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SUPPLEMENTAL GROUNDWATER INVESTIGATION

Vibratech, Inc.
Buffalo, New York

12/94

SUPPLEMENTAL GROUNDWATER INVESTIGATION

Vibratech, Inc.
Buffalo, New York

DECEMBER 1994

REF. NO. 5927 (2)
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CONESTOGA-ROVERS & ASSOCIATES

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1.0 INTRODUCTION

1.1 BACKGROUND/PREVIOUS INVESTIGATIONS

Vibratech, Inc. (Vibratech) owns and operates a facility (Site) at 537 East Delavan Avenue in Buffalo, New York, which manufactures vibration dampers and rotary shock absorbers for the trucking and railroad industries.

In August 1992, Vibratech, in anticipation of sale of the facility, retained Conestoga-Rovers & Associates (CRA) to perform a Phase I Environmental Assessment of potential environmental liabilities associated with current and former operations at the Site. The Phase I Environmental Assessment consisted of a Site inspection, a review of available documents and interviews with employees. The results of this assessment were presented in the report entitled, "Phase I Environmental Assessment Report, Vibratech, Inc., Buffalo, New York", dated September 10, 1992.

The Phase I assessment identified the railroad spur area located on the southern portion of the property as a potential area of soil contamination based on observed traces of oil near the railroad spur line. Several existing and former aboveground storage tanks (ASTs) and underground storage tanks (USTs) were identified as potential environmental concerns, although no evidence of any past releases from these tanks was discovered. The Phase I assessment also identified past use of polychlorinated biphenyls (PCBs) in transformers at the plant as a potential environmental liability.

Based on the Phase I assessment results, it was recommended that soil sampling be performed to better assess the environmental condition of the Site soils. CRA was retained to conduct the soil sampling program, the results of which are presented in the report entitled, "Phase II Environmental Investigation Report, Vibratech, Inc., Buffalo, New York", dated February 9, 1994.

The Phase II Investigation found the chemical condition of soil throughout most of the property to be typical of urban soils and fill materials. However, elevated concentrations of petroleum hydrocarbons and volatile organic compounds (VOCs) were detected in soil samples collected from the railroad spur area shown on Figure 1.1.

Based on the findings of the Phase II Investigation, CRA recommended additional investigations consisting of the following elements:

i) Additional soil sampling along the railroad spur to better delineate the extent of VOC and petroleum contamination;

ii) Installation and sampling of groundwater monitoring wells; and

iii) Soil sampling near the transformer area for PCB analyses.

The findings of these investigations are presented in CRA's report entitled "Supplemental Investigation, Vibratech, Inc." dated June 1994 and are summarized as follows:

i) The uppermost groundwater bearing unit at the Site is the upper few feet of fractured bedrock (Onondaga Limestone). This is overlain by 2 to 5 feet of variable fill soils and/or silty clay native soils;

ii) There is an area of approximately 6,250 square feet or less located along the railroad spur on the southern portion of the property (Figure 1.1) which contains elevated levels of VOC contamination in soil;

iii) Relatively low levels of VOC contamination in groundwater were measured within and immediately downgradient of the area of soil contamination. However, no widespread or highly concentrated VOC plume is indicated;

iv) VOC and semi-volatile organic compound (SVOC) results for soil and groundwater samples do not show evidence of widespread petroleum contamination; and

v) PCBs were not detected in soil sampled from the transformer area.

The Phase I, Phase II, and Supplemental Investigation Reports were submitted to the New York State Department of Environmental Conservation (NYSDEC). After reviewing these reports it was decided that additional groundwater characterization would be useful for developing a remedial program for the Site. The current study was designed to provide this additional groundwater characterization data.

1.2 INVESTIGATION OBJECTIVES

The objectives of the current investigation were to obtain the following:

i) groundwater chemistry information west of the Winchester Avenue sewer;

ii) groundwater chemistry information near the three residences bordering Vibratech to the southwest; and

iii) groundwater chemistry information close to or beneath the Main Plant building north of the area of concern.

The work performed to obtain these data is described in Section 2.0. Section 3.0 presents the results of the investigation and conclusions are presented in Section 4.0.

2.0 WORK PERFORMED

Work performed for this investigation consisted of installation and sampling of four groundwater monitoring wells as described below.

2.1 MONITORING WELL INSTALLATION

Four new monitoring wells, numbered MW-5 through MW-8, were installed at the locations shown on Figure 1.1. MW-5 is located approximately 100 feet north of MW-2, inside the main plant building, within the lower section of the loading dock area. This well was used to assess groundwater beneath the building, directly north of the area of concern. MW-6 is located next to the Buffalo Powder Coatings garage, between the area of concern and the nearest residences. This well was used to assess groundwater chemistry between the source area and the nearest residences. MW-7 is located on Vibratech property just west of the Winchester Avenue sewer. The Winchester Avenue sewer runs close to the west wall of the Vibratech building (on Vibratech property). The purpose of this well was to determine if the Winchester Avenue sewer is a barrier to off-Site migration of shallow groundwater. MW-8 is located on Vibratech property on the west side of the Main Building at approximately the mid-point of the building, and east of the Winchester Avenue sewer. As described below, this well did not yield sufficient water for collection of groundwater samples. The wells were installed, developed, surveyed, and sampled in accordance with the Supplemental Investigation Report (CRA, June 1994).

The four new monitoring wells were installed during October 1994. Buffalo Drilling Company (BDC) of Buffalo, New York, provided drilling services under the supervision of a qualified CRA hydrogeologist. Prior to drilling and between drilling locations the drill rig and associated equipment was cleaned according to protocols outlined in the Supplemental Investigation Report and all fluids generated during equipment cleaning were stored in Department of Transportation (DOT)

approved 55-gallon drums. Soils and drilling fluids generated during drilling were also stored in approved drums which were centrally located on-Site.

The monitoring wells were installed five feet into the upper bedrock. The boreholes for the wells were advanced using 4 1/4-inch inside diameter (ID) hollow stem augers. Lithologic samples were collected continuously (two foot samples at each two foot interval within the overburden by split spoon sampling, in accordance with ASTM D-1586 until bedrock was encountered). Bedrock was then cored using an HQ core barrel and subsequently reamed using a 4 1/4-inch tricone bit to achieve the desired annular diameter.

The wells were constructed using five foot lengths of 2-inch ID No. 10 slot Type 304 stainless steel well screen. Stainless steel 2-inch diameter riser was attached by threaded flush joint couples. The annular space was backfilled with a suitably graded silica sand and to an approximate depth of one foot above screen. A bentonite pellet seal with a minimum thickness of one foot was installed above the sandpack. After hydration of the seal, the remaining annular space was filled with cement-bentonite grout and finished with curb boxes mounted within concrete security collars. Table 2.1 presents a summary of the monitoring well completion details for the new wells. Stratigraphic and instrumentation logs are presented in Appendix A.

2.2 MONITORING WELL DEVELOPMENT

All new monitoring wells were developed upon completion using new bottom loading disposable bailers dedicated to each well. Approximately 25 well volumes were removed from MW-5 and MW-6. About ten volumes were collected from MW-7 because of slow recharge. Well MW-8 was bailed until it dewatered.

2.3 MONITORING WELL SURVEYING

The tops of the well casings were surveyed. The surveyed elevations are considered accurate to within approximately 0.1 feet.

2.4 GROUNDWATER SAMPLING AND ANALYSES

Groundwater sampling was conducted on October 28, 1994 by CRA. The four new well installations were purged to remove any development waters. Water levels were taken before and after pumping, using a Solinst electric water level indicator. Poly sheeting was placed in a five foot square around each well, delineating a clean sampling surface area. The wells were purged and sampled using a disposable 2-inch diameter polyethylene bottom loading bailer (volume approximately one liter) attached to polypropylene rope.

The wells were purged until consistent measurements of ±5 percent were obtained from three consecutive readings of pH, conductivity, and temperature or until a maximum of five well volumes had been removed. The exception to this was MW-8 which was bailed dry after the removal of one well volume and did not recharge. Therefore, a groundwater sample could not be collected from MW-8.

During sampling activities, all decontamination procedures were strictly followed. The sampling activities are summarized in Table 2.2 and were recorded in the CRA's field book for the project.

Groundwater samples from the four new wells were analyzed for Target Compound List (TCL) VOCs and SVOCs using SW-846 methodology and Quality Assurance/Quality Control (QA/QC) protocols.

3.0 RESULTS

This section presents and interprets the results of the Supplemental Groundwater Investigation.

3.1 HYDROGEOLOGY

Figure 3.1 presents the top of bedrock elevation contour map prepared based on data from all well installations at the facility. This map indicates that the top of bedrock slopes gently toward the southwest at approximately 2 feet per 100 feet. For lower overburden/upper weathered bedrock waterbearing zones such as that encountered at Vibratech, the slope of the bedrock is often the regional control on groundwater hydraulic gradients and flow directions.

Figure 3.2 presents the potentiometric surface map based on hydraulic head measurements obtained from all Site wells on December 9, 1994. This map shows the regional effect of the top of bedrock slope, and also shows a local hydraulic depression in the vicinity of monitoring wells MW-02 and MW-07. Based on review of subsurface utility locations at the Site, this depression appears to be attributable to a sanitary sewer which runs east to west along the south side of the Main Plant building from the vicinity of MW-02 to its junction with the municipal sanitary sewer running north to south on Vibratech property (along Winchester Avenue).

Based on the potentiometric surface maps, these two sewers receive groundwater discharge from the central portion of the Site, including the area of concern for VOC/petroleum contamination in soil. Based on this flow regime, the migration of chemicals from the area of concern would be expected to be nearly linear from the area of highest concentration near MW-04 toward Winchester Avenue. The higher hydraulic head measured at MW-07, located west of the Winchester Avenue sewer, compared to the measurement from MW-02, located east of the Winchester Avenue sewer, suggests that the Winchester Avenue sewer is

acting as a groundwater discharge boundary for groundwater flow from the area of concern.

3.2 CHEMICAL PRESENCE

Appendix B presents the data validation report for the groundwater analytical program and tabulates all analytical results. The data validation concluded that all results were valid for use in characterizing chemical presence in groundwater.

Table 2 in Appendix B presents all results of the October 1994 sampling of the new monitoring wells. As with the previous groundwater sampling, VOCs were the primary contaminants detected. The only SVOC detected was bis(2-ethylhexyl)phthalate at 9.2 µg/L in the field duplicate sample from MW-05. At low concentrations, this compound is generally considered an artifact attributable to field and/or laboratory methods. Considering the ubiquitous nature of this chemical and the absence of a detection in the original sample from MW-05, bis(2-ethylhexyl)phthalate is not considered a Site contaminant of concern.

Figure 3.3 presents a plot of the total VOC concentrations in groundwater based on data from all monitoring wells at the facility. This map shows that migration of VOCs in groundwater is occurring linearly from the portion of the area of concern where concentrations in soils were highest (near MW-04) toward the west along the south side of the Main Plant building. The hydraulic depression associated with the two sewers (described in Section 3.1) is apparently associated with preferential migration of groundwater between the area of concern and the Winchester Avenue sewer. Little migration of VOCs toward the north or south has occurred based on the concentrations at wells MW-03, MW-05, and MW-06.

The low concentration of VOCs measured at MW-05 indicates that no substantial VOC migration has occurred from the area of concern toward the north beneath the Main Plant building. The relatively low level of VOCs measured at MW-05 (75.4 µg/L) is likely due to its

proximity (within a few feet) of the area of concern. This is close enough for mechanical dispersion to have resulted in some VOC migration to this location. The measured total VOC concentration of 27 µg/L at MW-06 was comprised of 13 µg/L chloroethane and 14 µg/L of 1,1-dichloroethane. These concentrations are only marginally above the New York State Ambient Water Quality Standard of 5 µg/L for both chemicals.

The measured concentrations at MW-06 indicate that groundwater in the upper waterbearing zone beneath the residences southwest of the facility has not been substantially impacted by the Site.

No contaminants were detected at MW-07, located west of the Winchester Avenue sewer. This, considered with the potentiometric surface map, indicates that the Winchester Avenue sewer is acting as a hydraulic barrier to off-Site groundwater flow and VOC migration in groundwater. Based on the potentiometric and chemical data, groundwater beneath residences located west of Winchester Avenue has not been impacted by the Site.

4.0 CONCLUSIONS

Based on the results of this Supplemental Groundwater Investigation, CRA concludes the following:

i) preferential groundwater migration from the area of concern has resulted in an isolated area of upper zone groundwater contamination along the south side of the Main Plant building near MW-04 and MW-02;

ii) no significant impacts on groundwater west of Winchester Avenue or near the residences located southwest of the facility were found to have occurred;

iii) the Winchester Avenue sewer acts as a discharge boundary for groundwater flow from the plant; and

iv) preferential groundwater flow associated with the plant and Winchester Avenue sewers has limited the area of groundwater contamination. Remediation of the VOC and petroleum containing soils within the area of concern would likely result in subsequent reduction in the concentrations of VOCs in groundwater.

5.0 RECOMMENDATIONS

Based on the results of the Phase I and Phase II Environmental Investigations, the Supplemental Investigations, and this Supplemental Groundwater Investigation, CRA recommends that the VOC and petroleum containing soil within the area of concern (as shown on Figure 1.1) be remediated, either by removal or treatment. No other areas of the plant have been identified which require further investigation or remedial action.

FIGURES

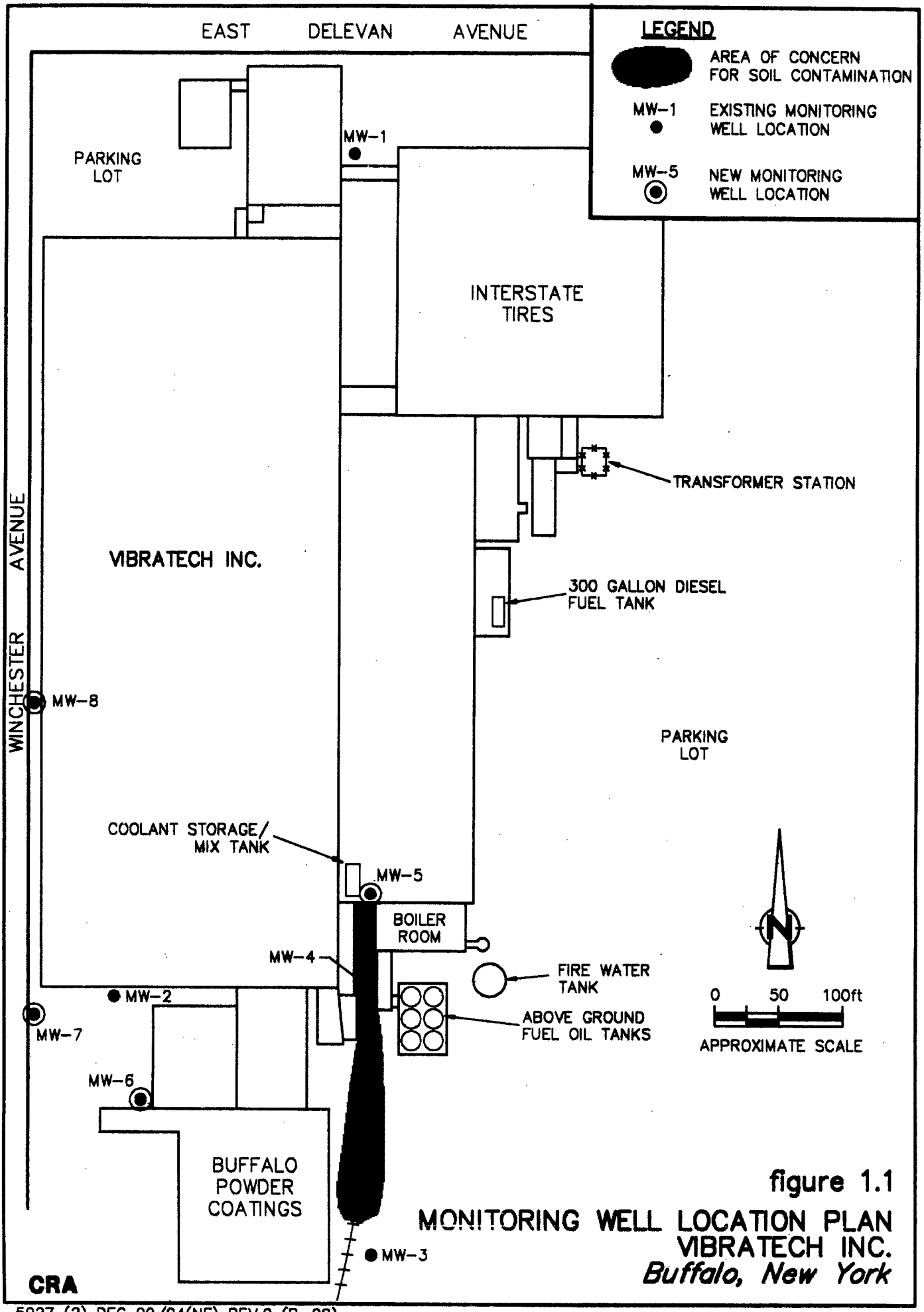

figure 1.1

MONITORING WELL LOCATION PLAN
VIBRATECH INC.
Buffalo, New York

5927 (2) DEC 09/94(NF) REV.0 (P-08)

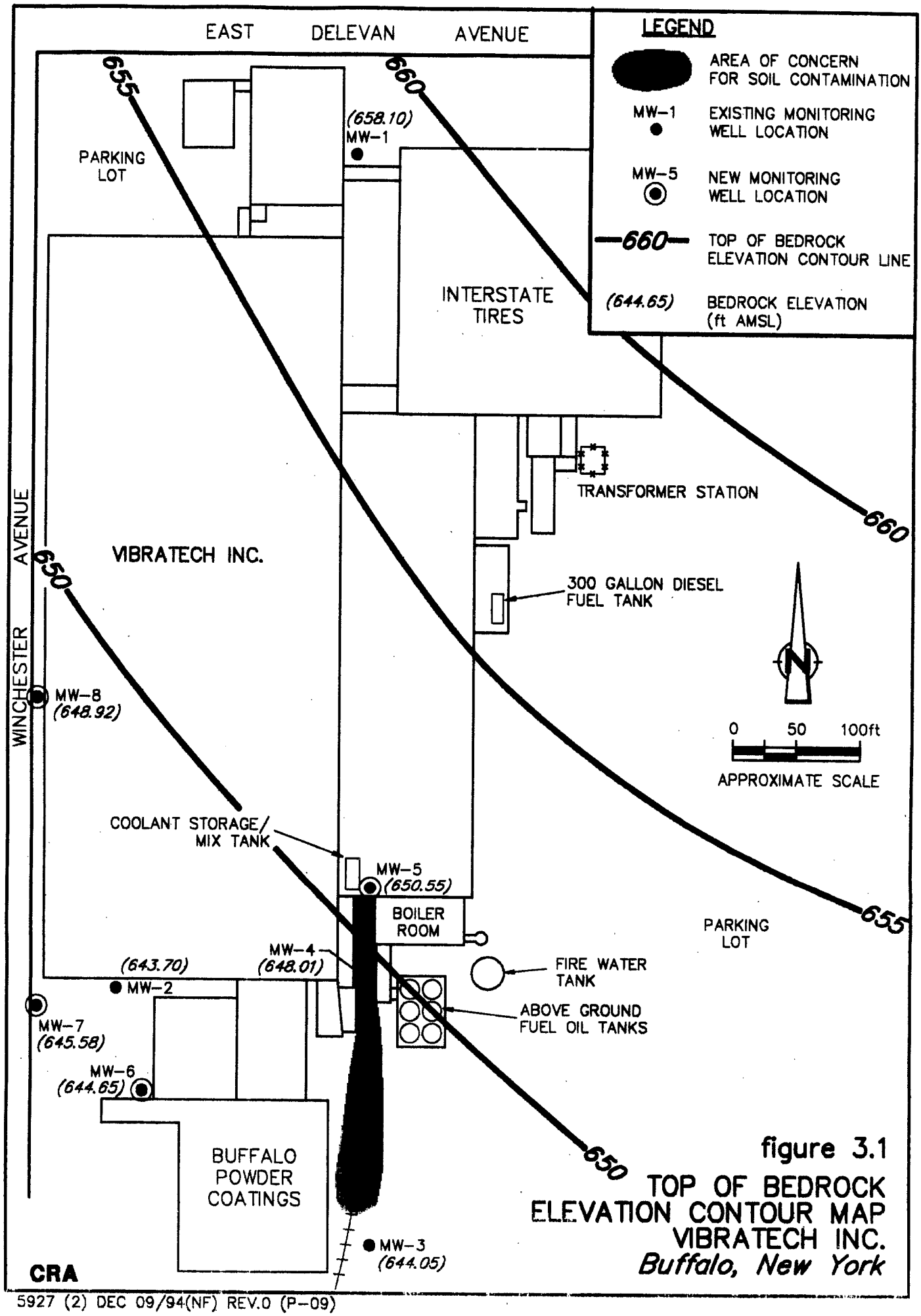

figure 3.1

TOP OF BEDROCK ELEVATION CONTOUR MAP
VIBRATECH INC.
Buffalo, New York

5927 (2) DEC 09/94(NF) REV.0 (P-09)

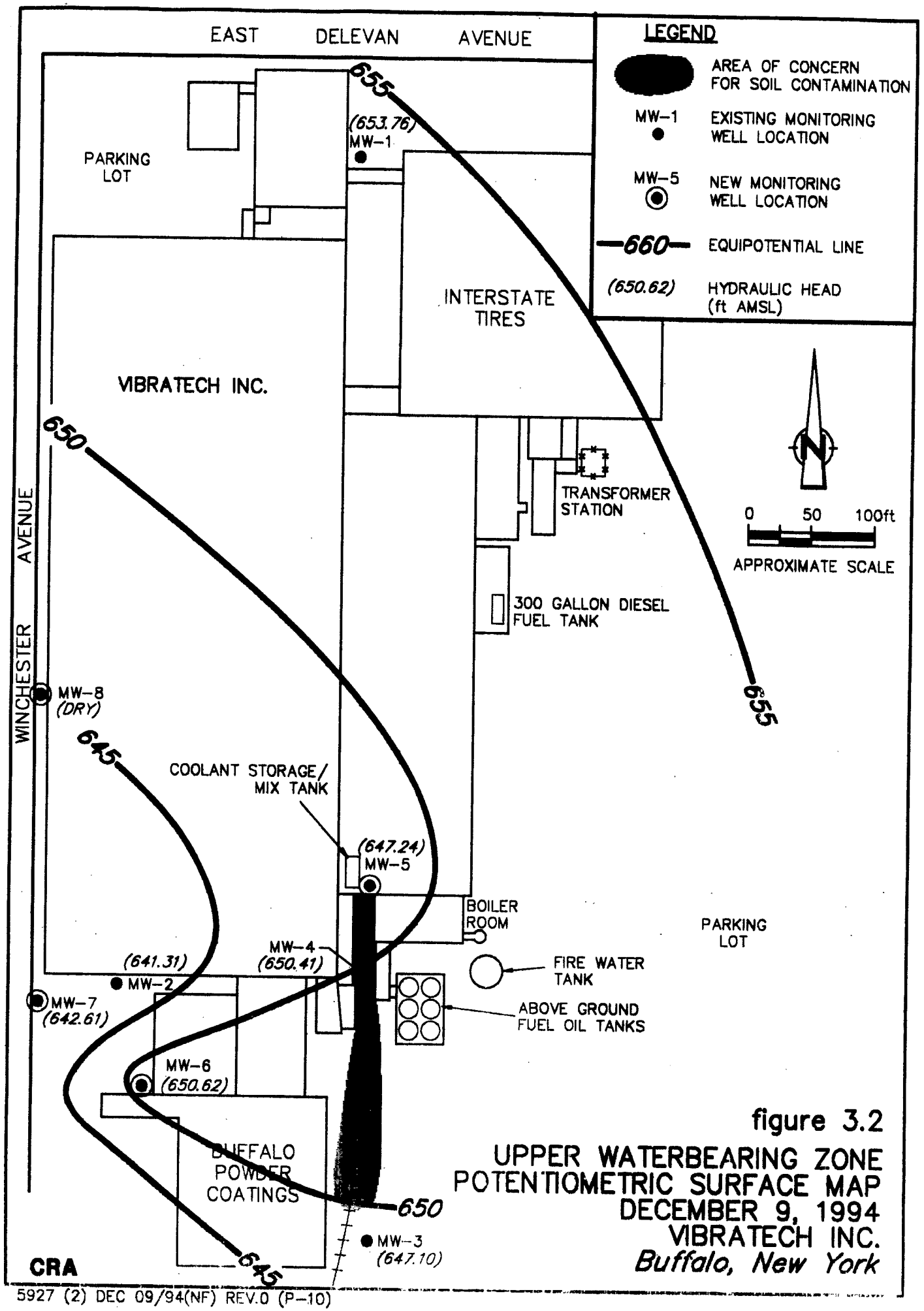

figure 3.2

UPPER WATERBEARING ZONE
POTENTIOMETRIC SURFACE MAP
DECEMBER 9, 1994
VIBRATECH INC.
Buffalo, New York

5927 (2) DEC 09/94(NF) REV.0 (P-10)

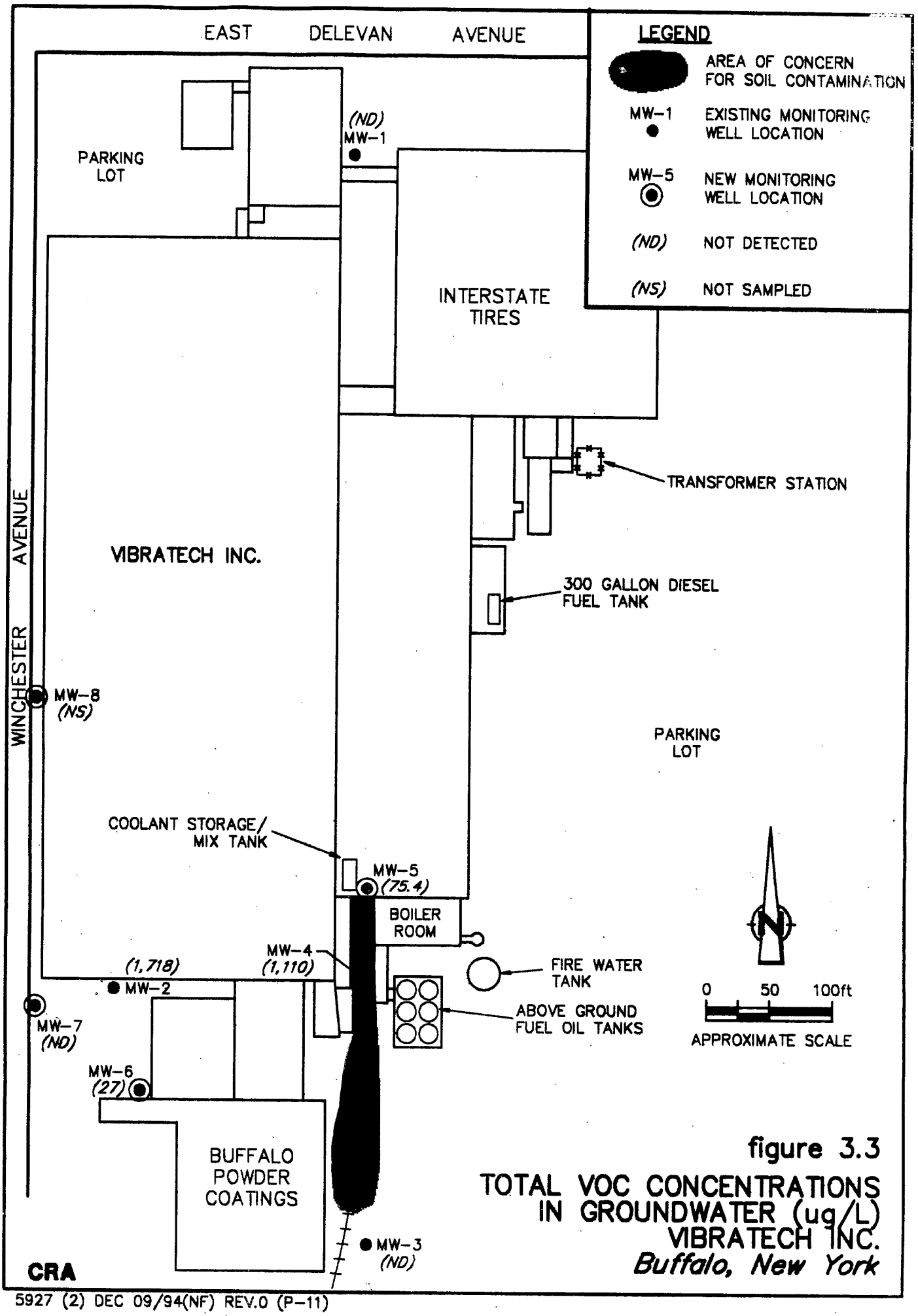

figure 3.3

TOTAL VOC CONCENTRATIONS IN GROUNDWATER (ug/L)
VIBRATECH INC.
Buffalo, New York

CRA

5927 (2) DEC 09/94(NF) REV.0 (P-11)

TABLES

TABLE 2.1

WELL COMPLETION DETAILS
VIBRATECH, INC.
BUFFALO, NEW YORK
OCTOBER 1994

Monitoring Well	*Top of Casing Elevation (Ft. AMSL)*	*Total Depth (Ft. BGS)*	*Screen Depth (Ft. BGS)*	*Depth to Bedrock Surface (Ft. BGS)*	*Screened Interval*	*Date Completed*
MW-5	654.05	8.8	3.8 - 8.8	3.5	Carbonate Rock	10/21/94
MW-6	656.35	15.9	10.9 - 15.9	10.0	Carbonate Rock	10/21/94
MW-7	649.58	8.4	3.4 - 8.4	3.7	Carbonate Rock	10/21/94
MW-8	652.92	9.1	4.1 - 9.1	4.0	Carbonate Rock	10/24/94

Key:
AMSL Above Mean Sea Level.
BGS Below Ground Surface.

TABLE 2.2

SAMPLE COLLECTION SUMMARY
VIBRATECH, INC.
BUFFALO, NEW YORK
OCTOBER 1994

Sample Number	*Collection Date*	*Time*	*Shipping Date*	*Matrix*	*Volume/ Analysis*	*Chain of Custody*
1 (MS/MSD) MW-6	10/28/94	0900	10/28/94	Groundwater	3 x 40 ml/VOA 3 x 1L amber	General Testing 10/28/94
2 MW-7	10/28/94	1000	10/28/94	Groundwater	2 x 40 ml/VOA 1 x 1L amber	General Testing 10/28/94
3 MW-5	10/28/94	1340	10/28/94	Groundwater	2 x 40 ml/VOA 1 x 1L amber	General Testing 10/28/94
4 MW-5 (Duplicate)	10/28/94	1400	10/28/94	Groundwater	2 x 40 ml/VOA 1 x 1L amber	General Testing 10/28/94

APPENDIX A

STRATIGRAPHIC & INSTRUMENTATION LOGS

STRATIGRAPHIC AND INSTRUMENTATION LOG

(L-06)

PROJECT NAME: Vibratech, Inc.
PROJECT NO.: 5927
CLIENT: Vibratech, Inc.
LOCATION: West side of building, Winchester St. East side of sewer line.

HOLE DESIGNATION: MW08
DATE COMPLETED: October 24, 1994
DRILLING METHOD: HSA / WR-HO
CRA SUPERVISOR: K.S. Wehn.

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE N VALUE
	REFERENCE POINT (Top of Riser) GROUND SURFACE	652.92	Curb Box			
	ML- Top Soil		Locking Cap; Cement Bentonite grout; Bentonite Seal	SS1		18
2.5	ML- Till some clay, fine	650.92		SS2		7
	Auger refusal	648.92				
5.0	Limestone (Onondaga Formation)		Sand Pack; 6" Borehole	rec.		RQD
	- fractured area			93%		81%
7.5	▽ water found*	646.62	2" Screen			
10.0	END OF BOREHOLE @ 9.1	643.82	9.1' BGS			
12.5						
15.0	* upon development, well was pumped dry and did not recover.					
17.5						
20.0						
22.5						
25.0						
27.5						
30.0						
32.5						

SCREEN DETAILS:
Screened interval: 4.0 to 9.0' BGS
Length: - 5.0'
Diameter - 2.0"
Slot: 10
Material: stainless steel.
Sandpack interval: 3.1' to 9.1 BGS.

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG

(L-06)

PROJECT NAME: Vibratech, Inc.
PROJECT NO.: 5927
CLIENT: Vibratech, Inc
LOCATION: Sidewalk at Winchester/ West loading dock West of sewer line.

HOLE DESIGNATION: MW07
DATE COMPLETED: October 24, 1994
DRILLING METHOD: HSA / WR-HO
CRA SUPERVISOR: K.S. Wehn

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE N VALUE
	REFERENCE POINT (Top of Riser) GROUND SURFACE	649.58				
	CONCRETE		locking cap; Cement Bentonite grout; Bentonite Pellets; 2" steel casing; 6" Borehole; 2" screen; Sandpack			
	ML - (Till) some clay, trace sand, gravel well compacted, reddish brown. moist			SS1		27
2.5	Spoon refusal	645.58		SS2		No rec.
	LIMESTONE (Onondaga Formation) Fractured	644.58		rec. 85%		RQD 8%
5.0		643.58				
	STATIC WATER LEVEL ▼	642.61				
7.5	EXTENSIVE fracturing, vugs, filled.	642.08				
	END OF BOREHOLE @ 8.4' BGS	641.18				
10.0						
12.5						
15.0						
17.5						
20.0						
22.5						
25.0						
27.5						
30.0						
32.5						

Screen DETAILS
Screened interval:
3.4 to 8.4 BGS
length - 5.0'
Diameter 2.0"
Slot: 10
Material - STAINLESS STEEL
Sand pack interval;
2.4' To 8.4'

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG

(L-06)

PROJECT NAME: Vibratech, Inc.
PROJECT NO.: 5927
CLIENT: Vibratech, Inc.
LOCATION: Southeast corner of West Loading Dock Facing Winchester Road.

HOLE DESIGNATION: -MW06
DATE COMPLETED: October 19, 1994
DRILLING METHOD: HSA / WR-HO
CRA SUPERVISOR: K.S. Wehn

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE N VALUE
	REFERENCE POINT (Top of Riser) GROUND SURFACE	656.35				
	Concrete ↕	655.45	Locking Cap			
	FILL : Shot rock.		Cement/ Bentonite grout			
2.5			6" Borehole			
5.0			2" Steel Casing			
7.5						
	END OF OVERBURDEN @ 9.9' BGS	646.45	Bentonite Pellets			
10.0	LIMESTONE (Onondaga Formation)					
	▽ STATIC LEVEL	644.85	▽ Sceen			
12.5						
15.0						
	END OF BOREHOLE @ 15.9' BGS	640.45				
17.5			SCREEN DETAILS: Screened Interval 11.5 - 15.9 Length - 5.0' Diameter - 2.0" Slot : 10 Material - Stainless-steel Sandpack interval : 10.0' to 16.0'			
20.0						
22.5						
25.0						
27.5						
30.0						
32.5						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG

(L-06)

PROJECT NAME: Vibratech, Inc
PROJECT NO.: 5927
CLIENT: Vibratech, Inc.
LOCATION: Inside loading dock of rear of plant

HOLE DESIGNATION: MW05
DATE COMPLETED: October 26, 1994
DRILLING METHOD: HSA / WR-HQ
CRA SUPERVISOR: K.S. Wehn

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE N VALUE
	REFERENCE POINT (Top of Riser) GROUND SURFACE	654.05'	CURB BOX			
2.5	PAVEMENT / ML - silt (Fill) some f-sand. Loose, brown, moist		cement bentonite grout; Bentonite seal; 2" steel casing	SS1		
	auger Refusal			SS2		
	END OF OVERBURDEN	650.55				
5.0	LIMESTONE (Onondaga Formation)			Rec.		RQD
	STATIC WATER LEVEL ▼	647.24	6" borehole; ▼	88%		80%
7.5	Abundant fracturing		sand pack; WELL SCREEN			
	END OF BOREHOLE @ 8.9'	646.05				
10.0		645.15				
12.5						
15.0						
17.5						
20.0						
22.5						
25.0						
27.5						
30.0						
32.5						

SCREEN DETAILS:
Screened interval:
3.8 to 8.9 BGS
Length - 5.0'
Diameter - 2.0"
Slot: 10
Material = stainless steel.
Sand Pack interval:
2.8 - 8.9 BGS

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

APPENDIX B

ANALYTICAL DATA VALIDATION

MEMO

TO: Kelly McIntosh REFERENCE NO: 5927

FROM: Paul McMahon/js/2 DATE: November 29, 1994

RE: Analytical Data Quality Assessment and Validation
Supplemental Groundwater Monitoring
Vibratech, Inc., Buffalo, New York - October 1994

The following details an assessment and validation of analytical results reported by General Testing Corporation (GTC) for environmental samples collected in October 1994 from the Vibratech Site. The samples submitted for Target Compound List (TCL) volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) analysis were as follows:

Parameter	*Matrix*	*Investigative Sample*	*Field Duplicates*	*MS/MSD*	*Trip Blank*	*Total*
TCL VOCs	Groundwater	3	1	1/1	1	7
TCL SVOCs	Groundwater	3	1	1/1	-	6

Note:
MS/MSD - Matrix Spike/Matrix Spike Duplicate.

Methods of analyses were referenced from "Test Methods for Evaluating Solid Waste", SW-846, 3rd Edition, 1986. All investigative samples submitted were analyzed by the following methods:

Parameter	*Methodology*
TCL VOCs	SW-846 8260
TCL SVOCs	SW-846 8270

For sample identification and location a sample key is presented in Table 1. An analytical results summary is included in Table 2. Evaluation of the data was based on information obtained from finished data sheets, blank data, and recovery data from matrix spikes, surrogates, and blank spikes. Quality Assurance/Quality Control (QA/QC) criteria by which these data have been assessed are referenced from the SW-846 methods of analysis and the "National Functional Guidelines for Organic Data Review", February 1994, both prepared by the United States Environmental Protection Agency (USEPA).

1. ANALYTICAL ASSESSMENT AND VALIDATION

Samples were preserved with HCl for VOC analyses providing a 14 day holding time. All extractions and analyses were performed within the method specified holding times.

Surrogate compounds were added for all sample analyses. All surrogate recoveries for VOCs were within required control limits. All SVOC surrogate recoveries were acceptable except one low recovery (20 percent) for 2-fluorophenol in sample MW-06. Per the Functional Guidelines, one SVOC surrogate outlier per fraction (acid base/neutral) is acceptable, as long as the recovery is greater than 10 percent. No qualification of the data was necessary on this basis.

Blank spike samples were analyzed for VOCs and SVOCs. All recoveries were within acceptable laboratory control limits.

Laboratory method blank analyses yielded non-detect results for all parameters, indicating that sample contamination from the laboratory was minimal. MS/MSD analyses were performed on sample MW-06 for VOC and SVOC determinations. All MS/MSD recoveries were acceptable, indicating good analytical accuracy. All relative percent difference (RPD) values from the MS/MSD analyses were acceptable, indicating good laboratory precision.

2. FIELD QA/QC RESULTS

Field QA/QC samples collected with the investigative samples included one trip blank (for VOCs only) and one field duplicate. All VOCs of interest were non-detect in the trip blank, indicating that contamination from bottle preparation, sampling, and storage was not a factor in this study.

Sample 004 was submitted "blind" to the laboratory as a field duplicate of MW-05. The analyses yielded results with adequate reproducibility, indicating acceptable sampling and laboratory precision.

3. CONCLUSION

The data submitted by GTC is acceptable for use without qualification.

TABLE 1

FIELD COLLECTION SUMMARY
SUPPLEMENTAL GROUNDWATER MONITORING
VIBRATECH, INC.
BUFFALO, NEW YORK
OCTOBER 1994

Sample I.D.	*Location*	*Date*	*Parameters*	*Notes*
001	MW-06	10/28/94	TCL VOCs, SVOCs	MS/MSD
002	MW-07	10/28/94	TCL VOCs, SVOCs	
003	MW-05	10/28/94	TCL VOCs, SVOCs	
004	MW-05	10/28/94	TCL VOCs, SVOCs	Field Duplicate of MW-05
Trip Blank	-	10/28/94	TCL VOCs	

Notes:

MS/MSD	Matrix Spike/Matrix Spike Duplicate.
SVOCs	Semi-Volatile Organic Compounds.
TCL	Target Compound List.
VOCs	Volatile Organic Compounds.

TABLE 2

ANALYTICAL RESULTS SUMMARY
SUPPLEMENTAL GROUND WATER MONITORING
VIBRATECH, INC.
OCTOBER 1994

Sample ID:	*MW-05*	*MW-05 (Dup.)*	*MW-06*	*MW-07*
Sample Date:	*10/28/94*	*10/28/94*	*10/28/94*	*10/28/94*
Parameter				
TCL Volatiles (µg/L)				
Chloromethane	5.0 U	5.0 U	5.0 U	5.0 U
Bromomethane	5.0 U	5.0 U	5.0 U	5.0 U
Vinyl chloride	5.0 U	5.0 U	5.0 U	5.0 U
Chloroethane	5.0 U	5.0 U	13	5.0 U
Methylene Chloride	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	10 U	10 U	10 U	10 U
Carbon disulfide	10 U	10 U	10 U	10 U
1,1-Dichloroethene	5.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	9.5	7.5	14	5.0 U
trans-1,2-Dichloroethene	5.0 U	5.0 U	5.0 U	5.0 U
cis-1,2-Dichloroethene	22	25	5.0 U	5.0 U
Chloroform	5.0 U	5.0 U	5.0 U	5.0 U
2-Butanone	10 U	10 U	10 U	10 U
1,2-Dichloroethane	5.0 U	5.0 U	5.0 U	5.0 U
1,1,1-Trichloroethane	5.0 U	5.4	5.0 U	5.0 U
Carbon tetrachloride	5.0 U	5.0 U	5.0 U	5.0 U
Bromodichloromethane	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloropropane	5.0 U	5.0 U	5.0 U	5.0 U
trans-1,3-Dichloropropene	5.0 U	5.0 U	5.0 U	5.0 U
Trichloroethene	34	37	5.0 U	5.0 U
Dibromochloromethane	5.0 U	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	5.0 U	5.0 U	5.0 U	5.0 U
cis-1,3-Dichloropropene	5.0 U	5.0 U	5.0 U	5.0 U
Bromoform	5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U
Tetrachloroethene	5.0 U	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	5.0 U	5.0 U	5.0 U	5.0 U
Toluene	5.0 U	5.0 U	5.0 U	5.0 U
Chlorobenzene	5.0 U	5.0 U	5.0 U	5.0 U
Ethylbenzene	5.0 U	5.0 U	5.0 U	5.0 U
Styrene	5.0 U	5.0 U	5.0 U	5.0 U
Xylene (total)	9.9	12	5.0 U	5.0 U
TCL Semi-Volatiles (µg/L)				
Phenol	11 U	11 U	10 U	11 U
2-Chlorophenol	11 U	11 U	10 U	11 U
2-Nitrophenol	11 U	11 U	10 U	11 U
2,4-Dimethylphenol	11 U	11 U	10 U	11 U
2,4-Dichlorophenol	11 U	11 U	10 U	11 U
4-Chloro-3-methylphenol	11 U	11 U	10 U	11 U
2,4,6-Trichlorophenol	11 U	11 U	10 U	11 U
2,4-Dinitrophenol	22 U	22 U	20 U	22 U
4-Nitrophenol	22 U	22 U	20 U	22 U
4,6-Dinitro-2-methylphenol	22 U	22 U	20 U	22 U
Pentachlorophenol	22 U	22 U	20 U	22 U
2-Methylphenol	11 U	11 U	10 U	11 U
4-Methylphenol	11 U	11 U	10 U	11 U
2,4,5-Trichlorophenol	11 U	11 U	10 U	11 U

TABLE 2

ANALYTICAL RESULTS SUMMARY
SUPPLEMENTAL GROUND WATER MONITORING
VIBRATECH, INC.
OCTOBER 1994

Sample ID:	*MW-05*	*MW-05 (Dup.)*	*MW-06*	*MW-07*
Sample Date:	*10/28/94*	*10/28/94*	*10/28/94*	*10/28/94*
Parameter				
TCL Semi-Volatiles (µg/L) (Contd..)				
N-Nitrosodimethylamine				
bis (2-Chloroethyl) ether	5.5 U	5.4 U	5.0 U	5.5 U
1,3-Dichlorobenzene	5.5 U	5.4 U	5.0 U	5.5 U
1,4-Dichlorobenzene	5.5 U	5.4 U	5.0 U	5.5 U
1,2-Dichlorobenzene	5.5 U	5.4 U	5.0 U	5.5 U
2,2'-oxybis (1-Chloropropane)	5.5 U	5.4 U	5.0 U	5.5 U
N-Nitroso-di-n-propylamine	5.5 U	5.4 U	5.0 U	5.5 U
Hexachloroethane	5.5 U	5.4 U	5.0 U	5.5 U
Nitrobenzene	5.5 U	5.4 U	5.0 U	5.5 U
Isophorone	5.5 U	5.4 U	5.0 U	5.5 U
bis (2-Chloroethoxy) methane	5.5 U	5.4 U	5.0 U	5.5 U
1,2,4-Trichlorobenzene	5.5 U	5.4 U	5.0 U	5.5 U
Naphthalene	5.5 U	5.4 U	5.0 U	5.5 U
Hexachlorobutadiene	5.5 U	5.4 U	5.0 U	5.5 U
Hexachlorocyclopentadiene	5.5 U	5.4 U	5.0 U	5.5 U
2-Chloronaphthalene	5.5 U	5.4 U	5.0 U	5.5 U
Dimethylphthalate	5.5 U	5.4 U	5.0 U	5.5 U
Acenaphthylene	5.5 U	5.4 U	5.0 U	5.5 U
Acenaphthene	5.5 U	5.4 U	5.0 U	5.5 U
2,4-Dinitrotoluene	5.5 U	5.4 U	5.0 U	5.5 U
2,6-Dinitrotoluene	5.5 U	5.4 U	5.0 U	5.5 U
Diethyl phthalate	5.5 U	5.4 U	5.0 U	5.5 U
4-Chlorophenyl-phenylether	5.5 U	5.4 U	5.0 U	5.5 U
Fluorene	5.5 U	5.4 U	5.0 U	5.5 U
1,2-Diphenylhydrazine	5.5 U	5.4 U	5.0 U	5.5 U
n-Nitrosodiphenylamine	5.5 U	5.4 U	5.0 U	5.5 U
4-Bromophenyl-phenylether	5.5 U	5.4 U	5.0 U	5.5 U
Hexachlorobenzene	5.5 U	5.4 U	5.0 U	5.5 U
Phenanthrene	5.5 U	5.4 U	5.0 U	5.5 U
Anthracene	5.5 U	5.4 U	5.0 U	5.5 U
Di-n-butylphthalate	5.5 U	5.4 U	5.0 U	5.5 U
Fluoranthene	5.5 U	5.4 U	5.0 U	5.5 U
Pyrene	5.5 U	5.4 U	5.0 U	5.5 U
Butylbenzylphthalate	5.5 U	5.4 U	5.0 U	5.5 U
3,3'-Dichlorobenzidine	5.5 U	5.4 U	5.0 U	5.5 U
Benzo [a] anthracene	5.5 U	5.4 U	5.0 U	5.5 U
bis (2-Ethylhexyl) phthalate	5.5 U	9.2	5.0 U	5.5 U
Chrysene	5.5 U	5.4 U	5.0 U	5.5 U
Di-n-octylphthalate	5.5 U	5.4 U	5.0 U	5.5 U
Benzo [b] fluoranthene	5.5 U	5.4 U	5.0 U	5.5 U
Benzo [k] fluoranthene	5.5 U	5.4 U	5.0 U	5.5 U
Benzo [a] pyrene	5.5 U	5.4 U	5.0 U	5.5 U
Indeno [1,2,3-cd] pyrene	5.5 U	5.4 U	5.0 U	5.5 U
Dibenz [a,h] anthracene	5.5 U	5.4 U	5.0 U	5.5 U
Benzo [g,h,i] perylene	5.5 U	5.4 U	5.0 U	5.5 U
4-Chloroaniline	5.5 U	5.4 U	5.0 U	5.5 U
2-Methyl naphthalene	5.5 U	5.4 U	5.0 U	5.5 U
2-Nitroaniline	5.5 U	5.4 U	5.0 U	5.5 U
3-Nitroaniline	5.5 U	5.4 U	5.0 U	5.5 U
Dibenzofuran	5.5 U	5.4 U	5.0 U	5.5 U
4-Nitroaniline	5.5 U	5.4 U	5.0 U	5.5 U
Carbazole	5.5 U	5.4 U	5.0 U	5.5 U

Notes:
TCL Target Compound List.
U Not detected at the associated value.