Proposed Cleanup Plan for Soil

Plainwell Mill Site, Operable Unit 7

Allied Paper/Portage Creek/Kalamazoo River Superfund Site

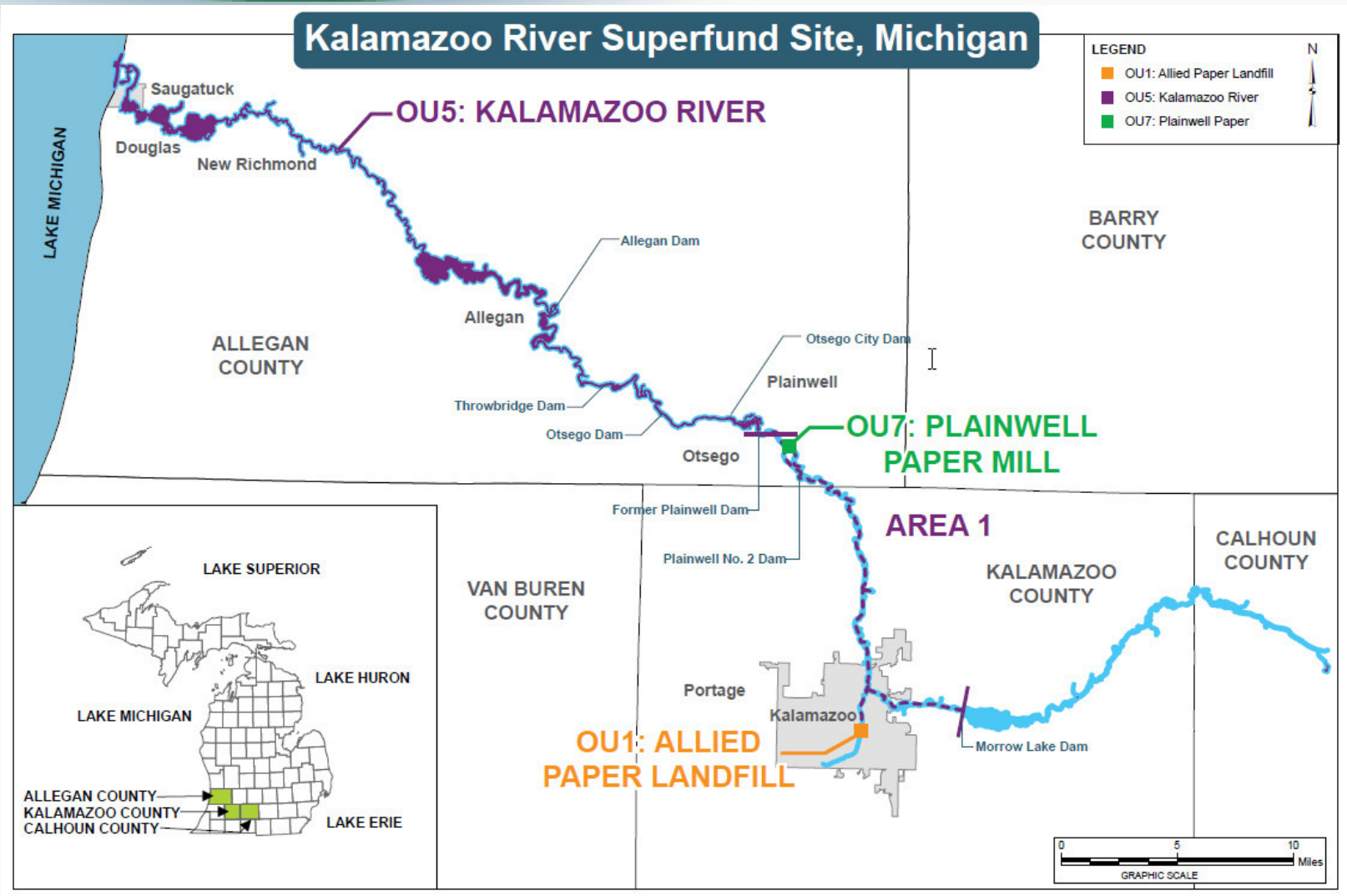
Plainwell, Allegan County, Michigan

June 16, 2015

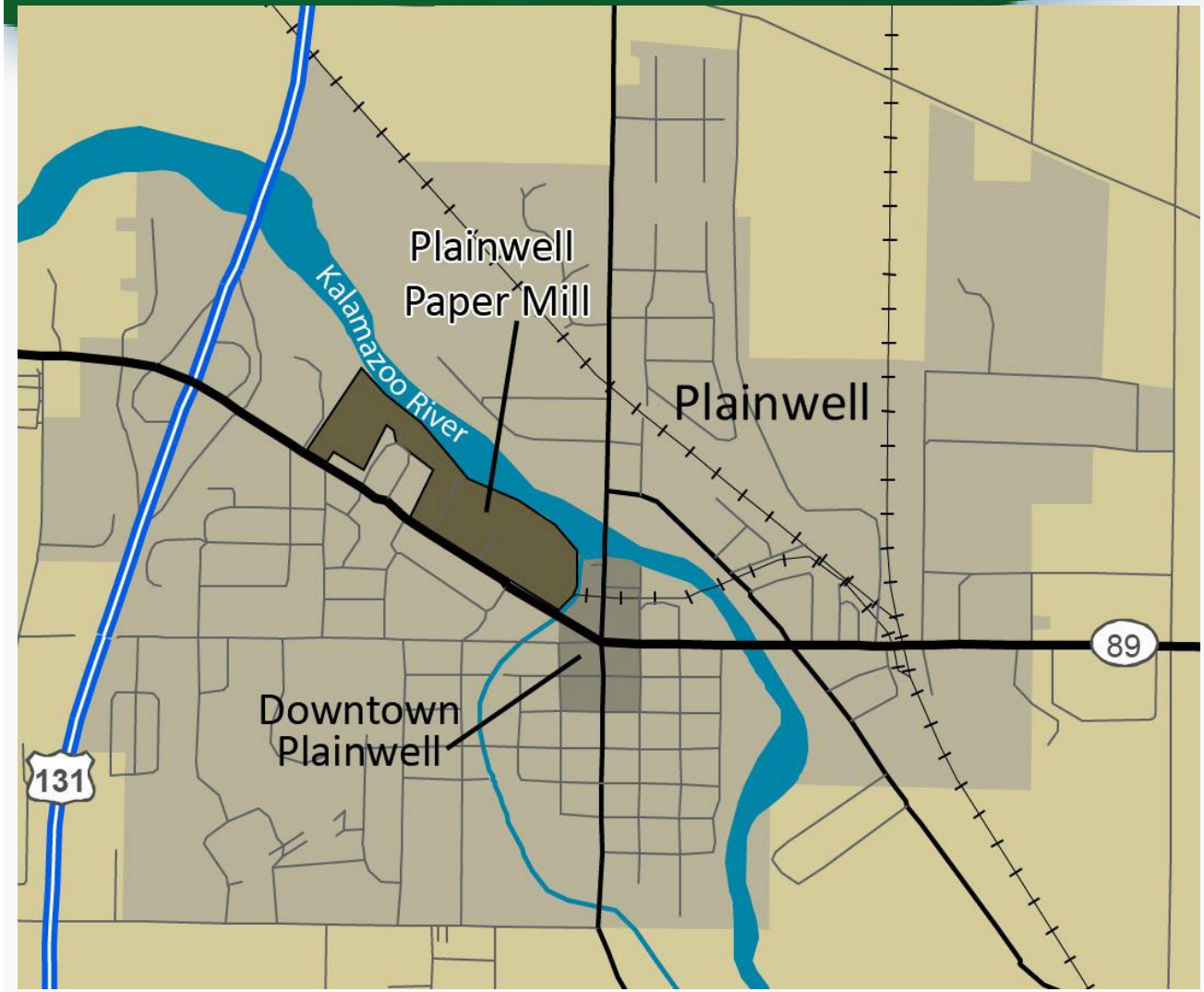
EPA's Proposed Plan for Site Cleanup

- Site History and Background
- Description of Cleanup Alternatives
- EPA's Selection Criteria
- EPA's Recommended Cleanup Alternative
- Next Steps
- Public Comment Period and Resource Information

Kalamazoo River Site Map



Site Map and Operational History



1884-2000: Operating paper mill by various companies

1954-2000: Wastewater treatment on site

1990: Placed on NPL

2005: Consent Decree between EPA and Weyerhaeuser

2006: City of Plainwell purchased property

2011: CRA purchased portion of property

Contamination History

- Mill – manufactured paper products and recycling of paper materials (including de-inking of carbonless copy paper containing PCBs)
- Wastewater treated in on-site wastewater treatment plant
- Wastewater sludge dewatered in lagoons

Progress Toward Cleaning Up the Site

Investigations

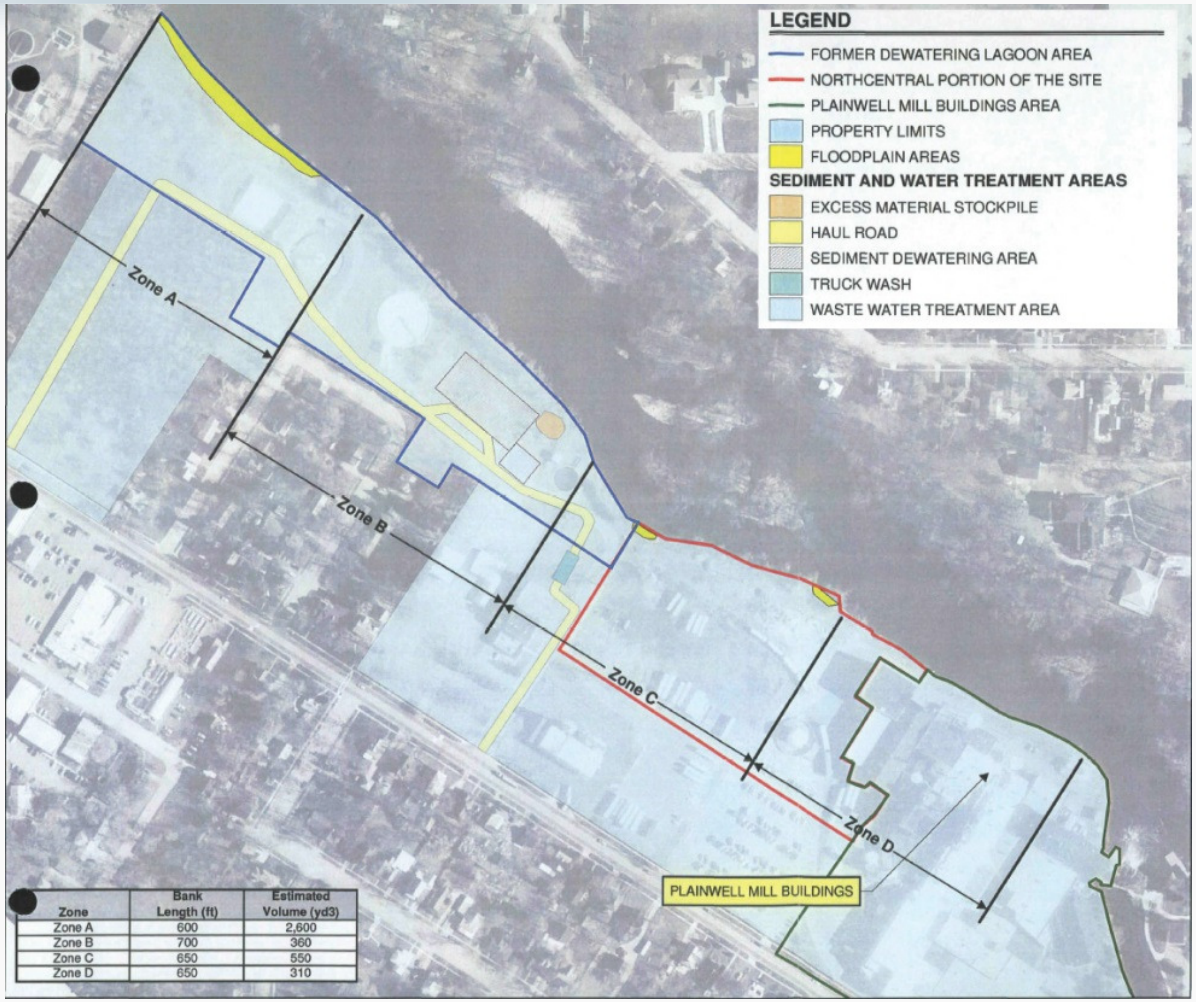
1996-2007 Preliminary Investigations

2005: Consent Decree to conduct work

Actions

- 2007-2009 Emergency Response Action to address Plainwell Mill banks adjacent to OU7

Plainwell Mill Banks Response Action



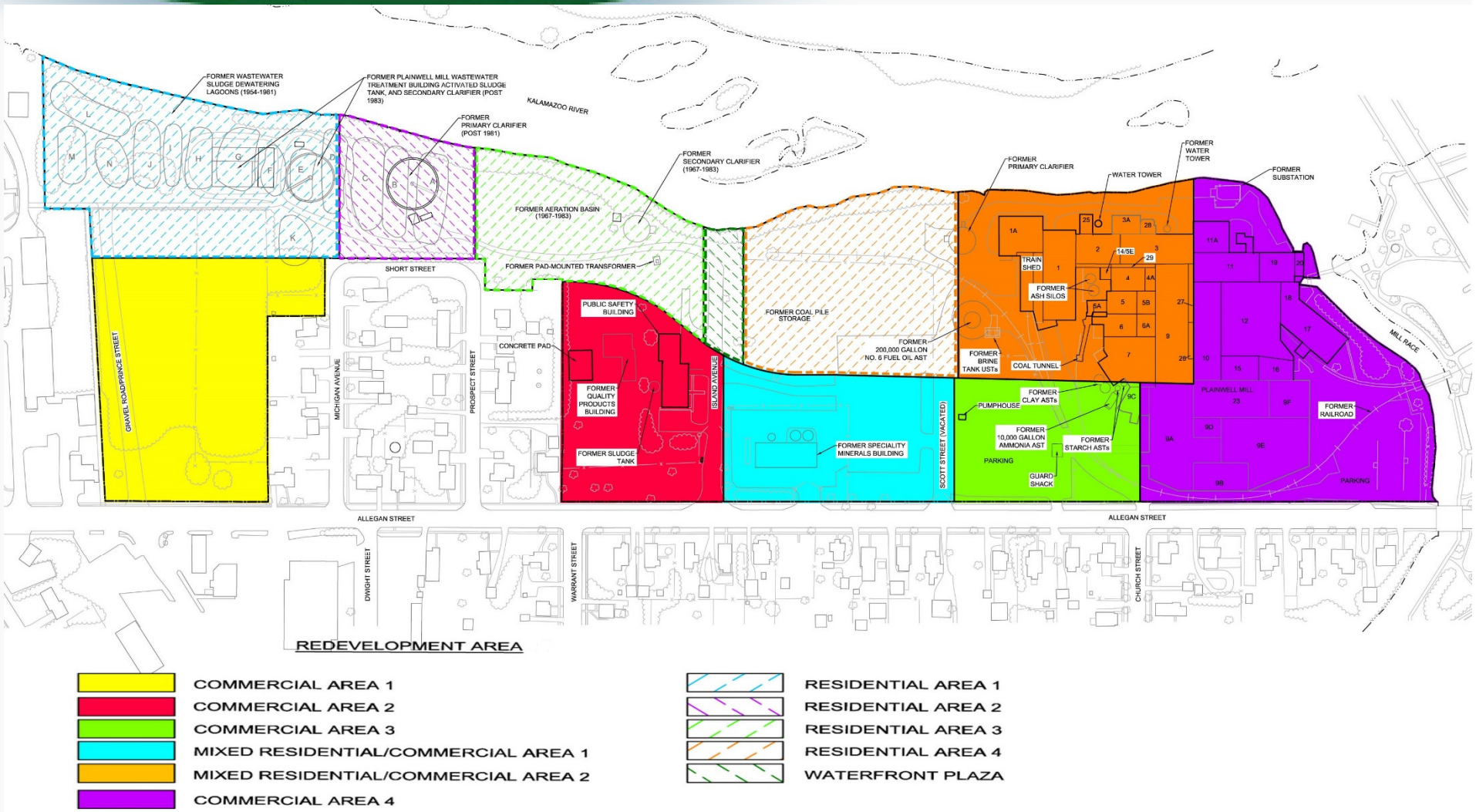
Zone	Bank Length (ft)	Estimated Volume (yd3)
Zone A	600	2,600
Zone B	700	360
Zone C	650	550
Zone D	650	310

Progress Toward Cleaning Up the Site (cont.)

- 2008-2011: Remedial Investigation (RI) field work conducted
- 2013: RI Report finalized and approved by EPA
- 2015: Feasibility Study (FS) Report finalized and approved by EPA
- June 2015: EPA issued proposed plan

Investigation Results

Redevelopment Areas



Soil

- Sample results compared to Michigan Generic Residential and Non-Residential Cleanup Criteria and Screening Levels (Part 201) and federal TSCA regulations for PCBs
- Contaminants of concern: Metals, VOCs, SVOCs, PCBs, cyanide (total), nitrate, phosphorus

Highest Concentrations Detected in Soil

Contaminants of Concern (COC)	Res Area 1	Res Area 2	Res Area 3	Res Area 4	Water-front Plaza	Mix Res/ Com Area 1	Mix Res/ Com Area 2	Com Area 1	Com Area 2	Com Area 3	Com Area 4
Benzene				3.4[a]							
Benzo(a)anthracene							43[b]				
Benzo(a)pyrene				4.9[b]			33[b,c]				3.1[b]
Benzo(b)fluoranthene							39[b]				
Dibenz(a,h)anthracene				6.4[b]			6.1[b]				
Indeno(1,2,3-cd)pyrene							22[b]				
Total PCBs	**1.6**[h]	**2.38**[h]		37.9[b,c]			**1.5**[h]	**2.7**[g]			53[b,c]
Arsenic	92[b,c]	17.5[b]	26.4[b]	55.8[b,c]	**6.6**[f]	20[b]	804[b,c,d]	10.6[b]	46.9[b,c]	18[b]	75.4[b,c]
Iron	15,600,000[b,c]										
Lead				2,050[b,c]			2,330[b,c]				771[b]
Manganese						1,880[e]		1,510[e]			3,900[d,e]

[a] - Exceedance of Residential SVIAC

[b] - Exceedance of Residential DCC

[c] - Exceedance of Non-Residential DCC

[d] - Exceedance of Residential PSIC

[e] - Exceedance of Non-Residential PSIC

[f] - Exceedance of Residential RBC of arsenic at 10^{-5} and 10^{-6}

[g] - Exceedance of Residential RBC of PCBs at 10^{-5}

[h] - Exceedance of TSCA (without restrictions) of PCBs (1 mg/kg)

Groundwater

- Compared to Part 201 criteria and Maximum Contaminant Levels (MCLs)
- Drinking water is not affected by the site
- Some metals (arsenic, manganese, iron, lead, and aluminum) contamination under the OU in shallow groundwater
- Groundwater remedy to be evaluated at a later date if necessary

Human Health Risk

- Subdivided into 11 redevelopment areas
  - Residential Areas 1-4, Mixed Residential/Commercial Areas 1-2, Commercial Areas 1-4, and Waterfront Plaza
- Evaluated residents, trespassers, commercial workers, construction workers, utility workers, and recreational users
- Evaluated exposures to surface soil, soil, and groundwater
- Established risk-based cleanup goals for arsenic and PCBs

Ecological Risks

- Baseline Ecological Risk Assessment was conducted for the Kalamazoo River in 2003
- Screening Level Ecological Risk Assessment was conducted for Plainwell Mill Site
  - Potential risk to avian and/or mammalian wildlife in the riparian corridor
  - Ecological cleanup goals were developed for the refined contaminants

Overview of Alternatives

Remedy Component	Alternative 1	Alternative 2A	Alternative 2B	Alternative 2C	Alternative 2D	Alternative 3A	Alternative 3B	Alternative 3C	Alternative 3D
No-Action	✓								
Excavation		✓	✓	✓	✓	✓	✓	✓	✓
Off-Site Disposal		✓	✓	✓	✓	✓	✓	✓	✓
On-Site Consolidation		✓	✓	✓	✓				
Institutional Controls		✓	✓	✓	✓		✓	✓	✓
Engineering Controls		✓	✓	✓	✓		✓	✓	✓
Future Land Use		Residential	Residential Non-Residential	Residential Non-Residential	Residential Non-Residential	Residential	Residential Non-Residential	Residential Non-Residential	Residential Non-Residential
Arsenic Cleanup Goal									
Residential (mg/kg)		7.6	7.6	**6.4**	*5.8*	7.6	7.6	**6.4**	*5.8*
Non-Residential (mg/kg)		7.6	37	**27**	*5.8*	7.6	37	**27**	*5.8*
PCBs Cleanup Goal									
Residential (mg/kg)		1	**2.5**	**2.5**	1	1	**2.5**	**2.5**	1
Non-Residential (mg/kg)		1	**9.1**	**9.1**	10	1	**9.1**	**9.1**	10
Cost	$0	Not Calculated	$4,462,820	$4,998,195	Not Calculated	$9,424,482	$4,363,857	$4,875,232	$7,477,202

(regular) means Michigan Part 201 Generic Residential Cleanup Criteria
(bold) means site-specific risk-based concentration corresponding to 10^{-5} risk level
(underline) means the self-implementing PCB standards at 40 CFR 761.61(a)
(italic) means the Statewide Default Background Level

Alternative 1

- No Action
- EPA always includes a “no action” alternative for comparison
- Cost $0

Common Elements of Alternatives 2 and 3

- Pre-remedial design delineation (vertical and horizontal extent)
- Pre-excavation activities
- Excavation of areas impacted above the cleanup goals for soil
- Removal of coal tunnel and associated materials
- Backfilling of excavation areas with clean fill
- Restoration, as appropriate
- Monitoring and maintenance of cap/cover and/or concrete slabs
- Institutional controls

Alternative 2-Series

- Consolidation of metals-impacted material with concentrations between the residential and non-residential cleanup goals
- Designated area on non-residential land use portion of OU7 for consolidated soil
- Installation of a gravel cover over consolidated material
- Off-Site disposal of VOCs, SVOCs, and metals above the PSIC and/or the Non-Residential cleanup goals, material that contains coal or coal debris, and PCB-impacted material
- Engineering controls, including preparation and implementation of a Soil Management Plan

Alternative 3-Series

- Off-Site disposal of VOCs, SVOCs, metals, and material that contains coal or coal debris, and PCB-impacted material above the cleanup goals.
- Engineering controls (except 3A)

Sub-Alternatives for 2-Series and 3-Series

Redevelopment Area	Land Use Designation	Soil Remedial Alternatives 2A and 3A	Soil Remedial Alternatives 2B and 3B	Soil Remedial Alternatives 2C and 3C	Soil Remedial Alternatives 2D and 3D
Residential Area 1, Residential Area 2, Residential Area 3, Residential Area 4, Mixed Residential/Commercial Area 1, Mixed Residential/Commercial Area 2	Residential	Residential GCC	Residential GCC	Residential GCC	Residential GCC
		1 mg/kg for PCBs	**2.5 mg/kg for PCBs**	**2.5 mg/kg for PCBs**	1 mg/kg for PCBs
				6.4 mg/kg for Arsenic	*5.8 mg/kg for Arsenic*
Waterfront Plaza	Non-Residential (Recreational)	Residential GCC	Non-Residential GCC	Non-Residential GCC	Non-Residential GCC
		1 mg/kg for PCBs	**9.1 mg/kg for PCBs**	**9.1 mg/kg for PCBs**	1 mg/kg for PCBs
				27 mg/kg for Arsenic	*5.8 mg/kg for Arsenic*
Commercial Area 1, Commercial Area 2, Commercial Area 3, Commercial Area 4	Non-Residential/ Commercial	Residential GCC	Non-Residential GCC	Non-Residential GCC	Non-Residential GCC
		1 mg/kg for PCBs	**9.1 mg/kg for PCBs**	**9.1 mg/kg for PCBs**	10 mg/kg for PCBs
				27 mg/kg for Arsenic	*5.8 mg/kg for Arsenic*
Cost		2A: Not Calculated 3A: $9.42 million	2B: $4.46 million 3B: $4.36 million	2C: $5.00 million 3C: $4.88 million	2D: Not Calculated 3D: $7.48 million

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GCC - Part 201 Generic Cleanup Criteria

Sub-Alternative A

Redevelopment Area	Land Use Designation	Soil Remedial Alternatives 2A and 3A	Soil Remedial Alternatives 2B and 3B	Soil Remedial Alternatives 2C and 3C	Soil Remedial Alternatives 2D and 3D
Residential Area 1, Residential Area 2, Residential Area 3, Residential Area 4, Mixed Residential/Commercial Area 1, Mixed Residential/Commercial Area 2	Residential	Residential GCC	Residential GCC	Residential GCC	Residential GCC
		1 mg/kg for PCBs	**2.5 mg/kg for PCBs**	**2.5 mg/kg for PCBs**	1 mg/kg for PCBs
				6.4 mg/kg for Arsenic	*5.8 mg/kg for Arsenic*
Waterfront Plaza	Non-Residential (Recreational)	Residential GCC	Non-Residential GCC	Non-Residential GCC	Non-Residential GCC
		1 mg/kg for PCBs	**9.1 mg/kg for PCBs**	**9.1 mg/kg for PCBs**	1 mg/kg for PCBs
				27 mg/kg for Arsenic	*5.8 mg/kg for Arsenic*
Commercial Area 1, Commercial Area 2, Commercial Area 3, Commercial Area 4	Non-Residential/ Commercial	Residential GCC	Non-Residential GCC	Non-Residential GCC	Non-Residential GCC
		1 mg/kg for PCBs	**9.1 mg/kg for PCBs**	**9.1 mg/kg for PCBs**	10 mg/kg for PCBs
				27 mg/kg for Arsenic	*5.8 mg/kg for Arsenic*
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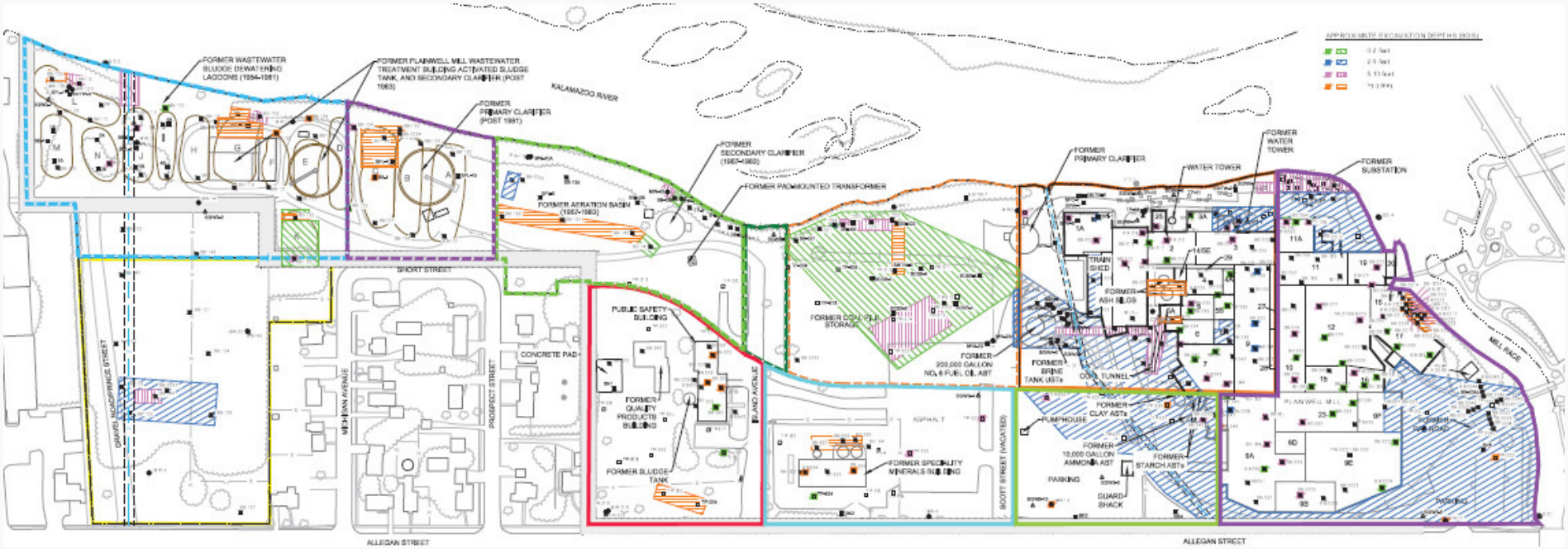
GCC - Part 201 Generic Cleanup Criteria

Soil Excavation Areas: Sub-Alternative A



Sub-Alternative B

Redevelopment Area	Land Use Designation	Soil Remedial Alternatives 2A and 3A	Soil Remedial Alternatives 2B and 3B	Soil Remedial Alternatives 2C and 3C	Soil Remedial Alternatives 2D and 3D
Residential Area 1, Residential Area 2, Residential Area 3, Residential Area 4, Mixed Residential/Commercial Area 1, Mixed Residential/Commercial Area 2	Residential	Residential GCC	Residential GCC	Residential GCC	Residential GCC
		1 mg/kg for PCBs	**2.5 mg/kg for PCBs**	**2.5 mg/kg for PCBs**	1 mg/kg for PCBs
				6.4 mg/kg for Arsenic	*5.8 mg/kg for Arsenic*
Waterfront Plaza	Non-Residential (Recreational)	Residential GCC	Non-Residential GCC	Non-Residential GCC	Non-Residential GCC
		1 mg/kg for PCBs	**9.1 mg/kg for PCBs**	**9.1 mg/kg for PCBs**	1 mg/kg for PCBs
				27 mg/kg for Arsenic	*5.8 mg/kg for Arsenic*
Commercial Area 1, Commercial Area 2, Commercial Area 3, Commercial Area 4	Non-Residential/ Commercial	Residential GCC	Non-Residential GCC	Non-Residential GCC	Non-Residential GCC
		1 mg/kg for PCBs	**9.1 mg/kg for PCBs**	**9.1 mg/kg for PCBs**	10 mg/kg for PCBs
				27 mg/kg for Arsenic	*5.8 mg/kg for Arsenic*
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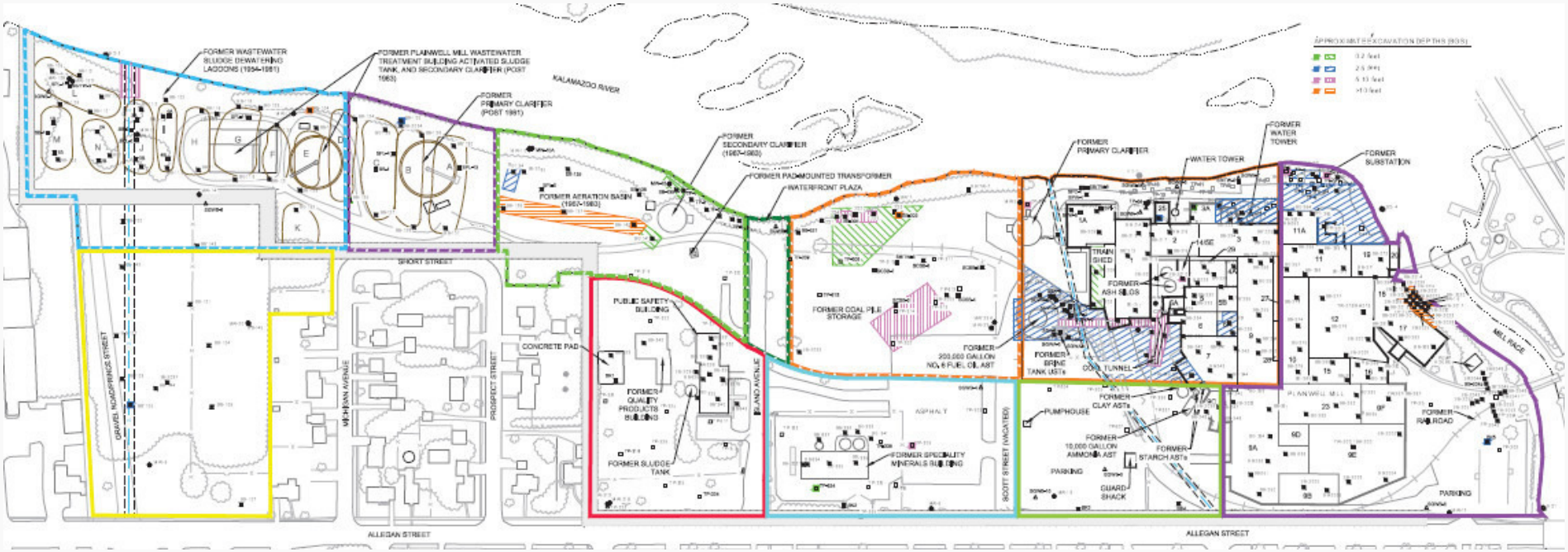
GCC - Part 201 Generic Cleanup Criteria

Soil Excavation Areas: Sub-Alternative B



Sub-Alternative C

Redevelopment Area	Land Use Designation	Soil Remedial Alternatives 2A and 3A	Soil Remedial Alternatives 2B and 3B	Soil Remedial Alternatives 2C and 3C	Soil Remedial Alternatives 2D and 3D
Residential Area 1, Residential Area 2, Residential Area 3, Residential Area 4, Mixed Residential/Commercial Area 1, Mixed Residential/Commercial Area 2	Residential	Residential GCC	Residential GCC	Residential GCC	Residential GCC
		1 mg/kg for PCBs	**2.5 mg/kg for PCBs**	**2.5 mg/kg for PCBs**	1 mg/kg for PCBs
				6.4 mg/kg for Arsenic	*5.8 mg/kg for Arsenic*
Waterfront Plaza	Non-Residential (Recreational)	Residential GCC	Non-Residential GCC	Non-Residential GCC	Non-Residential GCC
		1 mg/kg for PCBs	**9.1 mg/kg for PCBs**	**9.1 mg/kg for PCBs**	1 mg/kg for PCBs
				27 mg/kg for Arsenic	*5.8 mg/kg for Arsenic*
Commercial Area 1, Commercial Area 2, Commercial Area 3, Commercial Area 4	Non-Residential/ Commercial	Residential GCC	Non-Residential GCC	Non-Residential GCC	Non-Residential GCC
		1 mg/kg for PCBs	**9.1 mg/kg for PCBs**	**9.1 mg/kg for PCBs**	10 mg/kg for PCBs
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Cost		2A: Not Calculated 3A: $9.42 million	2B: $4.46 million 3B: $4.36 million	2C: $5.00 million 3C: $4.88 million	2D: Not Calculated 3D: $7.48 million

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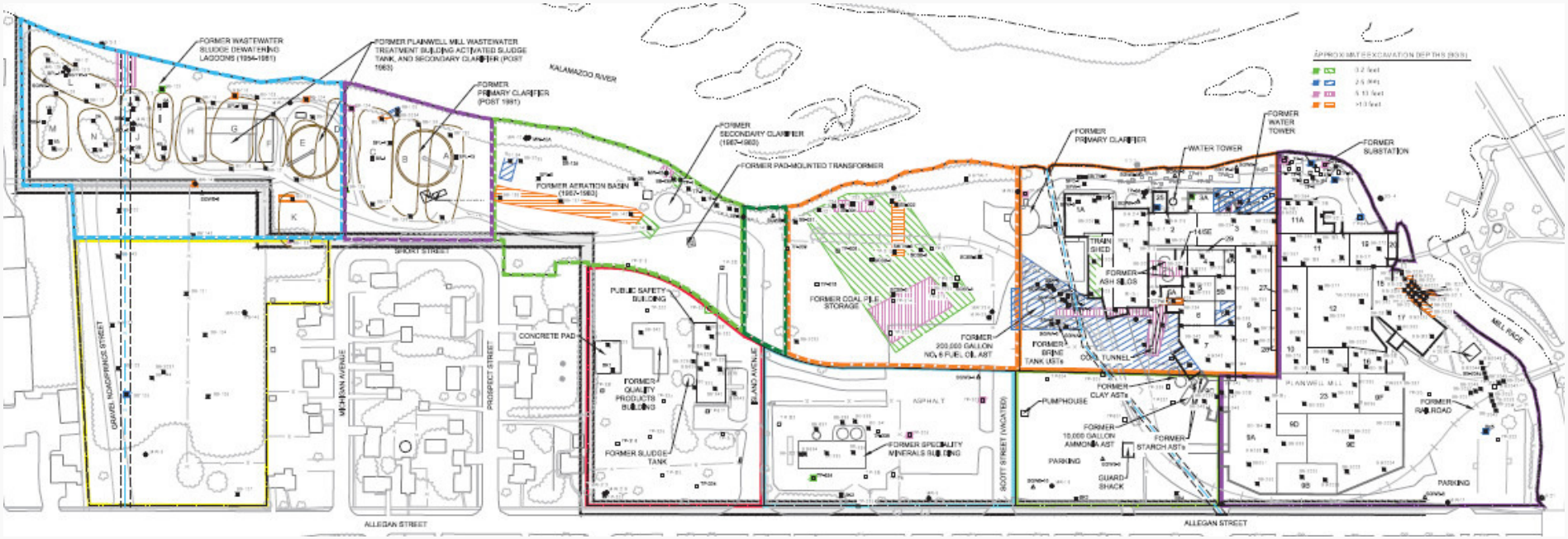
Soil Excavation Areas: Sub-Alternative C



Sub-Alternative D

Redevelopment Area	Land Use Designation	Soil Remedial Alternatives 2A and 3A	Soil Remedial Alternatives 2B and 3B	Soil Remedial Alternatives 2C and 3C	Soil Remedial Alternatives 2D and 3D
Residential Area 1, Residential Area 2, Residential Area 3, Residential Area 4, Mixed Residential/Commercial Area 1, Mixed Residential/Commercial Area 2	Residential	Residential GCC	Residential GCC	Residential GCC	Residential GCC
		1 mg/kg for PCBs	**2.5 mg/kg for PCBs**	**2.5 mg/kg for PCBs**	1 mg/kg for PCBs
				6.4 mg/kg for Arsenic	*5.8 mg/kg for Arsenic*
Waterfront Plaza	Non-Residential (Recreational)	Residential GCC	Non-Residential GCC	Non-Residential GCC	Non-Residential GCC
		1 mg/kg for PCBs	**9.1 mg/kg for PCBs**	**9.1 mg/kg for PCBs**	1 mg/kg for PCBs
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Commercial Area 1, Commercial Area 2, Commercial Area 3, Commercial Area 4	Non-Residential/ Commercial	Residential GCC	Non-Residential GCC	Non-Residential GCC	Non-Residential GCC
		1 mg/kg for PCBs	**9.1 mg/kg for PCBs**	**9.1 mg/kg for PCBs**	10 mg/kg for PCBs
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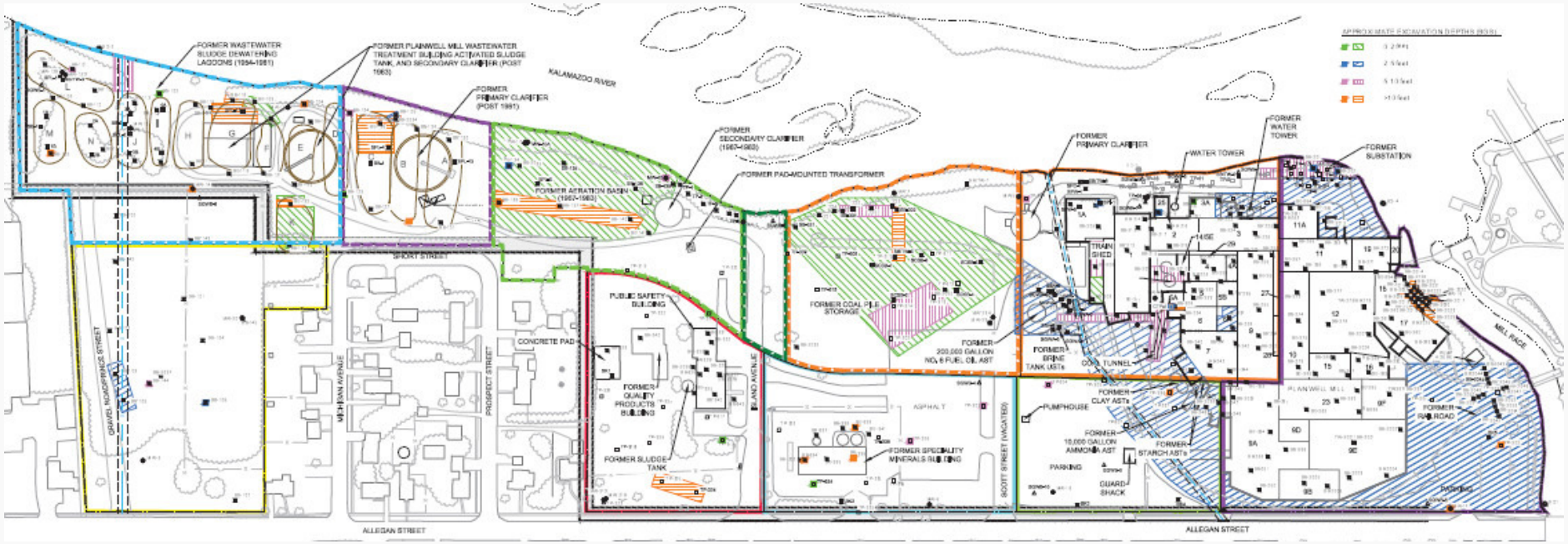
Soil Excavation Areas: Sub-Alternative D



Nine Superfund Remedy Selection Criteria

- Threshold Criteria
  1. Overall protection of human health and the environment
  2. Compliance with applicable or relevant and appropriate requirements (ARARs)
- Balancing Criteria
  3. Long-term effectiveness and permanence
  4. Reduction of toxicity, mobility or volume through treatment
  5. Short-term effectiveness
  6. Implementability
  7. Cost
- Modifying Criteria
  8. State Acceptance
  9. Community Acceptance

Evaluation Criteria Comparison

Evaluation Criterion	Alternatives			
	1	2A/D	2B/C	3A/B*/C/D
Overall Protection of Human Health and the Environment	○	●	●	●
Compliance with ARARs	○	○	●	●
Long-term Effectiveness and Permanence	○	●	●	●
Reduction of Toxicity, Mobility, or Volume through Treatment	○	○	○	○
Short-term Effectiveness	N/A**	●	●	●
Implementability	N/A**	●	●	●
Alternative A Cost ($ millions)	$0	NC	-	$9.42
Alternative B Cost ($ millions)	-	-	$4.46	$4.36
Alternative C Cost ($ millions)	-	-	$5.00	$4.88
Alternative D Cost ($ millions)	-	NC	-	$7.48
State Acceptance	The State supports the preferred alternative (Alternative 3B).			
Community Acceptance	Will be evaluated after the public comment period			
● Fully meets criterion ◉ Partially meets criterion ○ Does not meet criterion				

NC: Not calculated since alternative did not meet ARARs
* EPA's preferred alternative
** N/A: not applicable, since no remedy is being implemented in the No-Action Alternative
*** Alternatives do not result in a reduction of toxicity, mobility, or volume through treatment because it is impractical to treat large volumes of soil having low contamination levels

Overview of Alternatives

Remedy Component	Alternative 1	Alternative 2A	Alternative 2B	Alternative 2C	Alternative 2D	Alternative 3A	Alternative 3B	Alternative 3C	Alternative 3D
No-Action	✓								
Excavation		✓	✓	✓	✓	✓	✓	✓	✓
Off-Site Disposal		✓	✓	✓	✓	✓	✓	✓	✓
On-Site Consolidation		✓	✓	✓	✓				
Institutional Controls		✓	✓	✓	✓		✓	✓	✓
Engineering Controls		✓	✓	✓	✓		✓	✓	✓
Future Land Use		Residential	Residential Non-Residential	Residential Non-Residential	Residential Non-Residential	Residential	Residential Non-Residential	Residential Non-Residential	Residential Non-Residential
Arsenic Cleanup Goal									
Residential (mg/kg)		7.6	7.6	**6.4**	*5.8*	7.6	7.6	**6.4**	*5.8*
Non-Residential (mg/kg)		7.6	37	**27**	*5.8*	7.6	37	**27**	*5.8*
PCBs Cleanup Goal									
Residential (mg/kg)		1	**2.5**	**2.5**	1	1	**2.5**	**2.5**	1
Non-Residential (mg/kg)		1	**9.1**	**9.1**	10	1	**9.1**	**9.1**	10
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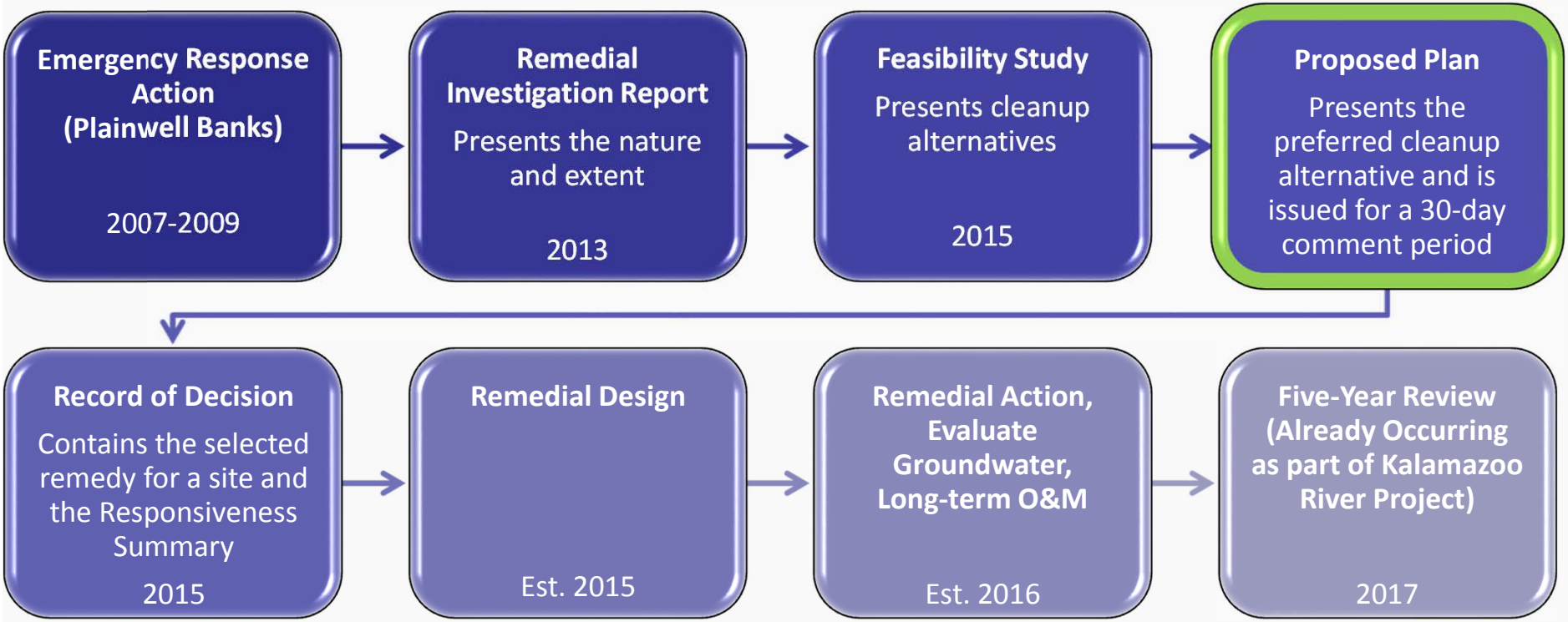
EPA's Recommended Alternative: 3B

- Is protective of human health and the environment
- Meets state and federal regulations - ARARs
- Is implementable
- Is long-term and short-term effective
- Is least costly protective alternative
- Cleans up to residential and non-residential Part 201 standards (and below Part 201 standards for PCBs)

Next Steps


Emergency Response Action (Plainwell Banks)
2007-2009
Remedial Investigation Report
Presents the nature and extent
2013
Feasibility Study
Presents cleanup alternatives
2015
Proposed Plan
Presents the preferred cleanup alternative and is issued for a 30-day comment period
Record of Decision
Contains the selected remedy for a site and the Responsiveness Summary
2015
Remedial Design
Est. 2015
Remedial Action, Evaluate Groundwater, Long-term O&M
Est. 2016
Five-Year Review (Already Occurring as part of Kalamazoo River Project)
2017

Public Comment Period

- 30-day period: Starts – June 8, 2015
  Ends - July 8, 2015

- Review Documents:
  - Online at: http://www.epa.gov/region05/cleanup/kalproject/
  - Charles Ransom Library, Kalamazoo Public Library, Allegan Public Library, Waldo Library, Otsego District Library, Saugatuck-Douglas Library
  - Region 5 EPA office

COMMENTS

Redevelopment