



2025 CU Boulder Hydropower Collegiate Competition Team

Conceptual Site



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Siting Considerations

Site Selection Primary Factors

To select an appropriate site for project development, 10 criteria were used to conduct a trade study. The most influential criteria were:

- Power Production** – How much electricity can the plant generate?
- Financial Impact** – How expensive is development?
- Competitive Advantage** – Does development make sense?
- Community Perception** – Is there local and regional support?
- Environmental Impact** – Is development sustainable?

The site at *Punta del Chorro* was selected for project development.

Renewable Integration and Grid Stability

SunZia Wind Facility

- Generation of 3,500 MW.



Floating Solar

- Provides 2,000 MWh/year.



Site Overview

Power Production: 470 MW

- Homes Powered: 96,000/yr
- Energy Storage: 2.8 GWh
- Generate Duration: 8 hours
- Pump Duration: 16 hours

Active Storage: 3,600 acre-ft

- Total Storage: 5,223 acre-ft

Average Head: 1,196 feet

- Conveyance Length: 5,600 ft

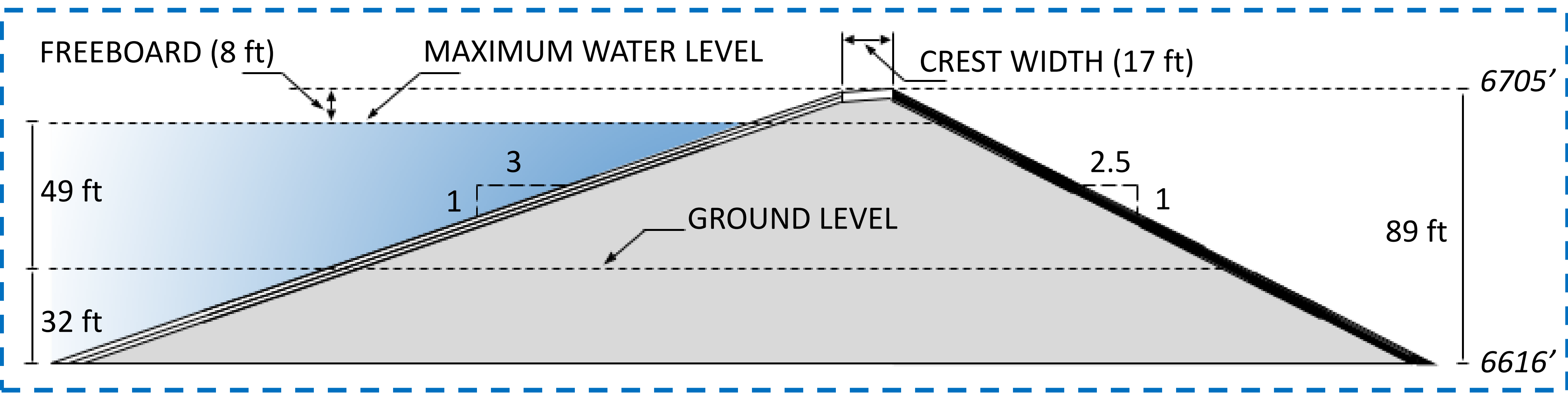
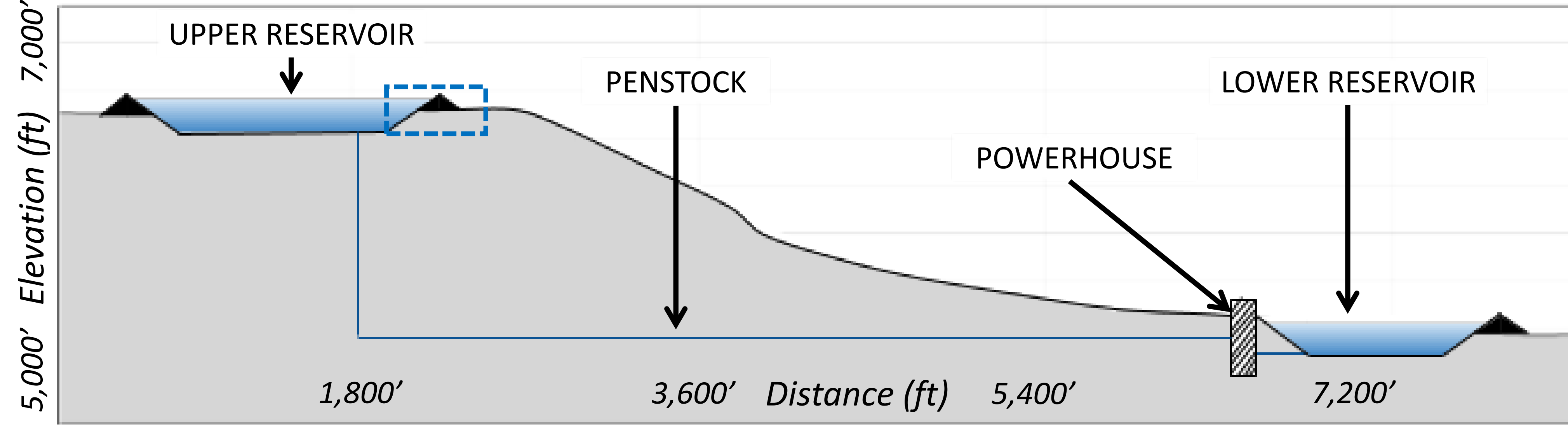
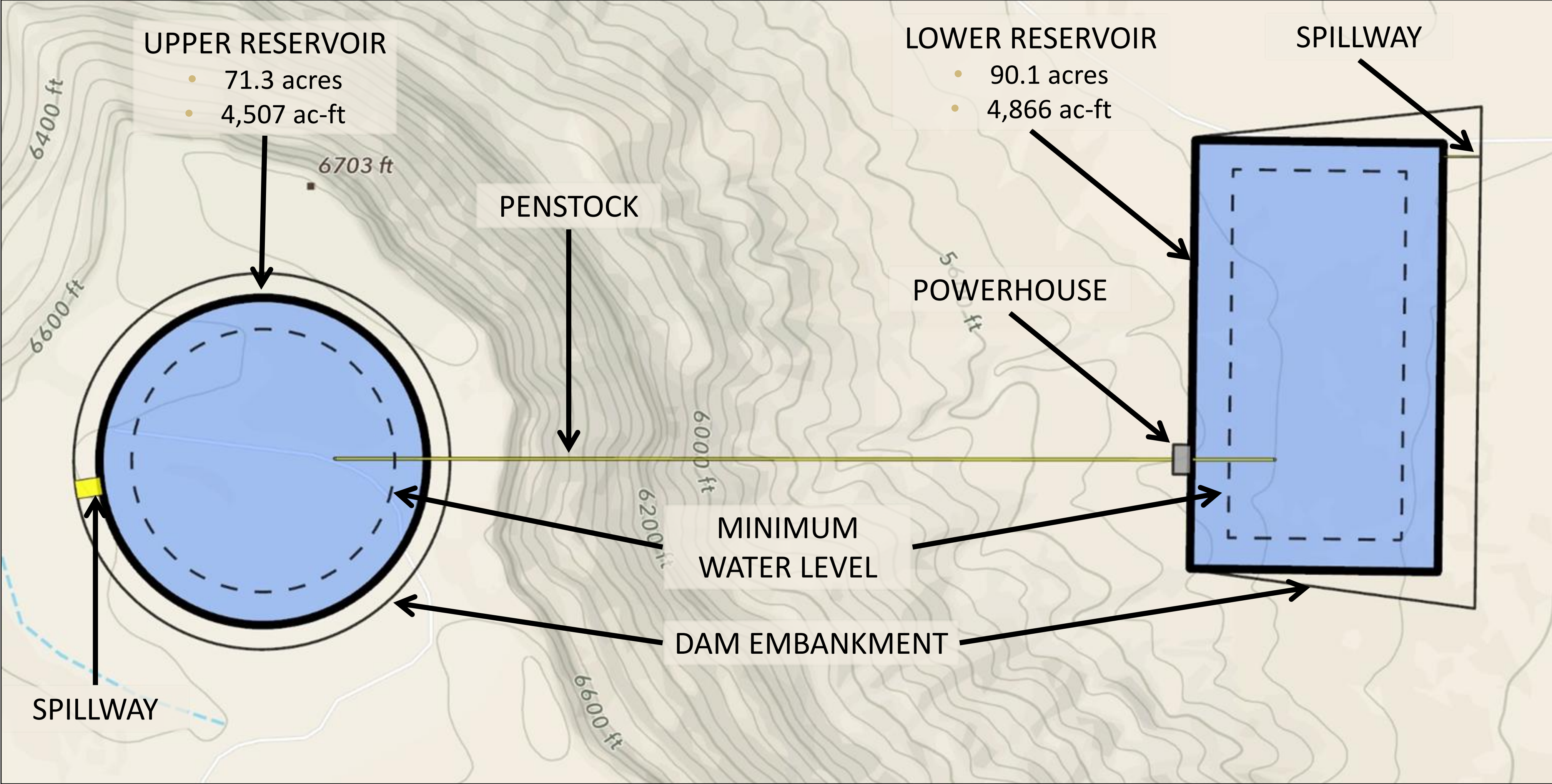
Distance to Grid: 35 miles

- Distance to SunZia: 67 miles



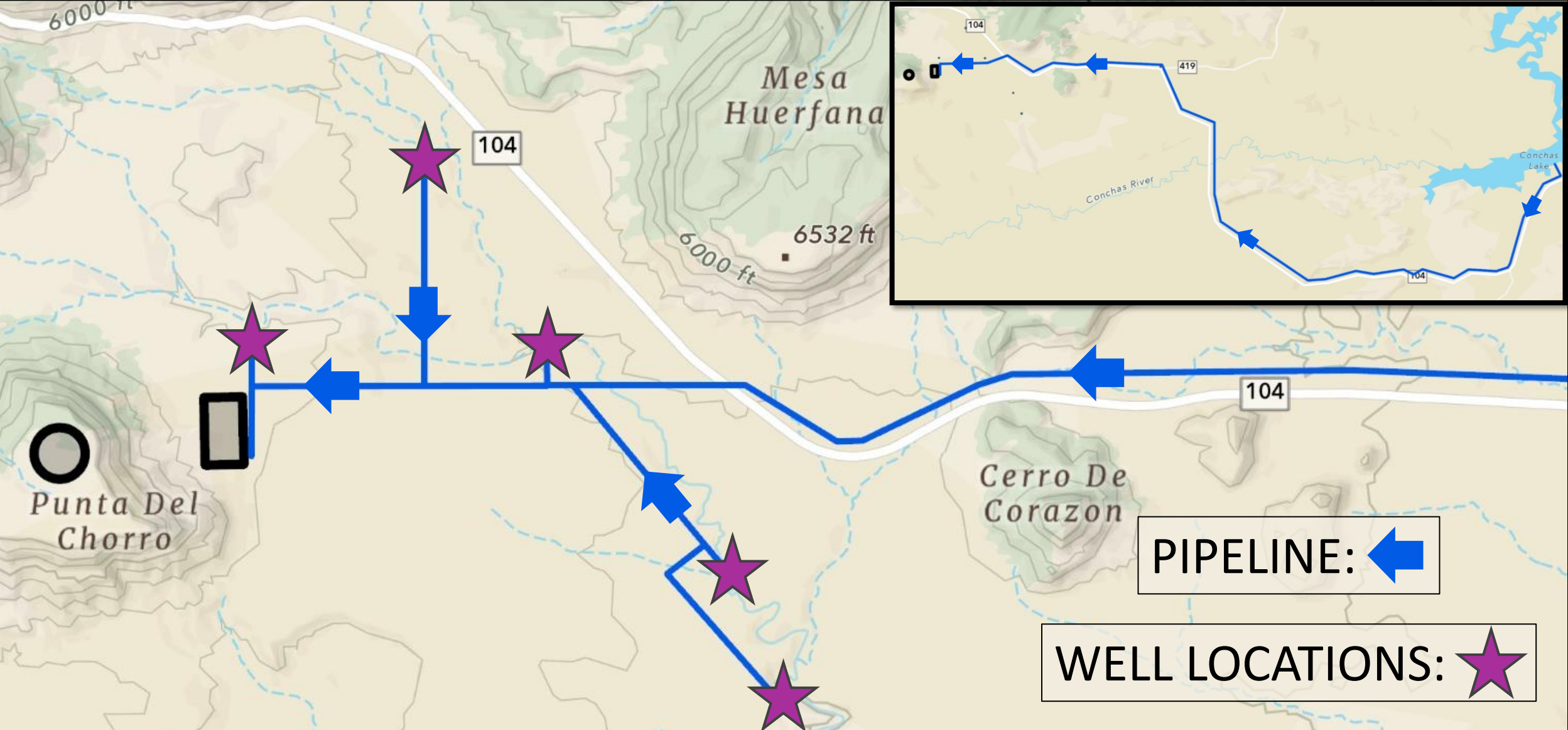
Site Design

Site Layout



Environmental Considerations

Water Sourcing



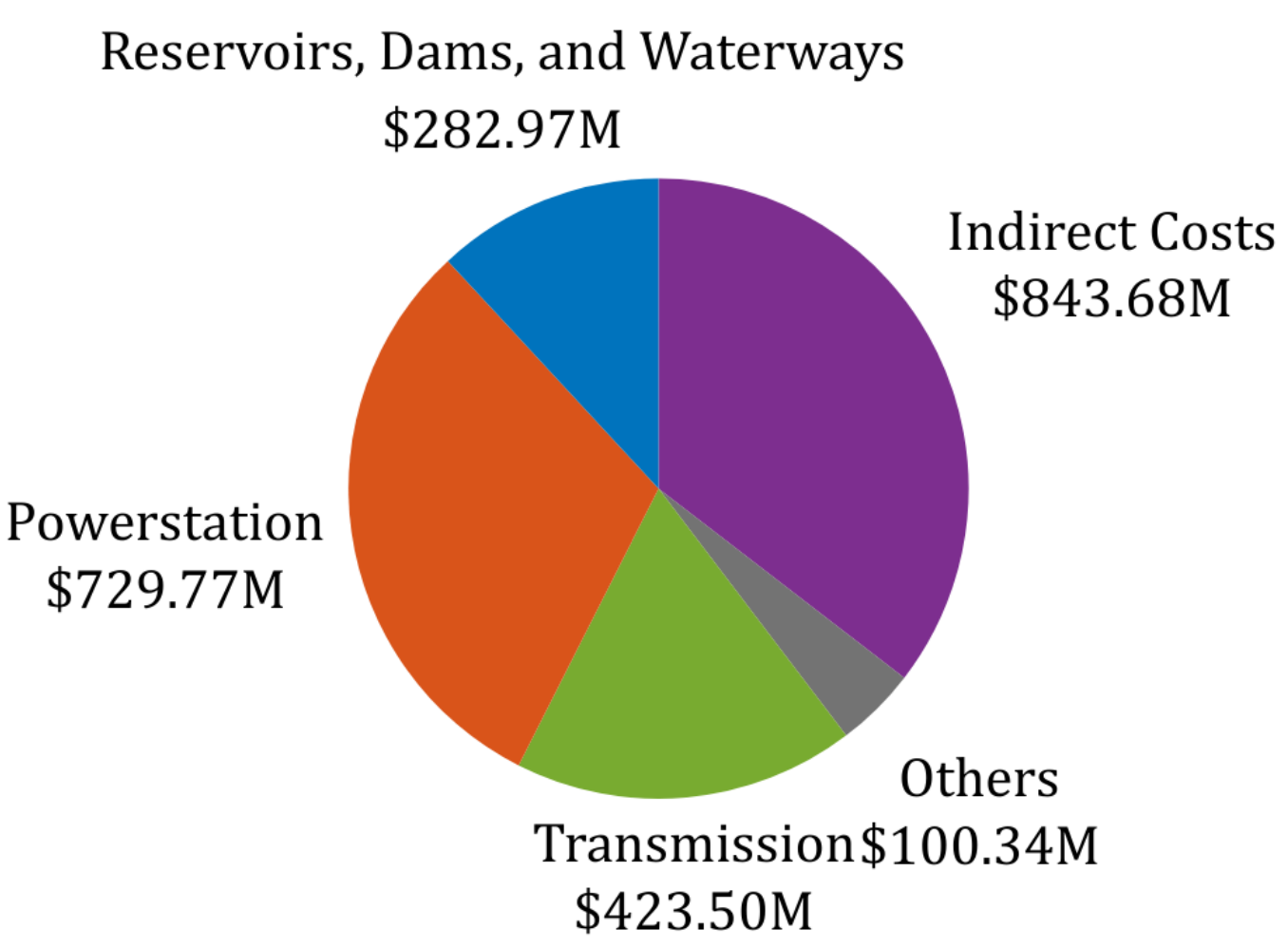
- 5 wells to supply **75%** of water
- Pipeline to supply **25%** of water
- Evaporation losses and precipitation gains offset

Regulations and Permits

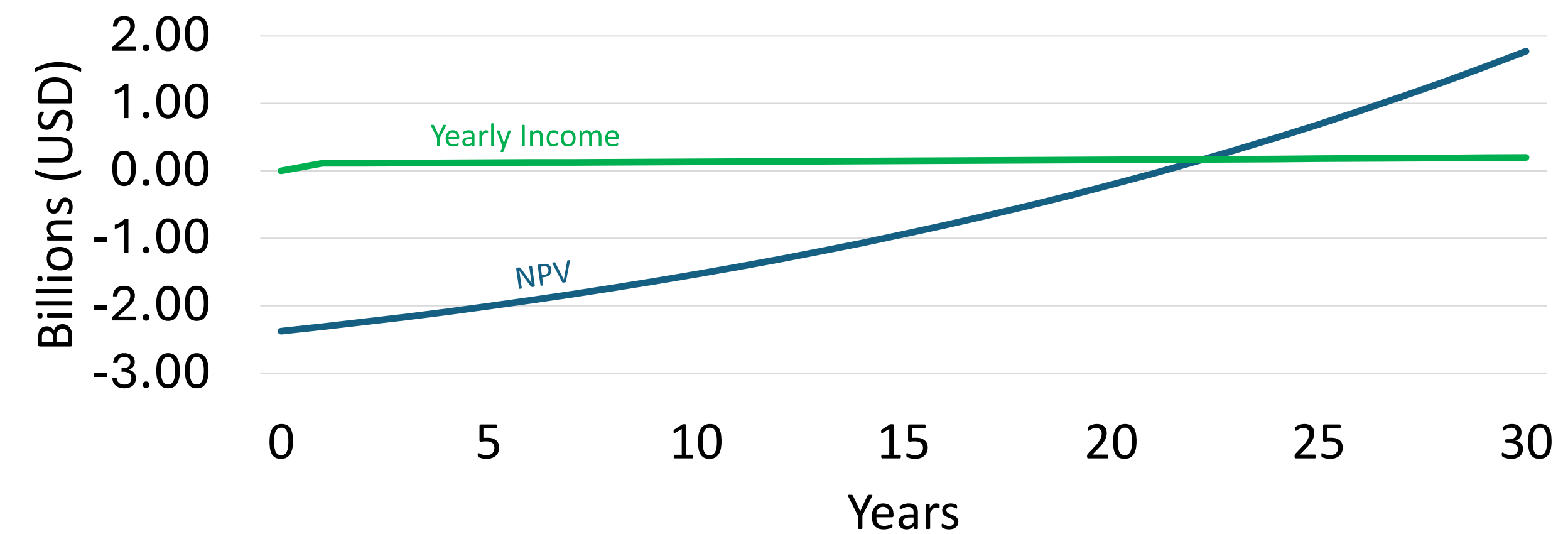
- Development meets local, state, and federal regulations
- Primary permit from FERC
- Feasibility studies support interconnection and safe grid integration

Estimated Economic Impact

Power Cycle
Estimated \$0.20/kWh
\$659,172 revenue per day
Pump Cycle
Estimated \$0.08/kWh
\$315,324 cost per day



Payback Period Analysis



Proposed Construction Timeline

Activity Name	Duration (days)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
PERMITTING and LAND ACQUIREMENT	1440								
ROAD CONSTRUCTION and IMPROVEMENT	360								
RESERVOIRS and PENSTOCK	810								
CO-DEVELOPMENT	630								
POWERHOUSE	810								
SUBSTATION and TRANSMISSION LINE	1440								