GROUNDWATER AND SUBSURFACE SOIL SAMPLING PLAN
GRADY McCAULEY CREATIVE GRAPHICS, INC.
MIDDLEBRANCH ROAD LOCATION
MIDDLEBRANCH, OHIO 44652

REVISION NO.1

DATE: NOVEMBER 26, 1985

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1.0 Introduction

This sampling plan was prepared in response to concerns raised by the Ohio Environmental Protection Agency (Ohio E.P.A.) and the U.S. Environmental Protection, Region V (E.P.A.) relative to the possible contamination of subsurface soils and groundwater underlying the Grady McCauley Creative Graphics, Inc. (Grady McCauley), Middlebranch, Ohio, plant and office facility. It is hypothesized that past, discontinued practices of discharging wastewater generated during screen cleaning operations through either of two leach well systems may have introduced organic chemical contaminants to the immediate environment.

A preliminary, screening survey of the potentially affected areas and aquifers was conducted during the period of March-July, 1985. Although data generated during this initial program is statistically insignificant, extremely low concentrations of several compounds were measured. In the interest of determining whether a contamination problem exists or, if a problem is verified, the extent and severity of the problem, Grady McCauley has elected to proceed with the sampling plan described below.

2.0 Scope of Work

The development of this plan included a review of historical information regarding the facility and its operation and interviews with its present owners. Based on this review, the scope of work is divided into the matrices of surface and subsurface soils and groundwater.

2.1 Surface and Subsurface Soils

2.1.1 Excluded Areas

2.1.1.1 Vicinity of Monitoring Wells 1 and 1A

Although minor contamination of surface and subsurface soils was reported from the results of the screening survey, this area does not require further study to develop data adequate to select a remedial alternative. Minimal, reported contamination of this area is attributed to the only marginally successful operation of Leach Wells 1 and 2. These wells repeatedly plugged and overflowed during their active lives; on several occasions, leach well overflow was observed percolating to the soil surface immediately above their buried location. These wells were pumped dry and filled with sand in 1983 and have not been used since that time. Consequently, potential residual contamination is believed to be confined to the immediately adjacent area.

2.1.1.2 Vicinity of Monitoring Wells 3 and 3A

Although minor contamination of surface and subsurface soils was reported from the results of the screening survey, this area does not require further study to develop data adequate to select a remedial alternative. Minimal, reported contamination of this area is attributed to its former use as a trash collection and burning site. Since all trash and burned residual trash were removed several years ago, it is reasonable to assume that no new sources of potential contamination exist. Consequently, any potential residual contamination is believed to be confined to the immediate vicinity of the former trash collection area.

2.1.2 Additional Monitoring Well Development

As will be discussed below, this sampling plan is phased on the basis of the results of preceding efforts. However, the following discussions are pertinent to the implementation and development of each phase which involves drilling and developing additional monitoring wells.

2.1.2.1 Sample Collection

Soil samples will be collected at five foot increments using the "split spoon" method of sample collection. Each sample will be labeled with respect to well number and depth at which it was collected and stored in an air tight container.

2.1.2.2 Sample Analysis

Each of the first four split spoon samples collected during the drilling of each new monitoring well will be extracted with chloroform. The extract solution will then undergo a gas chromotographic/purge and trap/flame ionization detector analysis to determine its ethylbenzene, xylene, and methylene chloride concentrations; these parameters were chosen as indicators of contamination on the basis of concentrations reported from soil samples collected during the screening analysis.

Remaining split spoon samples for each well will be composited to produce a fifth sample which will be extracted and analyzed as described above. If the analysis of the composite sample demonstrates the absence of ethylbenzene, methylene chloride, and xylene, no further analyses will be conducted. If the analysis demonstrates a measurable concentration of any of the compounds, additional, individual split spoon samples will be analyzed in the order in which they were collected until no measurable concentration of any of the three compounds is detected or until the supply of samples is exhausted.

2.2 Groundwater Monitoring Wells

The previous study area will be initially expanded to include two new wells which are labeled No. 4 and No. 5 on the attached topographic map and an existing well which has been labeled No. 6. The locations of these wells were chosen on the basis of the presumed groundwater flow direction demonstrated by the results of the screening survey. Also, wells No. 4 and No. 5 are located at the northeastern and southeastern extremes of Grady McCauley's property.

Should subsequent study results indicate that an expansion in the size of the study area is again required, the previously hypothesized hydraulic connection between groundwater and the Middle Branch of the Nimishillen Creek will be investigated further. Two sampling stations will be located approximately two hundred yards upstream and downstream of the stream segment believed most likely to be influenced by a groundwater contribution. If none of the contaminants listed above are detected during the stream sampling program, it will be assumed that the leading edge of the groundwater plume has not migrated to this distance.

This result will lead to the installation of two additional monitoring wells which are labeled No. 7 and No. 8 on the attached topographic map. Although they will not be located on Grady McCauley property, they will be valuable in supplying information regarding contamination at a "mid point" between the initial study expansion area and the stream.

2.2.1 Well Drilling and Development

All new wells will be sufficiently sized to allow their secondary use as pumping wells, rather than monitoring wells, should study results so dictate.

The wells will be drilled using the hollow rod/cable tool drilling method. As described in Section 2.1.2.1 above, "split spoon" subsurface soil samples will be collected concurrently with the drilling of each well. Each well will be advanced by driving a casing and drilling out the encased materials. The hollow tube sampler will be driven five feet ahead of the casing to collect undisturbed soil samples. The casing will then be driven to the depth of the sampler. A stainless steel screen will be installed at that depth to allow the collection of a water sample from that stratum. This sequential process will be repeated until bedrock is reached.

Subsequent to the selection of a screening interval(s), an appropriate length of PVC pipe, screened at the interval(s) selected from drilling logs will be inserted into the casing. The casing will be extracted to allow adjacent soils to cave around the screen(s). When the screen is sufficiently exposed, the remaining casing will be removed and the hole will be backfilled with bentonite pellets to the surface. A galvanized steel casing with locking cap will be fitted over the top of the PVC pipe; this casing will be driven into the ground and held in place by a concrete cap on the hole. All standard, accepted QA/QC procedures will be followed at all times.

2.2.2 Sample Collection

Each well will be bailed empty twice prior to the collection of a water sample. Water samples will be collected in duplicate and stored in labeled amber vials with septum tops. All samples will be refrigerated at all times prior to their analysis. The samples will be analyzed using a gas chromatographic/purge and trap/flame ionization detector method to determine their ethylbenzene, xylene, and isophorone concentrations; these parameters were chosen as indicators on the basis of concentrations reported from water samples collected during the screening survey.

2.2.3 Water Sample Collection Frequency

Initially, sample collection will be limited to Wells 4, 5, and 6. Samples will be collected on alternate weeks for a two month period or until a total of five sampling rounds per well are completed. This program will supply the minimum number of data points required to assign a statistical validity to the results of the sampling program.

Should a decision to initiate a stream sampling program be made, samples will be collected at the locations described in Section 2.2 above on alternate weeks for a two month period or until a total of five sampling rounds per location are completed. Additionally, the stream bank along the stream segment most likely to be affected by a hydraulic connection with groundwater will be carefully inspected to determine whether any suspect seep areas exist. Suspect areas will be sampled, and samples will be analyzed for all parameters included in Sections 2.1.2.2 and 2.2.2 above. A frequency of resampling will be established if measurable levels of contamination are observed from the results of the first sampling round; it is anticipated that an expanded sampling program will consist of a minimum of five samples at each location where contamination is discovered.

Should a decision to expand the program to include Monitoring Wells No. 7 and No. 8 be made, the sample collection frequency will be identical to that described above for Wells 4, 5, and 6.

2.2.4 Analytical and QA/QC Procedures

Only E.P.A.-approved analytical methods will be employed during the completion of this program. The selection of a particular method over acceptable alternatives will be made on the basis of its lower detection limit and potential interferences from other compounds believed to be present in a sample. All standard, accepted quality assurance/quality control procedures will be followed at all times during the collection and analyses of all samples generated during this program.

3.0 Project Schedule

The project can be initiated within 30 days following Ohio E.P.A.'s final approval of the sampling plan. However, in the interest of generating meaningful, representative data, it is recommended that the program should not be conducted during winter months. The following chart presents a proposed project schedule:

PROPOSED PROJECT SCHEDULE

MONTH/ACTIVITY	3/86	4/86	5/86	6/86	7/86	8/86	9/86	10/86	11/86
Drill & Develop Wells 4&5	1---15								
Sample Wells 4,5,&6	18----------	----------	---13						
Preliminary Lab Report			20						
Sample Stream & Seeps			25----------	----------	---------20				
Preliminary Lab Report					27				
Drill & Develop Wells 7&8					27----	---10			
Sample Wells 7&8						10----------	----------	---5	
Preliminary Lab Report								12	
FINAL REPORT									19

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TESTING
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GROUND WATER ASSESSMENT

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MIDDLEBRANCH, OHIO

PRESENTED TO:

DENNIS GRADY
DAVID MCCAULEY

BY:

WADSWORTH TESTING LABORATORIES, INC.

AUGUST 6, 1985

TABLE OF CONTENTS

	Page No.
Purpose and Scope.....	1
Site Description and History	1
General Geology	4
Drilling Method and Procedures	5
Laboratory Methods and QA/QC Procedures	7
Findings	8
Conclusions and Recommendations	18

Appendix "A" - Scope of Study

Appendix "B" - Process Wastewater Analytical Results

Appendix "C" - Area and Test Hole Well Logs

Appendix "D" - Middle Branch of the Nimishillen Creek Analytical Results

Appendix "E" - May, 1985, Monitor Well Analytical Results

Appendix "F" - July, 1985, Study Area Analytical Results

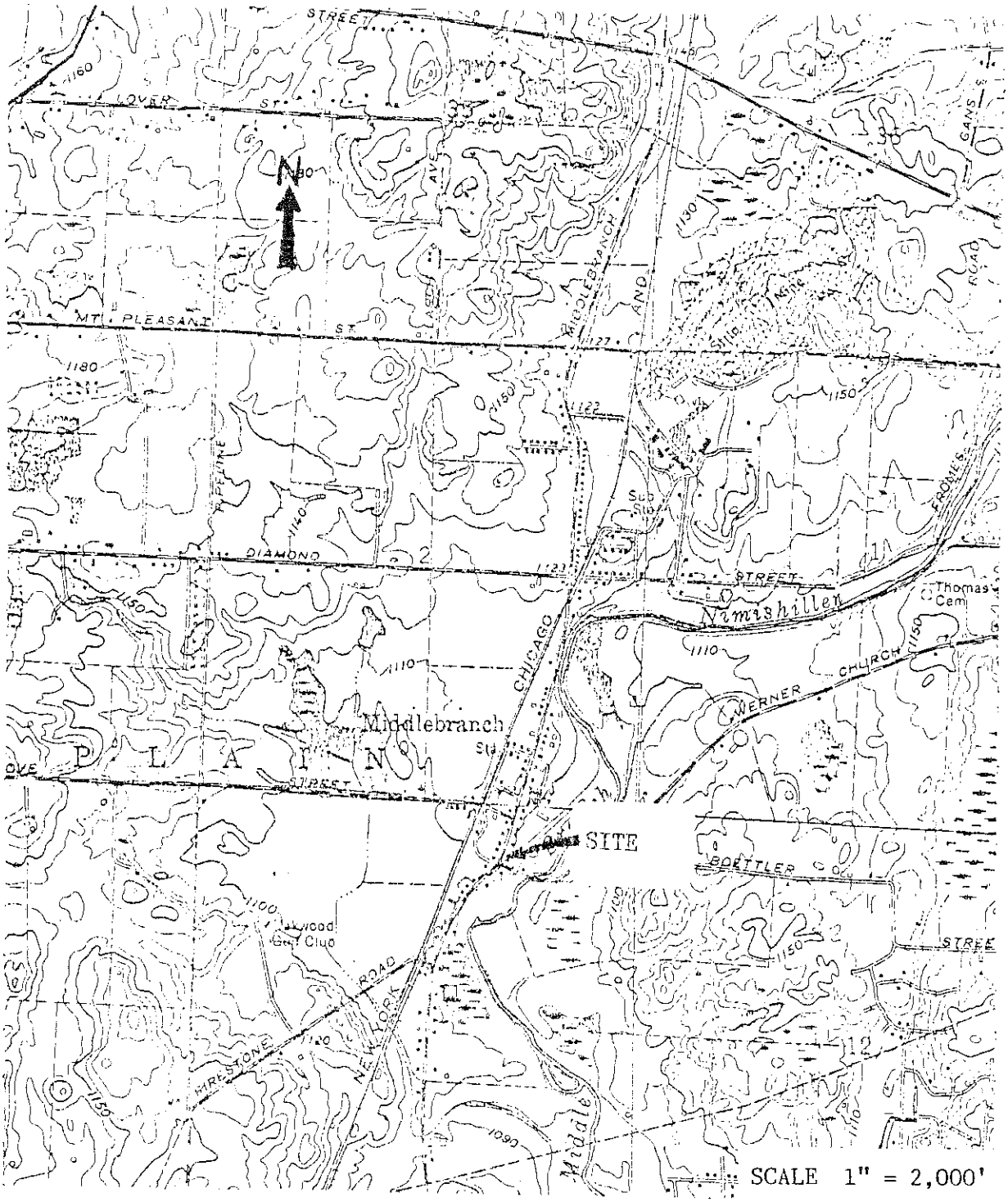
Purpose and Scope

In December, 1984, it was discovered that very trace amounts of organic solvents were present in two domestic water wells neighboring the Grady-McCauley Creative Graphics site located in Middlebranch, Ohio. The wells sampled and analyzed included the Heater residence, Mancini residence, Hill's Farm Supply, Grady-McCauley Annex building, and Lasure's new pole building. These locations are identified in Figure 1. Following that discovery, a ground water assessment was initiated by Wadsworth Testing Laboratories, Inc. with the assistance of the Ohio Drilling Company, Inc. The proposed December 26, 1984, "Ground Water Assessment" and January 10, 1985, Ohio EPA letter formed the basis of this report. These documents are found in Appendix "A".

Site Description and History

The Grady-McCauley property is located at 7390 Middlebranch Road, Middlebranch, Ohio. The site latitude is 40° 53' 03" N and longitude is 81° 19' 48" W. The study area map, aerial location map and site location map are found in Figures 1, 2, and 3, respectively. While the current Grady-McCauley property encompasses about 1.5 acres, it was determined that no permanent installations would be placed on the eastern most 1/2 acre of the property due to the pending sale of the parcel.

FIGURE 3



STREET
LOVER ST
MT. PLEASANT ST
DIAMOND
STREET
Nimishillen
Thomas Cem
WERNER CHURCH
CHICAGO
Middlebranch
P L A I N
STREET
SITE
BOETTLER
STREE
ROAD
NEW YORK
FIRESTONE
Middle
SCALE 1" = 2,000'

The existing Grady-McCauley structure shown in Figure 1 is utilized for the manufacturing of decorative decals. It is located in an area that is primarily residential with various light industry also present in the general vicinity. Reportedly, the Grady-McCauley (Dice Decal) facility has been a center of decal manufacturing since 1948. Prior to 1948, the segment of the complex identified as "A" in Figure 1 was reportedly used as a cheese house, retail operation, residential property and poultry cleaning operation. Segment "A" of the complex is the original structure. Additions were reportedly added in the years 1969, 1972, 1979 and 1983 and are identified in Figure 1 as B, C, D, and E, respectively.

On-site liquid waste disposal practices have not varied significantly through the years according to Grady-McCauley personnel. Liquid wastes emanating from on-site activities have historically been directed to underground septic tanks and leaching (dry) wells. Reportedly, two leaching (dry) wells of a slotted, concrete construction were abandoned in 1983. The general locations of these leaching wells are shown in Figure 1 and are identified as LW-1 and LW-2. LW-2 reportedly received the overflow from LW-1. Presently known to exist are a series of two slotted, concrete leaching (dry) wells which are identified as LW-3 and LW-4 in Figure 1. LW-4 reportedly received the overflow from LW-3. A fifth subsurface point source (identified as ST-5 on Figure 1) is a slotted, septic tank which reportedly received all on-site domestic wastes and art room process wastes. Chemical characteristics of the wastes contained in LW-4 and ST-5 are shown in Appendix B.

The volume of wastes directed to on-site subsurface units was not a part of this study yet, is recommended in further site investigation.

General Geology

Prior to selecting locations for site test holes/monitoring wells, a records search of area well logs on file at the Ohio Department of Natural Resources (ODNR), Division of Water was conducted. Available information was found to be scarce in this regard. Consequently, all on-site test holes were completed to bedrock to aid in the geological character determination. Pertinent area well logs obtained from ODNR and on-site test hole/monitoring well logs are included in Appendix "C".

The following is an excerpt from an earlier Ohio Drilling Co., Inc. report regarding geology of the study area:

> "The site under investigation is located on an alluvial terrace along the western edge of the Middlebranch of the Nimishillen Creek floodplain. A bedrock valley of undetermined depth underlies the unconsolidated floodplain sediments. This bedrock valley is probably pre-glacial in age and was formed during a general erosive period which developed many such features in Ohio.

The stratigraphy and lithology of the materials penetrated by the first three test holes in this investigation suggest that the sediments represent post-Wisconsin outwash deposits which grade upward into finer-grained materials deposited by lower energy local streams in more recent times.

The unconsolidated materials are underlain by shales and sandstones of Upper Pennsylvania age.

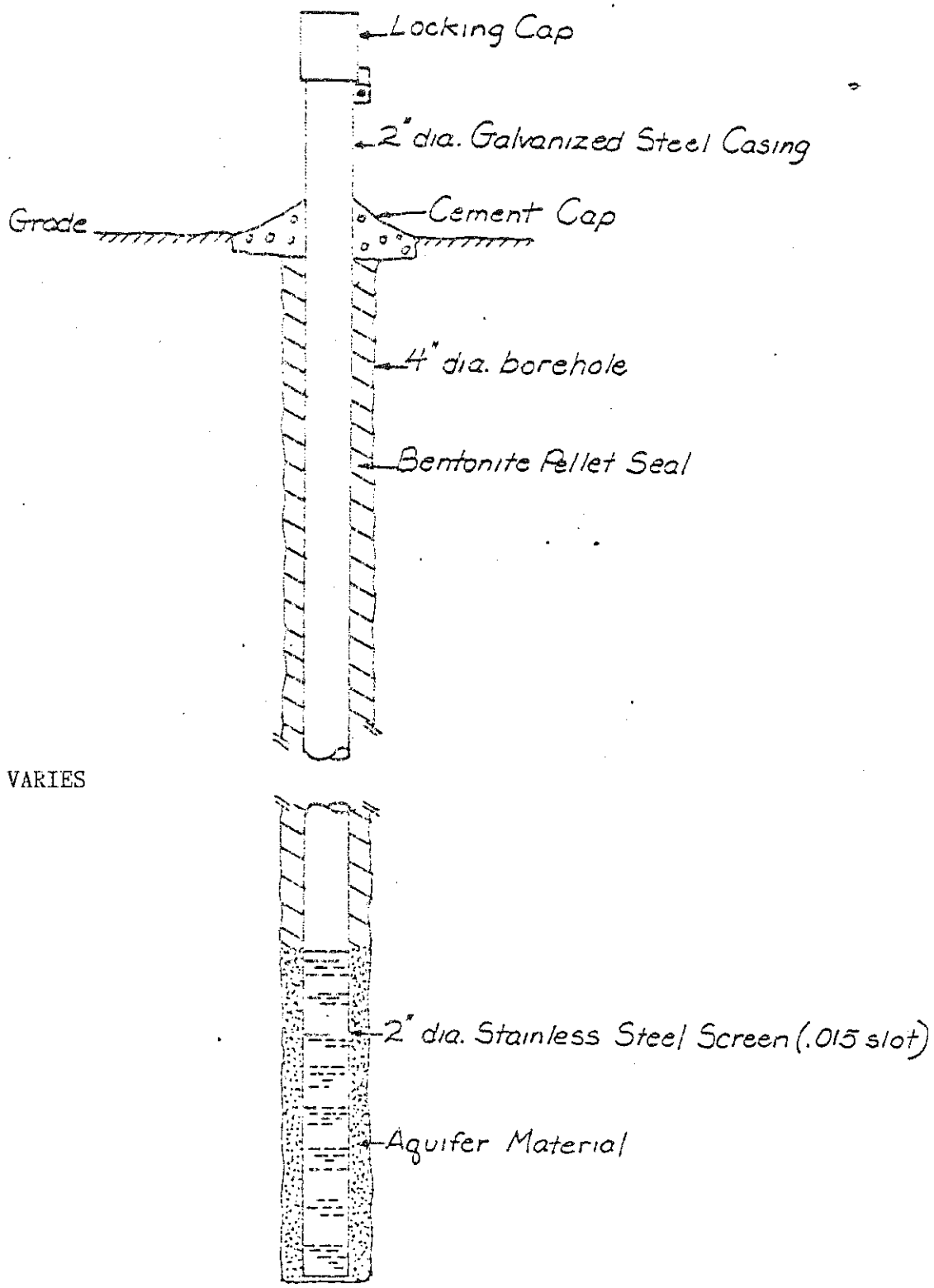
The sand and gravel deposits are water-bearing except near the surface."

Drilling Method and Procedures

All the test holes/monitoring wells were drilled using the small hollow rod cable tool drilling method. The hole is advanced by driving 4" diameter casing and drilling out the soil materials inside it. A hollow tube sampling device is driven three to five feet ahead of the drilling to recover undistured soil samples for analysis. The 4" casing is then driven to the depth where the soil sample was taken. A stainless steel screen is then installed at that depth to allow pumping that stratum for a water sample. This process is repeated until bedrock has been reached.

When a screening interval has been chosen, 2" diameter galvanized pipe with the appropriate length of 2" diameter stainless steel screen is inserted inside the 4" casing, which is bumped back to

FIGURE 4



NOT TO SCALE

let the natural formation cave around the screen. When the screen is sufficiently exposed the rest of the casing is pulled out while backfilling with pelletized bentonite to the surface to assure a good seal. The monitoring well is then developed and finished as shown in Figure 4.

Drilling Quality Assurance/Quality Control Procedures

All casing, monitoring well pipe, screen, and water-contact equipment were steam cleaned and rinsed with reagent grade methanol and water prior to use. Bailers for the recovery of water samples were rinsed in methanol and then water between uses.

Water samples were collected in duplicate and stored in a cooler until delivery could be made for analysis. Soil samples were collected in air-tight jars and kept cold until they reached the laboratory. The time lapse between collection and delivery of the soil and water samples was usually a few hours and never more than twenty-four hours

Laboratory Methods and QA/QC Procedures

Based on information generated from an initial assessment of two potential sources of contamination, a screening procedure in accordance with USEPA Methods 602/8020 was developed. As test holes were being developed, the water and/or soil samples were

immediately analyzed for toluene, ethylbenzene, and the xylenes. At least one sample from each well was analyzed by GC/MS Method 624 to assure proper identity of the components. (Wadsworth Testing Laboratories screened for those compounds identified in this method as well as the additional compounds found on the Hazardous Substances List [HSL]). The QA/QC procedures outlined in these methods were followed throughout the project.

Following the completion of the five monitoring wells, each well was resampled and analyzed for the HSL voltatile compounds by Method 624. The well 3A sample was also analyzed for the base/neutral and acid extractable organics using USEPA Method 625. Again, the quality control requirements outlined in these methods were followed.

Findings

A total of five on-site test holes were completed and converted into monitoring wells. The location of these monitor wells are given in Figure 1 and are identified as MW1, 1A, 2, 3, and 3A. The test holes/monitoring wells were completed in the same chronological order as their assigned numbers.

Through a carefully planned field sampling/laboratory analyses schedule, it was possible to determine, as the drilling progressed, which stratigraphic intervals in a given test hole contained contaminants. This information, in turn, was used to accurately select which interval(s) to screen for future ground water monitoring activities.

TABLE I

TEST HOLE #1

Depth(s)(ft.)	Sample Matrix Soil(mg/kg)	Sample Matrix Water(mg/L)
0-5	Ethylbenzene - 2,000 Xylenes - 13,000	
5-9	Ethylbenzene - 2,300 Toluene - BMDL Xylenes - 8,900	
9-15	Ethylbenzene - 730 Toluene - 170 Xylenes - 3,400	
15-20	Ethylbenzene - 140 Toluene - 420 Xylenes - 640	
20-25		Ethylbenzene - 0.029 Toluene - 0.029 Xylenes - 0.037
28-33		Ethylbenzene - 0.014 Toluene - 0.011 Xylenes - 0.020
35-40		Ethylbenzene - BMDL Toluene - BMDL Xylenes - BMDL
42-47		Ethylbenzene - 0.046 Toluene - 0.017 Xylenes - 0.078
48-53		Ethylbenzene - BMDL Toluene - BMDL Xylenes - BMDL
59-63		ND
62-67	ND	

ND - None Detected
BMDL - Below Minimum Detection limit

TABLE II

TEST HOLE #2

Depth(s)(ft.)	Sample Matrix: Soil(mg/kg)	Sample Matrix: Water(mg/L)
0-7	ND	
7-14	ND	
14-21	ND	
21-28	ND	
28-31		Ethylbenzene - BMDL Toluene - BMDL Xylenes - 0.016
35-38		Ethylbenzene - BMDL Toluene - BMDL Xylenes - BMDL
42-45		Ethylbenzene - BMDL Toluene - BMDL Xylenes - BMDL
49-52		Ethylbenzene - BMDL Toluene - BMDL Xylenes - 0.014
56-59		Ethylbenzene - BMDL Toluene - BMDL Xylenes - BMDL
63-66		Ethylbenzene - BMDL Toluene - BMDL Xylenes - 0.011
70-74	Methylene Chloride - 120 Toluene - 7	Xylenes - BMDL

ND - None Detected
BMDL - Below Minimum Detection limit

TABLE III

TEST HOLE #3

Depth(s)(ft.)	Sample Matrix Soil(mg/kg)	Sample Matrix Water(mg/L)
0-7	Methylene Chloride - 25	
7-11	Methylene Chloride - 81	
10-14	ND	
14-17		Isophorone present unable to quantitate with GC
21-24		1,1,1-Trichloroethane-0.026
28-31		Ethylbenzene - BMDL Toluene - 0.016 Xylenes - 0.032
35-38		ND
42-45		Ethylbenzene - 0.021 Toluene - 0.017 Xylenes - 0.094
42-49	Methylene Chloride - 8	

ND - None Detected
BMDL - Below Minimum Detection limit

In Tables I, II and III are the data obtained in completing Test Holes 1, 2, and 3, respectively. Table IV that follows, indicates the elevations of the top of the well pipe, screened interval and bedrock as a result of the Ohio Drilling Company's site survey:

Table IV

Well No.	Elevation of top of Pipe	Screened Interval	Elevation Bedrock
MW-1	1100.79 ft.	1058 - 1053 ft.	1031 ft.
MW-1A	1100.79 ft.	1080 - 1065 ft.	--
MW-2	1109.23 ft.	1044 - 1034 ft.	1032 ft.
MW-3	1096.70 ft.	1054 - 1049 ft.	1046 ft.
MW-3A	1096.77 ft.	1080 - 1065 ft.	--

Table I suggests that two distinct zones of organic contamination are present, the first between 20-35 feet and the second between 42-47 feet. These results necessitated a "nesting" of wells in this area hence, Monitoring Wells #1 and #1A.

Similar to Table I, Table III indicates two distinct and separate zones of organic contaminants in the ground water. In this area a well "nest" was placed, MW #3 and MW #3A. The former was screened at 42-47 feet and the latter between 16-31 feet. It is interesting to note in Table IV that monitor wells #1A and #3A are screened at the same interval as are monitor wells #1 and #3.

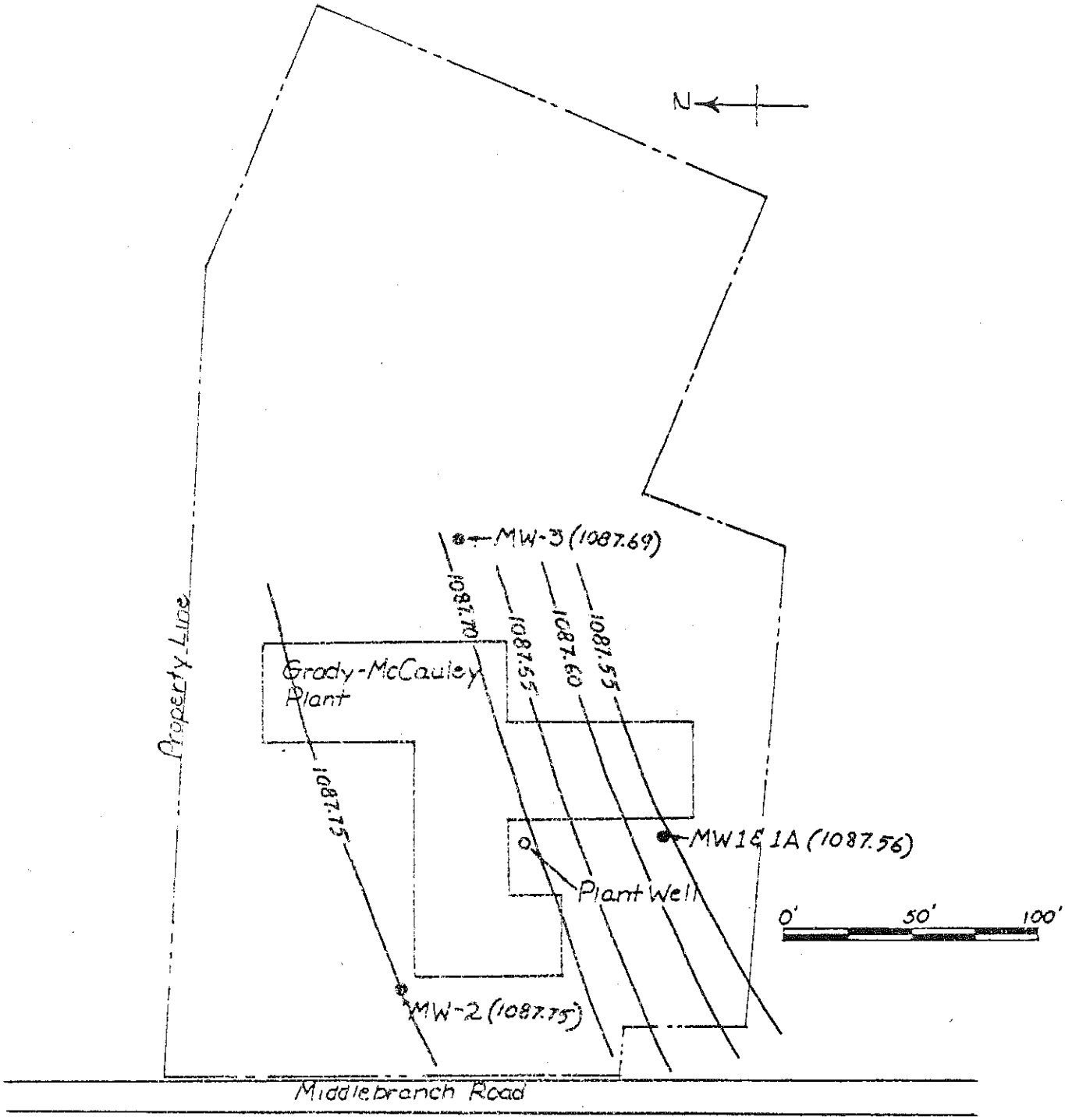
Table II includes data from Test Hole/Monitor Well #2. One of the purposes in establishing Test Hole/Monitor Well #2 was to provide a verifiable upgradient well for background analytical data. While Table II would suggest that trace organic solvents exist throughout the water column and in the soil atop the bedrock, the ground water data is believed to be a result of the "drawing back" of on-site subsurface organic solvents. Results from a follow-up volatile organic compound scan of the MW #2 ground water (Appendix "B") along with a hydrogeologic evaluation of the site support this concept.

The following exerpt regarding the site hydrogeology is reprinted from a previous Ohio Drilling Company report:

> "Water levels were taken on two consecutive days at to determine the natural gradient (plant well off for at least 48 hours) and to see what effect pumping the Grady-Mcauley plant well might have. (The plant well is identified on Figure 1).
>
> The datum are presented in the following table:

Well No.	Water Level 5/5/85 (no pumping)	Water Level 5/5/85 (pump on)
MW-1	1087.56 ft.	1087.54 ft.
MW-1A	1087.56 ft.	1087.70 ft.
MW-2	1087.75 ft.	1087.57 ft.
MW-3	1087.69 ft.	1087.54 ft.
MW-3A	1087.95 ft.	1087.78 ft.

FIGURE 5



Map of Site showing locations of test holes/monitoring wells and piezometric surface on 5-5-85 (plant well not pumping)

The water levels indicate that, at least on the measurement date, the water table has little natural gradient. Hence one would expect the ground water to be moving very slowly in this area. Furthermore, pumping the plant well appeared to have little or no measurable effect on water levels. The pumping rate is not known, but is not expected to be much more than 10 or 15 gallons per minute. In areas where there is no long-term accumulation of water level data from several monitoring points it is not wise to assign any particular significance to small differences in water level measurements. Measurement error can be large biasing factor when the data population is insufficiently large for statistical analysis to be applied. Keeping this in mind, a piezometric surface map has been drawn up showing the ground water contour lines insofar as we can determine. This map is shown in Figure 5. The natural ground water gradient appears to be toward the southeast, and is quite weak. The water levels when the plant well is pumping show a similar configuration except the gradient is more toward the east. Hence, the ground water flow seems to be moving very slowly to the southeast. Gradients may change in magnitude through the seasons and with variations in precipitation.

The contour of the bedrock surface presents an interesting geologic situation. One would expect that the Middle Branch of the Nimishillen Creek occupies a buried preglacial valley

and consequently that bedrock elevations would tend to increase away from the creek on either side; although such valleys can be highly irregular and not necessarily resemble the flood plains of the streams presently occupying them.

The bedrock at MW-3 is significantly higher than at the other two locations. This could represent a section of valley wall transported to its present location by glacial action, or a ridge rising between two valleys."

Given the general direction of ground water flow (southeast) in the area, the possibility of a hydraulic connection between the ground water emanating from the site and the water flow in the Middle Branch of the Nimishillen Creek exists. Although further study is warranted in this regard, an initial sampling and analysis for volatile organic compounds on the Middle Branch of the Nimishillen Creek was conducted for baseline monitoring purposes. Two grab samples were collected; one sample about 200 yards upstream of the Werner Church Road bridge and one sample at this bridge. These samples were found to contain no detectable volatile organic compounds. The results are contained in Appendix D.

After each of the on-site monitoring well screens were installed, a complete round of on-site ground water sampling was conducted on May 1, 1985. Prior to sample collection, each well was evacuated by 3-5 well volumes utilizing a teflon bailer device. Analytical results from this sampling effort are reported in Appendix "E".

Monitor Wells #1, 1A, 2 and 3 were all screened for the volatile organic group via EPA Method 624. Except for MW #1, all these wells showed no contamination. MW #1 results indicated the presence of three solvents - ethylbenzene, toluene and xylenes.

Monitor Well #3A was selected to be sampled and analyzed for a complete priority pollutant scan. These results indicated slightly elevated values for lead (0.11 mg/L) and zinc (9.5 mg/L). Significant levels of organic compounds were detected with isophorone and 3,3,5-trimethylcyclohexane posing the greatest concern at this time.

Isophorone and 3,3,5-trimethylcyclohxane are semi-volatile compounds identified within the base/neutral fraction of the priority pollutants. The EPA "Water Quality Criteria Documents" listed in the Friday, November 28, 1980, Federal Register (Vol. 45, No. 231) identifies the isophorone ambient water criterion to be 5.2 mg/L for the protection of human health via water and contaminated aquatic organism ingestion.

In July 1985, additional water samples were collected from those neighboring properties identified in the "Purpose and Scope" section of this report. These analytical results are included in Appendix "F". With the exception of the Grady-McCauley Annex building well, neighboring wells were found to be "clean. A slightly elevated level of lead and trace amounts of organic compounds - 1,1,1-trichloroethane and methylene chloride were found in the Annex.

Conclusions and Recommendations

A "localized" ground water assessment was conducted at and nearby the Grady-McCauley Creative Graphics site in Middlebranch, Ohio, during the period of March-July, 1985. Soils and water data from five (5) on-site test holes/monitoring wells, five (5) off-site domestic wells and the Middle Branch of the Nimishillen Creek were gathered to aid in this determination.

Soils and ground water containing elevated levels of organic compounds were found on-site in the areas of test holes/monitoring wells #1, 1A, 3 and 3A (Tables I & III,Appendix E and Figure 1). A slightly elevated lead concentration was found in MW #3. The on-site soils and ground water quality appear to have been directly impacted by past process waste disposal practices (Appendix B and Figure 1). These disposal practices have reportedly been eliminated.

A slightly elevated level of lead and trace amounts of organic solvents were detected in the drinking water of the Grady-McCauley Annex building (Appendix F and Figure 1). Other neighboring wells that have been included in the study (and discussed in the Purpose and Scope section of this report) were found to be of acceptable drinking water quality as a result of the July, 1985, monitoring effort. (Appendix F and Figure 1). Overall, this data would suggest that the contamination seems to be of a localized nature in relationship to the plant.

Considering the geology/hydrogeology characteristics of the study area and the analytical data gathered to date, we would recommend the following courses of action be followed:

- Eliminate any possibility of future process waste discharges on-site.

- Conduct an investigation into the volume of wastes that may have been previously discharged. Include in this investigation wastes that may have been discharged to the filter bed serving the Annex building (Figure 1).

- Establish the limits of the localized soil contamination. Additional soil samples should be collected in a radial pattern surrounding known point sources with an emphasis on downgradient locations. Screening for volatile organic compounds and lead is recommended.

- Establish the limits of the localized ground water contamination. Seek permission from the Lasure property owner to utilize the wells serving the Annex building and the Lasure new pole building as ground water monitoring points. Verify the depth of these wells. Install one additional test hole/ground water monitor well on the downgradient side of the Annex building well. Develop this proposed test hole/monitor well to bedrock and define the soil and water characteristics in the same manner as test holes 1, 2 and 3. If this proposed downgradient well is found to be "clean", utilize this well and the Lasure new pole building well as the outer limits of ground water quality detection. Investigate the possibility of a hydraulic connection between the local ground water and the Middle Branch of the Nimishillen Creek. If this connection exists, utilize several locations of this creek for water quality monitoring purposes.

- Initiate clean-up actions that are both technically feasible amd economically acheivable. Under investigation at this time is a multi-point lysimeter (vacuum) system with air stripping and/or granular activated carbon (GAC) treatment.

APPENDIX A

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December 26, 1984

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Attn: Mr. David McCauley

GROUNDWATER ASSESSMENT PROPOSAL

The recent discovery of the presence of organic solvents in the soil and groundwater on the Grady McCauley property has dictated that remedial action be undertaken. Neighboring water wells have been sampled with no organics being detected in those wells immediately to the north, west and south of the plant. Very low level concentrations were detected in the two well samples taken from areas east and southeast of the plant.

Since the contamination seems to be localized near the plant itself, the initial investigative steps to determine the extent of the contamination can be minimized. WADSWORTH TESTING LABORATORIES, with the assistance of The Ohio Drilling Co., proposes the following assessment plan.

1. Immediately begin the study of available area well logs and other geologic information to aid in the interpretation of the data developed by the field work.

2. Drill approximately four test holes at carefully chosen locations for the purpose of determining contamination levels in the soil and water as well as providing hydrogeological data.

   a. At least one test hole is necessary to determine the depth of the contamination near the suspected source.

   b. Other test holes are necessary to determine the vertical as well as the lateral migration of the contamination from the source(s), especially to the south and east.

c. Sufficient chemical analyses of the soil and/or water samples taken from each test hole will be performed to give an accurate assessment of the contamination.

d. If zones of high groundwater contamination are found, the test holes will be converted to water sample holes by screening them at the affected depths.

3. Following the drilling of the initial set of test holes, a hydrogeologic model will be developed for the affected area using the data obtained in steps 1 and 2. The model will propose source, distribution and dynamics of the contaminant plume. This information will be presented to Grady McCauley personnel. Subsequent presentations to the Ohio EPA will follow as required.

   If a refinement of the model is then deemed necessary, further test holes may be needed.

4. A remedial clean-up plan can be developed from the information presented in the above assessment.

If there are questions concerning this proposal, feel free to contact me at 454-5809.

Sincerely,

WADSWORTH TESTING LABORATORIES, INC.

Marvin W. Stephens, Ph D.
Vice President & Technical Director

MWS/sph

RECEIVED JAN

OhioEPA

Mr. David McCauley
Grady-McCauley Creative Graphics, Inc.
7390 Middlebranch Road
Middlebranch, Ohio 44652

January 10, 1985

Dear Mr. McCauley:

Thank you for providing me with a copy of Wadsworth Testing Laboratories' "Ground Water Assessment Proposal" dated December 26, 1984. Our review of the proposal finds it to be generally satisfactory, and we have no objection to initiation of the assessment as proposed.

We have several comments on the proposal. Many of these items are implied in the proposal; they are being listed here to avoid confusion in later reviews. Most of these comments can be addressed within the assessment report:

1. Hydrogeological investigation comments:

   a. The study should determine geological character to bedrock.

   b. The test holes should be developed into monitoring wells to allow repeat sampling, water level determination, and general monitoring as needed.

   c. The report should include well (and test hole) installation details, construction materials information, and well elevation and water level data.

   d. Monitor wells should be completed to the same saturated unit. This should result in a true potentiometric surface from which accurate flow direction can be determined.

   e. Well "nests" may be useful in the investigation.

2. The assessment report should include a Quality Assurance/Quality Control Plan that includes a written sampling plan.

3. The "sufficient chemical analysis" should include volatile organic and toxic heavy metals analysis. Routine ground water indicator parameters may be useful. At a minimum, at least one priority pollutant scan per sample matrix should be included (excepting the pesticide fraction).

Northeast District Office
2110 E. Aurora Road, Twinsburg, Ohio 44087 · (216) 425-9171

January 10, 1985

We feel the above items will substantially aid both your and our review of the assessment's findings, and lead to prompt decisions on any required remedial efforts.

We appreciate your prompt response to this matter. Please notify me when the assessment effort begins.

Sincerely,

Gary Gifford
Environmental Scientist
Division of Solid & Hazardous Waste Management
Northeast District Office

GG:kr

cc: Douglas C. Hasbrouck, District Chief, OEPA, Northeast District Office
Roger Hannahs, OEPA, DSHWM, Central Office

APPENDIX B

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Leach Well #4 - LW4
Laboratory Identification: 86192
Sample Matrix: Water

Date rec'd: 4/10/85
Date extracted:
Date analyzed: 4/17/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	38
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	ND
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND
		Others:	
		Xylenes	160

Note: ND (None detected, lower detectable limit = 10 mg/L)

BASE/NEUTRAL COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Leach Well #4 - LW4
Laboratory Identification: 86192
Sample Matrix: Water

Date rec'd: 4/10/85
Date extracted: 4/12/85
Date analyzed: 4/15/85

Acenaphthene	ND	Diethyl phthalate	ND
Acenaphthylene	ND	Dimethyl phthalate	ND
Anthracene	ND	2,4-Dinitrotoluene	ND
Benzidine	ND*	2,6-Dinitrotoluene	ND
Benzo(a)anthracene	ND	Di-n-octyl phthalate	ND
Benzo(b)fluoranthene	ND	1,2-Diphenylhydrazine	ND
Benzo(k)fluoranthene	ND	Fluoranthene	ND
Benzo(ghi)perylene	ND	Fluorene	ND
Benzo(a)pyrene	ND	Hexachlorobenzene	ND
Bis(2-chloroethoxy)methane	ND	Hexachlorobutadiene	ND
Bis(2-chloroethyl)ether	ND	Hexachlorocyclopentadiene	ND
Bis(2-chloroisopropyl)ether	ND	Hexachloroethane	ND
Bis(2-ethylhexyl)phthalate	ND	Indeno(1,2,3,-cd)pyrene	ND
4-Bromophenyl phenyl ether	ND	Isophorone	7,000
Butyl benzyl phthalate	ND	Naphthalene	ND
2-Chloronaphthalene	ND	Nitrobenzene	ND
4-Chlorophenyl phenyl ether	ND	N-Nitrosodimethylamine	ND
Chrysene	ND	N-Nitrosodiphenylamine	ND
Dibenzo(a,h)anthracene	ND	N-Nitrosodi-n-propylamine	ND
Di-n-butyl phthalate	ND	Phenanthrene	ND
1,2-Dichlorobenzene	ND	Pyrene	ND
1,3-Dichlorobenzene	ND	1,2,4,Trichlorobenzene	ND
1,4-Dichlorobenzene	ND		
3,3'-Dichlorobenzidine	ND*		

Note: ND (None detected, lower detectable limit = 5 mg/L)
ND* (None detected, lower detectable limit =25 mg/L)

ACID COMPOUNDS ANALYTICAL REPORT

Company: Grady-McCauley
Sample Identification: Leach Well #4 - LW4
Laboratory Identification: 86192
Sample Matrix: Water

Date rec'd: 4/10/85
Date extracted: 4/12/85
Date analyzed: 4/15/85

4-Chloro-3-methylphenol	ND	4-Nitrophenol	ND*
2-Chlorophenol	ND	Pentachlorophenol	ND*
2,4-Dichlorophenol	ND	Phenol	ND
2,4-Dimethylphenol	ND	2,4,6-Trichlorophenol	ND
2,4-Dinitrophenol	ND*		
2-Methyl-4,6-dinitrophenol	ND*		
2-Nitrophenol	ND		

Note: ND (None detected, lower detectable limit = 5 mg/L)
ND* (None detected, lower detectable limit =25 mg/L)

MS/DS IDENTIFIED COMPOUND (non-Regulated) WITH THEIR ESTIMATED CONCENTRATION

Company: Grady McCauley
Sample Identification: Leach Well #4 - LW4
Laboratory Identification: 86192
Sample Matrix: Water

Cyclohexanone	500 ug/L
1-methyl-2-Pyrrolidinone	25 ug/L
2-Cyclohexylidene Cyclohexanone	500 ug/L

ANALYTICAL RESULTS

Company: Grady McCauley
Sample Identification: Leach Well #4 - LW-4
Laboratory Identification: 86192
Sample Matrix: Water

Total Metals:

Arsenic	<0.005	mg/L
Barium	0.7	mg/L
Cadmium	0.11	mg/L
Chromium	0.47	mg/L
Hexavalent Chromium	<0.02	mg/L
Mercury	<0.005	mg/L
Lead	1.6	mg/L
Selenium	0.01	mg/L
Silver	0.18	mg/L

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Septic Tank #5 - ST5
Laboratory Identification: 85346
Sample Matrix: Water

Date rec'd: 3/8/85
Date extracted:
Date analyzed: 3/12/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	40
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	ND
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND

Others:

Acetone	69
Xylenes	180
Methyl Ethyl Ketone	83

Note: ND (None detected, lower detectable limit = 10 ug/L)

BASE/NEUTRAL COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Septic Tank #5- ST5
Laboratory Identification: 85346
Sample Matrix: Water

Date rec'd: 3/8/855
Date extracted: 3/19/85
Date analyzed: 3/20/85

Acenaphthene	ND	Diethyl phthalate	ND
Acenaphthylene	ND	Dimethyl phthalate	ND
Anthracene	ND	2,4-Dinitrotoluene	ND
Benzidine	ND*	2,6-Dinitrotoluene	ND
Benzo(a)anthracene	ND	Di-n-octyl phthalate	ND
Benzo(b)fluoranthene	ND	1,2-Diphenylhydrazine	ND
Benzo(k)fluoranthene	ND	Fluoranthene	ND
Benzo(ghi)perylene	ND	Fluorene	ND
Benzo(a)pyrene	ND	Hexachlorobenzene	ND
Bis(2-chloroethoxy)methane	ND	Hexachlorobutadiene	ND
Bis(2-chloroethyl)ether	ND	Hexachlorocyclopentadiene	ND
Bis(2-chloroisopropyl)ether	ND	Hexachloroethane	ND
Bis(2-ethylhexyl)phthalate	ND	Indeno(1,2,3,-cd)pyrene	ND
4-Bromophenyl phenyl ether	ND	Isophorone	ND
Butyl benzyl phthalate	ND	Naphthalene	ND
2-Chloronaphthalene	ND	Nitrobenzene	ND
4-Chlorophenyl phenyl ether	ND	N-Nitrosodimethylamine	ND
Chrysene	ND	N-Nitrosodiphenylamine	ND
Dibenzo(a,h)anthracene	ND	N-Nitrosodi-n-propylamine	ND
Di-n-butyl phthalate	ND	Phenanthrene	ND
1,2-Dichlorobenzene	ND	Pyrene	ND
1,3-Dichlorobenzene	ND	1,2,4,Trichlorobenzene	ND
1,4-Dichlorobenzene	ND		
3,3'-Dichlorobenzidine	ND*		

Note: ND (None detected, lower detectable limit = 20 ug/L)
ND* (None detected, lower detectable limit =100 ug/L)

ACID COMPOUNDS ANALYTICAL REPORT

Company: Grady-McCauley
Sample Identification: Septic Tank #5 - ST5
Laboratory Identification: 85346
Sample Matrix: Water

Date rec'd: 3/8/855
Date extracted: 3/19/85
Date analyzed: 3/20/85

4-Chloro-3-methylphenol	ND	4-Nitrophenol	ND*
2-Chlorophenol	ND	Pentachlorophenol	ND*
2,4-Dichlorophenol	ND	Phenol	ND
2,4-Dimethylphenol	ND	2,4,6-Trichlorophenol	ND
2,4-Dinitrophenol	ND*		
2-Methyl-4,6-dinitrophenol	ND*		
2-Nitrophenol	ND		

Note: ND (None detected, lower detectable limit = 20 ug/L)
ND* (None detected, lower detectable limit =100 ug/L)

APPENDIX C

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Grady Mc Cauley - Middlebranch, Ohio HOLE NO. MW-1 3" Test Hole

DRILLED BY Glyn Davis DRILLER COMPLETED March 15, 19 85

LOCATION 94 ft. east of Middlebranch Rd., 6 ft. west of building, 29 ft. north of south property line

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
5 ft.	Clay, Sand & Stones	5 ft.		
5 ft.	Sand, Clay & Stones	10 ft.		
5 ft.	Sand, Gravel & Little Clay			
	(dry)	15 ft.		
5 ft.	Fine Sand, Gravel & Little			
	Clay (stratified)	20 ft.		
22 ft.	Sand, Gravel & Little Clay	42 ft.		
7 ft.	Sand, Gravel & Clay	49 ft.	yes	
16 ft.	Sand, Gravel & Clay (dirty)	65 ft.		
4 ft.	Clay	69 ft.		
	Shale at	69 + ft.		
	Static water level = 12' 3"			
	Water encountered at 23 ft.			
	Pumped for water samples:	20' - 25'		
		35' - 40'		
		42' - 47'		
		48' - 53'		
		59' - 63'		

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Grady-McCauley - Middlebranch, Ohio HOLE NO. MW-2
3" Test Hole

DRILLED BY Glyn Davis DRILLER COMPLETED March 21, 19 85

LOCATION Approx. 40 ft. east of Middlebranch Rd., 8 ft. north of plant

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
7 ft.	Sand, Clay & Large Stones	7 ft.		
7 ft.	Sand, Gravel & Clay	14 ft.		
7 ft.	Sand, Larger Gravel &			
	Little Clay	21 ft.		
7 ft.	Sand, Gravel & Clay	28 ft.		
7 ft.	Sand, Gravel & Little Clay			
	(Layer of stones 34 - 36 ft)	35 ft.		8' 6"
4 ft.	Sand, Larger Gravel &			
	Little Clay	39 ft.		
10 ft.	Fine Sand, Gravel & Clay	49 ft.		
7 ft.	Sand, Gravel & Clay	56 ft.		
7 ft.	Sand, Gravel & Little Clay	63 ft.		
7 ft.	Sand, Larger Gravel &			
	Little Clay	70 ft.		
4 ft.	Sand, Gravel & Little Clay	74 ft.		
2 ft.	Clay, Sand & Gravel	76 ft.		
	Shale at 76 feet			
	Pumped for water sample:			
	1. 28' - 31'			
	2. 35' - 38'			
	3. 42' - 45'			
	4. 49' - 52'			
	5. 56' - 59' (oily film on surface of water)			
	6. 63' - 66' (oily film on surface of water)			
	7. 70' - 73'			

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Grady-McCauley - Middlebranch, Ohio HOLE NO. MW-3
3" Test Hole

DRILLED BY Glyn Davis DRILLER COMPLETED March 28, 19 85

LOCATION Approx. 130 ft. north of south property line, 41 ft. east of building

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
7 ft.	Clay, Sand & Stones	7 ft.		
3 ft.	Sand, Gravel & Clay	10 ft.		
4 ft.	Sand, Small Gravel & Clay	14 ft.		
7 ft.	Fine Sand, Small Gravel & Clay (tight)	21 ft.		
7 ft.	Sand, Gravel & Little Clay (tight)	28 ft.		
7 ft.	Fine Sand, Gravel & Clay (tight)	35 ft.		
7 ft.	Fine Sand, Gravel & Little Clay	42 ft.		
8 ft.	Sand, Larger Gravel & Little Clay	50 ft.		
	Shale at 50 ft.			
	Pumped for water samples:			
	1. 14' - 17' (Foam present on water surface)			
	2. 21' - 24'			
	3. 28' - 31'			
	4. 35' - 38'			
	5. 42' - 45'			

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

471099

COUNTY Stark TOWNSHIP Plain SECTION OF TOWNSHIP OR LOT NUMBER

OWNER Dice Decal Corp. ADDRESS 7390 Middlebranch Rd., Middlebra

LOCATION OF PROPERTY Same

CONSTRUCTION DETAILS

Casing diameter 5" Length of casing 40

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 30 gpm Duration of test 1 hrs

Drawdown -0- ft Date 8-21-74

Static level (depth to water) 12 ft

Quality (clear, cloudy, taste, odor) good

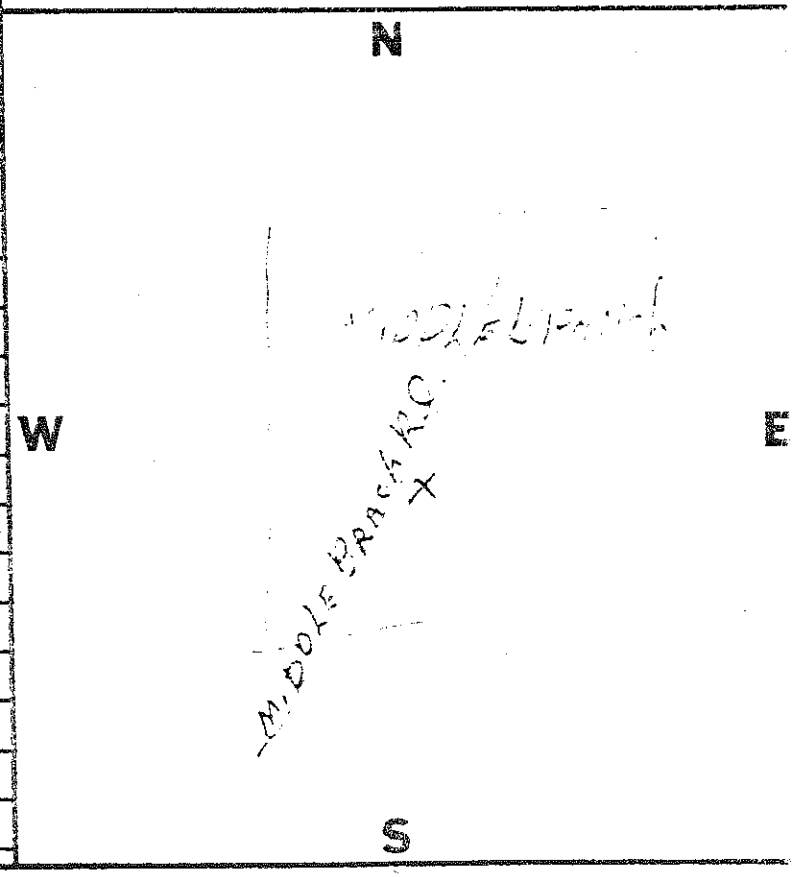
Pump installed by

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Gravel	0 ft	38 ft

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM D.M. Waltz Drilling Co. DATE August 22, 1974

ADDRESS Route 1, Strasburg, Oh 44680 SIGNED Paul A. Kale

*If additional space is needed to complete well log, use next consecutive numbered form.

#4511

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

591609

COUNTY Stark TOWNSHIP Plain SECTION OF TOWNSHIP 14

OWNER Don Heater ADDRESS 7412 Middlebranch N.Canton

LOCATION OF PROPERTY same as above

CONSTRUCTION DETAILS

Casing diameter 5" Length of casing 95'

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 10 gpm Duration of test 1 hrs

Drawdown 0 ft Date 3/20/81

Static level (depth to water) 38 ft

Quality (clear, cloudy, taste, odor) clear

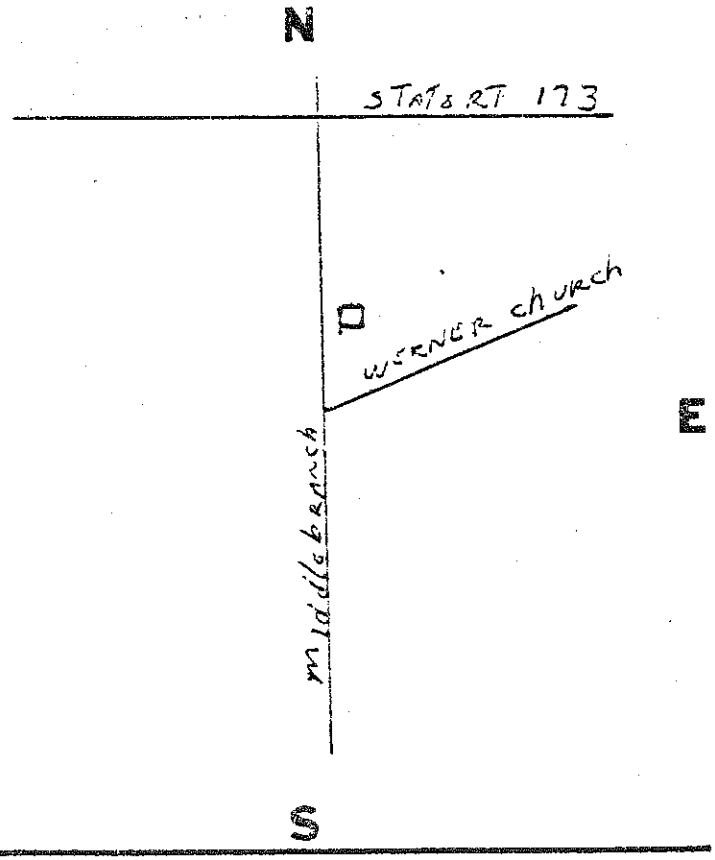
Pump installed by _____

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
drift	0 ft	88 ft
shale	88	120

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM ADAMS & SONS WELL DRILLING INC.

ADDRESS 4310 - 30th St., N.W. Canton, Ohio 44709

DATE 3/26/81

SIGNED R. Doug Adams

*If additional space is needed to complete well log, use next consecutive numbered form.

ORIGINAL COPY - ODNR, DIVISION OF WATER, FOUNTAIN SQ., COLS., OHIO 43224

WELL LOG AND DRILLING REPORT

296

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

№ 107099

County Stark Township Plain Section of Township or Lot Number 2

Owner Diamond Portland Cement Co Address Middlebranch O.

Location of property Main office in Middlebranch

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 191 ft.

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate 100 G.P.M. Duration of test 4 hrs.

Drawdown 17 ft. Date Jan 26 1952

Developed capacity 100 gpm

Static level—depth to water 42' ft.

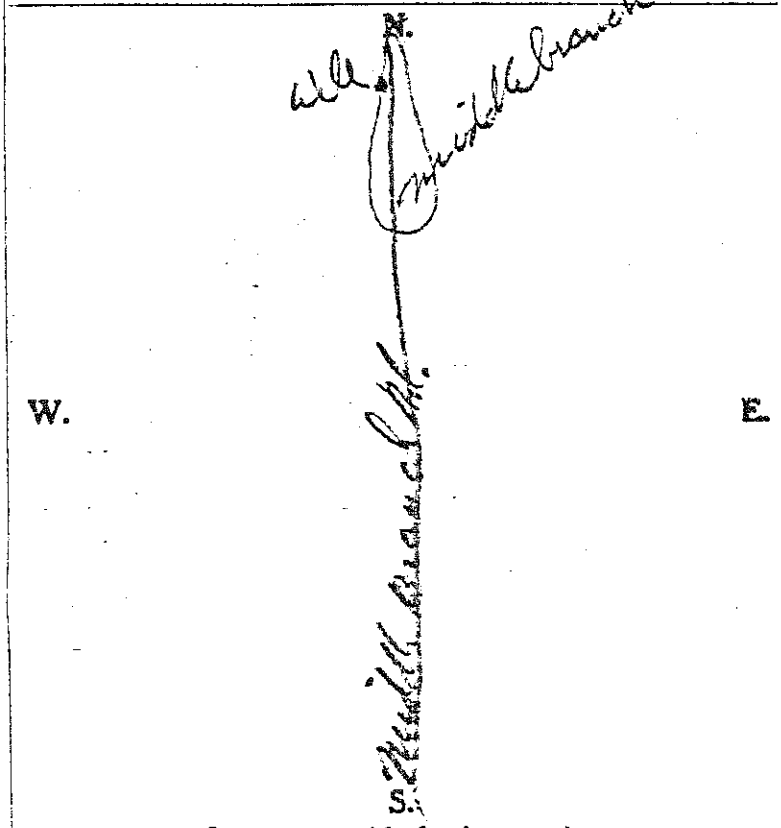
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
clay, sand + gravel	0 Feet	60 Ft.
shale	60	100 "
sand rock	100	178 "
shale	178	197 "
sand rock	197	218 "
shale	218	231 "
sand rock	231	254 "
shale	254	284 "
sand rock	284	316 "
shale	316	329 "
sand rock	329	357 "

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm M. J. Engel Drilling Co Date Jan 26 1952

Address R.D. #2 Massillon O. Signed M. J. Engel

10244

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus 12, Ohio

PLEASE USE PENCIL OR TYPEWRITER DO NOT USE INK.

Nº 277799

County Stark Township Plain Section of Township 11

Owner Mannie Brother Address 1654 Middlebrook Ave N.E.

Location of property Gorgeous Ave on Easton, turn left onto Middlebrook Ave House on right

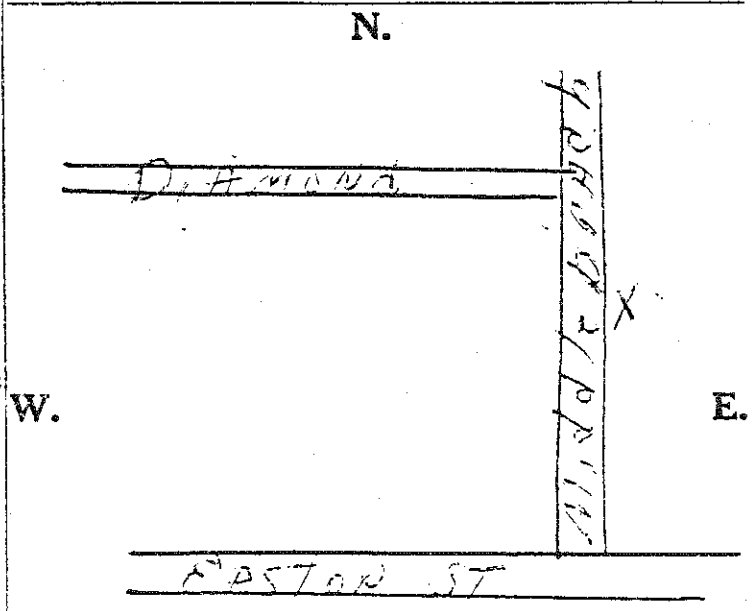
CONSTRUCTION DETAILS	BAILING OR PUMPING TEST
Casing diameter 4 inch Length of casing 70 ft.	Pumping Rate 10 G.P.M. Duration of test ..... hrs.
Type of screen ..... Length of screen	Drawdown No [illegible] ft. Date .....
Type of pump	Static level-depth to water 2 ft.
Capacity of pump	Quality (clear, cloudy, taste, odor) Cloudy
Depth of pump setting	
Date of completion	Pump installed by .....

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
	0 Feet	..... Ft.
yellow clay stone		40
gray clay stone	40	68
coarse gravel	68	70
Total depth 70 feet		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Parker Graham Date 7/16/62

Address 1174 Mt Pleasant Ave N Canton 20, O. Signed Parker Graham

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

495736

COUNTY Stark TOWNSHIP Plain SECTION OF TOWNSHIP OR LOT NUMBER

OWNER Lee Zimmerman ADDRESS 7460 Panther Ave. N.E., N. Canton

LOCATION OF PROPERTY 7530/7532 Lynx Ave. N.E., North Canton 44721

CONSTRUCTION DETAILS

Casing diameter 5" Length of casing 71' 9"

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 10 gpm Duration of test ½ hrs

Drawdown 35 ft Date March 18, 1976

Static level (depth to water) 25 ft

Quality (clear, cloudy, taste, odor) clear, no odor

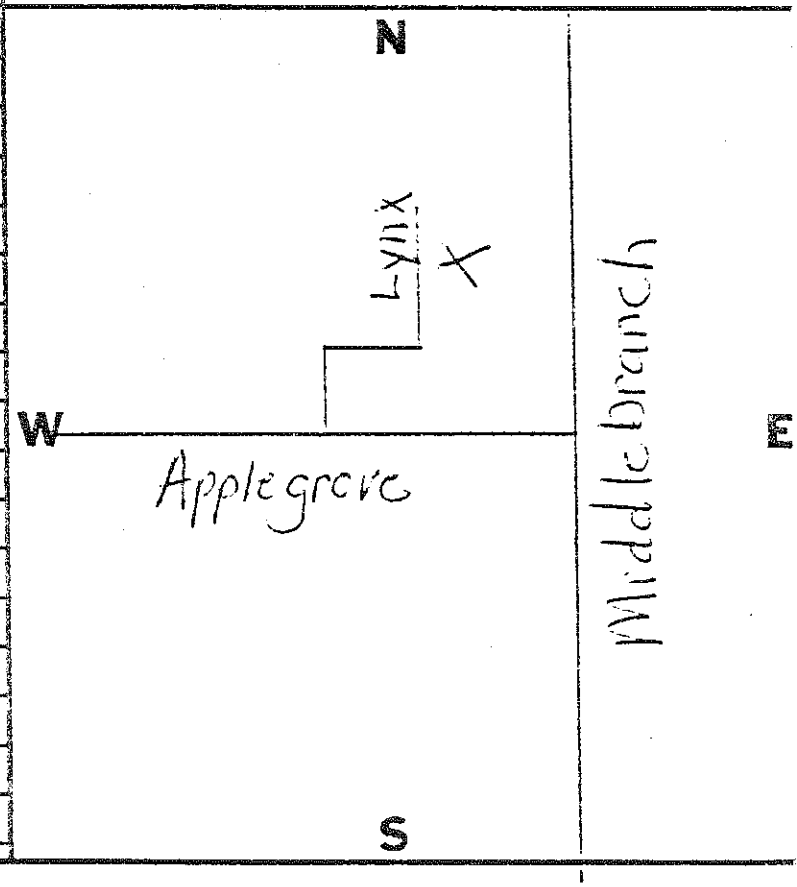
Pump installed by

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
sand and gravel	0 ft	55 ft
soft gray shale	55	69
gray sandstone	69	83
gray shale	83	90
blue shale	90	100

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM A.B. CULP DRILLING CO. DATE March 23, 1976

ADDRESS LOUISVILLE, OHIO 44641 SIGNED A.B. Culp

*If additional space is needed to complete well log, use next consecutive numbered form.

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio

PLEASE USE PENCIL OR TYPEWRITER. DO NOT USE INK.

No. 255983

County Stark Township Plain Section of Township 11

Owner Glenn Boettler Address 2955 Werner Church Rd. Canton, O.

Location of property Going north on Rt. 43, turn right onto Easton St., cont. approx. 2 miles, turn left onto Middlebranch Rd. Cont. 1/4 mile, turn right. House on left

CONSTRUCTION DETAILS

Casing diameter 4 inch Length of casing 45 feet

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST

Pumping rate 15 G.P.M. Duration of test hrs.

Drawdown 10 ft. Date

Developed capacity

Static level—depth to water 18 ft.

Pump installed by

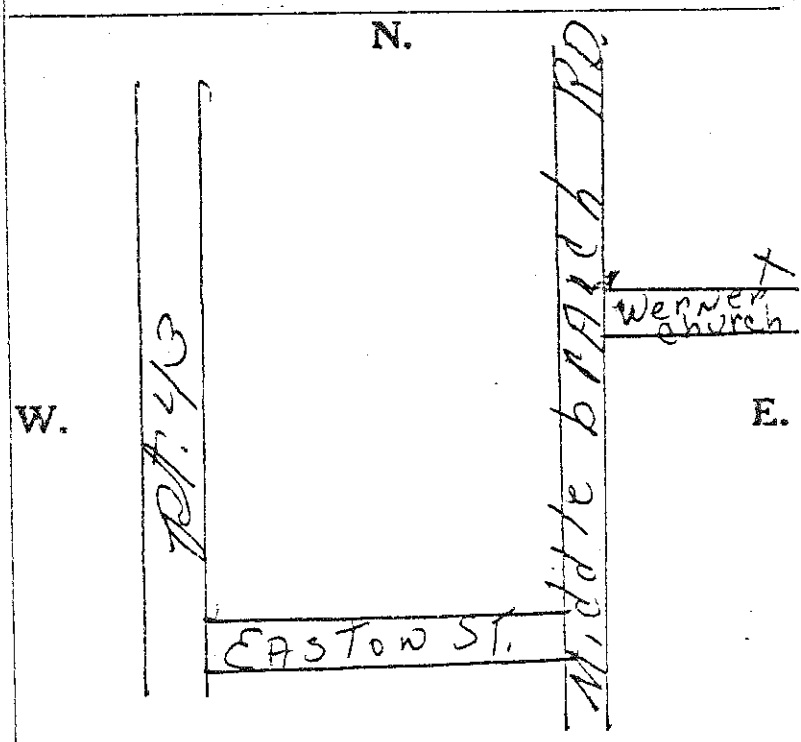
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
yellow clay stone	0 Feet	24 Ft.
gray clay stone	24	40
gray shale	40	50
lime layer	50	52
gray sandy shale	52	85

Total Depth 85 feet

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Parker Graham

Address 1274 Mt. Pleasant Rd. N.W.
North Canton 20, Ohio

Date June 25, 1961

Signed Parker Graham

APPENDIX D

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady-McCauley
Sample Identification: Middle Branch of the Nimishillen Creek-Werner Church Road Bridge
Laboratory Identification: 85431
Sample Matrix: Water

Date rec'd: 3/13/85
Date extracted:
Date analyzed: 3/14/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	ND
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	ND
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND

Note: ND (None detected, lower detectable limit = 10 ug/L)

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady-McCauley
Sample Identification: 200 yards Upstream of the Werner Church Road Bridge
Laboratory Identification: 85432
Sample Matrix: Water

Date rec'd: 3/13/85
Date extracted:
Date analyzed: 3/13/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	ND
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	ND
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND

Note: ND (None detected, lower detectable limit = 10 ug/L)

APPENDIX E

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: MW #1
Laboratory Identification: 86974
Sample Matrix: Water

Date rec'd: 5/1/85
Date extracted:
Date analyzed: 5/13/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	1,600 ug/L
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	640 ug/L
Chloromethane	ND	1,1,1-Trichloroethane	ND
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND
		Others:	
		Xylenes	4,400 ug/L

Note: ND (None detected, lower detectable limit = 10 ug/L)

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: MW #1-A
Laboratory Identification: 86975
Sample Matrix: Water

Date rec'd: 5/1/85
Date extracted:
Date analyzed: 5/13/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	ND
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	ND
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND

Note: ND (None detected, lower detectable limit = 10 ug/L)

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: MW #2
Laboratory Identification: 86976
Sample Matrix: Water

Date rec'd: 5/1/85
Date extracted:
Date analyzed: 5/13/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	ND
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	ND
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND

Note: ND (None detected, lower detectable limit = 10 ug/L)

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: MW #3
Laboratory Identification: 86977
Sample Matrix: Water

Date rec'd: 5/1/85
Date extracted:
Date analyzed: 5/13/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	ND
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	ND
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND

Note: ND (None detected, lower detectable limit = 10 ug/L)

METALLIC ANALYTICAL REORT

Company: Grady McCauley
Sample Identification: MW #3 - A
Laboratory Identification: 86978
Sample Matrix: Water

Antimony	<0.1	mg/L
Arsenic	<0.005	mg/L
Beryllium	<0.01	mg/L
Cadmium	<0.01	mg/L
Chromium	<0.02	mg/L
Copper	<0.01	mg/L
Lead	0.11	mg/L
Mercury	<0.002	mg/L
Nickel	<0.04	mg/L
Selenium	<0.005	mg/L
Silver	<0.01	mg/L
Thallium	<0.1	mg/L
Zinc	9.5	mg/L

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: MW #3 - A
Laboratory Identification: 86978
Sample Matrix: Water

Date rec'd: 5/1/85
Date extracted:
Date analyzed: 5/10/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	49 ug/L
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	48 ug/L
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	55 ug/L	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND
		Others:	
		Xylenes	85 ug/L

Note: ND (None detected, lower detectable limit = 10 ug/L)

BASE/NEUTRAL COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: MW #3 - A
Laboratory Identification: 86978
Sample Matrix: Water

Date rec'd: 5/1/85
Date extracted: 5/06/85
Date analyzed: 5/16/85

Acenaphthene	ND	Diethyl phthalate	ND
Acenaphthylene	ND	Dimethyl phthalate	ND
Anthracene	ND	2,4-Dinitrotoluene	ND
Benzidine	ND*	2,6-Dinitrotoluene	ND
Benzo(a)anthracene	ND	Di-n-octyl phthalate	ND
Benzo(b)fluoranthene	ND	Fluoranthene	ND
Benzo(k)fluoranthene	ND	Fluorene	ND
Benzo(ghi)perylene	ND	Hexachlorobenzene	ND
Benzo(a)pyrene	ND	Hexachlorobutadiene	ND
Bis(2-chloroethoxy)methane	ND	Hexachlorocyclopentadiene	ND
Bis(2-chloroethyl)ether	ND	Hexachloroethane	ND
Bis(2-chloroisopropyl)ether	ND	Indeno(1,2,3-cd)pyrene	ND
Bis(2-ethylhexyl)phthalate	ND	Isophorone	300,000
4-Bromophenyl phenyl ether	ND	Napthalene	ND
Butyl benzyl phthalate	ND	Nitrobenzene	ND
2-Chloronaphthalene	ND	N-Nitrosodimethylamine	ND
4-Chlorophenyl phenyl ether	ND	N-Nitrosodiphenylamine	ND
Chrysene	ND	N-Nitrosodi-n-propylamine	ND
Dibenzo(a,h)anthracene	ND	Phenanthrene	ND
Di-n-butyl phthalate	ND	Pyrene	ND
1,2-Dichlorobenzene	ND	1,2,4,Trichlorobenzene	ND
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
3,3'-Dichlorobenzidine	ND*		

Note: ND (None detected, lower detectable limit = 50 ug/L)
ND* (None detected, lower detectable limit =500 ug/L)

APPENDIX F

ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Womens Wash Room Sink N.E.
Laboratory Identification: 89080

Total Metals

Arsenic	<0.005	mg/L
Barium	0.3	mg/L
Cadmium	<0.01	mg/L
Chromium	<0.02	mg/L
Mercury	<0.005	mg/L
Lead	0.14	mg/L
Selenium	<0.005	mg/L
Silver	<0.01	mg/L
Hexavalent chromium	<0.02	mg/L

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Womens Wash Room Sink NE
Laboratory Identification: 89080
Sample Matrix: Water

Date rec'd: 7/11/85
Date extracted:
Date analyzed: 7/12/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	ND
Chlorobenzene	ND	Methylene chloride	5
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	1.5
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND

Note: ND (None detected, lower detectable limit = 1 ug/L)

BASE/NEUTRAL COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Womens Wash Room Sink NE
Laboratory Identification: 89080
Sample Matrix: Water

Date rec'd: 7/11/85
Date extracted: 7/15/85
Date analyzed: 7/15/85

Acenaphthene	ND	Diethyl phthalate	ND
Acenaphthylene	ND	Dimethyl phthalate	ND
Anthracene	ND	2,4-Dinitrotoluene	ND
Benzidine	ND*	2,6-Dinitrotoluene	ND
Benzo(a)anthracene	ND	Di-n-octyl phthalate	ND
Benzo(b)fluoranthene	ND	1,2-Diphenylhydrazine	ND
Benzo(k)fluoranthene	ND	Fluoranthene	ND
Benzo(ghi)perylene	ND	Fluorene	ND
Benzo(a)pyrene	ND	Hexachlorobenzene	ND
Bis(2-chloroethoxy)methane	ND	Hexachlorobutadiene	ND
Bis(2-chloroethyl)ether	ND	Hexachlorocyclopentadiene	ND
Bis(2-chloroisopropyl)ether	ND	Hexachloroethane	ND
Bis(2-ethylhexyl)phthalate	ND	Indeno(1,2,3,-cd)pyrene	ND
4-Bromophenyl phenyl ether	ND	Isophorone	ND
Butyl benzyl phthalate	ND	Naphthalene	ND
2-Chloronaphthalene	ND	Nitrobenzene	ND
4-Chlorophenyl phenyl ether	ND	N-Nitrosodimethylamine	ND
Chrysene	ND	N-Nitrosodiphenylamine	ND
Dibenzo(a,h)anthracene	ND	N-Nitrosodi-n-propylamine	ND
Di-n-butyl phthalate	ND	Phenanthrene	ND
1,2-Dichlorobenzene	ND	Pyrene	ND
1,3-Dichlorobenzene	ND	1,2,4,Trichlorobenzene	ND
1,4-Dichlorobenzene	ND		
3,3'-Dichlorobenzidine	ND*		

Note: ND (None detected, lower detectable limit = 10 ug/L)
ND* (None detected, lower detectable limit =50 ug/L)

ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Lasure New Pole Building Yard Hydrant
Laboratory Identification: 89079

Total Metals

Arsenic	<0.005	mg/L
Barium	0.2	mg/L
Cadmium	<0.01	mg/L
Chromium	<0.02	mg/L
Mercury	<0.003	mg/L
Lead	<0.05	mg/L
Selenium	<0.005	mg/L
Silver	<0.01	mg/L
Hexavalent chromium	<0.02	mg/L

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Lasure New Pole Building Yard Hydrant
Laboratory Identification: 89079
Sample Matrix: Water

Date rec'd: 7/11/85
Date extracted:
Date analyzed: 7/12/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	ND
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	ND
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND

Note: ND (None detected, lower detectable limit = 1 ug/L)

BASE/NEUTRAL COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Lasure New Pole Building Yard Hydrant
Laboratory Identification: 89079
Sample Matrix: Water

Date rec'd: 7/11/85
Date extracted: 7/14/85
Date analyzed: 7/14/85

Acenaphthene	ND	Diethyl phthalate	ND
Acenaphthylene	ND	Dimethyl phthalate	ND
Anthracene	ND	2,4-Dinitrotoluene	ND
Benzidine	ND*	2,6-Dinitrotoluene	ND
Benzo(a)anthracene	ND	Di-n-octyl phthalate	ND
Benzo(b)fluoranthene	ND	1,2-Diphenylhydrazine	ND
Benzo(k)fluoranthene	ND	Fluoranthene	ND
Benzo(ghi)perylene	ND	Fluorene	ND
Benzo(a)pyrene	ND	Hexachlorobenzene	ND
Bis(2-chloroethoxy)methane	ND	Hexachlorobutadiene	ND
Bis(2-chloroethyl)ether	ND	Hexachlorocyclopentadiene	ND
Bis(2-chloroisopropyl)ether	ND	Hexachloroethane	ND
Bis(2-ethylhexyl)phthalate	ND	Indeno(1,2,3,-cd)pyrene	ND
4-Bromophenyl phenyl ether	ND	Isophorone	ND
Butyl benzyl phthalate	ND	Naphthalene	ND
2-Chloronaphthalene	ND	Nitrobenzene	ND
4-Chlorophenyl phenyl ether	ND	N-Nitrosodimethylamine	ND
Chrysene	ND	N-Nitrosodiphenylamine	ND
Dibenzo(a,h)anthracene	ND	N-Nitrosodi-n-propylamine	ND
Di-n-butyl phthalate	ND	Phenanthrene	ND
1,2-Dichlorobenzene	ND	Pyrene	ND
1,3-Dichlorobenzene	ND	1,2,4,Trichlorobenzene	ND
1,4-Dichlorobenzene	ND		
3,3'-Dichlorobenzidine	ND*		

Note: ND (None detected, lower detectable limit = 10 ug/L)
ND* (None detected, lower detectable limit =50 ug/L)

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: D. Heater Residence
7412 Middlebranch Rd.
Laboratory Identification: 89384
Sample Matrix: Water

Date rec'd: 7/19/85
Date extracted:
Date analyzed: 7/23/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	ND
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	ND
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND

Note: ND (None detected, lower detectable limit = 1 ug/L)

BASE/NEUTRAL COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: D. Heater Residence
Laboratory Identification: 89702
Sample Matrix: Water

Date rec'd: 7/19/85
Date extracted: 7/31/85
Date analyzed: 8/5/85

Acenaphthene	ND	Diethyl phthalate	ND
Acenaphthylene	ND	Dimethyl phthalate	ND
Anthracene	ND	2,4-Dinitrotoluene	ND
Benzidine	ND*	2,6-Dinitrotoluene	ND
Benzo(a)anthracene	ND	Di-n-octyl phthalate	ND
Benzo(b)fluoranthene	ND	Fluoranthene	ND
Benzo(k)fluoranthene	ND	Fluorene	ND
Benzo(ghi)perylene	ND	Hexachlorobenzene	ND
Benzo(a)pyrene	ND	Hexachlorobutadiene	ND
Bis(2-chloroethoxy)methane	ND	Hexachlorocyclopentadiene	ND
Bis(2-chloroethyl)ether	ND	Hexachloroethane	ND
Bis(2-chloroisopropyl)ether	ND	Indeno(1,2,3-cd)pyrene	ND
Bis(2-ethylhexyl)phthalate	ND	Isophorone	ND
4-Bromophenyl phenyl ether	ND	Naphthalene	ND
Butyl benzyl phthalate	ND	Nitrobenzene	ND
2-Chloronaphthalene	ND	N-Nitrosodimethylamine	ND
4-Chlorophenyl phenyl ether	ND	N-Nitrosodiphenylamine	ND
Chrysene	ND	N-Nitrosodi-n-propylamine	ND
Dibenzo(a,h)anthracene	ND	Phenanthrene	ND
Di-n-butyl phthalate	ND	Pyrene	ND
1,2-Dichlorobenzene	ND	1,2,4,Trichlorobenzene	ND
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
3,3'-Dichlorobenzidine	ND*		

ND (None detected, lower detectable limit = 10 ug/L)

ND* (None detected, lower detectable limit = 50 ug/L)

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: L. Mancini Residence
7401 Middlebranch Road
Laboratory Identification: 89385
Sample Matrix: Water

Date rec'd: 7/19/85
Date extracted:
Date analyzed: 7/23/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	ND
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	ND
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND

Note: ND (None detected, lower detectable limit = 1 ug/L)

BASE/NEUTRAL COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: L. Mancini Residence
7401 Middlebranch Rd.
Laboratory Identification: 89385
Sample Matrix: Water

Date rec'd: 7/19/85
Date extracted: 7/23/85
Date analyzed: 7/25/85

Acenaphthene	ND	Diethyl phthalate	ND
Acenaphthylene	ND	Dimethyl phthalate	ND
Anthracene	ND	2,4-Dinitrotoluene	ND
Benzidine	ND*	2,6-Dinitrotoluene	ND
Benzo(a)anthracene	ND	Di-n-octyl phthalate	ND
Benzo(b)fluoranthene	ND	1,2-Diphenylhydrazine	ND
Benzo(k)fluoranthene	ND	Fluoranthene	ND
Benzo(ghi)perylene	ND	Fluorene	ND
Benzo(a)pyrene	ND	Hexachlorobenzene	ND
Bis(2-chloroethoxy)methane	ND	Hexachlorobutadiene	ND
Bis(2-chloroethyl)ether	ND	Hexachlorocyclopentadiene	ND
Bis(2-chloroisopropyl)ether	ND	Hexachloroethane	ND
Bis(2-ethylhexyl)phthalate	ND	Indeno(1,2,3,-cd)pyrene	ND
4-Bromophenyl phenyl ether	ND	Isophorone	ND
Butyl benzyl phthalate	ND	Naphthalene	ND
2-Chloronaphthalene	ND	Nitrobenzene	ND
4-Chlorophenyl phenyl ether	ND	N-Nitrosodimethylamine	ND
Chrysene	ND	N-Nitrosodiphenylamine	ND
Dibenzo(a,h)anthracene	ND	N-Nitrosodi-n-propylamine	ND
Di-n-butyl phthalate	ND	Phenanthrene	ND
1,2-Dichlorobenzene	ND	Pyrene	ND
1,3-Dichlorobenzene	ND	1,2,4,Trichlorobenzene	ND
1,4-Dichlorobenzene	ND		
3,3'-Dichlorobenzidine	ND*		

Note: ND (None detected, lower detectable limit = 10 ug/L)
ND* (None detected, lower detectable limit =50 ug/L)

VOLATILE COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Hills Farm Supply
7376 Middlebranch Road
Laboratory Identification: 89386
Sample Matrix: Water

Date rec'd: 7/19/85
Date extracted:
Date analyzed: 7/23/85

Benzene	ND	trans-1,2-Dichloroethene	ND
Bromodichloromethane	ND	1,2-Dichloropropane	ND
Bromoform	ND	cis-1,3-Dichloropropene	ND
Bromomethane	ND	trans-1,3-Dichloropropene	ND
Carbon tetrachloride	ND	Ethylbenzene	ND
Chlorobenzene	ND	Methylene chloride	ND
Chloroethane	ND	1,1,2,2-Tetrachloroethane	ND
2-Chloroethylvinyl ether	ND	Tetrachloroethene	ND
Chloroform	ND	Toluene	ND
Chloromethane	ND	1,1,1-Trichloroethane	ND
Dibromochloromethane	ND	1,1,2-Trichloroethane	ND
1,1-Dichloroethane	ND	Trichloroethene	ND
1,2-Dichloroethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethene	ND	Vinyl chloride	ND

Note: ND (None detected, lower detectable limit = 1 ug/L)

BASE/NEUTRAL COMPOUNDS ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Hills Farm Supply
7376 Middlebranch Rd.
Laboratory Identification: 89386
Sample Matrix: Water

Date rec'd: 7/19/85
Date extracted: 7/23/85
Date analyzed: 7/25/85

Acenaphthene	ND	Diethyl phthalate	ND
Acenaphthylene	ND	Dimethyl phthalate	ND
Anthracene	ND	2,4-Dinitrotoluene	ND
Benzidine	ND*	2,6-Dinitrotoluene	ND
Benzo(a)anthracene	ND	Di-n-octyl phthalate	ND
Benzo(b)fluoranthene	ND	1,2-Diphenylhydrazine	ND
Benzo(k)fluoranthene	ND	Fluoranthene	ND
Benzo(ghi)perylene	ND	Fluorene	ND
Benzo(a)pyrene	ND	Hexachlorobenzene	ND
Bis(2-chloroethoxy)methane	ND	Hexachlorobutadiene	ND
Bis(2-chloroethyl)ether	ND	Hexachlorocyclopentadiene	ND
Bis(2-chloroisopropyl)ether	ND	Hexachloroethane	ND
Bis(2-ethylhexyl)phthalate	ND	Indeno(1,2,3,-cd)pyrene	ND
4-Bromophenyl phenyl ether	ND	Isophorone	ND
Butyl benzyl phthalate	ND	Naphthalene	ND
2-Chloronaphthalene	ND	Nitrobenzene	ND
4-Chlorophenyl phenyl ether	ND	N-Nitrosodimethylamine	ND
Chrysene	ND	N-Nitrosodiphenylamine	ND
Dibenzo(a,h)anthracene	ND	N-Nitrosodi-n-propylamine	ND
Di-n-butyl phthalate	ND	Phenanthrene	ND
1,2-Dichlorobenzene	ND	Pyrene	ND
1,3-Dichlorobenzene	ND	1,2,4,Trichlorobenzene	ND
1,4-Dichlorobenzene	ND		
3,3'-Dichlorobenzidine	ND*		

Note: ND (None detected, lower detectable limit = 10 ug/L)
ND* (None detected, lower detectable limit =50 ug/L)

ANALYTICAL REPORT

Company: Grady McCauley
Sample Identification: Hills Farm Supply
Laboratory Identification: 89386

Total Metals:

Arsenic	<0.005 mg/L
Barium	<0.1 mg/L
Cadmium	<0.01 mg/L
Chromium	<0.02 mg/L
Mercury	<0.002 mg/L
Lead	<0.05 mg/L
Selenium	<0.005 mg/L
Silver	<0.01 mg/L
Hexavalent chromium	<0.02 mg/L