

US EPA ARCHIVE DOCUMENT

21E INC.



424048

ENVIRONMENTAL SITE ASSESSMENT
FINAL REPORT

228 SALEM STREET
WOBURN, MASSACHUSETTS

PREPARED FOR:
THE MAGGIORE COMPANIES

3

PREPARED BY:

21E INC.
330 BOSTON ROAD
BILLERICA, MA 01862

PROJECT NUMBER 90-0505-2 - DATED 08/10/93



2. DESCRIPTION

2.1 SITE OWNERSHIP AND LOCATION

According to the Woburn Assessors' Office, 228 Salem Street is owned by Diana Riley. Other sources reveal that the property is owned by Wedel Corporation and has been since 1985. As shown in the northwest corner of the USGS Boston North, MA 7.5 X 15 minute series topographic quadrangle map, the site is located approximately 2,500 feet west of the Aberjona River, 3,350 feet northeast of Woburn High School, and 2,700 feet northwest of Whittemore Pond (see Figure 1). The boundaries of the site are shown on maps 16 and 21, x coordinates 698264, y coordinate 542743 of the City of Woburn Assessors' plans. The northeast portion of this lot is to be subdivided and addressed separately from the majority of the parcel.

2.2 SITE DESCRIPTION

According to the Woburn Assessors' Office, the property is approximately 10 acres in area. The property lies between the 15 and 30 meter contours on the USGS Boston North, MA quadrangle. The topography of the site slopes to the northeast. No buildings exist on the site but a paved parking area and the brick floor of the buildings that previously existed on the site are still present in the central portion of the property. The site is bordered by Wildwood Avenue to the west, Salem Street to the south, Boston and Maine Railroad to the east, and properties occupied by BASF and Toxikon Laboratories to the north. A depression in the northeast corner of the site was filled with water during several visits to the site. This was the only area where standing water existed. According to Mr. John J. Riley, this area is a pond which was constructed, as required by the City of Woburn Planning Board, for drainage purposes when the rear 6 acres were developed. Vegetation on the property was abundant and appeared to be healthy.



3. BACKGROUND

As part of this project, previously prepared reports on the property located at 228 Salem Street in Woburn, MA were reviewed. The following section summarizes the materials presented in the YE²ARS report entitled "Hydrogeologic Investigation of the John J. Riley Tanning Company" (hereafter referred to as YE²ARS report) and the GEI report entitled "21E Assessment of J. J. Riley Property" dated April 19, 1985 (hereafter referred to as GEI report). The previous report prepared by 21E Inc. entitled "Final Report Environmental Site Assessment 228 Salem Street Woburn, MA," and dated December 26, 1990 (hereafter referred to as previous 21E Inc. report) is also summarized in this section. Other documents have also been reviewed and pertinent data from those sources has also been presented in this section.

J.J. Riley Tanning Company operated on the property from approximately 1915 to 1989 when operations ceased and all equipment was removed. Currently, the property is vacant. Previously, the operation existed on 15.8 acres of land. Since the previous reports, the back (northwest) area of the property has been subdivided and no longer is part of the Riley site. The current assessment was completed on approximately 10 acres of land. Formerly, the tanning operations took place in Buildings 1 and 2. To the north of Building 1 is the former location of the bag house and lagoon, which were utilized to store buffing dust until materials were removed as leather scrap. To the east of the lagoon is the former location of three underground fuel oil tanks and the power plant. To the north of the lagoon and power plant was the former hide storage area, which comprised about 51,000 square feet. On the northwestern portion of the current property, the lot is bounded by the drainage ditch. A sewer easement runs through the property between the former locations of Building 1 and 2. A currently unused industrial supply production well (PW#1) is located in the northeast portion of the property.

The property is bordered to the south by Salem Street, to the west by Wildwood Avenue, to the northwest by BASF and by Toxikon Laboratories to the northeast. The abutting lot to the northwest, currently occupied by the BASF Co., was formerly utilized by the Riley Company. The lot occupied by Toxikon Laboratories was formerly occupied by Bio Assay Inc. To the east, the property is bordered by land owned by B&M Railroad. Across the B&M Railroad land located to the northeast of the Site is land currently owned by Wildwood Conservation Trust. This land was formerly owned by the Beatrice Food Company and an industrial supply production well (PW#2) exists on this land which was



formerly utilized by the operations at 220 Salem Street. Across Salem Street to the south is currently an office building. This lot, 215 Salem Street, is the former location of a leather tannery, Murray Leather Co. Also across Salem Street to the south is a concrete form operation and a building which formerly housed a banding saws and knife company. A florist is located across Wildwood Avenue to the west of the Site.

Tanning operations on-site were primarily in the preparation of hides into leather for shoes. The facility was considered a medium sized operation. The process at the Riley site used the chrome tanning method.

The Riley facility used hexavalent chromium as a raw material in the chrome tanning method. However, prior to introduction into the tanning process the chromium (hexavalent) was converted to trivalent chromium. Trivalent chromium is NOT a hazardous substance according to the EPA although it is a priority pollutant metal. Chemicals formerly used on the Site which are hazardous substances were benzidine based dyes, phenolic based detergents (for soaking of hides), ortho-dichlorobenzene (for disinfecting), butyl acetate (as a solvent for lacquers and finishing products), and 1,1,1-trichloroethane (for cleaning one embossing plate prior to 1979). Several other chemicals not classified as hazardous substances were also used at the Site. Butoxyethanol, diisobutyl ketone, and methoxyethanol are volatile compounds which were used as solvents in carrying lacquers and finishing products. Fuel oil was used for the power plant.

The tanning process at the Riley site produced several waste products. One of these products was the sludge collected in the lagoon in the northwest portion of the site. These solids were dredged periodically from the lagoon and from the catch basin and landfilled on-site. According to previous reports, EP toxicity tests have been done on the material landfilled on-site and all levels including hexavalent chromium and total chromium are within acceptable levels. According to 310 CMR 30.125 (4)(e) wastewater treatment sludges and leather scraps from the leather industries are specifically not included as hazardous wastes "provided they do not fail the test for the characteristics of EP toxicity..." Buffing dust was also produced during the process. This dust was disposed of in a lagoon on-site. Buffing dust, which is primarily composed of leather particles, is not considered a hazardous waste according to the EPA and DEP 310 CMR 30.125 (4)(e). According to information obtained from Mr. Riley, the buffing dust has been removed from the Site.

Between November of 1980 and March of 1981, Ecology and



Environment, Inc., under contract to the EPA, sampled groundwater from PW#1 and PW#2. The results revealed levels of volatile organic compounds in both samples. Levels in PW#2, 28 to 1372 ppb (parts per billion) were significantly higher than from PW#1, 10 to 53 ppb. The source of contamination was not determined. According to the YE²ARS report "some of the contaminants present in PW#1 and PW#2 are also present in the City of Woburn's Municipal Production Wells G and H, which are located approximately 2000 feet northeast of Riley Production Well #2, and east of the Aberjona River (EPA, 1981)." Groundwater samples obtained from PW#1 were additionally analyzed for Priority Pollutants, no levels of benzidine were reported as detected.

As part of the investigation conducted by YE²ARS, nine (9) test pits were excavated on the 15.8 acre site. Three of the test pits (TP-7, TP-8, and TP-9) were located on the front (southern) 10 acres. TP-7 was excavated to a depth of 9'4", TP-8 to 6.5', and TP-9 to 7'. Six (6) monitoring wells (which no longer exist) were installed on the property by YE²ARS in 1983. Methods used by YE²ARS to determine that bedrock was encountered and the screening length of the monitoring wells was not available. Four of the six wells (B-1, B-2, B-3c, and B-6b) were installed in the front 10 acres. Refer to Figure 2 for former test pit and monitoring well locations. With the exception of B-6b, the wells were installed to bedrock. Groundwater levels in the four wells ranged from about 4 feet below grade in B-6b, to 37 feet in B-3c. Wells were surveyed and the groundwater flow direction was calculated to be west to east across the site. This flow direction was calculated while PW#2 was pumping under normal conditions.

Groundwater samples collected by YE²ARS in 1983 from wells B-1, B-2 and PW#1 were analyzed for chlorinated volatile organic compounds by EPA method 601. The results revealed no levels of chlorinated solvents in B-1 above the detection limit of 0.1 ppb. Groundwater from PW#1 was found to contain 0.4 ppb of trans-1,2-dichloroethene and 0.4 ppb of trichloroethene (TCE). 0.7 ppb trans-1,2-dichloroethene and 2.3 ppb of chlorobenzene were detected in the groundwater from B-2. This is a substantial decrease from the number and quantity of volatile organic compounds reported in 1980/1981 by Ecology & Environment, Inc.

Both reports concluded that the Riley tannery is not a probable source of contamination of Production Well #2. It was also concluded that the Riley site is not a probable source of the contamination detected in the City of Woburn's Municipal Wells G & H.

The former underground tanks were removed in November of



1989 by Clean Harbors. According to a 1982 DEQE (now DEP) Division of Air Quality Control material storage sheet, the former tanks were all 15,000 gallons in capacity and 2 years old. Two of the tanks were used for the storage of #6 fuel oil and the other tank was used to store #2 fuel oil. A Woburn Fire Department Report stated that the three tanks were removed in November of 1989 and the excavation was free of product. Also stated in the report was that no penetrations were noted in any of the tanks. The excavation was backfilled with the existing fill, according to the report. One soil sample from the tank removal was analyzed by Clean Harbors laboratory. The sample was found to contain 110 ppm (parts per million) of petroleum hydrocarbon/oil & grease by IR. EPA Method 503 (Standard Methods) present five methods distinguished by A through E designations. The Clean Harbors results indicate that D (extraction for sludges), E (petroleum fractionation) and B (infra red) were utilized.

Upon inspection of the property by 21E Inc., it was observed that the wells installed by YE²ARS were no longer existing on-site. However, 21E Inc. did note that three additional wells were located on the site. Information provided by Mr. Riley indicates that these wells were installed under authorization of Beatrice Foods through instruction by their counsel, Hale & Dorr. These wells were reportedly installed in July 1989 by Geraghty & Miller, Inc. 21E Inc. was unable to access the boring logs and drilling information as 21E Inc. was not contracted by Beatrice Foods.

In May 1990, based upon the above information, 21E Inc. installed four additional wells on the property, screened soil samples in the field and then again at 21E Inc. facilities under controlled conditions. Selected soil samples were delivered to the laboratory for chemical analysis.

21E Inc. analyzed selected groundwater samples obtained from seven wells (three existing and four new) for concentrations of the eight RCRA metals, volatile organic compounds, petroleum hydrocarbons and semivolatile (acid/base/neutral) compounds. These analyses were chosen based upon the chemicals formerly used or detected at the property. For example, semivolatile analysis will detect benzidine and phenols, whereas, volatile organic analysis will detect the chlorinated and aromatic solvents. Three soil samples were submitted for laboratory analysis. No levels of RCRA metals were found above the commonly expected ranges. See Table 1, page 18, 12/26/90 21E Inc. report.

Groundwater samples were collected and analyzed from the seven wells. No volatile organic compounds were reported in any



of the seven groundwater samples above the detection limit of 1 ppb. There were also no levels of petroleum hydrocarbons discovered above the detection limit of 0.1 ppm in the five wells tested. Semivolatile analysis of the groundwater samples from the two wells, reported no levels of semivolatile compounds including pesticides and PCBs. Total RCRA metals analysis of the three groundwater samples tested revealed no levels above the Drinking Water Standards as set forth by the Massachusetts Department of Environmental Protection.

It was the opinion of 21E Inc. at the time of the previous report that based on the data collected in the study, there was no evidence of a release or threat of release of oil or hazardous materials on the site under assessment.



4. UPDATE INVESTIGATION

SITE ASSESSMENT

An inspection of the property was conducted by 21E Inc. personnel on April 16, 1993. The site is currently vacant of any structures except for a small brick pumping station in the northeast corner of the property. Buildings that previously existed on this site were razed in 1991, according to Jack Fralick of the Woburn Health Department. Portions of the foundations and brick floors of the buildings that existed on this site are still present and a chain link fence almost completely encompasses the property. The only area not encompassed in the fencing is the former parking area. Access is limited to this area by concrete barriers.

The topography of the site gradually slopes to the northeast while the grade is much steeper in the northeast corner of the property. Just north of the pumping station a drainage depression exists that extends from west to east towards the railroad tracks. All portions of the site that are currently unpaved, are covered with vegetation that appears to be healthy.

A dark tar-like substance appeared to be advancing through cracks in the pavement in the north central portion of the site, presumably due to the uncommonly large volume of rain and melting snow this spring. This material was only observed on the visits during heavy rain periods.

21E Inc. has reinspected the property several times since the tar-like substance was observed. It has not been observed "oozing" since the heavy rains. In addition, during a site visit on June 25, 1993, the materials noted appear to be asphalt sealant or coatings which are traveling from the point of application. It is our opinion that the materials appear to be asphaltic in nature.

ZONING

The property is currently zoned for use as an industrial park. The site lies in Flood Zone C, an area of minimal flooding, according to FIRM maps.

SITE UTILITIES

The site is connected to city water and sewer service. No electric power lines enter the property from overhead. An industrial supply production well exists on the site in the



northeast corner of the property but it is no longer in use. Seven previously installed monitoring wells are still present on the site. The closest city wells are Wells G and H, 2,075 and 2,525 feet northwest of the site respectively, however, these wells were shut down in the early 1980s. The closest active water supply is an MWRA drawing system located 4,500 feet south southeast of the site. The water for this system is held in Spot Pond on the Stoneham/Melrose line. Due to the fact that a drawing system does not always provide an adequate supply of water, the wells at Horn Pond, about two miles southwest of the site, can also provide water for the site.

ABOVE/UNDERGROUND STORAGE TANKS

Conversations with the Woburn Fire Department and a review of their files revealed that there are currently no above or underground storage tanks on the site. However, in November of 1989 three 15,000 gallon underground tanks were removed from this site. Two of the tanks had been used to store #6 fuel oil, while the third stored #2 fuel oil. All three tanks were removed without incident. According to Fire Department records, the three tanks had been installed in 1981. There is currently no permit for storage tanks for this property on file with the Woburn City Clerk's Office.

Files were also reviewed concerning above/underground storage tanks on nearby properties. Walter C. and Dana H. Fowle own property 50 feet south of the site at 235 Salem Street. No tanks currently exist on this property but the Fire Department did provide information on former tanks. The property contained a number of aboveground #2 fuel oil tanks until the 1940s. The number, size, and date of installation of these tanks is unknown (according to Bill Sweeney of the Woburn Fire Department's Fire Prevention Office, these and many subsequent tanks were installed before accurate records were kept). In the 1940s, the above ground tanks were removed and a single 1,000 gallon underground #2 fuel oil tank was installed. In the 1950s the 1,000 gallon tank was filled with sand and a 5,000 gallon underground #2 fuel oil tank was installed. On January 8th, 1993 both of these tanks were removed without incident according to the Fire Department. On the same date a 4,000 gallon waste oil tank was removed. During the procedure the tank split and a spill ensued. Fire Department records indicated that approximately 50 square yards of soil was contaminated. No further information on the 4,000 gallon tank was available.

Murphy Waste Oil at 252 Salem Street, 100 feet east of the site, has recently undergone a partial closure supervised by Clean Harbors. Until early 1988, this property contained



nineteen storage tanks of various sizes. In March of 1988, fourteen storage tanks were removed from the property (two 20,000 gallon, five 12,000 gallon, two 10,000 gallon, two 5000 gallon, two 2,000 gallon and one 275 gallon tanks). All removed tanks were transported to John C. Tombarello & Sons. This left one 30,000 gallon, one 20,000 gallon and three 10,000 gallon tanks on the property. There were no records available as to the age of either the fourteen tanks removed nor the five remaining tanks. In June of 1988, two new storage tanks (one 20,000 gallon and one 10,000 gallon) and a 1,500 gallon receiver tank were installed. There is currently a permit on record in the City Clerk's Office for storage of up to 125,000 gallons of waste oil on the property. As of June 30, 1992, the DEP declared the company to be in compliance with all regulations regarding hazardous waste storage. The Woburn Fire Department had no records of any spills on this property.

Rivinius & Sons, Inc. located at 225 Salem Street, 50 feet south of the site, has a permit to store 2,000 gallons of Class A fluids aboveground. The City Clerk's Office also provided information on a tank removal on this property. On June 26, 1987, a 6,000 gallon oil tank was pumped out and cleaned. 600 gallons of oil were removed for disposal to a contracted facility. Fire Department Records revealed that the removed tank consisted of two chambers and contained a hydrocarbon mixture.

Johnson Brothers Greenhouse Inc. at 200 Wildwood Street, 50 feet west of the site, was granted a permit on September 4, 1968, for the storage of 40,000 gallons of heavy fuel oil. The Fire Department had no record of tanks on this property.

Severance Trucking located at 7 Walnut Hill Park, 875 feet south southeast of the site, has five underground tanks which include: one 5,000 gallon gasoline tank that is 19 years old, three 5,000 gallon diesel tanks, two of which are 11 years old and one which is 17 years old, and one 500 gallon waste oil tank that is 9 years old. On June 22, 1986, one of the diesel tanks failed a tightness test. Further investigations revealed that the tank was leaking at a rate of 0.083 gallons per hour. No tank removal permits or further reports were present in the file for this property.

The only other storage permit on file for the surrounding area belongs to New England Aerosol and Packing, Inc. at 6 Aberjona Drive, 1,675 feet east of the site. They are allowed to store up to 500 gallons of Class A toluene and zylol paint thinners and up to 6,000 gallons of Class B anilin oil or Class C naphtha (not to exceed 6,000 gallons aggregate). Neither the Fire Department nor the Woburn Health Department had any records

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5. FIELD METHODS

GROUND WATER SAMPLE COLLECTION

Groundwater from six of the seven on site monitoring wells was sampled on April 16, 1993. The seventh well, MW2, was not sampled at that time due to what was believed to be an obstruction or break in the PVC pipe that prevented the bailer from being lowered more than approximately 20 feet down the well. Upon further inspection, it was found that the PVC riser pipe was bent not broken, probably from the combination of having a heavy concrete block placed on the well so that it would not be damaged during building demolition, and winter frost heaves. After determining that MW2 was indeed intact, it was purged using a combination of a KV Systems submersible pump in series with a peristaltic pump and sampled with a one inch diameter stainless steel bottom filling bailer (See Appendix B).

Groundwater samples from monitoring wells MW1, MW2, MW3, MW4, RR-1, RR-2, and RR-3, were obtained for determination of volatile organic compounds via EPA method 8240. Groundwater samples from monitoring wells MW3, MW4, RR-1, and RR-2 were analyzed for concentrations of petroleum hydrocarbons. These wells were selected due to their locations both directly upgradient and down gradient of the former underground tank area. Groundwater samples from MW1, MW4, RR-1, and RR-2 were analyzed for concentrations of total Priority Pollutant metals. These wells were selected to collect background information (MW1) and from locations down gradient of former lagoons, catch basins and reported disposal areas (MW4, RR-1 and RR-2). Groundwater samples from MW3, MW4, and RR-2 were analyzed for concentrations of semi-volatile compounds. These wells were chosen based on their proximity to potential source areas, ie; lagoons and catch basins. A strict quality control program was utilized during the sampling procedures. Groundwater sampling was conducted according to 21E Inc. standard operating procedures.

Prior to sampling, groundwater level measurements were obtained with a water level indicator meter, Model 51453 manufactured by Slope Indicator, Co. Depth to the groundwater table was measured to the nearest 1/100th of an foot. Three standing well volumes were calculated for each monitoring well using the obtained groundwater level measurements and the specific monitoring well construction design. Three standing well volumes were purged from the monitoring wells using either a stainless steel bailer, a Masterflex peristaltic pump system equipped with dedicated PVC tubing, or the peristaltic pump



attached to a KV System submersible pump. The submersible pump and bailer are thoroughly cleaned with methanol and distilled water before sampling and between each monitoring well sampled. New PVC tubing is utilized for each monitoring well.

After recharge, groundwater samples were collected using a bottom filling stainless steel bailer. The bailer was thoroughly cleaned with methanol and distilled water before sampling and between each monitoring well sampled. New nylon rope was used for each well. Prior to filling the sample bottles, the bailer was rinsed with well water by filling and emptying the bailer three times. No unusual odors were detected during the purging and sampling activities.

Field/equipment blanks are a necessary procedure when sampling. An equipment blank was collected for volatile organic analysis but analysis was put on HOLD until necessary to complete. Equipment blanks are collected after sampling a suspected contaminated area. Since no suspected contaminated samples were collected, field/equipment blanks were not collected for every analysis.

Groundwater samples scheduled for volatile organic compound analysis (EPA Method 8240) were collected in new (certified cleaned) 40mL amber vials with a teflon seal cover. Care was taken to ensure no air bubbles were trapped in the samples. Two vials were collected from each well. VOA samples were preserved with HCl. The samples collected for metals analysis were collected in new (certified clean) HNO₃ preserved bottles. The remainder of the groundwater samples were collected in new (certified clean) 1000mL amber jars. Turbidity, low to moderate, was noted in the groundwater during sampling.

Groundwater samples from MW4 and RR-2 were recollected on May 5, 1993 for metals analysis. These samples were collected in new (certified cleaned) unpreserved bottles and immediately delivered to the laboratory for filtering, preservation and analysis.

Samples were immediately stored in a cold-packed cooler until shipment to a laboratory for analysis. Groundwater samples were hand delivered to the respective laboratories. Chain-of-custody forms were prepared and are included in Appendix C.

Groundwater samples were scheduled for volatile organic compound analysis (EPA method 8240), priority pollutant metals analysis, and semi-volatile organic analysis (EPA method 625) at Accutest Laboratories of New England, Inc. in Marlborough, MA.



Because 21E Inc. found that petroleum hydrocarbon methodologies are not consistent from laboratory to laboratory, groundwater analysis for petroleum hydrocarbons was scheduled at Environmental Consulting Laboratory, Inc. of Billerica, MA which specializes in petroleum hydrocarbon analysis by GC/FID.

ECL's detection limit for PHCs by GC/FID is 100 parts per billion. In general, the detection limit for Oil & Grease is in the part per million range (10 times higher). With regard to accurate quantitation, both Standard Methods 5520 F (formerly 503) and DEP Policy #WSC-401-91. 5520 F Oil and Grease/Hydrocarbon states that "the more polar hydrocarbons may be adsorbed by the silica gel" and "fatty matter recovered by the procedures for the determination of oil and grease also interfere." WSC-401-91 states that the oil and grease method (even IR and hydrocarbon cleanup) are subject to interferences (see Table 6 of Policy). Also see page 42 of the Policy for a more detailed description of possible interferences.

During the previous 21E Inc. investigation, the monitoring wells on the property were surveyed and depth to groundwater measurements were collected and converted to elevations to define the potentiometric surface or water table. The measurements were used to calculate the inferred groundwater flow direction, which was determined to be east. As part of this report, the inferred groundwater flow direction was calculated again using the most recent groundwater data and was determined to be east (see Figure 5).



6. RESULTS

CHEMICAL ANALYSIS

As previously described, groundwater samples were collected for selected laboratory analysis. The specific analysis chosen for each well was dependent on the location of the well. (See Field Methods for description of well locations.) For a summary of results refer to Table 1 and Appendix A.

VOLATILE ORGANIC COMPOUND ANALYSIS (EPA method 8240)

Six groundwater samples were analyzed for volatile organic compounds by EPA method 8240 at Accutest Laboratories of New England, Inc. in Marlborough, MA. VOA (volatile organic analysis) was performed due to the past solvent usage on the property and the previous analytical data generated from on- and off-site sources. This analytical method uses a purge and trap unit attached to a gas chromatograph with a mass spectrometer detector (GC/MS). Groundwater samples from MW1, MW3, MW4, RR-1, RR-2, and RR-3 were submitted for analysis of volatile organic compounds. The laboratory reported no levels of volatile organic compounds above the detection limit in any of the samples. The detection limit was 5.0 parts per billion (ppb) for most analytes.

PETROLEUM HYDROCARBON ANALYSIS

Four groundwater samples were submitted for petroleum hydrocarbon (PHC) analysis at Environmental Consulting Laboratory, Inc. of Billerica, MA. PHC analysis was chosen due to the past and present petroleum storage in the area and on the subject property. This method uses a solvent extraction of the sample, followed by concentration of the extract then injection into a gas chromatograph with a flame ionization detector (GC/FID).

The wells selected for PHC analysis are located surrounding the former underground tank area both in upgradient and down gradient locations. MW1 was selected for analysis to determine the possibility of background levels or off-site sources. MW3 was selected to represent an upgradient of the former tank area onsite location. Two wells located down gradient of the former tank area (MW4 and RR-2) were selected to determine if any possible contamination had migrated. The results of the four groundwater samples analyzed, MW1, MW3, MW4, and RR-2, reveal no



levels of petroleum hydrocarbons above the detection limit of 0.1 ppm.

PRIORITY POLLUTANT METALS

Four groundwater samples (MW1, MW4, RR-1, and RR-2) were analyzed for Priority Pollutant metals. MW1 was selected to represent background conditions. The proximity of RR-1 to the former lagoon and bag house compelled its selection for metals analysis. MW4 was selected for metals analysis due to its location immediately down gradient of the former hide storage area and former lagoon. The down gradient well RR-2 was sampled for metals to determine if any migration had occurred. Priority Pollutant metals include arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr), lead (Pb), mercury (Hg), selenium (Se), silver (Ag), antimony (Sb), copper (Cu), nickel (Ni), thallium (Tl), and zinc (Zn). This method uses an acid digestion of the sample followed by analysis on a graphite furnace, or an atomic absorption unit, or an inductively coupled argon plasma instrument; with the exception of mercury which utilizes a cold vapor extraction procedure. See Table for summary of results.

The groundwater sample obtained from MW1 was reported to contain Arsenic at 0.010 ppm, Chromium at 0.039 ppm, Copper at 0.040 ppm, Lead at 0.017 ppm, Nickel at 0.040 ppm, and Zinc at 0.15 ppm. The other metals were not reported above the method detection limit. The following metals were detected in MW4, As at 0.16 ppm, Be at 0.009 ppm, Cd at 0.019 ppm, Cr at 0.57 ppm, Cu at 0.56 ppm, Pb at 0.11 ppm, Ni at 0.30 ppm, Tl at 0.002 ppm, and zinc at 0.85 ppm. Antimony, mercury, selenium and silver were not reported above the method detection limit. RR-1 was reported to contain As at 0.021 ppm, Cr at 0.11 ppm, Cu at 0.078 ppm, Pb at 0.020 ppm, Ni at 0.080 ppm, Tl at 0.001 ppm, and Zn at 0.22 ppm. Antimony, beryllium, cadmium, mercury, selenium, and silver were not reported above the method detection limit. RR-2 was reported to contain As at 0.066 ppm, Cr at 0.20 ppm, Cu at 0.30 ppm, Pb at 0.055 ppm, Ni at 0.10 ppm, Tl at 0.002 ppm, and Zn at 0.68 ppm. Antimony, beryllium, cadmium, mercury, selenium, and silver were not reported above the method detection limit.

background

Although the groundwater onsite is not utilized as drinking water, the most commonly accepted set of standards are drinking water standards. The Safe Drinking Water Act (SDWA) has established standards at 0.05 ppm for arsenic, 0.01 ppm for cadmium, 0.05 ppm for chromium, 0.05 ppm for lead, 0.002 ppm for mercury, 0.01 ppm for selenium, and 0.05 ppm for silver. A draft version of ground water parameters according to the Code of Massachusetts Regulations is set to be finalized in the summer or

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fall of 1993. The new regulations set standards for antimony at 0.006 ppm, arsenic at 0.05 ppm, beryllium at 0.004 ppm, cadmium at 0.005 ppm, chromium at 0.10 ppm, lead at 0.015 ppm, mercury at 0.002 ppm, nickel at 0.10 ppm, selenium at 0.05 ppm, silver at 0.05 ppm, thallium at 0.002 ppm, and zinc at 1.0 ppm. Levels of lead in MW1 are above the groundwater standards but below SDWA levels. Arsenic, beryllium, cadmium, chromium, lead and nickel are above the groundwater standards and SDWA levels in the groundwater collected at MW4 on April 15, 1993, except for nickel which has no SDWA level set. The groundwater sample collected at RR-1 reportedly contains levels of chromium and lead above the groundwater standards. Lead and chromium in RR-1 are above SDWA limits. Levels of arsenic, chromium and lead are above groundwater standards and SDWA limits in the groundwater collected from RR-2 on April 16, 1993.

Upon receipt of the analytical results, a review of field sampling notes was undertaken. The field notes indicate low to moderate turbidity in the groundwater samples collected during the April 15 and 16, 1993 sampling round. Turbidity, in general, indicates soil particles are suspended in the groundwater sample. Based on this observation and knowledge of the site and area, 21E Inc. proposed to resample at least two of the wells. During the second sampling of wells MW4 and RR-2, the samples were collected in unpreserved bottles. Samples were immediately hand delivered to the laboratory to be filtered prior to preservation. The purpose of this filtration was to remove all suspended particles and determine the true metallic content dissolved in the groundwater samples. The second sampling of MW4 revealed that none of the thirteen Priority Pollutant Metals were reported above the method detection limit. The second sampling of RR-2 reported that zinc was present at a level of 0.053 ppm which is below the new draft groundwater standard set by the Code of Massachusetts Regulations and SDWA limits. All other metals were not reported above the method detection limit.

SEMIVOLATILE ORGANIC ANALYSIS (EPA method 625)

Three groundwater samples were chosen for semivolatile organic analysis (acid/base/neutral, ABN) at Accutest Laboratories of New England, Inc. in Marlborough, MA. ABN analysis was performed due to the past usage of benzidine and phenols in the manufacturing process on-site. MW3 and MW4 were selected for analysis due to their proximity to and down gradient location of possible source areas, ie; lagoon, bag house and hide storage areas. RR-2 was selected for analysis due to its location down gradient on the site. This method uses a solvent



extraction at an alkaline pH followed by a solvent extraction at an acidic pH. The extracts are concentrated then injected into a gas chromatograph with a mass spectrometer detector. Ground water samples from MW3, MW4, and RR-2 were submitted for analysis of semivolatile organic compounds. The results reported that MW3, MW4 and RR-2 contained butyl benzyl phthalate at concentrations of 23 ppb, 20 ppb, and 15 ppb respectively. Di-n-butyl phthalate was reported in both MW3 and MW4 at a concentration of 28 ppb and in RR-2 at a concentration of 30 ppb. However, both of these compounds, which are common laboratory contaminants were detected in the laboratory blank as well. The remaining semivolatile compounds, including pesticides and PCBs, were not reported above the method detection limit of 10 ppb in the groundwater samples analyzed.



7. SUMMARY AND CONCLUSION

The purpose of this investigation was to determine if a release or threat of release of oil or hazardous materials exists on the property located at 228 Salem Street in Woburn, MA since the previous 21E Inc. report dated 12/26/90. All pertinent information gathered has been presented herein. 21E Inc. has attempted to provide an accurate description of site conditions within the scope of this project.

The property is the former location of the Riley tanning company which began operations at the Site in approximately 1915. The Riley tanning company was a medium sized chrome tanning operation. The principle product was leather for shoes. As part of the process several chemicals were used on the site. Some of these are benzidine, phenols, 1,1,1-trichloroethane, butyl acetate, ortho-dichlorobenzene, and fuel oil (used as a heating fuel).

Previous investigations at the Site revealed that low levels of chlorinated solvents were present in the groundwater at the Site in 1985. The sludge which was produced from the former plant operations and which was collected in an on-site catch basin and lagoon, was analyzed for EP toxicity, according to previous reports. All levels of chemicals detected in the EP extract were within acceptable ranges. The analytical data and 310 CMR 30.125, which lists these materials as non hazardous (provided they do not fail the EP Toxicity test), indicate the materials are classified as not hazardous. 21E Inc. is of the opinion that the waste material would, if anything, become less hazardous over time, therefore testing the material for this scope was not deemed to be necessary.

During the previous 21E Inc. investigation, the monitoring wells on the property were surveyed and depth to groundwater measurements were collected and converted to elevations to define the potentiometric surface or water table. The measurements were used to calculate the inferred groundwater flow direction, which was determined to be east. As part of this report, the inferred groundwater flow direction was calculated again using the most recent groundwater data and was determined to be east.

The results of the 1990 analysis revealed no volatile organic compounds in the groundwater collected from MW1, MW2, MW3, MW4, RR-1, RR-2 or RR-3. Groundwater samples analyzed for petroleum hydrocarbons (MW1, MW2, MW3, MW4, and RR-2) revealed no petroleum products. Semivolatile analysis of groundwater collected from MW4 and RR-3 revealed no semivolatile compounds,



including pesticides and PCBs, present in the samples. Total RCRA metals analysis of groundwater from MW1, MW3, and RR-2 revealed no levels above the Drinking Water Standards as set forth by the Massachusetts Department of Environmental Protection. Soil samples (MW1, MW3 and MW4 at about 35') analyzed for total RCRA metals do not indicate levels above the commonly expected ranges.

A site visit and inspection was completed during the course of this investigation. The site is vacant and previously existing buildings have been razed. No record of the disposal of the razed building materials was available. However, since no recently disturbed areas were noted onsite, it is assumed that the materials were removed from the property. A tar-like substance was noted during a visit to the site during heavy rains. This substance appeared to be seeping up through cracks in the asphalt in the north central portion of the lot. A close inspection of the material revealed tar-like odors and a semisolid state. This material was not observed during all visits. In fact, the material was only observed during the period of extremely high volumes of rain. It is suspected that these materials are either a nonhardened asphaltic compound or mixture or remnants of the reportedly previously landfilled, nonhazardous, sludge materials.

An update, since 1990, of municipal and state (DEP) files was completed as part of this investigation. Municipal records reveal several site investigations have been conducted in the immediate area since 1985. These properties include Whitney Barrel Company at 256 Salem Street, Murphy Waste Oil Company at 252 Salem Street, the property at 225 Wildwood Avenue, and Woburn Municipal Wells G and H. Fire Department records included documentation of the removal of three 15,000 gallon underground fuel oil storage tanks from the Riley property. Several other underground storage tanks exist in the area.

DEP records included reports on a subsurface investigation at Murphy Waste Oil Company property. This investigation found soils and groundwater contaminated with volatile organic compounds, petroleum, and PCBs. A study at 225 Wildwood Avenue revealed volatile organic contamination in both soil and groundwater on-site. An NOR was issued to Whitney Barrel at 256 Salem Street. The NOR required subsurface investigation at the property. The subsurface investigation revealed contamination of both soil and groundwater with volatile organic compounds, semivolatile organic compounds, PCBs, and metals. Further investigations are ongoing at the property.

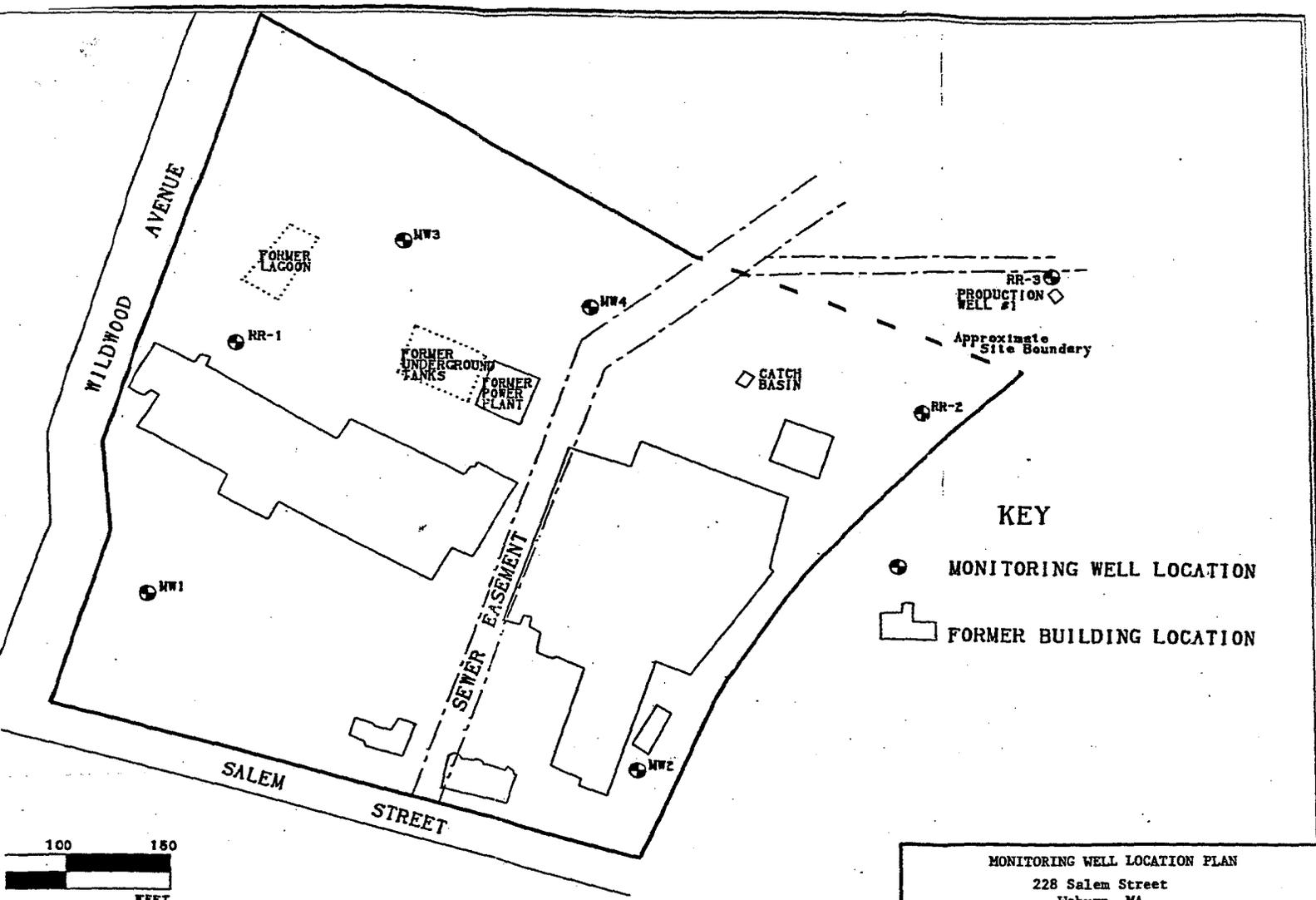
A resampling of the seven on-site wells was conducted during

the course of this investigation. All seven wells were sampled for volatile organic compounds. No compounds were reported above the detection limit. No petroleum hydrocarbons were detected in the four wells sampled.

Four wells were analyzed for Priority Pollutant metals. The initial sampling round reported elevated levels of metals in all four samples. Field notes indicated suspended particles in the groundwater samples. Resampling of the two wells which reported the highest concentrations was undertaken and the samples were filtered of suspended particles prior to preservation and analysis. With the exception of low levels of zinc (below Safe Drinking Water Act and 310 CMR 40 DRAFT groundwater standards) no metals were reported above the detection limits in either sample. Therefore, the levels of metals reported in the other two samples analyzed without filtering are most likely due to suspended solids not from actual metal content in the groundwater.

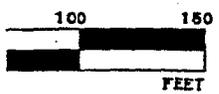
Two phthalates were detected in each of the three groundwater samples analyzed for semivolatile organic compounds. However, both of these phthalates were also detected in the laboratory blanks. It is most probable that the phthalates are due to laboratory contamination and are not site contaminants.

Based on the data collected during the course of this investigation, it is the opinion of 21E Inc. that there is no evidence of a release of oil or hazardous materials to the groundwater on the property located at 228 Salem Street in Woburn, MA. In addition, based on data obtained from this investigation and previous investigations, it appears that previous operations at the property have not adversely affected the environmental integrity of the Site.



KEY

- ⊕ MONITORING WELL LOCATION
- ▭ FORMER BUILDING LOCATION



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|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MONITORING WELL LOCATION PLAN 228 Salem Street Woburn, MA | |
| Scale: As shown Date: 06/03/93 Project Number: 90-0505-2 Drafted by: SMH | Prepared by: 21E INC.  Consulting Geologists, Hydrogeologists, Environmental Chemists |