

**DRAFT  
PRELIMINARY MSGRP SUPPLEMENTAL REPORT  
SOUTHERN AREA**

**REMEDIAL INVESTIGATION /FEASIBILITY STUDY**

**INDUSTRI-PLEX SITE  
WOBURN, MASSACHUSETTS**

**RESPONSE ACTION CONTRACT (RAC), REGION I**

**For  
U.S. Environmental Protection Agency**

**By  
Tetra Tech NUS, Inc.**

**EPA Contract No. 68-W6-0045  
EPA Work Assignment No. 116-RICO-0107  
TtNUS Project No. N4123**

**June 2003**



**TETRA TECH NUS, INC.**

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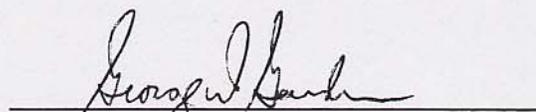
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Gordon Bullard  
Project Manager



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George D. Gardner, P.E.  
Program Manager

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## ACRONYMS

21E	310 Code of Massachusetts Regulations (CMR) Chapter 21E
AST	above ground storage tank
ATSDR	Agency for Toxic Substances and Disease Registry
AUL	Activity and Use Limitation
BTEX	benzene, toluene, ethyl benzene, xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
COC	contaminant of concern
CPAH	carcinogenic polynuclear aromatic hydrocarbons
CVOC	chlorinated volatile organic compounds
DCA	dichloroethane
DCE	dichloroethene
DDT	p,p'-Dichlorodiphenyltrichloroethane
DNAPL	dense non-aqueous phase liquid
DPS	downgradient property status
DPW	Department of Public Works
EPA	United States Environmental Protection Agency
FS	Feasibility Study
gpd	gallons per day
gpm	gallons per minute
GSIP	Groundwater/Surface Water Investigation Plan
HBHA	Halls Brook Holding Area
I-95	Interstate 95
I-93	Interstate 93
ISRT	Industri-Plex Site Remedial Trust
IRA	Immediate Response Action
IWPA	Interim Wellhead Protection Area
J	Estimated value based on data QC
lb	pound
LNAPL	Light Non-Aqueous Phase Liquid

**ACRONYMS (cont.)**

MADEP	Massachusetts Department of Environmental Protection
MBTA	Massachusetts Bay Transportation Authority
MCL	maximum contaminant limit
MCP	Massachusetts Contingency Plan
MDC	Metropolitan District Commission
mgd	million gallons per day
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
MIT	Massachusetts Institute of Technology
MSGRP	Multiple Source Groundwater Response Plan
MSMA	Monosodium Methane Arsenate
MWRA	Massachusetts Water Resources Authority
NA	Not analyzed
ND	Not detected
NDS	Not a Disposal Site
NFA	no further action
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NGVD	National Geodetic Vertical Datum
OU	Operable Unit
ppm	part per million
PA	Preliminary Assessment
PAH	polynuclear aromatic hydrocarbons
PCB	polychlorinated biphenyl compounds
PCC	Printed Circuit Corporation
PCE	tetrachloroethene
PRP	Potentially Responsible Parties
RAO	response action outcome
RAM	Release Abatement Measure
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study

**ACRONYMS (cont.)**

RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RTN	Release Tracking Number
SIC	Standard Industrial Code
SP	Settling Parties
SVE	soil vapor extraction
SVOC	semi-volatile organic compound
SWAP	Source Water Assessment Program
TCA	trichloroethane
TCE	trichloroethene
TPH	total petroleum hydrocarbons
TRI	toxic release inventory
TSP	trisodium phosphate
TtNUS	Tetra Tech NUS, Inc.
µg/l	microgram per liter
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	underground storage tank
UV	ultraviolet
VOC	volatile organic compound

## 1.0 INTRODUCTION

This report was prepared at the request of the U.S. Environmental Protection Agency (EPA) under contract number 68-W6-0045, Work Assignment No. 116-RICO-0107. The objective of this study is to support the EPA's Multiple Source Groundwater Response Plan (MSGRP) investigations prescribed under the Record of Decision (ROD) for the Industri-Plex Superfund Site by researching existing information on other potential source areas and evaluating their potential to impact the surface water and sediment quality of the Aberjona River.

The *Preliminary Multiple Source Groundwater Response Plan Report* was prepared in August 1997 by Halliburton NUS Corporation (HNUS). The *Preliminary MSGRP Report* only evaluated sites within a defined study area adjacent to the Industri-Plex Superfund Site in Woburn, Massachusetts, extending south to Route 128/Interstate 95. The *Preliminary MSGRP Supplemental Report – Southern Area* expands the previous investigations and study area to include the areas from Route 128/Interstate 95 in Woburn south to the Mystic Lakes in Winchester, Massachusetts.

The Industri-Plex Site is located in Woburn, Massachusetts, and encompasses approximately 245 acres (see Figure 1-1). As summarized in the ROD, from 1853 to 1931, the Site was used for the manufacturing of chemicals such as lead-arsenic insecticides, acetic acid, and sulfuric acid for local textile, leather, and paper manufacturing industries. Chemicals manufactured by other industries at the Site include phenol, benzene, picric acid, toluene and trinitrotoluene (TNT). From 1934 to 1969, the Site was used to manufacture glue from raw animal hide and chrome-tanned hide wastes. The residues and by-products from these operations caused the site soils to become contaminated with metals, including elevated levels of arsenic, lead and chrome.

In 1968, the Mark Phillip Trust (the Trust) purchased the property and between 1969 and 1980 developed the site into an industrial park. Site development activities in the mid-1970s resulted in numerous odor complaints and notices of violation from the Massachusetts Department of Environmental Quality Engineering. In June 1979, the U.S. Attorney's office, on behalf of the U.S. Army Corps of Engineers and EPA, filed suit against the Trust for illegal filling of wetlands. An injunction was issued and development activities were stopped. The Site was listed on the National Priorities List (NPL) in 1983.

The primary contaminants associated with the Industri-Plex Site are volatile organic compounds (VOCs), including benzene and toluene, and arsenic and chromium in groundwater; heavy metals, including arsenic, chromium and lead in soils; and hydrogen sulfide gaseous emissions from buried animal hides. Based on the groundwater flow direction, EPA recognized the potential for groundwater contamination to migrate to two inactive Woburn municipal supply wells located approximately one mile south of the Industri-Plex Site.

The September 1986 ROD for the Industri-Plex Site addressed site-specific soil and groundwater contamination as well as area-wide groundwater issues. The Remedial Investigation (RI) that supported the ROD focused on site-specific soil contamination and hotspot groundwater contamination. The Industri-Plex ROD and 1989 Consent Decree (See Section 1.2) also required further investigations of site-related contamination downgradient of the Site (e.g. groundwater, surface water, and sediments) as well as investigations of other potential sources possibly contributing contamination and impacting the aquifer at the site. The site-related investigation was entitled the “Groundwater, Surface Water Investigation Plan” (GSIP), and the investigation of other potential sources was entitled the “Multiple Source Groundwater Response Plan” (MSGRP). The data collected under the GSIP investigation would be incorporated into the MSGRP investigation. The MSGRP would serve as a Remedial Investigation and Feasibility Study (RI/FS). Based upon the MSGRP RI/FS, if EPA determined additional remedial actions were necessary (e.g. groundwater, surface water, sediment), then a second decision document (i.e. ROD) would be established for the Site.

The GSIP investigation is being performed by the Industri-Plex Settling Parties. The MSGRP investigation is being performed by the EPA. Under the MSGRP, EPA will include all relevant data collected from these investigations and others, and prepare a comprehensive RI documenting nature and extent of contamination, fate and transport of contamination and potential human health and ecological risks posed by contamination along the Aberjona River aquifer.

Contamination was discovered in two Woburn municipal wells, Well G and Well H, in 1979. VOCs found in the groundwater resulted in the closure of the two wells. Contamination was also found in site soils and sediments. This area, known as the Wells G&H Site, was listed on the NPL in 1983. The location of the Wells G&H Site in relation to the Industri-Plex Site is shown on Figure 1-1. The Aberjona River flows from north to south through both the Industri-Plex and Wells G&H Sites and thus is a conduit for contaminant migration from the Sites. Sediment samples from the Aberjona River and wetlands in the Wells G&H Site are contaminated with metals such as arsenic, chromium, and mercury as well as some polynuclear aromatic hydrocarbons (PAHs).

Additional background information concerning the objectives of the MSGRP and the Industri-Plex and Wells G&H Sites is presented below.

## **1.1 MSGRP Background**

Under the terms of the 1986 ROD for the Industri-Plex Site, EPA is responsible for conducting the MSGRP. The purpose of the MSGRP is to support an RI of general area-wide contamination as it affects or potentially affects the Aberjona River aquifer, and if necessary, to prepare a Feasibility Study (FS) to evaluate remedial alternatives to restore the aquifer and support a final ROD. The intent of the MSGRP is to: investigate other potential impacts on the area-wide aquifer; evaluate other potential sources of groundwater contamination immediately around the Industri-Plex Site; incorporate the site-related data collected under the GSIP; and determine if additional remedial actions are necessary (e.g. comprehensive groundwater remediation, downgradient sediment/surface water remediation) under a final ROD.

Under the 1986 Industri-Plex Site ROD, EPA established the southern boundary of the MSGRP study area to be Interstate 95 (I-95)/Route 128. Any studies of potential sources of groundwater contamination south of I-95 were considered part of the Operable Unit 3 (OU-3) Aberjona River Study for the Wells G&H Superfund Site. This initial concept for the area divided the investigation of the Aberjona River into two areas (north of I-95, and south of I-95).

When data obtained from studies at the Industri-Plex and Wells G&H Sites indicated that the Aberjona River at both sites contained similar contaminants of concern, EPA concluded that this divided approach was no longer reasonable or efficient. Hence, EPA has merged the Wells

G&H Aberjona River Study with the Industri-Plex MSGRP. In the spring of 2002, EPA announced the merger of these investigations in a Fact Sheet (see Appendix A). Under the MSGRP, EPA will prepare a comprehensive RI from the Industri-Plex area to the Mystic Lakes along the Halls Brook Holding Area (HBHA) and the Aberjona River.

The investigation of potential area-wide contamination sources, required as a component of the MSGRP, is presented in two preliminary reports. The Preliminary MSGRP Report, which covers the Industri-Plex area north of I-95/Route 128, was completed in 1997 (HNUS, 1997). The area covered in that report is bounded by northern Woburn along the Woburn/Wilmington town line to the north, I-95/Route 128 to the south, Interstate 93 to the east and Route 38 to the west. The Preliminary MSGRP Report presented the results of research from a number of sources and identified other potential sources of surface water, sediment or groundwater contamination in the vicinity of the Industri-Plex Site.

The recent expansion of the investigation area by EPA resulted in the need for a second report to cover the area south of I-95/Route 128. The focus of this second report, the Preliminary MSGRP Supplemental Report – Southern Area, is the investigation of other potential sources of contamination in the expanded area south of I-95/Route 128, including the Wells G&H Site and Aberjona River, extending south to the Mystic Lakes. Throughout this report the study area north of I-95/Route 128, covered in the 1997 Preliminary MSGRP Report, is referred to as the Northern Area. The study area south of I-95/Route 128 covered in this supplemental report is referred to as the Southern Area. The combined Northern and Southern Areas are referred to as the MSGRP/Aberjona River Study Area (Study Area). The boundaries of the Northern and Southern Areas, as described above, are shown on Figure 1-2.

The MSGRP scope includes the completion of additional research and compilation of information from prior investigations to identify other potential contamination sources within the Study Area. Surface water, sediment or groundwater contamination sources identified within or adjacent to the Study Area may be impacting the environment in the Aberjona River Watershed. The Preliminary MSGRP Report (HNUS, 1997) discusses research and relevant information for the Northern Area, and evaluates the contributions of other potential groundwater sources in the vicinity of the Industri-Plex Site and the migration of site-related contaminants downgradient to I-95.

This Supplemental MSGRP report for the Southern Area focuses on potential sources of groundwater and soil contamination and their possible impact on the surface water and sediment quality of the Aberjona River in the Southern Area, or the Wells G&H Site portion of the Study Area. Background information concerning both the Industri-Plex Site and the Wells G&H Site, in particular the OU-3 Aberjona River Study, is presented below.

## **1.2 Industri-Plex Site Background**

The Industri-Plex Site is an approximately 245 acre industrial area in Woburn, Massachusetts (see Figure 1-1). Details concerning past activities, site contaminants and activities leading up to the 1986 ROD and Consent Decree have been described in the 1997 Preliminary MSGRP Report (HNUS, 1997) and are not repeated here. A consortium of responsible parties formed the Industri-Plex Site Remedial Trust (ISRT) and entered into a Consent Decree with EPA in 1989. Under the Consent Decree, the ISRT's responsibilities generally included implementation of the soil remedy, an interim "hot spot" groundwater remedy, and the GSIP. The selected soil remedy specified in the 1986 ROD includes construction of a soil cover (both permeable and impermeable caps), a gas collection and treatment system, and institutional controls. The soil cover and gas collection and treatment system were substantially completed in 1998. In early 1990, the ISRT implemented an innovative air injection treatment system as the interim groundwater remedy. The system was unsuccessful. Since then, the ISRT has evaluated other potential interim treatment technologies and focused on completing the GSIP, which was completed in 2003. Work completed under the ROD-specified soil remedy is discussed in the Preliminary MSGRP Report (HNUS, 1997).

## **1.3 Wells G&H Site Background**

The Wells G&H Site covers approximately 330 acres in Woburn, Massachusetts (see Figure 1-1). Contamination of the two municipal wells, installed in 1964 and 1967, was discovered in 1979. The groundwater was contaminated with VOCs, including trichloroethene (TCE) and tetrachloroethene (PCE) and, as a result, the wells were shut down. Contaminants found in site soils included PAHs, polychlorinated biphenyl compounds (PCBs), VOCs and pesticides. Aberjona River sediments were found to be contaminated with heavy metals, including arsenic, chromium, mercury, and zinc, and some PAHs.

A ROD for the Wells G&H Superfund Site was signed in September of 1989, followed by a Consent Decree in 1991 between EPA and several Potentially Responsible Parties (PRPs) at the site. The ROD required the cleanup of groundwater contaminated principally with VOCs and/or soil remediation at five identified source area properties owned by the W. R. Grace Company, Unifirst Corporation, the Olympia Nominee Trust, Wildwood Conservation Corporation, and New England Plastics. The Consent Decree was entered with four of the five properties to clean up their soil and groundwater contamination. The fifth property, Olympia Nominee Trust, did not participate in the Consent Decree and has been in negotiations with EPA for the cleanup of their property. In 2003, EPA entered into an agreement (i.e. Administrative Order by Consent) with Olympia Nominee Trust to remove soils contaminated with PAHs, PCBs, and TCE from their property. EPA has identified the groundwater cleanup of these five source areas as the first Operable Unit (OU-1) for the site. The ROD and Consent Decree also required further investigations be conducted for the Central Area of the Site and the Aberjona River. The Central Area of the Site is defined as the area within the site boundaries not including the source area properties covered by the ROD or the Aberjona River. The investigation of the Aberjona River is being conducted by the EPA, while the Central Area investigation is being conducted by a group of PRPs under the 1991 Consent Decree. EPA has identified the Central Area as Operable Unit 2 (OU-2) and the Aberjona River Study as Operable Unit 3 (OU-3).

As stated above, four of the five Source Area property owners signed a Consent Decree with EPA in 1991 and have participated in the OU-1 remedial action to date. Contaminated soils have been excavated and treated on-site and/or transported off-site for disposal. Soil vapor extraction was used to treat the VOCs that remained in the soil. Separate treatment plants have been constructed in three of the source areas to pump and treat contaminated groundwater. Groundwater pump and treat systems at two of the source areas have been operating for 10 years. One system uses ultra-violet (UV)-chemical oxidation for treatment; the other system uses carbon adsorption. The system at a third source area, in operation for 4 years, includes air sparging, soil vapor extraction, groundwater extraction and treatment using air stripping and carbon adsorption.

Three of the five PRPs have participated in an investigation of the Central Area (OU-2) and its aquifer. The Central Area, as defined in the RI, includes the entire Wells G&H Site, with the exception of the five Source Area properties and the Aberjona River, its tributaries, and the

sediment and associated wetlands on the east side of the River. Additional OU-2 investigation and data collection activities to support a risk assessment for three properties, referred to as the Southwest Properties, are underway.

EPA is responsible for the OU-3 Aberjona River Study for the Wells G&H Site. The Aberjona River Study is designed to investigate the nature and extent of contamination in the Aberjona River sediments as well as evaluate potential human health and ecological risks. EPA and the U.S. Fish and Wildlife Service (USFWS) collected surface water, sediment and biota samples in 1995. Supplemental field activities, focusing on sediment sampling, were conducted in 1997, 2000, 2001, and 2002. The preliminary data, from the area bounded on the north by I-95/Route 128 and extending south to the Mystic Lakes, indicate that metals are the primary contaminants of concern in surface water and sediment. Baseline human health and ecological risk assessments for the Aberjona River Study are expected to be completed in 2003. The human health and ecological risk assessments, as well as the data from the GSIP investigation, will be used in the comprehensive Remedial Investigation/Feasibility Study (RI/FS) for the entire Aberjona River Study, discussed in Section 1.1. Any data gaps identified in the Industri-Plex GSIP and Wells G&H OU-3 Aberjona River Study will be addressed as part of the MSGRP RI/FS.

## 2.0 DEFINITION OF THE STUDY AREA

The MSGRP/Aberjona River Study Area (Study Area) encompasses the entire Industri-Plex and the Wells G&H Sites. The expansion of the Study Area south of I-95 to the Mystic Lakes extends the limits previously delineated in the *Preliminary MSGRP Report* (HNUS, 1997).

The boundaries of the Preliminary MSGRP study area were defined as Interstate 93 (I-93) to the east; I-95 to the south; Route 38 (Main Street) to the west; and slightly north of the Woburn/Wilmington town line. The Preliminary MSGRP study area focused on a portion of the Aberjona River watershed area north of Route 128/I-95, now referred to as the Northern Area.

As mentioned previously in Section 1, EPA's decision to merge the Wells G&H Site Aberjona River Study (OU-3) with the Industri-plex MSGRP expanded the Preliminary MSGRP study area to include an evaluation of potential contaminant sources in the southern portion of the Aberjona River watershed. This portion of the preliminary MSGRP focuses on sources south of I-95 to the Mystic Lakes and is referred to as the Southern Area.

The potential contaminant sources evaluated south of I-95 primarily include sources within the City of Woburn (excluding North Woburn) and the Town of Winchester. The boundaries of the Southern Area are defined as I-95 to the north, Route 38 (Main Street) to the west (from I-95 south to Horn Pond then due south to the Mystic Lakes), the Mystic Lakes to the south, and I-93 to the east, as far as the Winchester town line, and then by Highland Avenue in Winchester. The Southern Area boundaries are presented on Figure 1-2. The entire Aberjona River watershed area is presented on Figure 2-1; the southern portion of the watershed area is highlighted to indicate the area of concern for this investigation. Information about the Southern Area's geology, groundwater flow and surface water features is presented below.

### 2.1 Bedrock Geology

Information available from studies performed around the Wells G&H Site as well as other studies performed throughout the entire Aberjona River watershed was reviewed to determine bedrock type and elevations in the Southern Area, which are presented in Figure 2-2. These data were geologic maps that indicate areas of bedrock outcrop, by Massachusetts Institute of

Technology (MIT) research, and by field observations conducted along I-95 and I-93 as documented in various consultant's reports.

Localized bedrock identified within the Southern Area (around the Wells G&H Site and throughout southeast Woburn) includes the Salem gabbrodiorite (youngest), the Dedham granodiorite (older), and Precambrian gneiss and schist (oldest) (Zen et al., 1983).

The most pronounced bedrock feature within the Southern Area and throughout the Aberjona River watershed is a buried bedrock valley. The buried bedrock valley is believed to be a pre-glacial feature formed by the process of river erosion. This buried bedrock valley may represent the pre-glacial watercourse of the Aberjona River. Based on surface topography, buried tributaries that were connected to the pre-glacial river exist beneath two surface water features of the Southern Area, Horn Pond and Horn Pond Brook (Chute, 1959). The buried bedrock valley is a fault-controlled valley that has become wider and deeper during Pleistocene glaciation (Ecology and Environment, 1981). Due to glacial activity, the bedrock valley was re-structured to its current form of a U-shaped bedrock trough. The bedrock trough is oriented from north to south and appears to be U-shaped based on the observed high bedrock surface elevations on the east and west sides of the Southern Area (NUS, 1986). The bedrock trough is narrowest and shallowest at the northern end of the Aberjona River bedrock valley and becomes wider and deeper as it extends southward. The bedrock trough is approximately 2000 feet wide and 130 feet below ground surface at the location of the Industri-Plex and Wells G&H sites (McBrearty, 1994). Bedrock outcrops are most frequent along the boundary of the Aberjona River watershed study area, particularly to the west of Boston & Maine Railroad tracks, and in the northern portion of the basin. The bedrock lows appear to be associated with fault zones (Ecology and Environment, 1981).

Two major faults, the Walden Pond Fault and the Mystic Fault, are associated with the bedrock of the Southern Area (McBrearty, 1994). The Walden Pond Fault is a longitudinal fault located to the south of the Industri-Plex and Wells G&H Sites. The Mystic Fault is also oriented northeast to southwest and passes through the Industri-Plex Site. This fault trends N40<sup>o</sup>E and passes through the Aberjona River bedrock valley (McBrearty, 1994). Fractures within bedrock are commonly observed along fault zones. Bedrock in the vicinity of the Wells G&H Site

includes fractures consisting of joints generally striking N63<sup>0</sup>W and N90<sup>0</sup>W and dipping southwest (NUS, 1986).

## **2.2 Overburden Geology**

The overburden geology of the Southern Area primarily consists of glacial deposits including stratified drift and ice contact deposits, which fill the Aberjona River bedrock valley (Flanagan et al., 1999). Glacial deposits have been noted at a maximum depth of 160 feet below ground surface overlain by modern alluvial deposits. These glacial deposits can be generally separated into four stratigraphic layers. The uppermost layer is comprised of sand, silt, clay, and peat deposits that range in thickness from 0 to 30 feet. The second, or intermediate layer, is comprised of coarse sand that ranges in thickness from 10 to 50 feet. The third layer is comprised of coarse sand and gravel ranging in thickness from 20 to 50 feet. The lowermost layer, located in the deepest portions of the bedrock valley, is comprised of fine-grained sand and silt and can occur up to 60 feet thick (de Lima and Olimpio, 1989). These observations were confirmed by site-specific investigations conducted by the USGS and Ecology and Environment, Inc., which identified stratified drift deposits of glacial outwash landforms in the vicinity of Wells G&H, and as a broad unit through the Town of Winchester south to the Mystic Lakes.

In addition, a discontinuous layer of ice contact till deposits has been observed overlying bedrock in some areas (NUS, 1986). The till deposits include ablation till (deposited due to the melting of overlying glaciers) and basal or lodgment till (deposited directly from the base of the glacier as the ice flowed). The ablation till of the area consists of lenses of sorted sands and gravels. Basal till deposits of the Southern Area consist of a poorly sorted, dense, compact mixture of clay, silt, sand, gravels, and boulders. Occasionally, till deposits are located at the base and along the walls of the bedrock valley. However, most frequently, till deposits are located at high bedrock elevations such as on the west and east boundaries of the Southern Area. A large area of ice contact till deposits is located on the western side of the Southern Area. This large till area is approximately bounded by I-95 to the north, the Woburn/Winchester town line to the south, Route 38 (Main Street) to the west, and the Boston and Maine Railroad to the east (Ecology and Environment, 1981).

Surficial deposits immediately adjacent to the Aberjona River consist of stream and swamp deposits. Interbedded silty peat, sandy peat, and organic silts of variable thickness are primarily located adjacent to the Aberjona River and at low topographic areas surrounding the River. These deposits are Aberjona River floodplain deposits. Topsoil and artificial fill, approximately 5 to 10 feet deep, overlay surficial deposits in some areas (Ecology and Environment, 1981).

### **2.3 Groundwater Flow**

The overburden groundwater flow direction in the Southern Area has been interpreted from available reports and site investigations. In areas where data on groundwater flow conditions are deficient, the flow direction was assumed generally to follow the ground topography, the top of bedrock, and the surface water flow direction. Wells G&H site investigations provided information on groundwater flow, but were limited to data collected from the northeast section of the Southern Area. Additional groundwater flow data were obtained from numerous sources, including USGS open file reports, MIT studies, and consulting reports for various sites located within the Southern Area. However, groundwater flow data are deficient for the southernmost portion of the Southern Area.

Groundwater within the Southern Area appears to generally flow in a southward direction, parallel to the Aberjona River (Ecology and Environment, 1982). Based on the north-south orientation of the Aberjona River bedrock valley and the overburden materials that fill the valley, groundwater flow direction would be expected to travel through the valley in a southward direction. Groundwater flow in the center of the Aberjona River bedrock valley is parallel to the axis of the valley (Myette, Olimpio, and Johnson, 1987).

The 1982 Ecology and Environment report on north and east Woburn encompasses a majority of the Southern Area. The water table contour map from this report generally depicts groundwater flow down the center of the Aberjona River bedrock valley in a southward direction, parallel to the Aberjona River, as well as groundwater flow from the west and east sides of the valley inward toward the River. The groundwater flow directions from this contour map are based on water level measurements collected by Ecology and Environment. Tetra Tech NUS measured water levels from monitoring wells installed in the Northern Area in 2002.

The resulting water table contour map and inferred groundwater flow direction were similar to those depicted by Ecology and Environment in 1982 for north and east Woburn, which includes a majority of the Southern Area.

The geology and subsurface conditions in the Southern Area are generally consistent with those of the northern section of the Aberjona River watershed. Although limited groundwater level data are available, based on a comparison of groundwater flow directions from the Ecology and Environment and Tetra Tech NUS groundwater contour maps, it is reasonable to assume that groundwater flow patterns in the Southern Area will be generally consistent with those observed in the north section of the Aberjona River watershed. That is, groundwater flow down the center of the Aberjona River bedrock valley is parallel to the present Aberjona River and groundwater flow from the sides of the valley is east and west towards the River.

Highly transmissive stratified drift deposits fill a portion of the bedrock valley. The estimated transmissivities range from 1,400 ft<sup>2</sup>/day to greater than 4,000 ft<sup>2</sup>/day. According to Delaney and Gay, the aquifer system in the Aberjona River valley is the most productive in comparison to other aquifer systems throughout northeastern Massachusetts's coastal drainage basins. The most permeable stratigraphic unit observed in the vicinity of the Wells G&H Site is the coarse-grained stratified drift deposit, which appears to transmit the greatest amount of groundwater. The former municipal Wells G and H were screened within these deposits that yielded approximately 800 and 700 gallons per minute (gpm) (Delaney and Gay, 1980a). The transmissivity for the aquifer within the vicinity of Wells G&H was estimated to range from 17,600 ft<sup>2</sup>/day to 29,700 ft<sup>2</sup>/day (Myette, Olimpio, and Johnson, 1987). The highly transmissive materials also support the tendency for groundwater to discharge into the Aberjona River, as groundwater in the vicinity of the River flows towards it, converging upward, and discharging into the River. Groundwater discharging to the Aberjona River appears to flow through the adjacent wetland areas and through an underlying leaky streambed. Groundwater flow towards the river is reversed when the river stage rapidly increases (Solo-Gabriele, 1995). This reversal effect, however, is temporary and localized.

The stratified drift aquifer of the Southern Area is generally unconfined, and as a result, groundwater levels fluctuate in response to variation in recharge and discharge rates. The general direction of groundwater flow is horizontal throughout the stratified drift aquifer.

Exceptions to horizontal flow are: recharge areas where groundwater flows vertically downward; discharge areas where groundwater flows vertically upward; and in the vicinity of a pumping well, where groundwater may flow either vertically upward or downward. A peat layer overlies some of the stratified drift aquifer, but does not generally appear to impede groundwater flow. The peat layer is present in the vicinity of the Wells G&H Site, and peat deposits underlie most of the wetlands. Based on observation, the peat layer is a largely saturated material that appears to transmit water readily. Water transmitted through the peat layer is either groundwater discharged to the river or water withdrawn from the river due to localized pumping conditions (de Lima and Olimpio, 1989).

An assumption regarding the ability of the bedrock to transmit water is necessary because of the complex nature of flow in bedrock and the minimal flow data available for the bedrock. It should be noted, however, that in localized areas, bedrock may have a significant role in the groundwater flow regime. The bedrock and overlying till appear to contribute a minimal amount of leakage to the stratified drift aquifer. Leakage rates from bedrock have not been quantitatively measured, but leakage has been suggested from vertical and horizontal head gradients adjacent to the sand and gravel and till and bedrock boundaries (de Lima and Olimpio, 1989). The ability of bedrock to transmit water has also been demonstrated by a bedrock well, located just south of Wells G and H, which has a pumping capacity of 100 gpm (Myette, Olimpio, and Johnson, 1987).

Variations in groundwater flow direction have been observed in the vicinity of Wells G&H and the Riley production well. Wells G&H, as former municipal supply wells for the City of Woburn, have been reported to pump from 700 to 800 gpm (approximately 1.0 – 1.15 million gallons per day (mgd) in total) (Myette, Olimpio, and Johnson, 1987). The Riley production well, located north of Salem Street and east of the Boston and Maine Railroad tracks, has been reported to pump 700 gpm (approximately 1 mgd). Due to the long-term pumping of the Riley production well (1958 – 1989), a cone of depression formed in the southwest portion of the Wells G&H Site, changing the groundwater flow direction towards the production well. Overpumping reversed the natural groundwater flow direction in the vicinity of the pumping wells and induced infiltration from the surrounding surface water bodies (Myette, Olimpio, and Johnson, 1987).

The active Woburn water supply wells and Atlantic Gelatin (Kraft Foods) production wells may also affect the natural groundwater flow direction. Five operating water supply wells for the City of Woburn are located in the wetlands southwest of Horn Pond along the western border of the Southern Area. The exact rate of water withdrawal from these wells has not been precisely measured. According to the Woburn Water Department, the City of Woburn is registered for a total water withdrawal of 4.2 mgd. However, the average water withdrawal from these wells is 3.7 mgd (Woburn Water Department, 2003). The estimated water yield rates imply that the groundwater flow direction may have been affected locally, causing groundwater to flow toward the water supply wells within the vicinity of the wells.

According to a 1981 study, a cone of depression also occurred in the vicinity of the Atlantic Gelatin production wells located in southeast Woburn, east of the Aberjona River and adjacent to I-93, near the eastern boundary of the Southern Area (Ecology and Environment, 1981). Atlantic Gelatin has operated a total of seven production wells. Presently, the total permitted withdrawal rate is 1 mgd. Approximately 800,000 gallons per day are withdrawn from Atlantic Gelatin wells located in Winchester. The balance of approximately 200,000 gallons per day is withdrawn from Well No. 7, located in Woburn, near Whittemore Pond. According to the Atlantic Gelatin Environmental Manager, withdrawal rates have remained fairly consistent since the 1980s, and prior to 1980 withdrawal rates may have been slightly higher. The exact withdrawal rates are not known, but were no more than 20 percent greater than present withdrawal rates (Lowery, 2002). However, a 1967 report indicated withdrawal rates at 3 mgd at that time (CDM, 1967). Refer to Section 4.0 for further details on the history and current status of the Atlantic Gelatin wells.

The municipal and industrial supply wells discussed above pump and withdraw the most significant amounts of groundwater in the Southern Area. Irrigation, monitoring, and few domestic wells exist throughout the Southern Area. However, it is assumed that these wells do not consistently withdraw a significant amount of groundwater, and therefore are not expected to have an influence on area-wide groundwater flow direction. Refer to section 4.0 for details on these wells.

### **2.3.1 Groundwater Discharge Areas**

Surface water bodies within the entire Aberjona River watershed study area are generally assumed to represent groundwater discharge areas. Discharge areas are also observed within areas adjacent to the Aberjona River (Solo-Gabriele, 1995). It is also possible for these surface water bodies to represent groundwater recharge areas, particularly during "high water" periods, such as spring flood conditions. However, this seasonal variation is likely to be short-term and the volume of recharge limited. Another means of groundwater discharge is evapotranspiration, which is greatest from April to October within northeastern Massachusetts (Flanagan et al., 1999). Groundwater discharges are also attributed to withdrawals from pumping wells.

### **2.3.2 Groundwater Recharge Areas**

The recharge areas of the basin can be interpreted based on the characteristics of the surficial deposits and the slope of the land surface. These considerations limit the primary areas of recharge to the more permeable sands and gravels that occupy the lower, gently sloping areas of the basin. The hills that define the basin boundary are typically blanketed by glacial till deposits which generally have a much lower hydraulic conductivity than the sands and gravels that generally occupy the valley floor. Additionally, the steeper topography near the basin rim will result in a higher percentage of runoff during precipitation events than in the more gently sloping valley floor. Recharge areas occur in the uplands near a groundwater divide that is located near the Aberjona River watershed boundary (Solo-Gabriele, 1995). Also, it is recognized that some recharge will occur in areas of less permeable till and bedrock formations; however, it is assumed that the volume of this recharge is small in relation to the recharge of the valley floor deposits. The exposed bedrock may locally provide recharge to the bedrock aquifer. The impact of this localized recharge to the basin as a whole may need to be evaluated as part of a complete resource evaluation. According to a USGS report, 20 to 24 inches of precipitation per year, approximately half of the annual precipitation, is the average amount of recharge from precipitation to stratified drift aquifers in eastern Massachusetts (Flanagan et al., 1999).

## 2.4 Surface Water

Surface water in the Southern Area generally appears to flow in a southward direction, from topographic highs to topographic low areas. Most surface water bodies within the watershed flow towards and discharge into the Aberjona River, which flows south and discharges into the Mystic Lakes. The significant surface water bodies within the Southern Area, from north to south, include Whittemore Pond, Sweetwater Brook, Horn Pond, Russell Brook (which is presently culverted through the Town of Winchester and discussed further in Section 3.0), Horn Pond Brook, Winter Pond, Wedge Pond, and Judkins Pond. Figure 2-3 shows surface water bodies and surface water flow directions in the Southern Area.

Recharge to surface water bodies is by both precipitation and groundwater. The average annual precipitation for the Aberjona River watershed is 45.3 inches. Precipitation reaches the Aberjona River by man-made routes and natural surface runoff. Between rain events, water is supplied to the river primarily from the groundwater system (Solo-Gabriele, 1995).

During large storm events, Wedge Pond may receive backwater from the Aberjona River, which aids in the attenuation of the peak flow along the River (FEMA, 1979). According to the Town of Winchester Engineering Department, there have been no engineered controls installed to prevent or control back flow to Wedge Pond (Winchester Engineering Department, 2003). Tributaries to Horn Pond include Fowles Brook, Shaker Glen Brook, Cummings Brook, and Little Brook. The water level of Horn Pond is controlled by a dam structure. Horn Pond Brook appears to act as a conduit for surface water between Horn Pond and Wedge Pond. Wedge Pond drains into the Aberjona River, which drains into the Upper Mystic Lake.

Two small embayments lead into the Upper Mystic Lake. These embayments are the Upper and Lower Forebays and were created in 1864 when the water level of the Upper Mystic Lake was raised 6 feet by the construction of a dam. Six spillways make up this dam and control the surface water level of the Upper Mystic Lake. Each spillway is approximately eight feet wide. Flashboards are placed within each in order to control lake elevation (CDM, 1999). The Upper Forebay covers an area of 25.5 acres and has a mean depth of 6 feet. The Lower Forebay covers an area of 14.5 acres and has a mean depth of 8 feet. The Upper Mystic Lake covers an area of 126 acres and has a mean depth of 48 feet and a maximum depth of 90 feet. The

Lower Mystic Lake covers an area of 111 acres, has a mean depth of 33 feet and a maximum depth of 79 feet, and consists of a north and south basin, discharging into the Mystic River (Knox, 1991).

#### **2.4.1 Aberjona River**

The *Preliminary MSGRP Report* (HNUS, 1997) summarizes physical changes made to the Aberjona River as a result of development. According to the *Aerial Photographic Analysis of the Aberjona River Study Area* conducted by the EPA in 2002, physical changes were made to the course of the Aberjona River between 1938 and 1995. The course of the river prior to these changes is indicated on Figure 2-3, with the location of each of the four course changes described below highlighted. The following is a summary of the changes to the Aberjona River in the Southern Area from I-95 to the Mystic Lakes:

1. Between 1943 and 1952, a portion of the river was diverted to increase the size of a recreational area, presently Manchester Field. According to the file on Manchester Field at the Winchester Planning and Engineering office, request for land from the State for the field occurred in 1940 and actual work was conducted from 1943 to 1949. Prior to 1943, the river flowed east of its present location. The river currently flows along the east side of the Boston and Maine railroad tracks.
2. Between 1952 and 1955, a change in the river course was made where the tributary from Horn Pond meets the Aberjona River. This change was a result of building construction and filling of adjacent land.
3. Between 1963 and 1969, the river was diverted through a large underground culvert at the location of Winchester High School. The area was filled to increase the size of the recreational park. The river originally flowed along the western side of the park. Based on the review of a 1903 USGS topographic map, Judkins Pond was much larger in area. A significant amount of filling in the pond has occurred in order to construct the present Winchester High School and athletic field (refer to Figure 2-3).

4. Between 1969 and 1978, a portion of the river was diverted due to development where the present day Howard Johnson's restaurant is located, on the North side of Montvale Avenue. This change in the river course was a result of the construction of several buildings and parking lots in the area.

The Aberjona River is the primary river system within the Aberjona River watershed and has a drainage area of approximately 25 square miles (Solo-Gabriele, 1995). The Aberjona River originates in a low-lying wetland area, at an elevation of 120 feet National Geodetic Vertical Datum (NGVD), in Reading, Massachusetts (the northeast area of the watershed). The river flows for approximately 10 miles in a southward direction, as detailed below, and discharges into the Mystic Lakes at an elevation of approximately 3 feet NGVD. To the north, the river flows adjacent to the former Mishawum Lake (presently the Halls Brook Holding Area) which provides storage for Halls Brook and surrounding wetlands during elevated flow events (CDM, 1999). The river then flows south from the I-95 area, discharging into a 38-acre Wells G&H wetland. Near Olympia Avenue and just north of municipal Well H, the river splits into two main channels that converge approximately 1,000 feet downstream from the divergence. The Aberjona River continues to flow south into the Town of Winchester through several residential and municipal areas, including a major business area in the town center (CDM, 1999). The river finally drains into the Upper Mystic Lake. The average discharge is reported to be 29.5 cubic feet per second at the USGS station located approximately 0.5 mile upstream of Upper Mystic Lake in Winchester (USGS, 1999).

The general slope of the Aberjona River is 0.002 ft/ft. The width and depth of the river increases in the downstream (southerly) direction. The main tributary to the Aberjona River is Horn Pond Brook, which drains approximately 40 percent of the watershed area (Solo-Gabriele, 1995). Other tributaries to the Aberjona River include Halls Brook, Snyder Creek, Sweetwater Brook, and Whittmore Pond Brook. These tributaries and the surface water flow directions are shown on Figure 2-3. The Aberjona River within the Town of Winchester is approximately 20 to 40 feet wide. During base flow conditions (no storm events), the depth of the river is from approximately 1 to 3 feet deep, and less than 1 foot deep in flat topographic areas. The river passes through man-made ponds impounded by low dams at Davidson Park in the northern end of Winchester and behind Center Falls, located within the center of Winchester. At a man-made channel between the USGS surface water gauging station and

Waterfield Road, the width of the river decreases to 15 to 20 feet. The width of the river also decreases to 19 feet at a large concrete siphon located just upstream of a pedestrian bridge at the Wedgemere train station. During base-flow conditions, the velocity of the river is less than 0.5 feet per second upstream of Center Falls and approximately 1 foot per second downstream of Center Falls. In this area, the river flows through a culvert beneath the grounds of Winchester High School and discharges into Judkins Pond (CDM, 1999).

Due to major development within the Aberjona River watershed within the past 20 to 30 years, the amount of runoff to the river has increased significantly. The inflow increase varies as a result of storm events. The river is directed through many man-made features such as bridge openings, culverts, dams, and siphons. The Aberjona River has frequently overflowed and flooded the Town of Winchester as a result of storm events. Recent floods have occurred in October 1996 and June 1998 (CDM, 1999). The 1999 CDM report evaluated the causes of the flooding for the Town of Winchester and made recommendations to modify the river and manmade structures to improve flow and reduce the flooding conditions. The Town of Winchester is currently implementing as many of these recommendations as possible. However, the recommended changes that may reduce the flooding most significantly include deepening and widening the river at specific locations. These proposed modifications are still being evaluated for regulatory and budgetary issues.

It is important to note that the 1999 CDM report was prepared for the Town of Winchester. The City of Woburn also suffers from the negative effects of flooding along the river. According to the newspapers the Woburn Daily Times Chronicle and the Woburn Advocate, significant flooding within the City occurred in 1996, 1998, 1999, and 2001. Hence, the City is also interested in reducing flood conditions within its borders and is also evaluating engineering solutions to reduce flooding in low-lying areas.

### 3.0 LAND USE

This section discusses the businesses and industry located in the Southern Area whose operations may impact the groundwater, surface water, soil, or sediments of the Aberjona River watershed.

#### 3.1 Historical Land Use

Agricultural, industrial, and residential uses were the predominant land uses within the Southern Area from the late 1600's to the 1980's. Agricultural activities included piggeries and raising cattle and crops. The Murphy piggery, located approximately 1,500 feet northeast of Woburn's former municipal Well H, had been reported as a source of pollution in the form of stock yard runoff to Woburn surface waters (CDM, 1967). A large cranberry bog in Woburn, located south of Salem Street and continuing to Washington Street Circle, operated from 1910 to 1939. The cranberry bog is presently a conservation area maintained by the Woburn Conservation Commission with financial assistance from the Massachusetts Department of Natural Resources.

According to the book, Woburn, A Past Observed by John D. McElhiney, an apple orchard located in southern Wilmington (formerly part of Woburn) was operated during the late 1700s and 1800s as part of the Butter's family farm. There were reportedly 144 apple trees in the orchard that bore the famous "Baldwin" apples. However, further research indicated this orchard was located just outside of the northern portion of the Aberjona River watershed. Based on aerial photos from 1938 to 1969 and "anecdotal" references, it is possible that other apple orchards may have existed in Woburn. Two possible apple orchard locations were at the present day 200 Wildwood Avenue property, and just south of Route 128 at the present day Crest-Buick dealership at 399 Washington Street. However, based on a review of the City of Woburn Assessor's records of past ownership of the properties, and also on discussions with the present owners of the properties, there are no actual records of apple orchards previously located at the two properties.

Historically, the leather industry was a significant industrial presence in the MSGRP Northern and Southern Areas. The earliest tannery was built in Woburn in 1666. Approximately 100

tanneries, rendering factories, and leather-finishing companies have operated in Woburn, Stoneham, and Winchester at various times between 1838 and 1988. Between the 1870's and 1920's, the leather industry accounted for more than half of the total annual value of goods produced in the Aberjona River watershed (HNUS, 1997). The most productive period for the tanning industry occurred from the late 1870's to the 1920's; by approximately 1925 the tanning industry had reached its peak (Spliethoff and Hemond, 1996). Surface water contamination attributed to tanning and finishing operations was reported as early as 1871. This contamination was the result of the direct discharge of tanning wastes into surface waters (Durant, Zemach, and Hemond, 1990).

The first major sewer line in the Southern Area was installed in 1878 along the Aberjona River in Winchester. The City of Boston constructed this sewer line, referred to as the "Old Mystic Valley Sewer," to prevent contamination of the Upper Mystic Lake, which between 1864 and 1898 served as the local drinking water supply. The sewer line transported wastewater from tanneries located in Winchester Center south through Winchester, diverted it away from the Upper Mystic Lake, and finally discharged the wastewater into the Lower Mystic Lake. Although the wastewater was treated before discharge to the Lower Mystic Lake, the water quality of the lake eventually began to deteriorate. The Lower Mystic Lake was used as a discharge area until 1895. Because the "Old Mystic Valley Sewer" could not manage the volume of wastes generated by adjacent tanneries and other industries, the sewer line was extended in 1895 and connected with other sewer lines that discharged to Deer Island and Boston Harbor (Durant, Zemach and Hemond, 1990).

The "Old Mystic Valley Sewer" initially did not extend to north Woburn. Tanneries that were not connected to a sewer line collected their wastes in lagoons. The solids settled out and the wastewater was discharged directly into surface water bodies such as the Aberjona River and its tributaries. It was not until 1927 that construction began on the Metropolitan District Commission (MDC) sewer extension to north Woburn. This sewer line did not begin operating until 1932 due to problems caused by excessive groundwater infiltration (Durant, Zemach and Hemond, 1990).

After the completion of the MDC sewer extension in 1932, much of the tannery waste from facilities in north Woburn was discharged to the sewer system. However, capacity limits and

periodic plugging of the sewer lines due to high concentrations of solids in the tannery wastewater resulted in periodic overflows. Settling lagoons were eventually used to pretreat the tannery wastewater prior to discharge into the sewers. These lagoons generated a large volume of sludge that was periodically removed and disposed of in centrally located landfills or on-site disposal areas (Durant, Zemach and Hemond, 1990). The location and nature of these sludge disposal sites are not well known. These sites represent a potential source of contamination to the watershed (HNUS, 1997).

### **3.1.1 Former Tanneries, Leather Finishing Companies, and Renderers**

In addition to John J. Riley Company (a former leather tannery located on Salem Street, Woburn), 37 other leather tanning/finishing/rendering factories were located within the Southern Area (see Figure 3-1). The earliest tannery in the area began operating in approximately 1666. Few leather tanneries or finishers continued operating beyond the 1930's; the John J. Riley company, however, remained in operation until 1988. Atlantic Gelatin continues to operate a rendering plant in Woburn (see Section 3.1.2). Table 3-1 lists the tanneries, finishers, and renderers that operated in the Southern Area.

Tanning is a chemical process used to convert hides and skins into leather. Lime and sodium sulfide are often used to remove hair while chromium sulfate is typically used as the tanning agent. The finishing process then alters the surface characteristics of the leather. Typical finishing processes include vegetable retanning, bleaching, coloring and fat-liquoring. Mechanical operations, including trimming, drying, staking, dry milling and buffing, are also part of the finishing process. The rendering process is used to extract grease and glue from animal hides, bones and leather. Chrome-tanned leather is treated with acids in the rendering process, which results in dissolved chromium in the rendering effluent (Durant, Zemach, and Hemond, 1990).

Hazardous compounds typically associated with the leather industry include chromium, copper, lead, and zinc (Durant, Zemach, and Hemond, 1990). The 38 former leather industry sites discussed above are considered to have been or are potential sources of metals and organic solvent contamination to groundwater, surface water, sediment, and soil. Potential source areas located at former tannery sites are discussed in further detail in Section 5.0.

**TABLE 3-1  
TANNERIES, LEATHER FINISHING COMPANIES, AND RENDERERS IN THE SOUTHERN AREA  
DRAFT PRELIMINARY MSGRP SUPPLEMENTAL REPORT - SOUTHERN AREA  
INDUSTRI-PLEX SITE  
WOBURN, MASSACHUSETTS**

SITE # *	OPERATION	DATES	COMPANY NAME
1	Tanning	1875 - 1894	Kinney & Murphy
2	Finishing	1926 - ?	Paterson Patent Leather
3	Finishing	1918 - 1979	Murray Leather Company
4	Tanning	1918 - 1988	J.J. Riley Co.
5	Tanning	1875 - ?	Winn Tannery
6	Tanning	1875 - ?	J. H. Connolly
7	Finishing	1875 - 1961	Murray Leather Co.
8	Finishing	1904 - 1926	Ballard Japanning Co.
9	Tanning	1888 - 1918	J. Kendall Chrome Tannery (1)
10	Tanning	1894 - 1918	Griffin Place Curry Shop (1)
11	Finishing	1875 - 1961	Woburn Japanning Co.
12	Rendering	1939 - 1977	Tanners Degreasing Co.
13	Rendering	1875 - Present	Atlantic Gelatin
14	Finishing	1916 - 1929	A.H. McLatchy Co.
15	Rendering	1872 - 1980	J.O. Whitten Co.
16	Tanning	1838 - 1894	Waldmyer Tannery
17	Tanning	1876 - 1910	Blank Brothers Tannery
18	Tanning	1918 - 1940	Crescent Tanning Co.
19	Tanning	1875 - 1918	W.P. Fox Leather (2)
20	Tanning	1871 - 1957	Beggs and Cobb
21	Finishing	1904 - 1916	Haley Patent Leather Co.
22	Tanning	1899 - ?	Pantasote Leather Co.
23	Tanning	1875 - 1934	Prime Tanning Co.
24	Tanning	1875 - 1938	Tolman – Fox Corp.
25	Tanning	1875 - 1926	Amer. Hide & Leather Fact. E
26	Tanning	1875 - 1939	Amer. Hide & Leather Fact. S
27	Finishing	1926 - ?	Kean Brothers & Bedell
28	Tanning	1888 - 1939	Dorrington Leather Co.
29	Tanning	1875 - 1939	Amer. Hide & Leather Fact. D
30	Tanning	1888 - 1926	E. Cummings Leather Co.
31	Tanning	1888 - 1894	Watauga Tanning Co.
32	Tanning	1888 - 1894	E.C. Cottle (3)
33	Tanning	1888 - 1904	Middlesex Leather Co.(3)
34	Tanning	1888 - 1918	Cottle Leather Co.
35	Rendering	1918 - 1926	American Hide and Leather
36	Rendering	1888 - 1904	B.H. Nichols Grease Factory
37	Finishing	1888 - 1926	Beggs and Cobb Factory 1
38	Finishing	1888 - 1926	Beggs and Cobb Factory 2

\* Site # refers to locations on Figure 3-1.

(1) In 1918 was incorporated into Woburn Japanning Co. @ Site 11

(2) In 1918 was incorporated into Fox & Sone, Inc. @ Site 24

(3) In 1904 was incorporated into Amer. Hide & Leather Fact. D @ Site 29

Source: Durant, 1991

### **3.1.2 Atlantic Gelatin**

The Atlantic Gelatin plant is owned by Kraft Foods, Inc. and comprises 49 acres of a 100-acre facility. The site is located near Interstate Route 93 and Hill Street in the southeastern part of Woburn. The facility has operated as a gelatin processing plant since 1919 and abuts the western bank of the Aberjona River. The property is shown on Figure 3-1, Site # 13.

Sweetwater Brook is located just south of the property and discharges into the Aberjona River. Runoff from the property flows either directly into Sweetwater Brook, or is collected in catch basins and is discharged into the Aberjona River and surrounding wetlands.

The potential source areas at Atlantic Gelatin include a landfill, several petroleum underground storage tanks (USTs) and a power plant. The landfill is located on the western edge of the property and was formerly used for the disposal of sludge from the gelatin manufacturing process. The power plant was built in the 1930's to heat and power the facility. There is also a wastewater treatment plant on site, of which little is known regarding historical discharging practices. Several spills at the site have been reported to the Massachusetts Department of Environmental Protection (MADEP). These spills were primarily fuel oil releases that reached Sweetwater Brook. Additional details concerning the source areas at the site are discussed in Section 5.0.

### **3.1.3 Russell Brook**

Russell Brook served as a discharge point for wastewater from tanneries and other industries operating in both Woburn and Winchester. This brook is a tributary to Horn Pond Brook. According to the Massachusetts State Board of Health Fifth and Sixth Annual Reports, tannery waste was found to have contaminated Russell Brook in 1874 and 1875. During that period, eight tanneries were identified that discharged tannery wastes directly to the brook (Durant, Zemach, and Hemond, 1990). Investigations of Russell Brook in 1904, 1907, 1915, and 1921, also indicated significant contamination by tannery effluent discharges to the brook (Durant, Zemach, and Hemond, 1990). The dense grouping of tanneries in Woburn shown on Figure 3-1 along the railroad tracks (site numbers 19 and 23 – 38) likely contributed effluent discharges to Russell Brook.

Based on a 1903 topographic map of the area, the easterly headwaters of Russell Brook were located in wetlands in an area between Montvale Avenue and Jefferson Avenue, with one branch parallel to Eastern Avenue and another near the current location of the Shamrock School. The 1930 map also shows a second branch of the brook's headwaters was located in the area between Salem Street and Montvale Avenue, now occupied by the Woburn High School. This branch flowed south, under Montvale Avenue and parallel to Auburn Street, joining the easterly branch just west of the intersection of Garfield and Jefferson Avenues. The course of the brook (see Figure 3-2) appears to have followed Jefferson Avenue to the west, then turned south, generally parallel to the Boston and Maine railroad tracks. At Fowle Street the brook appears to split into two branches. One branch ran along the east side of the railroad tracks; the other branch ran southwest crossing Conn Street and then turning back to the southeast crossing under the tracks near the present location of Crane's Court and merging with the east side branch. This course of Russell Brook was also shown in the 1875 Town of Woburn Atlas. After the two branches merged, the brook continued south into Winchester, running southwest under Cross Street and Main Street before flowing into Horn Pond Brook.

A right-of-way and track map for the Boston and Maine railroad dated 1914, shows the brook running along and parallel to the tracks from approximately Conn Street in Woburn south to the Winchester town line. Historical engineering plans from Winchester indicate that Russell Brook flowed in a southwest direction from Woburn under Cross Street in Winchester before discharging into Horn Pond Brook.

A 1926 Sanborn map shows the open course of Russell Brook in Woburn. While details were not available at the Woburn City Engineer's office, a review of historic USGS topographic maps shows that sometime between the late 1920's and 1940's, portions of the brook were directed into culverts in Woburn. The maps show intermittent open channels and apparently culverted sections of the brook. While no records were available, the City Engineer's office suspects that the brook was culverted to allow for development in the area by private property owners. Presently, the railroad tracks have been removed and only the Boston and Maine right-of-way exists. Russell Brook in Woburn now appears like small drainage swales with overgrown vegetation and little observable flow during dry conditions.

Due to development within the Town of Winchester, Russell Brook has been both filled in and redirected by stone masonry culverts and aqueducts. Plans available from the Winchester Engineering Department indicate that the course of Russell Brook was changed in the mid-1930's. Engineering drawings dated May 1939 show plans for a masonry culvert for Russell Brook from Cross Street to Horn Pond Brook.

#### **3.1.4 Rock Avenue Landfill**

The Rock Avenue Landfill, located at the intersection of Rock Avenue and Hill Street in Winchester, has been extensively filled with sand, gravel, and some sewage/sludge material and demolition debris (see Figure 3-1). Prior to the 1930's, the Rock Avenue Landfill was used as a sand and gravel pit. From 1930 to 1978 the site was reportedly used for sludge/sewage disposal. Center Trucking Company and local residents also reportedly used the sandpit for disposal of oils, engine cleaners, and asphalt. Landfill operations for disposal of construction and building demolition debris began at the site in 1980 and ceased in 1983.

The landfill covers approximately two acres and is located approximately 2,000 feet southeast of Horn Pond and west of the Aberjona River. A series of environmental investigations were performed on the landfill beginning in January 1985. Neither Horn Pond nor the Aberjona River were sampled as part of the site investigations. The Petition Health Consultation dated February 26, 1998 stated that it was unlikely that the site would impact these nearby surface water bodies (ATSDR, 1998).

#### **3.1.5 Massachusetts Rifle Association**

The Massachusetts Rifle Association established a shooting club in the Walnut Hill portion of Woburn in 1875. The gun club is located at 290R Salem Street (see Figure 3-1) and provides indoor and outdoor shooting facilities for rifle, shotgun, and pistol. A small oil spill was documented from visual observations of surface soil during the 1980's. A surface soil composite sample contained chlordane and lead (ATSDR, 1989). Samples collected by EPA in 2001 from wetlands near the gun club have contained lead shot.

## **3.2 Current Zoning**

As previously stated, the Southern Area encompasses the southern portion of the Aberjona River watershed, which includes the City of Woburn and the Town of Winchester south of I-95. The current zoning for each municipality is discussed in the following sections.

### **3.2.1 Woburn Zoning**

The current zoning within the Woburn portion of the Southern Area includes residential, industrial park, business interstate, business highway, business neighborhood, business downtown, and office park classifications (City of Woburn, 2002). Woburn zoning laws permit a wide range of land uses within the Southern Area. A general summary of the zoning districts from the current zoning ordinance is presented below (City of Woburn, 2002). A zoning map for the City of Woburn is included in Appendix B.

Residential districts include: single family (R-1); two-family (R-2); townhouses and garden apartments (R-3), with a special permit from the City Council; and other types of apartments (R-4), with a special permit from the City Council. Residential areas and industrial/commercial areas for the City of Woburn are typically mixed throughout the Southern Area.

Industrial zoning districts include general industrial (I-G), industrial park (I-P) and industrial park two (IP-2) and permit light and heavy manufacturing and other industrial/commercial facilities with a size under 15,000 ft<sup>2</sup>. Industrial, commercial, and light and heavy manufacturing facilities over 15,000 ft<sup>2</sup> are allowed only by special permit. In addition, gasoline stations, repair garages, warehouse distribution centers, storage facilities, commercial radio or television transmission towers, passenger transportation terminals, rail terminals, and research businesses require special permits from the City within industrial zoning districts.

Neighborhood business (B-N), highway business (B-H), downtown business (B-D), and interstate business (B-I) districts allow activities similar to those for industrial districts; however, manufacturing, laboratories, and warehouses are not permitted in business districts. This zoning designation primarily includes retail, professional and general office, commercial services, restaurants, and hotels (which may require a special permit by the City). Special

permits are also required for other conditions which include the following: dwellings above a first - floor commercial structure, bowling alleys and billiard parlors, community centers, public cemeteries, retail establishments greater than 15,000 ft<sup>2</sup>, shopping centers, trade centers, fast food establishments, car wash establishments, repair garages, storage facilities, gasoline stations, commercial radio or cable television transmission towers, and passenger transportation terminals.

Office park districts include areas utilized for typical office space operation. Light manufacturing, research facilities, public cemeteries, community centers, hospitals, hotels and motels, trade centers, printing and publishing offices and municipal uses require a special permit by the City within office park districts.

Mixed-use (S-1) districts typically allow the following uses: residential; recreational and institutional; business, professional and general office; and medical and dental office. Manufacturing of any type is not allowed.

The open space zoning district was added in 2002. Open space (O-S) use is limited by permit to golf courses/driving ranges, cemeteries, agriculture, municipal uses, and building-mounted wireless communications links.

A number of recreational uses (e.g. golf courses, racquet sports facilities, physical fitness training and recreation facilities) are allowed in residential, business, industrial and other zoning districts, in some cases only with a special permit. Likewise, institutional uses (e.g. schools, child care centers, hospitals) are allowed in a number of zoning districts, in some cases only with a special permit.

The Floodway and Flood Plain District is an overlay district to all other zoning districts. Flood plain areas are indicated on the Woburn Flood Insurance Rate Map as Zones A, A1-30 and on the Flood Boundary and Floodway Maps as areas adjacent to water bodies with elevations equal to or less than those shown on the referenced maps. Floodway boundaries are shown on the Flood Boundary and Floodway Maps. The following uses are permitted in the Floodway and Flood Plain District if a special permit is granted, as specified in Section 9.4 of the Woburn zoning ordinance: buildings or structures, dams, bridges, recreational development and

agricultural uses. In each case, the ordinance contains a description of each use allowed under a special permit, as well as the conditions that must be met for approval of a special permit application.

A Groundwater Protection District was added to the Woburn Zoning Ordinance in 1995. This district overlies the zoning districts and applies to all new construction, reconstruction or expansion of existing buildings and new or expanded uses. Activities in any of the underlying zoning districts that are covered by the Groundwater Protection District must also comply with its requirements.

### **3.2.2 Winchester Zoning**

The current zoning within the Winchester portion of the Southern Area includes residential districts, industrial districts, business districts, and other special districts (Town of Winchester, 2002). The zoning laws permit a range of land uses. A general summary of the zoning districts based on the current zoning by-laws is presented below (Town of Winchester, 2002). A zoning map for the Town of Winchester is included in Appendix B.

Residential zoning is dedicated for buildings that are utilized for residential purposes only. The residential districts of Winchester consist of various dwelling types. Multiple family residential districts (RA-120) include multiple family dwellings arranged on lots that are compatible with adjacent residential areas. Apartment house residential zones (RB-20) are primarily located within Winchester Center, where mid-rise apartment houses are permitted and are compatible with adjacent residential and commercial areas.

Other residential districts include: planned residential districts (PRD, intended for single family homes, townhouses and garden apartments which require a special permit); residential districts A (RDA-20, intended for one-family dwellings located in low density areas or undeveloped areas); residential districts (RDC-15, intended as one-family occupancies only); residential districts B (RDB-10, intended for one-family occupancies located within an area of medium density with smaller lots than those in residential district A, or cluster areas which require a special permit); and general residence districts (RG-6.5, intended for one- or two-

family occupancies in well developed areas of medium to high density). Residential zoning districts are the predominant land use within Winchester.

The zoning by-laws include local, general and center business districts. Local business district (BL-0.50) zoning allows limited business uses and services. Three general business districts (GBD-1.0, GBD-2.0, GBD-3.0) allow retail; offices; and with a special permit, low rise apartments, town houses and combined business and residential uses. The center business district (CBD-2.0) is intended for retail, offices and other business uses where parking is not required due to the density of the area. The various business districts are grouped in Winchester Center and north of the Center along Route 38.

Industrial zoning for the Town of Winchester includes a limited light industrial district (IL-1.0). This district is intended for light manufacturing, miscellaneous service and related activities, retail and wholesale commercial establishments, laboratories for research, experimental and testing activities, and offices. Wholesale laundry or dry cleaning establishments are not allowed in this, or any other, district within Winchester. The limited light industry in Winchester is located in the northern portion of the town along the Woburn line.

The following educational, institutional, recreational, and agricultural uses are allowed in each of the 14 residential, business, industrial, and special districts described in the zoning ordinance: school; day care center; church or other place of worship; library or museum; public park, playground or other public recreational facility; and reservation wildlife preserve or other conservation area.

Special zoning districts for the Town of Winchester include conservancy-institutional districts (SCI-0.50), flood plain districts, multiple development districts (MD), independent elderly housing districts (IEH), adult use districts (AUD), and personal wireless service facilities districts. The conservancy-institutional special zoning district is intended for public use and to restrict other development, as well as preserve and maintain the groundwater table and protect against flood hazards. The floodplain district is an overlay district. The underlying permitted uses are allowed consistent with the requirements specified in the zoning ordinance. The majority of the area bordering the course of the Aberjona River from Judkins Pond south to the Upper Mystic Lake lies within the 100-year floodplain.

### 3.3 Current Land Use

The Aberjona River watershed area is highly urbanized, including portions of the towns and cities of Burlington, Reading, Stoneham, Wilmington, Woburn and Winchester, as well as portions of two major highways (Interstate 93 and Interstate 95). A 1992 study by the Metropolitan Area Planning Council (MAPC), North Suburban Water Supply Protection Plan, indicated that the general Southern Area is approximately 50 percent developed land and 50 percent undeveloped land (MAPC, 1992). Developed land use is mixed, including residential, industrial, and commercial office park. Based on 1985 data (MAPC, 1992) the majority of the developed land in Woburn and Winchester is residential (86 and 90 percent respectively). Commercial developments represent less than 10 percent (9 percent in Woburn and 6.5 percent in Winchester), while industrial land use represents less than 5 percent in Woburn and approximately 3.5 percent in Winchester.

Commercial developments include nurseries and greenhouses. There is a public golf course in Woburn, located west of Horn Pond, and another golf course in Stoneham, just east of I-93. Both golf courses are shown on Figure 3-1. Although it is a small percentage of the developed area in the watershed, the industrial land use represents the most significant threat to groundwater and surface water quality in the Southern Area because of the wide variety of associated activities that use chemicals and other hazardous compounds. The majority of the industrial land use is in the northern and central portions of the Southern Area, specifically in the southwest portion of Woburn and the northern portion of Winchester.

Based on data extracted from "2002 Harris Massachusetts Manufacturers Directory", the types of manufacturers or businesses that are located in the Woburn and Winchester portions of the Southern Area are presented in Table 3-2, categorized by primary Standard Industrial Code (SIC). Only SIC categories for facilities present in the Southern Area are listed in the table. For example, there are no longer any leather and leather products facilities (SIC 31) located in the Southern Area. Of the over 125 facilities located in Woburn and Winchester, 70% reported estimated sales of \$5 million or less (Harris, 2002). Only one facility, Admiral Metals Servicecenter, Inc., reported estimated sales over \$100 million. Potential hazardous materials and chemicals are used daily by manufacturing and industrial facilities. The storage, use, and disposal of these materials are strictly regulated at a state and federal level. If properly

**TABLE 3-2**  
**MANUFACTURING FACILITIES IN THE SOUTHERN AREA**  
**DRAFT PRELIMINARY MSGRP SUPPLEMENTAL REPORT - SOUTHERN AREA**  
**INDUSTRI-PLEX SITE**  
**WOBURN, MASSACHUSETTS**

<b>SIC/MANUFACTURING ESTABLISHMENTS</b>	<b>NUMBER OF FACILITIES IN WOBURN</b>	<b>NUMBER OF FACILITIES IN WINCHESTER</b>
20/Food and Kindred Products	6	1
23/Apparel and Textile Products (made from fabrics)	2	-
24/Lumber and Wood Products (excluding furniture)	4	-
25/Furniture and Fixtures	1	1
27/Printing, Publishing, and Allied Industries	19	5
28/Chemicals and Allied Products	3	-
30/Rubber and Miscellaneous Plastic Products	7	-
32/Stone, Clay, Glass, and Concrete Products	2	-
34/Fabricated Metal Products (except machinery and transportation equipment)	7	2
35/Machinery (except electrical)	24	1
36/Electrical and Electronic (machinery, equipment, and surplus)	6	1
37/Transportation Equipment	2	-
38/Measuring, Analyzing, and Controlling Instruments	10	2
39/Miscellaneous Manufacturing Industries	11	3
50/Wholesale Trade - Durable Goods	1	-
73/Business Services	5	-
76/Miscellaneous Repair Services	1	1
87/Engineering Research Management and Related Services	8	-

Source: 2002 Harris Massachusetts Manufacturers Directory

handled, these chemicals typically do not pose a significant threat to the public or the environment.

Machinery facilities (SIC 35), including machine tools and other types of industrial machinery and equipment, represent the largest number of facilities in the Southern Area. Such facilities typically use cutting oils and solvents as part of the machining process.

Most manufacturers of measurement and control instruments and electronic equipment (SIC 38), such as circuit boards, appear to be small businesses. Fabrication of circuit boards and other electronic components may involve chemical etching. Printed Circuit Corporation produces circuit boards and is a large quantity generator of hazardous wastes. It is one of the larger facilities in the area and is connected to the Massachusetts Water Resources Authority (MWRA) sanitary sewer system.

Printing, publishing and allied industries (SIC 27) represent the second largest number of facilities in the Southern Area. The printing process involves the use of inks and solvents. In particular, the printing of glossy book covers may use a variety of chlorinated organic compounds (HNUS, 1997).

The number of chemical manufacturers in the Southern Area has declined. Three facilities in Woburn are classified in SIC 28 – chemicals and allied products. The facilities produce skin care products (SIC 2844), polymers and medical grade tubing (SIC 2821), and coatings and adhesives (SIC 2851).

General manufacturing facilities, such as manufacturers of clothing (SIC23); rubber and plastic products (SIC30); stone, clay, glass and concrete products (SIC32); wood products (SIC24); and fabricated metal products (SIC34) are present in small numbers.

As discussed above, numerous types of industrial facilities that use or store hazardous materials are located in the Southern Area. Many other small businesses such as service stations, auto repair shops, photographic processors, and dry cleaners are present throughout the Southern Area as well.

## **4.0 WATER USERS**

This section provides information on the historical and present water users in the Southern Area, including the type of water use, the extent of use, and present conditions. Surface water and groundwater in the Aberjona River watershed have been used for industrial, municipal, agricultural, and domestic purposes. The growth of industry in the Aberjona River Watershed led to the development of groundwater resources that were principally used as process water by the tanning and chemical industries.

### **4.1 Groundwater Users**

Groundwater from the Southern Area has been used for municipal, industrial, and domestic purposes. The City of Woburn has used groundwater withdrawn from two local aquifers since three municipal wells were initially installed near Horn Pond in 1931. Three additional wells were installed near Horn Pond in 1937. From the mid-1960's to the late-1970's approximately 25 percent of the municipal supply was provided by municipal Wells G and H until they were closed in 1979 due to volatile organic compound (VOC) contamination. The City still obtains approximately 50 percent of its drinking water from groundwater wells located near Horn Pond (see Section 4.1.3). The balance of the City drinking water supply is provided by the Massachusetts Water Resource Authority (see Section 4.3). The Town of Winchester does not use groundwater from the Southern Area for drinking water purposes. A number of the industrial facilities in the Southern Area have obtained groundwater from wells installed for process and irrigation uses. More recently many private residential wells have been installed for irrigation purposes. More detailed discussions of the aquifer and specific groundwater uses are presented in the following sections.

#### **4.1.1 Aquifer Characteristics**

As discussed in Section 2.0, groundwater in the Aberjona River valley is present in a stratified drift aquifer. The aquifer is generally unconfined and water levels constantly change based on the amount of recharge to and discharge from the aquifer. The estimated transmissivities of the aquifer have been reported to range from less than 1,400 ft<sup>2</sup>/day to greater than 4,000 ft<sup>2</sup>/day (Delaney and Gay, 1980a). In the high-yielding portions of the aquifer, much higher

transmissivities have been reported. The transmissivity in the area near Wells G&H has been reported in various studies to range from 11,500 ft<sup>2</sup>/day to 14,000 ft<sup>2</sup>/day (deLima and Olimpio, 1989) and more specifically, 29,700 ft<sup>2</sup>/day and 17,600 ft<sup>2</sup>/day, respectively, at Wells G&H (Myette, Olimpio and Johnson, 1987).

USGS and other studies, which were discussed in Sections 2.2 and 2.3, have concluded that the aquifer has the potential to produce large quantities of groundwater. Wells with the largest potential yield would be located in those portions of the aquifer where the thickest sand and gravel deposits occur. These areas generally coincide with highly industrialized areas that include the associated handling and storage of hazardous materials and increased potential for groundwater contamination.

Groundwater is also present within bedrock. Some wells (both monitoring and supply wells) within the Southern Area are located within the bedrock aquifer and yield significant amounts of water as discussed in Section 2.3. However, the available information is localized and there is minimal data on the area-wide bedrock aquifer and groundwater conditions within bedrock.

#### **4.1.2 Historical Groundwater Users**

Groundwater wells have been installed in both stratified drift deposits and bedrock for municipal and industrial supply purposes. In Woburn, wells installed in stratified drift deposits include former municipal supply Wells G&H and two Riley Tannery production wells. The yields of Wells G&H and the Riley Tannery production well No. 2 were reported as 800, 700 and 750 gpm, respectively (NUS, 1986). Wells located in bedrock include Johnson Brothers greenhouses, (364 ft. deep well for irrigation and potable water, pumped at a rate of 5.2 gpm) and New England Plastics (three deep bedrock water supply wells with low yields, no longer in use) (Geotrans, 1994). A CDM report commissioned by the Aberjona River Watershed Committee in 1967 estimated groundwater withdrawals in Woburn of: 0.3 million gallons per day (mgd) at John J. Riley Leather Company; 0.02 mgd at Johnson Brother's Roses; 0.05 mgd at Independent Tallow Co. on Cedar Street; 3.0 mgd at General Foods, Inc. (i.e. Atlantic Gelatin) on Montvale Avenue; and in Winchester, 0.20 mgd at Leonard Field; 1.20 mgd at Parkview Apartments on Swanton Street; and 3.0 mgd at J. O. Whitten Co. on Cross Street (CDM, 1967). Summaries of historical groundwater users in the Southern Area within Woburn

and Winchester are included in Tables 4-1 and 4-2, respectively. The locations of wells for groundwater use are shown on Figure 4-1.

During its operation, the former McCord Winn Textron facility located at 620 Washington Street in Winchester withdrew approximately 0.2 mgd of groundwater for cooling water and irrigation according to the Commonwealth of Massachusetts, 1988 and 1989 Registration Statements for Estimated Water Withdrawals (Solo-Gabriele, 1995). Further details on this facility are included in Section 5.4.2.3 of this report.

Wells G&H were installed in 1964 and 1967, respectively, and provided approximately one quarter of the Woburn water supply until their closure in 1979, due to contamination. Wells G and H were capable of pumping at a combined rate of 1,100 gpm.

Seven groundwater supply wells have been installed on the Atlantic Gelatin (Kraft Foods) property; three are currently operational. Based on information from J. Magnifico of Kraft Foods, Atlantic Gelatin, the seven wells were installed between 1935 and 1960. Well No. 1 was installed in 1935 and abandoned in 2001. Well No. 2 was installed in 1936, rehabilitated in 1979, and is currently in use. Well No. 3 was installed in 1940 and abandoned in 1966. Well No. 4 was installed in 1941, collapsed in 1957, replaced in 1957 as well 4A, and shut down in the early 1970's. Well No. 5 was installed in 1957, was replaced in 2002, and is presently in use. Well No. 6 was installed in 1958, was not used until 1965, and abandoned in 1992. Well No. 7 was installed in 1960 and is presently in use (Magnifico, 2003). According to C. Lowery, Environmental Manager, four of the seven wells (Nos. 1, 2, 3, and 5) are located in Winchester. Well No. 4 is located near the main plant and has been inactive since the early 1980's. Well No.'s 6 and 7 are in Woburn, near Whittemore Pond (Lowery, 2002).

#### **4.1.3 Current Groundwater Users**

Regulations promulgated under the Massachusetts Water Management Act (310 CMR 36.00, 1994) require submission of applications for surface water or groundwater withdrawal at rates equal to or greater than 100,000 gallons per day (gpd). For water withdrawals less than the 100,000 gpd limit, state permits are not required. TtNUS obtained information on current

**TABLE 4-1**  
**SOUTHERN AREA HISTORICAL AND CURRENT GROUNDWATER USERS -**  
**WOBURN, MASSACHUSETTS**  
**DRAFT PRELIMINARY MSGRP SUPPLEMENTAL REPORT - SOUTHERN AREA**  
**INDUSTRI-PLEX SITE**  
**WOBURN, MASSACHUSETTS**

Location	Service Dates	Current Status	Well Use	Property Information
29 High Street	8/2/2001 - Present	in Use	industrial	Martignetti Enterprises Inc.
242 Salem Street	1/13/1997 - Present	in Use	irrigation	Charle's Ice Cream
174 Washington Circle	12/8/1992 - Present	in Use	irrigation	Richard Danielson Residence
Nashua Street Woburn	2/10/1992 - Present	in Use	industrial	Arlington Candy Company
2 Draper Street	2/10/1992 - Present	in Use	industrial	Arlington Candy Company
Salem Street (Wells G&H)	Well G = 1964 - 1979 Well H = 1967 - 1979	Not in Use	water supply	Wells G&H Wetlands (former municipal water supply wells)
228 Salem Street	1958- 1989	Not in Use	industrial	Riley Production Well
228 Salem Street	1958 - 1989	Not in Use	industrial	Riley Production Well
Washington Street	1958 - Unknown	Not in Use	irrigation	Johnson Brothers Greenhouses
Cedar Street	1962 - Unknown	Not in Use	water supply	New England Plastics
Cedar Street	1962 - Unknown	Not in Use	water supply	New England Plastics
Cedar Street	1952 - Unknown	Not in Use	water supply	New England Plastics
39 Cedar Street	1935 - 1987	Not in Use	unknown	Independent Tallow
Hill Street (AG-1)	1935 - 2001	in Use	industrial	Atlantic Gelatin
Hill Street (AG-2)	1936 - Present	in Use	industrial	Atlantic Gelatin
Hill Street (AG-3)	1940 - 1966	Not in Use	industrial	Atlantic Gelatin
Hill Street (AG-4)	1941 - early 1970's	Not in Use	industrial	Atlantic Gelatin
Hill Street (AG-5)	1957 - Present	in Use	industrial	Atlantic Gelatin
Hill Street (AG-6)	1965 - 1992	Not in Use	industrial	Atlantic Gelatin
Hill Street (AG-7)	1960 - Present	in Use	industrial	Atlantic Gelatin
10 Micro Drive	1926 - Present	in Use	industrial	Printed Circuit Corp.
Horn Pond (Well A-2)	1931 - Present	in Use	water supply	Municipal Water Supply Wells
Horn Pond (Well B)	1931 - Present	in Use	water supply	Municipal Water Supply Wells
Horn Pond (Well C-2)	1931 - Present	in Use	water supply	Municipal Water Supply Wells
Horn Pond (Well D)	1937 - Present	in Use	water supply	Municipal Water Supply Wells
Horn Pond (Well E)	1937 - 1994	Not in Use	water supply	Municipal Water Supply Wells
Horn Pond (Well F)	1937 - 1999	Not in Use	water supply	Municipal Water Supply Wells
Horn Pond (Well I)	1985 - Present	in Use	water supply	Municipal Water Supply Wells
Unknown	1952 - Unknown	Unknown	industrial	Sylvania Electric
Unknown	1952 - Unknown	Unknown	industrial	Sylvania Electric
Unknown	1952 - Unknown	Unknown	industrial	Sylvania Electric
Unknown	1954 - Unknown	Unknown	industrial	Sylvania Electric
Unknown	1954 - Unknown	Unknown	industrial	Sylvania Electric
Unknown	Unknown	Unknown	industrial	WIN Crush Stone
Unknown	Unknown	Unknown	industrial	Prime Tanning

Note: This summary is based on the Well Completion Reports filed at the Massachusetts Department of Environmental Management.

**TABLE 4-2**  
**SOUTHERN AREA HISTORICAL AND CURRENT GROUNDWATER USERS -**  
**WINCHESTER, MASSACHUSETTS**  
**DRAFT PRELIMINARY MSGRP SUPPLEMENTAL REPORT - SOUTHERN AREA**  
**INDUSTRI-PLEX SITE**  
**WOBURN, MASSACHUSETTS**

Location	Service Dates	Current Status	Well Use	Property Information
118 Church Street	4/17/1989 - Present	in Use	irrigation	Biff Kazrizian Residence
59 Bacon Street	6/16/1991 - Present	in Use	irrigation	Claude Stanziani Residence
Cross Street	April 1992 - Present	in Use	irrigation	Arnold Manson Residence
12 Nathaniel Road	3/1/1993 - Present	in Use	irrigation	Jack Rabbit Residence
21 Ginn Road	8/6/1993 - Present	in Use	irrigation	Michael Simeone Residence
954 Main Street	6/13/1996 - Present	in Use	irrigation	Nynex Building - address 125 High Street
114 Church Street	6/26/1996 - Present	in Use	irrigation	First Church of Christ
Skillings Road	7/25/1990 - Present	in Use	Private	Unknown
25 Glen Green Ave.	4/26/1989 - Present	in Use	irrigation	Mark Kramer Residence
23 Glen Green Road	4/26/1989 - Present	in Use	irrigation	Paul Lynch Address
540 Main Street	12/67 - Unknown	unknown	domestic	Richard J. Jr. Donovan Residence
Flinstone Road	5/15/1973 - Unknown	unknown	domestic	Virginia Shurgy Residence
154 Mt. Vernon Street	6/21/2000 - Present	in Use	irrigation	Whipsalt Marsh
156 Mt. Vernon Street	3/4/2002 - Present	in Use	irrigation	Whipsalt Marsh
1 Lakeview Street	8/9/2001 - Present	in Use	irrigation	Attorney Jeff Woolf Residence
12 Wedgmere Street	11/17/2000 - Present	in Use	irrigation	Frasier Walsh Residence
37 Wedgmere Street	8/5/1996 - Present	in Use	irrigation	Jeffrey Beir Residence
25 Foxcroft Road	8/11/1997 - Present	in Use	irrigation	Jay Pensavalle Residence
159 Sugar Hill Road	7/18/2000 - Present	in Use	domestic	Bob Scott Residence
16 Webster Street	7/6/2000 - Present	in Use	irrigation	David Pywell Residence
17 Meadowcroft Road	5/2/2001 - Present	in Use	irrigation	Keith Butbage Residence
19 Sheffield Road West	4/24/2000 - Present	in Use	irrigation	Ralph Dineen Residence
33 Dix Road	11/10/2000 - Present	in Use	irrigation	Patrick Fortin Residence
6 Lakeview Road	2/17/2000 - Present	in Use	irrigation	Forest Fontana Residence
6 Mystic valley Parkway	12/23/1999 - Present	in Use	irrigation	Arlen Fuller Residence
8 Salisbury Street	10/12/1999 - Present	in Use	irrigation	Glen Lamuraglia
134 Cross Street	1/71 - Unknown	Not in Use	industrial	J.O. Whitten Company
458 Main Street	3/7/89 - Present	in Use	irrigation	Manchester Field
458 Main Street	11/7/1988 - Present	in Use	irrigation	Manchester Field
242 Cambridge Street	6/18/1989 - Present	in Use	irrigation	Mahoney's Rocky Ledge
242 Cambridge Street	10/16/1989 - Present	in Use	irrigation	Mahoney's Rocky Ledge
242 Cambridge Street	8/5/1995 - Present	in Use	irrigation	Mahoney's Rocky Ledge
242 Cambridge Street	8/9/1995 - Present	in Use	irrigation	Mahoney's Rocky Ledge
Leonard Field	Unknown - Present	in Use	irrigation	Leonard Field
Swanton Street	Unknown	unknown	irrigation/ industrial	Parkview Apartments
620 Washington Street	Unknown - 1995	Not in Use	industrial	McCord Winn Textron Facility
620 Washington Street	Unknown - 1995	Not in Use	industrial	McCord Winn Textron Facility
Unknown	Unknown	unknown	industrial	Eastern Felt Co.
Unknown	1966 - Unknown	unknown	industrial	Kako Boadakian
Unknown	1938 - Unknown	unknown	municipal	Town of Winchester

Note: This summary is based on the Well Completion Reports filed at the Massachusetts Department of Environmental Management and Winchester Board of Health Department.

groundwater use from various municipal departments in Woburn and Winchester and also from published reports.

### Woburn

The City of Woburn maintains the only registered potential groundwater drinking water supply in the Southern Area; it is registered for a total water withdrawal of up to 4.2 mgd used city-wide (Woburn Water Department, 2003). Since the closure of Wells G&H in 1979, Woburn receives its water supply from groundwater wells located near Horn Pond (a different aquifer from the Wells G&H aquifer) and from the Massachusetts Water Resource Authority (MWRA). In 1990 the average withdrawal, or safe yield, from the wells in the Horn Pond area was reported at 4.5 mgd, supplied from six wells, and their pumping capacity was reported to be 6 mgd (MAPC, 1992). According to the Woburn Water Department, there are actually seven water supply wells located at Horn Pond. Approximately 10 years ago, one well, Well E, was taken off-line. Currently, five wells (Well A-2, Well B, Well C-2, Well D, and Well I) are in operation and supply an average of 3.7 mgd of water to Woburn (Woburn Water Department, 2003). Well F is no longer in operation and is in the process of being removed from service. Figure 4-1 shows the well locations and Table 4-1 shows service dates and current status for the wells.

According to the Woburn Plumbing Inspector and the Woburn Board of Health Agent, the City of Woburn does not regulate installation of private wells. Also, the City does not have a requirement for Well Completion Reports or well registration (Woburn Board of Health, 2002). Therefore, it should be noted that users of groundwater may exist within the Woburn portion of the Southern Area at unrecorded locations, as there is no complete inventory for water wells in Woburn. Based on approved plumbing permits and Well Completion Reports filed at the MADEP and a 1980 hydrologic data report by Delaney and Gay, the known locations where groundwater wells exist in the Woburn portion of the Southern Area are included in Table 4-1 and discussed below:

- Johnson's Roses (formerly Johnson Brother's Roses) - The original location was at 72 Wyman Street in Woburn. A deep well was re-furbished at this site. This site was sold in 1993, apparently to a developer who de-activated the well.

Johnson's Roses also maintained a business at another location on Washington Street. This property was sold to Cummings Property in the mid-1970s. A well is located at this site. It is not known if it is still active.

- Charles Ice Cream (presently Charles Ice Cream specialties located at 242 Salem Street) - This company is located at the former Riley Tannery Site. On June 5, 1997, the plumbing inspector found that the company connected their well to their domestic supply. The inspector ordered that the well supply be disconnected from the domestic supply and removed from the building. The well water reportedly is now used for irrigation purposes only. According to the Well Completion Report, the well was installed in 1997. It is a bedrock well drilled to a total depth of 505 feet below ground surface. A comment on the Well Completion Report stated that the hydrofracture yielded 1 gpm. According to a conversation with the owner of the company, Charlie Rotando, this well is presently used for irrigation and the well yields approximately 3 gpm.
- Atlantic Gelatin on Hill Street is permitted to withdraw up to 1 mgd from the four operational wells. The withdrawal is typically split as follows: 800,000 gpd from the wells located in Winchester (No.'s 1, 2, 5) and 200,000 gpd from Well No. 7 located in Woburn. The groundwater is used for process wash water; wastewater is discharged to the MWRA sanitary sewer system. No routine chemical testing of the process water is performed (Lowery, 2002).
- The Richard Danielson residence on Washington Circle uses a bedrock irrigation well. Further details on the status and the extent of use of the well were not documented on the Well Completion Report.
- Martignetti Enterprises, Inc. located at 29 High Street has a bedrock industrial well which yielded 75 gpm of water when tested, according to the Well Completion Report. Further details on the status and the use of the well were not documented on the Well Completion Report.

- The Arlington Candy Company located on 2 Draper Street uses two overburden wells for industrial purposes. One well, located at 2 Draper Street, is a 40 ft. overburden well. The second well, located on Nashua Street (which is perpendicular to Draper Street) is a 65 ft. overburden well. Further details on the status and the extent of use of the wells were not documented on the Well Completion Report.
- Printed Circuit Corporation located on 10 Micro Drive uses a bedrock well for industrial purposes. This well is an 850 ft. deep bedrock production well, which provides water to the circuit board production process. Water is reported to be drawn from 600 ft. (Briggs, 1992). Further details on the status and the extent of use of the well were not documented on the Well Completion Report. Further details on this facility are included in Section 5.4.2.9 of this report.
- Seven other industrial wells were/are located in Woburn within the Southern Area according to a hydrologic data report by Delaney and Gay. Four wells were/are located at Sylvania Electric, another at WINCrush Stone, and another at Prime Tanning. The exact address, extent of use or current status of the wells were not documented within the data report. The report did include limited data on the well at Sylvania Electric which was installed in 1952 (Delaney and Gay, 1980b).

The majority of wells within the City of Woburn are monitoring wells installed at the Industri-Plex Site, according to a review of Well Completion Reports for the City of Woburn by TtNUS in 2001. Well Completion Reports indicate that monitoring wells located in the Southern Area at Olympia Avenue, Main Street, and the Days Inn on Washington Street are overburden wells.

### Winchester

A review of Well Completion Reports for the Town of Winchester by TtNUS in 2001 demonstrates that in recent years a number of wells, predominantly bedrock wells, have been installed by residents for irrigation purposes. Table 4-2 provides a summary of water wells in Winchester based on the Well Completion Reports filed at the Department of Environmental Management and the Winchester Board of Health Department.

In 1988, a well was installed at Manchester Field for irrigation purposes, and in 1989, a second well was installed. There are no municipal water supply wells in Winchester. However, according to the 1980 hydrologic data report by Delaney and Gay, there was a municipal well located in Winchester, which was installed in 1938. The data report did not include details on the function, extent of use or current status of the well (Delaney and Gay, 1980b). According to the Winchester Public Works Department, in the past one industrial facility had a well for process water; there is no longer any industrial groundwater use. One private well used for drinking water was reported on High Street and there may be a few other private wells, which were not documented. However, according to the Winchester Board of Health Well Regulations, adopted on July 17, 1989, installation of water supply wells requires a permit from the Winchester Board of Health and any such wells must be registered with the Board of Health.

#### **4.1.4 MADEP Classification of Area Groundwater**

MADEP has designated the area surrounding Wells G&H as an Interim Wellhead Protection Area (IWPA). An IWPA is defined as the area within a ½ - mile radius of a public water supply that does not have a delineated Zone II. According to the 2001 MADEP Groundwater Source Approval Regulations, Zone II is classified as the area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated. These designations are part of the Source Water Assessment Program (SWAP) required by the 1996 amendments to the Safe Drinking Water Act.

The MADEP Bureau of Waste Site Cleanup has also developed a groundwater categorization system for use in risk characterization at disposal sites. Under the regulations (310 CMR 40.0000), these groundwater categories (GW-1, GW-2, and GW-3) must be identified to determine what standards are applicable to groundwater that is affected by the release of oil and/or hazardous materials, or any area to which the affected groundwater is expected to migrate. More than one category may apply to a single disposal site. These three groundwater categories are summarized below, based on the MADEP regulations, 310 CMR 40.0932.

GW-1 is used if the groundwater is located: (a) within a Current Drinking Water Source Area; or (b) within a Potential Drinking Water Source Area and indicates the groundwater must meet drinking water standards. A GW-2 classification applies to groundwater located within 30 feet of an existing occupied building or structure, where the average annual depth to groundwater in that area is 15 feet or less. This category of groundwater is considered to be a potential source of vapors of oil and/or hazardous material to indoor air. All groundwater is considered a potential source of discharge to surface water and therefore is, at a minimum, categorized as GW-3 (310 CMR 40.0932).

The various aquifers within the investigation area are categorized as either a Current Drinking Water Source Area or a Potential Drinking Water Source Area. An aquifer can be designated as a Current Drinking Water Source Area if it's within:

- A Zone II for a public water supply;
- An Interim Wellhead Protection Area for a public water supply;
- A Zone A of a Class A surface water body used as a public water supply;
- or
- 500 feet of a private water supply well.

An aquifer can be designated as a Potential Drinking Water Source Area if it's:

- 500 feet or more from a public water supply distribution pipeline;
- Within an area designated by a municipality specifically for the protection of groundwater quality to ensure its availability for use as a source of potable water supply; or
- Within a Potentially Productive Aquifer (PPA) that has not been excluded as a Non-Potential Drinking Water Source Area.

Whether or not an aquifer is Potentially Productive or is designated as a Non-Potential Drinking Water Source Area (NPDWSA) was originally established considering only aquifer yield and overlying land uses (PPAs are only medium and high yield aquifers, and NPDWSA's are low yield and/or with overlying land uses that cause exclusion). However, certain aquifer designations can be changed using site-specific technical information or an extensive petition process outlined in the MCP (310 CMR 40.0932(5)).

The aquifer characteristics described above are displayed on Priority Resources Maps for every town in the Commonwealth. The groundwater resources in the Southern Area are shown on the Woburn & Winchester Priority Resources Map (see Figure 4-2). The IWPA surrounds Wells G&H, the Aberjona River, and its associated wetlands, and is designated as a high yield aquifer. The MADEP designates the entire IWPA as a category GW-1 area. [It should be noted that the ½ -mile radius of the IWPA takes precedence over the NPDWSA/PDWSA designations; therefore, regardless of those NPDWSA/PDWSA designations in the Priority Resources Map, the whole area within the IWPA is a current drinking water source area to the inactive Wells G & H and therefore should meet drinking water standards (similar to the affect of a Zone II).] The balance of the aquifer in Woburn, from south of the Wells G&H IWPA to the Winchester town line, is also designated as a potentially productive high yield aquifer (GW-1/ GW-2/GW-3). From that point south to Wedge Pond the aquifer is designated predominantly as a non-potential drinking water source area with a high yield aquifer (GW-2/GW-3). The aquifer south of Wedge Pond is medium yield and is designated a non-potential drinking water source area (GW-2/GW-3). Even further south, in the area surrounding the upper forebay of Upper Mystic Lake, the aquifer changes to a potentially productive medium yield aquifer (GW-1/ GW-2/GW-3).

#### **4.1.5 Potential Groundwater Users**

The potential major groundwater users in the Aberjona River watershed Southern Area include industrial, municipal, domestic and agricultural users. Based on local permitting policies, the potential for domestic use of groundwater is limited. The availability of water supplied by the MWRA further limits the likelihood of installation of private drinking water wells. The potential for additional agricultural development is limited since a relatively small percentage of land remains undeveloped and available for agricultural expansion.

Groundwater of non-potable quality could potentially be used for industrial purposes, such as industrial make-up water or cooling water. The used process water, however, may require treatment prior to disposal if it exceeds any of the Maximum Contaminant Levels (MCLs) for groundwater discharge, as indicated in Title 5 of the Massachusetts Environmental Code.

For future municipal supply purposes, groundwater would require treatment and frequent water quality monitoring, given the fact that much of the aquifer in the Southern Area has been impacted by releases of oil or hazardous materials. Currently, adequate water supplies are available in Woburn (Horn Pond wells and MWRA) and Winchester (reservoirs and MWRA).

Because costs for domestic water and sewer use rates have increased dramatically over the past decade, private homes and businesses are increasingly installing groundwater wells for irrigation purposes (see Section 4.1.3).

## **4.2            Surface Water Users**

This section discusses the potential uses of surface water and impacts to surface waters due to withdrawal for manufacturing processes (cooling water) and discharges from industrial facilities.

### **4.2.1            Surface Water Withdrawal**

Surface water within the Aberjona River watershed was used in the past for agricultural purposes such as irrigation and the watering of livestock. Present day agricultural activity within the Aberjona River watershed is limited. Currently, there are no known surface water withdrawals from the Aberjona River within the Southern Area.

### **4.2.2            Permitted Discharges**

Woburn and Winchester are connected to the MWRA sewer system, and both communities are 95 to 99 percent serviced by MWRA sewer connections. According to the Woburn City Engineer's office, there are only 300 to 350 septic systems still in use (Woburn Engineering Department, 2002). The industrial facilities in the Southern Area are all connected to the MWRA sewer system.

National Pollutant Discharge Elimination System (NPDES) permits are issued to municipal and industrial dischargers to ensure that pollutant discharges do not result in a violation of water quality standards. An NPDES permit contains technology-based treatment requirements for

domestic or industrial facilities and for phased improvements in technology to allow higher levels of treatment. State and federal monitoring, inspection, and enforcement programs ensure compliance with standards and permits.

In September of 2002, EPA databases were reviewed to determine the number and location of facilities within Woburn and Winchester that have permitted NPDES wastewater discharges. In addition, EPA databases were reviewed for toxic release inventory (TRI) records and for facilities classified as generators of hazardous wastes regulated under the Resource Conservation and Recovery Act (RCRA). The latter information is useful in assessing the presence and use of toxic and/or hazardous materials within the Southern Area that could potentially impact surface water or groundwater resources. EPA database records for NPDES discharges, TRI and RCRA large quantity generators in Woburn and Winchester are included in Appendix C.

The EPA database lists no industrial facilities that hold NPDES permits for effluent discharges. The Town of Winchester holds permits for their water treatment plant and combined sewer overflows. The Parkview Condominium Association in Winchester holds an NPDES permit for heating/cooling water. There are no facilities with NPDES permits in the Woburn portion of the Southern Area. Of the 21 facilities listed in Woburn that have submitted TRI reports, 11 are within the Southern Area. Many of the 11 facilities have not submitted reports since the late 1990's. There are three facilities in Winchester that have submitted TRI reports, with the most recent submittal in 1994 (former McCord Winn Textron). One of the seven permitted large quantity generators in Woburn is in the Southern Area (Anika Research); Winchester Hospital is the sole large quantity generator listed in Winchester. Neither facility holds a RCRA storage permit.

#### **4.3 Municipal Water Supplies**

As noted above, Woburn obtains a portion of its municipal water supply from groundwater wells located near Horn Pond, within the Horn Pond watershed, which is located within the Aberjona River watershed (MAPC, 1992). Winchester obtains much of its municipal water supply from the North, Middle and South Reservoirs, located in Winchester, Stoneham and

Medford. The reservoirs are outside and east of the Aberjona River watershed and the Southern Area.

Both Woburn and Winchester obtain the balance of their municipal supplies from the MWRA. Based on data from 2001, the MWRA water supply system provided Woburn with an average flow of 3.642 mgd, and Winchester with an average flow of 1.086 mgd. A year-to-date comparison between 2002 and 2001 indicates that the use of MWRA-provided water increased in Winchester and decreased in Woburn. The increase for Winchester may be attributed to the impact of drought conditions on the capacity of their surface water supply. The decrease in MWRA water use by Woburn is likely due to increased flow from the Horn Pond wells. Future water use in the area is expected to vary with changes in population trends and as a result of the continuing installation and use of private domestic wells for irrigation purposes.

## 5.0 POTENTIAL CONTAMINATION SOURCES

This section identifies and summarizes available information for sites containing hazardous substances that may potentially impact groundwater, surface water, soils or sediments in the Southern Area. This summary is limited to sites within the boundaries of the Southern Area, as defined in Section 2.0.

TtNUS gathered information and data used to evaluate potential contamination sources from four primary sources: the MADEP Bureau of Waste Site Cleanup files and databases; remedial investigation (RI) reports for the Wells G&H Superfund Site; EPA's Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) database; and Aberjona River research studies performed by the Massachusetts Institute of Technology (MIT). The MADEP files and databases provided the majority of the information used in the evaluation of potential contamination sources.

The information obtained from each of the four above-mentioned sources was reviewed and is summarized in this section. TtNUS established criteria to screen sites identified in the various sources of information. Sites that were identified from the CERCLIS database, Wells G&H Site RI reports, and MADEP files as confirmed or potential sources of contamination that may impact the Aberjona River were evaluated in detail and are discussed in this section. The regulatory status of each site was also assessed. The screening process also identified sites that were assumed to have no potential impact on the quality of the Aberjona River. These sites were not evaluated further. MIT research studies are summarized in Section 5.1. Information from the CERCLIS database is summarized in Section 5.2. Sites associated with the Wells G&H Superfund Site are regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and are discussed in Section 5.3. MADEP sites regulated under the MCP are discussed in Section 5.4.

It is important to note that the majority of the analytical data reviewed for this report are more than five years old and were generated by numerous consultants, scientists, and engineering firms. The quality assurance/quality control methods applicable to these data could not be verified. Consequently, the data have been used only on a qualitative basis for this evaluation.

Non-point sources, such as runoff, spills and pesticide or fertilizer use, are also potential contaminant sources in the Southern Area. Environmental studies and reports, historical town

and city records, and academic research papers were reviewed to qualitatively evaluate the potential for non-point sources of contamination to impact the Aberjona River. Section 5.5 includes a discussion of potential non-point contaminant sources.

## **5.1 MIT Research Summary**

MIT has completed numerous environmental studies within the Aberjona River watershed. Several MIT research publications were reviewed during the preparation of this report to help identify potential point and non-point sources of contamination. As summarized in these publications, significantly elevated concentrations of arsenic, chromium, and lead have been found in Aberjona River sediments, from the Industri-Plex Site area, the Halls Brook Holding Area, the Wells G&H Site and further downstream to the Mystic Lakes.

Some of the MIT studies focus on the potential sources and distribution of arsenic. MIT has also researched the industrial history of the Aberjona River watershed, focusing on the leather tanning and finishing industry. Data collected by various MIT studies have indicated areas that may have been impacted by the Industri-Plex Site; associated transport mechanisms; the downgradient migration of contaminants of concern (COCs); and suspect areas that should be considered for future investigations. No new suspected source areas or non-point sources were identified during this review.

## **5.2 CERCLIS Sites Summary**

CERCLIS is a database in which the EPA stores management information on all locations evaluated under the Superfund program. The sites are identified for placement in CERCLIS through a variety of mechanisms, including formal notification requirements and citizen telephone calls. A site's presence in CERCLIS does not imply a level of risk to the public health and environment. Inclusion of a specific site in the database carries no local or regulatory consequence.

Preliminary Assessments (PAs) are performed by the EPA or states within one year of a site's inclusion in the CERCLIS database. Based on the results of the PA, additional investigations may be conducted. If a site is found to pose an environmental or public health threat

significant enough to warrant remedial action under Superfund, then the site may be listed as a National Priorities List (NPL) site. Less than 5 percent of CERCLIS sites become NPL sites.

The CERCLIS database contains nine sites in the Southern Area, eight in Woburn and one in Winchester. The Wells G&H Superfund Site is one of these nine CERCLIS sites. Four of the CERCLIS sites in Woburn are part of the Wells G&H Superfund Site (Aberjona Auto Parts, Unifirst, Whitney Barrel Co., and W.R. Grace Cryovac). These four sites are discussed in Section 5.3 as confirmed sources of contamination along with other non-CERCLIS sites that are also part of the Wells G&H Superfund Site (Wildwood, Olympia Nominee Trust, New England Plastics, and Murphy Waste Oil). Three of the remaining four CERCLIS sites, J.O. Whitten in Winchester, and Atlantic Gelatin, and John J. Riley Co. in Woburn, are listed as state-lead cleanups in CERCLIS and are regulated under the MCP. The Vac-Cent site in Woburn is currently being reassessed by EPA and may become a state-lead cleanup. These four sites are included with the group of MADEP sites evaluated using the screening process discussed in Section 5.4.1.

### **5.3 Wells G&H Sites Summary**

This section presents a summary of the confirmed contamination sources that were identified during the remedial investigations conducted at the Wells G&H Superfund Site and that are regulated under CERCLA. Five source areas were identified in the ROD as the first operable unit. Investigations to date in the Central Area, a separate operable unit, have focused on three additional areas, referred to as the Southwest Properties. Since these eight areas may have contributed to the contamination of the Aberjona River, they are included in this report as confirmed sources of contamination within the boundaries of the Wells G&H Superfund Site. The locations of these eight sites are highlighted on Figure 5-1. Known contaminants and activities underway at the confirmed source areas within the two operable units are briefly discussed below.

Where data are available for contaminants of concern, maximum reported concentrations of organic and inorganic contaminants are presented in tabular form. A map number on Figure 5-1 identifies the location of each site. Each site summary refers to the site name, address and map number.

### 5.3.1 Source Area Confirmed Sites

The five source area properties include Unifirst, W.R. Grace Cryovac, Wildwood Conservation Corp., New England Plastics and Olympia Nominee Trust. As mentioned in Section 5.2, Unifirst and W.R. Grace Cryovac are in the CERCLIS database as sites that are part of an NPL site. The other three source area properties (Wildwood, New England Plastics, Olympia Nominee Trust) are not listed in the CERCLIS database. Information applicable to each of these confirmed sites is presented below. These five sites are located within the Wells G&H Site boundaries and are highlighted on Figure 5-1.

#### 5.3.1.1 Unifirst, 15 Olympia Avenue, Woburn (Map #42)

A dry cleaning company operated at this site between 1966 and 1989. During the period from 1977 to 1982, the dry cleaning solvent, tetrachloroethylene (PCE), was stored in a 5,000-gallon aboveground storage tank (AST). Unifirst reported that a significant spill of PCE occurred in 1979; it was contained and cleaned up (NUS, 1986). In 1988, approximately 2 liters of dense non-aqueous phase liquid (DNAPL) containing 1.9 percent PCE were removed from a nearby monitoring well. Low levels of PCE were found in soil samples. Groundwater in the bedrock aquifer contained high levels of VOCs. Maximum concentrations reported for selected groundwater and soil contaminants are shown in the table below. The maximum contaminant level (MCL) for each contaminant in groundwater is also shown.

CONTAMINANT	MCL (µg/l)	GROUNDWATER (µg/l)	SOILS (mg/kg)
Trichloroethene (TCE)	5	684	Not detected (ND)
PCE	5	17,000	0.170
1,1,1-trichloroethane (TCA)	200	1,700	0.012

Source: Ebasco, 1988

A groundwater extraction and treatment system has been operational at this site since September 1992. The system extracts contaminated groundwater from the deep fractured bedrock under, and in the vicinity of, the site and treats it with a UV-chemical oxidation unit using hydrogen peroxide. While there is a release tracking number (RTN), 3-1424, assigned to this site, the MADEP considers the site to be adequately regulated by EPA under CERCLA.

#### 5.3.1.2 W.R. Grace, Cryovac Division, 369 Washington St., Woburn (Map # 51)

This facility has operated as a manufacturer of food wrapping materials since 1961. Degreasing solvents, such as TCE, were used by the facility. A pit behind the plant was used for waste disposal. Six drums were excavated in 1983 and contained high levels of TCE, vinyl chloride, trans-1,2-dichloroethene (DCE), and o-xylene. Low levels of contaminants were found in soils in the pit; little surface soil contamination was found. Wastes were also discharged to the municipal sewer system. Maximum concentrations reported for selected contaminants in groundwater and soils are presented below.

CONTAMINANT	MCL (µg/l)	GROUNDWATER (µg/l)	SOILS (mg/kg)
TCE	5	2,800	ND
PCE	5	83	ND
Vinyl chloride	2	3,600	ND
Arsenic	10	Not analyzed (NA)	18
Chromium	100	NA	33
Lead	15*	NA	51

\* - Action Level

Source: Ebasco, 1988.

A groundwater extraction and treatment system has been operational at this site since September 1992. The treatment system initially used UV-chemical oxidation and has been converted to carbon adsorption (Garren, 2002). The system captures groundwater from shallow bedrock and unconsolidated deposits (Geotrans, 1994). Deep bedrock contamination is captured by a deep well on the Unifirst property. W.R. Grace and Unifirst have an agreement that covers the cost of the treatment of groundwater from this deep well. While there is a release tracking number, 3-1423, assigned to this site, the MADEP considers the site to be adequately regulated by EPA under CERCLA.

#### 5.3.1.3 Wildwood Property, Salem St., Woburn (Map #53)

John J. Riley established the Wildwood Property as the Wildwood Conservation Corporation in 1985. Mr. Riley had sold this undeveloped land to Beatrice Foods, Inc. in 1978 and then re-purchased it in 1983. An industrial water supply well for the John J. Riley Tannery is located on the property. The well was installed in 1958 and was used for tannery operations until 1989 (RETEC, 1994). The tannery site, located at 228 Salem Street, is discussed in Section 5.4.2. During the period from 1966 to 1983, trails were observed connecting the site with the Whitney Barrel and Murphy Waste Oil Company sites. Sludge, discolored soils, trash, paint cans, 55-

gallon drums and debris piles were observed. The property lies within the 100-year floodplain of the Aberjona River.

Maximum concentrations reported for selected contaminants in groundwater and soils are presented in the table below. These VOCs were also found in water from the tannery production well mentioned above.

<b>CONTAMINANT</b>	<b>MCL (µg/l)</b>	<b>GROUNDWATER (µg/l)</b>	<b>SOILS (mg/kg)</b>
TCE	5	190,000	25
PCE	5	11,000	6.4
1,1,1-TCA	200	2,800	0.004
Arsenic	10	NA	60.7
Chromium	100	NA	3,060
Lead	15 *	NA	683

\* - Action Level

Source: Ebasco, 1988

Surface soils contained polynuclear aromatic hydrocarbons (PAHs), pesticides (chlordane, DDT), polychlorinated biphenyls (PCBs) (Aroclor-1254, Aroclor-1260), TCE, PCE, arsenic and lead. Disposal of sludge was evident on the surface in large portions of the site. The sludges contained high levels of lead, DDT, chlordane, arsenic, PCE and PAHs. Subsurface soils were found to contain higher levels of VOCs than surface soils, in particular, TCE and PCE (ATSDR, 1989). After excavation and removal of the suspected source area soils were completed in 1993, TCE concentrations in shallow groundwater decreased. However, TCE concentrations in the bedrock increased, probably due to migration via fractures in the rock. A pump-and-treat/air sparging/soil vapor extraction (SVE) system has been in operation treating site groundwater and soils since 1998. Groundwater is now treated with air stripping and carbon adsorption, which replaced a catalytic oxidation unit (Garren, 2002). This site was never regulated under the MCP since no releases have been reported to the MADEP.

#### 5.3.1.4 New England Plastics, Salem St., Woburn (Map #54)

This facility manufactures vinyl siding and other plastic products. In 1986, water from one of the industrial water supply bedrock wells was found contaminated with VOCs, primarily TCE and PCE. In 1988, effluent from the facility was noted to be entering the Aberjona River via a

drainage ditch. Two of the three bedrock industrial water supply wells on the property contained PCE, TCE, 1,1,1-TCA and trans-1,2-DCE. Maximum reported groundwater contaminant concentrations are presented in the table below. These contaminants were also found at lower concentrations in shallow overburden monitoring wells.

<b>CONTAMINANT</b>	<b>MCL (µg/l)</b>	<b>GROUNDWATER (µg/l)</b>	<b>SOILS (mg/kg)</b>
TCE	5	59	110
PCE	5	330	1,200
1,1,1-TCA	200	26	13
Arsenic	10	NA	6.8
Chromium	100	NA	22
Lead	15*	NA	289

\* - Action Level

Source: Ebasco, 1988

Surface soil samples contained PAHs, Aroclor-1260, TCE and PCE. 230 cubic meters of soil were excavated and disposed offsite (Garren, 2002). Contaminated soils in the identified source area were treated onsite using SVE between February 1998 and June 1999. After the ROD cleanup levels were reached the system was shut down; annual groundwater monitoring continues at the site (Mayor, 2002). This site was never regulated under the MCP since no releases have been reported to the MADEP.

5.3.1.5 Olympia Nominee Trust, 60 Olympia Avenue, Woburn (Map #43)

This 21-acre site is partially undeveloped and also includes a leased trucking terminal. The Olympia Nominee Trust purchased the property in 1985. Prior to that time, Hemingway Transport Co. operated the trucking terminal and had four underground storage tanks (USTs). The USTs at various times stored diesel, fuel oil, waste oil and gasoline. Juniper Development Group purchased the property in May 1983 and removed a leaking gasoline storage tank in July 1983 (ATSDR, 1989). The property lies within the 100-year floodplain of the Aberjona River.

In 1970, between 200 and 500 5-gallon containers of arsenic trioxide were discovered and removed from the undeveloped portion of the site. In 1971, a drum containing arsenic was found on the property near the Wildwood and Olympia Avenue intersection (ATSDR, 1989). In 1982, MADEP received a report of 17 drums containing an oily semi-solid material. In 1985, 10 rusted 55-gallon drums and a pile of pesticide caps were discovered near the railroad tracks and removed, along with associated contaminated soil (ATSDR, 1989). In February 1986, 12 drums were removed by the property owner under an Administrative Order and in February 1987, five overlooked/additional drums were removed by the property owner under Administrative Order (LeMay, 2003). Soil samples were reported to contain chlordane, PCBs, and chlorinated VOCs (CVOCs) (NUS, 1986). Maximum concentrations reported for selected contaminants in groundwater and soils are presented in the table below. Groundwater also reportedly contained arsenic, lead and chlordane (ATSDR, 1989). While TtNUS researched available documents, including MADEP files, no primary source information (e.g. site inspection reports, field notes, memos, log books) was located to substantiate the above-referenced ATSDR report historical site information.

CONTAMINANT	MCL (µg/l)	GROUNDWATER (µg/l)	SOILS (mg/kg)
TCE	5	3,400	0.019
PCE	5	45	0.009
PAHs	Not established	146	6.375
Arsenic	10	NA	139
Chromium	100	NA	924
Lead	15*	NA	424

\* - Action Level

Source: Ebasco, 1988

The site is one of five source areas within the Wells G&H first operable unit; the MADEP database lists the site, RTN 3-0594, as a Tier 1B site. A second RTN, 3-13442, is also listed for the same address. It appears, however, that this RTN is associated with an oil spill in 1996 which was cleaned up and a Class A1 Response Action Outcome (RAO) filed. The property owners and EPA entered into an Administrative Order in March 2003, to treat, cap, or remove contaminated soil. Source area groundwater remediation will be part of a remedial design (Garren, 2002).

### **5.3.2 Central Area (Southwest Properties) Confirmed Sites**

A remedial investigation was performed in 1994 to characterize the soils and groundwater at the Southwest Properties and determine the nature and extent of contamination. The investigation was a component of the Central Area studies outlined in the Wells G&H Site ROD. Three properties, Murphy Waste Oil, Whitney Barrel, and Aberjona Auto Parts were identified as confirmed sources of contamination. Whitney Barrel and Aberjona Auto Parts are listed in the CERCLIS database as sites that are part of an NPL site. Due to data gaps in the 1994 report, a risk assessment was not completed. Collection of additional data began in the fall of 2002. EPA will complete the risk assessment once data collection and analysis are complete. Background information concerning each of the three properties is summarized below. These three sites are also located within the Wells G&H Site boundaries and are highlighted on Figure 5-1.

#### **5.3.2.1 Murphy Waste Oil, 252 Salem St., Woburn (Map #46)**

Investigations completed in 1988 and 1990 found petroleum hydrocarbons in both soil and groundwater; soils also contained VOCs and PCBs (RETEC, 1994). The contaminated soils were excavated and disposed of offsite. The area was backfilled and a new waste oil facility was constructed. Petroleum-contaminated soils from the previous oil recycling activities remain beneath fill material that was added after the interim removal action.

According to the 1994 RI, surface soils contained 1,1-DCE, 1,2-DCE, TCE and benzene/toluene/ethylbenzene/xylenes (BTEX), PAHs, pesticides, and PCBs (RETEC, 1994). BTEX and 1,1-DCE were detected in subsurface soils, as well as PAHs, chromium and lead. Wetland sediment samples contained pesticides, PCBs and lead. Groundwater contaminants included VOCs and semivolatile organic compounds (SVOCs). The concentration of TCE in

groundwater exceeded its MCL, with the highest concentration reported as 22.6 µg/l. Manganese was the only metal found above MCLs. Maximum reported concentrations of selected analytes in surface soils, subsurface soils, and groundwater are summarized below (RETEC, 1994).

Analyte	Surface Soils (mg/kg)	Subsurface Soils (mg/kg)	Groundwater (µg/l)
Arsenic	17	42.6	ND
Chromium	8193 J	24	ND
Lead	1245 J	637	29
PAH	9.1	3.7	43
TCE	0.0018 J	2.1 J	22.6
PCE	ND	0.0016 J	3.8
Benzene	0.0005 J	ND	8.6 JD
PCBs	13.33	ND	ND

J = value estimated; D = diluted analysis value.

Four RTNs have been issued for this site. RTN 3-0534 was issued before the site became part of the Wells G&H Superfund Site. Under this RTN, corrective action studies have been conducted by MADEP since 1994 and are continuing (Mayor, 2002). The other three, more recent RTNs (3-20410, 3-20932, 3-0277), are all associated with oil spills; a Class A2 RAO status is indicated for each RTN in the MADEP database.

#### 5.3.2.2 Whitney Barrel, 256 Salem St., Woburn (Map # 47)

Operations began at this site in 1949 and included reconditioning of drums, tanks and other equipment, primarily from the food industry. The metal salvage and drum and tank cleaning operations used caustic and trisodium phosphate (TSP). Rinse waters were discharged under permit to the municipal sewer system. An EPA-directed investigation in 1980 found numerous empty tanks and drums, scrap metal and other debris. A history of leaks and spills from site operations has been documented. Soils contained VOCs, specifically TCE, PCE, xylene, toluene and ethylbenzene; the pesticide chlordane, at a maximum concentration of 26.8 mg/kg; and PCBs ranging from less than 1 mg/kg to 95 mg/kg. Groundwater contained VOCs, including 1,1-dichloroethane (DCA), TCA, vinyl chloride, benzene, xylene and toluene, as well as PCBs (RETEC, 1994).

According to the 1994 RI, surface soils contained primarily PAHs, and lesser concentrations of 1,1-DCE and BTEX. Pesticides and PCBs were detected in all surface soil samples; arsenic, chromium and lead were detected in higher concentrations in shallow, rather than deep, soils. BTEX and 1,1-DCE were detected in subsurface soils, as well as PAHs and carcinogenic PAHs (CPAHs). Groundwater contained a number of chlorinated VOCs, however all concentrations were below the respective MCL (RETEC, 1994). Although arsenic, lead and mercury were detected in groundwater, manganese was the only metal found above MCLs. Maximum reported concentrations of selected analytes in surface soils, subsurface soils and groundwater are summarized below (RETEC, 1994).

Analyte	Surface Soils (mg/kg)	Subsurface Soils (mg/kg)	Groundwater (µg/l)
Arsenic	4.4 J	5.8	ND
Chromium	618 J	61 J	ND
Lead	1207 J	387	ND
PAH	7.2	15.05	ND
TCE	ND	ND	3
PCE	ND	0.57 J	1.8 J
Benzene	0.0031	0.0006 J	1.1 J
PCBs	0.55	1.4	ND

J = value estimated.

There are two RTNs assigned to this site, 3-14372 and 3-0534; according to the MADEP database, the site is adequately regulated by EPA under CERCLA. An oil spill at the site was reported on October 21, 1996 and RTN 3-14372 assigned. A cleanup was implemented, and on October 21, 1997, an Immediate Response Action (IRA) Completion Statement was submitted which proposed to dismiss the RTN, and to list the site as an “Adequately Regulated Site” under CERCLA. However, correspondence from MADEP dated November 10, 1997 required two conditions to resolve the RTN: (1) the IRA conditions from the spill of October 21, 1996 had to be mitigated; and (2) the site had to be incorporated/ addressed by EPA/CERCLA actions. While it appears that the site is now regulated under CERCLA, the outcome of the 1997 MADEP conditions is not known based on information available in the MADEP files.

#### 5.3.2.3 Aberjona Auto Parts, 278 Salem St., Woburn (Map #49)

An EPA-directed investigation of the property in 1980 documented an unspecified number of empty 55-gallon drums and three petroleum USTs. Degreasing solvents were used in the salvage operations and spent solvent was discharged to the municipal sewer system. Since

the 1950's, the salvage operations included a grease pit and a 500-gallon UST for storage of waste oils and transmission fluid. The report documenting EPA's 1980 investigation noted that the contents of the UST were periodically collected for reprocessing by Murphy Waste Oil. The time frame during which this activity occurred was not stated. A gas station with two USTs was formerly located on the south side of the site. A portion of the property lies in the 100-year floodplain.

According to the 1994 RI, surface soils contained 1,1-DCE, BTEX, PAHs, CPAHs, pesticides and PCBs. 1,1-DCE was detected in subsurface soils, as well as PAHs, arsenic, chromium and lead (RETEC, 1994). Groundwater contaminants included TCE, PCE, and 1,2-DCE. Although arsenic, and mercury were detected in groundwater, manganese was the only metal found above MCLs. Maximum reported concentrations of selected analytes in surface soils, subsurface soils and groundwater are summarized below (RETEC, 1994).

Analyte	Surface Soils (mg/kg)	Subsurface Soils (mg/kg)	Groundwater (µg/l)
Arsenic	10.4	9.3	13.0
Chromium	20.8	544	ND
Lead	838	485	ND
PAH	13.4	0.233	ND
TCE	ND	ND	363
PCE	ND	ND	21.2 J
Benzene	ND	ND	ND
PCBs	0.76 J	5.1	ND

J = value estimated.

While RTN 3-1146 is assigned to this site, the MADEP considers the site to be adequately regulated by EPA under CERCLA. The property has been sold to a developer who plans to construct an ice rink on the property (Mayor, 2002).

### 5.3.3 Central Area – Other Identified Sources

The Central Area Phase 1A RI Report identified 11 other sources of contamination and concluded that many of them were "likely sources to the Wells G&H Site" (Geotrans, 1994). Ten of the identified sources have had releases from USTs, and contaminants such as BTEX, PAHs and other petroleum-related compounds have been detected in soils and groundwater.

These 10 sources are regulated under the MCP but are not sites that require further evaluation based on the screening criteria discussed in Section 5.4.1. One of the 11 sources (225 Wildwood Avenue) is included in the group of MADEP sites screened for further evaluation (see Section 5.4).

#### **5.4 MADEP Sites Summary**

As has been mentioned, the Southern Area is highly developed and industrialized. Large and small manufacturing and service businesses have reported spills and other incidents that have led to investigations and actions by MADEP. Some sites that were initially regulated under the state program are now regulated by CERCLA as part of the Wells G&H Superfund Site (see Section 5.3). MADEP files were reviewed for sites in the Southern Area regulated under the MCP and that had or may have had one or more releases of oil and/or hazardous materials. Based on available information in MADEP files, sites within the Southern Area were evaluated for their potential past, current, or future impact on environmental media, including groundwater, surface water, soil, and sediment using the screening process described in Section 5.4.1 below.

##### **5.4.1 Evaluation and Screening Process**

A four-level process was used to select sites for evaluation and screen them using various criteria to assess their potential as sources of contamination to the Aberjona River. Each level of screening resulted in dropping some sites from further evaluation as well as carrying other sites forward for further consideration. The evaluation and screening process described below presents each of the four levels in order of increasing selectivity.

## **Level 1 – Initial Identification of Sites**

Two types of listings from the MADEP database system were accessed to identify sites within the Southern Area. The “reportable releases” database includes primary release information as well as other related information, such as the chemicals that were released. The WSC\_ALL database is a combination of reportable releases tracked in the “front end” and “sites” databases. The "sites" database includes sites with RTNs first listed between approximately 1987 and 1993. The "front end" database, (formerly called "spills" or "new releases"), includes sites/releases reported since 1993. Appendix D contains a listing of all sites in Winchester and Woburn, downloaded from the MADEP WSC\_ALL database.

This database was searched to identify sites: 1) within the Southern Area boundaries; 2) that had the potential for contaminants to reasonably impact the Aberjona River based on their location; and 3) had reported releases of COCs (arsenic, lead, chromium, benzene, mercury, TCE, etc.). TtNUS compiled an initial group of 52 MADEP sites meeting these criteria. As part of an in-depth review of these sites, TtNUS completed file reviews for the 52 sites at the MADEP offices. The group includes confirmed sources within the Wells G&H Superfund Site regulated under CERCLA for which RTNs also have been assigned (see Section 5.3). The approximate locations of the 52 sites are shown by map number on Figure 5-1. Sites identified through the screening process described below as potential sources of contamination to the Aberjona River are highlighted on Figure 5-1. Those sites that were screened out are not highlighted. Note that Figure 5-1 includes two CERCLA-only sites (map numbers 53 and 54) that are discussed in Section 5.3.

Table 5-1 lists each of the 52 MADEP sites for which MADEP file information was obtained. For each site, the MADEP RTN is indicated (some properties have more than one RTN). The table also lists the town, site name and address, the MCP cleanup "status", and a brief description of the site's known or potential contaminant source. Those sites that are part of the Wells G&H Superfund Site and considered by MADEP to be “adequately regulated” under CERCLA, are so noted. Appendix E contains reported release information for the initial group of 52 sites, including the chemical(s) released and quantity, where known.

**TABLE 5-1  
INITIAL GROUP OF MADEP SITES  
DRAFT PRELIMINARY MSGRP SUPPLEMENTAL REPORT - SOUTHERN AREA  
INDUSTRI-PLEX SITE  
WOBURN, MASSACHUSETTS**

CITY/MAP#	ADDRESS	SITE NAME	RTN	MCP STATUS	NOTES
<b>WINCHESTER</b>					
1	37 CALUMET RD	RESIDENCE	3-18920	RAO - A2	release of heating oil;outside study area
2	<b>50 CROSS ST</b>	<b>NO LOCATION AID</b>	3-12909	RAO - A2	patent leather manufacturing/ VOCs, TPH
3	<b>134 CROSS ST</b>	<b>CROSS STREET LLC</b>	3-0115	Tier 1A	former tannery/ As, Cr, Hg
4	HILL ST & ROCK AVE	PROPERTY	3-0906	PENNFA	former landfill
5	39 HOLTON ST	JUNIPER DEVELOPMENT	3-11285	RAO B1	No DEP File
6	45 HOLTON ST	NO LOCATION AID	3-18324	RAO - A2	Fuel oil UST removal
7	586 MAIN ST	EXXON SERVICE STATION	3-0873/ 3-15301/ 3-17902	RAO - C/ RAO - B1/ DEF Tier1B	UST removal
8	599-605 MAIN ST	NO LOCATION AID	3-17908	DPS	Oil release
9	600 MAIN ST	NO LOCATION AID	3-12394	RAO - B1	No release
10	611 MAIN ST	NO LOCATION AID	3-15451	DPS	No DEP File
11	632 MAIN ST	COMMERCIAL PROPERTY	3-04426	RAO - A3	TPH/VOCs (BTEX)
12	643 MAIN ST	NO LOCATION AID	3-15576	DPS	Gasoline
13	<b>695 MAIN ST</b>	<b>PURITY SUPREME</b>	3-03603	RAO - A2	former coal/lumber business/petroleum/ Pb, CVOCs
14	757 MAIN ST	FRESH TOUCH OF WINCHESTER	3-04110	RAO	Release from dry-cleaner
15	765 MAIN ST	MAIN AND SKILLING RD	3-10877	RAO - A2	Gasoline
16	50 SWAN ST	CONSTRUCTION SITE	3-13619	RAO - A1	Asbestos only;outside study area
17	<b>620 WASHINGTON ST</b>	<b>MCCORD WINN TEXTRON (former)</b>	3-3176/ 3-12112	RAO - A2/ RAO - A2	240 yrs. of manufacturing operations/ TCA, petroleum
18	48 WATERFIELD ST	USPO	3-14389	RAO -A1	Heating oil
<b>WOBURN</b>					
19	<b>39 CEDAR ST</b>	<b>INDEPENDENT TALLOW CO/VACANT LOT</b>	3-1734/ 3-18789	NDS/Tier 2	former tannery, hide storage/ As, Cr in soils
20	91 CENTRAL ST, REAR	NO LOCATION AID	3-18041	RAO - B1	Release of lead
21	16 CONNECTICUT ST	DOLE & BAILEY, NEAR JOHN ST	3-15256/ 3-11501	RAO - A1/ RAO - A1	UST removal, release of anhydrous ammonia gas
22	<b>5-17 CRANES COURT</b>	<b>THERMO ELECTRON (former)</b>	3-12606	RAO - C	TCE
23	5 DRAPER RD	GENERAL PLASMA	3-4000	RAO - B1	AST (TCA), fuel oil UST
24	<b>5 GREEN ST</b>	<b>VAC-CENT</b>	3-0477	NFA	former tannery
25	<b>8-10 GREEN ST</b>	<b>PROPERTY</b>	3-0731	RAO - B2	former tannery, disposal pits
26	<b>HILL ST</b>	<b>ATLANTIC GELATIN (KRAFT/GENERAL FOODS)</b>	3-1099/ 3-1737/ 3-15970	DPS/ RAO - C/ RAO - A1	former landfill, coal-fired power plant, production wells on site

Bold = Sites summarized in Section 5.4

Bold/Italics = Sites summarized in Section 5.3

**TABLE 5-1  
 INITIAL GROUP OF MADEP SITES  
 DRAFT PRELIMINARY MSGRP SUPPLEMENTAL REPORT - SOUTHERN AREA  
 INDUSTRI-PLEX SITE  
 WOBURN, MASSACHUSETTS  
 PAGE 2 OF 2**

CITY/MAP#	ADDRESS	SITE NAME	RTN	MCP STATUS	NOTES
27	4 WHEELING AVE	NO LOCATION AID	3-11390	Tier 1C	residential/commercial use
28	62 HOLTON ST	NO LOCATION AID	3-18597	RAO - A2	No DEP File
<b>29</b>	<b>65 HOLTON</b>	<b>VAC-HYD</b>	3-2439	RAO	PCE, solvents
30	73 MAIN ST	NO LOCATION AID	3-14818	DPS	Gasoline, including benzene
<b>31</b>	<b>75 MAIN ST</b>	<b>WOBURN CAR WASH</b>	3-13604	Tier 1C	Petroleum
32	5 WHEELING AVE	NO LOCATION AID	3-2079	WCS PRM	UST removal, BTEX;outside study area
33	RTE 38 ROTARY	EXIT FOR RTE 128	3-14203	RAO - A2	Traffic accident, NaOH, H2SO4
34	RTE 39/MAIN ST	NO LOCATION AID	3-18749	RAO - A1	
<b>35</b>	<b>10 MICRO DR</b>	<b>PRINTED CIRCUIT CORP</b>	3-1263	NFA	TCE, vinyl chloride
<b>36</b>	<b>205 WILDWOOD AVE</b>	<b>DOWD ENTERPRISES</b>	3-1063	RAO - B2	part of Riley tannery, sludge lagoons/landfill
<b>37</b>	<b>225 WILDWOOD AVE</b>	<b>INDUSTRIAL PROPERTY</b>	3-1966	RAO - B2	buried hides, Pb, Cr
38	479-481 WILDWOOD AVE	NO LOCATION AID	3-13093	RAO - B1	UST removal
39	331 MONTVALE AVE	NO LOCATION AID	3-18530	Tier 2	PAHs
<b>40</b>	<b>30 NASHUA ST</b>	<b>AMERICAN SHOE MACHINERY</b>	3-0171	Tier 2	TCE, As, Cr
41	20 NORMAC RD	ROMICON INC (FRMR)	3-4186	LSP NFA	PCE below reportable concentration
<b>42</b>	<b>15 OLYMPIA AVE</b>	<b>UNIFIRST</b>	3-1424	Adequately Regulated	See Section 5.3.1
<b>43</b>	<b>60 OLYMPIA AVE</b>	<b>OLYMPIA NOMINEE TRUST</b>	3-0594	Tier 1B	See Section 5.3.1
44	73 OLYMPIA AVE	MOTORS, ELECTRONICS & CONTROL	3-3961	LSP NFA	VOCs;outside study area
<b>45</b>	<b>228 SALEM ST</b>	<b>JJ RILEY/BEATRICE</b>	3-0482 3-13444	RAO RAO - A1	former tannery, chrome lagoons, buried hides/sludges
<b>46</b>	<b>252 SALEM ST</b>	<b>MURPHY WASTE OIL</b>	3-2198	Adequately Regulated	See Section 5.3.2
<b>47</b>	<b>256 SALEM ST</b>	<b>WHITNEY BARREL CO</b>	3-0534	Adequately Regulated	See Section 5.3.2
48	263 SALEM ST	NO LOCATION AID	3-10691	Def Tier 1B	
<b>49</b>	<b>278 SALEM ST</b>	<b>ABERJONA AUTO PARTS</b>	3-1146	Adequately Regulated	See Section 5.3.2
50	7 WALNUT HILL RD	SEVERANCE TRUCKING CO	3-1262	RAO - A2	UST removal
<b>51</b>	<b>369 WASHINGTON ST</b>	<b>WR GRACE-CRYOVAC</b>	3-1423	Adequately Regulated	See Section 5.3.1
<b>52</b>	<b>22 CRANE'S COURT</b>	<b>CRANE'S COURT INDUSTRIAL PARK</b>	3-21078	Tier 1C	Former tannery, As, Cr

Bold = Sites summarized in Section 5.4

Bold/Italics = Sites summarized in Section 5.3

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Tetra Tech NUS, Inc.

DRAFT

Cleanup status categories, as defined by MADEP, are summarized below and presented in detail in Appendix D:

- Adequately Regulated: Sites covered by another MADEP program or regulatory agency, in this case the sites are part of the Wells G&H Superfund Site.
- RAO: A Response Action Outcome states that actions have been taken to achieve a level of no significant risk or substantial hazards have been eliminated. Class A – remedial work completed and “no significant risk” remains; Class B – “no significant risk” and no remedial action required; Class C – temporary cleanup, reevaluation every 5 years required with goal of achieving either Class A or B status.
- Tier 1 (A-C): Response actions require a permit and either MADEP or LSP supervision. “Def. Tier 1B” is a default classification where the responsible party has not complied with MADEP deadlines.
- Tier 2: Response actions do not require a permit and may be performed by an LSP. Sites with waivers under the pre-1993 program are considered Tier 2.
- DPS: Downgradient Property Status is claimed when the source of the contamination is determined to be an upgradient property.
- NFA: No further action as determined by MADEP or an LSP; applies to sites reported prior to October 1993.
- NDS: Not a disposal site; applies to sites reported prior to October 1993.

## **Level 2 – Evaluation of MADEP File Information**

The information collected from MADEP on the 52 sites was further screened for this report using criteria described below. Sites were retained if analytical data available in the site files indicated the presence of elevated levels and/or MCL exceedances of one or more of the following contaminants, including Industri-Plex-related contaminants of concern (COCs): arsenic, chromium, lead, mercury, benzene, toluene, TCE, PAHs, and total petroleum

hydrocarbons (TPH), and Wells G&H COCs: VOCs, PCBs and pesticides. Sites with a history of industrial use, in particular tanning, rendering, or finishing, were retained when available data included the above-mentioned COCs. Sites that had releases from spills or removals of underground storage tanks that involved gasoline, fuel oil or other petroleum-based contaminants only were screened out. Sites where the only evidence of contamination has been reported as remediated to a level of “no significant risk” with levels of hazardous material reduced to background, as defined in the MCP (e.g. Class A-1 RAOs), were also screened out. The 17 sites that met the above screening criteria were considered to be potential sources of contamination in the vicinity of the Aberjona River and are summarized in Table 5-2. The locations of these 17 sites are highlighted on Figure 5-1. The other 35 sites from the initial group of 52 did not meet the screening criteria and were not evaluated further. Ten of the 17 sites are located on or near properties that were former tanning, rendering, or finishing company operations. Table 5-3 lists the property names and map numbers of the 10 MADEP sites (locations shown on Figure 5-1) matched to the former tanning, rendering or finishing company names and locations (map numbers shown on Figure 3-1).

### **Level 3 – Final Screening (Group 1)**

Following a comprehensive evaluation of the available information for each of the 17 sites carried forward from the Level 2 screening, the sites were further segregated into two groups. Group 1 sites, summarized in Section 5.4.2, meet one or more of the following screening criteria:

- no documented contaminant migration via groundwater;
- the identified source was removed;
- a Class A2 RAO has been filed indicating that a “permanent solution with no significant risk” was achieved;
- a Class B2 RAO has been filed indicating that no significant risk exists contingent upon implementation of an Activity and Use Limitation (AUL) for the site; or
- MADEP has determined that no further action is required.

**TABLE 5-2  
MADEP SITES CONSIDERED POTENTIAL SOURCES OF CONTAMINATION  
DRAFT PRELIMINARY MSGRP SUPPLEMENTAL REPORT – SOUTHERN AREA  
INDUSTRI-PLEX SITE  
WOBURN, MASSACHUSETTS**

MAP ID	RTN #	SITE NAME	ADDRESS	MCP STATUS	COMMENTS
2	3-12909	Cross Street LLC	50 Cross Street, Winchester	RAO A2/ Phase II (12/2/99)	Former patent leather mfg; VOCs, TPH in soils & GW
3	3-0115	J.O. Whitten Property	134 Cross St., Winchester	Tier 1A (10/1/93)	Former tannery/rendering; As, Cr, Hg in site soils and River sediment.
13	3-3603	Purity Supreme (near former tannery)	695 Main St., Winchester	RAO A2 (8/25/95)	In vicinity of former tannery; metals in soil from dump area
17	3-12112/ 3-3176	McCord Winn Textron (former)	620 Washington St., Winchester	RAO A2/ (7/27/98, both RTNs)	Old grist mill; Winn, Inc. watch hand factory; AST and oil UST – all removed; VOC, TPH, no metals data; GW well for cooling/irrigation
19	3-18789	Former Independent Tallow Co.	39 Cedar St., Woburn	Tier 2/Phase II (9/29/00)	Former tannery; very high Cr, As, Hg in soils, metals in GW below the reporting limit
22	3-12606	Thermo Electron (former)	5-17 Cranes Court, Woburn	RAO C/ Phase IV (5/22/96)	VOCs in GW, no metals data (Note: 22 Cranes Ct. is a former tannery)
24	3-0477	Vac-Cent	5 Green St. Woburn	NFA (7/23/93)	Tolman-Fox Tannery 1875-1938 (Durant, 1991); Cr in soils, caustic
25	3-0731	Former tannery	8-10 Green St. Woburn	RAO B2 (5/19/00)	Tannery 1864-1934; auto junkyard 1934- 1973; metals in tannery disposal pit soils & GW
26	3-1737/3-10603/3- 11337/3-13270/3- 1099/3-1597/3-19962	Atlantic Gelatin/ Kraft/General Foods	Hill St., Woburn	1 RAO-C; 4 RAO-A1; 1DPS, 1closed	1997 soils w/SVOCs, pest. As, Hg, Pb @ 3x ref. Values; 4 active production wells
29	3-2439	VAC-HYD	65 Holton St., Woburn	RAO (4/22/94)	Pb, Cr>MCL;As<MCL;PCE & TCE > MCL
31	3-13604	Woburn Car Wash (former tannery site)	75 Main St. Woburn	Tier 1C/Phase II (5/22/97)	Horace-Conn Tannery abutted site; gasoline USTs
35	3-1263	Printed Circuit Corp.	10 Micro Drive, Woburn	NFA (3/18/94)	
36	3-1063	Dowd Enterprises	205 Wildwood St. Woburn	RAO – B2 (10/27/97)	Tannery hides/sludges disposed; very high Cr, some As
37	3-1966	Industrial Property	225 Wildwood St. Woburn	RAO – B2 (1/31/97)	2 areas with hides; As/Cr > soil & GW standards
40	3-0171	American Shoe Machinery	30 Nashua St. Woburn	Tier 2/Phase II (8/9/96)	High Cd, Cr, Pb in sludge & test pits; metals detected in GW
45	3-0482/3-13444	JJ Riley Tannery/Beatrice	228 Salem St. Woburn	RAOs	Water supply well in operation 1958-1989
52	3-21078	Crane'sCourt Industrial Park	22 Crane's Court, Woburn	Tier 1C	Former Beggs & Cobb tannery

Sources: MADEP databases; see references in specific site summaries in Section 5.4

**TABLE 5-3**  
**MCP SITES LOCATED AT/NEAR FORMER TANNERIES**  
**AND MANUFACTURING FACILITIES**  
**DRAFT PRELIMINARY MSGRP SUPPLEMENTAL REPORT – SOUTHERN AREA**  
**INDUSTRI-PLEX SITE**  
**WOBURN, MASSACHUSETTS**

<b>MCP SITE NAME/MAP # (refer to Figure 5-1)</b>	<b>FORMER TANNERY NAME/MAP # (refer to Figure 3-1)</b>
J.O. Whitten Property/ Map #3 134 Cross St. Winchester	John Maxwell Tannery/ Map #15
Dowd Enterprises/ Map #36 205 Wildwood St., Woburn	Riley Tanning Co./ Map # 4
Independent Tallow Co./ Map #19 39 Cedar St., Woburn	Buckham & Keane Co.; Crescent Tanning Co./ Map # 18
Vac-Cent/ Map #24 5 Green St., Woburn	Tolman-Fox Corp./ Map # 24
Cross Street LLC/ Map #2 50 Cross St., Winchester	Middlesex Japanning; A.H. McLatchy/ Map # 14
McCord Winn Textron/ Map #17 620 Washington St., Winchester	J.H. Winn, Inc./ Map # 5
Atlantic Gelatin/ Map #26 Hill St., Woburn	Atlantic Gelatin/ Map # 13
8-10 Green Street/ Map # 25 Woburn	Prime Tanning Co./ Map # 23
J.J. Riley Tannery/ Map # 45 228 Salem St., Woburn	J.J. Riley Tannery/ Map # 4
Crane's Court Industrial Park/Map #52 22 Crane's Court, Woburn	Beggs and Cobb Factory #1/ Map #37

All Group 1 sites are considered to pose no significant risk to the Aberjona River and therefore have been screened out from further evaluation. While the documented releases associated with the Group 1 sites have been adequately addressed under the MCP, historically these sites may have represented a potential source of contaminants to the Aberjona River.

#### **Level 4 – Final Screening (Group 2)**

Group 2 sites, summarized in Section 5.4.3, include sites that meet the following screening criteria:

- releases are actively being addressed under the MCP;
- site investigations in progress and no RAO (based on information in the MADEP files); sites that have active industrial facilities whose operations could be a potential source of contamination.

The Group 2 sites are considered to be potential current and future sources of contamination to the Aberjona River since there has not been a determination that the site represents “no significant risk.”

#### **General Site Summary Information**

The results of the final site screening, segregating the sites into Group 1 and Group 2, are shown in Table 5-4. The Group 1 sites are summarized in Section 5.4.2; the Group 2 sites are summarized in Section 5.4.3. The locations of the Group 1 and Group 2 sites are highlighted on Figure 5-1.

Each summary is based on information obtained from MADEP site file reviews conducted during mid to late 2000 and subsequently updated via MADEP on-line databases. A file review to update information on selected sites/RTNs was completed on April 17, 2003. During this file review, information was obtained on 22 Crane's Court, the only site with a RTN assigned since the initial file reviews were completed in 2000 that meets the screening criteria discussed in Section 5.4.1. The map number included in each site summary heading refers to the locations and legend shown on Figure 5-1. Site location, historical use, site investigations, COCs, and MADEP regulatory status

**TABLE 5-4**  
**FINAL SCREENING SUMMARY – MADEP SITES**  
**DRAFT PRELIMINARY MSGRP SUPPLEMENTAL REPORT – SOUTHERN AREA**  
**INDUSTRI-PLEX SITE**  
**WOBURN, MASSACHUSETTS**

MAP ID	SITE NAME	ADDRESS	COMMENTS	SCREEN IN/OUT
<b>GROUP 1</b>				
2	Cross Street LLC	50 Cross Street, Winchester	RAO A2, RAM and bioremediation performed	OUT
13	Purity Supreme (near former tannery)	695 Main St., Winchester	RAO A2	OUT
17	McCord Winn Textron (former)	620 Washington St., Winchester	RAO A2, Phase II report concluded no impact on the Aberjona River	OUT
22	Thermo Electron (former)	5-17 Cranes Court, Woburn	RAO C, about 3,000 feet from Aberjona River	OUT
24	Vac-Cent	5 Green St. Woburn	MADEP NFA, about 1 mile from Aberjona River	OUT
25	Former tannery	8-10 Green St. Woburn	RAO B2, AUL in place	OUT
29	VAC-HYD	65 Holton St., Woburn	RAO	OUT
31	Woburn Car Wash (former tannery site)	75 Main St. Woburn	Phase II, about 4,000 feet from Aberjona River, BTEX and gasoline USTs	OUT
35	Printed Circuit Corp.	10 Micro Drive, Woburn	MADEP NFA, about 2000 feet from Aberjona River	OUT
36	Dowd Enterprises	205 Wildwood St. Woburn	RAO B2, AUL in place	OUT
37	Industrial Property	225 Wildwood St. Woburn	RAO B2, tannery materials remain on site, AUL in place	OUT
45	JJ Riley Tannery/Beatrice	228 Salem St. Woburn	RAO A1/A2, arsenic-contaminated soils and tannery materials removed	OUT
<b>GROUP 2</b>				
3	J.O. Whitten Property	134 Cross St., Winchester	Tier 1A site; heavy metals in soils on the property abutting Aberjona River	IN
19	Former Independent Tallow Co.	39 Cedar St., Woburn	Phase II investigation underway as of 2000	IN
26	Atlantic Gelatin/ Kraft/General Foods	Hill St., Woburn	Active facility; landfill not completely characterized	IN
40	American Shoe Machinery	30 Nashua St. Woburn	Phase II investigation underway as of 1996	IN
52	Crane's Court Industrial Park	22 Crane's Court Woburn	Phase II investigation underway as of January 2003	IN

are included in each site summary, based on available information. Property owners and businesses that operated at a site are included where such information was available in the MADEP files. Discussions of contaminants present at these sites focus on those COCs identified for this MSGRP study; other contaminants may also be present at these sites. Where data were available for COCs, maximum reported concentrations of organic and inorganic contaminants are presented in tabular form as part of each MADEP site summary.

All site summaries and analytical data presented in Sections 5.4.2 and 5.4.3 are limited to information that was available in the MADEP site files at the time of the file review. No assumptions should be made that all information or data generated for all sites were available in the MADEP files. Much of the data is not recent. While more recent data may have been generated for some sites, if the information was not present when the MADEP file reviews were completed, it has not been included. In addition, no evaluation by TtNUS has been made regarding data quality, the use of approved sampling or analytical methods, data validation, or other quality control procedures. Therefore, the use of this information is strictly for general overview purposes.

#### **5.4.2 Group 1 Site Summaries**

Based on the screening criteria described in Section 5.4.1, 12 MADEP sites were screened out from further evaluation and are therefore considered Group 1 sites. The locations of these 12 sites are highlighted on Figure 5-1. This group of sites may have impacted the Aberjona River in the past but are not considered current sources of concern according to the MCP. Summaries for these 12 sites, including the information collected from MADEP files and other sources, are presented below. Each site summary refers to the site name, address and map number as highlighted on Figure 5-1.

##### **5.4.2.1 Cross Street, LLC, 50 Cross Street, Winchester, MA (Map # 2)**

This site encompasses approximately two acres and is located in a mixed commercial and residential section of Winchester. The site is located just downstream of Davidson Park and upstream of Leonard Pool. The Aberjona River is located approximately 400 feet south of the site. The site consists of a one-story and a two-story building, utilized as office space for several small commercial businesses. Tenants include a variety of offices, a children's theater group, a floral design studio, a ballet studio, and an artist's studio. A playground is also

situated in the northwestern corner of the site. A “hot rod club” has also reportedly met at the site in the past.

The original building on the site was constructed in 1873 and used until the 1920's for patent leather manufacturing by the Middlesex Japanning Company. The building also housed the A.H. McLatchy Company factory and a box company, Winchester Carton, prior to being renovated for office use only. The following table details the ownership information for the 50 Cross Street property (IES, 1999).

<b>DATE</b>	<b>OWNER – BUSINESS</b>
1873 - 1916	Middlesex Japanning – patent leather manufacture
1931 - 1945	A.H. McLatchy – leather finishing
Mid – 1940's	New England Patent Leather – patent leather manufacture
Late 1940's - 1965	Winchester Carton – box company
1974 - 1978	Cross Realty – office use
1982 - 1986	Glenn & Gail Matthews – office use
1986 - 1999	Mill Property Trust – office use
1999 – present	Cross Street, LLC – office use

Two underground fuel oil tanks were removed from the property in 1986. Reports in the MADEP files indicate that no contamination was detected at the time of excavation.

A site investigation was performed in 1995, including soil borings and installation of groundwater monitoring wells (IES, 1999). Laboratory analysis of soil samples indicated elevated levels of three VOCs, including 1,1,2-TCA at 35,536 µg/kg, and TPH. Groundwater samples collected from the monitoring wells indicated elevated levels of three VOCs, including TCE, and TPH. The investigation report concluded the former meeting area of the “hot rod club,” located in the south-central section of the property, was the source area of contamination due to spillage of waste automotive fluids (IES, 1999).

Soils excavated from the source area as part of a 1997 Release Abatement Measure (RAM) contained arsenic at 21.2 mg/kg, chromium at 29.4 mg/kg and lead at 124 mg/kg. Due to the volume of VOC-contaminated soils found on-site, bioremediation was performed between May and October 1997 (IES, 1999). According to MADEP database information, a Class A2 RAO was filed for RTN 3-12909 in 1999. This RAO category indicates that a permanent solution and a level of no significant risk were achieved, but oil and hazardous material concentrations have not been reduced to background.

5.4.2.2 Purity Supreme, 695 Main Street, Winchester, MA (Map # 13)

The site is located on a 2.3-acre parcel at the corner of Skillings Road and Main Street in Winchester. The site is bound to the north by Skillings Road, to the east by the former MBTA property, to the south by a tributary to the Aberjona River, and to the west by Main Street. A 1954 Town Engineering Plan notes an abandoned dump on the northern bank of the tributary to the Aberjona River. The area was suspected of containing landfill debris. No further information regarding this dump was available. The site is located in the vicinity of the former Loring and Avery Tannery. A tributary of the Aberjona River flows from Wedge Pond, west to east, across the southern portion of the site. Groundwater from the site flows south-southeast towards the Aberjona River. The following table summarizes historical ownership information for the property (SAIC, 1992). A retail food supermarket continues to operate on the site.

<b>DATE</b>	<b>OWNER – BUSINESS</b>
Prior to 1895	Unknown-residential use
1895-1902	Emerson Company - coal and lumber retail business
1902-1907	Blanchard & Kendall Company - coal and lumber retail business
1907-1956	George W. Blanchard Company - coal and lumber retail business
1956-1980	FINAST(First National Stores) – supermarket
1980 - present	Purity Supreme/Stop & Shop (leased) – supermarket

As part of a limited site investigation conducted in 1990 of the 695 Main Street and MBTA properties, soil, groundwater, and surface water samples were analyzed for VOCs, TPH, PCBs, and metals. Analytical results indicated low concentrations of arsenic, chromium, and lead in the soil, and chromium, lead, and mercury in the groundwater. There was one MCL exceedance, for lead, in the groundwater samples. Elevated levels of TPH were detected in soils in the northwest section of the site. Concentrations of metals in soils were reported to be within the range typically found for metals in naturally occurring soils (SAIC, 1992). Chlorinated VOCs, including TCE and DCE at concentrations greater than MCLs, were detected in groundwater samples collected from the northeast section of the site. Soil samples from the abandoned dump area contained arsenic (33.4 mg/kg), chromium (97 mg/kg), lead (742 mg/kg), and mercury (1.35 mg/kg) (SAIC, 1992). There were no documents found in the MADEP files that mentioned actions taken based on these data.

On March 20, 1991, MADEP was notified of a release or threat of release of oil or hazardous waste at 695 Main Street and the former MBTA property. A waiver application for the site was

approved by MADEP on June 4, 1992. A subsequent release notification was sent to MADEP on September 30, 1992, documenting indications of a release from a 1,000 gallon fuel oil UST during its removal on August 12, 1992. Contaminated soil was excavated; a request to transport the soil to an approved asphalt batching plant was included in the September 30, 1992 notification letter (SAIC, 1992a). A Class A2 RAO for RTN 3-3603 was filed in 1995, indicating that a “permanent solution with no significant risk” had been achieved.

5.4.2.3 McCord Winn Textron (former) , 620 Washington Street, Winchester, MA  
(Map # 17)

The site encompasses approximately nine acres and is located in north Winchester, bound by Calvary Cemetery to the north and west and by residential neighborhoods to the south and east. The Aberjona River runs through the property from the northeast to the southwest. The following table summarizes owners and businesses that operated on the property.

DATE	OWNER – BUSINESS
1751	Jeduthan Richardson - built grist mill
Early 1830's until 1841	Parker – mahogany veneer cutting mill
1872 – 1960's	J.H. Winn, Inc. – watch hand manufacturing
1970's - 1995	Winn/McCord Winn Textron – various manufacturing operations
1995	Manufacturing ceased
1997 – present	Faith Fellowship Ministries – worship services and school

Historical records indicate that the Jeduthan Richardson grist mill was built on the site in 1751. Asa and Harrison Parker operated a mahogany veneer cutting mill at this location until 1841. In 1872 the site became J.H. Winn, Inc. which was the first American factory to manufacture watch hands by machinery. The manufacture of clock hands was phased out in the 1960's. The production of fuel pump armatures began in the early 1970's and production of lumbar support systems began around 1985. All manufacturing on-site ceased in 1995 (ABB, 1997). As of November 1997, the property was owned by the Faith Fellowship Ministries of New England and used for Sunday worship services and as a Christian education school.

One AST and four USTs were formerly located on the property. A 500-gallon AST used to store 1,1,1-TCA was removed in 1995. Two 2,000-gallon fuel oil USTs were removed in 1988. Visually contaminated soil was removed during the excavation of these tanks. A 2,000-gallon gasoline UST, also used for lacquer storage, was removed in 1988 and a 5,000-gallon No. 2 fuel oil tank has also been removed. The McCord Winn facility generated several types of

waste, including 1,1,1-TCA, mineral spirits, corrosives, and flammables. All of these wastes were shipped off-site under manifests (ABB, 1997).

In April 1990, McCord Winn Textron notified MADEP that TCE had been detected in the groundwater beneath their facility. During testing required by MADEP, samples were collected that indicated low levels of TCE in two former production wells and at a permitted non-contact cooling water discharge point to the Aberjona River (Ventura, 1990).

A 1995 Phase I Initial Site Investigation found TPH concentrations in soils near the former UST ranging from 810 mg/kg to 4,800 mg/kg. Groundwater samples contained low levels of at least four VOCs, including TCE, but no TPH (ABB, 1997). The source of VOC contamination was not identified. A 1997 Phase II Comprehensive Site Assessment report found low levels of TCE in soils and groundwater samples collected on-site (ABB, 1997). Based on the concentrations of contaminants and lack of potential receptors, the 1997 report concluded that there was no indication that the site had affected the Aberjona River (ABB, 1997).

The MADEP database shows two RTNs for this site, 3-12112 and 3-3176. Class A2 RAOs were issued for both RTNs in July 1998, indicating that remedial work was completed and a level of no significant risk was achieved.

#### 5.4.2.4 Thermo Electron Corp. (former), 5-17 Cranes Court, Woburn, MA (Map # 22)

The site is bound by residential areas to the west and south, the Boston & Maine railroad right-of-way to the east, and businesses to the north. Thermo Electron Corp. operated at this site from 1964 until 1995. Since 1995, commercial/industrial businesses have occupied the two buildings onsite. In 1983, Thermo Electron notified EPA that it was a small quantity generator of ignitable and corrosive hazardous waste (including 1,1,1-TCA, acetone, and methanol). On July 27, 1993, an anonymous call was placed to EPA's Criminal Investigation Division stating that Thermo Electron had disposed of acids and chlorinated solvents consisting of hydrochloric and hydrofluoric acid and trichlorethylene (TCE) on the property and in the sewer, consistently between 1977 and 1980. The Woburn Department of Public Works (DPW) was contacted and stated that the property owners on Crane's Court pay an annual sewer fee, however, the DPW could only confirm if a property was connected to the sewer by performing a dye test (TtNUS, 2000). No additional information of the outcome of EPA's investigation was provided in the available documents.

In November 1994, 2,255 gallons of 1,1,1-TCA were removed from 41 55-gallon drums that remained in the western building. VOCs were detected in groundwater samples from onsite monitoring wells in 1995, 1997 and 1999. TCE was detected at concentrations greater than MCLs in the majority of the wells, in each of the three years. Maximum TCE concentrations in groundwater reported for each year are shown in the table below (TtNUS, 2000).

Year	Maximum TCE Concentration (µg/l)
1995	110
1997	120
1999	140

The Thermo Electron property is covered by buildings and asphalt which is cracked in some areas. The property is surrounded by either exterior building walls or a chain-link fence. Surface runoff can flow into a drainage ditch, which then flows into Russell Brook and Horn Pond. Horn Pond is located approximately 0.28 miles west of the Thermo Electron property. From Horn Pond, surface water flows through Horn Pond Brook and Wedge Pond before entering the Aberjona River.

As of 1996, a Class C RAO, or temporary solution, had been achieved for RTN 3-12606. Since the site had not reached a level of “no significant risk,” MADEP determined that the site must be reevaluated every five years. No further updates were provided in the MADEP databases to indicate whether a reevaluation was performed in 2001.

#### 5.4.2.5 Vac-Cent, 5 Green Street, Woburn, MA (Map # 24)

Vac-Cent operated as a casting foundry at this site approximately 20 years ago. A site investigation conducted in 1986 found 3 hot spots of beryllium and mercury in soil as well as sodium hydroxide (caustic soda) in soils.

Soils in test pits contained chromium which was attributed to the Tolman-Fox Corporation tannery that operated at the site from 1875 – 1938 (Durant, 1991). The MADEP database indicates that a no further action determination was made for RTN 3-0477 in 1993. The site is also listed in the CERCLIS database as a non-NPL site with an on-going reassessment.

5.4.2.6 8-10 Green Street, Woburn, MA (Map #25)

The site is 94,167 square feet in area and consists of seven buildings that are currently occupied by commercial and industrial businesses. The Prime Tanning Company operated at the site from 1864 to 1934. During that time, on-site wood-lined disposal pits were used for temporary tannery waste storage. From 1934 to 1973, the site was an auto junk yard and salvage business. From 1975 to the present, various commercial, industrial, and warehousing operations have occupied the site under the ownership of the Cohen Prime Realty Trust. The following table summarizes historical ownership for 8-10 Green Street (HETI, 1995).

<b>DATE</b>	<b>OWNER</b>
1864-1934	Prime Tanning Company
1934-1936	Charles Cohen, Philip Zelbuivite, Joseph Sanderson
1936-1973	Charles Cohen
1973-1975	Charles Cohen Family Trust
1975-present	Arthur Cohen, Cohen Prime Realty Trust

In 1986, arsenic, cadmium, lead and mercury were detected in groundwater samples. No VOCs were detected in the groundwater. Soil samples were not collected for laboratory analysis during this investigation (HETI, 1995).

In 1995, groundwater samples and subsurface and surface soil samples were collected as part of a Phase I limited site investigation (HETI, 1995). Metals were detected in groundwater but no detectable TPH or semi-volatile organic compounds were found. Subsurface soil analytical results indicated the presence of metals and TPH, with the highest concentrations found within the former tannery disposal pits. Lead and TPH were detected in surface soils collected from the property. Maximum reported contaminant concentrations for the three sets of samples are shown below (HETI, 1995; HETI 1997).

<b>Contaminant</b>	<b>Subsurface Soils (mg/kg)</b>	<b>Surface Soils (mg/kg)</b>	<b>Groundwater (µg/l)</b>
Arsenic	18	11	180
Lead	300	1300	6
TPH	3600	1700	NA

The Phase I report concluded that soil contamination appears localized within the area of the former waste disposal pits, and the potential for groundwater contaminant migration exists, either by natural flow or flow through the culverted stream (Russell Brook) (HETI, 1995).

A Class B2 RAO was filed for RTN 3-0731 in 2000. No remedial action was performed, however an Activity and Use Limitation (AUL) was placed on the site to restrict exposure to oil and hazardous material.

#### 5.4.2.7 VAC-HYD, 65 Holton Street, Woburn, MA (Map # 29)

The 43,053 square foot parcel lies in an area zoned for industrial use. The site consists of a two-story brick building, which was formerly occupied by Interturbine, Inc., VAC-HYD, Inc., and Eldim, Inc. for the manufacturing of jet engine components. From 1994 to the present, the building has been occupied by Industrial Heat Treating, Inc. (GEC, 1994).

The Aberjona River is located approximately 1,200 feet southeast of the site. Groundwater was determined to flow in a southerly direction from the site.

On November 28, 1988, a solvent release to a dry well on site was discovered and an emergency response was conducted to remove liquid and sediment from the impacted dry well. Laboratory analysis of the removed liquid indicated elevated levels of TPH, and VOCs, including 1,1,1-TCA and toluene (GEC, 1994).

A field investigation, including groundwater and sediment sampling, was conducted in 1993. Groundwater samples were analyzed for VOCs and dissolved RCRA metals. Selected groundwater analytical results are shown in the table below (GEC, 1994).

CONTAMINANT	MCL (µg/l)	CONCENTRATION (µg/l )
PCE	5	46 – 1000
1,1,1-TCA	200	3.2 – 22
Arsenic	10	5 – 22
Chromium	100	90 – 930
Lead	15	120 – 590

A sediment sample was collected from the dry well in 1993, five years following the release. Analytical results indicated PCE at 83 µg/kg and 1,1,1-TCA at 37 µg/kg (GEC, 1994). A March

22, 1994 Licensed Site Professional evaluation and opinion for RTN 3-2439 concluded that the 1988 solvent release to the dry well was the likely source of the chlorinated VOCs detected at the site. Two rounds of groundwater sampling indicated that PCE, 1,1-DCA, and 1,1,1-TCA have migrated downgradient. Elevated TPH and toluene levels were detected in the materials excavated from the dry wells in 1988 and were attributed to pavement run-off and automobiles (GEC, 1994). The MADEP database indicates that as of April 22, 1994, an RAO had been filed for RTN 3-2439; the RAO category was not defined.

#### 5.4.2.8 Woburn Car Wash, 75 Main Street, Woburn, MA (Map # 31)

The site is located 1,000 feet east of Horn Pond and consists of a car wash and a Mobil gas station. There are two 10,000 gallon USTs onsite. The site is located in the former Russell Brook drainage area, now channeled by a 60-inch culvert. The Horace-Conn Tannery was a former abutter to the site to the east-northeast.

A 1926 Sanborn Map shows the site as a filling station with two tanks. In 1986, two gasoline USTs (2,000 to 3,000 gallon) were removed and two 10,000 gallon USTs were installed.

The MADEP files document a release of approximately 55 gallons of gasoline from one of the on-site USTs. Historical groundwater data from 1990 and 1995 indicate part per million (ppm) level concentrations of BTEX compounds. One groundwater sample (1995) contained arsenic at a concentration of 12 µg/l. Data from 1997 showed BTEX concentrations in the same range as those detected previously (RemServ, 1997).

The MADEP database indicates that as of 1997, RTN 3-13604 was in a Phase II status. There is no more recent information as to whether an RAO has been filed for the site.

#### 5.4.2.9 Printed Circuit Corp., 10 Micro Drive, Woburn., MA (Map #35)

The site is located in a commercial and industrial zoned area. The Aberjona River is located 0.25 miles southeast of the site; groundwater flows southeast from the site. The site was previously part of the Blueberry Hill Quarry, which operated from the early 1900's to 1967 and was owned by the Winchester Crushed Stone Company.

In 1968, George D. Whitten purchased the property and constructed the existing 2-story building. Printed Circuit Corporation (PCC) acquired the property in 1978 and has manufactured printed circuit boards there from 1981 to the present. Before PCC acquired the building, metal plating and high-vacuum chamber operations occurred in the building. A production well with a total depth of 850 feet provides water to the circuit board production process. Water is reported to be drawn from a depth of 600 feet (Briggs, 1992).

A Phase I Environmental Site Assessment was performed in March 1988 at which time the building was occupied by PCC. The assessment, to investigate whether there had been a release, was updated in December 1988 and September 1989 (Briggs, 1992). VOCs were found in some soil samples and in groundwater collected from the PCC production well. The TCE concentration in groundwater exceeded the MCL.

Another Environmental Site Assessment Update was prepared in 1992 (Briggs) to investigate whether a release of oil and/or hazardous materials had occurred on the property. This update included a site inspection. The central portion of the building was used by PCC for the manufacturing of the printed circuit boards. This area contained concrete floors with floor drains. The report indicated that the floor drains are tied into the facility's wastewater pre-treatment system located in the western part of the building. Spent acid and alkaline solutions and rinses are treated and discharged, under permit, into the City of Woburn sewer system, which is connected to MWRA treatment facilities. Plastic containers and 55-gallon drums were also noted in the manufacturing area and were reportedly used to store chemicals used in the manufacturing process. Spills were noted on the concrete floor. Two ASTs containing 2,500 gallons of 1,1,1-trichloroethane and 3,400 gallons of methylene chloride were observed in the southwestern corner of the building (Briggs, 1992).

During another site assessment update in March 1994 the following changes for the two ASTs were noted (Capaccio, 1994). The methylene chloride tank was empty and PCC personnel stated that its use was discontinued in 1988. There was a small amount of 1,1,1-TCA in the other tank. The facility was not using the chemical in 1994.

Groundwater samples were collected from the onsite production well in 1992 and 1994 and analyzed for VOCs. Analytical results for VOCs that exceed the respective MCL are indicated below (Briggs, 1992; Capaccio, 1994):

Contaminant	MCL (µg/l)	1992 Data (µg/l)	1994 Data (µg/l)
Vinyl chloride	2	4.4	3.73
TCE	5	16.3	ND

The 1992 site assessment noted that neither vinyl chloride nor TCE are used by PCC. The report did not confirm a source of the VOCs found in the production well (Briggs, 1992). MADEP database information indicates that RTN 3-1263 is regulated under the older version of the MCP, and that a document had been submitted to MADEP stating that, based on a site assessment, no further action is required. This status information is from 1994, according to the MADEP database. The MADEP database listed an August 28, 2002 release of nickel at this address for Industrial Water Supply Well #1, RTN 3-22058. The release is currently unclassified. Since nickel is not a COC this site remains screened out.

5.4.2.10 Dowd Enterprises/205 Wildwood Avenue Limited Partnership; 205 Wildwood Avenue, Woburn, MA (Map # 36)

Documents available in the MADEP files reference Dowd Enterprises, Juniper Holdings Inc., and 205 Wildwood Avenue Limited Partnership in relation to investigations and other information on this site. The Phase II report states that the property is owned by Diana and John Riley (21E, 1995).

The property was part of the John J. Riley Tanning Company (228 Salem Street) from approximately 1915 to 1987 (see Section 5.4.2.12 for more information regarding the operations at the John J. Riley Company). Tannery sludge was landfilled in the northwest part of the site; sludge lagoons were located in the southwest part of the site. The approximate 6-acre northwest portion was subdivided from the main tannery parcel in 1987. In 1988, the warehouse structure was built; it has been occupied by BASF Corp. since that time. The site is located approximately 1,500 feet west of the Aberjona River, and groundwater at the site flows approximately east-southeast, toward the river.

Wastewater from tannery processes was discharged to a catch basin, and the associated settled-out solids were periodically dredged and landfilled onsite. At one time, wastewater was also discharged to a former settling pit/lagoon. Test pits excavated prior to the construction of the building encountered material identified as tanning and finishing process wastes (21E, 1995). The test pit soils contained heavy metals (e.g. chromium, lead, and arsenic). Soil

borings advanced during various site investigations found physical evidence of tannery wastes in the areas of the lagoons and landfill. Test pit soils also contained No. 6 fuel oil, which was reported to MADEP and RTN 3-1063 was assigned.

A Phase II investigation documented contamination related to past tannery disposal activities. The investigation concluded that no further action was required (21E, 1995). Inorganic contaminants (total metals) detected in soil borings advanced in three different areas of the site (Drumlin Road area, landfill area, and sludge lagoon area) are presented below (21E, 1995).

<b>Contaminant</b>	<b>Max. Soil Concentration (mg/kg)/sample Depth</b>
Arsenic	9.78/13-14.5 ft
Lead	190/5 - 7 ft.
Mercury	0.33/0 – 2 ft
Chromium	35,800/13 – 14.5 ft

Low levels of VOCs were detected in onsite soils, primarily in the sludge lagoon area. Dissolved metals, including arsenic and mercury, were detected in groundwater samples at concentrations below MCLs. Chlorinated VOCs were also detected in groundwater at concentrations up to 120 µg/l. A 1995 Phase II Report stated low levels of chlorinated solvents and VOCs have been reported in soil and groundwater.

MADEP database information indicates that a Class B2 RAO for RTN 3-1063 was filed in 1997. This classification indicates that no remedial action was conducted since no significant risk exists, contingent upon implementation of an Activity and Use Limitation for the site.

#### 5.4.2.11 Industrial Property at 225 Wildwood Ave. (Map # 37)

The approximately 9.5 acre site was wooded prior to 1979 when the site was developed. A building was constructed in 1979 and was occupied by an environmental testing laboratory from 1979 to approximately 1995. An HVAC equipment distributor currently occupies the building. Warehouse and office space was added following a building addition in 1988. The following table summarizes the historical ownership of the site (Gale, 1995).

DATE	OWNER – BUSINESS
1928 - 1976	Trustees of Woburn, 128 Realty Trust – undeveloped woodland
1976 - 1979	Walter Bushmich, et al. – undeveloped woodland
1979 - 1994	Michael Howland – environmental laboratory, warehouses
1994 - present	Connecticut Mutual Life Insurance – HVAC equipment distributor and book warehouse

A 3,000 gallon diesel fuel UST was removed in 1990; no evidence of spills or leaks was found. The site is zoned for industrial park use. Wells G&H are located approximately 1,200 feet east-northeast of the site. Groundwater from the site flows to the southeast (Key, 1996).

Subsurface investigations in the late 1980s revealed two areas with discolored soils and dark fibrous material. Based on historical information, the investigation concluded that these areas resulted from disposal of off-specification leather hides. Currently, the north area is partially covered by asphalt; the south area is vegetated. Soil samples from the two areas contained elevated concentrations of arsenic and chromium. Groundwater from the two areas contained lead and chromium at concentrations greater than the MCLs (Key, 1996). The highest concentrations of contaminants historically detected in soil and groundwater at the site are shown in the table below (Key, 1996).

Contaminant	Highest Concentration	
	Soil (mg/kg)	Groundwater (mg/l)
Arsenic	47	0.03
Chromium	3,600	0.344
Lead	62.1	0.204

The Phase II report concluded that “no significant risk” existed at the site and that an Activity and Use Limitation (AUL) be prepared based on the tannery materials remaining buried in the north and south areas (Key, 1996). According to the MADEP database, a Class B2 RAO, including an AUL, was filed for RTN 3-1966 in 1997.

#### 5.4.2.12 J.J. Riley Tannery, 228 Salem St., Woburn, MA (Map # 45)

The John J. Riley Company owned and operated a tannery at 228 Salem Street, and also owned an undeveloped parcel of land on Salem Street, now known as the Wildwood Property (see Section 5.1.1). The tannery consisted of a process building and office building and

operated between 1909 and 1988. The following table summarizes the ownership of the tannery during its operation.

DATE	OWNER - BUSINESS
1909 – 1978	John J. Riley Co. - tannery
1978 – 1983	Beatrice Foods - tannery
1983 – 1985	John J. Riley Co. - tannery
1985 – 1989	Employee owned - tannery

Two chromium lagoons, reportedly used until 1970, were located behind the process building. Sludge material and hides were buried on site. An overburden production well was located west of the railroad tracks. Little information was available regarding the pumping or groundwater quality from this well. A second production well for the tannery operations was located on the undeveloped property, now referred to as the Wildwood Property. Pumping of production well number two, located on the Wildwood Property, acted as a groundwater divide preventing groundwater beneath the tannery property from reaching Wells G&H while they were in operation. For this reason, the tannery site was not included in the monitoring conducted between 1983 and 1987 for the Wells G&H Site (ATSDR, 1989).

After 1989, the tannery buildings were demolished. The property was subdivided into six lots in 1994. Two lots were purchased and developed by Charles Ice Cream Specialty and Kraft Company in 1994. The remainder of the site is undeveloped. Wedel Corporation (John J. Riley, owner), as the PRP for the site, was responsible for the response actions taken in 1996, as described below. The site is listed in the CERCLIS database as a state-lead cleanup.

Groundwater results from monitoring well samples collected in 1993 showed no detections of VOCs, TPH or filtered (dissolved) metals of concern. Test pits excavated across the undeveloped portions of the site in 1996 uncovered surficial arsenic contamination in the southern portion of the site. Concentrations of total arsenic as high as 170 mg/kg were found in a sample from 0 – 6 inches bgs. Based on a potential imminent hazard condition, the area of surficial arsenic contamination was delineated. Under a MADEP-approved Immediate Response Action Plan, arsenic-contaminated soils were excavated to a depth of approximately one-foot and transported off-site. A total of 1,111 tons of soils were transported to either a thermal processing facility or landfill (21E, 1996). Following completion of this action a Class A-1 RAO was filed with MADEP in 1996 for RTN # 3-13444.

The test pit excavations also uncovered an area of the site with materials characteristic of tannery wastes at a depth of approximately 6 – 12 feet bgs. The materials were found in layers of varying colors, e.g. blue, orange/brown, pink and black. Samples from each of the four layers were analyzed for metals and organic compounds. No extractable organic compounds were found above the detection limit. The metals results are summarized in the table below (21E, 1996).

Layer/color	Concentration (mg/kg)		
	Chromium	Arsenic	Lead
Blue	82,500	NR	NR
Orange/Brown	13,500	NR	314
Pink	1,100	77	317
Black	3,250	61	409

NR = not reported.

Approximately 2,288 tons of tannery waste materials were excavated and transported off-site to either a treatment facility or landfill (21E, 1996). Following completion of the excavation, and satisfactory analytical results from confirmation sampling, a Class A-2 RAO was filed for RTN # 3-0482.

### 5.4.3 Group 2 Site Summaries

Based on the screening criteria described in Section 5.4.1, five MADEP sites were retained and are therefore considered Group 2 sites. The locations of these five sites are highlighted on Figure 5-1. These sites remain active within the MCP regulatory process; a determination of “no significant risk” has not been made and thus the sites are potential sources of contamination to the Aberjona River. Summaries, including the information collected from MADEP files and other sources, for these five sites are presented below. Each site summary refers to the site name, address and map number as highlighted on Figure 5-1.

#### 5.4.3.1 J.O. Whitten Property, 134 Cross Street, Winchester, MA (Map # 3)

The 134 Cross Street property encompasses approximately eight acres and is located in north Winchester. The property is bound to the east and south by the Aberjona River, to the west by the Massachusetts Bay Transportation Authority (MBTA) railroad tracks and to the north by commercial businesses. The following table lists owners and businesses that operated on the property.

DATE	OWNER – BUSINESS
Until 1877	Maxwell tannery (destroyed by fire in 1877)
Approx. 1900	J.O. Whitten Co. – rendering (edible gelatin products, glue)
1970	Swift & Company/Breco N.V. – manufacture of edible gelatin
1979 – 1980	Hudson Industries, Inc. – glue manufacture
1981	Plant destroyed by fire, buildings demolished
1985	Marotta Company – vacant lot

The property was used as a tannery in the late 1800's and then for rendering from the early 1900's through 1980. John Maxwell operated a tannery at the property until 1877, at which time a fire destroyed the tannery. The tannery was rebuilt, but was abandoned after John Maxwell's death. A coal-fired power plant was located in the center of the property. From 1900 to April 1980 various companies manufactured edible gelatin products and glue on the property. In August 1981, the plant was destroyed by fire and the buildings were demolished. Waste generated during the tanning and rendering operations, and power plant ash and cinders, were placed in open pits and lagoons located in the southern portion of the property (GEI, 1997).

An environmental assessment report completed in November 1984 was referenced but not available in the MADEP files. In September 1985, Mr. Angelo Marotta purchased the property with the intent of building a condominium complex. The property remains undeveloped. In January 1987, the property was listed as a Confirmed Disposal Site by MADEP based on site soil contamination.

Laboratory results from field investigations completed in the late 1980's to assess the environmental conditions at the site indicated the presence of arsenic, chromium, and mercury at elevated concentrations in test pit soils and in Aberjona River sediments (GEI, 1997). Cyanide was also detected in test pit soils and in one surface water sample collected from the Aberjona River at a location downstream from the property.

Groundwater and surface water samples were reported to contain arsenic, cyanide, toluene, and benzene (Durant, 1991). A remediation plan, including excavation and off-site disposal of soils and sludges containing cyanide and VOCs, was conditionally approved by MADEP in 1989. However, due to financial problems, the property owner did not complete the cleanup. MADEP had fencing installed in 1992 to restrict access to the site (Weston, 2001).

During a site reconnaissance in 1997, an EPA contractor documented: a landfill near the Aberjona River containing sludge material with arsenic, chromium and cyanide; pits containing lime sludge residue and scrap hides; and coal slag. EPA completed an Expanded Site Inspection in 2000. Surface and subsurface soil and groundwater samples were collected. The highest surface soil heavy metal concentrations were found in six locations at the property boundary abutting the Aberjona River. Maximum reported metal concentrations for these three sample types are presented below (Weston, 2001).

<b>Contaminant</b>	<b>Subsurface Soils (mg/kg)</b>	<b>Surface Soils (mg/kg)</b>	<b>Groundwater (µg/l)</b>
Arsenic	353	103 J	113
Chromium	338 J	248 J	93.2
Lead	498 J	431 J	NR

MADEP database information indicates that this RTN, 3-0115, is regulated under the older version of the MCP and that the site was ranked as Tier 1A which requires MADEP supervision of response actions. The status of any response actions is not known, based on available information. The site is also listed in the CERCLIS database as a state-lead cleanup.

#### 5.4.3.2 Independent Tallow Co., Inc., 39 Cedar Street, Woburn, MA (Map # 19)

The site is located along the Stoneham-Woburn town line in a commercial and light industrial area of Woburn. The property is owned by Independent Tallow LLC and has been used for various industrial operations since the early 1900s. The following table summarizes the historical ownership of the site (Vertex, 2000).

<b>DATE</b>	<b>OWNER – BUSINESS</b>
1904	Bailey & Blendinger Manufacturing Company – machine knife manufacturing
1910	Buckham & Keane Company – chrome tannery
1918	Buckham & Keane Company – japanning company
1926	Crescent Tanning Company – tannery
1947- 1987	Independent Tallow Company – tallow and crackling production

Historical maps of the area from 1918 and 1926 indicate hide storage areas on the site. Site assessments completed during the 1980s noted two process buildings and one small office building on the site, as well as the presence of an artesian well used for industrial process water (Geotechnical Consultants, 1986). The buildings were demolished and three fuel oil/diesel/ gasoline USTs were removed in 1988. A wetland area is located in the northeastern part of the site. Reports noted disposal of solid waste on the surface and many empty 55-gallon drums. No evidence of subsurface contamination was found (Geotechnical Consultants, 1986). Some of the nearby wetlands have been filled in with brick, concrete, and metal. A nearby stream was sampled for heavy metals in 1986; no heavy metals were detected at elevated concentrations. Groundwater flows south-southwest across the southern portion of the site towards the Aberjona River. There is also a southeasterly component of groundwater flow toward the on-site wetland area in the northern part of the site (Vertex, 2000). The site is upgradient of the Wells G&H wetlands.

There are two RTNs for this location. MADEP determined that RTN 3-1734 was “not a disposal site.” RTN 3-18789 was issued in 1999 following the discovery of elevated concentrations of metals, PAHs and TPH in site soils during a due diligence investigation. Surface soil samples and soil samples from test pits and soil borings in the southern and central northeastern portions of the site contained elevated concentrations of heavy metals. The highest concentrations found in the soil samples are shown in the table below (Vertex, 2000). Groundwater sampling showed all metals “below reporting limit” (Vertex, 2000).

<b>CONTAMINANT</b>	<b>TEST PITS</b>	<b>SURFACE SOILS</b>	<b>SOIL BORINGS</b>
Arsenic (mg/kg)	410	13	91
Chromium (mg/kg)	50,000	1,300	9,200

A Release Abatement Measure (RAM) was performed in September 2000 under RTN 3-18789. Approximately 1,640 tons of soil contaminated with arsenic, chromium, and mercury were removed from the central northeastern area. The majority of the soils were excavated from wetland areas (Vertex, 2000).

A Phase I report was submitted to MADEP in September 2000; following completion of the RAM, a RAM Completion Report was submitted to MADEP in December 2000. The report concluded that additional response actions were required and that a RAM Plan for the southern portion of the property would be completed to address PAH and metals

contamination in the soils (Vertex, 2000). There were no contaminants found in the groundwater.

A second RAM was begun in April 2001 to reduce risks associated with PAHs and metals in soils in the southern portion of the site and allow for the development of the site for residential apartment use. RAM activities were conducted concurrently with the construction activities associated with site redevelopment. Two USTs, two buried hydraulic lifts, buried leather scraps, an underground brick vault and structural debris were uncovered during subsurface construction activities. Petroleum-impacted groundwater was collected and transported off-site for disposal. Samples collected following completion of the remediation activities showed that concentrations of petroleum hydrocarbons had been reduced to acceptable MCP levels. A RAM Completion Report and RAO submittal are expected in 2003 (Vertex, 2002a).

According to the MADEP database, a Phase II investigation is underway. A request for a one-year extension to submit the Phase II Comprehensive Site Assessment was sent to MADEP on August 15, 2002 (Vertex, 2002). The request noted that if an RAO could not be achieved, the Phase II report will be completed and submitted to MADEP before August 20, 2003.

#### 5.4.3.3 Atlantic Gelatin (Kraft Foods), Hill Street, Woburn, MA (Map # 26)

The Atlantic Gelatin plant is owned by Kraft Foods, Inc. and comprises 49 acres of a 100-acre facility. The site is located near Route 93 and Hill Street in the southeastern part of Woburn. The facility has operated as a gelatin processing plant since 1919. The facility abuts the western bank of the Aberjona River. Sweetwater Brook crosses just south of the property and discharges into the Aberjona River. Runoff from the property flows either directly into Sweetwater Brook, or is collected in catch basins and is discharged into the Aberjona River and surrounding wetlands. There are seven production wells on the property for process water supply; three are currently inactive. No water quality data for these wells were available. The groundwater in the area is not used as a drinking water supply.

The potential source areas at Atlantic Gelatin include a landfill, several areas with above ground storage tanks containing process chemicals (e.g., sulfuric acid, hydrochloric acid, ammonium hydroxide, sodium hypochlorite), drum storage areas, above ground petroleum storage tanks and a power plant. The landfill is located on the western edge of the property and was formerly used for the disposal of sludge from the gelatin manufacturing process. The

Russel Station Power Plant was built in the 1930's at the site of a former coal-fired facility on the property. This oil-fired plant provides heat and power to the facility. There is also a wastewater treatment plant on site, for which little information is available regarding historical discharge practices. All floor drains in the processing areas and power plant are connected to the wastewater treatment plant. Treated wastewater is discharged via the Woburn municipal sewer system to the MWRA system. Dewatered sludge is currently transported off site to a compost facility. Until the early 1980s, the sludge was sent to the Woburn sanitary landfill. Before the Woburn sanitary landfill was developed, the sludge was disposed of at the landfill on the property.

Several spills at the site have been reported to the MADEP. These spills were primarily fuel oil releases, which have reached adjacent Sweetwater Brook.

In 1980, EPA collected samples from the Atlantic Gelatin property, including the landfill area, as part of the investigation into potential sources of the chlorinated VOCs found in groundwater at Wells G&H. Two surface water samples from Sweetwater Brook indicated the presence of 1,1,1-TCA and TCE. Chlorinated VOCs were also found in site groundwater samples. EPA concluded that these compounds were from an off-site source as they were both detected in an upstream sample as well (MADEP, 1999).

In August 1992, a release from a 30,000 gallon fuel oil UST was confirmed (RTN 3-1737). The UST was removed, contaminated soils excavated and disposed of off site, and oily groundwater was pumped from the excavation to a fractionation tank, before discharge under an NPDES permit to either Sweetwater Brook or the Aberjona River. In accordance with the 1999 Phase IV Remedy Implementation Plan, groundwater sampling was performed in 2000, 2001 and 2002 to monitor dissolved contaminant concentrations and light non-aqueous phase liquid (LNAPL) thickness in the vicinity of the fuel oil release. As of October 2002, dissolved phase contaminant concentrations were below the applicable standards; product thickness monitoring was continuing (CH2MHill, 2002a).

On November 17, 1997, as part of an EPA contractor site inspection, soil and sediment samples were collected from the Atlantic Gelatin property (Weston, 1998). All samples were analyzed for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide. The soil samples collected from the landfill area contained primarily SVOCs and metals at mg/kg levels, and some pesticides. Facility personnel indicated that the sludge disposed on site did not contain

hazardous substances; it is not known if power plant wastes were disposed of at the landfill. If so, this could explain the presence of PAHs and metals (Weston,1998). Sediment samples from the Aberjona River contained many of the same SVOCs, metals and pesticides as found in the landfill area soil samples. However, the site inspection report concluded “neither a release to groundwater from on-site sources nor impacts to nearby drinking water sources are known or suspected” (Weston, 1998).

In February of 1998, a release of 50 percent concentrated sodium hydroxide from an AST to wetlands occurred at the property (RTN 3-15970). A maximum of 862.32 pounds was released via a storm water outfall.

MADEP assigned RTN 3-19962 to a reported release of an estimated 900 gallons of sulfuric acid on September 21, 2000. An Immediate Response Action in 2000 was followed by a Release Abatement Measure in 2002 for which a Release Abatement Measure Completion Report was prepared and received by MADEP in November 2002 (CH2MHill, 2002). RTN 3-19962 was combined under the site-wide RTN 3-1737 in September 2001.

According to the MADEP database, there have been seven RTNs issued for releases at the facility. In addition to the 1992 fuel oil release (RTN 3-1737) for which a Class C RAO was filed in 1999, four RTNs (3-10603, 3-11337, 3-13270, 3-15970) issued between 1994 and 1998 have had Class A1 RAOs filed. In July 1999, Atlantic Gelatin filed a Downgradient Property Status submittal regarding the presence of chlorinated VOC groundwater contamination under RTN 3-1099, which covers the overall property, including the landfill. The site is also listed in the CERCLIS database as a state-lead cleanup.

#### 5.4.3.4 American Shoe Machinery, (now Custom Machine, Inc.) 30 Nashua Street, Woburn, MA (Map #40)

The site is bordered by residential areas to the north and west, by a commercial business to the south, and by property owned by the Boston and Maine Railroad, crossed by railroad tracks, and a stream to the east. The site is approximately 700 feet due south of Whittemore Pond. An unnamed tributary on the east side of the site runs between Whittemore Pond and the Aberjona River, which is approximately 0.5 miles due south (Knoll, 1993). While this “unnamed tributary” is likely Whittemore Pond Brook, current maps of the area do not clearly show the tributary discharging to the Aberjona River. It is believed that the tributary discharges

to the Aberjona River near Davidson Park through culverts that follow the railroad tracks. The following table summarizes owners and businesses that operated on the property.

<b>DATE</b>	<b>OWNER – BUSINESS</b>
Approx. 1926 – 1955	Massachusetts Gear and Tool – machine shop, tool and die operation
Late 1950's until early 1970's	Stein Realty Trust - Warehouse for storage and distribution of tapes and records
1974 – 1986	Stein Realty Trust/Samuel Plimpton - American Shoe Machinery
1986 – present	Mr. Cosmo Pasciuto - Custom Machine, Inc, Dynetics, G&M

The property was leased by American Shoe Machinery in 1974 and used for production, maintenance and refurbishment of shoe manufacturing machinery (Knoll, 1993). American Shoe Machinery operated at the site until 1986 when the property was sold. A 4,000 gallon fuel oil UST was removed prior to the sale of the property in 1986. The seller also notified the MADEP of the presence of VOCs in site soils, and heavy metals in drywells. Three businesses, including Custom Machine, Inc., have operated at the site since 1986.

A site inspection was completed in March 1993. Samples from soil borings did not contain any compounds of regulatory concern as shown in the table below. An earlier environmental site assessment conducted in 1984 noted that sludge samples collected from the dry wells and soil samples collected from test pits contained heavy metals in the mg/kg range (chromium – 186 mg/kg, lead – 786 mg/kg). Groundwater from one of the monitoring wells installed during the 1993 site investigation slightly exceeded MCLs, as shown in the table below (Knoll, 1993).

<b>Contaminant</b>	<b>MCL (µg/l)</b>	<b>Groundwater (µg/l)</b>	<b>Soils (mg/kg)</b>
TCE	5	8.2	NA
Arsenic	10	331	< 0.1
Chromium	100	410	< 0.05
Lead	15	140	0.21

NA = not analyzed.

According to the MADEP database, RTN 3-0171 was classified as a Tier II site and a Phase II investigation was underway in 1996. Groundwater data from June 1996, apparently appended to the Tier II Classification Form, show the following maximum concentrations: arsenic (80 µg/l); chromium (80 µg/l); and lead (100 µg/l). There is no more recent regulatory status information in the MADEP files, based on a second file review completed on April 17, 2003.

5.4.3.5 Crane's Court Industrial Park LLC, 22 Crane's Court, Woburn, MA  
(Map #52)

The site consists of two parcels, 22 Crane's Court (Lot 8) and Crane's Court R (Lot 16), totaling approximately five acres. Crane's Court R is an undeveloped parcel of approximately 2.1 acres, and is the northern of the two lots. The northwestern and east sides of Lot 16 are wooded; the balance of the parcel is either vacant or used for storage of cars and construction equipment. 22 Crane's Court, Lot 8, lies south of Lot 16 and is approximately 2.7 acres with an approximately 28,000 square foot building. Portions of the building are currently used by a sign fabricating company, a pipeline supply company, a landscaping/light construction company, vehicle and equipment storage, and by musicians as rehearsal space.

The site is bounded on the west by a culverted portion of Russell Brook and on the east by an unnamed brook and wetlands. Crane's Court bounds the site to the south and a commercial/industrial property bounds the site to the north. The site was vacant land in 1875 and was developed as a tannery between 1884 and 1888. Historical ownership information is summarized in the table below (GeolInsight, 2002).

DATE	OWNER – BUSINESS
1888 - 1938	Beggs and Cobb – currier, patent leather manufacturing
1947	Bashian Manufacturing Co. – porcelain enamel works
1969	Maintain Store Engineering Service and Maintenance Products, Inc. – sheet metal and woodworking
1979 - 2001	Carl R. Centola – owner of 22 Crane's Court parcel
1990 - 2001	Delores A. Centola – owner of Crane's Court R parcel

The site is located within a Zone II wellhead protection area for Woburn's municipal water supply wells which are located approximately 0.5 miles southwest of the site, adjacent to Horn Pond.

A UST containing naphtha was located in the southeast corner of the site from 1910 until 1926. A fuel oil UST remains in a concrete vault beneath the building. The Phase I report suggested that subsurface piping observed during the site inspection in 2002 may indicate another UST is present beneath the building. Two above-ground storage tanks containing petroleum products were also observed during the Phase I inspection (GeolInsight, 2002).

In April 2001, monitoring wells were installed and groundwater samples collected. Groundwater from a few wells contained VOCs and chromium at concentrations less than MCLs; arsenic was found in one well at a concentration (20 µg/l), slightly exceeding the MCL. Soil samples were collected from soil borings completed during monitoring well installation and from test pits excavated in the northern parcel. Based on these analytical results, shallow soil samples were collected in the northern parcel in August and September 2001, and analyzed for arsenic and chromium. A potential imminent hazard was identified based on an arsenic concentration exceeding 40 mg/kg for a sample collected within 12-inches of the ground surface and within 500 feet of a residence. The MADEP was notified, RTN # 3-21078 was assigned, and MADEP approved commencement of an Immediate Response Action. An Imminent Hazard Evaluation, completed in accordance with the MCP in March 2003, did not identify any imminent hazards to health, safety, or the environment (CEA, 2003).

During excavation of test pits in the northern portion of the site the following subsurface materials were observed: a layer of fill containing sand, gravel, brick and other debris; underlain by organic matter and peat; and then underlain by medium to coarse sand. Most of the test pits contained a 6 – 12 inch layer of red to white, friable granular material (Geolnsight, 2002). No further information, or analytical data, was provided for this material in the Phase I investigation report. Maximum reported contaminant concentrations from the Phase I investigation are summarized below (Geolnsight, 2002).

<b>Contaminant</b>	<b>MCL (µg/l)</b>	<b>Groundwater (µg/l)</b>	<b>Soil Borings (mg/kg)</b>	<b>Test Pit Soils (mg/kg)</b>
Arsenic	10	20	16	110
Chromium	100	30	73	46,000
Lead	15	ND	190	NA

The RTN was classified Tier IC and a Tier I permit issued, effective January 21, 2003. The permittee, Crane's Court Industrial Park, LLC, must complete further investigations to achieve an RAO by January 21, 2008. While this property and the former Thermo Electron property (see Section 5.4.2.4) are both contiguous to Russell Brook, it is not known if the brook was impacted by the activities at either property.

## **5.5            Non-Point Sources**

Non-point sources of contamination in the Southern Area may have some impact on the Aberjona River watershed. Potential non-point sources of contamination include: sewer overflows; historical use of arsenic- and lead-based pesticides; runoff from the roadways and highly developed areas; traffic accidents and spills; and fertilizer application.

During the period from approximately 1910 until the late 1940s, sewer overflows were potential sources of non-point pollution in the City of Woburn. The sewer overflows were caused by inadequate capacity and clogging of the lines due to high concentrations of solids in tannery effluents. This resulted in many complaints and the involvement of the Massachusetts Department of Health. In the late 1940's, the City of Woburn and the MDC (now MWRA) began a program of regular sewer line maintenance which eliminated the periodic overflows (Tarr, 1987). Within the Southern Area, the existing MDC main sewer line is constructed of reinforced concrete pipe and was laid approximately 10 feet below the water table, thus presenting problems with groundwater infiltration into the sewer lines, rather than sewer waste exfiltration into the aquifer. With proper maintenance, the sewer lines are no longer a potential source of non-point pollution.

Arsenic-based pesticides were manufactured by the former Merrimac Chemical Company, whose property is designated as the Industri-Plex Superfund Site in the Preliminary MSGRP Northern Area. Arsenic-based pesticides were used in the watershed for control of gypsy moths and for agricultural applications, including orchards. Due to the prevalence of arsenic and other heavy metals in the Aberjona River, particularly the sediments, TtNUS researched historical arsenic-based pesticide production and use in the area. A summary of this research is presented in the sections below. This information can be used in a qualitative assessment of potential impacts of these pesticides on soils and sediments of the Aberjona River watershed.

### **5.5.1            Inorganic Pesticide Manufacturing and Use**

This section presents information on the development, manufacturing and use of various arsenic - based pesticides. Also included is a discussion of the use of pesticides for gypsy moth control and agricultural purposes, as both an insecticide and a herbicide in the Aberjona River watershed.

## **Development and Use of Arsenic-Based Pesticides**

The use of arsenic-based pesticides within the United States began in the late nineteenth century. These insecticides were used on agricultural trees and plants, most commonly apple orchards. Arsenic-based pesticides were also used on forest and shade trees, such as elm and oak trees. The use of arsenic-based pesticides continued into the twentieth century but decreased by the late 1940's to the early 1950's due to the introduction of DDT. According to the Annual Agricultural Reports for the State of Massachusetts, experiments with DDT were conducted in 1944, and as a result, DDT was first applied in Massachusetts in 1945 for gypsy moth suppression. Prior to DDT, other chemical pesticide methods were attempted, such as applying acids, creosote, or petroleum on gypsy moth egg clusters (USDA, 1897). These methods were not effective, and therefore, arsenic-based insecticides were consistently used until DDT was introduced.

The first arsenic-based insecticide was copper arsenate, also referred to as "Paris Green". Paris Green was initially used in the United States in 1867 on the Colorado potato beetle. In time, the insecticide was applied in Massachusetts for gypsy moth control and was used until the 1900's (Peryea, 1998). Another arsenic-based insecticide applied was "London Purple," a form of calcium arsenite, which is a partially soluble compound in water (Forbush and Fernald, 1896). The application of London Purple began in 1891 (Forbush and Fernald, 1896). The disadvantages of London Purple were that it burned the leaves on trees, and had an uneven effect on gypsy moth control. According to the 1895 Annual Agricultural Report for the State of Massachusetts, the recommended composition of London Purple for gypsy moth control was 1 pound (lb) of poison mixed with 100 to 150 gallons of water.

These two insecticides were later replaced by lead arsenate. Lead arsenate was preferred because it did not burn the leaves of the trees, it was not poisonous to plants because of its lower solubility, and it was more effective in destroying gypsy moths. Lead arsenate was also advantageous because the poison effect was slower, it could be used at any strength with no damage to the foliage, it was visible wherever used by a white coating on leaves, and it had good adhesive qualities, therefore it remained on leaves longer (Forbush and Fernald, 1896).

Lead arsenate was invented in 1892 by F.C. Moulton of the Massachusetts Gypsy Moth Commission who discovered its effectiveness in destroying the gypsy moth (Peryea, 1998). In time, it was found that lead arsenate was an effective measure in controlling many leaf-eating pests in addition to the gypsy moth, such as the elm beetle, the tent caterpillar, the web worm, the tussock moth, and the canker moth, according to Agricultural Reports for the State of Massachusetts and a 1926 report from the Kansas State Agricultural College Department of Horticulture. This insecticide was used to control insects throughout the United States from the 1890s through the 1960s (State of Wisconsin, DPA 2002). The EPA banned the use of lead arsenate as an insecticide on August 1, 1988, because the compound is carcinogenic (USEPA, 1988).

### **Manufacturers of Arsenic – Based Pesticides**

Historically, arsenical pesticides were manufactured within the Aberjona River watershed at Merrimac Chemical Company which was located in Woburn, Massachusetts, in the MSGRP Northern Area, at the location of the Industri-Plex Superfund Site.

Merrimac Chemical Company, originally constructed as Woburn Chemical Works, operated at the Woburn location from 1853 to 1931. In 1863, the company merged with a competitor and became Merrimac Chemical Company. In 1929, Monsanto Chemical Company purchased the chemical company, and finally in 1931 the operations of Merrimac Chemical Company were relocated to Everett, Massachusetts (Aurilio et al., 1995).

By 1899, Merrimac Chemical Company was one of the largest producers of lead arsenate in the United States, and reached peak production of lead arsenate by 1918. According to Aurilio and others, there was no evidence that Merrimac Chemical Company produced any other arsenical pesticides, such as “Paris Green” or calcium arsenate. Although actual production data were not available for Merrimac Chemical Company, the average annual production of lead arsenate by Merrimac Chemical Company was indirectly estimated from national annual production data. The estimated quantities ranged from 126 to 162 metric tons per year. The following table, adapted from Table II of the 1995 report by Aurilio et al., presents estimated average annual lead arsenate quantities produced in the United States, per manufacturer, from 1899 to 1927, which was the period of lead arsenate production by Merrimac Chemical Company (Aurilio et al., 1995). Detailed information on the specific

manufacturers of lead arsenate within the United States was not included in the above-referenced Table II.

<b>Year</b>	<b>Total Lead Arsenate Production in the U.S. (metric tons)</b>	<b>Number of Lead Arsenate Manufacturers in the U.S.</b>	<b>Average Estimated Lead Arsenate Production Per Manufacturer (metric tons)</b>
1899	998	7	143
1900	1134	7	162
1901	1270	8	159
1902	1406	9	156
1903	1542	10	154
1904	1678	11	153
1905	1814	12	151
1906	1950	13	150
1907	2086	14	149
1908	2268	15	151
1909	2268	15	151
1910	2268	15	151
1911	2268	15	151
1912	2268	15	151
1913	2268	15	151
1914	2268	15	151
1915	2268	16	142
1916	2268	17	133
1917	2268	18	126
1918	2268	18	131
1919	2449	18	136
1920	2540	19	134
1921	2630	19	138
1922	2721	20	136
1923	2721	20	136
1924	9525	18	529
1925	6287	19	331
1926	7663	19	403
1927	7663	19	403

Source: Aurilio et al., 1995

## **Gypsy Moth Control**

The gypsy moth, *Porthetria dispar* (Linn), is a European species and has been a consistent nuisance for the United States. The gypsy moth was introduced to the United States in 1869 when Professor Leopold Trouvelot, who was using the moth to cross breed silk worms, accidentally released it from his laboratory in Medford, Massachusetts (Hitchcock, 1991). It was not until twenty years after the release that detrimental effects occurred in Medford, Massachusetts near the site of the release. The species population continued to spread and has currently reached as far as Pennsylvania (Hitchcock, 1991).

The Massachusetts Gypsy Moth Commission was established in 1890 by local citizens to control the gypsy moth infestation (Forbush and Fernald, 1896). The gypsy moth became a significant problem for the towns and cities within and adjacent to the Aberjona River watershed, including: Medford, Malden, Woburn, Winchester, Melrose, Everett, Burlington, Lexington, Arlington, Belmont, and Stoneham. Physical measures were initially used to control gypsy moth infestations, such as burlapping tree trunks and removing eggs from trees and destroying them. In some cases, the trees and brush of an area were cut down and then burned (USDA, 1897). From 1889 through 1890, Woburn and Winchester were only moderately infested by the gypsy moths. However, surrounding areas such as Arlington, Medford, and Stoneham were severely infested.

According to Forbush and Fernald, economic entomologists suggested that the most effective method to exterminate the gypsy moth was to spray with “arsenical poisons.” By 1890, spraying of Paris Green began in Medford, Malden, Arlington, Chelsea, and Everett (Forbush and Fernald, 1896). The greatest amount of spraying took place in the Glenwood and Wellington sections of Medford and the Edgeworth district of Malden. In 1890, Paris Green was sprayed from May to July within the Southern Area, which reduced the number of moths but did not effectively exterminate them. Paris Green could not kill larger larvae, and as a result, many caterpillars survived the spraying (Forbush and Fernald, 1896). By 1893, experiments on “arsenate of lead” proved that the compound would be a useful insecticide. Spraying of lead arsenate was conducted early in the season when the leaves were fully grown. This prevented injury to the foliage and was most effective after caterpillar hatching (Forbush and Fernald, 1896). In 1895, the Middlesex Fells Reservation (immediately east of

the Southern Area) was used as an experimental area for lead arsenate application, which proved to be a very effective insecticide (State Board of Agriculture, 1897).

Application of the lead arsenate pesticide was done by spraying, initially conducted by use of ground sprayers, and later aerial sprayers. The original composition of lead arsenate pesticide was a mixture of acetate of lead (in some cases nitrate of lead) dissolved in water and arsenate of soda, also dissolved in water. The recommended application rate for the gypsy moth was 5 – 10 lbs of arsenate of lead to 150 gallons of water, according to Annual Agricultural Reports of Massachusetts. According to the 1944 USDA “Annual Report for Gypsy and Brown-tail Moths”, the composition of the lead arsenate concentrate used for ground spraying was 5 lbs of lead arsenate to 100 gallons of water and 1 to ¼ lbs of fish oil, which was applied at a “rate of 30 lbs of poison to the acre”, approximately equal to “600 gallons of the mixture”. Also according to the 1944 USDA “Annual Report for Gypsy and Brown-tail Moths”, the composition of the lead arsenate concentrate used for aerial spraying was “582 lbs of lead arsenate, 72 gallons, 6 pints of water, 11.6 lbs of Santomerse D, 11 gallons, 5 pints of fish oil, and 2 gallons, 7 pints of motor oil #10”, which was applied at a “rate of 30 lbs per acre.” Records of the quantities and rates of the lead arsenate pesticide applied within the towns and cities of the Aberjona River watershed were not included in the USDA or the Massachusetts annual reports.

A review of annual reports for the Town of Winchester and Cities of Medford and Woburn indicated that a gypsy moth control department was established due to the severity of gypsy moth infestation and as required by the state law at the time. Based on town auditor reports from 1902 to 1970, “arsenate of lead” was consistently purchased beginning in 1906 and continuing through at least 1947, with some recorded purchases from Merrimac Chemical Company. There were no records available as to the quantities purchased or the amounts applied.

According to the annual reports for the City of Woburn, an account entitled, “Suppression of the Brown Tail and Gypsy Moth,” was established in the early 1900s. This account was included in the Report of the Commissioner of Public Property starting in 1905 and remained in existence until 1914. From 1915 until 1931, a “Moth Department” was included within the Department of Public Works, and from 1932 until 1970, this department was included within the Department of Protection of Persons and Property. A salary for a “Moth Superintendent” was a line item in the Auditor

Annual Reports up until and including 1971. The 1957 Auditor Report indicated that DDT was purchased; according to the 1958 Auditor Report, DDT and chlordane were purchased.

According to annual reports for the Town of Winchester, evidence of gypsy moth infestation was first indicated in the report of the Tree Warden in the 1902 annual report. By 1906, a “Gypsy and Brown Tail Moth Account” was established and remained in existence until 1956. According to the 1947 Tree Warden Report, use of the DDT began and was recommended for use in future years.

According to annual reports for the City of Medford, a “Gypsy and Brown Tail Moth Account” was established in 1905. This account was included in the Highway Department and remained in existence until 1920. By 1920, the “Gypsy and Brown Tail Moth Account” was included within the Department of Protection of Persons and Property and remained in existence until 1938. According to the 1944 annual report, a “Gypsy and Brown Tail Moth Account” did not exist, however the Forestry Department report included a line item for trees and moths. The exact year in which the “Gypsy and Brown Tail Moth Account” ended is not known, as the annual reports for the years 1939 through 1943 were missing from the Medford Historical Society archives. The Forestry Department report section of the 1947 Medford Annual Report stated that both DDT and arsenate of lead were sprayed on the trees for moth control. The Forestry Department report for the 1948 annual report stated that DDT was purchased and sprayed. The report did not mention arsenate of lead.

### **Agricultural and Other Uses**

In addition to their use for gypsy moth control, arsenical compounds have also been used to control other pests. Pesticide use within the United States was not recorded at the federal level until the 1960's. According to the USEPA 1990 reference, *Suspended, Canceled, and Restricted Pesticides*, inorganic arsenical compounds used as pesticides include arsenic trioxide, calcium arsenate, and lead arsenate (USEPA, 1990). The extent of use of these three pesticides has declined over time. The present uses of arsenic trioxide as an insecticide are: indoor and outdoor domestic dwellings; mole, gopher, and pocket gopher repellent for domestic outdoor dwellings; terrestrial nonfood crops; golf courses; and ornamental plants, lawns, and noncrop areas. The present uses of calcium arsenate as an insecticide include controlling cotton and soil insects. Calcium arsenate is also used as a herbicide for weed

control of lawns, as well as a pesticide for fruits and vegetables (Department of Health and Human Services, 2001).

During the 1970's, the Boston and Maine railroad used monosodium methane arsenate (MSMA) as a herbicide along the railroad tracks which run north - south through the Southern Area (Geotrans, 1987). Due to chemical and biochemical transformations of the MSMA compound, the conversion of MSMA into arsenate is controlled by soil/sediment desorption processes (USEPA, 1995). The quantities used and specific locations in which MSMA was applied within the Southern Area are not known.

According to the June 2001 Release Abatement Measure (RAM) Completion Report (RAM) prepared by BATG Environmental, Inc. for the Massachusetts Bay Transportation Authority (MBTA), it was common practice of the MBTA to apply lead arsenate on railways as a herbicide. The RAM also stated that the extent of lead arsenate use had not been investigated (BATG Environmental Inc., 2001). However, it can be assumed the lead arsenate was also applied for vegetation control along other segments of the railways, including those within the Southern Area.

In addition, lead arsenate was used commercially in orchards, and its use peaked in the 1940's. The rate of lead arsenate application for orchards ranged from 1 to 4 kilograms per tree per season (Brabander, Stanely, and Hemond, 2001).

Lead arsenate is also presently used in a formulation of wood preservatives (Department of Health and Human Services, 2001).

### **General Environmental Impacts of Lead Arsenate Pesticides**

According to studies for various sites where lead arsenate was applied, the degree of mobilization of the insecticide has varied. In most cases, lead has remained bound to the soil and has not migrated deep within the soil column. This was also true of arsenic in some cases. According to a 2002 report from the State of Wisconsin, Department of Agriculture, lead and arsenic remain in the soil long after the application of lead arsenate, as arsenic and lead do have a tendency to bind tightly to the surface soil under certain geochemical conditions. According to various studies within apple orchards, where lead arsenate was frequently applied over time, lead and arsenic

accumulated within the topsoil (Peryea, 1998). For example, according to a study conducted by the Washington Department of Ecology, orchard soils were contaminated with 1,000 ppm of lead and 800 ppm of arsenic due to pesticide application (Murphy and Aucott, 1998).

However, lead arsenate in soil environments is not always stable and may convert to less soluble minerals over time, based on the thermodynamics and chemical and physical properties of the lead arsenate compound as well as the soil chemistry (Peryea, 1998). In some of the cases reviewed, arsenic became dissolved and entered groundwater. Although arsenic pesticides are not highly water soluble, they can contaminate shallow aquifers, particularly in acidic and sandy soils (Murphy and Aucott, 1998).

### **5.5.2 Organic Pesticides**

As previously mentioned, by the 1950's the use of lead arsenate pesticide was replaced by the organic pesticide, DDT, and the use of organic pesticides began to increase within the Aberjona River watershed. According to the 1987 Geotrans report, chlorinated hydrocarbon compounds were used as pesticides for mosquito control as well as for controlling foliage-killing insects within the City of Woburn. These compounds were used extensively during the post-World War II decades. The amounts of pesticide applied are not known, however, spraying typically began in the early spring and continued through the early summer. It can be concluded that the spraying was very heavy at times, as it was reported that the pesticide Malathion and the kerosene mixture used for mosquito control produced a fog and at times decreased visibility (Geotrans Inc., 1987).

The Woburn Tree Department used insecticides that consisted of Malathion, Methoxychlor, and Kelthane. Malathion is a mixture of Aldrin and other pesticides. Methoxychlor is an analog of DDT and a chlorinated hydrocarbon, which has a long residual activity. Kelthane is also an analog of DDT and contains approximately 10 percent DDT. In addition, the pesticide Abate was used to kill mosquito larvae within wetlands in Woburn.

## 6.0 SUMMARY

The overall purpose of the Preliminary MSGRP Supplemental Report - Southern Area is to research existing information on potential sources of area-wide contamination and evaluate their potential to impact the groundwater, surface water and/or sediment in the vicinity of the Aberjona River. The Aberjona River runs through both the Industri-Plex and Wells G&H Sites and thus is a conduit for contaminant migration between the sites (see Figure 1-1). Investigations completed at the Wells G&H and Industri-Plex Sites indicated that the Aberjona River at both sites contained similar COCs. EPA therefore concluded that two separate investigations and two potential remedial decisions for the river were no longer reasonable or efficient. As a result, in the spring of 2002, EPA announced that it would merge the Wells G&H Aberjona River Study (OU-3) with the Industri-Plex MSGRP. This decision expanded the MSGRP study area to include portions of the Aberjona River from north of the Industri-Plex Site, downstream through the Wells G&H Site, and continuing south to the Mystic Lakes.

A number of investigations and reports concerning area-wide contamination will be used to support a MSGRP RI now underway. The GSIP, which defines the nature and extent of groundwater and surface water contamination at the Industri-Plex Site, is nearing completion by the Settling Parties under the Industri-Plex ROD. With the submittal of this report, two preliminary MSGRP reports have been completed; each report covering a different portion of the Aberjona River watershed. The Preliminary MSGRP report, completed in 1997, covers the Industri-Plex area north of I-95, referred to as the Northern Area. This report, the Preliminary MSGRP Supplemental Report – Southern Area, includes portions of the Aberjona River watershed from I-95 south to the Mystic Lakes, including the Wells G&H Site. The two preliminary MSGRP reports are a compilation of information obtained from MADEP file reviews, RI reports for the Industri-Plex and Wells G&H Sites, and MIT research studies. These resources identify potential contamination sources that may contribute to surface water, sediment, or groundwater contamination at or adjacent to the expanded MSGRP study area (see Figure 1-2).

A variety of industries have operated in the Southern Area since the early 1800s. Tanneries, leather finishing companies, renderers, chemical manufacturers, landfills, and metal fabricators operated in the portions of Woburn and Winchester that are within the Southern

Area. These industries often disposed of liquid waste in on-site lagoons and disposed of sludges, hides and other solid materials in on-site landfills. Historically, their operations may have contaminated groundwater, surface water, and/or sediments within the Aberjona River watershed. Industrial activities are currently concentrated in the southwest part of Woburn and the northern part of Winchester. In addition, facilities with leaking underground storage tanks may have also contributed to contamination in the watershed.

Non-point sources of contamination in the Southern Area that may have also impacted the Aberjona River watershed include: use of pesticides; runoff from roadways and highly developed areas; sewer overflows; traffic accidents and spills; leachate from landfills and dumps; and fertilizer application. Due to the prevalence of arsenic and other heavy metals in the Aberjona River, particularly the sediments, TtNUS researched historical arsenic-based pesticide production and use in the area. In the past, arsenic-based pesticides were used in the Southern Area for control of gypsy moths, and for agricultural applications.

Confirmed sources of contamination in the Southern Area are regulated under both CERCLA and the MCP. The Wells G&H Source Area (OU-1) includes five Source Area properties that were identified as confirmed sources of contamination. Remedial actions are underway at four of the five Source Area properties. In the Wells G&H Central Area (OU-2), remedial investigations are continuing to evaluate the condition of the Aberjona River aquifer outside of the OU-1 Source Areas, with particular emphasis on the Southwest Properties. The Wells G&H Aberjona River Study (OU-3) Baseline Human Health and Ecological Risk Assessments will be completed in 2003 and incorporated into the MSGRP Comprehensive RI. All remedial and investigation activities associated with the Wells G&H Source Area (OU-1), Central Area (OU-2), and Aberjona River Study (OU-3) are regulated under CERCLA.

The Wells G&H Site is surrounded by various sites where contamination sources are known to exist due to reported releases of oil and/or hazardous materials. The investigation and remediation of these sites are currently regulated under the MCP. Environmental site assessments, or Phase I site investigations, performed under the MCP do not typically extend beyond the individual site property boundaries, leaving the extent of potential off-site contamination undefined. The intent of the MCP is to remediate on-site sources of contamination at disposal sites; however, the downgradient impacts are not necessarily

always defined during preliminary investigations. A Phase II investigation, if necessary under the MCP, is conducted to determine the nature and extent of contamination (e.g. potentially beyond the property boundary) and identify the source of contamination.

Information obtained from MADEP files was reviewed for an initial group of 52 sites. The 52 sites were evaluated using a four-level screening process to assess their potential to impact the Aberjona River. Each level of the screening process resulted in sites that were either screened out from further consideration or were carried forward to the next screening level for more detailed review and evaluation. This report presents summaries of eight confirmed CERCLA sites and 17 MCP sites located within the Southern Area that may be considered potential sources of area-wide contamination based on the Level 1 and Level 2 screening. These 25 MADEP and CERCLIS Sites are highlighted on Figure 5-1. As documented through research and reviews of MADEP site files, these sites have had one or more COCs present at elevated levels, in one or more environmental media. Ten of the sites are located on properties where a tannery, finisher or renderer formerly operated. The research also identified a few sites where COCs were discovered during site investigations but the contaminants could not be attributed to known site operations.

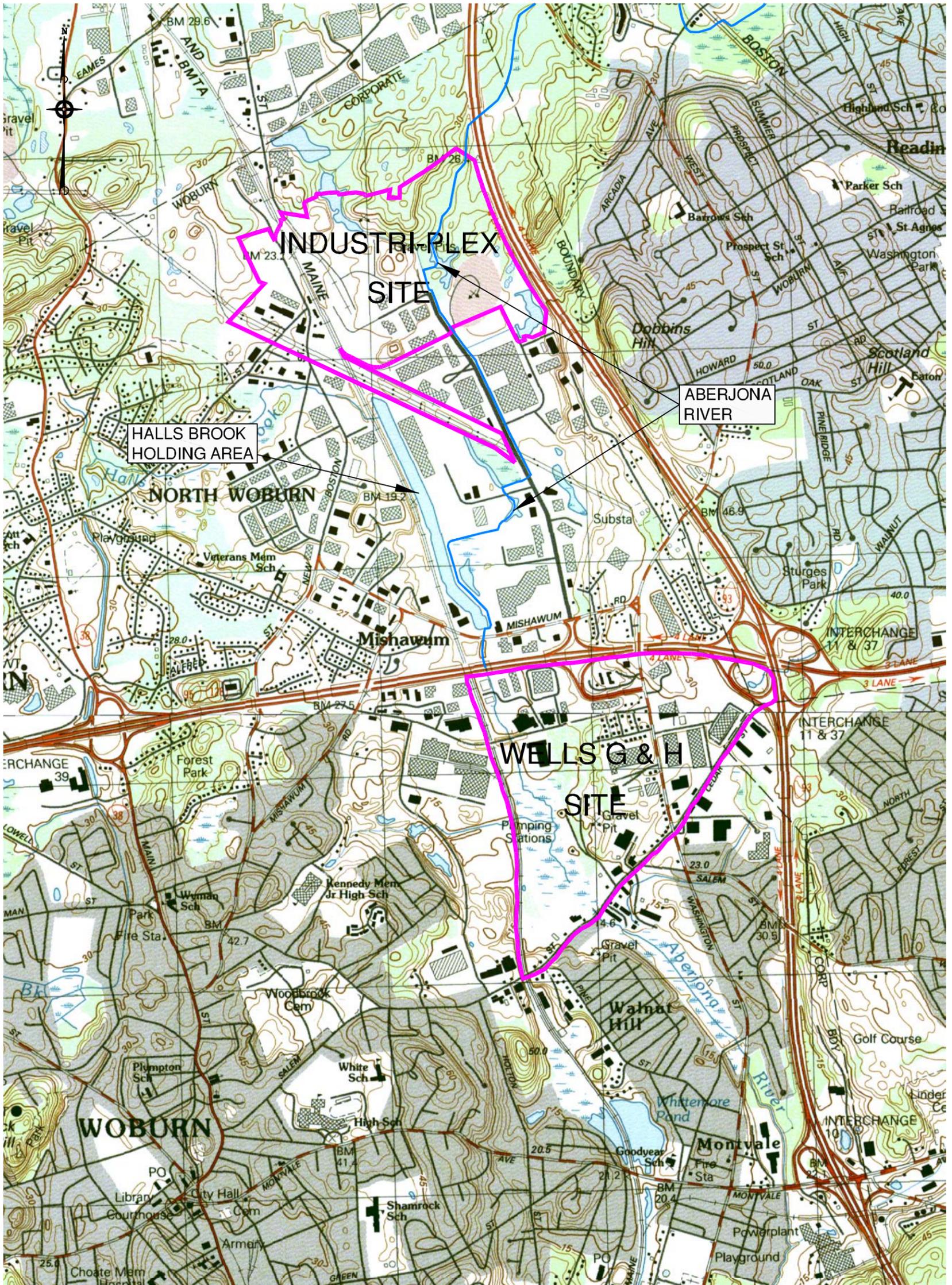
Screening Levels 3 and 4 were used to further segregate the 17 MCP sites into two groups. Group 1 (Level 3) includes 12 sites that are considered to pose “no significant risk” under the MCP and therefore have been screened out from further evaluation. While the documented releases associated with the Group 1 sites have been adequately addressed under the MCP, these sites may have represented potential sources of contaminants to the Aberjona River in the past. Group 2 (Level 4) includes five sites with active industrial facilities and/or releases that are being addressed under the MCP. The Group 2 sites are considered to be potential current and future sources of contamination to the Aberjona River since there has not been a determination that the sites represent “no significant risk.”

Information available in the MADEP files is limited, often not current, and the site-specific studies reviewed generally do not identify the extent of contaminant migration beyond the property boundaries. Therefore, the actual contribution of these potential sources to Aberjona River watershed contamination cannot be clearly defined. Very little surface water and sediment data were available from the MADEP site files. This is likely due to the number of

Phase I investigations (which do not typically extend beyond the site boundaries) found in the MADEP files for the selected Southern Area sites. However, other Industri-Plex and Wells G&H field investigation reports and MIT research publications have presented data indicating that elevated levels of arsenic, chromium, and lead have been detected in sediments throughout the MSGRP/Aberjona River study area.

EPA, in consultation with MADEP, will consider the information in this Preliminary MSGRP Supplemental Report – Southern Area, as well as the Preliminary MSGRP Report (Northern Area), August 1997, as the Agency proceeds with the RI/FS and ROD process for the Study Area.

## FIGURES



**LEGEND**

SUPERFUND SITE BOUNDARY

**GRAPHIC SCALE**



**NOTES:**

1. USGS IMAGES (GEO-TIFFs) FROM THE MASSACHUSETTS GIS.
2. SITE LOCATIONS OF INDUSTRI-PLEX AND WELLS G & H ARE TO BE CONSIDERED APPROXIMATE.
3. ALL LOCATIONS TO BE CONSIDERED APPROXIMATE.
4. PLAN NOT TO BE USED FOR DESIGN.

INDUSTRI-PLEX AND WELLS G & H SITE LOCATIONS  
 PRELIMINARY MSGRP SUPPLEMENTAL REPORT – SOUTHERN AREA  
 INDUSTRI-PLEX SITE – WOBURN, MASSACHUSETTS

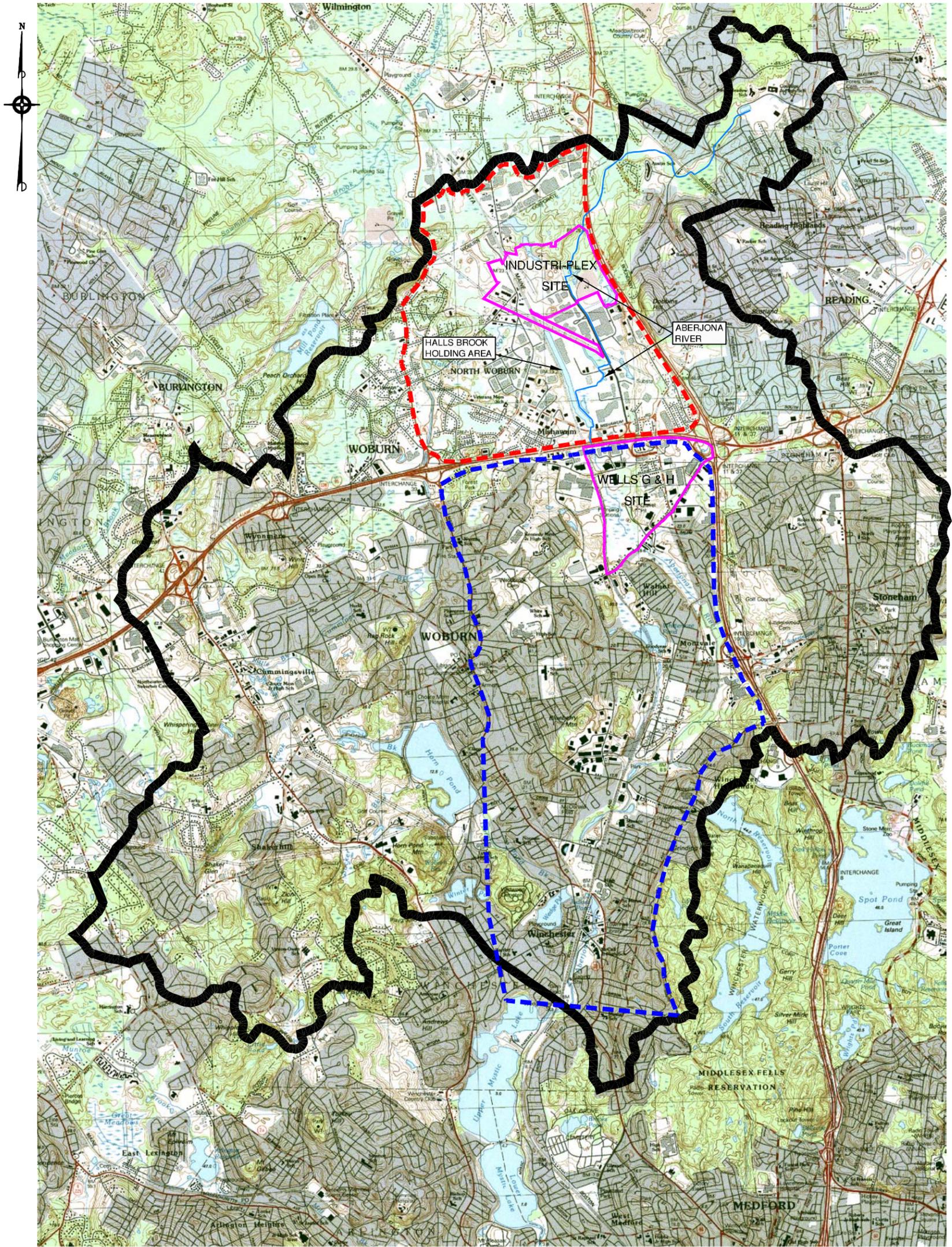
DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	P. CALL	DATE:	MAY 29, 2003
SCALE:	AS SHOWN	FILE NO.:	DWG\4123\1540\INDUSTRI-PLEX_AOC.DWG

FIGURE 1-1



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 (978)658-7899



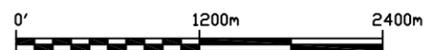
**LEGEND**

- ABERJONA RIVER WATERSHED
- SUPERFUND SITE BOUNDARY
- NORTHERN AREA
- SOUTHERN AREA

**NOTES:**

1. USGS IMAGES (GEO-TIFFs) FROM THE MASSACHUSETTS GIS.
2. SITE LOCATIONS OF INDUSTRI-PLEX AND WELLS G & H ARE TO BE CONSIDERED APPROXIMATE.
3. ALL LOCATIONS TO BE CONSIDERED APPROXIMATE.
4. PLAN NOT TO BE USED FOR DESIGN.

**GRAPHIC SCALE**



LOCATION OF MSGRP NORTHERN AND SOUTHERN AREAS  
 PRELIMINARY MSGRP SUPPLEMENTAL REPORT – SOUTHERN AREA  
 INDUSTRI-PLEX SITE – WOBURN, MASSACHUSETTS

FIGURE 1-2



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DATE: MAY 29, 2003

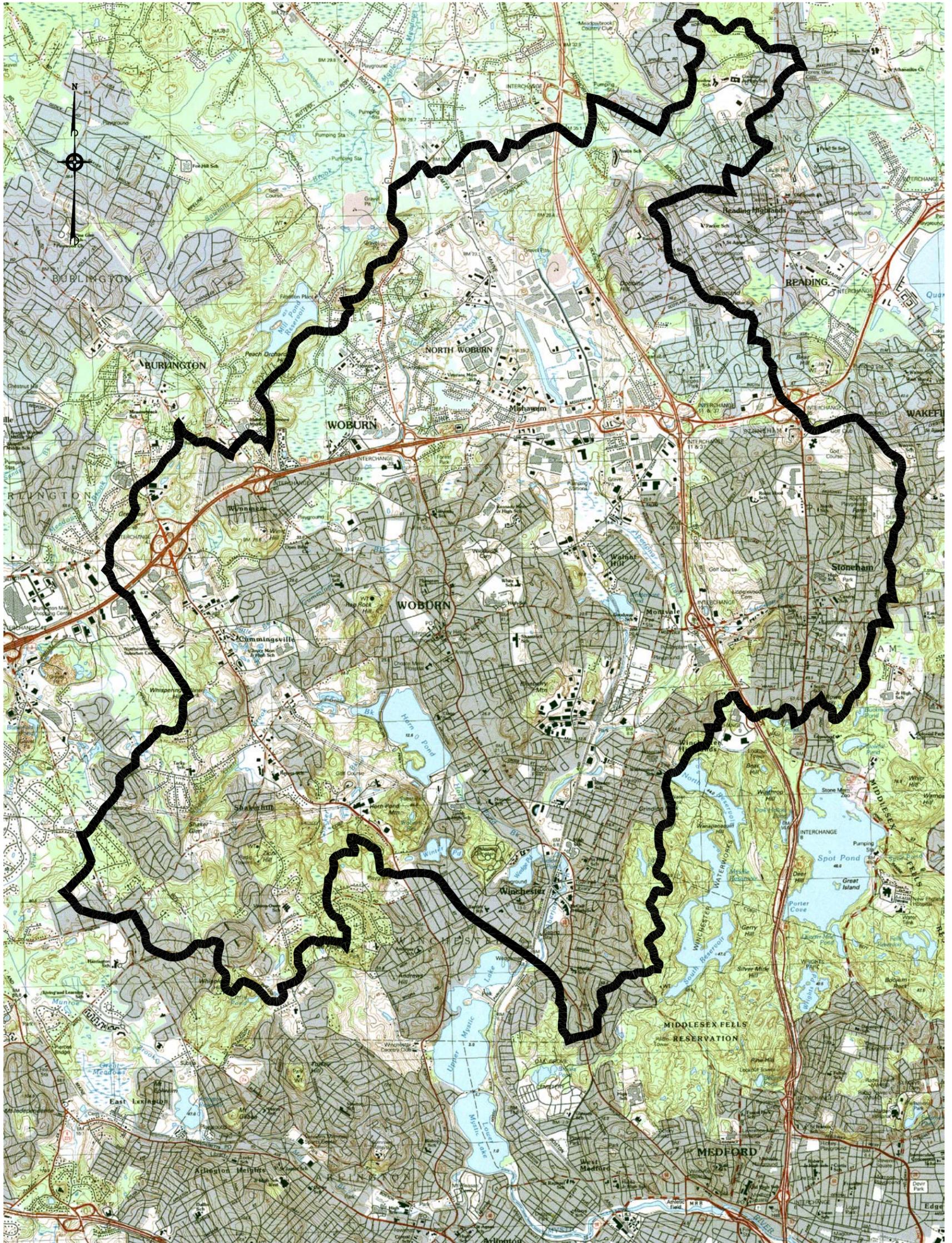
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Wilmington, MA 01887

(978)658-7899



GRAPHIC SCALE



**NOTES:**

1. ALL LOCATIONS TO BE CONSIDERED APPROXIMATE.
2. PLAN NOT TO BE USED FOR DESIGN.
3. USGS MAPPING (GEO-TIFFs) FROM MASSACHUSETTS GIS, NAD 83, IN METERS (OBTAINED 9/02).
4. LOCATION OF THE OUTLINE OF ABERJONA WATERSHED ADAPTED FROM FIGURE 1 (LOCATION OF ABERJONA WATERSHED) FROM REPORT ENTITLED: "SOURCES AND DISTRIBUTION OF ARSENIC IN THE ABERJONA WATERSHED, NOVEMBER, 1994", BY ANNA C. AURILIO ET AL.

**LEGEND**

ABERJONA WATERSHED PERIMETER (APPROX.)

**ABERJONA RIVER WATERSHED**

**FIGURE 2-1**

INDUSTRI-PLEX SUPERFUND SITE – SOUTHERN AREA MSGRP STUDY  
 WOBURN, MASSACHUSETTS



**TETRA TECH NUS, INC.**

DRAWN BY: R.G. DEWSNAP

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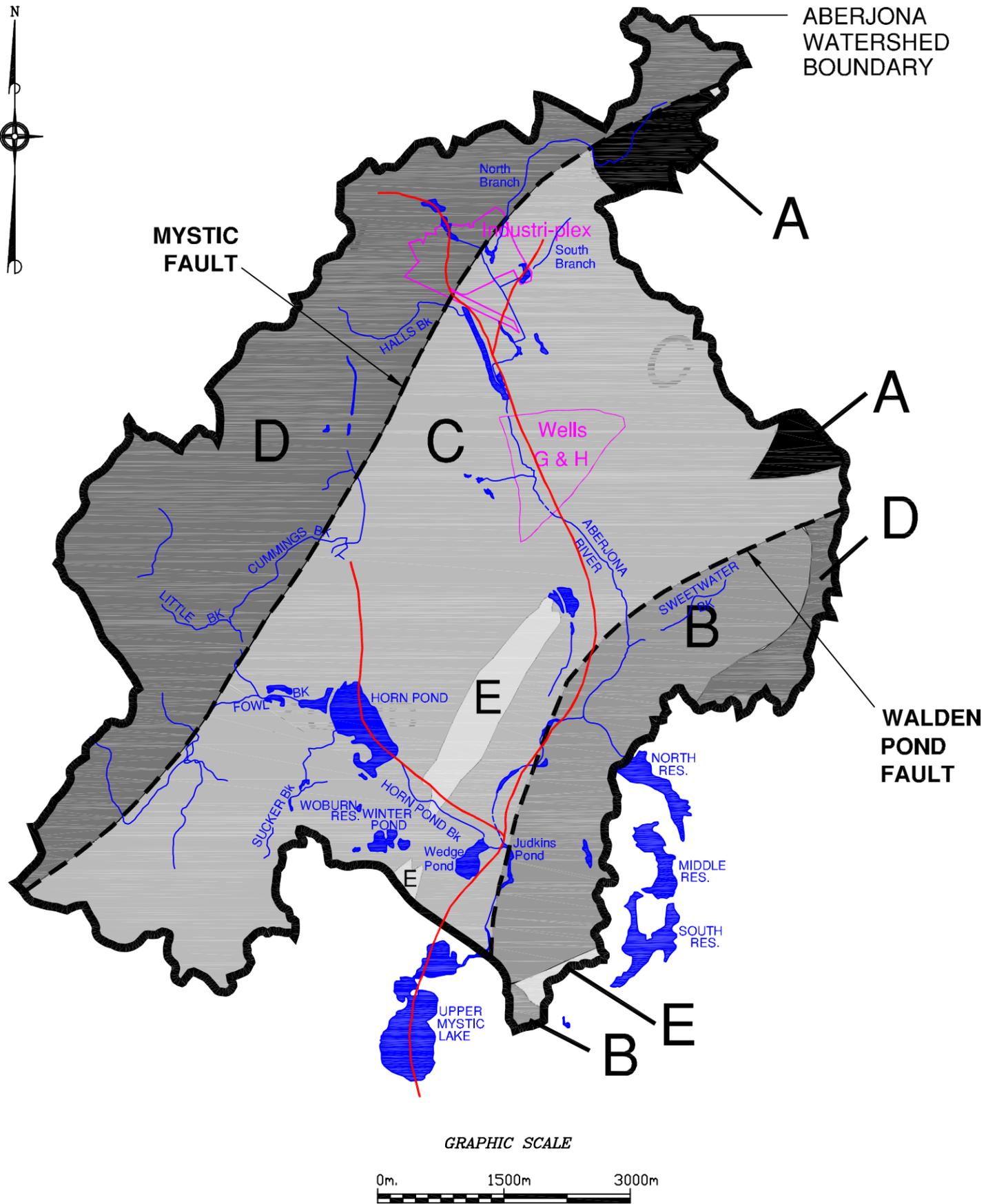
CHECKED BY: J. DANIELI

DATE: APRIL 30, 2003

SCALE: AS SHOWN

FILE NO.: D:\DWG\4123\0620\ABERJONA\_WS.DWG

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 (978)658-7899



**NOTES:**

1. BEDROCK GEOLOGY LOCATIONS DIGITIZED AND ADAPTED FROM USGS BEDROCK GEOLOGIC MAP OF MASSACHUSETTS BY ZEN ET AL (1983).
2. LOCATION OF OUTLINE OF THE ABERJONA WATERSHED ADAPTED FROM FIGURE 1 (LOCATION OF ABERJONA WATERSHED) FROM REPORT ENTITLED: "SOURCES AND DISTRIBUTION OF ARSENIC IN THE ABERJONA WATERSHED, NOVEMBER, 1994, BY ANNA O. AURILIO ET AL.
3. STREAMS, BROOKS, PONDS AND LAKES DIGITIZED FROM USGS MAPS (GEO-TIFF IMAGE FILES) OBTAINED FROM MASSACHUSETTS GIS.
4. STANDARD DESIGNATION OF BEDROCK GEOLOGY CHANGED FOR CLARITY (A=Dpgr, B=Zangr, C=Zdigb, D=Zv and E=Zw).
5. COORDINATES OF MAP: MASSACHUSETTS GRID COORDINATES SYSTEM, NAD 83 IN METERS.
6. ALL LOCATIONS TO BE CONSIDERED APPROXIMATE.
7. PLAN NOI TO BE USED FOR DESIGN.
8. BURIED BEDROCK VALLEY LOCATION FROM GEOLOGICAL SURVEY BULLETIN 1061-F, "GLACIAL GEOLOGY OF THE MYSTIC LAKES - FRESH POND AREA" BY NEWTON E. CHUTE, 1959.
9. FAULT IDENTIFICATION ACCORDING TO MIT THESIS BY DANIEL McBREARTY, "FRACTURE FLOW AS INFLUENCED BY GEOLOGIC FEATURES IN THE ABERJONA VALLEY, MASSACHUSETTS", JUNE 1993.

**LEGEND**

- FAULT LINE
  - BURIED BEDROCK VALLEY
  - - - CULVERTED WATER
- A PEABODY GRANITE (MIDDLE DEVONIAN) - ALKALIC GRANITE GRANITE CONTAINING FERRO-HORNBLLENDE. INTRUDES B
  - B GRAY GRANITE TO GRANODIORITE MORE MAFIC THAN GRANITE / DIORITE NORTH OF BOSTON INTRUDES E, D.
  - C DIORITE & GABBRO (PROTEROZOIC) - COMPLEX OF DIORITE AND GABBRO, SUBORDINATE METAVOLCANIC ROCKS AND INTRUSIVE GRANITE AND GRANODIORITE
  - D METAMORPHOSED MAFIC TO FELSIK FLOW, AND VOLCANICLASTIC AND HYPABYSSAL INTRUSIVE ROCKS (PROTEROZOIC) - INCLUDES SOME DIORITE AND GABBRO NORTH AND NORTHWEST OF BOSTON
  - E WESTBORO FORMATION (PROTEROZOIC) - QUARTZITE, SCHIST, CALC-SILICATE QUARTZITE, AND AMPHIBOLITE. CONSISTS OF QUARTZITE AND ARGILLITE IN SAUGUS AND LYNNFIELD AREAS

**GEOLOGIC BEDROCK MAP**

**FIGURE 2-2**

INDUSTRI-PLEX SUPERFUND SITE - SOUTHERN AREA MSGRP STUDY

WOBURN, MASSACHUSETTS

DRAWN BY: D.W. MACDOUGALL

REV.: 0

CHECKED BY: J. DANIELI

DATE: MARCH 12, 2003

SCALE: AS SHOWN

FILE NO.: \DWG\4123\0910\GEO\_BED.DWG

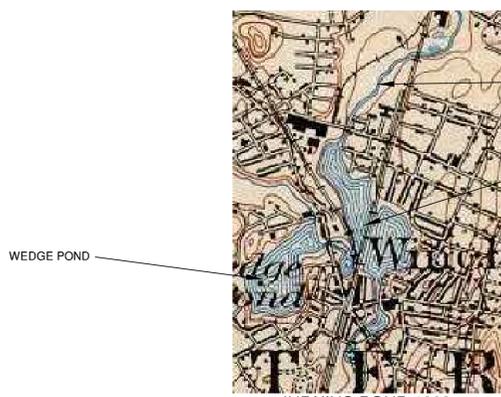
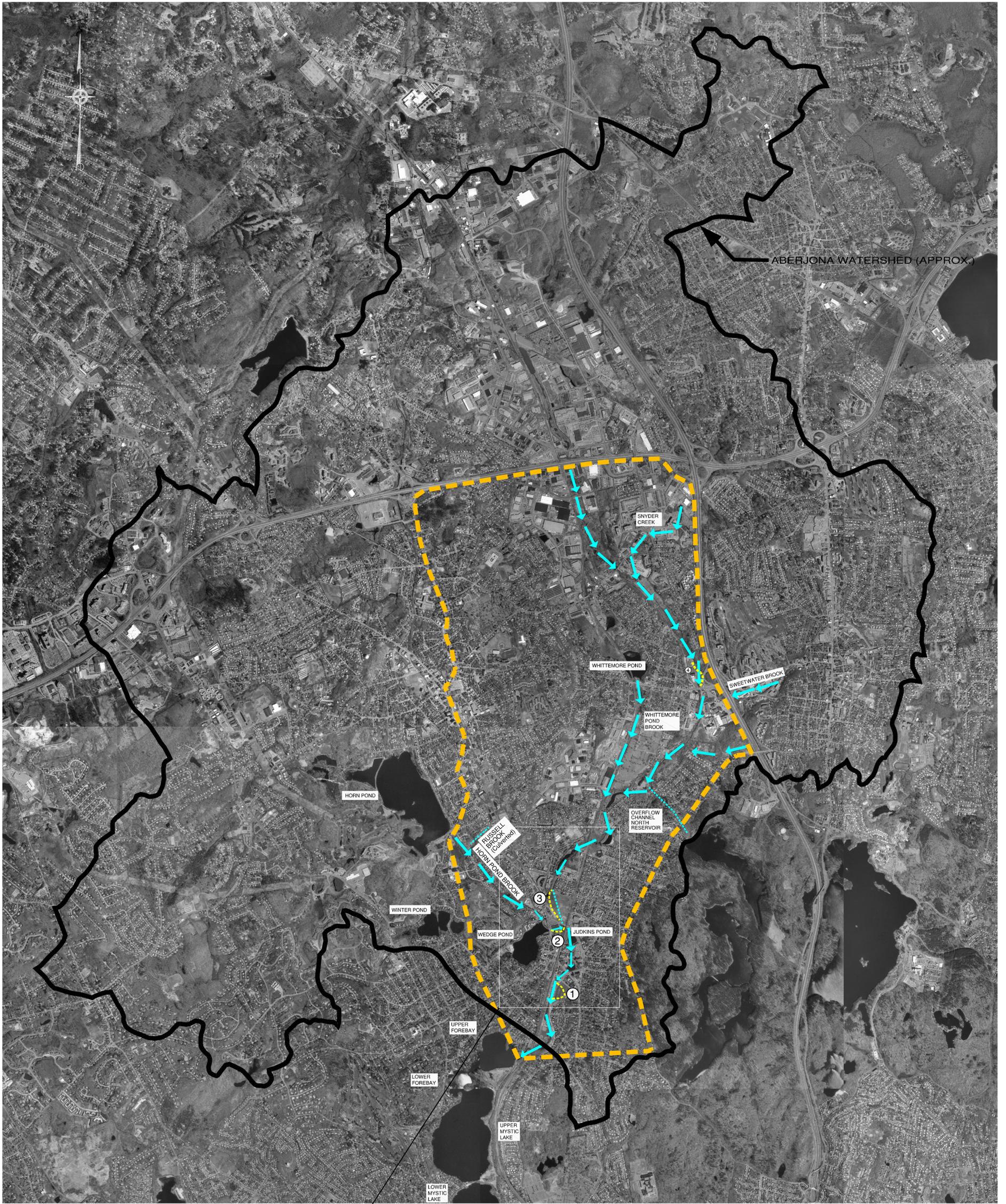


**TETRA TECH NUS, INC.**

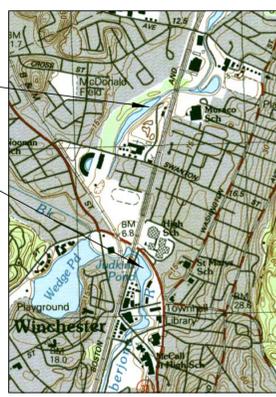
55 Jonspin Road

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JUDKINS POND 1903



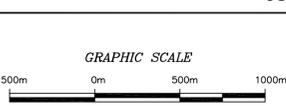
JUDKINS POND 1985

**LEGEND**

- PRESENT SURFACE WATER FLOW DIRECTION
- FORMER SURFACE WATER FLOW DIRECTION
- RIVER CHANGE AT MANCHESTER FIELD IN WINCHESTER, MA
- CHANGE WHERE HORN POND TRIBUTARY MEETS ABERJONA RIVER
- RIVER DIVERTED THROUGH UNDERGROUND CULVERT AT WINCHESTER HIGH SCHOOL
- RIVER DIVERTED BY PRESENT DAY HOWARD JOHNSON'S RESTAURANT LOCATED ON NORTH SIDE OF MONTVALE AVENUE
- SOUTHERN AREA BOUNDARY
- ABERJONA WATERSHED PERIMETER (APPROX.)

**NOTES:**

- ONE METER AERIAL PHOTOS FROM MASSACHUSETTS GIS, OBTAINED: 12/5/02.
- DATUM OF DRAWING IS MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, NAD 83 IN METERS.
- LOCATION OF THE OUTLINE OF THE ABERJONA WATERSHED ADAPTED FROM FIGURE 1 (LOCATION OF ABERJONA WATERSHED) FROM A REPORT ENTITLED: "SOURCES AND DISTRIBUTION OF ARSENIC IN THE ABERJONA WATERSHED, NOVEMBER, 1994, BY ANNA C. AURILO ET AL.
- SURFACE WATER FLOW DIRECTION ADAPTED FROM FIGURE 39 (ABERJONA RIVER STUDY AREA, WETLANDS STATUS & RIVER COURSES, 1995) FROM A REPORT ENTITLED: AERIAL PHOTOGRAPHIC ANALYSIS OF THE ABERJONA RIVER STUDY AREA MIDDLESEX COUNTY, MASSACHUSETTS, OCTOBER, 2002, BY U.S. E.P.A.
- ALL LOCATIONS TO BE CONSIDERED APPROXIMATE.
- PLAN NOT TO BE USED FOR DESIGN.
- INSET OF JUDKINS POND ADAPTED FROM BOSTON, MA. QUADRANGLE USGS 15 MINUTE SERIES, 1903 AND BOSTON, MA. QUADRANGLE USGS 7.5 X 15 MINUTE SERIES, 1985



DRAWN BY: D.W. MACDOUGALL  
 PREPARED BY: J. DANIEL  
 CHECKED BY: G. BULLARD

---

PROJECT MANAGER: G. BULLARD  
 PROGRAM MANAGER: G. GARDNER

**TITLE:** SURFACE WATER FEATURES & FLOW DIRECTION  
 SOUTHERN AREA MSGRIP STUDY  
 INDUSTRI-PLEX SUPERFUND SITE, WOBURN, MA

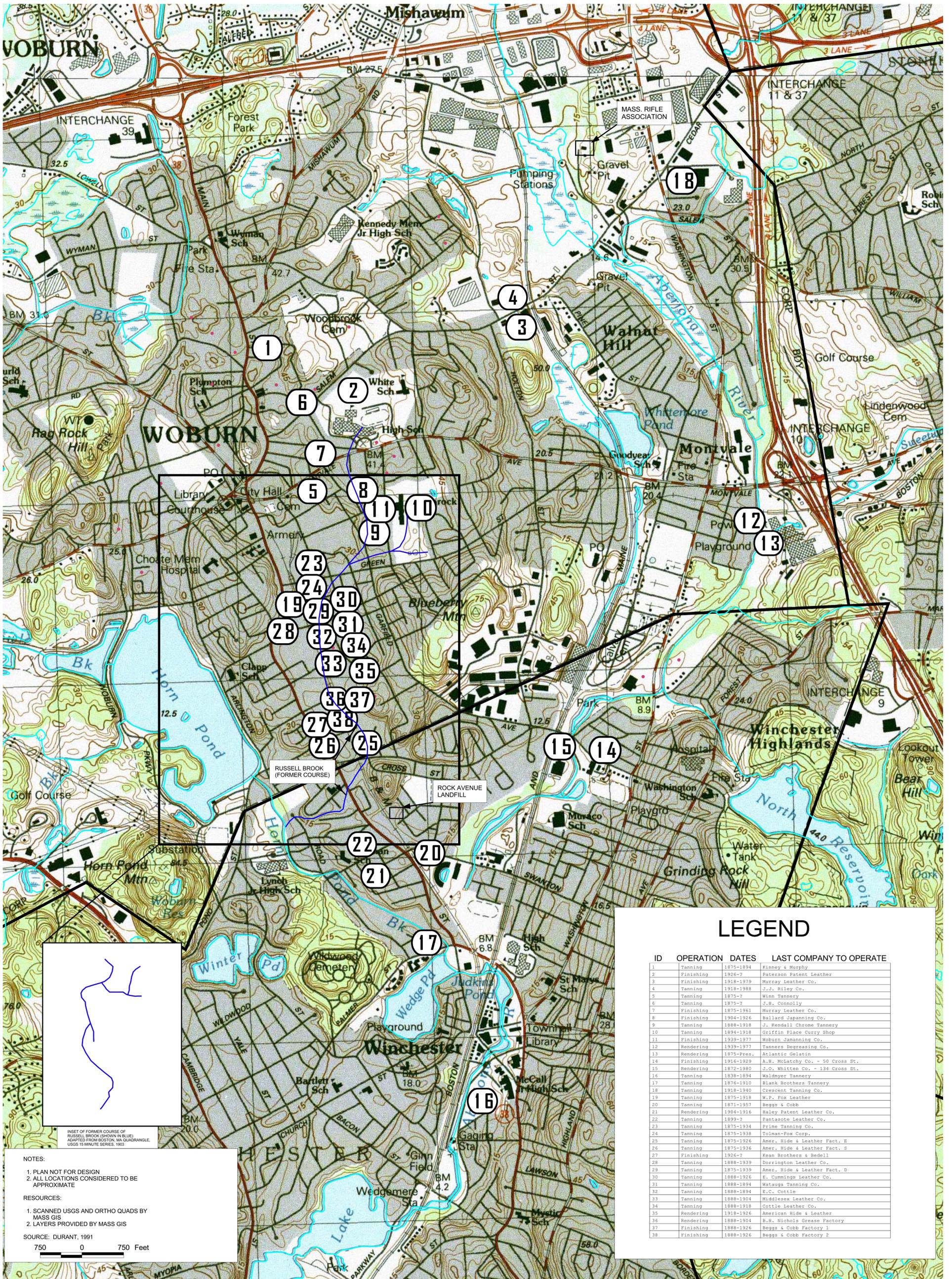
**SOURCE:** 1 METER ORTHOGRAPHIC PHOTOS FROM MASS. GIS

**SCALE:** AS SHOWN      **DATE:** JUNE 6, 2003      **PROJ. NO.:** 4123

**DRAWING NO.:** FIGURE 2-3      **ACFILE NAME:** DWG\4123\0623\SURFACE\_WATER\_FLOW\_DIRECTION.DWG      **REV.:** 0

**TETRA TECH NUS, INC.**

55 JONSPIN ROAD  
 WILMINGTON, MASSACHUSETTS 01887  
 (978)658-7899



### LEGEND

ID	OPERATION	DATES	LAST COMPANY TO OPERATE
1	Tanning	1875-1894	Kinney & Murphy
2	Finishing	1926-?	Paterson Patent Leather
3	Finishing	1918-1979	Murray Leather Co.
4	Tanning	1918-1988	J.J. Riley Co.
5	Tanning	1875-?	Winn Tannery
6	Tanning	1875-?	J.H. Connolly
7	Finishing	1875-1961	Murray Leather Co.
8	Finishing	1904-1926	Ballard Tanning Co.
9	Tanning	1888-1918	J. Kendall Chrome Tannery
10	Tanning	1894-1918	Griffin Place Curry Shop
11	Finishing	1939-1977	Woburn Jamanning Co.
12	Rendering	1939-1977	Tanners Degreasing Co.
13	Rendering	1875-Pres.	Atlantic Gelatin
14	Finishing	1916-1929	A.H. McLatchy Co. - 50 Cross St.
15	Rendering	1872-1980	J.O. Whitten Co. - 134 Cross St.
16	Tanning	1838-1894	Waldover Tannery
17	Tanning	1876-1910	Blank Brothers Tannery
18	Tanning	1918-1940	Crescent Tanning Co.
19	Tanning	1875-1918	W.F. Fox Leather
20	Tanning	1871-1957	Beggs & Cobb
21	Rendering	1904-1916	Haley Patent Leather Co.
22	Tanning	1899-?	Pantasoote Leather Co.
23	Tanning	1875-1934	Prime Tanning Co.
24	Tanning	1875-1938	Tolman-Fox Corp.
25	Tanning	1875-1926	Amer. Hide & Leather Fact. E
26	Tanning	1875-1936	Amer. Hide & Leather Fact. S
27	Finishing	1926-?	Keen Brothers & Bedell
28	Tanning	1888-1939	Dorrington Leather Co.
29	Tanning	1875-1939	Amer. Hide & Leather Fact. D
30	Tanning	1888-1926	E. Cummings Leather Co.
31	Tanning	1888-1894	Watauga Tanning Co.
32	Tanning	1888-1894	E.C. Cottle
33	Tanning	1888-1904	Middlesex Leather Co.
34	Tanning	1888-1918	Cottle Leather Co.
35	Rendering	1918-1926	American Hide & Leather
36	Rendering	1888-1904	B.H. Nichols Grease Factory
37	Finishing	1888-1926	Beggs & Cobb Factory 1
38	Finishing	1888-1926	Beggs & Cobb Factory 2

**NOTES:**

1. PLAN NOT FOR DESIGN
2. ALL LOCATIONS CONSIDERED TO BE APPROXIMATE

**RESOURCES:**

1. SCANNED USGS AND ORTHO QUADS BY MASS GIS
2. LAYERS PROVIDED BY MASS GIS

SOURCE: DURANT, 1991

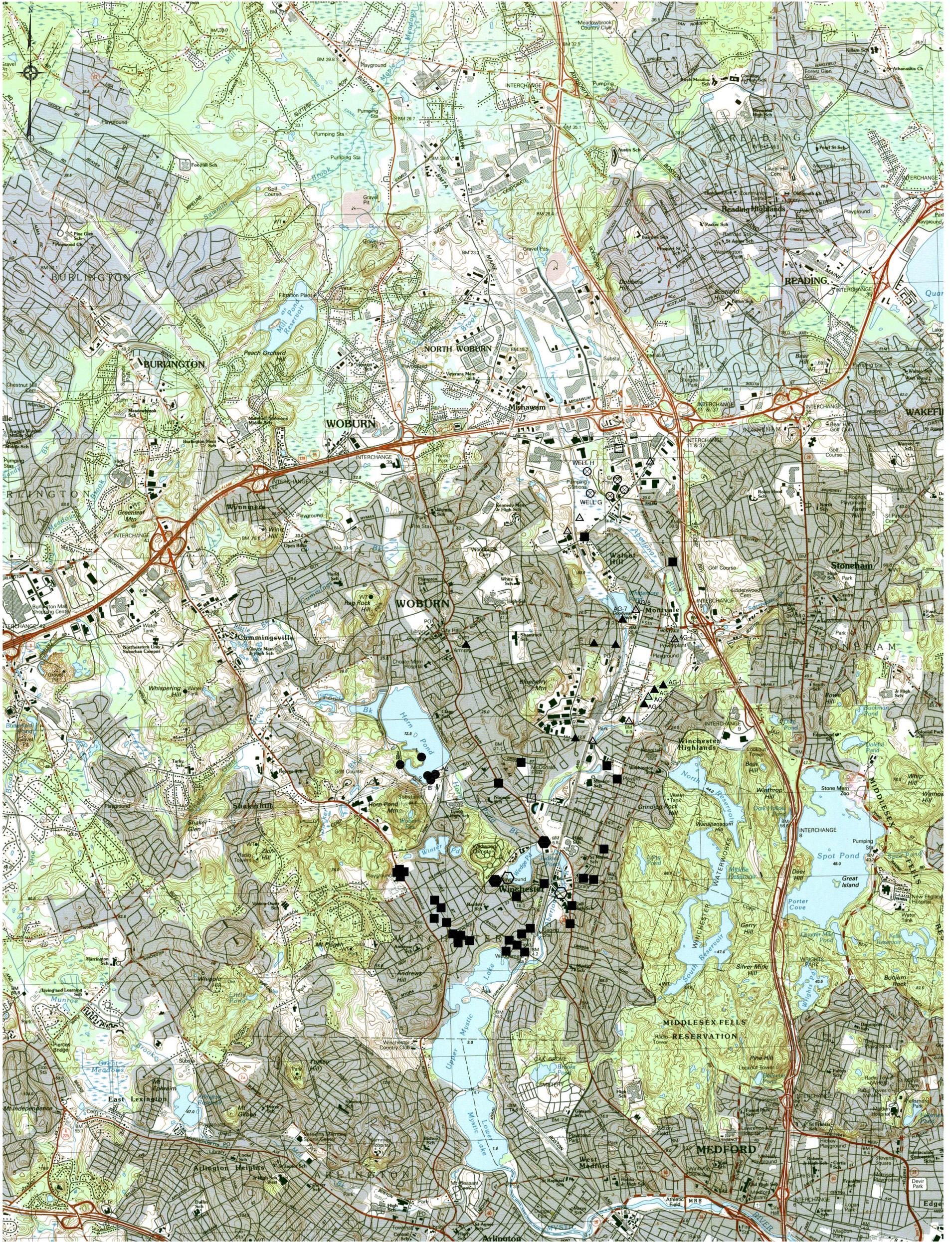
750 0 750 Feet

Location of Former Leather Tanneries, Finishing Companies, and Renderers in the Southern Area  
 Preliminary MSGRP Supplemental Report - Southern Area  
 Industri-Plex Site - Woburn, Massachusetts

DRAWN BY: D.W. MACDOUGALL      DATE: MAY 2, 2003  
 CHECKED BY: P. CALL      FILE: //4123/1540/TANNERY.APR

**FIGURE 3-1**

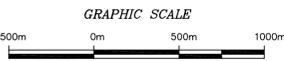
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 55 JONSPIN ROAD      WILMINGTON, MA 01887  
 (978)659-7899



LEGEND

PRIVATE / DOMESTIC	WATER SUPPLY	INDUSTRIAL	IRRIGATION	
●	●	▲	■	WELL PRESENTLY (DEC., 2002) IN USE
○	⊗	△	⊠	WELL NO LONGER IN USE (DEC., 2002)
◻	○	△	◻	UNKNOWN WELL STATUS (DEC., 2002)

NOTES:  
 1. ALL LOCATIONS TO BE CONSIDERED APPROXIMATE.  
 2. PLAN NOT TO BE USED FOR DESIGN.  
 3. USGS MAPPING IMAGES (GEO-TIFFs) FROM MASSACHUSETTS GIS, NOT ON A COORDINATE SYSTEM (OBTAINED 9/02).  
 4. WELL LOCATIONS FROM MASS. WELL COMPLETION REPORT, CITY OF WOBURN ENGINEERING DEPT., CONSULTING ENGINEER'S REPORTS AND TOWN OF WINCHESTER HEALTH DEPT WITH STREET ADDRESSES USED FOR SOME SPOT LOCATIONS AND ALL ARE TO BE CONSIDERED VERY APPROXIMATE.



DRAWN BY: R.G. DEWSNAP  
 PREPARED BY: J. DANIEL  
 CHECKED BY: G. BULLARD  
 PROJECT MANAGER: G. BULLARD  
 PROGRAM MANAGER: G. GARDNER

TITLE: GROUNDWATER USERS  
 INDUSTRI-PLEX SUPERFUND SITE - SOUTHERN AREA MSGRP STUDY  
 WOBURN, MASSACHUSETTS  
 SOURCE: MASSACHUSETTS GIS  
 SCALE: AS SHOWN DATE: FEBRUARY 03, 2003  
 DRAWING NO: PROJ NO: 4123  
 FIGURE 4-1 ACFILE NAME: REV: 2  
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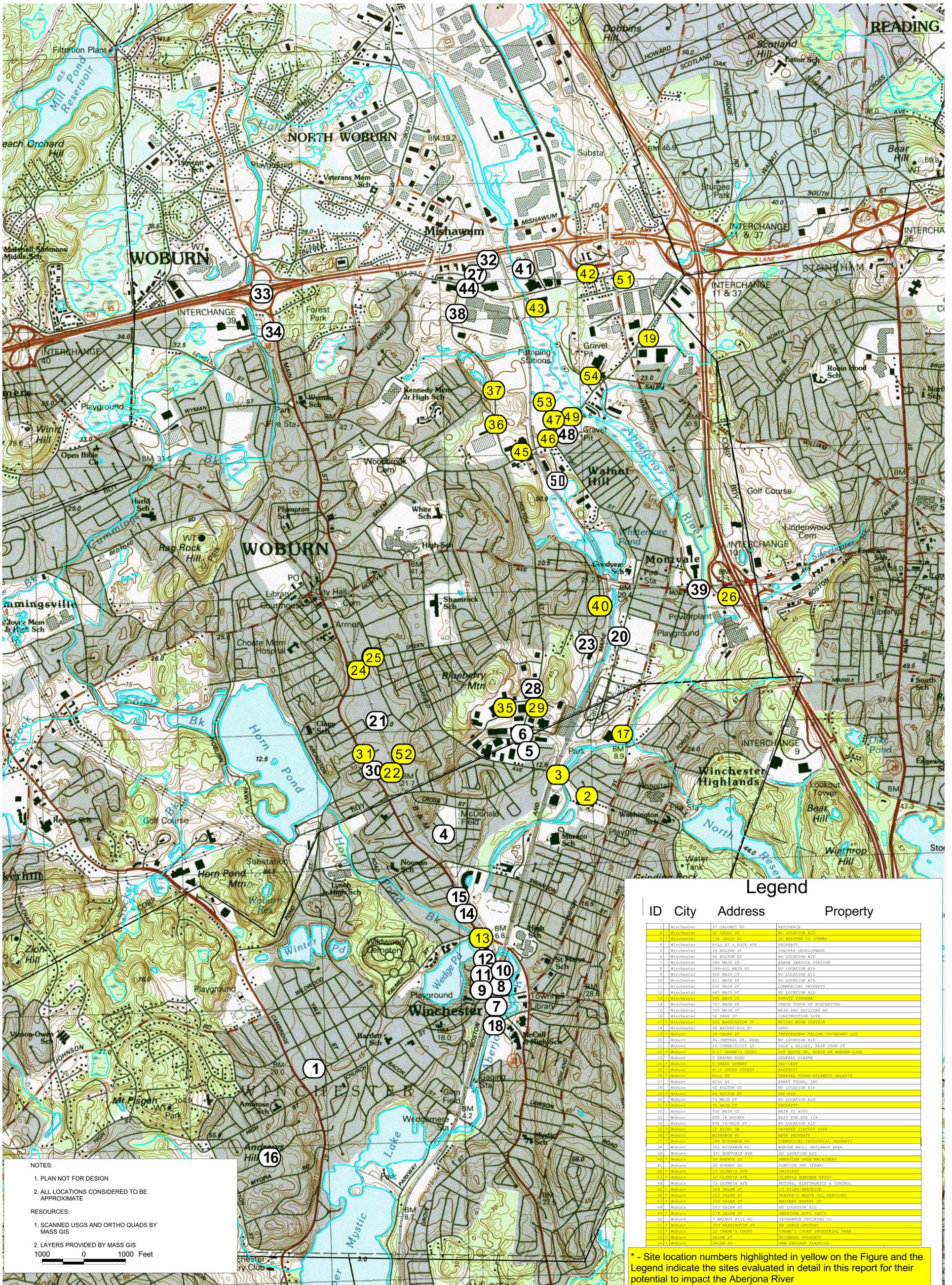
**Southern Area Groundwater Resources**  
 Preliminary MSGRP Supplemental Report - Southern Area  
 Industri-Plex Site - Woburn, Massachusetts

**FIGURE 4-2**

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DATE: JUNE 17, 2003  
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### Legend

ID	City	Address	Property
1	Winchester	37 CALUMBY RD	RESIDENCE
2	Winchester	50 CROSS ST	NO LOCATION AID
3	Winchester	134 CROSS ST	JO WHITTEN CO (FRM)
4	Winchester	811 ST & BOKR AVE	PROPERTY
5	Winchester	39 BOLTON ST	CONTRIV DEVELOPMENT
6	Winchester	45 HOLTON ST	NO LOCATION AID
7	Winchester	586 MAIN ST	EXXON SERVICE STATION
8	Winchester	589-693 MAIN ST	NO LOCATION AID
9	Winchester	600 MAIN ST	NO LOCATION AID
10	Winchester	611 MAIN ST	NO LOCATION AID
11	Winchester	632 MAIN ST	COMMERCIAL PROPERTY
12	Winchester	643 MAIN ST	NO LOCATION AID
13	Winchester	455 MAIN ST	PROPERTY DEVELOPMENT
14	Winchester	751 MAIN ST	FRESH TOUCH OF WINCHESTER
15	Winchester	765 MAIN ST	MAIN AND SKILLING RD
16	Winchester	50 SWAN ST	CONSTRUCTION SITE
17	Winchester	520 WASHINGTON ST	INDOOR WINE TASTING
18	Winchester	48 WATERFIELD ST	USPO
19	Woburn	49 CERAK ST	INDEPENDENT TALLOW CO/VALENT LOT
20	Woburn	91 CENTRAL ST, BEAR	NO LOCATION AID
21	Woburn	14 CORCORAN ST	DOLE & BAILEY, BEAR JOHN ST
22	Woburn	5-17 CRANE'S COURT	OFF ROUTE 38, NORTH OF WOBURN LINE
23	Woburn	5 DRAPER ROAD	GENERAL PLASMA
24	Woburn	5 GREEN STREET	VAC-CENT
25	Woburn	4-10 GREEN STREET	PROPERTY
26	Woburn	HILL ST	GENERAL FOODS-ATLANTIC BELT/IN
27	Woburn	HILL ST	KRAFT FOODS, INC
28	Woburn	62 BOLTON ST	NO LOCATION AID
29	Woburn	45 BOLTON ST	NO LOCATION AID
30	Woburn	73 MAIN ST	NO LOCATION AID
31	Woburn	75 MAIN ST	PROPERTY
32	Woburn	315 MAIN ST	MAIN ST AUTO
33	Woburn	875 30 HOBART	EXITE FOR RFE 128
34	Woburn	875 39 MAIN ST	NO LOCATION AID
35	Woburn	10 MICRO DR	PRINTED CIRCUIT CORP
36	Woburn	MISHAWUM RD	MBIA PROPERTY
37	Woburn	248 MISHAWUM RD	COMMERCIAL/INDUSTRIAL PROPERTY
38	Woburn	300 MISHAWUM RD	WOBURN MALL, METLANDS AREA
39	Woburn	331 MONTVALE AVE	NO LOCATION AID
40	Woburn	30 NASHUA ST	AMERICAN SHOE MACHINERY
41	Woburn	20 WOBURN RD	HOWSON INC (FRM)
42	Woburn	15 OLYMPIA AVE	UNIFREEZE
43	Woburn	60 OLYMPIA AVE	OLYMPIA NORWEX TRUST
44	Woburn	73 OLYMPIA AVE	MOTORS, ELECTRONICS & CONTROL
45	Woburn	230 SALEM ST	30 BERRY/BRONSTEIN
46	Woburn	252 SALEM ST	WHITNEY'S WASTE OIL SERVICES
47	Woburn	256 SALEM ST	WHITNEY BARREL CO
48	Woburn	263 SALEM ST	NO LOCATION AID
49	Woburn	270 SALEM ST	BARBERA WOOD BAZES
50	Woburn	7 WALNUT HILL RD	SEVERANCE PROCKING CO
51	Woburn	363 WASHINGTON ST	MR GRACE-CROVAC
52	Woburn	22 CRANE'S COURT	CRANE'S COURT INDUSTRIAL PARK
53	Woburn	SALEM ST	WILSON'S PROPERTY
54	Woburn	SALEM ST	NEW ENGLAND PLASTICS

\* - Site location numbers highlighted in yellow on the Figure and the Legend indicate the sites evaluated in detail in this report for their potential to impact the Aberjona River

## SITE LOCATIONS

PRELIMINARY MSGRP SUPPLEMENTAL REPORT - SOUTHERN AREA  
INDUSTRI-PLEX SITE - WOBURN, MASSACHUSETTS

DRAWN BY: D.W. MACDOUGALL  
CHECKED BY: P. CALL

DATE: JUNE 2, 2003  
FILE: //4123/1540/PROPERTY.APR

### FIGURE 5-1

TETRA TECH NUS, INC.  
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(978)658-7899

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## REFERENCES

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**APPENDIX A**  
**EPA FACT SHEET – “EPA MERGES TWO ABERJONA RIVER STUDIES”**



# Aberjona River

Industri-Plex and Wells G & H Superfund Sites, Woburn, MA

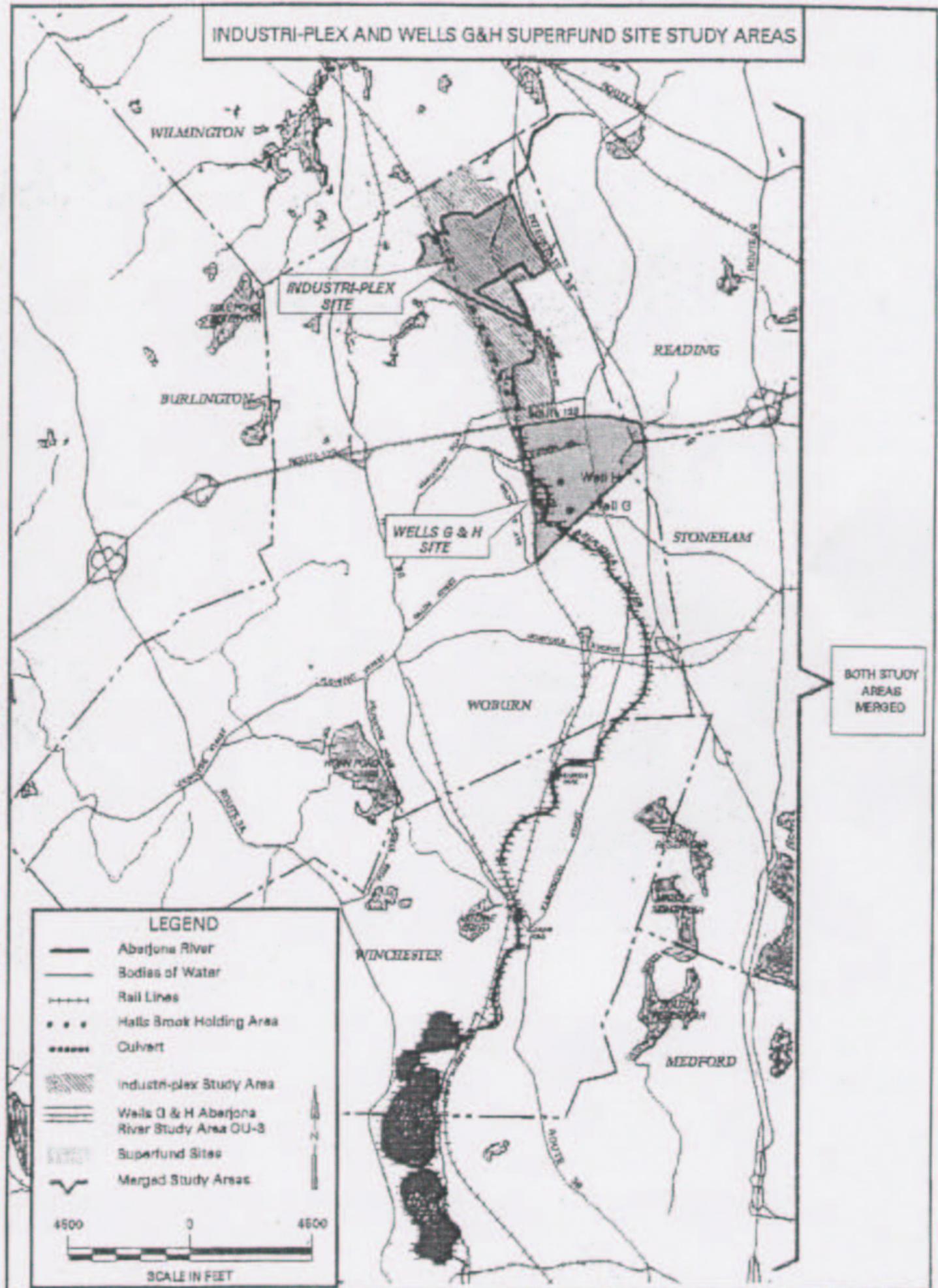
Spring 2002

## EPA Merges Two Aberjona River Studies

The Industri-Plex and Wells G&H Superfund Sites require two separate studies of the Aberjona River to evaluate the nature and extent of contamination and assess its potential threat to human health and the environment. The Industri-Plex Study Area, illustrated on the map with red hash lines, investigates the Halls Brook Holding Area and a portion of the upper reach of the Aberjona River; and the Wells G&H Aberjona River Study Area, illustrated on the map with green hash lines, investigates the lower reach of the Aberjona River. EPA plans to merge these studies into one, which will provide a more efficient and cost effective approach to managing the investigation of the Aberjona River.

The Aberjona River flows north to south from its headwaters in Reading through the Industri-Plex Superfund site and along Commerce Way and then merges with the Halls Brook Holding Area at Mishawum Road in Woburn. The River then proceeds under Route 128,

*continued on page 6*



The Aberjona River and current Industri-Plex and Wells G & H study areas which will be merged into one.

## Progress & Renewal: Industri-Plex Site

The Industri-Plex Superfund Site is a 245-acre industrial park. From 1853 until 1980, the site was used for manufacturing and then was developed for industrial use. The by-products and wastes from nearly 130 years of chemical manufacturing, light industry, and glue manufacturing contaminated soil and wetlands with heavy metals including arsenic, lead and chromium. The groundwater is contaminated with toluene, benzene and arsenic.

In 1983 the area was listed as a Superfund site. As part of EPA's 1986 cleanup decision, called a Record of Decision, and a 1989 agreement between EPA, MA DEP and the parties responsible for the cleanup, the first phase of cleanup called for a protective cap over approximately 110 acres of contaminated soil to prevent people from coming into contact with the contamination. To date, all of the protective caps have been constructed. Portions of the site have been safely redeveloped and put into productive uses such as a Regional Transportation Center, an Interstate-93 interchange, a public road extension, a Target Store, and an Office Park. This initial cleanup and redevelopment success has created jobs, enhanced property values and increased state and local tax revenues.

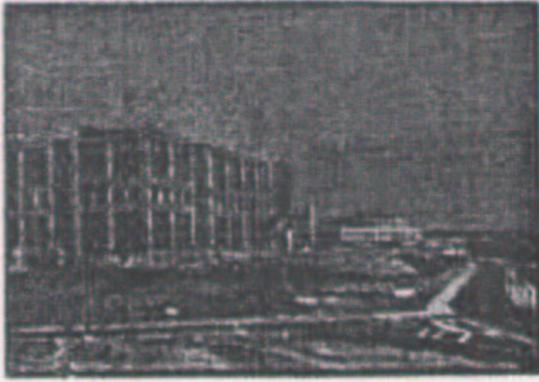
The 1986 Record of Decision and 1989 agreement also required the responsible parties to investigate the nature and extent of contamination migrating from the site into downstream surface water and sediments. In addition, EPA has been investigating other potential sources of contamination to the groundwater, surface water and sediments, in accordance with the 1986 decision and 1989 agreement. These investigations comprise the second phase of cleanup associated with the site and includes the investigation of Halls Brook Holding Area and the Aberjona River from the Industri-Plex site south to Route 128 (displayed on page one as the Industri-Plex Study Area). This second phase will be merged with the Wells G&H Aberjona River Study Area (displayed on page one) to form one comprehensive investigation. As part of this comprehensive investigation, EPA installed ten surface water sampling stations along the entire Aberjona River in May 2001 to continuously monitor surface water flow and automatically collect surface water samples during storm events. These stations will help EPA evaluate how contaminants are migrating in surface water under various conditions.



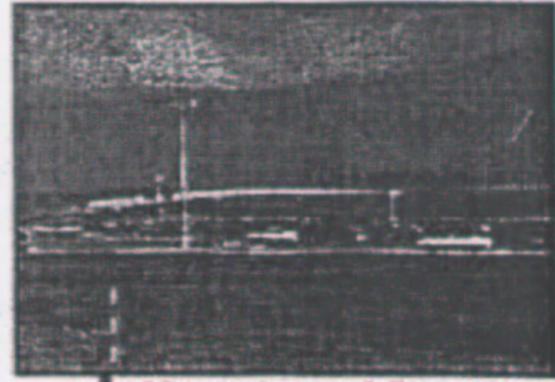
A before picture of the Industri-Plex site.



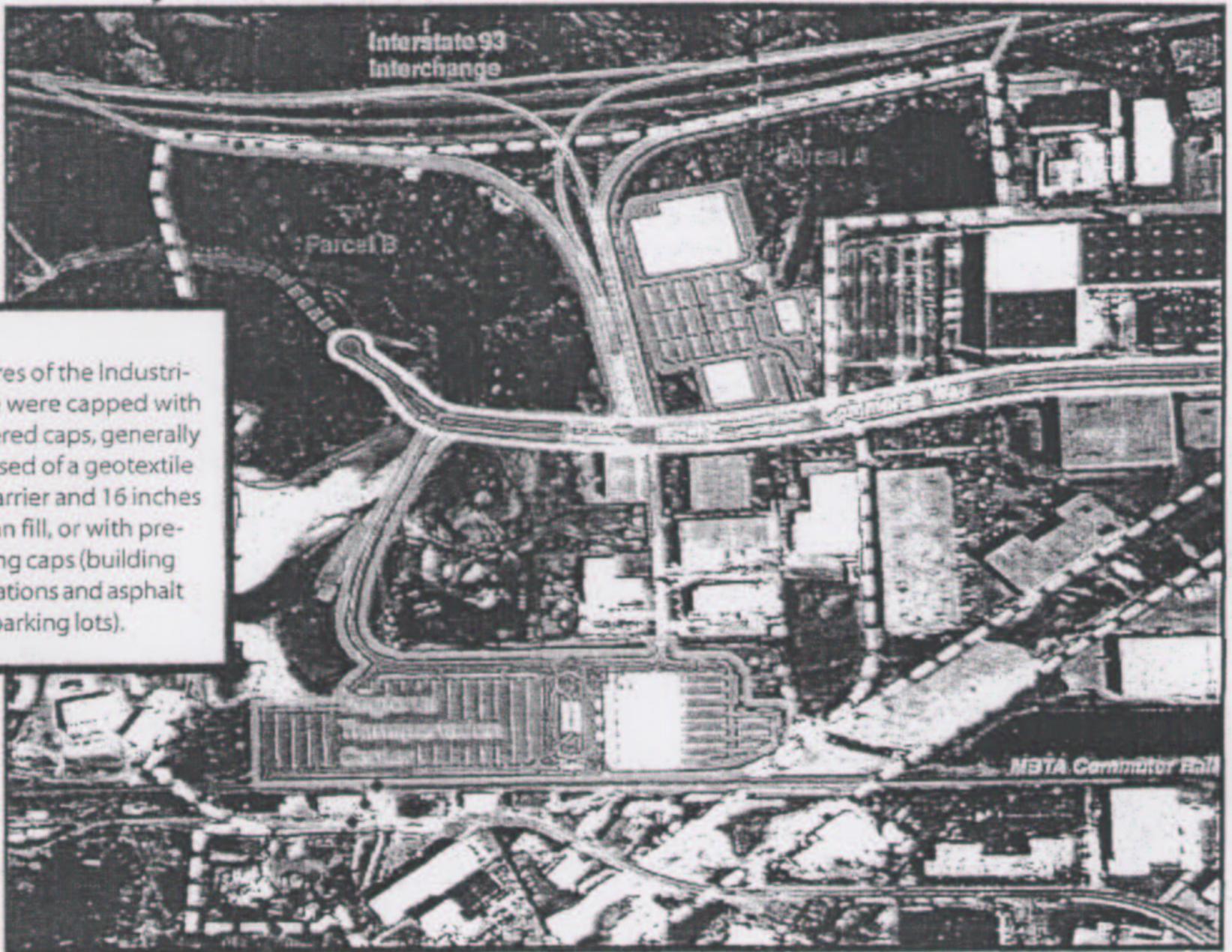
The smokestacks were demolished in 1996.



Genuity Building, Metro North Office Park



I-93 Interchange & Target Store



110 acres of the Industri-Plex site were capped with engineered caps, generally comprised of a geotextile fabric barrier and 16 inches of clean fill, or with pre-existing caps (building foundations and asphalt parking lots).

An aerial view of the Industri-Plex site redevelopment plan.

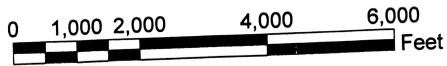


Anderson Regional Transportation Center

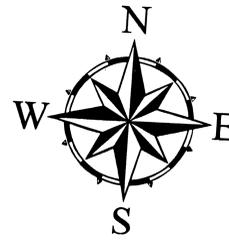
[Click here to view pages 4 & 5.](#)

**APPENDIX B**  
**ZONING MAPS – WINCHESTER AND WOBURN**

# ZONING MAP OF THE CITY OF WOBURN



EFFECTIVE APRIL 19, 1985  
REVISED THROUGH AUGUST 28, 2002



Legend	
<b>RESEIDENTIAL</b>	
	R-1 - SINGLE FAMILY
	R-2 - SINGLE & TWO FAMILY
	R-3 - TOWNHOUSE & GARDEN APTS.
	R-4 - APARTMENT, OTHER
<b>BUSINESS</b>	
	B-D - DOWNTOWN
	B-H - HIGHWAY
	B-I - INTERSTATE
	B-N - NEIGHBORHOOD
<b>INDUSTRIAL</b>	
	I-G - GENERAL
	I-P - INDUSTRIAL PARK
	I-P2 - INDUSTRIAL PARK 2
	O-P - OFFICE PARK
	O-P93 - OFFICE PARK
	S-I - MIXED USE
<b>OPEN SPACE</b>	
	OS - OPEN SPACE



Revisions	Date	
Open Space	1/1/2002	BFG
Open Space Rev.	4/3/2002	BFG
Open Space Rev	8/28/02	BFG

PREPARED BY THE CITY OF WOBURN  
ENGINEERING DEPARTMENT

# ZONING MAP

## TOWN OF WINCHESTER

### MASSACHUSETTS

SCALE

ROBERT E CONWAY TOWN ENGINEER

PREPARED FOR WINCHESTER PLANNING BOARD

INCORPORATED IN AND MADE A PART OF THE ZONING BY-LAW, ADOPTED MARCH 10, 1924, EFFECTIVE APRIL 11, 1924, AS ALTERED BY ALL AMENDMENTS TO JUNE 17, 2002  
NOTE: FOR OVERLAY DISTRICTS SEE TEXT

WINCHESTER PLANNING BOARD

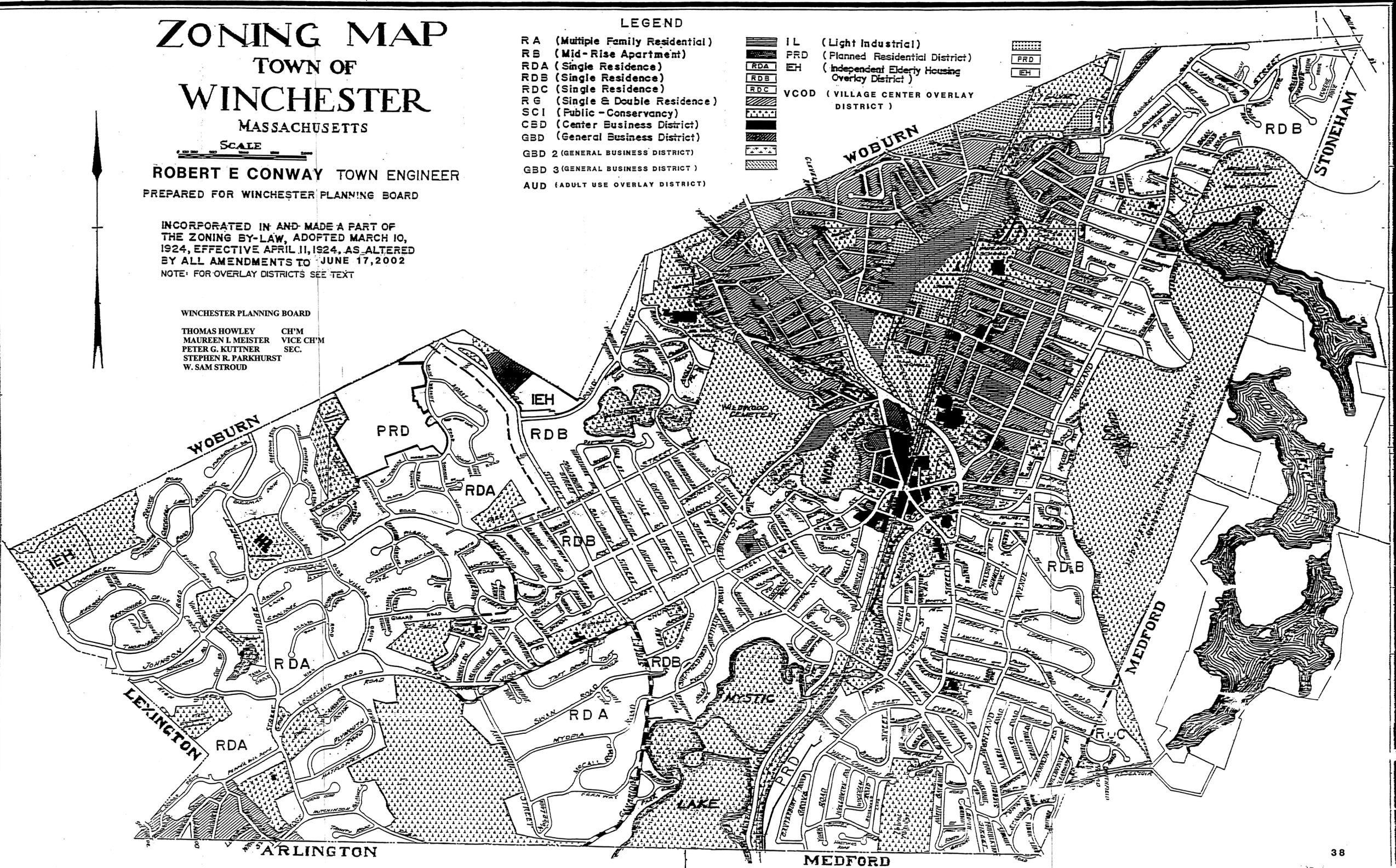
THOMAS HOWLEY CH'M  
MAUREN I. MEISTER VICE CH'M  
PETER G. KUTTNER SEC.  
STEPHEN R. PARKHURST  
W. SAM STROUD

#### LEGEND

- RA (Multiple Family Residential)
- RB (Mid-Rise Apartment)
- RDA (Single Residence)
- RDB (Single Residence)
- RDC (Single Residence)
- RG (Single & Double Residence)
- SCI (Public - Conservancy)
- CBD (Center Business District)
- GBD (General Business District)
- GBD 2 (GENERAL BUSINESS DISTRICT)
- GBD 3 (GENERAL BUSINESS DISTRICT)
- AUD (ADULT USE OVERLAY DISTRICT)

- IL (Light Industrial)
- PRD (Planned Residential District)
- IEH (Independent Elderly Housing Overlay District)
- VCOD (VILLAGE CENTER OVERLAY DISTRICT)

- PRD
- IEH



**APPENDIX C**

**EPA DATABASE RECORDS FOR WOBURN AND WINCHESTER – NPDES, TRI, RCRA**

**NOTE: RECORDS FOR WOBURN ARE ANNOTATED WITH “N” FOR NORTHERN AREA AND  
“S” FOR SOUTHERN AREA**



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### Query Results

PCS

Report  
an  
Error

Consolidated facility information (from multiple EPA systems) was searched to select facilities

**City Name:** Winchester  
**State Abbreviation:** MA

Results are based on data extracted on JAN-31-2003

**Note:** Click on the underlined CORPORATE LINK value for links to that company's environmental web pages.  
Click on the underlined MAPPING INFO value to obtain mapping information for the facility.  
Click on the underlined NPDES value to view detailed reports on the facility.

[Go To Bottom Of The Page](#)

### Facility Information

NPDES ID	Facility Information	FACILITY NAME	ADDRESS	COUNTY NAME	PERMIT ISSUED DATE	PERMIT EXPIRED DATE	SIC CODE	SIC DESC	MAPPING INFO	USGS HUC
<a href="#">MA0036421</a>	<a href="#">View Facility Information</a>	AFMC INC	135 SWANTON ST WINCHESTER, MA 01890	MIDDLESEX			5171	PETROLEUM BULK STATIONS AND TERMINALS	<a href="#">MAP</a>	01090001
<a href="#">MAG250009</a>	<a href="#">View Facility Information</a>	PARKVIEW CONDOMINIUMS	200 SWANTON STREET WINCHESTER, MA 01890	MIDDLESEX	NOV-28- 2000	APR-25- 2005	6513	OPERATORS OF APARTMENT BUILDINGS	<a href="#">MAP</a>	

MA0102792	<a href="#">View Facility Information</a>	WINCHESTER TOWN OF	71 MT VERNON ST WINCHESTER, MA 01890	MIDDLESEX			4952	SEWERAGE SYSTEMS	<a href="#">MAP</a>	01090001
MAG640037	<a href="#">View Facility Information</a>	WINCHESTER W T F	OFF OF BORDER ROAD WINCHESTER, MA 01890	MIDDLESEX	FEB-01-2001	NOV-15-2005	4941	WATER SUPPLY	<a href="#">MAP</a>	
MAU000008	<a href="#">View Facility Information</a>	WINCHESTER, TOWN OF	WINCHESTER /T/, MA 01890	MIDDLESEX					<a href="#">MAP</a>	

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Total Number of Facilities Displayed: 5

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**Query Results**

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Consolidated facility information (from multiple EPA systems) was searched to select facilities

City Name: Woburn  
 State Abbreviation: MA

Results are based on data extracted on JAN-09-2003

**Note:**  
 Click on the underlined TRI\_FACILITY\_ID value to view a detailed report on the facility.  
 Click on "View Facility Information" to view EPA Facility information for the facility.  
 Click on the underlined SUBMISSIONS value to view the list of DCN's for each of the TRI Reporting Year.

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**List of EPA-Regulated Facilities in TRI**

TRI FACILITY ID	FACILITY INFORMATION	FACILITY NAME	ADDRESS	COUNTY NAME	SUBMISSIONS
<a href="#">01801LPHND20SYL</a>	<a href="#">View Facility Information</a>	ALPHA INDUSTRIES INCORPORATED (N)	20 SYLVAN ROAD WOBURN, MA 018010000	MIDDLESEX	<a href="#">20</a>
<a href="#">01801WCHST9FORB</a>	<a href="#">View Facility Information</a>	AW CHESTERTON COMPANY (S)	9 FORBES ROAD WOBURN, MA 018010000	MIDDLESEX	<a href="#">8</a>
<a href="#">01888CHMRC8COMM</a>	<a href="#">View Facility Information</a>	CHOMERICS INCORPORATED (N)	8 COMMONWEALTH AVE WOBURN, MA 01888	MIDDLESEX	<a href="#">29</a>

01801CNNSS17PRE	<a href="#">View Facility Information</a>	CONNOISSEURS PRODS. CORP. (N)	17 PRESIDENTIAL WAY WOBURN, MA 018011040	MIDDLESEX	1
01801CNTNN181NE	<a href="#">View Facility Information</a>	CONTINENTAL BRANDS (N)	181 NEW BOSTON ST WOBURN, MA 018010000	MIDDLESEX	26
01801GGMNC19WHE	<a href="#">View Facility Information</a>	EG & G ENERGY MEASUREMENTS INCORPORATED (S)	19 WHEELING AVE. WOBURN, MA 01801	MIDDLESEX	2
01801MRSNC61HOL	<a href="#">View Facility Information</a>	EMERSON & CUMING INCORPORATED (S)	61 HOLTON STREET WOBURN, MA 01801	MIDDLESEX	25
01801GNRLP5DRAP	<a href="#">View Facility Information</a>	ENGELHARD SURFACE TECHNOLOGIES ENGELHARD CORPORATION (S)	5 DRAPER ST. WOBURN, MA 01801	MIDDLESEX	4
01801MCRDY10SON	<a href="#">View Facility Information</a>	HERLEY MDI (S)	10 SONAR DRIVE WOBURN, MA 018010000	MIDDLESEX	7
01801NSLTB50EVE	<a href="#">View Facility Information</a>	INSULTAB INCORPORATED (N)	50 EVERBERG RD. WOBURN, MA 01801	MIDDLESEX	13
01801TLNTCHILLS	<a href="#">View Facility Information</a>	KRAFT FOODS INCORPORATED (S)	HILL ST. WOBURN, MA 01801	MIDDLESEX	41
01801LCKMN44SIX	<a href="#">View Facility Information</a>	LKM INDUSTRIES (N)	44 SIXTH RD. WOBURN, MA 01801	MIDDLESEX	20
01801LYTRNDRAGO	<a href="#">View Facility Information</a>	LYTRON INCORPORATED (N)	55 DRAGON CT. WOBURN, MA 01801	MIDDLESEX	12
01888MDCNC64IND	<a href="#">View Facility Information</a>	MADICO INCORPORATED (N)	64 INDUSTRIAL PKY. WOBURN, MA 018014823	MIDDLESEX	34
01801MRSHL83COM	<a href="#">View Facility Information</a>	MARSHALLS DISTRIBUTION CENTER (N)	83 COMMERCE WAY WOBURN, MA 01801	MIDDLESEX	1
01801MSSTC5COMM	<a href="#">View Facility Information</a>	MASSTECH-EMS (N)	5 COMMONWEALTH AVE. WOBURN, MA 01801	MIDDLESEX	0
01801MRTNT185NE	<a href="#">View Facility Information</a>	MORTON INTERNATIONAL ADVANCED MATERIALS (N)	185 NEW BOSTON WOBURN, MA 018016230	MIDDLESEX	4
01801NWNGL310SA	<a href="#">View Facility Information</a>	NEW ENGLAND PLASTICS CORPORATION (S)	310 SALEM ST. WOBURN, MA 01801	MIDDLESEX	5
	<a href="#">View Facility Information</a>		317 NEW BOSTON ST		

<a href="#">01801NXSCS317NE</a>	<a href="#">Information</a>	NEXUS CUSTOM ELECTRONICS INC (N)	WOBURN, MA 01801	MIDDLESEX	0
<a href="#">01801PRNTD10MIC</a>	<a href="#">View Facility Information</a>	PRINTED CIRCUIT CORPORATION (S)	10 MICRO DR. WOBURN, MA 01801	MIDDLESEX	83
<a href="#">01801RLYLT228SA</a>	<a href="#">View Facility Information</a>	RILEY LEATHER COMPANY (S)	228 SALEM STREET WOBURN, MA 01801	MIDDLESEX	11
<a href="#">01801SMLBN5CONN</a>	<a href="#">View Facility Information</a>	SAMUEL BINGHAM COMPANY (S)	5 CONN STREET WOBURN, MA 018010000	MIDDLESEX	7
<a href="#">01801SNMNS8PRES</a>	<a href="#">View Facility Information</a>	SANMINA-SCI CORPORATION (N)	8 PRESIDENTIAL WAY WOBURN, MA 01801	MIDDLESEX	0
<a href="#">01801WNFLDCONNA</a>	<a href="#">View Facility Information</a>	WINFIELD BROOKS COMPANY INCORPORATED (S)	70 CONN STREET WOBURN, MA 018010787	MIDDLESEX	40

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### Query Results

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**City Name:** Winchester  
**State Abbreviation:** MA

Results are based on data extracted on JAN-09-2003

**Note:**

Click on the underlined TRI\_FACILITY\_ID value to view a detailed report on the facility.  
 Click on "View Facility Information" to view EPA Facility information for the facility.  
 Click on the underlined SUBMISSIONS value to view the list of DCN's for each of the TRI Reporting Year.

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#### List of EPA-Regulated Facilities in TRI

TRI FACILITY ID	FACILITY INFORMATION	FACILITY NAME	ADDRESS	COUNTY NAME	SUBMISSIONS
<a href="#">01890KYSTN35HOL</a>	<a href="#">View Facility Information</a>	EDWARDS BATTERY CORPORATION	35 HOLTON STREET WINCHESTER, MA 018900000	MIDDLESEX	<a href="#">6</a>
<a href="#">01890MCCRD620WA</a>	<a href="#">View Facility Information</a>	MCCORD WINN TEXTRON	620 WASHINGTON STREET WINCHESTER, MA 01890	MIDDLESEX	<a href="#">19</a>
<a href="#">01890LYMPC15LOW</a>	<a href="#">View Facility Information</a>	OLYMPIC SYSTEMS CORPORATION	15 LOWELL AVE. WINCHESTER, MA 01890	MIDDLESEX	<a href="#">5</a>





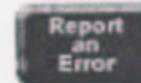
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Query Results



Query Selections

City: Woburn  
 State: MA  
 Reporting Year: 1997  
 Management Location: Both (Offsite and Onsite)  
 Waste Origin: Both (Wastes generated onsite and Wastes received from offsite facility)  
 Total Number of Facilities Retrieved are: 7

To see a detailed report on a facility, click on the underlined Handler ID

LIST OF EPA-REGULATED FACILITIES IN ENVIROFACTS

HANDLER ID	HANDLER NAME	ADDRESS	COUNTY NAME	GENERATOR STATUS	STORAGE STATUS	RCRA TDR STATUS	EXEMPT TDR STATUS
<u>MAD001030311</u>	ALPHA INDUSTRIES, INC. <sup>(2)</sup>	20 SYLVAN ROAD WOBURN, MA 018010000	MIDDLESEX	LQG	No RCRA Storage	NO TDR/NO RCRA PLAN	
<u>MAD980732614</u>	ANIKA RESEARCH (THERAPEUTICS) <sup>(3)</sup>	236 WEST CUMMINGS PARK WOBURN, MA	MIDDLESEX	LQG	No RCRA Storage	NO TDR/NO RCRA PLAN	

			018010000				
MAD001419514	CHOMERICS (N)	77 DRAGON COURT WOBURN, MA 018880000	MIDDLESEX	LQG	No RCRA Storage	NO TDR/NO RCRA PLAN	
MAD985293992	DAVOL, INC. (N)	160 NEW BOSTON ST WOBURN, MA 018010000	MIDDLESEX	LQG	No RCRA Storage	NO TDR/NO RCRA PLAN	
MAD058898776	MADICO, INC. (N)	64 INDUSTRIAL PARKWAY WOBURN, MA 018010000	MIDDLESEX	LQG	No RCRA Storage	NO TDR/NO RCRA PLAN	
MAD981214620	MORTON INTERNATIONAL ADVANCED MATERIALS (N)	185 NEW BOSTON ST WOBURN, MA 018010000	MIDDLESEX	LQG	No RCRA Storage	NO TDR/NO RCRA PLAN	
MAD019725365	WOBURN STEEL DRUM, INC. (N)	211 NEW BOSTON ST WOBURN, MA 018010000	MIDDLESEX	LQG	No RCRA Storage	NO TDR/NO RCRA PLAN	



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**Query Selections**

City: Winchester  
 State: MA  
 Reporting Year: 1997  
 Management Location: Both (Offsite and Onsite)  
 Waste Origin: Both (Wastes generated onsite and Wastes received from offsite facility)  
 Total Number of Facilities Retrieved are: 1

To see a detailed report on a facility, click on the underlined Handler ID

**LIST OF EPA-REGULATED FACILITIES IN ENVIROFACTS**

HANDLER ID	HANDLER NAME	ADDRESS	COUNTY NAME	GENERATOR STATUS	STORAGE STATUS	RCRA TDR STATUS	EXEMPT TDR STATUS
<u>MAD982199788</u>	WINCHESTER HOSPITAL	41 HIGHLAND AVENUE WINCHESTER, MA 018900000	MIDDLESEX	LQG	No RCRA Storage	NO TDR/NO RCRA PLAN	

**APPENDIX D**

**MADEP SITES IN WINCHESTER AND WOBURN**

**MADEP SITES IN WINCHESTER AND WOBURN**  
(see Definitions following this table)

RTN	LOCATION AID (SITE NAME)	TOWN	ADDRESS	CATEGORY	NOTIF. DATE	STATUS	DATE	PHASE	RAO CLASS	OHM (Oil, Hazardous Material)
3-0013923	NO LOCATION AID	WINCHESTER	1 LOWELL AVE	72 HR	6/21/1996	RAO	6/27/1997		A2	Oil
3-0000667	WINCHESTER ASSOCIATES	WINCHESTER	1017 MAIN ST	NONE	10/15/1988	RAO	8/2/1995			
3-0018602	NO LOCATION AID	WINCHESTER	11 SWAN RD	120 DY	8/6/1999	RTN CLOSED	7/27/2001			Oil
3-0019571	NO LOCATION AID	WINCHESTER	11 SWAN RD	120 DY	5/16/2000	RTN CLOSED	7/27/2001			Oil
3-0018598	NO LOCATION AID	WINCHESTER	12 SWANTON ST	72 HR	9/5/1999	TIER 2	4/4/2001	PHASE II		Oil
3-0001730	LOCATELLIS WINCHSTR RLTY TRUS	WINCHESTER	12 THOMPSON ST	NONE	1/23/1987	RAO	2/8/1999	PHASE II	A3	Oil
3-0010116	COMPUTER FULFILLMENT CO	WINCHESTER	120 CROSS ST	72 HR	10/28/1993	RAO	10/26/1994		A2	Oil
3-0000115	JO WHITTEN CO FMR	WINCHESTER	134 CROSS ST	NONE	1/30/1986	TIER 1A	10/1/1993			Hazardous Material
3-0000917	ULTIMAR PETROLEUM STATION	WINCHESTER	135 SWANTON ST	NONE	7/15/1987	TIER 2	8/4/1997	PHASE III		
3-0003782	RESIDENTIAL PROPERTY	WINCHESTER	14 COX RD	NONE	10/1/1993	RAO	12/15/1998		A2	Oil
3-0013768	SOLBERG	WINCHESTER	149-151 CROSS ST	120 DY	5/16/1996	RAO	10/31/1996		B1	Oil
3-0013290	DPW YARD	WINCHESTER	15 LAKE ST	TWO HR	12/22/1995	RAO	2/20/1996		A1	Oil
3-0001335	WINCHESTER DPW	WINCHESTER	15 LAKE ST	NONE	4/26/1994	TIER 2	6/22/1995	PHASE IV		Oil
3-0016919	LOWELL INDUSTRIAL PARK	WINCHESTER	15 LOWELL AVE	TWO HR	6/15/1998	RAO	4/30/1999		A2	Oil
3-0020546	NO LOCATION AID	WINCHESTER	15 LOWELL ST	TWO HR	3/29/2001	RAO	2/1/2002		A2	Oil
3-0001348	PROPERTY	WINCHESTER	171 SWANTON ST	NONE	1/15/1990	DEPNDS	4/12/1996			
3-0020515	NO LOCATION AID	WINCHESTER	18 FOREST ST	TWO HR	3/23/2001	RAO	7/30/2001		A1	Oil
3-0017364	NO LOCATION AID	WINCHESTER	23 GINN RD	TWO HR	9/30/1998	RAO	12/3/1998		A2	Oil
3-0002161	PROPERTY	WINCHESTER	24 WHITE ST	NONE	4/15/1989	RAO	6/10/1996			
3-0019506	NO LOCATION AID	WINCHESTER	240 POND ST	TWO HR	5/4/2000	RAO	5/24/2000		A2	
3-0015564	MAHONEYS GARDEN CTR	WINCHESTER	242 CAMBRIDGE ST	72 HR	9/26/1997	RAO	1/22/1998		A2	Oil
3-0012613	WINCHESTER GREEN CONDO TANK #1	WINCHESTER	247 WASHINGTON ST	72 HR	6/23/1995	RAO	6/28/1996		A2	Oil
3-0012614	WINCHESTER GREEN CONDO TANK #4	WINCHESTER	247 WASHINGTON ST	72 HR	6/23/1995	RAO	6/28/1996			Oil
3-0012484	RESIDENCE	WINCHESTER	3 TAFT CIR	72 HR	5/18/1995	TIER 2	7/27/2001	PHASE II		Oil
3-0010055	BY BONNELL FORD	WINCHESTER	330 CAMBRIDGE ST	TWO HR	10/13/1993	RAO	5/27/1994			Oil
3-0013214	BONNELL FORD 353 CAMBRIDGE ST	WINCHESTER	336 CAMBRIDGE ST	TWO HR	12/2/1995	RAO	2/24/1996		A1	Oil
3-0001269	KEYSTONE BATTERY	WINCHESTER	35 HOLTON ST	NONE	10/15/1989	RAO	5/19/1999	PHASE II	A2	
3-0014225	NO LOCATION AID	WINCHESTER	35 RIVER ST	72 HR	9/13/1996	RAO	1/16/1997		A1	Oil
3-0013414	NO LOCATION AID	WINCHESTER	36 GLEN RD	TWO HR	2/3/1996	RAO	6/7/1996		A2	Oil
3-0018920	RESIDENCE	WINCHESTER	37 CALUMET RD	120 DY	10/28/1999	RAO	10/28/1999		A2	Hazardous Material
3-0011285	JUNIPER DEVELOPMENT	WINCHESTER	39 HOLTON ST	120 DY	7/7/1994	RAO	7/14/1995		B1	Hazardous Material
3-0015722	NO LOCATION AID	WINCHESTER	39 HOLTON ST	72 HR	11/18/1997	RAO	3/23/1998		A1	Oil
3-0016689	NO LOCATION AID	WINCHESTER	4 FOXHUNT LN	TWO HR	4/10/1998	RAO	11/13/1998		A2	Oil
3-0017592	NO LOCATION AID	WINCHESTER	41 HIGHLAND AVE	72 HR	11/18/1998	RTN CLOSED	11/5/1999			Oil
3-0003740	WINCHESTER HOSPITAL	WINCHESTER	41 HIGHLAND AVE	NONE	10/15/1991	TIER 2	6/15/1998	PHASE III		Oil
3-0014506	NO LOCATION AID	WINCHESTER	42 EAST ST	TWO HR	11/18/1996	RAO	1/16/1997		A1	Oil
3-0018324	NO LOCATION AID	WINCHESTER	45 HOLTON ST	120 DY	5/20/1999	RAO	6/21/2001	PHASE II	A2	Oil & Hazardous Material
3-0002235	MCCALL JR HIGH SCHOOL	WINCHESTER	458 MAIN ST	NONE	12/28/1988	TIER 2	3/14/1997	PHASE V		Oil & Hazardous Material
3-0017594	NO LOCATION AID	WINCHESTER	458 MAIN ST	72 HR	11/18/1998	RTN CLOSED	3/22/1999	PHASE IV		Oil
3-0014389	USPO	WINCHESTER	48 WATERFIELD ST	TWO HR	10/23/1996	RAO	6/18/1997		A1	Oil & Hazardous Material
3-0012909	NO LOCATION AID	WINCHESTER	50 CROSS ST	120 DY	9/8/1995	RAO	12/2/1999	PHASE II	A2	Hazardous Material
3-0013619	CONSTRUCTION SITE	WINCHESTER	50 SWAN ST	TWO HR	3/25/1996	RAO	3/17/1997		A1	Hazardous Material
3-0000873	EXXON SERVICE STATION	WINCHESTER	586 MAIN ST	NONE	6/10/1987	RAO	3/24/2000	PHASE III	C	

**MADEP SITES IN WINCHESTER AND WOBURN**  
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RTN	LOCATION AID (SITE NAME)	TOWN	ADDRESS	CATEGORY	NOTIF. DATE	STATUS	DATE	PHASE	RAO CLASS	OHM (Oil, Hazardous Material)
3-0015301	NO LOCATION AID	WINCHESTER	586 MAIN ST	120 DY	7/15/1997	RAO	7/10/1998		B1	Hazardous Material
3-0017902	NO LOCATION AID	WINCHESTER	586 MAIN ST	120 DY	5/12/1999	DEF TIER 1B	5/19/2000			Hazardous Material
3-0017908	NO LOCATION AID	WINCHESTER	599 TO 605 MAIN ST	120 DY	1/22/1999	DPS	4/1/1999			Oil & Hazardous Material
3-0012394	NO LOCATION AID	WINCHESTER	600 MAIN ST	120 DY	4/14/1995	RAO	10/4/2001	PHASE II	B1	Hazardous Material
3-0015451	NO LOCATION AID	WINCHESTER	611 MAIN ST	120 DY	8/15/1997	DPS	9/9/1997			Oil & Hazardous Material
3-0000114	SUNOCO GASOLINE STATION FMR	WINCHESTER	611 MAIN ST	NONE	3/12/1986	RAO	8/1/1997	PHASE III	A2	Oil
3-0012112	MCCORD WINN TEXTRON	WINCHESTER	620 WASHINGTON ST	120 DY	1/27/1995	RAO	7/27/1998	PHASE III	A2	Oil & Hazardous Material
3-0003176	MCCORD WINN TEXTRON	WINCHESTER	620 WASHINGTON ST	NONE	12/19/1995	RAO	7/27/1998	PHASE II	A2	Oil
3-0004426	COMMERCIAL PROPERTY	WINCHESTER	632 MAIN ST	NONE	7/15/1993	RAO	8/9/1994		A3	
3-0000626	MAIN ST TEXACO STATION	WINCHESTER	641 MAIN ST	NONE	1/15/1990	DEF TIER 1B	9/28/1998			Oil
3-0014694	NO LOCATION AID	WINCHESTER	643 MAIN ST	72 HR	1/6/1997	RAO	9/18/1997		A2	Oil
3-0015576	NO LOCATION AID	WINCHESTER	643 MAIN ST	120 DY	9/30/1997	DPS	9/30/1997			Oil & Hazardous Material
3-0018310	NO LOCATION AID	WINCHESTER	671 MAIN ST	TWO HR	5/18/1999	DEF TIER 1B	5/25/2000			Oil
3-0004315	SUNOCO SERVICE STATION	WINCHESTER	671 MAIN ST	NONE	9/22/1992	TIER 2	8/11/1997	PHASE II		
3-0003603	PURITY SUPREME	WINCHESTER	695 MAIN ST	NONE	7/15/1992	RAO	8/25/1995		A2	Oil
3-0018784	JOHNSON RD	WINCHESTER	7 SOCRATES WAY	72 HR	9/23/1999	RAO	11/19/1999		A2	Oil
3-0019501	NO LOCATION AID	WINCHESTER	7 SOCRATES WAY	72 HR	5/3/2000	RAO	12/5/2000		A2	Oil
3-0021461	COTTAGE AVE	WINCHESTER	75 BACON ST	TWO HR	2/5/2002	UNCLASSIFIED	2/5/2002			Oil
3-0004110	FRESH TOUCH OF WINCHESTER	WINCHESTER	757 MAIN ST	NONE	10/15/1992	RAO	7/18/1997			
3-0010877	MAIN AND SKILLING RD	WINCHESTER	765 MAIN ST	120 DY	4/13/1994	RAO	4/15/1997	PHASE III	A2	Oil & Hazardous Material
3-0019511	NO LOCATION AID	WINCHESTER	794 MAIN ST	120 DY	4/26/2000	RAO	4/26/2000		B1	Oil
3-0010828	NO LOCATION AID	WINCHESTER	80 ARLINGTON ST	120 DY	4/6/1994	RAO	10/2/1995	PHASE II	A2	Oil
3-0013175	CLARK STREET	WINCHESTER	808 MAIN ST	72 HR	11/22/1995	RAO	11/17/1998	PHASE III	A2	Oil
3-0014393	NO LOCATION AID	WINCHESTER	81-83 BROOKSIDE AVE	TWO HR	10/22/1996	RAO	1/22/1997		A1	Oil
3-0011230	MACHINE SHOP	WINCHESTER	91 HEMINGWAY ST	72 HR	7/5/1994	RAO	10/6/1995		A3	Oil
3-0015998	RESIDENCE	WINCHESTER	97 SWANTON ST	TWO HR	2/9/1998	RAO	2/11/1999		A2	Oil
3-0017208	NO LOCATION AID	WINCHESTER	ABERJONA RIVER	120 DY	8/24/1998	RAO	10/11/2000		A1	Hazardous Material
3-0021213	WEDGEMERE RAIL STATION	WINCHESTER	BACON ST AND MYSTIC VALLEY F	TWO HR	10/26/2001	RAO	12/17/2001		A1	Oil
3-0000906	PROPERTY	WINCHESTER	HILL ST ROCK AVE	NONE	7/15/1987	PENNFA	8/2/1996			
3-0019855	NO LOCATION AID	WINCHESTER	IN FRONT OF 33 MCCALL RD	TWO HR	8/22/2000	RAO	10/23/2000		A2	
3-0014437	PARKVIEW ELEC PARK	WINCHESTER	LOWELL ST	TWO HR	10/26/1996	RAO	2/18/1997		A2	Oil
3-0011666	WINCHESTER TRANSFER STATION	WINCHESTER	MCKAY AVE	TWO HR	9/29/1994	RAO	11/29/1994		A2	Oil
3-0015796	AMTRAK WINCHESTER STATION	WINCHESTER	MOUNT VERNON ST	TWO HR	12/8/1997	RAO	7/1/1998		A1	Oil
3-0010895	1/2 PAST BELLVUE POND ON RIGHT	WINCHESTER	SOUTH BORDER RD	TWO HR	4/22/1994	RAO	7/11/1994			Oil
3-0018871	SOUTH RESERVOIR	WINCHESTER	SOUTH BORDER RD	TWO HR	10/22/1999	RAO	12/16/1999		A1	Oil
3-0014338	WINNING FARM	WINCHESTER	THORNBERRY RD	120 DY	10/11/1996	ADEQUATE REG	6/3/1999	PHASE II		Oil & Hazardous Material
3-0019264	NO LOCATION AID	WINCHESTER	WASHINGTON ST AT FAIRMOUNT	TWO HR	2/9/2000	RAO	3/24/2000		A1	Oil
3-0020673	OFF CONN ST	WOBURN	1 BRYANT ST	120 DY	5/1/2001	RAO	7/5/2001		A2	Oil
3-0010847	NO LOCATION AID	WOBURN	10 COMMERCE WAY	120 DY	2/15/1995	RAO	12/13/1996		B2	Hazardous Material
3-0013317	OFF MIDDLE ST	WOBURN	10 FAIRVIEW RD	TWO HR	1/10/1996	RAO	10/8/1996		A2	Oil
3-0014790	NO LOCATION AID	WOBURN	10 INDUSTRIAL PARK DR	TWO HR	2/4/1997	RAO	3/31/1997		A1	
3-0022058	INDUSTRIAL WATER SUPPLY WELL #1	WOBURN	10 MICRO DR	120 DY	8/28/2002	UNCLASSIFIED	8/28/2002			Hazardous Material
3-0001263	PRINTED CIRCUITS CORP	WOBURN	10 MICRO DR	NONE	1/15/1990	PENNFA	3/18/1994			

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3-0000473	BLOX BRUSSARD	WOBURN	100 ASHBURTON AVE	NONE	1/15/1987	DEF TIER 1B	3/31/1995			Oil
3-0018868	LOT D	WOBURN	100 BEDFORD RD	120 DY	10/15/1999	RAO	5/15/2000		A2	Oil & Hazardous Material
3-0014690	MAHONEY'S GREENHOUSE	WOBURN	100 BEDFORD ST	TWO HR	1/5/1997	RAO	3/12/1997		A1	Oil
3-0004185	ROMICON INC FMR	WOBURN	100 CUMMINGS PARK	NONE	1/15/1993	RAO	8/26/1996		B1	Oil & Hazardous Material
3-0013150	NE TRADE CTR	WOBURN	100 SYLVAN RD	TWO HR	1/9/1997	RAO	10/24/1997		A1	Hazardous Material
3-0002021	NORTHEAST TRADE CENTER	WOBURN	100 SYLVAN RD	NONE	4/15/1989	WCSPRM	6/21/1996			Oil
3-0019395	NO LOCATION AID	WOBURN	101 COMMERCE WAY	TWO HR	3/25/2000	RAO	5/30/2000		A2	
3-0010819	NO LOCATION AID	WOBURN	107 WINN ST	120 DY	3/7/1994	RAO	3/10/1995		A2	Oil & Hazardous Material
3-0000151	GORCHEV PHOTO	WOBURN	11 CABOT RD	NONE	1/15/1987	LSPNFA	8/2/1995			
3-0004787	ADMIRAL METALS CO INC	WOBURN	11 FORBES RD	NONE	10/1/1993	RAO	3/24/1999	PHASE II	A2	
3-0000488	MICHIZENI CONSTRUCTION	WOBURN	11 SIXTH RD	NONE	1/15/1987	DPS	3/24/1997			
3-0002194	GASOLINE STATION	WOBURN	117 PLEASANT ST	NONE	10/15/1989	TIER 2	12/12/1994			
3-0000854	HILLTOP CONSTRUCTION	WOBURN	124 DRAGON COURT	NONE	7/31/1986	DEF TIER 1B	8/9/1995			
3-0010660	BEHIND CHRISTYS	WOBURN	13 HOVEY ST	TWO HR	3/10/1994	RAO	9/13/1994		A2	Oil
3-0004212	PROPERTY	WOBURN	14 INDUSTRIAL PKWY	NONE	1/15/1993	WCSPRM	8/24/1998			Oil
3-0004520	FARRELLS SERVICE CENTER	WOBURN	146 MAIN ST	NONE	2/3/1992	RAO	8/1/1997			
3-0022145	NO LOCATION AID	WOBURN	15 CHESTNUT ST	TWO HR	9/25/2002	UNCLASSIFIED	9/25/2002			Oil
3-0001424	UNIFIRST	WOBURN	15 OLYMPIA AVE	NONE	1/15/1987	ADEQUATE REG	3/13/1998			Oil
3-0015256	DOLE & BAILEY NEAR JOHN ST	WOBURN	16 CONN ST	TWO HR	6/28/1997	RAO	10/20/1997		A1	Hazardous Material
3-0002404	DOLE & BAILEY CO	WOBURN	16 CONN ST	NONE	1/15/1990	RAO	9/26/1996		A3	Oil
3-0011501	NO LOCATION AID	WOBURN	16 CONN ST	TWO HR	8/22/1994	RAO	8/29/1995		A1	Hazardous Material
3-0021280	AUTOZONE	WOBURN	16 NORMAC RD	TWO HR	11/29/2001	RAO	2/25/2002		A1	Oil
3-0010753	NO LOCATION AID	WOBURN	160 NEW BOSTON ST	120 DY	3/22/1994	RAO	7/29/1997	PHASE II	B1	Hazardous Material
3-0014120	AT PARKVIEW ROAD	WOBURN	163 SALEM ST	TWO HR	8/15/1996	RAO	12/20/1996		A2	Oil
3-0014638	PARKVIEW RD	WOBURN	163 SALEM ST	72 HR	12/17/1996	TIER 2	12/24/1997	PHASE IV		Oil
3-0021315	PARKVIEW RD	WOBURN	163 SALEM ST	72 HR	12/7/2001	UNCLASSIFIED	12/7/2001			Hazardous Material
3-0019173	NO LOCATION AID	WOBURN	164 SALEM ST	TWO HR	1/16/2000	RAO	8/4/2000		A2	Oil
3-0003420	PROPERTY	WOBURN	17 HOLTON ST	NONE	1/15/1991	RAO	5/15/1997	PHASE II	B1	Oil & Hazardous Material
3-0000507	INDUSTRIAL BUILDING	WOBURN	171 MERRIMAC ST	NONE	1/15/1987	DPS	3/13/1997			
3-0003953	7-11 CONVENIENCE STORE 11506	WOBURN	173 CAMBRIDGE ST	NONE	7/15/1992	RAO	9/12/2001	PHASE III	A2	Oil
3-0014198	NO LOCATION AID	WOBURN	178 SALEM ST	72 HR	9/5/1996	RAO	10/22/1996		A2	Oil
3-0021138	NO LOCATION AID	WOBURN	17R HIGHLAND ST	TWO HR	10/6/2001	RAO	10/3/2002		A2	Oil
3-0010859	FMR CONTINENTAL BRANDS	WOBURN	181 NEW BOSTON ST	72 HR	4/14/1994	RTN CLOSED	1/9/1996			Hazardous Material
3-0015228	NO LOCATION AID	WOBURN	181 NEW BOSTON ST	TWO HR	6/20/1997	RAO	8/26/1997		A2	Oil & Hazardous Material
3-0000478	THREE C CO	WOBURN	181 NEW BOSTON ST	NONE	10/3/1986	RAO	7/5/2002	PHASE IV	A2	
3-0004250	MOBIL SERVICE STATION 01 D2R	WOBURN	183 CAMBRIDGE ST	NONE	1/15/1993	TIER 1C	1/25/1995	PHASE V		Oil
3-0020233	NO LOCATION AID	WOBURN	185 NEW BOSTON RD	TWO HR	12/18/2000	RAO	12/22/2000		A1	Oil
3-0015535	CNR FEDERAL & PLEASANT	WOBURN	19 PLEASANT ST	120 DY	9/12/1997	RAO	3/27/1998		A2	Oil
3-0014795	FLEET BANK	WOBURN	19 PLEASANT ST	120 DY	1/31/1997	RAO	1/20/1998		B2	Hazardous Material
3-0004167	STERLING BANK	WOBURN	19 PLEASANT ST	NONE	7/15/1993	DPS	9/12/1997			Oil
3-0000021	PROPERTY	WOBURN	19 SIXTH RD	NONE	2/13/1986	DEPNFA	5/15/1986			
3-0015164	NO LOCATION AID	WOBURN	195 NEW BOSTON ST	120 DY	5/30/1997	RAO	9/5/1997		A2	Hazardous Material
3-0000480	WINN TRUCKING TERMINAL	WOBURN	195 NEW BOSTON ST	NONE	1/15/1987	DPS	2/12/1998			Oil

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3-0020362	NO LOCATION AID	WOBURN	1R WASHINGTON ST	72 HR	2/1/2001	TIER 2	2/8/2002	PHASE II		Oil & Hazardous Material
3-0014003	BUILDING COMPLEX	WOBURN	2 DRAPER RD	72 HR	7/18/1996	RAO	9/20/1996		A2	Oil
3-0003218	AMES	WOBURN	2 ELM ST	NONE	7/15/1990	RAO	11/2/1998	PHASE II	B1	Oil
3-0020664	INTERSECTION RTES 38 & 128	WOBURN	2 ELM ST	TWO HR	5/3/2001	RAO	7/2/2001		A2	Oil
3-0016539	INTERSECTION RTES 38/128	WOBURN	2 ELM ST	120 DY	2/25/1998	TIER 1C	3/4/1999	PHASE IV		Hazardous Material
3-0002418	PURITY SUPREME	WOBURN	2 ELM ST	NONE	1/15/1990	RAO	8/24/1995		A2	
3-0014102	TANK #4	WOBURN	20 COMMERCE WAY	120 DY	8/8/1996	RAO	12/4/1996		A2	Oil
3-0004186	ROMICON INC FMR	WOBURN	20 NORMAC RD	NONE	1/15/1993	LSPNFA	5/19/1997			Hazardous Material
3-0020229	NO LOCATION AID	WOBURN	20 SONAR DRIVE NEAR	TWO HR	12/17/2000	RAO	12/22/2000		A1	Oil
3-0002099	EXXON FMR	WOBURN	201 CAMBRIDGE ST	NONE	4/15/1989	LSPNFA	4/12/1996			
3-0001063	DOWD ENTERPRISES	WOBURN	205 WILDWOOD ST	NONE	1/15/1990	RAO	10/27/1997		B2	Oil
3-0002147	PROPERTY	WOBURN	21 CABOT RD	NONE	4/15/1989	LSPNFA	3/9/1995			
3-0002371	CHOATE HOSPITAL	WOBURN	21 WARREN AVE	NONE	11/28/1988	DEPNDS	4/17/1996			Oil
3-0001738	WOBURN STEEL DRUM INC	WOBURN	211 NEW BOSTON ST	NONE	1/15/1987	ADEQUATE REG	6/2/1996			
3-0021078	CRANES COURT INDUSTRIAL PARK	WOBURN	22 CRANES COURT	TWO HR	9/12/2001	DEF TIER 1B	9/19/2002			Oil & Hazardous Material
3-0012123	INTERSECTION OF N MAPLE & NEW BOSTON ST	WOBURN	22 NORTH MAPLE	120 DY	1/31/1995	RAO	3/31/1995		A2	Oil & Hazardous Material
3-0001867	ACE DISPOSAL SERV FMR	WOBURN	22 NORTH MAPLE ST	NONE	1/15/1989	RAO	4/3/1998		A2	Oil
3-0018812	NO LOCATION AID	WOBURN	22 PROSPECT ST	120 DY	9/27/1999	RAO	1/24/2000		A2	Oil
3-0013126	NEAR GILL ST	WOBURN	22 SIXTH RD	120 DY	11/8/1995	DPS	5/24/1996			Hazardous Material
3-0003311	GASOLINE STATION FMR	WOBURN	22 WINN ST	NONE	10/15/1990	RAO	10/12/1999	PHASE III	A2	Oil
3-0000671	GLOBE TICKET CO	WOBURN	222 NEW BOSTON ST	NONE	10/15/1988	DEPNDS	5/23/1996			
3-0015393	BOSTON EDISON	WOBURN	225 MERRIMAC ST	TWO HR	8/6/1997	RAO	10/6/1997		A1	Oil
3-0001966	INDUSTRIAL PROPERTY	WOBURN	225 WILDWOOD AVE	NONE	1/15/1989	RAO	1/31/1997	PHASE III	B2	Oil
3-0013444	JJ RILEY/BEATRICE	WOBURN	228 SALEM ST	TWO HR	2/12/1996	RAO	8/14/1996		A1	Hazardous Material
3-0000482	JOHN J RILEY CO BEATRICE	WOBURN	228 SALEM ST	NONE	1/15/1987	RAO	3/9/1994		NC	
3-0002684	GULF TEXACO	WOBURN	229 LEXINGTON ST	NONE	1/15/1990	RAO	8/1/1996	PHASE II	A2	
3-0014776	INDUSTRIAL SITE	WOBURN	23 ATLANTIC AVE	TWO HR	1/29/1997	RAO	4/9/1997		A2	
3-0000853	MOBIL SERVICE STATION 01 006	WOBURN	23 PLEASANT ST	NONE	3/8/1987	RAO	6/20/1996		A2	Oil
3-0004671	FOWLE CO	WOBURN	235 SALEM ST	NONE	10/1/1993	RAO	12/27/1994		A1	Oil
3-0021905	NO LOCATION AID	WOBURN	24 NEW BOSTON RD	TWO HR	6/30/2002	UNCLASSIFIED	6/30/2002			Oil
3-0019759	NO LOCATION AID	WOBURN	24 THRU 26 CONN ST	120 DY	7/20/2000	RAO	4/9/2001		A3	Hazardous Material
3-0019664	NO LOCATION AID	WOBURN	24 TO 26 CONN ST	TWO HR	6/23/2000	RAO	4/9/2001			Hazardous Material
3-0019646	BOSTON EDISON STATION 211	WOBURN	240 POND ST	TWO HR	6/19/2000	RAO	7/27/2000		A2	Oil
3-0021665	NSTAR STA 211 TRAN 14A	WOBURN	240 POND ST	120 DY	4/11/2002	RAO	4/29/2002		A2	Oil
3-0004118	SHAKER GLEN VILLAGE BLDG 6&11	WOBURN	241 LEXINGTON ST	NONE	10/15/1992	RAO	6/7/1994			
3-0001736	PROPERTY	WOBURN	25 OLYMPIA AVE	NONE	8/25/1986	DEPNFA	2/6/1997			
3-0020410	MURPHYS WASTE OIL	WOBURN	252 SALEM ST	TWO HR	2/19/2001	RAO	4/13/2001		A2	Oil
3-0020932	MURPHYS WASTE OIL	WOBURN	252 SALEM ST	TWO HR	7/23/2001	RAO	9/28/2001		A2	Oil
3-0002198	MURPHYS WASTE OIL SERVICES	WOBURN	252 SALEM ST	NONE	10/15/1989	ADEQUATE REG	8/2/1996			
3-0010277	NO LOCATION AID	WOBURN	252 SALEM ST	TWO HR	12/7/1993	RAO	1/21/1994		A2	Oil
3-0014372	NO LOCATION AID	WOBURN	256 SALEM ST	TWO HR	10/21/1996	ADEQUATE REG	10/21/1997			
3-0000534	WHITNEY BARREL CO	WOBURN	256 SALEM ST	NONE	12/1/1986	ADEQUATE REG	3/6/1997			Oil

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3-0010691	NO LOCATION AID	WOBURN	263 SALEM ST	120 DY	1/27/1994	DEF TIER 1B	3/3/1995			Oil and Hazardous Material
3-0004336	COMMERCIAL INDUSTRIAL PROPERTY	WOBURN	268 MISHAWUM RD	NONE	7/15/1993	RAO	5/25/1999	PHASE II	A1	Oil
3-0018135	NO LOCATION AID	WOBURN	27 TORRICE DR	120 DY	3/26/1999	DPS	3/26/1999			Hazardous Material
3-0012006	LECHMERE WAREHOUSE	WOBURN	275 WILDWOOD ST	TWO HR	12/27/1994	RAO	4/26/1995		A2	Oil
3-0001146	ABERJONA AUTO PARTS	WOBURN	278 SALEM ST	NONE	1/15/1987	ADEQUATE REG	8/2/1995			
3-0018212	NO LOCATION AID	WOBURN	28 WEBSTER ST	120 DY	4/20/1999	RAO	4/25/2000		A2	Oil & Hazardous Material
3-0019498	NO LOCATION AID	WOBURN	28 WEBSTER ST	120 DY	4/25/2000	DPS	4/25/2000			Hazardous Material
3-0004693	BOSTON EDISON CO	WOBURN	285 LOCUST ST	NONE	10/1/1993	RAO	7/28/2000	PHASE IV	A2	
3-0004442	LANNAN CHEVROLET & OLDS	WOBURN	29-33 39 WINN ST	NONE	7/15/1993	RAO	7/29/1997			
3-0014266	NO LOCATION AID	WOBURN	295 MISHAWAUM RD	120 DY	9/23/1996	DPS	11/22/1996			Oil
3-0012279	NO LOCATION AID	WOBURN	295 SALEM ST	72 HR	3/17/1995	TIER 1C	3/15/1996	PHASE II		Oil
3-0004015	PROPERTY	WOBURN	299 MISHAWUM RD	NONE	7/15/1992	DEPNDS	6/20/1996			Oil
3-0000195	SUTHERLAND FOUNDRY	WOBURN	3 ABERJONA DR	NONE	1/15/1987	RAO	3/13/1997			
3-0014659	WYMAN STREET	WOBURN	3 BRAE CIR	72 HR	12/23/1996	RAO	12/30/1997		A2	Oil
3-0011396	NO LOCATION AID	WOBURN	3 FOREST GLEN CIR	TWO HR	7/30/1994	RAO	9/30/1994		A2	Oil
3-0012942	AT MAIN ST	WOBURN	3 GREEN ST	72 HR	9/18/1995	DEF TIER 1B	9/25/1996			Oil
3-0000595	WEYERHAUSER CORP	WOBURN	3 WHEELING AVE	NONE	6/24/1986	RAO	9/24/1999	PHASE IV	C	Oil
3-0014348	TANK #8	WOBURN	30 COMMERCE WAY	120 DY	9/30/1996	RAO	12/4/1996		A2	Oil
3-0013856	UST #7	WOBURN	30 COMMERCE WAY	72 HR	6/5/1996	RAO	12/4/1996		A2	Oil
3-0000171	AMERICAN SHOE MACHINERY	WOBURN	30 NASHUA ST	NONE	1/15/1990	TIER 2	8/9/1996	PHASE II		
3-0001932	EXXON FMR	WOBURN	300 CAMBRIDGE ST	NONE	1/15/1989	RAO	11/22/1994		A2	
3-0003794	WOBURN MALL WETLANDS AREA	WOBURN	300 MISHAWUM RD	NONE	11/22/1991	RAO	6/17/2000	PHASE III	B2	Oil
3-0011600	CHARETTES	WOBURN	31 OLYMPIA AVE	72 HR	9/16/1994	RTN CLOSED	9/15/1995			Oil
3-0003377	CHARRETTE	WOBURN	31 OLYMPIA AVE	NONE	1/15/1991	RAO	4/12/2002		A3	
3-0000979	GETTY STATION	WOBURN	310 MAIN ST	NONE	1/15/1990	PENNFA	8/9/1996			
3-0001264	NEW ENGLAND RESINS & PIGMENT	WOBURN	316 NEW BOSTON ST	NONE	1/15/1987	LSPNFA	10/28/1994			
3-0003664	GETTY SERVICE STATION	WOBURN	317 MONTVILLE AVE	NONE	7/15/1991	RAO	5/28/1996			
3-0019485	NO LOCATION AID	WOBURN	32 SYLVANUS WOOD LANE	120 DY	4/27/2000	RAO	7/6/2000		A2	Oil
3-0017904	PEACH ORCHARD ST	WOBURN	32 WEBSTER ST	TWO HR	2/4/1999	TIER 2	2/5/2001	PHASE II		Oil & Hazardous Material
3-0013520	EXXON STATION	WOBURN	322 MONTVALE AVE	TWO HR	3/4/1996	RAO	2/21/1997	PHASE II	A3	Oil
3-0019814	NO LOCATION AID	WOBURN	322 MONTVALE AVE	120 DY	8/1/2000	TIER 2	7/11/2001	PHASE II		Hazardous Material
3-0004547	FUEL TRANSF & STORAGE FACFMR	WOBURN	324 NEW BOSTON ST	NONE	10/1/1993	RAO	7/26/1995		A2	
3-0012666	NO LOCATION AID	WOBURN	324 NEW BOSTON ST	120 DY	7/7/1995	RAO	7/7/1995		B1	Hazardous Material
3-0001266	RESTAURANT	WOBURN	325 MONTVALE AVE	NONE	1/15/1990	DPS	3/14/1997			
3-0011780	AT CEDAR	WOBURN	325 WASHINGTON ST	TWO HR	10/27/1994	RAO	5/8/1995		A1	Oil
3-0004067	GETTY SERVICE STATION	WOBURN	325 WASHINGTON ST	NONE	10/15/1992	TIER 1C	9/3/1997	PHASE IV		Oil
3-0018530	NO LOCATION AID	WOBURN	331 MONTVALE AVE	120 DY	7/14/1999	TIER 2	7/17/2000	PHASE IV		Oil & Hazardous Material
3-0002642	DESTAFANO STUDIOS	WOBURN	34 COMMERCE WAY	NONE	1/15/1990	DPS	12/5/1996			
3-0012647	WOBURN PLAZA	WOBURN	344-400 CAMBRIDGE ST	120 DY	6/30/1995	TIER 1C	7/13/2000	PHASE V		Hazardous Material
3-0019128	CONTINENTAL METAL PRODUCTS	WOBURN	35 OLYMPIA AVE	TWO HR	1/1/2000	RAO	1/14/2000		A1	Oil
3-0018931	WOBURN PLAZA	WOBURN	356 CAMBRIDGE ST	120 DY	10/28/1999	RAO	10/27/2000		B1	Hazardous Material
3-0015592	Y&M WOBURN PLAZA	WOBURN	356 CAMBRIDGE ST	TWO HR	10/3/1997	RTN CLOSED	10/2/1998	PHASE IV		Hazardous Material
3-0020604	HORN POND PLAZA	WOBURN	358 CAMBRIDGE RD	TWO HR	4/19/2001	RAO	6/15/2001		A1	Oil

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3-0004105	DIGITAL EQUIPMENT CORP	WOBURN	36 CABOT ST	NONE	10/15/1992	RAO	1/31/1995			Oil
3-0013628	SZYMANSKI RESIDENCE	WOBURN	36 DAY CIR	TWO HR	4/3/1996	RAO	5/30/1996		A2	Oil
3-0021944	NO LOCATION AID	WOBURN	36 SIXTH ROAD	72 HR	7/17/2002	UNCLASSIFIED	7/17/2002			Oil
3-0022117	NO LOCATION AID	WOBURN	36 SIXTH ROAD	120 DY	9/16/2002	UNCLASSIFIED	9/16/2002			Hazardous Material
3-0019795	EG BARKER LUMBER	WOBURN	36-40 PROSPECT ST	120 DY	7/27/2000	TIER 2	8/3/2001	PHASE III		Oil
3-0001423	W R GRACE CRYOVAC	WOBURN	369 WASHINGTON ST	NONE	1/15/1987	ADEQUATE REG	3/13/1998			Oil
3-0010759	REAR OF 36 WINTER ST, WOBURN	WOBURN	36R WINTER ST	TWO HR	3/28/1994	RAO	5/31/1994		A1	Oil
3-0012665	NO LOCATION AID	WOBURN	38 ROBINSON RD	72 HR	7/10/1995	RAO	9/14/1995		A1	Oil
3-0001734	INDEPENDENT TALLOW CO INCFMR	WOBURN	39 CEDAR ST	NONE	1/15/1987	DEPNDS	7/23/1993			
3-0018789	VACANT LOT	WOBURN	39 CEDAR ST	120 DY	9/23/1999	TIER 2	9/29/2000	PHASE II		Oil & Hazardous Material
3-0014657	WARREN FORIEGN MOTORS	WOBURN	394 WASHINGTON ST	TWO HR	12/21/1996	RAO	2/7/1997		A1	Oil
3-0002365	HY TROUS CO	WOBURN	3R GREEN ST	NONE	1/28/1988	RAO	5/30/2001		A2	
3-0019845	PHEASANT LANE	WOBURN	4 BROOK RD	72 HR	8/17/2000	RAO	10/6/2000		A1	Oil & Hazardous Material
3-0001881	COMMERCIAL PROPERTY	WOBURN	4 FEDERAL ST	NONE	1/15/1989	DEPNFA	4/5/1996			
3-0015280	RESIDENCE	WOBURN	4 LEXINGTON ST	TWO HR	7/7/1997	RAO	8/8/1997		A2	Oil
3-0011390	PROPERTY	WOBURN	4 WHEELING AVE	120 DY	8/11/1994	RAO	8/7/2002	PHASE IV	C	Hazardous Material
3-0004824	LANNAN CHEVROLET & OLDS	WOBURN	40 WINN ST	NONE	10/1/1993	WCSPRM	3/1/1995			Oil
3-0019915	NO LOCATION AID	WOBURN	400 WASHINGTON ST	TWO HR	9/8/2000	RAO	12/7/2000		A1	Oil & Hazardous Material
3-0018729	WEST MARINE	WOBURN	406 WASHINGTON ST	TWO HR	9/10/1999	RAO	11/9/1999		A1	Oil
3-0012506	INDUSTRIPLEX	WOBURN	41 ATLANTIC AVE	TWO HR	5/24/1995	RAO	9/29/1995		A1	Oil
3-0020768	NO LOCATION AID	WOBURN	415 WILDWOOD AVE	120 DY	6/8/2001	DEF TIER 1B	6/17/2002			Oil
3-0018051	NO LOCATION AID	WOBURN	415 WILDWOOD ST	TWO HR	3/4/1999	RAO	3/13/2000		A1	Oil
3-0015803	WOBURN HOUSING AUTHORITY	WOBURN	44 LIBERTY AVE	TWO HR	12/9/1997	RAO	2/10/1998		A2	Oil
3-0020558	REAR OF PROPERTY	WOBURN	47 HENSHAW ST	120 DY	3/26/2001	RAO	3/26/2001		B1	Oil
3-0012478	REAR LOT	WOBURN	470 WILDWOOD DR	TWO HR	5/16/1995	RAO	7/6/1995		A2	Oil
3-0015665	BELL ATLANTIC	WOBURN	475 WILDWOOD AVE	72 HR	10/29/1997	RAO	9/14/2000	PHASE II	A2	Oil
3-0016630	BELL ATLANTIC LEASED GARAGE	WOBURN	475 WILDWOOD AVE	120 DY	3/30/1998	RTN CLOSED	10/4/1999			Oil
3-0001572	BEST PETROLEUM STATION 2	WOBURN	477 MAIN ST RTE 38	NONE	4/4/1988	RAO	7/18/2001		A2	Oil
3-0013093	NO LOCATION AID	WOBURN	479-481 WILDWOOD AVE	120 DY	10/26/1995	RAO	10/16/1996		B1	Hazardous Material
3-0019740	DIAMOND TRUCKING	WOBURN	48 6TH RD	TWO HR	7/19/2000	RAO	9/19/2000		A1	Oil
3-0019371	NO LOCATION AID	WOBURN	481 WILDWOOD AVE	TWO HR	3/15/2000	RAO	9/11/2000		A2	Oil
3-0012114	DS SERVICE CENTER	WOBURN	482 WASHINGTON ST	72 HR	1/24/1995	DEF TIER 1B	1/31/1996			Oil
3-0018754	NO LOCATION AID	WOBURN	485 WILDWOOD AVE	TWO HR	9/16/1999	RAO	9/21/1999		A1	
3-0004000	GENERAL PLASMA	WOBURN	5 DRAPER RD	NONE	10/15/1992	RAO	11/12/1996		B1	Hazardous Material
3-0000477	VAC CENT	WOBURN	5 GREEN ST	NONE	1/15/1987	DEPNFA	7/23/1993			
3-0004788	COMMERCIAL PROPERTY	WOBURN	5 SYLVAN RD	NONE	10/1/1993	LSPNFA	6/7/1994			Oil
3-0002079	PROPERTY	WOBURN	5 WHEELING AVE	NONE	4/15/1989	WCSPRM	8/20/1996			Oil
3-0015002	NO LOCATION AID	WOBURN	50 HIGH ST	72 HR	4/14/1997	TIER 2	11/12/1999			Oil
3-0021689	NO LOCATION AID	WOBURN	50 HIGH ST	72 HR	4/17/2002	RTN CLOSED	6/20/2002			Oil
3-0021962	NO LOCATION AID	WOBURN	50 HIGH ST	72 HR	7/24/2002	UNCLASSIFIED	7/24/2002			Oil
3-0002256	VINCO HEATING SUPPLY CO	WOBURN	50 HIGH ST	NONE	6/15/1989	TIER 2	11/12/1999	PHASE II		
3-0013836	WOBURN DPW CITY BARN	WOBURN	50 NORTH WARREN ST	72 HR	5/31/1996	TIER 2	6/6/1997	PHASE II		Hazardous Material
3-0000475	OIL DEPOT FMR	WOBURN	50 STURGIS ST	NONE	3/20/1985	TIER 1A	10/1/1993			

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3-0001512	CITGO STATION	WOBURN	505 MAIN ST	NONE	10/15/1988	PENNFA	12/3/1993			
3-0012606	OFF RTE 38 JUST N OF WOBURN TOWN LINE	WOBURN	5-17 CRANES CT	120 DY	6/20/1995	RAO	5/22/1996	PHASE IV	C	Hazardous Material
3-0003630	SERVICE STATION	WOBURN	529 MAIN ST	NONE	7/15/1991	RAO	8/11/1997			
3-0002680	COMMERCIAL PROPERTY	WOBURN	544 MAIN ST	NONE	1/15/1990	RTN CLOSED	10/14/1999			
3-0018178	NO LOCATION AID	WOBURN	545 MAIN ST	72 HR	4/9/1999	RTN CLOSED	3/3/2000	PHASE III		Oil
3-0002455	LUKIES SUNOCO SERVICE	WOBURN	545 MAIN ST CHURCH ST	72 HR	1/15/1990	TIER 2	8/9/1996	PHASE IV		
3-0003495	PROPERTY	WOBURN	56 HOLTON ST	NONE	4/15/1991	DEPNFA	6/19/1996			Oil
3-0003996	COUNTRY CLUB GARDENS APARTMENT	WOBURN	57 MILL ST	NONE	7/15/1993	RAO	8/8/1997	PHASE II	A2	Oil
3-0019134	NO LOCATION AID	WOBURN	57 WINN ST	120 DY	12/31/1999	TIER 2	1/5/2001	PHASE II		Oil
3-0019909	NO LOCATION AID	WOBURN	57 WINN ST	72 HR	9/7/2000	TIER 2	1/5/2001	PHASE II		Oil
3-0020811	NO LOCATION AID	WOBURN	57 WINN ST	120 DY	4/6/2001	RTN CLOSED	6/29/2001			Oil
3-0022048	NO LOCATION AID	WOBURN	60 OLYMPIA AVE	TWO HR	8/22/2002	UNCLASSIFIED	8/22/2002			Oil
3-0000594	OLYMPIA NOMINEE TRUST	WOBURN	60 OLYMPIA AVE	NONE	8/18/1986	TIER 1B	1/10/1996			Hazardous Material
3-0013442	WASHINGTON ST	WOBURN	60 OLYMPIA AVE	TWO HR	2/12/1996	RAO	4/12/1996		A1	Oil
3-0000476	TANNERY FMR	WOBURN	60 SOUTH BEDFORD ST	NONE	7/30/1986	DEF TIER 1B	8/9/1995			
3-0018597	NO LOCATION AID	WOBURN	62 HOLTON ST	TWO HR	8/5/1999	RAO	10/1/1999		A2	Hazardous Material
3-0010578	NO LOCATION AID	WOBURN	64 INDUSTRIAL PARK WAY	TWO HR	2/14/1994	RAO	2/21/1997	PHASE II	A1	Hazardous Material
3-0004505	INDUSTRIAL PROPERTY	WOBURN	64 INDUSTRIAL PKWY	NONE	7/15/1993	DPS	8/11/1997			
3-0002439	VAC HYD	WOBURN	65 HOLTON ST	NONE	1/15/1990	RAO	4/22/1994			
3-0001262	SEVERANCE TRUCKING CO	WOBURN	7 WALNUT HILL RD	NONE	5/14/1993	RAO	8/7/2000		A2	Hazardous Material
3-0012939	POLE 191-9/1X	WOBURN	7 WINN PARK	TWO HR	9/18/1995	RAO	11/17/1995		A1	Oil
3-0014063	LOT 8-69967	WOBURN	70 DRAGON CT	120 DY	7/29/1996	RAO	11/2/1998	PHASE II	B2	Hazardous Material
3-0018820	BURKES GARAGE	WOBURN	71 MAIN ST	72 HR	10/1/1999	TIER 1C	10/4/2000	PHASE II		Oil
3-0014818	NO LOCATION AID	WOBURN	73 MAIN ST	120 DY	2/11/1997	DPS	2/18/1998			Hazardous Material
3-0003961	MOTORS ELECTRONICS & CONTROL	WOBURN	73 OLYMPIA AVE	NONE	7/15/1992	LSPNFA	2/4/1994			Oil
3-0015336	NO LOCATION AID	WOBURN	74-110 COMMERCE WAY	120 DY	7/28/1997	RAO	2/18/1998		A2	Oil & Hazardous Material
3-0013604	PROPERTY	WOBURN	75 MAIN ST	120 DY	3/20/1996	TIER 1C	5/22/1997	PHASE II		Oil & Hazardous Material
3-0020469	NO LOCATION AID	WOBURN	78 DRAGON CT	TWO HR	3/13/2001	RAO	7/18/2001		A1	Oil
3-0002456	E V YEUELL INC	WOBURN	8 ADELE RD	NONE	1/15/1990	DEPNDS	7/23/1993			
3-0000121	CHOMERICS	WOBURN	8 COMMONWEALTH AVE	NONE	10/15/1990	RAO	7/27/1995			
3-0019894	CHOMERICS PARKING LOT	WOBURN	8 COMMONWEALTH AVE	TWO HR	8/31/2000	RAO	8/31/2001		A1	
3-0010733	NO LOCATION AID	WOBURN	8 COMMONWEALTH AVE	TWO HR	3/23/1994	RAO	5/20/1994		A1	Hazardous Material
3-0021596	NO LOCATION AID	WOBURN	8 DRAPER ST	TWO HR	3/21/2002	RAO	5/7/2002		A1	Oil
3-0017242	STAPLES WAREHOUSE	WOBURN	80 COMMERCE WAY	TWO HR	9/1/1998	RAO	10/19/1998		A2	Oil
3-0000731	PROPERTY	WOBURN	8-10 GREEN ST	NONE	10/15/1988	RAO	5/19/2000		B2	
3-0010002	MARSHALLS	WOBURN	83 COMMERCE WAY	72 HR	10/1/1993	RAO	10/15/1997	PHASE II	A2	Oil
3-0014869	MARSHALLS-COOLING TOWER AREA	WOBURN	83 COMMERCE WAY	120 DY	2/14/1997	RAO	2/18/2000	PHASE II	A2	Oil
3-0018041	NO LOCATION AID	WOBURN	91 CENTRAL ST REAR	120 DY	2/25/1999	RAO	3/1/1999		B1	Hazardous Material
3-0001732	RESTAURANT	WOBURN	921 BOYLSTON ST	NONE	7/15/1987	DEPNFA	7/23/1993			
3-0019427	MAIN ST AUTO	WOBURN	936 MAIN ST	120 DY	3/31/2000	RAO	8/26/2002		A3	Oil & Hazardous Material
3-0021848	BETWEEN NICHOLS AND ALTAVISTA	WOBURN	954 MAIN ST	TWO HR	6/13/2002	UNCLASSIFIED	6/13/2002			Oil

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3-0000479	WELLS G&H	WOBURN	ABERJONA RIVER VALLEY	NONE	1/15/1987	TIER 1A	10/1/1993			
3-0014639	INDUSTRIPLEX SITE	WOBURN	ATLANTIC AVE	72 HR	12/11/1996	ADEQUATE REG	12/11/1996			Oil
3-0013017	INDUSTRIAL PARK	WOBURN	ATLANTIC AVE/COMMERCE WAY	TWO HR	10/9/1995	RAO	12/7/1995		A1	Oil
3-0014616	POLE # 612/10	WOBURN	ATLANTIC WAY	TWO HR	12/11/1996	RAO	2/5/1997		A2	Oil
3-0012396	NO LOCATION AID	WOBURN	COMMERCE AND ATLANTIC	TWO HR	4/17/1995	RAO	7/21/1995			Hazardous Material
3-0001731	INDUSTRI PLEX 128	WOBURN	COMMERCE WAY ATLANTIC AVE	NONE	1/15/1987	TIER 1A	10/1/1993			Oil
3-0021448	BETWEEN MAIN AND JOHN STREETS	WOBURN	CONNECTICUT ST	TWO HR	1/31/2002	RAO	3/26/2002		A1	Oil
3-0011710	POWER STATION BY THE HORN POND	WOBURN	COVE ST	TWO HR	10/8/1994	RAO	10/9/1998	PHASE IV	A3	Oil
3-0012481	SUBSTATION #211	WOBURN	COVE ST	72 HR	5/17/1995	RAO	12/15/1995		B1	Hazardous Material
3-0002819	BOSTON EDISON SUBSTATION	WOBURN	COVE ST POND ST STATION 211	NONE	1/15/1992	RAO	10/9/1998	PHASE II	A3	
3-0019323	PETTIGLIO TERRACE	WOBURN	E NICHOLS ST APP CT	TWO HR	2/26/2000	RAO	4/28/2000		A1	Oil
3-0000150	NORTH WOBURN INDUSTRIAL PARK	WOBURN	GILL ST SIXTH RD	NONE	1/15/1987	RAO	7/30/1998			Oil
3-0001737	ATLANTIC GELATIN	WOBURN	HILL ST	NONE	1/15/1987	RAO	11/8/1999	PHASE V	C	Oil
3-0010603	ATLANTIC GELATIN	WOBURN	HILL ST	TWO HR	2/21/1994	RAO	2/21/1995		A1	Oil
3-0011337	ATLANTIC GELATIN	WOBURN	HILL ST	TWO HR	7/21/1994	RAO	11/22/1994		A1	Hazardous Material
3-0013270	GENERAL FOODS	WOBURN	HILL ST	TWO HR	12/12/1995	RAO	2/21/1996		A1	Oil
3-0001099	GENERAL FOODS ATLANTIC GELATIN	WOBURN	HILL ST	NONE	1/15/1990	DPS	2/3/2000	PHASE II		
3-0015970	KRAFT FOODS INC	WOBURN	HILL ST	TWO HR	2/2/1998	RAO	4/3/1998		A1	Hazardous Material
3-0019962	NO LOCATION AID	WOBURN	HILL ST	TWO HR	9/21/2000	RTN CLOSED	9/26/2001			Hazardous Material
3-0000180	PROPERTY	WOBURN	HOLTEN ST	NONE	1/15/1987	DEPNFA	3/5/1997			
3-0021113	LAKE AVE	WOBURN	LAKE ST	TWO HR	9/27/2001	RAO	11/15/2001		A2	Oil
3-0010175	POLE # 617/1	WOBURN	LINSCOTT RD	TWO HR	11/10/1993	RAO	3/2/1995		A1	Oil
3-0001890	UNDERCOVERWEAR	WOBURN	LOT 2A 1 PRESIDENTIAL DR	NONE	1/15/1989	TIER 2	8/9/1995	PHASE II		
3-0014666	HALF MILE EAST OF WOBURN ST	WOBURN	LOT 8 PRESIDENTIAL WAY	120 DY	12/24/1996	TIER 2	12/26/1997	PHASE II		Hazardous Material
3-0002518	UNDERCOVERWEAR	WOBURN	LOTS 4-4A PRESIDENTIAL DR	NONE	1/15/1990	WCSPRM	1/30/1992			Oil
3-0003292	UNDERCOVERWEAR	WOBURN	LOTS 7 7A PRESIDENTIAL DR	NONE	10/15/1990	LSPNFA	3/28/1996			Oil
3-0020029	WOBURN WRTC	WOBURN	MBTA COMMUTER RAIL LINE	120 DY	10/10/2000	RAO	6/22/2001		A2	Hazardous Material
3-0015197	@ NO MAPLE ST	WOBURN	MERRIMAC ST	TWO HR	6/12/1997	RAO	10/15/1997		A2	Oil
3-0011750	AT UNIVERSITY ST	WOBURN	MIDDLE ST	TWO HR	10/19/1994	RAO	11/21/1994		A1	Oil
3-0001735	MBTA PROPERTY	WOBURN	MISHAWUM RD	NONE	1/15/1987	DEPNFA	7/23/1993			
3-0000474	DUNDEE PARK SOUTHERN PORTION	WOBURN	NEW BOSTON ST	NONE	1/15/1987	ADEQUATE REG	5/23/1996			Oil
3-0021996	NO LOCATION AID	WOBURN	NEW BOSTON ST	TWO HR	8/2/2002	RAO	8/13/2002		A2	
3-0001092	STAFFORD MFG CO	WOBURN	NEW BOSTON ST	NONE	1/15/1990	ADEQUATE REG	8/2/1996			
3-0019334	INTERSECTION AT RYAN RD	WOBURN	NEW INDUSTRIAL RD	TWO HR	3/3/2000	RAO	6/1/2000		A1	Oil
3-0017377	EXIT 36	WOBURN	RTE 128 SOUTH	TWO HR	10/5/1998	RAO	12/10/1998		A2	Oil
3-0020071	EXIT 37	WOBURN	RTE 128 SOUTH	TWO HR	10/30/2000	RAO	1/11/2001		A1	Oil
3-0014203	EXIT FR RTE 128	WOBURN	RTE 38 ROTARY	TWO HR	9/6/1996	RAO	9/16/1997		A2	Hazardous Material
3-0018749	NO LOCATION AID	WOBURN	RTE 39/MAIN ST	TWO HR	9/15/1999	RAO	12/9/1999		A1	Hazardous Material
3-0019176	AT INTERSECTION OF RTE 128	WOBURN	RTE 93 NORTH	TWO HR	1/19/2000	RAO	3/14/2000		A1	Oil
3-0013743	AT MONTVALE AVE	WOBURN	RTE 93 NORTH	TWO HR	5/9/1996	RAO	7/9/1996		A1	
3-0020835	EXIT 37C RAMP	WOBURN	RTE 93 NORTH	TWO HR	6/24/2001	RAO	8/17/2001		A2	Oil
3-0021519	NO LOCATION AID	WOBURN	RTE 93 SOUTH	TWO HR	2/26/2002	RAO	5/3/2002		A1	Oil
3-0011061	NO LOCATION AID	WOBURN	RTE 93N FROM SOMERVILLE	TWO HR	3/27/1994	RAO	8/1/1994		A1	Oil

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3-0014663	INTERCHANGE	WOBURN	RTE 93S & 128N	TWO HR	12/24/1996	RAO	2/3/1997		A1	Oil
3-0021232	CAMBRIDGE RD	WOBURN	RUSSELL ST	TWO HR	11/2/2001	RAO	11/2/2001		A1	Oil
3-0000645	BLUEBERRY HILL QUARRY FMR	WOBURN	SEVEN MICRO DR	NONE	1/15/1990	DEPNFA	4/16/1996			
3-0015013	WINNING FARM INC	WOBURN	THORNBERRY RD	120 DY	4/23/1997	ADEQUATE REG	6/3/1999	PHASE II		Oil & Hazardous Material
3-0011870	INDUSTRIAL PARK	WOBURN	WASHINGTON ST	TWO HR	11/18/1994	RAO	2/13/1995		A2	Oil
3-0014128	OFF SALEM ST POLE 31-1/1X	WOBURN	WINN PARK	TWO HR	8/18/1996	RAO	10/17/1996		A1	Oil
3-0014439	@ MONTVALE AVE	WOBURN	WOOD AVE	TWO HR	10/28/1996	RAO	7/14/1997		A1	Oil

## MADEP DATABASE DEFINITIONS

The WSC\_ALL database is a combination of reportable releases tracked in the Front-End and Sites databases by MADEP. This information is updated monthly. The following definitions identify the information contained in each column of the Appendix B table.

(Source: MADEP Waste Site Cleanup Website)

1. **RTN**: Region # (1,2,3,4) followed by a dash and a unique 7 digit number.
2. **Location Aid**: Describes the site in terms of its location, use, or type (Bob's Gas Station" or "Across from Building 1").
3. **Town**: The city or town where the release of oil or hazardous material occurred.
4. **Address**: The street and number that most accurately describes the release location (mile marker or similar highway designations are used when appropriate).
5. **Category**: How quickly a release must be reported to DEP. The potential severity of a release dictates how soon it must be reported. Reporting categories are 2 hours, 72 hours, and 120 days.
6. **Notification date**: The date DEP uses to establish 21E deadlines. This date is usually the date when the site/release was reported to DEP. However, for some sites, especially those dating before 1993, the notification date may be later than the date DEP first learned about the site.
7. **Status**: 21E sites compliance status definitions:
  - **ADREG** (Adequately Regulated): A site/release where response actions are deemed adequately regulated under another DEP program or by another government agency.
  - **DPS** (Downgradient Property Status): A site where a DPS submittal to DEP has stated that contamination is coming from an upgradient property.
  - **PRECLASSIFIED**: A release that has not reached it Tier Classification deadline (usually one year after it was reported), and where an RAO Statement, DPS Submittal, or Tier Classification Submittal has not been received by DEP.
  - **RAO** (Response Action Outcome): A site/release where an RAO Statement was submitted. An RAO Statement asserts that response actions were sufficient to achieve a level of no significant risk or at least ensure that all substantial hazards were eliminated.

- **RTN CLOSED:** Future response actions addressing the release associated with this Release Tracking Number (RTN) will be conducted as part of the response actions planned for the site under another “primary” RTN.
- **TCLASS (Tier Classification):** A site/release where a Tier Classification Submittal was received, but the classification type has not been confirmed by DEP.

*Note: Sites are usually Tier Classified using the Numerical Ranking System (NRS). The NRS scores sites on a point system based on a variety of factors. These include the site’s complexity, the type of contamination, and the potential for human or environmental exposure to the contamination. In addition, some sites are automatically classified as Tier 1 if they pose an imminent hazard, affect public water supplies, or miss regulatory deadlines.*

- **TIER 1A:** A site/release receiving a total score equal to or greater than 550. These sites/releases require a permit and the person undertaking response actions must do so under direct DEP supervision.
- **TIER 1B:** A site/release where an NRS score of less than 550 and equal to or greater than 450. These sites/releases also require a permit, but response actions may be performed under the supervision of a Licensed Site Professional (LSP) without prior DEP approval.
- **TIER 1C:** A site/release receiving a total NRS score of less than 450 and equal to or greater than 350. A site/release receiving a total NRS score of less than 350, but which also meets any of the Tier 1 Inclusionary Criteria specified in 310 CMR 40.0520(2)(a), is also classified a Tier 1C. These sites/releases also require a permit, but response actions may be performed under the supervision of an LSP without prior DEP approval.
- **TIER 2:** A site/release receiving a total NRS score of less than 350, unless the site meets any of the Tier 1 Inclusionary Criteria (see above). Permits are not required at Tier 2 sites/releases and response actions may be performed under the supervision of an LSP without prior DEP approval. All pre-1993 transition sites that have accepted waivers are categorically Tier 2 sites.

- **DEF TIER 1B** (Default Tier 1B): A site/release where the responsible party fails to provide a required submittal to DEP by a specified deadline.

*The following definitions apply to sites that were reported to DEP prior to October 1993 and which were regulated under an older version of the MCP:*

- **NFA** (No Further Action): NFA means that response actions were conducted and DEP determined that no further action was needed for this site.
- **NDS** (Not a Disposal Site): NDS means that DEP has determined that these locations did not need to be reported and are not disposal sites.
- **PENDING**: Pending means that DEP is waiting for a required action to be fulfilled.
- **PENDING NFA**: Pending No Further Action means that a document was submitted to DEP asserting that a site assessment has determined that no further action is required. These submittals are considered pending until DEP audits them.

8. **Date**: The date a release/site was listed as its current compliance status.

9. **Phase**: Indicates the release/site cleanup phase:

- **PHASE I**: Initial Site Investigation, including Tier Classification. In this phase, samples are collected and analyzed to determine the types, amounts, and location of contaminants.
- **PHASE II**: Comprehensive Site Assessment. During Phase II, the risks posed to public health, welfare, and the environment are determined.
- **PHASE III**: Identification, Evaluation, and Selection of Comprehensive Remedial Action Alternatives and the Remedial Action Plan. In Phase III, cleanup options are assessed and a cleanup plan is selected.
- **PHASE IV**: Implementation of the Selected Remedial Action Alternative and Remedy Implementation Plan. The cleanup plan is implemented in Phase IV.

- **PHASE V:** Operation, Maintenance, and/or Monitoring. During Phase V, long-term treatment processes are implemented and monitored to track cleanup progress.

10. **RAOClass:** The class of Response Action Outcome submitted to DEP:

- **CLASS A RAO:** Remedial work was completed and a level of “no significant risk” has been achieved.
- **CLASS B RAO:** Site assessment indicates that “no significant risk” exists. No remedial work was necessary.
- **CLASS C RAO:** A temporary cleanup. Although the site does not present a “substantial hazard”, it has not reached a level of no significant risk. The site must be evaluated every 5 years to determine whether a Class A or Class B RAO is possible. All sites are expected to eventually receive a Class A or Class B RAO.

11. **OHM:** This field lists the type of oil or hazardous material that is present at the site.

**APPENDIX E**  
**REPORTED RELEASE INFORMATION FOR CANDIDATE SITES**

**REPORTED RELEASE INFORMATION FOR CANDIDATE SITES**  
(see Table 5-1 and Figure 5-1)

MAP #	SITE LOCATION	RTN	CHEMICAL	AMOUNT	UNITS
1	37 CALUMET RD	3-0018920	UNKNOWN CHEMICAL OF UNKNOWN TYPE	34000	MG/KG
2	50 CROSS ST	3-0012909	2-PENTANONE, 4-METHYL-	221.4	UG/G
2	50 CROSS ST	3-0012909	BENZENE, DIMETHYL	9197	UG/L
2	50 CROSS ST	3-0012909	ETHANE, 1,1,2-TRICHLORO-	35.536	UG/G
2	50 CROSS ST	3-0012909	ETHENE, 1,1-DICHLORO-	17	UG/L
2	50 CROSS ST	3-0012909	ETHENE, TRICHLORO-	10	UG/L
2	50 CROSS ST	3-0012909	UNKNOWN CHEMICAL OF TYPE - HAZARDOUS MATERIAL	94.4	MG/L
3	134 CROSS ST	3-0000115	UNKNOWN CHEMICAL OF TYPE - HAZARDOUS MATERIAL		
4	HILL ST & ROCK AVE	3-0000906	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
5	39 HOLTON ST	3-0011285	ETHENE, TETRACHLORO-	25	UG/L
6	45 HOLTON ST	3-0018324	2-METHYLNAPHTHALENE	31	MG/KG
6	45 HOLTON ST	3-0018324	9H-FLUORENE	420	MG/L
6	45 HOLTON ST	3-0018324	CHRYSENE	44	MG/L
6	45 HOLTON ST	3-0018324	NAPHTHALENE	6.3	MG/KG
7	586 MAIN ST	3-0000873	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
7	586 MAIN ST	3-0015301	LEAD	789	MG/KG
7	586 MAIN ST	3-0017902	UNKNOWN CHEMICAL OF TYPE - HAZARDOUS MATERIAL	55800	UG/L
8	599-605 MAIN ST	3-0017908	UNKNOWN CHEMICAL OF TYPE - HAZARDOUS MATERIAL	0.831	MG/KG
9	600 MAIN ST	3-0012394	ETHENE, CHLORO-	140	UG/L
10	611 MAIN ST	3-0015451	BENZENE, DIMETHYL	8.6	MG/L
10	611 MAIN ST	3-0015451	BENZENE, METHYL-	7.1	MG/L
10	611 MAIN ST	3-0015451	TOTAL PETROLEUM HYDROCARBONS (TPH)	560	MG/KG
11	632 MAIN ST	3-0004426	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
12	643 MAIN ST	3-0015576	UNKNOWN CHEMICAL OF TYPE - HAZARDOUS MATERIAL		
13	695 MAIN ST	3-0003603	NO INFO		
14	757 MAIN ST	3-0004110	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
15	765 MAIN ST	3-0010877	BENZENE, DIMETHYL	22000	UG/L
15	765 MAIN ST	3-0010877	BENZENE, METHYL-	15000	UG/L
15	765 MAIN ST	3-0010877	LEAD	1200	MG/KG
15	765 MAIN ST	3-0010877	TOTAL PETROLEUM HYDROCARBONS (TPH)	460	UG/L
16	50 SWAN ST	3-0013619	NO INFO (asbestos)		
17	620 WASHINGTON ST	3-0003176	UNKNOWN CHEMICAL OF TYPE - OIL		
17	620 WASHINGTON ST	3-0012112	ETHENE, TRICHLORO-	0.0083	PPM
17	620 WASHINGTON ST	3-0012112	PROPANE, 1,2-DICHLORO-	0.6	PPM
17	620 WASHINGTON ST	3-0012112	PROPANE, 1,2-DICHLORO-	0.6	PPM

**REPORTED RELEASE INFORMATION FOR CANDIDATE SITES**  
(see Table 5-1 and Figure 5-1)

MAP #	SITE LOCATION	RTN	CHEMICAL	AMOUNT	UNITS
17	620 WASHINGTON ST	3-0012112	TOTAL PETROLEUM HYDROCARBONS (TPH)	110	PPM
18	48 WATERFIELD ST	3-0014389	UNKNOWN CHEMICAL OF TYPE - HAZARDOUS MATERIAL		
19	39 CEDAR ST	3-0001734	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
19	39 CEDAR ST	3-0018789	ARSENIC	154	MG/KG
19	39 CEDAR ST	3-0018789	BENZ[A]ANTHRACENE	2.9	MG/KG
19	39 CEDAR ST	3-0018789	BENZ[E]ACEPHENANTHRYLENE	3.2	MG/KG
19	39 CEDAR ST	3-0018789	BENZO[A]PYRENE	24	MG/KG
19	39 CEDAR ST	3-0018789	CHROMIUM	36000	MG/KG
19	39 CEDAR ST	3-0018789	DIBENZ[A,H]ANTHRACENE	0.845	MG/KG
19	39 CEDAR ST	3-0018789	MERCURY	108	MG/KG
19	39 CEDAR ST	3-0018789	TOTAL PETROLEUM HYDROCARBONS (TPH)	1400	MG/KG
20	91 CENTRAL ST, REAR	3-0018041	LEAD	479	MG/KG
21	16 CONNECTICUT ST	3-0015256/ 3-0011501	NO INFO		
22	5-17 CRANES COURT	3-0012606	ETHENE, TRICHLORO-	9	UG/L
23	5 DRAPER RD	3-0004000	2-PROPANONE		
24	5 GREEN ST	3-0000477	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
25	8-10 GREEN ST	3-0000731	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
26	HILL ST	3-0001099	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
26	HILL ST	3-0001737	UNKNOWN CHEMICAL OF TYPE - OIL		
26	HILL ST	3-0011337	SULFURIC ACID	47	GAL
27	4 WHEELING AVE	3-0011390	SILVER	0.13	MG/L
28	62 HOLTON ST	3-0018597	COAL TAR PITCH	3000	GAL
29	65 HOLTON	3-0002439	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
30	73 MAIN ST	3-0014818	BENZENE	0.062	MG/L
31	75 MAIN ST	3-0013604	BENZENE, DIMETHYL	8.8	PPM
31	75 MAIN ST	3-0013604	BENZENE, ETHYL-	1.5	PPM
31	75 MAIN ST	3-0013604	ETHENE, TETRACHLORO-	0.11	PPM
31	75 MAIN ST	3-0013604	TOTAL PETROLEUM HYDROCARBONS (TPH)	25	PPM
32	5 WHEELING AVE	3-0002079	NO INFO		
33	RTE 38 ROTARY	3-0014203	SODIUM HYDROXIDE	75	GAL
33	RTE 38 ROTARY	3-0014203	SULFURIC ACID	10	GAL
34	RTE 39/MAIN ST	3-0018749	UNKNOWN CHEMICAL OF TYPE - HAZARDOUS MATERIAL	30	GAL
35	10 MICRO DR	3-0001263	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
36	205 WILDWOOD AVE	3-0001063	UNKNOWN CHEMICAL OF TYPE - OIL		
37	225 WILDWOOD AVE	3-0001966	UNKNOWN CHEMICAL OF TYPE - OIL		
38	479-481 WILDWOOD AV	3-0013093	BENZENE	20	UG/L
39	331 MONTVALE AVE	3-0018530	2-METHYLNAPHTHALENE	22.1	MG/KG
39	331 MONTVALE AVE	3-0018530	BENZ[A]ANTHRACENE	3.19	MG/KG
39	331 MONTVALE AVE	3-0018530	BENZ[E]ACEPHENANTHRYLENE	2.57	MG/KG

**REPORTED RELEASE INFORMATION FOR CANDIDATE SITES**  
(see Table 5-1 and Figure 5-1)

MAP #	SITE LOCATION	RTN	CHEMICAL	AMOUNT	UNITS
39	331 MONTVALE AVE	3-0018530	BENZENE	51	MG/KG
39	331 MONTVALE AVE	3-0018530	BENZO[A]PYRENE	3	MG/KG
39	331 MONTVALE AVE	3-0018530	DIBENZ[A,H]ANTHRACENE	3.09	MG/KG
39	331 MONTVALE AVE	3-0018530	INDENO(1,2,3-CD)PYRENE	1.9	MG/KG
	331 MONTVALE AVE				
39	331 MONTVALE AVE	3-0018530	NAPHTHALENE	15	MG/KG
39	331 MONTVALE AVE	3-0018530	UNKNOWN CHEMICAL OF TYPE - HAZARDOUS MATERIAL	17	MG/KG
40	30 NASHUA ST	3-0000171	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
41	20 NORMAC RD	3-0004186	UNKNOWN CHEMICAL OF TYPE - HAZARDOUS MATERIAL		
42	15 OLYMPIA AVE	3-0001424	UNKNOWN CHEMICAL OF TYPE - OIL		
43	60 OLYMPIA AVE	3-0000594	1,1'-BIPHENYL, CHLORO-DERIVS.		
43	60 OLYMPIA AVE	3-0000594	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
43	60 OLYMPIA AVE	3-0000594	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
44	73 OLYMPIA AVE	3-0003961	UNKNOWN CHEMICAL OF TYPE - OIL		
45	228 SALEM ST	3-0013444	ARSENIC	40	PPM
45	228 SALEM ST	3-0013444	ARSENIC	95	PPM
45	228 SALEM ST	3-0013444	ARSENIC	310	MG/KG
46	252 SALEM ST	3-0002198	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
47	256 SALEM ST	3-0000534	UNKNOWN CHEMICAL OF TYPE - OIL		
48	263 SALEM ST	3-0010691	1,1'-BIPHENYL, CHLORO-DERIVS.		
48	263 SALEM ST	3-0010691	ETHENE, CHLORO-		
48	263 SALEM ST	3-0010691	ETHENE, TRICHLORO-		
48	263 SALEM ST	3-0010691	UNKNOWN CHEMICAL OF UNKNOWN TYPE	80000	MG/KG
48	263 SALEM ST	3-0010691	UNKNOWN CHEMICAL OF UNKNOWN TYPE	1100	MG/L
49	278 SALEM ST	3-0001146	UNKNOWN CHEMICAL OF UNKNOWN TYPE		
50	7 WALNUT HILL RD	3-0001262	UNKNOWN CHEMICAL OF TYPE - HAZARDOUS MATERIAL		
51	369 WASHINGTON ST	3-0001423	UNKNOWN CHEMICAL OF TYPE - OIL		
52	22 CRANE'S COURT	3-0021078	ARSENIC	55	MG/KG
52	22 CRANE'S COURT	3-0021078	ARSENIC	110	MG/KG
52	22 CRANE'S COURT	3-0021078	CHROMIUM. ION (CR3+)	2900	MG/KG
Source: MADEP BWSC Releases Database [note: RTNs from WSC_all Database]					