



**US Army Corps of Engineers**



**Society of American Military Engineers  
Joint Engineer Training Conference  
Salt Lake City, UT  
11–15 May 2009**

**FUDS Restoration Program**

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HQ, US Army Corps of Engineers

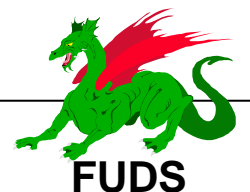
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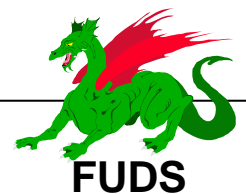
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# Overview

- **Introduction to FUDS**
- **Organizational Responsibilities**
- **Program Funding**
- **Program Initiatives**
- **Challenges**

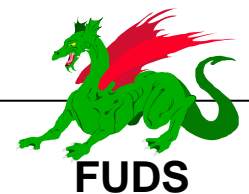




## What is FUDS?

**Definition: Real property that was under the jurisdiction of the Secretary and owned by, leased by, or otherwise possessed by the U.S. and those real properties where accountability rested with DoD but the activities at the properties were conducted by contractors that were transferred from DoD control prior to October 17, 1986.**

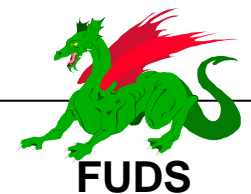
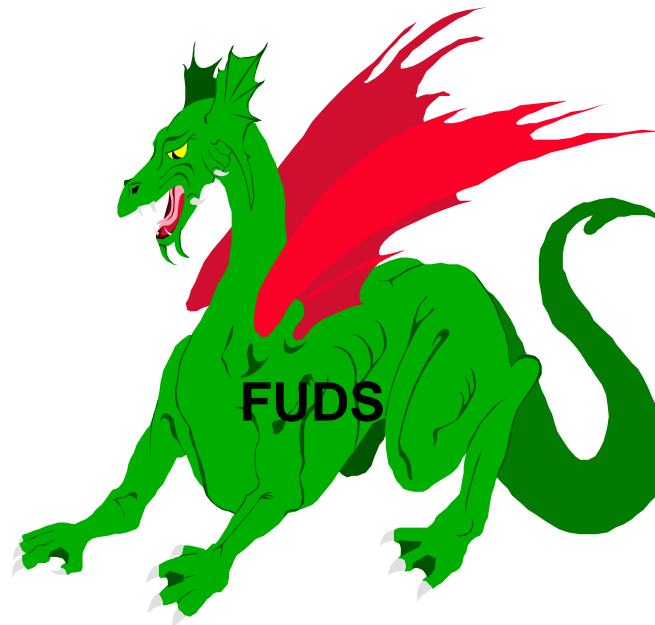
**Goal: “To reduce, in a timely and cost effective manner, the risk to human health and the environment resulting from past DoD activities at formerly used Department of Defense properties.”**





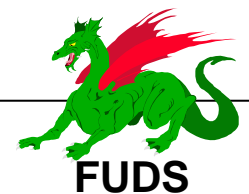
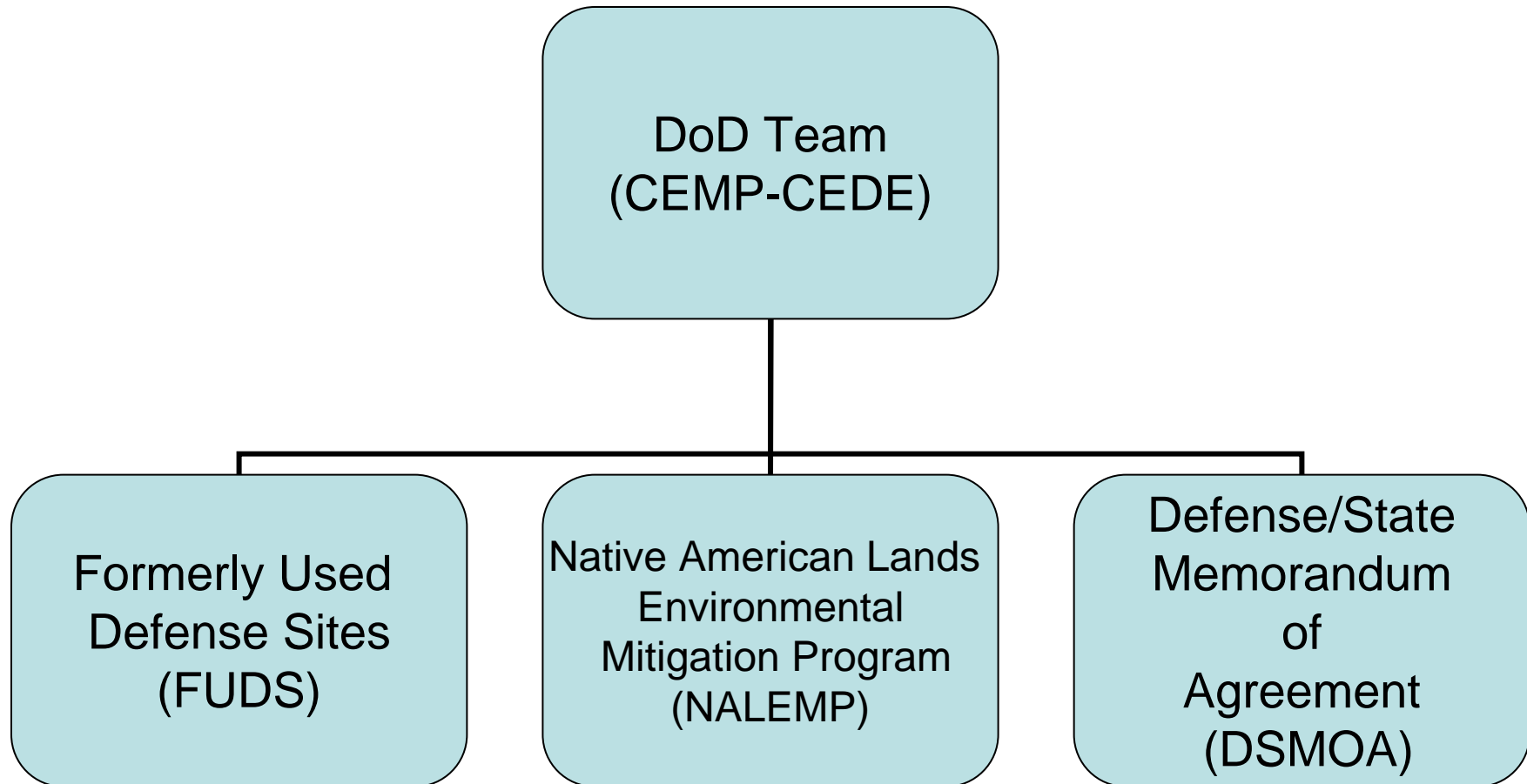
## FUDS is a Different Animal

- The FUDS Program addresses only **DoD generated** contamination that occurred before 1986, before transfer of property
- DoD **does not own** the property that FUDS is addressing
- We **do not certify** that the property is clean
- We work hand in hand with current property owners and regulators on cleanup efforts





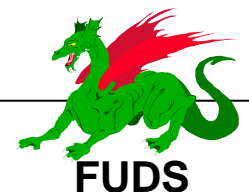
## HQUSACE Organizational Responsibilities





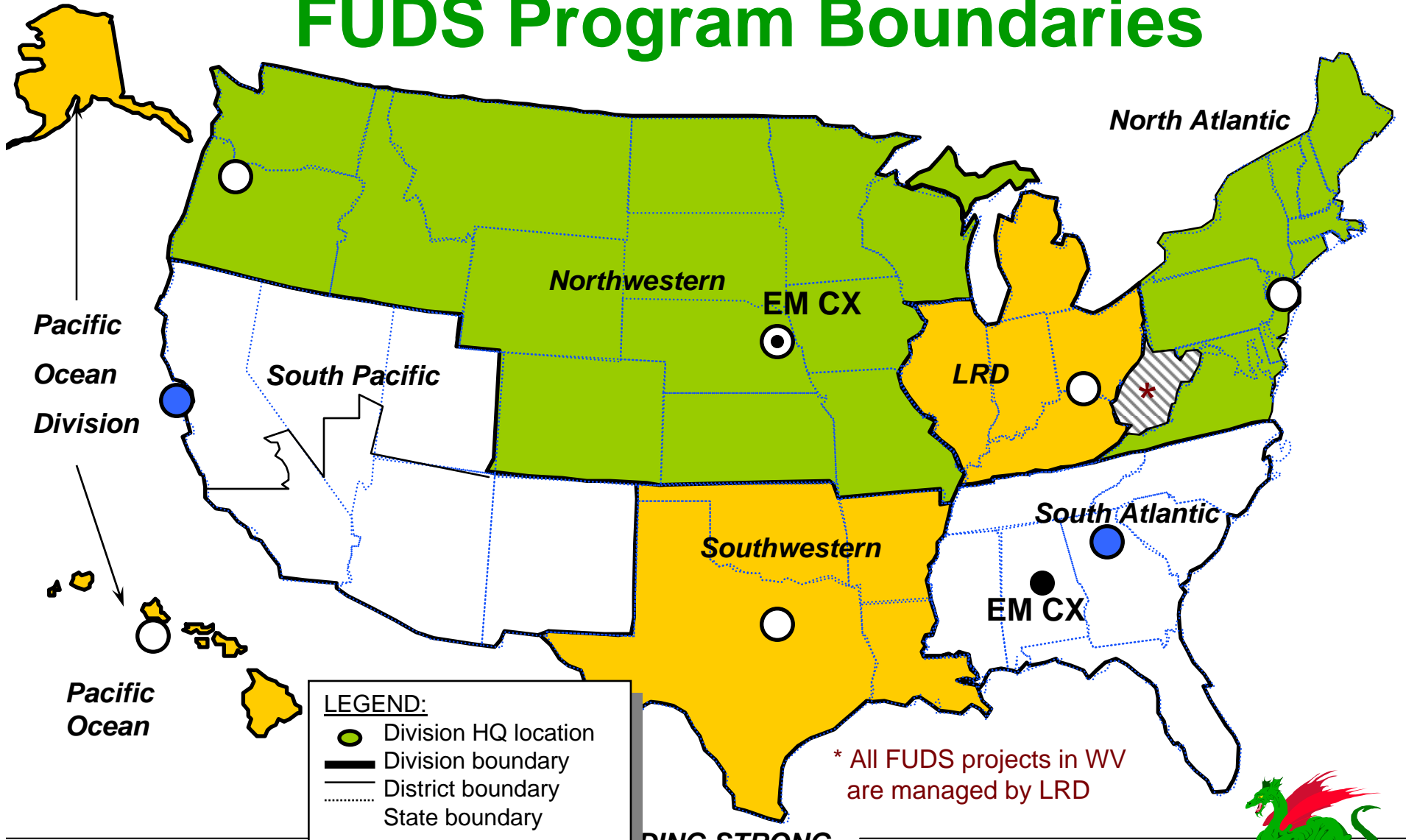
## USACE Organizational Responsibilities

- **HQUSACE, FUDS Program Management**
  - Stacy Hirata Acting Chief, Environmental Community of Practice (e-CoP)
  - Julian Chu, Acting Chief, DoD Team (CEMP-DE)
  - Jeff Waugh, Acting MMRP Team Leader under CEMP-DE
- **RBCs/Districts/CX, Program Execution**
  - **7 Divisions & 14 FUDS Program/Project Management Districts**  
**Supported by:**
    - **5 MM Design Centers**  
Baltimore, Omaha, and Huntsville MM Design Ctrs, South Pacific Division Range Support Center, and Recovered Chemical Warfare Materiel (RCWM) Design Ctr, Huntsville
    - **10 MM Remedial Action Districts**  
Baltimore, Omaha, Fort Worth, Louisville, Los Angeles, Sacramento, Mobile, Savannah, Hawaii, and Huntsville
    - **10 Potentially Responsible Party (PRP) Districts**
  - **Environmental & Munitions Center of Expertise (EM CX)**

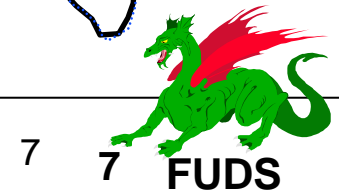




## FUDS Program Boundaries

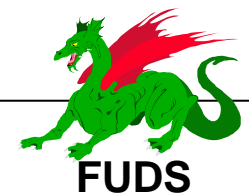
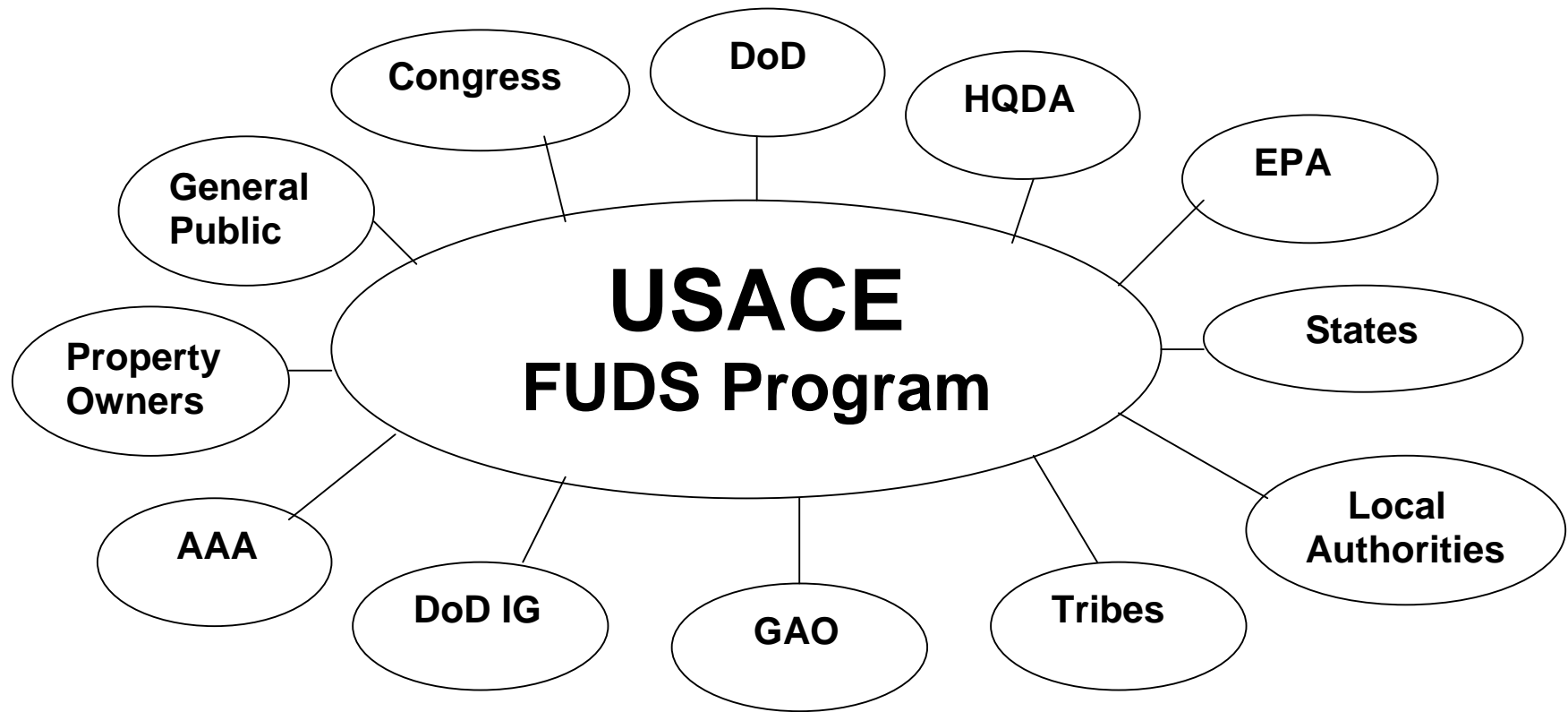


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# FUDS Stakeholders





# US Army Corps of Engineers

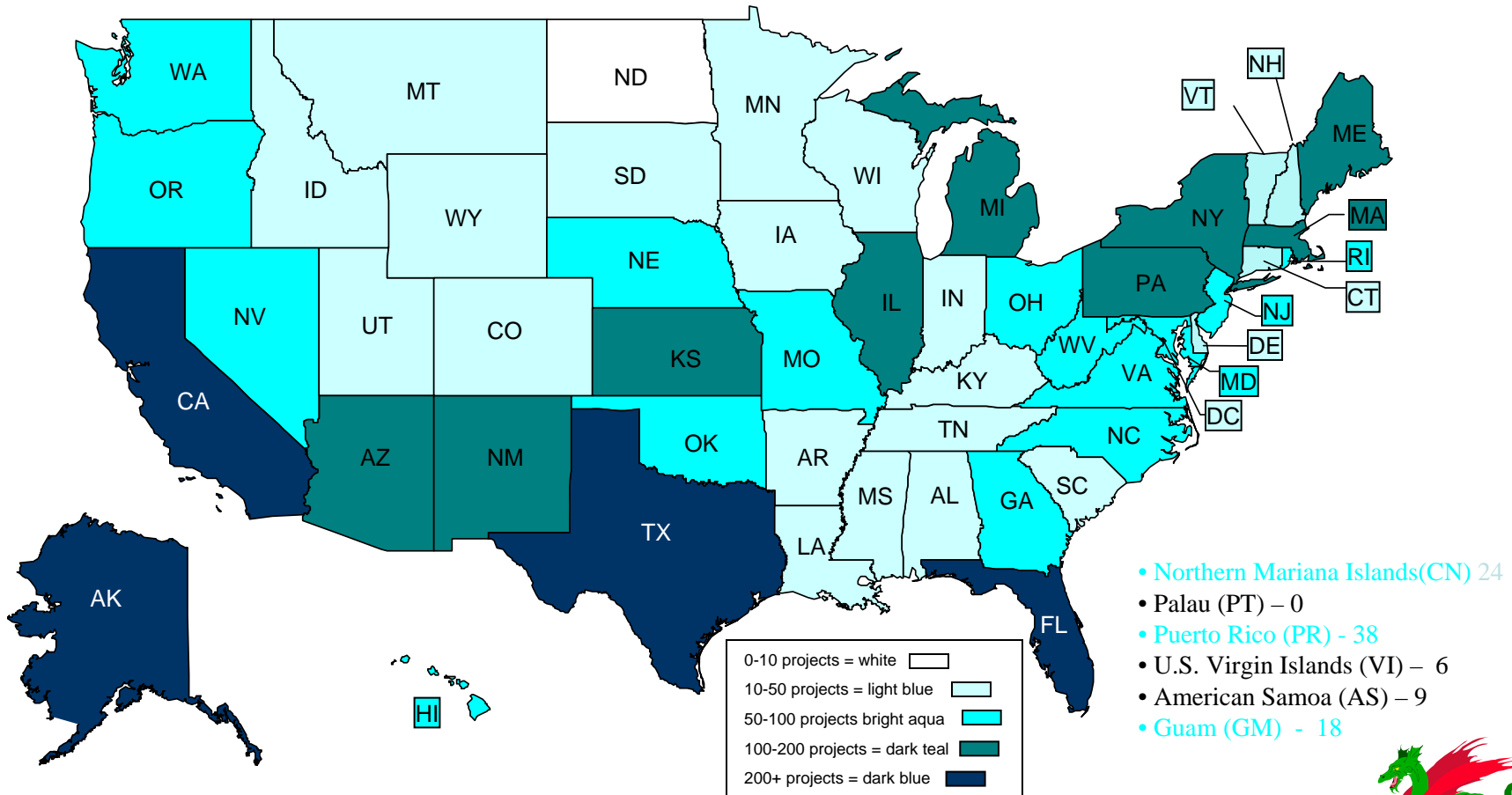


## Scope of FUDS Program

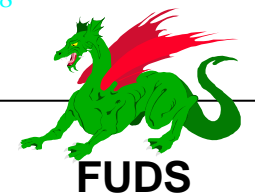
Data: **FY08** DERP Annual Report to Congress

Total Number of Distinct Properties: **9980**

Total Number of Projects (MMRP, MMRP/CWM, HTRW, CON/HTRW, and BD/DR): **4750**

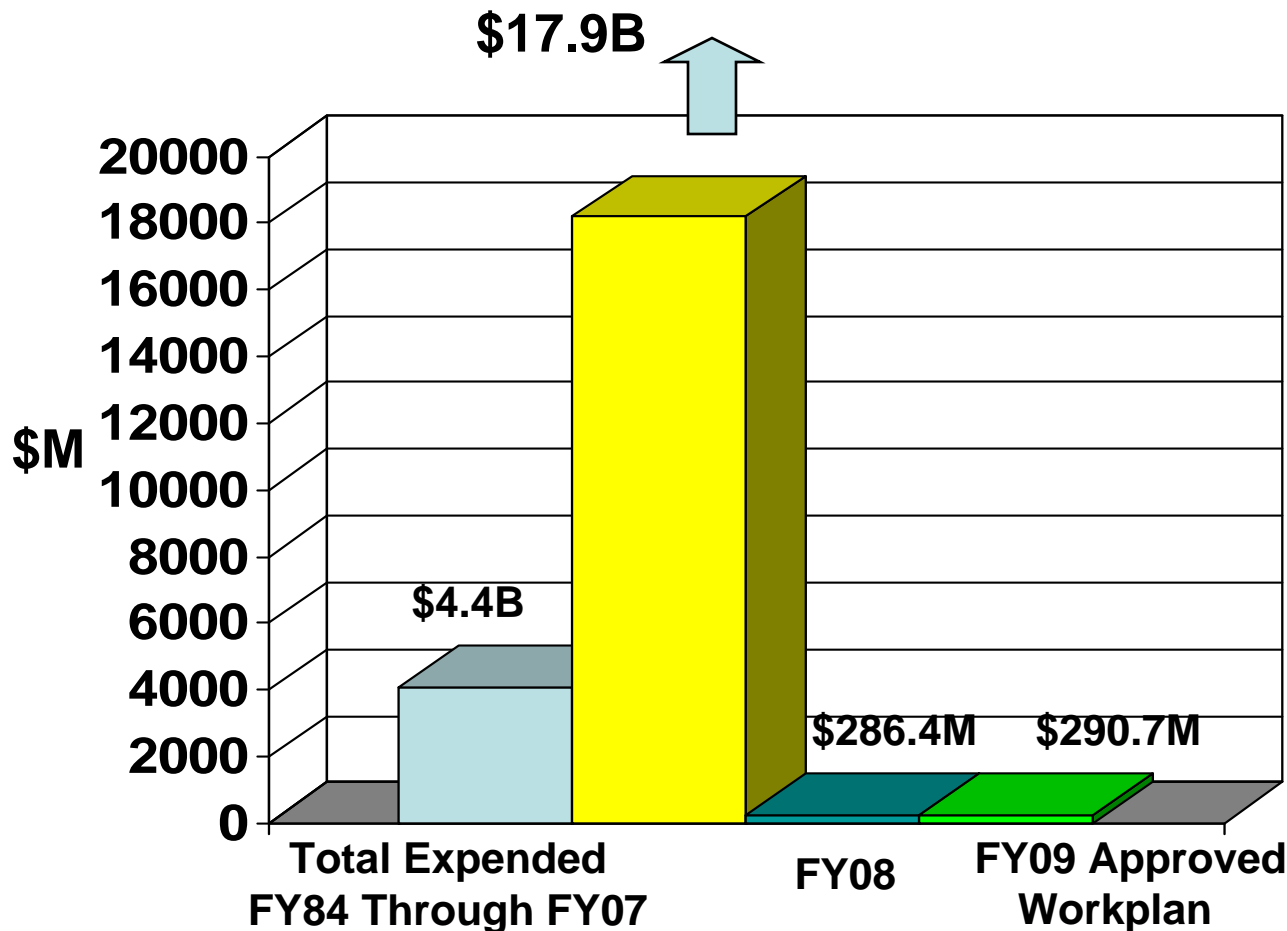


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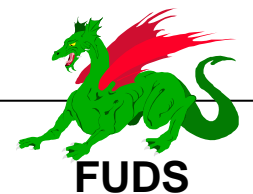




## FUDS Cost to Complete

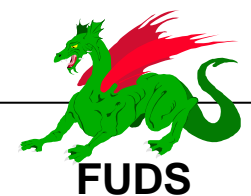
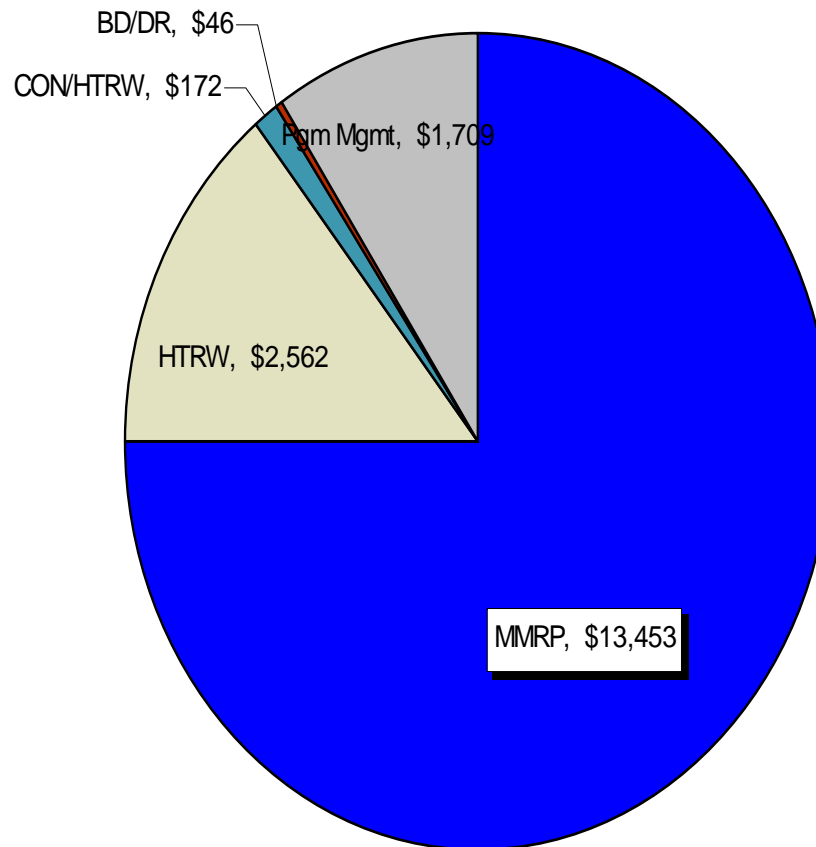


Note: Overall program funding insufficient to meet DoD's goals and stakeholders' expectations





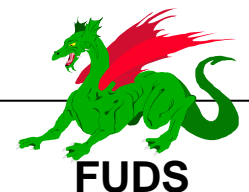
## FUDS Cost-to-Complete (\$M) Profile (Total CTC = 17.9B)





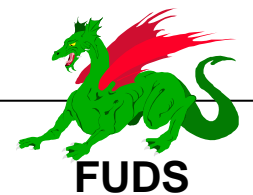
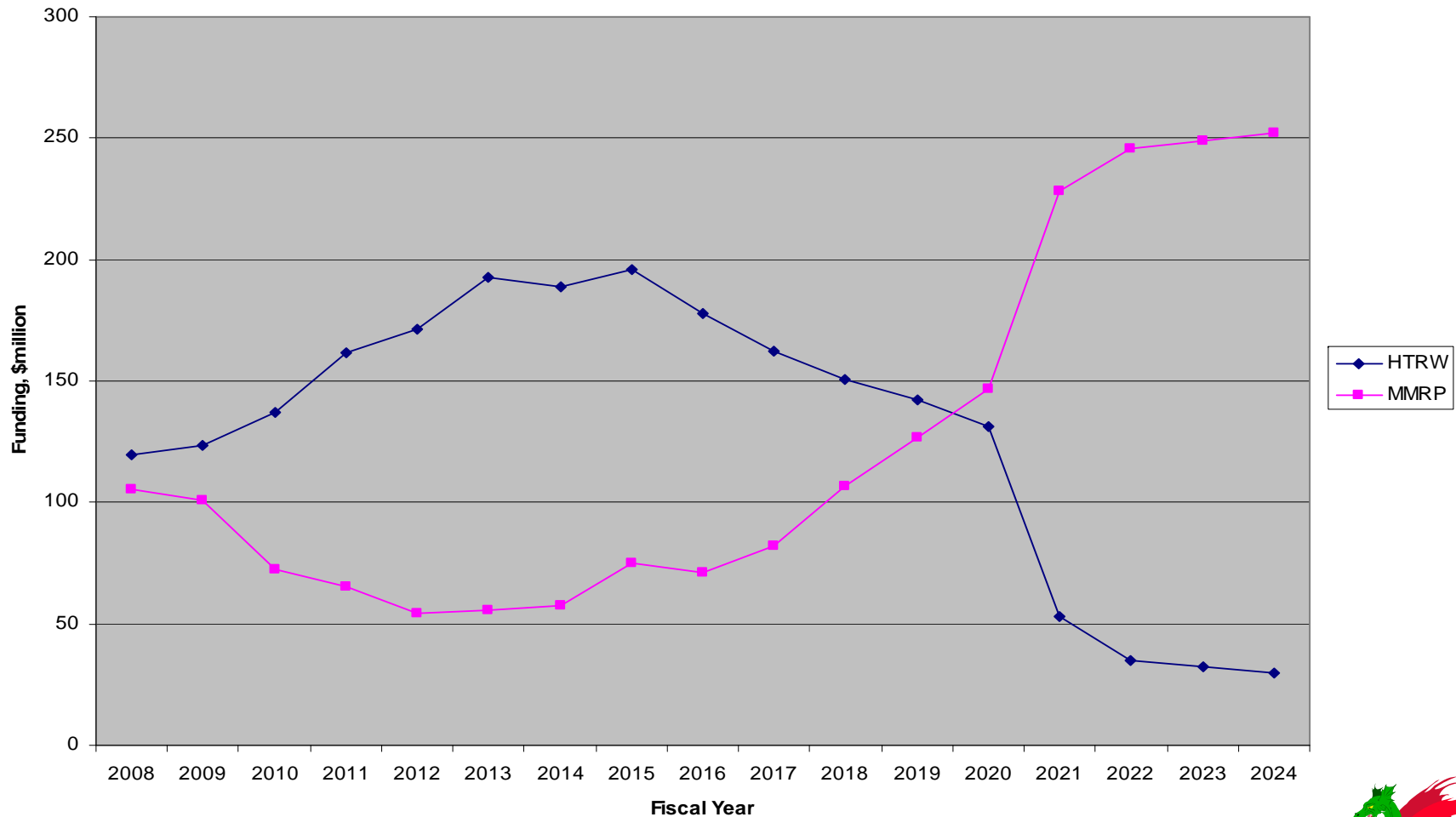
# FUDS Program Goals

- **IRP (HTRW & CON/HTRW) Projects**
  - Achieve Remedy-In-Place or Response Complete (RIP/RC) for all IRP projects by 30 Sep 2020
- **MMRP Projects (SI Phase Only)**
  - Complete FY2004 ARC baseline (765) MMRP-SI by 30 Sep 2010
  - Complete FY2005 ARC baseline (962) MMRP-SI by 30 Sep 2012
  - Complete FY2007 ARC baseline (1073) MMRP-SI by 30 Sep 2013





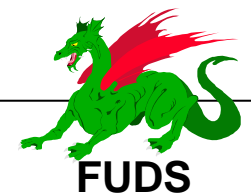
## Annual Funding for HTRW & MMRP as Planned





# Cost-to-Complete (FY09 & Beyond) for IRP (HTRW and CON/HTRW) Projects

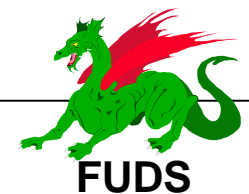
Phase	CTC (\$M)
SI	35.8
RI/FS	294.6
RD	51.9
RA-C	1,287.3
RA-O	606.9
LTM	457.8
<b>ALL</b>	<b>2,734.3</b>





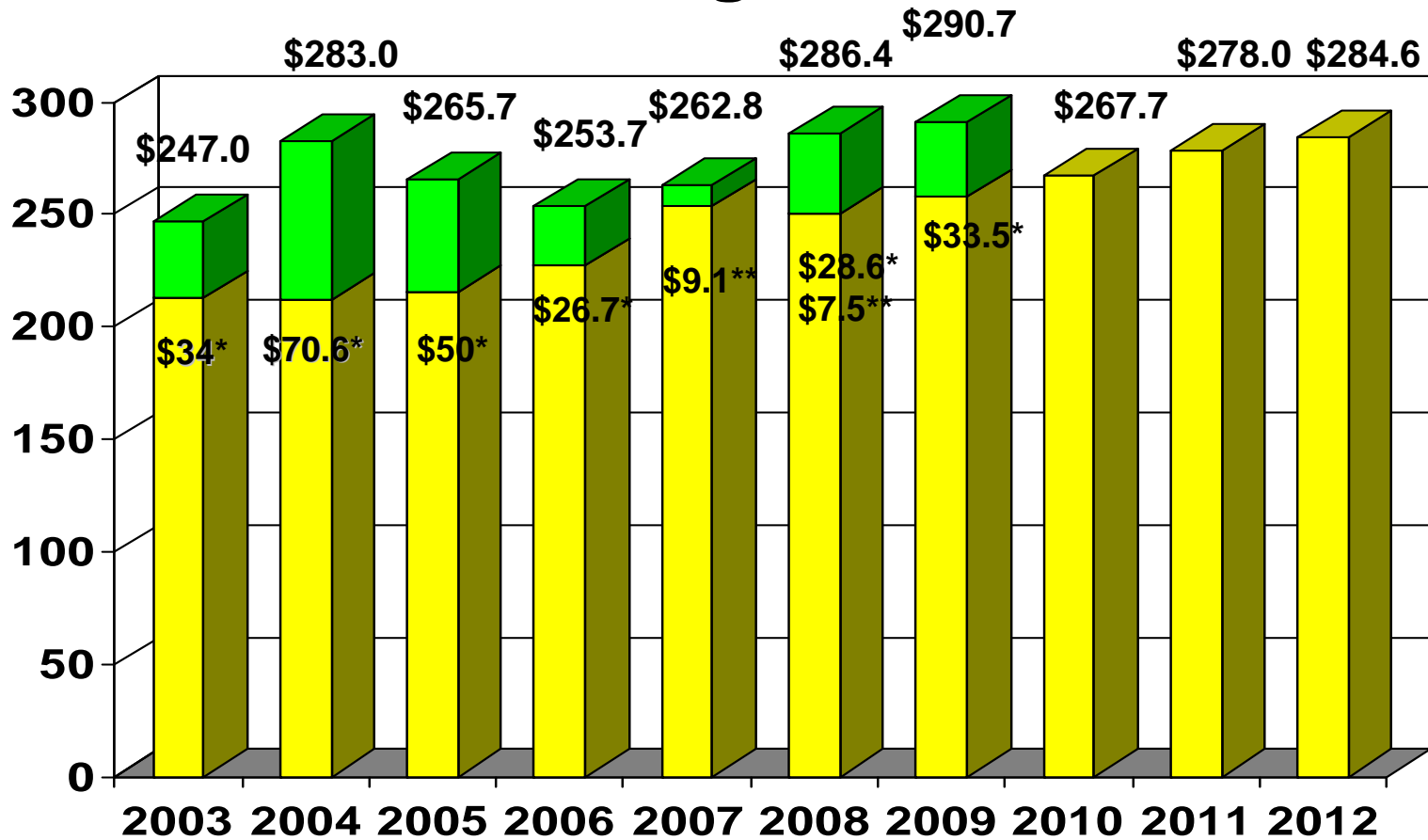
# Cost-to-Complete (FY09 & Beyond) for MMRP Projects

Phase	CTC (\$M)
SI	80.6
RI/FS	1,527.6
RD	54.8
RA-C	11,268.8
RA-O	1.7
LTM	519.2
<b>ALL</b>	<b>13,452.6</b>





## FUDS Program POM

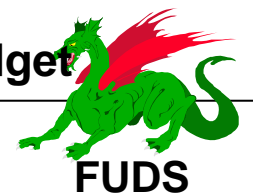


\*Plus up by Congress    \*\* Reprogrammed Prior Year

FY03-FY08: Actual Budget

FY09-FY12: Planned Budget

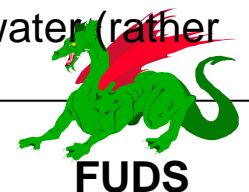
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## Green Remediation

- **Plum Brook Ordnance Works, Ohio**
  - Utilized **windrow composting** to effectively remediate soil contaminated with nitroaromatic compounds.
- **West Virginia Ordnance Works, West Virginia**
  - Enhanced in-situ bioremediation for groundwater cleanup – (1) emulsified oil substrate mixed with a microbial nutrient (yeast extract) and injected into the intermediate water bearing zone, and (2) using a Hydrogen Release Compound (HRC, registered trademark).
  - In-situ soil blending to distribute chemical amendments throughout the soil volume to promote either chemical oxidation or biodegradation processes and decrease the concentration of nitroaromatic compounds.
- **Spring Valley, Washington, D.C.**
  - Phytoremediation as an alternative technology to excavation and backfill for remediation of arsenic soils on residential properties.
- **Raritan Arsenal Building 160, New Jersey**
  - Installed passive vapor mitigation system using wind driven turbines on the roof top.
- **Nebraska Ordnance Plant, Nebraska**
  - Wind turbine to partially operate a groundwater circulation well.
  - Beneficial reuse of extracted and treated groundwater for irrigation of crops.
  - Advanced Oxidation Process to destroy contamination in extracted groundwater (rather than media transfer such as granular activated carbon or air stripping).





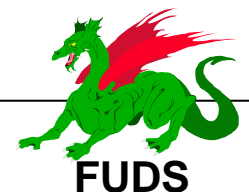
# Innovative Technologies Currently Used at HTRW and MMRP Sites

- **Remediation**

- Phytoremediation
- Genetically-engineered Phytoremediation
- In-situ Chemical Oxidation
- Lime on Grenade Ranges
- Thermal Conductive Heating for Fractured Rock
- Nanoscale Iron

- **Characterization**

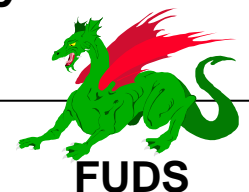
- Passive Ground Water Sampling / Point Sampling
- Multi-increment Sampling
- Hydrophysical / Geophysical Logging
- Visual Sampling Plan for planning sampling locations





## New MMRP MEC Technologies

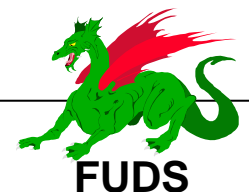
- **Commonly Available Innovative Technologies**
  - Multi-parameter anomaly classification
  - Portable x-ray technologies for classifying MPPEH
  - Underwater metal detectors
  - Visual Sample Plan For MEC
  - Robotic systems for clearing and mapping MRSs and excavating anomalies
- **Emerging Technologies Ready For Field Operations**
  - **Metal Mapper** multi-axis metal detector
  - **V-SEMS** and **M-SEMS** dual-technology metal detector (simultaneous magnetometer and EM measurements)
  - **TEMTADS** multi-component metal detector
  - **Physics-based** anomaly classifications
  - **In-situ learning** anomaly classifier





## FY09 Challenges

- **Meeting Program Goals and Stakeholder Expectation**
  - Strive to Meet IRP 2020 goal
  - Satisfy Stakeholder Concerns for Earlier Site Cleanup
- **GAO Audits**
  - Management of FUDS, FUDS Program Funding, and Emerging Contaminants
  - MMRP Sub-Program Funding and MMRP Project Duration/Progress
- **Resource Issues**
  - Larger, more visible programs (MILCON) taking precedence on contract





Questions ?

