Optimizing Remedies with Performance-Based Contracts

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FRTR meeting
November 2014

The Challenge of Performance Based Remediation

- What are the risks of relying on a performance-based remediation (PBR) strategy for remedy optimization?
- What is AFCEC doing to focus PBR Contractors on remedy optimization?
- How effective are PBR contracts in optimizing remedies?

Presentation Overview

- Size of the Air Force optimization challenge
- Pre-PBR approach to remedy optimization
- The promise of accelerated cleanup in a PBR world
- Optimized exit strategy as a PBR objective at complex sites
  - Program implementation
  - Example: Tinker Air Force Base, OK
- Technical surveillance of PBR Contractors
- The bottom line…….

Many Opportunities for Optimization at Air Force Sites

- Size of the Air Force restoration challenge
  - Total sites > 13,000 sites
  - ~60% active installations ~40% BRAC sites
- Current opportunities for optimization
  - Approximately 50% of annual funding tied to remedy optimization (~ 10% of total sites at RIP but not RC)
  - Another 10% of annual funding supports LTM optimization (~ 70% of total sites)
- Beyond Future Years Defense Program (FYDP)
  - 90% of expenditures expected to going to LTM and remedial action optimization

Environmental Restoration Program Optimization (ERP-O)

- ERP-O: Primary mechanism for optimization from 1999 to 2010
- Comprehensive & systematic review of cleanup activities at installations
- Optimize remedy effectiveness & efficiency to minimize life-cycle cost
- Promote sustainability principles in remedy selection

Focus of ERP-O

Remedial Systems & Monitoring Optimization
Decision Logic & Exit Strategies
Tools to Manage & Track Program Risk

12 Years of ERP-O Assessments

Remedy Optimization at 125 Installations
LTM Optimization at 32 Installations

Integrating Optimization with Annual Program Planning

Program Requirements Development (PRD) Process

Plan	Do			Check	Analyze	
Pre-Work Cell [Preparation]	**Table 1** [Review]	**Table 2** [Estimate]	**Table 3** [Produce]		**Table 4** [Plan]	**Post-Work Cell** [Refine]
• *Provide roadmaps and performance metrics* • *Training/ codify best practices in playbooks*	• *Evaluate requirements in a group setting* • *Align w/goals and program metrics*	• *Build lifecycle costs 30+ Years based on requirements* • *Formally document all assumptions*	• *Assemble a document audit trail and ensure internal controls are in place* • *Quality Review of all documents*		• *Develop Investment and Acquisition Strategy* • *Balance Lifecycle cost against TOA*	• *Validate Program & Report* • *Process Refinement*

- ERP-O did not provide expected return on investment
- Air Force now striving to better integrate optimization efforts into planning process
- Major changes in planning process started ~ 4 years ago

The PBR Paradigm Shift of 2010-2011

Policy change refocused cleanup program on:

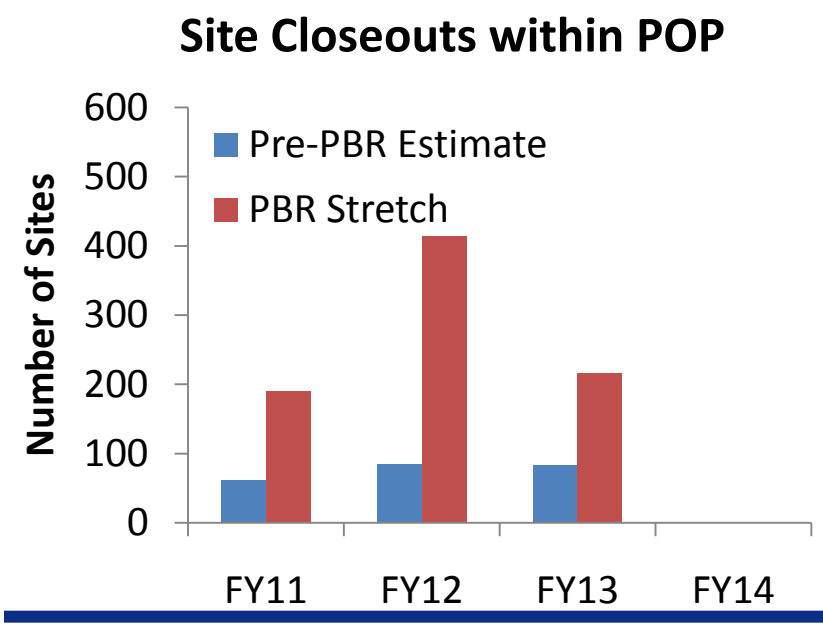
- Fence-to-fence completion vs. achieving remediation at individual sites
- Remedy optimization at the broadest range of sites across an installation vs. individual site optimization

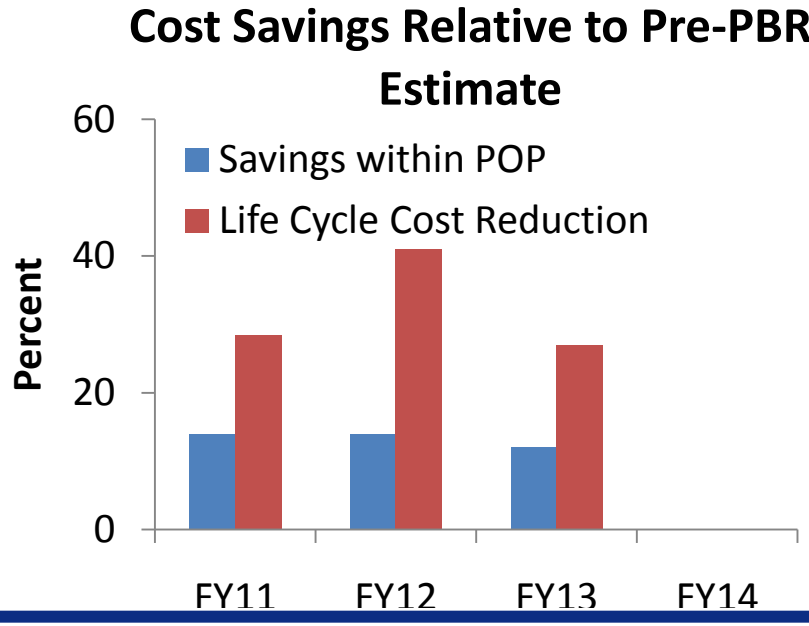
PBR contracts used to achieve objectives & spread risk

- Air Force sets minimum objectives; evaluates proposal merits; provides technical surveillance
- Contractor proposes stretch goals to accelerate cleanup; develops & implements technical approach; optimizes remedies and exit strategies
- GSR techniques required “to the extent practicable”

The Promise of PBR Contracts

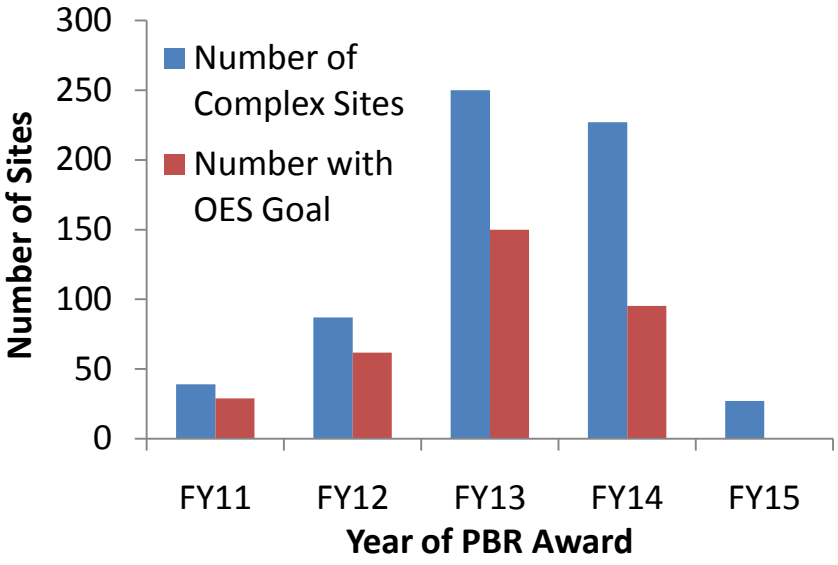
- PBR Contractors have proposed significant stretch goals
  - Technical approaches accepted during proposal evaluations (include mitigation/contingency plans)
  - PBR competition drives bidders to accept increased contract risk

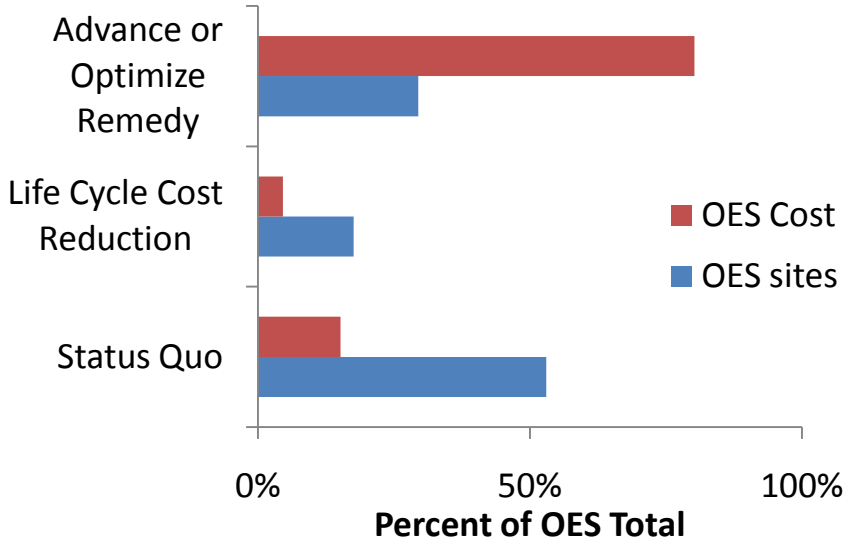




PBR and Long Term Restoration Liability

- PBR Contractors “stretch” at relatively few high risk-complexity-cost sites that are the long-term liability to the Air Force
- Optimized exit strategy (OES) is most common objective
- But what does OES mean?





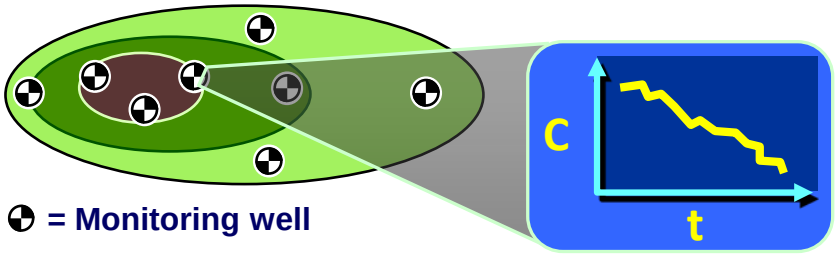
What Do We Get for the Investment in OES?

- Status Quo: Maintain regulatory compliance
  - PBR may not be the optimum contract vehicle
- Life Cycle Cost (LCC) Reduction: Primarily through monitoring network optimization
- Advance or Optimize Remedy
  - Are the most difficult sites in the Air Force (~100 sites)
  - Will drive future liability (>50% of out year LCC)
  - Performance towards site closeout and reduction in LCC in accordance with a performance model
  - Air Force surveillance needs to focus on assuring model adequacy and verifying progress

OES Baseline Assessments

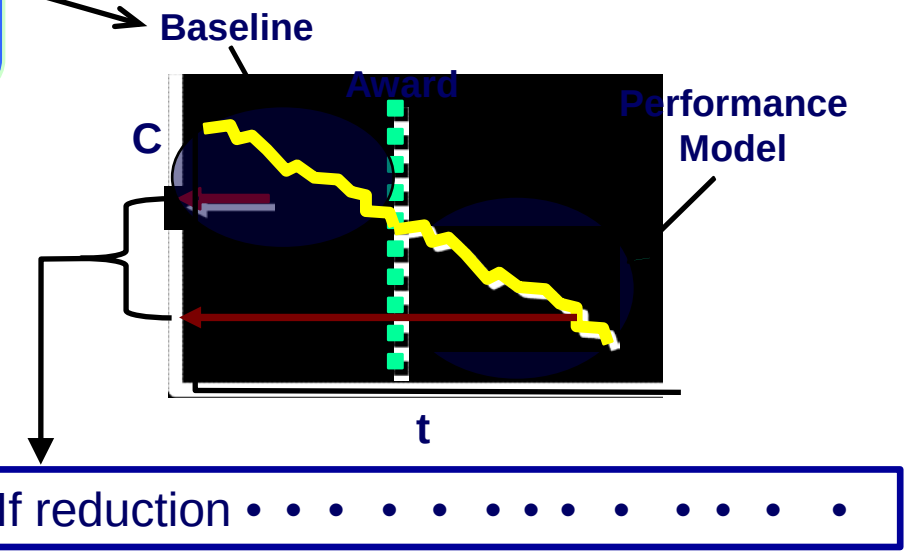
Geometric Mean of Total CVOCs (µM)

Well 1	0.425	
Well 2	0.362	Median
Well 3	0.155	0.259



Pre-Award

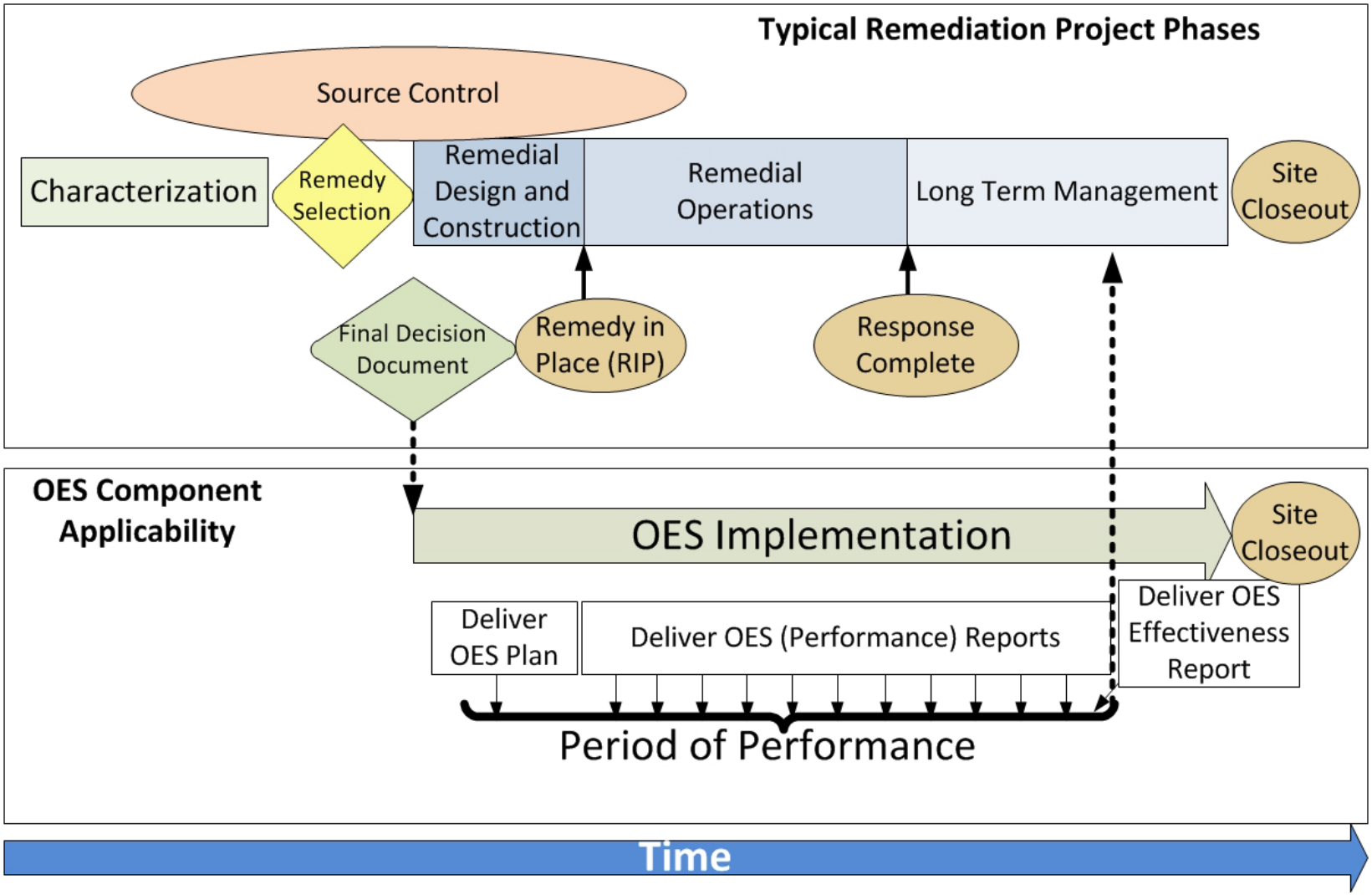
- Identify performance indicator
- Establish baseline of conditions from historical data
- Require contractor to propose performance goals/standards that meet or beat the baseline



Post-Award

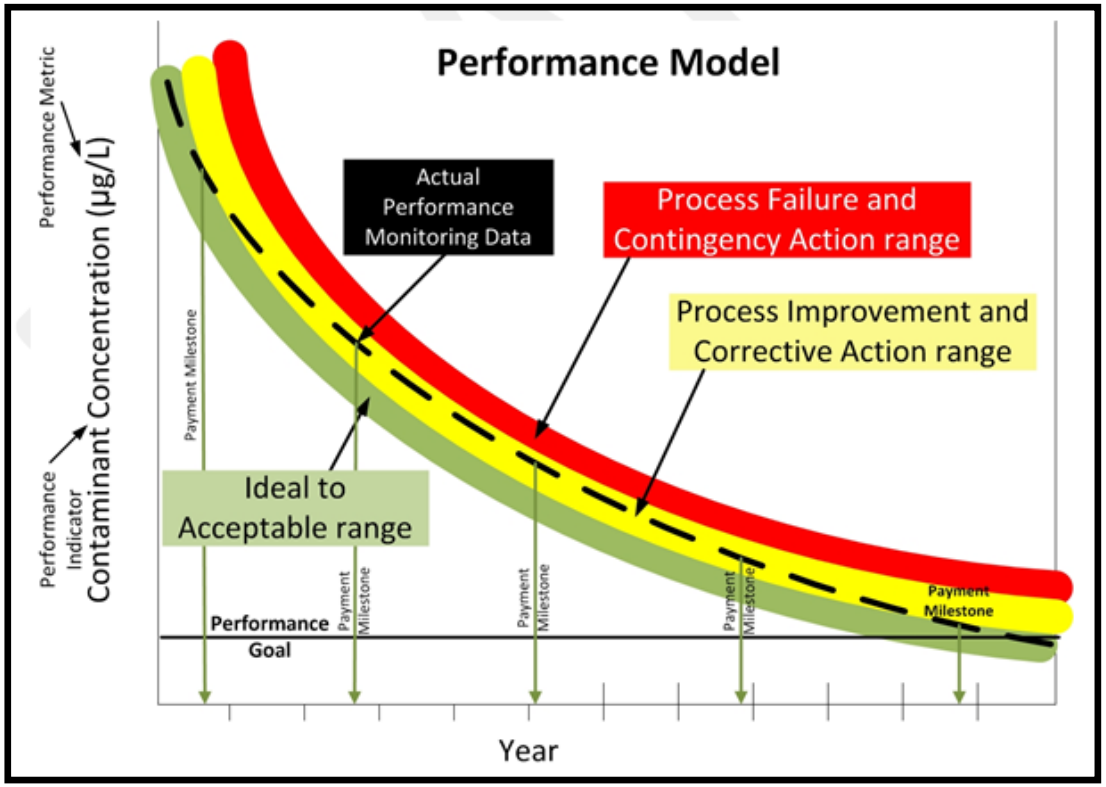
- Contractor must meet or beat proposed performance goal
- Problems:
  - Not all OES Sites have quantitative goals
  - Evaluating rebound

OES Implementation



OES Performance Model

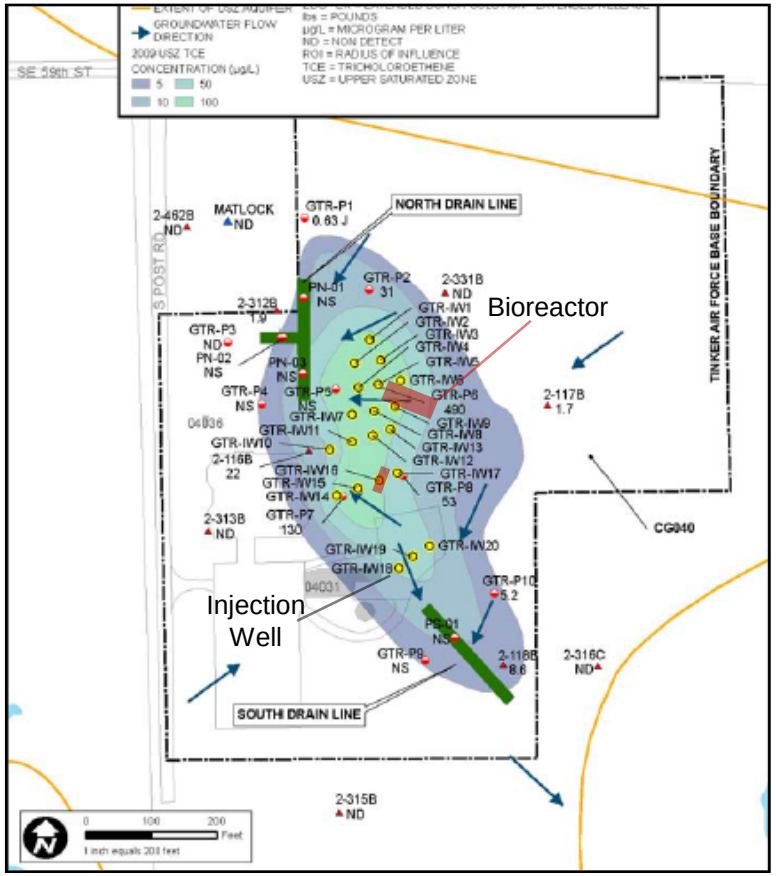
- Developed before or during remedial design (OES Plan)
- Used to track progress (OES Performance Reports)
- Updated if Plan B contingency approach is implemented
- AFCEC guidance document is available



Tinker AFB Site CG040 Remedy Optimization Plan

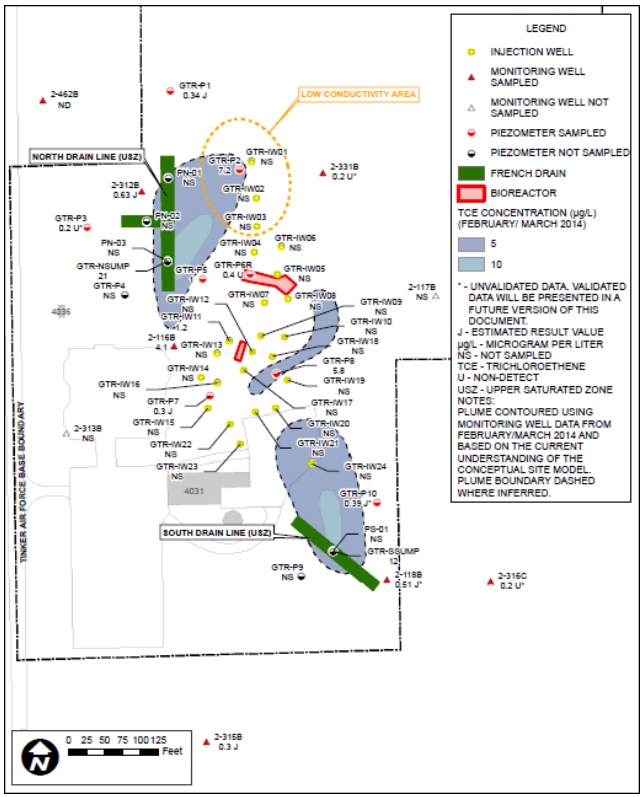
- Low mass recovery of existing P&T system unable to overcome back diffusion of TCE in low permeability sediments
- Optimized remedy includes:
  - In situ bioremediation with injection wells to distribute emulsified vegetable oil (EVO)
  - Recirculation through in situ bioreactors to promote flushing with treated water

TCE Plume Prior to Injections of 2012



Tinker AFB Site CG040 Performance Monitoring

TCE Plume of March 2014



Comparison with Performance Model

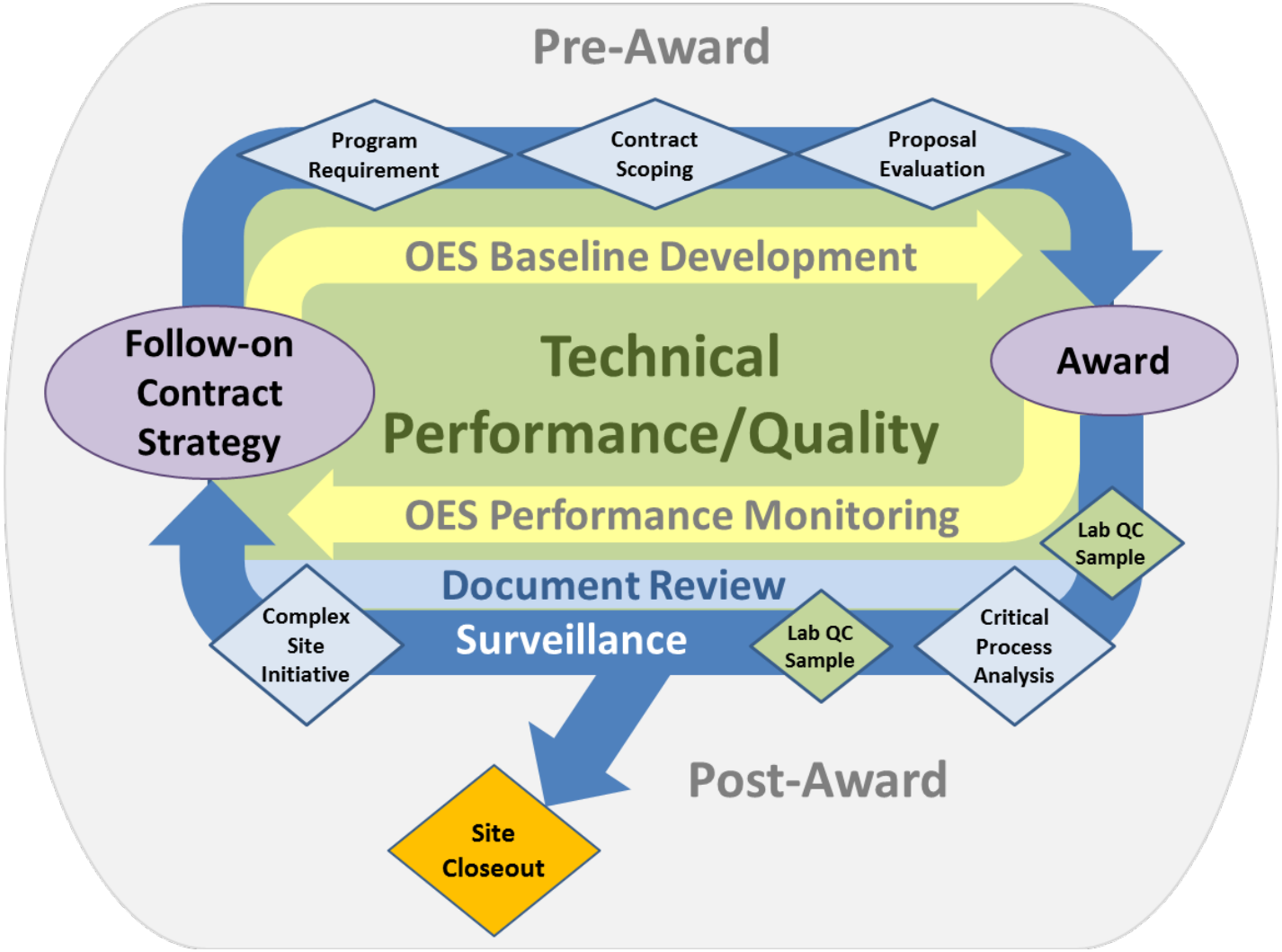
Progress appears to be on track, but:

- Is this TCE degradation or EVO partitioning?
- Will rebound occur after EVO is depleted?

Technical Oversight

- Technical report review in a PBR paradigm
  - Focus: Adequate Data / Correct Logic / Clear Packaging
  - Reviewer guidance and checklists developed
- Field and lab surveillance activities
- Independent verification (Critical Process Analysis)
  - Are remedial systems operating properly and successfully?
  - Is progress on track to meet objectives?
  - Should Contractor implement risk mitigation strategies or Plan B technical approaches?
- Technical surveillance tied to milestone payments

AFCEC Technical Performance Assessment



Complex Site Initiative (CSI)

- At some sites uncertainty is too great to set meaningful PBR objectives
  - Complex hydrogeology
  - Long cleanup times
  - Poor conceptual site model
  - Weak remedial strategy
- CSI charts path forward & aligns contracting strategy with technical reality
  - Independent review by remediation experts/specialists
  - Buys-down uncertainty with targeted data collection
  - Develops conceptual basis & decision logic for remedy optimization
  - Evaluates cleanup potential vs. alternative remedial strategies and endpoints

What's the Bottom Line……

- Site management and technical oversight requires new strategies to match the challenges of a PBR world
- How effective are PBR contracts in optimizing remedies?

Highly effective at accelerating cleanup of low risk less complex sites

But the jury is still out on high cost, high risk, more complex sites

Questions?