Evaluation of Light Non-Aqueous Phase Liquid (LNAPL)

Laura Luther, Chief

Tanks Remediation Unit

Missouri
Department of
Natural Resources

LNAPL Release Response Requirements

- No explosive or acute risks
- Delineate LNAPL, dissolved, and vapor phases
- No unacceptable risk from LNAPL or associated plume
- LNAPL and dissolved phase plume stable
- LNAPL removed to maximum extent practicable

Identification and Mitigation of Acute Risks

- Report Release
  - (573) 634-2436
  - (800) 424-8802
- Mitigate Acute Risks
  - Explosion
  - Fire
  - Exposure (dermal, ingestion, inhalation)
- Monitor Vapors for Explosive Risk

Regulatory Requirements Pertaining to LNAPL Removal

- Remove until no longer practicable
- Minimize spread into uncontaminated zones using appropriate method
- Dispose of recovered product appropriately
- Submit a removal report to MDNR within 45 days

LNAPL Conceptual Site Model and Characterization

- LCSM should be developed for every site having LNAPL that is not fully recovered during initial removal actions
- ASTM E2531-06
- While initial removal actions are occurring site characterization work plan must be developed

LNAPL Characterization Work Plan

- Determine vertical and horizontal extent of LNAPL, dissolved phase, and vapor phase
  - Borings, Wells, Soil Gas Sampling Points
  - Preferential Soils/Materials
  - Light Induce Fluorescence, Ultraviolet photography, etc.

LNAPL Characterization Work Plan

- Demonstrate extent practicable
  - Recovery Tables and Charts
  - API Distribution and Recovery Model
  - ASTM E2531-06
  - Other Recovery Models

LNAPL Characterization Work Plan

- Identify most appropriate removal method
  - Based on Site-Specific Characteristics
  - Pilot Tests
  - Other Documented Justification
- Determine extent of removal needed based on risks

LNAPL Removal Work Plan

- Based on LNAPL Characterization Report
- Explain most appropriate removal method
- Explain extent of removal based on LNAPL risk evaluation
- Identify metrics used to assess removal effectiveness
- Include schedule of implementation, operation, and monitoring of system

LNAPL Removal Requirements for Every Site

- No Acute Risks
- LNAPL must be removed until the LNAPL body and associated dissolved and vapor-phase plumes are decreasing
- LNAPL must be removed until the LNAPL body and associated dissolved and vapor-phase plumes do not pose an unacceptable risk

Evaluation of LNAPL Through the Risk-Based Process

- Appendix E
- Utilize Table B-5 or Analyze Sample of LNAPL
- If Petroleum Type is Unknown, then All COCs must be Considered Initially
- Do Not Ignore the Presence of LNAPL During Sampling

LNAPL Plume Stability

- LNAPL, Dissolved Phase, and Vapor Phase Plumes Must be Decreasing (Not Expanding into Uncontaminated Areas)
- Must Consider Seasonal and Groundwater Fluctuations
- Determination Must be Justified with Documentation

Requirements When Residual LNAPL will Remain In-Place

- No Acute Risks
- Characterization Complete
- No Unacceptable Chronic Risks
- Plume Decreasing
- Maximum Extent Practicable Reached Using Appropriate Method
- Long Term Stewardship

Long Term Stewardship

- Restrictive Covenant
- Deed Notice
- On Title for All Properties Containing LNAPL
- Section 12

Thank You

Laura Luther

Tanks Section

laura.luther@dnr.mo.gov

(573) 522-2092