U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

Understanding Risk Part III – Remedy Selection

Citizens Advisory Board FD&SR Committee Meeting Presentation

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Evaluating a Waste Unit

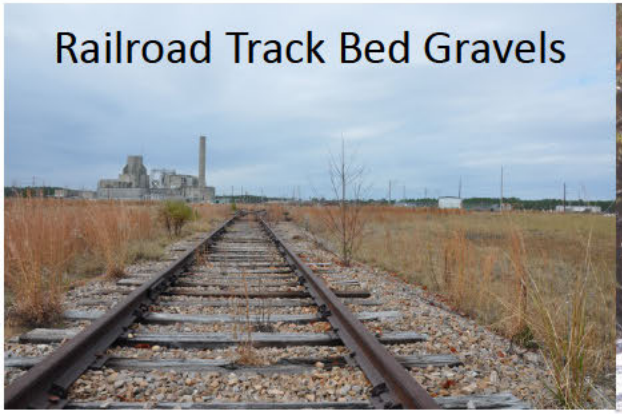
- Characterization
  - What contaminants are present?
  - How much (concentration) is there?
  - Where are the contaminants (e.g. structures, soil, groundwater)?
- Risk Assessment
  - Who/What could be exposed?
  - How harmful are the contaminants?
  - Is the likelihood of negative impact (e.g. cancer risk) high enough to warrant taking action to protect the receptor?
- Remedy Selection
  - Alternatives Analysis (Feasibility Study)
  - Public review of Proposed Plan and input
  - Three party (DOE, EPA, SCDHEC) agreement in Record of Decision

Data Collection – Media Types


Concrete Slab


Surface water

Groundwater

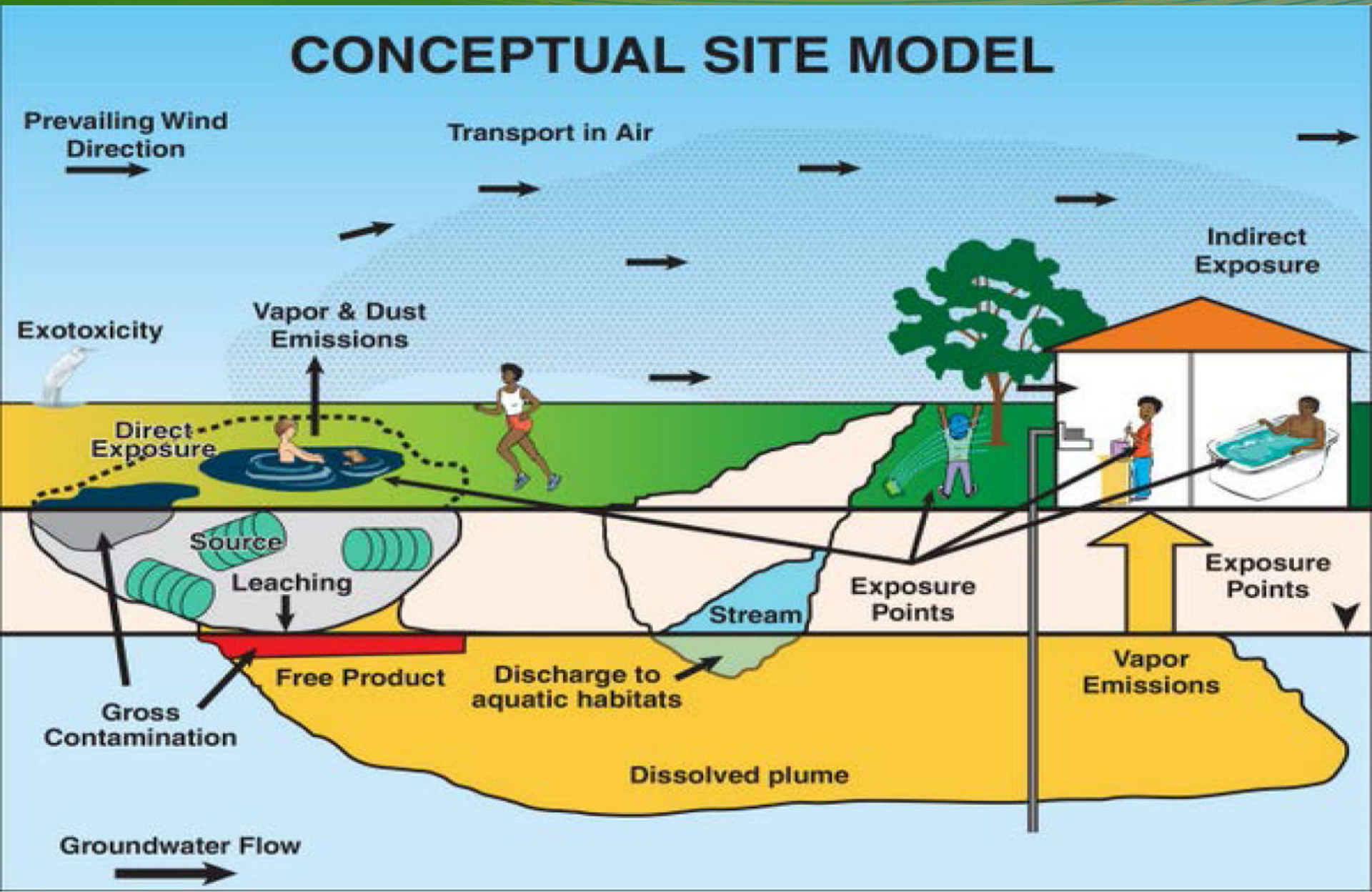

Railroad Track Bed Gravels

Soils

Risk Assessment

- Risk Assessments are used by DOE, the Environmental Protection Agency (EPA), and the South Carolina Department of Health and Environmental Control (SCDHEC) to decide if cleanup is needed, what will be cleaned up (e.g. groundwater) and to what level
- SRS closely follows the EPA Superfund guidance for risk assessment, evaluates both human and ecological health threats, and potential impact to environment
- The goal of Superfund is to reduce risks to a safe level, for both current and future potential exposure to site-related contamination

Risk Assessment (con't)



Is Remedial Action Required?

- Human health risks
  - Cancer risk greater than 1 in 1,000,000
  - Potential toxic effect exists (threshold based on no observed adverse effects)
- Ecological risks – target receptors evaluated based on both no observed effects and lowest level of observed effects, site-specific studies preferred if potential risk
- Environmental risks
  - Are groundwater or surface water currently above maximum contaminant levels (MCL) for safe drinking (surface water also evaluated for potential impact to ecological receptors such as fish)
  - Can contaminants in soil transport to groundwater or surface water in future

Establish Remedial Action Objectives

- Prevent exposure
  - of ***who/what***
  - to ***contaminant***
  - in ***soil/air/groundwater/surface water***
  - at levels above ***x***

Conduct Feasibility Study

- Purpose is to identify and evaluate potential cleanup technologies (alternatives) suitable for the site:
  - Land Use Controls – required when contaminants above action levels left in place. Include fencing, warning signs and administrative controls such as procedures or deed restrictions
  - Engineering Controls – prevent exposure through containment
  - Treatment Technologies – reduce toxicity, mobility or volume of contaminants
  - Removal
- Identification of applicable or relevant and appropriate requirements (ARARs)
- Develop and screen alternatives using effectiveness, implementability and cost

Detailed evaluation - The Nine Criteria

- Threshold Criteria
  - Overall protection of human health and the environment
  - Compliance with ARARs
- Primary Balancing Criteria
  - Long-term effectiveness and permanence
  - Reduction of toxicity, mobility or volume through treatment
  - Short-term effectiveness
  - Implementability
  - Cost
- Modifying Criteria
  - State acceptance
  - Community acceptance

Path to the Preferred Alternative

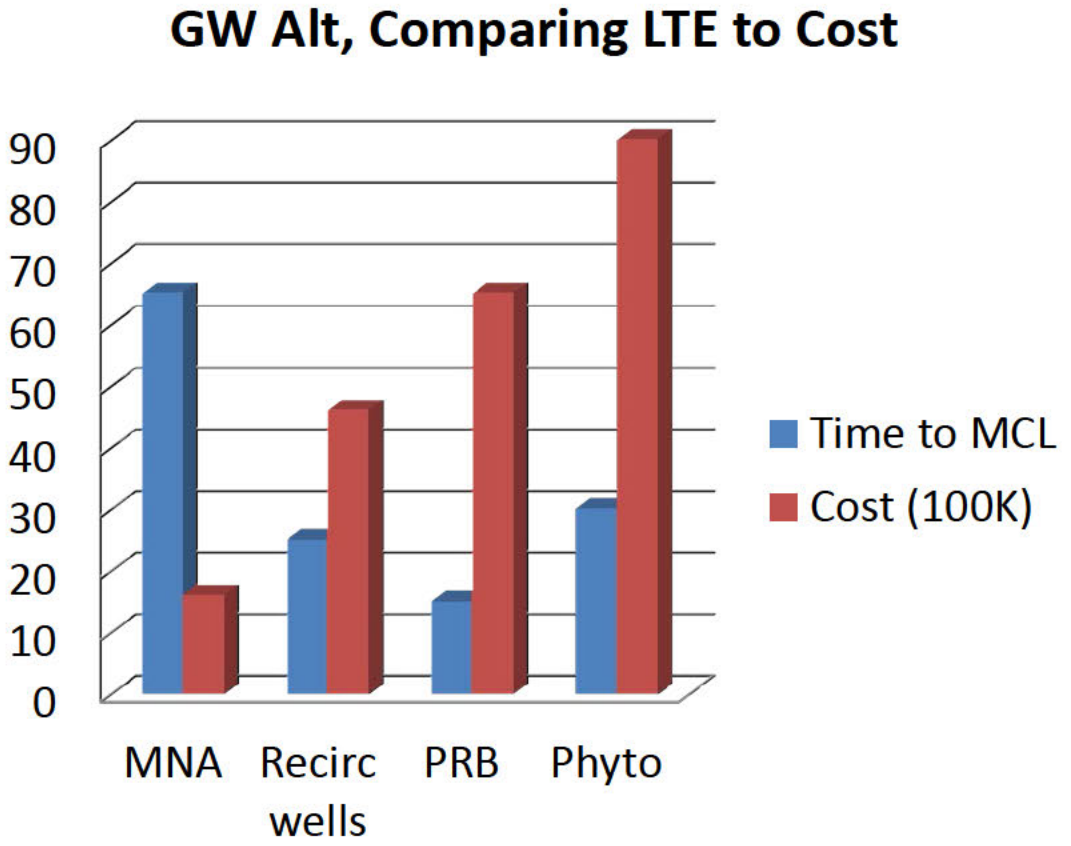
- Comparative analysis of alternatives done using descriptive assessment focusing on the balancing criteria

	Long-term Effectiveness	Reduce TMV through Treatment	Short-term Effectiveness	Implement-ability	Cost
Dig	5	1	3	4	8M
Grout/Cap	4	3	3	3	7M
LUCs/GW mon.	2	1	4	5	1M
No action	1	1	1	5	0M

1 = lowest, 5 = highest

Path to the Preferred Alternative (con't)

- If possible, a quantitative measure of benefit (e.g. Long-term Effectiveness) may help to choose between two alternatives
- For example, in selecting a groundwater remedy, the time to reach the cleanup goal (MCL) for each alternative can be compared



Remedy Selection – Proposed Plan

- Proposed Plan Presents Preferred Alternative
  - Should be written so general public understands problem and why preferred alternative proposed
  - Minimum of 30 days for public to comment
  - If interest, provide opportunity for public meeting to be held to present plan and receive/answer comments

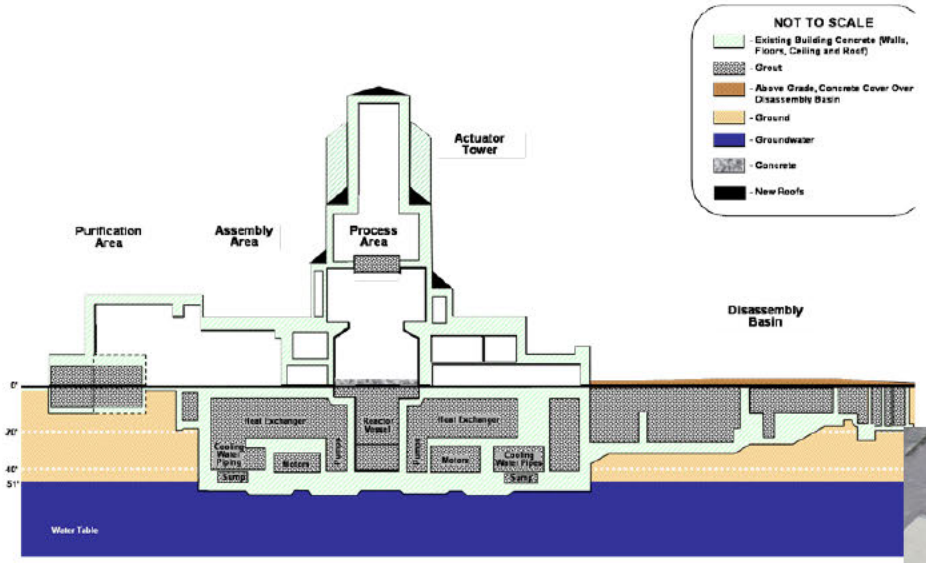
Remedy Selection – Record of Decision

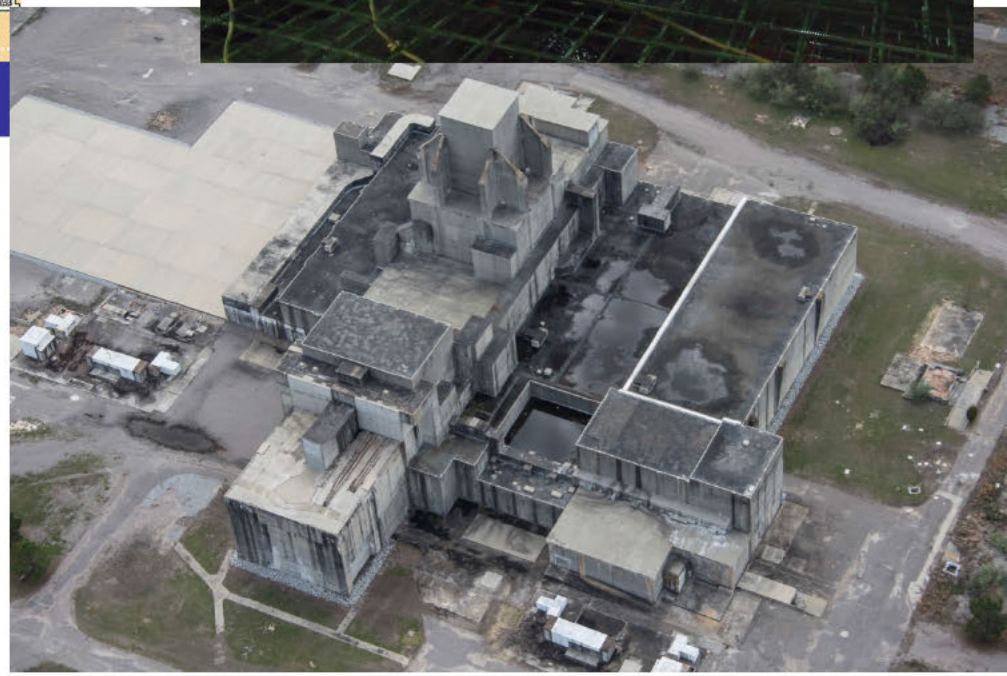
- Final Remedy Selection
  - Preferred alternative modified if necessary based on input from support agency (SCDHEC) and public
  - Final remedy decision documented in Record of Decision
  - Record of Decision describes how remedy meets legal requirements under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
  - Signed by the three parties to the SRS Federal Facility Agreement, DOE as lead agency, EPA, and SCDHEC

Soil Oxidation and Soil Vapor Extraction

P Ash Basin Cover

P-Reactor In Situ Decommissioning





P Stack demo IMG_0218.MOV

Questions?