Site Update – November 2020

Electro Plating Services Site, Madison Heights, Michigan

OSC Tricia Edwards

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
EPA
EMERGENCY RESPONSE

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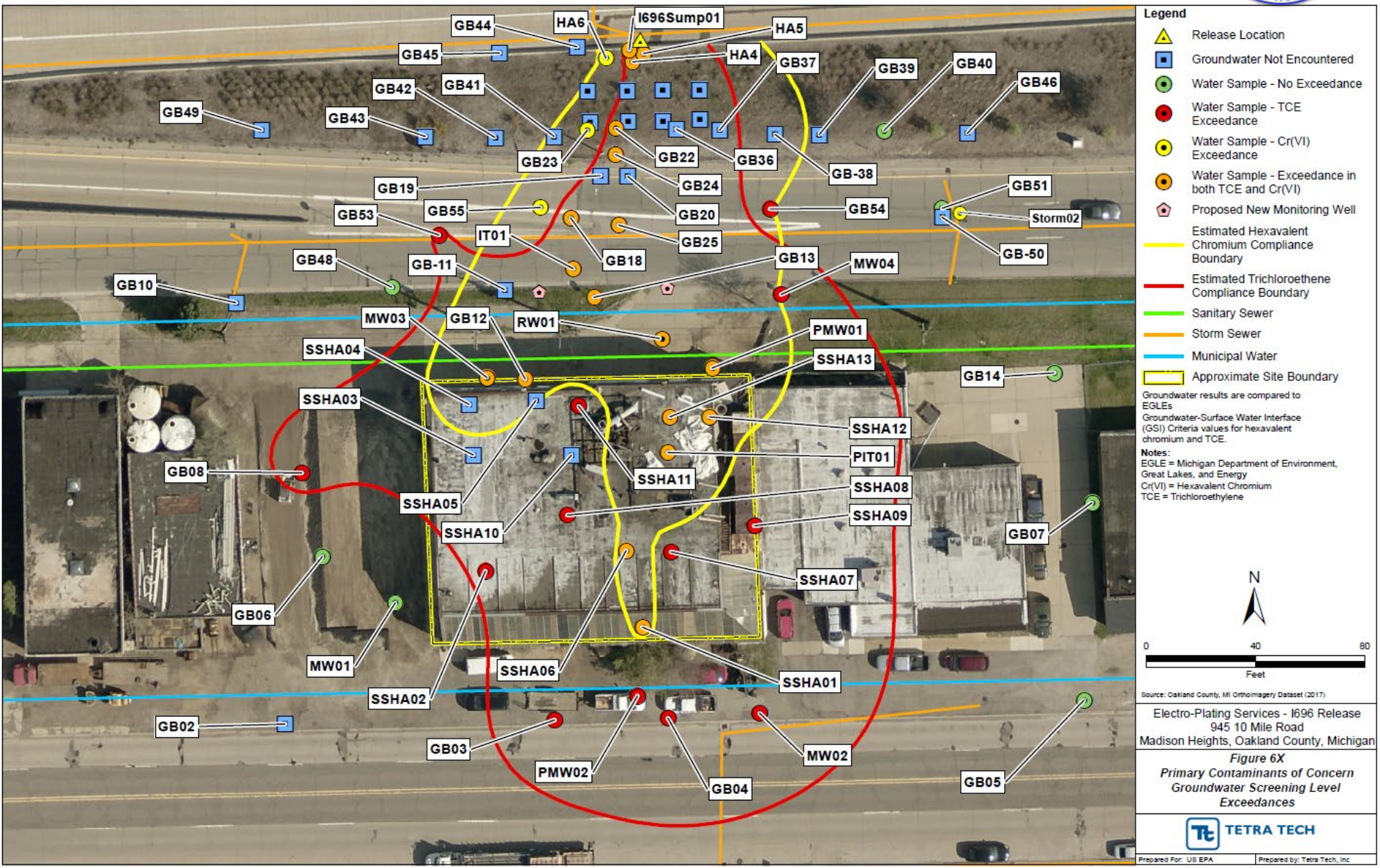
Initial Response on December 20


Bobcat
MT55

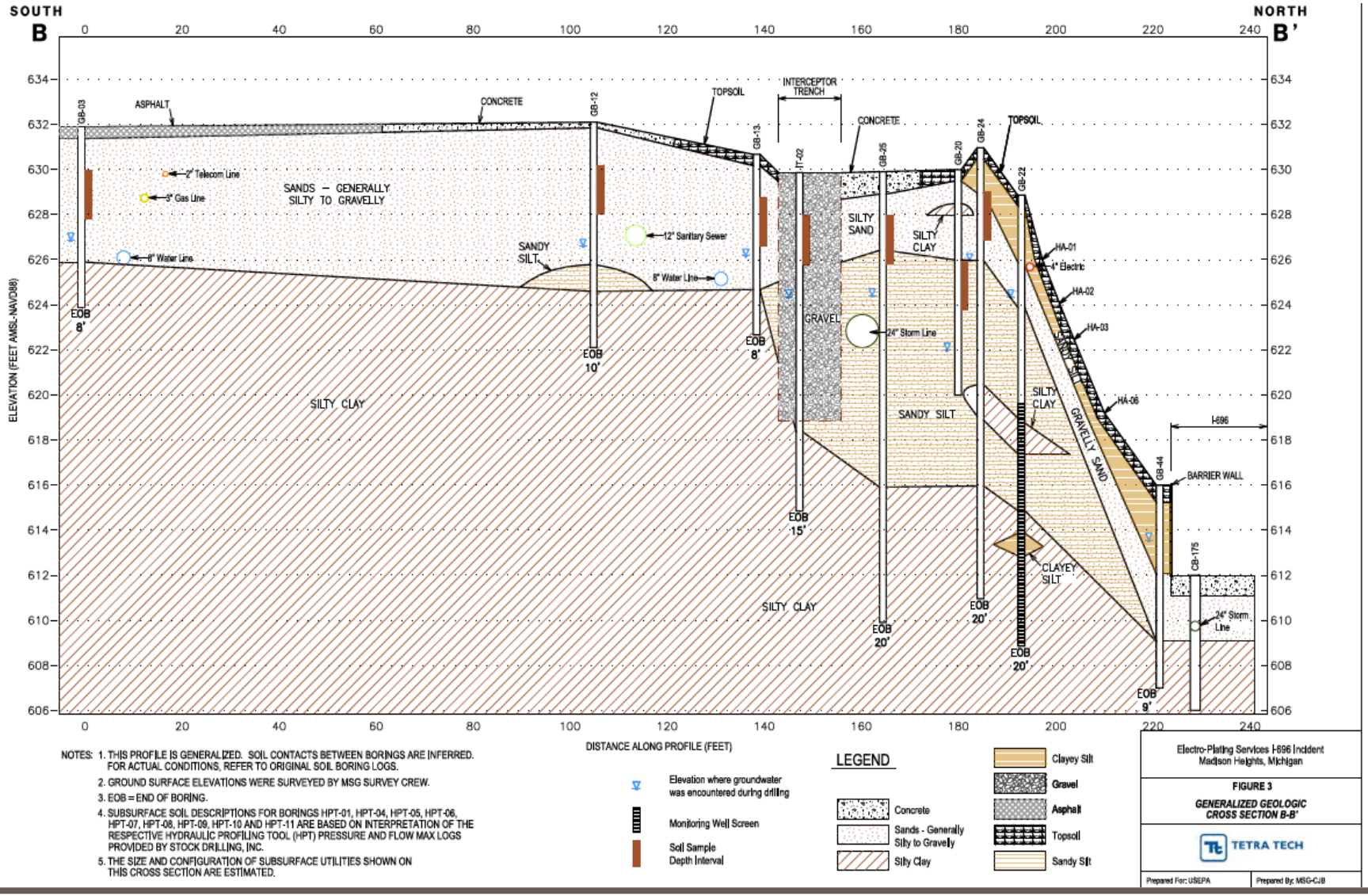
Embankment Sump

- I-696 Barrier Wall

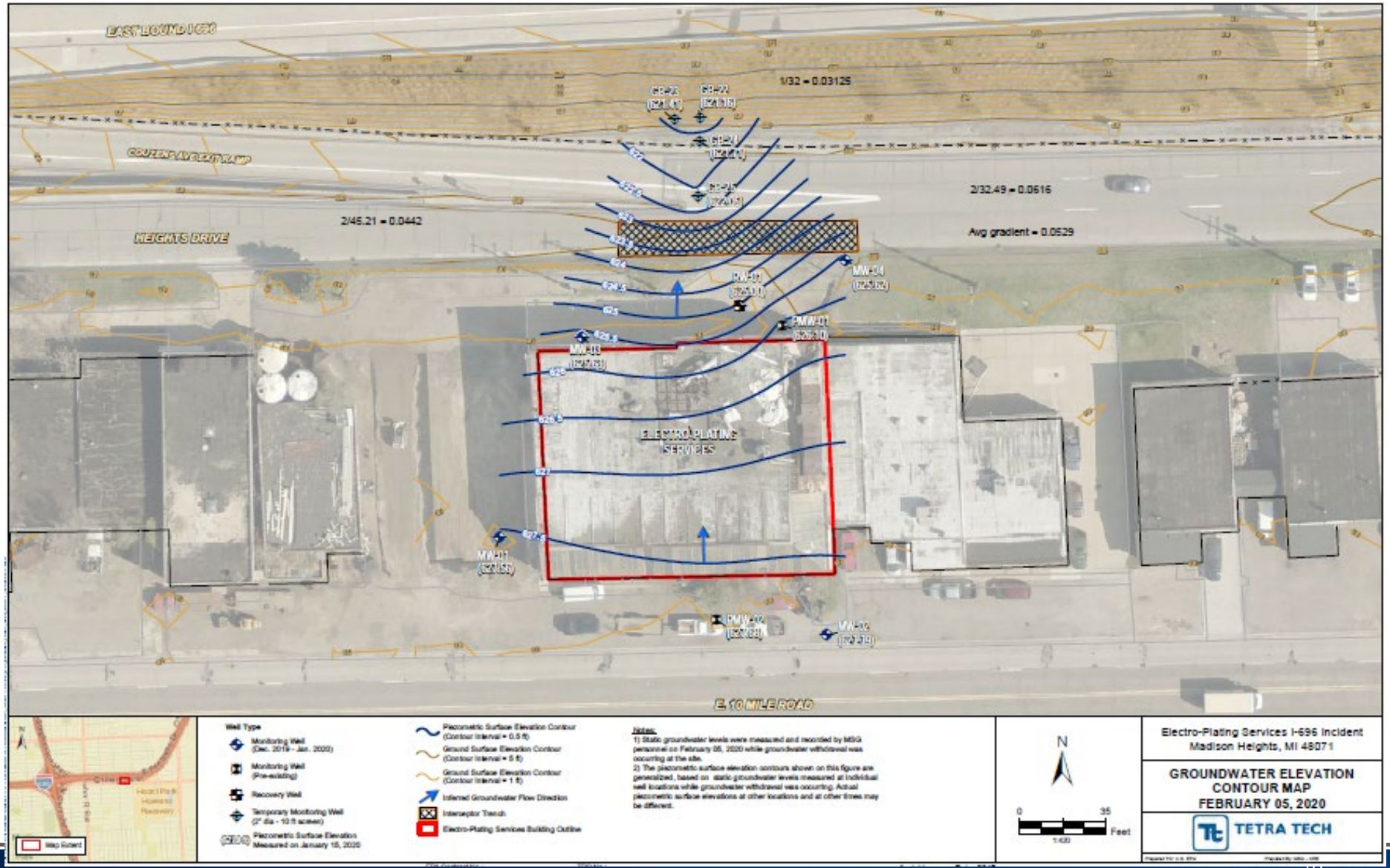
Site Investigation



Elevation Profile – Cross Section



Groundwater Flow



Response Actions

Response Actions

- Collection Systems:
  - Interceptor Trench
  - Basement Sump
  - I696 Embankment Sump
- Bypass System
- Winterization of Equipment
- Vapor Intrusion Study
- T&D of Waste
- Site Investigation

BYPASS SYSTEM – STORM SEWER

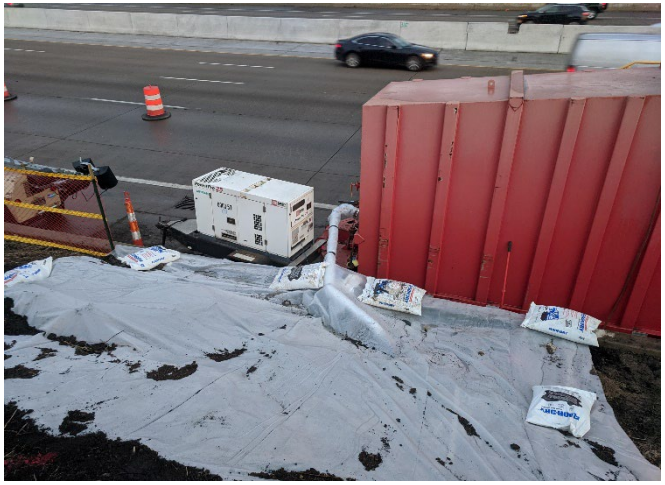
INTERCEPTOR TRENCH


KOMATSU


KOMATSU
RT3854
CAUTION


KOMATSU
WA270

INTERCEPTOR TRENCH



Winterization of Equipment

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INDOOR / SUB-SLAB SAMPLING

Late Winter / Spring Continued Operations

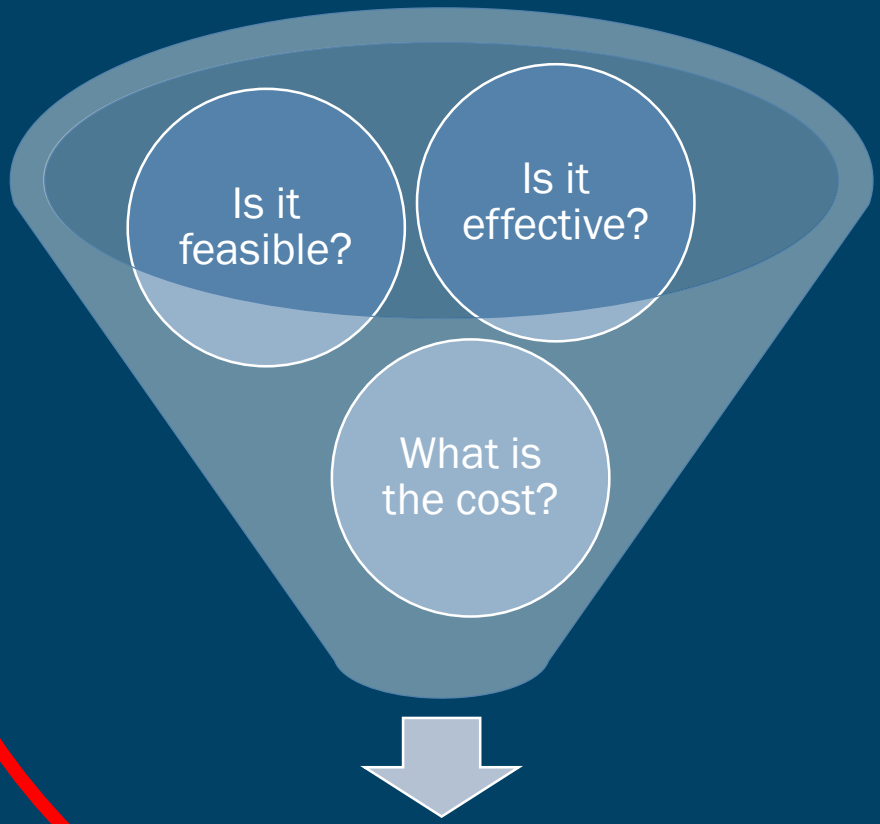
Quarantine – Site Operations

- COVID-19 – Operations Continued through quarantine
- Minimized personnel working on-site / Rotating schedules
- START Contractors only on-site as needed
- I696-Sump pumped up to Interceptor Trench
- Frac Tank removed from I-696
- T&D of Waste

- Engineering Plans / Continued to evaluate alternatives

EPA looked at a variety of technologies including:

- In-Situ (in-place) Treatment
- Groundwater collection and Conveyance
- Wastewater Treatment System
- Excavation/Containment
- A combination of more than one technology
- No further action



A total of 9 options were looked at before choosing In-Situ Treatment

What is In-Situ Treatment?

- In-situ treatment is the treatment of contamination in location where it is found in the environment, without removing the soil or groundwater from its location.
- Because the contaminated media (soil, groundwater, etc.) is treated In-Situ, the amount of waste produced is significantly reduced.
- This method is especially helpful when cleaning up high levels in levels of contamination.

Why did we choose In-Situ Treatment?

- Treatment of the Chemicals of Concern
  - Hexavalent Chromium
  - Trichloroethylene (TCE)
  - Cyanide
- Reduction of PFAS/PFOS
- Long Term benefits

How to Implement In-Situ Treatment

Permeable Reactive Barrier

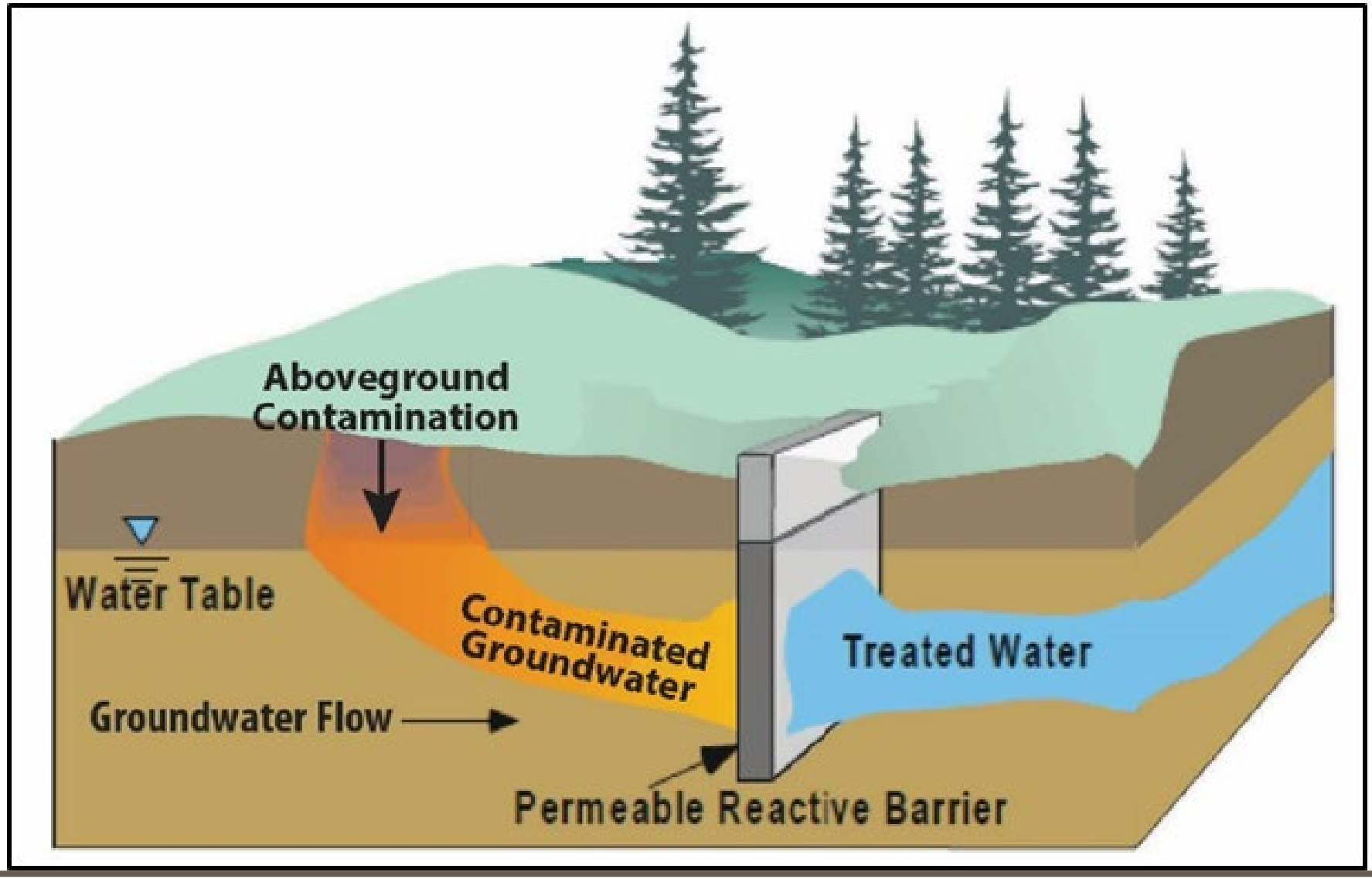
- A permeable reactive barrier (PRB) is an In-Situ treatment zone established within a contaminated groundwater unit through the application of reactive products.
- The reactive materials interact with the plume of contaminants as it passively migrates through the PRB, removing or degrading contaminants with treated groundwater migrating out of the PRB.
- The primary removal mechanisms include:

  (1) sorption and precipitation,

  (2) chemical reaction, and

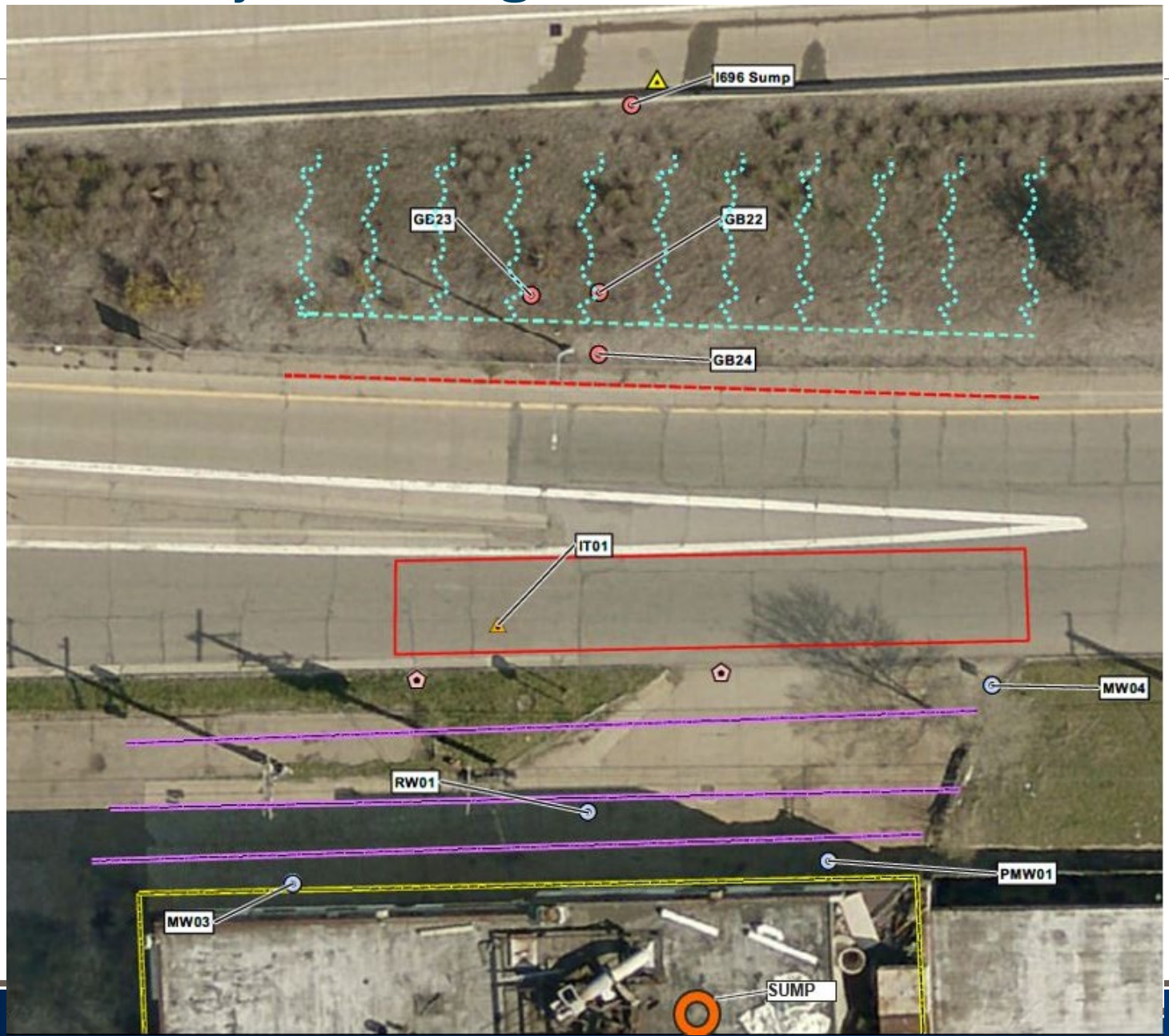
  (3) biological oxidation or reduction, depending on the target contaminants.

Conceptual Example Design



Interim Response Actions

Preliminary Site Design



Pilot Study

- 11 On-site Injection Points
- 3 Downgradient Soluble Reagent Injection Wells

Gravity fed soluble reagents into permanent injection wells along the embankment

Injection of the treatment reagents under pressure (on-site)

Pilot Study - Sump Application

- Soluble Reagent
  - 38 lbs ELS Microemulsion
  - 3.6 kg Ferrous Sulfate
  - 470 gal water

Dark color is an indication of reducing, anaerobic conditions

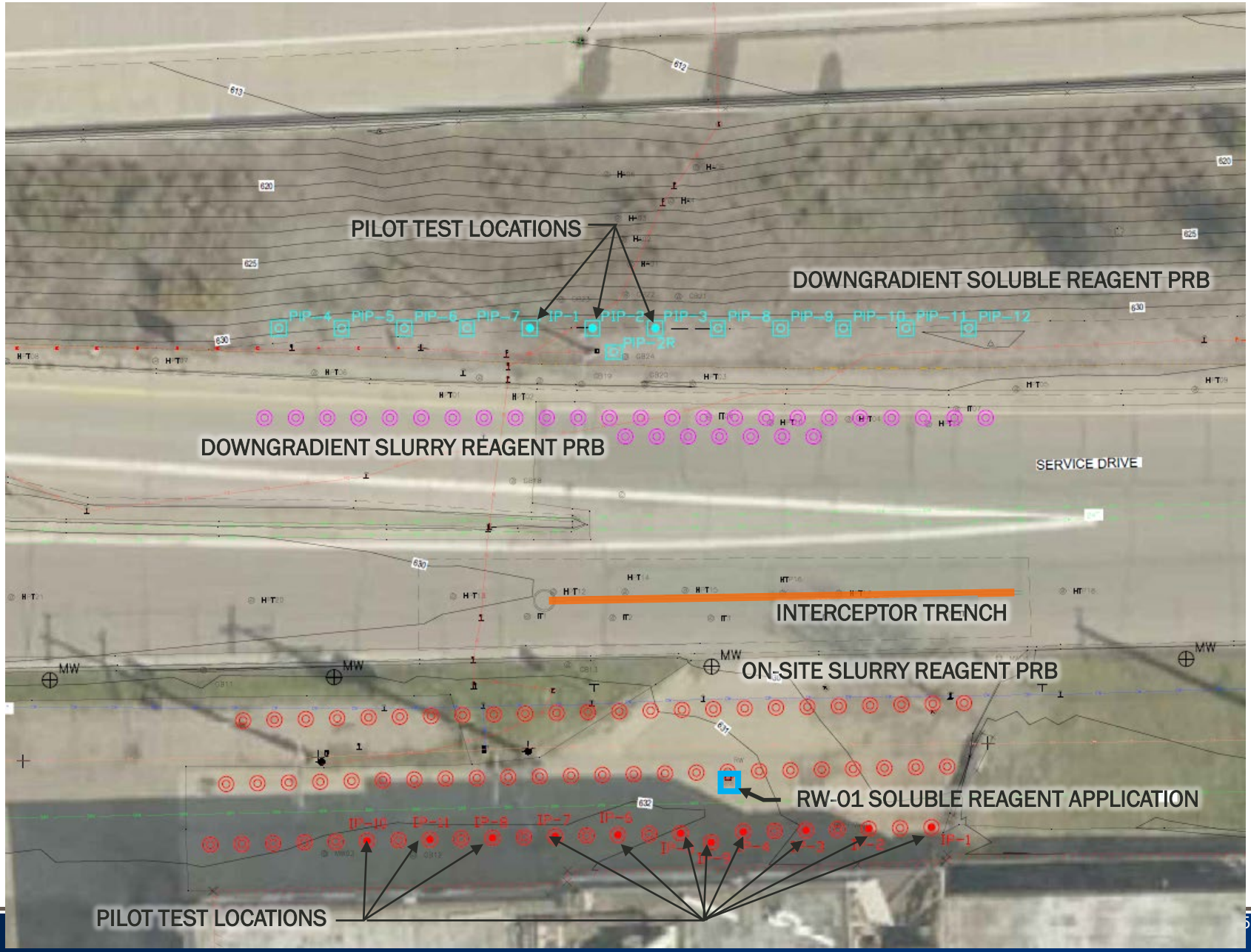
Interim Response Actions

- Lining of Sanitary & Storm Sewers – Cured In Place Pipe
  - Repair damaged underground wastewater and stormwater sewer pipes without excavation
  - Repair 1 manhole


e-rehab
MADISON HEIGHTS 10 MILE
1659 -> 1658
Circular 12inch Vitrified Clay Pip
204.90


MADISON HEIGHTS 10 MILE
1659 -> 1658
Circular 12inch Reinforced Concret
204.70

Full-Scale Application



On-Site PRB

- 61 Injection Points
- 5 – 9 feet bgs
- 19.6 gal reagent per foot
  - 31 lbs EHC Plus
  - 125 lbs Metafix I-3
  - 13.4 gal water
- 150 – 200 psi; typ. 175 psi
- 1.4 – 3.9 gpm; typ. 2.5 gpm
- Totals
  - EHC Plus – 9,500 lbs
  - Metafix – 38,100 lbs

On-Site PRB

Completed injections spaced apart to avoid daylighting

Very few, minor occurrences of daylighting

Downgradient Slurry PRB

- 28 Injection Points
- 5 – 11 feet bgs
- 4.6 gal reagent per foot
  - 12.8 lbs EHC Plus
  - 3.5 gal water
- 170 psi
- 2.3 – 4.6 gpm; typ. 4.6 gpm
- Total EHC Plus – 2,500 lbs

Downgradient Slurry PRB

Downgradient Soluble PRB

- 10 New, 2 PT Injection Wells
- Screened 6 – 16 feet bgs
- Target Reagent per Well
  - 38 lbs ELS Concentrate
  - 96 lbs GeoForm Soluble
  - 209 gal water
  - 225 gal per point
  - 2,250 gal total volume
- Completed Application
  - 3 Exceeded Target Volume
    - PIP-1, PIP-3, PIP-8
  - 7 Less than Target Volume
    - Remaining
  - 2 Negligable Volume
    - PIP-10, PIP-11
  - 1,460 gal total volume

- 246 lbs ELS Concentrate
- 622 lbs GeoForm Soluble

Downgradient Soluble PRB

Downgradient Soluble PRB

RW-01 Soluble Application

- 10 New Injection Wells
- Screened 6 – 16 feet bsg
- Target Application
  - 77 lbs ELS Concentrate
  - 191 lbs GeoForm Soluble
  - 440 gal water
  - 450 gal total volume
- Completed Application
  - 620 gal total volume
  - 106 lbs ELS Concentrate
  - 263 lbs GeoForm Soluble

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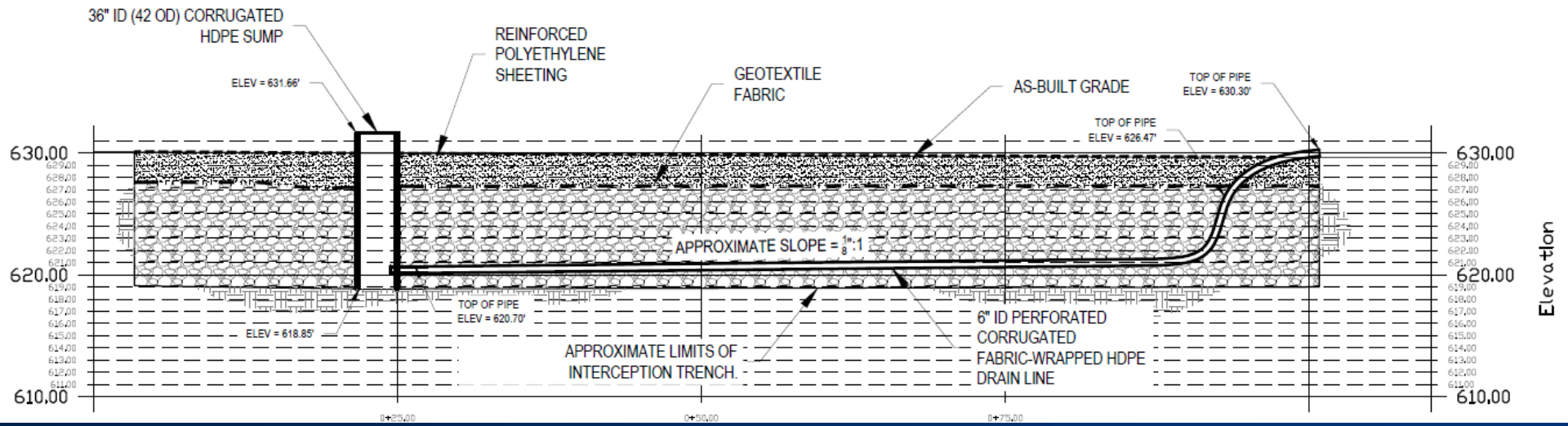
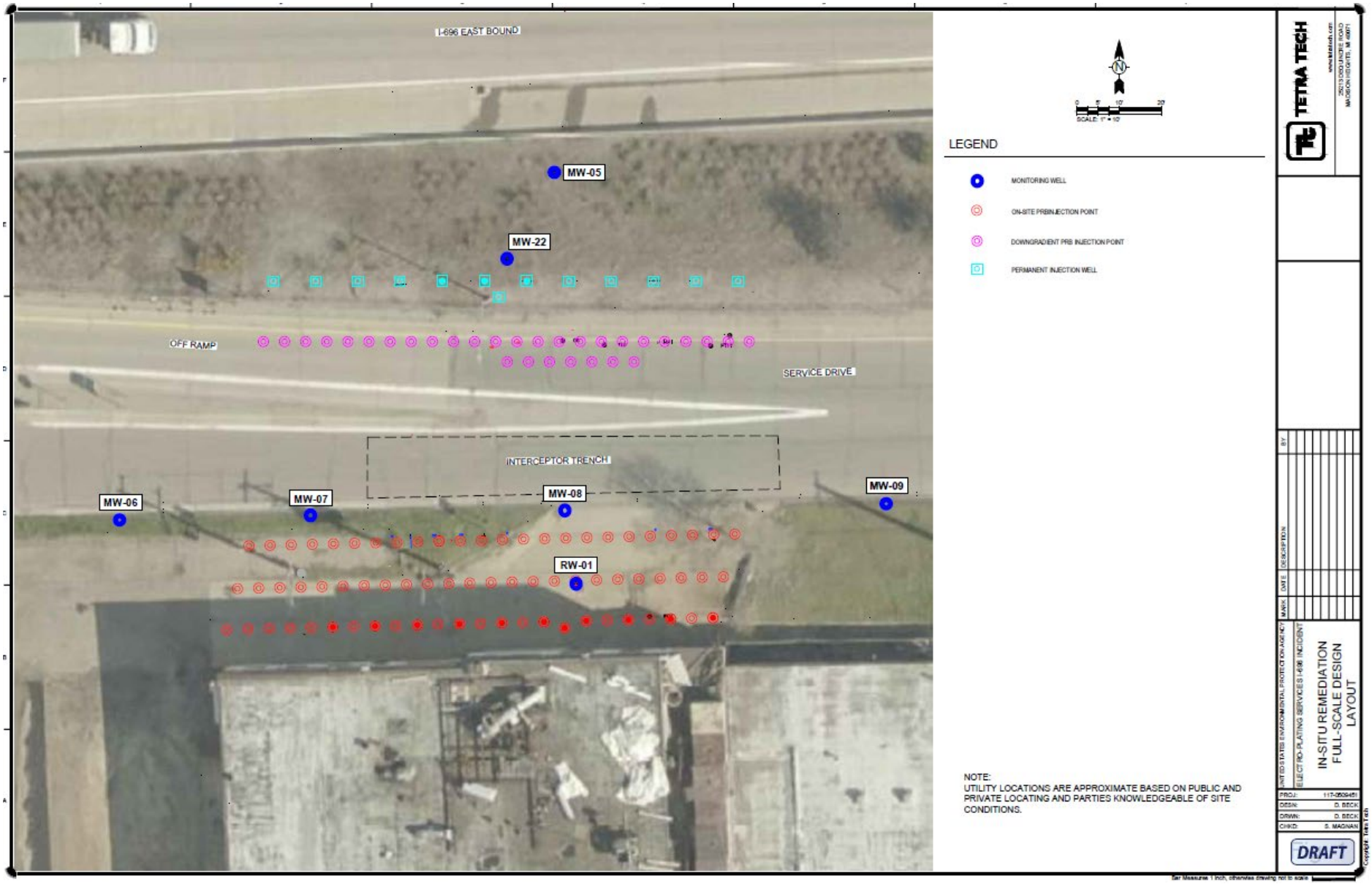
Interceptor Trench Soluble Application

- Excess product from downgradient soluble PRB
- Same reagent blend as PRB and RW-01
- Completed Application
  - 615 gal total volume
  - 105 lbs ELS Concentrate
  - 262 lbs GeoForm Soluble



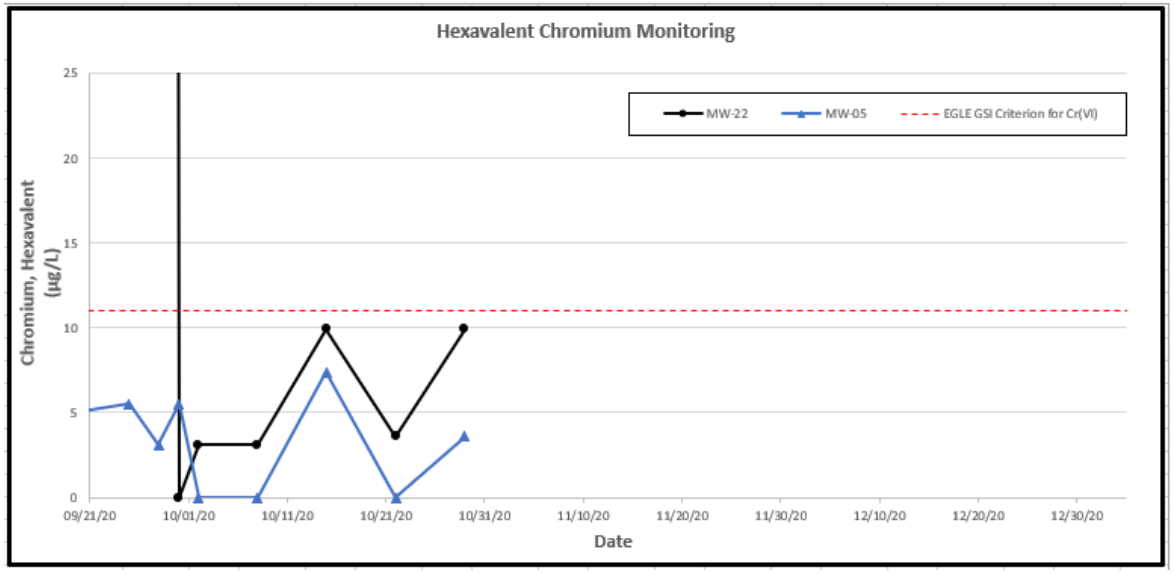
CURRENT CONDITIONS / SCHEDULE

Preliminary Cr (VI) Results



Weekly Monitoring at Embankment

Date	Chromium, Hexavalent (µg/L)	
	MW-22	MW-05
01/13/20	65	29,000
07/21/20	31,000	-
07/27/20	28,000	-
09/25/20	11,000	5.5
09/28/20	640	3.1
09/30/20	ND	5.5
10/02/20	3.1	ND
10/08/20	3.1	ND
10/15/20	9.9	7.4
10/22/20	3.6	ND
10/29/20	9.9	3.6



EGLE Groundwater Surface Water Interface Criteria – 0.011 mg/L

Post-Treatment Groundwater Analyses – Performance Monitoring Sampling

Site Contaminants

- Cyanide (Total, Available)
- Hexavalent Chromium
- Metals (TAL + Hg, Dissolved)
- PFAS
- VOCs

Performance Parameters

- Anions (Nitrate, Sulfate, Chloride)
- Dissolved Gases (Ethane, Ethene, Methane)
- Total Organic Carbon

1st Round of Sampling:	COMPLETED 11/02/2020
2nd Round of Sampling:	Mid-December

Milestones:

ESTIMATED TIMELINE	DESCRIPTION
Week of July 13	Pilot Study
Week of July 27	Lining of Sanitary & Storm Sewer
	Removal of By-Pass System
September 8-30	Full-Scale Injection

Milestones:

Date	Activity
10/5/2020	Pumping from the Interceptor Trench ceased
10/14/2020	Frac-Tank demobilized from the site
10/18/2020	ALL Pumping for collection/disposal ceased
Pump from I-696 sump to the Interceptor Trench	
10/18/2020	Frac-Tank #3 Emptied and Power Washed
Out of Service – Awaiting pick up	
10/24/2020	Merge lane on I-696 opened
*Jersey barriers moved to Service Drive and set to protect Interceptor Trench *Remaining barriers – Awaiting pick up	

Current Conditions

	Volume (Gallons) (10/20)
Total Liquid Currently On-Site	0
Total Liquid Taken Off-Site for Disposal	353,878
- D007/PFOS 293,959-gallons	
- N/H / PFOS 59,919-gallons	

Frac-Tank Cleaning / Demobilization

I-696 / Ramp / Service Drive

Schedule of Remaining Site Activities:

ESTIMATED TIMELINE	DESCRIPTION
Mid-December	2nd Round of Performance Monitoring Sampling
Late December / Early January	Open Couzens Ramp / Service Drive (CLOSED) / Demobilization of EPA / Transfer Site to EGLE
Spring 2021 (EPA)	Remove I-696 Sump / Restore*
	Remove Interceptor Trench / Restore Service Drive*
*Weather dependent / Subject to change	

INFORMATION UPDATES

- EPA - Website
  - https://www.epa.gov/mi/electro-plating-services-i696-release-site

- EGLE - Website
  - https://www.michigan.gov/egle/0,9429,7-135-3312_4118-515339--,00.html