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Midwest Generation

Powerton Generating Station

Groundwater Corrective Action Modeling

May 2026

BAS GROUNDWATER CONSULTING

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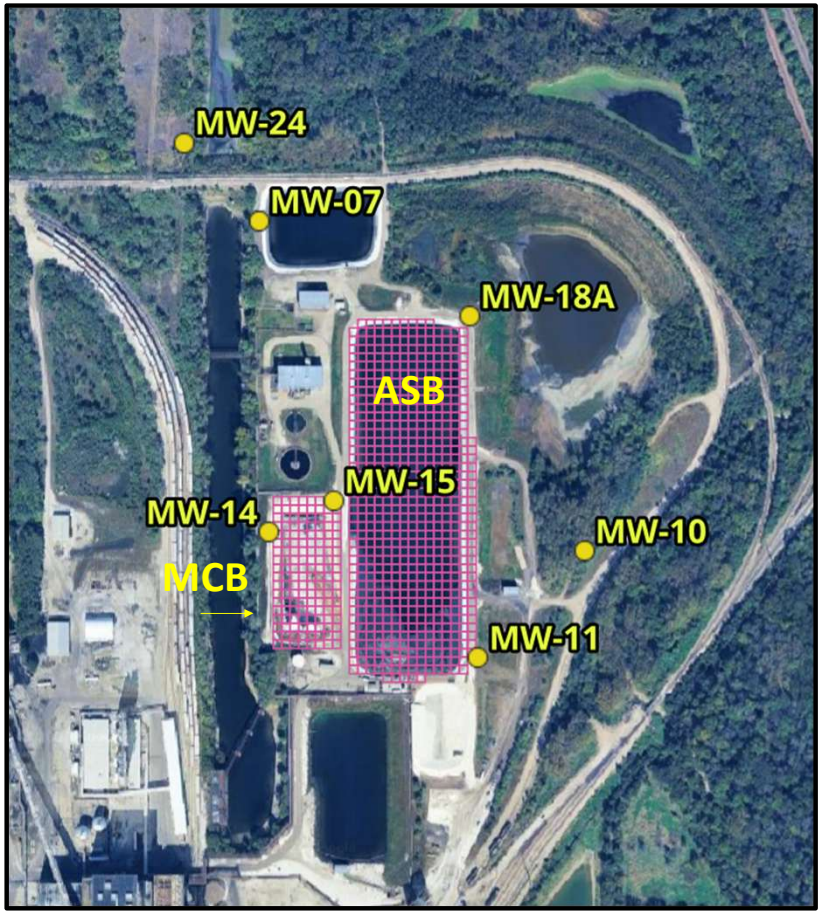
Baseline Model Simulation

- Model development of current, steady-state groundwater conditions was used as the basis for future, predictive scenarios.
- Applied a source of 100% (concentration = 1) at the water table beneath the Ash Surge Basin (ASB) and the Metals Cleaning Basin (MCB).
- Ran a 15-year transport simulation with advection and dispersion, with the steady-state flow model to establish hypothetical baseline concentrations in groundwater.
  - Dispersivity = 1 (all directions)
  - Porosity = 35%
  - "if the ASB and MCB have been leaking mass to groundwater for 15 years."
- The baseline distribution of hypothetical concentrations were used as the starting conditions for remedy scenarios.

Constant, hypothetical source beneath the MCB and ASB applied here:



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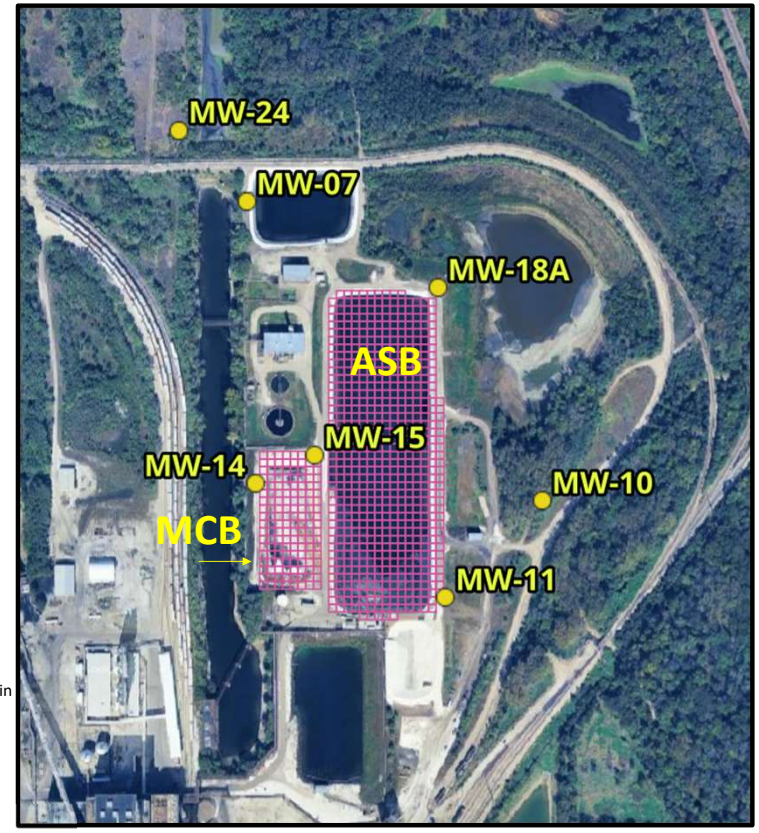
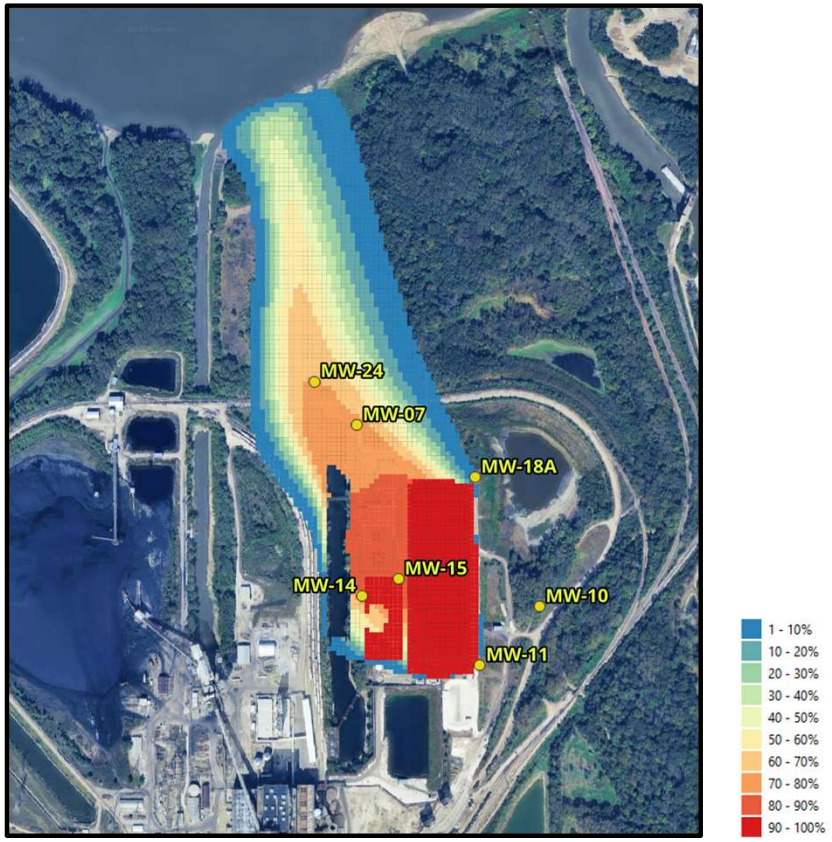
Baseline Model Simulation

- Constant, hypothetical source beneath the MCB and ASB applied here:



ASB = Ash Surge Basin
MCB = Metal Cleaning Basin

- Resulting hypothetical plume after 15 years (starting conditions for remedy scenarios):



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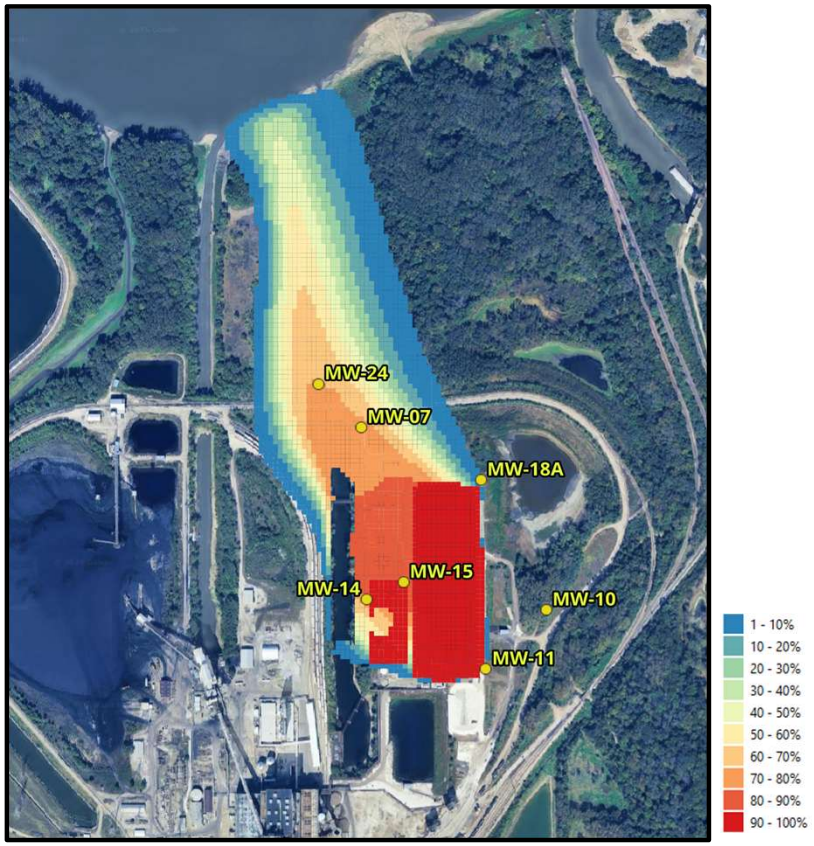
Remedy Scenario

- Remedy Scenario assumes seepage through dual composite liner
- Retrofit installation of a new composite liner and leachate collection system at the ASB and MCB.
  - Remove hypothetical mass from beneath the ASB and MCB
  - Dispersivity = 1 (all directions) & Porosity = 35%
  - Apply seepage (infiltration) through the liner:
    - Assume 2-foot pond depth
    - Assume poor liner contact
    - Resulting seepage rate = 0.572 mm/yr
  - Transport simulation of the starting concentrations moving through the transient flow field
    - Specific yield = 20%; Specific storage = 1E-04 ft^{-1}
  - Plot concentrations over time at nearby monitoring wells
    - Sulfate
    - TDS
    - Thallium
    - Arsenic
    - Cobalt

ASB = Ash Surge Basin
MCB = Metal Cleaning Basin

- Resulting hypothetical plume for Baseline Scenario (starting conditions for remedy scenario):



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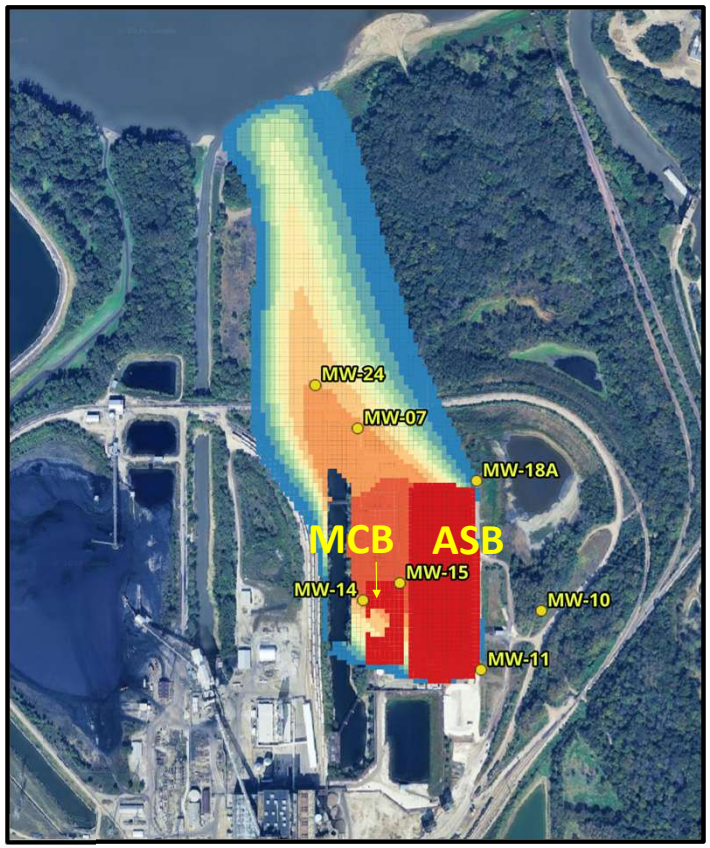
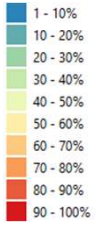
Remedy Scenario

- Resulting hypothetical plume for Baseline Scenario (<u>starting conditions</u> for remedy scenario):





ASB = Ash Surge Basin
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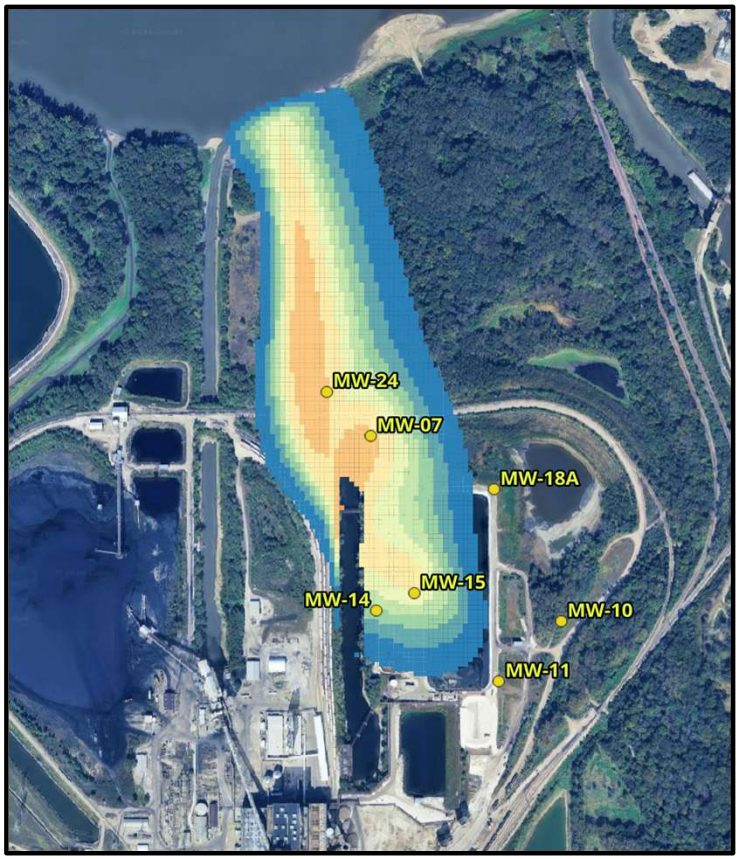
- Concentrations at **5 years**:



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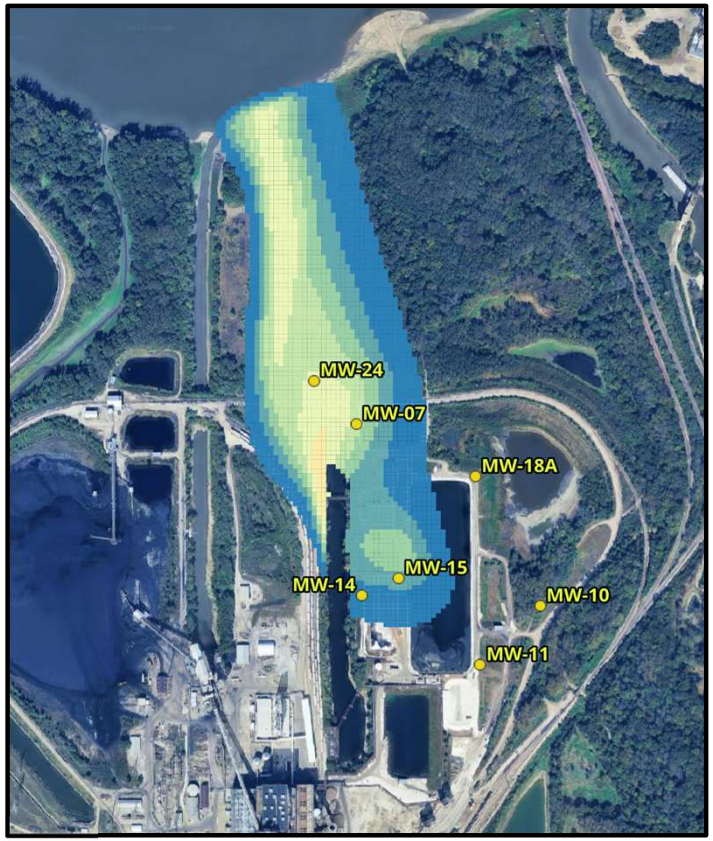
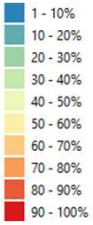
Remedy Scenario

- Concentrations at **10 years**:





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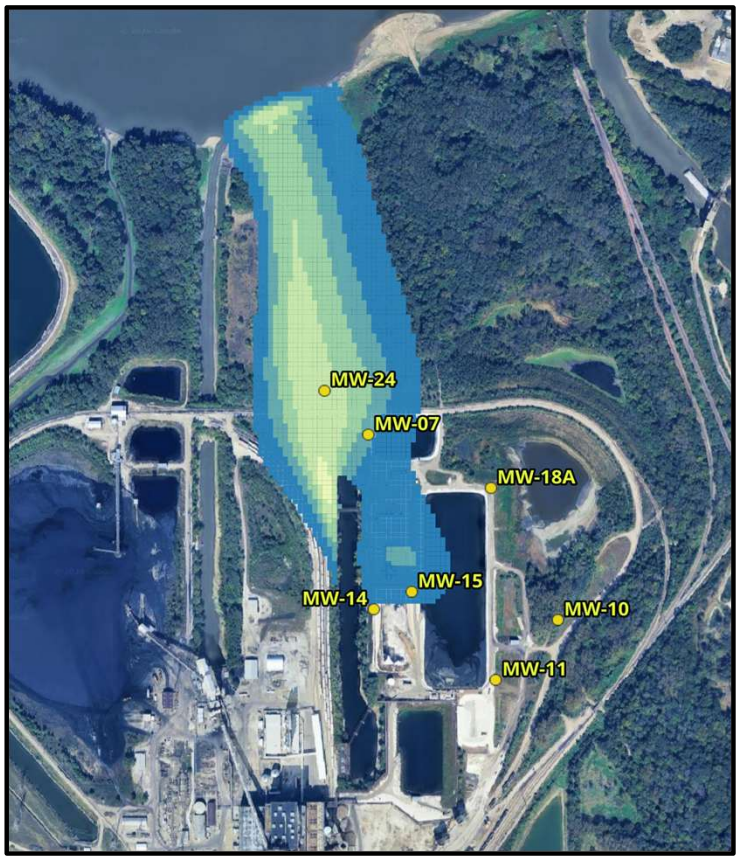
- Concentrations at **15 years**:



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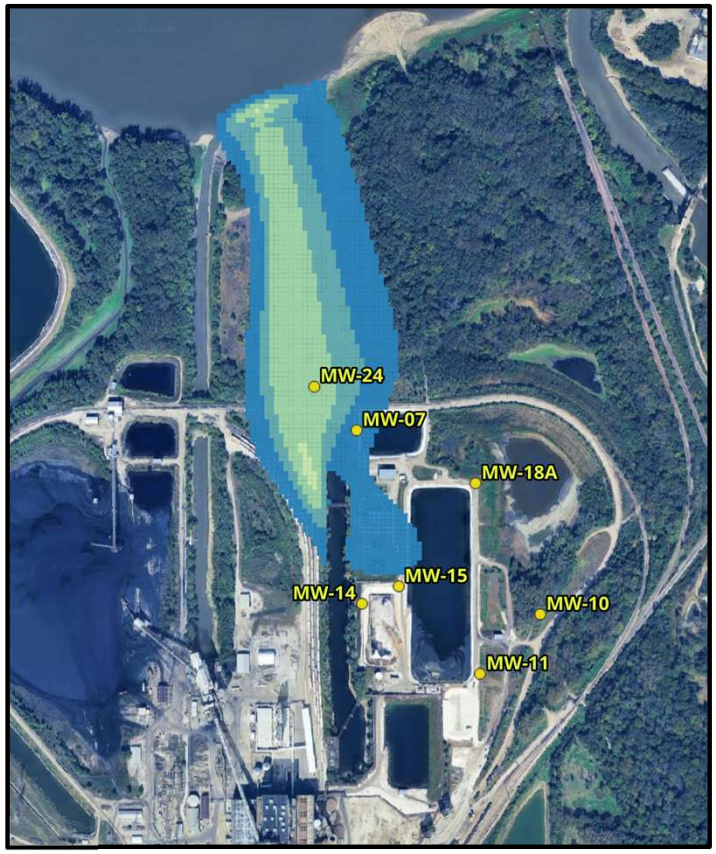
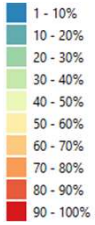
Remedy Scenario

- Concentrations at **20 years**:





ASB = Ash Surge Basin
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- Concentrations at **25 years**:

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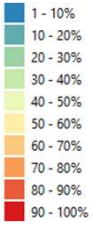
- Concentrations at **30 years**:



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- Concentrations at **35 years**:

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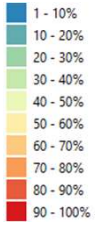
- Concentrations at **40 years**:



ASB = Ash Surge Basin
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- Concentrations at **50 years**:

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GWPS

Constituent	GWPS (mg/L)
Sulfate	400.000
TDS	1200.000
Arsenic	0.010
Cobalt	0.006
Thallium	0.002

GWPS = Groundwater Protection Standard

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Remedy Scenario Graphs

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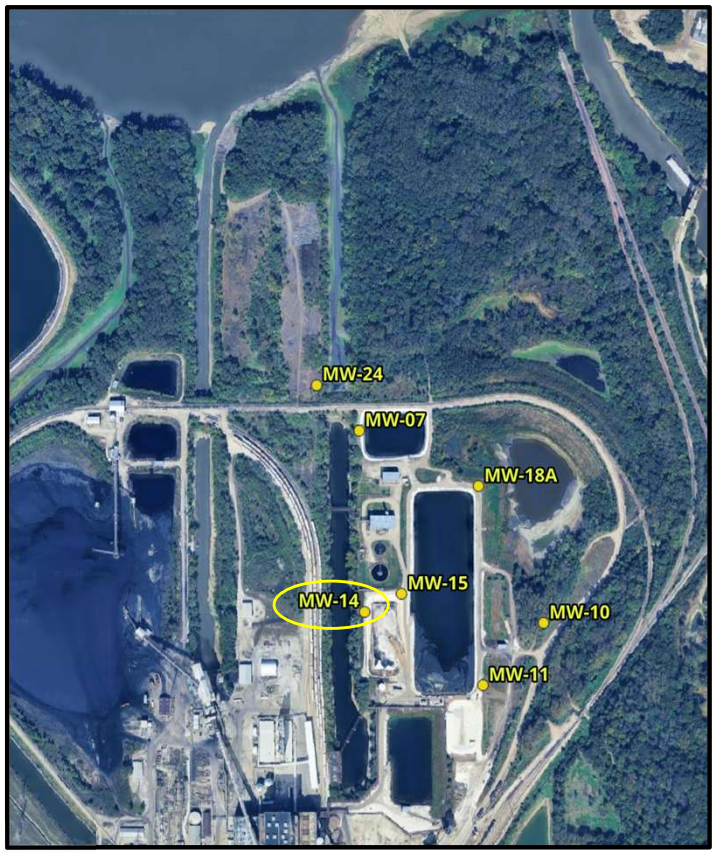
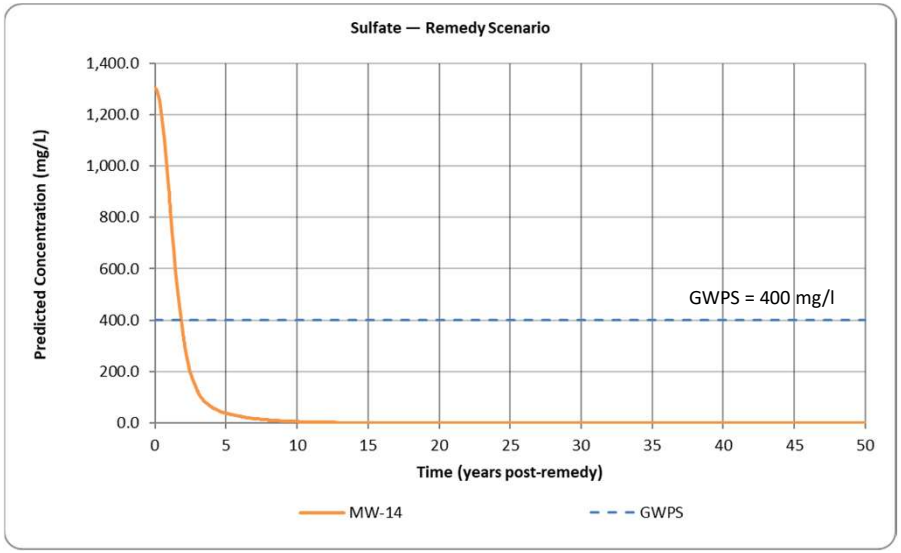
Remedy Scenario: Sulfate

Monitor Well Locations





Showing the layer with the well screen per well

MW-14 – Layer 1

Sulfate concentrations fall below GWPS within 2.5 years in MW-14

GWPS = Groundwater Protection Standard

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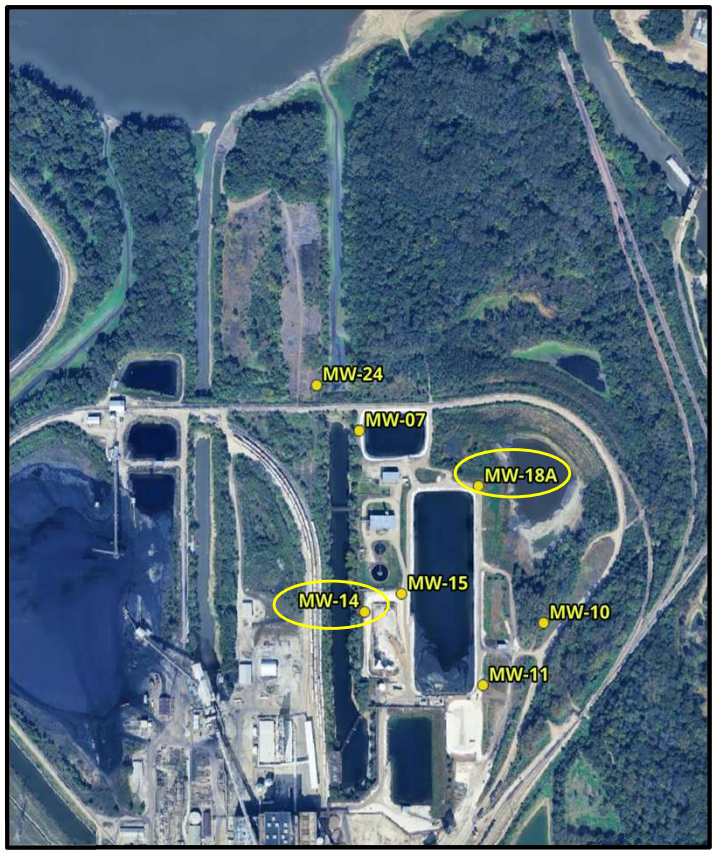
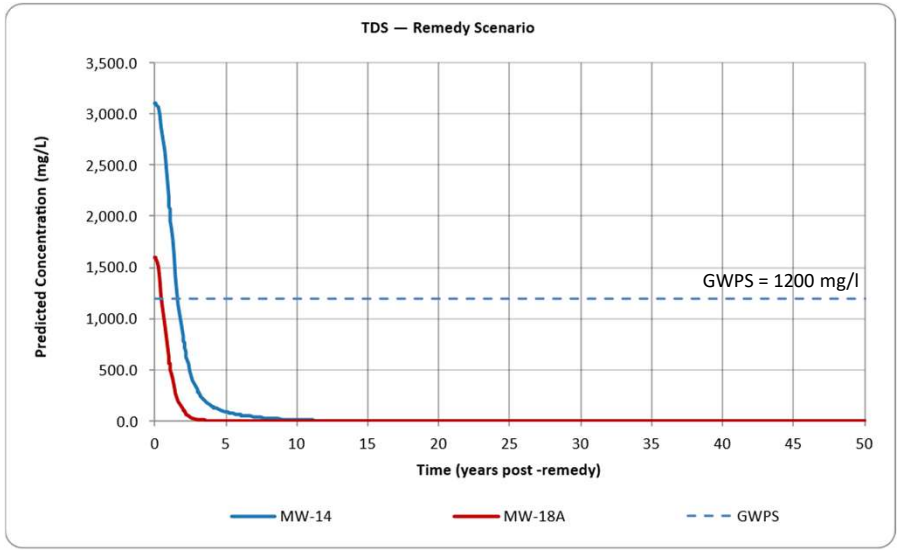
Remedy Scenario: TDS

Monitor Well Locations





Showing the layer with the well screen per well

MW-14 – Layer 1
MW-18A – Layer 1

TDS concentrations fall below GWPS within 1 year in MW-18A and within 2.5 years in MW-14

GWPS = Groundwater Protection Standard

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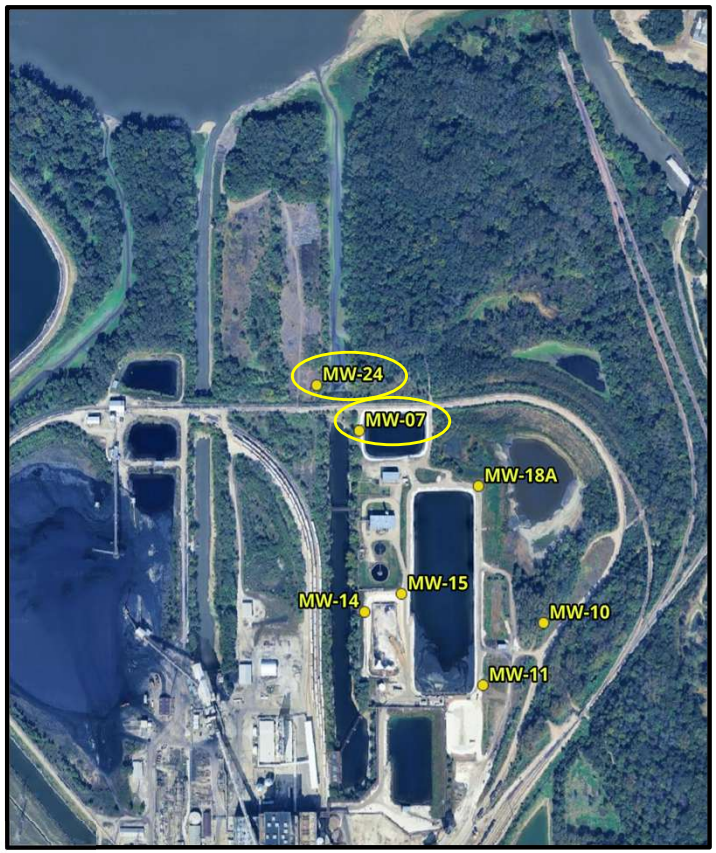
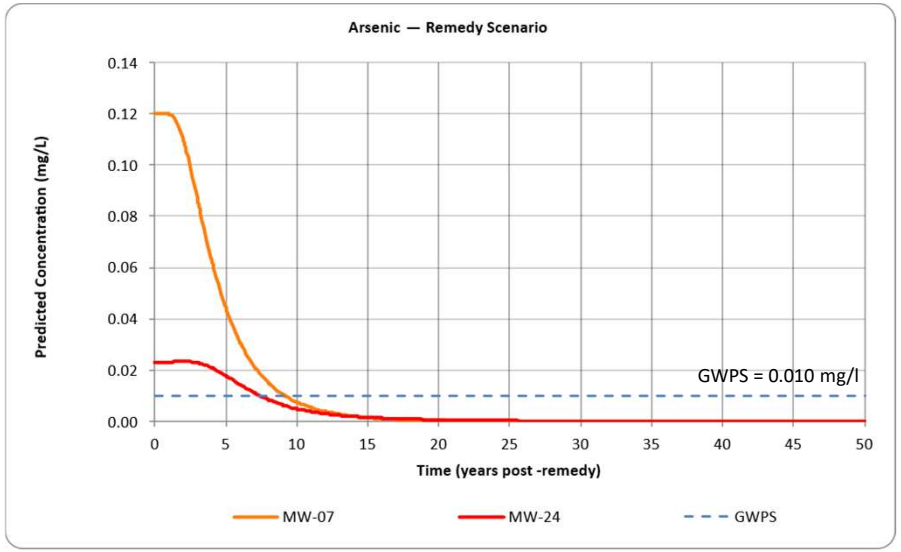
Remedy Scenario: Arsenic

Monitor Well Locations





Showing the layer with the well screen per well

MW-07 – Layer 2
MW-24 – Layer 3

Arsenic concentrations fall below GWPS within 10 years in MW-07, and within 8 years in MW-24

GWPS = Groundwater Protection Standard

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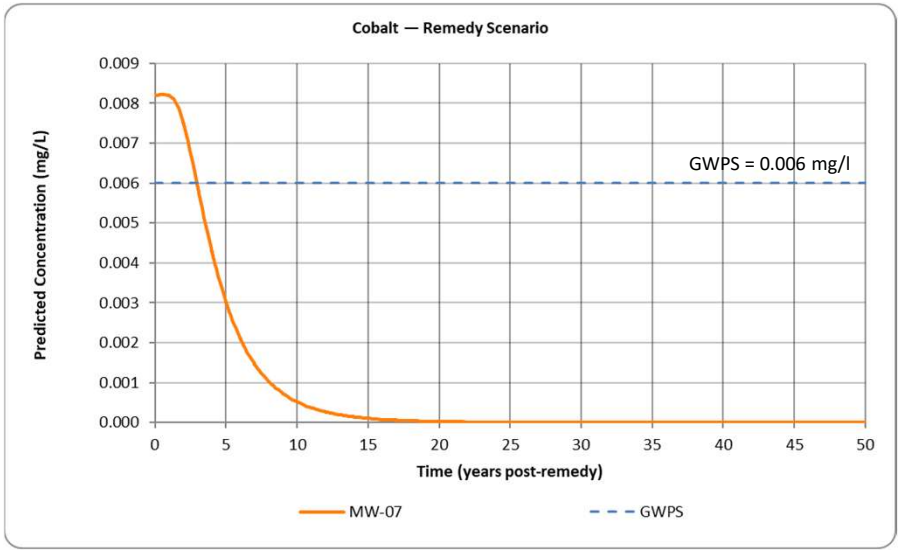
Remedy Scenario: Cobalt

Monitor Well Locations



Showing the layer with the well screen per well

MW-07 – Layer 2

Cobalt concentrations fall below GWPS within 4 years in MW-07

GWPS = Groundwater Protection Standard

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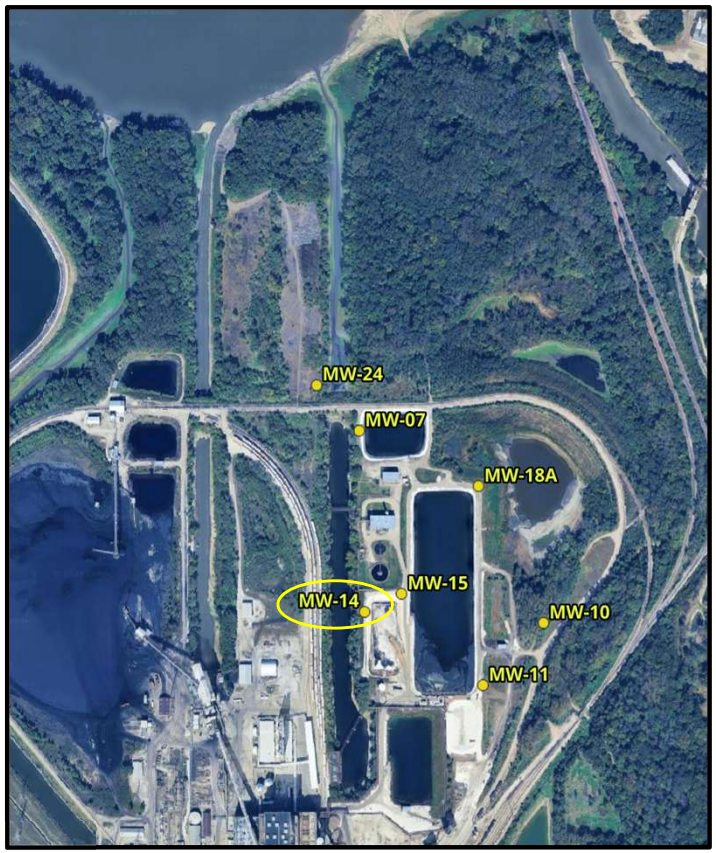
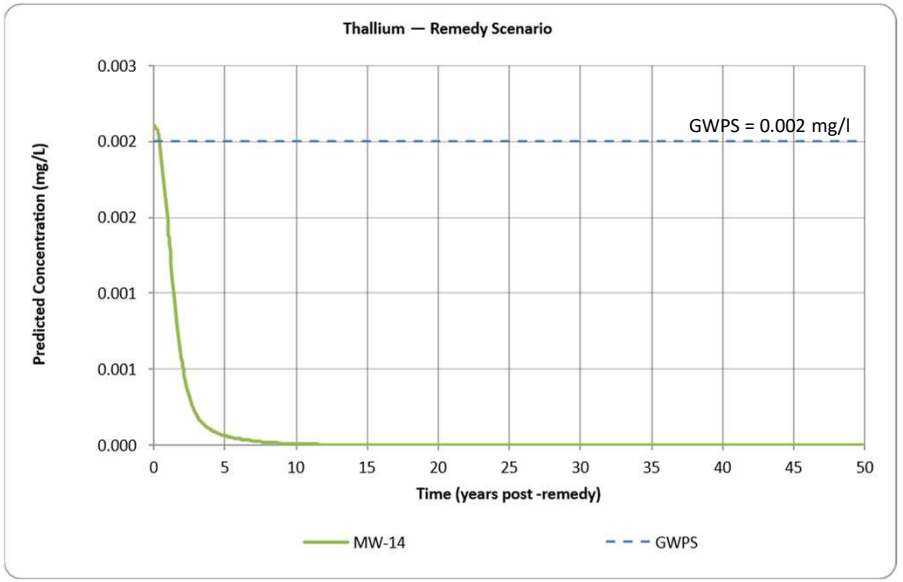
Remedy Scenario: Thallium

Monitor Well Locations





Showing the layer with the well screen

MW-14 – Layer 1

Thallium concentrations fall below GWPS within 1 year in MW-14

GWPS = Groundwater Protection Standard

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