An Adaptive Approach to Integrating RCRA Corrective Action with Facility Demolition

Diana Marquez; Martha Hildebrandt, PG; and David Barker, PG (Burns & McDonnell); and Charles Grant (Nutrien)

Battelle Bioremediation Symposium

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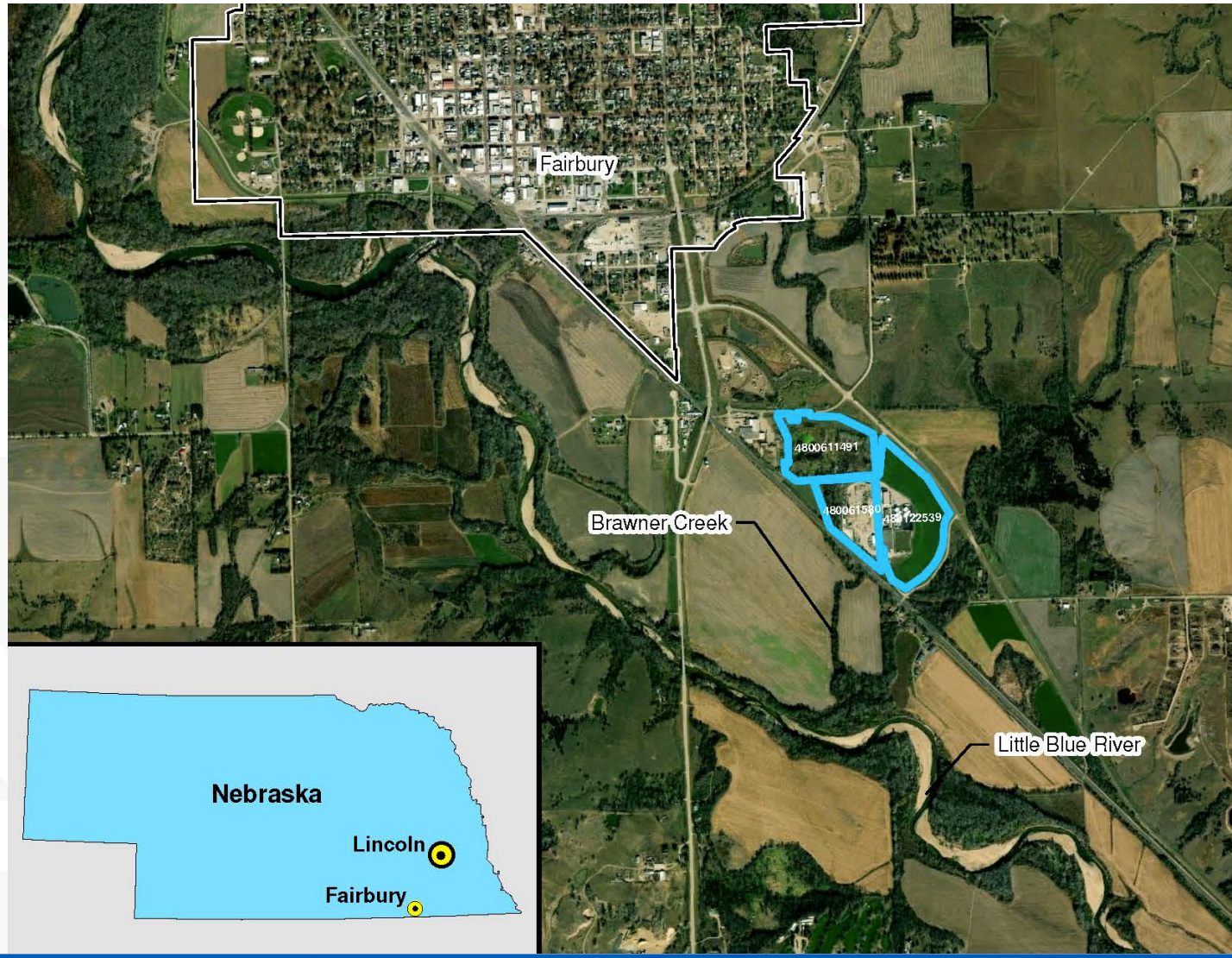
Project Location

- ~ 70 miles southwest of Lincoln, NE
- ~130 miles southwest of Omaha, NE



0 2,000 4,000 N
Feet

Source: ESRI and Burns & McDonnell Engineering.

Former Agrium Advanced Technologies Facility – January 2016

BURNS McDONNELL

Operations History

- Began operations in 1979
- Produced zinc and manganese sulfate micronutrients for use in fertilizer and animal feed supplements
- Feedstocks included:
  - Brass mill fume
  - Zinc oxides from zinc smelters
- Zinc sulfate filtrations produces “lead cake”
  - Characteristically hazardous waste: lead, cadmium, arsenic, chromium, mercury

Operations History

Feedstock Unloading

Operations History

Material Processing

Operations History

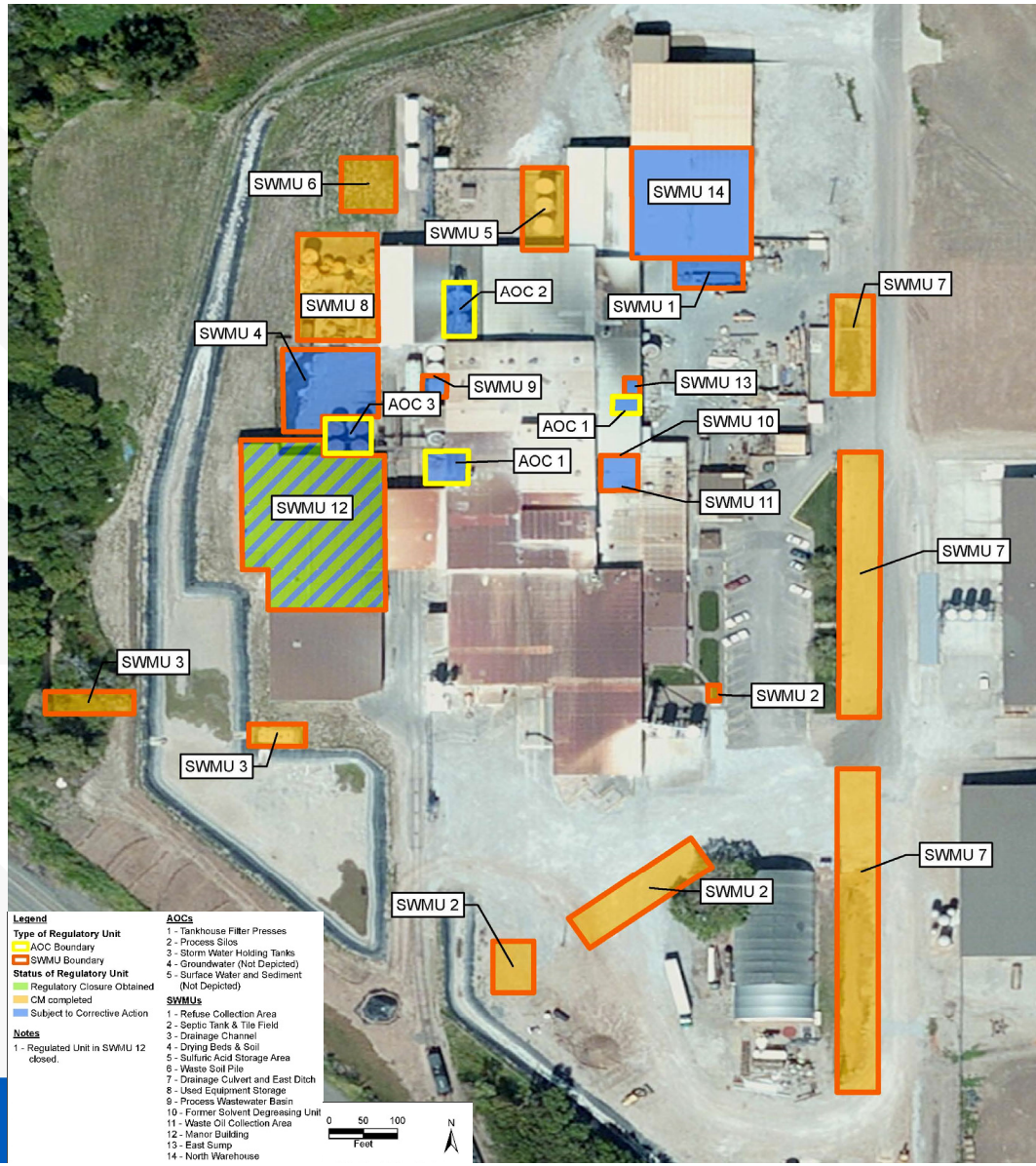
Filtration

Regulatory History

- 1997 - Issued Unilateral Administrative Order (USEPA)
  - Removal/disposal of waste pile
  - Removal/disposal of lead cake
  - Prepare Zinc Oxide Dust Handling Plan
- 1998 – Administrative Order on Consent for Corrective Action (USEPA)
  - RFI/Risk Assessment
  - CMS/CMI
- 2007 – Administrative Order on Consent (NDEQ)
  - Closure of Lead Cake Storage Area
  - Site assessment
  - Post-closure monitoring

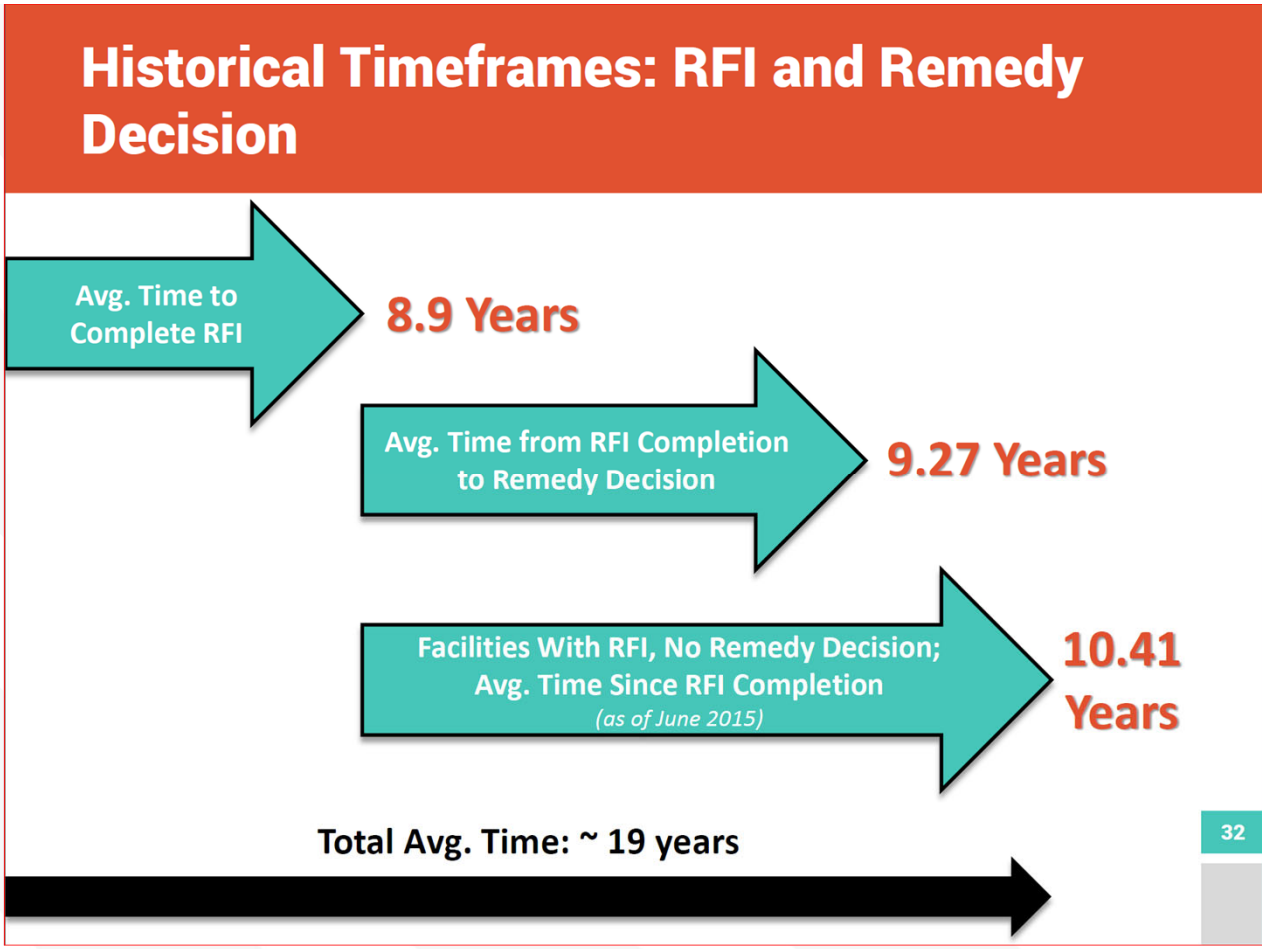
Problem Formulation in April 2016

- Property acquired by current owner and operations ceased in 2014
- Previous corrective action had addressed SWMUs outside of buildings
- Forward momentum in regulatory program had stalled
- Owner wanted property cleared and ready for development by end of calendar year.



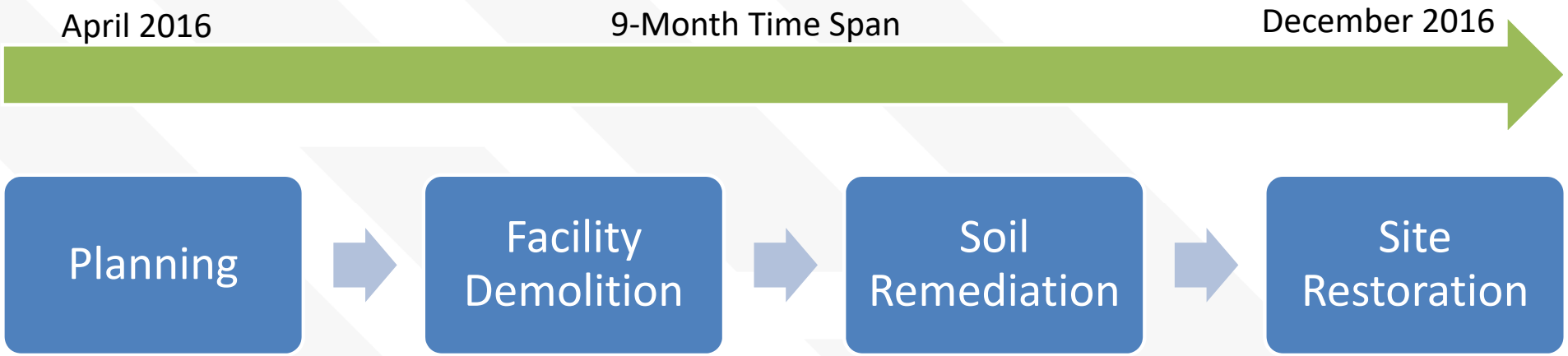
Challenges

1. Slow regulatory program
2. Lack of site characterization
3. Multiple regulatory jurisdictions



From: RCRA Facilities Investigation Remedy Selection Track (FIRST) Toolbox Training, July 22, 2015

Process


April 2016
9-Month Time Span
December 2016
Planning
Facility Demolition
Soil Remediation
Site Restoration

Planning

- Agile Work Plans with decision trees for:
  - Pre-Characterization Work Plan – Further delineation
  - Soil Excavation Plan – Extent of remediation
  - Soil Treatment Work Plan – Soil treatment and disposal
- Single Party Oversight – One contractor responsible for management, planning, demolition and remediation
- Simultaneous demolition and characterization

Demolition

- Removed and disposed of 580 tons of fertilizer solids as hazardous waste
- Removed and recycled 320 tons of metal
- Rubblized 11,450 tons of concrete for on-site reuse
- Removed and disposed of 760 tons of demolition debris and
- 94 loads of concrete as nonhazardous waste

Demolition

Soil Remediation

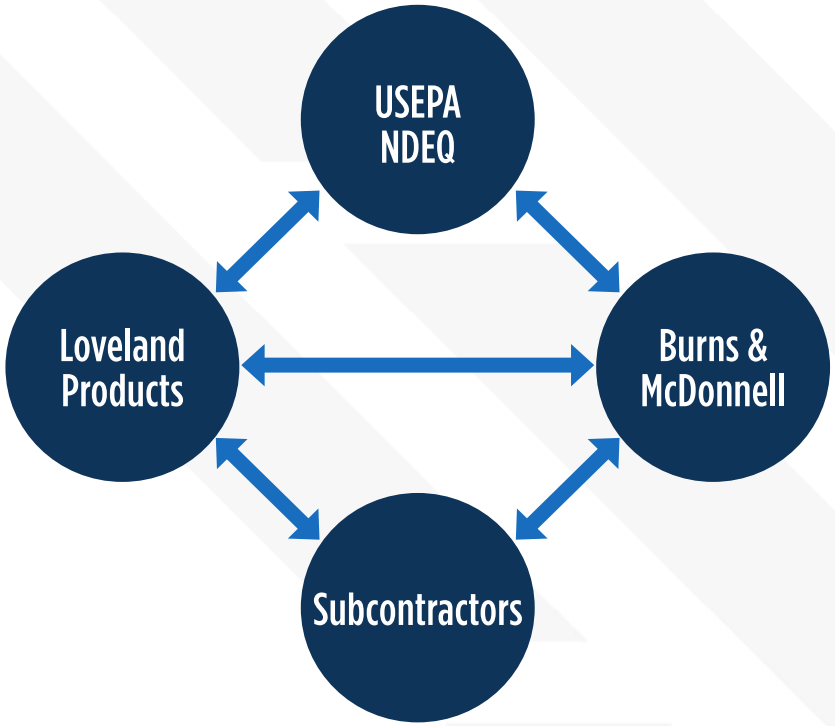
- Excavation area based on grid sampling conducted during characterization
- Stabilized in-situ, excavated and disposed of 6,850 tons of soil as nonhazardous waste
- After stabilization, soil was disposed as nonhazardous waste, resulting in $1.3 million in cost savings

Soil Remediation

Site Restoration

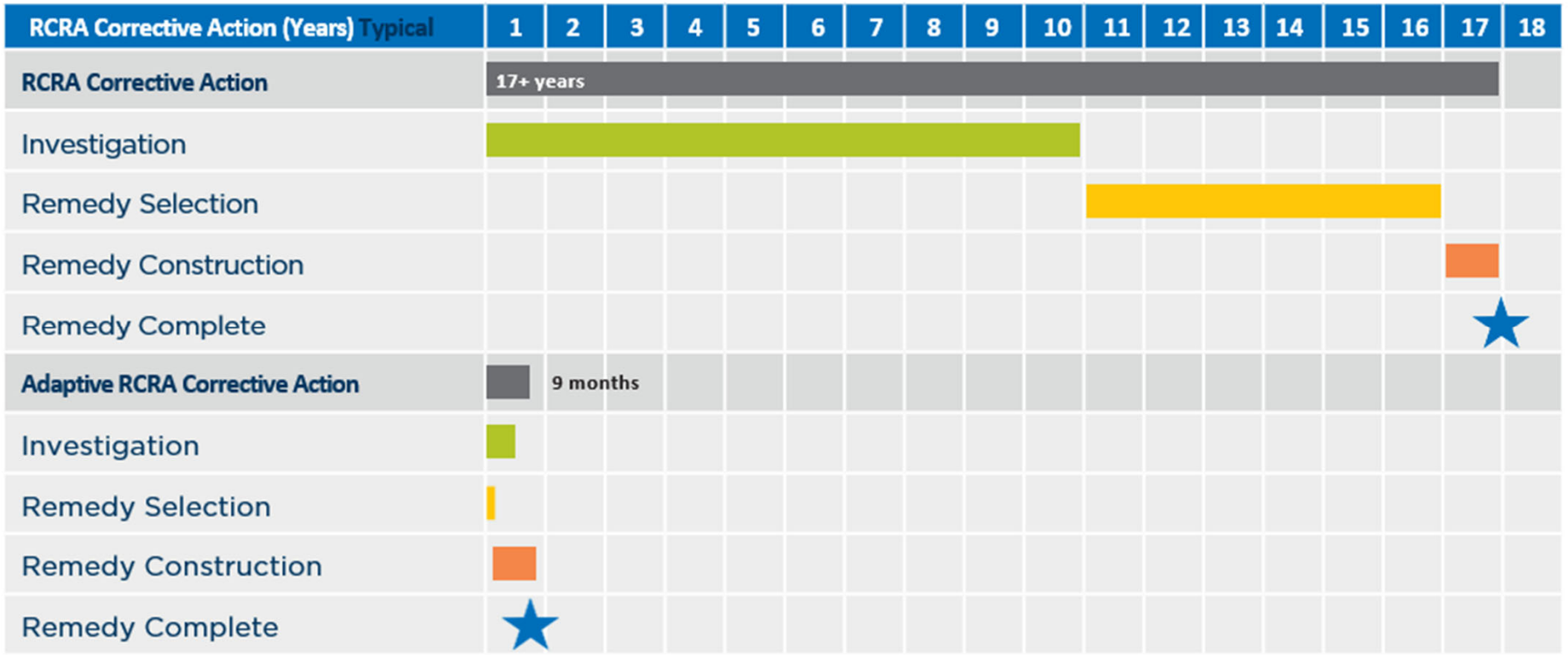
- Crushed/rubblized concrete used as backfill in excavated areas
- Site surface restored with gravel cover
- Removal of impacted soil significantly reduced Loveland's financial liability and risk
- Site immediately available for development and reuse

Secret to Success – Communication!



Weekly phone calls and daily communication ensured quick consensus on decisions

How Did This Compare to Normal?



Results

- The facility was successfully decommissioned
- Vadose zone soil was remediated to established cleanup levels on schedule and within budget.

More than

7,000

man-hours worked at the site over a

9-month

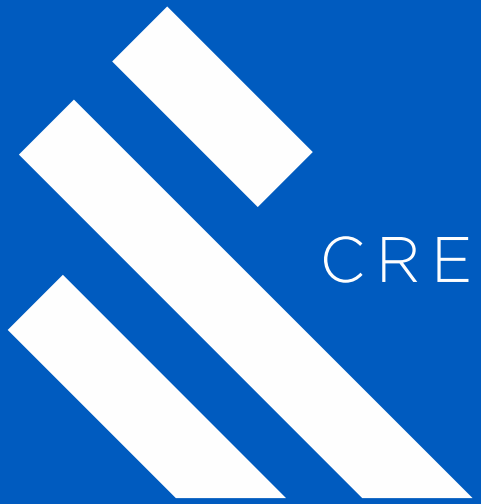
period with no recordable injuries or illnesses

Lessons Learned

- Develop work plans with clear decision trees that are accepted by all stakeholders.
- Keep open lines of communication
- Be responsive to stakeholder concerns in a timely manner.
- Have an on-site construction manager with environmental experience
- Authorize project team to execute decisions.

Questions?

CREATE AMAZING.



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