

Kachess Inactive Storage

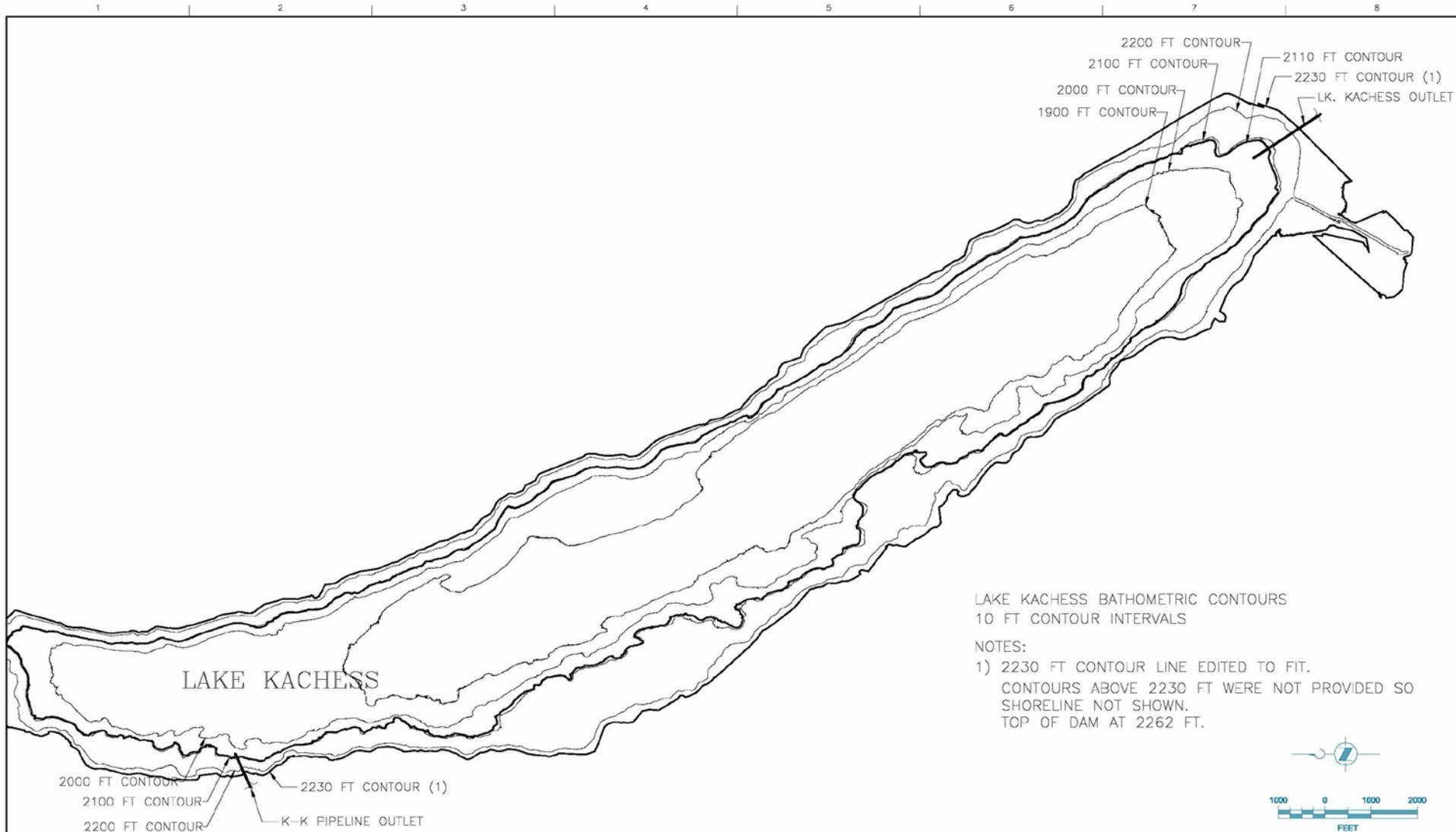
Project Location



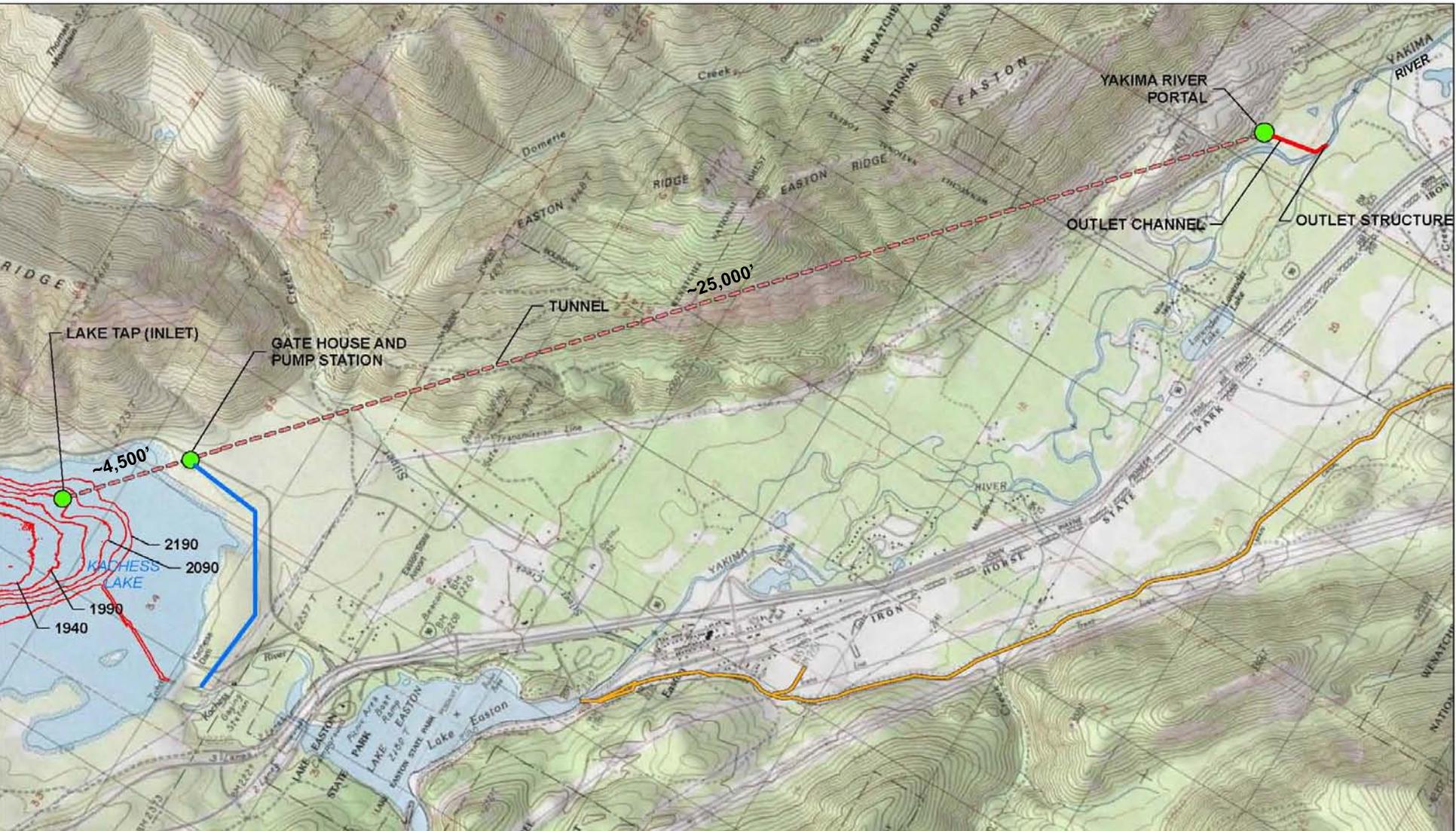
Inactive Storage Design Criteria

- Draw Lake Kachess down an additional 200,000 acre-feet below the existing dead pool storage elevation 2192.75.
- Based upon Lake Kachess bathymetry this would require drawdown to a new low lake elevation 2110.
- The minimum instream flow in the Kachess River below Kachess Dam will be via a 20 cfs pump station.
- To maintain an average capacity of 550 cfs, the tunnel will have a 1,200 cfs maximum capacity and the pump station option will have a 1,000 cfs firm capacity.
- Lake Kachess unscreened outlet will be via a lake tap at bottom elevation 2060 and in-rock tunnel.

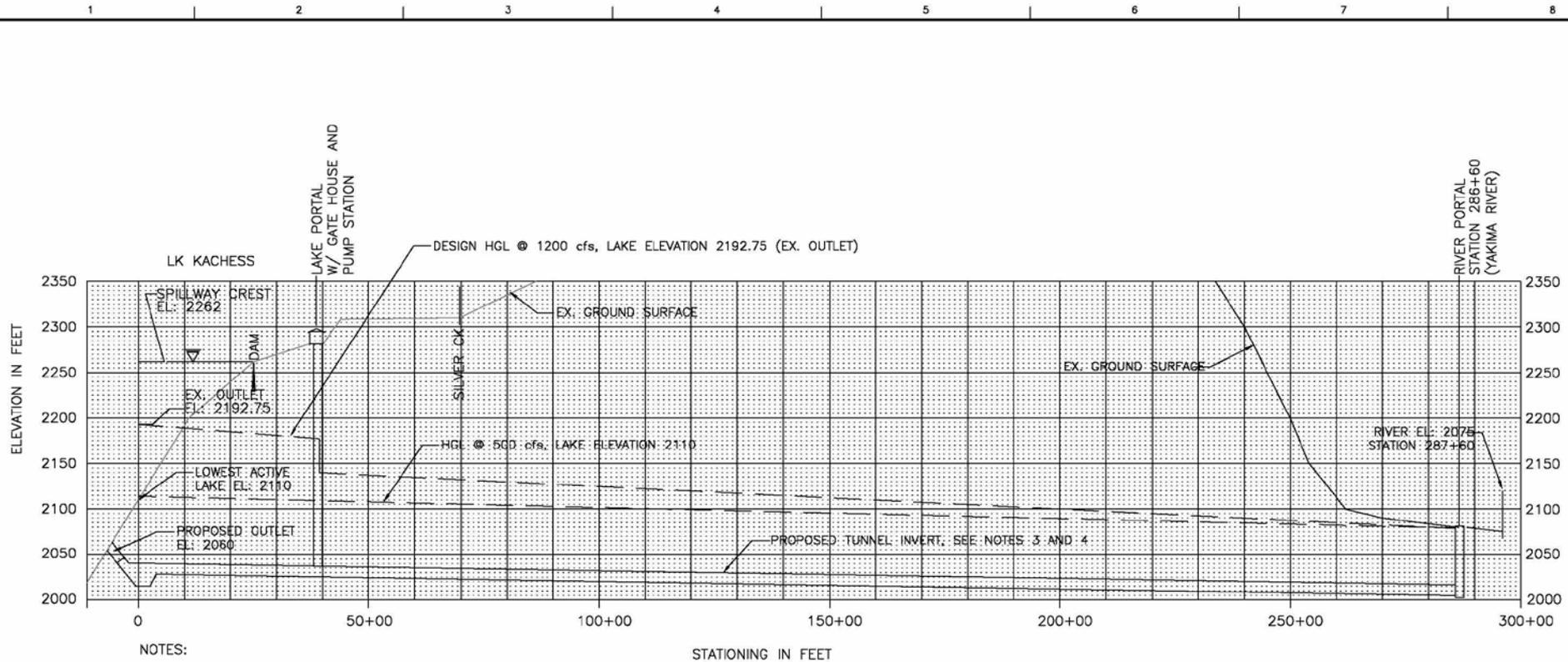
Lake Kachess Contours



Inactive Storage Tunnel Plan



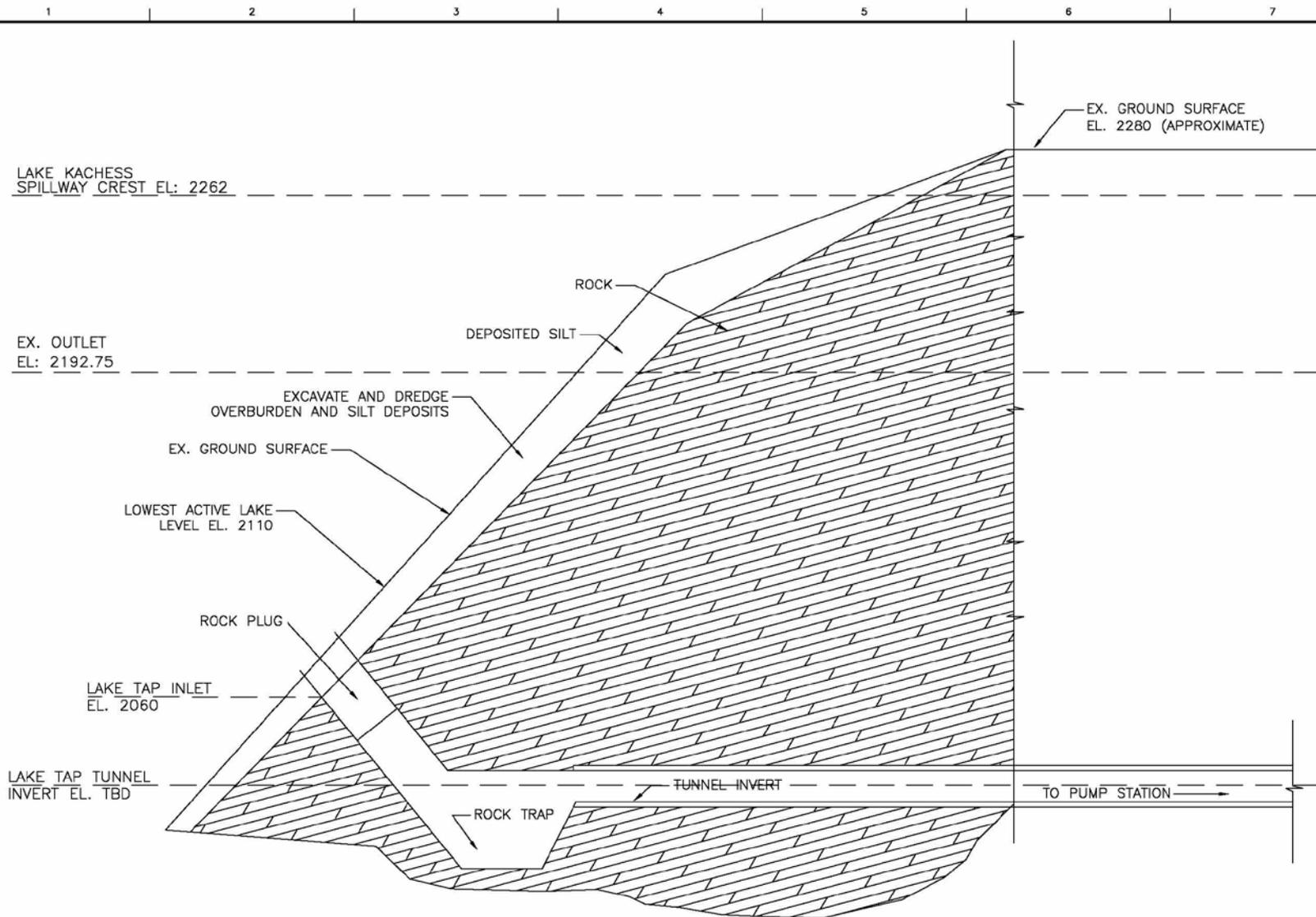
Inactive Storage Tunnel Profile



NOTES:

- 1) STORAGE VOLUME OF LAKE KACHESS
 - BETWEEN SPILLWAY CREST AND EXISTING OUTLET = 239,000 ac.ft.
 - BETWEEN EXISTING OUTLET AND PROPOSED OUTLET = 200,000 ac.ft.
- 2) AVERAGE ELEVATION OF YAKIMA RIVER AT PROPOSED TUNNEL DISCHARGE = 2075 ft.
- 3) TUNNEL LOCATION AND PROFILE SHOWN FOR CONCEPTUAL PURPOSES ONLY.
- 4) TUNNEL EQUIVALENT DIAMETER 148 inches BASED ON DESIGN CRITERIA USED:
 - DESIGN FLOWS OF 1200 CFS AT LAKE ELEVATION 2192.75 ft WITH DECLINING FLOW RATE AS LAKE LEVEL DROPS.
 - FLOW VELOCITY OF 10 fps. MAXIMUM FLOW VELOCITY OF 20 FPS.

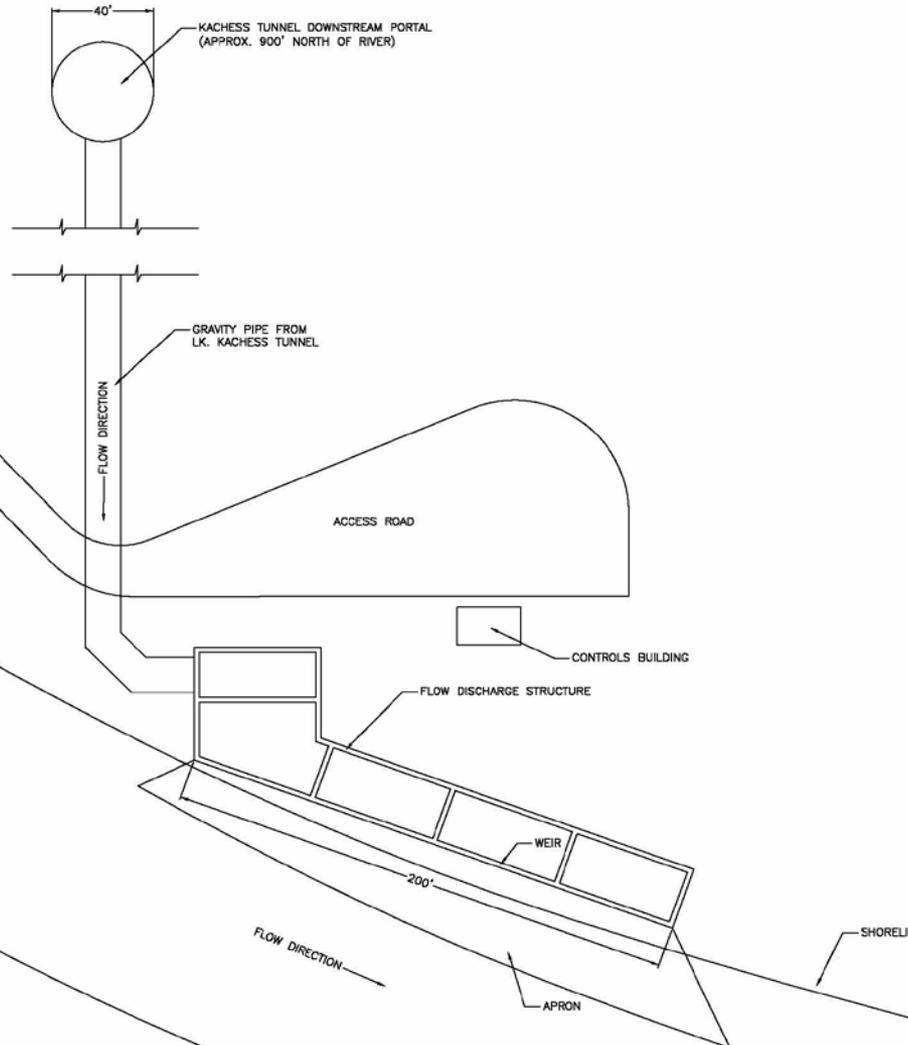
Kachess Lake Tap Section



Yakima River Discharge Structure

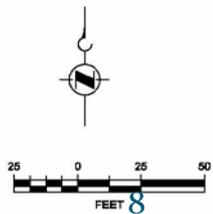
SECTION 16, T20N, R14E, W.M.

YAKIMA RIVER
WATER SURFACE ELEVATION: 2075±



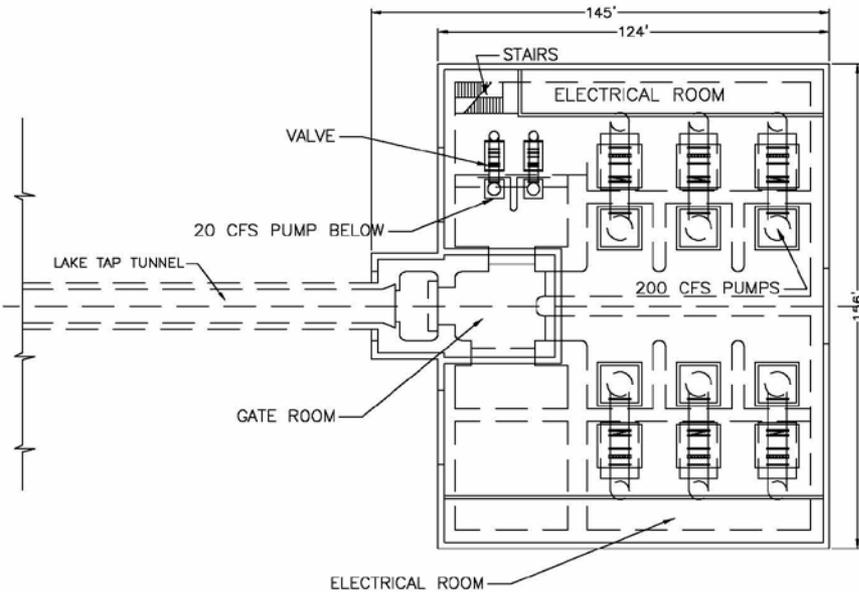
NOTES:

1. LENGTH OF DISCHARGE STRUCTURE APPROXIMATE. DIMENSIONS DEPEND ON WEIR FLOW RATE AND SCREEN REQUIREMENTS.
2. SCHEMATIC SKETCH ONLY - RIVER SHORELINE IS APPROXIMATE.

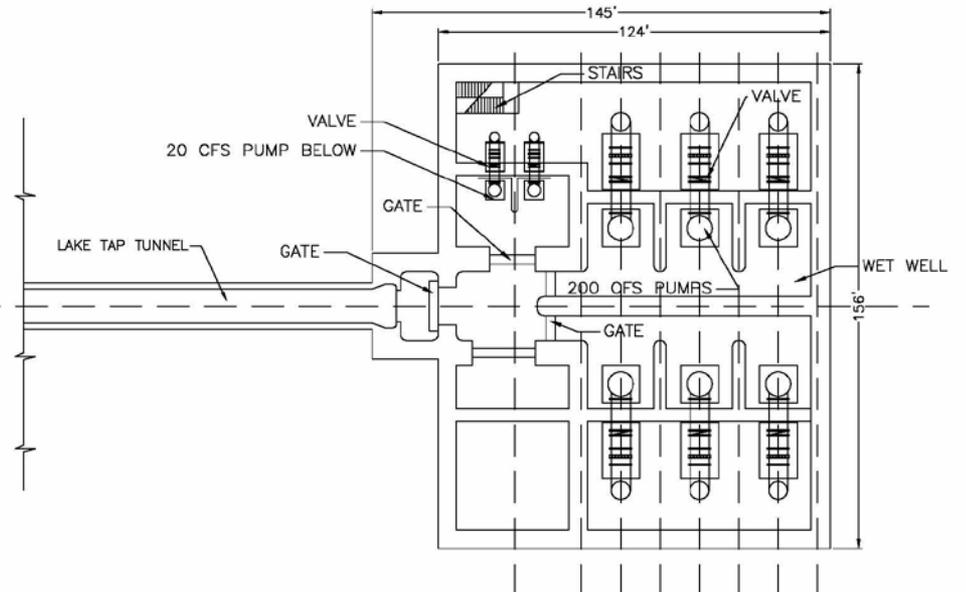


1,000 CFS Pump Station

1 2 3 4 5 6 7 8

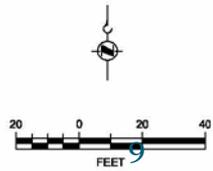


GROUND SURFACE FLOOR PLAN

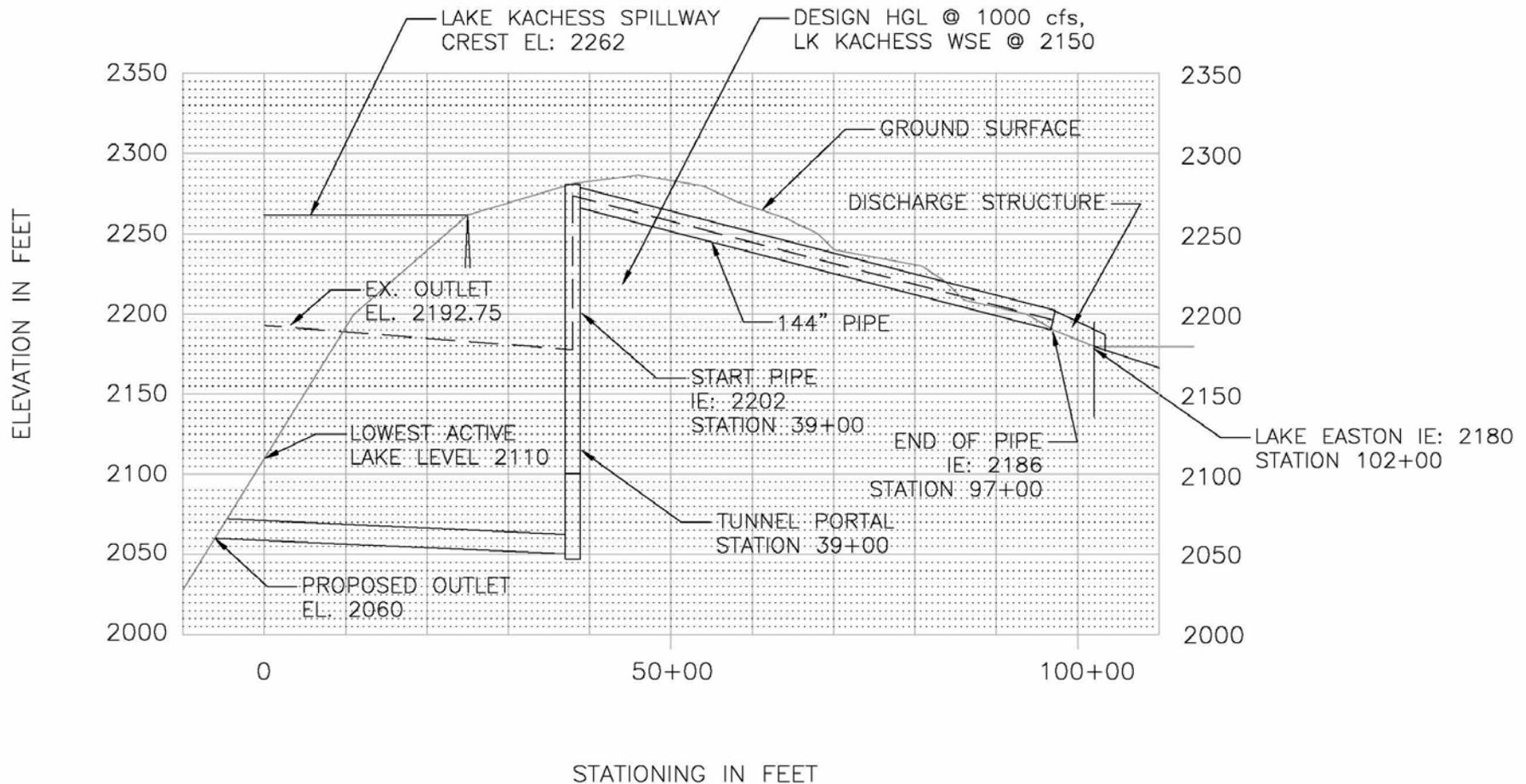


PUMP ROOM FLOOR PLAN

NOTE 1. THIS ILLUSTRATION SHOWS 5 DUTY PUMPS, EACH 200 CFS FOR A TOTAL DESIGN FLOW OF 1000 CFS AND ONE 20 CFS DUTY PUMP FOR MAINTAINING INSTREAM FLOW.



Pump Station Profile



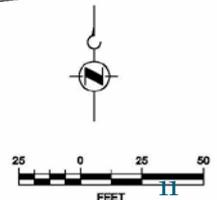
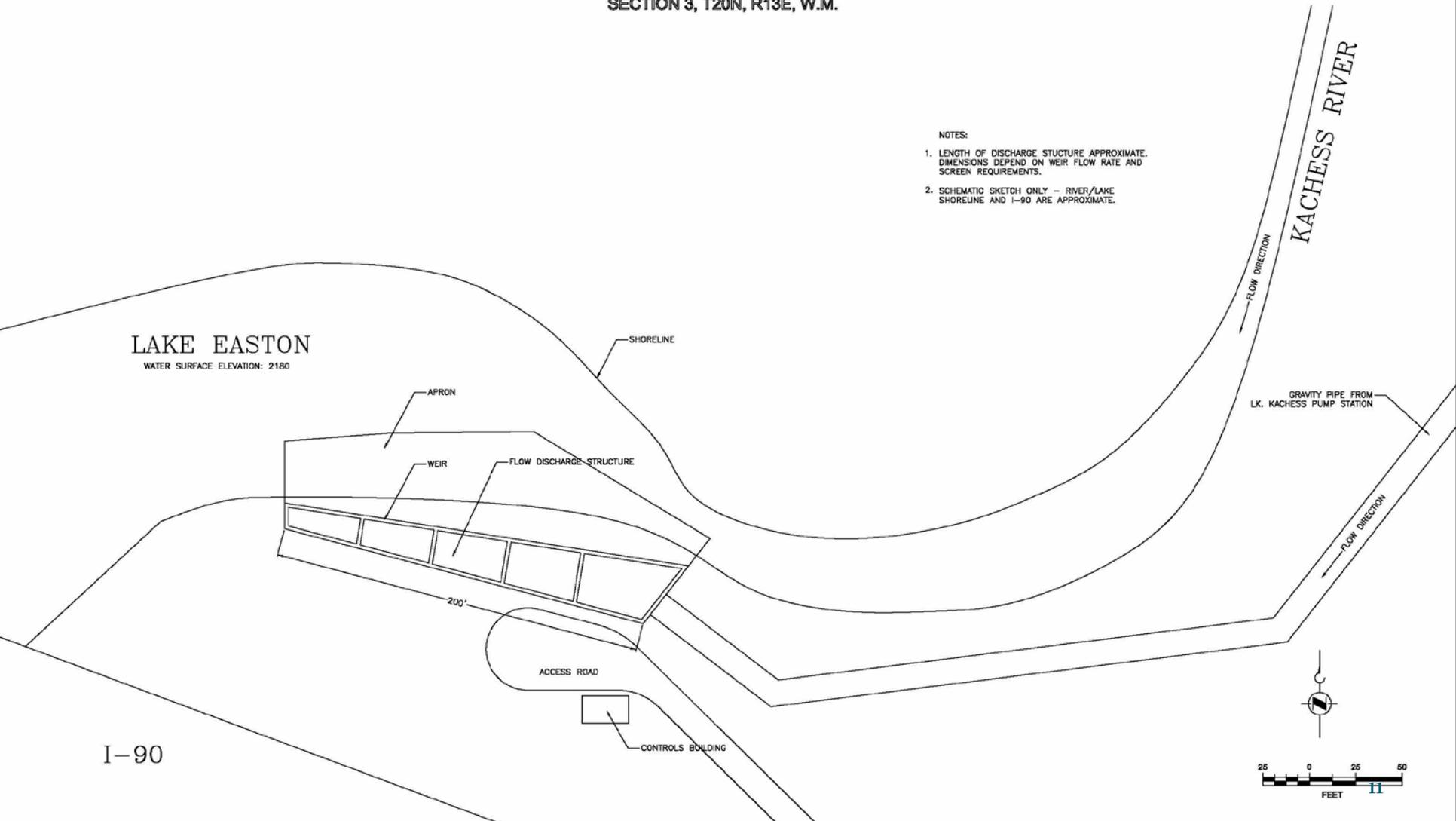
Pump Station Lake Easton Outlet

1 2 3 4 5 6 7 8

SECTION 3, T20N, R13E, W.M.

NOTES:

1. LENGTH OF DISCHARGE STRUCTURE APPROXIMATE. DIMENSIONS DEPEND ON WEIR FLOW RATE AND SCREEN REQUIREMENTS.
2. SCHEMATIC SKETCH ONLY - RIVER/LAKE SHORELINE AND I-90 ARE APPROXIMATE.



Project Challenges

- Local recreational and environmental impacts of additional 80 feet of lake drawdown
- Complex tunneling and/or pump station concepts with limited geotechnical information
- Deep tunnel and/or pump station portals into rock
- Lake tap outlet complexity
- Pumping and tunnel discharge structures

Next Steps

- Refine concepts & prepare cost estimates
- Additional results presented at the 9/22 Workgroup mtg. and also summarized in a Technical Memorandum for Workgroup review