

Public Involvement Meeting

December 12, 2002

Former Raytheon Facility
430 Boston Post Road, Wayland, Massachusetts

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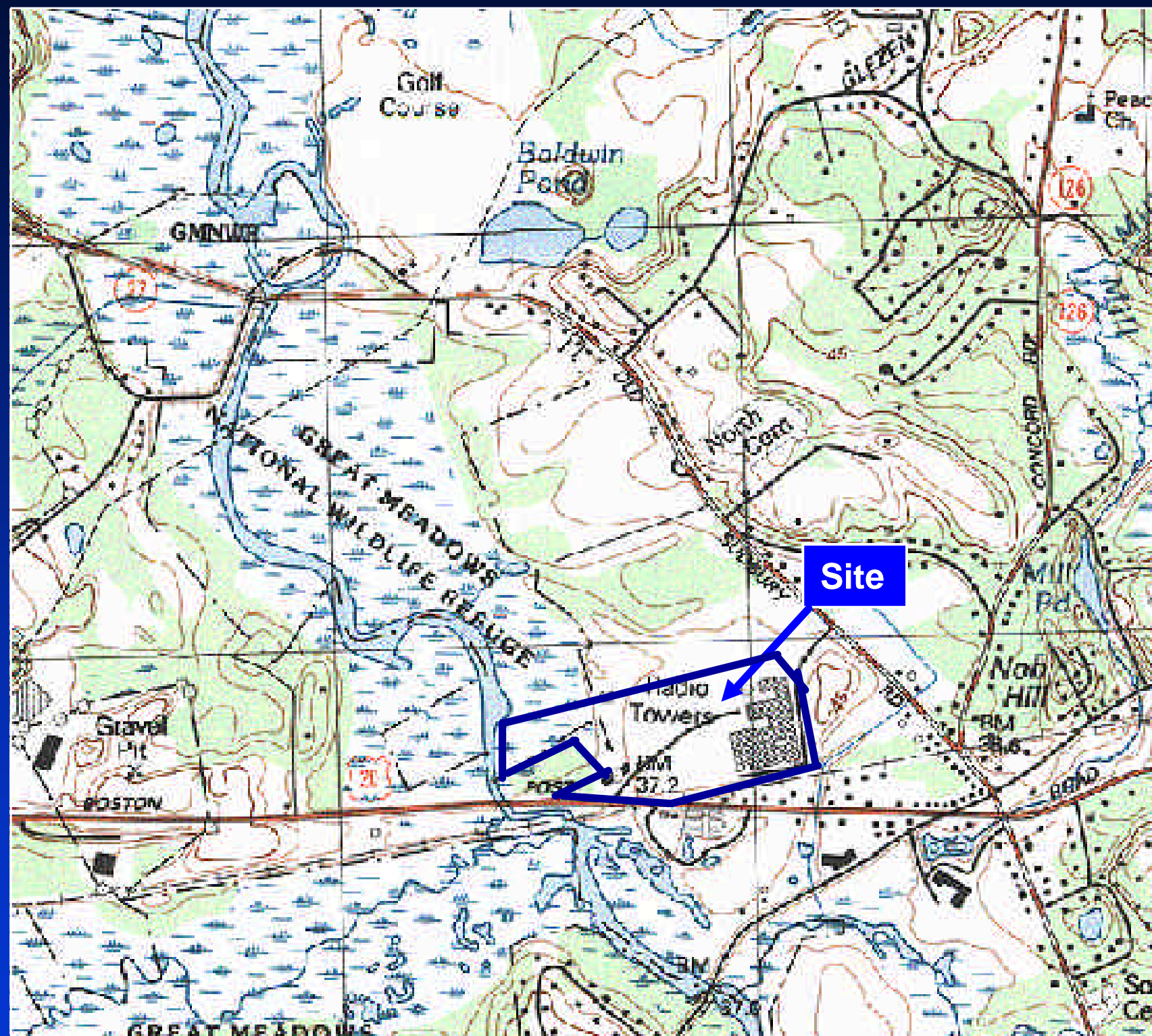
Purpose of Meeting

PART I – Update on on-going assessment and in situ remedial pilot study:

- Additional assessment in northern portion of Site
- Release Abatement Measure (RAM) Plan Modification #1
- Additional reportable conditions (Phase IV)

PART II – Draft Phase IV Remedy Implementation Plan:

- Clean up plan for groundwater in southern portion of Site
- Clean up plan for sediment in wetlands
- Implementation schedule



Locus Map

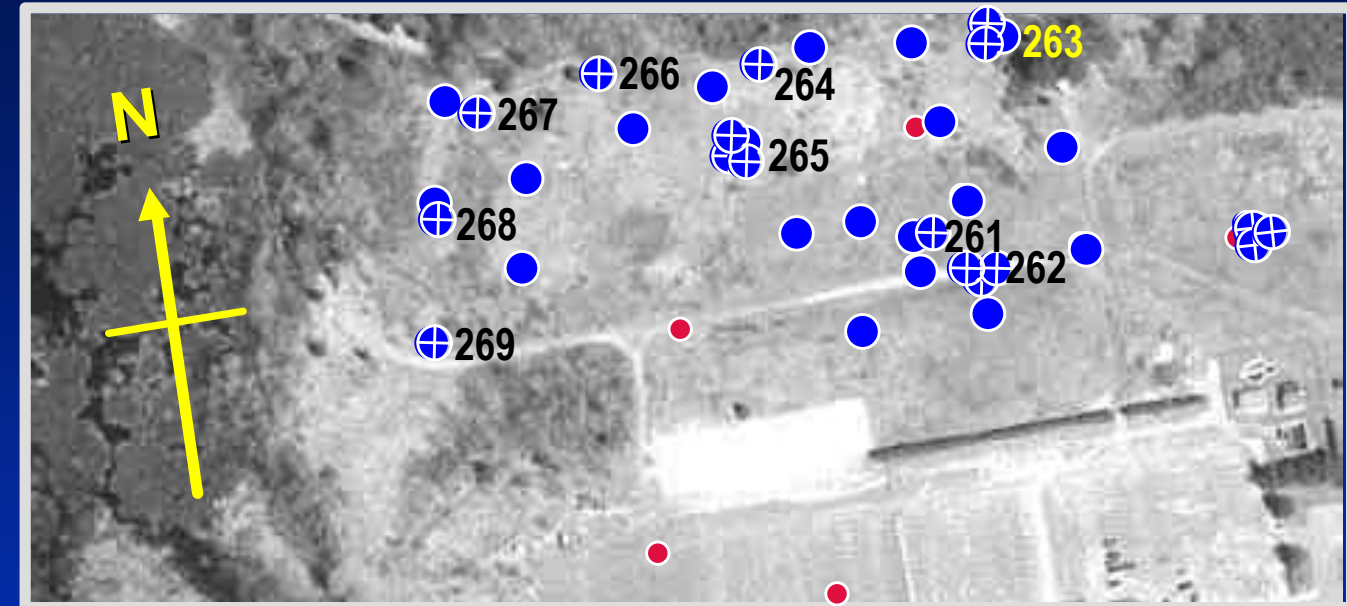
PART I

**On-going Assessment and
In Situ Remedial Pilot
Study**

Northern Portion of Site

Currently installing 27 monitoring wells:

Monitoring Well(s)	Depth(s) (feet)
MW-261S	24
MW-262S/M/D	25/50/76
MW-263S/M	20/50
MW-264D	77
MW-265S/M/D	18/45/89
MW-266D	105
MW-267D	121
MW-268D	127
MW-269	



Legend

- ⊕ Newly Installed Monitoring Well Location
- Waterloo Profiler Boring Location
- Existing Monitoring Well Location

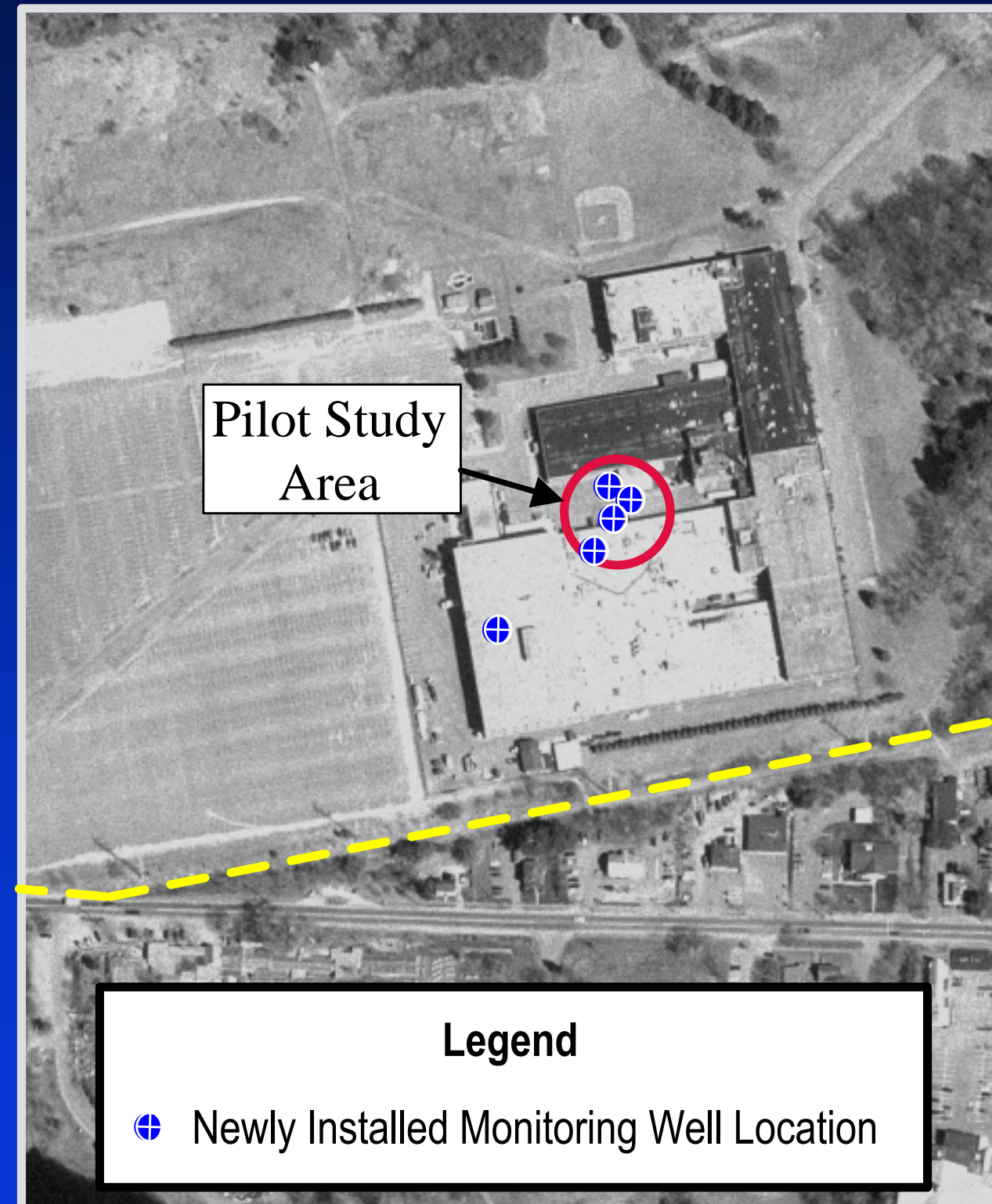
Northern Portion of Site

Proposed additional Site assessment activities:

- **Develop and conduct off-property investigation during Winter/Spring 2003**
 - Finish on-going investigation and review data
 - Develop Scope of Work
 - Public review of Scope of Work
 - Submit Scope of Work to DEP
 - Amend Notice of Intent (NOI)
 - Receive amended Order of Conditions
 - Obtain access to northern properties
 - Initiate field investigation

RAM Plan Modification #1

- Expansion of existing pilot study
- Installed 5 monitoring wells (9 Nov)
- Injected 9,000 gallons of permanganate (13 – 14 Nov)
- Advanced four post-injection soil borings & submitted four soil samples for analyses (23 Nov)
- Post injection groundwater monitoring
 - Weekly field parameter monitoring
 - Quarterly VOC monitoring
- Schedule
 - Completion anticipated Fall 2003



RAM Plan Modification #1



Two 5,000-gallon tanker trucks were used to transport and store sodium permanganate



Geoprobe™ direct-push rig used to install temporary injection points



Trailer-mounted pumping system used to pump permanganate from tanker truck into injection points

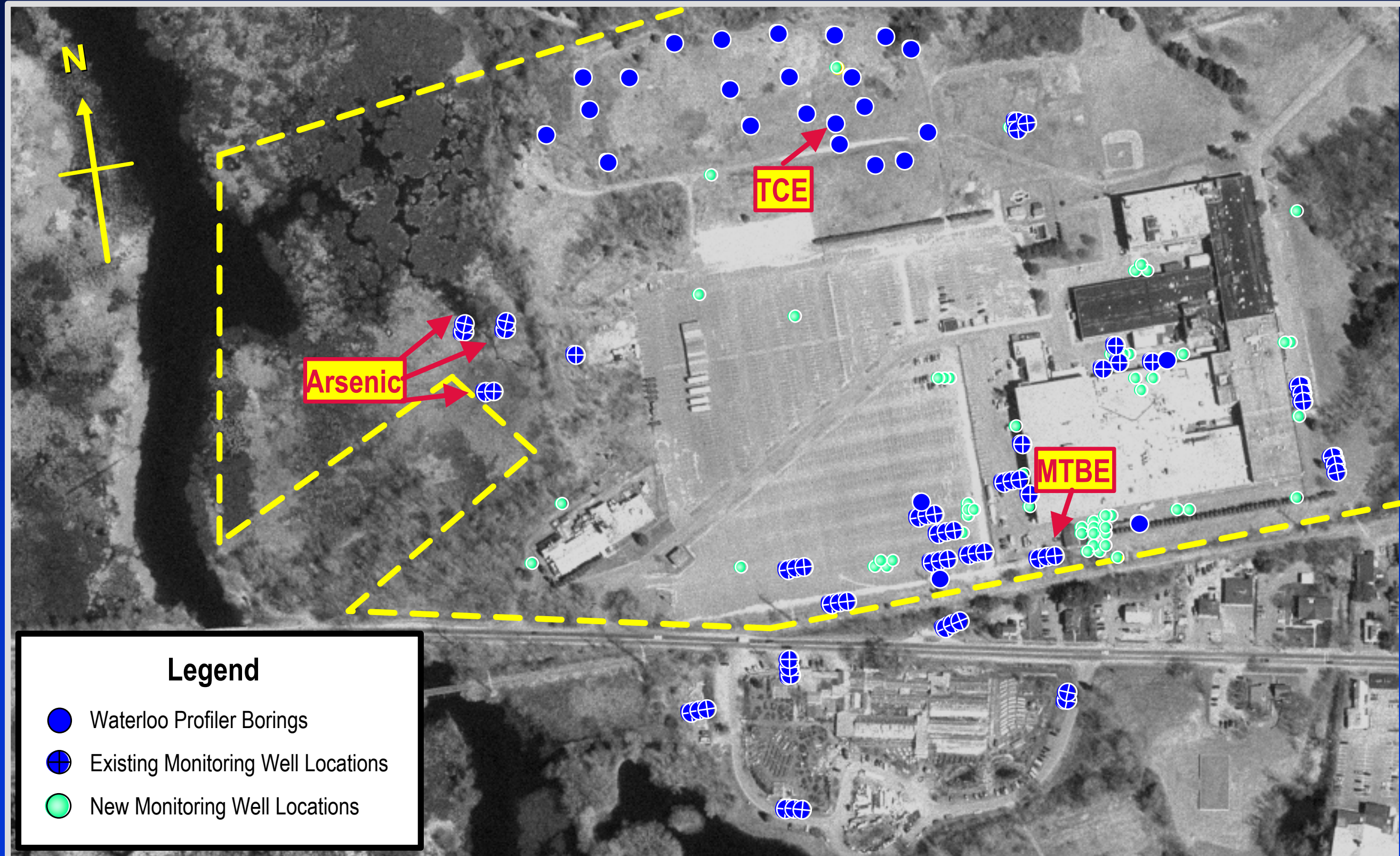
Additional Reportable Conditions

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- TCE in groundwater in northern portion of site (MW-TP-3 area)
- Methyl tert butyl ether (MTBE) in groundwater in well MW-202M
- Arsenic in groundwater in western portion of site (MW-313S/D, MW-314D, MW-315S/D)
- Release Notification Form to be submitted in December 2002

Additional Reportable Conditions

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PART II

**Phase IV Remedy
Implementation Plan**

Phase IV Remedy

Proposed clean up plan:

- **Groundwater in southern portion of Site**
 - Implementation of in situ chemical oxidation
- **Wetlands**
 - Excavation and restoration of wetlands

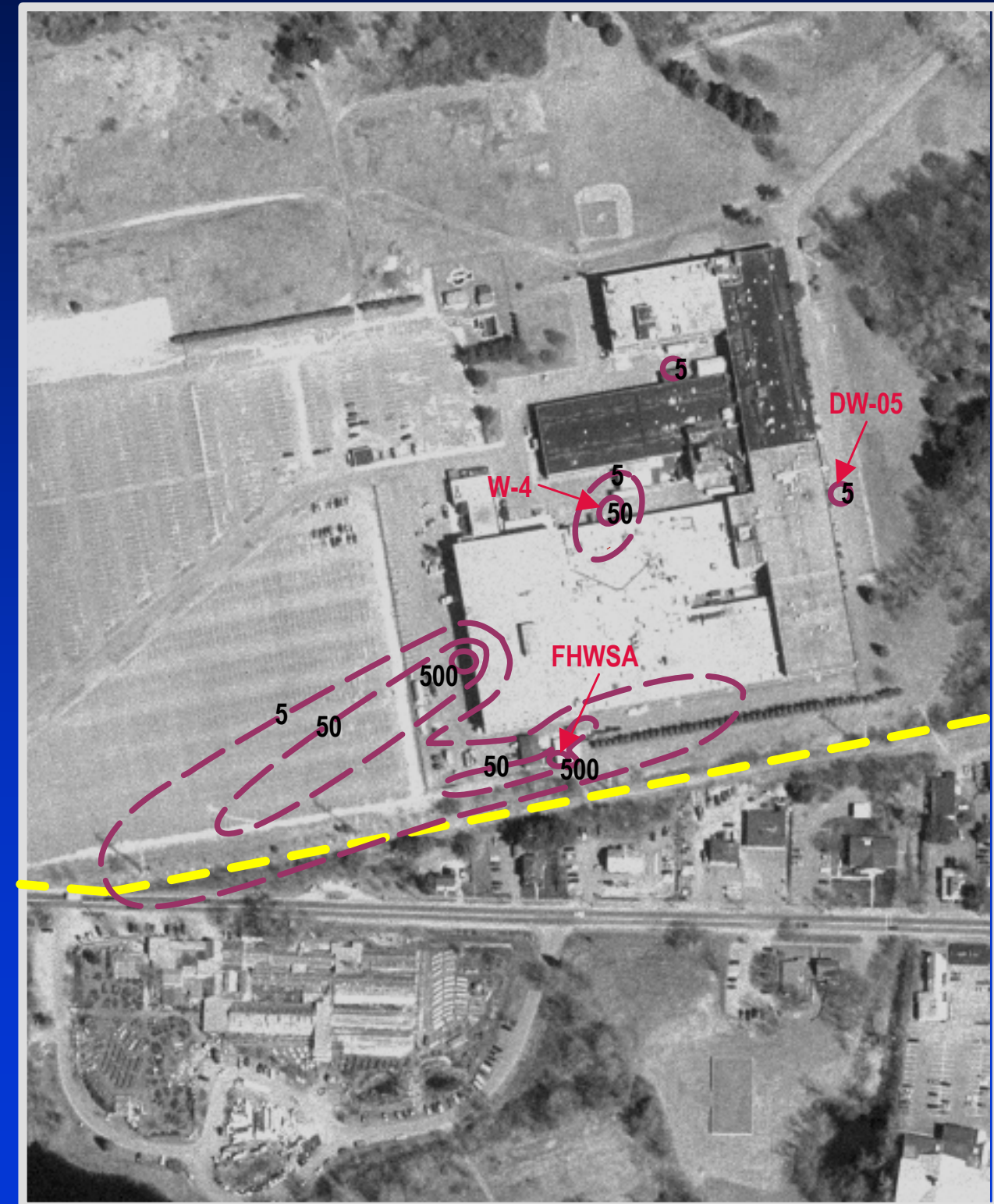
Groundwater in Southern Portion of Site

Plan View of TCE in Groundwater

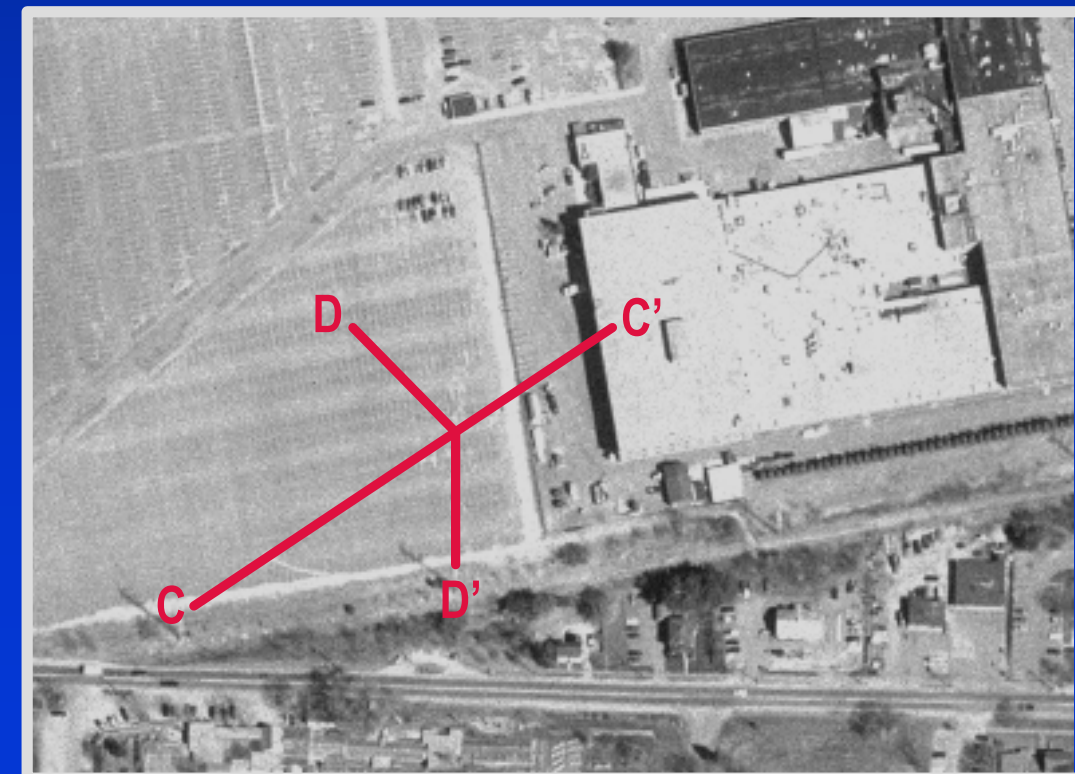
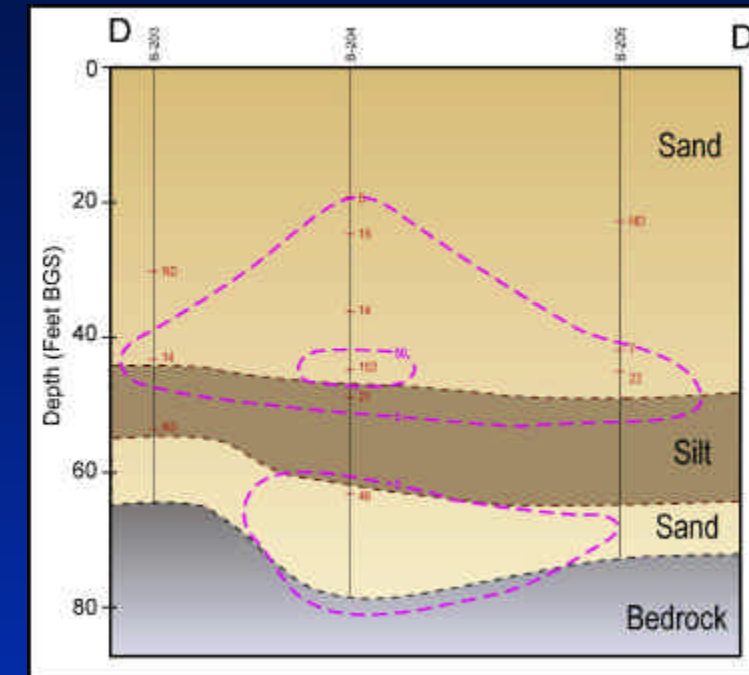
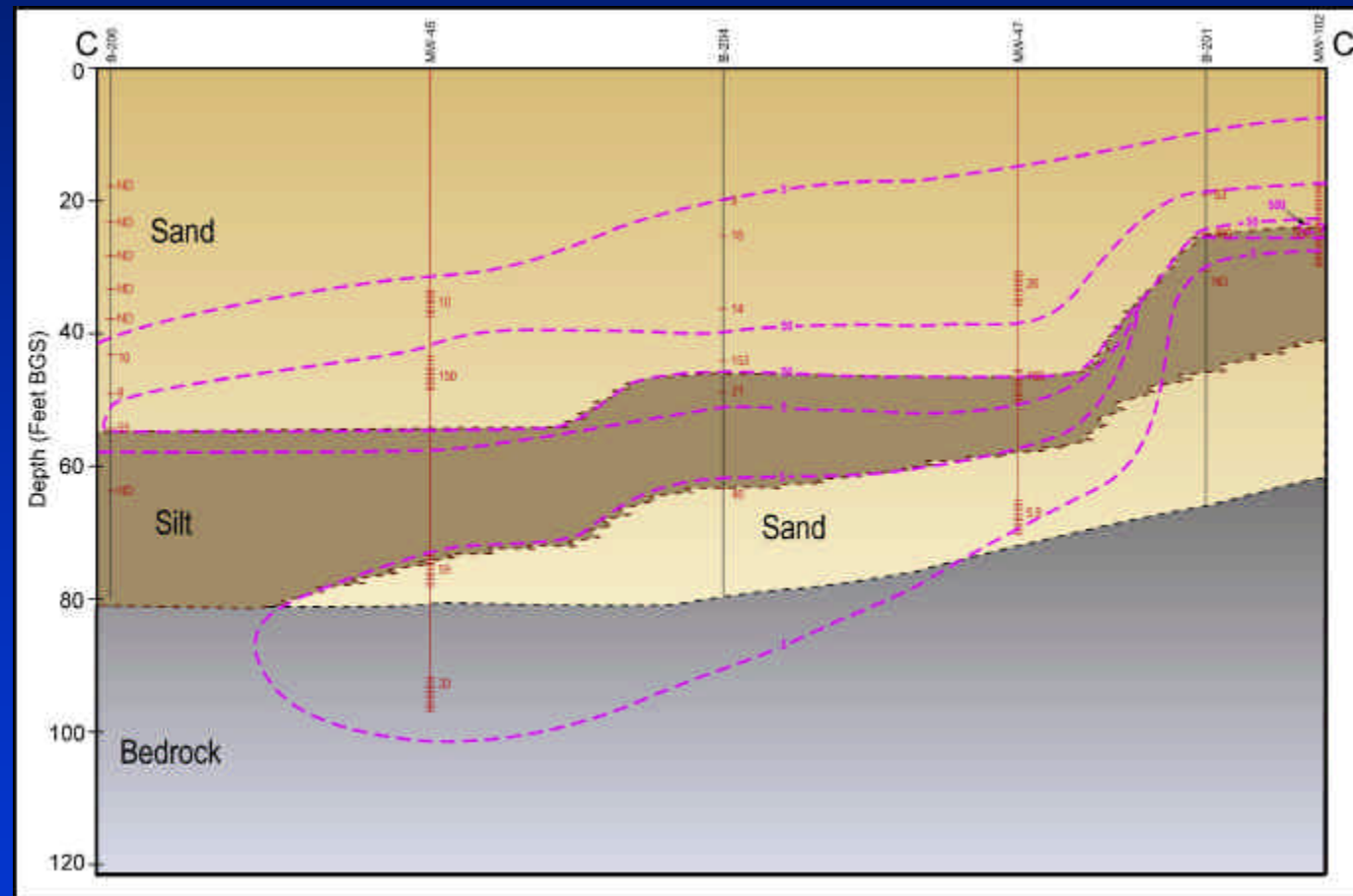
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Three potential source areas:

- Former manhole W-4
- Former hazardous waste storage area (FHWSA)
- Former drywell DW-05

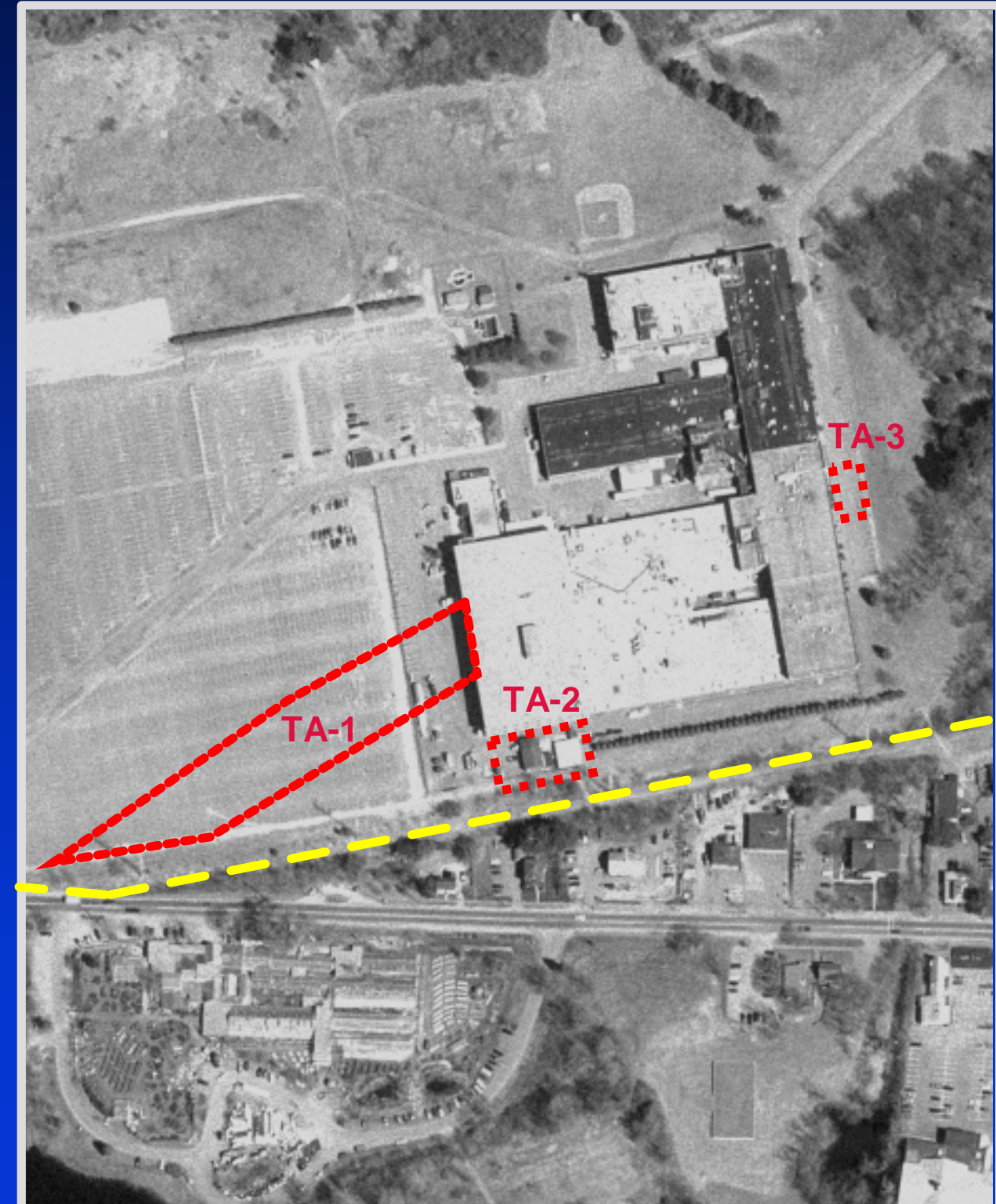


Cross-Sectional View of TCE **Raytheon** in Groundwater



Clean Up Plan

- Three treatment areas (TA-1, TA-2, TA-3)
- Clean up goal: MMCLs
- In situ chemical oxidation
 - Final design based on results of ongoing pilot study
 - Final design will be submitted for public review and comment
 - Final design anticipated to include:
 - pressure injection of permanganate near source areas
- Monitoring



Implementation Schedule

<i>Date</i>	<i>Event</i>
Dec. 2002	Complete Phase IV RIP
Fall 2003	Complete RAM Plan Modification #1 pilot study
Fall 2003	Detail design of full-scale remedy
Fall/Winter 2003	Submit Phase IV Addendum
2004	Implementation of remedy

Wetlands

Regulatory Overview

- **Wetland contaminants include PCBs, PAHs and heavy metals in soil/sediment**
- **PCBs regulated by the US EPA under the Toxic Substance Control Act (TSCA); “Application for Risk-Based Disposal Approval” to be submitted**
- **Comprehensive federal, state and local permitting process**
- **MCP Phase IV Remedy Implementation Plan (RIP) to provide overview of design and implementation process of selected remedial alternative for all contaminants.**

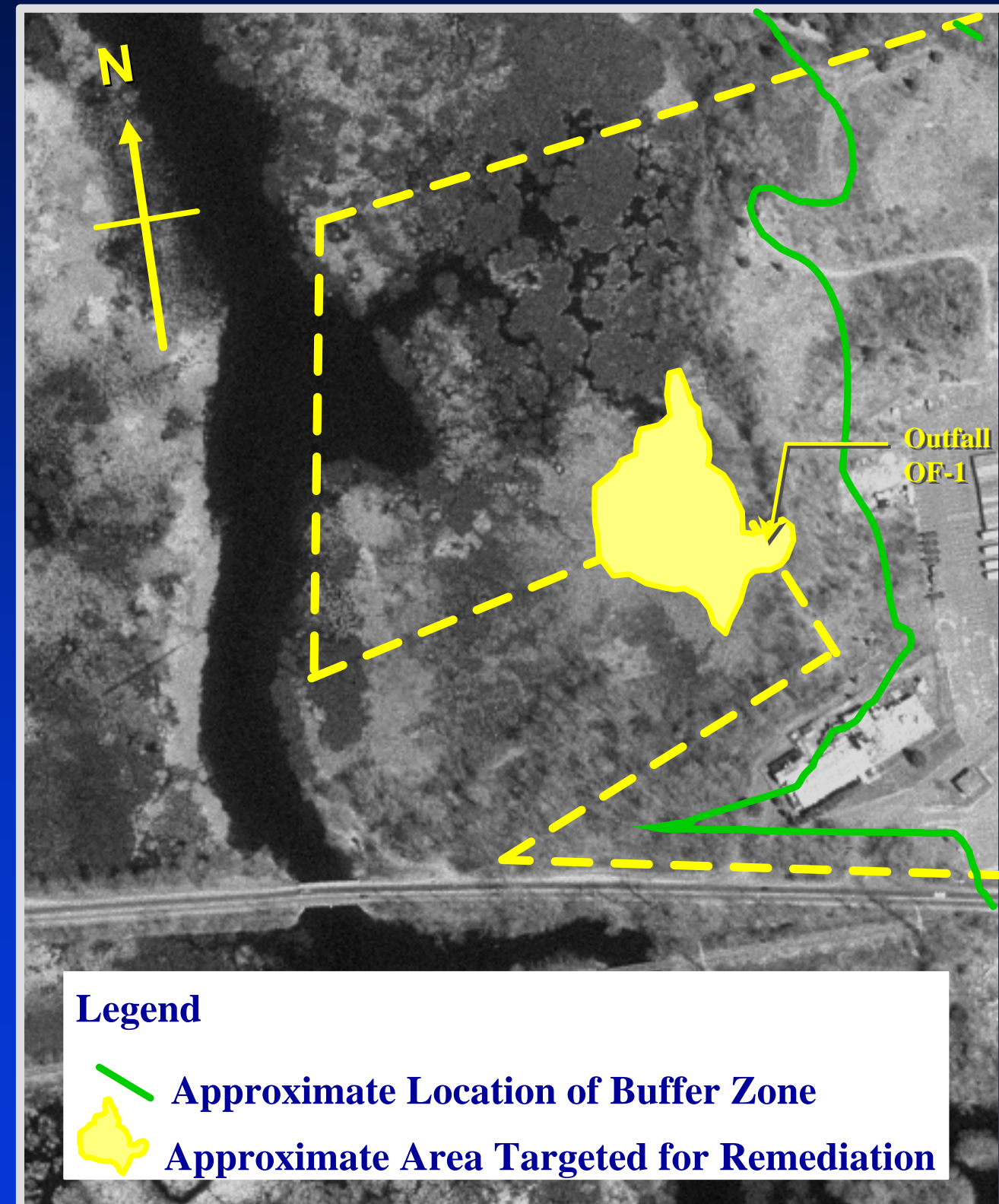
Phase II Wetlands Findings

- **Approximately 0.6 acres of stunted growth related to historic contaminant releases**
- **PCBs, PAHs and heavy metals soil/sediment pose a condition of “significant risk” to human health and the environment**
- **Wetland area requiring cleanup to abate “significant risk” includes the area of stunted vegetative growth**
- **Additional comprehensive response actions required**

Development of Cleanup Goals

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- Be protective of human health and the environment
- Meet state and federal regulatory requirements governing wetland cleanup
- Identify a balanced cleanup approach
 - Remove the contaminants of concern
 - Minimize the destruction of the existing wetland habitat during remediation
- Meet EPA, DEP, Army Corps of Engineers, Conservation Commission permitting requirements



Wetlands Clean up

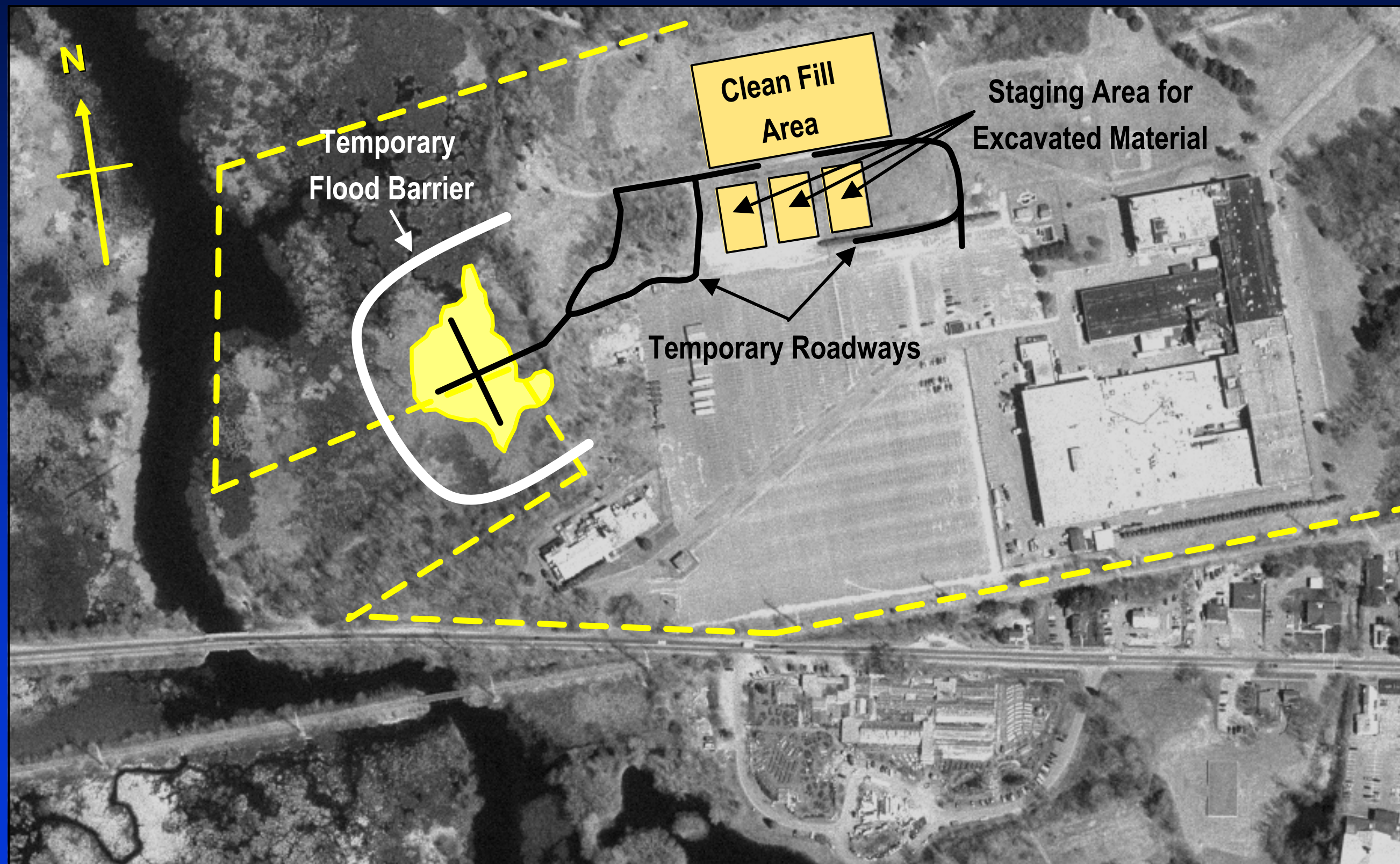
Phase IV includes:

- **Conceptual design for excavation of approximately 1.6 acres of impacted sediment and restoration of wetland**
- **Verification Sampling in accordance with TSCA requirements to ensure clean up goals have been met**
 - Additional perimeter sampling to be conducted

Implementation

- **Excavation**
- **Staging**
- **Traffic plan – to be developed with Town and property owner**
- **Restoration**

Wetlands Clean up



Excavation



Restoration Plan

- **Clean, weed-free soil, with >12% organic material**
- **Replanting with native species, mixture of seed mix and plantings**
- **Annual monitoring of wetland hydraulics and plant survival**
- **Five-year monitoring schedule**

Example Wetland Restoration



Example wetland excavation for industrial site remedial action and replacement of impacted material

Example Wetland Restoration



Example wetlands excavation: restored hydraulics and restored vegetation in photo on right

Previous Wetland Soil/Sediment Investigations

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- > 100 analyses of samples since 1991
- Impacts concentrated near outfall (OF-1)
- Area of stunted growth coincides with metal concentrations
- Contaminants in sediments at depths 0 - 12 inches

- Sampling Locations
- Approximate Location of Buffer Zone



Summer 2002 Wetland Soil/Sediment Investigations

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TASK	PROPOSED	ACTUAL	ANALYSES
Upland Soil Borings	12	15	screened VOCs, PP13 Metals
Monitor Well Instalation	6	6	VOCs, PAHs, PCBs, PP13 Metals
Sediment Sampling	6	6	VOCs, PCDDs, PCDFs, cyanide, boron, fluoride, ammonia, phosphorous, nitrate, chloride, aldehydes, alcohols, glycols
Waste Characterization	2	2	TCLP VOCs, TCLP SVOCs, TCLP Metals, TCLP Pesticides, TCLP Herbicides
Groundwater Monitoring	7	7	VOC, PP13 Metals, PCBs, PAHs

Net Environmental Benefit Analysis

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- **Net Environmental Benefit Analysis (NEBA) is a process to establish a cleanup level that minimizes damage and maximizes the benefit to the environment**
 - NEBA = (positive effects) – (negative effects)
 - weighs damage of wetland excavations vs. benefit of wetland cleanup
- **NEBA recently provided as an appendix to Draft Application for Risk-Based Disposal Approval**

Remedial Scenarios

	EXCAVATION AREA	IMPACT	BENEFIT
Scenario 1	0.6 acres – Area of Stunted Growth	Area provides only fraction of wetland services	Positive
Scenario 2	1.6 acres - Area of Stunted Growth + Risk Management Area	Area provides limited wetland Services	Positive
Scenario 2B	1.85 acres - Area of Stunted Growth + PCBs >4.7 ppm	Functioning wetland outside Area of Stunted Growth + Risk Management Area	Negative
Scenario 3	5.3 acres – EPA Level of 1 ppm PCBs	Functioning wetland outside Area of Stunted Growth + Risk Management Area	Negative

Implementation Schedule

<i>Date</i>	<i>Event</i>
Dec. 2002	Complete Phase IV RIP
Winter 2003	Submit wetland permitting - Additional opportunity for public comment
Pending Permit Approval	EPA Review of Risk-Based Disposal Approval Application - Additional opportunity for public comment
Pending Permit Approval	Update Phase IV RIP to reflect EPA and permitting changes, if any - Additional opportunity for public comment
Pending Permit Approval	Implementation of wetland remedial action
Pending Permit Approval	Restoration of wetland

PIP Schedule for Draft Phase Raytheon IV RIP

- **Initial PIP comments thru December 17, 2002**
- **All documents are available in repositories and web page**

On-Line Document Repository

- **Web site containing electronic copies of documents stored in public repository**
- **URL: www.ermne.com**
- **Username: Raytheon**
- **Password: Wayland**

Q & A