A Case Study of a Successful Brownfields Remediation Project at a Former Manufacturing Facility

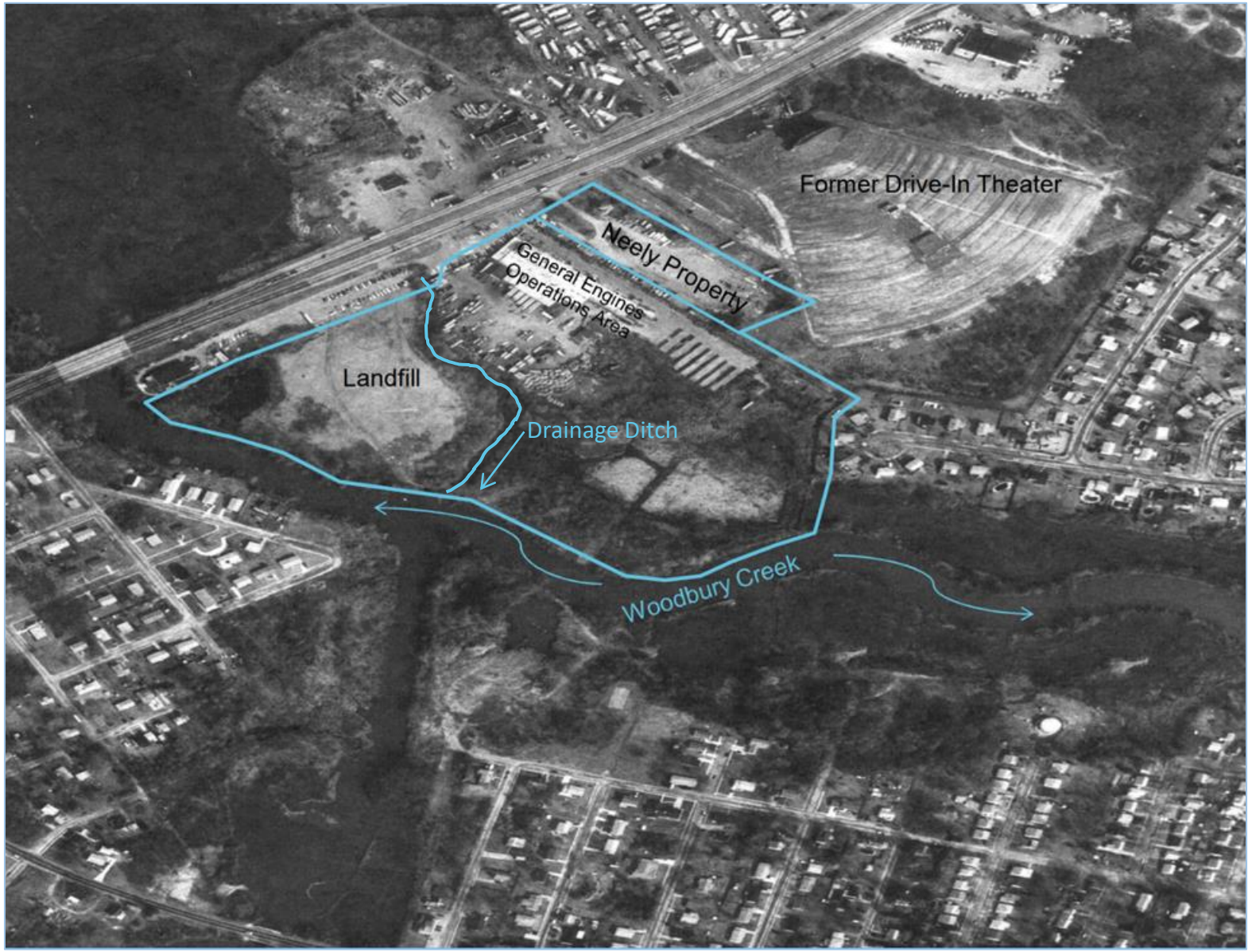
Christopher Wong P.G. (AECOM, Conshohocken, PA) | David J. Russell, P.E., BCEE, LSRP (AECOM, Conshohocken, PA)

Site History

- Successful Family-owned Business - Entrepreneurs
- Specialty Truck Bed Assembly Plant Since 1950s
  - Specialty Truck Beds
  - Paint Booths
  - Maintenance Activities
- On-Site Asbestos Landfill in Wetlands
- Municipal Waste Disposal
- Recycling Experiments
- Mid 1980s - Adjoining Property Purchased for Planned Expansion
- In 1992, Cessation of Operations Triggered NJDEP's ECRA/ISRA Process

Site Setting

- Tidal Wetlands & Marsh Area of Delaware River Basin
- Majority of Site is Fill
- Woodbury Clay acts as a confining layer at 15-20 feet bgs
- Depth to Groundwater 5 feet bgs
- GW Flow Southwest-West Toward Surface Water Body (Woodbury Creek)
- Tidally Influenced Environmentally Sensitive Drainage Ditch which Discharges to Surface Water Body that Discharges to the Delaware River


Former Drive-In Theater
Neely Property
General Engines Operations Area
Landfill
Drainage Ditch
Woodbury Creek

Project Objectives

- Primary constituent of concern is trichloroethene (TCE) and its derivatives
- Objective was to remediate the Areas of Concern (AOCs) effectively to facilitate sale of the property and development as a Brownfields property
- Site is located adjacent to a major New Jersey Interstate exit which provided optimum access for commercial/ industrial logistics operations

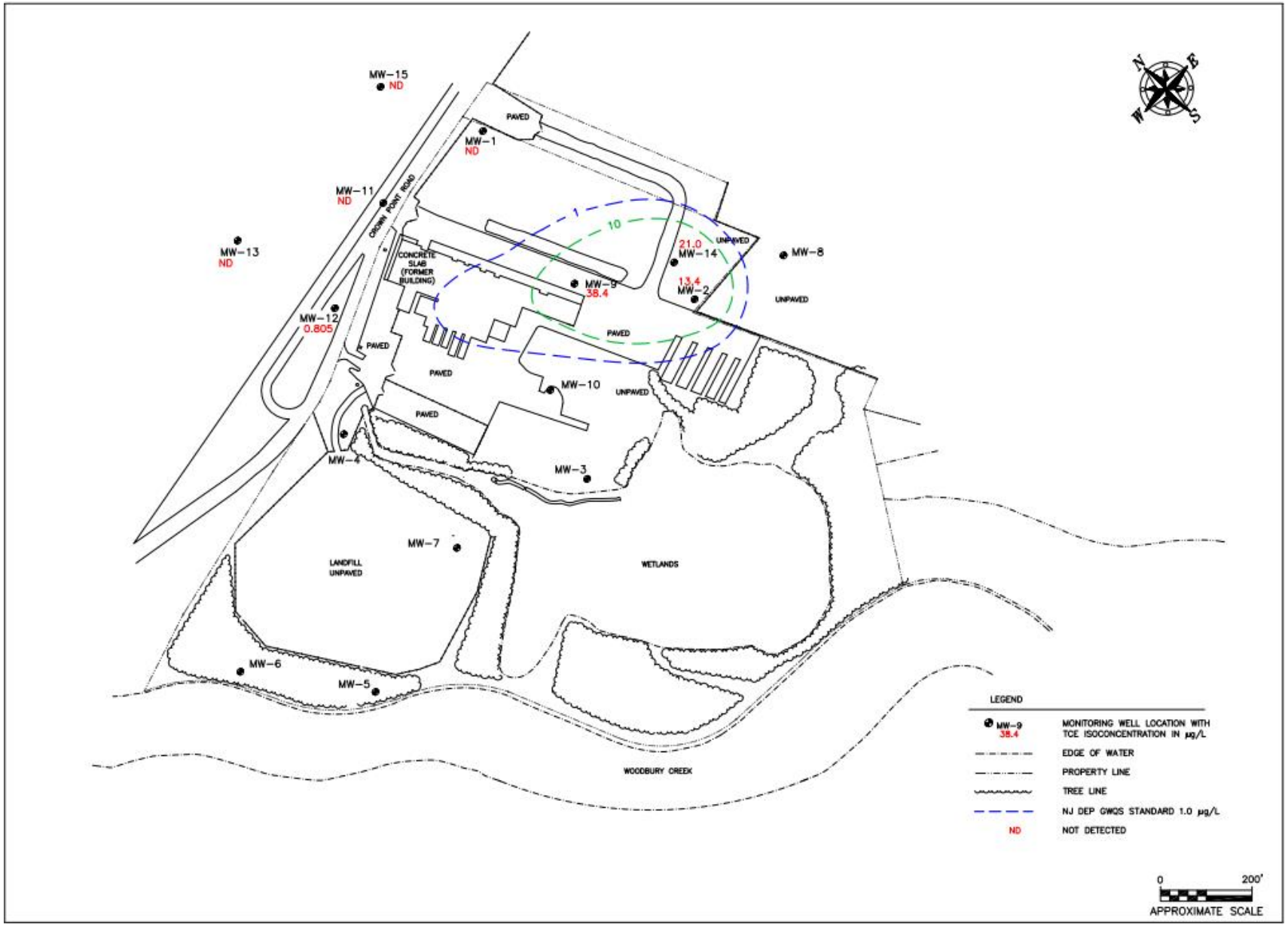
Remedial Activities

- Excavation and disposal of drums and contaminated soils from the adjacent property
- 22 AOCs remediated under a Memorandum of Agreement (MOA) with NJDEP
- Three AOCs addressed through institutional controls (deed notice with a clean soil cap)
- On-site solid waste landfill, which included asbestos, was closed in accordance with NJDEP Solid Waste regulations
- TCE impacted groundwater associated with the adjacent property. Reductive dechlorination with indigenous bacteria under anaerobic conditions was active throughout the dissolved plume

Remedial Activities

Remedial Activities

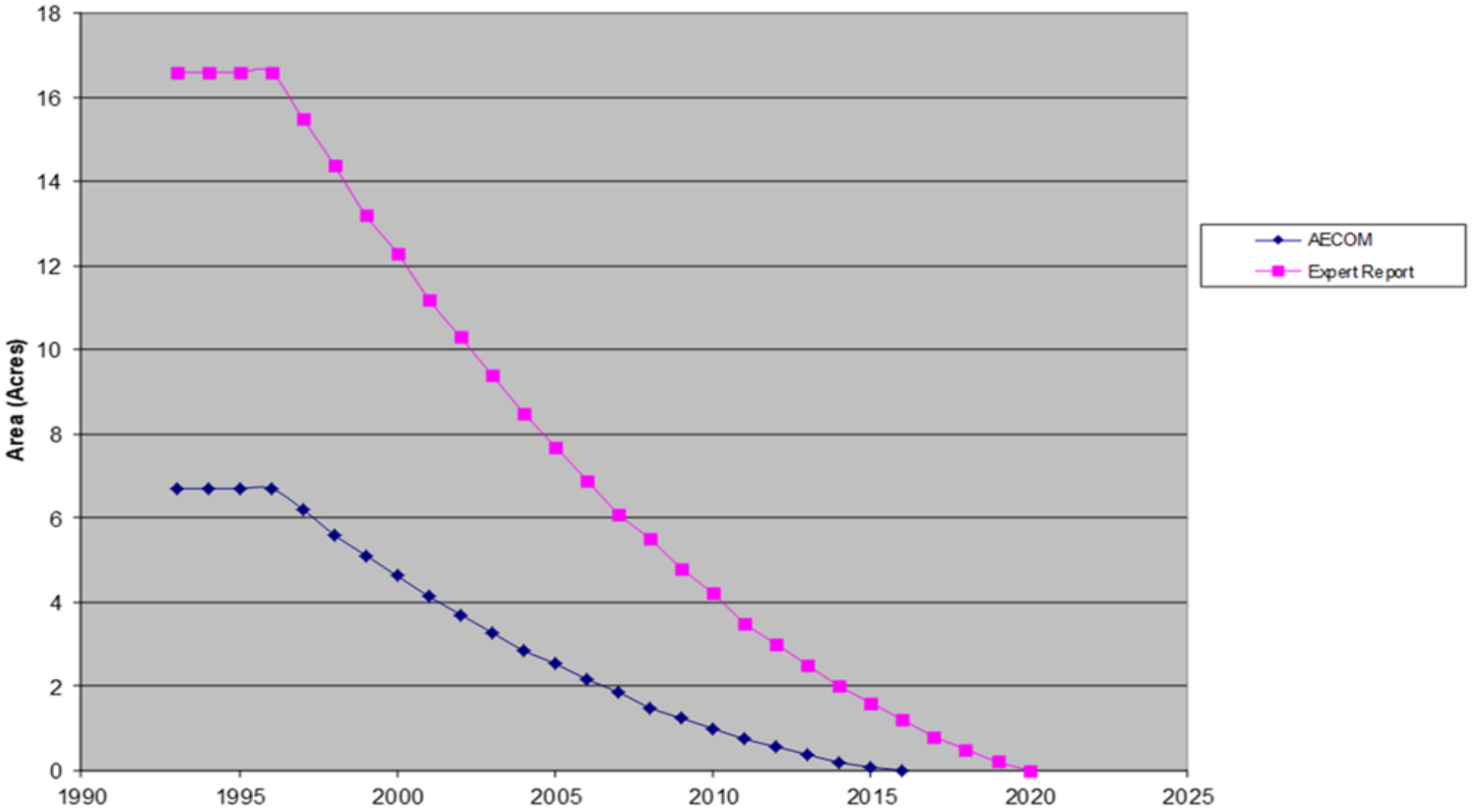
- Grid injection program to enhance ongoing reductive dechlorination using 3-D Microemulsion™ (3DMe) at one AOC
- Injections reduced concentrations in the source area by an order of magnitude; decreasing concentration trends continue to be evident
- Groundwater monitoring program conducted as part of the approved natural attenuation remedy for the past 25 years


MW-15
ND
MW-1
ND
MW-11
ND
MW-13
ND
MW-12
0.805
MW-14
21.0
MW-2
13.4
MW-9
38.4
MW-8
MW-10
MW-4
MW-3
MW-7
MW-6
MW-5
CROWN POINT ROAD
CONCRETE SLAB (FORMER BUILDING)
PAVED
UNPAVED
LANDFILL UNPAVED
WETLANDS
WOODBURY CREEK
1
10
N
E
S
W
LEGEND
MW-9 38.4
MONITORING WELL LOCATION WITH TCE ISOCONCENTRATION IN µg/L
EDGE OF WATER
PROPERTY LINE
TREE LINE
NJ DEP GWQS STANDARD 1.0 µg/L
ND
NOT DETECTED
0
200'
APPROXIMATE SCALE

Remedial Action Results

- Groundwater monitoring demonstrated decreasing concentration trends and reduced contaminant plume
- NJDEP pursued Responsible Party for Natural Resource Damages (NRD) of 5.4 acres of land or $993,173
- Responsible party countered by quantifying the equivalent cost of impact to groundwater and the associated area of land affected, based upon infiltration rates. A consent judgment was issued for NRD settlement of $65,000

Figure 1
Comparison of Simulated TCE Plume Areas



Remedial Action Results

- NJDEP issued a groundwater natural attenuation remedial action permit (RAP) and a soil RAP in 2022 for the three AOCs addressed by institutional and engineering controls (deed notice/clean soil cap) with monitoring and maintenance requirements.
- A Restricted Use Response Action Outcome (RAO) was issued for the entire site in July 2022. The RAO is essentially equivalent to a conditional no further action from the NJDEP under New Jersey's Licensed Site Remediation Professional program.

Lessons Learned

- The issuance of the entire site RAO facilitated sale of the property to a Brownfields developer that successfully developed the site into a warehouse logistics facility.
- The soil RAP is being maintained by the new property owner and the GW RAP by the responsible party.
- This case study demonstrates how properties with significant soil and groundwater impacts can be remediated effectively, resulting in a successful Brownfield Development.