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# Physical Sciences Facility (PSF)

## Pacific Northwest National Laboratory

### Critical Decision 2 - Approve Performance Baseline

Energy Systems Acquisition Advisory Board (ESAAB)  
June 2007

Chad Henderson, Federal Project Director

# Agenda

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- **Why Are We Here?**
- **Project Scope**
- **Summary Schedule**
- **Cost Estimate and Funding Profile**
- **Confidence in the Baseline**
- **Response to Direction from Previous ESAABs**
- **DOE Order 413.3A Prerequisites Met**
- **Conclusion and Recommendations**

# Why Are We Here?

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- **Request approval of the Physical Sciences Facility (PSF) Project Performance Baseline**
- **Request delegation of CD-3 and CD-4 authority to the Under Secretary for Science by designating the PSF Project as a Non-Major System Project**

## Project Related Decision – Pending OMB Review

- **Request Delegation of Authority for Approval of the Business Case for two privately financed facilities to the Under Secretary for Science**
  - Biological Sciences Facility (BSF)
  - Computational Sciences Facility (CSF)

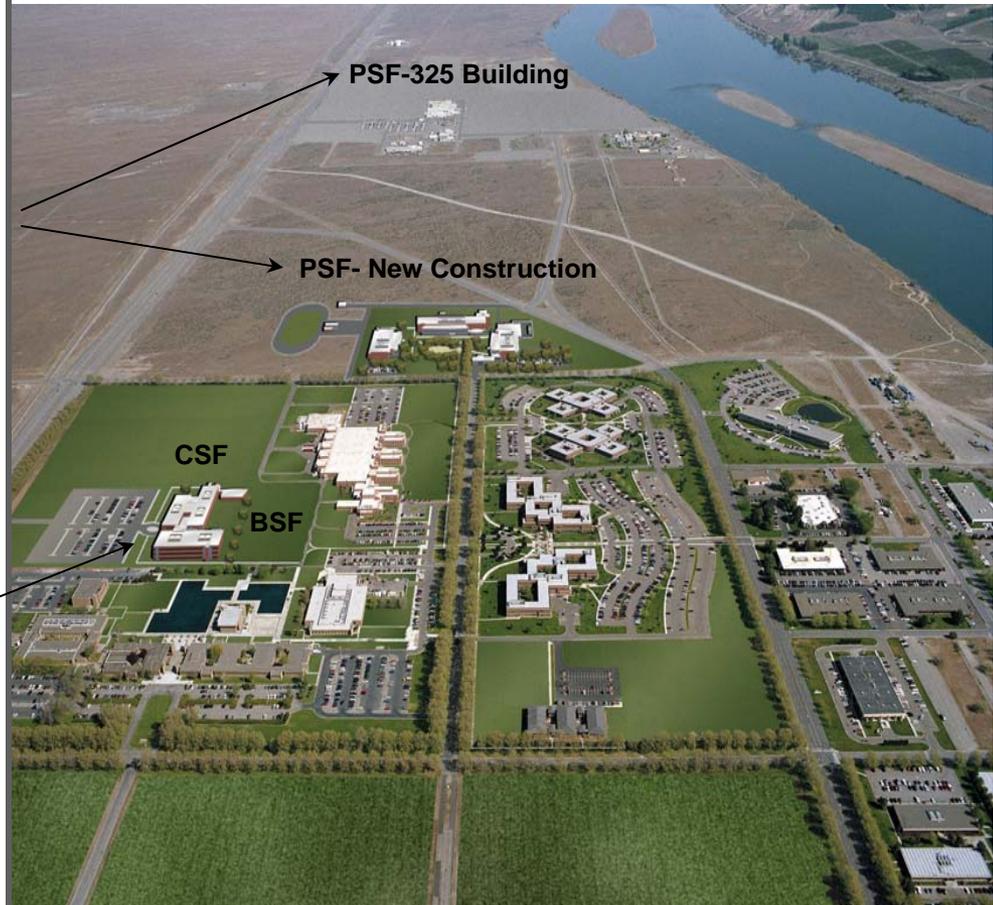
# CRL Scope Approved at CD-1R

*critical capabilities retained; mixed-funding approach*

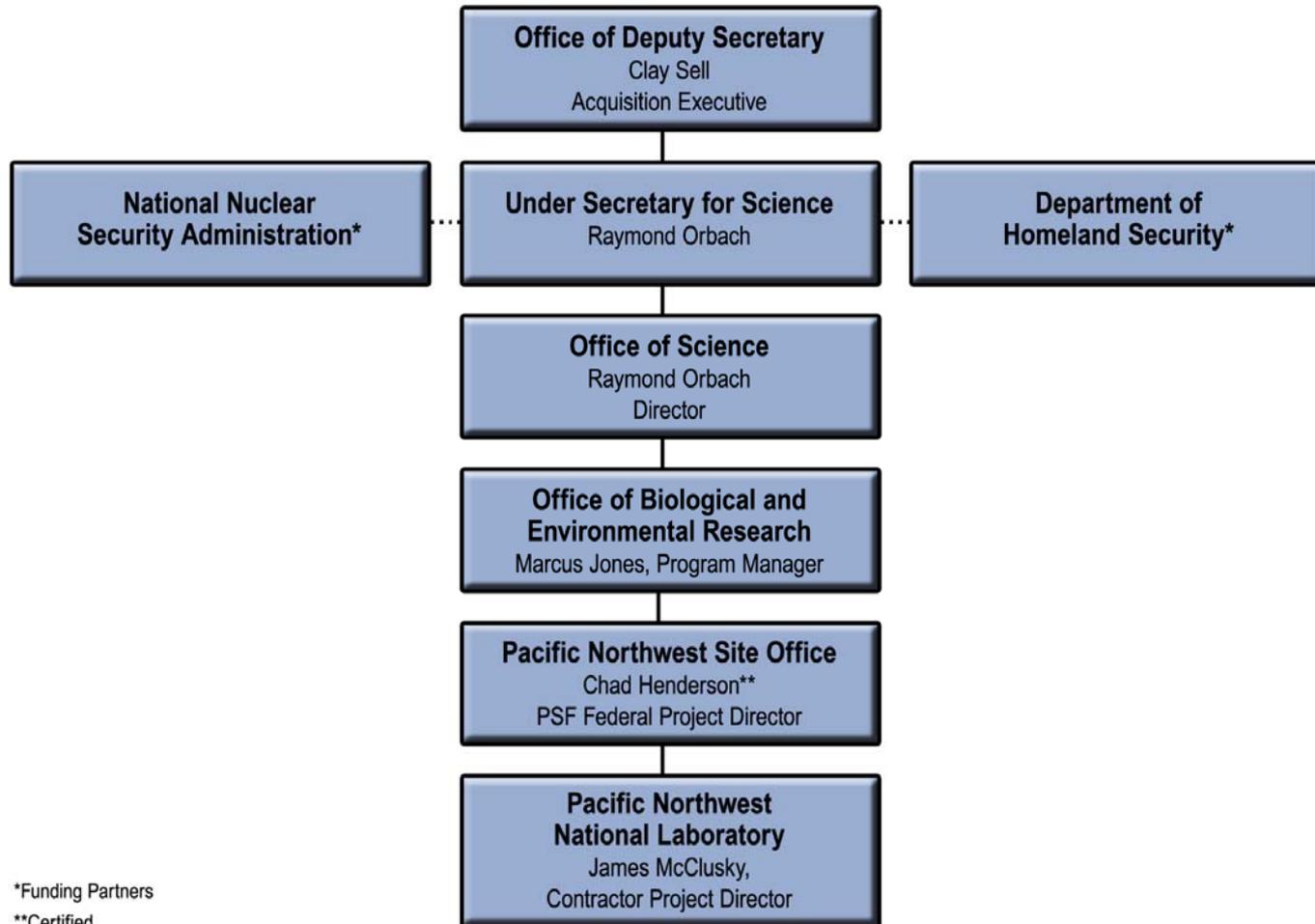
## Mission Critical Capabilities

- **PSF – New Construction**
    - Ultra-trace
    - Radiation Detection
    - Materials Science & Technology
    - Chemistry and Processing
    - Large Detector Laboratory
  - **PSF - 325 Building**
    - Shielded Operations
    - Radiation Detection
    - Materials Science & Technology
    - Chemistry and Processing
  - **BSF - Systems Biology**
  - **CSF - Information Analytics**
- } 3<sup>rd</sup> Party
- **Other retained facilities** - Certification and Dosimetry, Subsurface Science, and Environmental Biomarkers

**Physical Sciences Facility Line-item Performance Parameters Include New Construction at the PNNL Site of ~190,000 sq. ft. and Life-extension Upgrades of 325 Building**



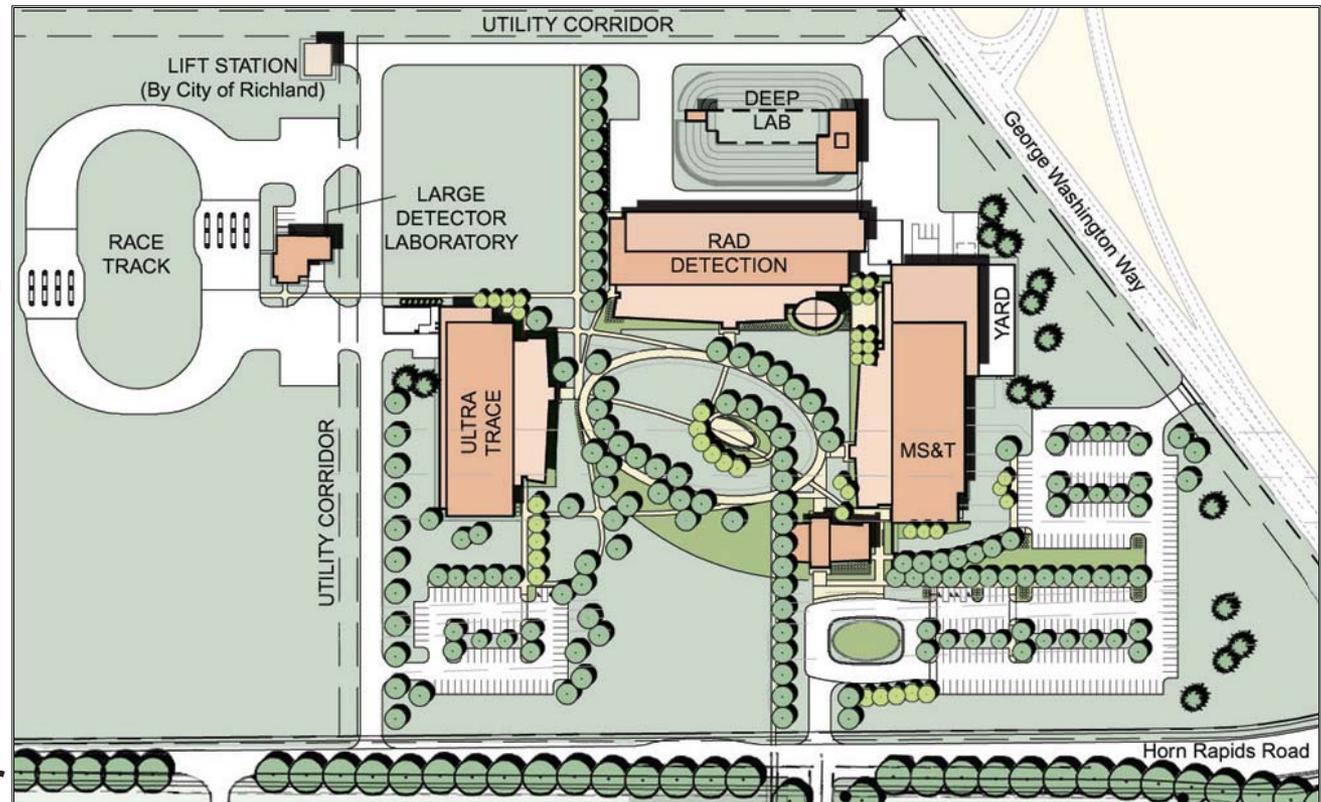
# Project Organization



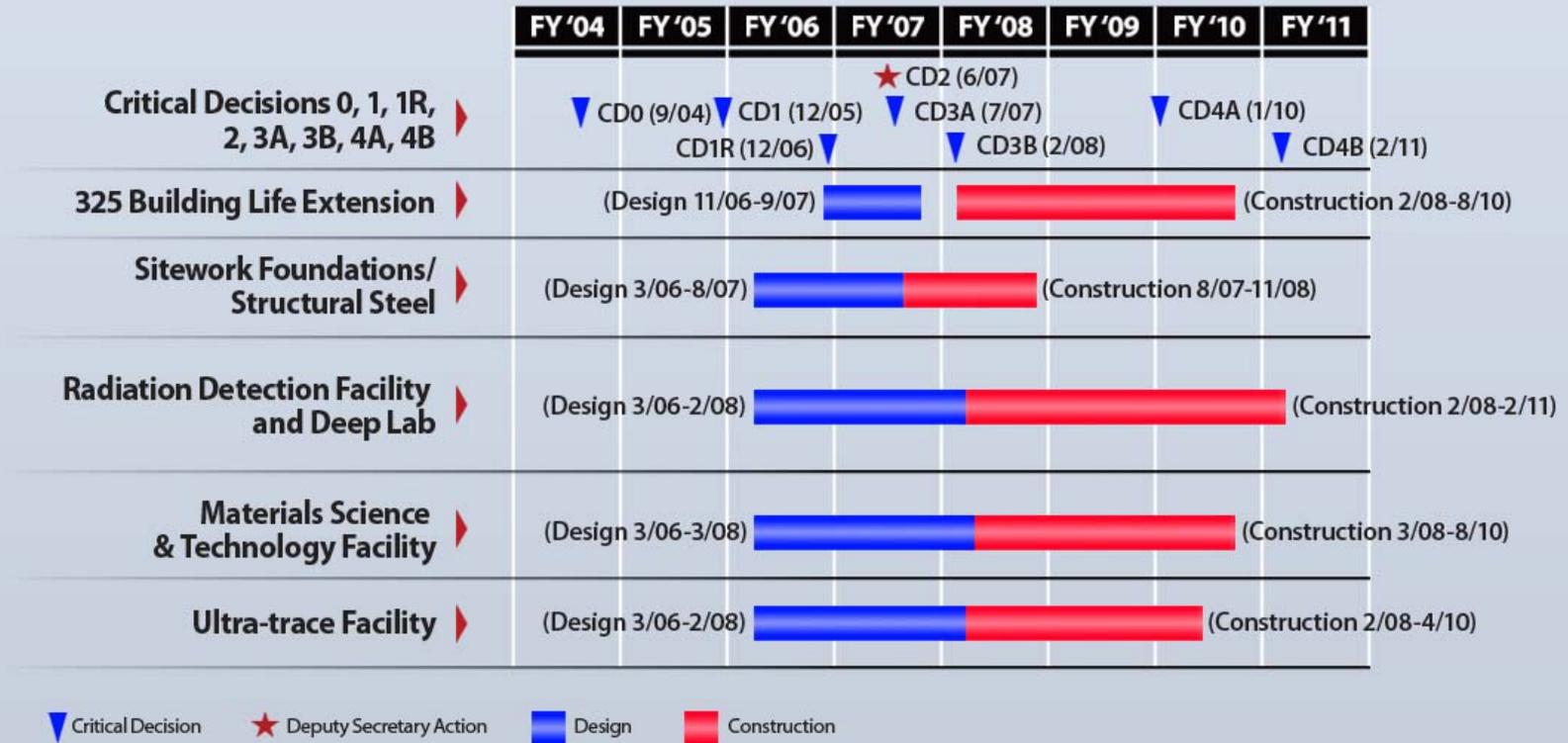
# Project Scope

- Design and construct new facilities on the PNNL Site
- Modernize 325 Building for a 20-year life extension and update the nuclear safety basis
- Startup new construction
- Operationally accept the nuclear safety updates for 325 Building

## PSF New Construction



# PSF Line Item Summary Schedule



➤ **Your decision today is on the Critical Path!**

# Cost Estimate and Funding Profile

## Project Cost Estimate by WBS

WBS	Description	Budget (\$M)
1.1.1	Project Integration and Support	16.7
1.1.2	PSF New Facilities Design, Construction, and Startup	123.9
1.1.3	Building 325 Life Extension	32.9
	Other Project Costs (OPC)	11.8
	<b>Total Estimated Cost</b>	<b>185.3</b>
	<b>Contingency</b>	<b>38.7</b>
	<b>Total Project Cost</b>	<b>224.0</b>

← 24% of remaining work

## Project Funding Profile (\$M)

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total
TEC	0.986	6.960	17.820	19.920	58.834	77.211	19.138	9.005	209.874
OPC	0.850	5.000	0	0	1.545	4.257	2.464	0.011	14.127
TPC	1.836	11.960	17.820	19.920	60.379	81.468	21.602	9.016	224.000*

\* The project has identified the Large Detector Laboratory (3440 Building) as a bid-alternate. If the Large Detector Laboratory bid alternate cannot be funded within the current Total Project Cost of \$224 million, the Office of Science will cover the increased cost to construct this facility, estimated at \$2M.

# Confidence in the Baseline

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## **Actions by the Project Team have reduced risk and complexity**

- Effective changes made to DOE and Contractor project staffing
- Implemented sound risk management plan
- Completed “Risk Informed” process and independent review of 325 Building safety documentation by DOE Safety Basis Review Team
- Prepared independent cost estimate
- Formal agreements in place with EM and Funding Partners

## **Actions by Independent Reviewers**

- Conducted successful SC IPR’s - January and April 2007
- Completed successful External Independent Review – May 2007
- Received Earned Value Management System certification – June 2007

# Responses to Direction from Previous ESAABs

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- **Approved alternative financing proposal – Pending OMB Review**
  
- **Incorporated safety requirements into design and construction**
  - Prepared Project Integrated Safety Management Plan
  - DOE Approved Hazards Analysis Report - new construction
  - DOE Approved Safety Evaluation - 325 Building
  
- **Defined CD- 4 criteria and included in the baseline**

# DOE O 413.3A CD-2 Prerequisites Met

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- ✓ Performance Baseline
- ✓ Project Execution Plan
- ✓ Earned Value Management System
- ✓ Performance Baseline Validation
- ✓ External Independent Review
- ✓ Independent Cost Estimate
- ✓ Quality Assurance Program
- ✓ Preliminary Design
- ✓ Project Data Sheet
- ✓ Design Review
- ✓ Preliminary Safety Design Report
- ✓ Hazard Analysis Report
- ✓ Preliminary Security Vulnerability Assessment Report
- ✓ Preliminary Safety Evaluation Report
- ✓ Sustainability Report (LEED Certification)
- ✓ National Environmental Policy Act Documentation – FONSI approved 1/29/07

➤ **CD2 ESAAB folder on the SharePoint Site**

**<https://spteam1.pnl.gov/sites/crl/Web/ESAAB.aspx>**

# Conclusion

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**The performance baseline is well defined  
and ready for approval**

# Recommendations

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- **Approve the PSF Project Performance Baseline—  
TPC \$224M\*, complete February 2011**
- **Approve the Project Execution Plan**
- **Delegate CD-3 and CD-4 authority to the Under Secretary  
for Science by designating the  
PSF Project as a Non-Major System Project**
- **Request delegation to approve the Business Case for  
privately financed facilities to Under Secretary for  
Science — Pending OMB Review**

\* SC is committed to funding any mission critical requirements above \$224 M (e.g., \$2M Large Detector Laboratory)

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# Backup Information

**PNNL PSF Project**

**ESAAB for CD-2**

**June 2007**

# Risk Management

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## ➤ Programmatic Risks

- Funding Availability - MOU signed with funding partners that supports the performance baseline; Continue to work with DHS. FY 2008 House mark fully supports project.
- EM Integration – Formal agreement signed by EM and SC on integration of PSF and EM cleanup of 300 Area.
- Business Case Approval – Reviewed within DOE and submitted to OMB; working with OMB to address remaining questions. Delayed approval impacts project schedule.
- CD-2 Approval – Baseline approval and subsequent approval to start construction are on the critical path; reviews have been positive. The project is ready to proceed. Delays will affect project end date and cost.

## ➤ Project Risks

- 325 Building Scope and Safety Basis Expectations - DOE SC has now accepted approach to safety basis; Remaining risk is that nuclear safety requirements will change during execution.
- Higher Than Expected Bids for Construction - Advance notice to contractors and nationwide advertising; Bid options identified for new construction and 325 scope prioritized; Escalation evaluated and included to cover reasonable expectations of potential growth.

# November 2006 Memorandum of Understanding

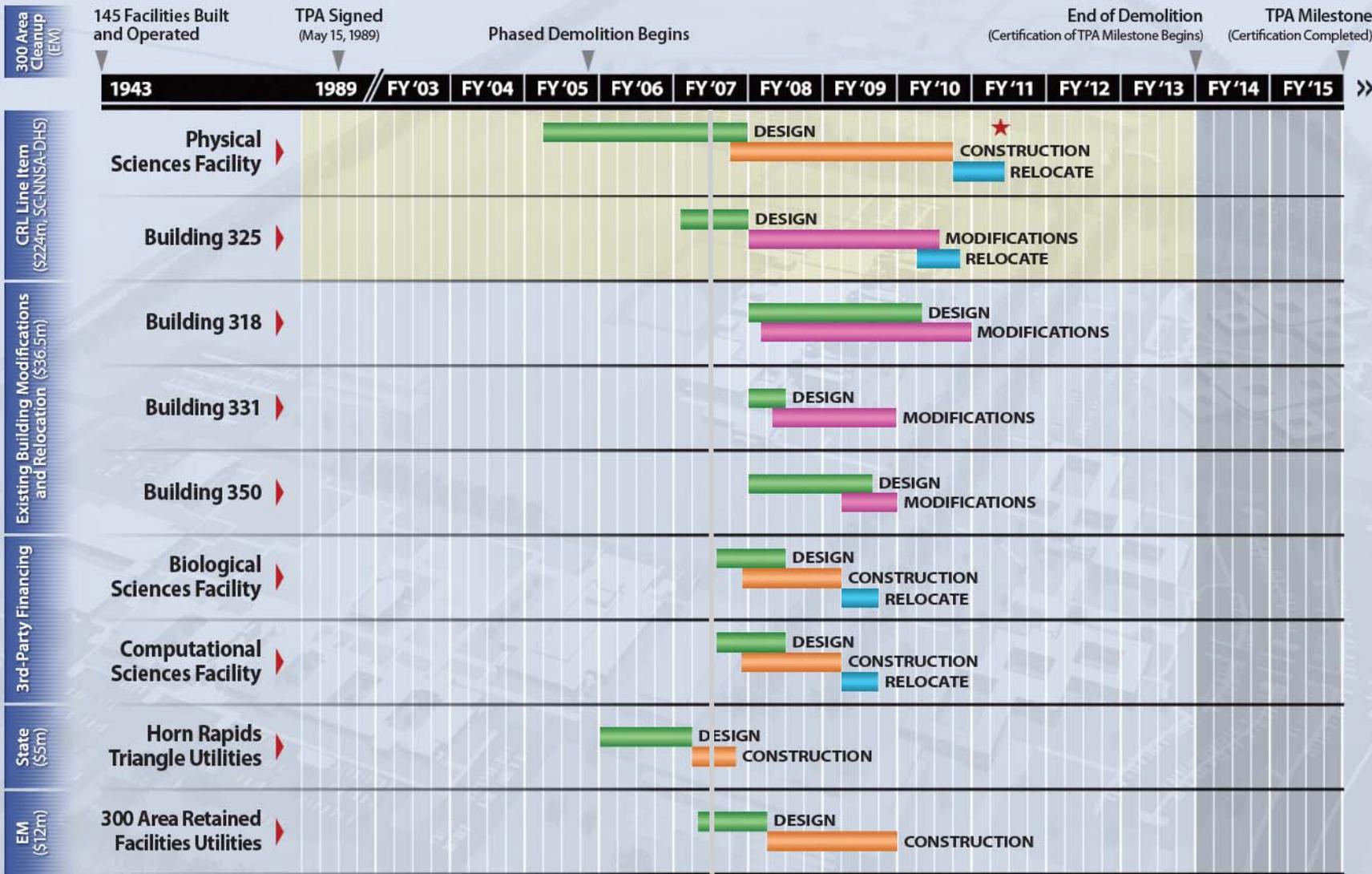
**“The Office of Science will manage the overall project and will deal with any funding growth without additional costs to NNSA and DHS.”**

Funding Strategy	Prior Years	2007	2008	2009	2010	2011	Total
NNSA	\$18,470	\$7,920	\$0	\$37,919	\$3,625	\$1,689	\$69,623
SC	\$10,896	\$0	\$35,379	\$40,549	\$7,977	\$3,643	\$98,444
DHS	\$2,250	\$0	\$25,000	\$15,000	\$10,000	\$3,684	\$55,934
Subtotal PSF Line Item	\$31,616	\$7,920	\$60,379	\$93,468	\$21,602	\$9,016	\$224,000
Assumed Cong. Mark (SC)		+\$10,000*		-\$10,000			
Assumed Cong. Mark (DHS)		+\$2,000*		-\$2,000			
<b>Project Profile</b>	<b>\$31,616</b>	<b>\$19,920</b>	<b>\$60,379</b>	<b>\$81,468</b>	<b>\$21,602</b>	<b>\$9,016</b>	<b>\$224,000</b>

\*The total project profile in FY 2007 is based on the assumption that the lower of Congressional marks for the SC FY 2007 appropriation (\$10M) is added. Contributions in FY 2009 will be reduced by the amount of any earmarks in the FY 2007 Appropriation (e.g., DHS appropriation of \$2M added in 2007 and commensurate reduction in DHS contribution in 2009).

# 300 Area Replacement Facilities Chronology

## Construction, Modification, Replacement & Disposition



★ Deputy Secretary Approval (Project Completion)

# Capability Replacement Laboratory Total Project Cost

## Capability Replacement Laboratory Funding Profile and Strategy

(thousands of dollars, including escalation and contingency)

	Prior Years	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total	Funding Source
	\$18,470	\$7,920	\$0	\$37,919	\$3,625	\$1,689	\$69,623	NNSA
	\$10,896	\$10,000	\$35,379	\$30,549	\$7,977	\$3,643	\$98,444	SC
	\$2,250	\$2,000	\$25,000	\$13,000	\$10,000	\$3,684	\$55,934	DHS
<b>Subtotal PSF Line Item</b>	<b>\$31,616</b>	<b>\$19,920</b>	<b>\$60,379</b>	<b>\$81,468</b>	<b>\$21,602</b>	<b>\$9,016</b>	<b>\$224,000</b>	
300 Area Utilities	\$0	\$1,600	\$4,900	\$5,500	\$0	\$0	\$12,000	EM
PSF' Site Utilities	\$5,000	\$0	\$0	\$0	\$0	\$0	\$5,000	State of Washington
<b>Subtotal Utilities</b>	<b>\$5,000</b>	<b>\$1,600</b>	<b>\$4,900</b>	<b>\$5,500</b>	<b>\$0</b>	<b>\$0</b>	<b>\$17,000</b>	
<b>Modifications to Buildings 318, 331, and 350</b>	<b>\$0</b>	<b>\$0</b>	<b>\$450</b>	<b>\$1,700</b>	<b>\$5,550</b>	<b>\$0</b>	<b>\$7,700</b>	PNNL/GPP
Relocation of PSF capabilities to PSF' and 325	\$0	\$250	\$250	\$300	\$4,700	\$6,700	\$12,200	PNNL
Interim moves out of 300 Area	\$0	\$0	\$800	\$5,500	\$0	\$0	\$6,300	PNNL
Non PSF transition support	\$0	\$1,500	\$1,500	\$2,500	\$2,500	\$2,300	\$10,300	PNNL
<b>Subtotal Relocation</b>	<b>\$0</b>	<b>\$1,750</b>	<b>\$2,550</b>	<b>\$8,300</b>	<b>\$7,200</b>	<b>\$9,000</b>	<b>\$28,800</b>	
<b>Subtotal Other Funding Sources</b>	<b>\$5,000</b>	<b>\$3,350</b>	<b>\$7,900</b>	<b>\$15,500</b>	<b>\$12,750</b>	<b>\$9,000</b>	<b>\$53,500</b>	
<b>Total All Sources</b>	<b>\$36,616</b>	<b>\$23,270</b>	<b>\$68,279</b>	<b>\$96,968</b>	<b>\$34,352</b>	<b>\$18,016</b>	<b>\$277,500</b>	

# Reviews and Assessments

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- **CD-0 Approved – September 2004**
- **Mission Need Revalidated in February 2005**
- **CD-1 Approved – December 2005**
- **SC Office of Project Assessment Review – January 2006**
- **CD1-R Approved – December 2006**
- **SC Office of Project Assessment Review (new construction scope) – January 2007**
- **SC Office of Project Assessment Review (follow-up) – April 2007**
- **OECM Earned Value Management System Certification Review – May 2007**
- **OECM External Independent Review – May 2007**
- **Pre-ESAAB meeting – June 2007**

# Business Case for Alternatively Financed Facilities

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- Updated Business Case submitted to OMB April 2007
- Department continues to work remaining issues with OMB
- Departmental position (SC, GC, OECM, CFO) is that Business Case meets A-11 and represents best deal for Government
- PSF Project baseline approval is on critical path
- Anticipate OMB approval by July. Project critical path requires approval of PSF baseline now.