EPA Update: Ranges; Alternatives to OB/OD and BIP

National Association of Ordnance Contractors

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History of OB/OD/BIP Under RCRA

- 1978 – proposed: ban on all OB/OD of hazardous waste
- 1980 – final rule: OB/OD is prohibited, except for explosives/propellants when:
  - There are no safe alternatives, or
  - It is an emergency.

  Note: This exemption for OB/OD of explosives was considered temporary pending development of alt technologies.
- 1987 – final 40 CFR Part 264 Subp X rules: includes OB/OD

History: Ranges

- Landmark firing range case: Connecticut Coastal Fishermen's Assoc v. Remington Arms, 2nd Circuit Court of Appeals (1993) [EPA amicus brief, 8/31/92]…two definitions of "solid waste" and "hazardous waste"
  - **Regulatory**: narrowly defined (characteristic; listings)
    - For permitting
  - **Statutory**: more broadly defined
    - Statutory authorities

Statutory & Regulatory Authorities

- **Statutory**
- RCRA 3004(u); 40 CFR 264.101: SWMUs releases
- RCRA 3004(v); 40 CFR 264.101: releases beyond fac boundary
- RCRA 3007: info gathering & inspections, incl. sampling
- RCRA 3008(a): compliance orders
- RCRA 3008(h): interim status corrective action orders
- RCRA 3013: monitoring, analysis, & testing orders
- RCRA 7003/CERCLA 106/SDWA: imminent & substantial endangerment orders
- **Regulatory**
- 40 CFR 264/270: permit regs
- RCRA 3005(c)(3); 40 CFR 270.32(B)(2): omnibus authority to add permit conditions to protect HH&E

Current Status of OB/OD Under RCRA

- OB/OD Universe:
  - 169 RCRA OB/OD facilities
    - 61 operating (26%)
    - 108 closing/closed (64%)
  - Lots of OB/OD outside this universe
    - Range cleanup on range
    - Training
    - Emergencies
  - 54 Superfund OB/OD NPL sites (includes some RCRA)

<u>Operating</u>

DOD 35

DOE 4

NASA 1

Total Fed Govt 40(66%)

Private Sector 21(34%)

EPA OB/OD Activities

- **EPA is Documenting OB/OD:**
  - **Contamination**
  - **Procedures to Clean Up/Clean Close**
    - **Site assessments**
    - **Cleanup procedures**
    - **Difficulties achieving clean closure**
  - **Costs to Cleanup/Clean Closure**
  - **Technical Alternatives**
  - **Working with ICE, DOD, NAS, DOT, ATF, FBI, DHS, NBSCAB, States**

EPA Activities

EPA-DOD OB/OD Workgroup

- Meets Quarterly
- To discuss issues of concern:
  - Contamination
  - Closure/Clean-up of OB/OD Sites
  - Alternatives to OB/OD
  - DOD optimization study
  - Problematic Sites
  - Risk Assessments

OB/OD Contamination

- **OB/OD/BIP is relatively uncontrolled, uncontained**
- **Media**
  - Air, Soils, Surface Water, Ground Water
- **Contaminants of Concern**
  - RDX, TNT, Perchlorate, Metals,
  - UXO, Kick-out
- **Characterizing contamination is difficult**
  - Legacy sites (i.e., contributions from other sources, e.g. training and testing ranges, manufacturing)
  - Legacy wastes (many waste streams prohibited from OB/OD today were burned pre-RCRA)
  - Inability to adequately monitor air
- **But, enough info exists (RCRA, Superfund, Army cold regions/Canadian/SERDP studies) to indicate environmental contamination**

OB/OD Contamination Data

- Next slides are worst cases identified.
- Red numbers are the number of times the concentrations in soil or ground water exceed EPA action levels [action levels used are in brackets after each contaminant].
- This data was compiled by two summer interns (Jordan 2014, and Michelle 2015) from RCRA and CERCLA data.

OB/OD Contaminant Data

Soils

- **RDX** [5.6 mg/kg EPA residual screening level]
  - Chemtronics, Inc. — 290 mg/kg — **52X**
  - Camp Minden (LA AAP) — 100mg/kg explosives
- **TNT** [19 mg/kg EPA resid screening level]
  - Umatilla Army Depot, OR — 36,045 mg/kg — **1897X**
  - Chemtronics, Inc. — 280 mg/kg
- **Perchlorate** [15 µg/L]
  - Redstone Arsenal (Army/NASA) — 106,000 µg/kg — **7067X**
    - **Note**: legacy site [Thiokol]
- **Worst concentrations tend to be close in and further out**

OB/OD Contaminant Data (cont.)

Groundwater

RDX [2 µg/L]		
• Bangor Ordnance Disposal (Navy)	10,000 µg/L	**5,000X**
• Nebraska Ordnance Plant	534 µg/L	
• Mass Military Reservation	370 µg/L, 7300 ft plume	
• Dahlgren Naval Warfare Center	127 µg/L	
• Redstone Arsenal (Army/NASA)	96 µg/L	
TNT [2 µg/L]		
• Banger Ordnance Disposal (Navy)	40 µg/L (stormwater)	**20X**
• Nebraska Ordnance Plant	39 µg/L	
Perchlorate [15 µg/L]		
• Mass Military Reservation	500 µg/L, 10,000 ft plume	**33X**

OB/OD Cleanup Costs

- **3 contamination zones:**
  - Unit (incl particulate fallout area)
  - Kick-out area
  - Ground water plume
- **Cleanup costs:**
  - Lawrence Livermore Natl Lab (DOE) $627m
  - Ft. Wingate, NM >$202m
  - Air Force Real Property Agency/ Castle Air Force Base >$150m
  - Nebraska Ordnance Plant $61m
  - Umatilla Army Depot, OR >$60m
  - Idaho Natl Engg Lab (DOE) $48.3m
  - Iowa Army Ammunition Plant $40.3m
  - US Army Garrison/Ft. Wainwright $10.9m

- Plattsburgh Air Force Base $8.9m
- Banger Ordnance Disposal $8.9m
- Chemtronics, Inc. $6.2-8.2m
- Aqua Tech Environmental Inc. (Groce Labs) $4.7m
- Picatinny Arsenal, NJ $3.9m
- Cecil Field USN Air Station $2.8m
- US Army/NASA Redstone Arsenal $1.7m
- Moffett Naval Air Station, CO $1.1m
- Bangor Naval Submarine Base $.9m

Umatilla, OR

OB/OD Unit Cleanup

- 2,200 multi-increment soil samples (MIS) collected (metals & explosives)
- 1m cu yds soils excavated and screened for munitions & explosives of concern (MEC)
- 25,000 tons haz waste soils sent off-site for treatment/disposal
- 15,000 tons non-haz soils sent off-site for disposal
- 142,000 MEC recovered/destroyed
  - 5.3m lbs metal recycled

OB/OD Cleanup

OB/OD Closure/Cleanup Costs

- At least 4 sites above $100m
- Many sites > $10m

- **Costs for**:
  - Site assessments (geophys for UXO/frag/kick-out; soil and groundwater sampling), and
  - Remediation (retrieval of kick-out/UXO; excavation, soil sifting; groundwater plumes)

- **Many sites unable to achieve clean closure**
  - Close with contamination in place, post-closure/long-term care; institutional restrictions

Alternatives to OB/OD

- **NAS 2019 Report [Alternatives for Demilitarization]**
  - Alternatives exist for many energetic waste streams
    - Many alternatives currently in use; RCRA-permitted
    - Some wastes still problematic
  - Funding is major obstacle
- **EPA Report [Alternatives to OB/OD]**
  - Posted on our website
  - Many appropriate for BIP

U.S. Comptroller General - Sept 6, 1996

- Ruled in favor of DOD (Industrial Operations Command) to prohibit OB/OD as an option in its 4/10/96 solicitation for proposals for demilitarization.
  - Based on Congressional concerns with adverse environmental and cost impacts of OB/OD and Congressional intent that OB/OD be phased-out as soon as possible, wherever possible.
  - The fact that no statute bans OB/OD does not prohibit an agency from determinations consistent with legitimate Congressional environmental concerns.
  - In restricting the use of OB/OD, the agency is reasonably acting in response to repeated Congressional concerns about the environmental risks posed by and specific to OB/OD.

EOD

- Regarding Emergencies [EPA's RCRA Military Munitions Rule]:
  - Defined as:
    1) "immediate responses needed" → exemption; or
    2) "imminent and substantial endangerment" → emergency permit
  - Places decision-making with EOD professionals
  - Places contamination concerns with others: owners of the energetics, owners of the land
  - Keep record for 3 yrs: what, when, where, result

EOD/BIP

- **Factors**
  - Safety: uncertainty; stability; armed?
  - Safe to move?
  - Proximity to people and property
  - Urgency/expediency
  - Number of items
  - Availability of alternatives
  - Contamination/cleanup
- **Alternatives**
  - Robotics
  - Disassembly
  - Case penetration/energetics removal
  - Closed Detonation Chambers
  - Chemical Destruction
  - Thermal Destruction

- **Examples**
  - Mass Military Reservation
    - Apex of recharge zone of designated sole source aquifer
    - Detonation chamber
  - Pier 91: Detonation chamber
  - Camp Hale: BIP

Conclusions Regarding OB/OD

Progress:

- Alternatives demonstrated
- Reliance on OB/OD reduced

But, given OB/OD and BIP:

- Are relatively dirty technologies (relatively uncontrolled with greater potential for contamination)
- Difficult and costly to achieve clean closure
- Full Life-Cycle costs often favor alternatives
- Alternatives exist for many energetic wastes
- Strong Congressional and public interest
- Alternatives Are Safe, Cleaner, Cheaper

OB/OD and BIP should be avoided when:

- Safe to move
- Large quantities involved
- Populations in close proximity
- Safe alternatives exist, including MTUs
- Not an emergency situation
- Future land use

Range Cleanup

- Importance of Site Assessment
  - Historical records; photos
  - Site reconnaissance
  - Enhanced Digital Geo-referenced Technologies
    - EPA-DOD UXO Principles 3/7/00
  - Sampling

Conclusions

- ACTION:
  - Support renewed efforts by DOD and others to:
    - Reassess the use of OB/OD
    - Further develop alternatives
    - Phase out OB/OD where safe alternatives exist
    - Develop procedures to effectively assess and clean up OB/OD contamination
    - Assess case-specific determinations regarding a better way, including MTUs instead of BIP…stay tuned

Thank You

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Questions