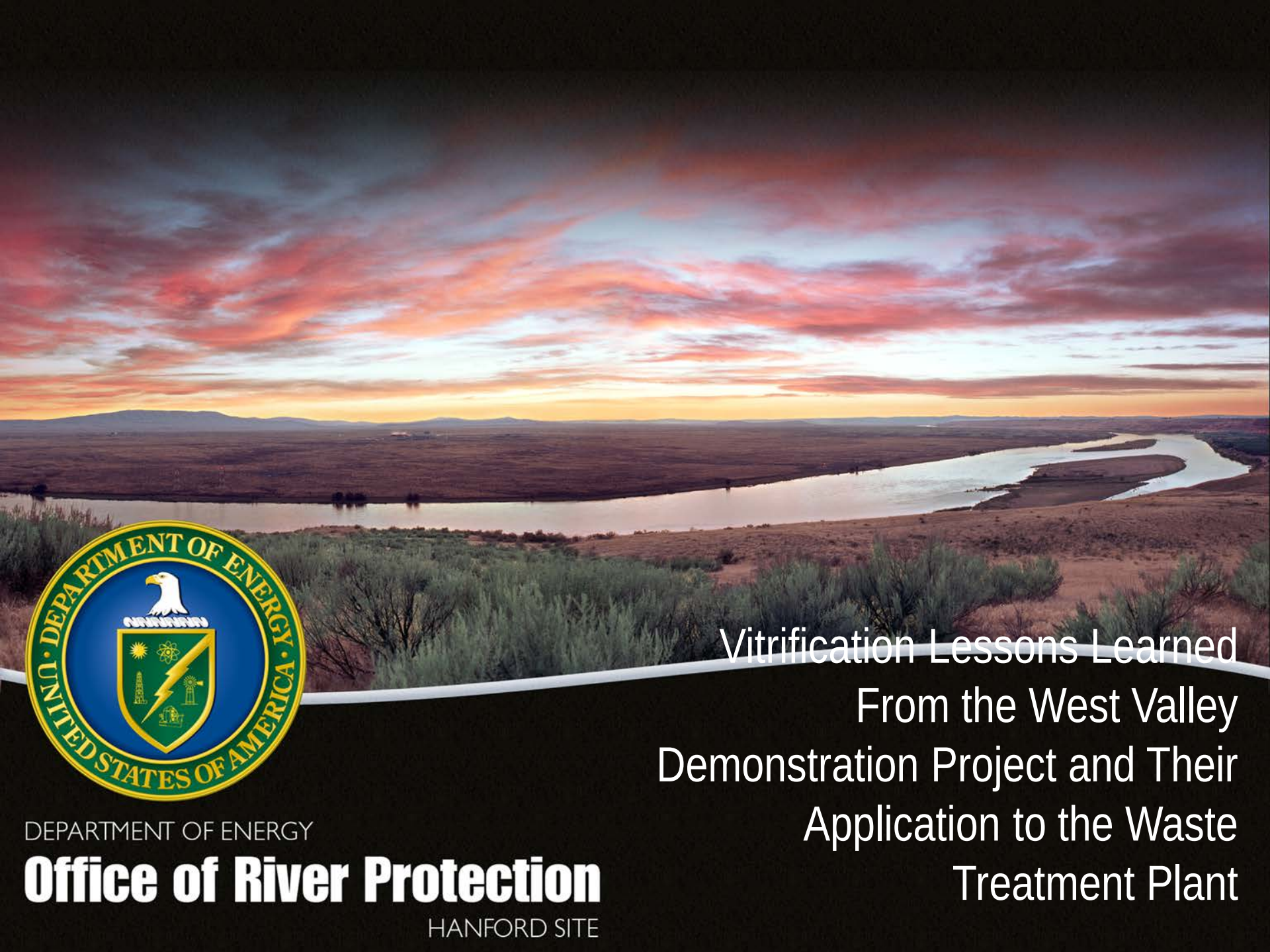


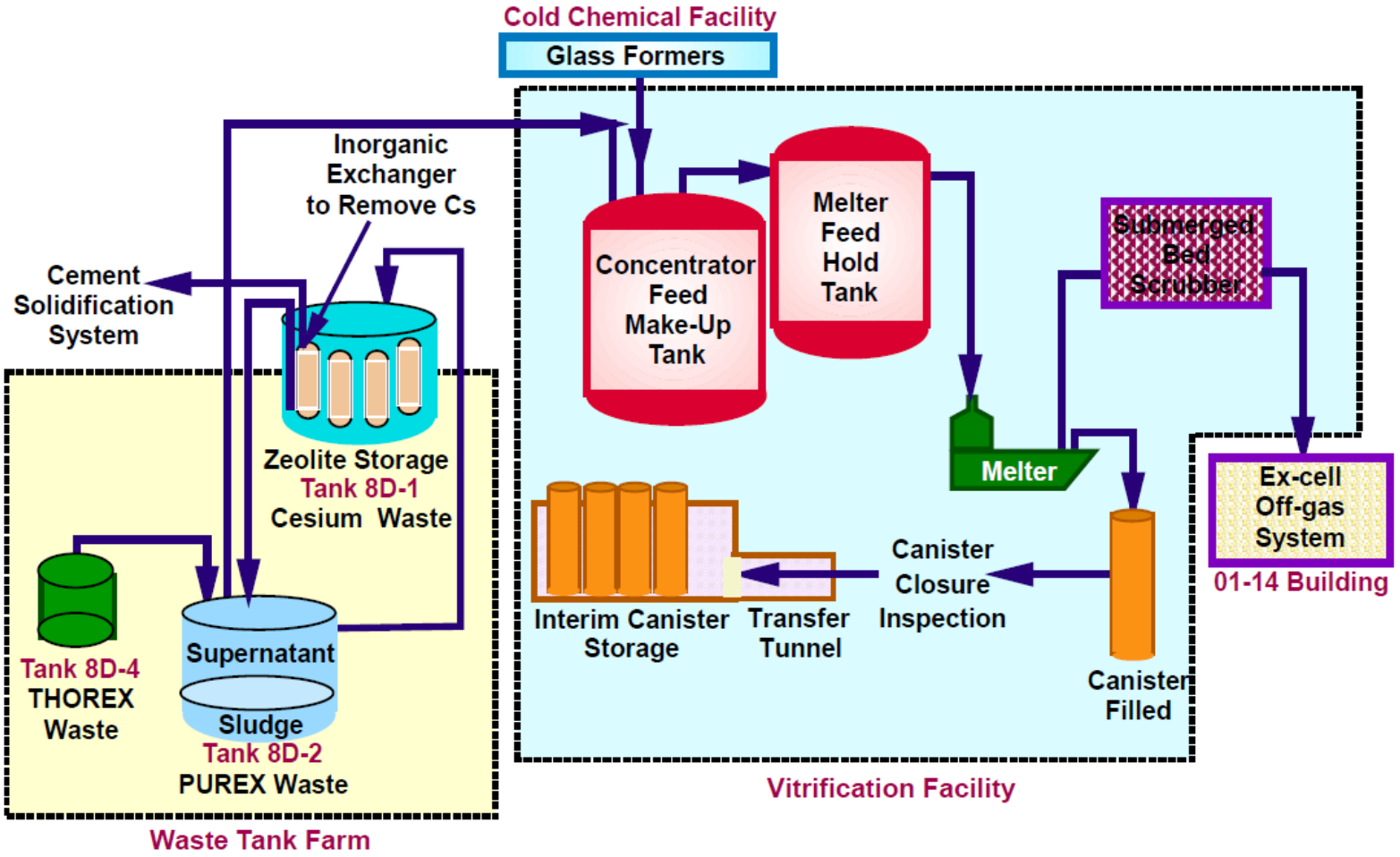
Vitrification Lessons Learned From the West Valley Demonstration Project and Their Application to the Waste Treatment Plant

DEPARTMENT OF ENERGY

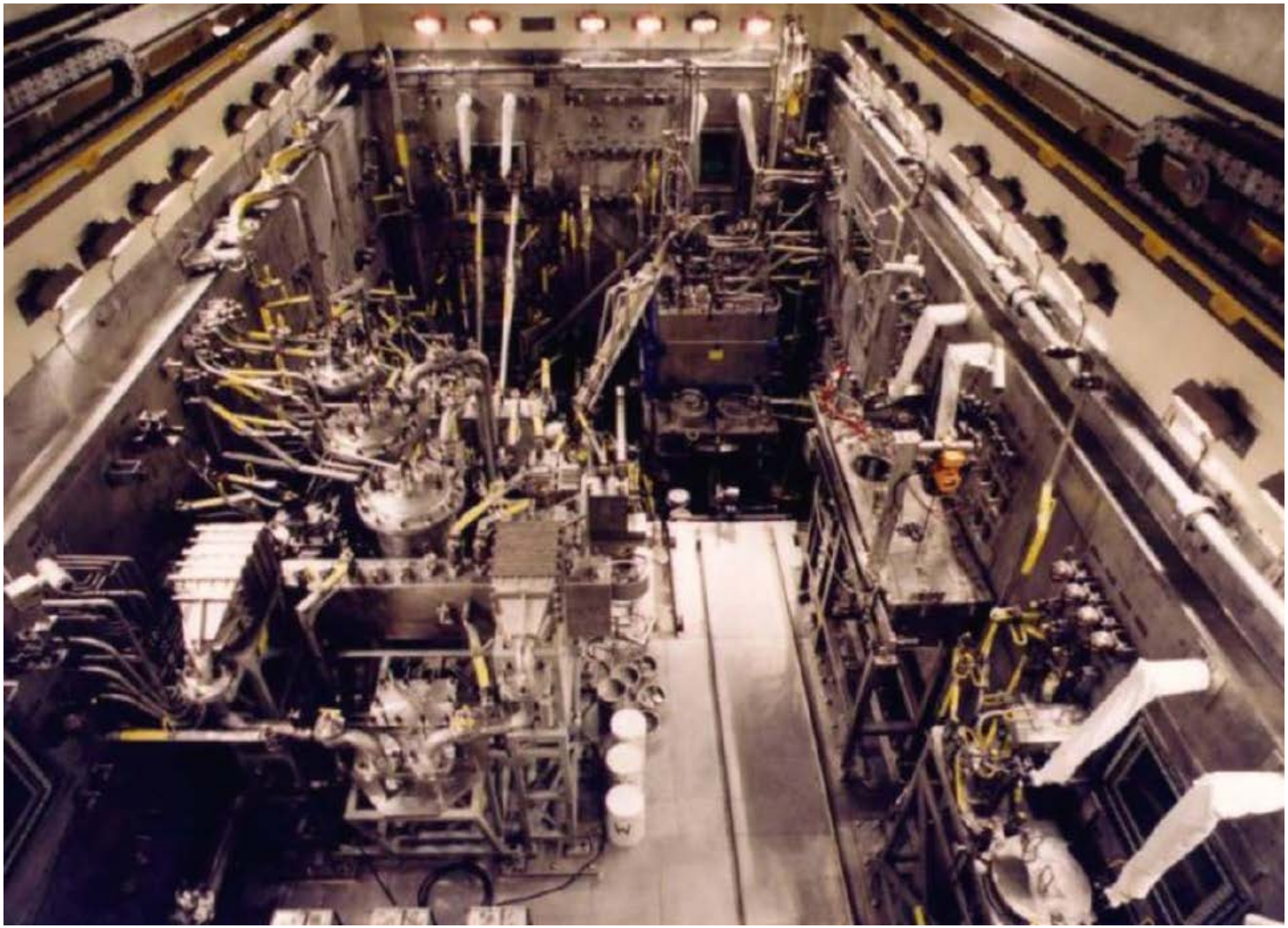
Office of River Protection

HANFORD SITE

West Valley HLW Processing Flowsheet



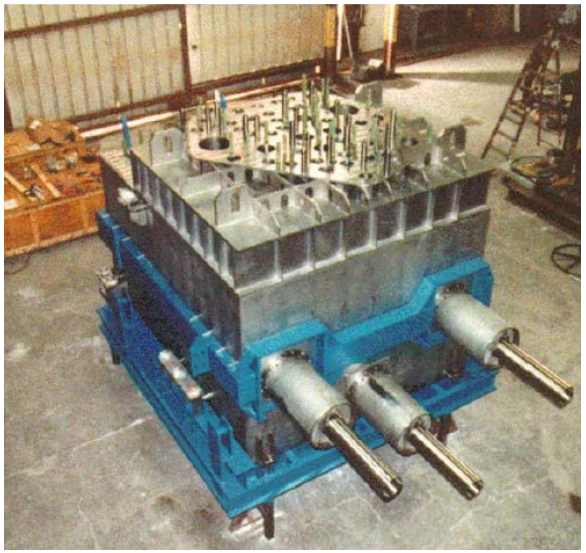
West Valley Vitrification In Cell

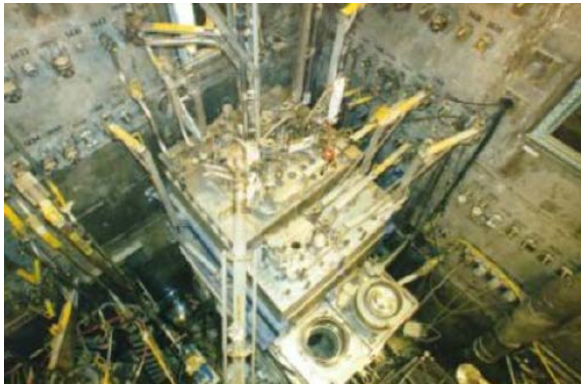


West Valley Melter

Slurry fed, joule heated

- 3 single-phase circuits
- 3 Inconel® electrodes
- 1150°C operating temperature
- 10-ft × 10-ft × 10-ft, water-cooled jacket
- 60 tons
- Capacity: ~5,000 lb glass
- Production ~1 ton/day





WTP HLW Melter

- Melter wt: 89 Tons without Glass/100 Ton with Glass
- Melter size: 14’-4” × 13’-8” × 11’ high
- Glass Pool area: 8’ × 5’ × 4’ high
- Production rate 3 tons/day
- 2 side large Plate electrodes used (cooled)
- External surface of refractory cooled by Cooling panels using cooling water

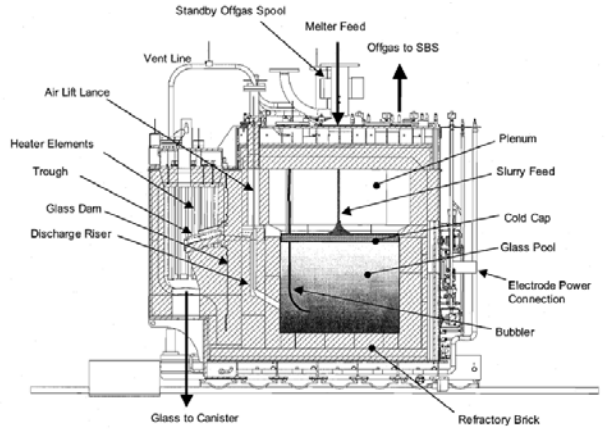


Figure 6.1-1 HLW Melter Sectional View along North-South Axis at Discharge Riser
(Electrodes are mounted in the East and West walls of glass pool refractory box)

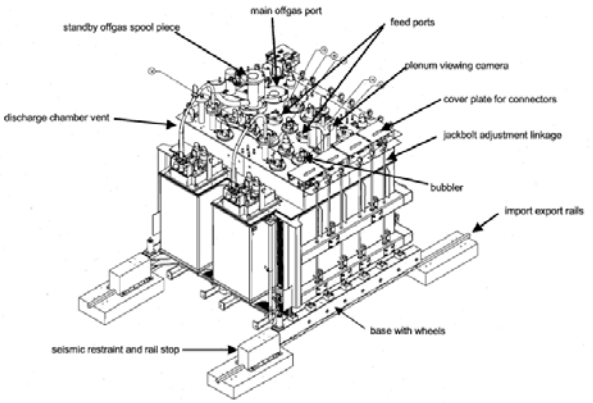


Figure 6.1-2 Isometric View of HLW Melter
(Note: plenum viewing camera will not be purchased and installed for commissioning)

West Valley Melter Operations Lessons Learned That Are Applicable to WTP

- Electrical conduit design & contamination due to pressure spikes
- Silicon carbide discharge heater operational strategies
- Melter pressure control with a quick acting control valve
- Excessive Accumulation of thin glass fibers in the glass pour stream
- Melter offgas piping accumulation of solids
- Failed melter dam during initial melter heat-up
  - Drawing transpositional errors
  - Melter heat-up rate was too fast