



Remediation 101:

Understanding Remediation, Brownfields, and RECAP

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Louisiana Department of Environmental Quality



LDEQ OFFICES



ENVIRONMENTAL SERVICES

WATER PERMITS

WASTE PERMITS

AIR PERMITS

PERMITS SUPPORT DIVISION

ENVIRONMENTAL COMPLIANCE

SURVEILLANCE

ENFORCEMENT

EMERGENCY RESPONSE & RADIOLOGICAL SERVICES

ENVIRONMENTAL ASSESSMENT

AIR QUALITY ASSESSMENT

WATER QUALITY ASSESSMENT

REMEDATION

LABORATORY SERVICES

UNDERGROUND STORAGE TANK

MANAGEMENT & FINANCE

FINANCIAL SERVICES

INFORMATION SERVICES

GENERAL SERVICES

HUMAN RESOURCES





Remediation Services Division

The mission of Remediation Services (RSD) is to pursue a unified approach to the remediation of soil and groundwater impacted by contaminants and ensure consistent application of cleanup standards and methods





What We Do

RSD provides regulatory oversight of all sites in Louisiana that require assessment and remediation of contaminated soils and/or groundwater

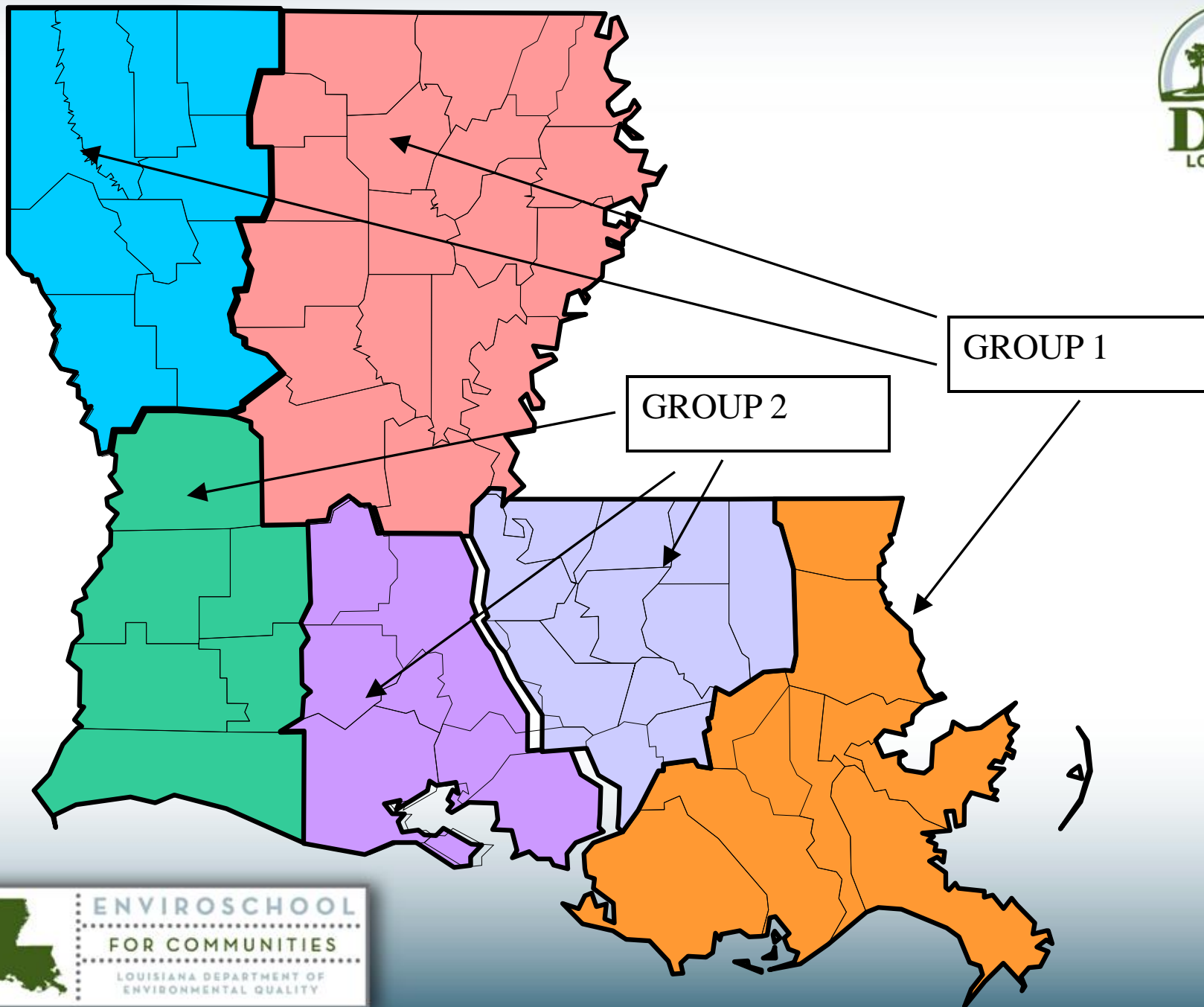




Organization

- **Location of Staff**
 - Headquarters – all regions represented
 - Regional offices
 - Group 1 – New Orleans, Monroe, and Shreveport
 - Group 2 – Lafayette, Lake Charles, Baton Rouge







Types of Sites

- Solid Waste
- Inactive and/or Abandoned
- Hazardous Waste
- Groundwater
- Voluntary Remediation Program (VRP)





Regulations

- Each assessment and/or cleanup is governed by site type and applicable regulation
- Example: IAS sites are under Part VI: IAS Regulations; Solid Waste sites are under Part VII of the Solid Waste Regulations
- The Regulations are media based – such as solid waste, hazardous waste, inactive and/or abandoned waste site
- The Division is function-based: We clean up the site regardless of what type it is and use the appropriate sections in each regulation
- RECAP is the universal cleanup regulation for all sites

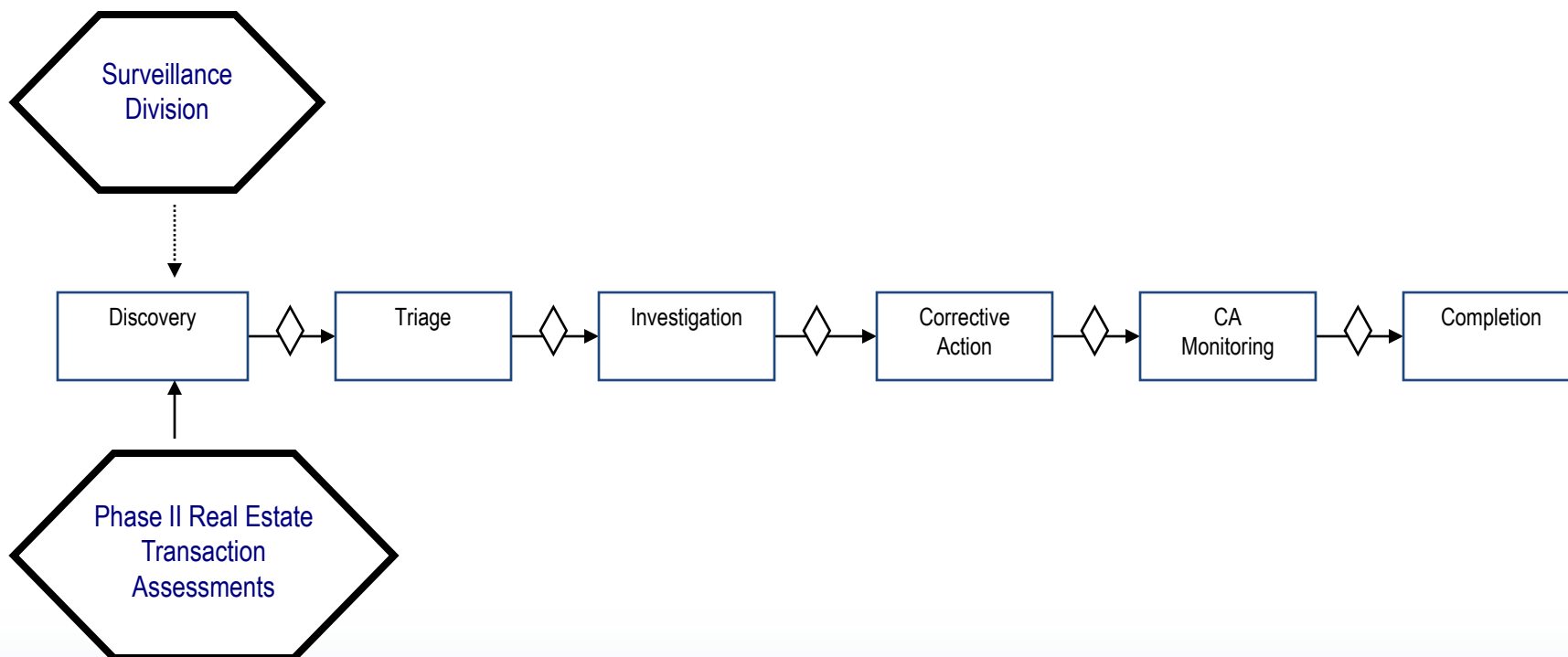


Process Flow Chart





Remediation Process

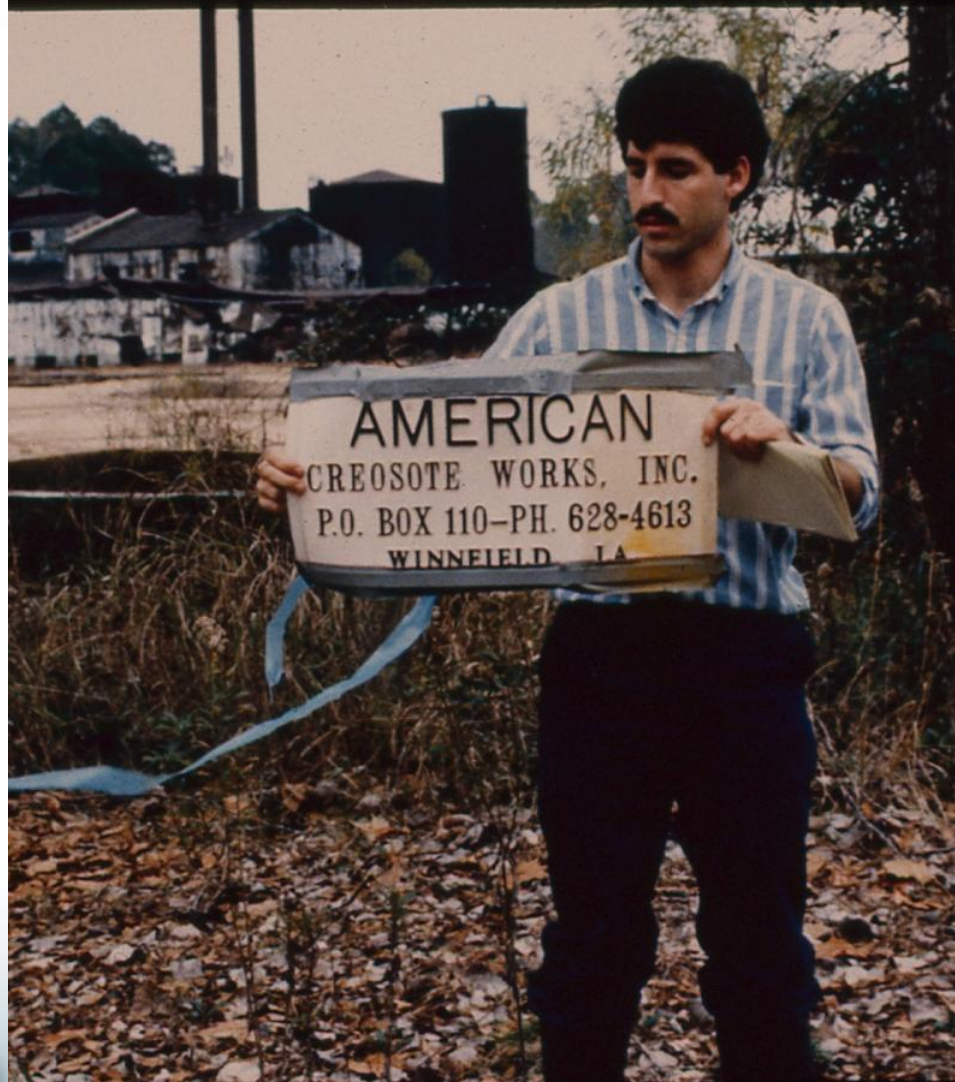


Site Discovery



- Owners or prospective owners provide notice and limited information to RSD
- Referrals of sites from other Divisions
- RSD's Potential Site List
- Referrals from EPA





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we supply CREOSOTE &
TREATMENT
WOOD
TERMITE - RAY BROWN
SAFE







Triage

- Manager reviews preliminary site assessment information
- Site is classified for action under the appropriate regulation (solid waste, IAS, etc.)
- Site is discussed in Operations Group meeting to ensure proper assignment of fees/classification
- Site is Assigned to a Team Leader for action





Interim Actions

- Removals of tanks, drums, process units
- Fencing to prevent contact
- Stabilize situation



Leak from Tank Piping



Sealing Cast for Leaking Pipe









Site Investigation



- Investigate soil and groundwater contamination
- Samples taken to delineate extent laterally and vertically
- Wells put in to classify groundwater and determine concentrations of COCs
- RECAP Evaluation Performed







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Diluted Wolmanac® CCA Type C

Concentrate Part Wolmanac®
CCA Type C Concentrate 50%
(EPA REG. NO. 62190-2)

Work Tank Diluent for treating chemical containing:

Chromic Acid	(percent varies)
Cupric Oxide	according to
Arsenic Pentoxide	solution strength(s)
Water	minimum 90%

WARNING

CAUSES EYE IRRITATION. HARMFUL TO THE SKIN, OR IF INHALED OR SWALLOWED.
AVOID PROLONGED AND/OR REPEATED CONTACT.

FIRST AID: **Eye Contact** - Immediately flush with large amounts of water for 15 minutes. Immediately seek medical aid.

Skin Contact - Immediately flush area with large amounts of water. Remove contaminated clothing. Immediately seek medical aid.

Ingestion - Immediately seek medical aid. Do not induce vomiting. Give 1 glass of milk or 1 to 2 ounces (30 to 60 grams) of activated charcoal in water to victim as directed. DO NOT ATTEMPT TO GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

For use by Licensed Treaters only.
See Wolmanac® Manual, Wolmanac® Concentrate Label,
and Material Safety Data Sheets for further information.



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Site Remediation



- If site does not meet standards (RECAP) – remedial action must be done
- Use any number of remedial technologies:
 - dig and haul
 - passive or active groundwater treatment
 - Incineration
 - bioremediation; etc.

Site must attain RECAP standards before stopping treatment



Removing buried tank



Excavation of soil and debris



Treating Water



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Installing Groundwater Treatment



Installing Wells



Backfilling with clean soil



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Grading and Finishing



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Seeding



Process Area Before Cleanup



Site After Clean up



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Monitoring

- Ensure that groundwater meets the treatment goal
- Monitoring continues for at least 4 quarters after treatment goal is met to verify that groundwater is clean





Site Completion

- All RECAP Standards are met
- Institutional controls, i.e. Conveyance notices, in place
- Engineering controls (fences, caps) in place, if needed
- Site receives a No Further Action (NFA) Letter, if RECAP standards have been met for the intended use (non-industrial, industrial)





Why Some Sites do not get NFA (No Further Action)

- Site soils or groundwater exceed RECAP standards
- Sites cleaned to an industrial standard, but conveyance notice has not been recorded





Final Goal

**Clean up all sites in
compliance with RECAP and
sites' intended future uses**





Programs of Interest

Superfund

Brownfields and VRP

Ready-for-Reuse





Working with Superfund

- RSD and EPA Region VI Superfund Program has long historical working relationship
- RSD has lead on 2 Superfund Sites
- Most Superfund Sites have finished cleanup and are deleted and/or in Operation and Maintenance (O&M)
- State assumes 100% for O&M; State provides 10% match on Superfund cleanups for orphan sites





Funding

- Responsible Party
- Cooperative Agreements
- Hazardous Waste Site Cleanup Fund
- Solid Waste Fee
- Environmental Conditions Review Fee
- Groundwater Fees





Some Numbers

- Current Universe – 792 currently assigned

	Last Year	Since 2000
No Further Actions	260	1,559
Cleanup Plans Approved	49	911





LDEQ'S RISK EVALUATION/CORRECTIVE ACTION PROGRAM (RECAP)

PROGRAM OVERVIEW



LDEQ's RECAP



RECAP is a consistent decision-making process for the assessment of, and the response to, environmental contamination that is based on the protection of human health and the environment.



LDEQ's RECAP Program Objectives



- Ensure protection of human health and environment
- Establish minimum remediation standards as mandated by the Legislature
- Focus resources on areas posing the greatest risk
- Ensure consistent procedures and standards used throughout LDEQ



Principles of RECAP



- Uses best available science to be applied at any site including those with limited resources
- Allows acceptable level of contaminants to be left in place that won't harm human health or the environment
- Is protective of human health and the environment when it's implemented correctly at a Brownfield or any other type of site.





LDEQ's RECAP

- Based on national health risk assessment principles/methods
- Tiered framework
- Lower tiers
 - require less information
 - very conservative, protective assumptions
 - generic risk-based levels
 - often used for screening



LDEQ's RECAP



- Higher tiers:
 - require more information
 - site-specific information used in place of some assumptions
 - site-specific risk-based levels developed
 - used to determine if corrective action is necessary and/or to develop remedial criteria





LDEQ's RECAP

Under RECAP, site evaluation is based on the comparison of:

an acceptable constituent concentration
with
the constituent concentration at the site



LDEQ's RECAP



The RECAP document presents the regulations on how the “acceptable” constituent concentration is defined and how it will be used to make site management decisions.

Acceptable Concentration = Screening Standard

And

Acceptable Concentration = RECAP Standard





LDEQ's RECAP

Two fundamental elements of RECAP:

1. Identification of the appropriate RECAP Standard
2. Estimation of the constituent concentration at the site



Concentrations – what they mean



- RECAP Standards are presented in Parts per Million (ppm)
- A ppm = mg/kg (soil) or mg/L (water)
- Not all soil and groundwater data is presented in comparable concentrations.
- Must compare “apples to apples”



What is a Part per Million?



- One drop of water in a million drops of water
- That means that 1 ppm = approximately one drop of ink in a 40 gallon drum of water
- Or - one second per 280 hours
- Or - a precision of 0.0001%



What is a Part per Billion?



- Differs from ppm by a factor of 1000
- One drop of water in a billion drops of water
- That means that 1 ppb = approximately one drop of ink in an Olympic-sized swimming pool
- Or - one second per 32 years



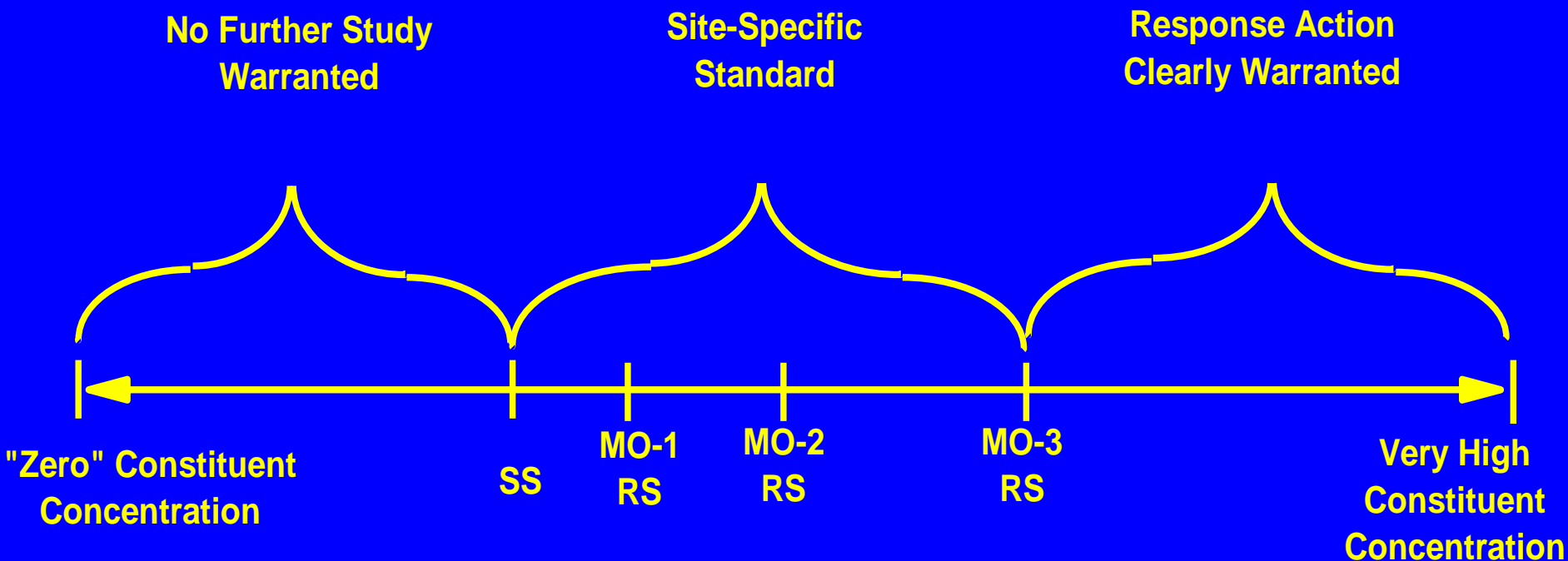
RECAP Program Framework



- Screening Option
- Management Option 1 (MO-1)
- Management Option 2 (MO-2)
- Management Option 3 (MO-3)



Figure 1:
LDEQ Risk Evaluation/Corrective Action Program
Comparison of Screening Standards (SS) and RECAP Standards (RS)



NOTE: MO= Management Option, RS=RECAP Standards

Screening Option



Screening Standards (SS)

- soil and groundwater
- protective of human health and environment
- industrial and non-industrial sites
- uses Reasonable Maximum Exposure (RME) assumptions from EPA (not worst case, but more than average)
- target risk 10^{-6} (Carcinogens)
- target hazard quotient 0.1 (Non-Carcinogens)
(assumes 10 chemicals attacking same target organ)



Screening Process



- Compare maximum concentration to SS:
If \leq SS, then NFA warranted
If $>$ SS, then MO-1, MO-2 or MO-3 or remediate to screening standards
- Identify areas, media, or COCs
- Minimal submittal requirements



Screening Standards



- Screening Standards are NOT intended to be the concentration for cleanup of all sites.
- Higher tiers are just as protective, based on site-specific considerations.



Management Option 1



MO-1 RECAP Standards

- soil and groundwater
- protective of human health and environment
- industrial and non-industrial sites
- uses RME assumptions from EPA
- target risk 10^{-6} (Carcinogens)
- target hazard quotient 1.0 (Non-Carcinogens)
- enclosed space



Management Option 1



Compare the appropriate concentration to the limiting RS:
RS:

If \leq Limiting RS, then NFA

If $>$ Limiting RS, then proceed to MO-2 or MO-3 or
remediate to MO-1 RS





MO-2 RECAP Standards

- soil and groundwater
- protective of human health and environment
- industrial and non-industrial sites
- uses RME assumptions from EPA
- target risk 10^{-6} (Carcinogens)
- target HQ 1.0 (Non-Carcinogens)
- site-specific environmental fate and transport (EF&T) data
- additional pathways (enclosed occupied structures/high particulate emissions)



Management Option 2



Compare the appropriate concentration to the limiting RS:

If \leq Limiting RS, then NFA

If $>$ Limiting RS, then proceed to MO-3 or
remediate to MO-2 RS



Management Option 3



- MO-3 RECAP Standards
- Site-specific exposure data
- uses RME assumptions from EPA
- Target Risk 10^{-6} to 10^{-4} (Carcinogens)
- Target HQ 1.0 (Non-Carcinogens)
- Site-specific environmental fate and transport (EF&T) data
- Alternate RECAP Standards



Management Option 3



Compare the appropriate concentration to the limiting RS:
RS:

If \leq Limiting RS, then NFA

If $>$ Limiting RS, then remediate to MO-3 RS



Groundwater Classifications



Groundwater Classification 1: Public Water Supply

Groundwater Classification 2: Domestic Water Supply

Groundwater Classification 3: Not a Potential Public or Domestic Water Supply due to low yield and total suspended solids



LDEQ RECAP

Ecological Risk Assessment



- *Guidelines for Ecological Risk Assessment*, EPA 1998
- Tiered framework
- Ecological Checklist



LDEQ's RECAP Program Benefits



- Ensures protection of human health and the environment
- Increases the number of sites remediated or closed in a timely manner
- Clarifies risk evaluation process
- Preserves limited land disposal capacity
- Promotes research efforts in risk analysis, remediation technology and risk reduction



LDEQ's RECAP Program Benefits for Brownfields



- Ensures protection of human health and the environment for the intended use of the Brownfield property.
- An integral part of increasing the number of properties that are redeveloped and put back into public use and commerce.



LDEQ's RECAP

Internet Information



- Internet Address: <http://www.deq.louisiana.gov/recap>
- Email: recap@la.gov
- Web Site Information
 - RECAP Document
 - Associated Rule Changes
 - RECAP Contacts
 - Frequently Asked Questions
 - Frequently Requested Files
 - RECAP Web Links





BROWNFIELDS REDEVELOPMENT IN LOUISIANA (*RECLAIMING OUR LAND AND COMMUNITIES*)



Brownfields in Louisiana



- What Are Brownfields and Why?
- Brownfields Redevelopment Tools
 - Decreased Regulatory Barriers
 - Financial Incentives (Federal and State)
 - Technical Incentives



What Are Brownfields?



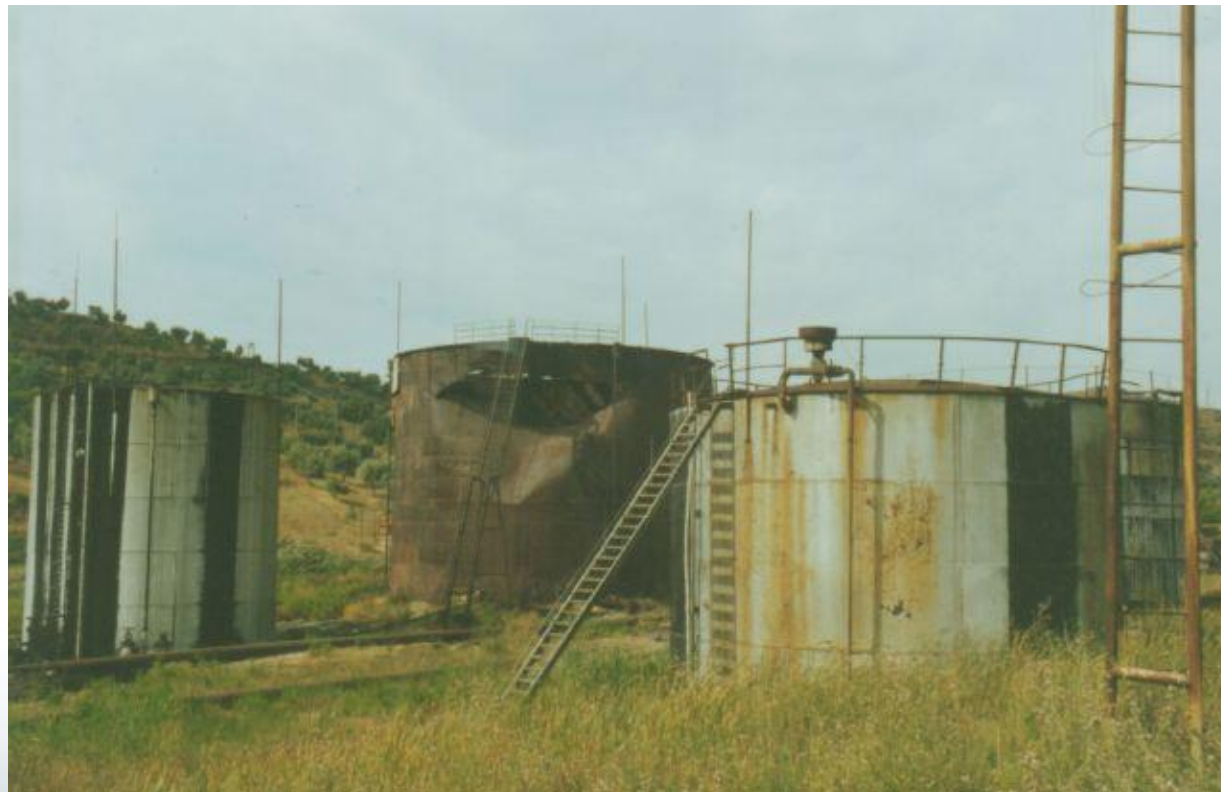
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant



Brownfields



Brownfields



Brownfields



Brownfields



Barriers to Redevelopment or Why Do Brownfields Exist?



- Modern trend of business/industry to move out of urban centers
- Cost of site investigation
- Cost of cleanup versus value of property
- Non-environmental factors (location, infrastructure, etc.)
- LIABILITY/SUPERFUND ISSUES



What Is Superfund?



- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) enacted by Congress in 1980, amended in 1986
- CERCLA gave the federal government (EPA) authority to take direct action at contaminated sites
- Created Superfund liability scheme



Superfund Liability



- Generators, transporters, owners, operators, disposers, even future purchasers liable for cleanup costs (“Polluter Pays”)
- Strict, joint, several, and retroactive liability
 - Don’t have to show fault
 - One or all responsible parties can be held responsible for cleanup costs
 - Liable for past disposal even if it was legal



State “Superfund” Liability



- Louisiana “superfund” law found in Chapter 12 of Environmental Quality Act
- Substantially similar to federal Superfund law



Superfund Liability (Cont'd)



- Chilling Effect on Property Redevelopment
 - Sellers/Owners Afraid To Assess (Investigate Contamination)
 - Buyers Afraid To Buy
 - Lenders Afraid To Lend
 - Insurers Afraid To Insure



Why Are Brownfields a Problem?



- Greenfields Developed for Business/Industrial Use
- Ultimately New Brownfields Are Created
- Potentially Valuable Land Resources Unused
- Neighborhoods Blighted
- Decreased Tax Base



Benefits Of Brownfield Redevelopment



- Reduction of Health and Environmental Risk Through Cleanup of Contaminated Properties
- Productive Use of Formerly Idle Properties
- Revitalization of Neighborhoods
- Job Creation
- New Tax Base



Brownfields Redevelopment Tools



- Decreased Regulatory Barriers/Streamlined Cleanup Processes
- Financial Incentives
- Technical Assistance
- Louisiana Risk Evaluation/Corrective Action Program (RECAP)



Tools-Decreasing Barriers & Streamlining Process



- Streamlined Remediation Process “One-cleanup”
- Prioritized Brownfield Cleanups
- Louisiana Voluntary Remediation Program (VRP)
- State/EPA Memoranda of Agreement
- Comfort Letters



Louisiana Voluntary Remediation Program (VRP)



- A Brownfields Redevelopment Tool
- Helps To Manage Liability/Superfund Issues
- Provides A Release Of STATE Liability For Further Cleanup Costs At A Site
- Release Of Liability Applies To Participant And His/Her Successors And Flows To Future Buyers, Developers, And Lenders



Louisiana Voluntary Remediation Program (cont'd)



- Program Is Voluntary, Applicant May Exit Upon 15-days Notice
- Non-Responsible Applicants May Perform More Flexible, Less Costly Cleanups Married To A Particular Use, Requiring
 - Land Use Restrictions
 - Institutional Controls





Non-Responsible Party

- You are a “non-responsible party”—if you **didn't**:
 - Create, haul, dispose, dump, discharge (or knowingly allow), operate disposal site,
- And so, you **did**:
 - Acquire the property “innocently” (bought, inherited, received donation, etc.)



Louisiana Voluntary Remediation Program (cont'd)



- Over 100 Properties Have Participated in the Louisiana VRP To Date
- 36 Properties Have Completed Cleanup
- More Than 1100 Acres of Property Addressed



What About Federal Superfund Liability?



- LDEQ Has Negotiated a **VOLUNTARY CLEANUP MEMORANDUM OF AGREEMENT (MOA)** with USEPA Region 6
- MOA Gives Assurances That USEPA Will Respect Issuances Of State Releases Of Liability
- MOA Was Signed in October, 2004



American Can Property



American Can Property



American Can Property



American Can Property



Shreveport Convention Center



Shreveport Convention Center



Shreveport Convention Center



Tools-Financial Federal Grants



- **SMALL BUSINESS LIABILITY RELIEF AND BROWNFIELDS REVITALIZATION ACT** Enacted On January 11, 2002
- Provides Some Superfund Liability Reform
- Formally Recognizes State Voluntary Cleanup Programs
- More Than Doubled Federal Brownfields Funding
- Adds Funding For Petroleum-only Sites



Tools-Financial Federal Grants



Funding for States, Local Governments, Non-Profit Organizations

- Site Assessment Grants
- Cleanup Grants
- Cleanup Revolving Loan Funds (RLF)
- Coalition Grants (Assessment and RLF)
- Job Training Grants



Louisiana Local Brownfield Programs (Funded By EPA)



Alexandria, Baton Rouge, Shreveport, New Orleans, Lake Charles, Gretna, West Monroe
New Orleans Regional Planning Commission,
South Central Planning Commission, Acadiana Regional Planning and Development District



Tools-Financial Federal Tax Incentives



- TAX INCENTIVE
 - Federal Brownfields Tax Incentive
 - Recently Extended by Congress
 - Can Deduct Cleanup Expenses In The Same Year Incurred





Tools-Financial

LA Brownfields Investor Tax Credit

- Credits for Investigation and Cleanup Costs
- Credit Is Against Louisiana Income Tax
- 15% Credit for Investigation Costs
- 50% Credit for Cleanup Costs
- Credit May Be “Rolled Over” or Transferred for Up to Ten Years



Tools-Financial

LA Brownfields Investor Tax Credit



Eligibility

- Must Be a Brownfield
- Participate in the LA VRP
- Must Be Non-Responsible Applicant (not the polluter)





Tools-Financial

LA Brownfields Investor Tax Credit!

- So Far:
 - 11 Applications Received by DEQ
 - Over \$1.3 Million in Tax Credits Requested
 - More Than \$30 Million in Direct Economic Benefits Anticipated



Tools-Financial

Direct State Assistance



- Louisiana Targeted Brownfields Assessment Program
 - Primarily for Public or Non-Profit Applicants
 - Phase 1 & 2 Environmental Site Assessments
 - Full RECAP Site Investigations
 - Over 20 Brownfield Properties Assessed to Date



Tools-Financial

Direct State Assistance



- Louisiana Brownfields Cleanup Revolving Loan Fund
 - Coming Soon to a Brownfield Near You
 - Below-Market-Interest Loans to Local Governments, Non-Profits, and Private Companies to Cleanup Brownfield Properties
 - DEQ Currently Has \$1M in RLF
 - To Compliment Local Government RLF's





Other Tools

- Technical Assistance
 - LDEQ
 - EPA
 - Direct Technical Advice and Consultation
 - Educational Workshops and Presentations
- **LDEQ Risk Evaluation Corrective Action Program (RECAP)**





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To Learn More About Brownfields



- www.deq.louisiana.gov/brownfields





COMING TO NEW ORLEANS IN 2009!

- 13th Annual **Brownfields2009** National Conference

New Orleans, Louisiana

November 16-18, 2009

Sponsored by EPA and ICMA

www.brownfields2009.org



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DEQ in 2009

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