SCANNED

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December 17, 2003

SL = Wyman

Ms. Kimberly N. Tisa
PCB Coordinator/Environmental Specialist
Office of Ecosystem Protection
EPA–New England, Region 1
1 Congress Street
Suite 1100 (CPT)
Boston, MA 02114-2023

Re: Combined MCP/EPA Risk Assessment Scope of Work
Former Tombarello & Sons Property
207 Marston Street
Lawrence, Massachusetts
3-18126

Dear Ms. Tisa:

The attached document presents the proposed Scope of Work (SOW) and assumptions to be used in the Risk Assessment for the Former Tombarello & Sons Property 207 Marston Street, Lawrence, Massachusetts. The SOW incorporates information obtained from the following sources:

- Historic sampling at the site as well as WESTON sampling in February, July, and September of 2003;
- Review of an approved Risk Assessment (GenCorp, Lawrence Location – ENSR, March 2003) already completed in compliance with both the Massachusetts Contingency Plan (MCP) and the Massachusetts Department of Environmental Protection (MDEP) Guidance For Disposal Site Risk Characterization (MDEP, 1996), as well as with current EPA risk assessment guidance and protocols;
- Discussions with you as to what protocols would need to be observed in order to ensure Toxic Substances Control Act (TSCA) compliance for risk-based site closure, as outline in Subpart O of TSCA;
- Discussions with the potential buyer as to possible reuse scenarios for the site, and accompanying assumptions regarding exposure to site contaminants; and

- Review of current literature and guidance from various sources regarding appropriate risk assessment assumptions for such items as toxicity factors, absorption factors, inhalation and ingestion rates, etc.

This SOW details the proposed assumptions to be used in the risk assessment and shows the sampling data currently proposed for use in the assessment. Weston would like to ensure that the assumptions and data proposed to be used in the assessment be agreed upon prior to expending the effort to produce a full risk assessment. Therefore, it is requested that this document be reviewed by you and/or your risk assessment group and comments be returned by January 16, 2004, in order to expedite completion of the Risk Assessment, and other MCP documentation including, but not limited to :

- The Phase 2 Comprehensive Site Assessment (CSA),
- The Phase 3 Remedial Action Plan (RAP), and
- The Phase 4 Remedy Implementation Plan (RIP)

Should you have any questions, please don't hesitate to contact me at (603) 656-5487. Thank you for your time and consideration in this matter.

Very truly yours,
WESTON SOLUTIONS, INC.

James P. Ricker, P.G.
Project Manager

/jpr
Attachments

CC: P. Donahue (MDEP)
J. Grifoni (First Lawrence Financial)
P. Hoskins (WESTON)

# SCOPE OF WORK
# HUMAN HEALTH RISK ASSESSMENT
# FORMER TOMBARELLO SONS PROPERTY
# 207 MARSTON STREET
# LAWRENCE, MASSACHUSETTS

3-18126

Prepared for:

**WESTON SOLUTIONS, INC.**
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Prepared by:

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December 2002
2003 ?

W.O. No. 13057.001.002

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# LIST OF ACRONYMS

| | |
|---|---|
| ADD | average daily exposure dose |
| ADE | average daily exposure |
| Baumgartner | W.Z. Baumgartner & Associates, Inc. |
| bgs | below ground surface |
| CSA | Comprehensive Site Assessment |
| EPA | U.S. Environmental Protection Agency |
| EPH | extractable petroleum hydrocarbons |
| ft | feet |
| HEA | Higgins Environmental Associates, Inc. |
| IRIS | Integrated Risk Information System |
| kg | kilogram |
| $m^3$ | cubic meters |
| MCP | Massachusetts Contingency Plan |
| MDEP | Massachusetts Department of Environmental Protection |
| mg | milligrams |
| PAHs | polycyclic aromatic hydrocarbons |
| PCBs | polychlorinated biphenyl compounds |
| ppm | parts per million |
| RAFs | relative absorption factors |
| RfC | Reference Concentrations |
| RfD | Reference Doses |
| SF | Slope Factor |
| Site | Tombarello & Sons Property |
| SVOCs | semi-volatile compounds |
| TPH | total petroleum hydrocarbons |
| UCL | upper concentration limit |
| VOCs | volatile organic compounds |
| VPH | volatile petroleum hydrocarbons |
| Weston® | Weston Solutions, Inc. |

# SECTION 1

# INTRODUCTION

# 1. INTRODUCTION

## 1.1 OBJECTIVE

On behalf of Weston Solutions, Inc. (Weston®), a human health risk assessment for the former Tombarello & Sons property located on Marston Street in Lawrence, Massachusetts will be performed in accordance with guidelines provided by the U.S. Environmental Protection Agency (EPA) and regulations consistent with the Massachusetts Contingency Plan (MCP), 310 CMR 40.0900. The purpose of this study will be to evaluate whether chemicals found in soil and ground water pose a significant risk to human health, public welfare or the environment, as defined in the MCP and by EPA.

## 1.2 METHODS

This risk assessment will performed in accordance with both EPA and Massachusetts Department of Environmental Protection (MDEP) guideline documents including the *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A), Interim Final* (EPA, 1989), *Guidance for Disposal Site Risk Characterization — In Support of the Massachusetts Contingency Plan* (MDEP, 1995), *Background Documentation for the Development of the MCP Numerical Standards* (MDEP, 1994), *Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of MDEP VPH/EPH Approach* (MDEP, 2002a), and other relevant guidance documents from the EPA.

The report will be organized as follows:

- Hazard identification
- Dose-response information
- Exposure assessment
- Risk characterization

# SECTION 2

# HAZARD IDENTIFICATION

# 2. HAZARD IDENTIFICATION

## 2.1 SITE DEFINITION

The location for this assessment is defined as the former Tombarello & Sons Property (Site). Marston Street is located on the western border of the Site, Hofmann Street is located on the northern border of the Site, and Route 495 is located on the eastern border of the Site. The Sons of Italy Lodge abuts the Site to the south. The Merrimack River is located approximately 400 feet (ft) east of the Site. In accordance with relevant Brownfields legislation, exempting new buyers from responsibility for historic releases to environmental media, this assessment considers only those risks posed to future on-site receptors and/or potential continuing releases to the environment. All future releases to both groundwater and surface water in the vicinity of the Site will be eliminated by either source removal or removal of transport pathways, such as storm drains, etc. Therefore, the river is not considered part of this Site in this assessment. The Site and the area surrounding the Site is zoned for medium intensity industrial uses. The Site is now vacant, but in recent years, it had been used as a metal recycling facility and scrap metal handling yard. See the *Phase 2 Comprehensive Site Assessment (CSA)*, (WESTON, 2004) for details.

## 2.2 REVIEW OF THE ANALYTICAL DATABASE

The data set for this assessment includes laboratory analytical data. Field screening data is not included in the dataset. The data set includes soil and ground water data collected by W.Z. Baumgartner & Associates, Inc. (Baumgartner) in 1998, soil and ground water data collected by Higgins Environmental Associates, Inc. (HEA) in 1999, soil data collected by Haley & Aldrich in 2001, and soil, sediment and ground water data collected by WESTON in 2003. WESTON performed an overall data quality review in accordance with the requirements of the MCP and a data validation under the EPA Region I protocols of the data from samples collected by WESTON. The following guidelines will be used to evaluate soil, sediment and ground water analytical data and to develop a list of chemicals of potential concern for the Site. Chemicals reported by the laboratory as estimated concentrations (i.e., flagged with a "J") will be considered to be representative of actual concentrations. Field duplicate samples

will be averaged. A concentration of one-half of the detection limit will be used to represent the possible presence of a chemical in samples in which the chemical was reported as not detected, unless it had not been positively detected in any samples in that particular medium. Samples reported as non-detect will be excluded if one-half the detection limit was greater than the maximum detected value in that medium.

Background concentrations will be considered for metals detected in soil. Background soil concentrations for metals will be based on concentrations considered by the MDEP to be typical of Massachusetts Background Concentrations (MDEP, 1992; 1994; 1995; 2002a). If the maximum concentration for a particular metal is detected at concentrations less than background conditions during these sampling rounds, then it will be eliminated from the list of chemicals of concern.

### 2.2.1 Soil Data Set for Risk Assessment

In July 1998, Baumgartner collected 15 soil samples between zero to 11 ft below ground surface (bgs) from nine soil borings (SB-1, SB-2, SB-3, SB-4, SB-6, SB-6, SS-7, SS-8, and SS-9). The samples were analyzed for semi-volatile compounds (SVOCs), RCRA 8 metals, volatile organic compounds (VOCs), pesticides and polychlorinated biphenyl compounds (PCBs), and total petroleum hydrocarbons (TPH) (gasoline and diesel range organics). The TPH data will not be included in the assessment.[1] The analytical data are shown is Table 1. Figure 1 of the *Phase 2 CSA* (WESTON, 2004) shows the locations of these samples.

In April 1999, HEA collected 24 soil samples between zero and six inches below the ground surface from eight locations. These locations included four samples on the south east side of the Site in the vicinity of WESTON monitoring well MW-7 (Baumgartner location SB#5); five samples in the vicinity of Baumgartner SS#8, five samples in the vicinity of Baumgartner SS#7; six samples in the vicinity of WESTON monitoring well MW-5 (Baumgartner location SB#6), and one sample from the following locations: F7, F2, ALL, and SB2-SS1. The samples were

[1] Note that HEA subsequently collected VPH and EPH samples in the locations where TPH was detected by Baumgartner. The EPH/VPH data will be used to assess risks due to petroleum compounds.

analyzed for extractable petroleum hydrocarbons (EPH) and polycyclic aromatic hydrocarbons (PAHs), cadmium and lead, volatile petroleum hydrocarbons (VPH) and target VOCs (including benzene, toluene, ethylbenzene, xylenes, naphthalene, and methyl-t-butyl ether), VOCs, and PCBs. Figure 1 of the *Phase 2 CSA* (WESTON 2004) shows the locations of these samples. The analytical data are shown in Table 2.

In September 2001, Haley and Aldrich collected 35 soil samples between zero and 15 ft bgs. The samples were collected primarily on the eastern/southeastern portions of the Site and in the vicinity of the Bailer Press Building. The samples were analyzed for PCBs. Figure 1 of the *Phase 2 CSA* (WESTON, 2004) shows the locations of these samples. The analytical data are shown in Table 3.

In February 2003, WESTON collected 28 soil samples from borings WSB-1 through WSB-12 and WSB-14 between zero and 7 ft bgs. The samples were analyzed for PCBs, EPH and PAHs, and RCRA metals. In July 2003, WESTON collected 15 additional samples from borings WSB-16 through WSB-18, WSB-21 and WSB-22 between 0 - 3 ft bgs in the vicinity of boring WSB-12. In addition, WESTON collected 15 soil samples between 0 - 3 ft bgs in the vicinity of boring WSB-12 and 18 soil samples between 0 – 3 ft bgs in the vicinity of boring WSB-6. The samples were analyzed for PCBs. Also, in July 2003, 44 composite samples were collected between 0 - 1 or 1 to 3 ft bgs. The Site was divided into a grid and each composite sample was collected from two of the grid areas. The samples were analyzed for PCBs. In September 2003, WESTON collected discrete samples from the areas that made up the composite samples with the elevated concentrations. WESTON collected five samples at all of the composite locations (one from the actual composite location, and one 10 ft off in each direction), with the exception of hot spot DE12, where only three perimeter samples could be collected because of the loading dock. One sample from each location was analyzed, and if the results indicated total PCB concentrations of 37.5 parts per million (ppm) or higher, then we took then the other four perimeter samples were analyzed as well to delineate lateral extent.] The samples were analyzed for PCBs. Figure 1 of the *Phase 2 CSA* (WESTON, 2004) shows the locations of these samples. The laboratory results for these samples are shown in Table 4.

### 2.2.2 Ground Water Data Set for Risk Assessment

In July 1998, Baumgartner collected ground water samples from monitoring wells MW-2, MW-2A, MW-3, MW-3A, and MW-4. The samples were analyzed for VOCs, pesticides and PCBs, total and dissolved metals, and SVOCs.

In June 1999, HEA collected ground water samples from monitoring wells MW-1, MW-5, MW-6, and MW-7. The samples were analyzed for VOCs and metals. Samples from monitoring wells MW-1 and MW-5 were also analyzed for VPH and target VOCs (including benzene, toluene, ethylbenzene, xylenes, naphthalene, and methyl-t-butyl ether) and EPH and PAHs.

In February 2003, WESTON collected ground water samples from monitoring wells MW-1, MW-5, MW-6, and MW-7. The samples were analyzed for VOCs and dissolved metals.

The ground water samples collected by Baumgartner, HEA, and WESTON between 1998 and 2003 will be used as the database for this assessment. Note that in many instances, wells from previous sampling rounds had been covered or destroyed, or could not be found. Therefore, new wells or geoprobe sampling devices were installed as close as possible to previous locations. All groundwater sampling locations are shown on Figure 1 of the *Phase 2 CSA* (WESTON, 2004). The analytical sampling results are shown in Table 5.

### 2.2.3 Sediment Data Set for Risk Assessment

In February 2003, WESTON collected three sediment samples. One sample was collected from a catch basin on the up gradient side of the Site, one sample was collected at an outfall area, which is connected to the Merrimack River, and one sample was collected from the river sediment. The samples were analyzed for EPH, PCBs and RCRA metals. The results are shown in Table 6. Catch basins, manholes and portions of the Merrimac historically had been sampled as well, by Haley and Aldrich, but these samples are not included in the assessment, as they represent a snapshot in time, and it is very likely that sediment concentrations have fluctuated over the years due to flushing or storm drains and scouring or other depositional activities in the river. WESTON samples were located in such a way as to recreate many of the previous sediment sampling locations. However, as noted in Subsection 2.1, under Brownfields, these data will not

be evaluated in this assessment, as the planned reuse of the site includes elimination of any pathways for future migration of site contaminants to the river.

# SECTION 3

# DOSE-RESPONSE ASSESSMENT

# 3. DOSE-RESPONSE ASSESSMENT

The dose-response assessment presents data relating potential doses received from exposure to chemicals to potential health effects (response). Information is provided in this section relative to the dose-response relationships for the chemicals of concern at the Site, based on available laboratory animal studies and human epidemiology as reported in the EPA's Integrated Risk Information System (IRIS) database, EPA's Health Effects Assessment Summary Tables, EPA's Health Risk Technical Support Center, and the *Background Documentation for the Development of the MCP Numerical Standards* (MDEP, 1994).

## 3.1 ASSESSMENT OF NONCARCINOGENIC HEALTH EFFECTS

Chronic oral Reference Doses (RfD) or chronic Reference Concentrations (RfC) will be used to evaluate noncarcinogenic effects. An RfD is a health-based criterion that will be used to evaluate noncarcinogenic effects from exposures involving ingestion or dermal contact. Likewise, subchronic RfDs have been developed to estimate noncarcinogenic health effects from subchronic exposures. MDEP defines a subchronic exposure as an exposure between several days and seven years (MDEP, 1995).[2] An RfC is a health-based criterion that will be used to evaluate noncarcinogenic effects from inhalation exposures. RfDs and RfCs are presented in Table 7.[3]

## 3.2 ASSESSMENT OF CARCINOGENIC HEALTH EFFECTS

Carcinogens are considered by EPA and MDEP policy to lack a threshold of no adverse effects; this policy implies that any exposure carries some risk. Cancer slope factors will be used to estimate risks resulting from oral and dermal exposures. Similarly, inhalation Unit Risks will be

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[2] Note that a subchronic RfD was published by HEAST (1997) for PCBs. The subchronic RfD will be used to evaluate risks to construction workers exposed over a six-month subchronic exposure period.

[3] MADEP RfD for lead will be used to evaluate non-carcinogenic health risks due to exposure to lead. Note that, in general, the use of this RfD generally results in a more conservative result.

used to evaluate cancer risks resulting from inhalation exposures. SFs and Unit Risks are presented in Table 7.

Carcinogens are classified by EPA using a weight-of-evidence classification system to indicate the degree of confidence between chemical exposure and the likelihood of causing human cancer. Classifications are based primarily on the degree of evidence for cancer to occur based on human and animal studies. EPA weight-of-evidence categories are:

- A, known human carcinogen.
- B1 or B2, probable human carcinogen (B1 indicates that limited human data are available; B2 indicates sufficient data in laboratory animals and inadequate or lack of evidence in humans).
- C, possible human carcinogen based on limited laboratory animal evidence and inadequate or lack of human data.
- D, not classifiable based on inadequate or no evidence.
- E, no evidence of carcinogenicity to humans. Carcinogenic risks will be evaluated for all Class A and B carcinogens and for Class C carcinogens if sufficient toxicity data is available to quantify risks.

General information and brief toxicological summaries for the chemicals of concern to human health at the Site will be presented. Where available, information will be derived from the IRIS database, from EPA Health Effects Assessment Summary Tables (EPA, 1992), from MDEP, and from the Agency of Toxic Substances and Disease Registry Toxicological Profiles.

# SECTION 4

# EXPOSURE ASSESSMENT

# SECTION 5

# RISK EVALUATION

# 5. RISK EVALUATION

## 5.1 METHODS TO EVALUATE NONCARCINOGENIC AND CARCINOGENIC RISKS

### 5.1.1 Estimation of Noncarcinogenic Risk

Noncarcinogenic effects are characterized in terms of a hazard index. This method assumes that there is an exposure below which adverse effects are not expected to occur (EPA, 1989a). The hazard index is calculated for each noncarcinogenic constituent of concern by dividing the average daily exposure concentration (ADE) in $mg/m^3$ by the chemical-specific RfC, also in

$$Hazard\ Index = \frac{ADE}{RfC}$$

$mg/m^3$, as shown in the equation below

or by dividing the average daily exposure dose (ADD) in mg/kg/day by the chemical-specific

$$Hazard\ Index = \frac{ADD}{RfD}$$

RfD, also in mg/kg/day, as shown in the equation below.

The hazard indices for each chemical will be summed to yield a hazard index for that particular exposure pathway. Then for each receptor, hazard indices for each exposure pathway are summed to yield a total hazard index for the receptor. This hazard index is a screening hazard index. If the screening hazard index exceeds one, then further evaluation will be needed to classify chemicals into groups that share similar mechanisms of action. In this case, a separate hazard index will be calculated for each group of chemicals that share similar mechanisms of action. If the hazard index for each group is less than one, risks associated with exposure to the chemicals are not considered to be significant.

### 5.1.2 Estimation of Carcinogenic Risk

The potential for carcinogenic health effects is characterized in terms of an incremental lifetime cancer risk, an estimate of the incremental lifetime probability of an individual developing cancer above background cancer incidence. An incremental lifetime carcinogenic risk is calculated for each chemical in the inhalation pathway by multiplying the lifetime ADE in $\mu g/m^3$ by the

$$Risk = ADE \times Unit\ Risk$$

chemical-specific Unit Risk in $(\mu g/m^3)^{-1}$ as shown in the equation below.

Likewise, the incremental lifetime cancer risk is calculated for each chemical in the ingestion and dermal exposure pathways by multiplying the lifetime ADD in mg/kg/day by the chemical-

$$Risk = ADD \times SF$$

specific cancer Slope Factor (SF) as shown in the equation below.

For each exposure pathway, the chemical-specific risks are summed together, then the risks for each exposure pathway are summed to yield a total risk for that particular medium. Finally, risks for all media of concern are summed to yield a total site risk for each receptor. A total incremental lifetime carcinogenic risk that does not exceed the acceptable total lifetime carcinogenic risk limit indicates that the exposure is unlikely to produce a significant risk of cancer above normal background rates. In accordance with the MCP, the acceptable lifetime carcinogenic risk limit is equal to $1 \times 10^{-5}$ (*i.e.*, one in 100,000).[6] This number represents the

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[6] Note that the MADEP acceptable risk limit is within the EPA acceptable risk range, which is equal to $10^{-4}$ to $10^{-6}$.

middle of the EPA acceptable lifetime cancer risk range of 1 by $10^{-6}$ to 1 by $10^{-4}$ (i.e., one in 1,000,000 to one in 10,000)

## 5.2 RISKS TO SAFETY AND PUBLIC WELFARE

The risks associated with exposure to the chemicals of potential concern at the Site will be evaluated in terms of safety, public welfare and the environment. MDEP has developed UCLs for chemicals detected in ground water and soil. Exposure point concentrations of chemicals detected in soil and ground water will be compared to UCLs. EPA does not have a provision to evaluate public welfare risk.

# SECTION 6

# REFERENCES

# 6. REFERENCES


Health Effects Summary Tables (HEAST). 1992, 1997. United States Environmental Protection Agency.

Integrated Risk Information System (IRIS). United States Environmental Protection Agency.

Massachusetts Contingency Plan. 1999. 310 CMR 40.0000.

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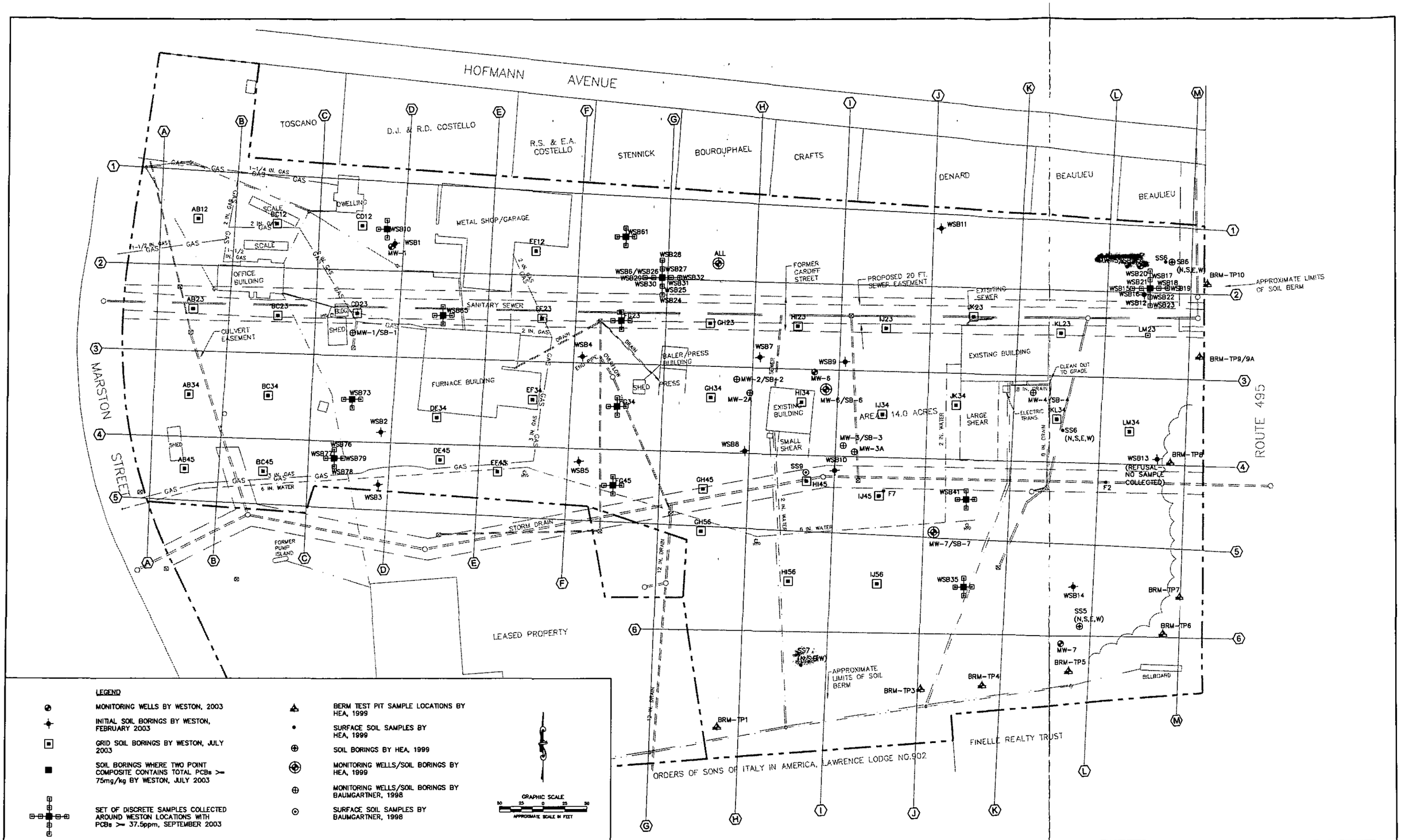
# FIGURE




LEGEND

- MONITORING WELLS BY WESTON, 2003
- INITIAL SOIL BORINGS BY WESTON, FEBRUARY 2003
- GRID SOIL BORINGS BY WESTON, JULY 2003
- SOIL BORINGS WHERE TWO POINT COMPOSITE CONTAINS TOTAL PCBs >= 75mg/kg BY WESTON, JULY 2003
- SET OF DISCRETE SAMPLES COLLECTED AROUND WESTON LOCATIONS WITH PCBs >= 37.5ppm, SEPTEMBER 2003
- BERM TEST PIT SAMPLE LOCATIONS BY HEA, 1999
- SURFACE SOIL SAMPLES BY HEA, 1999
- SOIL BORINGS BY HEA, 1999
- MONITORING WELLS/SOIL BORINGS BY HEA, 1999
- MONITORING WELLS/SOIL BORINGS BY BAUMGARTNER, 1998
- SURFACE SOIL SAMPLES BY BAUMGARTNER, 1998

| NO. | DATE | APPR. | REVISION |
|---|---|---|---|
| | | | |

FORMER TOMBARELLO & SONS SITE
MARSTON STREET
LAWRENCE, MASSACHUSETTS

WESTON SOLUTIONS
MANCHESTER NEW HAMPSHIRE

| | CHECKED | DATE | CLIENT APPROVALS | DATE |
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| | DES. ENG. | | | |
| | PROJ. ENG. | | | |
| | PROJ. MGR. | | | |
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# SAMPLE LOCATION MAP

| DRAWN | DATE | FIGURE NO. | REV. NO. |
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| TAC | DEC 2003 | 1 | |
| SCALE | W.O. NO. | SHT. | OF |
| AS SHOWN | 13057.001.002 | | |

# TABLES

**Table 1**
**Baumgartner Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| Analytes | SB1 0-2' 7/8/1998 | SB1 2'-4' 7/8/1998 | SB1 9'-11' 7/8/1998 | SB2 0-2' 7/8/1998 | SB2 2'-4' 7/8/1998 | SB3 0-2' 7/8/1998 | SB3 2'-4' 7/8/1998 | SB4 0-2' 7/8/1998 | SB4 [illegible] 7/8/1998 | SB5 4-6' 7/8/1998 | SB6 0-2' 7/8/1998 | SB6 4-6' 7/8/1998 | SS-7 0-6" 7/8/1998 | SS-8 0-6" 7/8/1998 | SS-9 0-6" 7/8/1998 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Semivolatile Organics (mg/kg)*** | | | | | | | | | | | | | | | |
| Acenaphthalene | 2.28 | N/A | N/A | <8.3 | N/A | <0.33 | N/A | 19.4 | 0.367 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Acenaphthene | <1.65 | N/A | N/A | <8.3 | N/A | <0.33 | N/A | <6.67 | <0.33 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Anthracene | 6.71 | N/A | N/A | <8.3 | N/A | 0.493 | N/A | 36 | 1.19 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Benzo(a)Anthracene | 24.6 | N/A | N/A | <8.3 | N/A | 1.96 | N/A | 58.6 | 3.95 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Benzo(a)Pyrene | 15.3 | N/A | N/A | <8.3 | N/A | 1.71 | N/A | 32.2 | 3.1 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Benzo(b)fluoranthene | 19.3 | N/A | N/A | <8.3 | N/A | 2.07 | N/A | 39.5 | 2 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Benzo(g,h,I)Perylene | 3.94 | N/A | N/A | <8.3 | N/A | 0.455 | N/A | 6.84 | 0.715 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Benzo(k)fluoranthene | 8.96 | N/A | N/A | <8.3 | N/A | 1.49 | N/A | 22.6 | 0.718 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Chrysene | 25 | N/A | N/A | <8.3 | N/A | 2.14 | N/A | 60.4 | 4.09 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Dibenzo(a,h)Anthracene | <1.65 | N/A | N/A | <8.3 | N/A | <0.33 | N/A | <6.67 | <0.33 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Fluoroanthene | 42.9 | N/A | N/A | <8.3 | N/A | 2.7 | N/A | 118 | 7.28 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Fluorene | 2.69 | N/A | N/A | <8.3 | N/A | <0.33 | N/A | 25.8 | 0.42 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Indeno(1,2,3-cd)Pyrene | 4.39 | N/A | N/A | <8.3 | N/A | 0.48 | N/A | 7.63 | 0.826 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| 2-Methylnaphthalene | <1.65 | N/A | N/A | <8.3 | N/A | <0.33 | N/A | <6.67 | <0.33 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Naphthalene | <1.65 | N/A | N/A | <8.3 | N/A | <0.33 | N/A | <6.67 | <0.33 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Phenanthrene | 29.4 | N/A | N/A | <8.3 | N/A | 1.99 | N/A | 143 | 4.23 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Pyrene | 56 | N/A | N/A | 12.1 | N/A | 4.24 | N/A | 141 | 9.56 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Dibenzofuran | <1.65 | N/A | N/A | <8.3 | N/A | <0.33 | N/A | 14 | <0.33 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Carbazole | 2.41 | N/A | N/A | <8.3 | N/A | <0.33 | N/A | 16.2 | 0.442 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Butylbenzylphthalate | <1.65 | N/A | N/A | <8.3 | N/A | <0.33 | N/A | <6.67 | 0.372 | N/A | <0.33 | N/A | N/A | N/A | N/A |
| Bis(2-ethylhexyl)phthalate | <1.65 | N/A | N/A | 15.8 | N/A | <0.33 | N/A | <6.67 | 2.24 | N/A | 0.524 | N/A | N/A | N/A | N/A |
| ***Metals (mgkg)*** | | | | | | | | | | | | | | | |
| Arsenic | | 3.22 | N/A | 2.74 | 3.18 | 9.52 | 4.4 | 5.73 | 13.3 | 3.99 | 3.62 | 4.2 | 10.7 | 11.8 | 4.98 |
| Barium | | 25.6 | N/A | 13.3 | 16.7 | 333 | 12.5 | 54 | 197 | 16.4 | 44.3 | 19.8 | 141 | 552 | 52.9 |
| Cadmium | | 2.62 | N/A | <0.98 | <0.99 | 2.67 | <1.01 | <0.99 | 5.78 | <1 | <1.01 | <0.95 | 8.19 | 4.95 | <0.96 |
| Chromium | | 10.1 | N/A | 6.46 | 8.55 | 60.4 | 8.69 | 33 | 57.4 | 7.19 | 14.5 | 7.63 | 62.3 | 64 | 38.3 |
| Lead | | 712 | N/A | 26.8 | 9.74 | 928 | 5.45 | 106 | 3470 | 8.58 | 37.4 | 4.01 | 672 | 4410 | 172 |
| Mercury | | <0.1 | N/A | 0.43 | <0.1 | 0.97 | <0.1 | 0.5 | 2.13 | <0.1 | <0.1 | <0.1 | 4.19 | 7.13 | 1.06 |
| Selenium | | <1.01 | N/A | <0.98 | <0.99 | <0.95 | <1.01 | <0.99 | <0.96 | <1 | <1.01 | <0.95 | <0.95 | <0.95 | <0.96 |
| Silver | | 2.21 | N/A | <0.98 | <0.99 | 1.71 | <1.01 | <0.99 | <0.96 | <1 | <1.01 | <0.95 | 20.8 | <0.95 | <0.96 |
| ***TARGET VOCs*** | | | | | | | | | | | | | | | |
| Benzene | <0.1 | N/A | N/A | <0.1 | N/A | <0.1 | N/A | <0.1 | <0.002 | N/A | <0.002 | N/A | N/A | N/A | N/A |
| Ethylbenzene | <0.1 | N/A | N/A | <0.1 | N/A | <0.1 | N/A | <0.1 | <0.002 | N/A | <0.002 | N/A | N/A | N/A | N/A |
| MtBE | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | <0.1 | N/A | N/A | <0.1 | N/A | <0.1 | N/A | <0.1 | <0.002 | N/A | <0.002 | N/A | N/A | N/A | N/A |
| Toluene | <0.1 | N/A | N/A | <0.1 | N/A | <0.1 | N/A | <0.1 | <0.002 | N/A | <0.002 | N/A | N/A | N/A | N/A |
| Xylenes | <0.1 | N/A | N/A | <0.1 | N/A | <0.1 | N/A | <0.1 | <0.002 | N/A | <0.002 | N/A | N/A | N/A | N/A |
| ***VOCSs*** | | | | | | | | | | | | | | | |
| Trichlorofluoromethane | <0.1 | N/A | N/A | <0.1 | N/A | <0.1 | N/A | <0.1 | <0.002 | N/A | <0.002 | N/A | N/A | N/A | N/A |
| Tetrachloroethene | <0.1 | N/A | N/A | <0.1 | N/A | <0.1 | N/A | <0.1 | <0.002 | N/A | <0.002 | N/A | N/A | N/A | N/A |
| 1,1,1-Trichloroethane | <0.1 | N/A | N/A | <0.1 | N/A | <0.1 | N/A | <0.1 | <0.002 | N/A | <0.002 | N/A | N/A | N/A | N/A |
| ***Pesticides/PCBs/Herbicides (mg/kg)*** | | | | | | | | | | | | | | | |
| Aroclor 1016 | <0.1665 | N/A | N/A | <0.0333 | N/A | <3.33 | N/A | <3.33 | <0.333 | N/A | <0.0333 | N/A | <0.333 | <0.333 | <0.333 |
| Aroclor 1221 | <0.333 | N/A | N/A | <0.0666 | N/A | <6.66 | N/A | <6.66 | <0.666 | N/A | <0.0666 | N/A | <0.666 | <0.666 | <0.666 |
| Aroclor 1232 | <0.1665 | N/A | N/A | <0.0333 | N/A | <3.33 | N/A | <3.33 | <0.333 | N/A | <0.0333 | N/A | <0.333 | <0.333 | <0.333 |
| Aroclor 1242 | <0.1665 | N/A | N/A | <0.0333 | N/A | <3.33 | N/A | <3.33 | <0.333 | N/A | <0.0333 | N/A | <0.333 | <0.333 | <0.333 |
| Aroclor 1248 | 3.092 | N/A | N/A | 0.6194 | N/A | <3.33 | N/A | <3.33 | 3.663 | N/A | <0.0333 | N/A | 3.696 | 7.193 | <0.333 |
| Aroclor 1254 | <0.1665 | N/A | N/A | <0.0333 | N/A | <3.33 | N/A | <3.33 | <0.333 | N/A | <0.0333 | N/A | <0.333 | <0.333 | <0.333 |
| Aroclor 1260 | 3.923 | N/A | N/A | 0.7659 | N/A | 59.27 | N/A | 0.6094 | 5.828 | N/A | 0.6793 | N/A | 2.707 | 3.397 | <0.333 |
| ***Other Analyses (mg/kg)*** | | | | | | | | | | | | | | | |
| TPH (GRO) | N/A | N/A | <5 | N/A | 5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <5 | 21.7 | <5 |
| TPH (DRO) | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2260 | 2740 | 1900 |

DRO = diesel range organics
GRO = gasoline range organics
mg/kg = milligrams per kilogram
PCBs = polycyclic biphenyls
TPH = total petroleum hydrocarbons
VOC = volatile organic compound

**Table 2**
**Higgins Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| | SB5 North 0-6" 4/28/1999 | SB5 South 0-6" 4/28/1999 | SB5 East 0-6" 4/28/1999 | SB5 West 0-6" 4/28/1999 | SS8 0-6" 4/28/1999 | SS8 North 0-6" 4/28/1999 | SS8 South 0-6" 4/28/1999 | SS8 East 0-6" 4/28/1999 | SS8 West 0-6" 4/28/1999 | SS7 0-6" 4/28/1999 | SS7 North 0-6" 4/28/1999 | SS7 South 0-6" 4/28/1999 | SS7 East 0-6" 4/28/1999 | SS7 West 0-6" 4/28/1999 | F2 0-6" 7/8/1998 | F7 0-6" 7/8/1998 | SB2-SS1 0-6" 7/8/1998 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EPH (ug/kg)** | | | | | | | | | | | | | | | | | |
| C9-C18 Aliphatics | 2,000 | <1.4 | <1.41 | <13.7 | <1.39 | | | | 1,200 | | | 1,100 | | | 2,400 | 550 | <3.45 |
| C19-C36 Aliphatics | 6,600 | 770 | 2,700 | 5,000 | 1,350 | | | | 8,900 | | | 8,800 | | | 23,800 | 5,500 | 1,900 |
| C11-C22 Aromatics | <3.4 | <1.4 | 620 | <13.7 | <1.39 | | | | <3.49 | | | <7.05 | | | <38 | <3.41 | <3.45 |
| **PAHs** | | | | | | | | | | | | | | | | | |
| Acenaphthalene | <3.4 | <1.4 | <1.41 | <13.7 | <1.39 | N/A | N/A | N/A | <3.49 | N/A | N/A | <7.05 | N/A | N/A | <38 | <3.41 | <3.45 |
| Acenaphthene | <3.4 | 3 | <1.41 | <13.7 | <1.39 | N/A | N/A | N/A | <3.49 | N/A | N/A | <7.05 | N/A | N/A | <38 | 6 | <3.45 |
| Anthracene | <3.4 | 6 | 2 | <13.7 | 4 | N/A | N/A | N/A | 14 | N/A | N/A | 35 | N/A | N/A | <38 | 19 | <3.45 |
| Benzo(a)Anthracene | 10 | 8 | 6 | <13.7 | 5 | N/A | N/A | N/A | 24 | N/A | N/A | 72 | N/A | N/A | <38 | 25 | <3.45 |
| Benzo(a)Pyrene | 11 | 9 | 7 | <13.7 | 9 | N/A | N/A | N/A | 44 | N/A | N/A | 38 | N/A | N/A | <38 | 26 | <3.45 |
| Benzo(b)fluoranthene | 15 | 12 | 13 | <13.7 | 9 | N/A | N/A | N/A | 40 | N/A | N/A | 61 | N/A | N/A | <38 | 32 | 5 |
| Benzo(g,h,I)Perylene | 12 | 8 | 10 | <13.7 | 13 | N/A | N/A | N/A | 51 | N/A | N/A | 69 | N/A | N/A | <38 | 46 | <3.45 |
| Benzo(k)fluoranthene | 11 | 8 | 10 | <13.7 | 8 | N/A | N/A | N/A | 34 | N/A | N/A | 53 | N/A | N/A | <38 | 22 | 5 |
| Chrysene | 18 | 11 | 10 | 21 | 12 | N/A | N/A | N/A | 51 | N/A | N/A | 84 | N/A | N/A | <38 | 51 | 7 |
| Dibenzo(a,h)Anthracene | <3.4 | <1.4 | <1.41 | <13.7 | <1.39 | N/A | N/A | N/A | <3.49 | N/A | N/A | <7.05 | N/A | N/A | <38 | <3.41 | <3.45 |
| Fluoroanthene | 24 | 18 | 12 | 26 | 15 | N/A | N/A | N/A | 68 | N/A | N/A | 120 | N/A | N/A | <38 | 87 | 8 |
| Fluorene | <3.4 | 4 | <1.41 | <13.7 | 2 | N/A | N/A | N/A | <3.49 | N/A | N/A | 52 | N/A | N/A | <38 | 10 | <3.45 |
| Indeno(1,2,3-cd)Pyrene | 9 | 6 | 7 | <13.7 | <1.39 | N/A | N/A | N/A | 42 | N/A | N/A | <7.05 | N/A | N/A | <38 | 39 | <3.45 |
| Naphthalene | <3.4 | <1.4 | <1.41 | <13.7 | <1.39 | N/A | N/A | N/A | <3.49 | N/A | N/A | <7.05 | N/A | N/A | <38 | <3.41 | <3.45 |
| 2-Methylnaphthalene | <3.4 | <1.4 | <1.41 | <13.7 | <1.39 | N/A | N/A | N/A | <3.49 | N/A | N/A | <7.05 | N/A | N/A | <38 | <3.41 | <3.45 |
| Phenanthrene | 13 | 15 | 5 | <13.7 | 9 | N/A | N/A | N/A | 32 | N/A | N/A | 72 | N/A | N/A | <38 | 67 | 6 |
| Pyrene | 23 | 16 | 12 | 25 | 14 | N/A | N/A | N/A | 69 | N/A | N/A | 120 | N/A | N/A | <38 | 71 | 7 |
| **Metals** | | | | | | | | | | | | | | | | | |
| Cadmium | 6.6 | 0.59 | 5.45 | 5.4 | 2.72 | 4.58 | 3.42 | 3.36 | 2.98 | N/A | N/A | N/A | N/A | N/A | 6.4 | 4.58 | 3.24 |
| Lead | 550 | 100 | [illegible] | [illegible] | 270 | 500 | 310 | 490 | 330 | N/A | N/A | N/A | N/A | N/A | 610 | 770 | 210 |
| ***VPH*** | | | | | | | | | | | | | | | | | |
| C5-C8 Aliphatics | <0.021 | 0.062 | <0.021 | <0.02 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.51 | <0.023 | N/A |
| C9-C12 Aliphatics | 2 | <0.025 | <0.021 | <0.02 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.7 | <0.023 | N/A |
| C9-C10 Aromatics | 0.58 | <0.025 | <0.021 | <0.02 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 8.1 | 0.29 | N/A |
| **Target VOCs** | | | | | | | | | | | | | | | | | |
| Benzene | <0.021 | 0.130 | <0.021 | <0.02 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.081 | <0.023 | N/A |
| Ethylbenzene | <0.021 | <0.025 | 0.044 | 0.050 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.190 | 0.280 | N/A |
| MtBE | <0.021 | 0.480 | <0.021 | <0.02 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.340 | <0.023 | N/A |
| Naphthalene | <0.021 | 1.900 | <0.021 | <0.02 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1.900 | 3.400 | N/A |
| Toluene | 0.047 | 0.040 | 0.058 | 0.087 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.850 | 0.065 | N/A |
| Xylenes | 0.114 | <0.025 | 0.350 | 0.300 | | | | | | | | | | | 1.710 | 2.170 | |
| **VOCs by 8260** | | | | | | | | | | | | | | | | | |
| Trichlorofluoromethane | 1 | 0.2 | 0.69 | 0.72 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3 | 3 | N/A |
| 1,1,1-Trichloroethane | <0.001 | <0.001 | <0.001 | <0.001 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <0.001 | <0.001 | N/A |
| Tetrachloroethene | 0.22 | <0.001 | <0.001 | 0.079 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <0.001 | <0.001 | N/A |
| **PCBs** | | | | | | | | | | | | | | | | | |
| Aroclor 1016/1242 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 2000.0 |
| Aroclor 1221 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| Aroclor 1232 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aroclor 1248 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aroclor 1254 | [illegible] | <0.0001 | [illegible] | [illegible] | 1.0 | [illegible] | [illegible] | [illegible] | [illegible] | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 6100.0 | 3000.0 | <0.0001 |
| Aroclor 1260 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 3200.0 | 2600.0 | 3200.0 | 3500.0 | 2900.0 | <0.0001 | <0.0001 | <0.0001 |

EPH = extractable petroleum hydrocarbons
PAH = polycyclic aromatic hydrocarbons
PCB = polycyclic biphenyls
VOC = volatile organic hydrocarbon
VPH = volatile petroleum hydrocarbons
ug/kg = micrograms per kilogram

**Table 2**
**Higgins Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| | ALL 0-6" 7/8/1998 | SB6-SS1 0-6" 7/8/1998 | SB6-SS2 0-6" 6/4/1999 | SB6-N1 0-6" 6/4/1999 | SB6-E1 0-6" 6/4/1999 | SB6-S1 0-6" 6/4/1999 | SB6-W1 0-6" 6/4/1999 |
|---|---|---|---|---|---|---|---|
| **EPH (ug/kg)** | | | | | | | |
| C9-C18 Aliphatics | <3.44 | <3.62 | N/A | N/A | N/A | N/A | N/A |
| C19-C36 Aliphatics | **700** | **1,300** | N/A | N/A | N/A | N/A | N/A |
| C11-C22 Aromatics | <3.44 | <3.62 | N/A | N/A | N/A | N/A | N/A |
| **PAHs** | | | | | | | |
| Acenaphthalene | <3.44 | <3.62 | N/A | N/A | N/A | N/A | N/A |
| Acenaphthene | <3.44 | **8** | N/A | N/A | N/A | N/A | N/A |
| Anthracene | **4** | **15** | N/A | N/A | N/A | N/A | N/A |
| Benzo(a)Anthracene | **8** | **24** | N/A | N/A | N/A | N/A | N/A |
| Benzo(a)Pyrene | **10** | **26** | N/A | N/A | N/A | N/A | N/A |
| Benzo(b)fluoranthene | **10** | **32** | N/A | N/A | N/A | N/A | N/A |
| Benzo(g,h,I)Perylene | <3.44 | **51** | N/A | N/A | N/A | N/A | N/A |
| Benzo(k)fluoranthene | **9** | **24** | N/A | N/A | N/A | N/A | N/A |
| Chrysene | **15** | **45** | N/A | N/A | N/A | N/A | N/A |
| Dibenzo(a,h)Anthracene | <3.44 | <3.62 | N/A | N/A | N/A | N/A | N/A |
| Fluoroanthene | **18** | **61** | N/A | N/A | N/A | N/A | N/A |
| Fluorene | <3.44 | **11** | N/A | N/A | N/A | N/A | N/A |
| Indeno(1,2,3-cd)Pyrene | <3.44 | **37** | N/A | N/A | N/A | N/A | N/A |
| Naphthalene | <3.44 | **5** | N/A | N/A | N/A | N/A | N/A |
| 2-Methylnaphthalene | <3.44 | <3.62 | N/A | N/A | N/A | N/A | N/A |
| Phenanthrene | **13** | **62** | N/A | N/A | N/A | N/A | N/A |
| Pyrene | **16** | **50** | N/A | N/A | N/A | N/A | N/A |
| **Metals** | | | | | | | |
| Cadmium | **4.57** | **8.21** | N/A | N/A | N/A | N/A | N/A |
| Lead | **160** | **790** | N/A | N/A | N/A | N/A | N/A |
| ***VPH*** | | | | | | | |
| C5-C8 Aliphatics | <0.026 | <0.028 | N/A | N/A | N/A | N/A | N/A |
| C9-C12 Aliphatics | <0.026 | <0.028 | N/A | N/A | N/A | N/A | N/A |
| C9-C10 Aromatics | <0.026 | <0.028 | N/A | N/A | N/A | N/A | N/A |
| **Target VOCs** | | | | | | | |
| Benzene | <0.026 | <0.028 | N/A | N/A | N/A | N/A | N/A |
| Ethylbenzene | <0.026 | <0.028 | N/A | N/A | N/A | N/A | N/A |
| MtBE | <0.026 | <0.028 | N/A | N/A | N/A | N/A | N/A |
| Naphthalene | **2.900** | <0.028 | N/A | N/A | N/A | N/A | N/A |
| Toluene | <0.026 | <0.028 | N/A | N/A | N/A | N/A | N/A |
| Xylenes | <0.026 | <0.028 | | | | | |
| **VOCs by 8260** | | | | | | | |
| Trichlorofluoromethane | **0.11** | **0.47** | N/A | N/A | N/A | N/A | N/A |
| 1,1,1-Trichloroethane | <0.001 | **0.25** | N/A | N/A | N/A | N/A | N/A |
| Tetrachloroethene | <0.001 | <0.001 | N/A | N/A | N/A | N/A | N/A |
| **PCBs** | | | | | | | |
| Aroclor 1016/1242 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aroclor 1221 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| Aroclor 1232 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aroclor 1248 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aroclor 1254 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aroclor 1260 | <0.0001 | 57000.0 | <0.0001 | 92000.0 | 3800.0 | <0.0001 | <0.0001 |

EPH = extractable petroleum hyd
PAH = polycyclic aromatic hydro

**Table 3**
**Haley and Aldrich Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| Sample ID | B4 | D5 | E4 | F2 | F4 | G3 | BLR-TP2 | G4 | H2 | H3 | BLR-TP1 | BLR-TP1 | BRM-TP1 | H6 | I3 | I4 | J1 | J5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grid ID | B4 | D5 | E4 | F2 | F4 | G3 | G3 | G4 | H2 | H3 | H3 | H3 | H6 | H6 | I3 | I4 | J1 | J5 |
| Depth | 0-1' | 0-1' | 0-1' | 0-1' | 0-1' | 0-1' | 0-1' | 0-1' | 0-1' | 0-1' | 1.5-2' | 3-4.5' | 4-6' | 0-1' | 0-1' | 0-1' | 0-1' | 0-1' |
| Aroclor 1016 | | | | | | | | | | **6.5** | **3.2** | **2.1** | | **8.7** | | **0.81** | | |
| Aroclor 1242 | | | | | | **64** | | | | | | | | | | | | |
| Aroclor 1254 | | | | | | | | | | | | | | | | | | |
| Aroclor 1260 | **0.85** | **52** | **15** | **26** | **11** | | **2** | **21** | **11** | **37** | **2.8** | **3.6** | **13** | **8.2** | **43** | **2.2** | **2.6** | **0.74** |

| Sample ID | BRM-TP3 | SCC-1 | BRM-TP4 | BRM-TP4 | L5 | BRM-TP5 | M2 | BRM-TP10 | SM2-3 | BRM-TP9/9A | M3 | BRM-TP8 | BRM-TP8 | M4 | BRM-TP7 | BRM-TP7 | BRM-TP6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grid ID | J6 | K6 | K6 | K6 | L5 | L6 | M2 | M2 | M2 | M3 | M3 | M4 | M4 | M4 | M5 | M5 | M6 |
| Depth | 9-11' | 0-1' | 3.5-5' | 6-7' | 0-1' | 9-11' | 0-1' | 0-1' | 0-1' | 4-6' | 0-1' | 4-5' | 5-6' | 0-1' | 3-6' | 12-15' | 11-13' |
| Aroclor 1016 | **2.6** | | | **9.3** | | **11** | | | | | | | | | | **0.37** | **4.5** |
| Aroclor 1242 | | | | | | | | | | | | | | **66** | | | |
| Aroclor 1254 | | | | | | | | **0.86** | | | **9.2** | **11** | **0.68** | | | | |
| Aroclor 1260 | **9.3** | **3.2** | **78** | **62** | **3.8** | **60** | **1.4** | **1.1** | **2.8** | **42** | **2.4** | | **0.47** | | **9.9** | **0.57** | **11** |

**Table 4**
**WESTON Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| **Sample ID** | WSB-1 | WSB-1 | WSB-2 | WSB-2 | WSB-3 | WSB-3 | WSB-4 | WSB-4 | WSB-5 | WSB-5 | WSB-6 | WSB-6 | WSB-7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 |
| **Sample Depth (feet bgs)** | 1-3 | 3-5 | 1-3 | 3-5 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 |
| | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **EPH** | | | | | | | | | | | | | |
| C9-C18 Aliphatics | <27.1 | <31.4 | **369** | <619 | <29.2 | <138 | <27.5 | <30.9 | <90.1 | <164 | <28.4 | <32.1 | <27.9 |
| C19-C36 Aliphatics | **123** | <31.4 | **1650** | **7300** | **545** | **497** | **399** | <30.9 | **345** | **812** | **311** | <32.1 | **582** |
| C11-C22 Aromatics | **375** | <31.4 | **983** | **1670** | **182** | **1140** | **150** | <30.9 | **968** | **272** | **527** | <32.1 | **136** |
| **Metals** | | | | | | | | | | | | | |
| Arsenic | **6.1** | **5.88** | **7.42** | **11** | **5.49** | **6.75** | **8.97** | **15.6** | **13.6** | **14.2** | **17.9** | **8.52** | **9.89** |
| Barium | **106** | **64** | **107** | **166** | **74.4** | **142** | **156** | **52.9** | **344** | **867** | **55.8** | **19.4** | **70.6** |
| Cadmium | **4.01** | <0.796 | **716** | **20** | **1.82** | **3.86** | **2.88** | <0.796 | **3.75** | **5.77** | **1.61** | <0.801 | **2.3** |
| Chromium | **23.2** | **12.4** | **34.4** | **220** | **27.5** | **30.7** | **29.1** | **15.5** | **40** | **52.2** | **29.6** | **12.6** | **48.6** |
| Lead | **1180** | **159** | **1330** | **168** | **389** | **563** | **381** | **30.2** | **2700** | **1260** | **92.2** | <8.01 | **215** |
| Mercury | **2.71** | **0.145** | **1.17** | **0.367** | **3.07** | **2.42** | **0.912** | <0.0392 | **1.07** | <1.86 | **0.327** | <0.0414 | **1.39** |
| Selenium | <7.1 | <7.96 | <6.89 | <10.7 | <7.94 | <7.12 | <6.87 | <7.96 | <7.48 | <8.66 | <6.89 | <8.01 | <7.12 |
| Silver | <0.71 | <0.796 | <0.689 | <1.07 | <0.794 | <0.712 | <0.687 | <0.796 | <0.748 | <0.866 | <0.689 | <0.801 | <0.712 |
| **Total PCBs** | **1.6** | **0.05** | **26.4** | <0.05 | **0.27** | **21.8** | **9.8** | **0.25** | **1.9** | **7** | **2.700** | **34** | **0.8** |

**Table 4**
**WESTON Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| **Sample ID** | WSB-7 | WSB-8 | WSB-8 | WSB-9 | WSB-9 | WSB-10 | WSB-10 | WSB-11 | WSB-11 | WSB-12 | WSB-12 | WSB-14 | WSB-14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 | 2/12/03 |
| **Sample Depth (feet bgs)** | 1-3 | 1-3 | 3-5 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 |
| | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **EPH** | | | | | | | | | | | | | |
| C9-C18 Aliphatics | <27.5 | <133 | **45** | <31.6 | <32.4 | <137 | **63.5** | <144 | <144 | <142 | <30.1 | <28.2 | **1750** |
| C19-C36 Aliphatics | **126** | **219** | **826** | **104** | <32.4 | **2310** | **557** | **361** | **918** | **396** | <30.1 | **250** | **6980** |
| C11-C22 Aromatics | **83.9** | **240** | **255** | <31.6 | <32.4 | **70.6** | **214** | **739** | **649** | **156** | <30.1 | **72.1** | **1955** |
| **Metals** | | | | | | | | | | | | | |
| Arsenic | **6.13** | **4.49** | **8.1** | **7.33** | **5.56** | **69.4** | **10.8** | **6.04** | **14.3** | **8.51** | <3.91 | <3.69 | **14.05** |
| Barium | **197** | **35.3** | **184** | **228** | **18.9** | **195** | **526** | **82.3** | **176** | **376** | **46.6** | **45.8** | **765** |
| Cadmium | **3.07** | <0.669 | **3.55** | **1.42** | <0.866 | **0.977** | **4.1** | **1.68** | **12.5** | **10.6** | <0.782 | **2.11** | **6.245** |
| Chromium | **28.9** | **15.5** | **35.5** | **20.6** | **12.6** | **40.1** | **47** | **28.7** | **57.9** | **40.7** | **10.1** | **24.6** | **52.15** |
| Lead | **517** | **99.2** | **464** | **94.9** | <8.66 | **789** | **1320** | **216** | **709** | **652** | **13.7** | **115** | **1240** |
| Mercury | **0.535** | **0.401** | **1.29** | **0.174** | <0.0433 | **0.323** | **2.08** | **0.661** | **2.26** | **0.715** | <0.0382 | **1.28** | **1.41** |
| Selenium | <7.2 | <6.69 | <7.58 | <8.38 | <8.66 | <7.18 | <7.41 | <7.51 | <7.51 | <7.33 | <7.82 | <7.38 | <7.7 |
| Silver | **1.62** | <0.669 | <0.758 | <0.838 | <0.866 | <0.718 | <0.741 | <0.751 | <0.751 | <0.733 | <0.782 | <0.738 | **0.99** |
| **Total PCBs** | **7.1** | **7.3** | <0.04 | **0.36** | **0.04** | **4.8** | **26** | **0.45** | **4.5** | **7.1** | **0.09** | **0.15** | **7.85** |

**Table 4**
**WESTON Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| **Sample ID** | WSB-14 | WSB-14 | WSB-16 | WSB-16 | WSB-16 | WSB-17 | WSB-17 | WSB-17 | WSB-18 | WSB-18 | WSB-18 | WSB-21 | WSB-21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | 2/12/03 | 2/12/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 |
| **Sample Depth (feet bgs)** | 3-5 | 5-7 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 |
| | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **EPH** | | | | | | | | | | | | | |
| C9-C18 Aliphatics | <30.6 | <30.9 | | | | | | | | | | | |
| C19-C36 Aliphatics | **77.6** | <30.9 | | | | | | | | | | | |
| C11-C22 Aromatics | 30.6 | <30.9 | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | | |
| Arsenic | **10.7** | **4.66** | | | | | | | | | | | |
| Barium | **1480** | **18.1** | | | | | | | | | | | |
| Cadmium | <0.808 | <0.786 | | | | | | | | | | | |
| Chromium | **15.1** | **8.34** | | | | | | | | | | | |
| Lead | **2230** | <7.86 | | | | | | | | | | | |
| Mercury | **0.28** | <0.0398 | | | | | | | | | | | |
| Selenium | <8.08 | <7.86 | | | | | | | | | | | |
| Silver | <0.808 | <0.786 | | | | | | | | | | | |
| **Total PCBs** | <0.04 | <0.04 | 3.1 | <0.5 | <0.6 | 3.1 | <0.6 | <0.6 | 1.7 | <0.6 | <0.6 | 18.2 | <0.6 |

**Table 4**
**WESTON Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| **Sample ID** | WSB-21 | WSB-22 | WSB-22 | WSB-22 | WSB-25 | WSB-25 | WSB-25 | WSB-26 | WSB-26 | WSB-26 | WSB-27 | WSB-27 | WSB-27 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 |
| **Sample Depth (feet bgs)** | 2-3 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 |
| | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **EPH** | | | | | | | | | | | | | |
| C9-C18 Aliphatics | | | | | | | | | | | | | |
| C19-C36 Aliphatics | | | | | | | | | | | | | |
| C11-C22 Aromatics | | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | | |
| Arsenic | | | | | | | | | | | | | |
| Barium | | | | | | | | | | | | | |
| Cadmium | | | | | | | | | | | | | |
| Chromium | | | | | | | | | | | | | |
| Lead | | | | | | | | | | | | | |
| Mercury | | | | | | | | | | | | | |
| Selenium | | | | | | | | | | | | | |
| Silver | | | | | | | | | | | | | |
| **Total PCBs** | <0.6 | 17 | <0.6 | <0.6 | 14.9 | <0.6 | <0.6 | 44.5 | 510 | 7.1 | 24 | <0.6 | <0.6 |

**Table 4**
**WESTON Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| **Sample ID** | WSB-30 | WSB-30 | WSB-30 | WSB-31 | WSB-31 | WSB-31 | WSB-32 | WSB-32 | WSB-32 | AB13 | AB13 | AB35 | AB35 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 |
| **Sample Depth (feet bgs)** | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 | 0-1 | 1-3 | 0-1 | 1-3 |
| | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **EPH** | | | | | | | | | | | | | |
| C9-C18 Aliphatics | | | | | | | | | | | | | |
| C19-C36 Aliphatics | | | | | | | | | | | | | |
| C11-C22 Aromatics | | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | | |
| Arsenic | | | | | | | | | | | | | |
| Barium | | | | | | | | | | | | | |
| Cadmium | | | | | | | | | | | | | |
| Chromium | | | | | | | | | | | | | |
| Lead | | | | | | | | | | | | | |
| Mercury | | | | | | | | | | | | | |
| Selenium | | | | | | | | | | | | | |
| Silver | | | | | | | | | | | | | |
| **Total PCBs** | <20 | <20 | <0.6 | 13,000 | 2.7 | <0.6 | <3 | <3 | <0.6 | 1.1 | <0.6 | 17.2 | <0.7 |

**Table 4**
**WESTON Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| **Sample ID** | BC13 | BC13 | BC35 | BC35 | CD13 | CD13 | CD35 | CD35 | DE13 | DE13 | DE35 | DE35 | EF13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 |
| **Sample Depth (feet bgs)** | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 |
| | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **EPH** | | | | | | | | | | | | | |
| C9-C18 Aliphatics | | | | | | | | | | | | | |
| C19-C36 Aliphatics | | | | | | | | | | | | | |
| C11-C22 Aromatics | | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | | |
| Arsenic | | | | | | | | | | | | | |
| Barium | | | | | | | | | | | | | |
| Cadmium | | | | | | | | | | | | | |
| Chromium | | | | | | | | | | | | | |
| Lead | | | | | | | | | | | | | |
| Mercury | | | | | | | | | | | | | |
| Selenium | | | | | | | | | | | | | |
| Silver | | | | | | | | | | | | | |
| **Total PCBs** | **10.2** | **1.2** | **3.75** | **<0.7** | **22.1** | **<0.6** | **4.6** | **200** | **45** | **<0.6** | **3.4** | **<0.6** | **11** |

**Table 4**
**WESTON Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| **Sample ID** | EF13 | EF35 | EF35 | FG13 | FG13 | FG35 | FG35 | GH24 | GH24 | GH46 | GH46 | HI24 | HI24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 |
| **Sample Depth (feet bgs)** | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 |
| | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **EPH** | | | | | | | | | | | | | |
| C9-C18 Aliphatics | | | | | | | | | | | | | |
| C19-C36 Aliphatics | | | | | | | | | | | | | |
| C11-C22 Aromatics | | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | | |
| Arsenic | | | | | | | | | | | | | |
| Barium | | | | | | | | | | | | | |
| Cadmium | | | | | | | | | | | | | |
| Chromium | | | | | | | | | | | | | |
| Lead | | | | | | | | | | | | | |
| Mercury | | | | | | | | | | | | | |
| Selenium | | | | | | | | | | | | | |
| Silver | | | | | | | | | | | | | |
| **Total PCBs** | <0.6 | **24.5** | **7.8** | **38** | <0.6 | **66** | <0.6 | **3.7** | <0.6 | **28** | 0.5 | **2.8** | <0.6 |

**Table 4**
**WESTON Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| **Sample ID** | HI46 | HI46 | IJ24 | IJ24 | IJ46 | IJ46 | JK24 | JK24 | JK46 | JK46 | LM24 | LM24 | KL24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 | 7/14/03 |
| **Sample Depth (feet bgs)** | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 | 1-3 | 0-1 |
| | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **EPH** | | | | | | | | | | | | | |
| C9-C18 Aliphatics | | | | | | | | | | | | | |
| C19-C36 Aliphatics | | | | | | | | | | | | | |
| C11-C22 Aromatics | | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | | |
| Arsenic | | | | | | | | | | | | | |
| Barium | | | | | | | | | | | | | |
| Cadmium | | | | | | | | | | | | | |
| Chromium | | | | | | | | | | | | | |
| Lead | | | | | | | | | | | | | |
| Mercury | | | | | | | | | | | | | |
| Selenium | | | | | | | | | | | | | |
| Silver | | | | | | | | | | | | | |
| **Total PCBs** | **11.4** | **1.5** | **18.1** | <0.6 | **12.4** | <0.6 | **5.75** | **3.5** | **37.8** | **4** | **25.7** | <0.6 | **4.9** |

**Table 4**
**WESTON Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| **Sample ID** | KL24 | WSB-35 | WSB-35 | WSB-35 | WSB-41 | WSB-41 | WSB-41 | WSB-45 | WSB-45 | WSB-45 | WSB-50 | WSB-50 | WSB-50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | 7/14/03 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 |
| **Sample Depth (feet bgs)** | 1-3 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 |
| | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **EPH** | | | | | | | | | | | | | |
| C9-C18 Aliphatics | | | | | | | | | | | | | |
| C19-C36 Aliphatics | | | | | | | | | | | | | |
| C11-C22 Aromatics | | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | | |
| Arsenic | | | | | | | | | | | | | |
| Barium | | | | | | | | | | | | | |
| Cadmium | | | | | | | | | | | | | |
| Chromium | | | | | | | | | | | | | |
| Lead | | | | | | | | | | | | | |
| Mercury | | | | | | | | | | | | | |
| Selenium | | | | | | | | | | | | | |
| Silver | | | | | | | | | | | | | |
| **Total PCBs** | **5.9** | **38** | **1.9** | <0.6 | **16.3** | **41** | <0.5 | **16** | <0.6 | <0.6 | **71** | **0.8** | **39** |

**Table 4**
**WESTON Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| **Sample ID** | WSB-56 | WSB-56 | WSB-56 | WSB-61 | WSB-61 | WSB-61 | WSB-65 | WSB-65 | WSB-65 | WSB-70 | WSB-70 | WSB-70 | WSB-73 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 |
| **Sample Depth (feet bgs)** | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 | 0-1 |
| | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **EPH** | | | | | | | | | | | | | |
| C9-C18 Aliphatics | | | | | | | | | | | | | |
| C19-C36 Aliphatics | | | | | | | | | | | | | |
| C11-C22 Aromatics | | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | | |
| Arsenic | | | | | | | | | | | | | |
| Barium | | | | | | | | | | | | | |
| Cadmium | | | | | | | | | | | | | |
| Chromium | | | | | | | | | | | | | |
| Lead | | | | | | | | | | | | | |
| Mercury | | | | | | | | | | | | | |
| Selenium | | | | | | | | | | | | | |
| Silver | | | | | | | | | | | | | |
| **Total PCBs** | <0.5 | 3.5 | 7.9 | 31 | <0.6 | <0.6 | 25 | <0.6 | <0.6 | <0.5 | <0.5 | <0.7 | 4.9 |

**Table 4**
**WESTON Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| **Sample ID** | WSB-73 | WSB-73 | WSB-73 | WSB-76 | WSB-76 | WSB-76 | WSB-77 | WSB-77 | WSB-77 | WSB-77 | WSB-78 | WSB-78 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 |
| **Sample Depth (feet bgs)** | 1-2 | 2-3 | 3-4 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 | 3-4 | 0-1 | 1-2 |
| | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **EPH** | | | | | | | | | | | | |
| C9-C18 Aliphatics | | | | | | | | | | | | |
| C19-C36 Aliphatics | | | | | | | | | | | | |
| C11-C22 Aromatics | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | |
| Arsenic | | | | | | | | | | | | |
| Barium | | | | | | | | | | | | |
| Cadmium | | | | | | | | | | | | |
| Chromium | | | | | | | | | | | | |
| Lead | | | | | | | | | | | | |
| Mercury | | | | | | | | | | | | |
| Selenium | | | | | | | | | | | | |
| Silver | | | | | | | | | | | | |
| **Total PCBs** | **22** | <0.5 | <0.5 | **0.7** | **530** | **0.7** | **2.2** | **37** | **220** | **8.4** | **15.6** | **86** |

**Table 4**
**WESTON Analytical Soil Results**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| Sample ID | WSB-78 | WSB-79 | WSB-79 | WSB-79 | WSB-80 | WSB-80 | WSB-80 |
|---|---|---|---|---|---|---|---|
| Sample Date | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 | 9/2/2003 |
| Sample Depth (feet bgs) | 2-3 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 |
| | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **EPH** | | | | | | | |
| C9-C18 Aliphatics | | | | | | | |
| C19-C36 Aliphatics | | | | | | | |
| C11-C22 Aromatics | | | | | | | |
| **Metals** | | | | | | | |
| Arsenic | | | | | | | |
| Barium | | | | | | | |
| Cadmium | | | | | | | |
| Chromium | | | | | | | |
| Lead | | | | | | | |
| Mercury | | | | | | | |
| Selenium | | | | | | | |
| Silver | | | | | | | |
| **Total PCBs** | 14 | 10 | 107 | 22 | 8.3 | 20.1 | 62 |

bgs = below ground surface
EPH = extractable petroleum hydrocarbons
mg/kg = milligrams per kilogram

**Table 5**
**Ground Water Data - Risk Assessment Dataset**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| | Baumgartner | | | | | Higgins | | | | Weston | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW-2 7/9/1998 | MW-2A 7/9/1998 | MW-3 7/9/1998 | MW-3A 7/9/1998 | MW-4 7/9/1998 | MW1 6/10/1999 | MW5- 6/10/1999 | MW6- 6/10/1999 | MW7- 6/10/1999 | MW1-SB-1 2/13/2003 | MW5-SB-12 2/13/2003 | MW6-SB-9 2/13/2003 | MW7-SB-14 2/13/2003 |
| ***VOCs by 8260 (ug/L)*** | | | | | | | | | | | | | |
| Acetone | <10 | <10 | <10 | <10 | <10 | <15 | <15 | <15 | <15 | <25 | <25 | <25 | 140 |
| Benzene | 2.5 | <2 | 13.6 | 3.4 | <2 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 4.55 |
| Chloroethane | <2 | <2 | <2 | <2 | <2 | <1 | <1 | <1 | 13 | <2 | <2 | <2 | <2 |
| 1,1-Dichloroethane | 113.8 | <2 | 74.2 | 16.7 | <2 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| cis-1,2-Dichloroethene | 2.2 | <2 | 9.2 | 2.4 | <2 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 57.6 |
| 4-Methyl-2-pentanone | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| Naphthalene | 4.1 | <2 | <2 | <2 | <2 | <1 | <1 | <1 | <1 | <1 | <1 | 3.97 | 3.27 |
| Tetrachloroethene | <2 | <2 | 7.1 | 2.6 | <2 | <1 | <1 | <1 | <1 | <1 | 1.53 | 3.61 | 38.2 |
| Toluene | 3 | <2 | 2 | <2 | <2 | <1 | <1 | 2 | <1 | <1 | <1 | <1 | <1 |
| 1,1,1-Trichloroethane | 14.5 | <2 | 5.3 | 3.9 | <2 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Trichloroethene | <2 | 3.2 | 2.7 | 4.4 | 3.2 | <1 | <1 | <13 | <1 | <1 | <1 | 56.8 | 17.6 |
| 1,2,4-Trimethylbenzene | 2.4 | 3.3 | 3.3 | 2.8 | 3.3 | <1 | <1 | <1 | <1 | <1 | 1.1 | 2.04 | 2.83 |
| Vinyl Chloride | <2 | <2 | <2 | <2 | <2 | <1 | <1 | <1 | <1 | <2 | <2 | <2 | 4.66 |
| Xylenes | 5.7 | <2 | <2 | <2 | <2 | <1 | <1 | <1 | <1 | <2 | 2.32 | 2.06 | <2 |
| Methyl-tert-Butylether | NA | NA | NA | NA | NA | <1 | <1 | 5 | <1 | <1 | 125 | 4.92 | 1320 |
| **Pesticides/PCBs/Herbicides** | | | | | | | | | | | | | |
| phenolics | <50 | NA | 72 | NA | <50 | | | | | | | | |
| **Metals (mg/L)** | | | dissolved | | | | | likely total | | | | dissolved | |
| Arsenic | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.01 | <0.01 | <0.01 | <0.01 | <0.05 | <0.05 | <0.05 | <0.05 |
| Barium | 0.177 | 0.049 | 0.07 | 0.048 | 0.108 | | | | | <0.05 | 0.07 | 0.07 | <0.05 |
| Cadmium | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | | <0.005 | <0.005 | <0.005 | <0.005 |
| Chromium | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | NA | NA | 0.013 | 0.016 | <0.02 | <0.02 | <0.02 | <0.02 |
| Lead, | <0.003 | <0.003 | <0.003 | <0.003 | 0.006 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | 0.006 | <0.005 | <0.005 |
| Mercury, | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | | | | | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Selenium | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | | | | | <0.01 | <0.01 | <0.01 | <0.01 |
| Silver | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | | | | | <0.005 | <0.005 | <0.005 | <0.005 |
| **Semivolatile Organics (ug/L)** | ND | ND | ND | ND | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| **VPH (µg/L)** | NA | NA | NA | NA | NA | | | | | NA | NA | NA | NA |
| C5-C8 Aliphatics | | | | | | <1 | <1 | N/A | N/A | | | | |
| C9-12 Aliphatics | | | | | | <1 | <1 | N/A | N/A | | | | |
| C9-C10 Aromatics | | | | | | <1 | <1 | N/A | N/A | | | | |
| **Target VOCs** | | | | | | | | | | | | | |
| Benzene | | | | | | <1 | <1 | N/A | N/A | | | | |
| Ethylbenzene | | | | | | <1 | <1 | N/A | N/A | | | | |
| MtBe | | | | | | <1 | <1 | N/A | N/A | | | | |
| Naphthalene | | | | | | <1 | <1 | N/A | N/A | | | | |
| Toluene | | | | | | <1 | <1 | N/A | N/A | | | | |
| xylenes | | | | | | <1 | <1 | N/A | N/A | | | | |

**Table 5**
**Ground Water Data - Risk Assessment Dataset**
Former Tombarello and Sons Property
Lawrence, Massachusetts

| | Baumgartner | | | | | Higgins | | | | Weston | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW-2 7/9/1998 | MW-2A 7/9/1998 | MW-3 7/9/1998 | MW-3A 7/9/1998 | MW-4 7/9/1998 | MW1 6/10/1999 | MW5- 6/10/1999 | MW6- 6/10/1999 | MW7- 6/10/1999 | MW1-SB-1 2/13/2003 | MW5-SB-12 2/13/2003 | MW6-SB-9 2/13/2003 | MW7-SB-14 2/13/2003 |
| **EPH (µg/L)** | NA | NA | NA | NA | NA | | | | | NA | NA | NA | NA |
| C9-C18 Aliphatics | | | | | | <10 | <10 | N/A | N/A | | | | |
| C19-C36 Aliphatics | | | | | | <10 | <10 | N/A | N/A | | | | |
| C11-C22 Aromatics | | | | | | <10 | <10 | N/A | N/A | | | | |
| **PAHs** | | | | | | | | | | | | | |
| Acenaphthalene | | | | | | <10 | <10 | N/A | N/A | | | | |
| Acenaphthene | | | | | | <10 | <10 | N/A | N/A | | | | |
| Anthracene | | | | | | <10 | <10 | N/A | N/A | | | | |
| Benzo(a)Anthracene | | | | | | <0.1 | <0.1 | N/A | N/A | | | | |
| Benzo(a)Pyrene | | | | | | <0.1 | <0.1 | N/A | N/A | | | | |
| Benzo(b)fluoranthene | | | | | | <0.1 | <0.1 | N/A | N/A | | | | |
| Benzo(g,h,I)Perylene | | | | | | <0.1 | <0.1 | N/A | N/A | | | | |
| Benzo(k)fluoranthene | | | | | | <0.1 | <0.1 | N/A | N/A | | | | |
| Chrysene | | | | | | <0.1 | <0.1 | N/A | N/A | | | | |
| Dibenzo(a,h)Anthracene | | | | | | <0.1 | <0.1 | N/A | N/A | | | | |
| Fluoroanthene | | | | | | <10 | <10 | N/A | N/A | | | | |
| Fluorene | | | | | | <10 | <10 | N/A | N/A | | | | |
| Indeno(1,2,3-cd)Pyrene | | | | | | <0.1 | <0.1 | N/A | N/A | | | | |
| 2-Methylnaphthalene | | | | | | <5 | <5 | N/A | N/A | | | | |
| Naphthalene | | | | | | <10 | <10 | N/A | N/A | | | | |
| Phenanthrene | | | | | | <10 | <10 | N/A | N/A | | | | |
| Pyrene | | | | | | <10 | <10 | N/A | N/A | | | | |

EPH = extractable petroleum hydrocarbons
mg/L = milligrams per liter
PAH = polycyclic aromatic hydrocarbon
PCB = polycyclic biphenyls
ug/L = micrograms per liter
VOC = volatile organic hydrocarbons