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Brownfields Road Map to Understanding Options for Site Investigation and Cleanup

Sponsored by:

U.S. EPA Office of Superfund Remediation and Technology Innovation (OSRTI)

Delivered: October 3, 2012, 2:00 PM - 4:00 PM, EDT (18:00-20:00 GMT)

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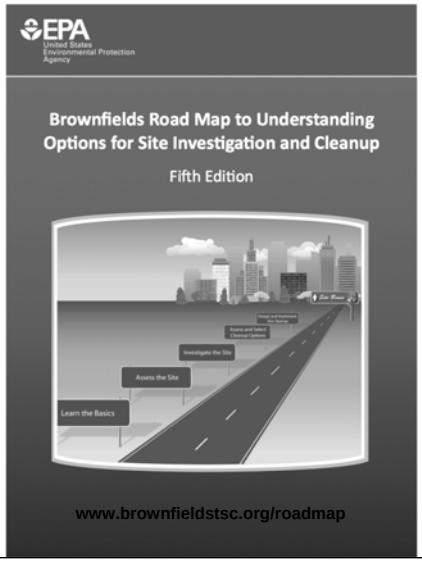

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- Q&A
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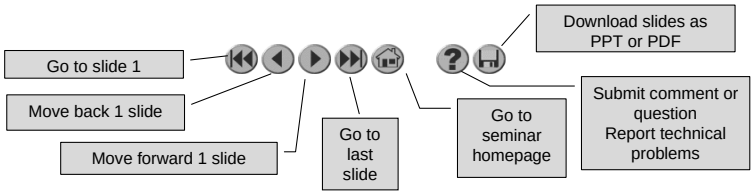

- This event is being recorded
- Archives accessed for free **http://cluin.org/live/archive/**

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Although I'm sure that some of you have these rules memorized from previous CLU-IN events, let's run through them quickly for our new participants.

Please mute your phone lines during the seminar to minimize disruption and background noise. If you do not have a mute button, press *6 to mute #6 to unmute your lines at anytime. Also, please do NOT put this call on hold as this may bring delightful, but unwanted background music over the lines and interupt the seminar.

You should note that throughout the seminar, we will ask for your feedback. You do not need to wait for Q&A breaks to ask questions or provide comments. To submit comments/questions and report technical problems, please use the ? Icon at the top of your screen. You can move forward/backward in the slides by using the single arrow buttons (left moves back 1 slide, right moves advances 1 slide). The double arrowed buttons will take you to 1st and last slides respectively. You may also advance to any slide using the numbered links that appear on the left side of your screen. The button with a house icon will take you back to main seminar page which displays our agenda, speaker information, links to the slides and additional resources. Lastly, the button with a computer disc can be used to download and save today's presentation materials.

With that, please move to slide 3.

Welcome

- **Introductions**
- **Review of Agenda**

Topic	Presenter
Relevance for EPA Grant Recipients and Applicants	Megan Quinn, EPA
Overview of the Road Map	Carlos Pachon, EPA
Discussion of Core Chapters	Ignacio Dayrit, CCLR
A Closer Look at Spotlights	Dan Powell, EPA
Questions and Answers	Carlos Pachon, EPA
Wrap-up	Carlos Pachon, EPA

Relevance for EPA Grant Recipients and Applicants

- **The Road Map may be helpful for those receiving or applying for EPA funding or technical assistance**
- **Background information, activities and considerations are presented about several EPA programs, including:**
  - Assessment Grants
  - Cleanup Grants
  - Targeted Brownfields Assessments
  - State and Tribal Response Programs
- **Learn more about EPA grants for brownfields at www.epa.gov/brownfields/grant_info**

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Resources for EPA Grant Recipients and Applicants

- **The FY13 Assessment, RLF and Cleanup Grant Guidelines are posted at www.epa.gov/brownfields/applicat.htm**
  - Proposals are due November 19, 2012
- **The FY13 Area-Wide Planning Grant Guidelines are posted at www.epa.gov/brownfields/applicat.htm**
  - Proposals are due November 30, 2012
- **The National Brownfields Conference is May 15-17, 2013 in Atlanta, Georgia (www.brownfieldsconference.org)**

Target Audiences

- New and less experienced stakeholders
- Decision-makers looking for detailed information
- Community members
- Stakeholders who hire or oversee site cleanup professionals
- Regulators
- Other stakeholders, including financial institutions and insurance agencies

Fifth Edition – Back to Basics Theme

- Helps non-technical stakeholders understand the process of assessing and cleaning up brownfields sites
- Focuses on concepts, strategies and methods to prepare sites for reuse
- Introduces a range of considerations and activities for each phase of a brownfields project
- Uses independent "spotlights" to provide an overview of specific technical and policy issues, best practices and innovative approaches to site assessment and cleanup

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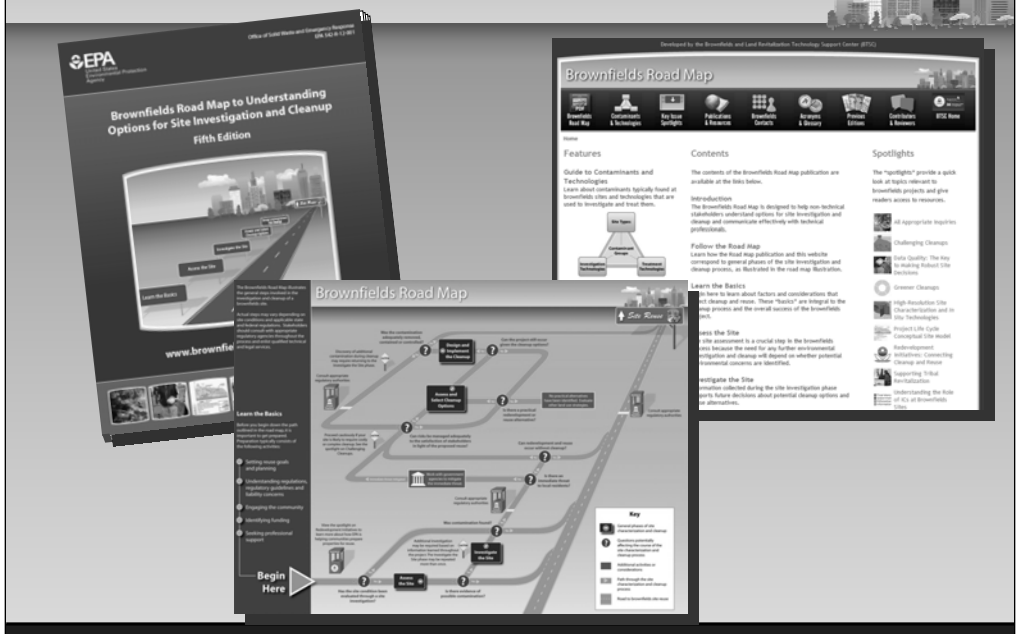
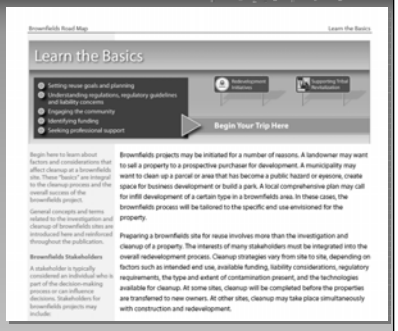
Fifth Edition – New Format



New Section – Learn the Basics



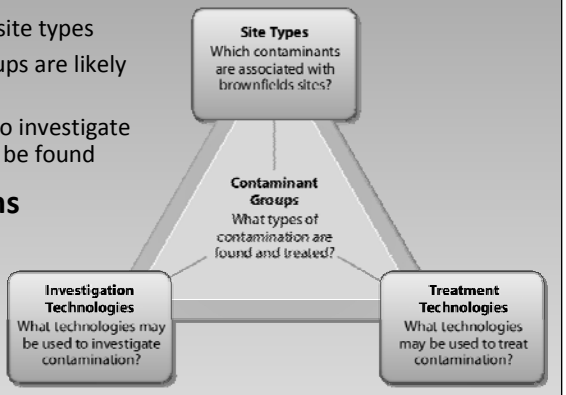
- Setting reuse goals and planning
- Understanding regulations, regulatory guidelines and liability concerns
- Engaging the community
- Identifying funding
- Seeking professional support
- Spotlights EPA's redevelopment initiatives to more efficiently and collaboratively prepare contaminated properties for reuse
- Spotlights EPA's efforts to support tribal revitalization

Highlights of the Road Map Website

- **Online version of publication**
- **Links to technical resources**
  - Approximately 300 available resources
  - Listed within each section
  - Searchable by title
  - Options to preview and download
- **Spotlight issues**
  - Provides quick look at relevant topics
  - Can be updated with new issues as they emerge
- **"Clickable" Road Map**

Online Guide to Contaminants and Technologies

- **Presents the range of technologies for investigating and remediating contaminants found at typical brownfields sites**
- **Provides navigation options to help users find details based on what is currently known about their site**
  - Find information about specific site types
  - Identify which contaminant groups are likely to be found
  - Learn about technologies used to investigate and treat contaminants likely to be found
- **Links to related publications and resources**



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Online Guide to Contaminants and Technologies – EXAMPLE

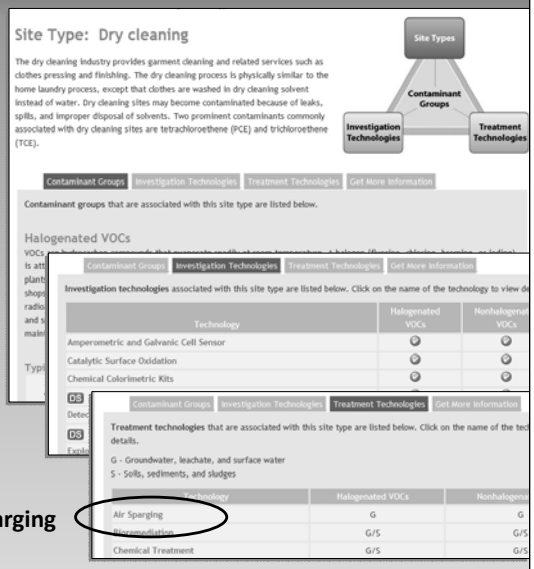
- **My brownfields project involves property once used for dry cleaning operations**
  - What types of contaminants are typically found on dry cleaner sites?
  - What technologies can be used to effectively investigate my site?
  - What technologies are available for treating contamination on my site?
  - Where can I find more information?
- **Start with the site type**
  - Summary matrix shows that halogenated and nonhalogenated volatile organic compounds (VOCs) are typically found
  - Click the site type for more information

Dry cleaning

Site Type	Halogenated VOCs	Nonhalogenated VOCs	Halogenated SVOCs	Nonhalogenated SVOCs	Fuels	Metals and metalloids
Agricultural	✓	✓	✓	✓	✓	✓
Battery recycling and disposal						✓
Chemical and dye manufacturing	✓	✓	✓	✓		
Chlor-alkali manufacturing	✓		✓			✓
Cosmetics manufacturing	✓	✓				✓
Drum recycling	✓	✓	✓	✓	✓	✓
Dry cleaning	✓	✓				
Gasoline stations		✓		✓	✓	✓
Glass	✓					✓

Online Guide to Contaminants and Technologies – EXAMPLE

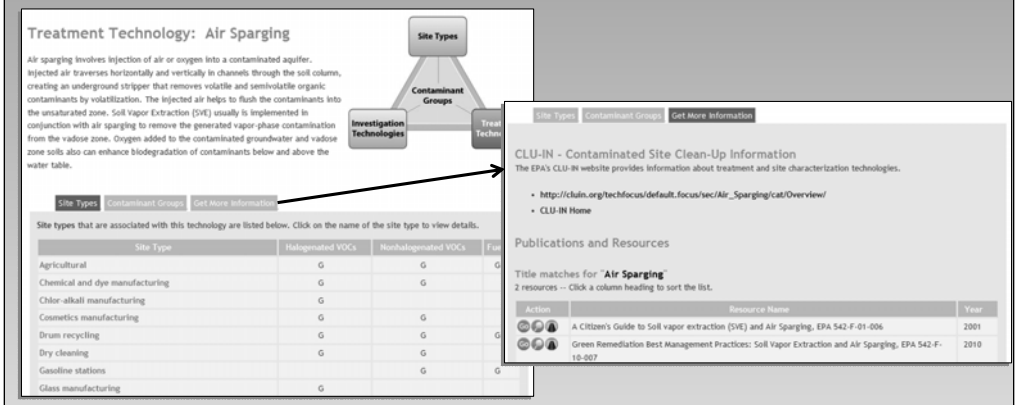
- Read more about the contaminants
- Learn about investigation and treatment technologies used for those contaminants
- Click on a technology to learn more



Treatment technology: Air sparging

Online Guide to Contaminants and Technologies – EXAMPLE

- **Description of the technology is provided**
- **Links to more information and resources are available from the "Get More Information" tab**



Brownfields and Technical Support Contacts

- **Links to contacts at the state and EPA national and regional levels who are available to assist cleanup and redevelopment efforts at brownfields sites**
- **Contacts are a valuable resource for support and guidance**
  - Applicable laws
  - Regulations
  - Policies
- **May be able to offer technical assistance associated with the selection of technologies**

State Brownfields Program Contacts

EPA Regional Brownfields Coordinators

EPA Regional Land Revitalization Coordinators

EPA Targeted Brownfields Assessments

EPA Technical Assistance to Brownfields Communities (TAB) Providers

Tribal Brownfields Programs

Argonne NATIONAL LABORATORY

US Army Corps of Engineers

The Brownfields and Land Revitalization Technology Support Center

1-877-838-7220 (toll free)

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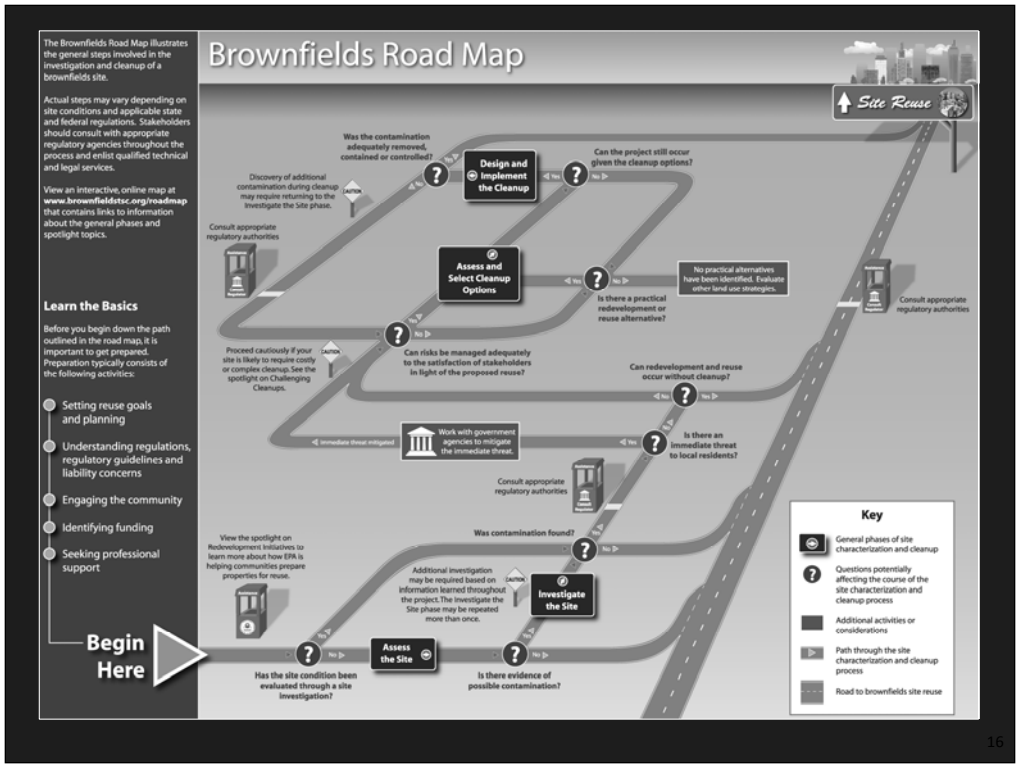
Brownfields Road Map
The Brownfields Road Map illustrates the general steps involved in the investigation and cleanup of a brownfields site.
Actual steps may vary depending on site conditions and applicable state and federal regulations. Stakeholders should consult with appropriate regulatory agencies throughout the process and enlist qualified technical and legal services.
View an interactive, online map at www.brownfieldstsc.org/roadmap that contains links to information about the general phases and spotlight topics.
Learn the Basics
Before you begin down the path outlined in the road map, it is important to get prepared. Preparation typically consists of the following activities:
Setting reuse goals and planning
Understanding regulations, regulatory guidelines and liability concerns
Engaging the community
Identifying funding
Seeking professional support
Begin Here
Site Reuse
Was the contamination adequately removed, contained or controlled?
Design and Implement the Cleanup
Can the project still occur given the cleanup options?
Discovery of additional contamination during cleanup may require returning to the Investigate the Site phase.
Consult appropriate regulatory authorities
Assess and Select Cleanup Options
No practical alternatives have been identified. Evaluate other land use strategies.
Is there a practical redevelopment or reuse alternative?
Consult appropriate regulatory authorities
Proceed cautiously if your site is likely to require costly or complex cleanup. See the spotlight on Challenging Cleanups.
Can risks be managed adequately to the satisfaction of stakeholders in light of the proposed reuse?
Can redevelopment and reuse occur without cleanup?
Work with government agencies to mitigate the immediate threat.
Is there an immediate threat to local residents?
Consult appropriate regulatory authorities
Was contamination found?
View the spotlight on Redevelopment Initiatives to learn more about how EPA is helping communities prepare properties for reuse.
Additional investigation may be required based on information learned throughout the project. The Investigate the Site phase may be repeated more than once.
Investigate the Site
Assess the Site
Has the site condition been evaluated through a site investigation?
Is there evidence of possible contamination?
Key
General phases of site characterization and cleanup
Questions potentially affecting the course of the site characterization and cleanup process
Additional activities or considerations
Path through the site characterization and cleanup process
Road to brownfields site reuse

Core Road Map Chapters

- Each chapter expands and updates content from the previous edition of the Brownfields Road Map
- General information about the phase is provided
- Typical activities conducted during the phase are listed
- Questions to be considered during each phase are highlighted
- Possible outcomes of the phase and next steps are explained

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Assess the Site

? **Has the site condition been evaluated through a site investigation? Is there evidence of possible contamination?**

- **The site assessment is crucial for determining further environmental investigation and cleanup steps**
  - Typically begins with an ASTM International Phase I Environmental Site Assessment (ESA)
  - Includes the conduct of an All Appropriate Inquiries (AAI) investigation
- **Information collected during the site assessment provides early indications for the cleanup requirements associated with the intended reuse of the site**
- **Information is typically organized into a project life cycle conceptual site model (CSM)**

Assess the Site

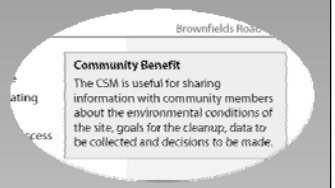
(continued)

- **Typical activities conducted during the site assessment phase:**
  - Establishing a core project team including technical experts
  - Identifying future plans for reuse
  - Exploring options for funding and technical assistance
  - Conducting the ASTM International Phase I ESA (or equivalent)
  - Developing the CSM
  - Reviewing government oversight programs
  - Reaching out and encouraging community participation
- **Many questions should be considered during this phase**
  - Project goals and planning (e.g., has a redevelopment plan been prepared?)
  - Oversight (e.g., will the site be entered into a voluntary cleanup program?)
  - Community (e.g., how can meaningful community involvement be solicited?)
  - Site conditions (e.g., what is known about the site?)
  - Funding (e.g., who will pay for the site investigation and cleanup?)

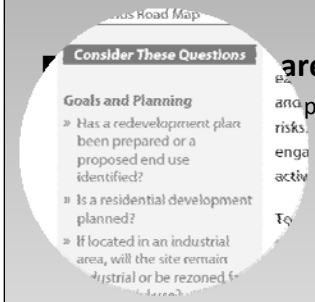
Assess the Site

(continued)

- **The Road Map connects information collected while assessing the sites to later phases of the project**
  - Determining the scope of the site investigation
  - Understanding data quality considerations
  - Aligning cleanup requirements to the intended reuse
  - Sharing information with the local community



- **are highlighted**
  - planning



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Assess the Site

(continued)

- **Possible courses of action based on the results of the site assessment are outlined**
- **More than 40 helpful resources associated with site assessments are linked from the Road Map website**
- **Spotlight topics**
  - All Appropriate Inquiries
  - Project Life Cycle CSM

Plan Your Next Step

The next course of action is determined by the results of the site assessment and what has been learned about the site. Several possible outcomes and subsequent courses of action are explained below.

Result of Site Assessment	Course of Action
No evidence of contamination is found and there is no evidence of possible contamination. Stakeholder concerns have been addressed adequately.	Confirm results with appropriate regulatory officials before proceeding with redevelopment activities.
Evidence of contamination is found that poses a significant potential risk to human health or the environment.	Contact the appropriate federal, state, local, or tribal government agencies responsible for hazardous waste. Based on feedback of the government agency, identify the cleanup levels required for redevelopment, and proceed to the Investigate the Site phase.
Contamination possibly exists, as indicated by the presence of RECs.	Proceed to the Investigate the Site phase.
Contamination definitely exists, but no site investigation has been conducted.	Proceed to the Investigate the Site phase.
Contamination definitely exists and a site investigation has been performed.	Proceed to the Investigate the Site phase if additional investigation is warranted; otherwise, proceed to the Assess and Select Cleanup Options phase.

Investigate the Site

?

Was contamination found?
Is there an immediate threat to local residents?
Can redevelopment and reuse occur without cleanup?

- **The site investigation confirms contamination and identifies its source, nature and extent**
  - Also referred to as a Phase II ESA
  - May include baseline risk assessments
  - Results are used to support project decisions, set cleanup goals, assess anticipated cleanup costs and evaluate the economic viability of the project
- **Available technologies improve site investigation results**
- **Best management practices (BMPs) have emerged to incorporate systematic project planning, dynamic work strategies and the use of real-time measurement technologies**

Investigate the Site

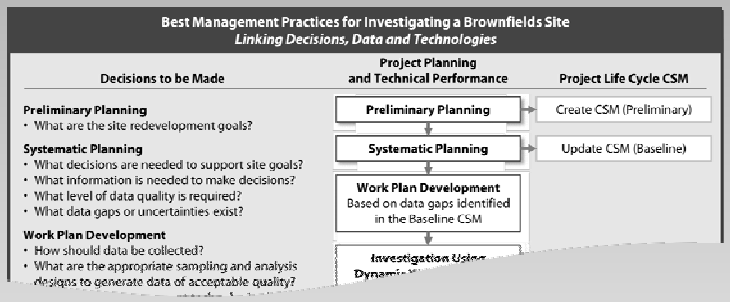
(continued)

- **The site investigation phase typically involves:**
  - Exploring the potential for obtaining EPA grant funding or technical assistance
  - Inviting community members to participate in discussions
  - Researching available technologies and methods to conduct the site investigation
  - Conducting a Phase II ESA
  - Performing a risk assessment
  - Evaluating potential cleanup costs and constraints
  - Updating the project life cycle CSM and sharing with stakeholders
- **Project teams should consider many questions, including several related to options for the site investigation:**
  - Has the full range of available technologies been explored?
  - What real-time technologies are available to facilitate site investigation and support data collection efforts?
  - Can the technologies selected reduce the number of mobilizations to the site?
  - Will the site investigation involve iterative steps to address data gaps?

Investigate the Site

(continued)

- **Helping stakeholders understand the true conditions of their sites**
  - Introduction to different types of uncertainty
  - Description of technologies that produce real-time results to supplement laboratory analysis
  - Best management practices for linking decisions, data and technologies



Types of Uncertainty

Using BMPs helps to reduce a variety of uncertainties associated with brownfields projects.

Analytical Uncertainty
Methods, Quantity, Quality, Validation, Appropriate Use

Sampling Uncertainty
Media, Methods, Location, Distribution, Depth, Purpose

Site Decision Uncertainty
Risk, Action Levels, Remedy, Stakeholders, Acceptability

Resource Uncertainty
Funding, Schedule, Personnel, Logistics, Weather

Investigate the Site

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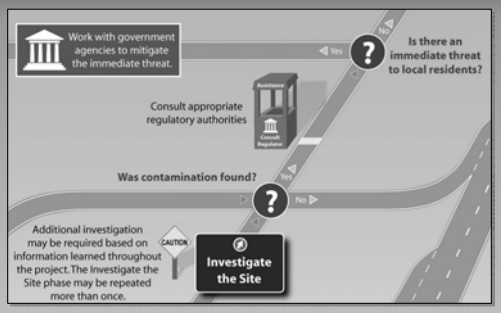

- **Possible courses of action based on the results of the site investigation are presented**
  - Includes potential for conducting additional site investigation as more information is known about the site
- **More than 75 helpful resources associated with site investigation are linked from the Road Map website**
- **Spotlight topics**
  - Data Quality: The Key to Making Robust Site Decisions
  - High Resolution Site Characterization and *In Situ* Technologies
  - Vapor Intrusion

Assess and Select Cleanup Options

?

Can risks be managed adequately in light of the proposed reuse?
Can the project occur given the cleanup options?
Is there a practical redevelopment or reuse alternative?

- **Data and information known about a property are used to review and evaluate cleanup options applicable to specific site conditions and consistent with cleanup and reuse goals**
- **Involvement of the affected community contributes significantly to long-term acceptance and support of the selected cleanup alternative and the overall reuse goals**
- **It is important to frame discussions and decisions around budget considerations and schedule constraints so that the project remains financially viable**

Assess and Select Cleanup Options

(continued)

- **Helping stakeholders select the best options**
  - Establishing cleanup objectives that consider the end use
  - Communicating information about the proposed cleanup option to brownfields stakeholders, including members of the affected community
  - Identifying cleanup technologies and approaches that have a proven track record for sites with similar contaminants and conditions
  - Enlisting the help of a professional environmental practitioner with experience in applying these technologies at similar sites
  - Assessing the use of institutional controls (IC) as part of the cleanup approach
  - Collaborating with regulatory agency stakeholders to ensure that regulatory requirements are properly addressed
- **Recognizing and coping with challenging cleanups**

Identifying the Best Options for Challenging Cleanups

The cleanup of some brownfields sites may be complicated by site conditions and the specific contamination found on or near the property. See Spotlight 8, Challenging Cleanups, for a more detailed discussion.

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Assess and Select Cleanup Options

(continued)

Consider These Questions

Goals and Planning

- Is there a consensus that site characterization uncertainties have been sufficiently reduced?
- How is the appropriate and feasible level of cleanup identified?

Oversight

- Are there federal, state, local or tribal cleanup requirements?
- Are there prescribed standards for the cleanup?
- Is there a state environmental insurance program?

The Community

- How can the community participate in the review and selection of options?
- What environmental standards should be considered to ensure that community stakeholders are satisfied with the outcome and process of the cleanup?
- Are cleanup options acceptable in light of community concerns?
- Are cleanup options compatible with regional or local planning goals and requirements?

Options

- Are the options acceptable in light of community concerns about protection and reuse of the site?
- Are the cleanup options compatible with regional or local planning goals and requirements?
- What are the short- and long-term effects of the cleanup technologies under consideration?
- What options are available to monitor the performance of cleanup technologies?
- Are proposed ICs appropriate in light of community concerns?
- What plans, including financial assurances, are being made to ensure that ICs remain functional as long as contamination is present?
- Does the proposed cleanup approach place burdens on future land owners or occupants?

Funding

- How long will cleanup take?
- What will cleanup cost?
- Will schedule constraints or the estimated cost adversely affect the project's viability?
- Who will pay for long-term costs to maintain the cleanup, including any ICs?

- **Questions to be considered to assist stakeholders with assessing options**
  - Are cleanup options compatible with regional or local planning goals and requirements?
  - How long will the cleanup take?
  - What will the cleanup cost?
  - Who will pay for long-term costs to maintain the cleanup, including any ICs?
- **More than 90 helpful resources for assessing and selecting cleanup options are linked from the Road Map website**
- **Spotlight topics**
  - Challenging Cleanups
  - Understanding the Role of ICs at Brownfields Sites

Design and Implement the Cleanup

?

Was the contamination adequately removed, contained or controlled? Has contamination been discovered that requires more investigation?

- **The property is prepared for redevelopment and reuse by carrying out the selected cleanup options**
- **The design of the cleanup plan and implementation of the chosen remedies involves close coordination with all other redevelopment efforts in the immediate vicinity of the site**
- **Maintaining stakeholder participation during cleanup promotes long-term community acceptance and support**

Design and Implement the Cleanup

(continued)

- **Typical activities conducted during this phase include:**
  - Reviewing applicable federal, state, local and tribal regulations and guidelines
  - Developing conceptual cleanup and monitoring plans
  - Establishing contingency plans to address the discovery of additional contamination during cleanup, including tools such as environmental insurance
  - Conducting public outreach meetings on a regular basis
  - Providing updates about the progress of cleanup activity
  - Sharing successes when important cleanup milestones are achieved
  - Informing the community about changes in activity that could affect reuse plans
  - Monitoring the performance of the cleanup
  - Working with the state voluntary cleanup program (VCP), if applicable, and county or local officials to facilitate the placement and implementation of institutional controls
- **Implementing the cleanup may lead to the discovery of additional contamination, requiring further site investigation and characterization**

Design and Implement the Cleanup

(continued)

- **The Road Map presents cleanup plans and activities in the context of available options**
  - Options may evolve during a project as site conditions are understood
  - Real-time technologies and BMPs used to investigate the site also help to evaluate the results of the cleanup
  - Sometimes, additional investigation is required
- **Examples of questions to be considered**
  - Are there federal, state, local and tribal requirements for the design, installation and monitoring of cleanup activities?
  - Can redevelopment and cleanup activities be performed concurrently?
  - How will the cleanup design affect long-term liabilities or future use of the site?
  - How will long-term monitoring be funded and managed?

Design and Implement the Cleanup

(continued)

- **Possible courses of action based on the results of the cleanup**
  - If contamination has been adequately removed, contained or controlled, consult with the appropriate regulatory officials before proceeding with redevelopment activities
  - If additional contamination has been discovered, consult with the appropriate regulatory officials to determine next steps
  - Conduct additional sampling to delineate the extent and nature of the contamination and to assess the overall viability of the project
  - Collect after-performance samples for monitoring the cleanup
- **More than 100 helpful resources for designing and implementing cleanups are linked from the Road Map website**
- **Spotlight topics**
  - Greener Cleanups

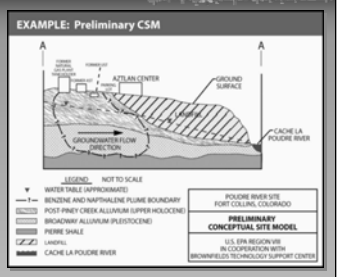
Spotlights: Opportunities & Challenges

- **Project Life Cycle CSM**
- **Vapor Intrusion**
- **Challenging Cleanups**
- **Understanding the Role of Institutional Controls at Brownfields Sites**

Road Map Spotlights

- All Appropriate Inquiries
- Challenging Cleanups
- Data Quality: The Key to Making Robust Site Decisions
- Greener Cleanups
- High-Resolution Site Characterization and *In Situ* Technologies
- Project Life Cycle CSM
- Redevelopment Initiatives: Connecting Cleanup and Reuse
- Supporting Tribal Revitalization
- Understanding the Role of ICs at Brownfields Sites
- Vapor Intrusion

Project Life Cycle CSM



- **A CSM is a graphical and written summary of what is known or hypothesized about environmental contamination at a site**
- **CSMs assist stakeholders to:**
  - More fully understand site conditions and features
  - Synthesize information from multiple sources
  - Identify which information is unknown or uncertain about the site
  - Define a plan for collecting additional information
  - Obtain stakeholder agreement on site conditions and related project investigation, design and cleanup plans
- **Triad Resource Center website (www.triadcentral.org)**
  - Tools for developing and using a CSM
  - Examples of CSMs

Project Life Cycle CSM

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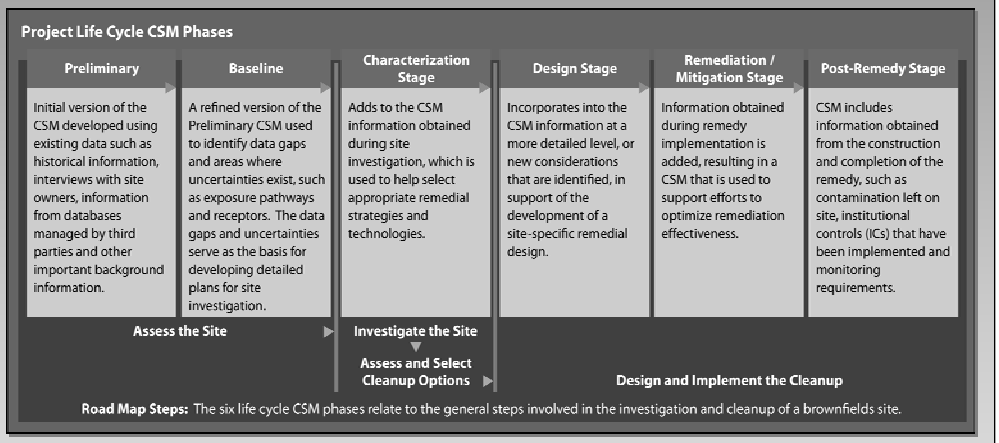
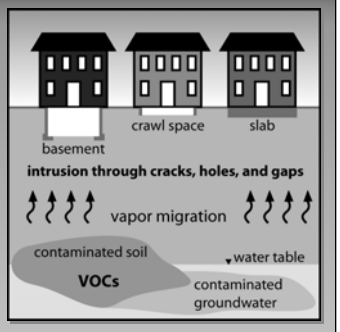
- **The CSM evolves through all stages of site redevelopment and becomes a tool to support technical and communication needs**



Vapor Intrusion



- **Vapor Intrusion (VI) occurs when toxic vapors enter structures, become concentrated and contaminate the indoor air**
- **Sources include chemicals in contaminated soil or groundwater**
  - Vapor-causing contaminants are commonly referred to as volatile organic compounds (VOCs)
  - Examples of VOCs include gasoline, degreasers, dry-cleaning solvents, naphthalene and some pesticides
  - VI is also caused by semivolatile organic compounds (SVOC)
- **VI should be evaluated for all brownfields projects with possible VOC contamination in the subsurface of the site property or in the subsurface of nearby property**

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Vapor Intrusion

(continued)

- Evaluating the potential for VI should begin early in the site assessment and investigation phases
- The movement of volatile vapors can be difficult to quantify – appropriate sampling should be conducted during the site investigation to evaluate potential exposure pathways
- Concerns should be incorporated into the project life cycle CSM
- Operation, maintenance and monitoring of mitigation systems are generally necessary
- Some states have specific VI guidance – environmental agencies should be consulted to ensure that up-to-date and appropriate guidance is followed

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Vapor Intrusion

(continued)

- **Strategies to reduce or eliminate indoor air contaminant risks may include (but are not limited to):**
  - Remediating or controlling the sources of contamination in the subsurface
  - Increasing natural building ventilation
  - Ventilating the affected buildings with properly operated heating, ventilation and air conditioning systems
  - Restricting the use of the facilities of concern
  - Changing the location or altering the design of future buildings
- **Key resources available on the Road Map Website**
  - *Brownfields Technology Primer: Vapor Intrusion Considerations for Redevelopment* provides a detailed introduction to VI and summarizes techniques for assessment and mitigation
  - EPA's VI website: **www.epa.gov/oswer/vaporintrusion/**
  - CLU-IN website issues – Vapor Intrusion: **www.clu-in.org/issues/default.focus/sec/Vapor_Intrusion/**

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Challenging Cleanups

- **Some brownfields properties are contaminated with chemicals that are highly mobile, hard to find or difficult to treat**
  - Contaminants are difficult to capture or separate
  - Contamination is located in hard-to-reach areas (for example, fractured bedrock)
  - Contaminants do not degrade naturally in the environment
  - Challenging cleanups affect a variety of site types
- **Contaminant concentrations and properties affect project planning**
- **An accurate characterization of the site and a solid understanding of contaminant behavior in the environment is critical**
- **CLU-IN Contaminant Focus (www.cluin.org/contaminantfocus)**

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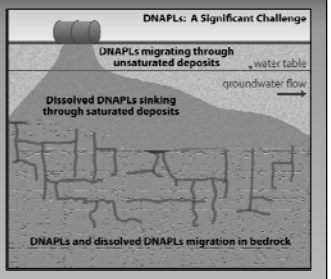
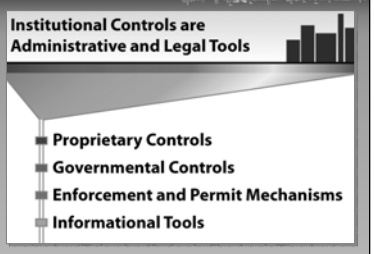
Challenging Cleanups

(continued)



- **EXAMPLE: Dense Non-Aqueous Phase Liquids (DNAPLs)**
  - Do not easily dissolve in water (only slightly soluble)
  - Tend to sink through groundwater and permeate into fine-grained soil units such as silt and clay
  - Migrate in multiple directions
  - Act as continuing sources of contamination
  - Traditional cleanup systems (pump and treat) may require years
- **A variety of effective strategies, including combining several options, exist for challenging cleanups:**
  - Treatment of the source area
  - Treatment of the dissolved plume
  - Containment of the plume or polishing agents
  - Institutional controls

Understanding the Role of ICs



- **ICs are a broad spectrum of administrative and legal tools**
  - Minimize the potential for exposure to residual contamination
  - Restrict land use activities to protect physical cleanup measures
- **Provide information that helps modify or guide human behavior at a site**
- **Normally supplement engineered controls**
- **Typically used in conjunction with the overall cleanup remedy to support reuse**

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Understanding the Role of ICs

(continued)

- **Long-Term Considerations**
  - Long-term costs and administrative implications of maintaining and enforcing ICs
  - Planning for implementation, maintenance and enforcement challenges
  - Comparison of the costs of leaving contamination in place while maintaining ICs to the costs associated with treating or removing contamination
- **Key resources available on the Road Map Website**
  - EPA fact sheet: "An Introduction to the Cost of Engineering and Institutional Controls at Brownfield Properties"
    www.epa.gov/brownfields/tools/lts_cost_fs.pdf
  - EPA fact sheet: "Addressing Long-Term Stewardship: Highlights from the Field" (highlights long-term considerations for maintaining and enforcing ICs)
    www.epa.gov/brownfields/tools/lts_fs_04_2008.pdf

Questions & Answers

Wrap-up

- **The Brownfields Road Map is available online at:**

www.brownfieldstsc.org/roadmap

- **This webinar will be available for future viewing at www.cluin.org/live/archive**
- **Visit the BTSC at www.brownfieldstsc.org**
- **EPA's Office of Solid Waste and Emergency Response (OSWER) is building the technical capacity of small and disadvantaged businesses – learn more at http://cluin.org/smallbusiness/**

Coming soon…….

- **Brownfields Grantees' Road Map to Understanding Quality Assurance Project Plans**
- **Leveraging Contracts for Innovative Site Characterization and Cleanup: Contracting Primer and Administrative Toolkit**

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Resources & Feedback

- To view a complete list of resources for this seminar, please visit the **Additional Resources**
- Please complete the **Feedback Form** to help ensure events like this are offered in the future

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