U.S. Environmental Protection Agency
Public Meeting
Region 2

Combe Fill South Landfill Superfund Site
Chester Township, New Jersey

August 22, 2018

- **Welcome and Introduction**
- **Overview**
  - Purpose of Public Meeting and the Superfund Process
  - Site History and Site Activities
  - Summary of Site Contamination and Risks
  - Summary of Proposed Remedies
  - Questions

NJDEP

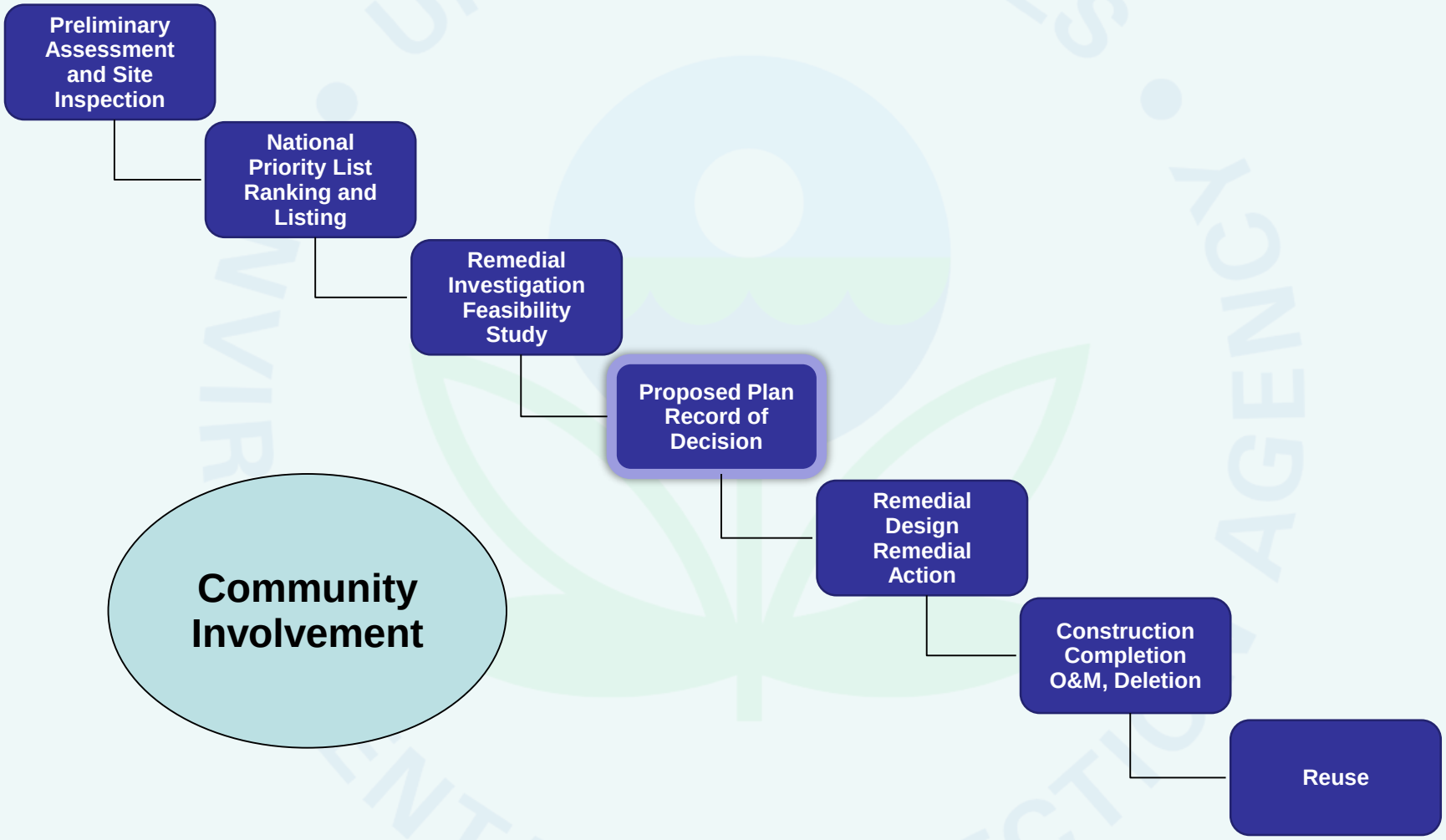
550259

Purpose of Public Meeting

- Present EPA's preferred remedies for both the on and off-Site areas known as Operable Units (OUs):
  - OU1 amendment – upgrade and expand the existing groundwater extraction, conveyance and treatment systems, implement long-term monitoring (LTM) and institutional controls (ICs); and remove remainder of North Waste Cell
  - OU2 interim – implement long-term monitoring and institutional controls

- Record of Decision (ROD) – presents final decision after EPA's review of public comments

Superfund Process



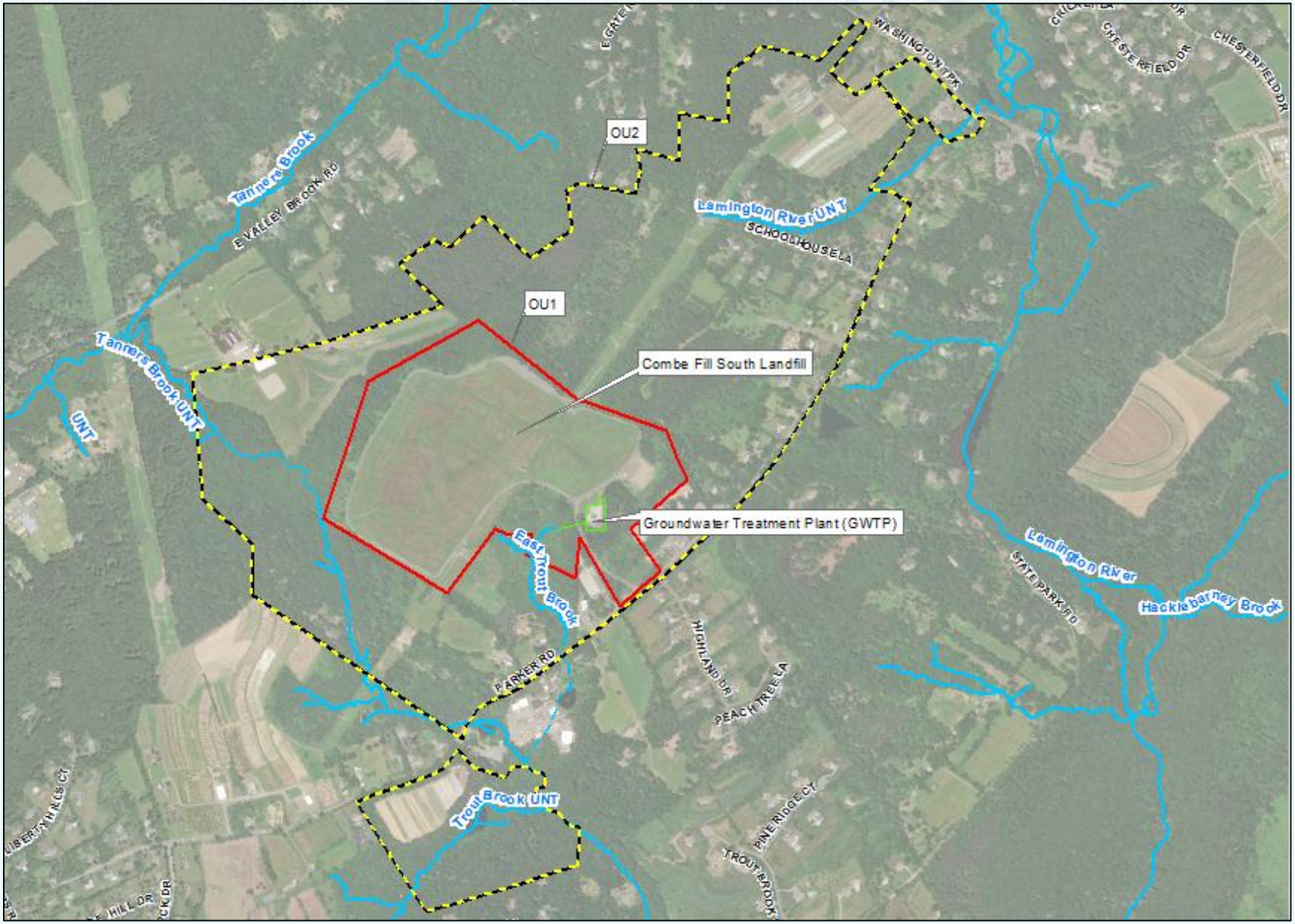
Combe Fill South Landfill

- Located in Chester and Washington Townships, Morris County, New Jersey
- Is an inactive municipal landfill located off Parker Road about two miles southwest of the Borough of Chester
- Consists of three separate fill areas covering about 65 acres of the 115-acre parcel that was owned by the Combe Fill Corporation (CFC)
- September 1, 1983 - listed on the National Priorities List

Scope and Role of Action

- CFS Site is addressed as two operable units:
  - OU1 - landfill property and groundwater directly underlying the landfill
  - OU2 - groundwater, both overburden and bedrock, surface water and sediment near and downgradient of the landfill property boundary

Site Layout


OU2
OU1
Combe Fill South Landfill
Groundwater Treatment Plant (GWTP)
Tanners Brook
Tanners Brook UNT
UNT
Lamington River UNT
SCHOOLHOUSE LA
East Trout Brook
Trout Brook UNT
Lamington River
Hacklebarney Brook
STATE PARK RD
PARKER RD
HIGHLAND DR
PEACH TREE LA
PINE RIDGE CT
TROUT BROOK
CHESTERFIELD DR
WASHINGTON TPK
E VALLEY BROOK RD

Site History

- 1940s – Operated as municipal refuse and solid waste landfill
- 1972 - Chester Hills, Inc. takes over ownership and operation
  - Landfill approved to accept municipal and non-hazardous industrial wastes, sewage sludge, septic tank wastes, chemicals, and waste oils
- 1978 – CFC takes over ownership and operation
- 1973 to 1981 - Numerous violations included the absence of an initial layer of residual soil on the bedrock prior to waste placement
- 1981 – CFC ordered to discontinue waste disposal operations. CFC ceased landfill operations, filed for bankruptcy and was liquidated

OU1 Original ROD - 1986

Addressed the remediation of the landfill and overburden groundwater by including:

- An alternate water supply for affected residences;
- Capping of the 65-acre landfill in accordance with Resource Conservation and Recovery Act requirements;
- An active collection and treatment system for landfill gases;
- Pumping and on-Site treatment of shallow groundwater and leachate, with discharge to Trout Brook;

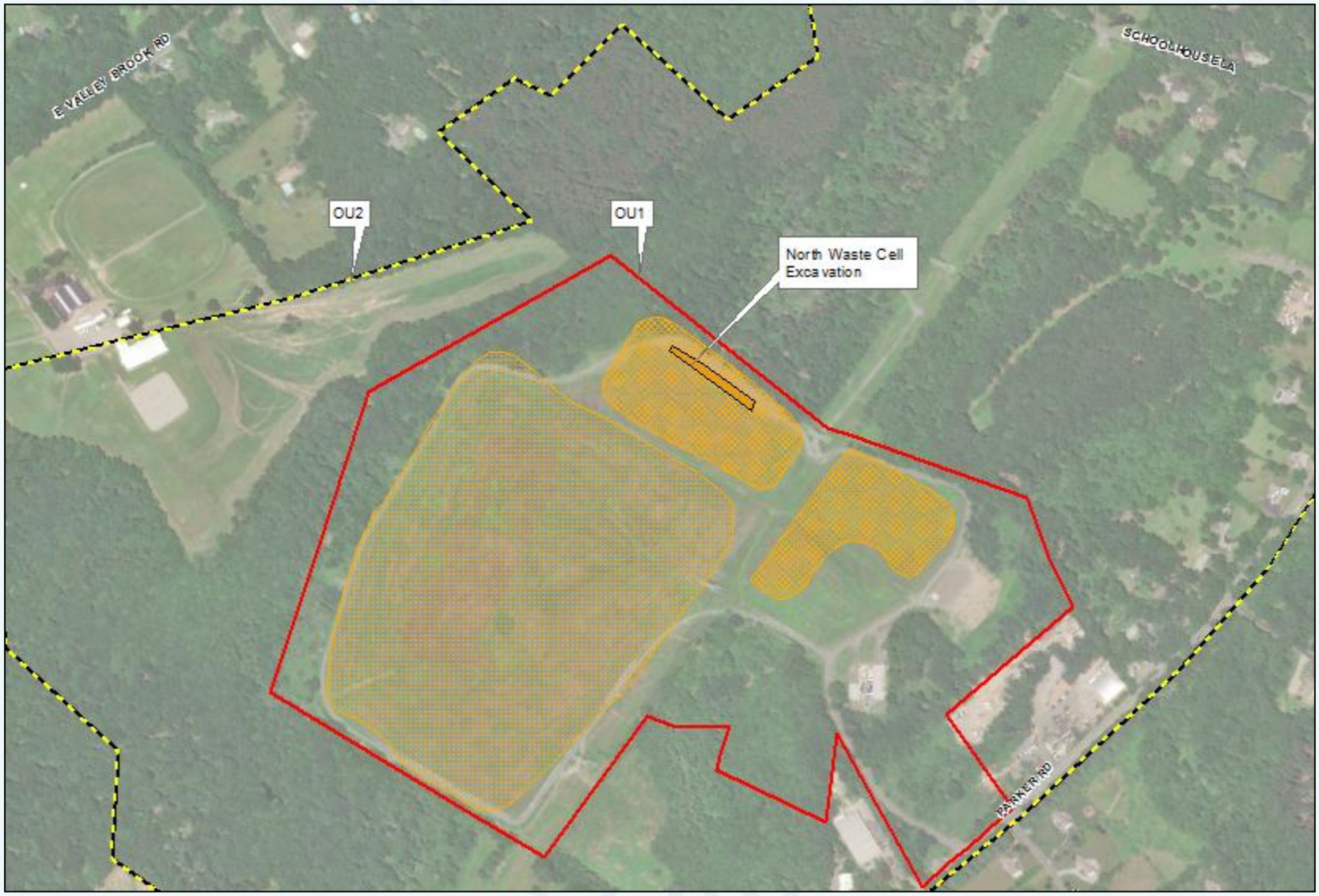
OU1 Original ROD - 1986

- Surface water controls to accommodate seasonal precipitation and storm runoff;
- Security fencing to restrict Site access;
- Appropriate environmental monitoring to ensure the effectiveness of the remedial action; and
- A supplemental feasibility study to evaluate the need for remediation of the deep aquifer.

North Waste Cell

- Previously unknown area found just outside of the capped landfill in 2001
- Contains mostly pharmaceutical waste
- Significant contributor to groundwater contamination, mostly 1,4-Dioxane
- Excavated waste and disposed off-site in 2006
- Portion still remaining on-site underneath the landfill cap

North Waste Cell and Fill Areas



Enforcement

Enforcement –

- 2005 - initial settlement resulted with former owner/operators paid NJDEP and EPA $12,500,000 in costs
- 2009 - second settlement against 300 private parties and municipalities paid EPA $69 million in past costs, paid $3.2 M in natural resource damages, NJDEP $27 million annuity to fund O&M and future work

Waterline Project

- Purpose – to protect residences threatened by contaminated groundwater from the landfill
  - Waterline project connected 73 homes/businesses
  - Connected along Parker Rd, Schoolhouse Lane, and a small portion of Route 513
  - Completed in July 2015
  - Cost approx. $9M

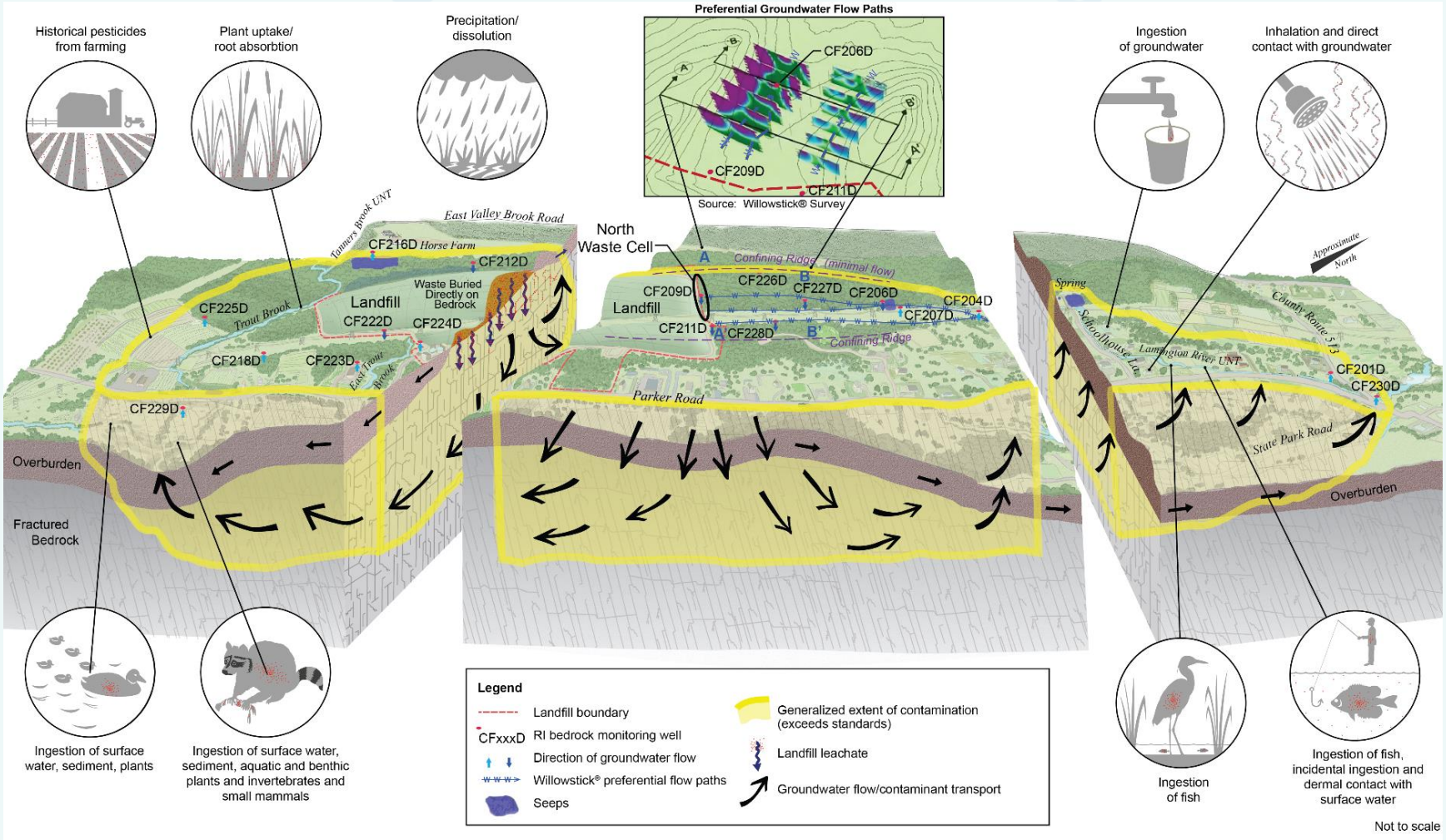
OU2 Studies Post-ROD

- Groundwater in the bedrock aquifer in the surrounding area
- Surface water in tributaries of the Black (Lamington) River, Trout Brook and Tanners Brook
- Sediment in the same tributaries
- Background surface water and sediment

Findings of Post-ROD Studies

- Eight groundwater contaminants originate at the landfill: 1,4-dioxane, benzene, trichloroethene, DEHP, alpha-BHC, arsenic, lead and chromium;
- Groundwater contaminants are found in both the overburden and bedrock aquifers;
- Bedrock groundwater flows away from the landfill mostly to the northeast and southwest;
- Bedrock groundwater moves through three significant fracture zones from the landfill to Schoolhouse Lane;
- Some groundwater empties into the tributaries of the Black (Lamington) River, Trout Brook and Tanners Brook;
- Several groundwater contaminants are also found in surface water;
- Sediment contaminants are *not* landfill related; and
- Contaminated soil vapor has *not* impacted buildings in the area.

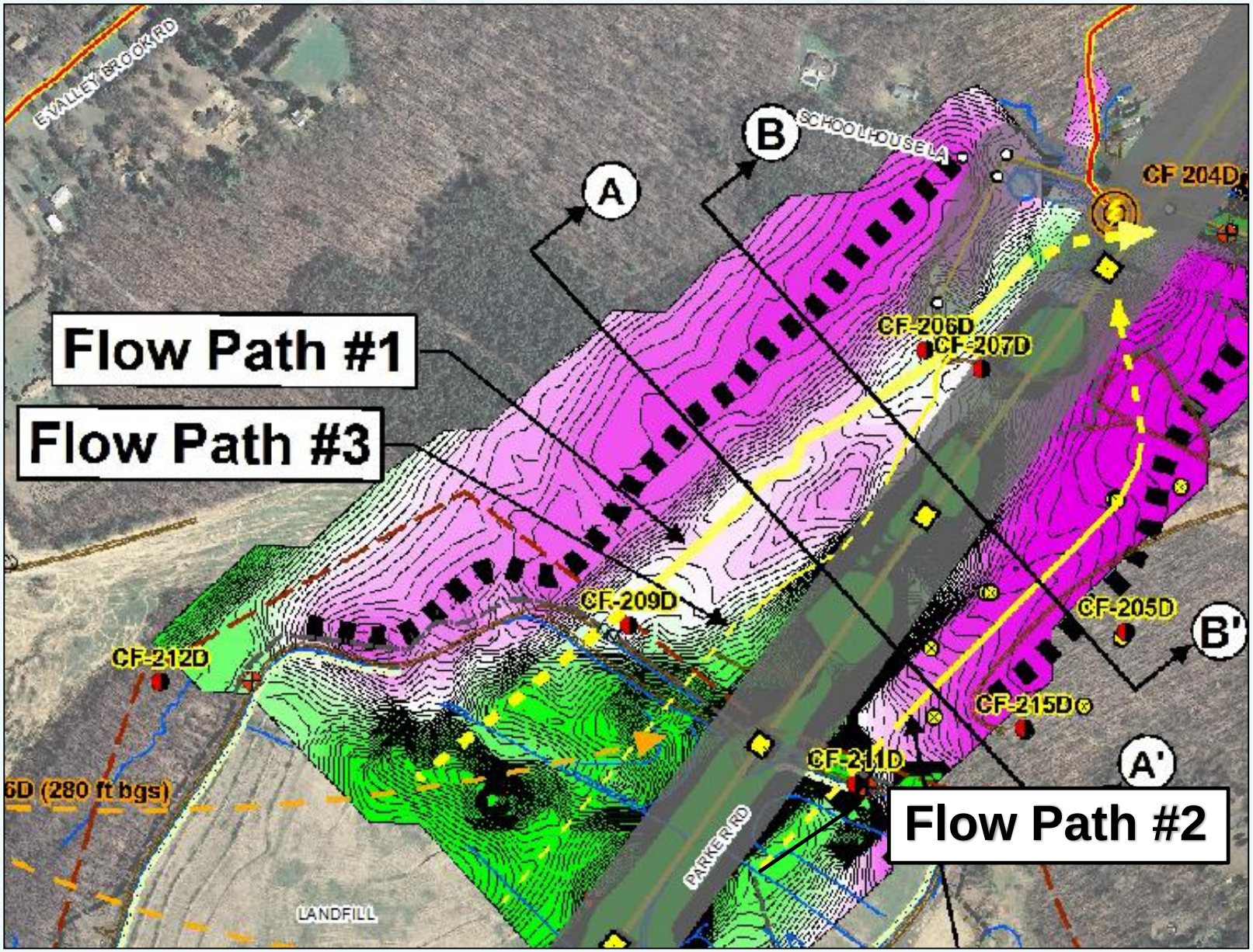
Conceptual Site Model (CSM)



1,4-Dioxane in Groundwater

- White contour lines: groundwater concentrations.

Willowstick Preferential Pathways



Human Health Risk Assessment (HHRA) Process

- Step 1 • Hazard Identification
- Step 2 • Exposure Assessment
- Step 3 • Toxicity Assessment
- Step 4 • Risk Characterization

Drinking water use pathway

Source: Thinkstock Photos

HHRA Conclusions

- Evaluated potential adverse effects of contaminants in groundwater to residents and in surface water to recreational users.
- Resident: Exceeded EPA's target risk range of $1x10^{-4}$ to $1x10^{-6}$ and noncancer hazard index (HI) of 1.
  - Excess lifetime cancer risk (ELCR) of $7x10^{-3}$
  - Noncancer HI of 13 for an adult and 15 for a child
  - Lead model predicted 68% of population of children age 1-6 years old would expected to have a blood lead concentration above 5 ug/dL.
- Recreational User: Cancer risks are within the target risk range and HI is less than 1.
- Conclusion – remediation is necessary to protect public health or welfare or the environment from actual or threatened releases of pollutants or contaminants from this Site.

COCs

Residents
• Arsenic • Benzene • Chromium • DEHP • 1,4-Dioxane • Lead • TCE

Screening Level Ecological Risk Assessment (SLERA) Process

- Step 1
  - Problem Formulation
- Step 2
  - Exposure Assessment
- Step 3
  - Ecological Effects (Toxicity) Assessment
- Step 4
  - Risk Characterization

Great Blue Heron

SLERA Conclusions

- Evaluated potential hazards to aquatic biota, benthic invertebrates, amphibians and plants, and bioaccumulation up the food chain in wildlife from exposure to contaminants in surface water, seeps/springs and sediment.

- Exceeded surface water and sediment ecological benchmarks.

- Wildlife Food Chain Modeling – All contaminants have HQs less than 1, except for vanadium (HQ of 1.7), not site-related, for one species.

Remedial Action Objectives for OU1 ROD amendment

- Limit migration of contaminated groundwater and leachate from OU1 to OU2
- Enhance the treatment plant to reduce concentrations of 1,4-dioxane being discharged to surface water
- Reduce the toxicity, mobility and volume of contamination in the North Waste Cell to reduce impact on groundwater
- Prevent exposure to contaminated groundwater

Remedial Action Objective for OU2 Interim remedy

- Prevent current and future exposure to human receptors
  - (via ingestion, dermal contact and inhalation) to site-related contaminants in groundwater and surface water at concentrations in excess of federal and state standards.

Nine Criteria for Alternative Evaluation

Type	Criteria
Threshold Criteria	1. Overall Protection of Human Health and the Environment 2. Compliance with State and Federal Regulations
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. Support Agency Acceptance 9. Community Acceptance

Remedial Alternatives OU1

OU1-G1 - No Action

OU1-G2 - Upgrade OU1 groundwater extraction treatment (GWET) System, Source area removal with LTM/ICs

OU1-G3 - Upgrade OU1 GWET System, Additional groundwater extraction,

Source area removal with LTM/ICs

Preferred Remedy for OU1

- Alternative OU1-G3: Addition of new bedrock extraction wells, upgrade OU1 GWET system, source area removal, and LTM/ICs

  - Capital Cost - $10,457,289
  - Annual O&M Cost - $920,360
  - Present Worth Cost - $21,933,592
  - Time Frame >30 years

Remedial Alternatives OU2

OU2-G1 - No Action

OU2-G2 - LTM/ICs

OU2-G3 – Installation of extraction wells and groundwater treatment of OU2 groundwater with LTM/ICs

Preferred Remedy for OU2

- Alternative OU2-G2: Long-term monitoring/institutional controls
  - Capital Cost - $0
  - Annual O&M Cost - $111,200
  - Present Worth Cost - $ 781,100
  - Time Frame - 10 years

Basis for Preferred Remedies

OU1-G3 ROD Amendment

- Groundwater extraction rate improves from 45 to 70 gpm to 200 gpm
  - Using larger conveyance lines
    - Allowing for continuous pumping
  - Deeper wells would improve containment and hydraulic control of the OU1 contaminated groundwater
- North Waste Cell source material removal
  - Principal threat waste removal would assist in groundwater remediation

OU2 – G2 Interim Remedy

- Aggressive pumping from OU1 remedy would affect OU1/OU2 border
  - Expected to impact OU2 groundwater
- Final OU2 remedy would be based on groundwater and surface water data from OU1 remedy

30-Day Public Comment Period
August 12 – September 11, 2018

Administrative Record available at:

Chester Library
250 West Main Street
Chester, New Jersey 07930
(908) 879 - 7612
M – Th - 9:00 am - 9:00 pm
Fri - 9:00 am - 5:00 pm
Sat 9:00 am -1:00 pm

or

EPA Records Center, Region 2
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-4308
www.epa.gov/superfund/combe-fill-south
Mondays – Fridays - 9:00 am - 5:00 pm

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Questions?