



Vulnerability Analysis – Expanded Capabilities in Spill Response

Karen Adams [CSX], Sarah Elsokkary, and Tiffanee Grumbly [Arcadis]



Vulnerability Analysis – Requirements

- A vulnerability analysis is required under 40 CFR Part 112, Appendix F, Section 1.4.2 to identify the potential impacts of an oil discharge at those facilities required to maintain a Facility Response Plan (FRP).
- This includes completing a substantial harm evaluation, worst case discharge analysis, and planning distance for potential impacts to sensitive areas
- EPA provides a template to complete the FRP which does not include additional information to assist in real world worst case spill response needs. The enhanced vulnerability analysis includes this information.

Vulnerability Analysis - Enhancements

Regulatory Requirement

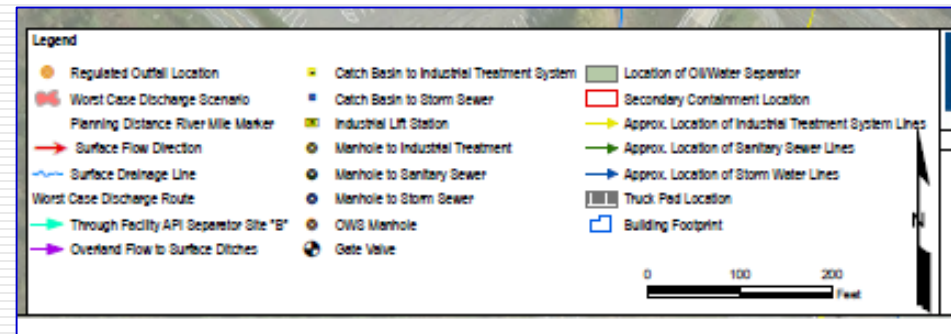
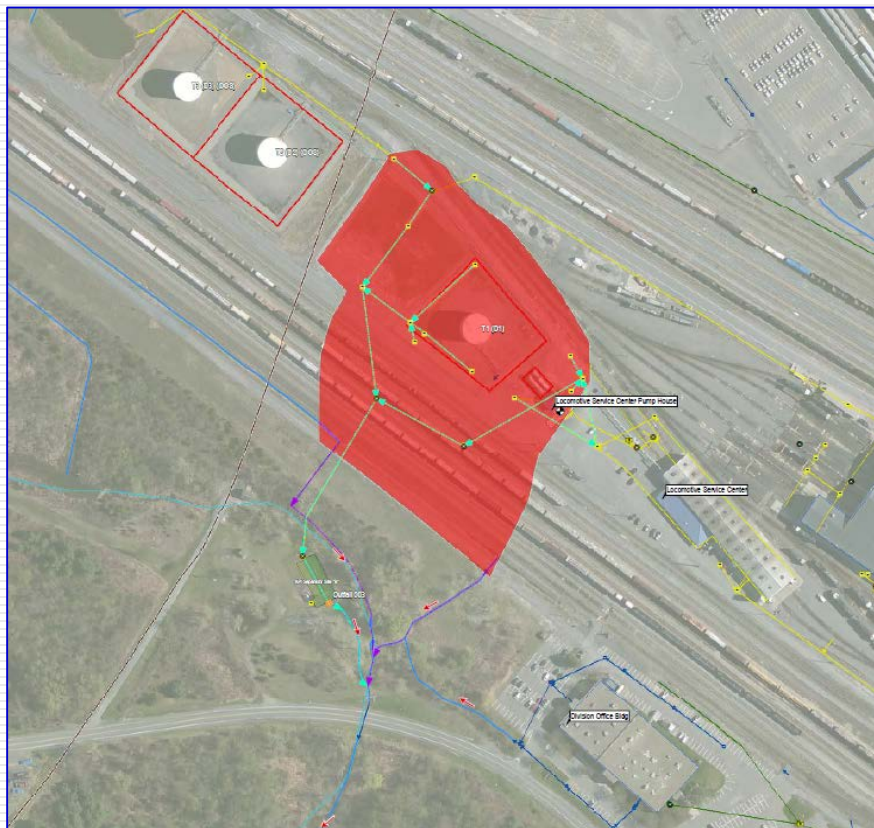
- Calculate planning distance and determine potential effects of an oil discharge to sensitive areas

Enhancement

- Calculate and depict graphically instantaneous worst case discharge zone
- Depict graphically worst case discharge routes:
 - Through treatment process
 - Through storm sewer and/or surface waters
- Depict graphically ecological and manmade sensitive areas
- Depict graphically locations for spill equipment deployment

Vulnerability Analysis - Enhancements

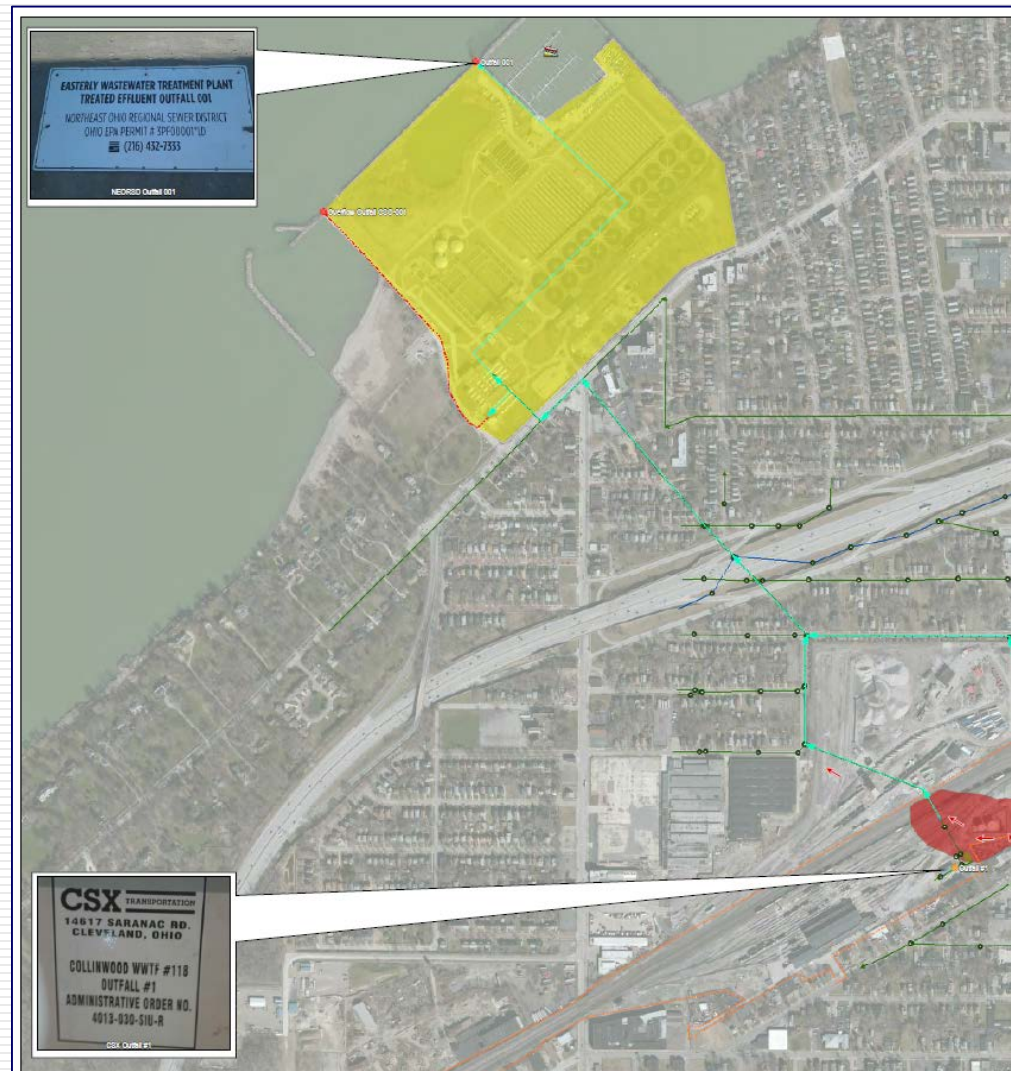
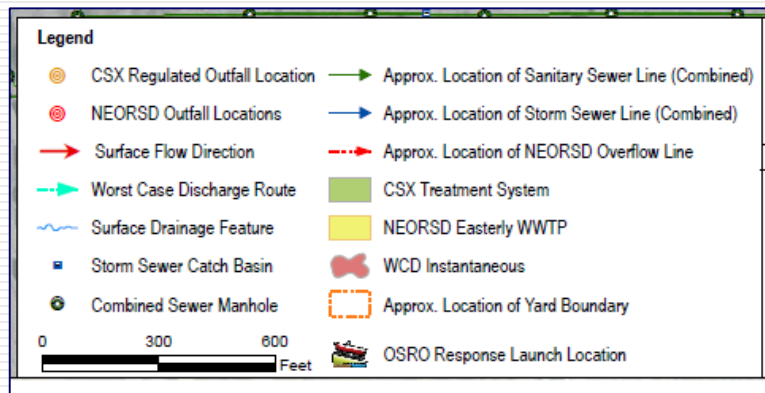
- Depict extent of instantaneous worst case discharge and potential spill pathways



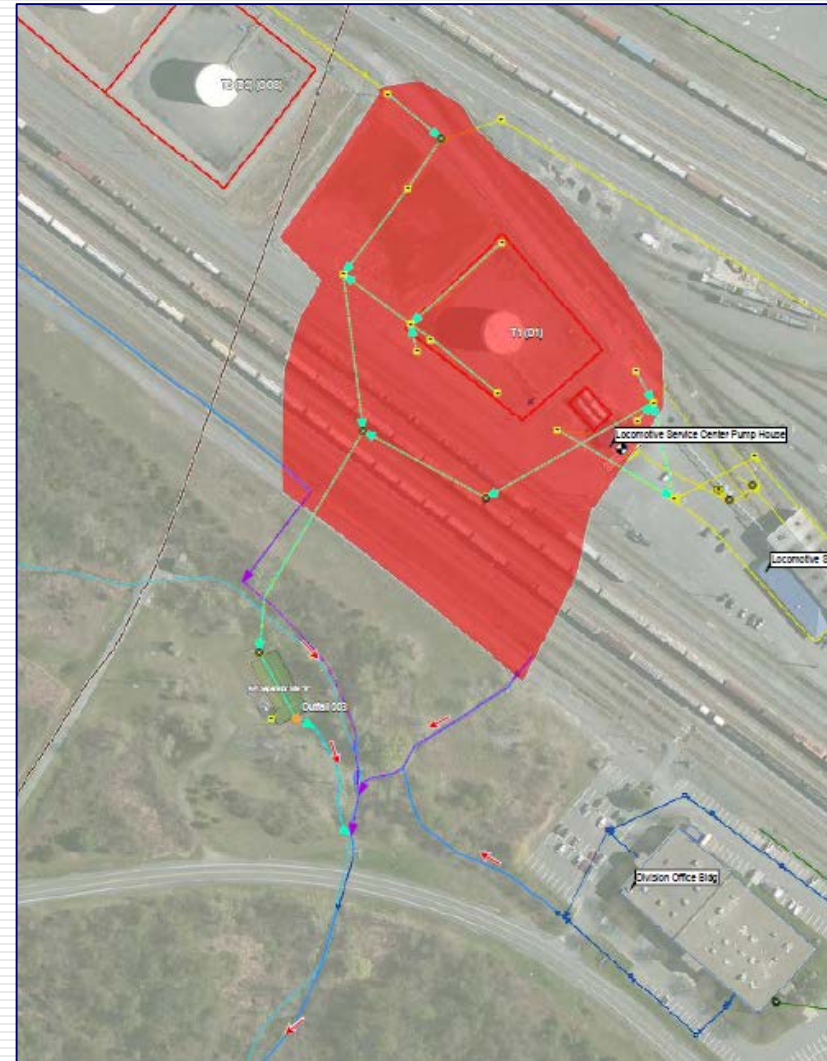
Estimated instantaneous worst case discharge scenario is based on volume of worst case discharge, site conditions, and assumed six inch depth.

Vulnerability Analysis - Enhancements

- Depict worst case discharge routes through treatment system

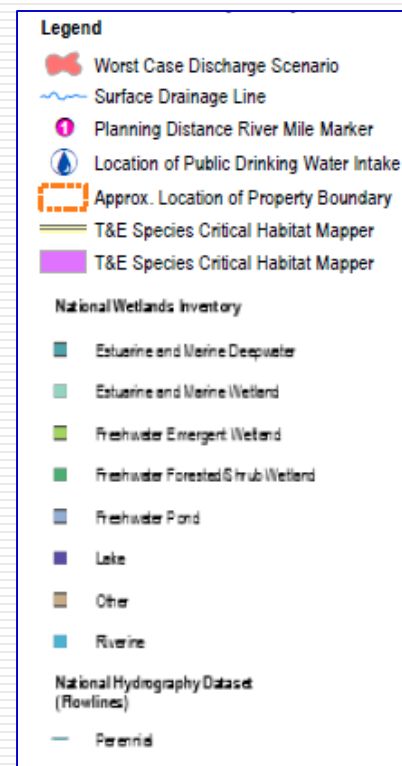
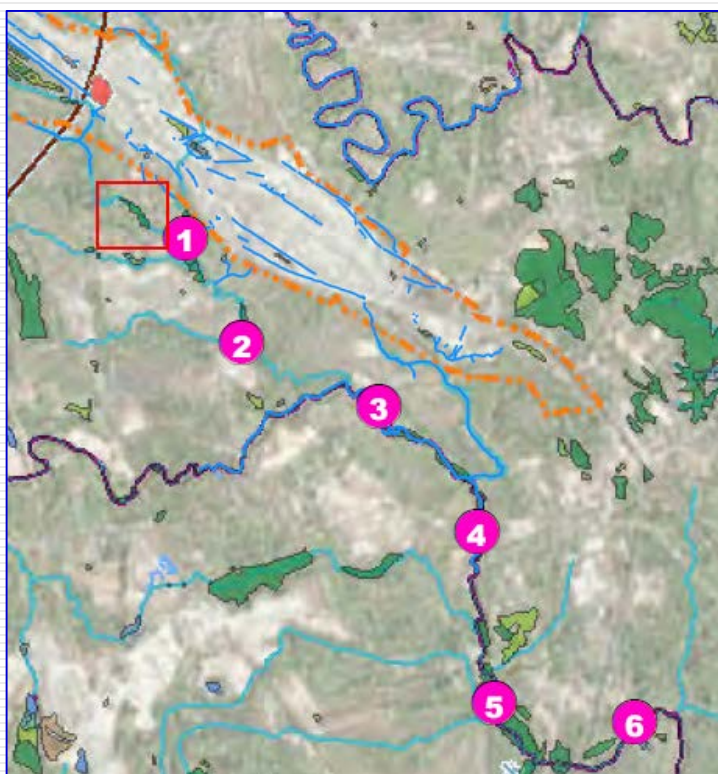


- Depict worst case discharge routes through storm sewer or surface water



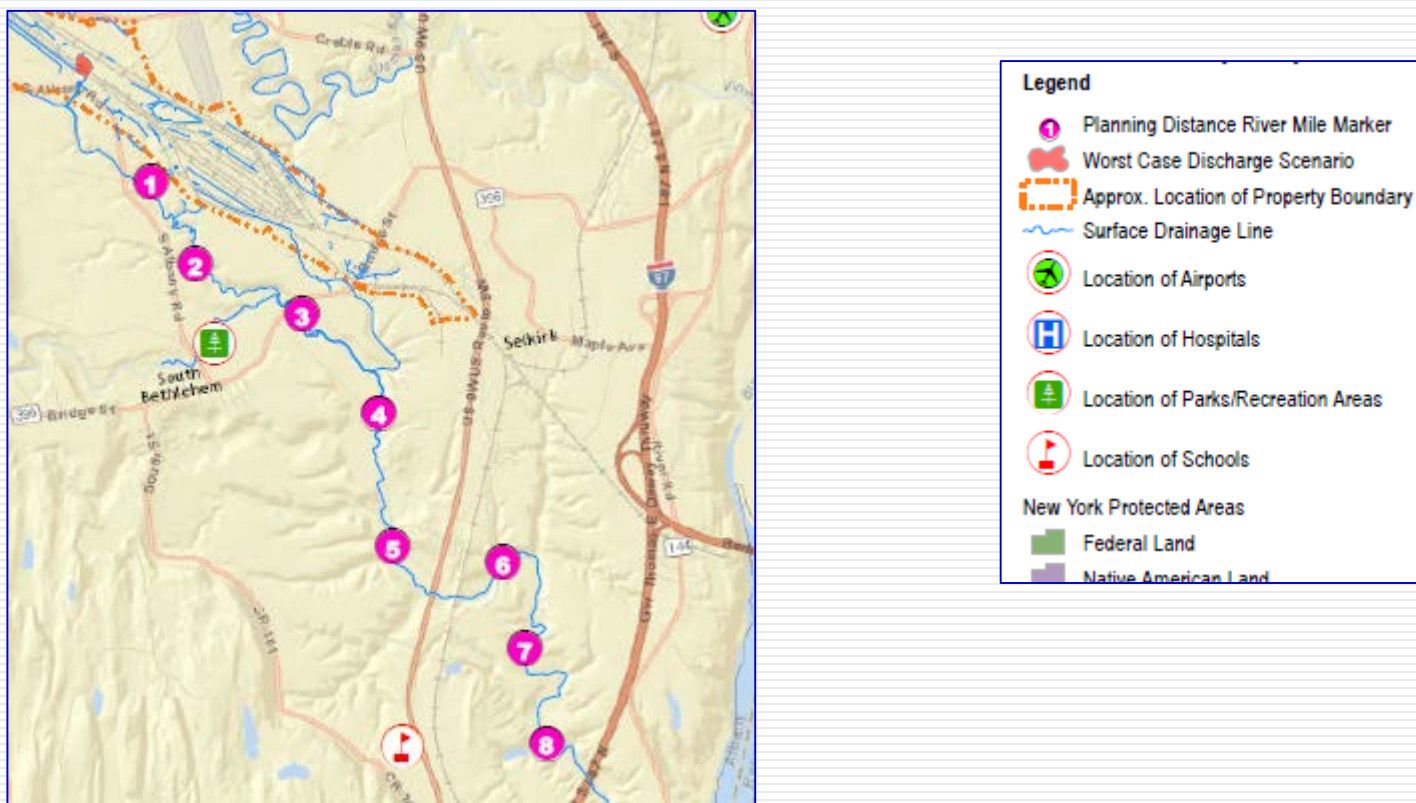
Vulnerability Analysis - Enhancements

- Depict ecological sensitive areas along calculated planning distance



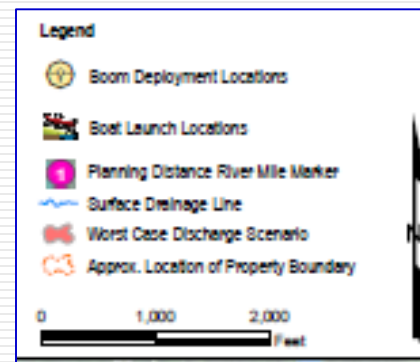
Vulnerability Analysis - Enhancements

- Depict manmade sensitive areas along calculated planning distance



Vulnerability Analysis - Enhancements

- Location of boom deployments within calculated planning distance



Boom Deployment Location	Creek/Road Crossing	Coordinates	Distance Downstream from Outfall (miles)	Approximate Time Discharge reaches Deployment Location
1	UT of Coeyman's Creek/S. Albany Road	42.55216°, -73.84547°	0.79	36 minutes
2	UT of Coeyman's Creek/Dirt Parking Area	42.54671°, -73.83871°	1.58	1 hour 12 minutes
3	Coeyman's Creek/Bridge Street	42.53866°, -73.8278°	2.91	1 hour 30 minutes
4	Coeyman's Creek/Picway Road	42.52752°, -73.81982°	4.01	1 hour 48 minutes
5	Coeyman's Creek/Kruger Road	42.51926°, -73.82132°	4.71	1 hour 54 minutes
6	Coeyman's Creek/N. Route 9W	42.51137°, -73.81679°	5.46	2 hours 6 minutes
7	Coeyman's Creek/Old Ravena Road	42.51268°, -73.80849°	5.98	2 hours 12 minutes
8	Coeyman's Creek/Under New York State Thruway	42.49331°, -73.80208°	8.41	2 hours 48 minutes
9	Coeyman's Creek/Off Riverview Drive	42.479°, -73.794°	9.8	3 hours 6 minutes
10	Discharge into Hudson River Boat Launch @ Coeyman's Landing Marina	42.4759°, -73.7898°	10.22	3 hours 12 minutes

Vulnerability Analysis - Enhancements



[illegible]

Vulnerability Analysis - Conclusion

- Three things to take away
 1. Regulatory requirement that has been enhanced to be beneficial to CSX and emergency responders that we hire
 2. Enhancements provide continuity for personnel turnover, support for announced/unannounced exercises, and EPAs more stringent training requirements
 3. Enhancements provide quick reference guide for terminal management staff using drawings to provide real world depictions

How tomorrow moves

