# U.S. EPA Superfund Optimization: Progress and Outcomes

## Federal Remediation Technologies Roundtable
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Kirby Biggs,
Carlos Pachon
Ed Gilbert, Matt Jefferson

Office of Superfund Remediation & Technology Innovation
U.S. EPA

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## Agenda

- The nature of Superfund Remedies: Updates from the 2017 Superfund Remedy Report
- Key Elements of the Superfund Optimization Program
- Findings from the 2017 Superfund Optimization Report
- Conclusions


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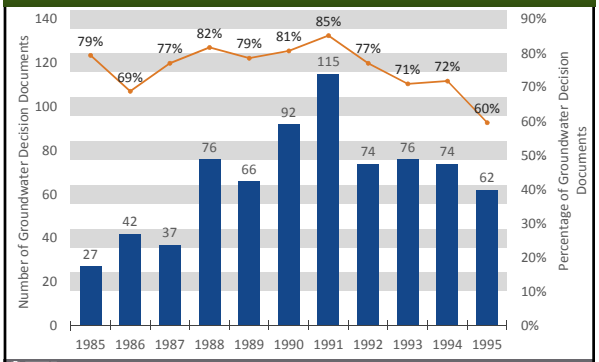
## P&T Selection for Decision Documents with Groundwater Remedies (FY 1985-1995)

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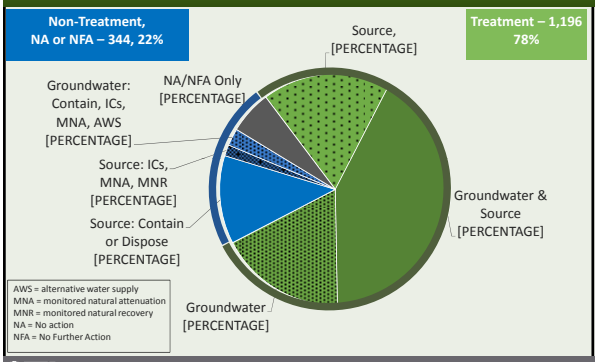
## Treatment at Superfund Sites (FY 1982-2014)
Number of Sites = 1,540

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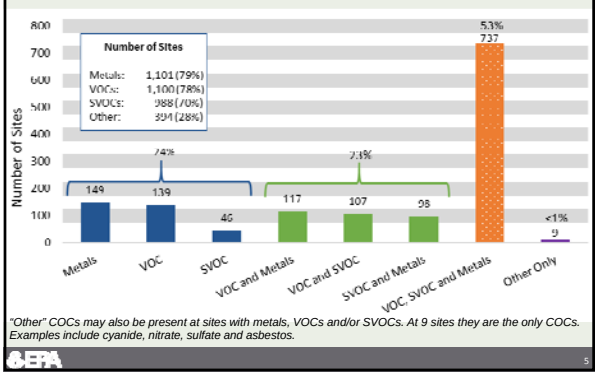
## COCs at Superfund Sites (FY 1982-2014)




*"Other" COCs may also be present at sites with metals, VOCs and/or SVOCs. At 9 sites they are the only COCs. Examples include cyanide, nitrate, sulfate and asbestos.*

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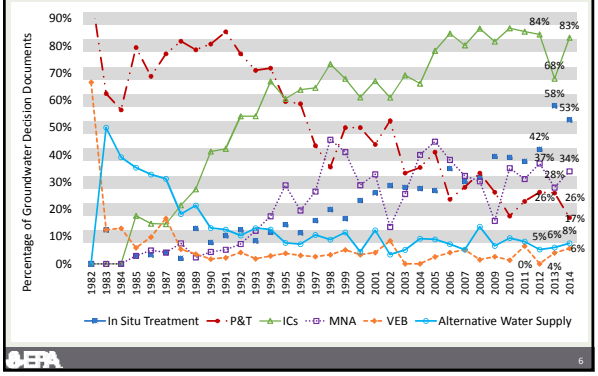
## Selection Trends for Decision Documents with Groundwater Remedies (FY 1986-2014)
Groundwater Decision Documents = 2,357

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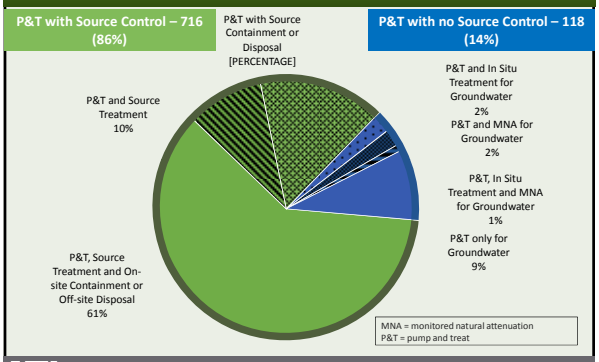
## Summary of Selected Groundwater P&T Remedies (FY 1982-2014)

P&T Sites 834

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## EPA s Working Definition of Optimization

*Systematic site review by a team of independent technical experts, at any phase of a cleanup process, to identify opportunities to improve remedy protectiveness, effectiveness and cost efficiency, and to facilitate progress toward site completion.*

**EPA s National Optimization Program revolves around third-party evaluations**

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## Key Optimization Components and Superfund Pipeline Activities


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## Optimization Evaluations – Accomplishments to Date

| Region | Events/Region | | | Total Events 1997 to Date | % per Region |
|---|---|---|---|---|---|
| | 1997-2010 | 2011-2017 | 2018 to Date | | |
| 1 | 10 | 20 | 0 | 30 | 11% |
| 2 | 12 | 15 | 0 | 27 | 10% |
| 3 | 18 | 9 | 2 | 29 | 11% |
| 4 | 11 | 4 | 0 | 15 | 6% |
| 5 | 12 | 5 | 2 | 19 | 7% |
| 6 | 5 | 16 | 0 | 21 | 8% |
| 7 | 6 | 17 | 0 | 23 | 9% |
| 8 | 4 | 25 | 2 | 31 | 12% |
| 9 | 6 | 25 | 1 | 32 | 12% |
| 10 | 10 | 19 | 5 | 34 | 13% |
| Total | 94 | 155 | 12 | 261 | 100% |

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## Superfund Optimization Work

- **2012 National Optimization Strategy:**
  - » Defined engagement process
  - » Identified priority areas to tackle at sites
  - » Four main components:
- **2018: Action 7 of the Administrators' Superfund Task Force Recommendations seeks to** "Promote Use of Third-Party Optimization Throughout the Remediation Process and Focus Optimization on Complex Sites or Sites of Significant Public Interest".

| FY2017 Optimization Evaluations and Optimization Related Technical Support Efforts | |
|---|---|
| Status | Total |
| Carryover projects from FY16 | 36 |
| New Projects Started in FY17 | 35 |
| Completed in FY17 | 25 |
| Carryover projects to FY18 | 46 |
| Total Active Projects in FY17 | 71 |

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## Optimization Reviews

- **Optimization reviews result in site-specific reports with recommendations that fall within one of six standard recommendation categories:**
  - » remedy effectiveness
  - » cost reduction
  - » technical improvement
  - » site closure
  - » green remediation
  - » redevelopment potential
- **There are three prevalent optimization concepts applied during third-party optimization of sites regardless of the remedial stage**
  - » Adaptive site management
  - » CSM development/revision
  - » Alternative technologies/approaches

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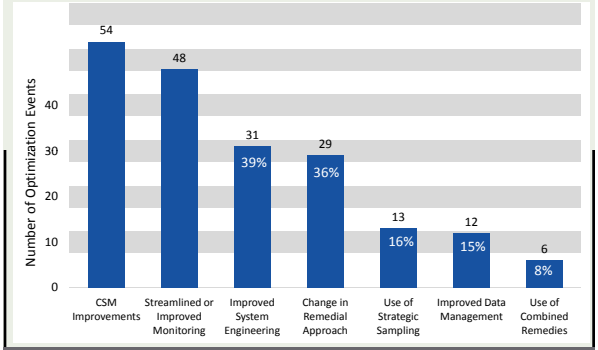
## Number of Implemented Tools and Techniques
### Total Number of Optimization Events = 80

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## Summary of Outcomes from Remedy Optimization Efforts

**2011-2015 – 645 Recommendations**

- **Remedy effectiveness 273**
- **Cost reduction 152**
- **Technical improvement 158**
- **Site closure 107**
- **Green remediation 32**
- **Total (some rec in +1 group) 722**

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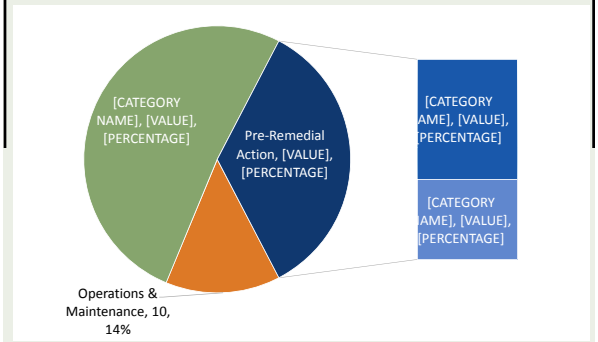
## Superfund Phase of Optimization Events
### Number of Superfund Optimization Reviews and Technical Support Events 72

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## Going Forward: Optimization in the Superfund Remedial Acquisition Framework (RAF)

National Superfund Contracts Under RAF:

- Design and Engineering Services (DES)
- Remediation Environmental Services Contract (RES)
- Environmental Services and Operations (ESO)

Similar Optimization Requirements in RES & DES Contracts

» The contractor shall consider and, to the extent requested by EPA, apply optimization activities for all contract activities. Optimization is defined ….

» Upon request, the contractor shall present optimization options or recommendations for independent review during systematic project planning meetings, provide a cost analysis or cost estimate for these activities, maintain records of optimization related activities, and participate in any third party optimization activities on projects they are executing, as requested by EPA.

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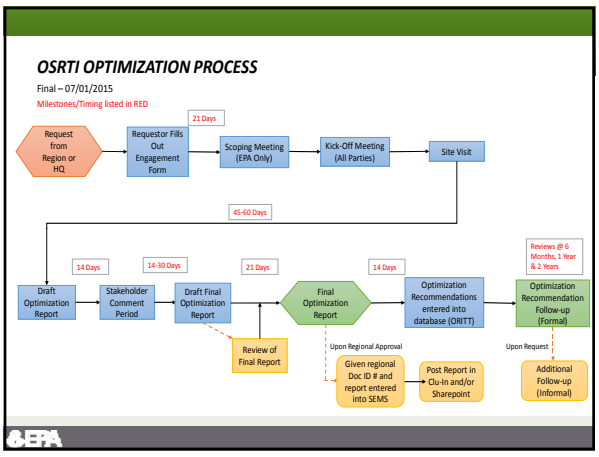


## *Progress Towards Institutional Practice in Waste Programs*

- **Standardized processes applied to**
  - » COI, site engagement and kickoff
  - » Onsite visits and interviews
  - » Report format and development/review/QC process
  - » Optimization Report Inventory and Tracking Tool (ORITT) – tool for tracking metrics
  - » Optimization Project Log (OPL) – tool for program/project management
- **Identifying and applying process improvements to reduce cost and time**
  - » Streamlined standardized optimization report template
  - » "Portfolios": multiple reviews conducted during singular travel events
- Regional management involved in optimization
  - Increased number of sites and level of interest
  - Staffing realities, leveraging program expertise
- Other programs adapting
  - Office of Underground Storage Tanks: 7 Tribal Sites
  - RCRA-LEAN RFI
  - Region-lead Optimization
- Provide access to broad network of optimization support
  - Superfund HQ Mission Support Contractors
  - Regional Remedial Action Contractors
  - Support from other Agencies: USACE

## *Federal Agency Optimization Policies: Many Federal Partners have embraced both Optimization and Green Remediation*

| Agency | Optimization Policy (Y/N), | Remedial Phases | Comments |
|---|---|---|---|
| DOD | Y | Post and including Remedy Selection | General requirement to optimize – no specific requirements |
| Army | Y | Same as DOD | |
| USACE | Y | Same as DOD, also RA-O | Required optimizations on existing FUDS remedial systems with annual O&M costs>$100,000 |
| Navy | Y | All | Optimization across all remedial phases |
| Air Force | Y | All | Performance-based contracting (PBC) requires optimization approaches with major focus of achieving accelerated site completion |
| DOE | N | unknown | Anecdotal suggests some localized efforts |
| EPA | Y | All | Formal program, selected third party optimizations, also recognizes processes typically used by project team e.g. CSM, TRIAD, GR, as included in optimization |

## Conclusions

- Optimization is a mature effort (20 years) and fully integrated in the Superfund program across regions and project lifecycles
- We're acting on the findings: 64% of the recommendations at optimized projects are already implemented, in progress or planned
- Seeing benefits in five main areas: Remedy effectiveness, Cost reduction, Technical improvement, Site closure, Green remediation
- Going forward, we see continuing support and integration, as evidenced by Superfund Task Force Recommendation and the Superfund Remedial Action Framework

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## *EPA Optimization Resources Available on EPA Web Page: www.cluin.org/optimization*

- ***Remediation Optimization: Definition, Scope and Approach***
- **Optimization Review Guides**
  - » Investigation-Stage
  - » Design-Stage
  - » Remedy-Stage
  - » LTM-Stage
- **Site-specific reports**
- **Summary Reports on Implementation Progress**

## Thank you!

www.cluin.org/srr

www.epa.gov/superfund

**Kirby Biggs**
biggs.kirby@epa.gov
**703-823-3081**

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