Public Involvement Meeting for the Bird Machine Company Property February 2007

Presented By

Baker Hughes Incorporated

and Weston Solutions, Inc.

Presenters

- Clayton Curtis, Manager, Health Safety & Environment, Baker Hughes
- Arthur Cunningham, LSP, Weston Solutions, Inc., Licensed Site Professional
- Susan A. Sundstrom, Ph.D., D.A.B.T. Human Health Risk Assessment

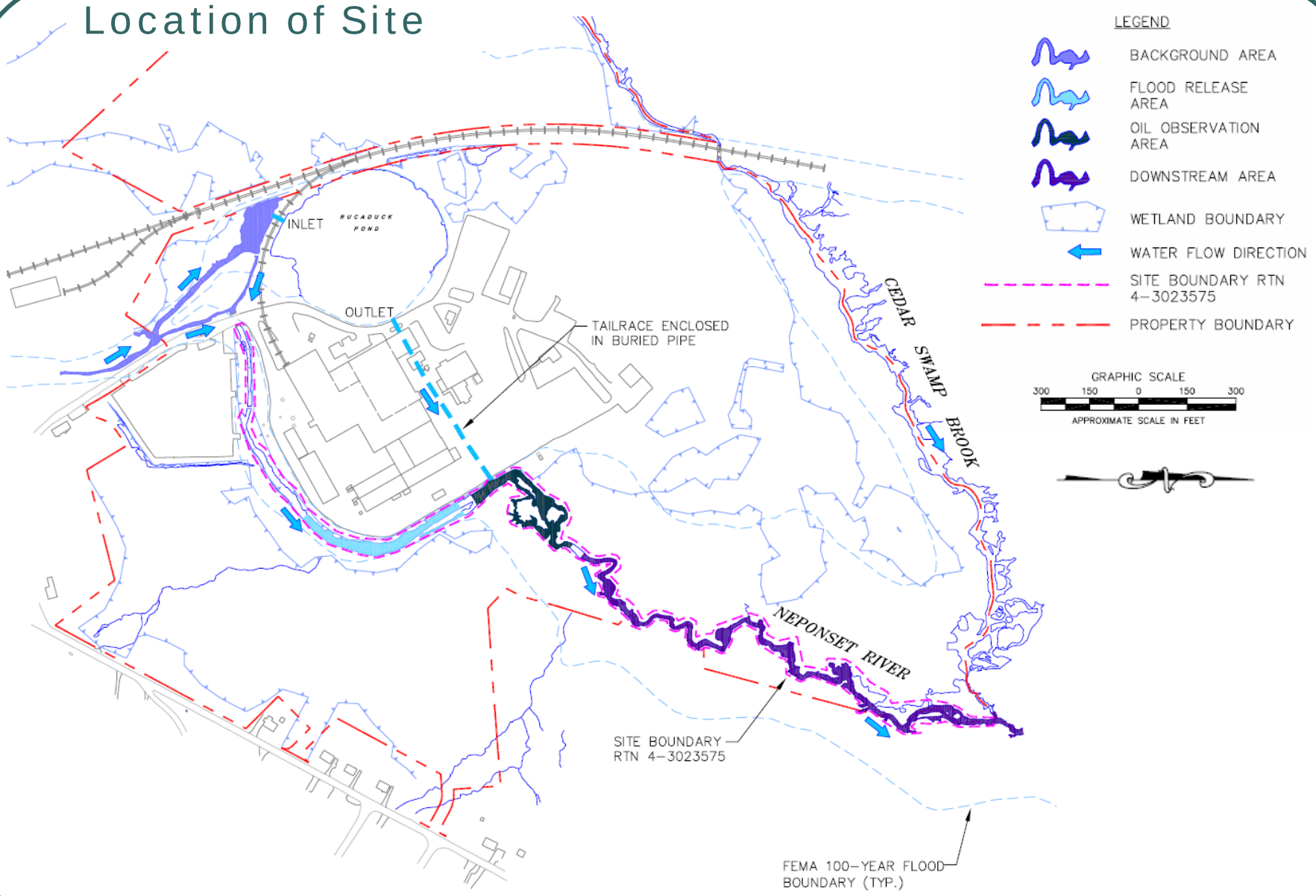
Purpose of Tonight's Meeting

- Present Phase II Report for the Release of Hydrocarbons to the Neponset River
- Allow opportunity for comments on Phase II Report
- Describe the next steps following the Phase II Report

Additional Information to Be Presented Tonight

- MCP Groundwater Category Determination
  - Is the site in a GW-1 or GW-3 groundwater category?
- Response to comments regarding the Town's Water Supply
  - Review of previous studies and reports on water supply

Location of Site



Background Information

- Historically, Outfall 2 has had an intermittent oil sheen, occasionally requiring booms
- A Release of Hydrocarbons was observed (Ice) reported, January 2004
- Immediate Response Action started in January 2004 – investigated potential sources in the river

Background Information

- Phase I Report filed in January 2005
  - Initial Site Investigation
  - Definition of “Site” expanded to include all outfalls, and historical releases of oil from any of the outfalls at the BMC

Background Information

- Second Release of Hydrocarbons occurred at Outfall 7 in October 2005 (“Flood Release”)
- Immediate Response Action proceeded in October 2005
- IRA Included:
  - Cleaning of oil from Building 8
  - Cleaning of storm drain system
  - Removing oil impacted vegetation and oily water at Outfall 7
  - Deployment of oil absorbent booms at Outfall 7

Background Information

- Removed stormwater drain line that was suspected of releasing oil to the Neponset through Outfall 2
- Environmental Risk Characterization completed in June 2006
- Public Involvement Meeting July 2006

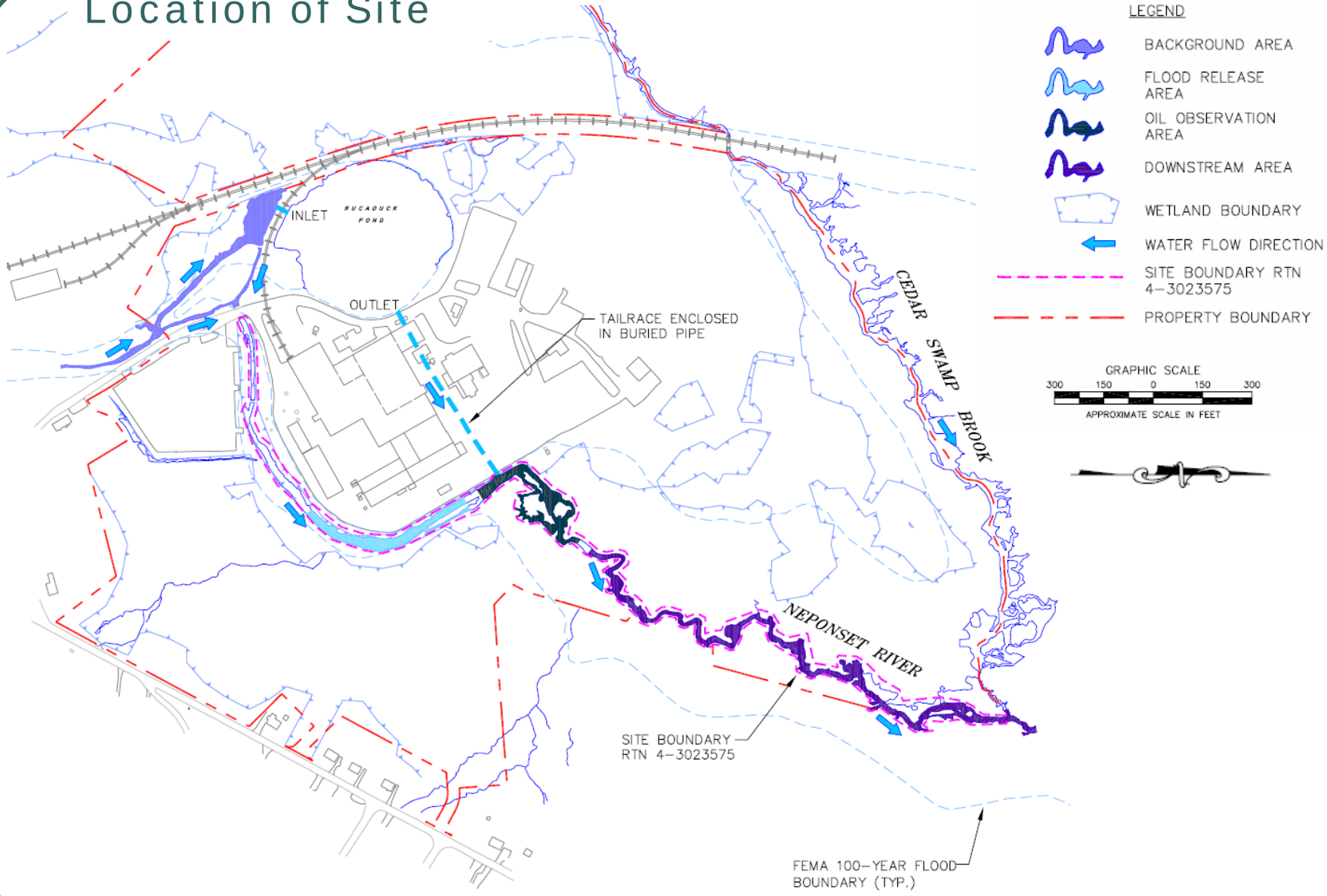
Since last Public Involvement Meeting

- July through December 2006
  - 4th round of surface water samples
  - Visual inspection of booms at Outfall 2 & 7
  - No sheen noted and no oil observed on Outfall 2 & 7 booms
  - Booms removed from Outfall 7 in December 2006
  - Storm drain pipe replacement has eliminated sheen from Outfall 2
- Phase II Report Completed January 2007

Release of Hydrocarbons Phase II Comprehensive Site Assessment Report

- **Describes the releases of hydrocarbons to the Neponset River**
- Summarizes data collected during investigations of the River
- Describes Nature and Extent of contaminants

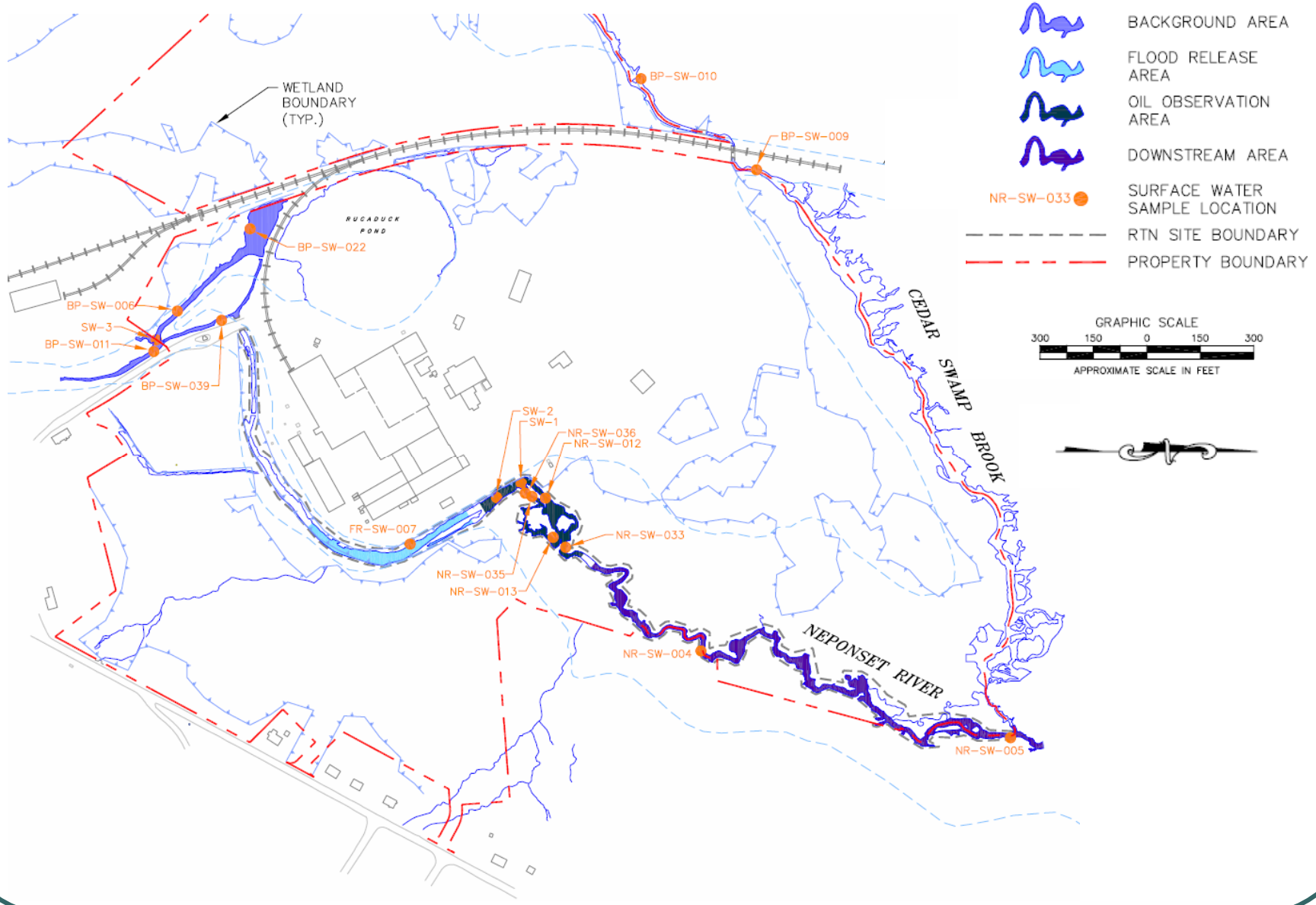
Location of Site



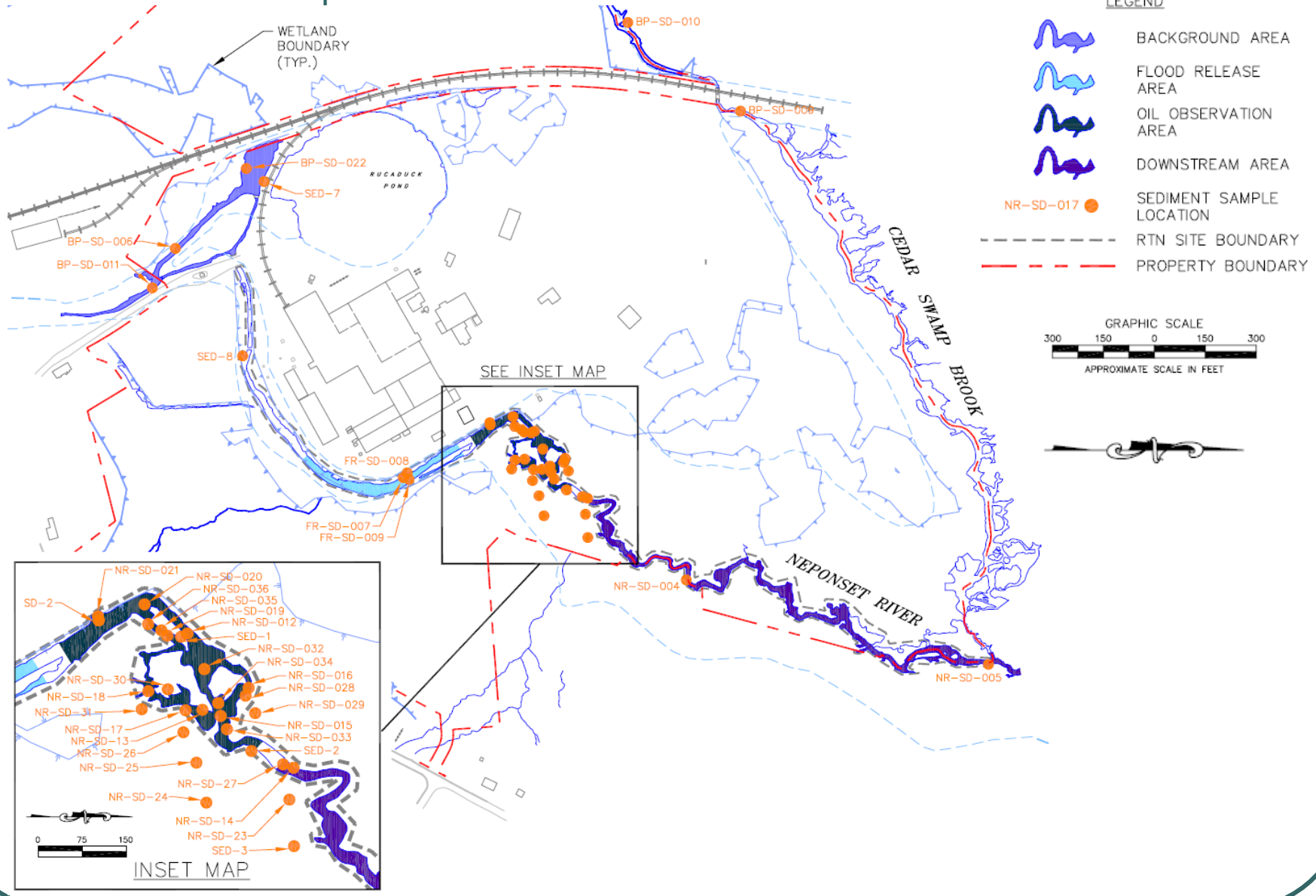
Release of Hydrocarbons Phase II Comprehensive Site Assessment Report

- Describes the releases of hydrocarbons to the Neponset River
- **Summarizes data collected during investigations of the River**
- **Describes Nature and Extent of contaminants**

Surface Water Sample Locations



Sediment Sample Locations



Release of Hydrocarbons Phase II Comprehensive Site Assessment Report

- Describes the Environmental Fate and Transport of contaminants
- Characterizes Potential Risks Associated with the Release of Hydrocarbons to Neponset River:
  - Environmental Risk Characterization
  - Human Health Risk Assessment

Environmental Risk Characterization

- July 2006 (PIP) presentation:
  - Conclusion - contaminants released posed No Significant Risk to the environment
- Since July 2006:
  - Flood Release data was incorporated in the Environmental Risk Characterization
    - Appendix F of the Phase II Report
  - Inclusion of the Flood Release data did not change the conclusions

Discussion Opportunity

Questions & Answers

Massachusetts Contingency Plan (MCP)
Method 3, Human Health Risk Assessment
Release of Hydrocarbons to the
Neponset River
RTN 4-3023575
Bird Machine Company, South Walpole, MA

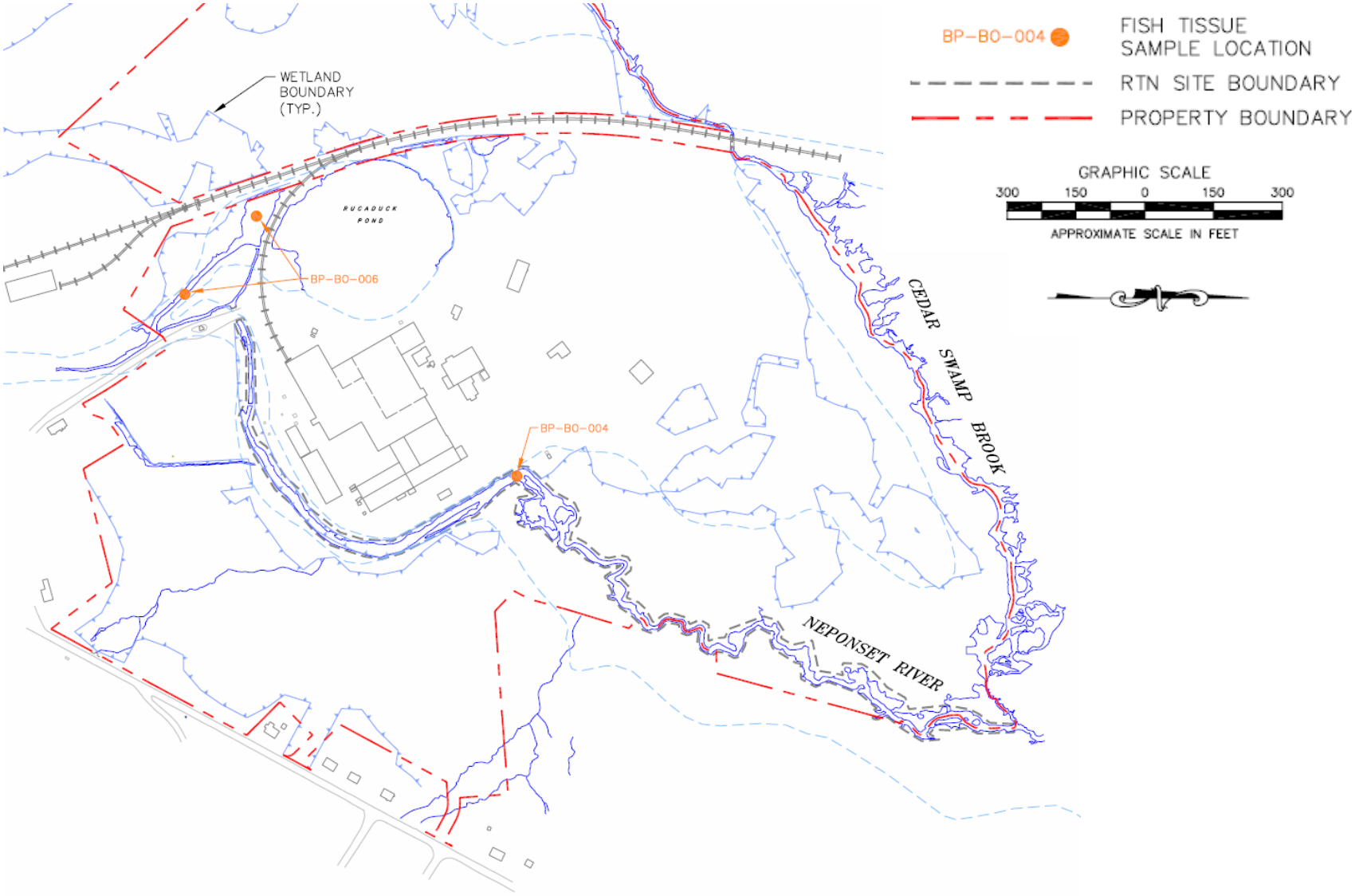
Presented by:

Susan A. Sundstrom, Ph.D., D.A.B.T.

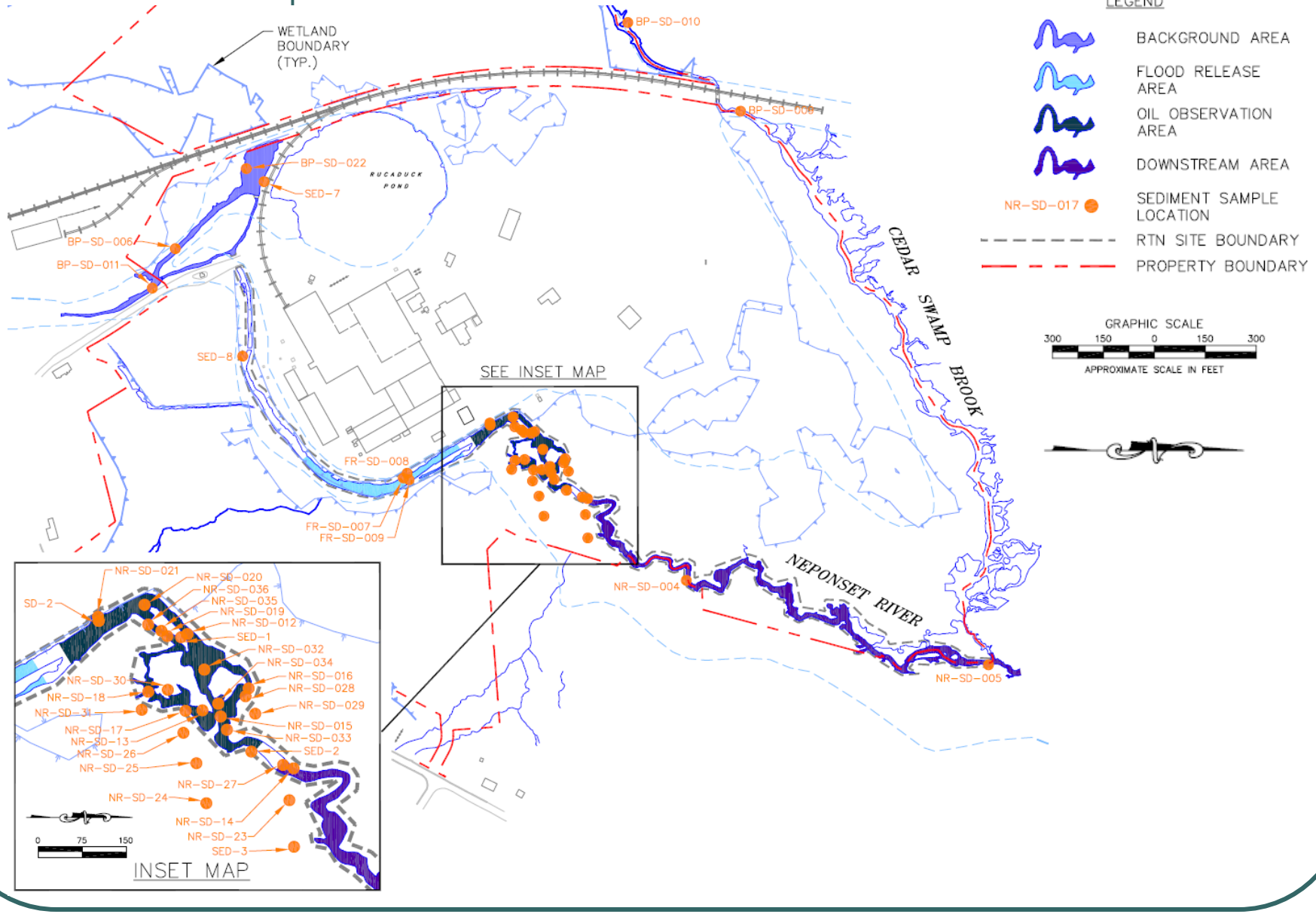
Components of a Human Health Risk Assessment

- **Hazard Identification**
- Exposure Assessment
- Dose Response
- Risk Characterization

Fish Tissue Sample Locations



Sediment Sample Locations



Surface Water Sample Locations

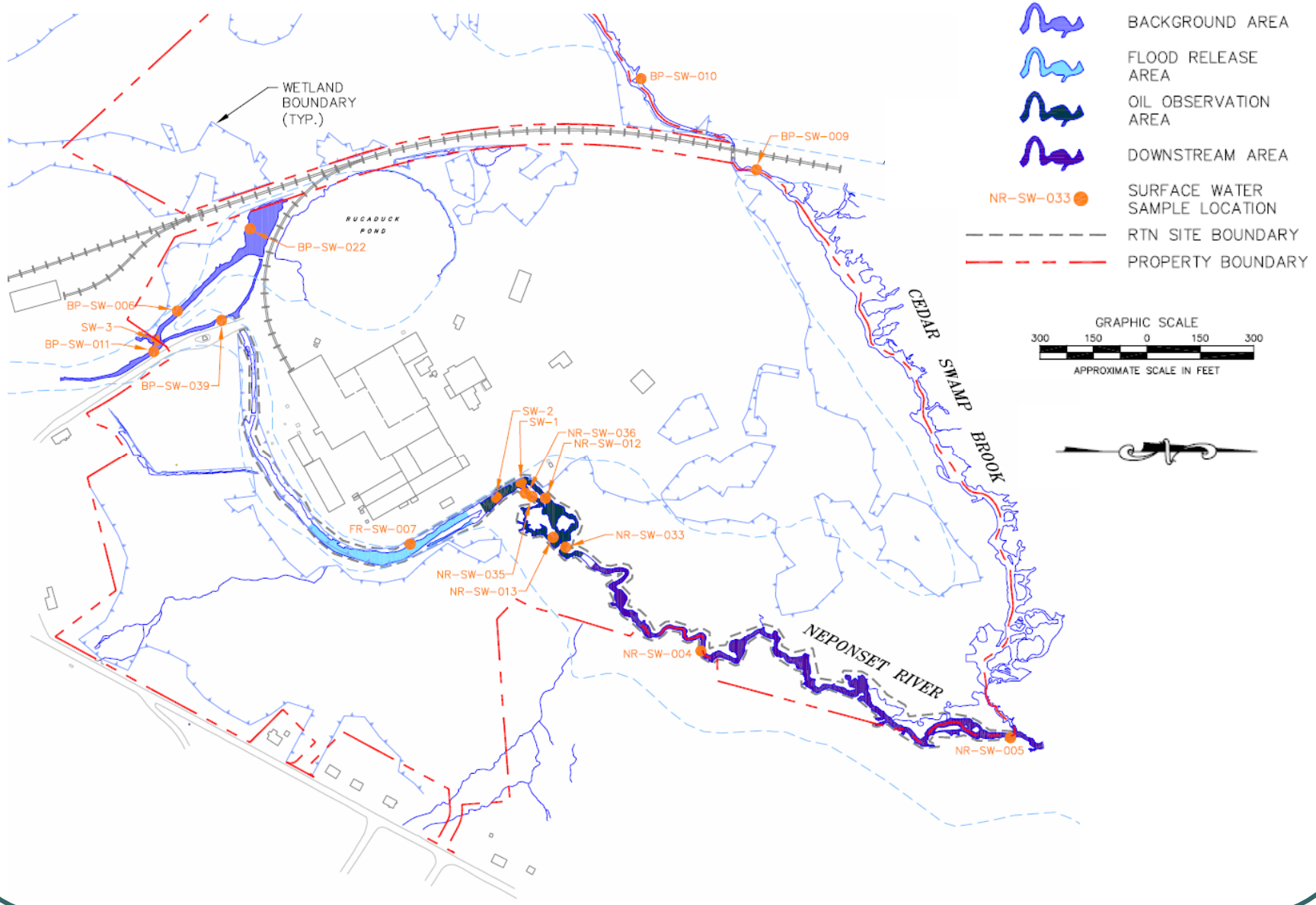


Table 7: Fish Tissue Data

PAHs (mg/kg)	Site	Reference	Metals (mg/kg)	Site	Reference
2-methylnaphthalene	<0.031	<0.031	antimony	< 0.028	< 0.027
acenapthene	0.037	0.031	arsenic	0.035	0.037
acenaphthylene	<0.031	<0.031	barium	3.9	2
anthracene	<0.031	<0.031	beryllium	< 0.0092	< 0.0091
benzo(a)anthracene	<0.031	<0.031	cadmium	0.016	0.035
benzo(a)pyrene	<0.031	<0.031	chromium	2.1	1.3
benzo(b)fluoranthene	<0.031	<0.031	copper	0.5	0.96
benzo(g,h,i)perylene	<0.031	<0.031	lead	0.1	0.19
benzo(k)fluoranthene	<0.031	<0.031	mercury	< 0.013	< 0.015
chrysene	<0.031	<0.031	nickel	1	0.59
dibenz(a,h)anthracene	<0.031	<0.031	selenium	< 0.28	< 0.27
fluoranthene	0.036	0.04	silver	< 0.0092	< 0.0091
fluorene	0.047	<0.031	thallium	< 0.0092	< 0.0091
indeno(1,2,3-c,d)pyrene	<0.031	<0.031	vanadium	0.065	0.12
naphthalene	<0.031	<0.031	zinc	15.5	18.4
phenanthrene	0.11	0.077			
pyrene	<0.031	0.043			

Contaminants of Concern

SEDIMENT	SURFACE WATER
EPH C19-C36 Aliphatics	**EPH** C19-C36 Aliphatics C11-C22 Aromatics
PAHs acenapthene anthracene benzo(k)fluoranthene fluorene naphthalene phenanthrene	**PAHs** fluorene phenanthrene
SVOCs Bis (2-ethylhexyl)phthalate butylbenzylphthalate	**SVOCs** 1,2,4-Trichlorobenzene
VPH C5-C8 Aliphatics	
Metals antimony arsenic barium beryllium cadmium chromium lead mercury nickel selenium silver thallium vanadium zinc	**Metals** barium beryllium cadmium chromium nickel

Components of a Human Health Risk Assessment

- Hazard Identification
- **Exposure Assessment**
- Dose Response
- Risk Characterization

Exposure Scenario

- Child wading (age 1 through 7)
  - 62 days per year
  - 2 hours per day for a total of 7 years
- Adult wading (age 8 through 31)
  - 62 days per year
  - 2 hours per day for a total of 23 years

Table 9: Exposure Point Concentrations in Sediment

Chemicals	FLOOD RELEASE AREA AVERAGE CONCENTRATION (mg/kg)	OIL OBSERVATION AREA AVERAGE CONCENTRATION (mg/kg)	DOWN GRADIENT AVERAGE CONCENTRATION (mg/kg)	SCREENING EXPOSURE POINT CONCENTRATION (mg/kg)
EPH				
C19-C36 Aliphatics	154.67	47.455	80.50	154.67
PAHs				
acenapthene		0.034		0.03
anthracene		0.083		0.08
benzo(k)fluoranthene		0.357		0.36
fluorene		0.056		0.06
naphthalene		0.333		0.33
phenanthrene		0.361		0.36
SVOCs				
Bis (2-ethylhexyl)phthalate	0.35			0.35
butylbenzylphthalate	0.17			0.17
VPH				
C5-C8 Aliphatics	2.75			2.75
Metals				
antimony	1.32	4.05	4.28	4.28
arsenic	1.26	9.22	12.55	12.55
barium	12.50	144.65	89.00	144.65
beryllium	0.02	1.69	1.11	1.69
cadmium	0.12	3.68	6.40	6.40
chromium	149.33	51.40	49.50	149.33
lead	13.60	301.82	140.50	301.82
mercury	0.29	1.17	1.04	1.17
nickel	155.00	35.49	33.50	155.00
selenium	0.73	1.17	2.13	2.13
silver	0.09	1.22	2.54	2.54
thallium		2.05		2.05
vanadium	4.67	61.42	36.00	61.42
zinc	155.33	246.92	270.00	270.00

Table 10: Exposure Point Concentrations in Surface Water

Chemicals	FLOOD RELEASE AREA AVERAGE CONCENTRATION (ug/l)	OIL OBSERVATION AREA AVERAGE CONCENTRATION (ug/l)	DOWN GRADIENT AVERAGE CONCENTRATION (ug/l)	EXPOSURE POINT CONCENTRATION (ug/l)
EPH				
C19-C36 Aliphatics	313.00	94.167		313.00
C11-C22 Aromatics	116.00			116.00
PAHs				
fluorene		0.220		0.22
phenanthrene		0.175		0.18
SVOCs				
1,2,4-Trichlorobenzene		0.470		0.47
Metals				
barium	30	34.417	26	34.42
beryllium		0.088		0.09
cadmium		0.068		0.07
chromium		1.223	0.420	1.22
nickel		2.372	1.700	2.37

Components of a Human Health Risk Assessment

- Hazard Identification
- Exposure Assessment
- **Dose Response**
- **Risk Characterization**

Table 14: Chronic Hazard Indices – Surface Water & Sediment

CHILD	INGESTION-SEDIMENT			DERMAL CONTACT-SEDIMENT			DERMAL CONTACT-SURFACE WATER			TOTAL
CHEM-ICALS	CADD (mg/kg/d)	RfD (mg/kg/d)	HI	CADD (mg/kg/d)	RfD (mg/kg/d)	HI	CADD (mg/kg/d)	RfD (mg/kg/d)	HI	
EPH	1.55E-04	2.03E+00	7.73E-05	2.52E-04	2.03E+00	1.26E-04	3.97E-03	2.03E+00	3.72E-02	3.74E-02
PAHs	4.12E-07	4.90E-01	1.25E-05	1.53E-06	4.90E-01	4.53E-05	2.33E-06	7.00E-02	6.67E-05	1.25E-04
SVOCs	5.23E-07	2.20E-01	1.84E-05	1.71E-07	2.20E-01	5.99E-06	1.98E-06	1.00E-02	1.98E-04	2.22E-04
VPH	2.75E-06	4.00E-02	6.87E-05	4.49E-05	4.00E-02	1.12E-03	0.00E+00	0.00E+00	0.00E+00	1.19E-03
Metals	9.63E-04	2.04E+00	3.18E-01	1.29E-03	2.04E+00	1.66E-01	1.53E-06	1.72E+00	1.58E-05	4.83E-01
TOTAL			**3.18E-01**			**1.67E-01**			**3.75E-02**	**5.22E-01**

Table 15: Incremental Lifetime Carcinogenic Risks - Sediment & Surface Water

CHILD	INGESTION-SEDIMENT			DERMAL CONTACT-SEDIMENT			
CHEMICALS	LADD (mg/kg/d)	SF (mg/kg/d)-1	ILCR	LADD (mg/kg/d)	SF (mg/kg/d)-1	ILCR	TOTAL
PAHs							
Benzo(k)fluoranthene	9.98E-09	7.30E-02	7.28E-10	1.16E-08	7.30E-02	8.49E-10	1.58E-09
SVOCs							
Bis (2-ethylhexyl)phthalate	3.50E-08	1.40E-02	4.90E-10	1.14E-08	1.40E-02	1.60E-10	6.50E-10
Metals							
arsenic	1.25E-06	1.50E+00	1.88E-06	6.14E-07	1.50E+00	9.21E-07	2.80E-06
			1.88E-06			**9.23E-07**	**2.80E-06**
ADULT							
CHEMICALS	LADD (mg/kg/d)	SF (mg/kg/d)-1	ILCR	LADD (mg/kg/d)	SF (mg/kg/d)-1	ILCR	TOTAL
PAHs							
Benzo(k)fluoranthene	5.14E-09	7.30E-02	3.75E-10	3.03E-08	7.30E-02	2.22E-09	2.59E-09
SVOCs							
Bis (2-ethylhexyl)phthalate	1.80E-08	1.40E-02	2.52E-10	2.98E-08	1.40E-02	4.17E-10	6.69E-10
Metals							
arsenic	6.46E-07	1.50E+00	9.68E-07	1.60E-06	1.50E+00	2.40E-06	3.37E-06
			9.69E-07			**2.41E-06**	**3.38E-06**
Total							**6.18E-06**

Human Health Risk Characterization Conclusions

- No Significant Risk of Harm to Human Health – (MCP Regulation)
  - Hazard Index < 1
  - Cancer Risk < 1 in 100,000
- Site
  - Hazard Index = 0.5
  - Cancer Risk = 0.6 in 100,000

Human Health Risk Characterization Conclusions

- No Significant Risk of Harm to Safety
  - No rusted drums or containers, no explosive hazards, and no corrosive, reactive or flammable materials present

Discussion Opportunity

Questions & Answers

Phase II Report Conclusions

- Actions were completed to remove one known source of release of oil to the River via Outfall 7 (the Flood Release);
- Actions were completed to prevent a suspected source of release of oil to the River via Outfall 2;

Phase II Report Conclusions (continued)

- Residual hydrocarbon compounds and metals are measurable in sediment at concentrations above background

- A condition of **No Significant Risk** to human health, public welfare, safety, and the environment exists for current and reasonably foreseeable future exposures

Phase II Report Conclusions (concluded)

- No further Phase Reports are required under the MCP.

Next Steps in the MCP Process

- Public Comment Period – Ends in 20 days (March 13, 2007)
- Response to Comments
- If Necessary, Reissuance of Phase II Report – Within 60 days of close of Comment Period (May 12, 2007)

Steps Following Phase II

- Evaluate Feasibility of Achieving Background
- Prepare Response Action Outcome Statement
- Public Comment
- File Final Response Action Outcome Statement

Discussion Opportunity

Questions & Answers

July 2006 PIP meeting follow-up

- In response to information/investigations referenced at the July 2006 PIP meeting, file/document reviews were conducted:
  - Town of Walpole Water & Sewer and Town Administrator's Offices
  - MassDEP Southeast Regional Office, Lakeville, MA
  - EPA Region I Office, Boston, MA
  - Massachusetts Water Resources Authority, Boston, MA

MCP Groundwater Category Determination

Groundwater Category Determination

- MCP Requires Determination of Appropriate Groundwater Category
- GW-1 – Applies to current or potential drinking water sources
- GW-2 – Applies to groundwater that is considered a potential source of vapors to the indoor air of a building
- GW-3 – Applies to all groundwater

Groundwater Category Determination

- Previous WESTON documents indicated that groundwater categories would be GW-3 for entire property, and GW-2 for areas within 30 ft of buildings
- Public comment received suggested that groundwater category should be GW-1

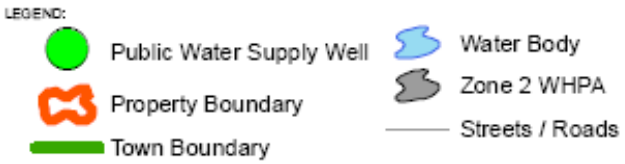
Groundwater Category Determination

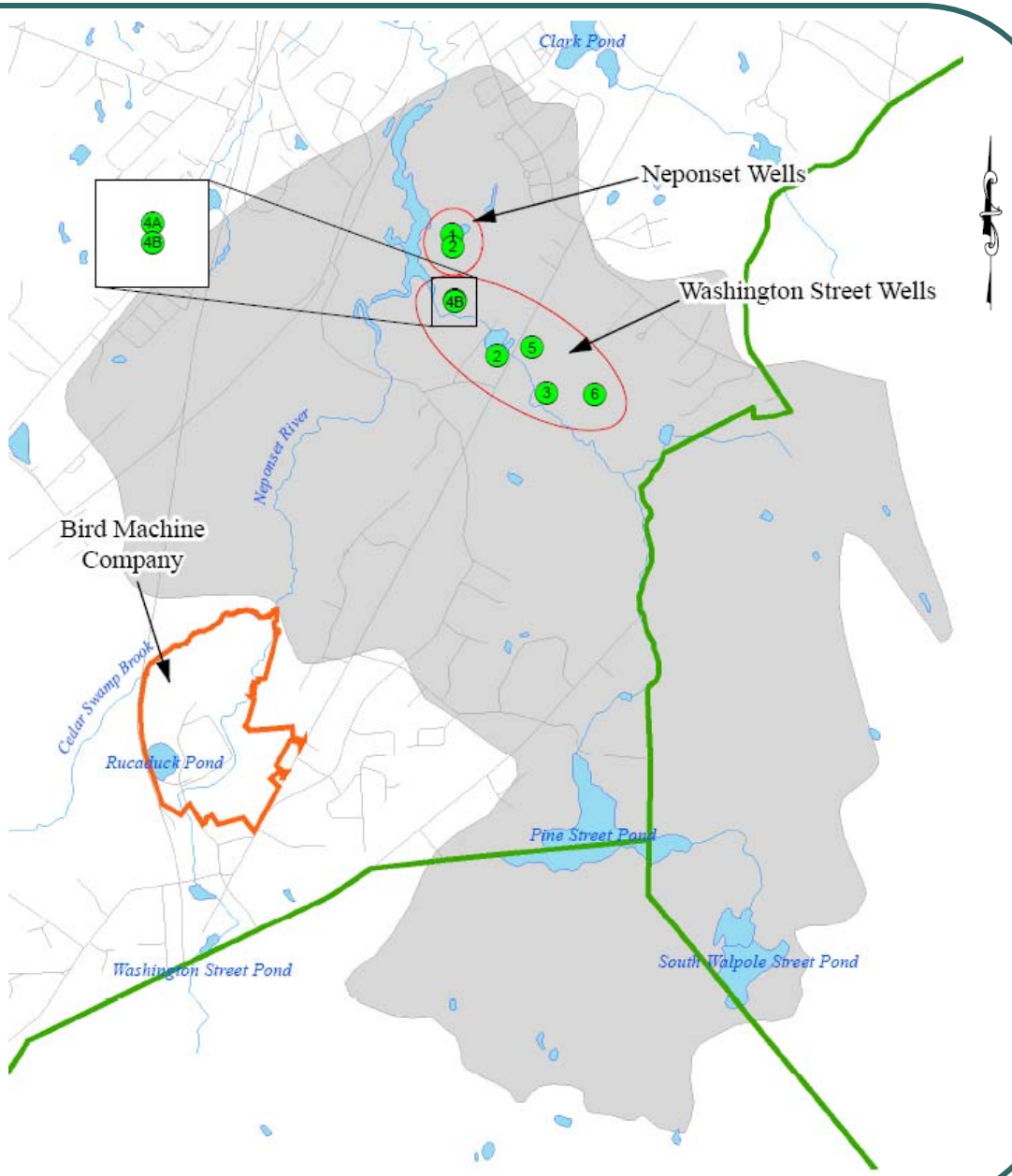
- Criteria for inclusion as a Category GW-1 (310 CMR 40.0932)
- Groundwater shall be defined as Category GW-1 if the groundwater is located
  - (a) within a Current Drinking Water Source Area
  - (b) within a Potential Drinking Water Source Area

Current Drinking Water Source Area - MCP Definition

- (a) Within Zone 2
- (b) Within the Interim Wellhead Protection Area
- (c) Within Zone A of a Class A Surface Water Body
- (d) Within 500 ft of a Private Water Supply Well

Walpole Public Water Supply Wells (School Meadow Brook) Zone 2 Boundary





Current Drinking Water Source Evaluation

- Bird Machine Company property is not located
  - Within Zone 2
  - Within Wellhead Protection Area
  - Within Zone A of a Class A Surface Water Body
  - within 500 ft of known private water supply wells

- Therefore, groundwater at the property is not located within a Current Drinking Water Source

Potential Drinking Water Source Area - MCP Definitions

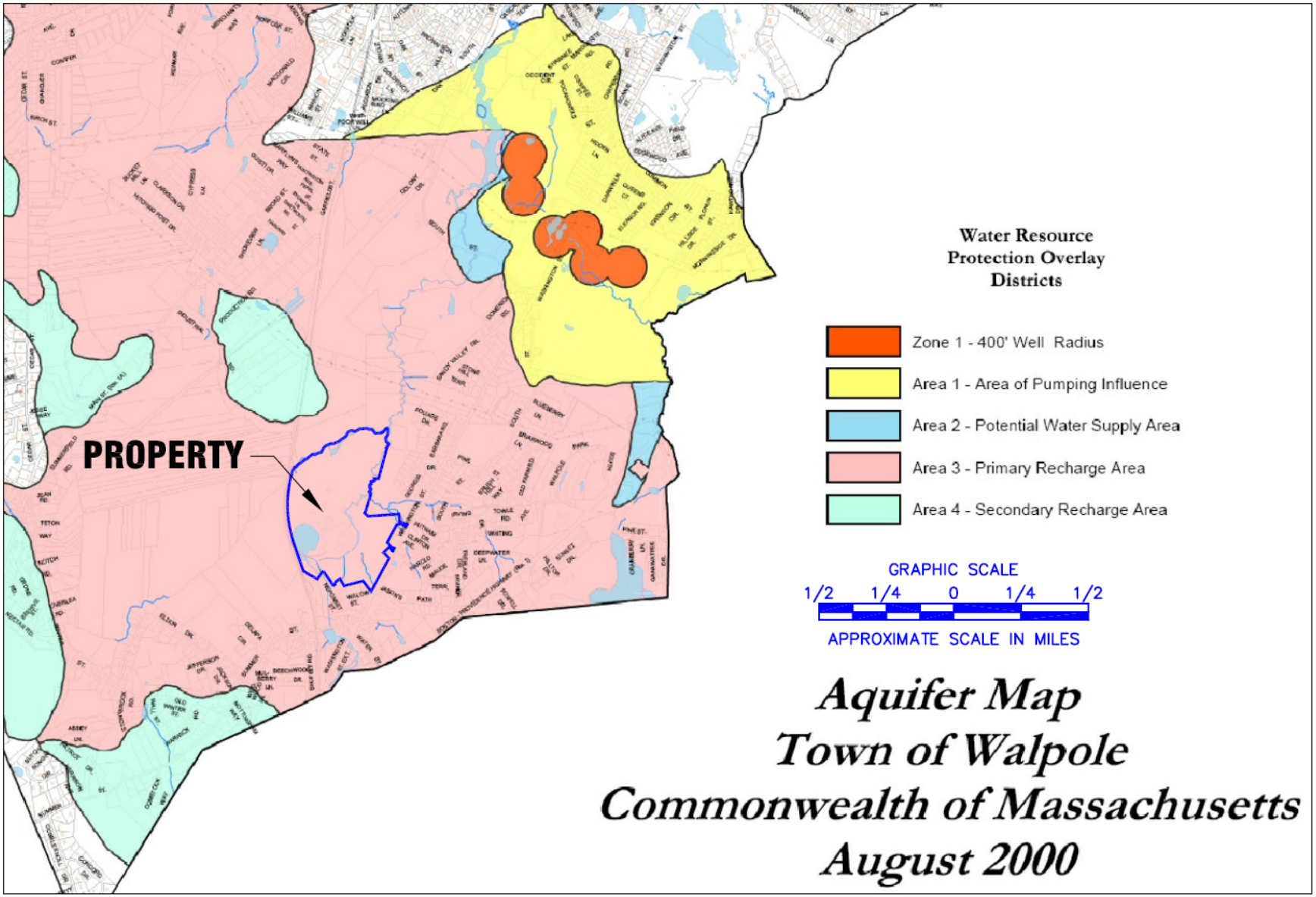
- (a) Not served by public water supply
- (b) Designated by a municipality to ensure its availability for use as a source of potable water supply
- (c) Located within a Potentially Productive Aquifer [designated by USGS as high (>300 gpm) or medium (100 – 300 gpm) yield aquifers]

Potential Drinking water source

- **This area is served by a Public Water supply.**

Walpole Ordinance Definitions

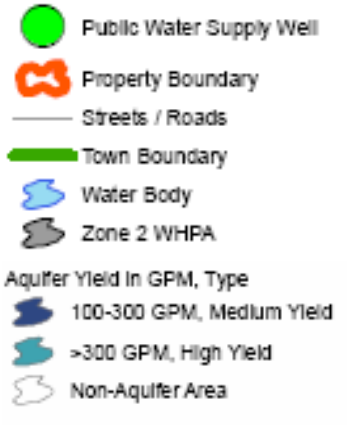
- Aquifer – “Contains significant amounts of potentially producible water”
  - e.g. School Meadow Brook well field, stratified drift aquifer, transmissivity exceeding 3,900 ft^2/day over 500+ acres
- Recharge Areas – Transmit water either directly or indirectly (via surface water) to an aquifer
  - e.g. Bird Machine property, transmissivity less than 400 ft^2/day, groundwater discharges to Cedar Swamp Brook and Neponset River

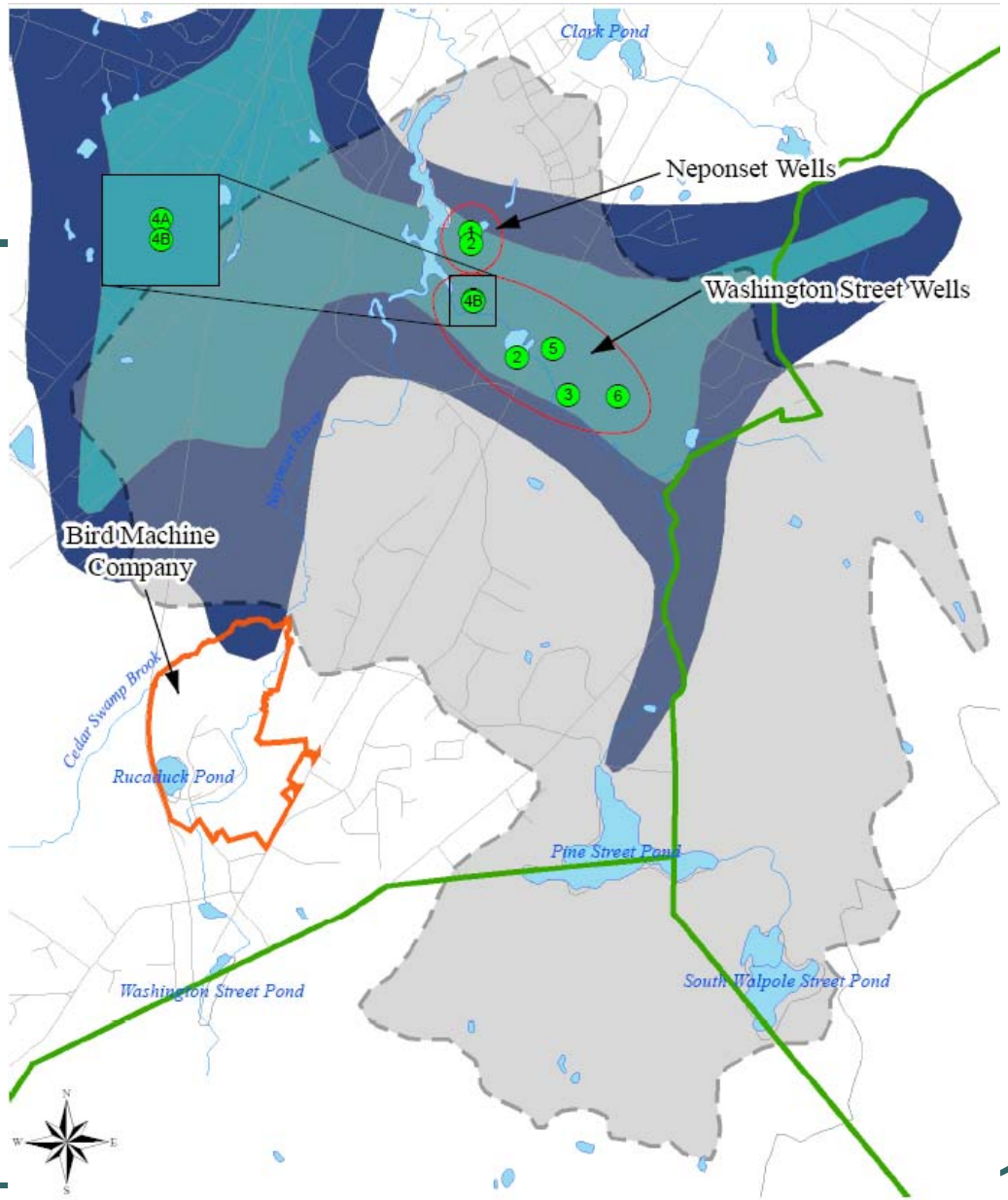

PROPERTY
Water Resource
Protection Overlay
Districts
Zone 1 - 400' Well Radius
Area 1 - Area of Pumping Influence
Area 2 - Potential Water Supply Area
Area 3 - Primary Recharge Area
Area 4 - Secondary Recharge Area
GRAPHIC SCALE
1/2 1/4 0 1/4 1/2
APPROXIMATE SCALE IN MILES
Aquifer Map
Town of Walpole
Commonwealth of Massachusetts
August 2000

Potential Drinking water source

- This area is served by a Public Water supply.
- **This area has not been designated for use as a source by the Town of Walpole.**

USGS High and Medium yield aquifer boundaries





High yield >300 gpm

Medium Yield 100-300 gpm

Potential Drinking Water Source

- This area is served by a Public Water Supply.
- This area has not been designated for use as a source.
- **A small portion of the northeast corner of the property is in a potential medium yield aquifer. None of the Bird MCP sites are in that area.**

Potential Drinking Water Source Evaluation – Additional Support

- Saturated soil thickness and soil transmissivity data collected by WESTON indicates this property does not overlay a high or medium yield aquifer.

Calculation of Maximum Pumping Rate

Equations:

u = 1.87(r**2)(S/Tt)

r =	0.333
S =	0.1
T =	2992
t =	90
u =	7.701E-08

Q = sT/114.6W(u)

W(u) =	15.802	(from table)
s =	20	

Solution:

Q = 33.04 gpm

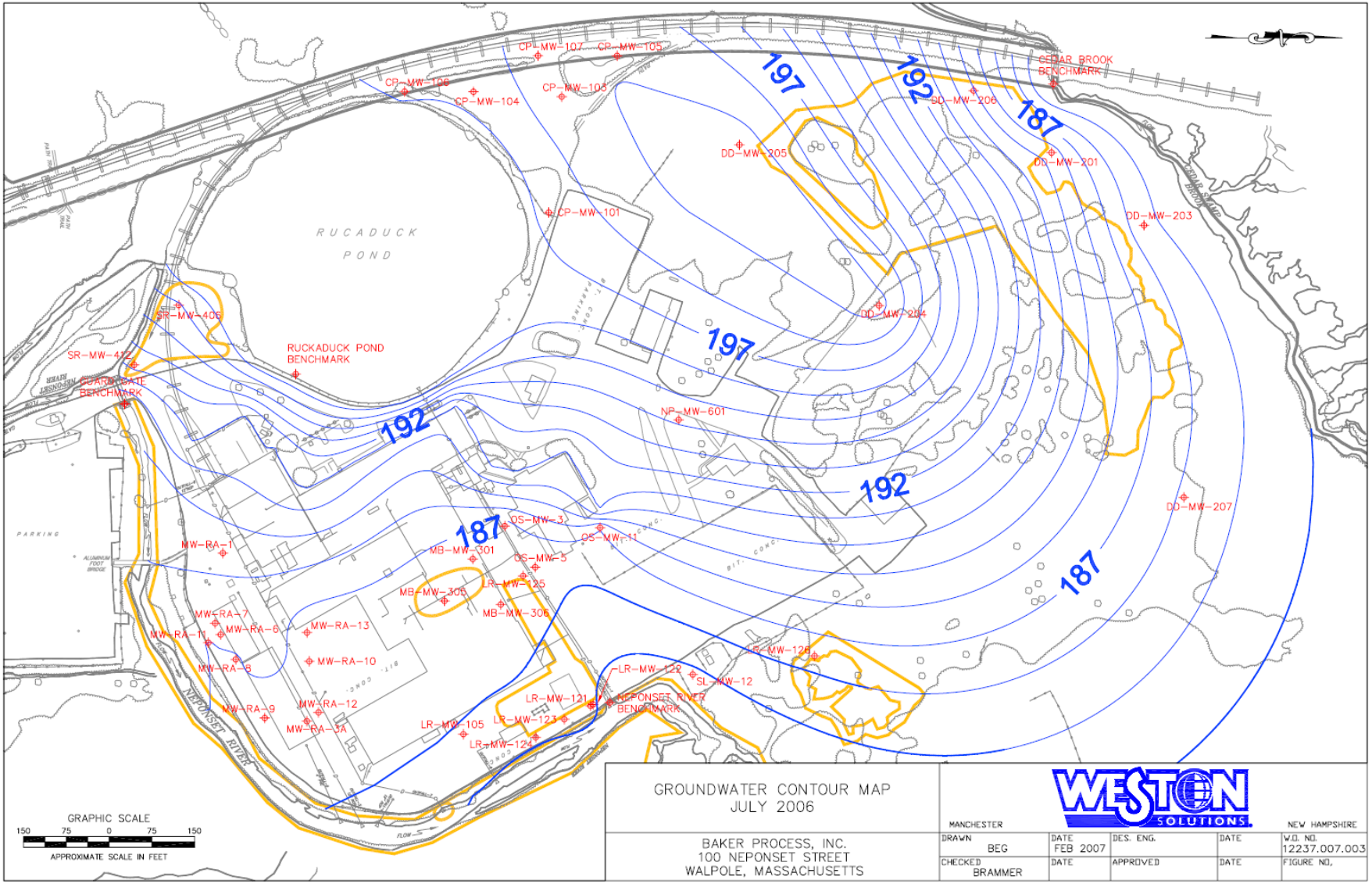
Terms:

T = Transmissivity(gal/day/ft)
s = Available Drawdown(ft)
S = Storativity(dimensionless)
r = Well Casing Radius(ft)
t = Time Since Pumping Starts(day)
Q = Discharge from Well(gpm)
u = Exponential Integral(calculated)
W(u) = Theis Well Function(from table)

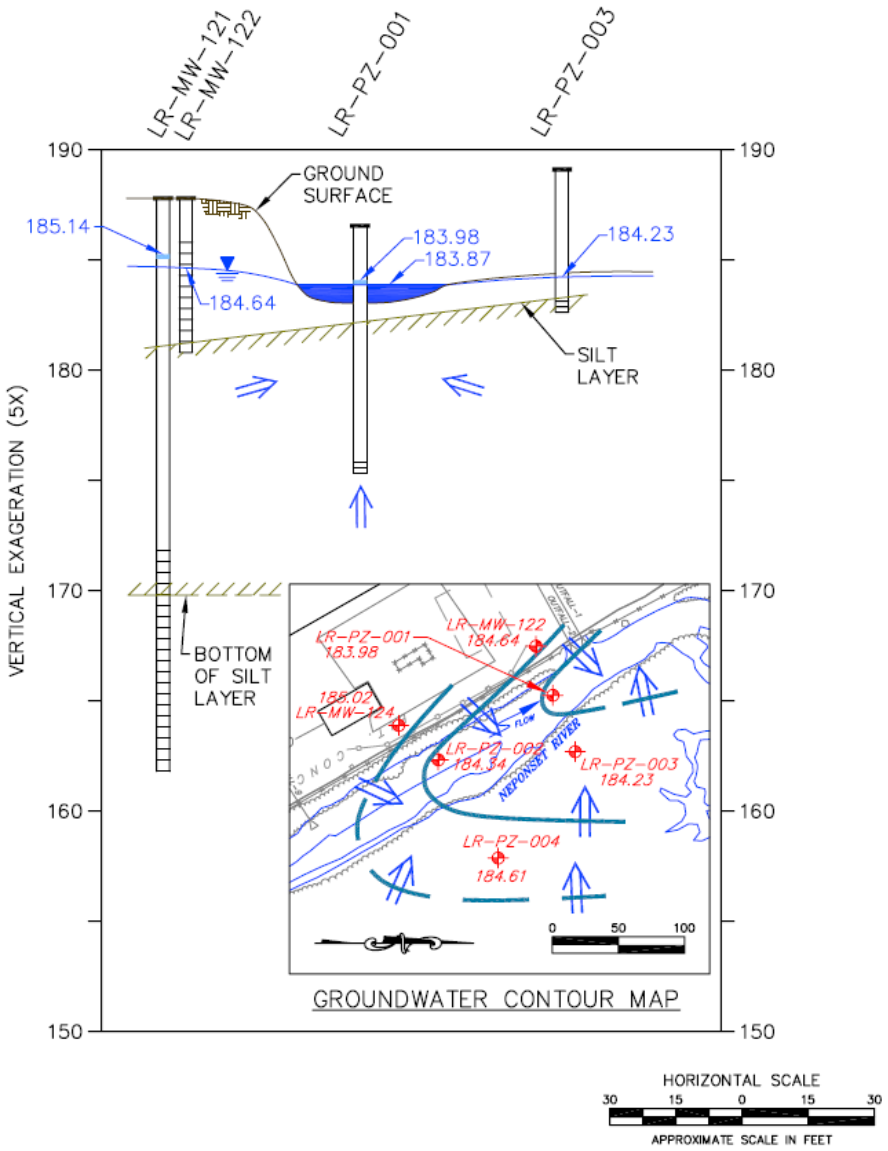
Groundwater Category Conclusion

- **MassDEP MCP GW-1 category does not apply at the MCP sites.**

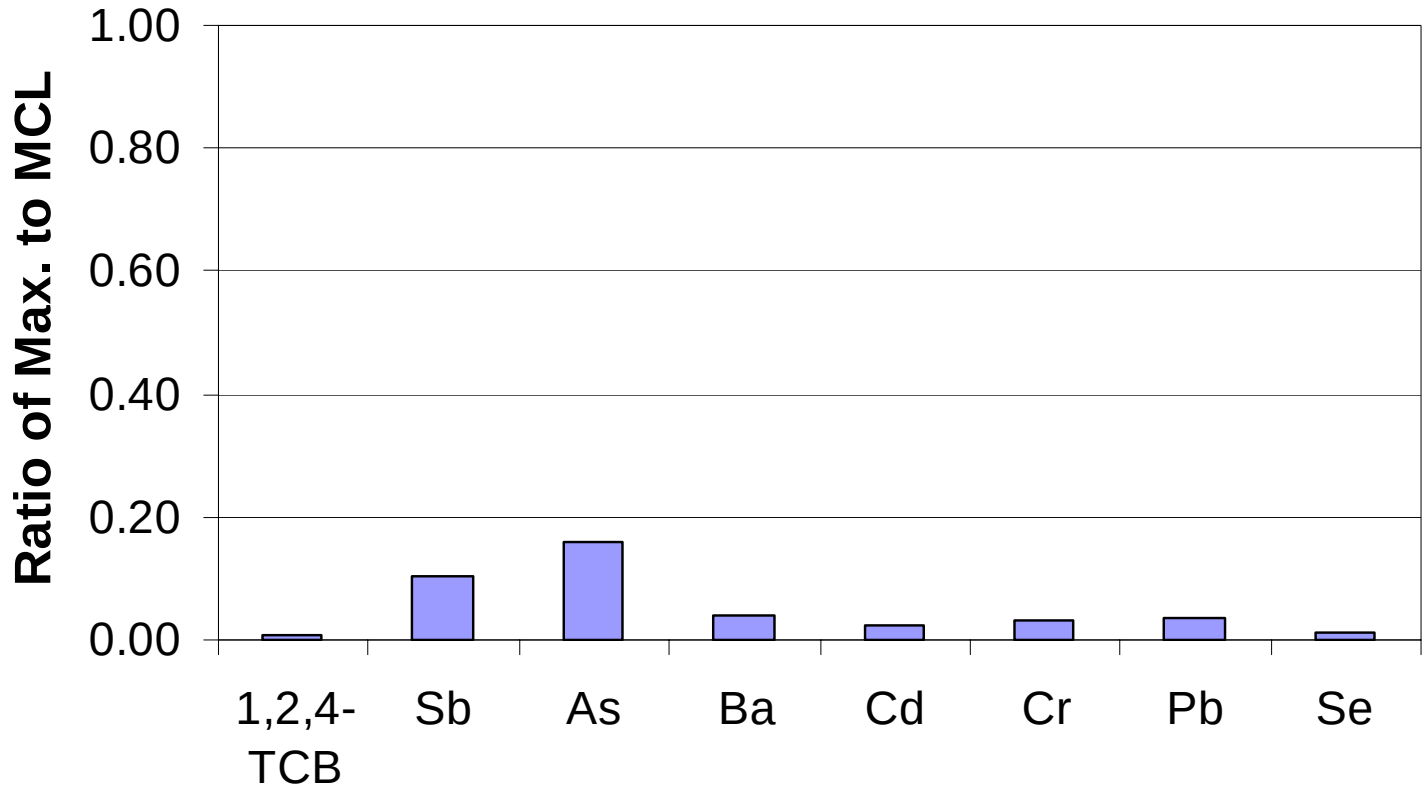
Property-Wide Groundwater Contours



Neponset River Groundwater Contours and Cross-section



Surface Water Concentrations compared to Drinking Water Standards



Conclusions Regarding Potential Impact of Bird Machine Company on Public Water Supply:

- Groundwater from BMC property discharges to the Neponset River and Cedar Swamp Brook
- The only pathway for contaminants to move from Bird Machine property to Public Water Supply is via the Neponset River
- Surface water samples from Neponset River and Cedar Swamp Brook did not have any exceedences of primary MCLs (drinking water standards)

Discussion Opportunity

Questions & Answers

Actions Planned for the Summer 2007

Lead Release Area
Demolition Debris Area
Manufacturing Building Area

Lead Release Area
RTN 4-3023513

- Submit Revised Release Abatement Measure Plan to remove debris from wetland buffer during Summer 2007
  - Restore Area 3 using clean cover and new vegetation
- Purpose is to reduce environmental risk
- Submit RAM Completion Report and delayed Phase II/III Reports in December 2007

Demolition Debris Area
RTN 4-3024105

- Western ACM (RTN 4-3025233) was linked to DDA in September 2006
- RAM Completion Report submitted in November 2006
- Phase II and Phase III reports are due in July 2007

Demolition Debris Area RTN 4-3024105 (Concluded)

- Perform preliminary Phase III evaluation of three possible alternatives
  - No action with deed restrictions and monitoring
  - Regrading and capping approximately 3 acres, with deed restrictions and monitoring
  - Excavation of approximately 30,000 cubic yards of debris and soil exceeding residential standards, with off-site transportation and disposal

New Reportable Release

- New release discovered when working in Manufacturing Building Area.
- Reportable release of metals and dioxin discovered near former lab
- Investigation to determine extent of release and potential impacts
- Dioxin in soil = 88 parts per trillion (ppt) verses 50 ppt reportable quantity
- Will be reported by 3/1/07

Manufacturing Building Area RTN 4-3024222

- Link South Rail Spur (RTN 4-0020129) to Manufacturing Building Area
- Phase II and Phase III reports are due in August 2007