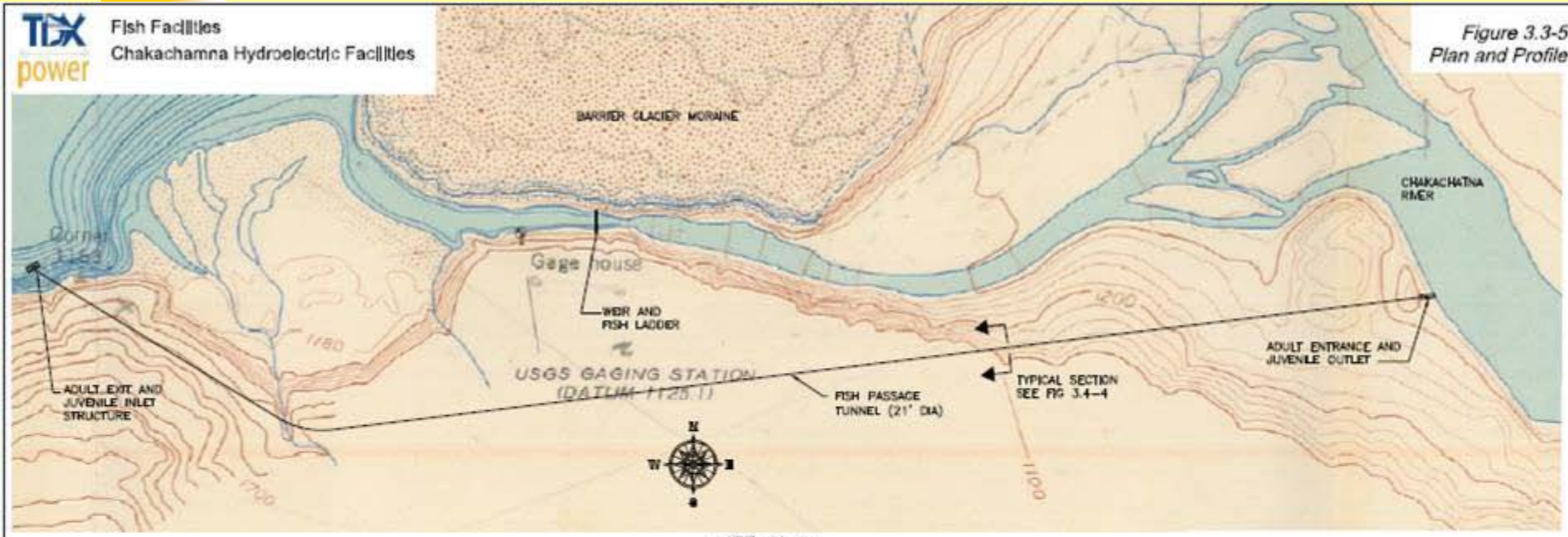
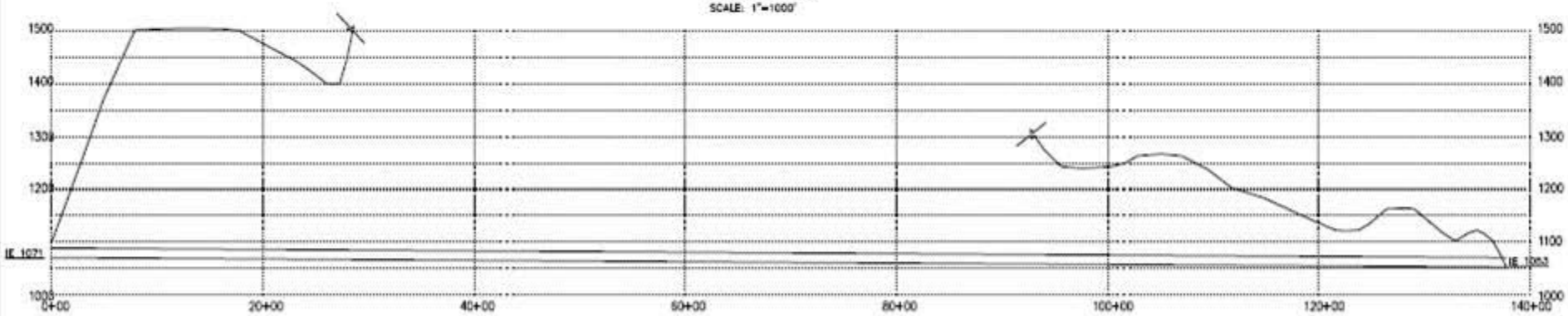
Fish Facilities
Chakachamna Hydroelectric Facilities

Figure 3.3-5
Plan and Profile



SITE PLAN
SCALE: 1"=1000'

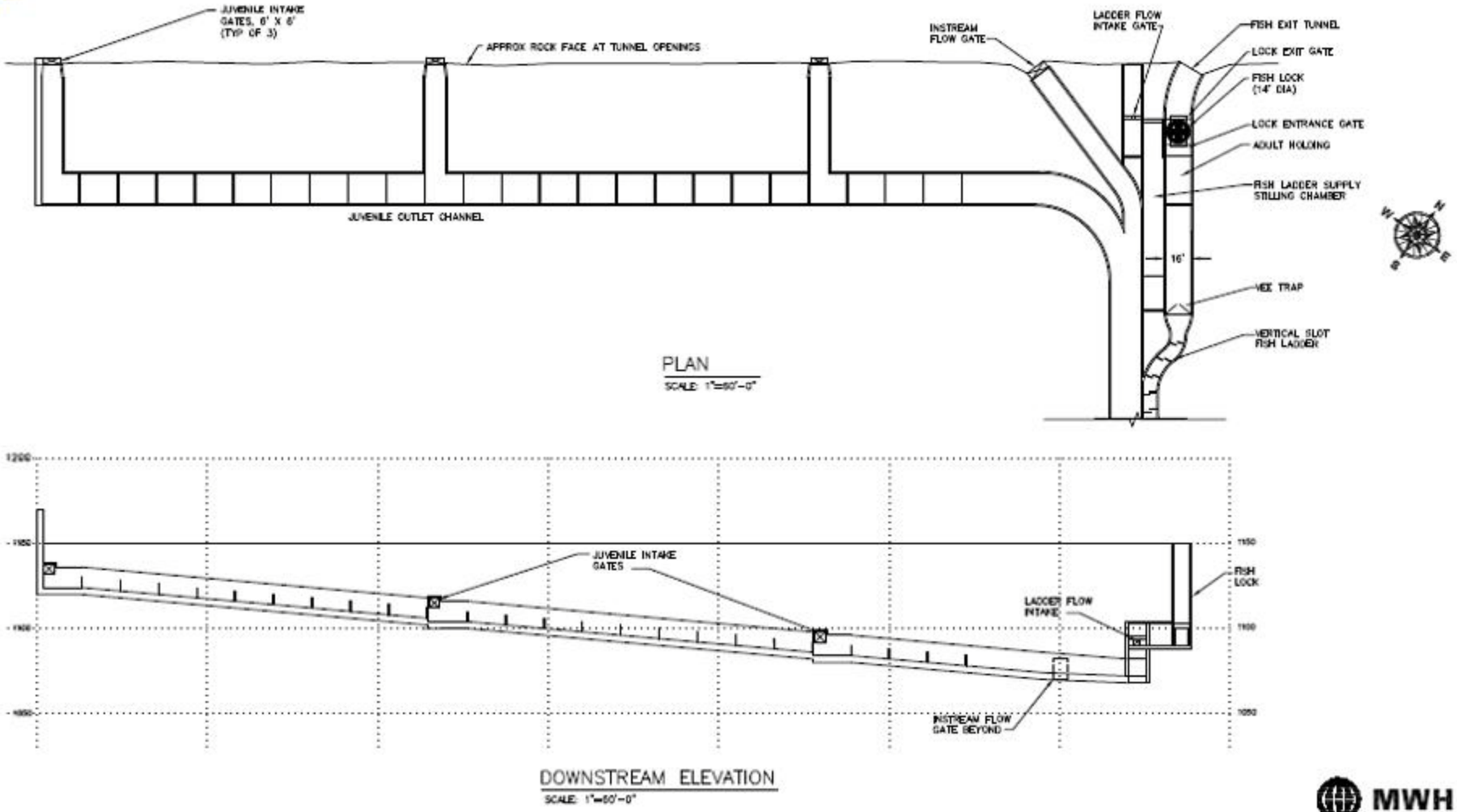


PROFILE
HORIZ: 1"=1000'
VERT: 1"=200'

MWH

Fish Facilities
Chakachamna Hydroelectric Facilities

Figure 3.3-6
Adult Exit and Juvenile Inlet Structure



MWH

Geotechnical Considerations

- Seismic – Castle Mountain Fault
- Volcanic – Mount Spurr (1992 & 1953 eruptions)
- Glacial – Barrier, Blockade, McArthur, Shamrock

CHAKACHAMNA FISHERIES

- 5 species of salmon use the basin
- Sockeye the main salmon species
- Dolly Varden ubiquitous in the streams
- Lake trout observed in lake
- Not a large anadromous fishery but worthy of protecting
- Fish passage at lake outlet required
- Possible temperature enhancement to river

CHAKACHAMNA WILDLIFE

- 56 species of birds
- 16 species of mammals
- Moose, wolves, lynx, bear, wolverine, other fur bearers
- None on the endangered species list
- Less impact than other hydro projects of similar size

CHAKACHAMNA LAKE OUTLET

MT. SPURR GEOTHERMAL

KENIBUNA LAKE

McARTHUR RIVER POWERHOUSE SITE

Economic/Financial

- 1.6 Bkwh annual power production
- One third of the present Railbelt demand
- $1.7 Billion – 2008 dollars
- Debt Financing
- State Equity