

Recommendations for Closure of Low-Threat Chlorinated Solvent Cases

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Region 2 Groundwater Committee Project

Working Group:

- Kevin Brown, CEG
- Cleet Carlton, PG
- Alec Naugle, PG (committee chair)
- Brian Thompson, CHG, CEG

Peer Review:

- Groundwater Committee
- Stephen Hill
- Groundwater Committee Partners
- External Peer Review

Presentation Outline:

- **Legal/Policy Framework**
- **Region 2 Case Survey**
- **Low-Threat Criteria**
- **Case Management**

You want to close a chlorinated solvent case ?



Key Policies & Decisions

1. 68-16 “Non-Degradation” Policy

- Restricts reduction of existing “high” water quality, except when:
 - 1) Consistent with maximum benefit to the people of the State;
 - 2) Does not unreasonably affect present and anticipated uses; and
 - 3) Does not result in water quality less than prescribed in the Water Board’s Basin Plan and policies

Key Policies & Decisions

2. 92-49 “Investigations & Cleanup” Policy

- Cleanup must have a “substantial likelihood” to achieve cleanup goals in a “reasonable time frame”
- Must attain background or the best that is reasonable (i.e., technologically and economically feasible) if background is not
- Same exceptions as Non-Degradation Policy

Key Policies & Decisions

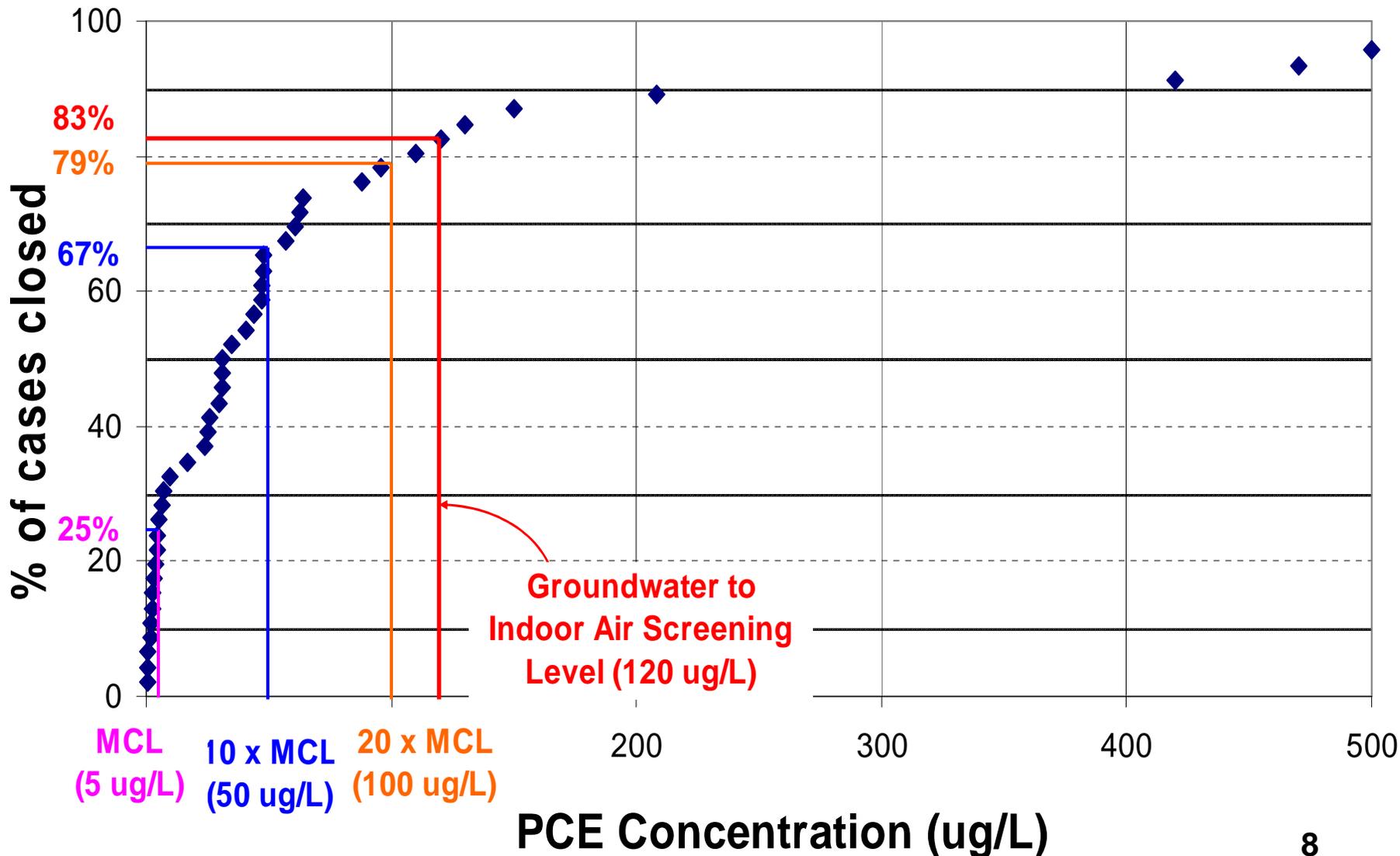
3. “Walker” Decision (1998)

- Cleanup standards do not have to be met at time of case closure, but within a reasonable time frame
- Given CSM, “decades to hundreds of years” may be reasonable

4. “Texaco” Decision (1998)

- When considering “maximum benefit to the people of the state,” can consider statewide consequences of requiring immediate attainment of cleanup standards (i.e., costs, landfill impacts, environmental consequences)

Region 2's Practice (over ~last 5 years) Maximum PCE Concentrations at Closure (46 Cases)



Recognizing Differences between Fuel and Solvent Cases

Fuels

- Less toxic
- Amenable to bio-degradation
- Less mobile in subsurface
- Smaller groundwater plumes

Solvents

- More toxic
- Bio-degradation is slower or absent
- More mobile in subsurface
- Larger groundwater plumes

Emphasize the Importance of a Good Conceptual Site Model



Low-Threat Criteria

1. Development a Complete CSM

1a) Evaluate Sources

1b) Characterize Site

1c) Identify Exposure Pathways
and Receptors

No Unacceptable Risks and Threats



Risks to Human and Ecological Health



AND



Threats to Water Resources and the Environment



Low-Threat Criteria

1. Development of a Complete CSM

1a) Evaluate Sources

1b) Characterize Site

1c) Identify Exposure Pathways and Receptors

2. Mitigation of Risks and Threats

2a) No Unacceptable Risks - Human & Ecological Health

2b) No Unacceptable Threats – Water Resources and Beneficial Uses

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3. No Adverse Affects from Residual Contamination

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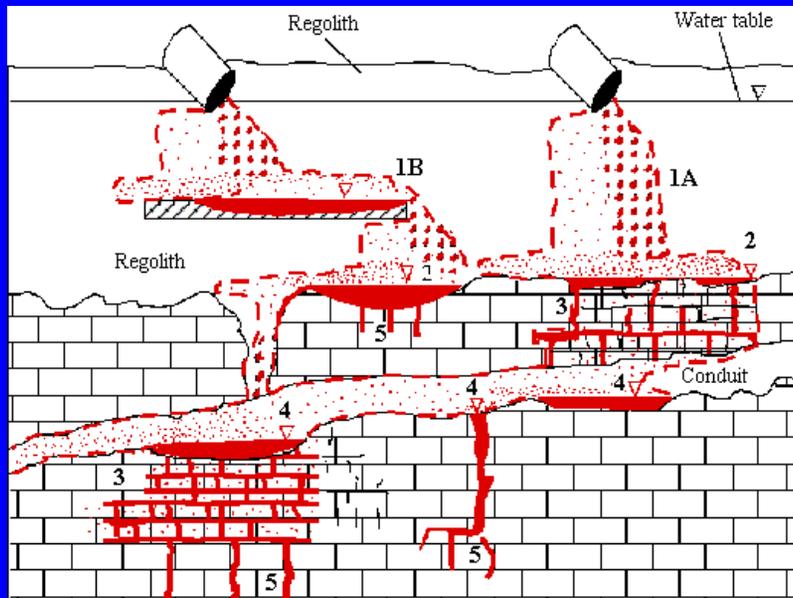
2b) No Unacceptable Threats – Water Resources and Beneficial Uses

3. No Adverse Affects from Residual Contamination

3a) Remediate Sources

Source Zone Reduction

Source mitigation is a fundamental requirement for case closure and source reduction is an integral part of monitored natural attenuation strategies.



Source: modified from Wolfe W.J. and Haugh, C.J., 200 and Wolfe, W.J., et al, 1997), USGS reports.

Evaluation:

- Primary and Secondary Sources
- Remedy Verification and Source Reduction Monitoring
- Reduction to the Extent Practical (risk/threat levels, best available technologies, technical and economic feasibility)

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3. No Adverse Affects from Residual Contamination

3a) Remediate Sources

3b) Stable to Retreating Plume

Stable to Retreating Plumes



- **Effective monitoring network and strategy**
- **Natural attenuation rates of parent contaminants and byproducts**
- **Evidence of biodegradation**
- **Trends of spatial and time-series data plots**
- **Presence of biogeochemical indicators**
- **Mass flux**

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3a) Remediate Sources

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3c) Reasonable Time Frame

What's a Reasonable Timeframe?



- **Case-specific determination**
- **Comparison between cleanup and beneficial-use timeframes**
 - Support hydrogeologic and contaminant interpretations/assumptions
 - Confirmation water and beneficial use plans, projects, timeframes, etc.

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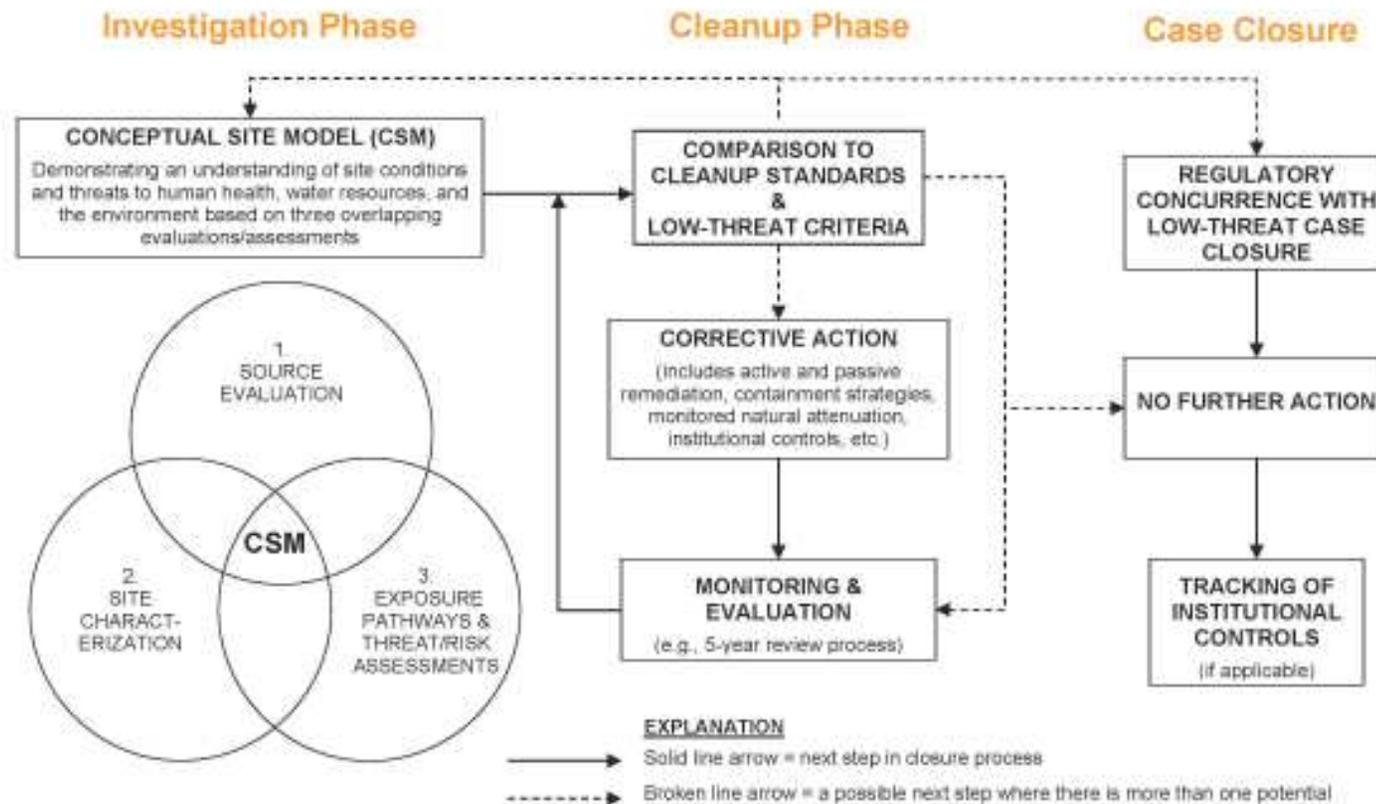
3d) Appropriate Risk Management

Risk Management

- **Regulatory perspective is evolving**
- **2003 Porter-Cologne Act amendment**
- **Water Board oversight not required**
- **Case-specific determination**
 - Lead oversight by another State or local agency
 - Local process (permits) to catch infractions
 - 3rd Party stewardship (with financial assurance)
 - Public and stakeholder concerns
- **Strategies not consistent with low threat**
 - Containment zone
 - Containment remedies
 - Engineering controls mitigating unacceptable risks/threats

Case Management

A Guide to the Cleanup Process



Concluding Remarks

- **Closing “low threat” cases is possible**
 - 10 to 20 times the MCL (for PCE) reasonable?
- **Low-threat criteria are a management tool**
 - Improve support for case closure
 - Facilitate discussions about cleanup timeframes and reasonable foreseeable uses of land and water resources.
- **Low-threat closure not always recommended**
 - Potential issues – program compatibility (RCRA/CERCLA), commingled & offsite plumes...
 - Other recommendations - Containment, 5-year review process, No further active remediation concurrence...

Questions?

