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# Piecing Together a Closure Puzzle

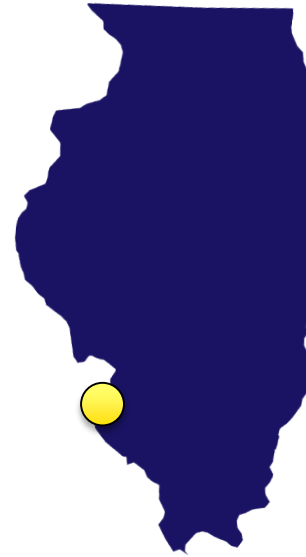
Implementation of a  
Closure Strategy  
Utilizing Site Specific  
Remediation  
Objectives  
Dupo MP Yard

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# UPRR Dupo Yard – Site Context and Challenges



- Former Missouri Pacific yard
- Active classification and maintenance facilities
- Large site – total property ~800 acres
- Variety of environmental impacts
  - Metals and petroleum constituents in soil
  - Arsenic in groundwater
  - LNAPL
- Conventional/presumptive remedies costly and disruptive





# PROJECT TIMELINE



To be continued ....

Well installation,  
Impacts found

RI Report

Monitoring, skimming, bailing

1984

1986

1993

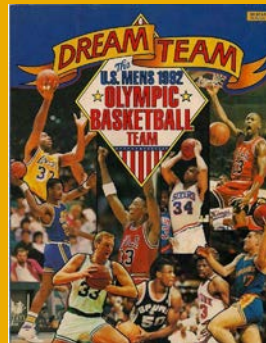
1994

2006

Illinois EPA Notice  
of Liability

NPDES  
Consent Order

Risk Assessments



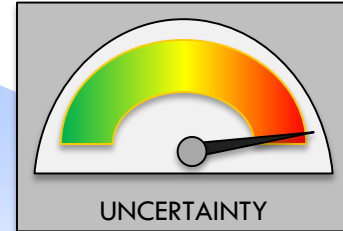
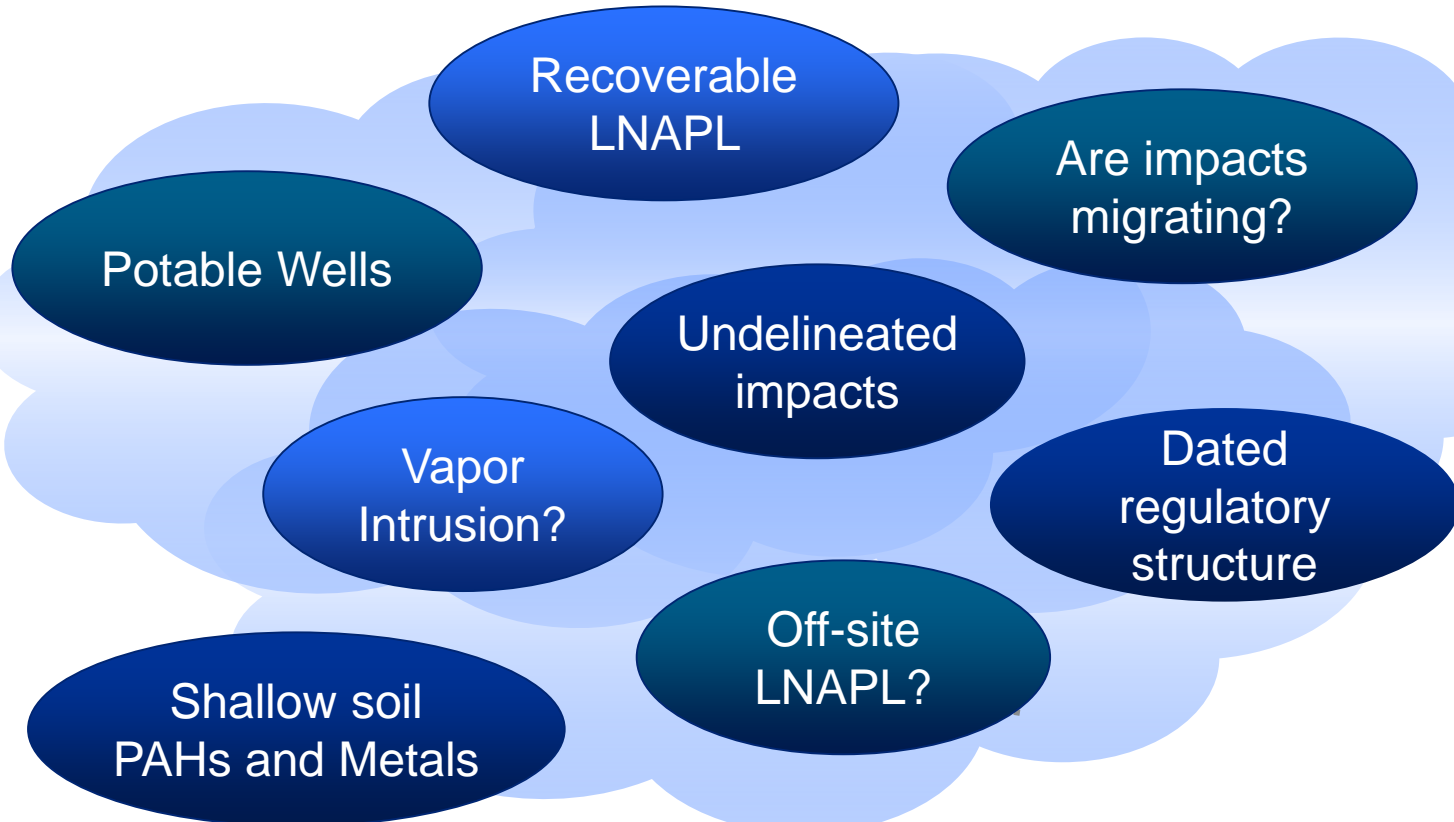
# Regulatory Engagement



- Starting in 2007 UPRR seeks to refresh and reboot Illinois site management
- Demonstrated commitment to progress and collaboration through in-person project meetings and listening to agency feedback
- Illinois EPA staff helped steer the project toward the shared goal of all parties – management of potential risks and close-out of historical liabilities and obligations



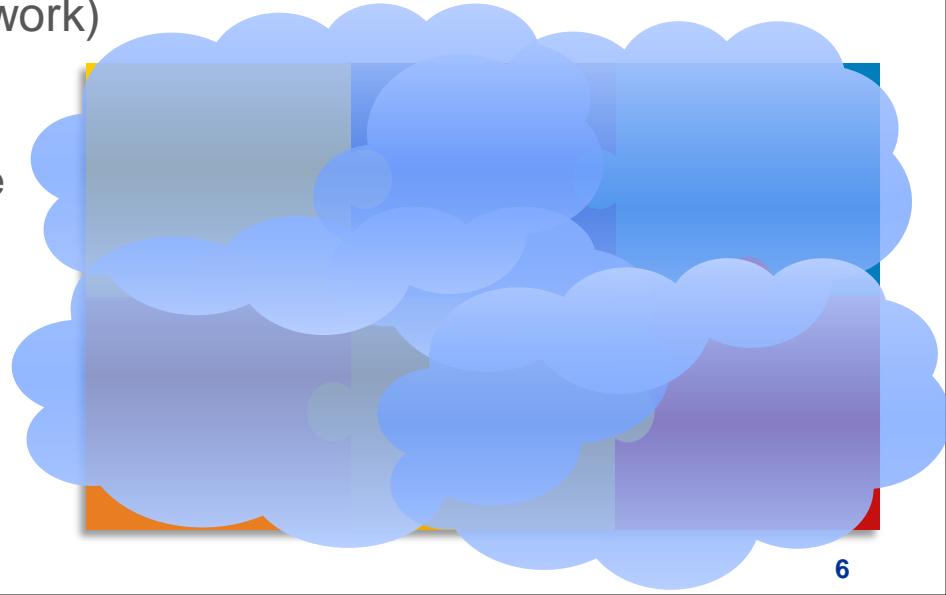
# Where do we start?



# Finding a Path Forward



- Identify high-risk areas and easily addressed items
- Compartmentalize issues and address piece-by-piece
- Prepare separate site-specific evaluations (Tier 3 submittals in Illinois EPA framework)
  - Shallow soil (PAHs, metals, etc.)
  - Arsenic in groundwater
  - Offsite groundwater impacts for benzene
  - LNAPL delineation and management
  - Indoor air/vapor intrusion



# Shallow Soil Impacts



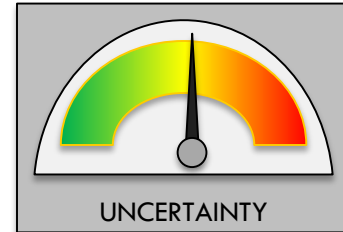
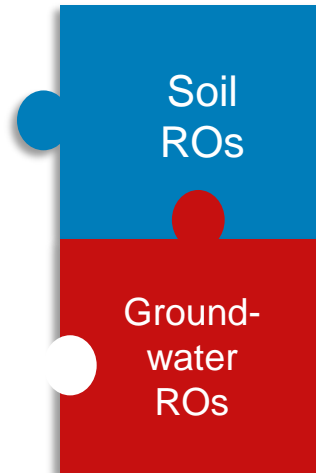
- Extensive sampling done to assess PAHs and inorganics
- Tier 3 risk assessments used to set site-specific remediation objectives (ROs)
- Good as a first step in the closure process:
  - Demonstrates a lack of short-term/worker risk
  - Starts down an institutional-control/risk management closure path



# On- and Off-site Groundwater



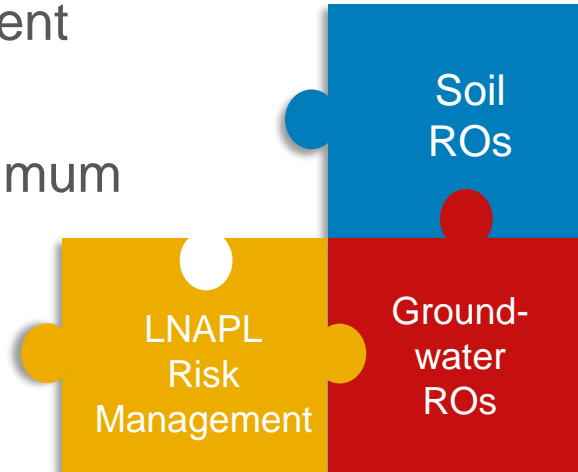
- Quarterly monitoring of extensive well network (including potable wells) to establish base data set
- Monitoring optimization to reduce long-term costs
- Geochemical assessment of dissolved arsenic
- Trend/degradation rate analyses for areas where delineation is impractical
- Illinois EPA approved Tier 3 Remediation Objectives and cessation of monitoring





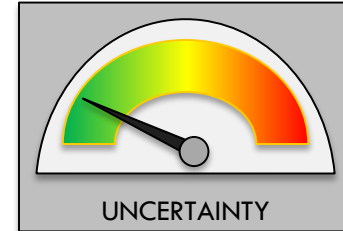
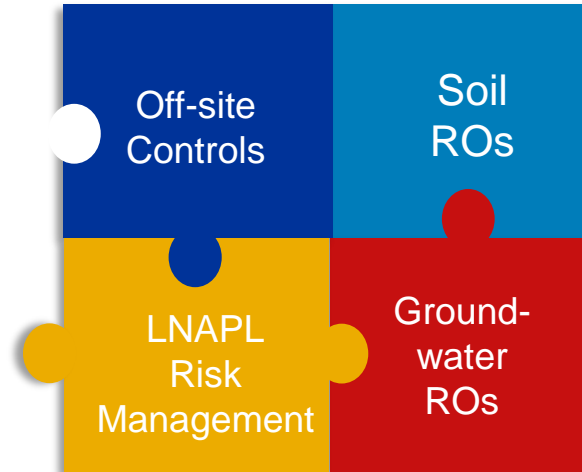
# On-site LNAPL

- LIF and petrophysical investigations to characterize a large, semi-confined LNAPL body and develop an LNAPL CSM
- LNAPL mobility/stability assessment
- LNAPL recovery (skimming) to demonstrate recovery to the maximum extent practicable
- Risk management and institutional controls



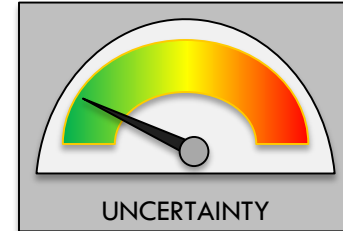
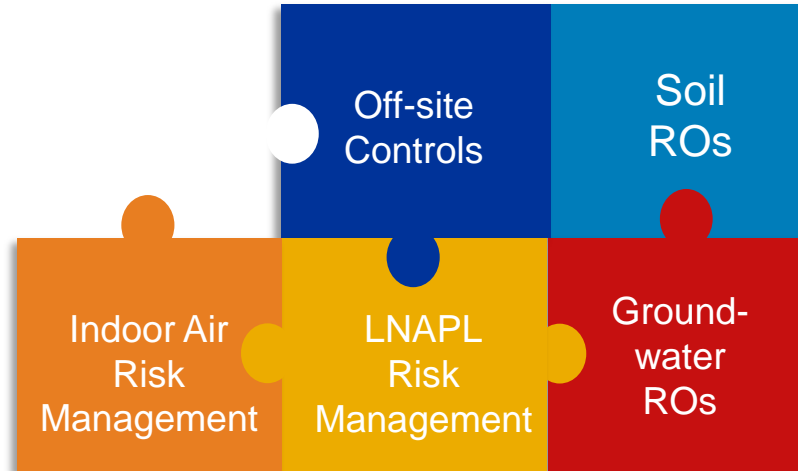
# Off-site Impacted Property

- LNAPL and groundwater impacts identified on a commercial property (restaurant/bar) across the street
- UPRR purchased property
- Building demolition and institutional controls

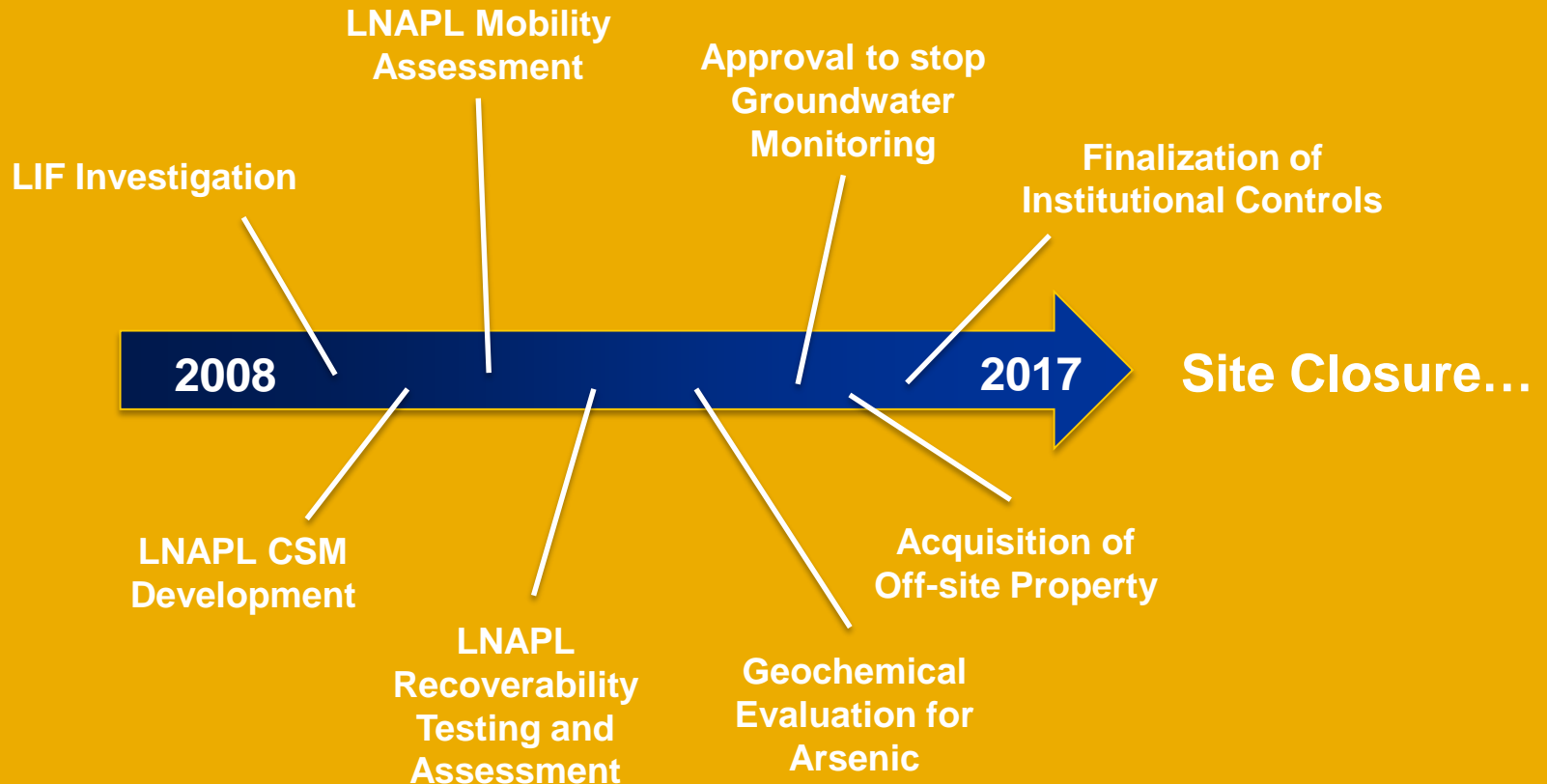


# Indoor Air Risks

- Potential vapor intrusion or methane risks at on-site buildings
- Survey of structures and design of vapor mitigation systems
- Manage long-term system O&M through field operations

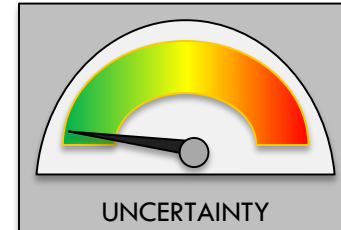
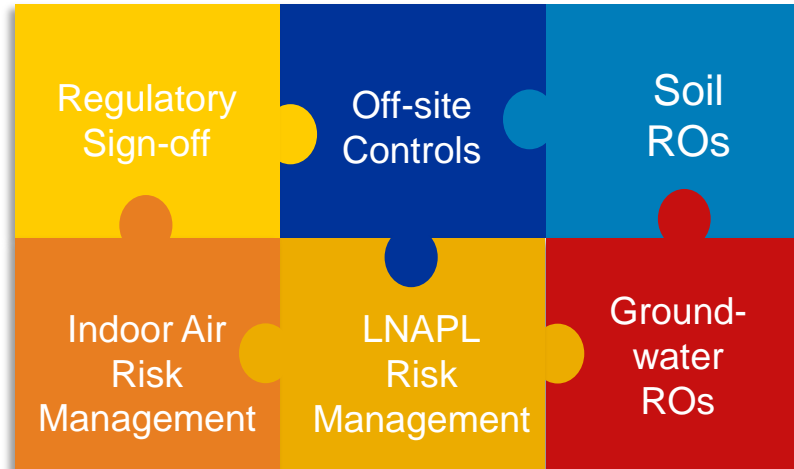
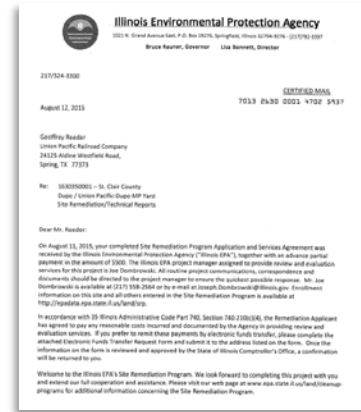


# PROJECT TIMELINE REVISITED



# The Final Piece?

- Find a regulatory closure mechanism
- Enroll the site in the Illinois EPA SRP (voluntary program)
- Close out prior orders/notices with regulatory concurrence





# Results and Take-aways

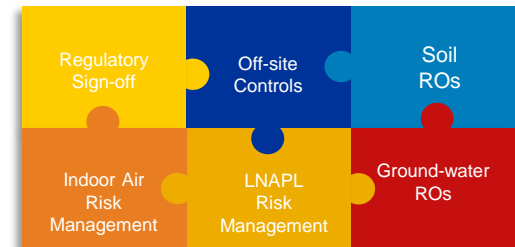


Breaking a complex project into manageable, compartmentalized pieces allowed both UPRR and Illinois EPA to make faster progress and move the site forward.

Focused efforts for each aspect of the project led to:

- Defining and addressing potential risks
- Defining alternative or risk-based remediation goals
- Regulatory closure with manageable long-term obligations

**Regulatory approvals of alternative project endpoints have led to more than \$2M in actual or planned reserve reductions**





# THANK YOU

Questions and Discussion

