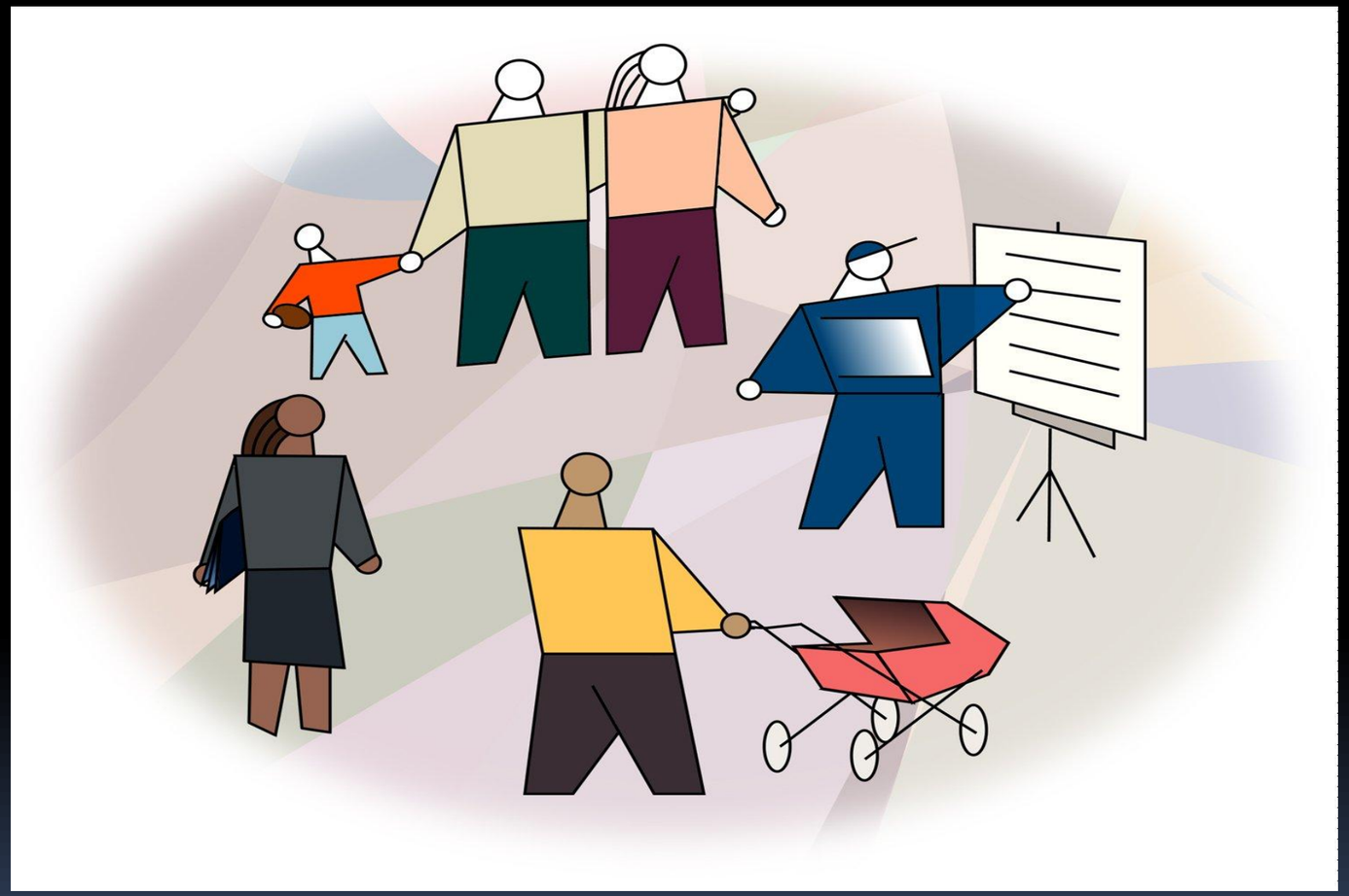
Peterson/Puritan, Inc. Superfund Site
Operable Unit 2 -- J. M. Mills Landfill and Adjacent Parcels

Cumberland and Lincoln, RI

Overview of the Remedial Investigation

Public Meeting, Cumberland Public Library/Hayden Center
December 2012

Welcome



EPA Presenters:

- *David Newton, Remedial Project Manager*
- *Chau Vu, Human Health Risk Assessor*
- *Bart Hoskins, Ecological Risk Assessor*
- *Sarah White, Community Involvement Coordinator*

State of Rhode Island
Department of Environmental Management

EPA Partners with the State
RIDEM Office of Waste Management

235 Promenade Street
Providence, RI 02908-5767

Paul Kulpa
State Project Manager
(401) 222-4700 x-7111

Under an Administrative Order by Consent, Site Work for Operable Unit 2 is predominantly conducted by Potentially Responsible Parties (PRPs)

EPA and RIDEM oversee the work submitted by the performing parties.

Performing Parties for the Remedial Investigation/Feasibility Study (RI/FS) Include:

- Waste Management
- CCL Custom Manufacturing, Inc.
- CONOPCO Inc.
- Teknor Apex

- Environmental Consultants:
  - Groundwater Consultants Inc.
  - ARCADIS/BBL

BRWC/FOB manages the Technical Assistance Grant (TAG)

Agenda

- Welcome and Introductions
- Site History
- Summary of Remedial Investigation (RI) Field Work
- Summary of RI Findings
    - Nature and Extent of Contamination
    - Baseline Human Health Risk Assessment (BHHRA)
    - Baseline Ecological Risk Assessment (BERA)
- Where Are We Now/Next Steps (Schedule)?
- Where to Go for More Information?
- Questions and Answers

Site History

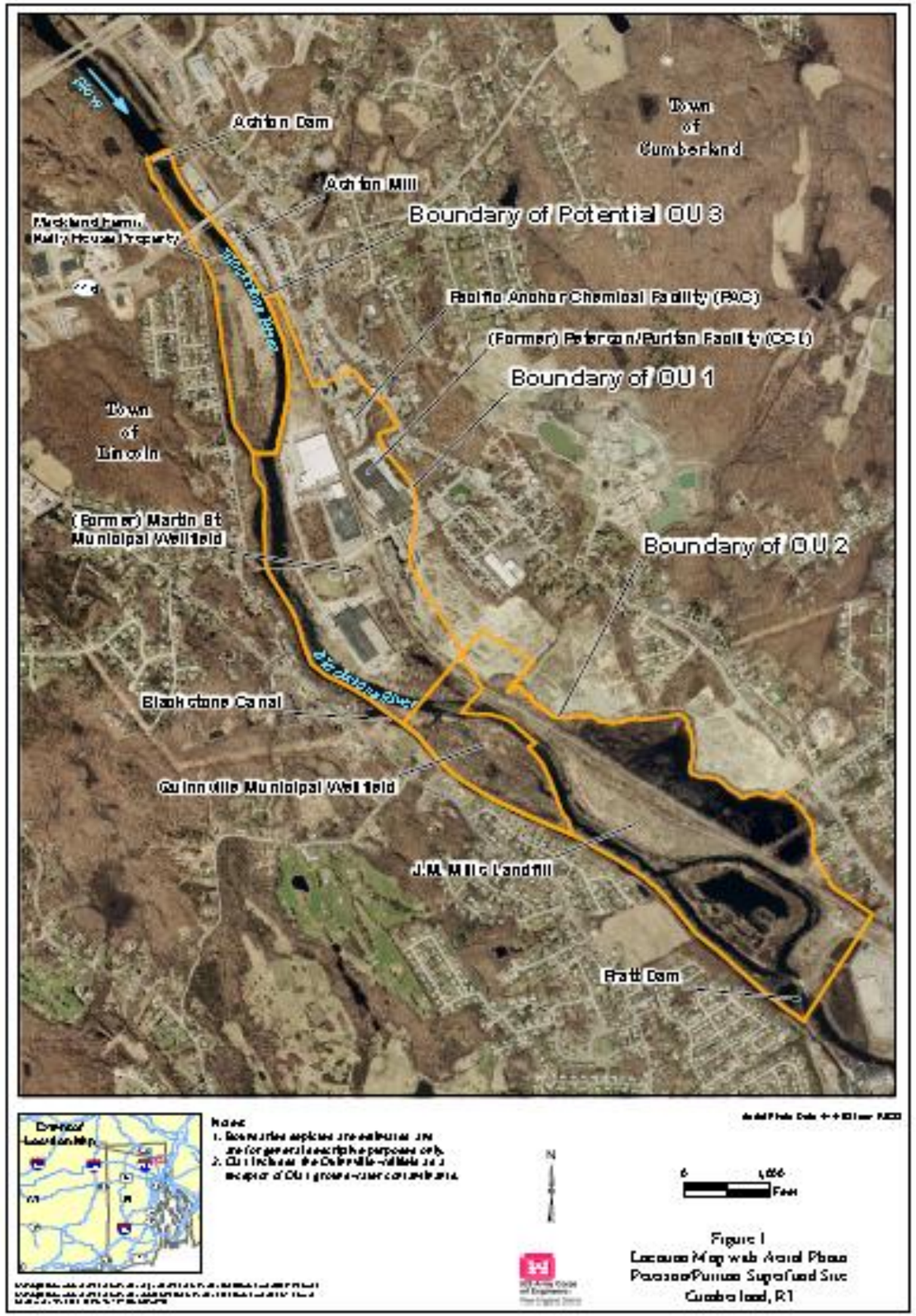
Discovery: 1979

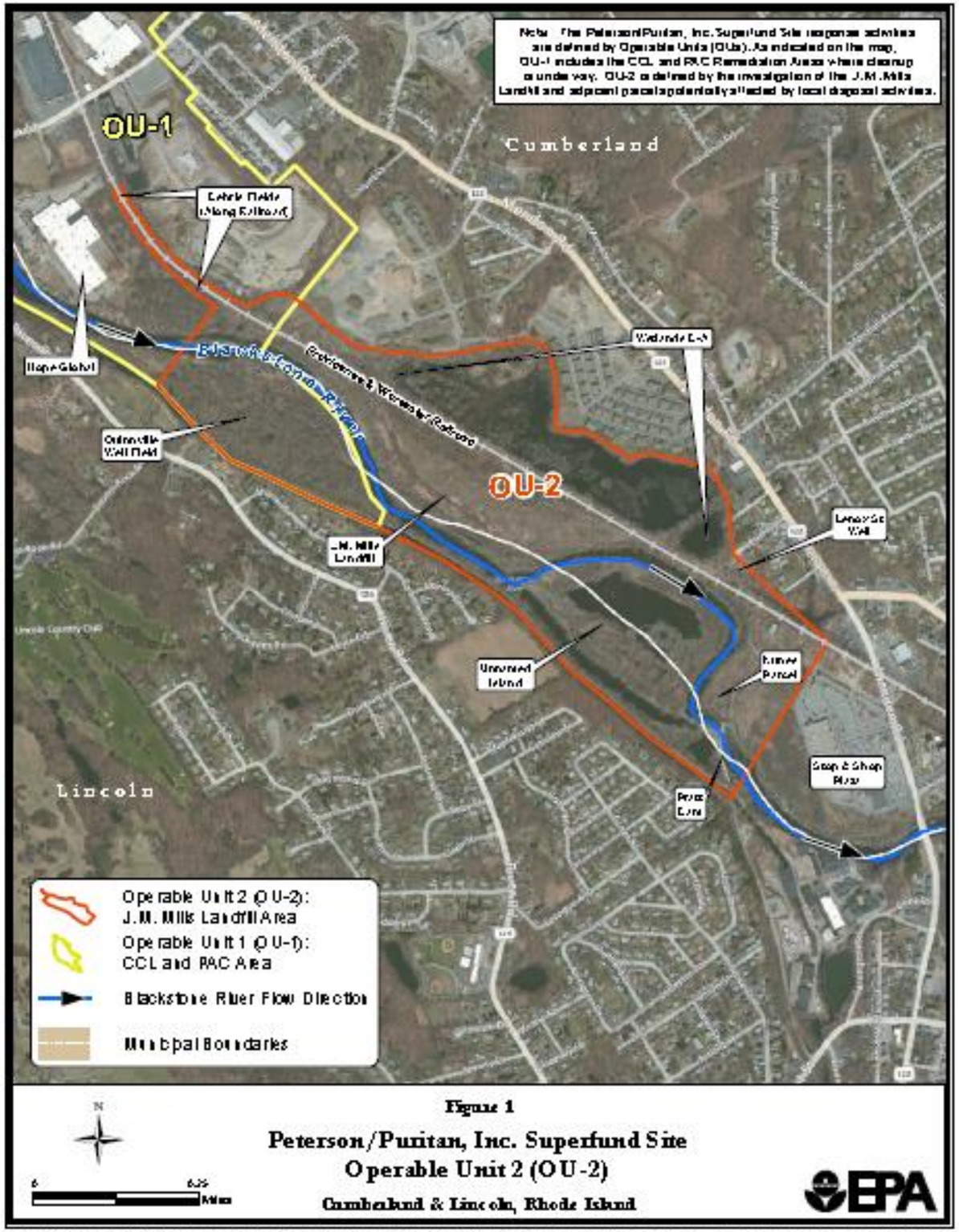
NPL Listing due to Groundwater Impacts

Proposed Date: 12/30/1982

Final Date: 09/08/1983

The Site extends over two miles of mixed industrial/residential property in Cumberland and Lincoln, RI. It is situated in and along the Blackstone River and includes a portion of the Blackstone River Valley National Heritage Corridor between the Ashton Dam to the north, and the Pratt Dam to the south. Multiple source areas identified. Quinnville well field is a receptor to OU1 and OU2. Lenox St. Well included in OU2.





Peterson/Puritan, Inc. Superfund Site

Operable Unit 2

REMOVAL ACTIONS

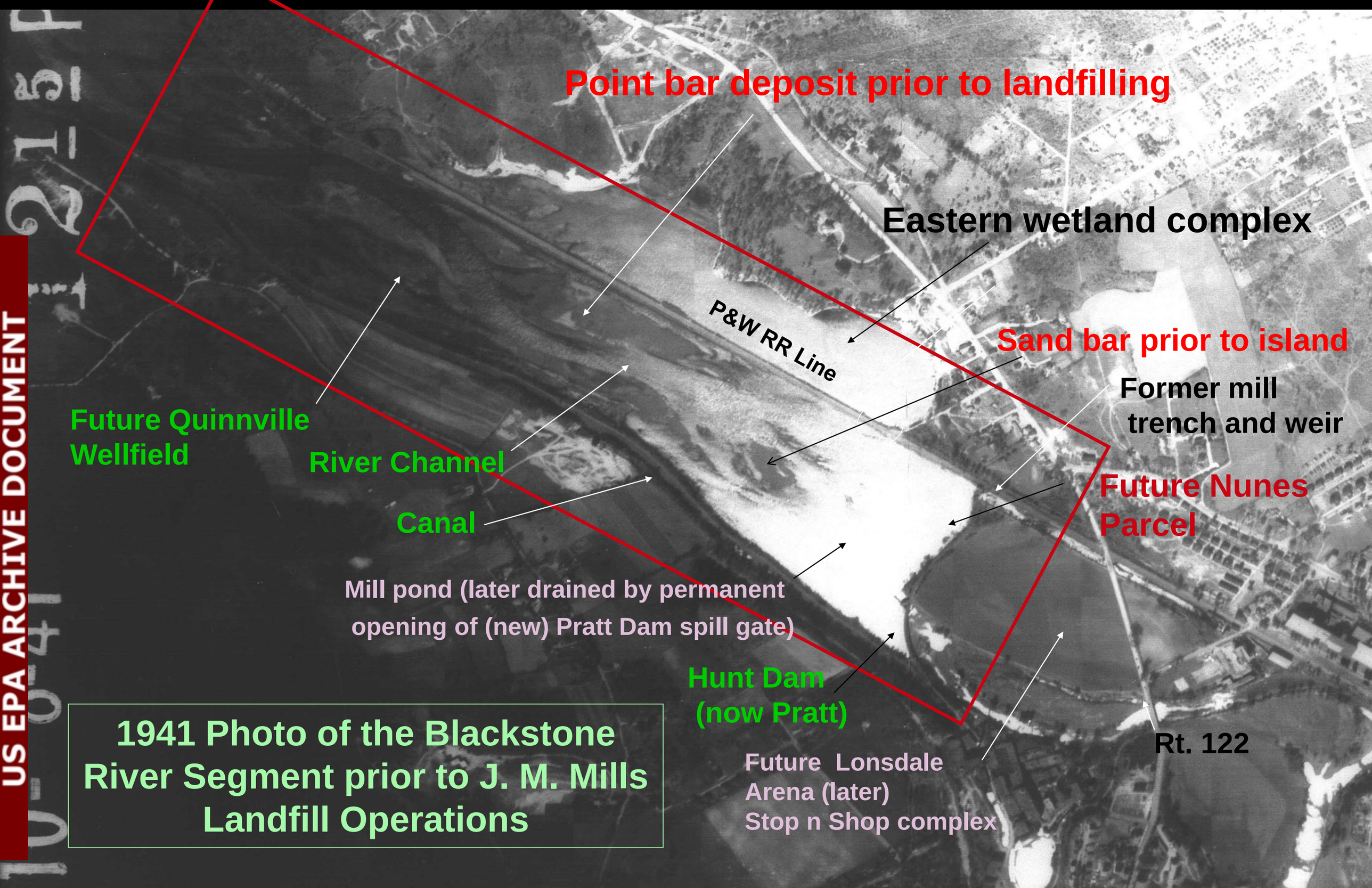
✓ ***1992***- Removal Action conducted in response to construct a fence to limit access and removal of drums at base of the J.M. Mills Landfill

✓ ***1997***- Removal Action conducted adjacent to the J.M. Mills Landfill to address recently disposed asbestos-containing wastes found outside of the fenced-in area. Security fence was extended to limit further dumping.

REMEDIAL AND ENFORCEMENT WORK

✓***2001***- Administrative Order signed by performing parties to conduct Remedial Investigation and Feasibility Study for OU-2

✓***1993 & Current-*** Search for parties potentially responsible for contamination at OU-2 (Notice PRPs) Currently over 110 PRPs have been notified for OU-2



1941 Photo of the Blackstone River Segment prior to J. M. Mills Landfill Operations

Sand and gravel excavations expand

CUMBERLAND

J.M. Mills Landfill (future site)

Quinnville Wellfield (before well development)

Lenox St. Well (future)

Nunes Parcel (future site)

Unnamed Island (welded to tow path)

LINCOLN

Access to river via dirt roads/paths

Lonsdale Arena

1956

First Quinnville
well site

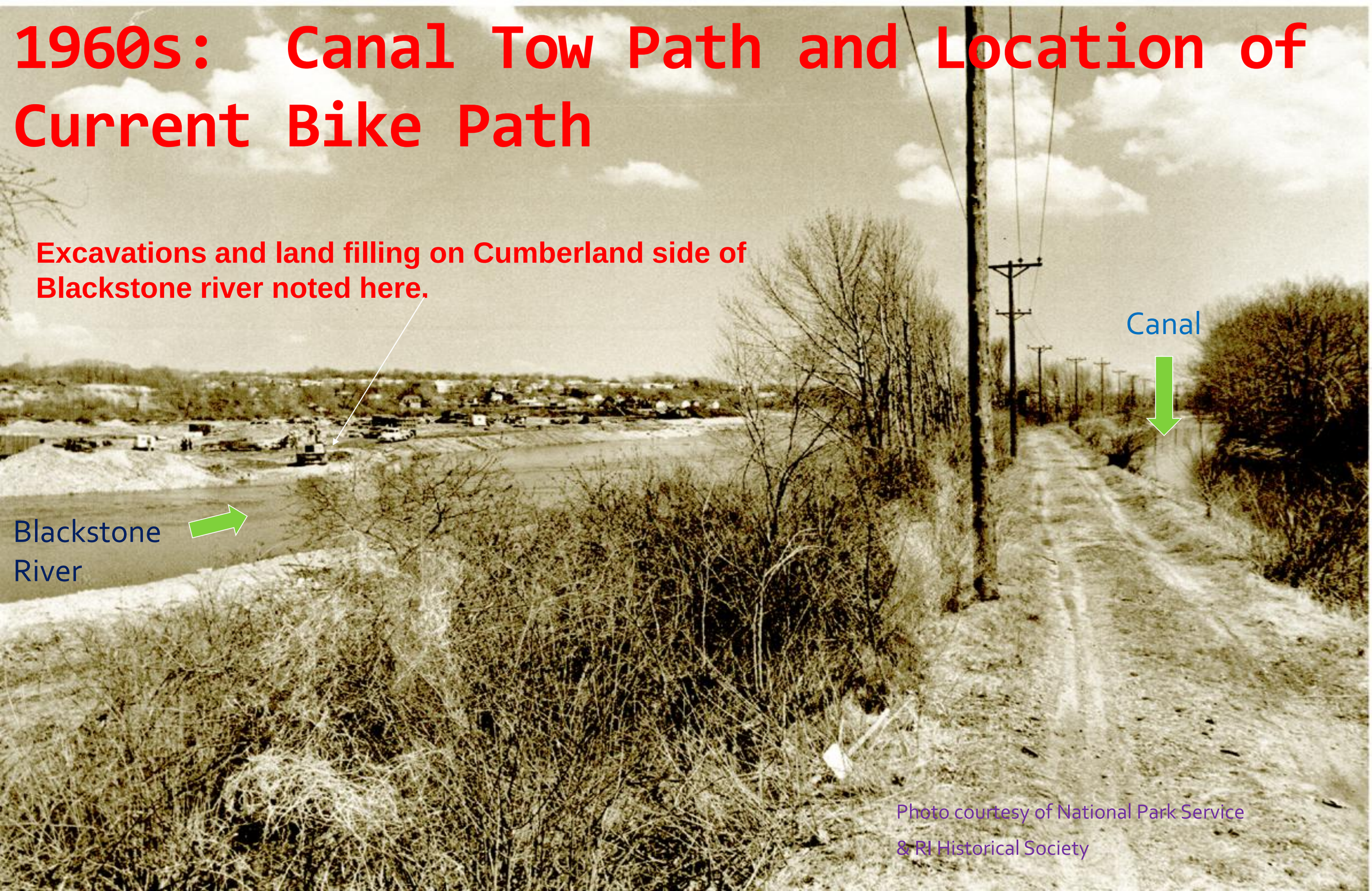
Location of J. M. Mills Landfill

Nunes Parcel
river bank expands

Unnamed Island

1963

1960s: Canal Tow Path and Location of Current Bike Path



1960's: Nunes Parcel, Unnamed Island, and J.M. Mills Landfill

Quinnville Wellfield (2 wells)

J.M. Mills Landfill
Operations increasing

Lenox Street Well

Entrance
To Landfill
(& Nunes
Parcel)

Unnamed Island
Landfilling, earth dams,
berms, and other operations;
access from Pratt Dam

1970

1976

Peterson/Puritan

1974 P&W RR Accident
Spills TCE & PCE

Landfill operations well underway

Quinnville Wells (3)

Liquids disposal pit located

Sand and gravel mining and filling well established; a back channel well established
(with earth dams and access roads)

Lenox Street Well

Landfilling at Nunes Parcel

PETERSON-PURITAN LANDFILL
CUMBERLAND, RHODE ISLAND
PIC 20101144S
CERCLIS ID NO. RID055176283
DATE FLOWN: MAY 5, 1976
SOURCE: SCS FRAME NO. 176
ORIGINAL FILM SCALE 1:38,000
MISSION ID: 44007-176
APPROX. PHOTO SCALE 1 inch = 555 feet

-N-

The eastern wetlands

Lenox St. Well

J. M. Mills Landfill

P&W RR line and access road from transfer station to landfill

Excavator

Tow path and canal

Access road over Pratt Dam to Nunes Parcel

sta

1987- Oblique Photo Showing Sand and Gravel Operations on Unnamed Island

Site Conditions During Negotiations Initiating OU2 Remedial Investigation and Feasibility Study

1987 Administrative Order re-signed 2001

- Field work began 2003
- Draft RI Report submitted late 2007
- EPA takes control of Risk Assessments
- Risk Assessments completed 2009
- RI Report finalized Fall 2012
- Feasibility Study underway w/ Spring 2013 completion date anticipated

Quinnville Wellfield

J.M. Mills Landfill

Unnamed Island

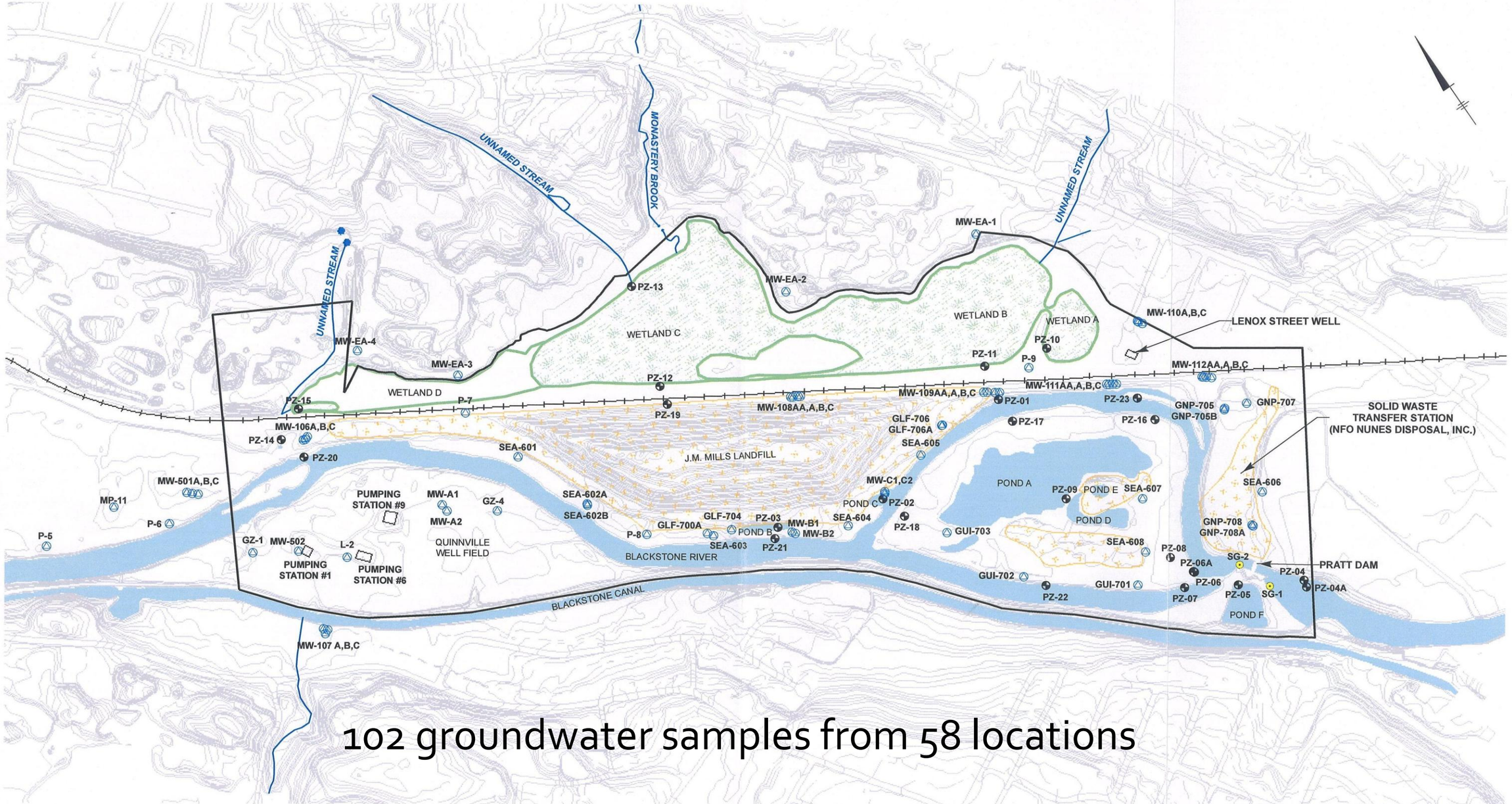
Lenox St. Well

Nunes Parcel

2000

Summary of RI Field Work

- Field sampling investigations from August 2003 to November 2009
- 208 soil samples from 59 borings
- 102 groundwater samples from 58 locations
- 74 surface water samples
- 104 sediment samples (including 23 for toxicity testing)
- 6 leachate samples next to waste on J.M. Mills Landfill and Unnamed Island
- 3 air monitoring points on the J.M. Mills Landfill
- 312 fish tissue samples (from over 100 different fish)



102 groundwater samples from 58 locations

NOTES:

1. NFO - NOW OR FORMERLY OWNED BY
2. SOME OF THE MONITORING WELLS SHOWN WERE NOT SAMPLED DURING THE RI. SEE RI TEXT FOR A DESCRIPTION OF WHICH WERE SAMPLED AS PART OF THE 4 SAMPLING EVENTS DURING THE RI.

LEGEND:

- MONITORING WELL
- PIEZOMETER/STAFF GAUGE
- STAFF GAUGE
- OU2 BOUNDARY
- BURIED WASTE
- WETLAND (INTERMITTENTLY WET)
- SURFACE WATER

0 500 1,000 Feet
GRAPHIC SCALE

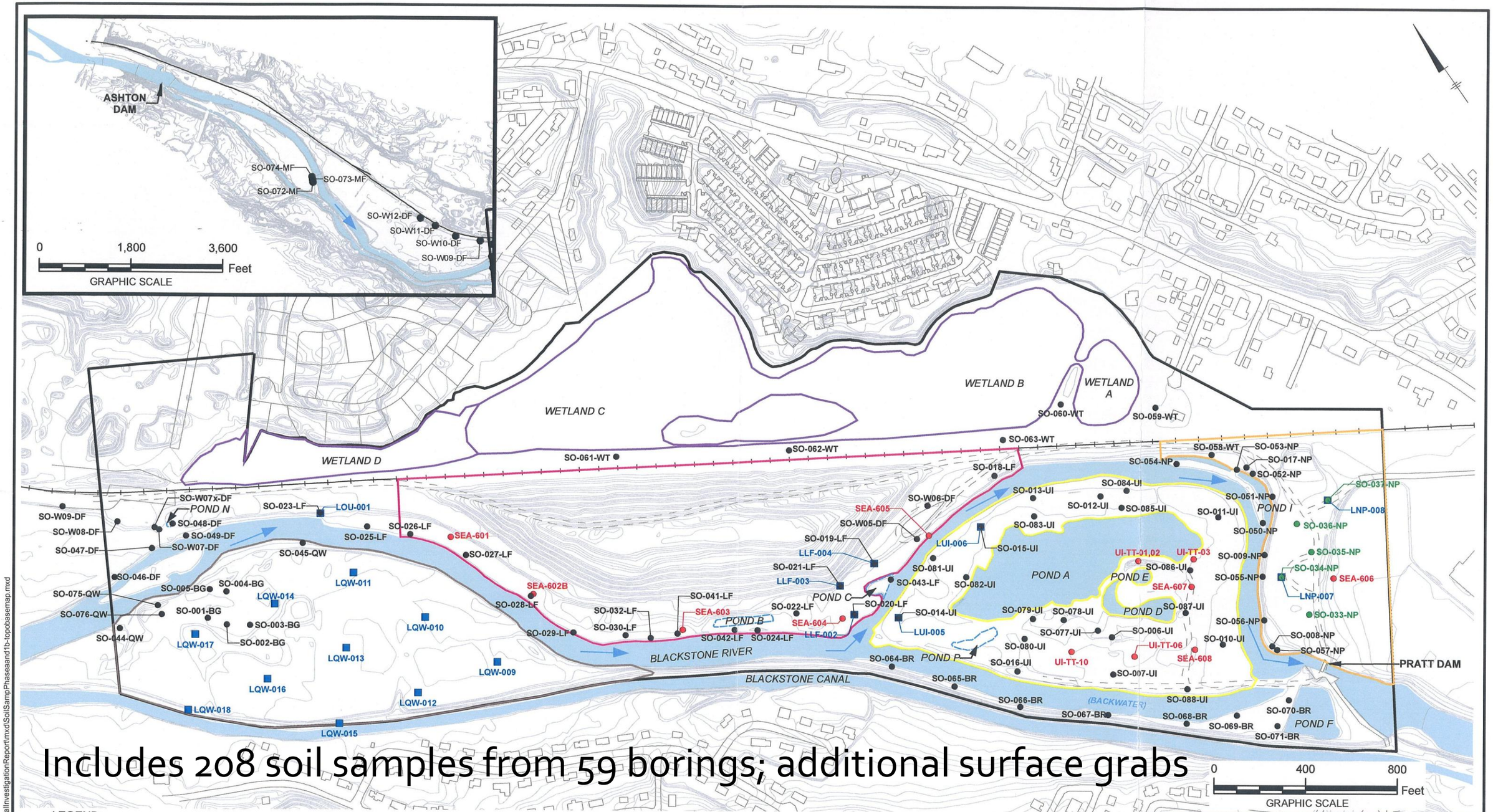
PETERSON PURITAN SUPERFUND SITE - OU2
CUMBERLAND AND LINCOLN, RHODE ISLAND
REMEDIAL INVESTIGATION REPORT

MONITORING WELLS, PIEZOMETER AND STAFF GAUGES

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
2-1

6/15/07 SYR-85 E
Peterson/Puritan (37902.012)
Q:\Peterson_Puritan\Cumberland_RI\RemedialInvestigationReport\mxd\Wells.mxd



Includes 208 soil samples from 59 borings; additional surface grabs

LEGEND:

- SO-029-LF ● PHASE 1A SURFACE SOIL SAMPLE LOCATION
- SEA-602B ● PHASE 1A SUBSURFACE SOIL SAMPLE LOCATION
- SO-033-NP ● PHASE 1A SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
- LQW-009 ■ PHASE 1B SOIL SAMPLE LOCATION
- OU2 BOUNDARY
- RAILROAD
- HISTORICAL ACCESS ROAD
- DIRECTION OF SURFACE WATER FLOW
- WATER
- HISTORICAL POND
- J.M. MILLS LANDFILL
- UNNAMED ISLAND
- QUINNVILLE WELL FIELD
- WETLAND
- SOLID WASTE TRANSFER STATION (NFO NUNES DISPOSAL, INC.)

NOTES:

1. SAMPLE LOCATIONS AND BASEMAPPING ARE IN THE COORDINATE SYSTEM: STATE PLANE RHODE ISLAND NAD 83 FEET. LOCATIONS RECORDED IN THE FIELD USING GPS.
2. LOCATIONS WITH MULTIPLE LABELS (E.G., SO-023-LF AND LOU-001) REPRESENT STATIONS WHERE SAMPLING RETURNED TO THE SAME LOCATION IN 2005 DURING THE PHASE IB INVESTIGATION AND COLLECTED AN ADDITIONAL SURFACE SOIL SAMPLE TO BE ANALYZED FOR DIOXIN/FURANS.
3. SUBSURFACE SOIL LOCATIONS CAN HAVE MULTIPLE DEPTH INTERVALS COLLECTED. SAMPLE IDs FOR SOIL SAMPLES COLLECTED AT DEPTH DIFFER FROM THEIR SAMPLE STATIOI
4. NFO - NOW OR FORMERLY OWNED BY

PETERSON PURITAN SUPERFUND SITE - OU2
CUMBERLAND AND LINCOLN, RHODE ISLAND
REMEDIAL INVESTIGATION REPORT

SOIL SAMPLE LOCATIONS

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
2-2

6/14/06 SYR-8
Peterson Puritan
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TP-09
TP-08
TP-10
TP-20
TP-04
TP-07
TP-05
TP-19
TP-03
TP-06
SO-104-NP
TP-13
TP-01
TP-02
TP-11
TP-12
TP-14
SO-105-NP
TP-23
TP-22
TP-15
TP-18
TP-21
TP-17
TP-16

Estimated Waste Area

RIDOT Soil Removal (for flood compensation)

LEGEND:

- TEST PIT LOCATION - SAMPLE(S) COLLECTED
- TEST PIT LOCATION - NO SAMPLES COLLECTED
- SOIL BORING LOCATION - HAND AUGERED (UNABLE TO EXCAVATE TEST PIT)
- PHASE 1A PROJECTED BOUNDARY OF BURIED SOLID WASTE
- REVISED PHASE 1B PROJECTED BOUNDARY OF BURIED SOLID WASTE
- AREA OF EXCAVATION PERFORMED BY RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (RIDEM)

NOTE:

1. 2002 AERIAL PHOTO OBTAINED FROM RHODE ISLAND GEOGRAPHIC INFORMATION SYSTEM: http://www.edc.uri.edu/rigis/

0 150 300 Feet

GRAPHIC SCALE

PETERSON PURITAN SUPERFUND SITE - OU2
CUMBERLAND AND LINCOLN, RHODE ISLAND

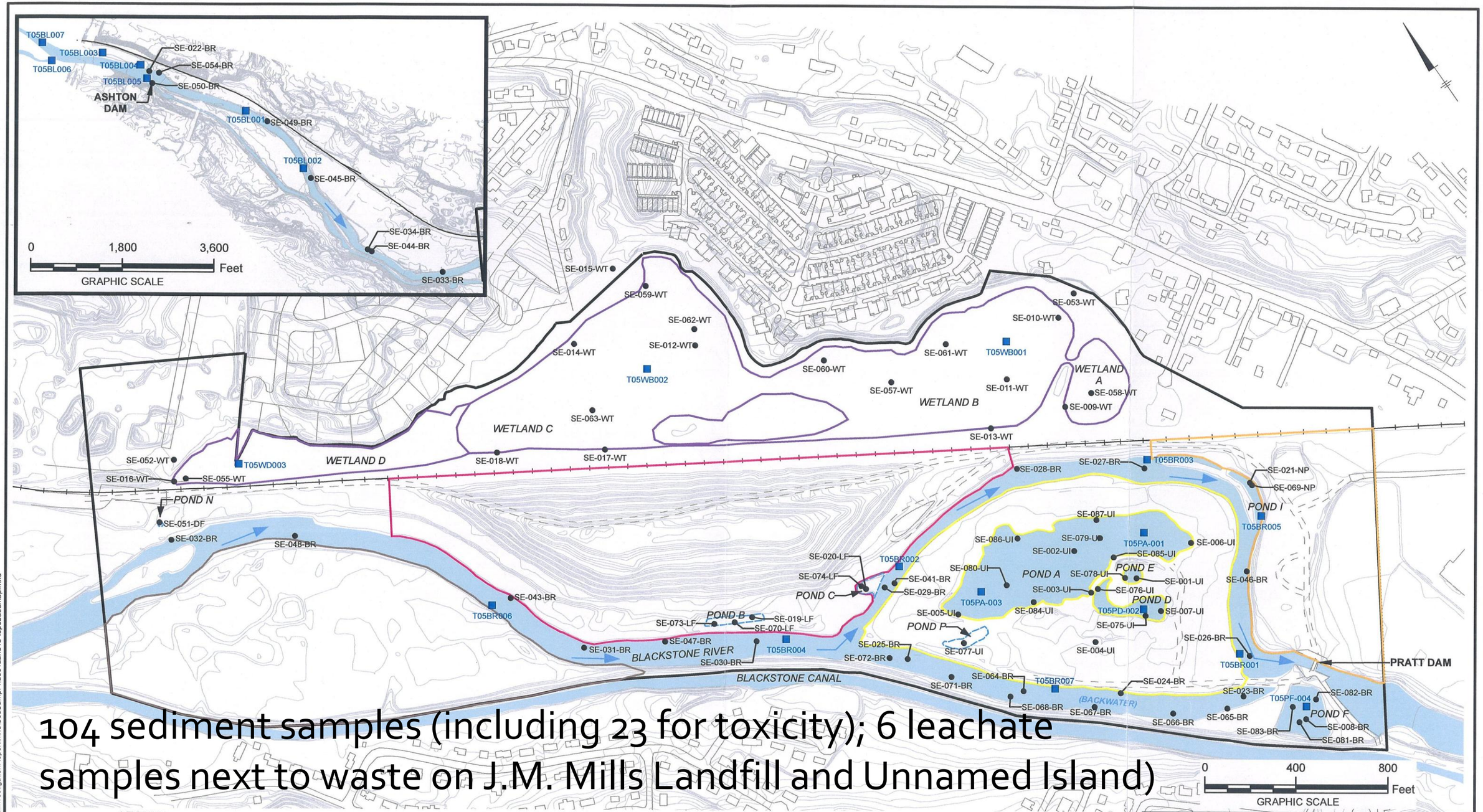
REMEDIAL INVESTIGATION REPORT

NUNES PARCEL SOIL SAMPLING - NOVEMBER 2006

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
2-3

6/14/07 ROCH-85 EAB
PETERSON PURITAN [ROCH-85 EAB]
E:\Peterson_Puritan\Cumberland_RI\RemedialInvestigationReport\mxd\LIMITSOFEXCAVATION.MXD



104 sediment samples (including 23 for toxicity); 6 leachate samples next to waste on J.M. Mills Landfill and Unnamed Island)

LEGEND:

- SE-001-UI ● PHASE 1A SEDIMENT SAMPLE LOCATION
- T05BR004 ■ PHASE 1B SEDIMENT SAMPLE LOCATION
- OU2 BOUNDARY
- RAILROAD
- HISTORICAL ACCESS ROAD
- DIRECTION OF SURFACE WATER FLOW
- WATER
- HISTORICAL POND
- J.M. MILLS LANDFILL
- UNNAMED ISLAND
- QUINNVILLE WELL FIELD
- WETLAND
- SOLID WASTE TRANSFER STATION (NFO NUNES DISPOSAL, INC.)

NOTES:

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2. NFO - NOW OR FORMERLY OWNED BY

PETERSON PURITAN SUPERFUND SITE - OU2
CUMBERLAND AND LINCOLN, RHODE ISLAND
REMEDIAL INVESTIGATION REPORT

SEDIMENT SAMPLE LOCATIONS

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
2-4

6/14/07 SYR-85 E
Peterson Puritan
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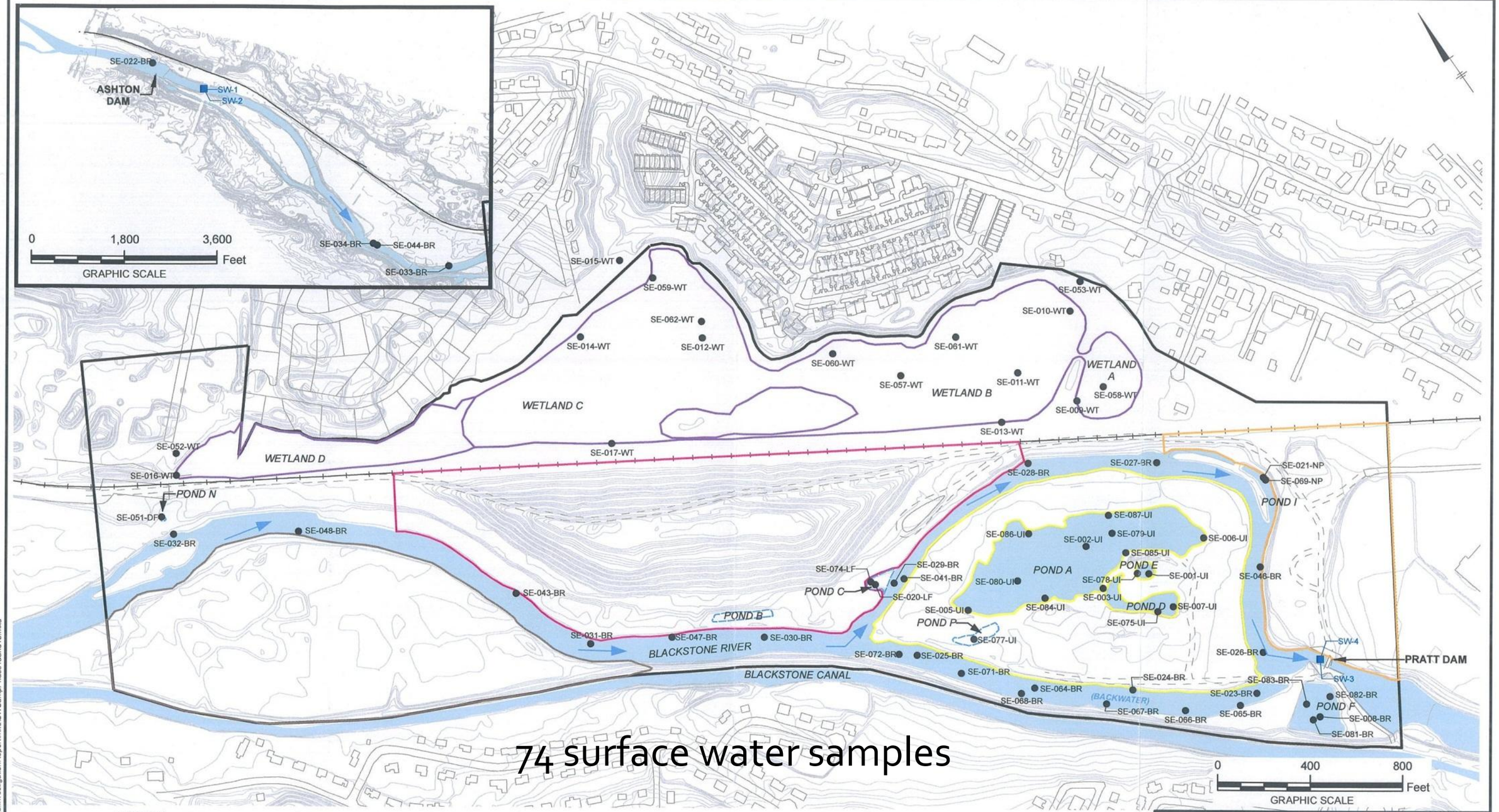

74 surface water samples

LEGEND:

- SE-032-BR ● PHASE 1A SURFACE-WATER SAMPLE LOCATION
- SW-4 ■ PHASE 1B SURFACE-WATER SAMPLE LOCATION
- OU2 BOUNDARY
- RAILROAD
- HISTORICAL ACCESS ROAD
- DIRECTION OF SURFACE WATER FLOW
- WATER
- HISTORICAL POND
- J.M. MILLS LANDFILL
- UNNAMED ISLAND
- QUINNVILLE WELL FIELD
- WETLAND
- SOLID WASTE TRANSFER STATION (NFO NUNES DISPOSAL, INC.)

NOTES:

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PETERSON PURITAN SUPERFUND SITE - OU2
CUMBERLAND AND LINCOLN, RHODE ISLAND
REMEDIAL INVESTIGATION REPORT

SURFACE-WATER SAMPLE LOCATIONS

ARCADIS BBL
infrastructure, environment, facilities

FIGURE 2-6

6/14/07 SYR-8
Peterson Puritan
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312 fish tissue samples (from over 100 different fish from river and ponds)

P-6

ALBION DAM

BR-1

ASHTON DAM

BR-2

BR-3

POND A (P-1)

BR-3

BACKWATER

PRATT DAM

POND F (P-2)

NOTES:

1. 1997 AERIAL PHOTOGRAPH OBTAINED FROM THE UNIVERSITY OF RHODE ISLAND'S DIGITAL IMAGERY SERVER (HTTP://ORTHO.EDC.URI.EDU/). 2002 AERIAL PHOTO OBTAINED FROM RHODE ISLAND GEOGRAPHIC INFORMATION SYSTEM: HTTP://WWW.EDC.URI.EDU/RIGIS/

2. SAMPLE LOCATIONS NAMED USING THE FOLLOWING DESIGNATION:
   <WATER BODY>-<SAMPLE NUMBER>
   EX. BR-1 FISH SAMPLE LOCATION ONE (1) COLLECTION FROM THE BLACKSTONE RIVER (BR)

3. SAMPLE LOCATIONS RECORDED IN THE FIELD USING GPS.

LEGEND:

- FISH COMMUNITY SURVEY AND FISH TISSUE SAMPLE LOCATIONS
- OU2 BOUNDARY
- DIRECTION OF SURFACE WATER FLOW

0 1,500 3,000 Feet

GRAPHIC SCALE

PETERSON PURITAN SUPERFUND SITE - OU2
CUMBERLAND AND LINCOLN, RHODE ISLAND
REMEDIAL INVESTIGATION REPORT

FISH COMMUNITY SURVEY AND FISH TISSUE SAMPLE LOCATIONS

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
2-7

6/14/07 SYR-8
Peterson/Puritan
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Summary of RI Findings

3 Large Disposal Areas Identified

- J. M. Mills Landfill
- Nunes Parcel
- Unnamed Island

Mixed waste deposits found:

- Solid waste
- Hazardous substances
- Bulky wastes (tanks, trucks, trailers, tires, construction/demolition debris)

Debris Fields Observed along RR Tracks and River's Edge are extensions of past Landfill Operations

Sand and Gravel pits on the Unnamed Island were filled with wastes

Nature & Extent of Contamination

- J.M. Mills Landfill:
  - contains hazardous waste materials
  - not extensively sampled following EPA's P*resumptive Remedy Guidance for LFs*
  - soil surrounding landfill showed elevated metals (likely contributed by landfill operations and re-suspension and deposition during river flooding)
  - debris piles
- Nunes Parcel/RIDEM soil removal area:
  - waste disposal area
  - variety of COCs including VOCs, metals (lead) in soil;

Nature & Extent of Contamination

- Unnamed Island:
  - waste disposal pits and hummocks
  - primarily elevated COCs including organics and metals in soil;
  - pond surface water – elevated metals
  - pond sediment – elevated metals and organics
- Southern Bank/Pratt Dam:
  - predominantly upstream river sources
  - metals (slightly elevated in lead)

Nature & Extent of Contamination

- Quinnville Wellfield:
  - no evidence of landfill disposal operations
  - well house demolition (vandalism)
  - metals and PAHs detected (slightly elevated lead, similar to many areas along river)
- Site-wide groundwater:
  - VOCs, PAHs, other SVOCs, pesticides, metals, PCBs
  - no well-defined plume; detections scattered and, although some exceeded levels of concern, most detections were not significant

Nature & Extent of Contamination

- Blackstone River:
  - surface water
    - main channel low levels except during high-flow event (PAHs and metals)
    - inlets along river showed elevated PAHs and metals
  - sediment
    - main channel low levels of PAHs and metals
    - inlets along river showed elevated PAHs and metals
  - fish tissue on-site, near site, and in up river locations– elevated metals and PCBs

Estimate of Known Waste Volumes

J.M. Mills -- 2,100,000 cy
(with adjacent "Debris Fields" @ 21,000 cy
along RR tracks)

Nunes -- 56,000 cy (also with surface debris
and building onsite)

Unnamed Island -- 39,500 to 44,000 cy
South portion of Island only

Baseline Human Health Risk Assessment (BHHRA)

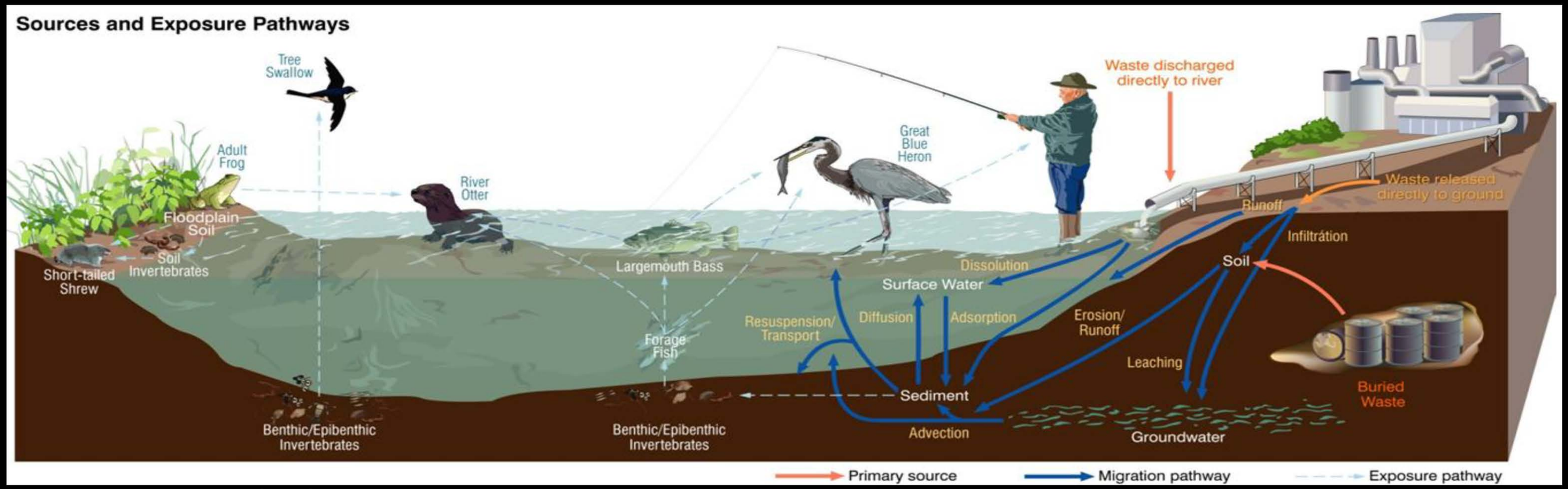
Objectives of the BHHRA

- Evaluate human health risks from being exposed to contaminants at the site via pathways such as:
  - ingestion of soil, surface water, sediment, groundwater, and landfill leachate;
  - ingestion of fish;
  - direct skin contact with surface soil, surface water, and sediment; and
  - inhalation of indoor and outdoor air.
- Develop the preliminary remediation goals (PRGs) for the contaminated media based on results from the BHHRA.

Four Steps of the BHHRA

- Hazard identification
- Exposure assessment
- Toxicity assessment
- Risk characterization

Risk Summary Conceptual Site Model



Human Receptors and Pathways

Soil, groundwater, drinking water

Potential Future Residents

- Ingestion of and skin contact with groundwater and soil
- Inhalation of contaminants related to use of groundwater as drinking water

Soil, groundwater, fugitive dust, leachate

Construction Workers

- Ingestion of and skin contact with groundwater and soil
- Skin contact with landfill leachate
- Inhalation of fugitive dust and ambient air from excavations

Soil, landfill gas, indoor air

Commercial/Site Workers

- Ingestion of and skin contact with soil
- Inhalation of landfill gas
- Inhalation of contaminated indoor air via vapor intrusion

Soil, sediment, surface water, leachate, fish tissue, landfill gas

Recreational Users

- Ingestion of fish tissue
- Ingestion of and skin contact with soil, sediment, and surface water
- Skin contact with landfill leachate
- Inhalation of landfill gas

Soil, sediment, surface water, landfill gas, leachate

Trespassers

- Ingestion of and skin contact with soil and sediment
- Skin contact with surface water and landfill leachate
- Inhalation of landfill gas

Baseline Human Health Risk Assessment (BHHRA)

- Hazard Identification
  - Site-related chemicals of potential concern: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs)/carcinogenic polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), dioxin, pesticides, metals
  - Areas of concern: J.M. Mills Landfill, Unnamed Island, Southern Bank/Pratt Dam, Nunes Parcel/RIDEM Removal Area, Quinnville Wellfield, Debris Fields, Wetlands A-D, the Blackstone River
  - Media of concern: Soil, Surface Water, Sediment, Indoor/Outdoor Air, Groundwater, Landfill Leachate, Fish Tissue

BHHRA (cont.)

- Exposure Assessment
  - People likely exposed: Potential Future Residents, Construction Workers, Commercial/Site Workers, Recreational Users, Trespassers
  - Exposure pathways: Ingestion, Dermal (Skin) Contact, Inhalation
  - Exposure assumptions:

    Exposure frequencies – 350 d/yr for residents and less for workers

    Exposure duration – 30 years for resident, 25 years for commercial workers, 1 year for construction worker

    Ingestion rates – 100 milligrams of soil per day (adult) and 200 milligrams per day (child)

BHHRA (cont.)

- Toxicity Assessment: Used available EPA toxicity data to estimate potential non-cancer and cancer health effects for chemicals of potential concern (VOCs, SVOCs/PAHs, PCBs, dioxins, pesticides, metals)

  - Non-cancer hazard is a comparison of allowable exposure to amount of exposure estimated at the site.

  - Cancer risk is the increased probability of getting cancer.

BHHRA (cont.)

- Risk Characterization:
  - For each pathway, calculate cancer risk and non-cancer hazard index for receptors.
  - Combine risks across pathways for each receptor to get sum cancer risks and sum hazard indices.
  - Assess and present uncertainties.

Elevated Human Health Risk Results

- Nunes Parcel/RIDEM Removal Area soil
  - Potential future residents incidentally ingesting and having skin contact with soil (PAHs, PCBs, pesticides, dioxin, and arsenic), and breathing indoor air (VOCs)
  - Potential future construction workers incidentally ingesting soil and breathing dust (lead)
  - Commercial/site workers incidentally ingesting and having skin contact with soil (PAHs, pesticides, dioxin, and arsenic), and breathing indoor air (VOCs)

- Southern Bank/Pratt Dam, Quinnville Wellfield, and Unnamed Island
  - Potential future construction workers incidentally ingesting soil and breathing dust (lead)

Elevated Human Health Risk Results (cont.)

- Site-wide groundwater
  - Potential future residents using groundwater for drinking, bathing, and doing household chores (VOCs, PAHs, PCBs, pesticides, and metals)
- Blackstone River and on-site pond fish (Ponds A and F)
  - Recreational users eating fish (PAHs, PCBs, pesticides, and arsenic)
  - Elevated risks also found for eating fish from the reference pond and area
- J.M. Mills Landfill and Nunes Parcel
  - Presumptive remedy

- Baseline Ecological Risk Assessment (BERA)

Ecological Risk Assessment Summary

Purpose:

Protect public health ***and the environment*** from the release…of any hazardous substance, pollutant, or contaminant.

Major Elements of Ecological Risk Assessment

- Exposure Assessment
- Effects Assessment
- Risk Characterization

Exposure Assessment

- Conceptual Model: Identify plant and animal populations that can be exposed to contaminants in water, sediment, or soil

- Identify exposure pathways, such as drinking on-site water, or consuming plants or animals (invertebrates) that live in soil or sediment

- Estimate exposure dose for each chemical and receptor

- Example question: How much lead will a bird be exposed to from eating worms from on-site soil?

Effects Assessment

- Compare site exposure doses to doses found to cause *no adverse effects* in laboratory studies.

- If the estimated site dose exceeds the "safe dose" from the scientific literature, then there is risk of adverse effect to on-site animals or plants.

- This is usually done through simple computer models using assumptions about how much of a chemical will move from soil, water, or sediment into wildlife

- It is possible to verify exposure assumptions to reduce uncertainty by measuring chemical in plants or animals on site.

Risk Characterization

- Includes a qualitative and quantitative presentation of the risk results
- Integrates contaminant exposure and toxicity information
- Includes a discussion of uncertainties in the analysis
- Presents any unacceptable risk results for consideration in the Feasibility Study

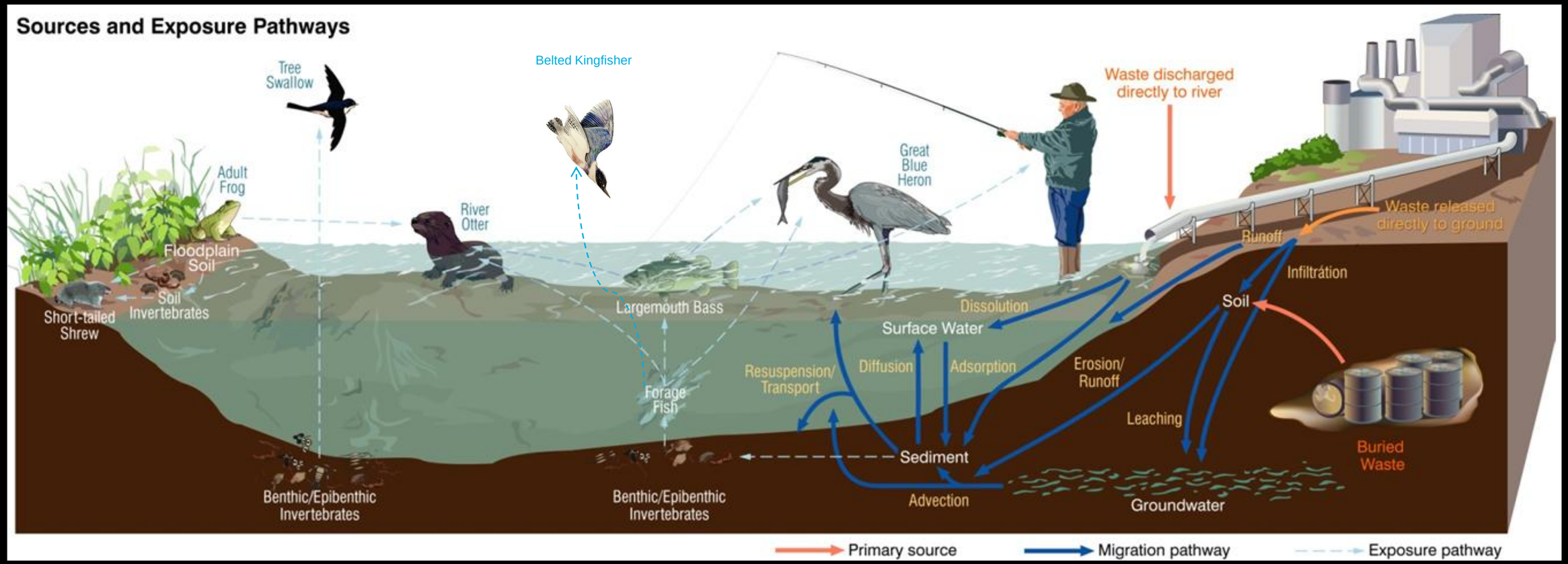
Baseline Ecological Risk Assessment (BERA) Chemicals , Areas, and Media of Concern

- Site-related chemicals of potential ecological concern:, Semi-volatile organic compounds (SVOCs)/polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides, metals

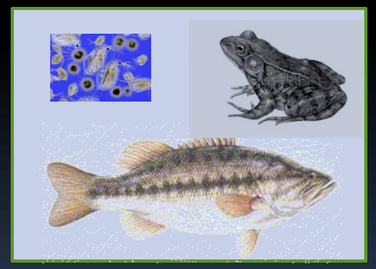
- Areas of concern: J.M. Mills Landfill, Unnamed Island, Southern Bank/Pratt Dam, Nunes Parcel/RIDEM Removal Area, Quinnville Wellfield, Wetlands A-D, the Blackstone River

- Media of concern: Soil, Surface Water, Sediment, Fish Tissue

Risk Summary Conceptual Site Model



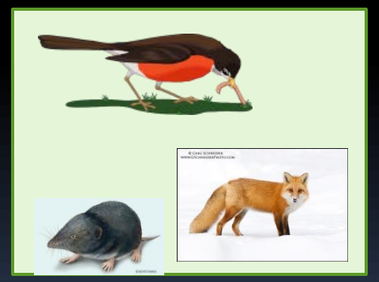
Sediment Receptors



Surface water Receptors

Ecological Receptor Groups used in Risk Assessment

Fish-eating (piscivorous) Receptors



Terrestrial Receptors (soil-based food web)

Sediment Receptors

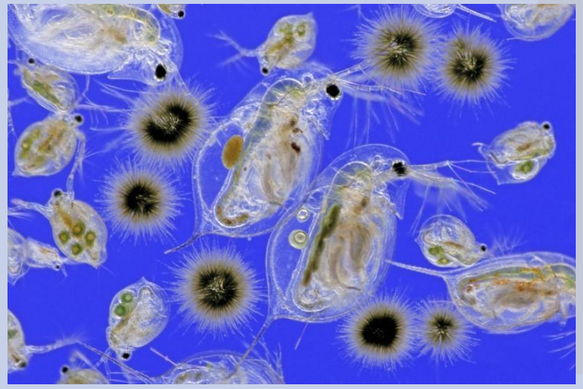
- Sediment organisms evaluated using literature-based benchmarks
- Laboratory toxicity tests were used to determine if chemicals in sediment are toxic
- Community analysis – sediments from the site are studied to see if

Sediment Toxicity Testing

Surface Water Receptors

- Risk to fish and amphibians evaluated using Ambient Water Quality Criteria, which are water concentrations found to be protective of aquatic life based on laboratory studies

- Fish collected for community analysis and chemical analysis



Fish-Eating (piscivorous) Animals

- Mammals (River Otter) and birds (Heron, Kingfisher) evaluated
- Evaluated using measured fish tissue concentrations and food chain model
- Assumed to drink site water and eat fish from River and on-site ponds

Terrestrial Receptors (soil-based food web)

- Evaluated using food chain modeling based on uptake from soil to earthworms, and incidental soil consumption

- Large and small mammals and birds used to cover different sizes of exposures areas

Baseline Ecological Risk Assessment Results Elevated Risk Summary

- Soil – Terrestrial Risks
  - Potential risk to birds from one organic chemical and several metals in all areas of the site; South Bank/Pratt Dam, Nunes Parcel/RIDEM Removal Area, Quinnville Wellfield, Wetlands A-D, Unnamed Island, and J.M. Mills Landfill
  - Potential risk to mammals from metals at J.M. Mills Landfill

- Surface Water/Sediment
  - No actionable risk in Blackstone River and Wetlands
  - Unnamed Island ponds had risk to benthic invertebrates (toxic sediments), amphibians, fish, fish-eating mammals and birds from metals and/or PAHs
  - Risk to benthic invertebrates and fish in ponds adjacent to Blackstone River from metals and PAHs in sediment and/or water

Risk Assessment Results - Ecological

- Soil

- Risk to large birds across entire site from BEHP, lead, cadmium, and zinc
- Risk to small birds on Unnamed Island from BEHP, lead, and zinc
- Risk to small mammals at J.M. Mills LF from aluminum and zinc

- Surface Water

- Risk to aquatic receptors in onsite ponds from aluminum, cadmium, barium, and copper

- Sediment

- Risk to aquatic receptors in onsite ponds from cadmium, copper, PAHs, and 4,4'-DDD, a pesticide breakdown product

Ecological Risk – Looking Ahead

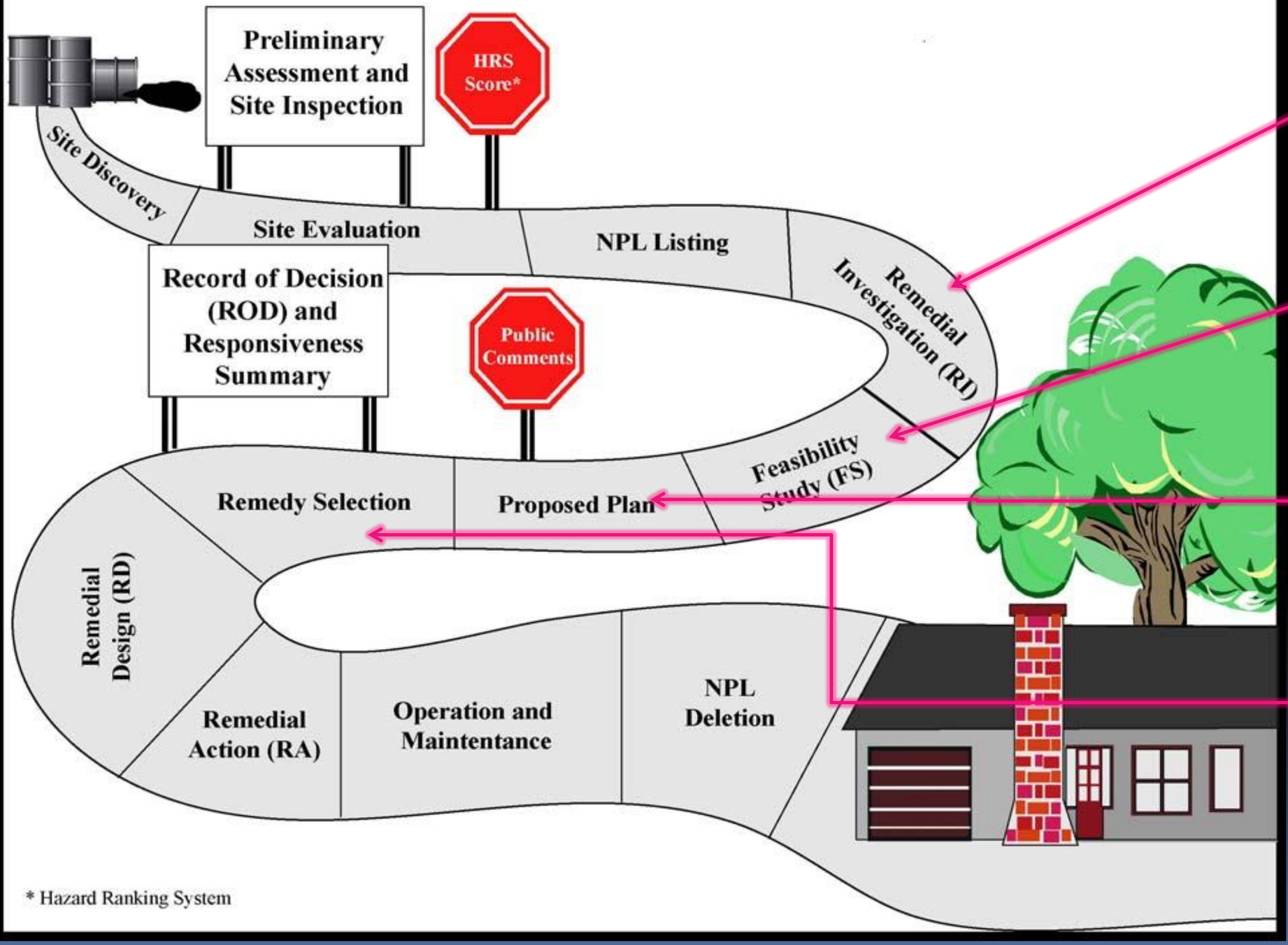
- Further refinement of risk estimation in the Feasibility Study phase is possible in order to better distinguish site-related risks from historical industrial river corridor risks

- Remediation goals will be set by medium (except water) to reduce ecological risk

Where Are We Now?

- Operable Unit 1 Clean-up well underway
- Operable Unit 2 Remedial Investigation complete
- Feasibility Study for OU-2 under development
- Target date for Record of Decision—Fall 2013

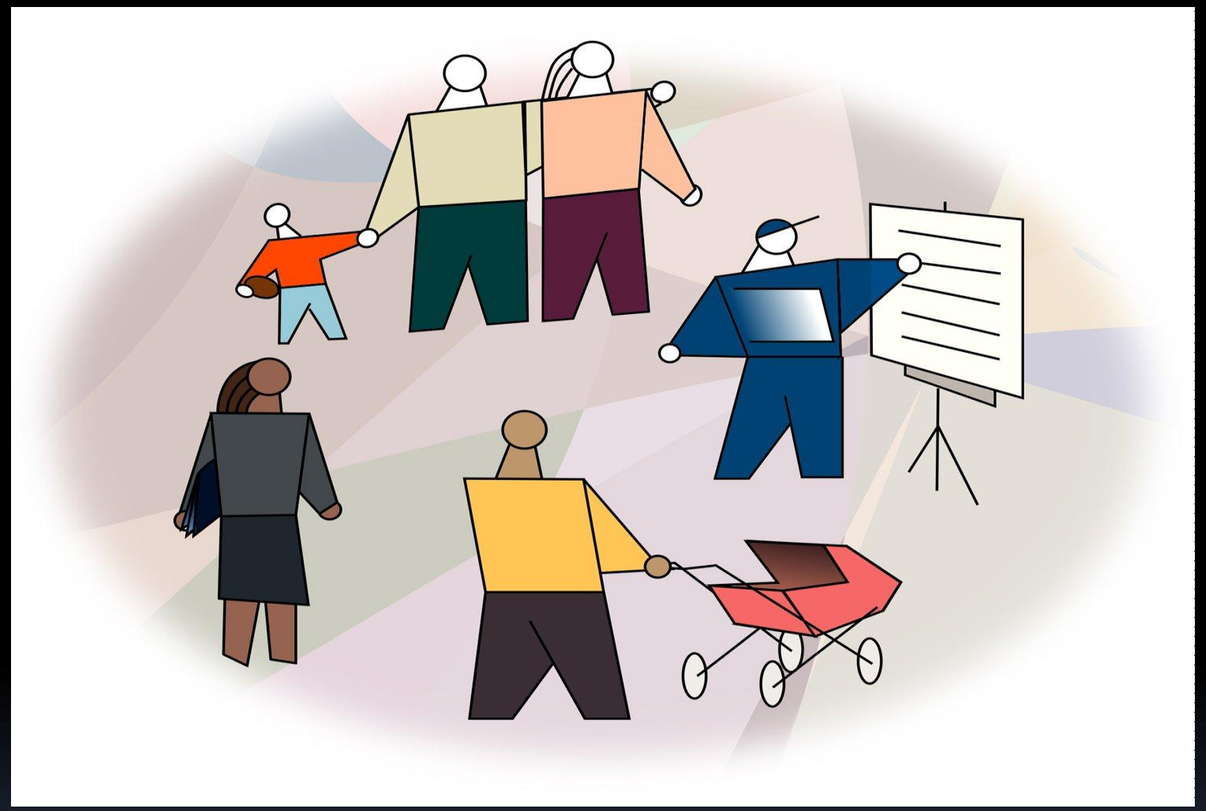
The Superfund Process



PROGRESS For OU-2

- ✓ RI Studies are complete
- ➢ Feasibility Study Underway
- ➢ Proposed Plan Summer 2013
- ➢ Remedy Decision Fall of 2013

Your Chance to be Heard:
EPA's Community Involvement (CI)



- Attend public meetings and hearings
- Participate in community information sessions
- Join/Form a Community Advisory Group
- Visit local information repository sites such as your town Library
- Contact your local Community Involvement Coordinator and/or Site Manager

Technical Assistance Grant recipient– Blackstone River Watershed Council/Friends of the Blackstone

Peterson/ Puritan Website: http://www.epa.gov/region1/superfund/sites/peterson

EPA United States Environmental Protection Agency

http://www.clu-in.org/

Technology Innovation and Field Services Division

Citizen's Guide Series to Cleanup Technologies

Posted: November 7, 2012

The Citizen's Guide series: a set of 22 fact sheets that summarizes cleanup methods used at Superfund and other sites. Updated in 2012 to include information about new technologies and techniques.

Each fact sheet is two pages long and answers six questions about the cleanup method:

1) What is it? 2) How does it work? 3) How long will it take? 4) Is it safe? 5) How might it affect me? and 6) Why use it?

Spanish translations of these guides will be available in 2013.