

Headquarters U.S. Air Force

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AFCEE Technology Transfer Program Update

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HQ USAF/A7CVR
6 December 2006**

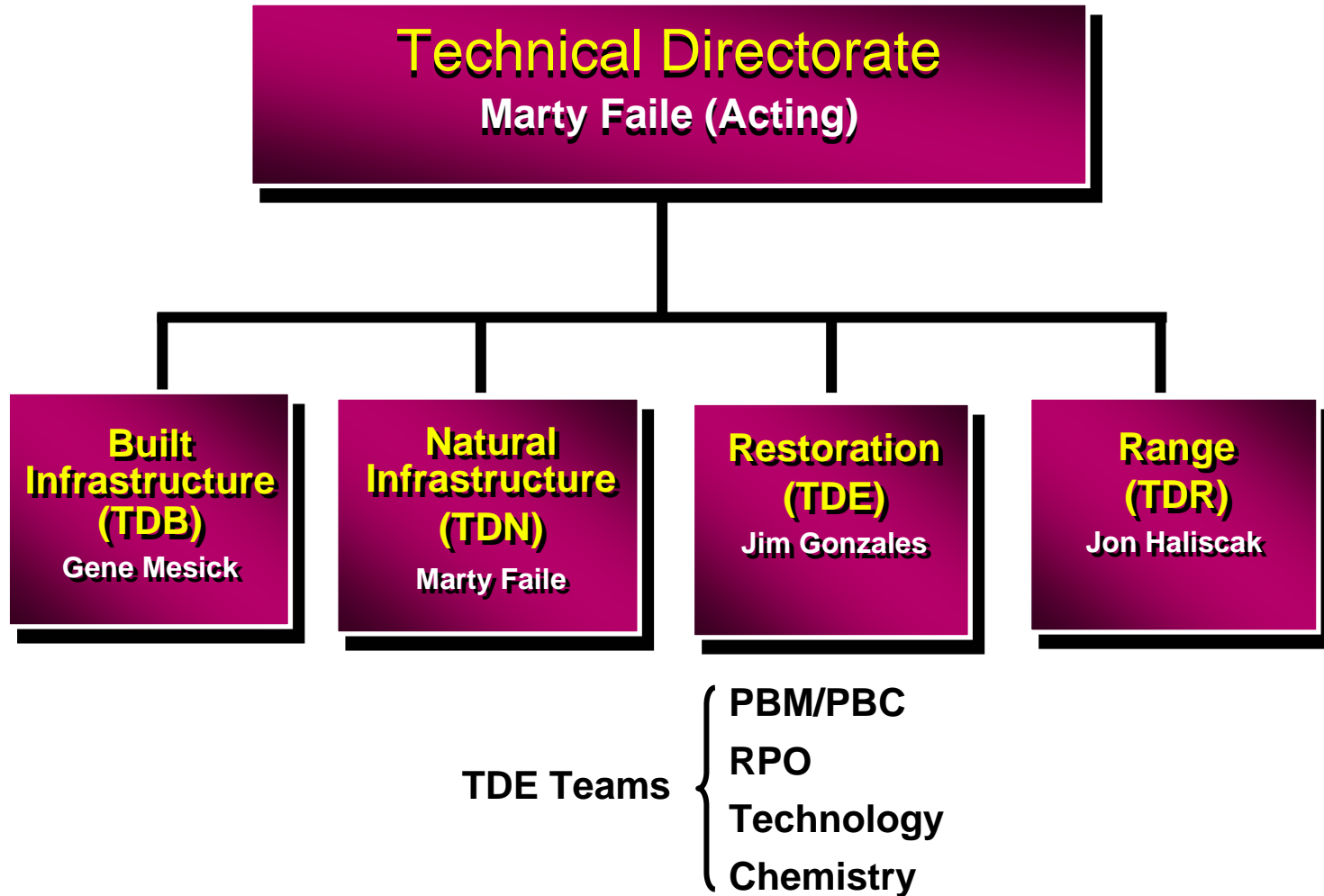


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AFCEE Technical Directorate





Environmental Technology Program

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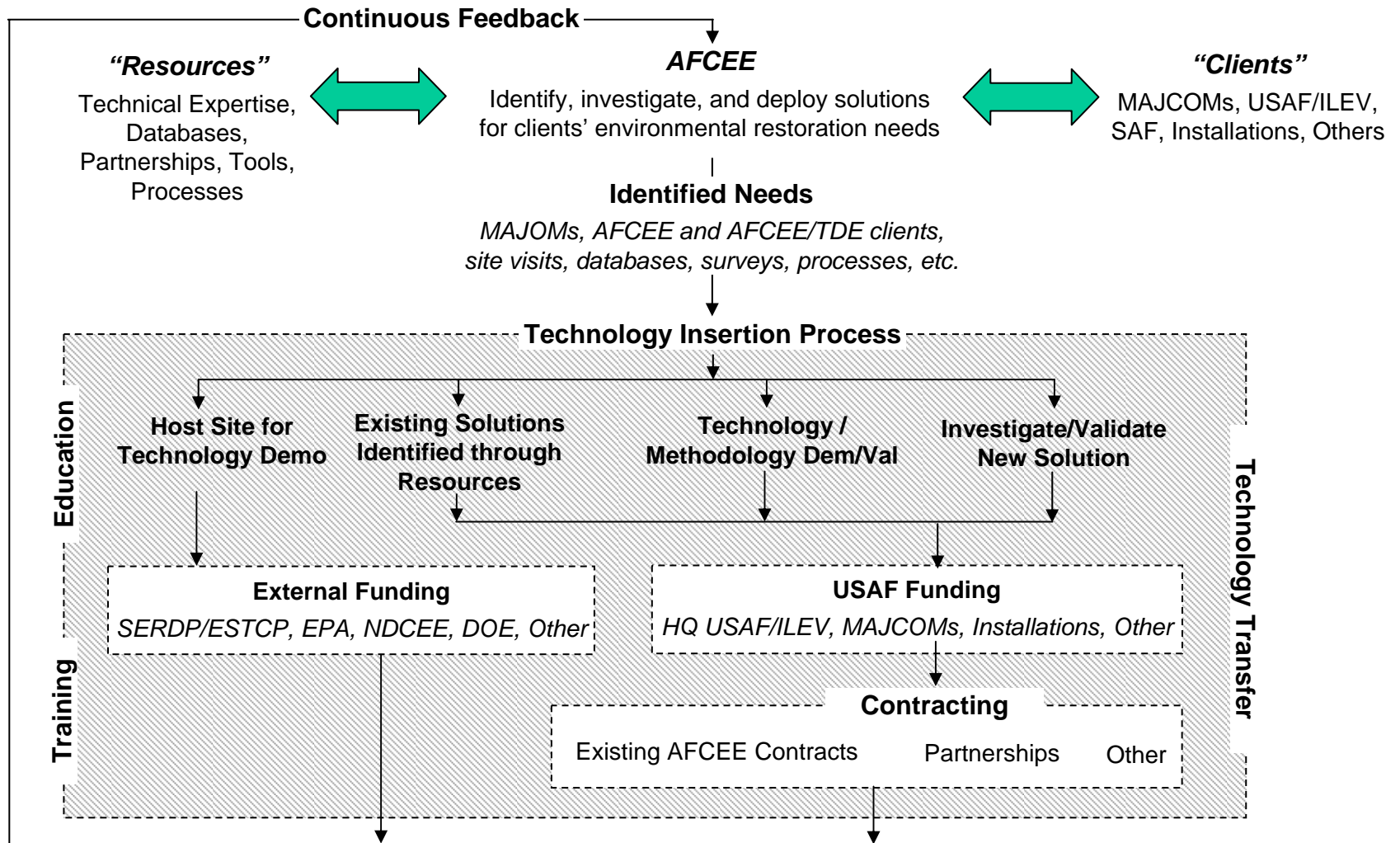
- Use technology demonstration & deployment versus R&D
 - ✓ Leave R&D to industry, other agencies
 - ✓ AFCEE dem/val's COTS or GOTS technologies under field conditions – to achieve site closure
 - ✓ “Technology” refers to new equipment or new processes that streamline cleanup operations
 - ✓ Move from high-cost active system technologies to low-cost passive system technologies
 - ✓ No vested interests other than save \$ and close sites



...creating an adaptive, innovative, and implementable path forward for Air Force restoration into the future



AFCEE Environmental Technology Transfer Process





AFCEE Technology Transfer – Return on Investment

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<u>Technology (# sites)</u>	<u>Savings</u>	<u>ROI</u>
■ Bioremediation / Bioventing (176)	\$54.0M	5:1
■ Natural Attenuation (45)	\$525M	45:1
■ Internal Combustion Engine (6)	\$3.5M	2:1
■ Bioslurper (33)	\$15.5M	6:1
■ Risk-Based Site Closure (22)	\$10.1M	5:1
■ Diffusion Samplers (18)	\$2.4M	8:1
■ Remedial Process Optimization (AF-wide)	\$120M	12:1
■ Phytotechnologies (8)	\$7M	6:1

Total Savings - \$738M

AVG ROI - 11:1

Site Closures - 165

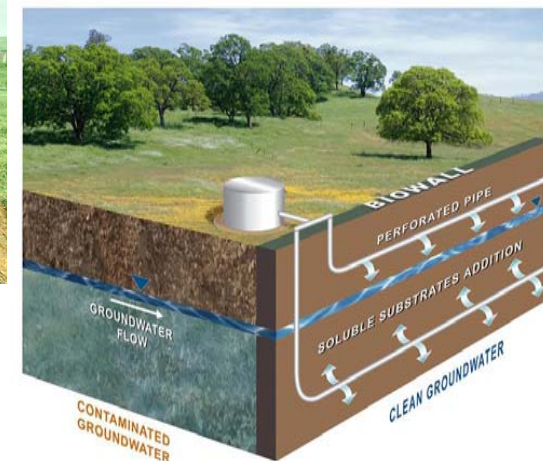


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Enhanced In Situ Bioremediation – Biowalls

■ Enhanced In Situ Bioremediation (EISB) – Biowalls

- ✓ **Significant taxpayer savings when compared to existing technologies**
- ✓ **Requires minimal maintenance; can treat TCE plumes at fraction of cost of pump-and-treat**
- ✓ **Construction costs typically 1/3 of construction costs of permeable zero-valent walls**
- ✓ **Uses simple organic materials, often free (e.g., tree mulch, agriculture waste products)**
- ✓ **Nine biowalls installed to date**
 - Altus, Offutt, Dover, Ellsworth, FE Warren, NAS Ft Worth JRB, Whiteman
- ✓ **Longest biowall installed to date is Altus AFB at 5,200+ linear ft**
 - \$30M avoidance
- ✓ **AFCEE “how-to manual” due out December 2006**

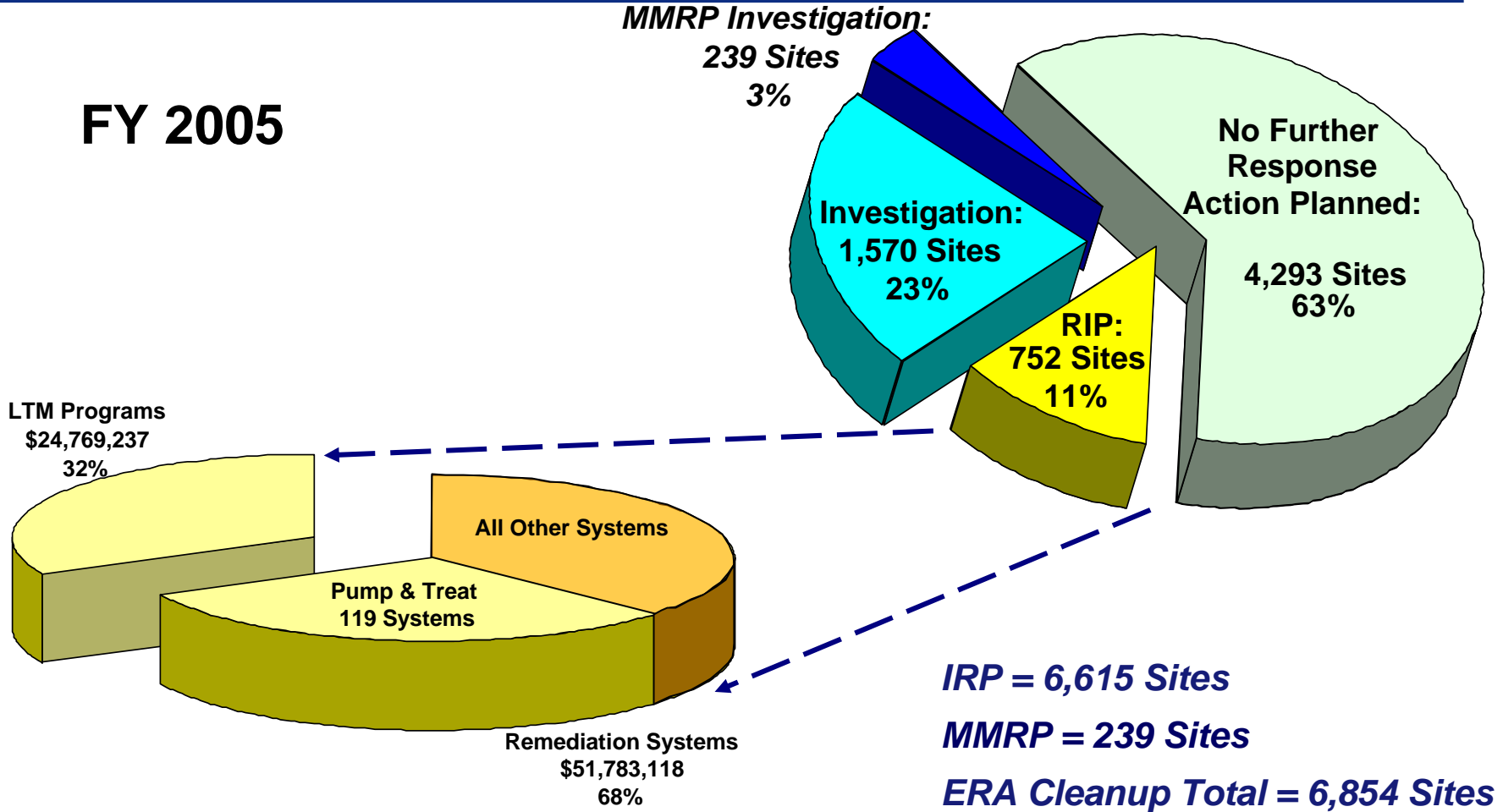




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Program Status Optimization Potential

FY 2005



74% PROGRAM COMPLETE

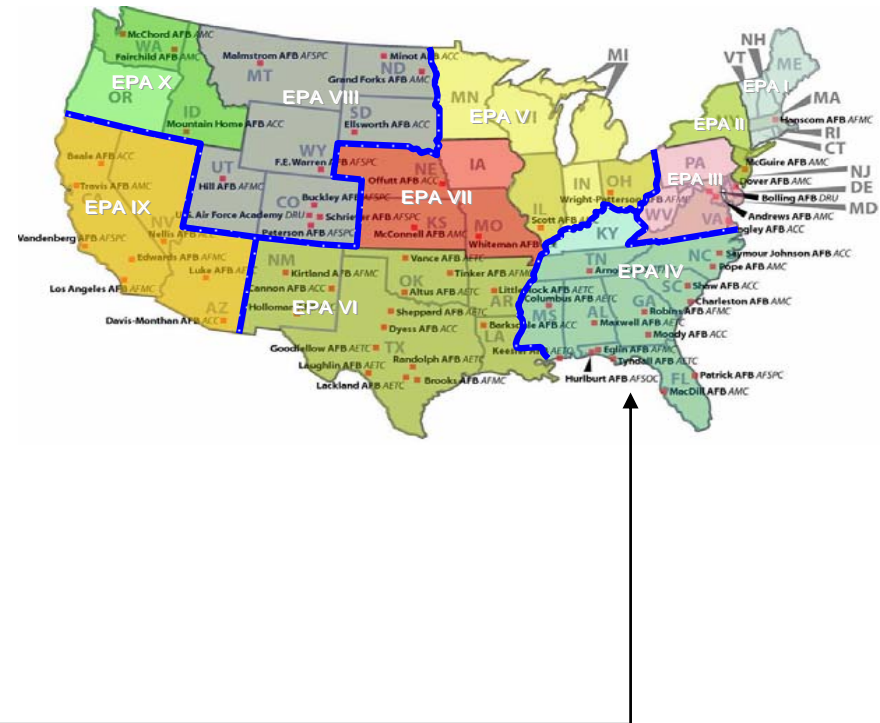
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Remedial Action-Operations & Long Term Monitoring Consolidation

- Long Term Monitoring
 - \$24.8M in FY05
- Remedial System O&M
 - \$51.8M in FY05
 - Pump-and-Treat Systems
 - \$25.6M alone
 - Longest expected operating lifetime (i.e., 27 yrs)
- Regional RA-O/LTM Consolidation
 - Region 4
 - Greatest MAJCOM participation
 - FY07 Performance Based Contract
 - Regions 1, 2, 3 & 5 in FY08





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P2 Technology Support for the Weapon Systems

✓ **\$5M weapon system pollution prevention (P2) program**

- **Environmentally Advantaged Radar Absorbing Material**
 - Two materials currently undergoing full scale tests on F-16 demonstrate 70% & 30% reduction in application time; quicker return to the field
- **Low Temperature Cure Powder Coating**
 - Joint Air Force/Navy project to gain the advantage of low-VOC powder coatings for non-flight critical composite aircraft parts; will reduce over 10,000 lbs of VOCs, plus over \$300K in labor/materials
- **Environmentally Advantaged (LBOD) Aircraft Deicing Fluids (ADF)**
 - Demonstrations on KC-135 aircraft prove the effectiveness of the non-toxic, biodegradable, non-corrosive, cost-effective, drop-in substitute for the propylene glycol (PG) based deicing fluids

✓ **AFCEE's partnership with the weapon system environmental community improves the process to transition P2 technologies to the war fighter**

