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Annual DHS University
Network Summit



Mitigating and Recovering from Chemical and Biological Attacks

Breakout Session - Panel 4

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Panel 4 – Mitigating and Recovering from Chemical and Biological Attacks

Dr. Leslie Yeo (Monash Univ., AUS)

Enabling Surface Acoustic Wave Microfluidic Technologies for the
Development of Rapid Miniaturized Biological Warfare Agent Detection Systems

Dr. Eiichi Tamiya (Osaka Univ., JAP)

Biosensor Network Systems for Early Detection of Chemical/Biological Threats

Dr. George Bettinger (Univ. Texas Medical Branch, USA)

Rift Valley Fever - Current Situation and Research on Diagnostics and
Vaccines



Overview of DHS S&T Response & Restoration Efforts

March 19, 2008

University Programs Summit

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Outline

Biological Response and Restoration

- **Restoration Guidance**
- **Interagency Biological Restoration Demonstration**

Chemical Response and Restoration

- **Restoration Guidance**
- **Prototype High Throughput Laboratory**
- **CWA Fixed Labs**



DHS S&T Response & Restoration Program

GOAL: Generates capabilities for rapid return of a *biological-* or *chemical-*contaminated site to a normal condition. Areas of *primary* support include:

- Development of technologies and guidelines for decontamination
- Strategies, capabilities and tools for the analysis of contaminated areas before and after a restoration process



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Restoration Guidance

–Restoration Guidance & Checklist for Major Airports after a Bioterrorist Attack

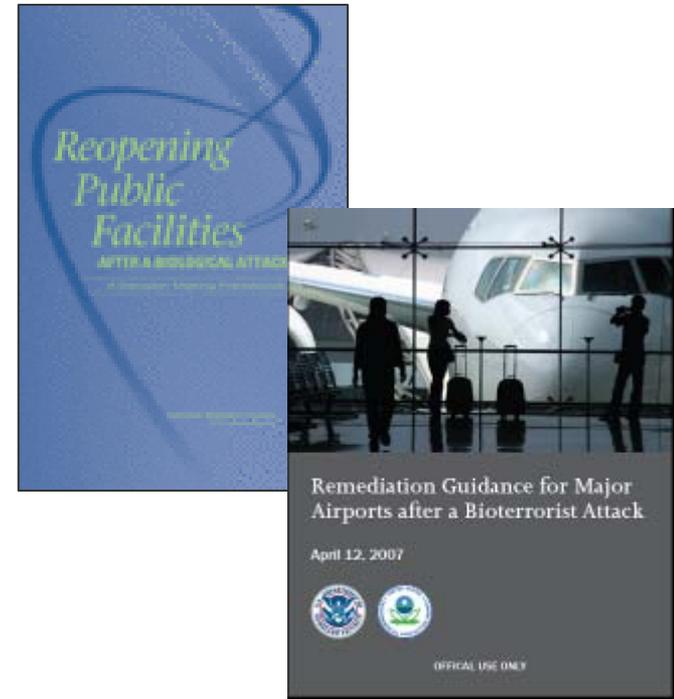
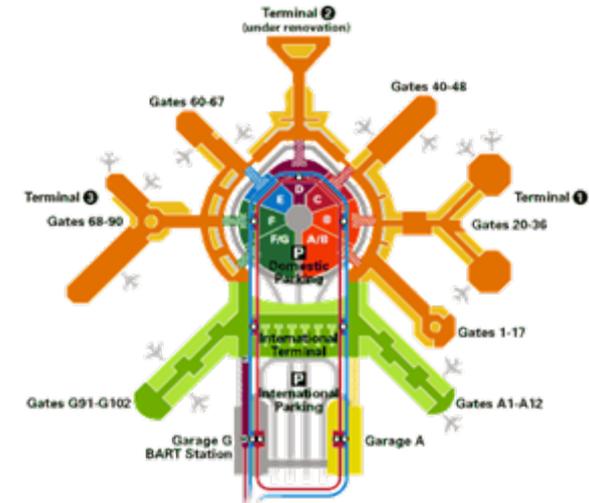
- NAS Study: *Reopening Public Facilities after a Biological Attack: A Decision Making Framework*
- “Pre-reviewed” Protocols & Plans

–Airport Preparedness Workshop

- Co-sponsored with EPA/CDC
- Eastern Airports (Port Authority of NY & NJ, Washington Metropolitan Authority, & Chicago Dept. of Aviation)

–Restoration Guidance for Transit Systems

- Partners (WMATA, MTA)
- Builds off of Restoration Guidance for Airports



Evaluation of Sampling Methods and Strategies in an Operational Environment

Background:

- Idaho National Laboratory (INL) Test Site
- Funded by DHS S&T and JPEO-CBD
- Experimental design/sample collection plans created by EPA, NIST, and PNNL
- Onsite sample analysis conducted by the 9th Area Medical Laboratory using a JPM Guardian mobile laboratory, operations managed by JHU APL
- Sample collection conducted by:
 - National Guard Bureau Civil Support Teams
 - EPA Emergency Response personnel
 - HazMat responders from Miami Dade County, Florida



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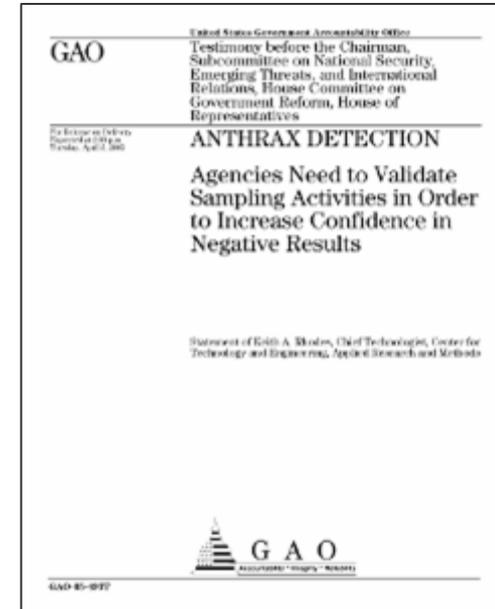
Evaluation of Sampling Methods and Strategies in an Operational Environment

Validated Sampling Plan Working Group:

- Established in response to GAO report “GAO-05-493T” regarding response to Anthrax attacks of 2001
- VSP WG members:
 - Chaired by DHS S&T
 - DoD, EPA, CDC, FBI, and NIST
- Group mission:
 - Validation of sampling strategies and plans

Objectives of INL Tests:

- Compare sampling strategies (judgmental and probabilistic) against concentration gradient to characterize and clear a building
- Gather on efficiency of sample collection methods in operational environment
- Gather baseline data on rapid detection methods using operational samples
- Apply test data to assist in validation of different dispersal and sampling models



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Interagency Biological Restoration Demonstration

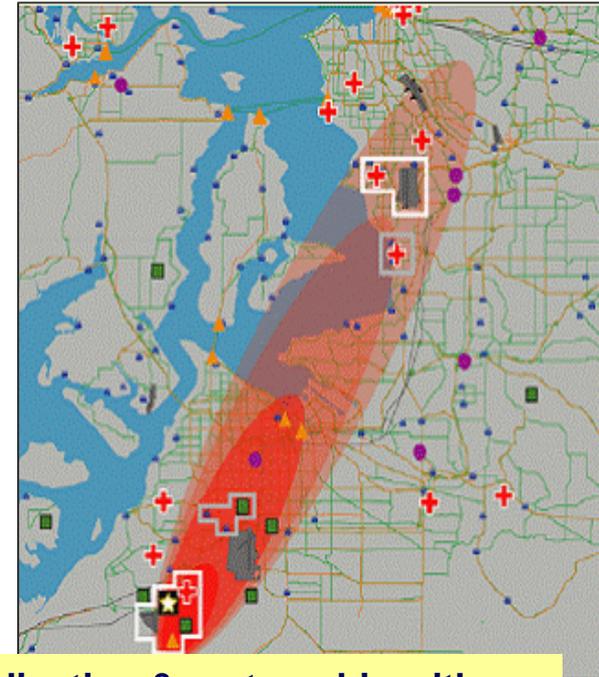
(Wide Area Restoration)

Goal/Objectives

- **Goal:** This program is focused on providing a coordinated, systems approach to the recovery and restoration of wide urban areas, to include DOD infrastructures and high traffic areas following the aerosol release of a biological agent.
- **Objectives:**
 - Study the social, econ, & ops interdependencies
 - Develop strategic restoration plans for DOD & DHS
 - Id & demo technologies that support restoration
 - Exercise restoration activities & technology solutions



**DOD (DTRA) & DHS (S&T)
co-sponsored program**



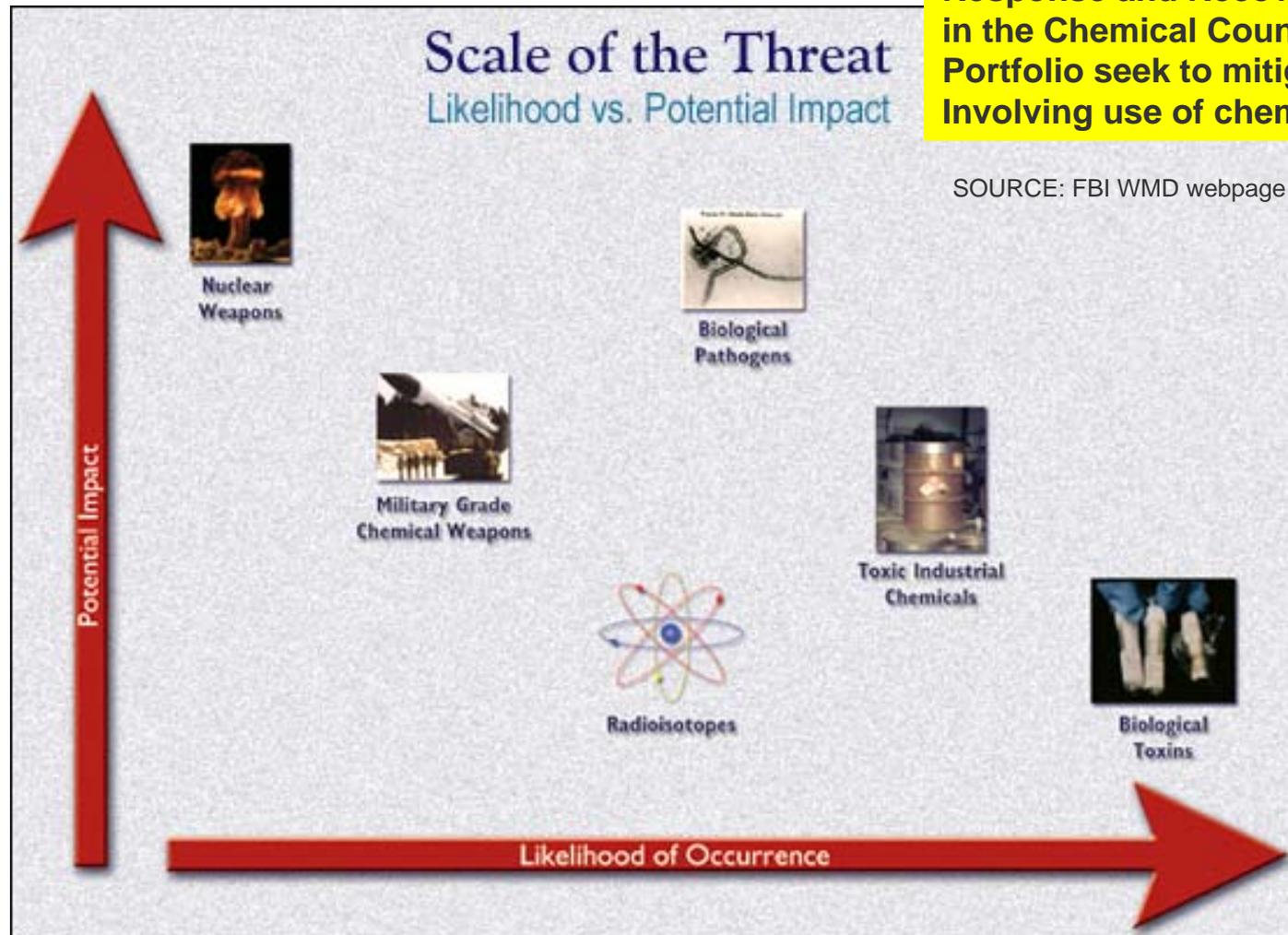
**Coordination & partnership with
Interagency (EPA/CDC/etc), urban
area, and other identified partners**



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WEAPONS OF MASS DESTRUCTION

Response and Recovery projects in the Chemical Countermeasures Portfolio seek to mitigate impacts Involving use of chemical agents



SOURCE: FBI WMD webpage



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Restoration Guidance

– Restoration Guidance & Checklist for Major Airports after a Chemical Attack

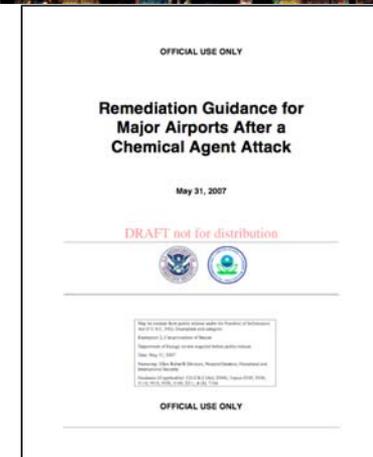
- Builds upon earlier Biological Restoration project
- “Pre-reviewed” Protocols & Plans
- Establishes clearance goals for re-occupancy

– Key Stakeholder Activities

- Partner - Los Angeles International Airport
- Table-top exercise; final technology demonstration including new fixed and mobile lab assets

– Focused Technology Development Tasks

- Statistical sampling strategies and methods
- Decontamination of large volumetric spaces
- Agent fate on materials



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Transportable Prototype High-throughput Integrated Laboratory Identification System

– Mobile Laboratory Platform for On-site Analysis of Environmental Samples

- Rapidly deployable; operational within hours
- Utilizes modified EPA analytical methods
- Ability to analyze CWAs and TICs
- Capacity: several hundred samples/day

– Key Attributes

- Multiple GC-MS instruments; LC-MS capability for CWA degradation products
- Purge and trap, pressurized solvent extraction techniques for sample prep
- Laboratory Information Management System
- Capability to interface with CWA Fixed Labs



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CWA Fixed Lab Capability

– Enhancing Readiness to Respond to Emergencies

- Funded jointly by DHS S&T and US EPA
- Establishes network of prototype environmental labs to assist with assessment & remediation of CWA contamination
- Labs will have full EPA certification, standard methods for monitoring agents, standard reporting protocols
- Optimized protocols will maximize throughput

– Prototype Network

- Labs established in US Northeast corridor, Mid-Atlantic, Southeast, Southern and West regions
- Combination of Federal and State labs that will form an *EPA-led* environmental Chemical Laboratory Network (*eLRN*)





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