R.E.W.
ENVIRONMENTAL CONSULTANTS

May 9, 2002
Revised June 10, 2002

Mr. John Bruni
Bruni Realty
36 Essex Road
Ipswich, Massachusetts 01938

RE: Supplemental Site Investigation
36 Essex Road, Ipswich, Massachusetts

Dear Mr. Bruni:

REW Environmental Consultants, Inc., (REW) has completed a limited evaluation of the property located at 36 Essex Road in Ipswich, Massachusetts, the "site." The purpose was to evaluate subsurface conditions with respect to certain contaminant source locations identified by REW Environmental Consultants, Inc., in our report entitled "Environmental Property Screen," dated May 24, 2000. Following is a synopsis of our findings based on the data we have collected:

Environmental Property Screen – Overview

REW Environmental Consultants, Inc., of Danvers, Massachusetts completed a preliminary environmental site assessment (assessment) of the subject property. The assessment was initiated to identify any potentially existing "recognized environmental conditions."

Recognized Environmental Conditions is an ASTM term and is defined as follows:

> The presence or likely presence of any hazardous materials or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of most substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term includes hazardous materials and petroleum products even under conditions in compliance with laws. The term is not intended to include de minimus conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

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Based on our evaluation of relevant site conditions, we recommended a subsurface characterization of groundwater focusing on potential contaminant source locations. Specifically, we identified on-site septic system(s) and grease traps (or holding tanks) as potential sources for degrading groundwater quality. A third source area was identified at the outfall of site catch basins.

Objective

The objective was to evaluate the quality of soil and groundwater at the site, and to gauge the relative implications with respect to the "Reporting Concentrations and Risk Characterization Standards" of the Massachusetts Contingency Plan, specifically 310 CMR 40.1795, Subpart P and .0900 Subpart I, respectively.

To achieve the above stated objective, we planned a boring program to collect information necessary to confirm or dismiss environmental issues related to the above described findings. Monitoring wells were to be installed to collect water samples. There were two sampling scenarios considered for completing this assessment: (1) authoritative and (2) statistical.

(1) An authoritative sampling program involves the biased placement of borings based on site history, topography (downgradient areas), preliminary data of characterization, and other site-specific conditions. The use of an authoritative sampling program focuses resources in areas that are believed to have the highest probability of evidencing some degree of contamination. This is a very common, professionally acceptable and effective method for the characterization of properties that have specific and well-documented history.

(2) A statistical sampling program systematically places borings over the entire site and makes a conclusion concerning the probability of missing a particular-sized area of contamination, if present, at the site. This is more valuable at properties involving large tracts of land and where the exact location and extent of contamination are unknown or random.

In considering the information developed and presented in the initial evaluation, REW determined that an authoritative sampling program was more suitable for the site primarily because of its character (i.e., identifiable areas where there is potential contaminant source locations). As part of the authoritative sampling program, REW proposed to take soil samples from various depths below grade to the groundwater interface (within the capillary fringe or saturated zone) or to refusal. The soil samples taken

within the capillary fringe or saturated zone would increase detection of shallow releases of oil and/or hazardous material, and aid in evaluating the potential for contaminant movement from on and off-site sources.

Following is an overview of the locations that were proposed for this evaluation:

- Install monitoring wells on the downgradient position of the two septic systems. Collect water samples for volatile and chlorinated solvents.
- Advance borings in the locations of the two grease traps and collect soil samples for possible oil and grease.
- Advance shallow borings in the northern area of the site to collect a single composite for the analysis of herbicides and pesticides.
- Install a monitoring well proximate to the outfall for the catch basins. Collect a water sample for petroleum hydrocarbon analysis.

Actual Boring Placement and Advancement

On April 5, 2002, we advanced five borings in areas that we believe would have the highest probability of evidencing some degree of contamination, if present. With Essex Street forming the southern border, borings were placed as follows:

- One boring (B1) was placed proximate to the outfall for the catch basins. This boring was converted to a monitoring well (MW1).
- One boring (B2) was placed between the Pizza Shop and Market in proximity to the grease trap.
- One boring (B3) was placed near the leaching field located in the central area of the parking lot. This boring was converted to a monitoring well (MW2).
- One boring (B4) was placed on the north side of the restaurant and dry cleaner in proximity to the grease trap.
- One boring (B5) was attempted to be placed on the north side of the restaurant and dry cleaner in proximity to the leaching field. However, sufficient geologic resistance prevented the boring from being achieved. On May 20, 2002, using a backhoe, we set a well in the area leachfield. The well was set below the undisturbed portion of the excavation, which was approximately 5 feet below grade. The well was set to 8 feet below grade.
- In addition to the boring program, we collected a composite sample from the open (vacant) area of land on the northern side for the analysis of herbicides and pesticides.

For the activities of April 5, 2002, AM Environmental and Structural Drilling (AM) of Leominster, Massachusetts advanced each boring to the maximum depth at which contamination was expected to be observed or to refusal using a truck-mounted probe. AM collected soil samples using a 2-inch diameter disposable liner inserted in a four-foot stainless steel macro-sampler. The sampler was driven into undisturbed soils by means of hydraulic pressure to retrieve four- foot continuous samples. The intent of the borings was to allow the taking of soil samples based on an interval that would allow for the interpretation of site-related issues. For example, we collected sample specific and sometimes composite samples from the four-foot core and screened the sample headspace for the presence of volatile hydrocarbons using a photoionization detector (i.e., a HNu Meter) instrument.

Prior to the start, between each sample and each boring, REW and AM followed specific decontamination protocol for extracting samples from the liners to prevent possible cross contamination and to protect the integrity of samples being collected. AM utilized a total of 60 linear feet of disposable liners under this boring program.

Attached hereto as **Exhibit A** is plot of the site illustrating locations of borings with respect to certain site attributes.

Surficial Geology

In general, site surficial geology consists of fine to coarse sands, "some" fine to coarse gravel, "little" silt and cobbles to approximately 12 feet below grade. In the B1 location, marine clay was encountered between 9 feet and 12 feet below grade. The "zone of saturation" was encountered at about 7 feet below grade. However, at B1/MW1, the static level of groundwater was recorded at 2.83 feet below grade. Boring logs are provided as **Appendix A** to this report.

Soil Visual Quality

As described, soil samples were collected using a truck-mounted probe from various depths. Of the locations that we explored, none of the soil samples exhibited olfactory evidence of contamination. There was no discoloration or staining to the soil recovered in the sampling tubes. A composite soil sample was collected from the open (agriculture) field on the north side of the parcel for the analysis of pesticides and herbicides.

Monitoring wells were installed at the B1 and B3 locations. A third well was installed by hand at or near the B5 location. In general, there was no evidence of a sheen or odor was noted in any of the water samples drawn from the three newly installed wells.

Headspace Responses

As stated, we screened soil sample recoveries for the presence of volatile hydrocarbon compounds using a photoionization detector (PID) instrument. Screening is also referred to as headspace analysis. The methodology which we employed for headspace analysis followed standard industry practices of placing a soil sample into a glass jar sealed with tin-foil and screw covers, warming the sample to ambient temperature, then agitating the sample to disturb volatile gases within the soil pore space, then allowing the sample to equilibrate. REW recorded relative HNu responses from the headspace of each sample, using a HNu Meter (Model HW-101) equipped with a 10.2 electron volt (eV) lamp, by inserting the HNu Meter probe through the tin foil.

The HNu Meter measures the total concentration of hydrocarbon gases in parts per million (ppm) in the sample headspace relative to an isobutylene standard calibration gas. The recorded concentrations are actual instrument responses and are isobutylene equivalents. The HNu does not discriminate among specific compounds and the results merely indicate the presence of hydrocarbon gases not contaminants.

PID responses ranged from no response to 0.2 ppm/v. PID responses of 0.2 ppm/v were documented at B3 and B5. At B3, PID responses of 0.2 ppm/v were documented at approximately 5 feet and 8 feet below grade. At B5, a PID response of 0.2 ppm/v was documented at approximately 5 feet below grade. These responses approach the instrument detection threshold of 0.1 ppm/v, and are not considered to be indicative for the presence of contaminants of a volatile nature. By comparison, the reporting threshold during an underground tank removal is 100 ppm/v. Based on the responses and our field observations, site conditions did not warrant chemical analysis with respect to petroleum-related or volatile compounds. PID responses are tabulated as **Table 1**. Instrument responses are also provided on the boring logs in **Appendix A**.

Monitoring Well Construction

AM constructed two overburden wells using 2 - inch diameter PVC well screen and solid casing. The well screens were set to straddle the water table surface, enabling the potential detection of non-aqueous phase liquids (NAPLs). The well screens were set above and below the water table to account for seasonal fluctuations. Boring and geologic characteristics determined the length of screen used and the final depth of the well. To minimize contamination from surface activities, AM placed a bentonite seal at the union between the riser pipes and screens.

AM set monitoring wells at the B1 and B3 locations as MW-1 and MW-2, respectively. The installation of these wells was to an approximate depth of 12 feet below grade with a screen length of 10 feet. A third well was installed by hand at or near the B5 location to a depth of approximately 8 feet below grade. Refer to **Exhibit A** for the location of the monitoring well with respect to boring placement at the site.

Monitoring Well Construction

REW developed the wells installed by AM on April 8, 2002, by removing a minimum of three well volumes of water using a peristaltic pump and dedicated tubing. REW developed the newly installed third well (MW-3) on May 20, 2002, by removing a minimum of three well volumes of water using a peristaltic pump and dedicated tubing. Development helps remove disturbed sediment in the groundwater caused by drilling and well construction activities and promotes flow into the well from the surrounding aquifer. Following development and allowing each well to recover, we collected groundwater samples from the two newly installed monitoring wells for the analysis of petroleum hydrocarbon, oil and grease, volatile compounds, and chlorinated hydrocarbons.

Except for a two week stabilization period, REW collected groundwater samples according to the U.S. EPA Guidance Document 600/2-85/104; Practical Guide for Groundwater Sampling, and according to the DEP Guidance Document WSC-310-91; Standard References for Monitoring Wells. We used dedicated disposable gloves and tubing to minimize cross-contamination between the two wells and to enhance the integrity of sampling.

We recorded water elevations using a Solinst Water Level indicator before taking water samples on April 8, and May 20, 2002. The groundwater at the time of the referenced readings lies at an average depth of approximately 7.5 feet below grade. Refer to boring logs in **Appendix A** for groundwater measurements.

Results – Soil Analysis

As stated, a composite soil sample was collected from the open (agriculture) field on the north side of the parcel for the analysis of pesticides and herbicides. According to the analysis, there was no detection of pesticide or herbicide analytes.

Results – Groundwater Analysis

There was no detection of petroleum hydrocarbon in the groundwater above the method detection limit of 80 µg/l. For VOC, there was detection of dibromochloromethane at 2 µg/l, bromodichloromethane at 8 µg/l and chloroform at 26 µg/l at the MW2 location. There was detection of bromodichloromethane at 10 µg/l and chloroform at 89 µg/l at the MW3 location. Chloroform is possibly the primary source for dibromochloromethane. Aside from common laboratory use, which could result in sample contamination at the laboratory, these chemicals are commonly associated with chlorinated water, disinfectants and cleaners for general (over-the-counter) use.

Well MW-1 and MW-2 were also sampled for general hydrocarbons. Accordingly, there was no detection of hydrocarbons at the MW-1 location above the detection limit of 80 µg/l, which is the outfall for parking lot drains. The reporting threshold is 1 mg/l (or 1,000 µg/l) for the RCGW-2 category. At MW-2, which represents the leachfield area, hydrocarbons were reported at 0.5 mg/l (or 500 µg/l). Under the new MCP, there is no reporting threshold for oil and grease. In our opinion, given the concentration of oil and grease at MW-2, a more specific petroleum characterization is not warranted. The RCGW-2 threshold was applied to characterize the site since the drinking water is town supplied.

MCP Applicability of Findings to Groundwater

Tabulated as **Table 2** is an analytical summary of site groundwater with a comparison to the MCP "Reporting Concentrations." Accordingly, the detectable concentrations of dibromochloromethane, bromodichloromethane and chloroform do not exceed the Reporting Concentrations or the Risk Characterization Standards of the Massachusetts Contingency Plan, specifically 310 CMR 40.1795, Subpart P and .0900 Subpart I, respectively. A copy of the analytical report is provided as **Appendix B**.

Opinion

Based on our subsurface evaluation as described and presented above, we have prepared the following synopsis with respect to site conditions.

> Soil samples collected via probe methodology exhibited no olfactory evidence of contamination. There was no discoloration or staining to the soil recovered in the sampling tubes.
>
> There were no PID instrument responses to the headspace for seven soil samples that would otherwise indicate potential evidence of contamination of a volatile nature. Based on the responses, site conditions did not warrant chemical analysis with respect to petroleum-related or volatile compounds.
>
> Quantitative analysis of groundwater indicates detection of dibromochloromethane, bromodichloromethane and chloroform at the leaching fields; however, the concentrations do not exceed Reporting Concentrations of the Massachusetts Contingency Plan. Contaminants of these types are probably related to chlorinated waters and/or the cleaning and disinfecting agents used in the commercial buildings.
>
> Based on the data collected and presented in this report including a limited subsurface investigation, REW Environmental Consultants, Inc., found no contamination at concentrations that would be of concern. No further work is recommended.

If you have questions or need a better understanding of the issues, please contact me at 978-777-2055.

Sincerely,
REW Environmental Consultants, Inc.

Dick Warren
Principal

Corresponding Test Data available upon request.