



OCT 6 9 24 AM 1999

RECEIVED

October 1, 1999

Mr. John Schmeltzer  
Vermont ANR/DEC  
Waste Management Division  
103 South Main St. /West Building  
Waterbury, VT 05671-0404

RE: Initial Investigation of Suspected Subsurface Petroleum Contamination  
Tuttle's True Value Hardware, Bennington, Vermont (VTDEC #98-2341)

Dear Mr. Schmeltzer:

Enclosed please find the summary report for the site investigation conducted at the above referenced site. Mr. Freed has reviewed this report and requested that we forward a copy to you for review.

For your reference, Apollo Industries' new 9-1-1 address is:

Apollo Industries  
105 North End Drive  
North Clarendon, VT 05759

Please contact me if you have any questions or comments.

Sincerely,

Christine Ward  
Hydrogeologist

Enclosure

c.: Walt Freed, Apollo Industries (w/o enclosure)  
GI#39841189

Doc # 9-20-11-99  
11/11/99

**INITIAL INVESTIGATION OF  
SUSPECTED SUBSURFACE PETROLEUM  
CONTAMINATION**

**TUTTLE'S TRUE VALUE HARDWARE  
113 DEPOT STREET  
BENNINGTON, VERMONT**

(VTDEC SITE #98-2341)  
GI#39841189

September 30, 1999

*Prepared for*

Apollo Fuels, Inc.  
RR 2, Box 278A  
North Clarendon, VT 05759

*Prepared by*



P.O. Box 943  
Williston, Vermont 05495  
(802) 865-4288



## TABLE OF CONTENTS

<b>I. INTRODUCTION</b> .....	<b>1</b>
<b>II. SITE BACKGROUND</b> .....	<b>1</b>
A. SITE HISTORY .....	1
B. SITE DESCRIPTION.....	2
C. SITE GEOLOGY .....	2
<b>III. INVESTIGATIVE PROCEDURES</b> .....	<b>2</b>
A. SOIL BORINGS / MONITORING WELL INSTALLATION.....	2
B. GROUNDWATER FLOW DIRECTION AND GRADIENT.....	4
C. GROUNDWATER SAMPLING AND ANALYSES.....	4
D. SOIL STOCKPILE SCREENING .....	5
E. SENSITIVE RECEPTOR SURVEY .....	5
<b>IV. CONCLUSIONS</b> .....	<b>6</b>
<b>V. RECOMMENDATIONS</b> .....	<b>7</b>
<b>REFERENCES</b> .....	<b>8</b>

### APPENDICES

#### Appendix A - Maps

    Site Location Map

    Site Map

    Groundwater Contour Map

    Contaminant Concentration Map

#### Appendix B - Soil Logs and Monitoring Well Specifications

#### Appendix C - Liquid Level Monitoring Data

#### Appendix D - Water Quality Data

#### Appendix E - Analytical Laboratory Report



## I. INTRODUCTION

This report summarizes the initial investigation of suspected subsurface petroleum contamination at Tuttle's True Value Hardware (the Site) at 113 Depot Street in Bennington, Vermont (see Site Location Map, Appendix A). This work was requested by John Schmeltzer of the Vermont Department of Environmental Conservation (VTDEC) in a letter to Walt Freed of Apollo Fuels, Inc., dated January 22, 1999. Work was requested by the VTDEC at the Site in response to suspected subsurface petroleum contamination detected during the excavation for a new water line in March 1998.

This work was performed in accordance with the <sup>May 22</sup> ~~March 18~~, 1999, *Work Plan and Cost Estimate for a Site Investigation of Suspected Petroleum Contamination* prepared by Griffin. The work plan was approved by John Schmeltzer (VTDEC) in a letter to Walter Freed dated April 8, 1999 (received by Griffin May 25, 1999).

## II. SITE BACKGROUND

### A. Site History

On March 5, 1998, suspected petroleum contamination was encountered during the excavation for a new water line between the store building and the service department building [2]. Approximately 6 cubic yards of petroleum impacted soil from the excavation was stockpiled on plastic on-site as it was not suitable for use as backfill around the new water line.

Griffin inspected the Site on March 6, 1998. Soil and water samples collected from the water line excavation were screened for volatile organic compounds (VOCs) using an HNu™ systems model HW-101 photoionization detector (PID) equipped with a 10.2 eV lamp. PID measurements from the soils and water head space ranged from 4.5 parts per million (ppm) to greater than 200 ppm.

According to an employee at Tuttle's and an invoice from Burgess Brothers, Inc. (excavators), three 500-gallon capacity underground storage tanks (USTs) were removed from the Site on June 7, 1996. According to the employee's statement, the USTs were located between the main store building and the service shop (i.e., in the vicinity of the newly excavated water line). An old site plan shows a buried UST on the north side of the service shop (see Site Map, Appendix A). A letter from Arnold Blackstone, representative of Henry M. Tuttle Company, Inc. (former owner of the property) to Walter Freed, dated May 28, 1996, indicates the presence of an abandoned 500-gallon gasoline UST at the property. This letter stated that the UST had been out of service for over ten years. These documents were provided to John Schmeltzer of the VTDEC by Walter Freed of Apollo Industries on March 22, 1999.

As a result of the petroleum contamination detected in the subsurface, the VTDEC requested that additional work be conducted at the Site in order to determine the extent and degree of petroleum contamination.

## **B. Site Description**

Tuttle's True Value Hardware is located in a commercial/ industrial area of downtown Bennington. The retail store faces west toward Depot Street; the property extends east to North Street. The store building is in the shape of a horseshoe, with the western part being the retail showroom and offices, and the northern and eastern parts of the building are used for storage (see Site Map, Appendix A). The service department is at the southern end of the horseshoe. South of the service department building is an open-front storage shed. East of these buildings is a large warehouse for the storage of lumber.

The ground surface topography across the Site is relatively flat. The westerly flowing Walloomsac River is north of the subject property. The area is serviced by municipal water and sewer.

## **C. Site Geology**

According to the Surficial Geologic Map of Vermont [3], the Site is underlain by glaciofluvial outwash gravel. Bedrock below the Site is mapped as Winooski Dolomite, consisting mainly of buff-weathered, pink, buff, and gray dolomite [4].

# **III. INVESTIGATIVE PROCEDURES**

To further define the extent of subsurface petroleum contamination in the area of the former gasoline UST(s), the following investigative tasks were undertaken: soil borings; monitoring well installations; determination of groundwater flow direction and gradient; groundwater sample collection and analyses for petroleum related constituents; and a sensitive receptor survey.

## **A. Soil Borings / Monitoring Well Installation**

On June 22, 1999, one shallow monitoring well, MW-4, was installed at the Site utilizing hollow-stem auger drilling methods with an air hammer. The transmission for the drill rig broke down during the advancement of the second soil boring on June 22, 1999. On July 6, 1999, we remobilized at the Site to install monitoring wells MW-1, MW-2, and MW-3. Technical Drilling Services, Inc. (TDS), of Sterling, Massachusetts, advanced the soil borings and installed the

monitoring wells under the supervision of a Griffin hydrogeologist. The monitoring well locations are indicated on the Site Map (Appendix A).

Soil samples collected from the borings were logged by the supervising hydrogeologist and screened for the presence of VOCs using an HNu™ systems Model HW-101 PID equipped with a 10.2 eV lamp. Prior to screening, the PID was calibrated with isobutylene referenced to benzene. Soils were screened using the Griffin Jar/Polyethylene Bag Headspace Screening Protocol, which conforms to state and industry standards. Soil characteristics and contaminant concentrations were recorded by the hydrogeologist in detailed soil logs which are presented in Appendix B. Use of the air hammer and the cobbly nature of the subsurface soils limited the use of the split spoon sampler for soil sample collection. Most of the soil samples collected for PID screening were collected from the auger flights.

Monitoring well MW-1 was installed in a presumed upgradient direction from the source area of the former UST(s). Monitoring well MW-2 was installed close to the source area, in a presumed downgradient to crossgradient direction, of the former UST(s). MW-2 was located slightly north of the proposed monitoring well location due to uncertainties in the exact location of an underground electric line between the store building and the service department building. Monitoring well MW-3 was installed near the new water line, in a presumed crossgradient to downgradient direction from the former UST(s). Monitoring well MW-4 was installed in a presumed downgradient direction from the former UST(s).

The soil encountered in the four soil borings consisted primarily of sandy silt with gravel to gravelly silt from grade to approximately two feet below grade. Between two feet to approximately five feet below grade the fraction of coarser material increased in size and percentage with depth. A zone of cobbles was encountered from approximately five feet to eight feet below grade. The cobble zone was underlain by an approximate two foot thick layer of gravelly silt with sand to silty gravel. This was underlain by silt to a depth of eleven feet below grade which marked the vertical extent of the deepest boring. During drilling the water table was encountered at approximately five feet below grade.

The soil sample collected near the ground surface in the boring for monitoring well MW-1 had a PID measurement of 70 ppm. The soil sample collected at the bottom of the boring (9 feet below grade) had a PID measurement of 0.4 ppm. In the soil boring for monitoring well MW-2, the soil sample collected at 5 feet below grade had a PID measurement of 17 ppm, that decreased to 5 ppm in the soil sample collected at the bottom of the boring at 9 feet below grade. The silty gravel soil sample collected at 9 feet below grade in the boring for monitoring well MW-3 had a PID measurement of 30 ppm; the PID measurement in the underlying silt at 11 feet below grade decreased to 5 ppm. No VOCs were measured with the PID from the soils collected from the boring for monitoring well MW-4.

The monitoring wells were constructed in a similar fashion, with two-inch diameter, Schedule 40 PVC well screen and riser. Monitoring wells MW-1, MW-2, and MW-3, each contain a seven-foot length of 0.010-inch, factory-slotted screen; MW-4 contains an eight-foot length of screen.

A sand pack was installed in the annular space around the well screen from the bottom of the boring to approximately 0.4 foot above the top of the screened interval in each borehole. An approximate one-foot thick bentonite seal was then installed above the sand pack. Each well was fitted with a gripper cap, and secured with a water-tight road box. The road box on each well is flush-mounted, set in concrete, and suitable for vehicular traffic. The monitoring wells were developed by bailing immediately after installation.

## **B. Groundwater Flow Direction and Gradient**

Water table elevation measurements were collected from the four on-site monitoring wells on July 29, 1999. The top of casing elevations were determined relative to MW-1, which was arbitrarily set at 100 feet. The depth to water in each well was subtracted from the top of casing elevation to obtain the relative water table elevation. No free phase product was detected in the wells on July 29, 1999. Water level data are presented in Appendix C. Water table elevations were plotted on the Site Map to generate the Groundwater Contour Map (Appendix A).

The depth to groundwater measured on July 29, 1999, in the four site monitoring wells ranged from approximately 2.5 feet to 5.5 feet below grade. The relative water table elevations measured on July 29, 1999, suggest that groundwater flow at the Site exhibits radially inward flow directed generally toward the west at a shallow hydraulic gradient on the order of 0.25%. This groundwater flow direction parallels the Walloomsac River rather than flowing toward the river as originally assumed.

## **C. Groundwater Sampling and Analyses**

Griffin collected groundwater samples from the four on-site monitoring on July 29, 1999. The water samples were analyzed by Endyne, Inc. of Williston, Vermont, by EPA Method 8021B for the presence of benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tertiary butyl ether (MTBE), naphthalene, 1,3,5-trimethylbenzene (TMB) and 1,2,4-TMB. Results of the laboratory analyses for the monitoring wells are summarized in Appendix D. The laboratory analysis report is contained in Appendix E. Analytical results of the trip blank and duplicate samples indicate that adequate quality assurance and control were maintained during sample collection and analysis.

No targeted petroleum compounds were reported above the sample specific detection limits in the groundwater sample collected from monitoring well MW-1. No unidentified peaks (UIPs) were reported for the groundwater sample collected from monitoring well MW-1.

Trace concentrations of benzene and 1,2,4-TMB and a low concentration of naphthalene, below the Vermont Groundwater Enforcement Standards (VGES) for these compounds, were reported for the groundwater sample collected from monitoring well MW-2.

Concentrations of benzene, 1,3,5-TMB, 1,2,4-TMB, and naphthalene, exceeding their respective VGES, were reported for the groundwater sample collected from MW-3. Concentrations of toluene, ethylbenzene, and xylenes, below their respective VGES, were also reported in the sample from MW-3.

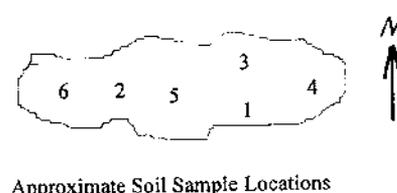
A trace concentration of benzene, below the VGES for this compound, was reported for the groundwater sample collected from monitoring well MW-4. No other petroleum compounds targeted by EPA Method 8021B were reported above the sample specific detection limits for the groundwater sample collected from monitoring well MW-4. No UIPs were reported for this sample.

#### D. Soil Stockpile Screening

Approximately 6 cubic yards of petroleum-impacted soils from the excavation of the water line are stockpiled on site. The soil stockpile is located approximately 200 feet east of the former UST(s) source area.

Six discrete soil samples were collected by Griffin personnel from the soil stockpile using a hand auger. Each sample was screened for VOCs using a PID in accordance with Griffin's Jar/Polyethylene Bag Headspace Analysis Protocol, which conforms to state and industry standards. Soil screening results are summarized in the table below.

Sample #	Depth (feet)	PID Reading (ppm)
1	0.5	0
2	0.5	0
3	1	0
4	0.75	0.2
5	1	0
6	1.75	0.1



Approximate Soil Sample Locations

The depth of sample collection with the hand auger was limited by the cobbly nature of the stockpiled soils. However, the extent of residual contamination within the soil stockpile is also likely limited by the high percentage of cobbles. No visual or olfactory evidence of petroleum was noted from the stockpiled soils.

#### E. Sensitive Receptor Survey

A qualitative risk assessment was conducted during the water line inspection on March 6, 1998, and during the drilling on June 22, 1999, and on July 6, 1999, to identify known and potential receptors of the contamination detected at the Site. Based on these visual surveys, a determination of the potential risk to identified receptors was made.

The soil and groundwater in the vicinity of the former UST(s) are receptors of the contamination detected.

The subsurface utility lines in the yard area include the water line and an electrical line between the store building and the service department building. There is a shallow tile drain line between the two catchbasins in the yard; the invert of the drain pipe at the catchbasins was measured on June 22, 1999, to be approximately 1.5 feet below grade. Standing water was noted in the northern catchbasin on June 22, 1999. Given the shallow depth to groundwater measured in the monitoring wells on July 29, 1999, these utility and drain lines may provide a corridor for migration of the detected petroleum contamination. However, given the high permeability of the cobbly subsurface soils in the vicinity of the Site, these lines and other potential utility corridors may not necessarily provide preferential pathways for groundwater flow.

Based on the Dig Safe information, there are no other known telephone or electric lines in the yard area surrounding the former UST(s). According to the Bennington Public Works Department, there are no known water or sewer lines in the yard area surrounding the former UST(s).

The nearest surface water is the westerly flowing Walloomsac River, located approximately 200 feet north of the former UST(s) location. The reach of the river north of the Site near the Depot Street bridge was inspected on June 22, 1999. No signs of petroleum contamination such as sheens, seeps, or stains were observed. The risk to the Walloomsac River is considered minimal given the distance between the former UST(s) and the river.

The entire area is served by municipal water and sewer systems. No in-use public or private water supply wells were identified in the vicinity of the site, based on visual observations.

#### IV. CONCLUSIONS

Based on the results of this site investigation at Tuttle's True Value Hardware, Griffin presents the following conclusions:

- 1) The source of petroleum contamination detected in soils at the Site was the former 500-gallon gasoline UST(s) at the property. The volume of product released is unknown. The source of the petroleum contamination (i.e., the UST system) was removed in June 1996.
- 2) PID measurements from soils collected during the water line excavation in March 1998 indicate that adsorbed petroleum compounds existed in the soils in the reported vicinity of the former gasoline UST(s). With the source UST(s) system eliminated, it is expected that adsorbed petroleum compound concentrations will decrease over time with the progressive action of natural mitigative processes including biodegradation, volatilization, and diffusion.

- 3) Four groundwater monitoring wells, MW-1 through MW-4, were installed under Griffin supervision at the Site on June 22, 1999, and on July 6, 1999. Slightly elevated PID measurements were obtained from the soil samples collected from the borings for monitoring wells MW-1, MW-2, and MW-3. The PID measurements in these three borings decreased with depth. No VOCs were measured with the PID in the soil samples collected from the boring for monitoring well MW-4.
- 4) The depth to groundwater measured on July 29, 1999, in the four site monitoring wells ranged from approximately 2.5 feet to 5.5 feet below grade. The shallow groundwater flow beneath the Site on this date was estimated to be directed toward the west at a hydraulic gradient on the order of 0.25%. This flow direction parallels the nearby Walloomsac River.
- 5) Groundwater samples were collected from the four site monitoring wells on July 29, 1999. Concentrations of select petroleum compounds detected in the groundwater sample collected from monitoring well MW-3 exceeded their respective VGES. With the source UST(s) removed, it is expected that dissolved petroleum compound concentrations will decrease over time with the progressive action of natural mitigative processes, including dilution, dispersion, and biodegradation.
- 6) There appear to be no significant potential risks to identified sensitive receptors based on currently available data.

## V. RECOMMENDATIONS

Based on the above conclusions, Griffin presents the following recommendations:

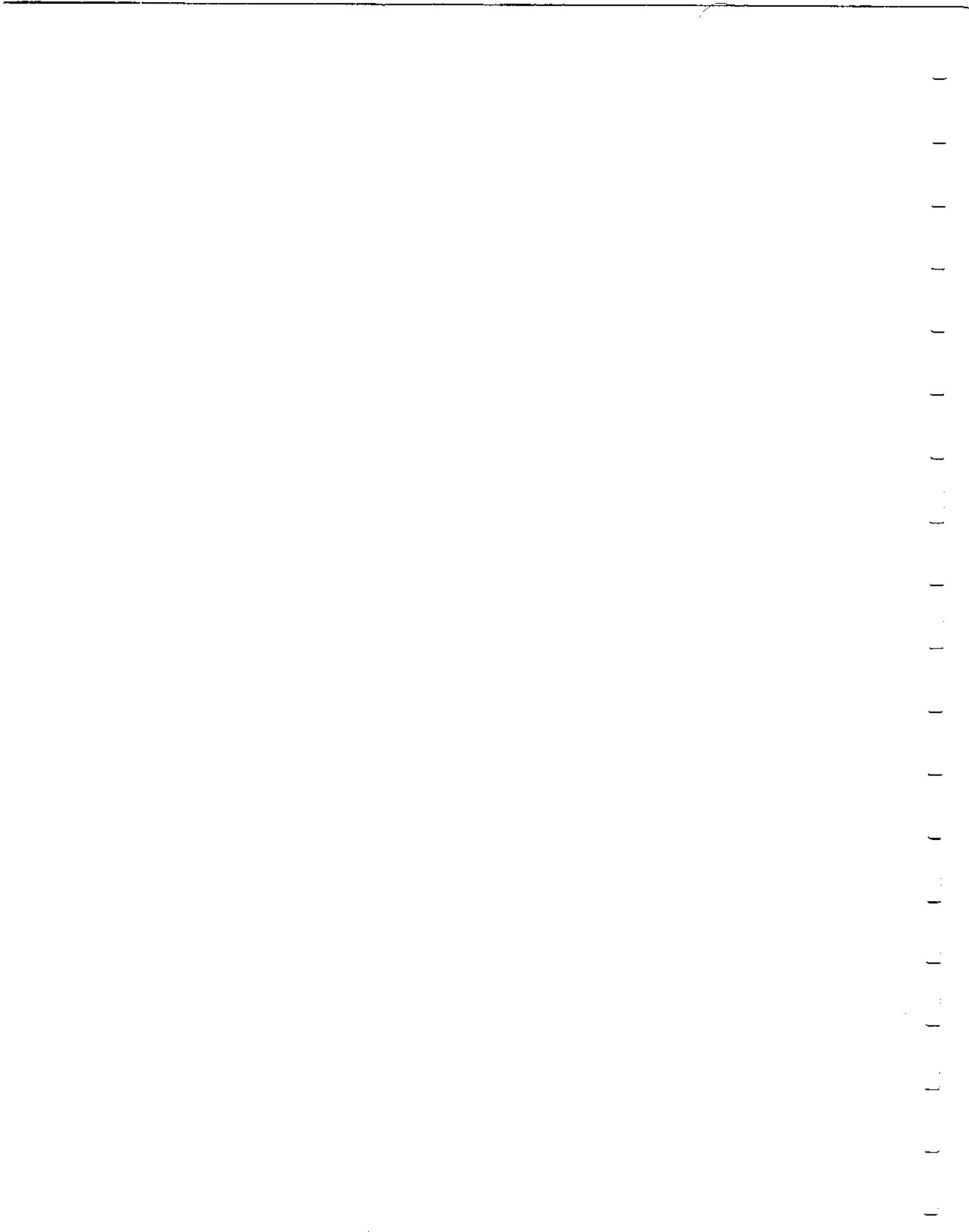
1. Since select compounds were detected in the groundwater collected from monitoring well MW-3 at concentrations exceeding their respective VGES, a confirmatory round of groundwater elevations and samples should be collected from the four on-site monitoring wells in October/November 1999 (three months from the July 29, 1999, sampling event). The groundwater samples should be analyzed for petroleum compounds by EPA Method 8021B. The frequency of future sampling will be reassessed following the October/November 1999 sampling event.
2. Based on the PID measurements of the soil stockpile on June 22, 1999, and on July 6, 1999, (<1 ppm) and no visual or olfactory indications of petroleum impacts in the stockpile, Griffin recommends that the soil be thin-spread on-site in accordance with VTDEC guidelines (August 1996) and with VTDEC approval.

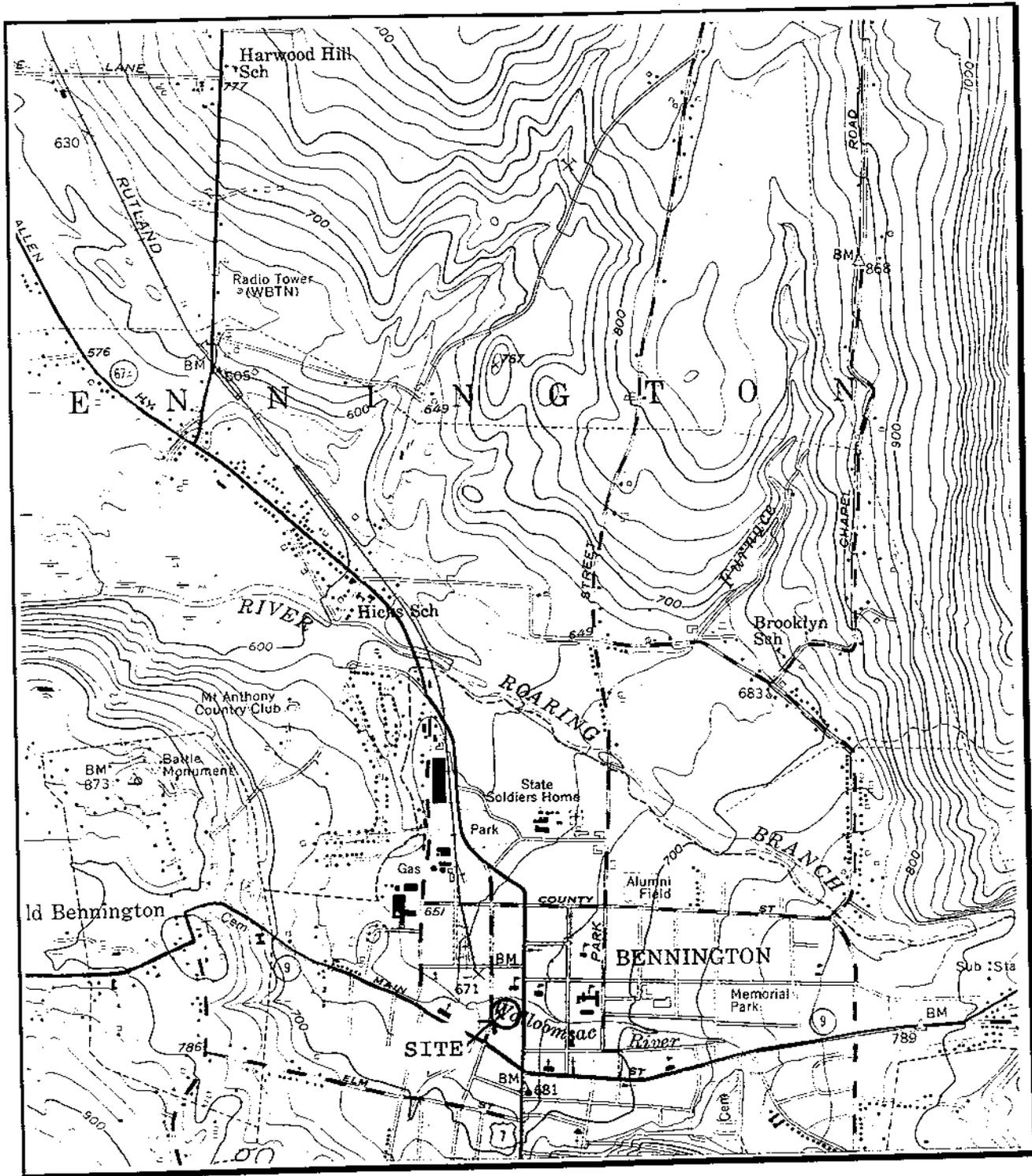
## REFERENCES

1. USGS 7.5 Minute Topographic Map, Bennington, VT, dated 1954.
2. Griffin International, March 11, 1998, *Petroleum Contamination at Tuttle's True Value Hardware*, letter report to Mr. Walter E. Freed, Apollo Industries.
3. Doll, Charles G., ed., 1970, *Surficial Geologic Map of Vermont*, Vermont Geological Survey.
4. Doll, Charles G., ed., 1961, *Centennial Geologic Map of Vermont*, Vermont Geological Survey.

**APPENDIX A**

**Site Location Map**  
**Site Map**  
**Groundwater Contour Map**  
**Contaminant Concentration Map**





**SITE LOCATION MAP - TUTTLE'S TRUE VALUE HARDWARE (VTDEC #98-2341)**

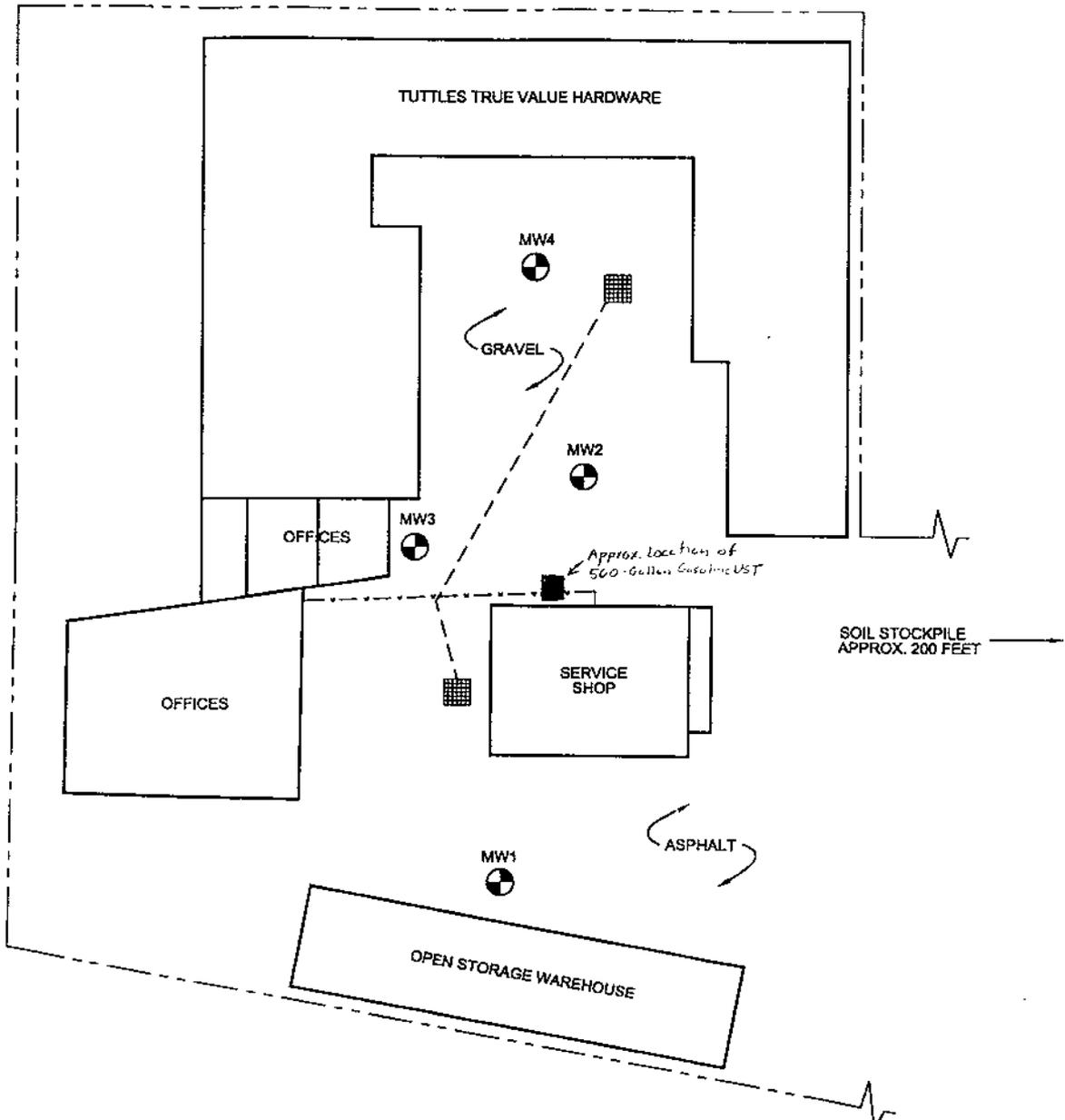
**Bennington, Vermont**

Source: USGS 7.5 minute Bennington-VT quadrangle, dated 1954.

Scale: 1:24,000



DEPOT STREET



**LEGEND**

-  MONITORING WELL
-  PROPERTY LINE
-  WATER LINE
-  DRAIN LINE
-  CATCH BASIN

SOURCE: BUILDINGS AND PROPERTY LINES BASED ON "PLOT PLAN OF HENRY M. TUTTLE CO. INC." DRAWN BY W.O. NOYES, P.E. 10/26/81. MONITORING WELL LOCATIONS SURVEYED BY GRIFFIN ON 7/29/99

JOB #:39841189

VTDEC SITE # 98-2341



**TUTTLES TRUE VALUE HARDWARE**

113 DEPOT STREET BENNINGTON, VERMONT

**SITE MAP**

DATE: 9/29/99

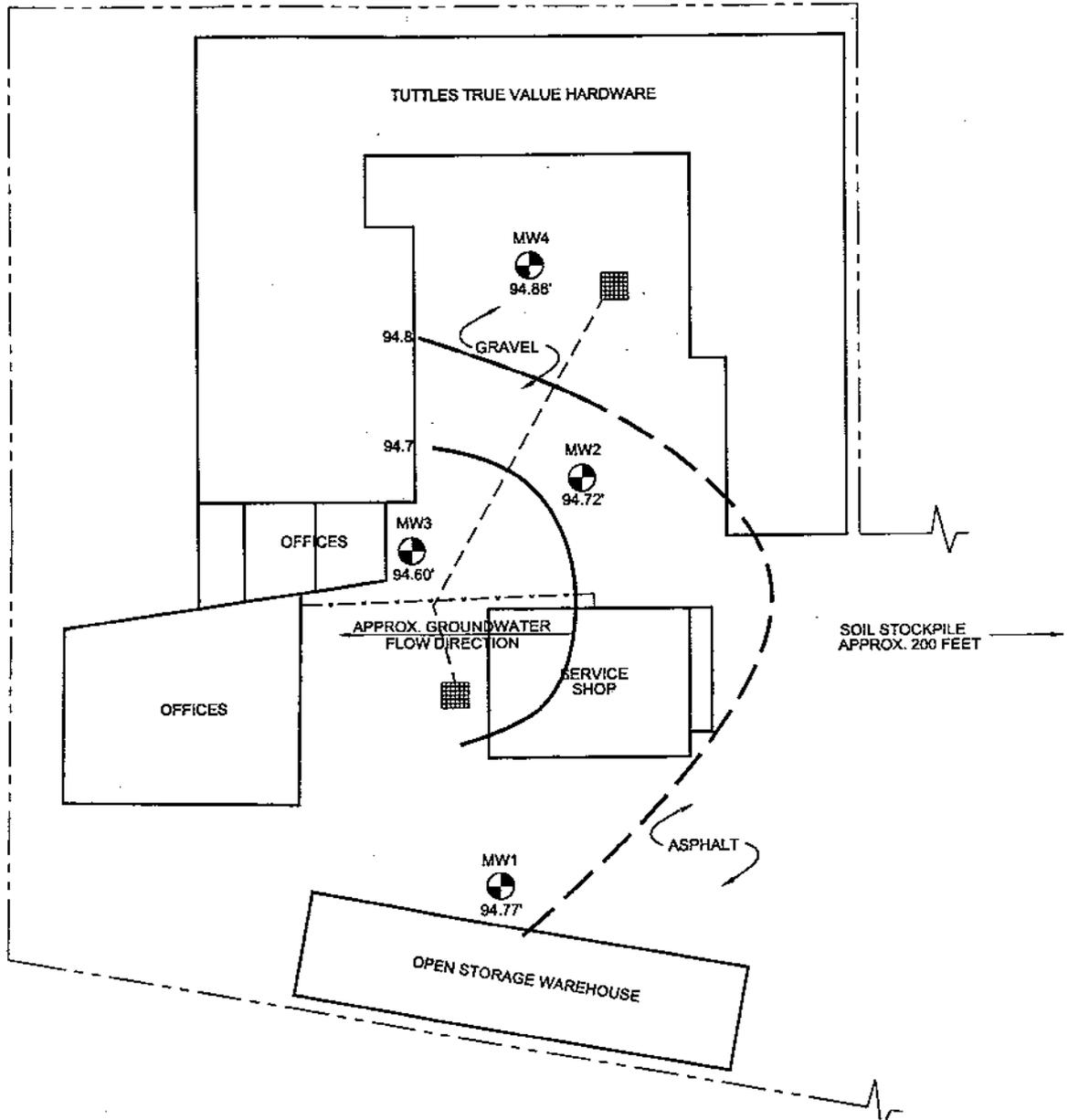
DWG.#: 1

SCALE:1"=40'

DRN.:JL

APP.:CW

DEPOT STREET



**LEGEND**

- MONITORING WELL WITH GROUNDWATER LEVEL ELEVATION
- PROPERTY LINE
- WATER LINE
- DRAIN LINE
- CATCH BASIN

94.7 GROUNDWATER TABLE CONTOUR (DASHED WHERE INFERRED)

SOURCE: BUILDINGS AND PROPERTY LINES BASED ON "PLOT PLAN OF HENRY M. TUTTLE CO. INC." DRAWN BY W.O. NOYES, P.E. 10/26/81. MONITORING WELL LOCATIONS SURVEYED BY GRIFFIN ON 7/29/99. JOB #38841189 VTDEC SITE # 98-2341



**TUTTLES TRUE VALUE HARDWARE**  
113 DEPOT STREET BENNINGTON, VERMONT  
**GROUNDWATER CONTOUR MAP**

MEASURED 7/29/99

DATE: 9-30-99

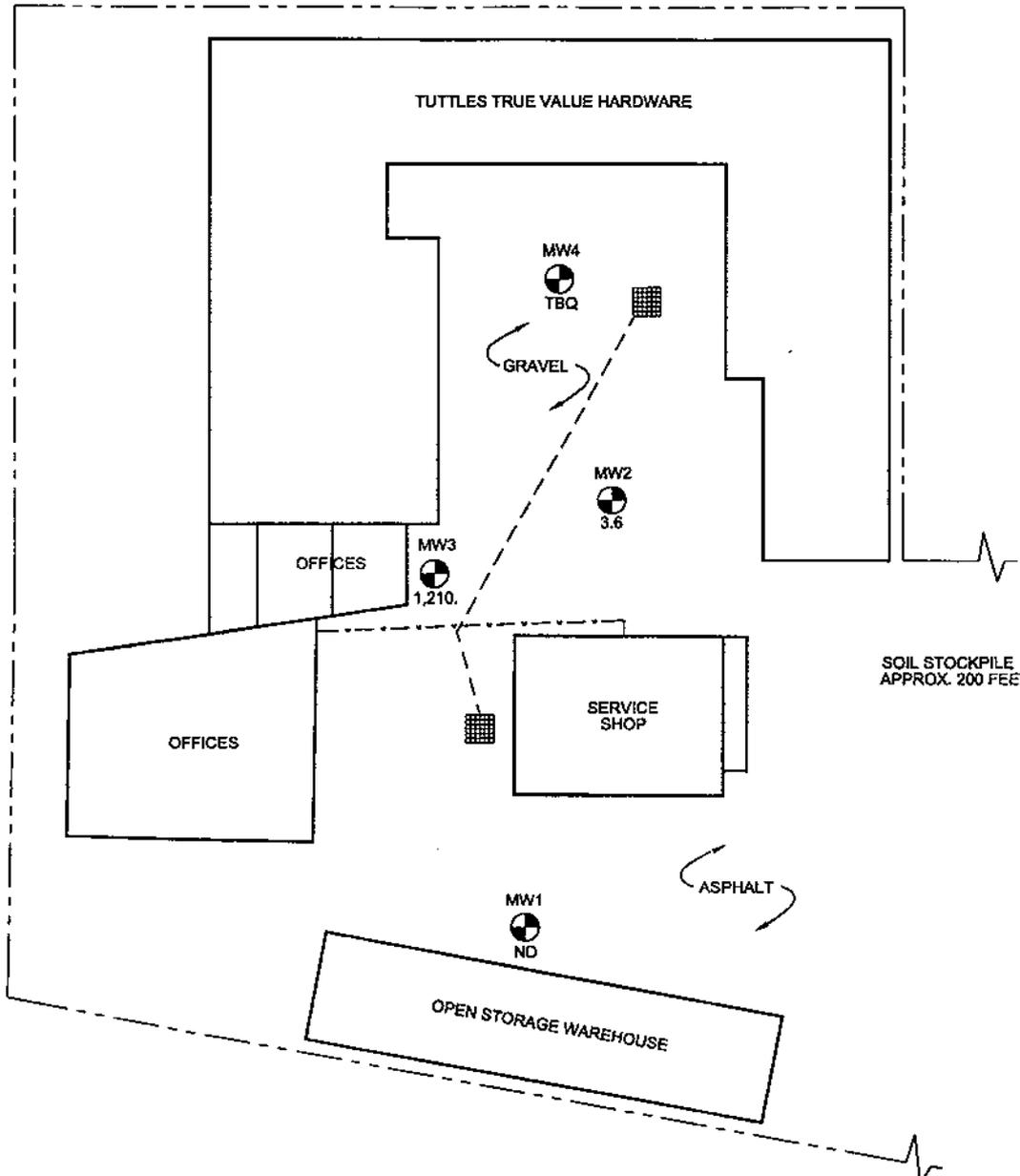
DWG.#: 2

SCALE: 1" = 40'

DRN.: JL

APP.: CW

DEPOT STREET



**LEGEND**

MONITORING WELL VOC CONCENTRATION (ppb)

ND NONE DETECTED

PROPERTY LINE

TBQ TRACE BELOW QUANTITATION

WATER LINE

DRAIN LINE

CATCH BASIN

SOURCE: BUILDINGS AND PROPERTY LINES BASED ON "PLOT PLAN OF HENRY M. TUTTLE CO. INC." DRAWN BY W.O. NOYES, P.E. 10/26/81. MONITORING WELL LOCATIONS SURVEYED BY GRIFFIN ON 7/29/99. JOB #39941189 VTDEC SITE # 98-2341



**TUTTLES TRUE VALUE HARDWARE**

113 DEPOT STREET BENNINGTON, VERMONT

**CONTAMINANT CONCENTRATION MAP**

TOTAL TARGETED VOCs - METHOD 8021B

MEASURED 7/29/99

DATE: 9/30/99

DWG.#: 3

SCALE: 1" = 40'

DRN.: JL

APP.: CW

**APPENDIX B**

**Soil Logs and Monitoring Well Specifications**

**BORING LOG: Tutties True Value Hardware**

**Boring No: MW-1**

Page 1 of 1

Griffin Project #: 39841189	Drilling Method: Hollow Stem Auger
Drilled by : TDS	Pilot Boring Dia.: 4.25-inch
Driller: Steve	Final Boring Dia.: 4.25-inch
Supervised by: Griffin International	DTW from grade: 5 feet
Logged by: C. Ward	DTW Date, Time: 7/6/99, 1200
Date Started: 7/6/1999	Total Depth: 9 feet
Date Finished: 7/6/1999	PID: HNu Model HW-101, 10.2 eV
Protection Level: D+	Soil Drilled: sand, silt, gravel

Time	Sample No.	Depth (ft)	Blows/ 6" (140 lb.)	Pen/ Rec (")	PID	Description and Comments
11:15	1	0-2	off auger	-	70	Sandy silt with gravel (ML). 50% silt, 30% sand, 20% gravel. Dry, olive gray.
11:40	2	9	off auger	-	0.4	Gravelly silt with sand (ML). 50% silt, 30% gravel, 20% sand. Wet, dark brown. Cobbles encountered at 5 feet below grade.

Prepared by: TLC



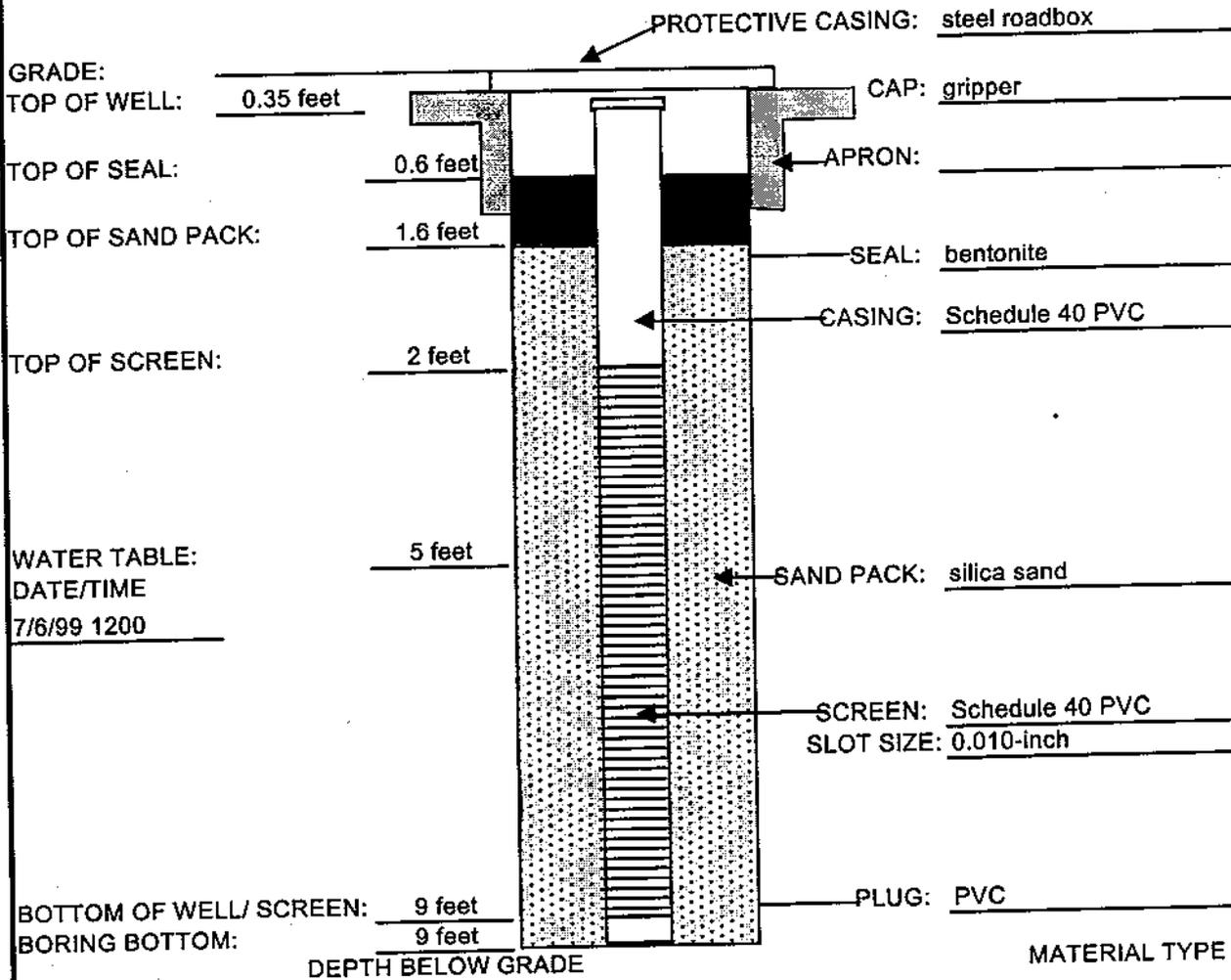
### Well Construction Diagram

PROJECT NAME: Tuttle's True Value Hardware

Well No: MW-1

Griffin Project #: 39841189  
 Drilled by : TDS  
 Driller: Steve  
 Supervised by: Griffin International  
 Logged by: CW

Date Installed: 7/6/1999  
 Drilling Method: Hollow Stem Auger  
 Boring Diameter.: 4.25-inch  
 Well Inside Diameter: 2 inches  
 Development Method: bailer



Prepared by: TLC

*Griffin International, Inc.*

PO Box 943  
 Williston, Vermont  
 (802) 865 - 4288



**BORING LOG: Tuttle True Value Hardware**Boring No: **MW-2**

Page 1 of 1

Griffin Project #: 39841189  
 Drilled by : TDS  
 Driller: Steve  
 Supervised by: Griffin International  
 Logged by: C. Ward  
 Date Started: 7/6/1999  
 Date Finished: 7/6/1999  
 Protection Level: D+

Drilling Method: Hollow Stem Auger  
 Pilot Boring Dia.: 4.25-inch  
 Final Boring Dia.: 4.25-inch  
 DTW from grade: approximately 5 feet  
 DTW Date, Time: 7/6/99, 09:40  
 Total Depth: 9 feet  
 PID: HNu Model HW-101, 10.2 eV  
 Soil Drilled: silt, gravel

Time	Sample No.	Depth (ft)	Blows/ 6" (140 lb.)	Pen/ Rec (")	PID	Description and Comments
9:30	1	0-2	off auger	-	0	Sandy silt with gravel (ML). 50% silt, 30% sand, 20% gravel. Dry, dark brown.
9:37	2	5-5.25	50/3"	0.25/0.2	17	Silty gravel (GM). 70% fine gravel, 30% silt. Wet, olive brown. Cobbles encountered from approximately 4 feet to 8 feet below grade.
9:50	3	9	off auger	-	5	Silty gravel (GM). 70% gravel, 30% silt. Wet, brown.

Prepared by: TLC



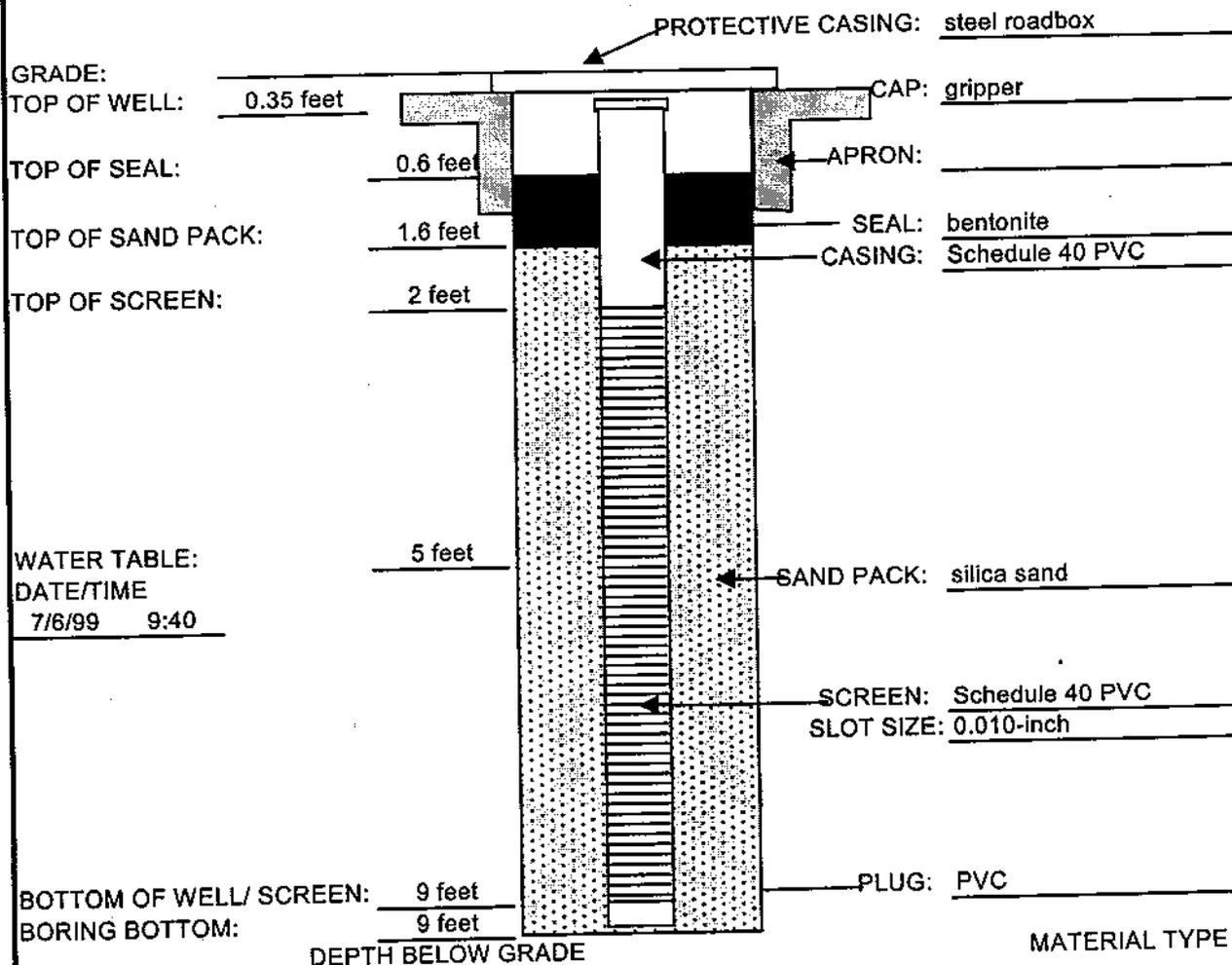
### Well Construction Diagram

PROJECT NAME: Tuttle's True Value Hardware

Well No: **MW-2**

Griffin Project #: 39841189  
 Drilled by: TDS  
 Driller: Steve  
 Supervised by: Griffin International  
 Logged by: CW

Date Installed: 7/6/1999  
 Drilling Method: Hollow Stem Auger  
 Boring Diameter.: 4.25-inch  
 Well Inside Diameter: 2 inches  
 Development Method: bailer



Prepared by: TLC

*Griffin International, Inc.*

PO Box 943  
 Williston, Vermont  
 (802) 865 - 4288



**BORING LOG: Tuttle's True Value Hardware**Boring No: **MW-3**

Page 1 of 1

Griffin Project #: 39841189	Drilling Method: Hollow Stem Auger
Drilled by : TDS	Pilot Boring Dia.: 4.25-inch
Driller: Steve	Final Boring Dia.: 4.25-inch
Supervised by: Griffin International	DTW from grade: approximately 5 feet
Logged by: C. Ward	DTW Date, Time: 7/6/99, 10:45
Date Started: 7/6/1999	Total Depth: 11 feet
Date Finished: 7/6/1999	PID: HNu Model HW-101, 10.2 eV
Protection Level: D+	Soil Drilled: silt, gravel

Time	Sample No.	Depth (ft)	Blows/ 6" (140 lb.)	Pen/ Rec (")	PID	Description and Comments
10:30	1	0-2	off auger	-	3	Sandy silt with gravel (ML). 50% silt, 25% sand, 25% gravel. Dry, dark brown.  Cobbles at 5 feet to approximately 8 feet below grade.
10:39	2	9-10.75	13/17/21/19	24/9	30	Silty gravel (GM). 85% gravel, 15% silt. Wet, brown.
10:39	3	10.75-11	-	-	5	Silt (ML). 100% silt. Wet, brown.

Prepared by: TLC



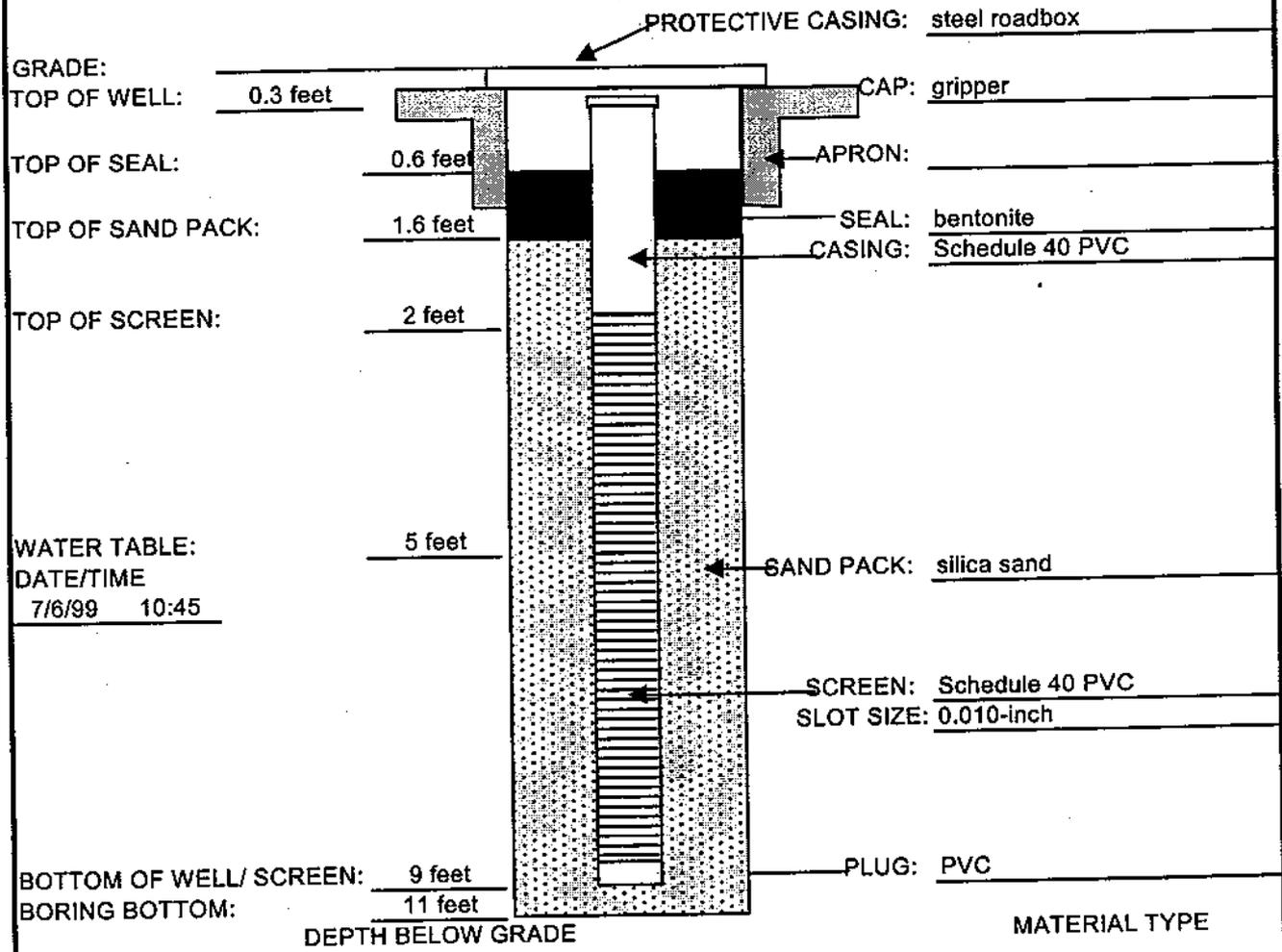
### Well Construction Diagram

PROJECT NAME: Tuttle's True Value Hardware

Well No: MW-3

Griffin Project #: 39841189  
 Drilled by: TDS  
 Driller: Steve  
 Supervised by: Griffin International  
 Logged by: CW

Date Installed: 7/6/1999  
 Drilling Method: Hollow Stem Auger  
 Boring Diameter.: 4.25-inch  
 Well Inside Diameter: 2 inches  
 Development Method: bailer



Prepared by: TLC

Griffin International, Inc.

PO Box 943  
 Williston, Vermont  
 (802) 865 - 4288



**BORING LOG: Tutties True Value Hardware**

**Boring No: MW-4**

Page 1 of 1

Griffin Project #: 39841189	Drilling Method: Air Hammer and Hollow Stem Auger
Drilled by : TDS	Pilot Boring Dia.: 4.25-inch
Driller: Scott	Final Boring Dia.: 4.25-inch
Supervised by: Griffin International	DTW from grade: 2.3 feet
Logged by: C. Ward	DTW Date, Time: 6/22/99, 12:00
Date Started: 6/22/1999	Total Depth: 10 feet
Date Finished: 6/22/1999	PID: HNu Model HW-101, 10.2 eV
Protection Level: D+	Soil Drilled: silt, clay

Time	Sample No.	Depth (ft)	Blows/ 6" (140 lb.)	Pen/ Rec (")	PID	Description and Comments
9:40	1	0-2	off auger	-	0	Gravelly silt (ML). 60% silt, 30% gravel, 10% sand. Dry, black.
11:28	2	10	off auger	-	0	Silt and clay (ML/CL). 80% silt and clay, 10% sand, 10% gravel. Wet, olive gray.

Prepared by: TLC



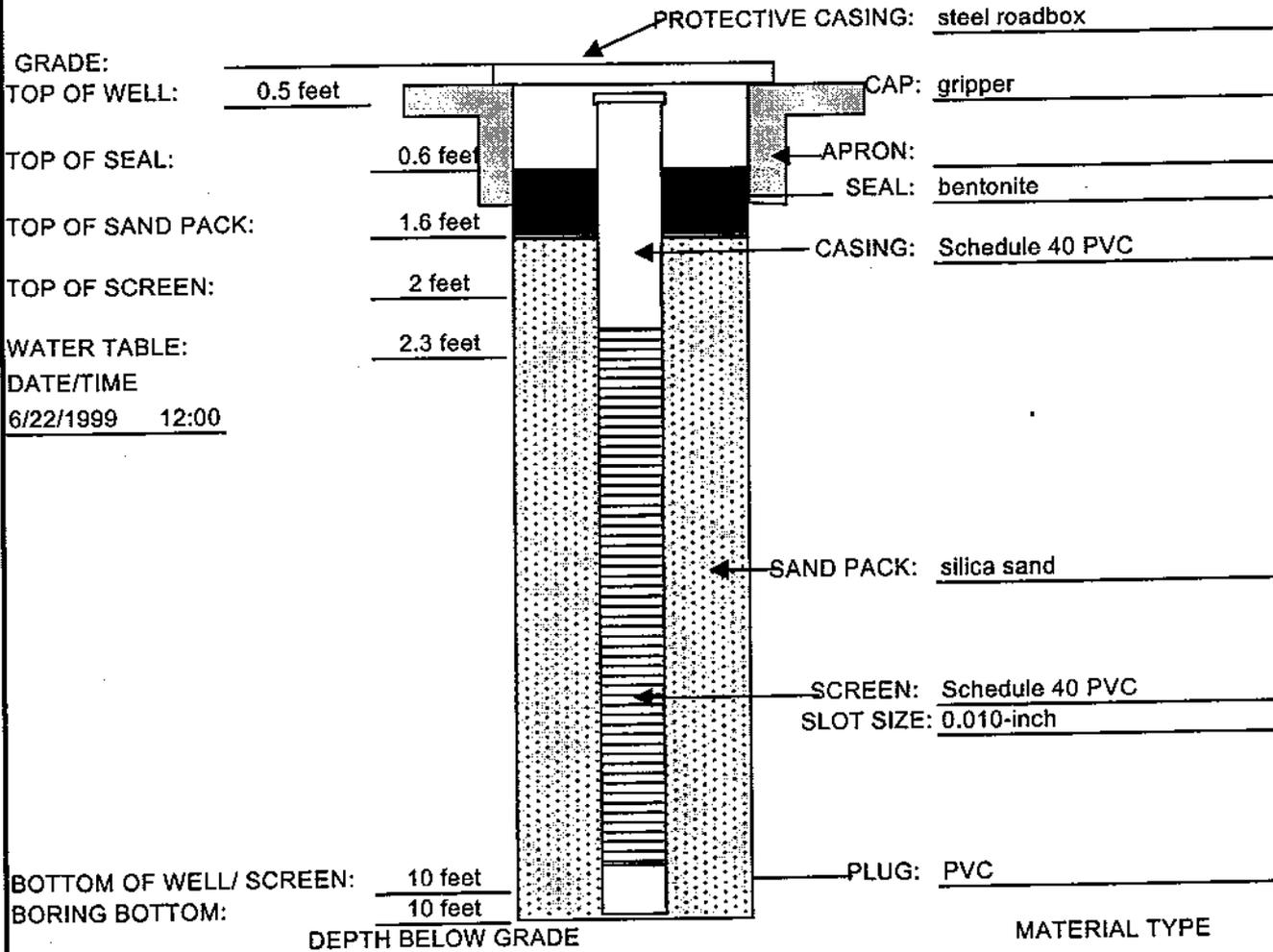
### Well Construction Diagram

PROJECT NAME: Tuttle's True Value Hardware

Well No: **MW-4**

Griffin Project #: 39841189  
 Drilled by : TDS  
 Driller: Scott  
 Supervised by: Griffin International  
 Logged by: CW

Date Installed: 6/22/1999  
 Drilling Method: Hollow Stem Auger  
 Boring Diameter.: 4.25 inch  
 Well Inside Diameter: 2 inches  
 Development Method: bailer



Prepared by: TLC

*Griffin International, Inc.*

PO Box 943  
 Williston, Vermont  
 (802) 865 - 4288





**APPENDIX C**

**Liquid Level Monitoring Data**



**LIQUID LEVEL MONITORING DATA**

**TUTTLES TRUE VALUE HARDWARE  
113 DEPOT STREET  
BENNINGTON, VERMONT**

7/29/99

Well I.D.	Well Depth bgs	Top of Casing Elevation	Depth To Product btoc	Depth To Water btoc	Product Thickness	Specific Gravity Of Product	Water Equivalent	Corrected Depth To Water	Corrected Water Table Elevation
MW-1	9	100.00	-	5.23	-	-	-	-	94.77
MW-2	8	97.48	-	2.76	-	-	-	-	94.72
MW-3	8	98.42	-	3.82	-	-	-	-	94.60
MW-4	10	97.14	-	2.26	-	-	-	-	94.88

All Values Reported in Feet

btoc - Below Top of Casing

bgs - Below Ground Surface

nm - not measured

Elevations determined relative to top of casing of MW-1, which was arbitrarily set at 100'

Top of Casing Elevations surveyed by Griffin on 7/29/99



**APPENDIX D**

**Water Quality Data**



**WATER QUALITY DATA**

**TUTTLES TRUE VALUE HARDWARE  
113 DEPOT STREET  
BENNINGTON, VERMONT**

**MONITORING WELL MW-1**

PARAMETER	Sample Date: Analytical Method:	7/29/99 8021B				VGES (ppb)
Benzene		ND(1)				5.
Toluene		ND(1)				1,000.
Ethylbenzene		ND(1)				700.
Xylenes		ND(1)				10,000.
Total BTEX		ND				-
MTBE		ND(10)				40.
1,3,5-Trimethylbenzene		ND(1)				4.
1,2,4-Trimethylbenzene		ND(1)				5.
Naphthalene		ND(1)				20.
Total Targeted VOCs		ND				-

**MONITORING WELL MW-2**

PARAMETER	Sample Date: Analytical Method:	7/29/99 8021B				VGES (ppb)
Benzene		<b>TBQ(1)</b>				5.
Toluene		ND(1)				1,000.
Ethylbenzene		ND(1)				700.
Xylenes		ND(1)				10,000.
Total BTEX		<b>TBQ</b>				-
MTBE		ND(10)				40.
1,3,5-Trimethylbenzene		ND(1)				4.
1,2,4-Trimethylbenzene		<b>TBQ(1)</b>				5.
Naphthalene		<b>3.6</b>				20.
Total Targeted VOCs		<b>3.6</b>				-

All Values Reported in ug/L (ppb)

ND(1) - None Detected above Detection Limit (Detection Limit)

TBQ(1) - Trace Below Quantitation Limit (Quantitation Limit)

Detections are bolded.

Blank cell - not analyzed

VGES - Vermont Groundwater Enforcement Standard; VTDEC Groundwater Protection Rule and Strategy, dated 11/15/1997

VGES

# WATER QUALITY DATA

## TUTTLES TRUE VALUE HARDWARE 113 DEPOT STREET BENNINGTON, VERMONT

### MONITORING WELL MW-3

PARAMETER	Sample Date: Analytical Method:	7/29/99 8021B			VGES (ppb)
Benzene		<b>38.2</b>			5.
Toluene		<b>TBQ(10)</b>			1,000.
Ethylbenzene		<b>91.6</b>			700.
Xylenes		<b>235.</b>			10,000.
Total BTEX		<b>365.</b>			-
MTBE		ND(100)			40.
1,3,5-Trimethylbenzene		<b>204.</b>			4.
1,2,4-Trimethylbenzene		<b>565.</b>			5.
Naphthalene		<b>76.0</b>			20.
Total Targeted VOCs		<b>1,210.</b>			-

### MONITORING WELL MW-4

PARAMETER	Sample Date: Analytical Method:	7/29/99 8021B			VGES (ppb)
Benzene		<b>TBQ(1)</b>			5.
Toluene		ND(1)			1,000.
Ethylbenzene		ND(1)			700.
Xylenes		ND(1)			10,000.
Total BTEX		<b>TBQ</b>			-
MTBE		ND(10)			40.
1,3,5-Trimethylbenzene		ND(1)			4.
1,2,4-Trimethylbenzene		ND(1)			5.
Naphthalene		ND(1)			20.
Total Targeted VOCs		<b>TBQ</b>			-

All Values Reported in ug/L (ppb)

ND(1) - None Detected above Detection Limit (Detection Limit)

TBQ(1) - Trace Below Quantitation Limit (Quantitation Limit)

Detections are bolded.

Blank cell - not analyzed

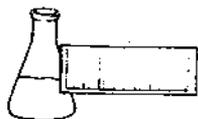
VGES - Vermont Groundwater Enforcement Standard; VTDEC Groundwater Protection Rule and Strategy, dated 11/15/1997

>VGES:

**APPENDIX E**

**Analytical Laboratory Report**





**ENDYNE, INC.**

**Laboratory Services**

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

**REPORT OF LABORATORY ANALYSIS**

CLIENT: Griffin International

ORDER ID: 3359

PROJECT NAME: Tuttle's True Value/#39841189 REF.#: 141,843 - 141,848

REPORT DATE: August 11, 1999

DATE SAMPLED: July 29, 1999

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

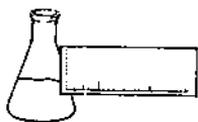
Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.  
Laboratory Director

enclosures



**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

EPA METHOD 8021B--PURGEABLE AROMATICS

CLIENT: Griffin International

DATE RECEIVED: July 30, 1999

PROJECT NAME: Tuttles True Value/#39841189

REPORT DATE: August 11, 1999

CLIENT PROJ. #: 39841189

ORDER ID: 3359

	21Z\001F0414	21Z\001F0441	21Z\001F0381	21Z\001F0383	21Z\001F0416
Ref. #:	141,843	141,844	141,845	141,846	141,847
Site:	MW 1	MW 2	MW 3	MW 4	Duplicate <i>mw2</i>
Date Sampled:	7/29/99	7/29/99	7/29/99	7/29/99	7/29/99
Time Sampled:	12:30	12:42	12:52	12:46	12:45
Sampler:	T.C. & J.R.				
Date Analyzed:	8/10/99	8/11/99	8/9/99	8/9/99	8/10/99
UIP Count:	0	>10	>10	0	>10
Dil. Factor (%):	100	100	10	100	100
Surr % Rec. (%):	91	99	85	91	97
Parameter	Conc. (ug/L)				
MTBE	<10	<10	<100	<10	<10
Benzene	<1	TBQ <1	38.2	TBQ <1	TBQ <1
Toluene	<1	<1	TBQ <10	<1	<1
Ethylbenzene	<1	<1	91.6	<1	<1
Xylenes	<1	<1	235.	<1	<1
1,3,5 Trimethyl Benzene	<1	<1	204.	<1	<1
1,2,4 Trimethyl Benzene	<1	TBQ <1	565.	<1	1.8
Naphthalene	<1	3.6	76.0	<1	7.4

21Z\001F0328

Ref. #:	141,848				
Site:	Trip Blank				
Date Sampled:	7/29/99				
Time Sampled:	7:15				
Sampler:	T.C. & J.R.				
Date Analyzed:	8/7/99				
UIP Count:	0				
Dil. Factor (%):	100				
Surr % Rec. (%):	95				
Parameter	Conc. (ug/L)				
MTBE	<10				
Benzene	<1				
Toluene	<1				
Ethylbenzene	<1				
Xylenes	<1				
1,3,5 Trimethyl Benzene	<1				
1,2,4 Trimethyl Benzene	<1				
Naphthalene	<1				

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated



32 James Brown Drive  
Williston, Vermont 05496  
(802) 879-4333

JOB # 39841189

CHAIN-OF-CUSTODY RECORD

10/15 32500

Project Name: TUTHRS RUEVALE  
 Site Location: BENNINGTON VT  
 Endyne Project Number: 3359

Reporting Address: Griffon  
 Company: Griffon  
 Contact Name/Phone #: CHRIS CARD

Billing Address: Griffon  
 Sampler Name: T. V. H. K. L. M.  
 Phone #: 301-1188

Lab #	Sample Location	Matrix	G R A B	C O M P	Date/Time	Sample Containers		Field Results/Remarks	Analysis Required	Sample Preservation	Rush
						No.	Type/Size				
141813	MW1	120	X		12/9/99 11:20	2	VOL 40ml		SOILB	HCl	
141841	MW2				1242						
141815	MW3				1252						
141846	MW4				1246						
141817	DUP				1215						
141848	TRIP BLANK				10715						

Relinquished by: Signature *Mark Lopez* Date/Time 7 Oct 17 9:30  
 Received by: Signature *Atace Benjamin* Date/Time 7 Oct 17 9:30

Relinquished by: Signature *Atace Benjamin* Date/Time 7 Oct 17 10:15  
 Received by: Signature *Austin Flouge* Date/Time 7 Oct 17 10:15

New York State Project Yes  No  Requested Analyses

	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
1	pH		12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 801/9/8020
2	Chloride		13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pests/PCB
3	Ammonia N		14	Turbidity	19	BTEX	24	EPA 608 Pests/PCB		
4	Nitrite N		15	Conductivity	20	EPA 601/602	25	EPA 8240		
5	Nitrate N									
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)									
30	Other (Specify):									

