Enabling EM's Cleanup Mission with Science and Technology

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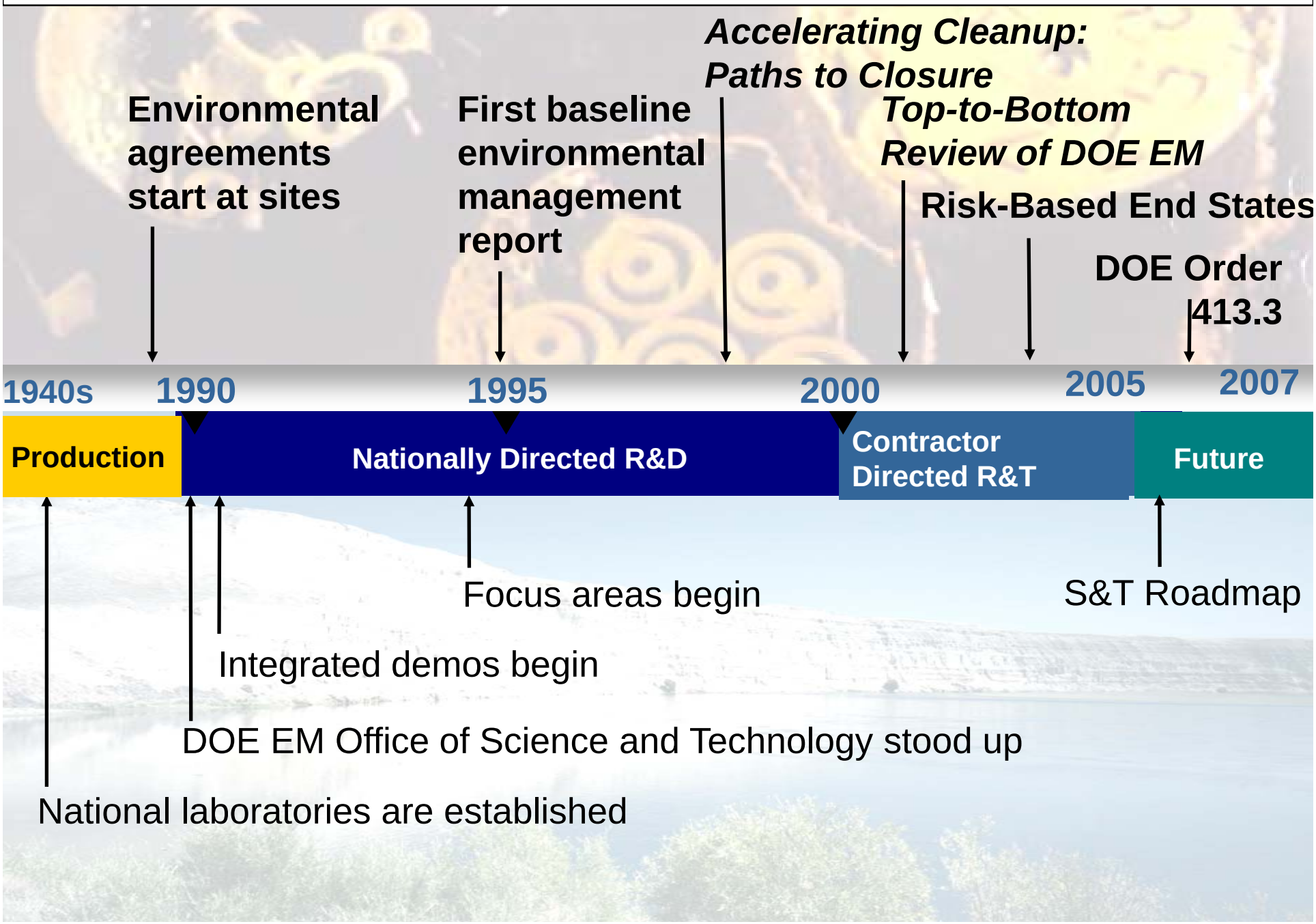
Battelle

Pacific Northwest National Laboratory
Operated by Battelle for the U.S. Department of Energy

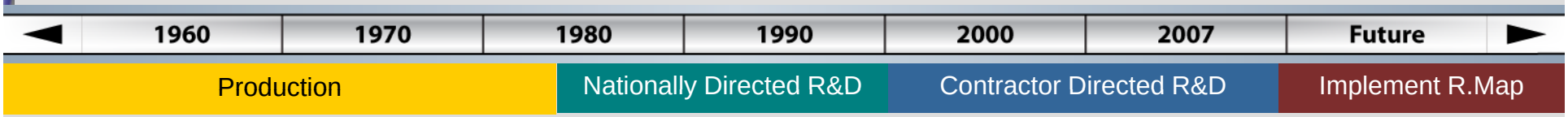
Role of the National Labs During the Production Mission

- Support production
  - Actinide chemistry expertise
  - Separations expertise
- Environmental monitoring
- Waste form development

Programmatic History of DOE Legacy Waste Cleanup

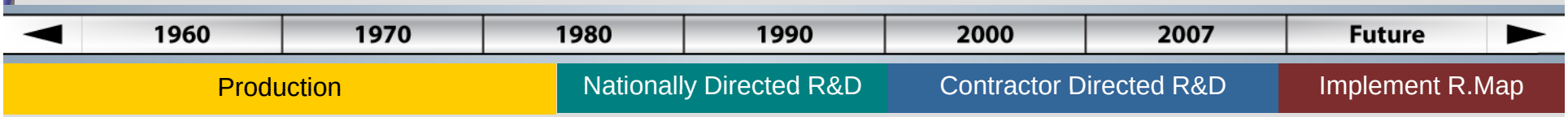


Major S&T Contributions to the EM Mission: Waste Processing



- Baseline for West Valley
- Baseline for DWPF
- Tank 101-SY gas release
- Transfer melter tech. to DWPF
- Waste Treatment Plant S&T begins
- Waste Integration Team
- Plutonium disposition resolved
- Spent nuclear fuel packaging
- WTP seismic resolved
- External Flowsheet Review team

Major S&T Contributions to the EM Mission: Site Characterization and Remediation



In situ vitrification demonstration ▲

In situ bioremediation demonstration ▲

In situ bioremediation demonstration ▲

In situ redox manipulation ▲

Groundwater/vadose zone Integration Project/EMSP ▲

Cesium migration ▲

Immobilized low-activity waste disposal performance assessment

Sitewide system assessment remediation technology ▲

In situ groundwater remediation technology

Integrated Field-scale Subsurface Research Challenge Project ▲

Summary of PNNL's Capabilities and Facilities

- Capabilities
  - Subsurface science
  - Chemical process engineering
  - Ecological science
  - Integrated assessment and risk analysis
  - Environmental and human health and safety
- Facilities
  - Environmental Molecular Sciences Laboratory
  - Radiochemical laboratories (RPL, 331)
  - Support facilities (APEL, 318, PDL-West)
- Technical Leadership
  - Largest single provider of S&T for EM and its contractors
  - Leading technical authority on Hanford tank waste issues (208 reports, 189 journal articles since 2001)
  - Leading technical authority on Hanford subsurface issues (36 reports, 104 journal articles since 2001)

Reemergence of S&T within EM

- Consistent with the expectations of DOE Order 413.3, OET is focused on technical risk reduction.
- To build upon EM's successes and support OET, the labs are focused on contributions that will provide
  - Technical risk reduction
  - Transformational solutions
  - Technical assistance