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**INITIAL SITE INVESTIGATION REPORT**

**MUNSON EARTH-MOVING  
SOUTH BURLINGTON, VERMONT**

**PROJECT NO. V93221V**

**NOVEMBER 2, 1993**

**Prepared for:**

**Mr. Jim Emmerson  
Munson Earth-Moving Corporation  
366 Dorset Street  
South Burlington, VT 05403**



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November 2, 1993

Mr. Jim Emmerson  
Munson Earth-Moving Corporation  
366 Dorset Street  
South Burlington, VT 05403

re: Initial Site Investigation  
Munson Earth-Moving  
South Burlington, Vermont

DEC Site #93-1417  
JGI Project No. V93221V

Dear Mr. Emmerson:

The following report provides a summary of field investigations performed in September, 1993 at the Munson Earth-Moving Corporation's underground storage tank (UST) facility in South Burlington, Vermont. The main purpose of our study was to assess the magnitude and extent of contamination resulting from petroleum releases at the site.

Our study included soil and groundwater sampling and analyses and an initial risk evaluation. A site location map, site plan, area land use map, test pit logs, groundwater analytical results, groundwater contour map, and contaminant concentration maps are included in the summary report, as well as our findings, conclusions and recommendations for further action at the site. The details and results of this study are subject to the Limitations included in Appendix A.

Sampling and analysis of soils at the site indicate that petroleum-contaminated soils, as defined by the State of Vermont guidelines, exist outside the immediate vicinity of the USTs. Groundwater analyses of the leak detection/monitoring wells on site suggest that the contamination has resulted from isolated leaks in the piping. While no free-phase petroleum product was found at these wells, benzene concentrations at four of the eight wells were found to exceed the state drinking water standards.

Based on the information obtained during the course of this investigation, we have recommended that a limited amount of additional work be performed. This would include a soil gas survey to further evaluate the source and extent of petroleum contamination at the site, particularly near

Mr. Jim Emmerson  
Page 2  
November 2, 1993

the public right-of-ways and building areas. Additional monitoring wells would be installed with follow-up sampling and analyses at all well sites. These tests would be used to evaluate whether groundwater quality is within acceptable limits near the site boundary, and would provide downgradient points for quarterly monitoring at the site.

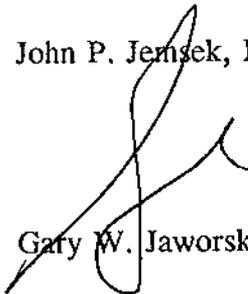
On-site petroleum contamination does not pose a significant risk to human health or the environment, since 1) the volume of product released is probably small, 2) groundwater appears to move slowly across the site, and 3) there do not appear to be sensitive receptors downgradient of the site. Consequently, no soil or groundwater treatment has been recommended in response to the known product release.

We trust that the contents of this report will satisfy your present needs. Should you have any questions or if we can be of further assistance to you, please do not hesitate to contact our office. We thank you for the opportunity to have been of service to you, and look forward to working with you in the future.

Very truly yours,

JAWORSKI GEOTECH, INC.

John P. Jernsek, Ph.D.



Gary W. Jaworski, P.E., Ph.D.

V#2/etc

cc: Chuck Schwer, Vermont Department of Environmental Conservation

Attachment

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## 1.00 EXECUTIVE SUMMARY

This report provides results of an initial site investigation at the Munson Earth-Moving Corporation underground storage tank (UST) facility located on Dorset Street in South Burlington, Vermont (Figure 1). The main objectives of the study were to evaluate the extent of petroleum contamination in soil and groundwater near the three gasoline and three diesel USTs at the site, and identify potential sensitive receptors in the area. The Vermont Department of Environmental Conservation (DEC) requested the study in response to two piping-related tank test failures, in addition to reports of occasional floating product in the leak detection/monitoring wells.

Field work performed in September, 1993 included a site survey, five subsurface explorations by backhoe, field screening of soils for Volatile Organic Compounds (VOCs), and groundwater level monitoring and sampling at the eight monitoring wells. Laboratory analyses of the groundwater samples were performed to evaluate the quantity of Total Petroleum Hydrocarbons (TPH) and selected VOCs in the groundwater. Additionally, a windshield survey of land within 500 to 1,000 feet of the site was performed to assess the risk to sensitive receptors such as residential wells, basements or wetlands.

Chemical testing and observations of the groundwater indicated that the main source of gasoline contamination is near the vent pipe leak for UST No. 1, located adjacent to the maintenance garage. A lesser gasoline source appears to be the distribution pipe to UST No. 3. Some product was observed in test pits near the first source, but no product was found in any of the monitoring wells. Benzene, at levels above the drinking water standard, is found in four of the eight wells, the highest level being 500 times the Maximum Contaminant Level (MCL). The highest TPH values in water are related to past fuel or oil contamination near the diesel USTs, and exceed 25 to 50 milligrams per liter. Field screening of soil samples retrieved from excavations indicate that petroleum contamination has migrated outside the immediate vicinity of the USTs, with concentrations exceeding 100 parts per million (ppm) benzene-equivalent in an area estimated to be larger than 100 feet by 100 feet.

Geology at the site consists of one to four feet of silty, fine sands overlying silt. A relatively flat water table surface is found about three feet below ground surface (BGS), residing in the silty, fine sand unit. A local southwest groundwater flow direction is established for the site, with off-site flow conditions probably influenced by ancillary drainage trenches for Dorset Street. From a review of the site area, no sensitive receptors were found within 500 feet of the site, or further downgradient of the site. Some risk may be associated with vapor intrusion in confined areas such as trenches, depending on the extent of the free-phase or dissolved-phase plume.

It is recommended that a soil gas survey and test boring program be used to delineate the extent of contamination from the known multiple sources. Installation of additional monitoring wells, sampling and analysis are required to evaluate the need for long-term monitoring, or possible treatment, at the site. The position of the wells should be based on the soil gas survey and test boring results.

## 2.00 BACKGROUND

Munson Earth-Moving Corporation (Munson) maintains an office and construction equipment storage and maintenance facility at 366 Dorset Street, South Burlington, Vermont. A Site Location Map is provided as Figure 1. As shown on Figure 2, Subsurface Exploration Location Plan, the USTs are grouped in two locations, three beneath a gasoline pumping island (USTs 1, 2, and 3) and three beneath a diesel pumping island (USTs 4, 5, and 6). A summary of the UST information is provided in Table 1. Eight, four-inch diameter monitoring wells are used for leak detection purposes, which are routinely inspected by Munson for presence of floating petroleum product greater than ¼-inch in thickness.

Jaworski Geotech Inc. (JGI) performed tank tightness testing at the Munson site on July 9 and 10, 1993. The UST testing and subsequent inspections revealed that two of the gasoline USTs had leaks in the piping. The pipe leak at UST No. 1 was attributed to a break in the vent pipe located adjacent to the Munson maintenance building. The point of release was about six feet west of the first garage bay entrance at a depth of about 0.5 feet (Photograph 3). The break is suspected to have occurred when contractors recently excavated a utility trench along the side of the building. The release of gasoline during the tightness test was estimated to have been less than five gallons. Additional releases at this point would have occurred only if complete filling of the UST was attempted.

The second leak was located within the distribution line for UST No. 3, with a leak rate of 0.37 gallons per hour detected using the method described in the July 14, 1993 report prepared by JGI. The history of release at this location is not necessarily significant, since the pumping system is suction-based and the measured leak rate is moderate.

Munson repaired both piping leaks when they were discovered, with follow-up tests indicating that the retrofitted USTs passed tightness requirements.

In July, 1993, the DEC included the Munson facility on the Active Hazardous Waste Site List as Site #93-1417. The listing was attributed to the failure of UST No. 1 and No. 3 to meet tightness standards and the subsequent release of petroleum product at the site. The DEC discovered free product in one of the wells on July 7, 1993, at which time Munson initially contacted JGI regarding the tank testing. The DEC also reported floating diesel product in August 4, 1992 during a facility inspection. Inconsistent labeling within the DEC and Munson's records exists. However, using Figure 2 as a reference, it is suspected that diesel or oil was identified in monitoring well MW-3 and gasoline was found in monitoring well MW-7.

This initial investigation was performed in response to the DEC July 27, 1993 letter requesting Munson to assess the extent of petroleum contamination. Subsequent activity by Munson has been reviewed under the State of Vermont Petroleum Cleanup Fund reimbursement program.

JGI's August 3, 1993 proposal outlines the investigation's scope of work, which was approved by the DEC Hazardous Materials Management Division, Sites Management Section in their August 26, 1993 letter to Munson. The main tasks included the following:

1. Inspection of monitoring well construction in compliance with Appendix A, 1991 Vermont UST regulations,
2. Survey of wells and landmarks using a transit and stadia,
3. Subsurface explorations by backhoe at five locations,
4. Field screening of 13 soil samples for VOCs,
5. Groundwater level monitoring and sampling at the eight monitoring wells,
6. Analysis of groundwater samples for VOCs and TPH, and
7. Evaluation of initial risks due to petroleum contamination at the site.

All field work was completed in September, 1993. The DEC documentation used in the preparation of this report include *"UST Closure and Site Assessment Requirements, February, 1991"*, *"Agency Guidelines for Petroleum Contaminated Soil and Carbon Media"*, *"Preparing Initial Site Investigation Reports at Leaking Underground Tank Sites"*, and *"Underground Storage Tank Regulations, Feb. 1, 1991"*. The following sections summarize the results of the initial study.

### **3.00 SITE DESCRIPTION AND SETTING**

The Munson facility is located on the east side of Dorset Street at the corner of San Remo Drive in South Burlington, Vermont. The site global coordinates are 44° 27' 29" N latitude and 73° 10' 47" W longitude, with an average elevation of 320 feet above Mean Sea Level estimated from the United States Geological Survey topographic map (Figure 1).

As shown on Figure 2, the central office and maintenance garage are attached as one building. The fuel storage and dispensing area is located to the south of the garage. Electric conduits extend from the garage to the dispensing islands. Most of the property is used for parking of earth-moving vehicles and storage of related-equipment. The entrance area to the maintenance yard and fueling area are paved with asphalt. The garage has five bays on its south side and four bays on its north side. Photographs of the southern side of the site are provided as Photographs 1 and 2.

A drain system exists with interior floor drains and catch basins and storm drain lines found north of the building. The storm drain lines connect to the main utilities along Dorset Street. A second utility trench on the property extends from Dorset Street along the south side of the building near the first garage entrance. Various utilities run along the east side of Dorset Street, including electric, water, storm drain and sanitary sewer. Dorset Street has been undergoing improvement since fall of 1991 under the direction of the Vermont Agency of Transportation. As reported by the Agency resident engineer, Mr. Paul Horton, the deepest

trench is the road drainage trench, and is approximately three to seven feet below grade in the area. No significant instances of fuel product have been reported during the Dorset Street construction, except one instance where some fuel was adsorbed with pads approximately one year ago. Some occurrences of fuel vapor have been noticed within catch basins. The actual location of these observations has not been established.

USTs have been in use for over 25 years at the Munson site. Petroleum stains are found in various areas of the site and appear to be associated with minor leakage from vehicle engines. Drums and other containers exist at the rear of the building. Retrofitted steel tanks are used for aboveground storage of used motor oil which is recycled for heating fuel. The history of spills or releases at the site have not been researched within this study, nor has an environmental site assessment of the property been performed.

Relationship of the property lines to the main site features are approximately illustrated in Figure 3. The Munson property is comprised of three lots, totaling a 300-foot by 300-foot area. Property lines have not been located by survey in the field. Land use on the abutting properties is largely commercial along Dorset Street and industrial along San Remo Drive. Residences are located in condominium developments southwest of the site, northwest on Sherry Road, and further east on Barrett Street.

No major surface water bodies are found within 1,000 feet of the site. All water supply for the area is provided by the Champlain Water District, with no residences found to have private wells based on a windshield survey of the area and conversations with Art Barnier of the water district. As noted on Figure 3, several properties near the Munson site have USTs. One leaking UST site has been included on the Vermont Hazardous Waste Site list (DEC No. 921233), the former Alco Equipment building at 350 Dorset Street.

#### **4.00 SEPTEMBER 1993 FIELD PROGRAM**

##### **4.10 Soil Sampling and Screening**

Subsurface explorations by backhoe were completed at the site to gain an initial estimate of the contaminant conditions at the site. Dense pavement conditions required use of heavy equipment for excavation, and prevented sampling with a hand auger. The five test pits were excavated at locations shown in Figure 2. Test pit logs are provided in Appendix B. The test pit depths generally did not extend beyond four to five feet in order to minimize disturbance and the spread of contaminants at the site.

Soil samples were collected at representative depths at each location. A HNu Model PI-101 photoionization detector (PID) with a 10.2 electron volt lamp was used to analyze for VOCs. The instrument was calibrated with 100 ppm isobutylene span gas to yield a manufacturer specified benzene-equivalent calibration. The baggie method for field screening was used which involved the placement of five samples in disposable bags where they were allowed to equilibrate. The PID was inserted into the baggie and the maximum reading recorded. Results of the soil screening are provided in Table 2.

Product was observed within discrete sandy zones in test pits TP-1 and TP-3, with vapors also noticeable in TP-2 and TP-4. The PID measurements indicated the presence of VOCs in these excavations, with values in excess of 100 ppm benzene-equivalent at a depth of four to five feet for TP-1, 2, and 3. Seepage zones were observed at approximately this depth in TP-1 and TP-3 (see Photograph 4). The depth coincides with a transition from fine sands above, to moderately dense silt below.

Sandy soil beneath the UST No. 1 vent pipe leak appeared to have residual gasoline, and yielded a value of 170 ppm benzene-equivalent (Table 2, GS-1). A downgradient sample several hundred feet downgradient in the wetlands across Dorset Street had background levels of less than 0.2 ppm benzene-equivalent (Table 2, GS-2). The DEC has set cleanup targets of 20 ppm benzene for gasoline-contaminated soil and ten ppm for diesel fuel.

#### **4.20 Groundwater Sampling and Analysis**

Groundwater within the eight, four-inch diameter polyvinyl chloride (PVC) monitoring wells were examined for floating product using a dedicated one-liter polyethylene bailer for each well. No floating product was found in the wells, although globules of petroleum existed in wells MW-1 and MW-3 near the diesel island. Some sheen and petroleum vapors were noticed in all the wells except MW-2 and MW-6. All wells appeared to be properly screened through the water table with a one to two foot solid riser.

Static water level, conductivity, and temperature were recorded for each of the wells on September 18, 1993, and are listed in Appendix C. All wells had higher than normal specific conductivity values and are likely related to road salt effects in addition to effects of dissolved or suspended solids and petroleum compounds. The water table contour map based on these measurements is provided in Figure 2. The average depth to groundwater was about 3.5 feet below ground surface.

The well hydraulic response in each of the wells was low, but adequate. Except for monitoring well MW-3, the wells recovered to 90 percent of their original level after one hour. MW-3 had a saturated well thickness about two to three times that of the other wells. A total of 1.5 to 3.0 well volumes were removed from each well prior to sampling for VOCs and TPH, two rounds of "bail-downs" performed.

Sampling procedures included using sample containers prepared in the laboratory with appropriate preservatives. After transfer of the water to the containers, the samples were kept chilled on ice and express mailed to Amro Environmental Laboratories in Merrimack, New Hampshire two days after sampling. The Chain of Custody and laboratory results are provided in Appendix D. Tests were completed within the suggested holding times for TPH by freon extraction and infrared spectroscopy (EPA method 418.1) and VOCs by gas chromatography (EPA method 8020).

A summary of the analytical results is provided in Table 3. To facilitate analysis of the VOCs, the total concentration of Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) was summed for each well. This value has been contoured on the site plan within Figure 4 using a

logarithmic progression for contour intervals. Similarly, TPH values for groundwater across the site was contoured in Figure 5.

#### **4.30 Hydrogeology and Extent of Contamination**

The geology of the site consists of a thin layer of fine sands overlying lake silts deposited within glacial Lake Vermont. The top of the silt unit may gently dip in a westerly direction, consistent with the topographic trend for the site.

As shown on Figure 2, the site maintains a relatively flat water table surface, with a 0.007 gradient to the southwest toward a local drainage basin within the Potash Brook system. Flow immediately downgradient of the site is expected to be altered by drainage trenches constructed along Dorset Street, since the minimum depth of the trench lies one to three feet below the average water table surface height at the site.

The silt has low permeability and specific yield, but contains occasional thin zones of silty fine sand. A conservatively high estimate of hydraulic conductivity of the saturated fine sand is probably between 1 to 15 feet per day. Therefore, a conservatively high estimate of groundwater transport velocity is less than 250 feet per year. Due to its topographic setting near a gentle hill crest, some downward groundwater movement also may occur at the Munson site.

Fairly high concentrations of petroleum constituents in groundwater are evident from the chemical concentration contour maps (Figures 4 and 5), with maximum values exceeding background or MCL levels by two to three orders of magnitude. The distribution of BTEX values is in agreement with the two known sources of gasoline releases, as well as the groundwater flow conditions.

The major source of BTEX contamination appears to be at the UST No. 1 vent pipe break with monitoring well MW-7, the nearest well, having the highest concentrations. The maximum Methyl Tertiary Butyl Ether (MTBE) concentration is at MW-8, directly downgradient of the UST No. 3 piping failure. This leak appears to be a smaller source volume than the UST No. 1 leak. A third source north of the diesel pumping island is less distinct from the BTEX contours (Figure 4).

TPH contours illustrate an area north of the diesel USTs as a locus of heavier petroleum contamination, perhaps related to weathered diesel or bunker-type oil. To illustrate the difference in the nature of petroleum contamination across the site, BTEX concentrations have been plotted versus TPH in Figure 6. High ratios of BTEX to TPH are associated with lighter fuels such as gasoline, and lower ratio values are indicative of highly-weathered fuels or heavier petroleum products such as oils. Contamination at monitoring well MW-1 and MW-3, therefore, does not appear to be related to recent gasoline contamination.

#### **5.00 INITIAL RISK EVALUATION**

The main contaminant source of concern is the gasoline released from piping at UST No. 1 and

No. 3. The suspected spill volume has not been determined but is believed to be on the order of ten gallons. Therefore, floating product probably does not exist as an off-site threat.

Dissolved gasoline constituents may degrade potential drinking water sources and pose some health hazards due to vapor intrusion into basements or confined spaces. Downgradient regions appear to be southwest of the Munson site, toward a wooded lot across Dorset Street. However, the presence of the Dorset utility trenches may alter flow paths downgradient of the site.

Contaminant movement appears to be less than one foot per day, assuming a porosity of 0.15, hydraulic gradient of 0.007 and hydraulic conductivity of 15 feet per day. Vapor movement within the unsaturated sand zone may occur independently of the groundwater plume.

A windshield survey of the area indicates that very few basements exist in residences within 500 feet of the site (Figure 3). Those found are generally located on Sherry Road west-northwest of the site. Private water supplies, water bodies or significant wetlands are not known to exist within the search radius. Therefore, there does not appear to be imminent hazards off-site.

Depending on the volume of the spill and specific exposure routes, long-term hazards may exist due to vapor intrusion within confined spaces. Natural attenuation and dilution factors should degrade existing concentrations in all phases, and inhibit contaminant transport, particularly within the low-permeability silt unit. Soil ingestion by children is a possible exposure route for the heavier and less mobile petroleum constituents. However, the Munson facility is secured with fencing and locking gate, making this a low risk.

## **6.00 CONCLUSIONS AND RECOMMENDATIONS**

Field screening of soils at the site indicate that petroleum-contaminated soils, as defined by the state guidelines, exist outside the immediate vicinity of the USTs. Gasoline contamination, either free-phase, dissolved in groundwater, or vapor phase, appears to be limited to an area downgradient of the maintenance building and gasoline island (Figure 4).

Groundwater analyses of the monitoring wells on site suggest that the gasoline contamination has resulted from two isolated leaks in the piping at UST No. 1 and No. 3. While no free-phase petroleum product was found in the monitoring wells, benzene concentrations at four of the eight wells were found to exceed the state drinking water standards.

Heavier petroleum or weathered fuel contamination is suspected in the vicinity of the diesel fuel island, and is reflected by high TPH levels in the groundwater at upgradient locations. The source may be the diesel USTs which are somewhat downgradient of the wells detecting the highest TPH values (MW-1 and MW-3).

On-site petroleum contamination does not pose a significant risk to human health or the environment, since 1) the volume of product released is probably small, 2) groundwater appears to move slowly across the site, and 3) sensitive receptors have not been identified downgradient of the site. Consequently, no soil or groundwater treatment is recommended in response to the

known product release. A potential safety hazard may exist due to problems related to vapor intrusion in confined spaces.

Based on the information obtained during the course of this investigation, it is recommended that a limited amount of additional work be performed, including a soil gas survey, new monitoring well installation and groundwater sampling and analyses. The following summarizes these recommendations:

1. There is some disagreement in labeling of USTs and monitoring wells between the DEC's and Munson's records. The labeling and numbering as shown in Figure 2 has been used in this report and, for consistency, should be referred to in all future work at the site. Permanent labeling of the monitoring well caps with well numbers should be made, as listed in Figure 2, and Munson and the DEC records should be annotated to reflect the labeling.
2. To reduce the potential for further leaching of product at the former UST No. 1 leak location, the pavement should be patched at the excavation used to repair the vent pipe.
3. The soil gas survey should employ probes extending two feet below ground surface at distance 10 to 50 feet between sampling points. Soil gas samples should be screened for carbon dioxide, oxygen and/or methane levels to discern areas of fuel contamination and biodegradation. Additionally, total organic vapor content should be measured with a PID to establish the extent of gasoline contamination. The survey should reasonably delineate the extent of shallow contamination at the site.
4. Results of the soil gas survey should be used to determine placement of additional borings and monitoring wells. It is anticipated that four borings completed in regions downgradient of the UST facility, with installation of monitoring wells at three of the boring-sites, will meet the objectives of determining the horizontal and vertical extent of contamination at the site.

Borings should be performed with a hollow-stem auger or other suitable drilling method which will allow continuous split-spoon sampling. The sampling will be used to confirm the site geology and the vertical extent of VOC contamination at the site. Field screening using a PID should be performed at one-foot intervals where contamination occurs, defined as greater than two ppm benzene-equivalent. Borings should extend a minimum depth of eight feet unless refusal is met.

Monitoring wells should be constructed using two-inch diameter, schedule 40 PVC pipe. Depending on the water table, well screens extending from two to seven feet BGS should be installed, with the screen portion having a factory slotted 0.01-inch width, surrounded by a sand pack. All borings

should be grouted with a bentonite slurry below the well screen, with a bentonite seal from 1.5 to 0.5 feet BGS. A secured and labeled flush-mounted well casing should be installed, as suggested in Appendix A of the Vermont UST regulations.

5. The new wells should be surveyed, water levels measured at all wells, and a new water table contour map developed for the site. Groundwater sampling and analysis should include sampling of all 11 monitoring wells for TPH and BTEX, using standard EPA methods for well purging, sampling and analysis. Quarterly monitoring may be recommended, depending on the results of the additional field work.

Based on the available information, it is expected that these further investigations will provide necessary information on the limits of soil and groundwater contamination at the site, and evaluate whether off-site contamination may exist. The choice of any soil or groundwater treatment measures can be made assuming the areas of most severe contamination have been adequately defined.

Due to the current land use in the area and apparent lack of human or environmental receptors, it is anticipated that corrective action will be required only if free phase product is recovered during the boring program. This policy would also be consistent with the UST monitoring program approved for the site.

TABLE 1

Munson Earth-Moving  
Project No. V93221V

Summary of UST Information

DEC Facility No. 863 6391 Munson Earth Moving Corp. 366 Dorset Street South Burlington, Vermont								
UST No.	Contents	Date Installed	Size (Gallon)	Diameter (ft)	Length (ft)	Tank Type	Type of Pump	July 1993 Tank Testing
1	Gas	1966	4000	5.3	24	steel	Suction	vent line leak, possible loss of 5 gallons, repaired day of test
2	Gas	1966	3000	5.3	18	"	"	tight
3	Gas	1981	6000	8.0	16	"	"	leak in distribution line beneath island, repaired day of test
4	Diesel	1966	4000	5.3	24	"	"	tight
5	Diesel	1966	4000	5.3	24	"	"	tight
6	Diesel	1981	6000	8.0	16	"	"	tight

Note: Information gathered from the DEC file data and JGI's July, 1993 Tank Testing Report. No spill/overflow protection installed at site. Monitoring Wells used for leak detection purposes.

V#2

**TABLE 2**

Munson Earth-Moving  
Project No. V93221V

**Field Screening Results for VOCs in Soil, September 17, 1993**

Location	Depth Interval (ft)	Soil Type	VOC Content (ppm benzene equivalent)
TP-1	2.5-3.5	fine sand	150
TP-1	4-5	silt	154
TP-2	1-2	fine sand	34
TP-2	3.5-4.5	sandy silt	140
TP-3	1-2	fine sand	<0.2
TP-3	4.5-5	sandy silt	140
TP-3	5-5.5	fine sand	135
TP-3	7-8	silt	80
TP-4	3.5-4.5	silty fine sand	<0.2
TP-4	5-5.5	silt	66
TP-5	2-4	silty fine sand	<0.2
GS-1	0.5-1	sand	170
GS-2	0.5-1	silty sand with organic matter	<0.2

Note: VOC values obtained using HNu photoionization device and baggie method (see text for explanation). Grab sample, GS-1, located below site of leak in UST No. 1 vent pipe, GS-2 taken in wetland soils located 150 feet west of Dorset St.

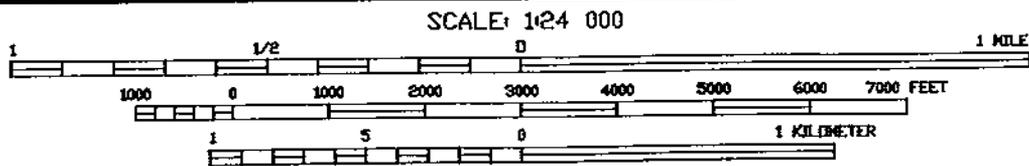
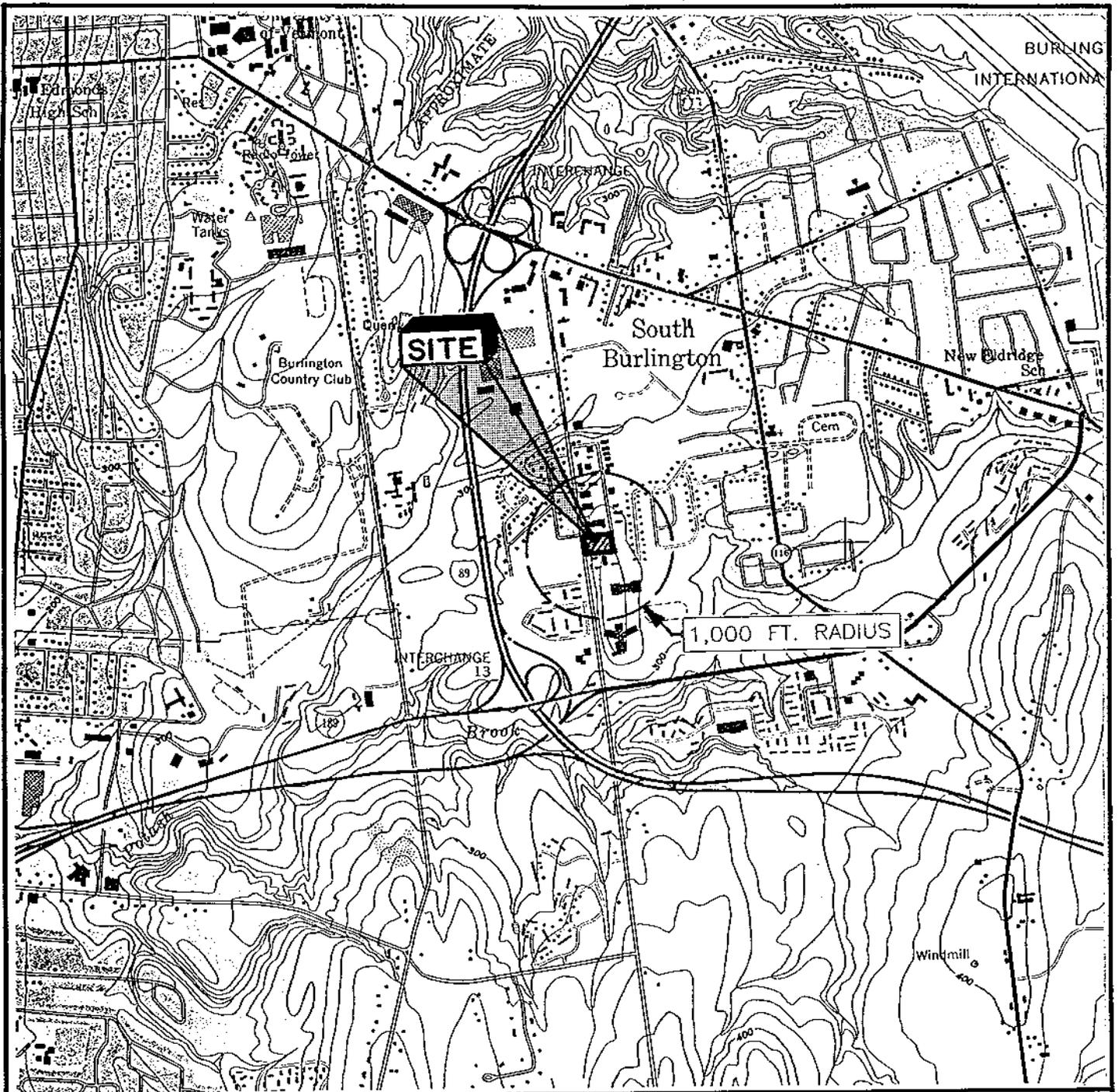
TABLE 3

Munson Earth-Moving  
Project No. V93221V

Summary of Laboratory Results for Groundwater Samples Obtained on September 18, 1993

Well Id	TPH	Benzene	Toluene	Ethylbenzene	T. Xylene	T. BTEX	MTBE
MW-1	25.7	<0.01	<0.01	<0.01	0.035	<0.065	<0.01
MW-2	0.82	<0.002	<0.002	<0.002	<0.002	<0.008	<0.002
MW-3	52.1	0.014*	<0.01	<0.01	0.043	<0.077	<0.01
MW-4	1.83	<0.002	<0.002	<0.002	0.0098	<0.0158	<0.002
MW-5	0.81	<0.002	<0.002	0.0041	0.0025	<0.0106	<0.002
MW-6	0.86	0.082*	0.011	0.095	0.35	0.538	<0.002
MW-7	6.53	2.4*	5.3*	1.7*	11*	20.4	<0.1
MW-8	7.27	1.4*	0.17	<0.1	0.53	<2.2	2.2
MCL	N/A	0.005	1	0.7	10.0	N/A	N/A

Note: All values in mg/l; see Appendix D for Laboratory Reports and Figure 2 for well locations; Total Petroleum Hydrocarbon (TPH) content determined using EPA Method 418.1 with a 0.5 mg/l detection limit; BTEX parameters (Benzene, Toluene, Ethylbenzene and Xylene) and Methyl-t-Butyl-Ether (MTBE) determined using EPA Method 8020. Maximum Contaminant Levels (MCL) are taken from current Federal Drinking Water Standards.



CONTOUR INTERVAL 20 FEET  
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

PROJECT: MUNSON EARTH MOVING  
SOUTH BURLINGTON, VT

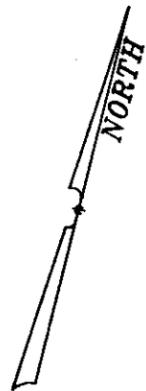
PROJECT NO. V93221

DATE: OCTOBER, 1993

SOURCE: BURLINGTON, VT  
USGS QUAD REV 1987

FIGURE 1  
 SITE  
 LOCATION  
 MAP



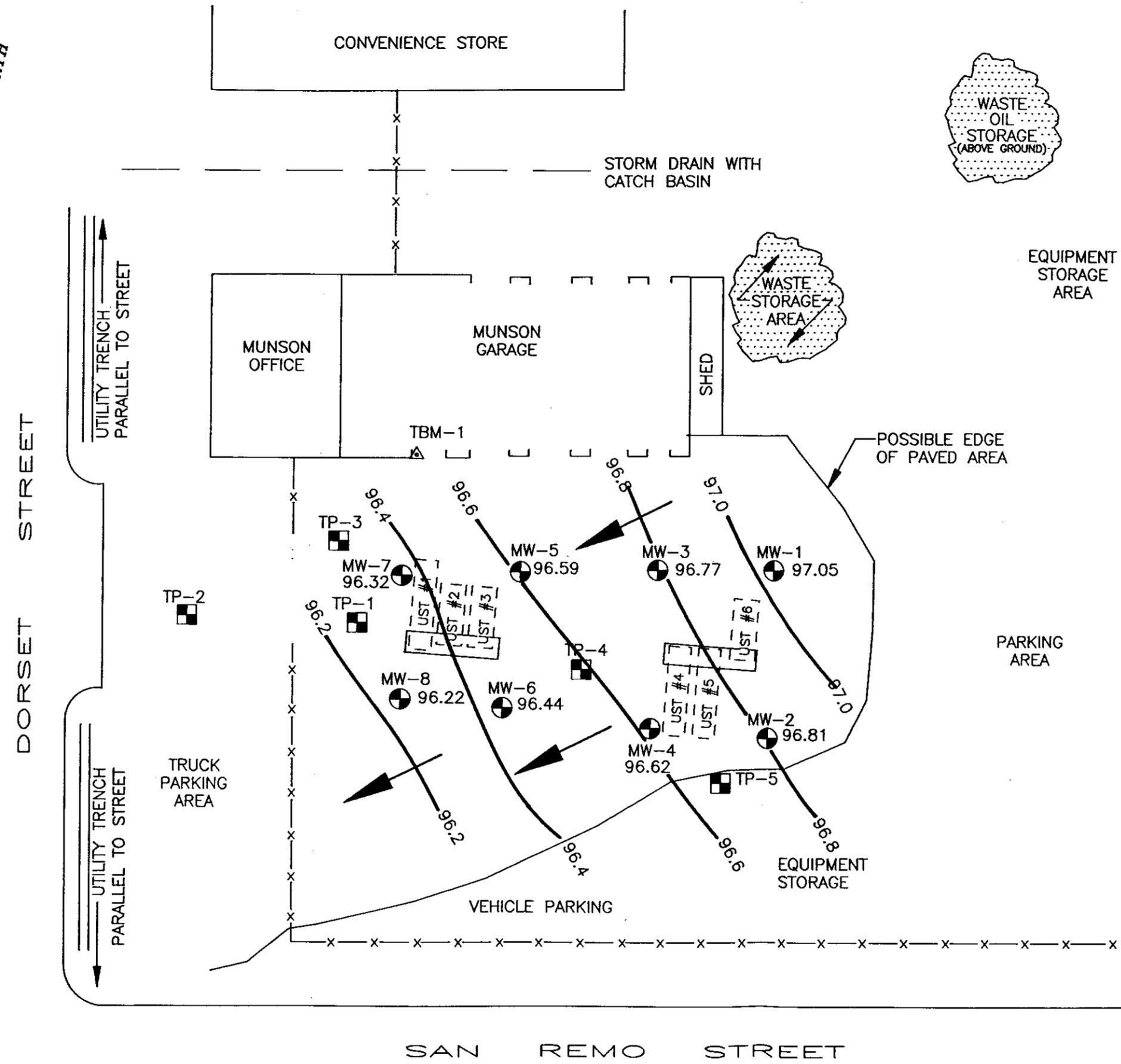


NOTES:

1. THIS PLAN INCLUDES INFORMATION GATHERED FROM A STADIA SURVEY AND LINE OF SIGHT OBSERVATIONS AS WELL AS SKETCHES BY MUNSON EARTH MOVING CORPORATION AND CITY TAX MAPS. USE OF THIS PLAN IS LIMITED TO THE ILLUSTRATION OF SUBSURFACE EXPLORATIONS AND PERTINENT FEATURES.
2. TEST PITS SHOWN AS TP-1 THROUGH TP-5 WERE EXCAVATED IN SEPTEMBER, 1993 BY JGI, USING EQUIPMENT OWNED AND OPERATED BY MUNSON EARTH MOVING CORPORATION. MONITORING WELLS SHOWN AS MW-1 THROUGH MW-8 WERE INSTALLED BY OTHERS PRIOR TO JGI'S INVOLVEMENT.

LEGEND:

- TP-1 TEST PIT
- 96.00 MONITORING WELL/ WATER ELEVATION
- TBM-1 TEMPORARY BENCHMARK ON CONCRETE FLOOR OF GARAGE BAY ELEV.=100.00ft
- x-x-x- CHAIN LINK FENCE
- WATER TABLE SURFACE ELEVATION CONTOUR 9-18-93
- GROUNDWATER FLOW DIRECTION



**MUNSON EARTH MOVING**  
 SOUTH BURLINGTON, VERMONT

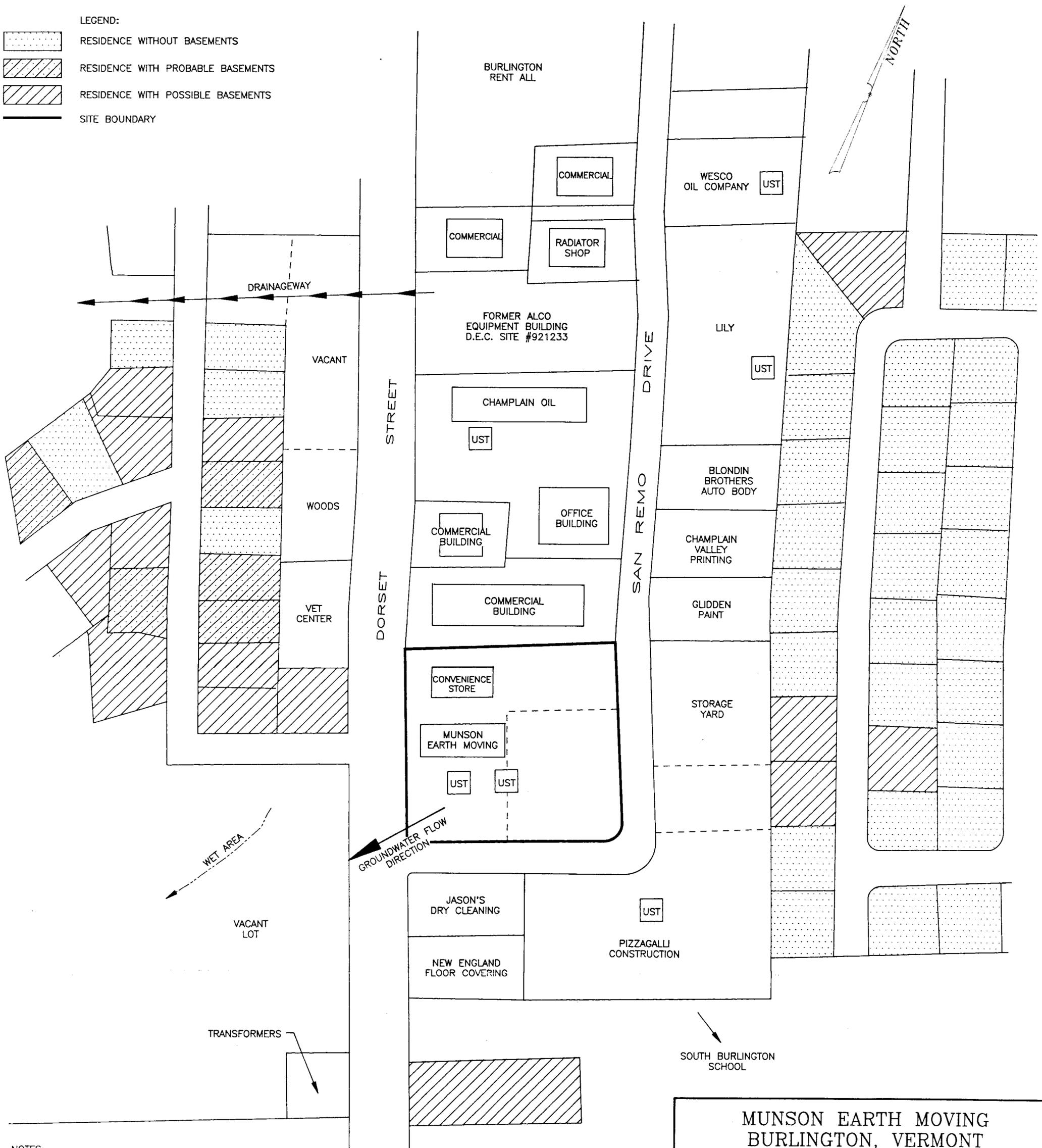
**FIGURE 2**  
**SUBSURFACE EXPLORATION**  
**LOCATION PLAN**

PREPARED FOR:  
 MUNSON EARTH MOVING CORP.  
 366 DORSET STREET  
 SOUTH BURLINGTON, VT 05403



DATE: NOVEMBER, 1993  
 SCALE: 1" = 30'  
 PROJECT NO. V93221

- LEGEND:
-  RESIDENCE WITHOUT BASEMENTS
  -  RESIDENCE WITH PROBABLE BASEMENTS
  -  RESIDENCE WITH POSSIBLE BASEMENTS
  -  SITE BOUNDARY



NOTES:  
 1. THIS PLAN WAS PREPARED FROM TRACING REDUCE COPIES OF TAX MAPS AVAILABLE FROM THE CITY OF BURLINGTON TAX ASSESSORS OFFICE. MAPS USED ARE MAP NUMBERS 23, 25, 40 & 42. THE SUBJECT PROPERTY IS ON MAP NO. 25.



NO.	REVISION	DATE	CHK'D

DESIGNED: \_\_\_\_\_ SCALE: 1"=100'  
 DRAWN: DEB DATE: 11/2/93  
 CHECKED: G.J. DATE: \_\_\_\_\_  
 APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_

**MUNSON EARTH MOVING  
 BURLINGTON, VERMONT**

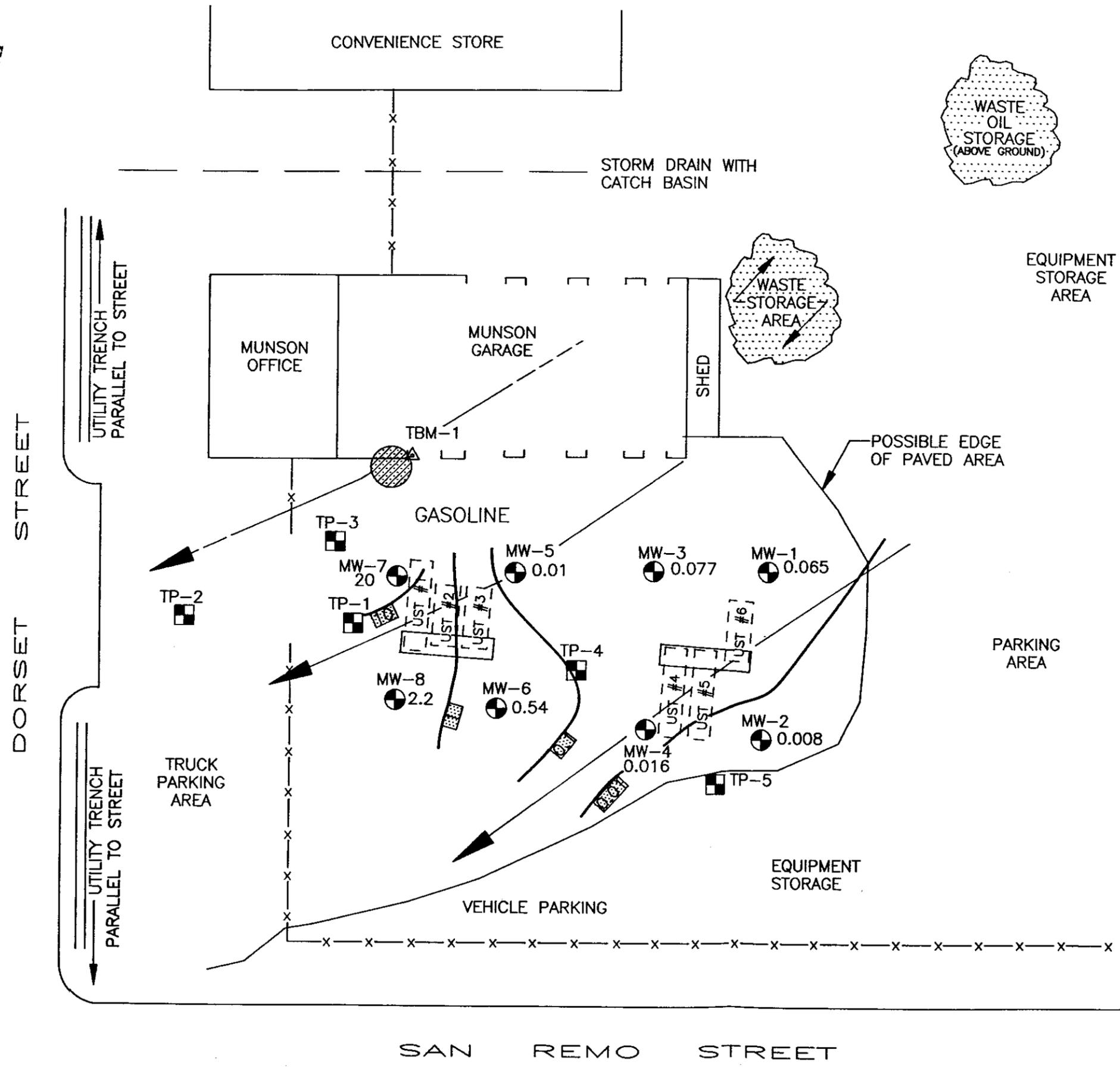
**FIGURE 3  
 LOCAL AREAS MAP**

PREPARED FOR: **MUNSON EARTH MOVING CORP.**  
 366 DORSET STREET  
 SOUTH BURLINGTON, VT 05403

PROJECT NO. **V93221**

NOTES:

1. THIS PLAN INCLUDES INFORMATION GATHERED FROM A STADIA SURVEY AND LINE OF SIGHT OBSERVATIONS AS WELL AS SKETCHES BY MUNSON EARTH MOVING CORPORATION AND CITY TAX MAPS. USE OF THIS PLAN IS LIMITED TO THE ILLUSTRATION OF SUBSURFACE EXPLORATIONS AND PERTINENT FEATURES.
2. TEST PITS SHOWN AS TP-1 THROUGH TP-5 WERE EXCAVATED IN SEPTEMBER, 1993 BY JGI, USING EQUIPMENT OWNED AND OPERATED BY MUNSON EARTH MOVING CORPORATION. MONITORING WELLS SHOWN AS MW-1 THROUGH MW-8 WERE INSTALLED BY OTHERS PRIOR TO JGI'S INVOLVEMENT.



LEGEND:

- TP-1 TEST PIT
- 2.2 MONITORING WELL/TOTAL BTEX VALUE 9/18/93
- TBM-1 TEMPORARY BENCHMARK ON CONCRETE FLOOR OF GARAGE BAY ELEV.=100.00ft
- x-x-x- CHAIN LINK FENCE
- TOTAL BTEX CONCENTRATION CONTOUR, IN PPM
- KNOWN PRODUCT RELEASE JULY, 1993
- GROUNDWATER FLOW DIRECTION

**MUNSON EARTH MOVING**  
SOUTH BURLINGTON, VERMONT

**FIGURE 4**  
**GROUNDWATER BTEX CONCENTRATION MAP**

PREPARED FOR:  
MUNSON EARTH MOVING CORP.  
366 DORSET STREET  
SOUTH BURLINGTON, VT 05403

**JGI**  
JAWORSKI  
GEOTECH, INC.

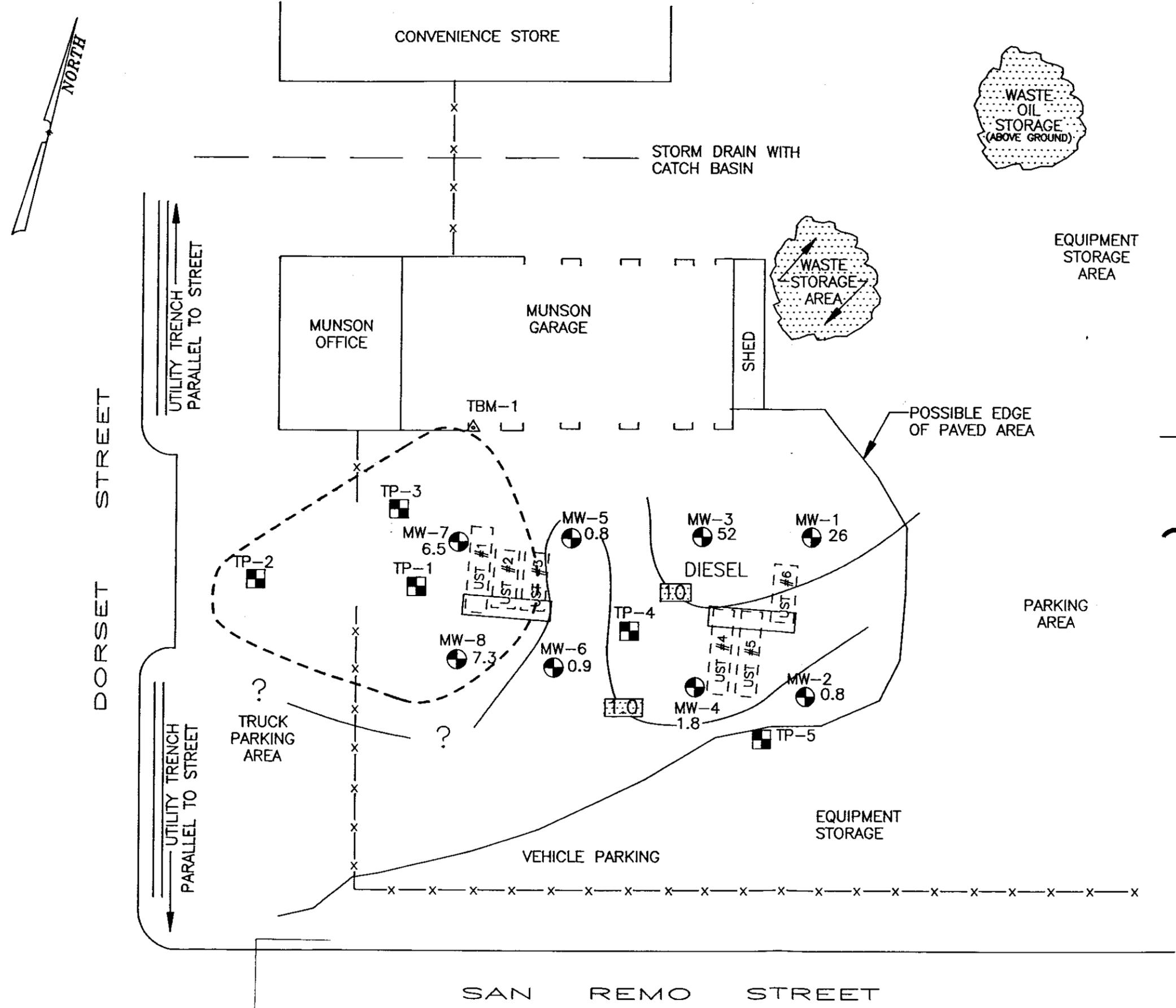
DATE: NOVEMBER, 1993  
SCALE: 1" = 30'  
PROJECT NO. V93221

NOTES:

1. THIS PLAN INCLUDES INFORMATION GATHERED FROM A STADIA SURVEY AND LINE OF SIGHT OBSERVATIONS AS WELL AS SKETCHES BY MUNSON EARTH MOVING CORPORATION AND CITY TAX MAPS. USE OF THIS PLAN IS LIMITED TO THE ILLUSTRATION OF SUBSURFACE EXPLORATIONS AND PERTINENT FEATURES.
2. TEST PITS SHOWN AS TP-1 THROUGH TP-5 WERE EXCAVATED IN SEPTEMBER, 1993 BY JGI, USING EQUIPMENT OWNED AND OPERATED BY MUNSON EARTH MOVING CORPORATION. MONITORING WELLS SHOWN AS MW-1 THROUGH MW-8 WERE INSTALLED BY OTHERS PRIOR TO JGI'S INVOLVEMENT.

LEGEND:

- TP-1 TEST PIT
- 0.8 MONITORING WELL/TPH CONCENTRATION PPM
- TBM-1 TEMPORARY BENCHMARK ON CONCRETE FLOOR OF GARAGE BAY ELEV.=100.00ft
- x-x-x- CHAIN LINK FENCE
- TPH CONCENTRATION CONTOUR, PPM
- SOIL VOC EXCEEDING 100 PPM AS BENZINE AT 0 TO 4 FEET



**MUNSON EARTH MOVING**  
 SOUTH BURLINGTON, VERMONT

**FIGURE 5**  
**GROUNDWATER TPH CONCENTRATION MAP**

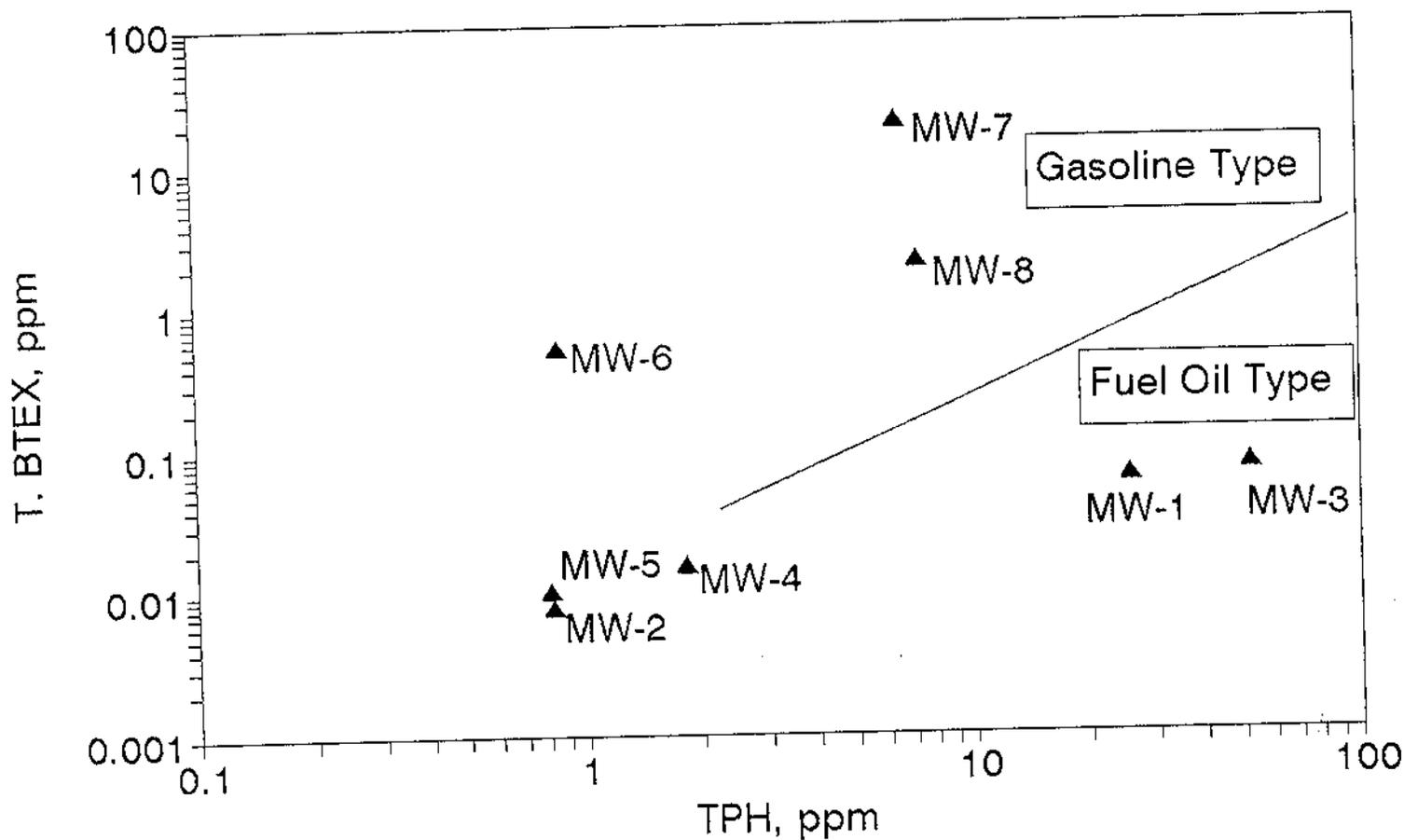
PREPARED FOR:  
 MUNSON EARTH MOVING CORP.  
 366 DORSET STREET  
 SOUTH BURLINGTON, VT 05403



DATE: NOVEMBER, 1993  
 SCALE: 1" = 30'  
 PROJECT NO. V93221

# Sept. 18, 1993 Well Data

## Munson - S. Burlington, VT



PREPARED FOR:  
 MUNSON EARTH MOVING CORP.  
 366 DORSET STREET  
 SOUTH BURLINGTON, VT 05403

DATE: NOVEMBER, 1993  
 SCALE: AS NOTED  
 PROJECT NO: V93221

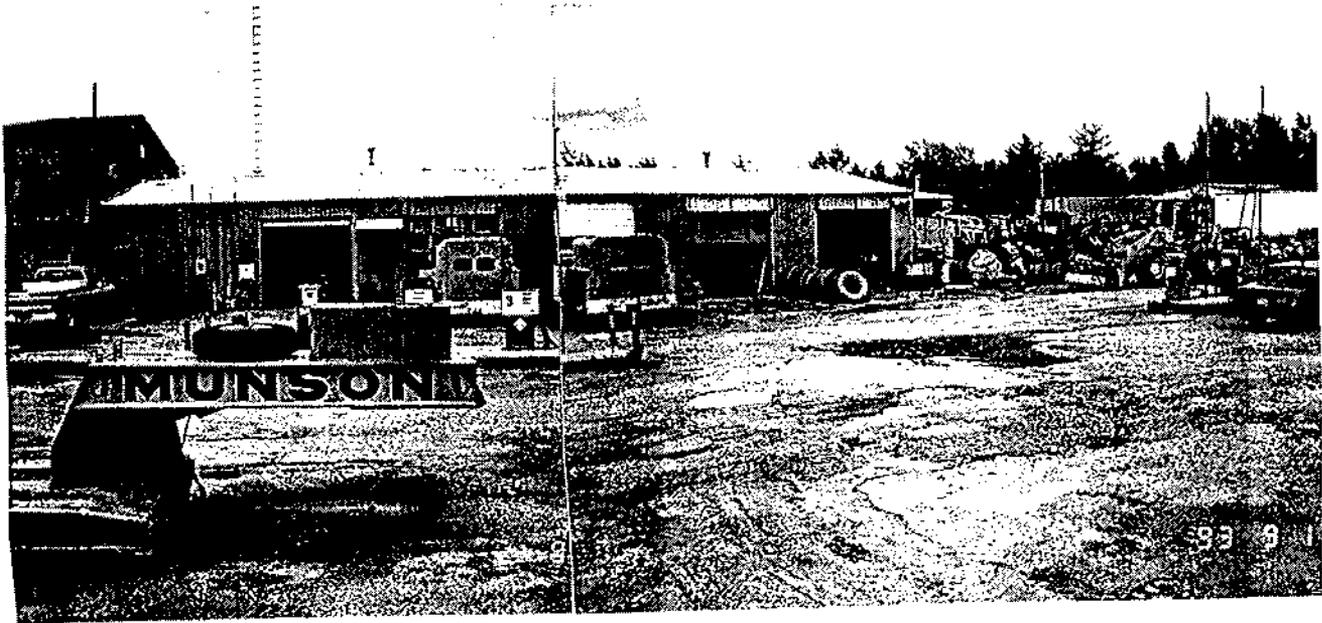
MUNSON EARTH  
 MOVING  
 SOUTH BURLINGTON, VERMONT

FIGURE 6  
 GRAPH OF BTEX  
 VS.  
 TPH CONCENTRATIONS





(1)



(2)



(1) View of Munson Facility  
Through Entranceway.

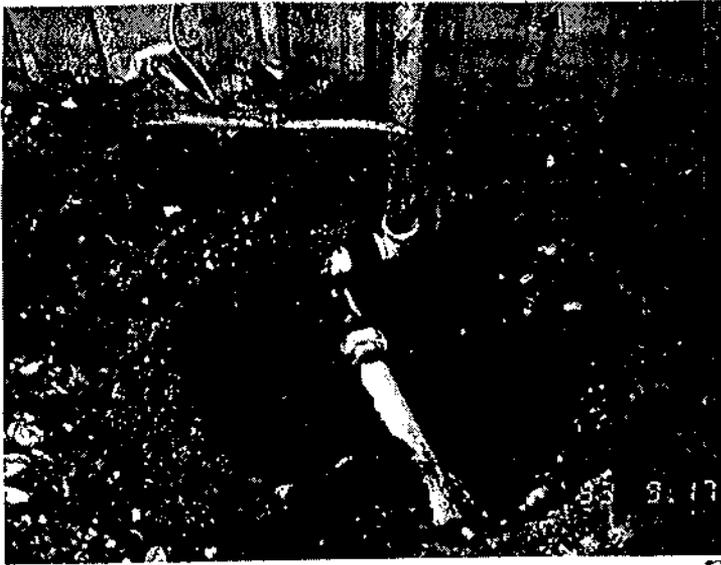
(2) Panoramic View of Gas  
(Left) and Diesel Islands  
and Maintenance Building.

PROJECT NAME:

Munson Earth Moving  
South Burlington, Vermont

PROJECT NO.:

V93221V



(3)



(4)



(3) Location of Repaired Leak at Base of Vertical Vent Pipe for UST No. 1.

(4) View of Test Pit (TP-3) Showing Seepage at 5.0 Feet and General Stratigraphy.

PROJECT NAME:

Munson Earth Moving  
South Burlington, Vermont

PROJECT NO.:

V93221V

## LIMITATIONS

1. Analytical tests performed in the field and in the laboratory were done so for the purpose of identifying the likelihood that hazardous wastes exist beneath the Site. Analytical tests were not completed for every compound on the Environmental Protection Agency list of priority pollutants, nor was the entire Site explored for the purpose of revealing a potential problem. Explorations were widely spaced, thus it is possible that hazardous materials may be present beneath unexplored areas of the Site.
2. The analyses and conclusions in this report are based in part upon chemical test data provided by others and are contingent upon their validity. Should additional chemical analyses indicate different evidence of contamination, these data should be reviewed by Jaworski Geotech, Inc. and the conclusions presented herein may be modified. It should be noted that variations in the type of contaminants, their concentrations, and their direction of flow will occur due to water table fluctuations and alteration of disposal practices, as well as other factors. As such, it cannot be stated with absolute certainty whether or not a hazardous waste contamination problem exists or will exist in the future at the site.
3. This study and report have been prepared for the exclusive use of Munson Earth-Moving Corporation and their Lender and Title Insurer associated with the Site solely for the use of an evaluation of the Site. This report and the findings contained herein shall not, in whole or part, be disseminated or conveyed to any other party, nor used by any other party, in whole or in part, without prior written consent of Jaworski Geotech, Inc. This report has been prepared in accordance with generally accepted environmental assessment practices. No other warranty, expressed or implied, is made.



# TEST PIT LOG

<b>PROJECT:</b> Munson Earth Moving South Burlington, Vermont <b>PROJECT NO.:</b> V93221V <b>DATE:</b> September 17, 1993	<b>JGI INSPECTOR:</b> Jack Jemsek <b>WEATHER:</b> Cool, Occas. Light Rain	<b>TEST PIT NO.:</b> TP-2 <b>LOCATION:</b> In entrance 35.0' from Dorset Street <b>SURFACE EL.:</b> 99.0'								
<b>EXCAVATION EQUIPMENT:</b> <b>CONTRACTOR:</b> Munson Earth Moving <b>OPERATOR:</b> <b>MAKE:</b> CAT <b>MODEL:</b> 416 <b>CAPACITY:</b> 6 c.y. <b>REACH:</b> 12 ft.	<b>GROUNDWATER OBSERVATIONS</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">DATE</th> <th style="width: 25%;">TIME</th> <th style="width: 25%;">DEPTH</th> <th style="width: 25%;">NOTES</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">09/17/93</td> <td style="text-align: center;">11:20</td> <td></td> <td style="text-align: center;">(1)</td> </tr> </tbody> </table>		DATE	TIME	DEPTH	NOTES	09/17/93	11:20		(1)
DATE	TIME	DEPTH	NOTES							
09/17/93	11:20		(1)							

DEPTH FT.	STRATUM CHANGE	SOIL DESCRIPTION	BOULDER SIZE/COUNT	NOTES
1	0.4'	Asphalt pavement and sandy Gravel subgrade, black to brown.		
2	1.9'	Silty, fine SAND, mostly fine Sand, some Silt, trace Clay, greenish/brown, moist, trace petroleum odor. VOC at 1.5' = 34 ppm. (2)		
3		Silty, fine SAND, fine Sand and Silt, greenish/grey with orange mottles, moist, trace petroleum odor. VOC at 4.0' = 140 ppm.		
4				
5		Excavation terminated - 4.0'.		
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

**NOTES:**  
 (1) None observed to 4.0'.  
 (2) See text for VOC screening method.

**PIT DIMENSIONS:**  
 LENGTH: 6.0'                      WIDTH: 3.0'                      DEPTH: 4.0'

**REMARKS:** The stratification lines represent the approximate boundary between soil types and the transition may be gradual. Water level readings have been made in the test pits at times and under conditions stated on the test pit logs. Fluctuations in the level of the groundwater may occur due to other factors than those present at the time measurements were made.  
 Proportions used: trace (0-10%), little (10-20%), some (20-35%), and (35-50%)



# TEST PIT LOG

<b>PROJECT:</b> Munson Earth Moving South Burlington, Vermont <b>PROJECT NO.:</b> V93221V <b>DATE:</b> September 17, 1993		<b>JGI INSPECTOR:</b> Jack Jemsek <b>WEATHER:</b> Cool, Occas. Light Rain <b>TEST PIT NO.:</b> TP-3 <b>LOCATION:</b> 30.0' NW of Gas Island <b>SURFACE EL.:</b> 99.7'									
<b>EXCAVATION EQUIPMENT:</b> <b>CONTRACTOR:</b> Munson Earth Moving <b>OPERATOR:</b> <b>MAKE:</b> CAT <b>MODEL:</b> 416 <b>CAPACITY:</b> 6 c.y. <b>REACH:</b> 12 ft.		<b>GROUNDWATER OBSERVATIONS</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">DATE</th> <th style="width: 25%;">TIME</th> <th style="width: 25%;">DEPTH</th> <th style="width: 25%;">NOTES</th> </tr> </thead> <tbody> <tr> <td>09/17/93</td> <td>2:10</td> <td>5.0'</td> <td>(1)</td> </tr> </tbody> </table>		DATE	TIME	DEPTH	NOTES	09/17/93	2:10	5.0'	(1)
DATE	TIME	DEPTH	NOTES								
09/17/93	2:10	5.0'	(1)								
DEPTH FT.	STRATUM CHANGE	SOIL DESCRIPTION	BOULDER SIZE/COUNT	NOTES							
1	0.5'	Asphalt pavement and sandy Gravel subgrade, black to red/brown.									
2	2.0'	Fine SAND, little Silt, occasional roots, red/brown to orange/brown, moist, no petroleum odor. VOC at 1.5' = <0.2 ppm. (2)									
3	7.0'	Sandy SILT, some fine Sand, mostly Silt, trace Clay, olive/brown to olive/grey, moist to wet, fine Sand seam, 0.2' thick, at 5.0' seepage of product and water. VOC at 4.5 - 5.0' = 140 ppm.									
4											
5											
6											
7											
8		SILT, little Clay, little fine Sand, grey, very moist to wet. VOC at 8.0' = 80 ppm.									
9		Excavation terminated - 8.0'.									
10											
11											
12											
13											
14											
15											
16											
<b>NOTES:</b> (1) Seepage with product. (2) See text for VOC screening method.											
<b>PIT DIMENSIONS:</b> LENGTH: 6.0'                      WIDTH: 3.0'                      DEPTH: 8.0'											
<b>REMARKS:</b> The stratification lines represent the approximate boundary between soil types and the transition may be gradual. Water level readings have been made in the test pits at times and under conditions stated on the test pit logs. Fluctuations in the level of the groundwater may occur due to other factors than those present at the time measurements were made. Proportions used: trace (0-10%), little (10-20%), some (20-35%), and (35-50%)											

# TEST PIT LOG

<b>PROJECT:</b> Munson Earth Moving South Burlington, Vermont <b>PROJECT NO.:</b> V93221V <b>DATE:</b> September 17, 1993	<b>JGI INSPECTOR:</b> Jack Jemsek <b>WEATHER:</b> Cool, Occas. Light Rain	<b>TEST PIT NO.:</b> TP-4 <b>LOCATION:</b> 20.0' East of Gas Island <b>SURFACE EL.:</b> 100.4'								
<b>EXCAVATION EQUIPMENT:</b> <b>CONTRACTOR:</b> Munson Earth Moving <b>OPERATOR:</b> <b>MAKE:</b> CAT <b>MODEL:</b> 416 <b>CAPACITY:</b> 6 c.y. <b>REACH:</b> 12 ft.	<b>GROUNDWATER OBSERVATIONS</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 25%;">DATE</th> <th style="width: 25%;">TIME</th> <th style="width: 25%;">DEPTH</th> <th style="width: 25%;">NOTES</th> </tr> <tr> <td style="text-align: center;">09/17/93</td> <td style="text-align: center;">2:10</td> <td style="text-align: center;">5.0'</td> <td style="text-align: center;">(1)</td> </tr> </table>		DATE	TIME	DEPTH	NOTES	09/17/93	2:10	5.0'	(1)
DATE	TIME	DEPTH	NOTES							
09/17/93	2:10	5.0'	(1)							

DEPTH FT.	STRATUM CHANGE	SOIL DESCRIPTION	BOULDER SIZE/COUNT	NOTES
1	0.5'	Asphalt pavement and sandy Gravel subgrade, black to red/brown.		
2		Silty SAND, mostly fine to coarse Sand, little Silt, little organic matter and roots, brown, moist.		
3	2.5'			
4		Silty, fine SAND, mostly fine Sand, little Silt, olive/grey, moist to wet. VOC at 4.0' = <0.2 ppm. (2)		
5	4.2'			(3)
6		SILT, grey, moist. VOC from 5.0 - 5.5' = 66 ppm.		
7		Excavation terminated - 5.5'.		
8				
9				
10				
11				
12				
13				
14				
15				
16				

**NOTES:**  
 (1) Seepage.                      (2) See text for VOC screening method.  
 (3) Seepage from 3.8 to 4.2' in brownish zone (probable sand seam).

**PIT DIMENSIONS:**  
 LENGTH: 6.0'                      WIDTH: 3.0'                      DEPTH: 5.5'

**REMARKS:** The stratification lines represent the approximate boundary between soil types and the transition may be gradual. Water level readings have been made in the test pits at times and under conditions stated on the test pit logs. Fluctuations in the level of the groundwater may occur due to other factors than those present at the time measurements were made.  
 Proportions used: trace (0-10%), little (10-20%), some (20-35%), and (35-50%)



# TEST PIT LOG

<b>PROJECT:</b> Munson Earth Moving South Burlington, Vermont <b>PROJECT NO.:</b> V93221V <b>DATE:</b> September 17, 1993	<b>JGI INSPECTOR:</b> Jack Jemsek <b>WEATHER:</b> Cool, Occas. Light Rain	<b>TEST PIT NO.:</b> TP-5 <b>LOCATION:</b> 30.0' South of diesel island <b>SURFACE EL.:</b> 100.5'
<b>EXCAVATION EQUIPMENT:</b> <b>CONTRACTOR:</b> Munson Earth Moving <b>OPERATOR:</b> <b>MAKE:</b> CAT <b>MODEL:</b> 416 <b>CAPACITY:</b> 6 c.y. <b>REACH:</b> 12 ft.	<b>GROUNDWATER OBSERVATIONS</b> DATE      TIME      DEPTH      NOTES	

DEPTH FT.	STRATUM CHANGE	SOIL DESCRIPTION	BOULDER SIZE/COUNT	NOTES
1	0.5'	Fill, silty SAND with Gravel.		
2	2.0'	Silty SAND, mostly fine to coarse Sand, little Silt, little organic matter and roots, brown, moist.		
3		Silty, fine SAND, mostly fine Sand, little Silt, sand seam at 4.0 to 4.2', moist, no petroleum odors. VOC from 2.0 to 4.0' = <0.2 ppm. (1)		
4				
5				
6				
7		Excavation terminated - 4.5'.		
8				
9				
10				
11				
12				
13				
14				
15				
16				

**NOTES:**  
 (1) See text for VOC screening method.

**PIT DIMENSIONS:**  
 LENGTH: 6.0'      WIDTH: 3.0'      DEPTH: 4.5'

**REMARKS:** The stratification lines represent the approximate boundary between soil types and the transition may be gradual. Water level readings have been made in the test pits at times and under conditions stated on the test pit logs. Fluctuations in the level of the groundwater may occur due to other factors than those present at the time measurements were made.  
 Proportions used: trace (0-10%), little (10-20%), some (20-35%), and (35-50%)



## MONITORING WELL FIELD GROUNDWATER MEASUREMENTS

PROJECT	Munson Earth-Moving South Burlington, Vermont	CLIENT	Munson Earth-Moving Corporation South Burlington, Vermont
PROJECT NO.	V93221V	WEATHER	Overcast, 10 C
DATE	September 28, 1993	INSTRUMENT(S)	Tape Measure
TECHNICIAN	Jack Jemsek		

WELL NO.	SURFACE ELEV.	WELL ELEV.	WATER TABLE ELEV.	DEPTH OF WELL	DEPTH TO WATER	WATER COLUMN THICKNESS	TEMP. (deg C)	pH	SPECIFIC CONDUCTANCE (uS/cm)	
									TOP	BOTTOM
MW-1	100.16	100.01	97.43	6.00	2.58	3.42				
MW-2	100.66	100.34	97.13	5.40	3.21	2.19				
MW-3	99.95	99.72	96.83	12.00	2.89	9.11	Not Stable			
MW-4	100.61	100.41	96.95	7.50	3.46	4.04				
MW-5	99.92	99.76	96.91	7.35	2.85	4.5				
MW-6	100.43	100.28	96.81	9.50	3.47	6.03				
MW-7	99.73	99.61	96.83	7.35	2.78	4.57				
MW-8	100.00	99.90	96.64	7.00	3.26	3.74				

Comments: Local benchmark (concrete floor at W corner of W bay of Maintenance Garage) = 100.00 ft; all depths in ft.

## MONITORING WELL FIELD GROUNDWATER MEASUREMENTS

PROJECT	Munson Earth-Moving South Burlington, Vermont	CLIENT	Munson Earth-Moving Corporation South Burlington, Vermont
PROJECT NO.	V93221V	WEATHER	Overcast, 19 C, Occas. Light Rain
DATE	September 18, 1993	INSTRUMENT(S)	Tape Measure, YSI Temperature and Conductivity Meter
TECHNICIAN	Jack Jemsek		

WELL NO.	SURFACE ELEV.	WELL ELEV.	WATER TABLE ELEV.	DEPTH OF WELL	DEPTH TO WATER	WATER COLUMN THICKNESS	TEMP. (deg C)	pH	SPECIFIC CONDUCTANCE (uS/cm)	
									TOP	BOTTOM
MW-1	100.16	100.01	97.05	6.00	2.96	3.04	19.8	N/A	1130	
MW-2	100.66	100.34	96.81	5.40	3.53	1.87	20.4	N/A	800	
MW-3	99.95	99.72	96.77	12.00	2.95	9.05	16.6	N/A	1930	
MW-4	100.61	100.41	96.62	7.50	3.79	3.71	20.4	N/A	950	
MW-5	99.92	99.76	96.59	7.35	3.17	4.18	20.5	N/A	1350	1690
MW-6	100.43	100.28	96.44	9.50	3.84	5.66	17.9	N/A	1610	1730
MW-7	99.73	99.61	96.32	7.35	3.29	4.06	20.8	N/A	2060	2060
MW-8	100.00	99.90	96.22	7.00	3.68	3.32	18.5	N/A	1660	1660

Comments: Local benchmark (concrete floor at W corner of W bay of Maintenance Garage) = 100.00 ft; all depths in ft.

October 5, 1993

Ms. Martha Doelle  
Jaworski Geotech, Inc.  
The Junction Marketplace  
White River Jt., VT 05001

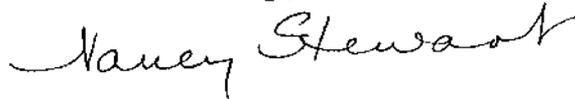
Dear Martha:

Enclosed please find the results for the samples (your project V93221 JGI-Munson Earth-Moving) received on September 21, 1993. No quality control problems were encountered during the analyses of these samples. This project was assigned AMRO Project Number 5298. If you have any questions regarding this project in the future, please refer to this number.

This letter is an integral part of your data report.

Please do not hesitate to call if you have any questions.

Sincerely,



Nancy Stewart  
Vice President

encl.  
NS/db

## AMRO Environmental Laboratory Report

Client:  
Jaworski Geotech, Inc.  
The Junction Marketplace  
White River Jt., VT 05001

Client Designation:  
V93221 JGI-Munson Earth-Moving

Attn: Ms. Martha M. Doelle

Samples Qty/Type: 8/Aqueous

AMRO Designation: 5298  
Date Sampled: 09/18/93  
Date Rec'vd: 09/21/93  
Date Complete: 09/30/96  
COC #: 4851

Sample Identity	AMRO Identity	Test Parameter	Results	Units	Date of Analysis	Run by	EPA Method
MW-1	5298-01	TPH by IR	25.7	mg/l	09/30/93	SH	418.1
MW-2	5298-02	TPH by IR	0.82	mg/l	09/30/93	SH	418.1
MW-3	5298-03	TPH by IR	52.1	mg/l	09/30/93	SH	418.1
MW-4	5298-04	TPH by IR	1.83	mg/l	09/30/96	SH	418.1
MW-5	5298-05	TPH by IR	0.81	mg/l	09/30/93	SH	418.1
MW-6	5298-06	TPH by IR	0.86	mg/l	09/30/93	SH	418.1
MW-7	5298-07	TPH by IR	6.53	mg/l	09/30/93	SH	418.1
MW-8	5298-08	TPH by IR	7.27	mg/l	09/30/93	SH	418.1

All analyses performed in accordance with:

USEPA Methods of Chemical Analysis for Water & Waste.

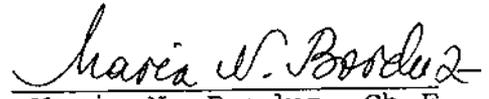
Standard Methods for the Examination of Water and Wastewater.

USEPA SW846 Manual, 3rd. ed.

The following standard abbreviations and conventions apply throughout all sections:

< = 'Less than' followed by the detection limit. = 0.5 mg/l

Certified by:

  
Maria N. Borduz, Ch.E.

## LABORATORY REPORT

EPA Method 8020  
Volatile Organic Compounds

Client: Jaworski Geotech, Inc.  
Client I.D.: V93221 JGI-Munson Earth-Moving  
MW-1  
AMRO I.D.: 5298-01  
Date sampled: 09/18/93 Date received: 09/20/93  
Date prepared: 10/03/93 Date analyzed: 10/03/93  
Sample Qty/Type: 1/Water

Test Parameter	Results (ug/L)	Reporting Limit(ug/L)
Benzene	ND	10
Toluene	ND	10
Chlorobenzene	ND	10
Ethylbenzene	ND	10
Xylene (total)	35	10
Methyl-tert-butyl ether (MTBE)	ND	10

ND = Not Detected at or above the reporting limit.

Approved by Nancy Stewart  
Nancy Stewart

LABORATORY REPORT

EPA Method 8020  
Volatile Organic Compounds

Client: Jaworski Geotech, Inc.  
Client I.D.: V93221 JGI-Munson Earth-Moving  
MW-2  
AMRO I.D.: 5298-02  
Date sampled: 09/18/93 Date received: 09/20/93  
Date prepared: 09/30/93 Date analyzed: 09/30/93  
Sample Qty/Type: 1/Water

Test Parameter	Results (ug/L)	Reporting Limit(ug/L)
Benzene	ND	2
Toluene	ND	2
Chlorobenzene	ND	2
Ethylbenzene	ND	2
Xylene (total)	ND	2
Methyl-tert-butyl ether (MTBE)	ND	2

ND = Not Detected at or above the reporting limit.

Approved by Nancy Stewart  
Nancy Stewart

LABORATORY REPORT

EPA Method 8020  
Volatile Organic Compounds

Client: Jaworski Geotech, Inc.  
Client I.D.: V93221 JGI-Munson Earth-Moving  
MW-3  
AMRO I.D.: 5298-03  
Date sampled: 09/18/93 Date received: 09/20/93  
Date prepared: 09/30/93 Date analyzed: 09/30/93  
Sample Qty/Type: 1/Water

Test Parameter	Results (ug/L)	Reporting Limit (ug/L)
Benzene	14	10
Toluene	ND	10
Chlorobenzene	ND	10
Ethylbenzene	ND	10
Xylene (total)	43	10
Methyl-tert-butyl ether (MTBE)	ND	10

ND = Not Detected at or above the reporting limit.

Approved by Nancy Stewart  
Nancy Stewart

## LABORATORY REPORT

EPA Method 8020  
Volatile Organic Compounds

Client: Jaworski Geotech, Inc.  
Client I.D.: V93221 JGI-Munson Earth-Moving  
MW-4  
AMRO I.D.: 5298-04  
Date sampled: 09/18/93 Date received: 09/20/93  
Date prepared: 09/30/93 Date analyzed: 09/30/93  
Sample Qty/Type: 1/Water

Test Parameter	Results (ug/L)	Reporting Limit (ug/L)
Benzene	ND	2
Toluene	ND	2
Chlorobenzene	ND	2
Ethylbenzene	ND	2
Xylene (total)	9.8	2
Methyl-tert-butyl ether (MTBE)	ND	2

ND = Not Detected at or above the reporting limit.

Approved by Nancy Stewart  
Nancy Stewart

## LABORATORY REPORT

EPA Method 8020  
Volatile Organic Compounds

Client: Jaworski Geotech, Inc.  
Client I.D.: V93221 JGI-Munson Earth-Moving  
MW-5  
AMRO I.D.: 5298-05  
Date sampled: 09/18/93 Date received: 09/20/93  
Date prepared: 09/30/93 Date analyzed: 09/30/93  
Sample Qty/Type: 1/Water

Test Parameter	Results (ug/L)	Reporting Limit (ug/L)
Benzene	ND	2
Toluene	ND	2
Chlorobenzene	ND	2
Ethylbenzene	4.1	2
Xylene (total)	2.5	2
Methyl-tert-butyl ether (MTBE)	ND	2

ND = Not Detected at or above the reporting limit.

Approved by Nancy Stewart  
Nancy Stewart

## LABORATORY REPORT

EPA Method 8020  
Volatile Organic Compounds

Client: Jaworski Geotech, Inc.  
Client I.D.: V93221 JGI-Munson Earth-Moving  
MW-6  
AMRO I.D.: 5298-06  
Date sampled: 09/18/93 Date received: 09/20/93  
Date prepared: 09/30/93 Date analyzed: 09/30/93  
Sample Qty/Type: 1/Water

Test Parameter	Results (ug/L)	Reporting Limit (ug/L)
Benzene	82	2
Toluene	11	2
Chlorobenzene	ND	2
Ethylbenzene	95	2
Xylene (total)	350	2
Methyl-tert-butyl ether (MTBE)	ND	2

ND = Not Detected at or above the reporting limit.

Approved by Nancy Stewart  
Nancy Stewart

## LABORATORY REPORT

EPA Method 8020  
Volatile Organic Compounds

Client: Jaworski Geotech, Inc.  
Client I.D.: V93221 JGI-Munson Earth-Moving  
MW-7  
AMRO I.D.: 5298-07  
Date sampled: 09/18/93 Date received: 09/20/93  
Date prepared: 09/30/93 Date analyzed: 09/30/93  
Sample Qty/Type: 1/Water

Test Parameter	Results (ug/L)	Reporting Limit(ug/L)
Benzene	2,400	100
Toluene	5,300	100
Chlorobenzene	ND	100
Ethylbenzene	1,700	100
Xylene (total)	11,000	100
Methyl-tert-butyl ether (MTBE)	ND	100

ND = Not Detected at or above the reporting limit.

Approved by Nancy Stewart  
Nancy Stewart

## LABORATORY REPORT

EPA Method 8020  
Volatile Organic Compounds

Client: Jaworski Geotech, Inc.  
Client I.D.: V93221 JGI-Munson Earth-Moving  
MW-8  
AMRO I.D.: 5298-08  
Date sampled: 09/18/93 Date received: 09/20/93  
Date prepared: 09/30/93 Date analyzed: 09/30/93  
Sample Qty/Type: 1/Water

Test Parameter	Results (ug/L)	Reporting Limit (ug/L)
Benzene	1,400	100
Toluene	170	100
Chlorobenzene	ND	100
Ethylbenzene	ND	100
Xylene (total)	530	100
Methyl-tert-butyl ether (MTBE)	2,200	100

ND = Not Detected at or above the reporting limit.

Approved by Nancy Stewart  
Nancy Stewart

CHAIN OF CUSTODY RECORD

Proj No.		Project Name				Type, Size & No. of Containers	MATRIX Water - A Soil/Solid-S Waste-W Other-O	Explain	TPH by IR	VOCs 602/8020	Remarks
V93221		TGI - MUNSON EARTH - MOVING									
Samplers (Signature)											
Sta. No.	Date	Time	Comp.	Grab	Station Location						
MW-1	9/18/93	16:54		X		2 VOAS 1 litre	A	X	X	Weathered Diesel	
MW-2	9/18/93	17:02		X		2 VOAS 1 litre	A	X	X	18	
MW-3	9/18/93	16:36		X		2 VOAS 1 litre	A	X	X	Weathered Diesel	
MW-4	9/18/93	16:44		X	16:29	2 VOAS 1 litre	A	X	X	Weathered Diesel	
MW-5	9/18/93	16:22		X		2 VOAS 1 litre	A	X	X	gas/diesel	
MW-6	9/18/93	16:29		X		2 VOAS 1 litre	A	X	X		
MW-7	9/18/93	16:07		X		2 VOAS 1 litre	A	X	X	gas	
MW-8	9/18/93	16:15		X		2 VOAS 1 litre	A	X	X	gas	
<del>16:29</del>											
<del>16:15</del>											
<del>16:29</del>											
<del>16:15</del>											
Relinquished by: (Signature)		Date Time	Received by (Signature)			<input checked="" type="checkbox"/> Fax to (phone) 802 295 6089		Send Results to:			
Relinquished by: (Signature)		Date Time	Received by (Signature)			Results needed		MARTHA DOELLE JAWORSKI GEOTECH THE JUNCTION MKTPLACE WHITE RIVER JCT. VT 05001			
Relinquished by: (Signature)		Date Time	Received by (Signature)			AMRO Project No.		Remarks			
Relinquished by: (Signature)		Date Time	Received for Laboratory by: (Signature)			Seal Intact?					
						Yes No N/A					