Managing Construction Activities at Disposal Sites

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Patricia Donahue & Iris Davis

MassDEP Northeast Region Office

Wilmington, MA

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Presentation Summary

- Why Construction?
  - Problems encountered
- Regulatory Requirements
  - MassDEP expectations for submittals
- Case Studies/Examples
- Q & A Forum

Why this topic?

- Redevelopment of industrial land for commercial/residential use
- Level of investigation and cleanup not always commensurate with new uses or project
- New or different exposures created without adequate LSP evaluation
- Successor LSP/new parties

Problem Areas

- Lack of Site Characterization – particularly for pre-RAO RAMs
  - Precharacterize before excavation
    - Better able to manage Remediation Waste
    - Saves time and money
- Documentation of: soil Re-use, background
- Soil Stockpiles >120 days or 90 for HW
  - Not maintained/covered

Problem Areas

- No documentation of feasibility evaluation of remedial alternatives
- Inadequate documentation of caps/barriers
  - How remedial measures were conducted,

    e.g. sub slab systems, caps
- RAM abuse/misuse
  - Documentation & level of effort not always commensurate with scope of project , e.g. very large projects

Regulatory Jurisdiction & Definitions

- Remediation Waste
- Remedial Action
- Response Action Performance Standard
- Regulatory vehicles for remediation
- Release Abatement Measures

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Remediation Waste

310 CMR 40.0030

- Remediation Waste – means any Uncontainerized Waste, Contaminated Media or Contaminated Debris that is managed pursuant to 310 CMR 40.0030
- Contaminated Media: soil or water which exceeds release notification threshold ($\geq$ RCs)

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Remedial Action

310 CMR 40.0006

Definition: means any containment or removal

- Includes construction activities which involve removal, treatment, disposal or relocation of Contaminated Media (not assessment)
- Handling Remediation Waste must be done by one of five MCP remediation vehicles - *except where a Class A-1, A-2 or B-1 RAO applies*

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Response Action Performance Standard (RAPS)

310 CMR 40.0191

- Applies to all response actions
- Reasonable level of diligence to assess, evaluate and design remedial actions to achieve NSR and where feasible reduce OHM to background

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RAPS – employed during all response actions

- Consider relevant policies & guidelines by MassDEP & EPA
- Use accurate and up to date methods, practices and technologies
- Use scientifically defensible investigative practices

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RAPS – protective of health, safety, public welfare and environment

- Technologies which reuse, recycle, destroy, detoxify or treat OHM
- Minimize the need for long term management
- Containment where other measures not feasible
- Reduce the overall mass and volume of OHM
- Restore groundwater where feasible to applicable standards within reasonable period of time

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Risk Management Considerations

- RW Removal - not all or nothing, mass reduction to reduce overall risk
- RW Treatment – time, space constraints
- Building design & placement
- Clean utility corridors
- Containment & Consolidation
  - Capping
  - Soil reuse

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LRA IRA RAM URAM Phase IV

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Regulatory Vehicles

- Limited Removal Action (LRA)
- Immediate Response Action (IRA)
- **Release Abatement Measures (RAM)**
- Utility-Related Abatement Measure (URAM)
- Comprehensive Response Action (Phase IV)

Limited Removal Action

310 CMR 40.0318

- Limited Removal Action (LRA)
- Prior to notification (120 days)
- 100 yd^3 oil or waste oil
- 20 yd^3 of hazmat or mixture
- RAPs and BOL provisions apply

Immediate Response Actions

310 CMR 40.0410

- Must be taken for 2/72 hour reporting conditions
- Could be taken concurrently with other response/remedial actions
- Need approval (written or presumptive) by MassDEP

Utility Related Abatement Measures

310 CMR 40.0461

- Used to manage contamination on public ROWs, utility easements and private property
- Installation, repair, replacement or decommissioning of utilities
- Sanitary sewer, water or drainage systems, steam lines, gas lines, electric, telephone, cables
- URAM notification required; not the same as release notification

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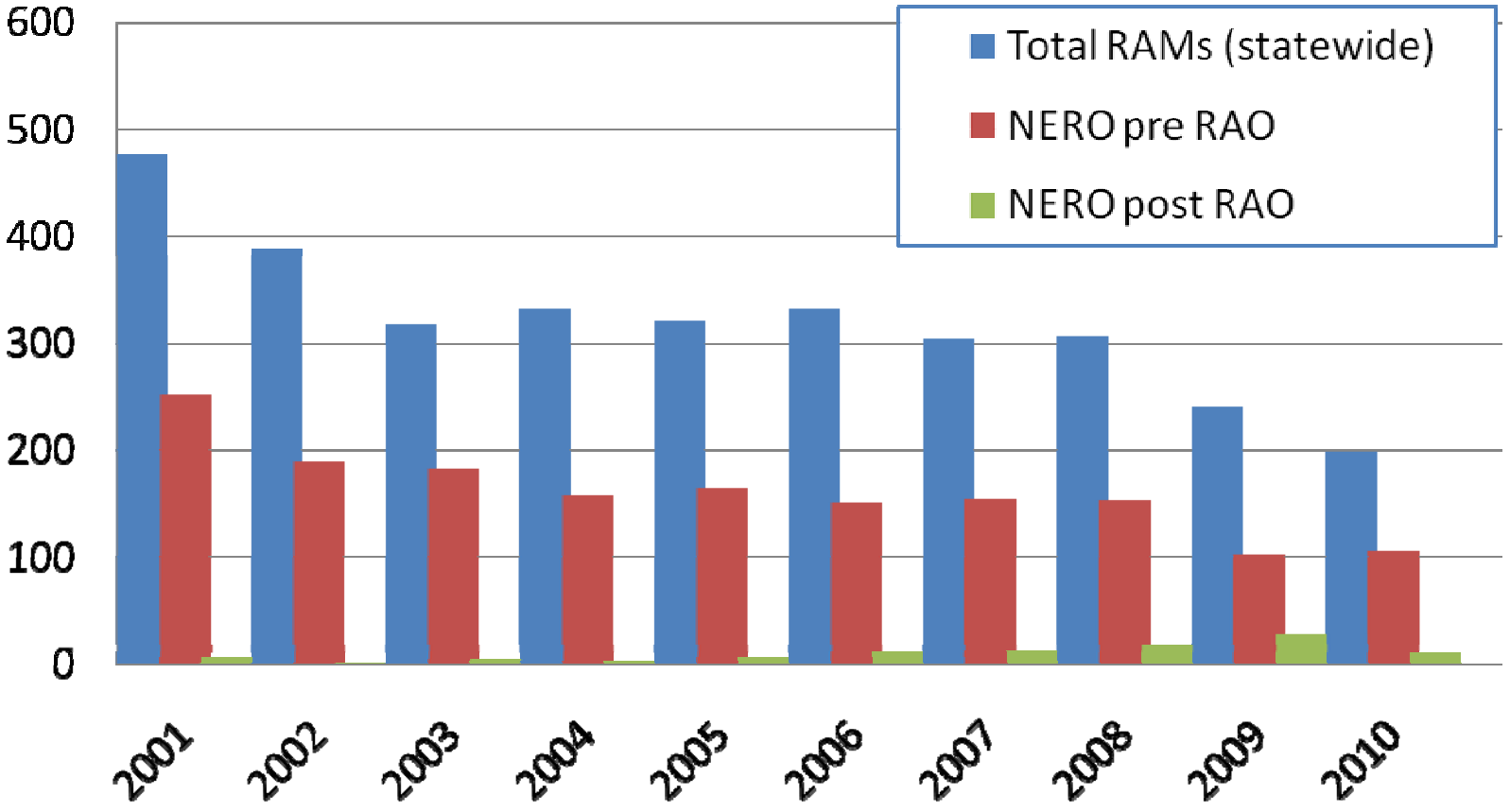
Phase IV – Remedy Implementation Plan

310 CMR 40.0874

- Required 3 years from TC
- Phase III documents the Remedial Action Plan
- Then implement Phase IV - RIP

RAM stats – 10 year



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Release Abatement Measures

310 CMR 40.0440

- May be conducted pre or post RAO
- Reduce risk in a cost-effective manner
- Limited in scope and complexity
- At least commensurate with site complexity
  - Known source(s), reliable site history, known COCs and characteristics, data variability, prior remediation
- Need to have adequate site characterization for the proposed construction activities

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Construction RAMs

Jimmy Hoffa

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Release Abatement Measures

310 CMR 40.0442(1)

- RAMS shall not:
  - Be implemented without sufficient understanding of site conditions and surrounding receptors
  - Be continued where conditions are substantially different from what was expected
  - Be conducted in a manner which could pose a significant risk
  - Prevent or impede the implementation of future response actions (buildings, caps)

Release Abatement Measures

310 CMR 40.0442(3)

- Construction of buildings, within and adjacent to the footprint must have:
  - Site assessment and risk characterization
  - Feasibility evaluation
  - Reduce below UCLs, where feasible or eng. bar.
  - Eliminate or control any sources
  - Remedial actions needed to achieve NSR

  Applies to both pre or post RAO activities

RAM Documentation

310 CMR 40.0440

- Plan
  - Describe project and timeframe
  - Provide summary of OHM data
    - What and where it is
  - Document SI, RC, FS within bldg footprint
  - Management procedures for remediation waste handling, treatment, disposal
  - Dust/vapor/odor monitoring & control
  - H&SP

RAM Documentation

310 CMR 40.0445

- Status Reports
  - Describe activities completed and those pending
  - Include new site information or data
  - Modifications to Plan

Modified RAM Plan

310 CMR 40.0443(4)

- Must be submitted if:
  - Contaminants or conditions are found which significantly increase the degree or change the type of exposure to nearby receptors
  - Significant change to on-site treatment processes, e.g. off-site disposal to on-site treatment

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Case Study A

- Pre-RAO RAM (2003)
- Former industrial site, multiple OHM
- Conversion to residential condominiums
- Excavated soils related to redevelopment
- No pre-characterization, relied on adjacent site data
- No site investigation, feasibility evaluation within footprint of building

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Case Study A - 2003

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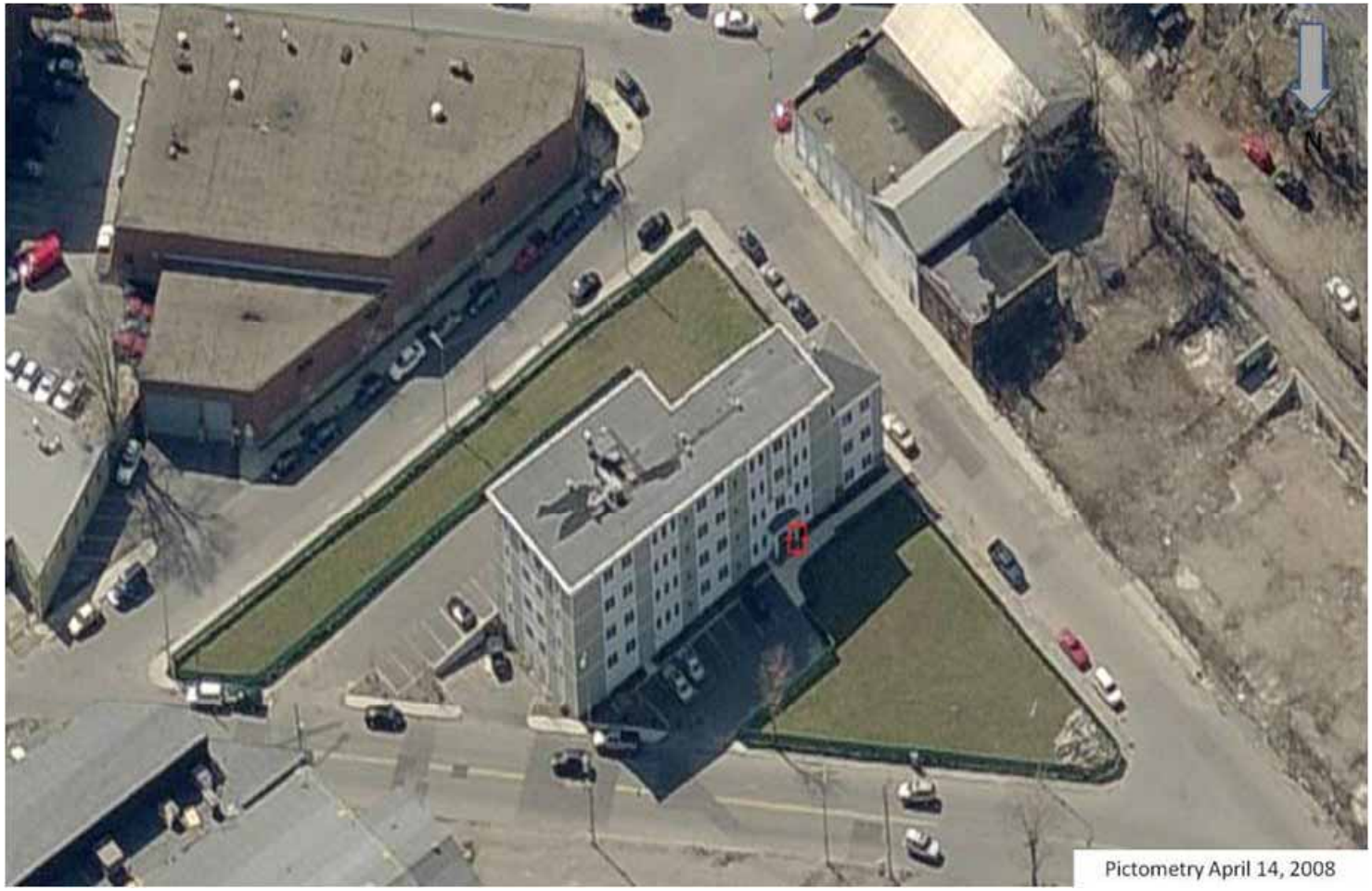
Case Study A - 2008



Pictometry April 14, 2008

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Case Study A

- Very limited discussion of soil re-use
- Stated they will comply with Construction Policy, but didn't
- Passive venting system proposed, but no documentation or plans to confirm installation
- LSP left company
- Start over

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Case Study B

- Post-RAO RAM
- AUL allowed residential construction on a portion of site
- Former municipal dump, possible industrial releases
- Limited assessment
- Location of proposed buildings moved
- Excavation without RAM Plan
- Mismanagement of Remediation Waste

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Case Study B - 2005

67 Smith Place, Cambridge MA RTN # 3-0940 2005 Orthophoto

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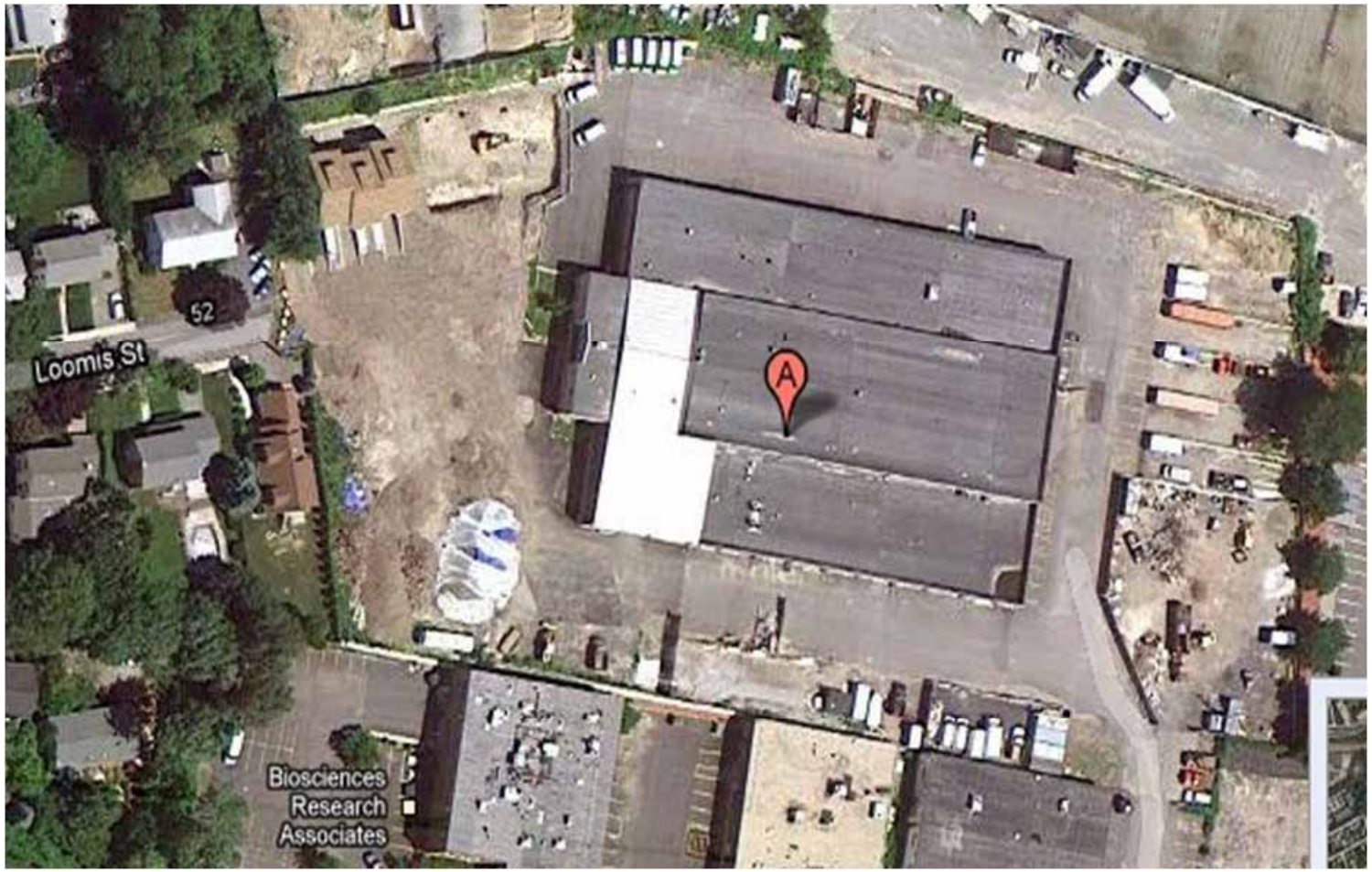
Case Study B -2010



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Case Study B

- Audit required additional soil testing
- Revised risk characterization
- RAM Plan for remainder of construction
- Clean utility corridors
- Soil management and capping plan

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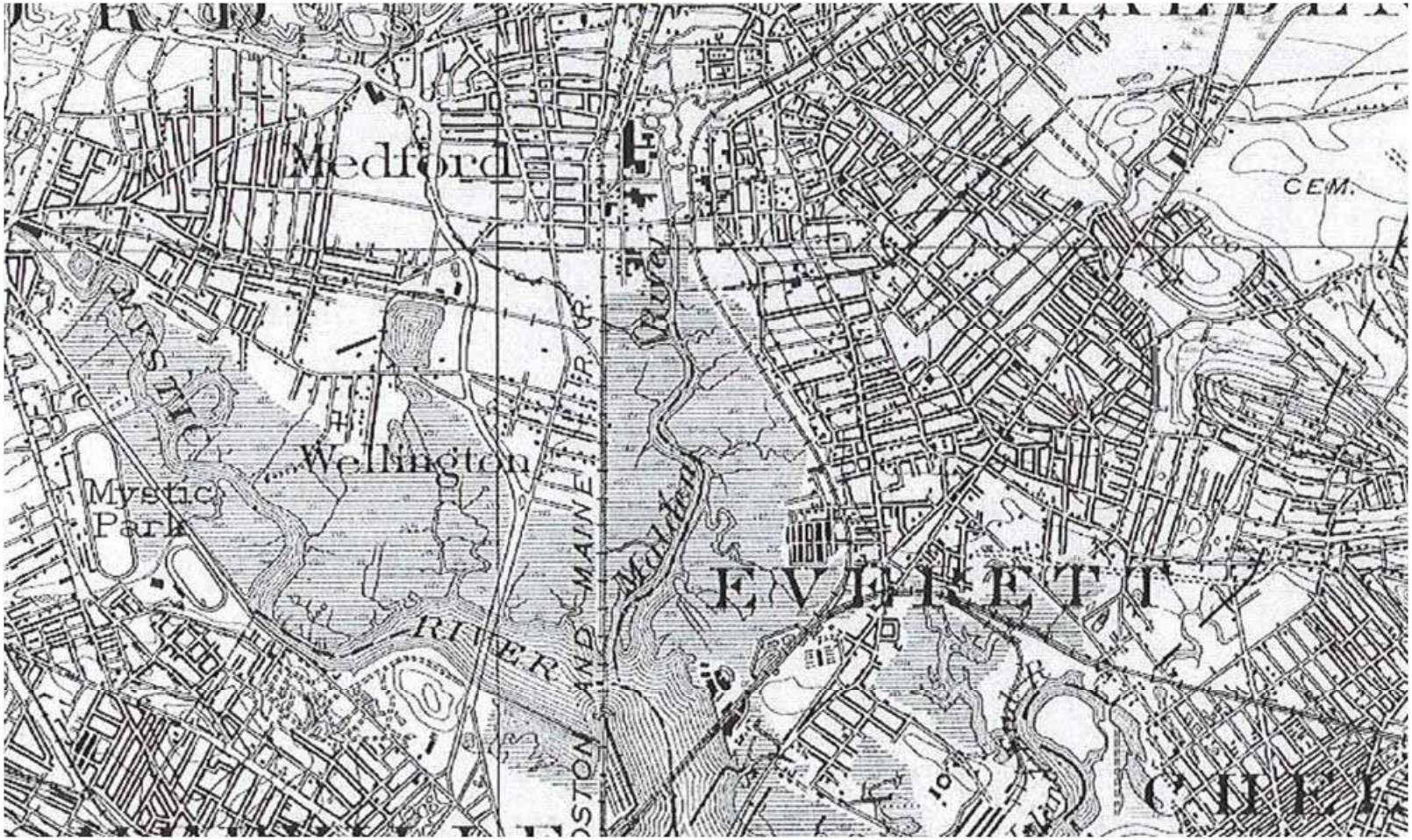
Historic Fill

- What is it? Typically…. historic fill is:
  - Non-native soil intentionally placed on property, typically in urban areas
  - No point source of OHM, history of filling
  - May contain PAHs, metals, petroleum in relatively low concentrations
  - May contain wood/coal ash
  - May contain lead from leaded gasoline, lead paint

1903



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Historic Fill

- Reporting exemption at (310 CMR 40.317(8) for hazmat from residues in the environment from:
  - Point of application of lead based paint
  - Emissions from the exhaust of an engine
  - Application of pesticides consistent with labeling

Historic Fill

- Reporting exemption for fill containing wood/coal ash (310 CMR 40.317(9))
- Does site meet technical update?
- Burden of proof on LSP using lines of evidence approach, site history, microscopy, levels and types of PAHs, metals
- Can make a site specific determination that OHM is due to wood/coal ash
- If not, must notify and follow MCP

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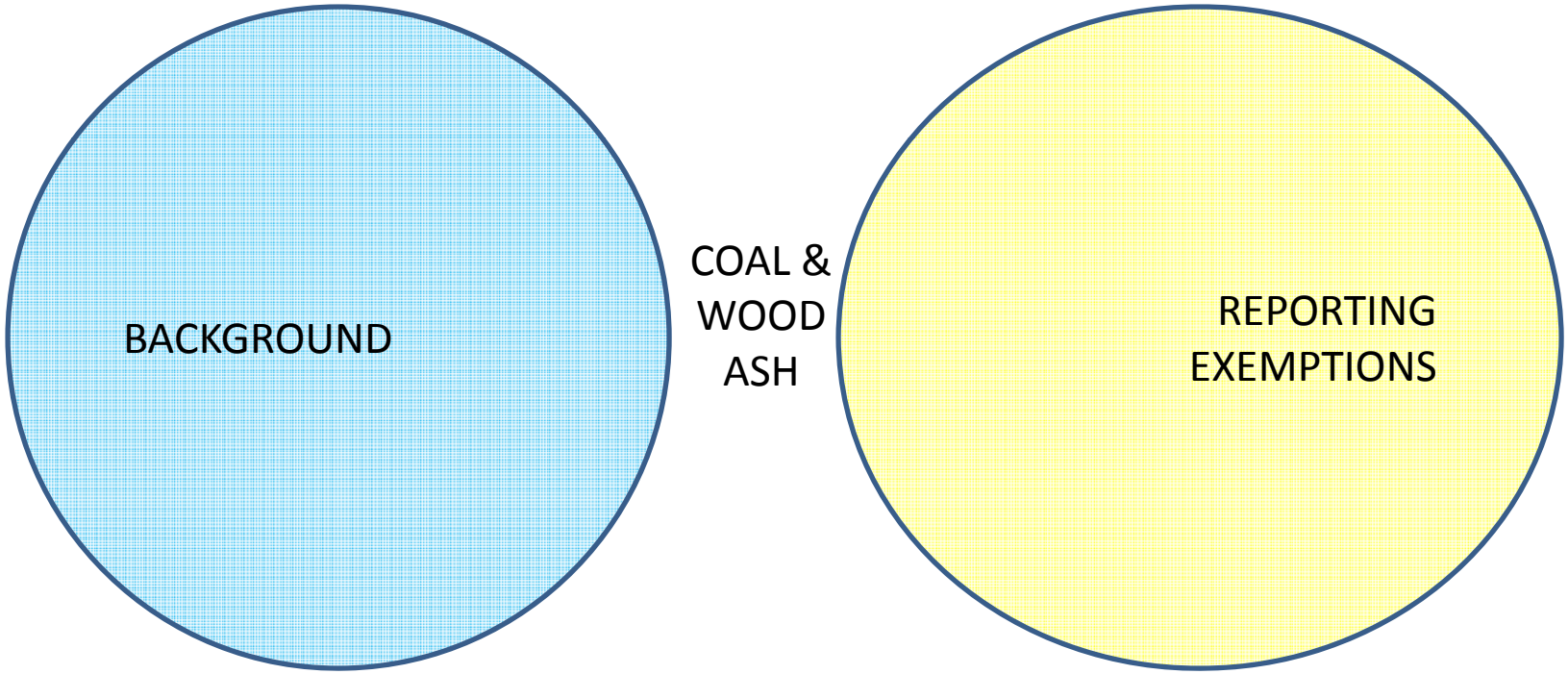
Wood & Coal Ash



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Resources

- MassDEP Technical Update – *Background Levels of PAHs and Metals in Soil*, 2002
- LSPA White Paper – *Methods for Evaluating Application of the Coal Ash and Wood Ash exemption under the MCP*, 1999
- LSPA Online Technical Journal – *Identification of Historic Fill Using Readily Available Information Sources*, 2010

Caps/Barriers (for soil)

- Common Remedial Action
- Designed to form a barrier between OHM and receptor
- Caps may need to prevent infiltration, control migration
- All Caps & Barriers must
  - Control vapors or dusts
  - Prevent direct contact
  - Minimize erosion which could damage cap
  - Be monitored and maintained

Design of Caps/Barriers

- Depends on type, location and concentration of OHM
- Receptors
  - Inhalation – dust, vapors
  - Dermal contact
  - Leaching
- Recommend a minimum of two layers, often 3 or more
  - Isolation layer – soil, pavement, structure
  - Demarcation layer – geotextile, highly visible
  - Gas venting layer for old landfills

Design of Caps/Barriers

- Paved areas
  - recommended 1 foot separation layer, 2-4” sub-base & top layer
- Bricks, gravel, cobblestone, decks, not equivalent to pavement
- S-1 areas, generally 3 feet of clean fill or equivalent geotextile

S-1 Soil Category

- S-1 has the highest likelihood of exposure
- Shall be categorized as S-1 if accessible or potentially accessible, and:
  - Currently used for growing fruits/vegetables
  - Child's frequency or intensity of use is high
  - Adult's frequency or intensity of use is high

  Bottom line, school, residences & playgrounds

  Soil is S-1 to 15 feet

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Design of Caps/Barriers

- More flexibility with a Method 3
- Site specific assumptions
- Institutional controls, AUL
- S-1 areas, using Method 3, generally accept 3 feet of clean fill or equivalent cap using a geotextile or combination thereof

Maintenance

- Periodic Inspection, Maintenance and Repair Requirements Specified in the AUL
- Post construction monitoring more frequent over first year, settlement, etc.
- Recommend an inspection at least once per year, for pavement caps, more frequent for soil caps
- Repairs and inspections should be documented

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Engineered Barriers

310 CMR 40.0996

- Must meet technical standards of RCRA Subpart N, 40 CFR 264.300
- Only for soil
- Draft MassDEP Guidance 2002
- OMM Plan
- FAM

Post RAO

310 CMR 40.1067

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Changes in Site Activities/Uses

310 CMR 40.1080

- Applies to Sites with AULs
  - Not specifically permitted activities/uses
- LSP Evaluation of proposed activity or use
- Risk Characterization
  - To demonstrate NSR or
  - Response action plan to achieve NSR
- LSP Opinion and RC Submitted to MassDEP
- AUL Amendment for permanent changes

Release Notification Exemption

310 CMR 40.0317(17)

- Releases of OHM where a RAO, NFA, WCS has been provided UNLESS:
  - The levels of OHM would negate or change the determination or statement, i.e., RAO
  - Changes in activities, uses and/or exposures upon which the RAO was based change to cause a new or increased exposure (310 CMR 40.0020)
  - Needs evaluation by an LSP and possibly response actions to achieve/maintain NSR

Release Notification Exemption

310 CMR 40.0317(17)

- Intent – to not require notification for RC exceedances at a closed site which have already been evaluated
- Exemption language somewhat grey

What does that mean? Considerations

- New contaminant of concern ≥ RCs
- New area of contamination, outside RAO boundary
- New exposures not considered in RAO or increased exposures, evaluate risk
- Evaluate to see if the RAO is still valid
- When in doubt…notify (can be retracted if you find out it wasn't necessary) or call to discuss

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Auditing Sites w/AULs

- MassDEP may initiate an audit of an AUL site at any time
- AUL sites in NERO are audited on periodic basis
- 1400+ in NERO
- 75-100/year

Case Study C

- Post-RAO development into assisted living
- High concentrations of PCBs in building materials and soil
- AUL required excavation with LSP oversight, H&SP and SMP
- Excavation without H&SP and SMP
- Rubble stockpiled on site
- Mismanagement of remediation waste

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Case Study C

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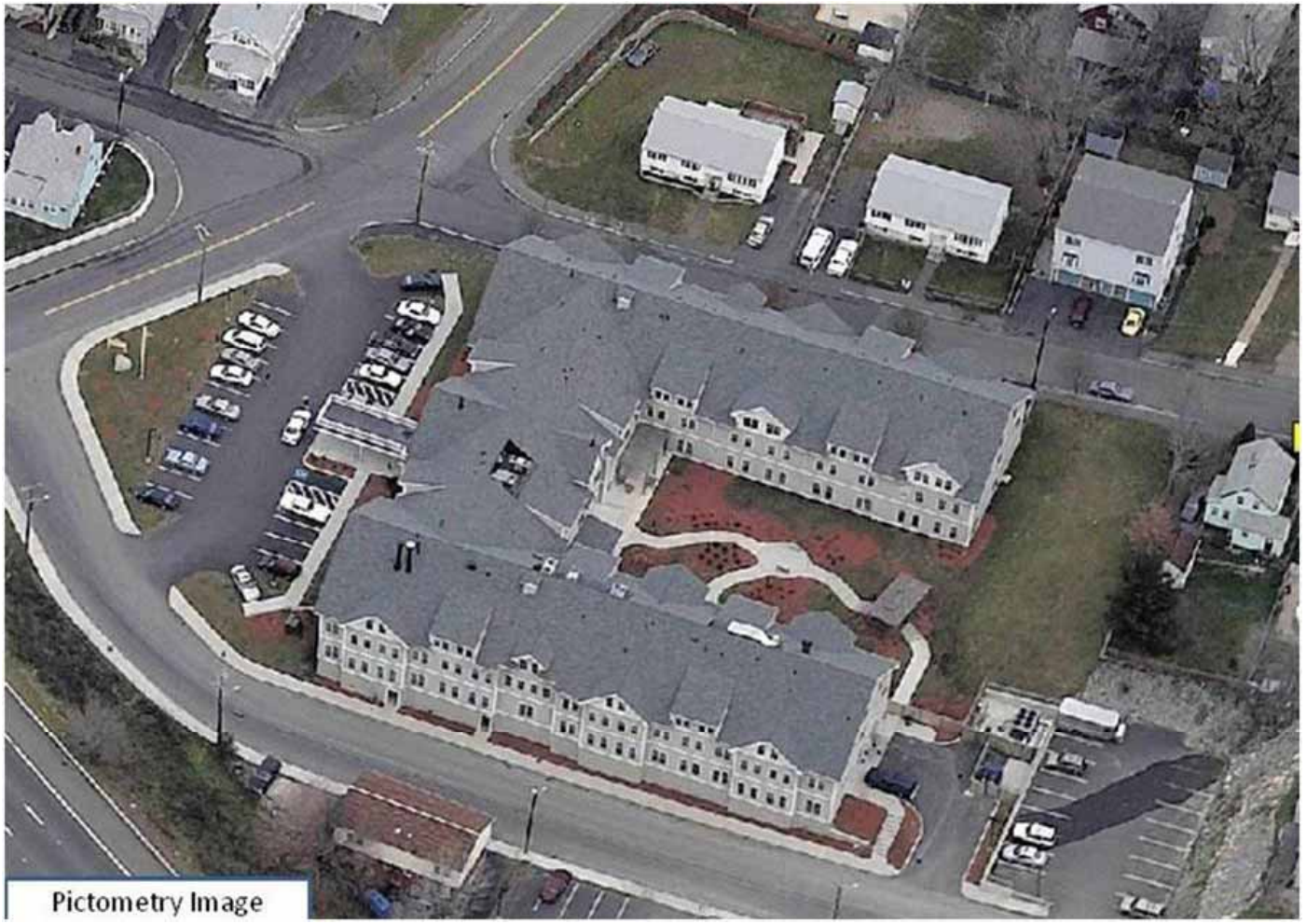
Case Study C



Pictometry Image

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Case Study C

- Audit Required:
  - Removal of contaminated debris
  - Sampling below foundation
  - Sampling outside building
  - Define extent of contamination
  - Revised RAO

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Summary

- Need a good understanding of site before construction starts
- Pre-characterize soil before excavating
- RAM is not always the proper vehicle, don't be afraid of Phase IV
- Where necessary, install a proper cap and document its construction

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Thank You!

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Questions

Patricia Donahue

patricia.donahue@state.ma.us

(978) 694-3364

Iris Davis

iris.davis@state.ma.us

(978) 694-3399

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