Phase II Ground Water Assessment Report
Keebler Company Facility
Raleigh, North Carolina
October 18, 1994

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Prepared For

Keebler Company
Elmhurst, Illinois

Prepared By

Aquaterra, Inc.
Raleigh, North Carolina

aquaterra
A GREAT LAKES CHEMICAL CORPORATION COMPANY

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October 18, 1994

Mr. Howard Hsu, Environmental Compliance Manager
Keebler Company
545 Lamont Road
Elmhurst, Illinois 60126

Reference: Phase II Ground Water Assessment Report
Keebler Company
Raleigh, North Carolina
Aquaterra Job No. 4107601

Dear Mr. Hsu:

Aquaterra has completed the attached *Phase II Ground Water Assessment Report* for the work conducted at the vacant Keebler facility in Raleigh, North Carolina. The Phase II activities have been successful in continuing the definition of the ground water contaminant plume beneath the central portion of the site. This report describes the scope of work and field methods, provides analytical results, conclusions, and recommendations.

As previously mentioned, if Alcatel's progress at the site is less than desirable, Aquaterra would be pleased to assist Keebler in continuing the assessment activities.

Aquaterra appreciates continuing to assist Keebler in finalizing their negotiations with Alcatel and the property buyer. If you have any questions or comments concerning this report, please call me at (919) 859-9987.

Sincerely,

AQUATERRA, INC.

Thomas V. Taylor, P.G.
Project Manager

Senior Peer Review By

David L. Duncklee, P.G.
Branch Manager

410791/TVT/pjc

Phase II Ground Water Assessment Report
Keebler Company Facility
Raleigh, North Carolina
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1 Introduction

The Keebler Company (Keebler) retained Aquaterra, Inc., (Aquaterra) to conduct Phase II ground water assessment activities at the vacant Keebler facility at 2900 Wake Forest Road in Raleigh, North Carolina (see Figure 1). Aquaterra had previously conducted a Phase II environmental site assessment (ESA) for a potential buyer of the property and a Phase I ground water assessment for Keebler at the site. The Phase II ESA included the installation and sampling of four temporary monitoring wells at locations of potential ground water impact from both on-site and off-site sources. The analytical results from two of these wells located along the north property boundary of Keebler, adjacent to Alcatel Network Systems (Alcatel), indicated impact from several volatile organic compounds (VOCs) at concentrations exceeding North Carolina Groundwater Quality Standards under Title 15A NCAC 02L .0202 (g) (2L Standards).

The results of the Phase II ESA prompted Keebler to conduct Phase I ground water assessment activities by installing six permanent ground water monitoring wells to determine the source and extent of the VOC impacted ground water identified along the northeastern property boundary. The analytical results from these wells indicated VOC impact apparently limited to the northeastern-central portion of the Keebler property extending downward into fractured bedrock. The most likely source of the ground water contamination appears to originate on the Alcatel property located to the northeast of Keebler, based primarily on the shallow ground water flow direction and documented ground water impact of chlorinated solvents at Alcatel.

Based on the above information, Keebler authorized Aquaterra to commence with additional (i.e., Phase II) ground water assessment activities to further determine the extent of ground water impact as presented in this report. For more detailed information regarding previous assessment activities, please reference the following reports prepared by Aquaterra:

- July 29, 1994, *Phase II Environmental Site Assessment* prepared for Tri Properties, Inc.
- August 2, 1994, *Addendum to Phase II Environmental Site Assessment* prepared for Tri Properties, Inc.
- September 27, 1994, *Ground Water Assessment Report* prepared for Keebler Company

2 Objectives and Scope of Work

The objective of the Phase II ground water assessment was to further delineate the horizontal and vertical extent of ground water impact on the Keebler property in accordance with DEM guidelines.

The scope of work included the following tasks:

- Install two shallow and three intermediate ground water monitoring wells (i.e., EPA type II wells) to further assess the horizontal extent of ground water impact in the unconsolidated and top of fractured bedrock water bearing units.
- Install one deep monitoring well (i.e., EPA type III well) to assess the vertical extent of impacted ground water near existing wells MW-2 and MW-2i.
- Develop and sample the wells for analysis of purgeable halocarbons, and total chromium, copper, lead, and nickel.
- Survey the measuring point at the top of the well casings for referencing water level measurements and determine ground water flow directions and gradients.
- Prepare a *Phase II Ground Water Assessment Report* for submittal to Keebler that describes field methods, provides analytical results, conclusions, and recommendations.

3 Field Activities

3.1 Monitoring Well Installation

3.1.1 Shallow and Intermediate Wells

Two shallow (MW-6s and MW-7s) and three intermediate ground water monitoring wells (MW-1i, MW-6i, and MW-7i) were installed on-site from September 26 to October 3, 1994, to further delineate the horizontal extent of ground water impact in the unconsolidated (shallow wells) and top of competent fractured bedrock (intermediate wells) hydrogeologic units (see Figure 2). Wells MW-6s and MW-6i were installed within the warehouse portion of the building and wells MW-7s and MW-7i were installed within the old snack plant portion of the building. Well MW-1i was paired with existing well MW-1s near the north corner of the Keebler property. The wells were installed under the direct supervision of an Aquaterra geologist.

It should be noted that the five original shallow wells installed during the Phase I ground water assessment, designated as MW-1 through MW-5, have been redesignated as MW-1s through MW-5s. The suffix "s" indicates a shallow well where the well screen intersects the water table. The wells designated with the suffix "i" indicate an intermediate well where the well screen is located entirely within the top of competent fractured bedrock. These wells may or may not be constructed with a surface casing (i.e., EPA type III well). The well designated with the suffix "d" indicates a deep well where the well screen is installed within competent bedrock well below the soil/bedrock interface. This well will be constructed with a surface casing (see Section 3.1.2).

Access for the four wells located inside the plant was provided by coring a 10-inch hole through the concrete floor slab at each well location. The borings for the shallow and intermediate monitoring wells were drilled with either a CME-75, Mobile B-53 ATV, or a CME-45 ATV drilling rig using 4.25-inch inside diameter hollow-stem augers to the boring termination depths (shallow wells) or auger refusal (intermediate wells). The borings for the intermediate wells were advanced into competent bedrock with a 4-inch diameter air-hammer to the desired depth using the augers or steel threaded pipe as temporary casing to keep the hole from collapsing. Well MW-7i was advanced into rock with a 4-inch diameter core barrel due to difficulties with the air-hammer.

Soil samples were not collected with a split-spoon sampler due to vertical space constraints inside the building or the well was paired with an existing well where split-spoon samples were already collected. Field classification of auger cuttings was performed by the geologist or technician according to the Unified Soil Classification System (ASTM D 2488-84). Soil boring and well construction information are recorded on the Boring/Well Construction Logs, Well Construction Schematic, and DEM Well Construction Records (Form GW-1) in Appendix A.

The shallow and intermediate wells were constructed of 2-inch diameter PVC casing with 10-foot length, 0.010-inch slot, PVC screen in the shallow wells and either 5 or 15-foot length, 0.010-inch slot, PVC screen in the intermediate wells as described in the standard procedures in Appendix B. A sand pack was not installed around the screens of the intermediate wells due to annular space restrictions. Instead, a well screen sock was slipped over the screen interval and time release bentonite pellets were placed inside the top of the sock, just above the screen, and secured with stainless steel hose clamps above and below the bentonite. The well screen and bentonite was then installed in the boring and the bentonite was allowed to set up over night. On the following morning, the integrity of the bentonite seal was checked by tugging slightly on the well. Additional time release bentonite was then added from the surface to ensure a competent seal. The seal was then checked again by pumping water from the well with a 2-inch, low flow, submersible pump while measuring the water level in the annular space outside the well.

The bottom of the well screens for the shallow wells (MW-6s and MW-7s) were positioned at a depth of 23 feet below grade to intersect the water table measured at approximately 15 to 17 feet below grade. The intermediate well screens were installed to 42.5 (MW-1i) to 73 (MW-7i) feet below grade. Each wellhead was fitted with a water-tight lockable cap and a flush-mount steel manhole type cover.

Cuttings generated during all drilling activities were placed in labeled 55-gallon drums and left on-site for future characterization and possible disposal.

3.1.2 Deep Well

As of this writing, the construction of deep well MW-2d has not been completed. This well will be installed in the vicinity of wells MW-2s and MW-2i to determine the vertical extent of VOC impacted ground water on the northeastern portion of the site (see Figure 2).

During October 1 through 6, 1994, The boring for well MW-2d was advanced with a 7 7/8-inch tricone roller bit using air to the top of competent bedrock. Due to collapsing of the borehole in the unconsolidated material, a 6-inch diameter PVC surface casing was installed to 28.5 feet below grade and was tremie grouted in-place. Once the grout set, the hole was advanced to 80 feet with a 5 7/8-inch air hammer through competent gneissic bedrock with zones of extremely hard quartz-rich layers. A 4-inch diameter PVC surface casing was installed in the hole to 80 feet and was tremie grouted in-place to prevent a carrying down of contaminants from the shallow zone to deeper zones during subsequent drilling. Once the grout set, the hole was advanced with a 4-inch diameter air hammer while looking for potential water bearing fracture zones. No apparent water bearing zones were encountered to a depth of 150 feet below grade. Therefore, the boring was terminated at 150 feet in very competent gneiss with no apparent fractures.

After approximately 48 hours of completion, the boring was determined to be dry with an electric water level probe. Construction of well MW-2d will commence following removal of drilling tools that the subcontractor is having difficulty in removing from the borehole. Well construction information and analytical results from the sampling of the well, if water is present, will be included in an addendum to this report.

3.2 Ground Water Sampling Activities

Following well development activities with either a disposable Teflon bailer or a decontaminated low-flow 2-inch submersible pump, wells MW-1i, MW-6s, MW-6i, and MW-7s were purged of at least three well volumes with disposable Teflon bailers just prior to sampling on October 4, 1994, according to the procedures in Appendix B. Wells MW-1s and MW-7i were purged to dryness before three well volumes of water could be removed.

All six ground water samples were submitted for analysis of purgeable halocarbons according to EPA Method 601 and for total chromium, copper, lead, and nickel according to standard preparation Method 3030C. Preparation Method 3030C for metals involves a filtering process conducted in the laboratory and is recommended by the North Carolina Department of Environment, Health, and Natural Resources, Division of Environmental Management (DEM). Method 3030C was not requested for the total metals analysis performed from the original sampling of wells MW-1, MW-2, MW-2i, MW-3, MW-4, and MW-5.

3.3 Survey and Ground Water Flow Direction

The reference point of each well was surveyed for vertical control against a temporary benchmark at an assumed elevation of 100.00 feet located on the north corner of the concrete slab for the former corn hopper and food grade oil aboveground tanks. Static water levels were measured in all wells on-site with an electric water level probe on October 11, 1994. Intermediate depth wells MW-2i, MW-6i, and MW-7i were measured again on October 17, 1994, to verify the original data.

The water levels were used to calculate the water table elevation (shallow wells) or potentiometric elevation (intermediate wells) at each well location. These elevations were used to create a water table contour map and an intermediate potentiometric contour map (see Table 1 and Figures 3 and 4). Figure 3 indicates the generalized shallow ground water flow direction toward the west and figure 4 indicates the generalized intermediate ground water flow direction toward the west-northwest (see Section 4.2).

4 Hydrogeology

4.1 Site Geology

Based on the boring logs, apparent fill material was encountered to depths of approximately 7 (MW-7/7i) to 15 feet (MW-6/6i) below the finished floor elevation. The material beneath the apparent fill consisted primarily of micaceous silty fine sand and fine sandy silt underlain by relatively thin layers of fairly competent and weathered rock with flowing silts and sands to the ultimate auger refusal depths of 51 (MW-6i) to 54 (MW-7i) feet below grade. Boring MW-1i did not encounter the layered weathered rock zone and met with auger refusal at 32.5 feet below grade. Bedrock consists of slightly to moderately fractured gneiss with small dikes and/or sills of coarse grained granite.

According to the *Geology and Mineral Resources of Wake County*, North Carolina Department of Resources and Community Development, Division of Land Resources, Geological Survey Section, Bulletin 86, 1979, the bedrock beneath the site is classified as *injected gneiss and schist* and described as *layered mica gneiss and schist with numerous dikes and sills of granite, pegmatite, and aplite.*

4.2 Hydraulic Gradients

As mentioned in Section 3.3, the generalized shallow ground water flow direction is toward the west in response to a horizontal hydraulic gradient that ranges from approximately 0.014 to 0.020 foot per foot. The generalized intermediate ground water flow direction is toward the west-northwest in response to a horizontal hydraulic gradient of approximately 0.0017 foot per foot.

The water levels measured in well nest MW-1s/MW-1i were not included in either of the contour maps due to the location of the wells on the northwest side of the filled-in stream that traverses the property (see Figures 3 and 4). It is believed that the filled-in stream may be a ground water discharge boundary, whereby ground water is generally flowing toward the filled-in stream from all locations on-site (i.e., ground water to the southeast of the filled-in stream is flowing to the west and ground water to the northwest of the stream is flowing generally to the southeast). Insufficient water level data exists to the northwest of the filled-in stream to verify the ground water flow direction in that area. Water level data was included from well MW-5 on the water table contour map because of its proximity to the filled-in stream.

The vertical hydraulic gradients at well nests MW-1s/MW-1i, MW-2s/MW-2i, MW-6s/MW-6i, and MW-7s/MW-7i were calculated by dividing the difference in the water level elevation between the respectively paired shallow and intermediate wells,

based on the October 11, 1994, water level data, by the difference in elevation between the midpoint of the saturated filter pack in the two wells. The vertical gradient at well nests MW-1s/MW-1i and MW-6s/MW-6i were 0.032 and 0.042 foot per foot upward, respectively. The vertical gradient at well nests MW-2s/MW-2i and MW-7s/MW-7i were -0.014 and -0.009 foot per foot downward, respectively. The upward vertical gradient in the two well nests located nearest the filled-in stream (MW-1s/MW-1i and MW-6s/MW-6i) indicates that these well are located in the vicinity of a ground water discharge area. Conversely, The downward vertical gradient in the two well nests located furthest from the filled-in stream (MW-2s/MW-2i and MW-7s/MW-7i) indicates that these wells are located in a ground water recharge area.

5 Analytical Results

The purgeable halocarbon analytical results from the October 4, 1994, sampling event revealed several VOCs in shallow wells MW-6s and MW-7s and intermediate wells MW-6i and MW-7i at total VOC concentrations ranging from 23.5 (MW-6i) to 7,022.7 μg/L (parts per billion) (MW-7i). The samples from wells MW-7s and MW-7i contained dichloromethane. The laboratory report indicated that dichloromethane is a possible laboratory contaminant.

No purgeable halocarbons were detected at or above the method detection limit in the samples collected from wells MW-1s and MW-1i (see Table 2 and Appendix C). Several of the VOCs detected in wells MW-6s, MW-6i, MW-7s, and MW-7i exceeded 2L Standards (see Tables 2 and 3).

The total metals analytical results by standard preparation Method 3030C revealed concentrations of lead exceeding the 2L Standard in wells MW-1s, MW-6s, MW-6i, MW-7s, and MW-7i. These lead concentrations may be indicative of background (i.e., naturally occurring) conditions (see Tables 2 and 3 and Appendix C).

Shallow and intermediate total VOC isopleth maps were generated based on the analytical results from the sampling of the shallow and intermediate wells conducted on August 22, 1994, (wells MW-2s, MW-2i, MW-3s, MW-4s, and MW-5s) and October 4, 1994, (MW-1s, MW-1i, MW-6s, MW-6i, MW-7s, and MW-7i) (see Figures 5 and 6). Figure 5 indicates a VOC plume migrating generally to the west from the Keebler/Alcatel property border with the highest concentrations in the vicinity of well cluster MW-2s/2i/2d. Figure 6 indicates a VOC plume migrating generally to the west from the Keebler/Alcatel property border with the highest concentrations in the vicinity of well nest MW-7s/7i.

6 Conclusions

Aquaterra concludes the following based on testing and observations conducted to date:

- The area of ground water impact from VOCs appears to extend from the northeastern property border with Alcatel to the central portion of the Keebler property.

- The data indicate that the VOC plume concentrations and migration rates appear to be greater in the top of fractured bedrock hydrogeologic unit as compared to the shallow unconsolidated hydrogeologic unit.

- The filled-in stream located on the northwestern portion of the site is probably a ground water discharge area indicated by the upward vertical hydraulic gradients noted in well nests MW-1s/1i and MW-6s/6i. This condition could assist preventing further migration of the plume to the west.

- Downward vertical hydraulic gradients exist at well nests MW-2s/2i and MW-7s/7i, which could enhance the downward movement of contaminants in these areas to the fractured rock unit.

- The relatively low concentrations of VOCs in well nest MW-6s/6i appear to indicate that these wells are located near the downgradient edge of the plume.

- If the highly competent rock identified at depth in the boring for well MW-2d extends across the site, this condition would help prevent further vertical migration of contaminants into the deep competent rock unit.

- Neither the shallow nor intermediate horizontal extent of VOC impact has been adequately defined to the south and southwest of the plant.

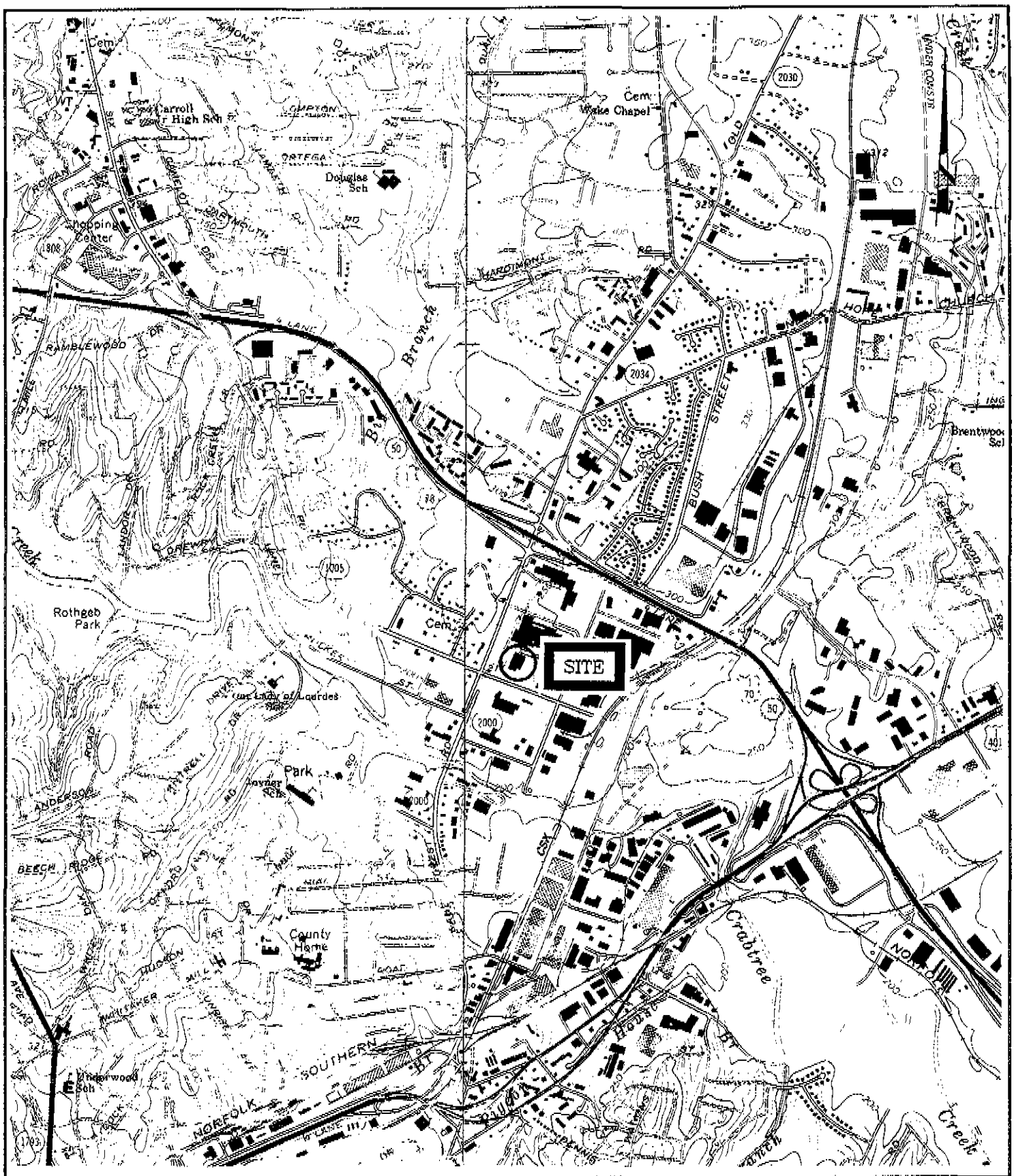
- The data indicates that Alcatel continues to appear to be the most likely source of the ground water contamination identified beneath the Keebler property.

7 Recommendations

Aquaterra recommends that Keebler continue to assist Alcatel in their assessment activities by providing them access to the installed wells for monitoring purposes and access to the Keebler property for additional well installation, as needed. Aquaterra suggests that Keebler have an environmental representative on-site during all activities performed by Alcatel to document such activities for liability reasons.

The next phase of ground water assessment at the site should include two paired shallow and intermediate wells located to the south and southwest of well nest MW-7s/7i outside the snack plant facility.

To determine whether impacted ground water is moving off-site, monitoring well installation should proceed at approximately three locations along the central section of the southwest property border. These wells should be installed as intermediate wells in the top of fractured bedrock with the central well being nested with a shallow well.



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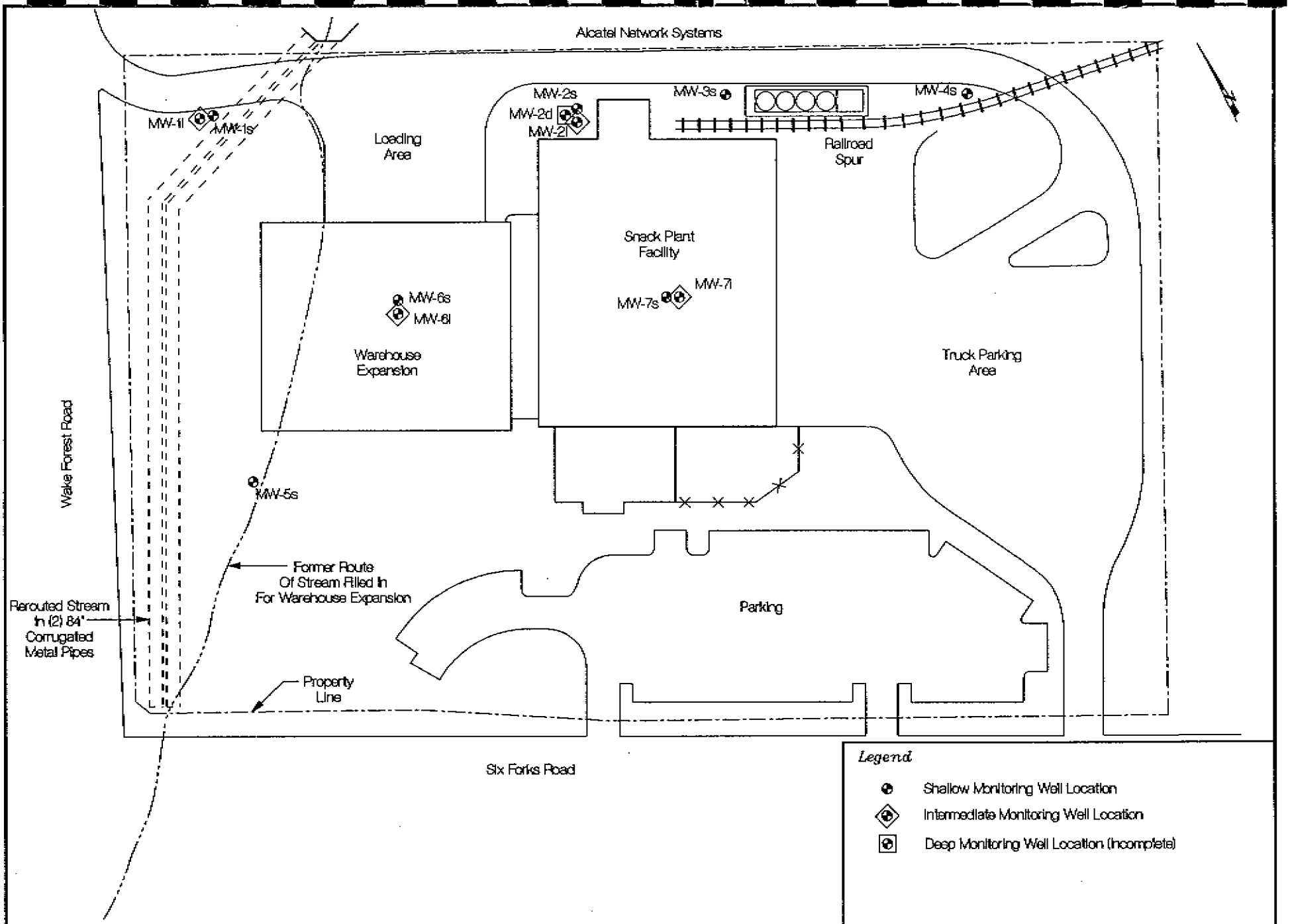
Author	Drawing	Layers	Date	Title
			7-28-94	Site Location Map
Job No.	Revision	Figure	Scale	Project
4106300		1	1" = 2000'	Keebler Site Raleigh, North Carolina



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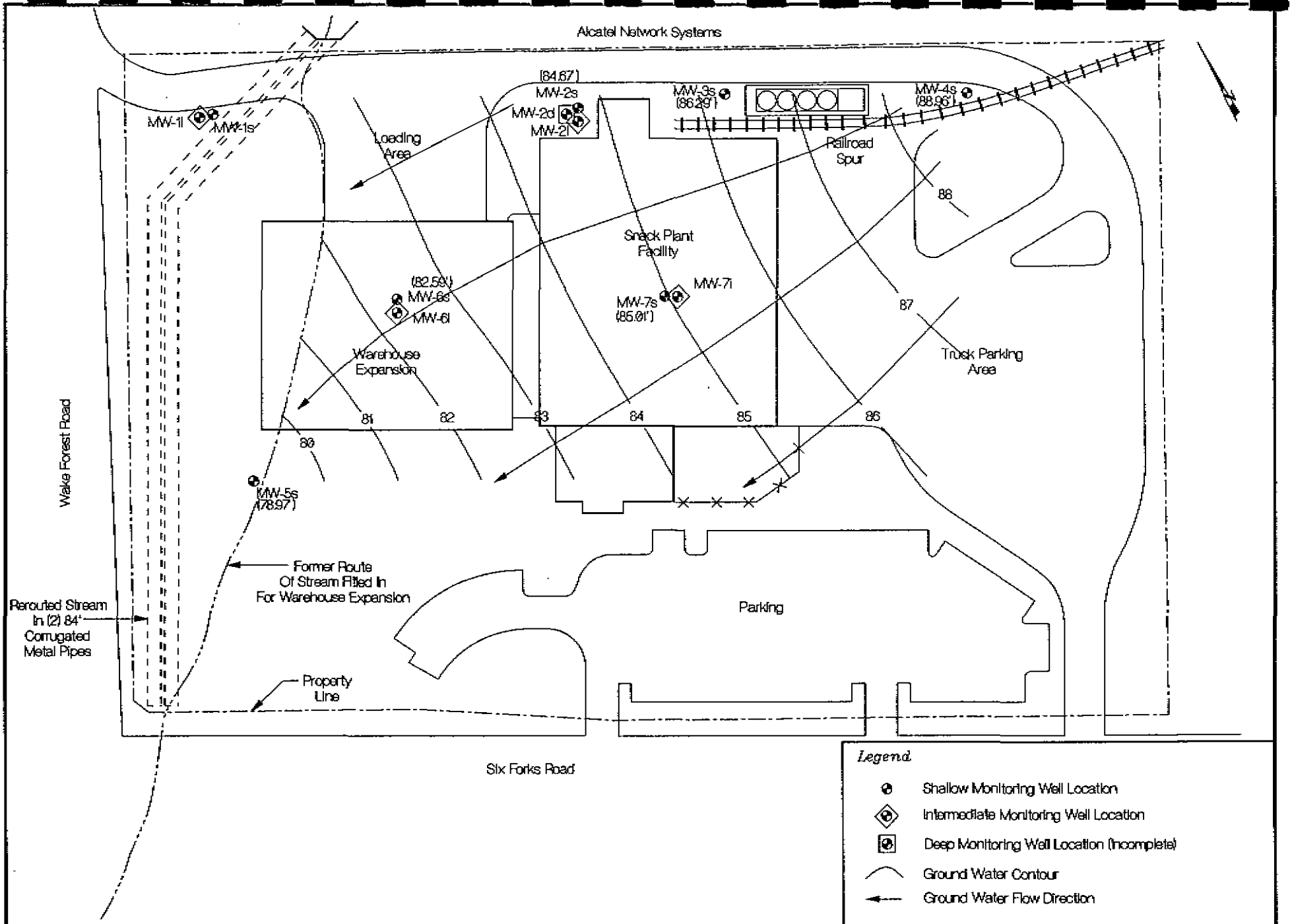
Author	Drawing	Layers	Date	Title
EVC	41076-1	0,1,2	7-25-94	Monitoring Well Location Map
Job No.	**Revision**	**Figure**	**Scale**	**Project**
41076-01	10-17-94	2	1" = 100'	Keebler Site Raleigh, North Carolina



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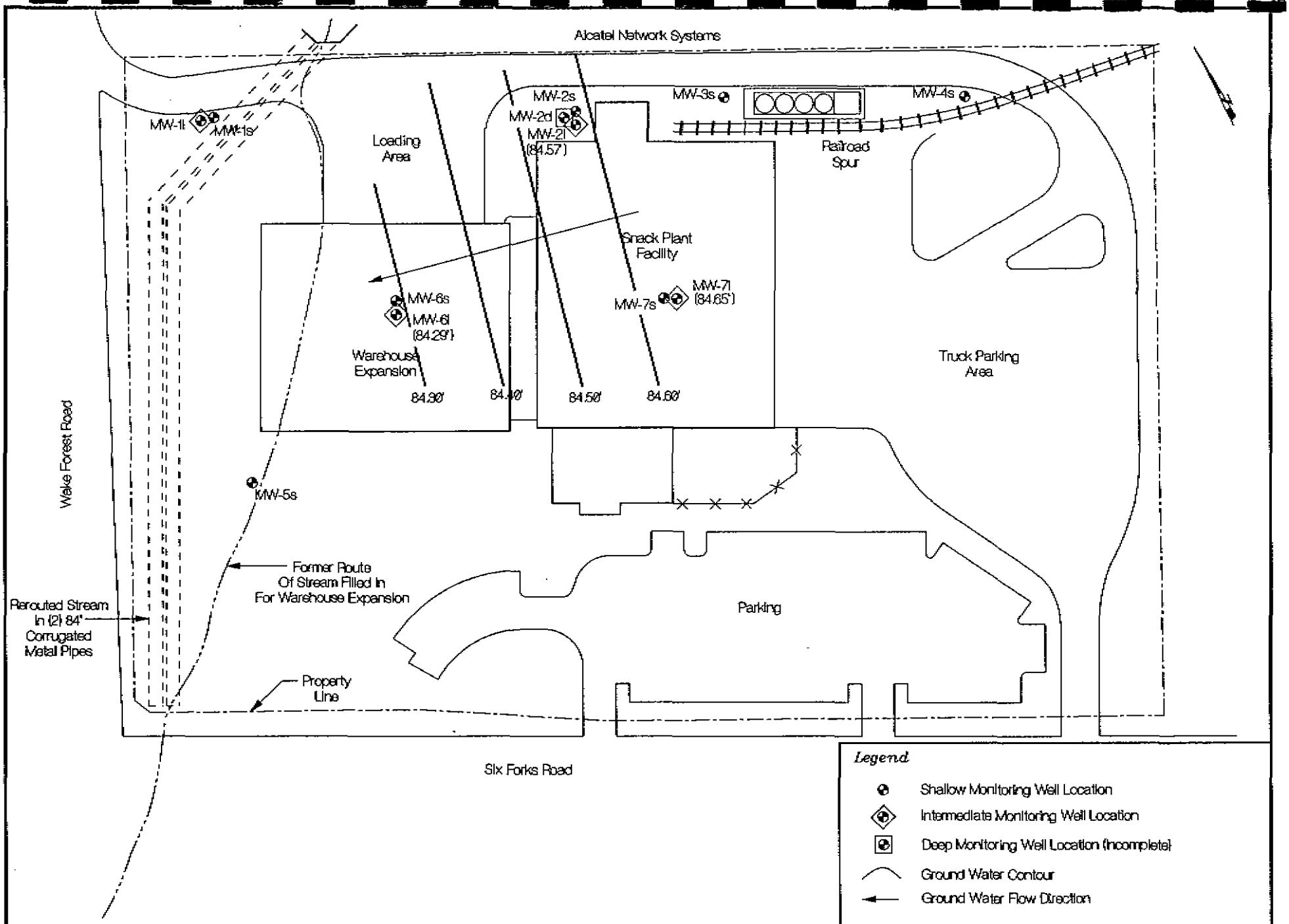
Author	Drawing	Layers	Date	Title
EVC	41076-1	0,1,3	7-25-94	Water Table Contour Map (10-11-94)
Job No.	**Revision**	**Figure**	**Scale**	**Project**
41076001	10-17-94	3	1" = 100'	Keebler Site Raleigh, North Carolina



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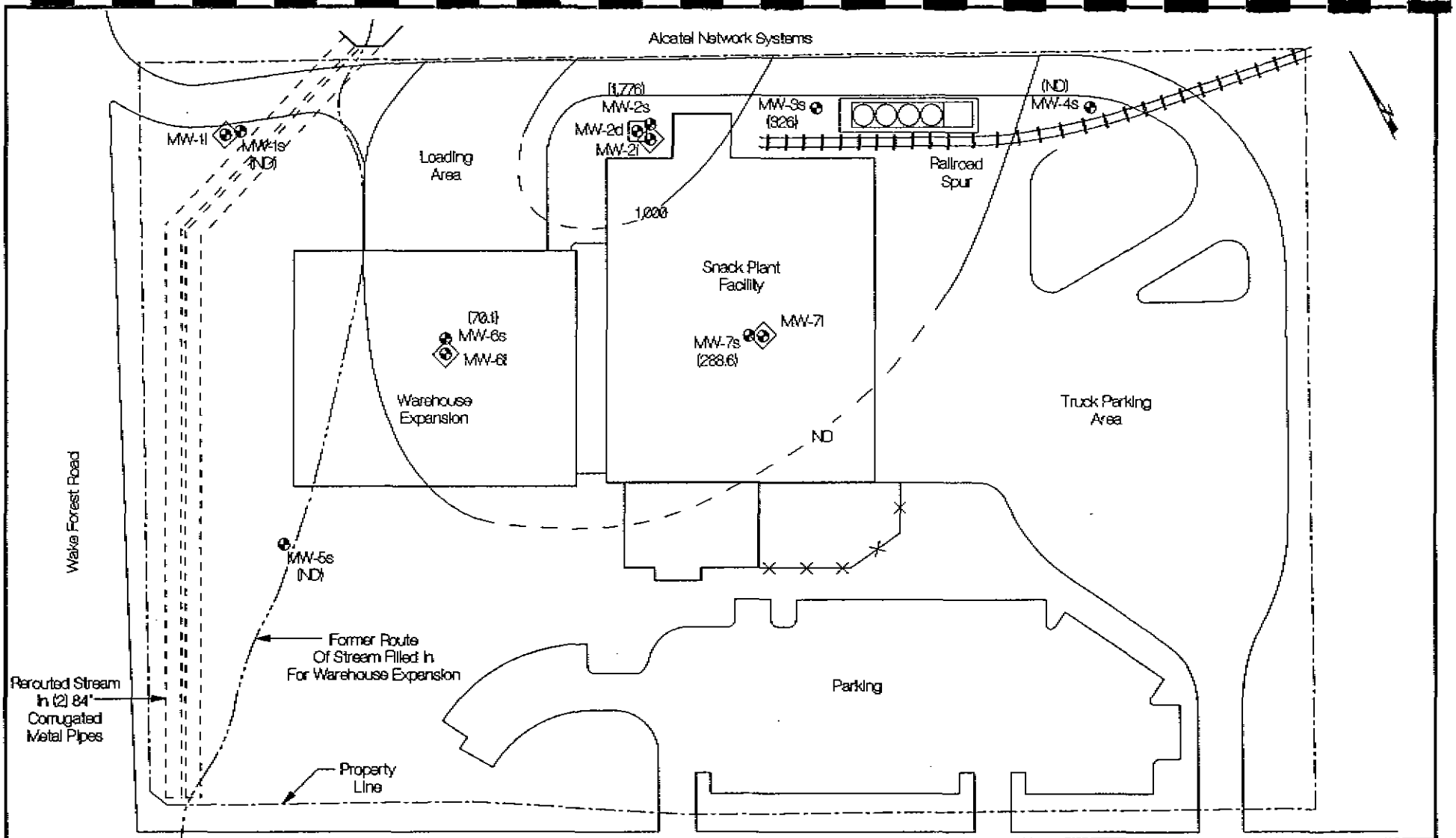
Author	Drawing	Layers	Date	Title
EVC	41076-1	0,1,4	7-25-94	Intermediate Potentiometric Contour Map (10-17-94)
Job No.	**Revision**	**Figure**	**Scale**	**Project**
41076001	10-18-94	4	1" = 100'	Keebler Site Raleigh, North Carolina



Notes:

Compounds identified as possible laboratory contaminants were not included in totals.
Wells MW-2s, 2i, 3s, 4s, and 5s were sampled on 8-22-94.
Wells MW-1s, 1i, 6s, 6i, 7s, and 7i were sampled on 10-4-94.

Legend

- Shallow Monitoring Well Location
- Intermediate Monitoring Well Location
- Deep Monitoring Well Location (Incomplete)
- (326) Total Volatile Organic Compound (VOC) Concentration
- ND Not Detected At Or Above The Method Detection Limit

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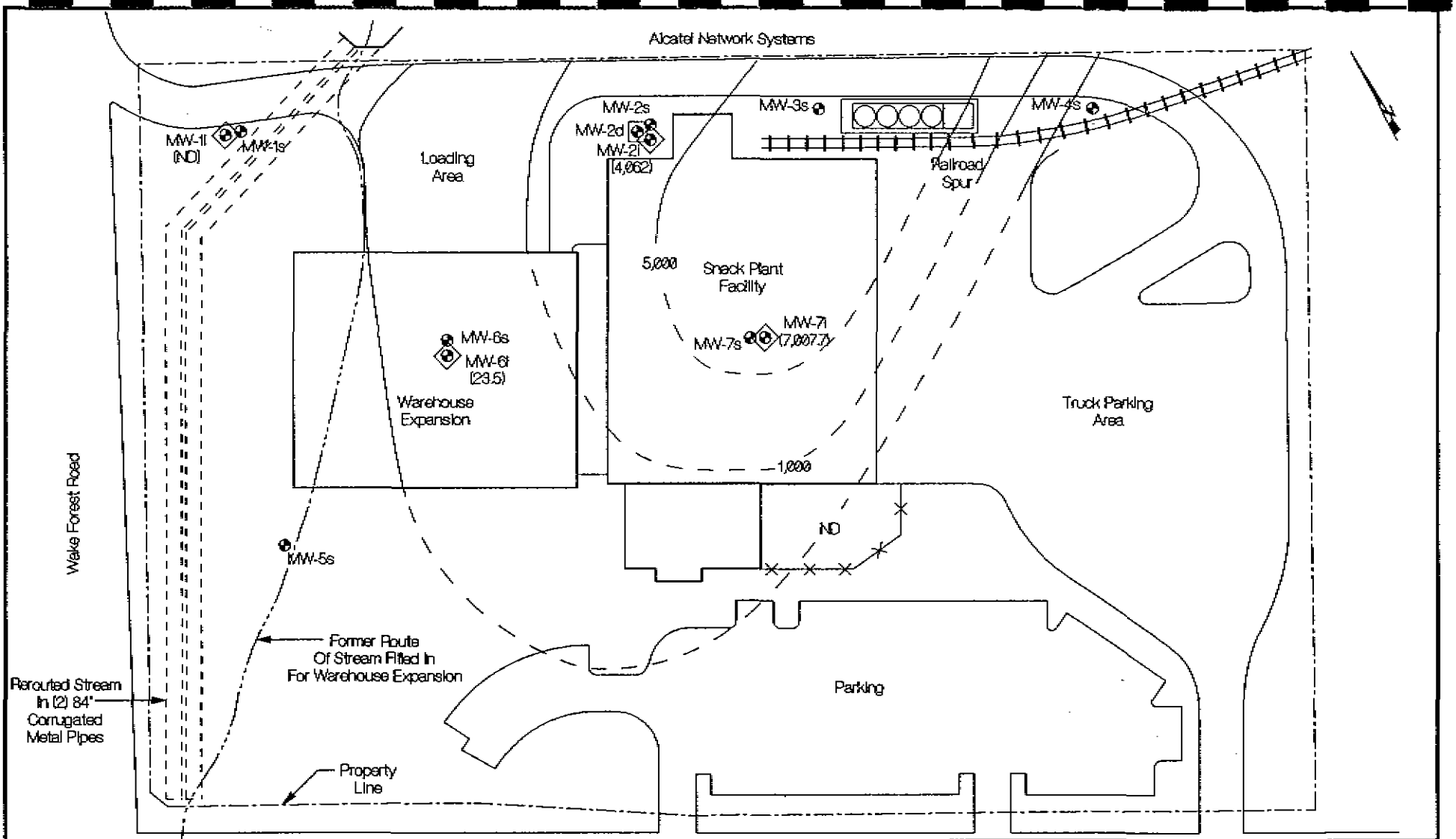
Author	Drawing	Layers	Date	Title
EVC	41076-1	0,1,5	7-25-94	Shallow Total VOCs Concentration Map
Job No.	**Revision**	**Figure**	**Scale**	**Project**
4107601	10-18-94	5	1" = 100'	Keebler Site Raleigh, North Carolina



Notes:

Compounds identified as possible laboratory contaminants were not included in totals.
Wells MW-2s, 2i, 3s, 4s, and 5s were sampled on 8-22-94.
Wells MW-1s, 1i, 6s, 6i, 7s, and 7i were sampled on 10-4-94.

Legend

- Shallow Monitoring Well Location
- Intermediate Monitoring Well Location
- Deep Monitoring Well Location (Incomplete)
- (23.5) Total Volatile Organic Compound (VOC) Concentration
- ND Not Detected At Or Above The Method Detection Limit

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Author	Drawing	Layers	Date	Title
EVC	41076-t	0,1,6	7-25-94	Intermediate Total VOCs Concentration Map
Job No.	**Revision**	**Figure**	**Scale**	**Project**
4107601	10-18-94	6	1" = 100'	Keebler Site Raleigh, North Carolina

Table 1. Monitoring Well Reference Point and Ground Water Elevations, Keebler Company Facility, Raleigh, North Carolina.

Monitoring Well	Reference Point Elevation	Water Level Measurement (October 11, 1994)	Water Level Elevation
MW-1s	95.29	16.98	78.31
MW-1i	95.17	16.16	79.01
MW-2s	99.24	14.57	84.67
MW-2i	98.47 98.47	14.08 13.90[a]	84.39 84.57[a]
MW-2d	well incomplete	Dry @ 80'	--
MW-3s	98.84	12.55	86.29
MW-4s	99.98	11.02	88.96
MW-5s	93.99	15.02	78.97
MW-6s	99.80	17.21	82.59
MW-6i	99.80 99.80	15.74 15.51[a]	84.06 84.29[a]
MW-7s	99.88	14.87	85.01
MW-7i	99.76 99.76	15.16 15.11[a]	84.60 84.65[a]

All units in feet referenced to temporary site benchmark at assumed elevation of 100.00 feet
[a] *Measured on October 17, 1994*

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410791

Table 2. October 4, 1994, Ground Water Analytical Results, Keebler Company Facility, Raleigh, North Carolina.

Parameter	Sample ID					
	MW-1s	MW-1i	MW-6s	MW-6i	MW-7s	MW-7i
Purgeable Halocarbons (EPA Method 601)						
1,1,1-Trichloroethane (1,1,1-TCA)	ND	ND	1.7	1.6	16	230[a]
1,1,2-Trichloroethene (TCE)	ND	ND	27[a]	4.4[a]	ND	11[a]
1,1-Dichloroethane (1,1-DCA)	ND	ND	4.8	ND	2.8	9.5
1,1-Dichloroethene (1,1-DCE)	ND	ND	23[a]	12[a]	89[a]	640[a]
1,2-Dichloroethane (1,2-DCA)	ND	ND	ND	ND	ND	5[a]
1,2-Dichloropropane	ND	ND	ND	ND	ND	7.4[a]
Chloroform	ND	ND	0.6	ND	0.8[a]	4.8[a]
Dichloromethane[b]	ND	ND	ND	ND	1.1	15[a]
Tetrachloroethene (PCE)	ND	ND	13[a]	5.5[a]	120[a]	6,100[a]
Total	**ND**	**ND**	**70.1**	**23.5**	**229.7**	**7,022.7**
Total Metals (Standard Preparation Method 3030C)						
Chromium	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Lead	38[a]	11	23[a]	103[a]	21[a]	19[a]
Nickel	ND	ND	16	ND	ND	ND

All units in µg/kg (parts per billion)
ND = Not detected at or above the method detection limit
[a] *Concentration exceeds T15A NCAC 02L Groundwater Quality Standards; see Table 3*
[b] *Dichloromethane is a possible laboratory contaminant*

Aquaterra Job No. 4107601
410791

Table 3. **North Carolina Groundwater Quality Standards, Keebler Company Facility, Raleigh, North Carolina.**

Compound	T15A NCAC 02L Groundwater Quality Standard
1,1,1-Trichloroethane (1,1,1-TCA)	200
1,1,2-Trichloroethene (TCE)	2.8
1,1-Dichloroethane (1,1-DCA)	700
1,1-Dichloroethene (1,1-DCE)	7.0
1,2-Dichloroethane (1,2-DCA)	0.38
1,2-Dichloropropane	0.56
Chloroform	0.19
Dichloromethane	5.0
Tetrachloroethene (PCE)	0.7
Lead	15
Nickel	100

All units in parts per billion

Aquaterra Job No. 4107601
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Boring /Well Construction Log

Well Construction Permit Number *NA*

Aquaterra, Inc.

I. D. Number	*MW - 1i*			Purpose	*Ground Water Monitoring*
Project Name	*Keebler Company - Raleigh*			Contractor	*Bore & Core, Inc.*
Project No.	*4107601*			Registration No.	*763*
Geologist	*Tom Taylor*			Driller	*Tony Debetsky*
Start Date	*9/26/94*	Complete Date	*9/27/94*	Equipment	*CME-75*

Drilling Method	*4 1/4" ID hollow stem augers to refusal at 32.5'; 4" air hammer to*
Comments	*42.5'; very high flow of water during drilling; install 5' screen with*
	filter sock (no sand pack) to 42.5'; time release bentonite placed in
	top of sock above screen with hose clamps. No split-spoon samples
	taken.

Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	*8" / 4"*	*0' - 3"*	*Topsoil*	
Riser Type	*PVC*	*3" - 11'*	*Dark gray slightly clayey silty micaceous fine*	
Diameter	*2"*		*fine to medium sand - possible fill*	
Screen Type	*PVC*	*11' - 15'*	*Gray slightly clayey silty micaceous fine to medium*	
Diameter	*2"*	-	*SAND (SM)*	
Riser Interval	*0' - 37.5'*	*15' - 16'*	*Gray slightly clayey silty micaceous fine to medium*	
Screen Interval	*37.5' - 42.5'*	-	*SAND (SM) with rock fragments*	
Slot Size	*0.010"*	*16' - 25'*	*Greenish gray silty CLAY (CL) with minor organic*	
Grout Type	*Portland #1*	-	*debris (very stiff)*	
Interval	*0' - 33'*	*25' - 32.5'*	*Silty fine to medium micaceous SAND (SM) with*	
Bentonite Type	*Time Release*	-	*rock fragments*	
Interval	*33' - 37.5'*	*32.5' - 42.5'*	*Gneissic bedrock (fracture noted from 38.8' to*	
Filter Pack	*Screen Sock*	-	*40.0')*	
Interval	*37.5' - 42.5'*	-		
Total Depth	*42.5'*	-	*Auger refusal @ 32.5'*	
R.P. Elevation	*95.17'*	-	*Boring terminated @ 42.5'*	
Datum	*TBM*	-		
Water Level Information		-		
Date	**W.L. Below R.P.**	-		
10/11/94	*16.16'*	-		
		-		
		-		

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Style 2.

Boring /Well Construction Log

Well Construction Permit Number *NA* *Aquaterra, Inc.*

I. D. Number	*MW - 6s*			Purpose	*Ground Water Monitoring*
Project Name	*Keebler Company - Raleigh*			Contractor	*Bore & Core, Inc.*
Project No.	*4107601*			Registration No.	*763*
Geologist	*Dave Stewart*			Driller	*Robert Cassell*
Start Date	*10/2/94*	Complete Date	*10/2/94*	Equipment	*Mobile B-53 ATV*

Drilling Method	*4 1/4" ID hollow stem augers.*
Comments	*No split-spoon samples taken; well installed inside warehouse.*

Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	*8"*	*0' - 7"*	*Concrete Slab*	
Riser Type	*PVC*	*7" - 1'*	*Gravel Subbase*	
Diameter	*2"*	*1' - 15'*	*Reddish-brown fine sandy silt - Probable Fill*	
Screen Type	*PVC*	*15' - 23'*	*Gray silty fine SAND (SM)*	
Diameter	*2"*	-		
Riser Interval	*0' - 13'*	-		
Screen Interval	*13' - 23'*	-	*Boring terminated @ 23'*	
Slot Size	*0.010"*	-		
Grout Type	*Portland #1*	-		
Interval	*0' - 9'*	-		
Bentonite Type	*Pellets*	-		
Interval	*9' - 11'*	-		
Filter Pack	*Coarse Sand*	-		
Interval	*11' - 23'*	-		
Total Depth	*23'*	-		
R.P. Elevation	*99.80'*	-		
Datum	*TBM*	-		
Water Level Information		-		
Date	**W.L. Below R.P.**	-		
10/11/94	~~*82.59'*~~ 17.21	-		
		-		
		-		

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Style 2.

Boring /Well Construction Log

Well Construction Permit Number *NA* *Aquaterra, Inc.*

I. D. Number	*MW - 6i*			Purpose	*Ground Water Monitoring*
Project Name	*Keebler Company - Raleigh*			Contractor	*Bore & Core, Inc.*
Project No.	*4107601*			Registration No.	*763*
Geologist	*Tom Taylor/Dave Stewart*			Driller	*Tony Debetsky*
Start Date	*9/27/94*	Complete Date	*10/2/94*	Equipment	*Mobile B-53 ATV*

Drilling Method	*4 1/4" ID hollow stem augers to refusal at 51'; 4" air hammer to*
Comments	*58'; well installed inside warehouse; 5' screen with filter sock (no*
	sand pack); time release bentonite placed in top of sock above
	screen with hose clamps. No split-spoon samples taken.

Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	*8" / 4"*	*0' - 7"*	*Concrete slab*	
Riser Type	*PVC*	*7" - 1'*	*Gravel subbase*	
Diameter	*2"*	*1' - 15'*	*Reddish-brown fine sandy silt - probable fill*	
Screen Type	*PVC*	*15' - 28.5'*	*Gray silty fine SAND (SM)*	
Diameter	*2"*	*28.5' - 51'*	*Layers of weathered rock and clayey fine to*	
Riser Interval	*0' - 53'*	-	*medium sand*	
Screen Interval	*53' - 58'*	*51' - 58'*	*Competent gneissic bedrock (4" fracture noted*	
Slot Size	*0.010"*	-	*at about 53')*	
Grout Type	*Portland #1*	-		
Interval	*0' - 51'*	-		
Bentonite Type	*Time Release*	-	*Auger refusal @ 51'*	
Interval	*51' - 53'*	-	*Boring terminated @ 58'*	
Filter Pack	*Screen Sock*	-		
Interval	*53' - 58'*	-		
Total Depth	*58'*	-		
R.P. Elevation	*99.80'*	-		
Datum	*TBM*	-		
Water Level Information		-		
Date	**W.L. Below R.P.**	-		
10/11/94	*15.74'*	-		
		-		
		-		

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Style 2.

Boring /Well Construction Log

Well Construction Permit Number *NA*

Aquaterra, Inc.

I. D. Number	*MW - 7s*			Purpose	*Ground Water Monitoring*
Project Name	*Keebler Company - Raleigh*			Contractor	*Bore & Core, Inc.*
Project No.	*4107601*			Registration No.	*763*
Geologist	*Dave Stewart*			Driller	*Robert Cassell*
Start Date	*10/3/94*	Complete Date	*10/3/94*	Equipment	*CME-45 ATV*

Drilling Method	*4 1/4" ID hollow stem augers.*
Comments	*No split-spoon samples taken; well installed inside plant building.*

Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	*8"*	*0' - 7"*	*Concrete slab*	
Riser Type	*PVC*	*7" - 1'*	*Gravel Subbase*	
Diameter	*2"*	*1' - 7'*	*Reddish-brown to dark brown slightly clayey*	
Screen Type	*PVC*	-	*silt with wood debris - probable fill*	
Diameter	*2"*	*7' - 12'*	*Reddish-brown fine sandy clayey micaceous SILT*	
Riser Interval	*0' - 13'*	-	*(ML) - possible fill*	
Screen Interval	*13' - 23'*	*12' - 23'*	*Orange-brown fine sandy SILT (ML)*	
Slot Size	*0.010"*	-		
Grout Type	*Portland #1*	-		
Interval	*0' - 9'*	-		
Bentonite Type	*Pellets*	-	*Boring terminated @ 23'*	
Interval	*9' - 11'*	-		
Filter Pack	*Coarse Sand*	-		
Interval	*11' - 23'*	-		
Total Depth	*23'*	-		
R.P. Elevation	*99.88'*	-		
Datum	*TBM*	-		
Water Level Information		-		
Date	**W.L. Below R.P.**	-		
10/11/94	*14.87'*	-		
		-		
		-		

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Style 2.

Boring /Well Construction Log

Well Construction Permit Number *NA* ***Aquaterra, Inc.***

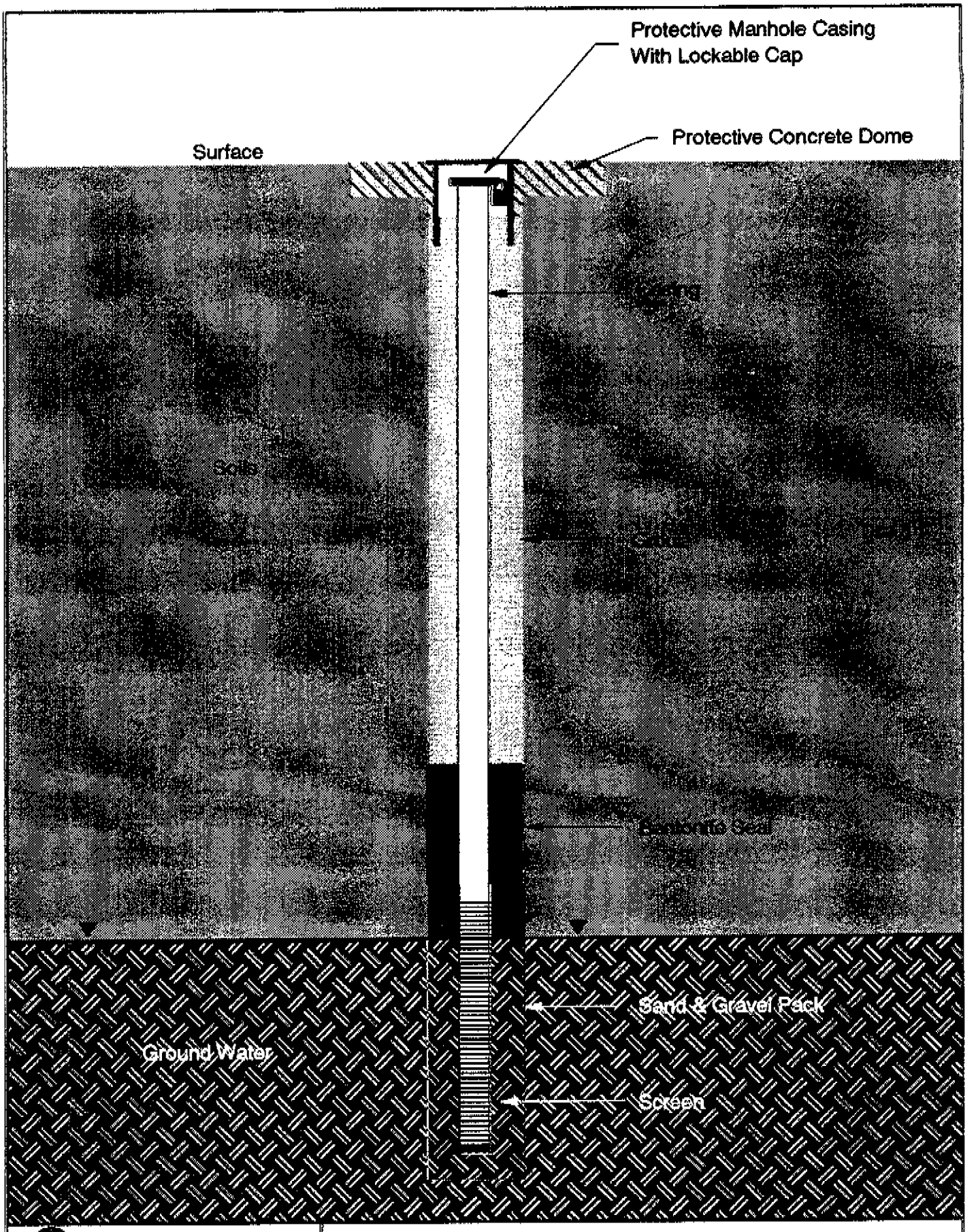
I. D. Number	*MW - 7i*			Purpose	*Ground Water Monitoring*
Project Name	*Keebler Company - Raleigh*			Contractor	*Bore & Core, Inc.*
Project No.	*4107601*			Registration No.	*763*
Geologist	*T. Taylor/M. Tischler/D. Stewart*			Driller	*Tony, Larry, Jim*
Start Date	*9/29/94*	Complete Date	*10/2/94*	Equipment	*CME-45 ATV*

Drilling Method	*4 1/4" ID hollow stem augers to refusal at 54'; core rock from 54'*
Comments	*to 73'; well installed inside plant building. 15' screen with filter sock*
	(no sand pack); time release bentonite placed in top of sock above
	screen with hose clamps. No split-spoon samples taken.

Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	*8" / 4"*	*0' - 7"*	*Concrete slab*	
Riser Type	*PVC*	*7" - 1'*	*Gravel subbase*	
Diameter	*2"*	*1' - 7'*	*Reddish-brown to dark brown slightly clayey*	
Screen Type	*PVC*	-	*silt with wood debris - probable fill*	
Diameter	*2"*	*7' - 12'*	*Reddish-brown fine sandy clayey micaceous SILT*	
Riser Interval	*0' - 58'*	-	*(ML) - possible fill*	
Screen Interval	*58' - 73'*	*12' - 25'*	*Orange-brown fine sandy SILT (ML)*	
Slot Size	*0.010"*	*25' - 54'*	*Layers of weathered rock and clayey fine to*	
Grout Type	*Portland #1*	-	*medium sandy silt*	
Interval	*0' - 56'*	*54' - 73'*	*Competent gneissic bedrock (few small seams*	
Bentonite Type	*Time Release*	-	*noted @ 69' and 71', 1/2" each)*	
Interval	*56' - 58'*	-		
Filter Pack	*Screen Sock*	-		
Interval	*58' - 73'*	-		
Total Depth	*73'*	-	*Auger refusal @ 54'*	
R.P. Elevation	*99.76'*	-	*Boring terminated @ 73'*	
Datum	*TBM*	-		
Water Level Information		-		
Date	**W.L. Below R.P.**	-		
10/11/94	*15.16'*	-		
		-		
		-		

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Style 2.



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A GREAT LAKES CHEMICAL CORPORATION COMPANY

Style 2

Standard Type II Belowgrade Monitoring
Well Construction Schematic

North Carolina Department of Environmental, Health & Natural Resources
Division of Environmental Management- Groundwater Section
P.O. Box 27687-Raleigh, N.C. 27611-7587

For Office Use Only	
Quad. No.	Serial No.
Lat.	Long. / Pc
Minor Basin	
Basin Code	
Header Ent.	GW-1 Ent.

WELL CONSTRUCTION RECORD

1. Well Identification: MW-1i

Drilling Contractor: BORE & CORE, INC.
Driller Registration Number: 763

State Well Construction Permit Number: NA

2. Well Location: (Show sketch of the location below)
Nearest Town: RALEIGH, NC
County: WAKE
2900 WAKE FOREST RD.
(Road, Community, or Subdivision and Lot No.)

3. Owner: KEESLER COMPANY
Address: ONE HOLLOW TREE LN.
(Street or Route No.)
ELMHURST IL 60126
City State Zip Code

4. Date Drilled: 9-27-94 Use of Well: Monitoring
5. Total Depth: 42.5' Cuttings Collected: No
Does Well Replace Existing Well: No
6. Static Water Level: 16.16 Feet Below Top Of Casing
Top of Casing: 0 Feet Above Land Surface
7. Yield (gpm): NA Test Method
8. Water Zones: (depth)
9. Chlorination: NA Amount

Depth From	Depth To	Drill Log Formation Description
0	3"	TOPSOIL
3"	11'	DARK GRAY SLIGHTLY CLAYEY MICACEOUS FINE TO MEDIUM SAND - POSSIBLE FILL
11'	15'	GRAY SLIGHTLY CLAYEY SILTY MICACEOUS FINE TO MEDIUM SAND (SM)
15'	16'	GRAY SLIGHTLY CLAYEY SILTY MICACEOUS FINE TO MEDIUM SAND (SM) W/ ROCK FRAGMENTS
16'	25'	GREENISH-GRAY SILTY CLAY (CL) W/ MINOR ORGANIC DEBRIS (VERY STIFF)
25'	32.5'	SILTY FINE TO MEDIUM MICACEOUS SAND (SM) W/ ROCK FRAGMENTS
32.5'	42.5'	GNEISSIC BEDROCK (FRACTURE NOTED FROM 38.8' - 40.0')

If additional space is needed, use back of form.

10. Casing:

Depth (ft.) From	To	Diameter	Wall Thickness	Material
0	37.5'	2"	Sch 40	PVC

11. Grout:

Depth (ft.) From	To	Material	Method
0	33'	PORTLAND	TREMIE
33'	37.5'	Bentonite (TIME RELEASE)	PLACED IN SCREEN SOCK

12. Screen:

Depth (ft.) From	To	Diameter	Slot Size	Material
37.5'	42.5'	2"	0.010"	PVC

13. Gravel Pack:

Depth (ft.) From	To	Size	Material
37.5'	42.5'	NONE	SCREEN SOCK

Location Sketch
(Show direction & distance from at least two State Roads, or other map reference points.)

(SEE REVERSE)

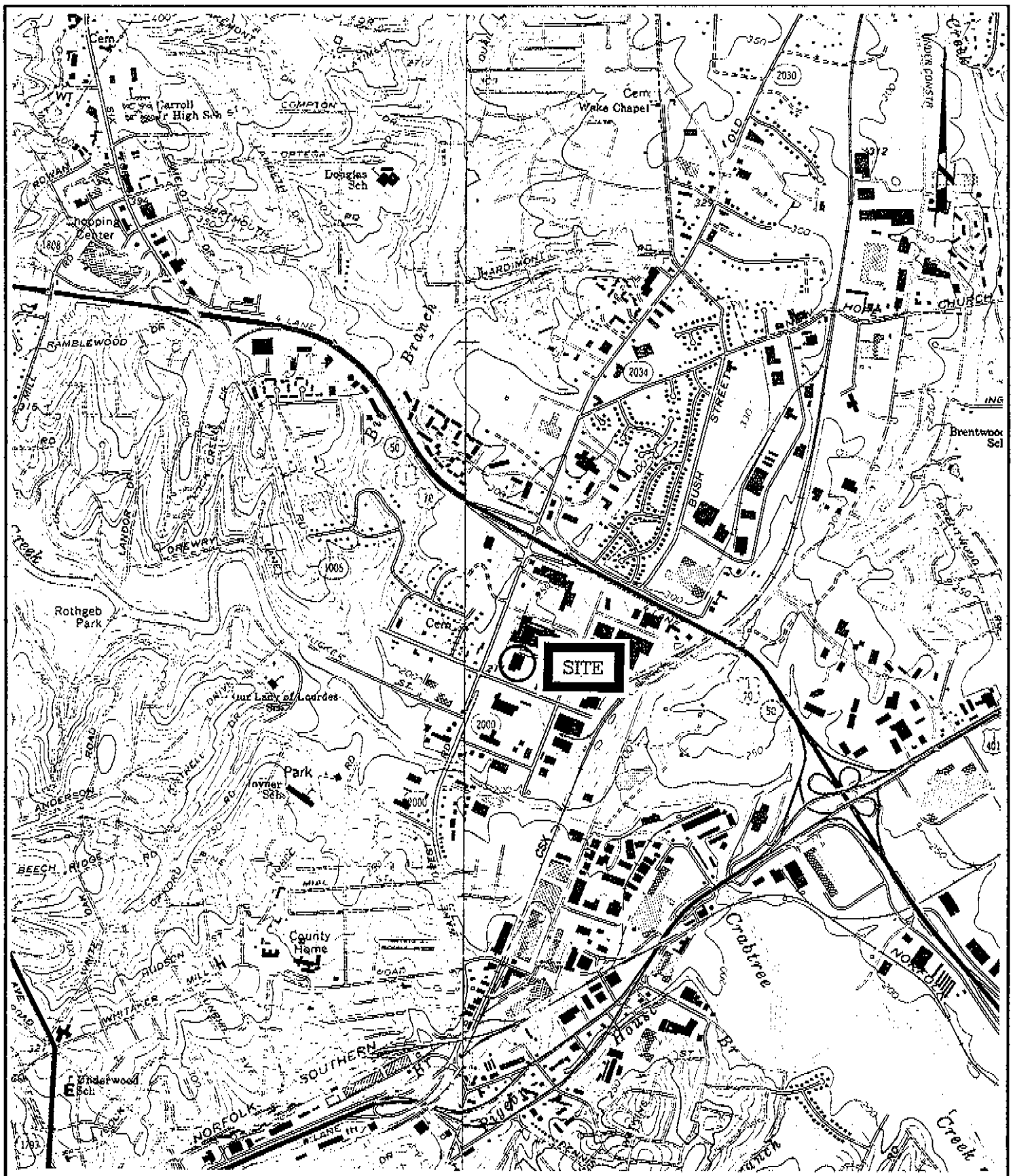
14. Remarks:

I do hereby certify that this well was constructed in accordance with 15 NCAC 2C, well construction standards, and that a copy of this record has been provided to the well owner.

Signature of Contractor or Agent: [signature] Date: 10-18-94

GW-1 Revised 2/90

Submit original to Division of Environmental Management & copy to well owner.



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A GREAT LAKES CHEMICAL CORPORATION COMPANY

Author	Drawing	Layers	Date	Title
			7-28-94	Site Location Map
Job No.	**Revision**	**Figure**	**Scale**	**Project**
4106300		1	1" = 2000'	Keebler Site Raleigh, North Carolina

North Carolina Department of Environmental, Health & Natural Resources
Division of Environmental Management- Groundwater Section
P.O. Box 27687-Raleigh, N.C. 27611-7587

For Office Use Only	
Quad. No.	Serial No.
Lat.	Long. Pc
Minor Basin	
Basin Code	
Header Ent.	GW-1 Ent.

WELL CONSTRUCTION RECORD

1. Well Identification: MW-6S

Drilling Contractor: Bore & Core, Inc.
Driller Registration Number: 763

State Well Construction Permit Number: NA

Well Location: (Show sketch of the location below)
Nearest Town: Raleigh, North Carolina
County: Wake
2900 WAKE FOREST RD.
(Road, Community, or Subdivision and Lot No.)

2. Owner: Keebler Company
Address: One Hollow Tree Lane
(Street or Route No.)
Elmhurst (City) IL (State) 60126 (Zip Code)

3. Date Drilled: 10/2/94 Use of Well: Monitoring
4. Total Depth: 23' Cuttings Collected: No
5. Does Well Replace Existing Well: No
6. Static Water Level: ~~22.37~~ 17.21 Feet Below Top Of Casing
Top of Casing: NA Feet Above Land Surface
7. Yield (gpm): NA Test Method
8. Water Zones: (depth)
9. Chlorination: NA Amount

Depth From	Depth To	Drill Log Formation Description
0'	7"	Concrete Slab
7"	1'	Gravel Subbase
1'	15'	Reddish-brown fine sandy silt - probable fill
15'	23'	Gray silty fine SAND (SM)
		Boring terminated @ 23'

If additional space is needed, use back of form.

10. Casing:

Depth (ft.) From	To	Diameter	Wall Thickness	Material
0'	13'	2"	Sch 40	PVC

Location Sketch
(Show direction & distance from at least two State Roads, or other map reference points.)

11. Grout:

Depth (ft.) From	To	Material	Method
0'	9'	Portland I	~~Mixture~~ Pour
9'	11'	Bentonite	Pour

(SEE REVERSE)

12. Screen:

Depth (ft.) From	To	Diameter	Slot Size	Material
13'	23'	2"	0.010"	PVC

13. Gravel Pack:

Depth (ft.) From	To	Size	Material
11'	23'		Coarse Sand

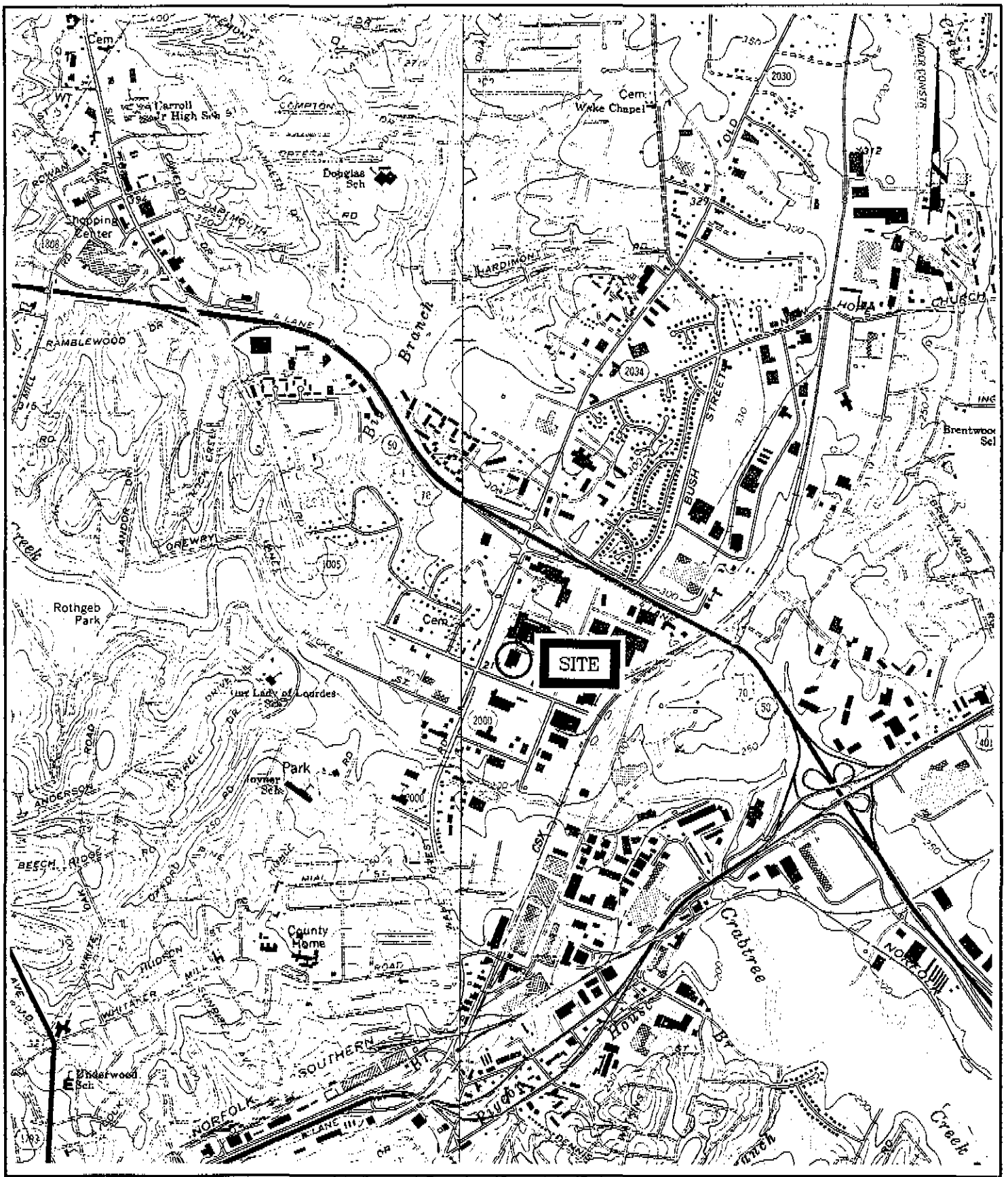
14. Remarks:

I do hereby certify that this well was constructed in accordance with 15 NCAC 2C, well construction standards, and that a copy of this record has been provided to the well owner.

Signature of Contractor or Agent: [signature] Date: 10-18-94

GW-1 Revised 2/90

Submit original to Division of Environmental Management & copy to well owner.



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A GREAT LAKES CHEMICAL CORPORATION COMPANY

Author	Drawing	Layers	Date	Title
			7-28-94	Site Location Map
Job No.	Revision	Figure	Scale	Project
4106300		1	1" = 2000'	Keebler Site Raleigh, North Carolina

North Carolina Department of Environmental, Health & Natural Resources
Division of Environmental Management- Groundwater Section
P.O. Box 27687-Raleigh, N.C. 27611-7587

For Office Use Only	
Quad. No.	Serial No.
Lat.	Long. Pc
Minor Basin	
Basin Code	
Header Ent.	GW-1 Ent.

WELL CONSTRUCTION RECORD

Well Identification: HW-6i

Drilling Contractor: BORE & CORE, INC.
Driller Registration Number: 763

State Well Construction Permit Number: NA

1. Well Location: (Show sketch of the location below)
Nearest Town: RALEIGH, NC
County: WAKE
2900 WAKE FOREST RD.
(Road, Community, or Subdivision and Lot No.)

Owner: KEEBLER COMPANY
Address: ONE HOLLOW TREE LN.
(Street or Route No.)
ELMHURST IL 60126
City State Zip Code

3. Date Drilled: 10-2-94 Use of Well: Monitoring
Total Depth: 58' Cuttings Collected: No
Does Well Replace Existing Well: No
6. Static Water Level: 15.74 Feet Below Top Of Casing
Top of Casing: 0 Feet Above Land Surface
7. Yield (gpm): NA Test Method
8. Water Zones: (depth)
Chlorination: NA Amount

Depth From	Depth To	Drill Log Formation Description
0	7"	CONCRETE SLAB
7"	1'	GRAVEL SUBBASE
1'	15'	REDDISH-BROWN FINE SANDY SILT - PROBABLE FILL
15'	28.5'	GRAY SILTY FINE SAND (SM)
28.5'	51'	LAYERS OF WEATHERED ROCK AND CLAYEY FINE TO MEDIUM SAND
51'	58'	COMPETENT GNEISSIC BEDROCK (4" FRACTURE NOTED AT ~ 53')

If additional space is needed, use back of form.

9. Casing:
Depth (ft.)

From	To	Diameter	Wall Thickness	Material
0	53'	2"	Sch 40	PVC

Location Sketch
(Show direction & distance from at least two State Roads, or other map reference points.)

(SEE REVERSE)

11. Grout:
Depth (ft.)

From	To	Material	Method
0	51'	PORTLAND	TREMIE
51'	53'	Bentonite (TIME RELEASE)	PLACED IN SCREEN SOCK

12. Screen:
Depth (ft.)

From	To	Diameter	Slot Size	Material
53'	58'	2"	0.010"	PVC

13. Gravel Pack:
Depth (ft.)

From	To	Size	Material
53'	58'	NONE	SCREEN SOCK

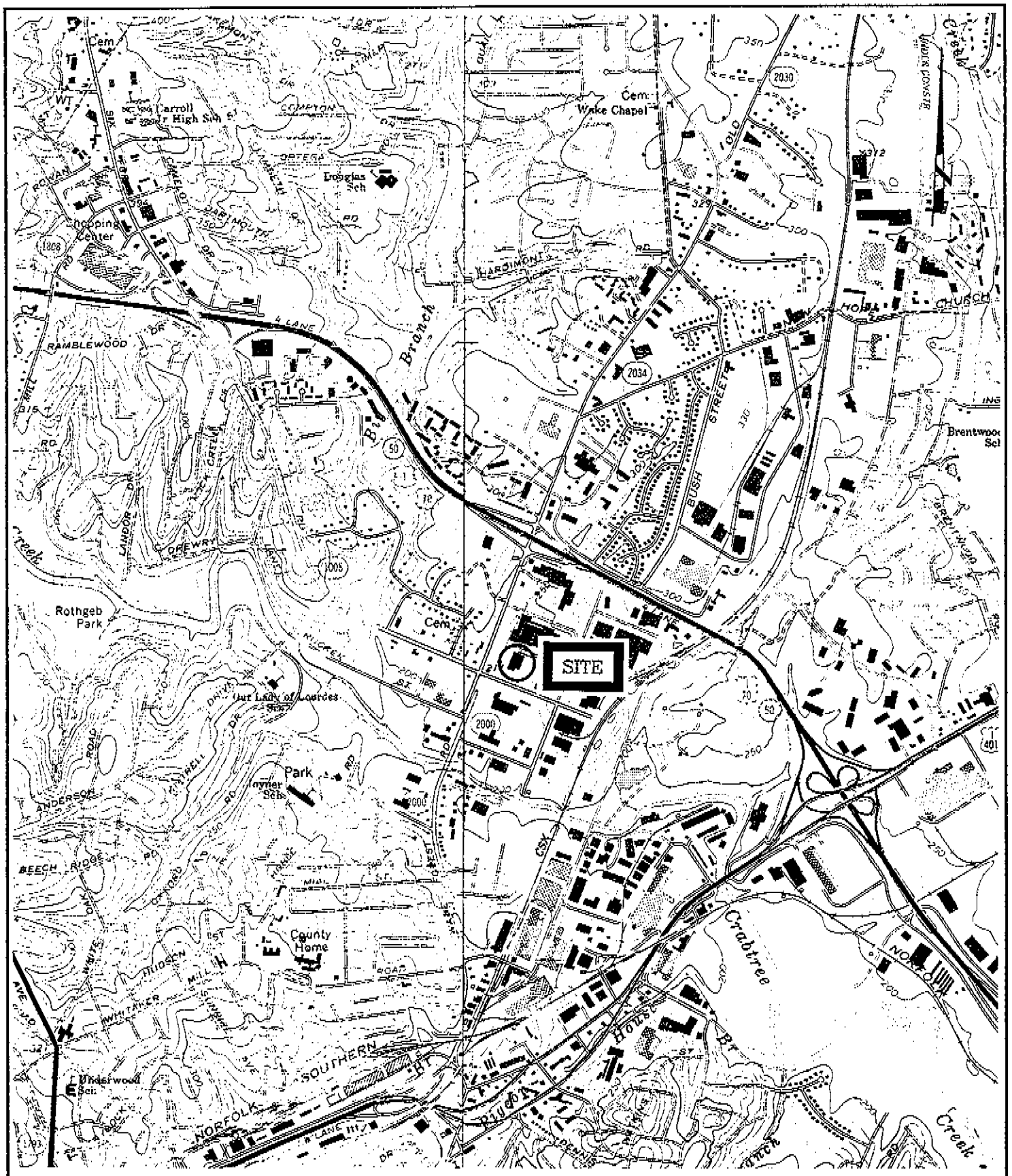
14. Remarks:

I do hereby certify that this well was constructed in accordance with 15 NCAC 2C, well construction standards, and that a copy of this record has been provided to the well owner.

Signature of Contractor or Agent: [signature] Date: 10-18-94

GW-1 Revised 2/90

Submit original to Division of Environmental Management & copy to well owner.



	Author	Drawing	Layers	Date 7-28-94	Title Site Location Map
aquaterra ▲ GREAT LAKES CHEMICAL CORPORATION COMPANY	Job No. 4106300	Revision	Figure 1	Scale 1" = 2000'	Project Keebler Site Raleigh, North Carolina

North Carolina Department of Environmental, Health & Natural Resources
Division of Environmental Management- Groundwater Section
P.O. Box 27687-Raleigh, N.C. 27611-7587

For Office Use Only	
Quad. No.	Serial No.
Lat.	Long. Pc
Minor Basin	
Basin Code	
Header Ent.	GW-1 Ent.

WELL CONSTRUCTION RECORD

1. Well Identification: MW-7s

Drilling Contractor: Bore & Core, Inc.
Driller Registration Number: 763

State Well Construction Permit Number: NA

2. Well Location: (Show sketch of the location below)
Nearest Town: Raleigh North Carolina
2900 WAKE FOREST RD.
(Road, Community, or Subdivision and Lot No.)

County: Wake

Owner: Keebler Company
Address: One Hollow Tree Lane
(Street or Route No.)
Elmhurst IL 60126
City State Zip Code

3. Date Drilled: 10/3/94 Use of Well: Monitoring
4. Total Depth: 23' Cuttings Collected: No
5. Does Well Replace Existing Well: No
6. Static Water Level: 14.87' Feet Below Top Of Casing
Top of Casing: NA Feet Above Land Surface
7. Yield (gpm): NA Test Method
8. Water Zones: (depth)
9. Chlorination: NA Amount

Depth From	Depth To	Drill Log Formation Description
0	7"	Concrete Slab
7"	1'	Gravel subbase
1'	7'	Reddish-brown to dark brown slightly clayey silt with wood debris - probable fill
7'	12'	Reddish-brown fine sandy clayey micaceous SILT (ML) - possible fill
12'	23'	Orange-brown fine sandy SILT (ML)
		Boring terminated @ 23'

If additional space is needed, use back of form.

10. Casing:

Depth (ft.) From	To	Diameter	Wall Thickness	Material
0'	13'	2"	Sch 40	PVC

11. Grout:

Depth (ft.) From	To	Material	Method
0'	9'	Portland I	Pour
9'	11'	Bentonite	Pour

12. Screen:

Depth (ft.) From	To	Diameter	Slot Size	Material
13'	23'	2"	0.010"	PVC

13. Gravel Pack:

Depth (ft.) From	To	Size	Material
11'	23'		Coarse Sand

Location Sketch
(Show direction & distance from at least two State Roads, or other map reference points.)

(SEE REVERSE)

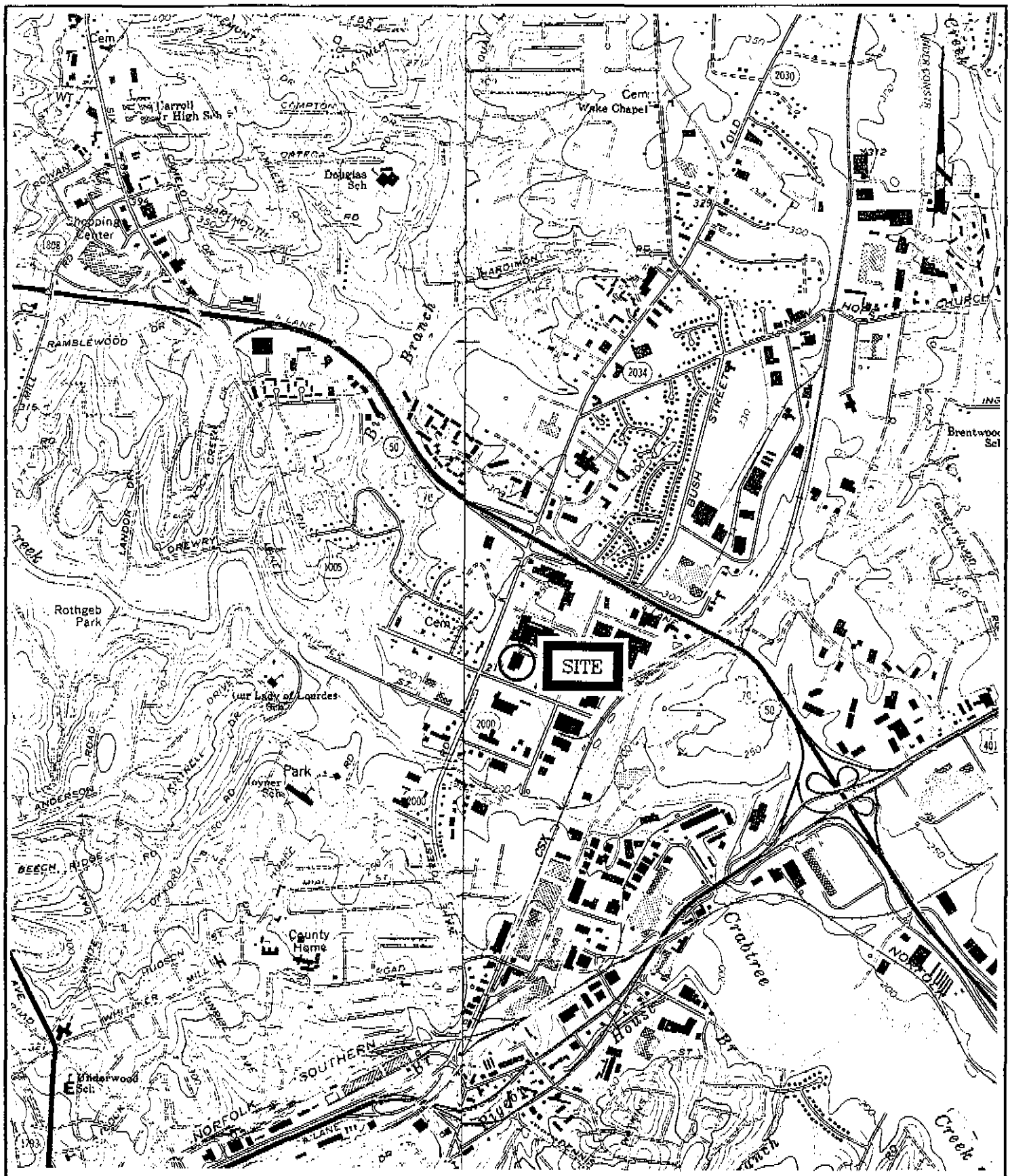
14. Remarks:

I do hereby certify that this well was constructed in accordance with 15 NCAC 2C, well construction standards, and that a copy of this record has been provided to the well owner.

Signature of Contractor or Agent: Thomas L. Ton Date: 10-18-94

GW-1 Revised 2/90

Submit original to Division of Environmental Management & copy to well owner.



	Author	Drawing	Layers	Date	Title
aquaterra				7-28-94	Site Location Map
A GREAT LAKES CHEMICAL CORPORATION COMPANY	Job No. 4106300	Revision	Figure 1	Scale 1" = 2000'	Project Keebler Site Raleigh, North Carolina

North Carolina Department of Environmental, Health & Natural Resources
Division of Environmental Management- Groundwater Section
P.O. Box 27687-Raleigh, N.C. 27611-7587

For Office Use Only	
Quad. No.	Serial No.
Lat.	Long. Pc
Minor Basin	
Basin Code	
Header Ent.	GW-1 Ent.

WELL CONSTRUCTION RECORD

Well Identification: MW-7i

Drilling Contractor: BORE & CORE, INC.
Driller Registration Number: 763

State Well Construction Permit Number: NA

1. Well Location: (Show sketch of the location below)
Nearest Town: RALEIGH, NC
County: WAKE
2900 WAKE FOREST RD.
(Road, Community, or Subdivision and Lot No.)

Owner: KEEBLER COMPANY
Address: ONE HOLLOW TREE LN.
(Street or Route No.)
ELMHURST IL 60126
City State Zip Code

3. Date Drilled: 10-2-94 Use of Well: Monitoring
4. Total Depth: 73' Cuttings Collected: No
5. Does Well Replace Existing Well: No
6. Static Water Level: 15.16' Feet Below Top Of Casing
Top of Casing: 0 Feet Above Land Surface
7. Yield (gpm): NA Test Method
8. Water Zones: (depth)
Chlorination: NA Amount

Depth From	Depth To	Drill Log Formation Description
0	7"	CONCRETE SLAB
7"	1'	GRAVEL SUBBASE
1'	7'	REDDISH-BROWN TO DARK BROWN SLIGHTLY CLAYEY SILT W/ WOOD DEBRIS - PROBABLE FILL
7'	12'	REDDISH-BROWN FINE SANDY CLAYEY MICACEOUS SILT (ML) - POSSIBLE FILL
12'	25'	ORANGE-BROWN FINE SANDY SILT (ML)
25'	54'	LAYERS OF WEATHERED ROCK & CLAYEY FINE TO MEDIUM SANDY SILT
54'	73'	COMPETENT GNEISSIC BEDROCK (FEW SHALE SEAMS NOTED @ 69' & 71')

If additional space is needed, use back of form.

9. Casing:

Depth (ft.) From	To	Diameter	Wall Thickness	Material
0	58'	2"	Sch 40	PVC

10. Grout:

Depth (ft.) From	To	Material	Method
0	56'	PORTLAND	TREMIE
56'	58'	Bentonite (TIME RELEASE)	PLACED IN SCREEN SOCK

11. Screen:

Depth (ft.) From	To	Diameter	Slot Size	Material
58'	73'	2	0.010"	PVC

12. Gravel Pack:

Depth (ft.) From	To	Size	Material
58'	73'	NONE	SCREEN SOCK

Location Sketch
(Show direction & distance from at least two State Roads, or other map reference points.)

(SEE REVERSE)

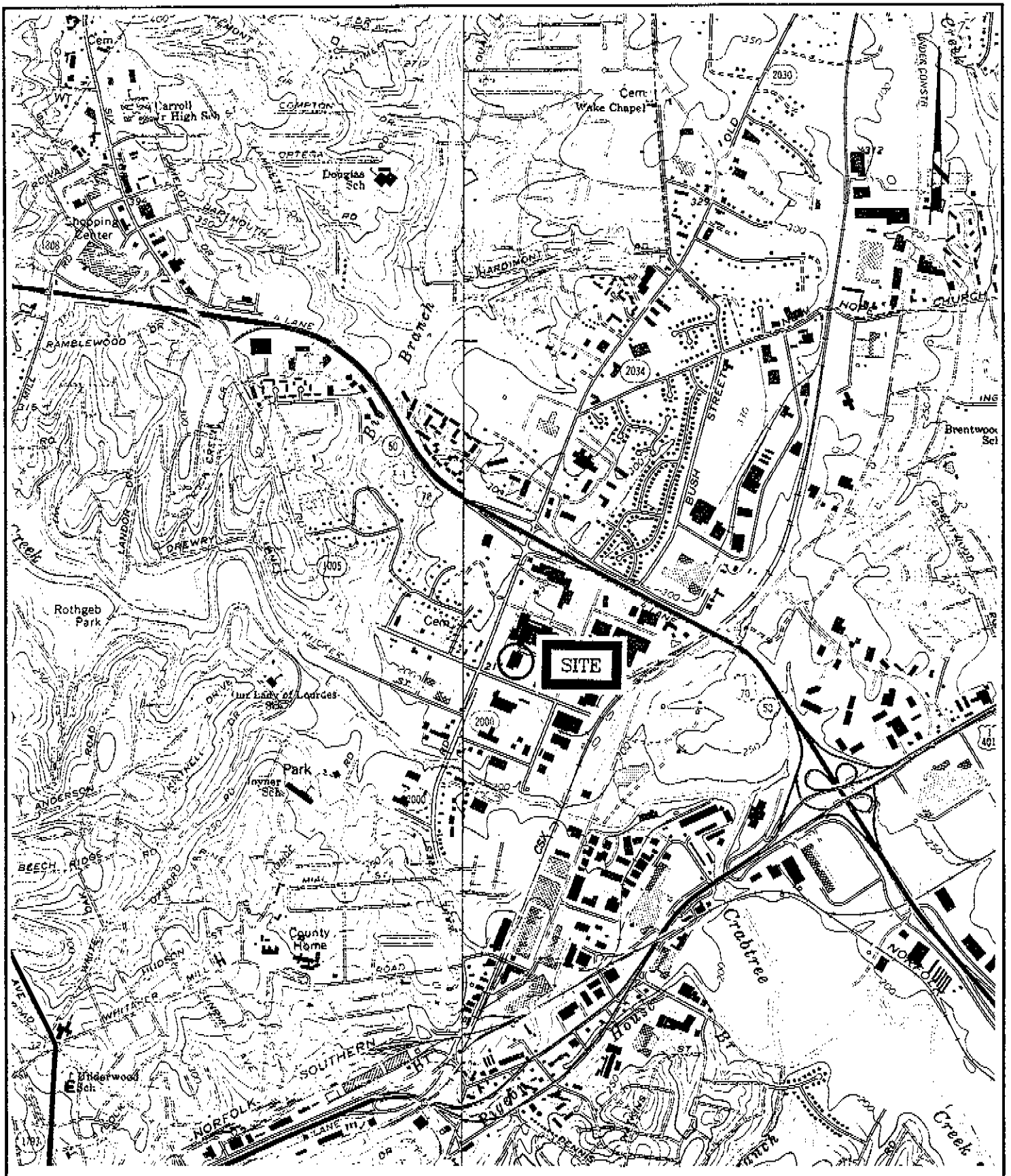
14. Remarks:

I do hereby certify that this well was constructed in accordance with 15 NCAC 2C, well construction standards, and that a copy of this record has been provided to the well owner.

Signature of Contractor or Agent: [signature] Date: 10-18-94

GW-1 Revised 2/90

Submit original to Division of Environmental Management & copy to well owner.



	Author	Drawing	Layers	Date	Title
aquaterra A GREAT LAKES CHEMICAL CORPORATION COMPANY				7-28-94	Site Location Map
	Job No. 4106300	Revision	Figure 1	Scale 1" = 2000'	Project Keebler Site Raleigh, North Carolina

Monitoring Well Installation

Monitoring wells are installed in both unconsolidated and consolidated formations to provide secure sampling points for discrete intervals within confined or unconfined aquifers or hydrostratigraphic units. Following drilling activities, typically 2 or 4-inch diameter PVC, or other material, monitoring well screen and casing is placed in the boring in accordance with the standards specified in the *RCRA Ground Water Monitoring Technical Enforcement Guidance Document.*

Well Construction

Once the boring is complete, a ground water monitoring well is constructed by installing a casing and screen to the desired depth. The annulus is typically backfilled to approximately 1 to 2 feet above the well screen with a sand pack selected based on the size of the formation material. A 1 to 2-foot bentonite seal is emplaced above the sand pack. The remaining annulus is then grouted to the surface with No. 1 Portland cement. The wellhead is secured with a watertight, lockable well cap and is protected by either a steel manhole cover (at grade) or steel casing (above grade). Refer to the well construction schematics for details of well construction.

Well Development

Monitoring wells are typically developed by using decontaminated Teflon bailers or new disposable bailers as surge blocks, by pumping, or by other acceptable well development procedures. Well development is performed to remove fines from the sand pack and well screen to minimize turbidity in samples and to improve the hydraulic connection between the well screen and the formation.

Surveying

Surveying is performed to determine the relative reference point elevation of the wells. Elevations are referenced to either the state grid system (mean sea level) or an assumed elevation at a temporary benchmark established on-site. Elevations are measured to the nearest 0.01 foot, and are used for creating ground water contour maps.

Ground Water Sampling

Field Parameters

Prior to ground water sample collection, the water level in each well is measured with a decontaminated electric water level probe. Water level measurements are used to create ground water contour maps (either water table or potentiometric) and to calculate well volumes. The wells are purged by removing three to five times the well volume, or until dry, with decontaminated Teflon bailers, new disposable bailers, or low-flow submersible pumps to remove stagnant water so that a representative ground water sample can be obtained. Depending on the site status, temperature, specific conductivity, and pH are measured and recorded in the field following removal of each volume of water. Samples are generally not collected until the field parameters stabilize within approximately 10% of each other.

Ground Water Sample Collection

Ground water samples are typically collected within 1 hour of purging to minimize the loss of any volatile organic compounds (VOCs) that may be present. Laboratory decontaminated bottom-valve Teflon bailers, new disposable bailers, or low-flow submersible pumps may used to withdraw the samples.

All ground water samples are decanted into laboratory provided containers appropriate for the parameters being analyzed, preserved as required by the analytical technique, and are labeled with the following information: sampler's name, date of collection, sample number, analysis to be performed, and project number. Samples are stored and transported to the analytical laboratory in an insulated cooler chilled to approximately 4°C. To ensure sample integrity, all samples are transported in accordance with EPA chain-of-custody protocols. All samples are typically transported to the laboratory within 24-hours of sample collection, if possible.

pace INCORPORATED
ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

RECEIVED
OCT. 7 1994

October 06, 1994

Mr. Tom Taylor
Aquaterra Environmental Consultants
PO Box 37579
4901 Waters Edge Dr.
Raleigh, NC 27627-7579

RE: PACE Project No. 641004.509
Client Reference: Keebler

Dear Mr. Taylor:

Enclosed is the report of laboratory analyses for samples received October 04, 1994.

Footnotes are given at the end of the report.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

Kris H. Kommalan

Kris H. Kommalan
Project Manager

Enclosures

9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
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FAX: 704-875-9091

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ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

Aquaterra Environmental Consultants
PO Box 37579
4901 Waters Edge Dr.
Raleigh, NC 27627-7579

October 06, 1994
PACE Project Number: 641004509

Attn: Mr. Tom Taylor

Client Reference: Keebler

PACE Sample Number:			92 0273044		
Date Collected:			10/04/94		
Date Received:			10/04/94		
Client Sample ID:			MW-1s		
Parameter	Units	MDL		METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Chromium	mg/L	0.010	ND	200.7	10/05/94
Copper	mg/L	0.010	ND	200.7	10/05/94
Lead W/3030C Digestion	mg/L	0.005	0.038	239.2	10/05/94
Nickel	mg/L	0.010	ND	249.2	10/05/94
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS				601	
1,1,1-Trichloroethane	ug/L	1.0	ND		10/05/94
1,1,2,2-Tetrachloroethane	ug/L	1.0	ND		10/05/94
1,1,2-Trichloroethane	ug/L	1.0	ND		10/05/94
1,1,2-Trichloroethene	ug/L	1.0	ND		10/05/94
1,1-Dichloroethane	ug/L	1.0	ND		10/05/94
1,1-Dichloroethene	ug/L	1.0	ND		10/05/94
1,2-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,3-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,4-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,2-Dichloroethane	ug/L	1.0	ND		10/05/94
1,2-Dichloropropane	ug/L	1.0	ND		10/05/94
2-Chloroethoxyethane	ug/L	1.0	ND		10/05/94
Bromodichlormethane	ug/L	0.5	ND		10/05/94
Dibromochloromethane	ug/L	0.5	ND		10/05/94
Bromoform	ug/L	0.5	ND		10/05/94
Bromomethane	ug/L	1.0	ND		10/05/94
cis-1,3-Dichloropropene	ug/L	1.0	ND		10/05/94
Carbon tetrachloride	ug/L	1.0	ND		10/05/94
Chloroform	ug/L	0.5	ND		10/05/94
Dichlorodifluoromethane	ug/L	1.0	ND		10/05/94
Trichlorofluoromethane	ug/L	1.0	ND		10/05/94

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REPORT OF LABORATORY ANALYSIS

Mr. Tom Taylor
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October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

PACE Sample Number:			92 0273044		
Date Collected:			10/04/94		
Date Received:			10/04/94		
Client Sample ID:			MW-1s		
Parameter	Units	MDL		METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS				601	
Chlorobenzene	ug/L	1.0	ND		10/05/94
Chloromethane	ug/L	1.0	ND		10/05/94
Chloroethane	ug/L	1.0	ND		10/05/94
Dichloromethane	ug/L	1.0	ND		10/05/94
trans-1,3-Dichloropropene	ug/L	1.0	ND		10/05/94
Tetrachloroethene	ug/L	1.0	ND		10/05/94
trans-1,2-Dichloroethene	ug/L	1.0	ND		10/05/94
Chloroethene (Vinyl chloride)	ug/L	1.0	ND		10/05/94

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REPORT OF LABORATORY ANALYSIS

Mr. Tom Taylor
Page 3

October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

PACE Sample Number:			92 0273052		
Date Collected:			10/04/94		
Date Received:			10/04/94		
Client Sample ID:			MW-1i		
Parameter	Units	MDL		METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Chromium	mg/L	0.010	ND	200.7	10/05/94
Copper	mg/L	0.010	ND	200.7	10/05/94
Lead W/3030C Digestion	mg/L	0.005	0.011	239.2	10/05/94
Nickel	mg/L	0.010	ND	249.2	10/05/94
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS				601	
1,1,1-Trichloroethane	ug/L	1.0	ND		10/05/94
1,1,2,2-Tetrachloroethane	ug/L	1.0	ND		10/05/94
1,1,2-Trichloroethane	ug/L	1.0	ND		10/05/94
1,1,2-Trichloroethene	ug/L	1.0	ND		10/05/94
1,1-Dichloroethane	ug/L	1.0	ND		10/05/94
1,1-Dichloroethene	ug/L	1.0	ND		10/05/94
1,2-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,3-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,4-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,2-Dichloroethane	ug/L	1.0	ND		10/05/94
1,2-Dichloropropane	ug/L	1.0	ND		10/05/94
2-Chloroethoxyethane	ug/L	1.0	ND		10/05/94
Bromodichlormethane	ug/L	0.5	ND		10/05/94
Dibromochloromethane	ug/L	0.5	ND		10/05/94
Bromoform	ug/L	0.5	ND		10/05/94
Bromomethane	ug/L	1.0	ND		10/05/94
cis-1,3-Dichloropropene	ug/L	1.0	ND		10/05/94
Carbon tetrachloride	ug/L	1.0	ND		10/05/94
Chloroform	ug/L	0.5	ND		10/05/94
Dichlorodifluoromethane	ug/L	1.0	ND		10/05/94
Trichlorofluoromethane	ug/L	1.0	ND		10/05/94
Chlorobenzene	ug/L	1.0	ND		10/05/94
Chloromethane	ug/L	1.0	ND		10/05/94
Chloroethane	ug/L	1.0	ND		10/05/94
Dichloromethane	ug/L	1.0	ND		10/05/94

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REPORT OF LABORATORY ANALYSIS

Mr. Tom Taylor
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October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

PACE Sample Number:			92 0273052		
Date Collected:			10/04/94		
Date Received:			10/04/94		
Client Sample ID:			MW-1i		
Parameter	Units	MDL		METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS				601	
trans-1,3-Dichloropropene	ug/L	1.0	ND		10/05/94
Tetrachloroethene	ug/L	1.0	ND		10/05/94
trans-1,2-Dichloroethene	ug/L	1.0	ND		10/05/94
Chloroethene (Vinyl chloride)	ug/L	1.0	ND		10/05/94

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Mr. Tom Taylor
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October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

PACE Sample Number:			92 0273060		
Date Collected:			10/04/94		
Date Received:			10/04/94		
Client Sample ID:			MW-6s		
Parameter	Units	MDL		METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Chromium	mg/L	0.010	ND	200.7	10/05/94
Copper	mg/L	0.010	ND	200.7	10/05/94
Lead W/3030C Digestion	mg/L	0.005	0.023	239.2	10/05/94
Nickel	mg/L	0.010	0.016	249.2	10/05/94
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS				601	
1,1,1-Trichloroethane	ug/L	1.0	1.7		10/05/94
1,1,2,2-Tetrachloroethane	ug/L	1.0	ND		10/05/94
1,1,2-Trichloroethane	ug/L	1.0	ND		10/05/94
1,1,2-Trichloroethene	ug/L	1.0	27		10/05/94
1,1-Dichloroethane	ug/L	1.0	4.8		10/05/94
1,1-Dichloroethene	ug/L	1.0	23		10/05/94
1,2-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,3-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,4-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,2-Dichloroethane	ug/L	1.0	ND		10/05/94
1,2-Dichloropropane	ug/L	1.0	ND		10/05/94
2-Chloroethoxyethane	ug/L	1.0	ND		10/05/94
Bromodichlormethane	ug/L	0.5	ND		10/05/94
Dibromochloromethane	ug/L	0.5	ND		10/05/94
Bromoform	ug/L	0.5	ND		10/05/94
Bromomethane	ug/L	1.0	ND		10/05/94
cis-1,3-Dichloropropene	ug/L	1.0	ND		10/05/94
Carbon tetrachloride	ug/L	1.0	ND		10/05/94
Chloroform	ug/L	0.5	0.6		10/05/94
Dichlorodifluoromethane	ug/L	1.0	ND		10/05/94
Trichlorofluoromethane	ug/L	1.0	ND		10/05/94
Chlorobenzene	ug/L	1.0	ND		10/05/94
Chloromethane	ug/L	1.0	ND		10/05/94
Chloroethane	ug/L	1.0	ND		10/05/94
Dichloromethane	ug/L	1.0	ND		10/05/94

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REPORT OF LABORATORY ANALYSIS

Mr. Tom Taylor
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October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

PACE Sample Number:			92 0273060		
Date Collected:			10/04/94		
Date Received:			10/04/94		
Client Sample ID:			MW-6s		
Parameter	Units	MDL		METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS				601	
trans-1,3-Dichloropropene	ug/L	1.0	ND		10/05/94
Tetrachloroethene	ug/L	1.0	13		10/05/94
trans-1,2-Dichloroethene	ug/L	1.0	ND		10/05/94
Chloroethene (Vinyl chloride)	ug/L	1.0	ND		10/05/94

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REPORT OF LABORATORY ANALYSIS

Mr. Tom Taylor
Page 7

October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

PACE Sample Number:			92 0273079		
Date Collected:			10/04/94		
Date Received:			10/04/94		
Client Sample ID:			MW-6i		
Parameter	Units	MDL		METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Chromium	mg/L	0.010	ND	200.7	10/05/94
Copper	mg/L	0.010	ND	200.7	10/05/94
Lead W/3030C Digestion	mg/L	0.005	0.103	239.2	10/05/94
Nickel	mg/L	0.010	ND	249.2	10/05/94
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS				601	
1,1,1-Trichloroethane	ug/L	1.0	1.6		10/05/94
1,1,2,2-Tetrachloroethane	ug/L	1.0	ND		10/05/94
1,1,2-Trichloroethane	ug/L	1.0	ND		10/05/94
1,1,2-Trichloroethene	ug/L	1.0	4.4		10/05/94
1,1-Dichloroethane	ug/L	1.0	ND		10/05/94
1,1-Dichloroethene	ug/L	1.0	12		10/05/94
1,2-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,3-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,4-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,2-Dichloroethane	ug/L	1.0	ND		10/05/94
1,2-Dichloropropane	ug/L	1.0	ND		10/05/94
2-Chloroethoxyethane	ug/L	1.0	ND		10/05/94
Bromodichlormethane	ug/L	0.5	ND		10/05/94
Dibromochloromethane	ug/L	0.5	ND		10/05/94
Bromoform	ug/L	0.5	ND		10/05/94
Bromomethane	ug/L	1.0	ND		10/05/94
cis-1,3-Dichloropropene	ug/L	1.0	ND		10/05/94
Carbon tetrachloride	ug/L	1.0	ND		10/05/94
Chloroform	ug/L	0.5	ND		10/05/94
Dichlorodifluoromethane	ug/L	1.0	ND		10/05/94
Trichlorofluoromethane	ug/L	1.0	ND		10/05/94
Chlorobenzene	ug/L	1.0	ND		10/05/94
Chloromethane	ug/L	1.0	ND		10/05/94
Chloroethane	ug/L	1.0	ND		10/05/94
Dichloromethane	ug/L	1.0	ND		10/05/94

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REPORT OF LABORATORY ANALYSIS

Mr. Tom Taylor
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October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

PACE Sample Number:			92 0273079		
Date Collected:			10/04/94		
Date Received:			10/04/94		
Client Sample ID:			MW-6i		
Parameter	Units	MDL		METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS				601	
trans-1,3-Dichloropropene	ug/L	1.0	ND		10/05/94
Tetrachloroethene	ug/L	1.0	5.5		10/05/94
trans-1,2-Dichloroethene	ug/L	1.0	ND		10/05/94
Chloroethene (Vinyl chloride)	ug/L	1.0	ND		10/05/94

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REPORT OF LABORATORY ANALYSIS

Mr. Tom Taylor
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October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

PACE Sample Number:			92 0273087		
Date Collected:			10/04/94		
Date Received:			10/04/94		
Client Sample ID:			MW-7s		
Parameter	Units	MDL		METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Chromium	mg/L	0.010	ND	200.7	10/05/94
Copper	mg/L	0.010	ND	200.7	10/05/94
Lead W/3030C Digestion	mg/L	0.005	0.021	239.2	10/05/94
Nickel	mg/L	0.010	ND	249.2	10/05/94
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS				601	
1,1,1-Trichloroethane	ug/L	1.0	16		10/05/94
1,1,2,2-Tetrachloroethane	ug/L	1.0	ND		10/05/94
1,1,2-Trichloroethane	ug/L	1.0	ND		10/05/94
1,1,2-Trichloroethene	ug/L	1.0	ND		10/05/94
1,1-Dichloroethane	ug/L	1.0	2.8		10/05/94
1,1-Dichloroethene	ug/L	1.0	89		10/05/94
1,2-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,3-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,4-Dichlorobenzene	ug/L	1.0	ND		10/05/94
1,2-Dichloroethane	ug/L	1.0	ND		10/05/94
1,2-Dichloropropane	ug/L	1.0	ND		10/05/94
2-Chloroethoxyethane	ug/L	1.0	ND		10/05/94
Bromodichlormethane	ug/L	0.5	ND		10/05/94
Dibromochloromethane	ug/L	0.5	ND		10/05/94
Bromoform	ug/L	0.5	ND		10/05/94
Bromomethane	ug/L	1.0	ND		10/05/94
cis-1,3-Dichloropropene	ug/L	1.0	ND		10/05/94
Carbon tetrachloride	ug/L	1.0	ND		10/05/94
Chloroform	ug/L	0.5	0.8		10/05/94
Dichlorodifluoromethane	ug/L	1.0	ND		10/05/94
Trichlorofluoromethane	ug/L	1.0	ND		10/05/94
Chlorobenzene	ug/L	1.0	ND		10/05/94
Chloromethane	ug/L	1.0	ND		10/05/94
Chloroethane	ug/L	1.0	ND		10/05/94
Dichloromethane	ug/L	1.0	1.1		10/05/94

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REPORT OF LABORATORY ANALYSIS

Mr. Tom Taylor
Page 10

October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

PACE Sample Number:			92 0273087		
Date Collected:			10/04/94		
Date Received:			10/04/94		
Client Sample ID:			MW-7s		
Parameter	Units	MDL		METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS				601	
trans-1,3-Dichloropropene	ug/L	1.0	ND		10/05/94
Tetrachloroethene	ug/L	10.0	120		10/05/94
trans-1,2-Dichloroethene	ug/L	1.0	ND		10/05/94
Chloroethene (Vinyl chloride)	ug/L	1.0	ND		10/05/94

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REPORT OF LABORATORY ANALYSIS

Mr. Tom Taylor
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October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

PACE Sample Number:			92 0273095		
Date Collected:			10/04/94		
Date Received:			10/04/94		
Client Sample ID:			MW-7i		
Parameter	Units	MDL		METHOD	DATE ANALYZED
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Chromium	mg/L	0.010	ND	200.7	10/05/94
Copper	mg/L	0.010	ND	200.7	10/05/94
Lead W/3030C Digestion	mg/L	0.005	0.019	239.2	10/05/94
Nickel	mg/L	0.010	ND	249.2	10/05/94
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS				601	
1,1,1-Trichloroethane	ug/L	5.0	230		10/05/94
1,1,2,2-Tetrachloroethane	ug/L	5.0	ND		10/05/94
1,1,2-Trichloroethane	ug/L	5.0	ND		10/05/94
1,1,2-Trichloroethene	ug/L	5.0	11		10/05/94
1,1-Dichloroethane	ug/L	5.0	9.5		10/05/94
1,1-Dichloroethene	ug/L	100	640		10/05/94
1,2-Dichlorobenzene	ug/L	5.0	ND		10/05/94
1,3-Dichlorobenzene	ug/L	5.0	ND		10/05/94
1,4-Dichlorobenzene	ug/L	5.0	ND		10/05/94
1,2-Dichloroethane	ug/L	5.0	5.0		10/05/94
1,2-Dichloropropane	ug/L	5.0	7.4		10/05/94
2-Chloroethoxyethane	ug/L	5.0	ND		10/05/94
Bromodichlormethane	ug/L	2.5	ND		10/05/94
Dibromochloromethane	ug/L	2.5	ND		10/05/94
Bromoform	ug/L	2.5	ND		10/05/94
Bromomethane	ug/L	5.0	ND		10/05/94
cis-1,3-Dichloropropene	ug/L	5.0	ND		10/05/94
Carbon tetrachloride	ug/L	5.0	ND		10/05/94
Chloroform	ug/L	2.5	4.8		10/05/94
Dichlorodifluoromethane	ug/L	5.0	ND		10/05/94
Trichlorofluoromethane	ug/L	5.0	ND		10/05/94
Chlorobenzene	ug/L	5.0	ND		10/05/94
Chloromethane	ug/L	5.0	ND		10/05/94
Chloroethane	ug/L	5.0	ND		10/05/94
Dichloromethane	ug/L	5.0	15		10/05/94

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October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

PACE Sample Number:			92 0273095		
Date Collected:			10/04/94		
Date Received:			10/04/94		
Client Sample ID:			MW-7i		
Parameter	Units	MDL		METHOD	DATE ANALYZED
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS				601	
trans-1,3-Dichloropropene	ug/L	5.0	ND		10/05/94
Tetrachloroethene	ug/L	100	6100		10/05/94
trans-1,2-Dichloroethene	ug/L	5.0	ND		10/05/94
Chloroethene (Vinyl chloride)	ug/L	5.0	ND		10/05/94

These data have been reviewed and are approved for release.

Charles M. Cabaniss
Manager, Inorganic Chemistry

Margaret S. Harding
Manager, Organic Chemistry

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REPORT OF LABORATORY ANALYSIS

FOOTNOTES
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October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

MDL Method Detection Limit
ND Not detected at or above the MDL.

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QUALITY CONTROL DATA

October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

Lead W/3030C Digestion
Batch: 92 30962
Samples: 92 0273044, 92 0273052, 92 0273060, 92 0273079, 92 0273087
92 0273095

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Lead W/3030C Digestion	mg/L	0.005	ND

LABORATORY CONTROL SAMPLE:

Parameter	Units	MDL	Reference Value	Recv
Lead W/3030C Digestion	mg/L	0.005	0.020	98%

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QUALITY CONTROL DATA

October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

ICP QUALITY CONTROL
Batch: 92 30921
Samples: 92 0273044, 92 0273052, 92 0273060, 92 0273079, 92 0273087
92 0273095

METHOD BLANK:

Parameter	Units	MDL	Method Blank
INDIVIDUAL PARAMETERS			
Calcium	mg/L	0.10	ND
Magnesium	mg/L	0.10	ND
Molybdenum	mg/L	0.020	ND
Potassium	mg/L	0.10	ND
Sodium	mg/L	0.10	ND
ICP QUALITY CONTROL			
Nickel	mg/L	0.010	ND
Cadmium	mg/L	0.010	ND
Vanadium	mg/L	0.010	ND
Lead	mg/L	0.10	ND
Barium	mg/L	0.010	ND
Copper	mg/L	0.010	ND
Chromium	mg/L	0.010	ND
Beryllium	mg/L	0.010	ND
Zinc	mg/L	0.010	ND
Cobalt	mg/L	0.010	ND
Iron	mg/L	0.010	ND
Silver	mg/L	0.005	ND
Manganese	mg/L	0.010	ND
Aluminum	mg/L	0.010	ND

LABORATORY CONTROL SAMPLE:

Parameter	Units	MDL	Reference Value	Recv
INDIVIDUAL PARAMETERS				
Calcium	mg/L	0.10	5.0	102%
Magnesium	mg/L	0.10	5.0	98%
Molybdenum	mg/L	0.020	0.500	94%
Potassium	mg/L	0.10	5.0	86%

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QUALITY CONTROL DATA

October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

ICP QUALITY CONTROL
Batch: 92 30921
Samples: 92 0273044, 92 0273052, 92 0273060, 92 0273079, 92 0273087
92 0273095

LABORATORY CONTROL SAMPLE:

Parameter	Units	MDL	Reference Value	Recv
ICP QUALITY CONTROL				
Sodium	mg/L	0.10	5.0	90%
Nickel	mg/L	0.010	0.500	96%
Cadmium	mg/L	0.010	0.500	95%
Vanadium	mg/L	0.010	0.500	98%
Lead	mg/L	0.10	0.50	96%
Barium	mg/L	0.010	0.500	102%
Copper	mg/L	0.010	0.500	100%
Chromium	mg/L	0.010	0.500	97%
Beryllium	mg/L	0.010	0.500	91%
Zinc	mg/L	0.010	0.500	96%
Cobalt	mg/L	0.010	0.500	97%
Iron	mg/L	0.010	0.500	98%
Silver	mg/L	0.005	0.050	90%
Manganese	mg/L	0.010	0.500	97%
Aluminum	mg/L	0.010	0.500	101%

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REPORT OF LABORATORY ANALYSIS

QUALITY CONTROL DATA

October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

PURGEABLE HALOCARBONS
Batch: 92 30976
Samples: 92 0273044, 92 0273052, 92 0273060, 92 0273079, 92 0273087
92 0273095

METHOD BLANK:

Parameter	Units	MDL	Method Blank
PURGEABLE HALOCARBONS			(1)
1,1,1-Trichloroethane	ug/L	1.0	ND
1,1,2,2-Tetrachloroethane	ug/L	1.0	ND
1,1,2-Trichloroethane	ug/L	1.0	ND
1,1,2-Trichloroethene	ug/L	1.0	ND
1,1-Dichloroethane	ug/L	1.0	ND
1,1-Dichloroethene	ug/L	1.0	ND
1,2-Dichlorobenzene	ug/L	1.0	ND
1,3-Dichlorobenzene	ug/L	1.0	ND
1,4-Dichlorobenzene	ug/L	1.0	ND
1,2-Dichloroethane	ug/L	1.0	ND
1,2-Dichloropropane	ug/L	1.0	ND
2-Chloroethoxyethane	ug/L	1.0	ND
Bromodichlormethane	ug/L	0.5	ND
Dibromochloromethane	ug/L	0.5	ND
Bromoform	ug/L	0.5	ND
Bromomethane	ug/L	1.0	ND
cis-1,3-Dichloropropene	ug/L	1.0	ND
Carbon tetrachloride	ug/L	1.0	ND
Chloroform	ug/L	0.5	ND
Dichlorodifluoromethane	ug/L	1.0	ND
Trichlorofluoromethane	ug/L	1.0	ND
Chlorobenzene	ug/L	1.0	ND
Chloromethane	ug/L	1.0	ND
Chloroethane	ug/L	1.0	ND
Dichloromethane	ug/L	1.0	1.5
trans-1,3-Dichloropropene	ug/L	1.0	ND
Tetrachloroethene	ug/L	1.0	ND
trans-1,2-Dichloroethene	ug/L	1.0	ND
Chloroethene (Vinyl chloride)	ug/L	1.0	ND

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

PURGEABLE HALOCARBONS
Batch: 92 30976
Samples: 92 0273044, 92 0273052, 92 0273060, 92 0273079, 92 0273087
92 0273095

LABORATORY CONTROL SAMPLE:

Parameter	Units	MDL	Reference Value	Recv
1,1,1-Trichloroethane	ug/L	1.0	20	85%
1,1,2,2-Tetrachloroethane	ug/L	1.0	20	110%
1,1,2-Trichloroethane	ug/L	1.0	20	95%
1,1,2-Trichloroethene	ug/L	1.0	20	85%
1,1-Dichloroethane	ug/L	1.0	20	95%
1,1-Dichloroethene	ug/L	1.0	20	80%
1,2-Dichlorobenzene	ug/L	1.0	20	100%
1,3-Dichlorobenzene	ug/L	1.0	20	95%
1,4-Dichlorobenzene	ug/L	1.0	20	95%
1,2-Dichloroethane	ug/L	1.0	20	95%
1,2-Dichloropropane	ug/L	1.0	20	90%
2-Chloroethoxyethane	ug/L	1.0	20	75%
Bromodichlormethane	ug/L	0.5	20	95%
Dibromochloromethane	ug/L	0.5	20	100%
Bromoform	ug/L	0.5	20	90%
Bromomethane	ug/L	1.0	20	85%
cis-1,3-Dichloropropene	ug/L	1.0	20	100%
Carbon tetrachloride	ug/L	1.0	20	95%
Chloroform	ug/L	0.5	20	95%
Dichlorodifluoromethane	ug/L	1.0	20	100%
Trichlorofluoromethane	ug/L	1.0	20	95%
Chlorobenzene	ug/L	1.0	20	90%
Chloromethane	ug/L	1.0	20	95%
Chloroethane	ug/L	1.0	20	95%
Dichloromethane	ug/L	1.0	20	90%
trans-1,3-Dichloropropene	ug/L	1.0	20	95%
Tetrachloroethene	ug/L	1.0	20	95%
trans-1,2-Dichloroethene	ug/L	1.0	20	85%
Chloroethene (Vinyl chloride)	ug/L	1.0	20	100%

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REPORT OF LABORATORY ANALYSIS

FOOTNOTES
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October 06, 1994
PACE Project Number: 641004509

Client Reference: Keebler

MDL	Method Detection Limit
ND	Not detected at or above the MDL.
(1)	Dichloromethane is a possible lab contaminant.

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aquaterra

A GREAT LAKES CHEMICAL CORPORATION COMPANY

0180 6410004507

CHAIN-OF-CUSTODY RECORD
ANALYTICAL REQUEST

№ 1870

PROJECT NAME: Keebler

REPORT TO: Tom Taylor

TURNAROUND: ☐ NORMAL ☐ 5-DAY ☒ OTHER (SPECIFY): 24 hr

ADDRESS: Six Forks Rd, Raleigh NC

AFFILIATION/LOCATION: Project Mgr/Aquaterra, Raleigh

REQUESTED DUE DATE:

JOB NUMBER: 4107601

PHONE: (919) 859-9987

P.O. # / BILLING REFERENCE: Will Call

SAMPLED BY (PRINT): William D. Stewart / Dave Rakiezy

SAMPLER'S SIGNATURE: William Stewart / [illegible]

SAMPLE ID	SAMPLE LOCATION	DATE	TIME	MATRIX: WATER	MATRIX: SOIL	MATRIX: OTHER	NUMBER OF CONTAINERS: TOTAL	UNPRESERVED	H_2SO_4	HNO_3	HCL	N_aOH	pH < 2 OR > 12: Y	pH < 2 OR > 12: N	601	Cd, Cu, Pb, Ni (by 3020)	REMARKS
MW-1s	See Map	10/4/94	12:15	✓			4			1	3		✓		✓	✓	27304.4
MW-1i	↓	↓	11:45	✓			4			1	3		✓		✓	✓	27305.2
MW-6s			12:05	✓			4			1	3		✓		✓	✓	27306.0
MW-6i			11:30	✓			4			1	3		✓		✓	✓	27307.9
MW-7s			12:00	✓			4			1	3		✓		✓	✓	27308.7
MW-7i	↓	↓	11:30	✓			4			1	3		✓		✓	✓	273095

ADDITIONAL COMMENTS:

RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME	AIRBILL #
William D. Stewart / Aquaterra	[illegible] / Aqua	10-4-94	1:00	
[illegible] / Aqua	[illegible] / PACE	10/4	4:00	

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