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MONITORING WELL LOCATIONS MAP PARTIALLY SCANNED

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HAZARD RANKING SYSTEM DOCUMENTATION RECORD
REFERENCES 22-30

Evergreen Manor Groundwater Contamination

ILD 984 836 734

Prepared by Illiois Environmental Protection Agency
May 29, 1997

Well Size 5" Depth 63' Cased 63'

Static Water 30 Draw Down 40 ~~60~~

Formations		
top soil	2	2
sandy gravel	55	57
gravel	6	63

Screen Length ..... Slot ..... Mat .....

Sec. 29 Twn. 46n Range 2E

Town Roscoe County Winn.

Location #5 Evergreen

Date Completed 9/27/82

Driller Chuck Ed Rig 55

OLSON WELL CO.

Job No. 8229

Phone 815/239-2194
R. R. 2, No. Pec Rd.
Pecatonica, Ill. 61063

Pump 1/2HP 230V 2W RJ Date 10/18/82

Pump Set 40' Feet On 1" Pipe sch80

Tank W202 Location Basement

Pit Less Adp. Baker 5

Dist. Well to Tank 52

Distance Well to Nearest Building 45'

Septic Tank no

Drain Field

Barnyard

Well Location Front

Well Size 5" Depth 60' Cased 60'

Static Water 35 Draw Down 40

Formations		
Top soil	2	2
sand-gravel	53	55
gravel	5	60

Screen Length ..... Slot ..... Mat .....

Sec. 29 Twn. 46N Range 2E

Owner Roscoe County Winn.

Location lot # 8 Evergreen

Date Completed 10/20/82

Driller Chuck & Ed Rig Star

Owner Wayne Brake

OLSON WELL CO.

Job No. 8236

Phone 815/239-2194
R. R. 2, No. Pec Rd.
Pecatonica, Ill. 61063

Pump 1/2HP? 230V 2W RJ Date 11/12/82

Pump Set 40' Feet On 1" Pipe Sch80

Tank W202 Location Basement

Pit Less Adp. Baker

Dist. Well to Tank 40'

Distance Well to Nearest Building 40'

Septic Tank 100'

Drain Field 120'

Barnyard no

Well Location Front yard

Well # 1292-8236

Well Size 5" Depth 60' Cased 60'

Static Water 35 Draw Down 40

Formations		
top soil	2	2
sand-gravel	51	53
gravel	7	60

Screen Length 2' Slot 20 Mat S.S.

Sec 29 Twn 46N Range 2E

Township Roscoe County Winn.

Location LOT #10 Evergreen sub.

Date Completed 11/8/82

Driller Chuck & Ed Rig Star

Owner Wayne Brake

OLSON WELL CO.

Job No. 8237

Phone 815/239-2194
R. R. 2, No. Pec Rd.
Pecatonica, Ill. 61063

Pump 1/2HP 230V 2W RJ Date 11/12/82

Pump Set 40 Feet On 1" Pipe ch 80

Tank W202 Location Basement

Pit Less Adp. Baker

Dist. Well to Tank 35'

Distance Well to Nearest Building 35'

Septic Tank 100

Drain Field 115'

Barnyard no

Well Location Front yard

Well # 1293-8237

Engineering A Better World

94-271

RIEDEL ENVIRONMENTAL
SERVICES INC.

2010400015
Evergreen Manor
SF/Tech

Midwest Great Lakes Region:
St. Louis District
18207 Edison Ave.
Chesterfield, Missouri 63005-3703
(314) 532-7660
FAX: (314) 536-1655

Steven J. Handley
April 4, 1994

Mr. Gregory W. Dunn
Illinois Environmental Protection Agency
2200 Churchill Rd.
P.O. Box 19276
Springfield, IL. 62794

RE: Evergreen Manor Monitoring Well Installation
Contract# HW-3007. RES Job#3936

Dear Mr. Dunn:

Riedel Environmental Services is pleased to present the enclosed summary of field activities which were conducted at the above mentioned site.

Also enclosed you will find a map of the area with elevations which were surveyed by a State of Illinois Registered Land Surveyor.

If You have any questions or comments concerning the contents of this document, please contact our office at your earliest convenience. It has been our pleasure to assist you on this project and we look forward to working with you in the near future.

Sincerely,

Steven J. Handley

Steven J. Handley
Hydrogeologist/Project Manager

RECEIVED
APR 05 1994
IEPA/DLPC

COPY

Chicago District:
5233 North Pearl Street
Rosemont, Illinois 60018
(708) 671-0061

24-Hour Hotline (800) 334-0004
A Subsidiary of Riedel Environmental Technologies Inc.

Detroit District:
28340 Goddard Road
Romulus, Michigan 48174
(313) 946-8640

Evergreen Manor Monitoring Well Installation
Roscoe, Illinois
Illinois Environmental Protection Agency

RECEIVED
APR 05 1994
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Riedel Environmental Servuces,Inc.
February 1994

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Appendix B: Health and Safety Plan

Appendix C: Well Completion Forms

Appendix D: Subsurface Exploration Logs

Appendix E: Assumptions

Section 1

1.1 Scope of Work

Riedel Environmental Services, Inc. (RES) was awarded the task of installing 20 monitoring wells (see appendix A) at three locations in the vicinity of Evergreen Manor, Roscoe, Illinois (see figure 1) in accordance with contract HW-3007. The locations, as determined by the Illinois Environmental Protection Agency (IEPA) project manager, were installed on the properties owned by Ecolab, Inc., Kelley's Sand and Gravel, and Illinois Department of Transportation (IDOT). At each location two wells were constructed (see figure 2); one deep and one shallow. The well depths at each location were determined beforehand by the Agency project manager. All wells were drilled and constructed under guidelines set forth by Illinois Department of Public Health's Illinois Water Well Construction Code (77 Ill. Adm. Code, Part 920). Each well is protected by a steel outer casing equipped with a locking hinged top.

After completion each well was developed using an air lift procedure as directed by the RES project manager. Each well was later surveyed by a licensed Illinois land surveyor to the nearest 0.01 foot (top of casing) using Illinois state planar coordinates (horizontal control) and U.S.G.S. datum (vertical control).

1.2 Health and Safety

RES developed a Health and Safety plan (appendix B) based on contamination parameters detected in aqueous samples taken from residential wells in the immediate vicinity, and site specific hazards determined by the RES project manager during a site visit conducted prior to the commencement of field activities.

Since the contamination parameters in question were volatile in nature it was determined that air monitoring in the breathing zone be conducted using a photo ionization detector (PID). If levels were detected above a predetermined level (see appendix B), all workers in the immediate vicinity of the drilling operations would be required to upgrade their personal protective equipment (PPE) to level C. Otherwise workers were required to conduct drilling activities in modified level D (i.e. work clothes, steel toe boots, gloves, hard hat, eye and ear protection). The PID was also utilized to detect contamination potential which could emanate from the bore hole. This was accomplished by lowering the PID probe into the center of the down hole tool and noting the level indicated on the instrument.

Other safety risks involved general drilling hazards, uneven terrain, utilities and inclimate weather conditions. All appropriate utility representatives were notified well in advance of the initiation of field work and all utilities were consequently well marked.

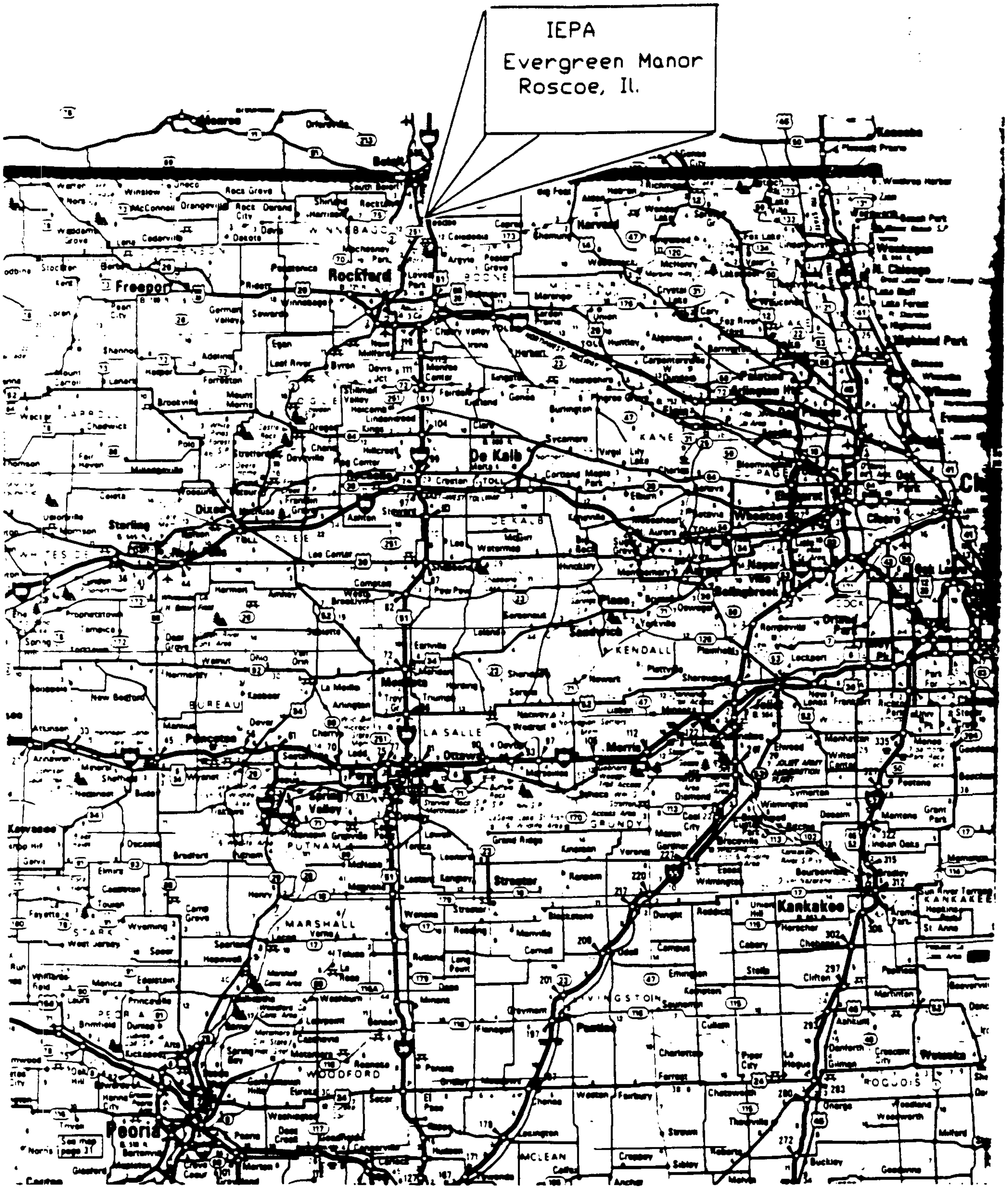
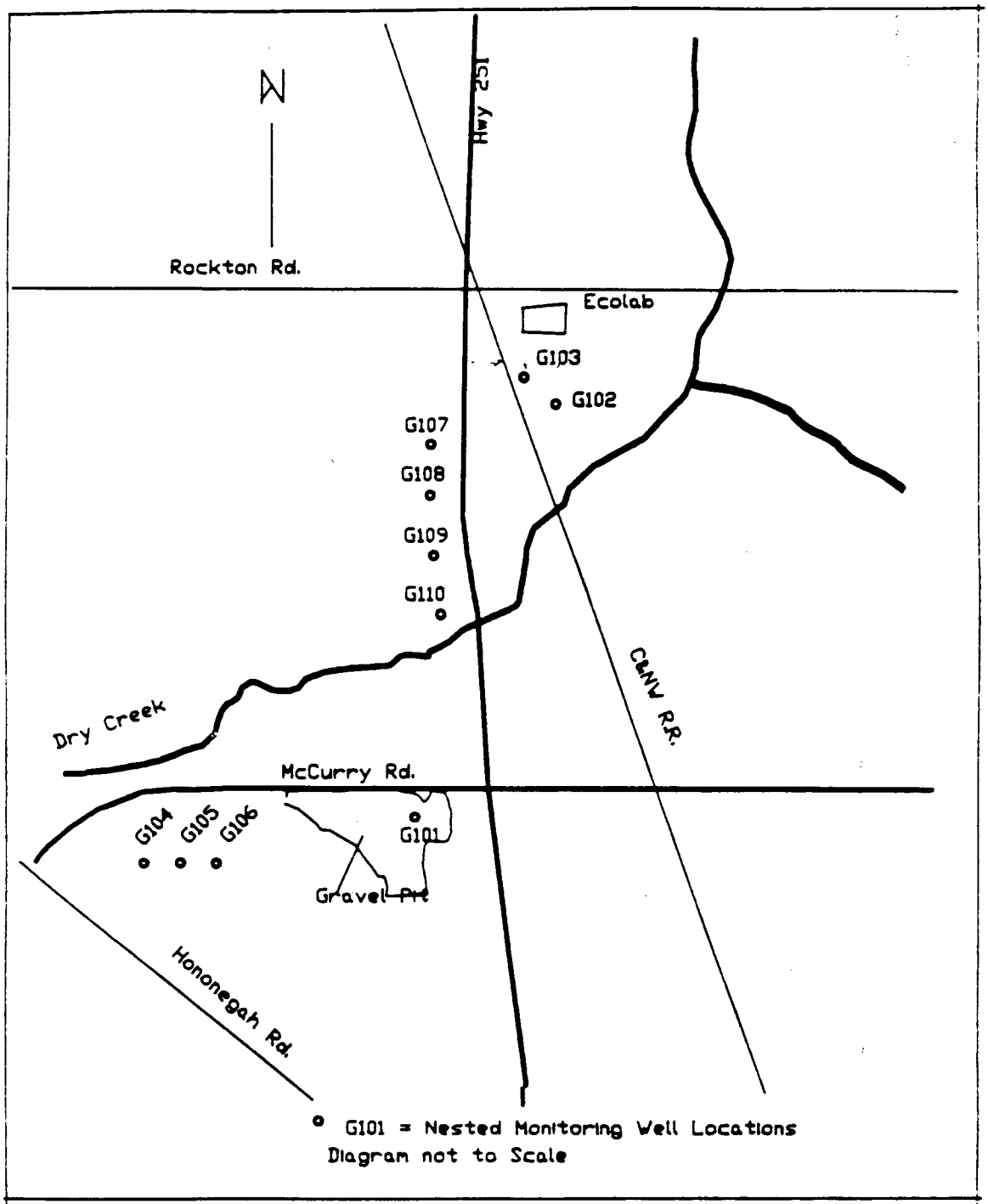


Figure 1 General Location Map
Riedel Environmental Services, Inc.
Job # 3936



Evergreen Manor Site Map

Figure 2 RES Job #3936 1/28/94
Riedel Environmental Services

Section 2

2.1 Summary of Field Activities

Each well was constructed with the following materials unless otherwise specified:

- (1) 2"x10' 0.01 slot schedule 304 stainless steel screen
- 2" schedule 304 stainless steel riser to the water table interface
- 2" schedule 40 PVC riser to the surface (plus necessary stickup above surface level)
- 2" expandable locking plug to seal riser
- Quartz sand to two feet above screen
- Hydrated bentonite chips to three feet above sand
- Grout to surface with slurry consisting of 5% bentonite powder, Portland cement, and water (municipal source)
- (1) 4"x5' steel protective cover with hinged locking cap

Completed well construction diagrams for each well can be found in appendix C.

2.1.1 Kelley's Quarry

All monitoring wells on the quarry property were drilled using an IR-TH60 reverse rotary drill rig utilizing the dual wall method whereby the drill stem is advanced to depth with reverse circulating air as the lubricating medium. Drill cuttings are also removed from the bore hole by

the compressed air and are diverted into drums at the surface. An overshot casing can then be advanced along the annulus created by the drilling tool which serves to keep the hole open while the drilling tool is removed and while construction of the well is in progress. The overshot casing is then removed during the grouting procedure.

Monitoring wells G101-D and G101-S were drilled in the floor of the quarry itself and consequently were shallower than the other wells on the quarry property (located in the adjacent field). Drilling commenced at 11:47 on 12/7/93. PID readings down hole in G101-D at 40 and 60 feet below surface level (bsl.) were 100 parts per million (ppm) and 32 ppm respectively. Temperatures were damp and very cold on the day that G101-D was drilled which could have had an effect on the PID instrument. Some loss of circulation was experienced during the drilling of G101-D. This was evident due to the shallow proximity of the water table and the observation that ground water was pushed to the surface in the area around the rig. This was remedied by the replacement of the tri-cone bit which allowed for a better seal around the drill rod and no loss in circulation was observed thereafter. Monitoring well G101-D was completed on 12/8 with a total depth (TD) of 80 feet bsl.

Drilling for monitoring well G101-S started at 13:19 on 12/8 and was completed without complication by 17:00 the same day with a TD of 40 feet bsl. A PID reading of approximately 100 ppm was measured down hole at 10 feet bsl., however, the reading was not steady and could be attributed to excessive moisture or cold temperatures that were sustained throughout the day.

Temperatures began to warm enough to cause the ground to thaw in the field area adjacent to the quarry. Further complicating the conditions in the field was precipitation in the form of rain which made the field area inaccessible. Upon consultation with the Agency project manager, it was decided to move the drilling operations to the Ecolab site and allow the field area time to either dry out or re-freeze.

Nested wells in the field area were drilled to predetermined (by the Agency project manager) depths of 60 feet bsl. and 100 feet bsl. at each location (three locations total).

On 12/14 drilling was begun on G104-D. PID readings at 60' bsl. fluctuated between 40 and 150 ppm (downhole). PID levels outside the well bore were 0 ppm. The fluctuation in PID readings could be attributed to moisture in the air or in the bore hole or both. PID readings at 80 feet bsl. were 50 ppm (down hole) and were stable for the duration of the air monitoring. Drill cuttings from this bore hole were logged by the RES project manager as requested by the Agency project manager. Well construction of G104-D was partially completed (not grouted) by 17:30 (TD= 100 feet bsl.) Static water level (SWL) was measured to be 31.2 feet bsl. (at 13:25). Grouting of the well was completed by 8:17 on 12/15.

While attempting to move the rig to begin drilling G104-S the drill rig became stuck in the mud. The drillers were able to hydraulically lift the rig above grade while gravel from the quarry was placed under the wheels. This method was successful but continuing warm temperatures and additional precipitation delayed further progress.

Drilling commenced at G104-S at 10:24 (12/15). PID readings of note were detected at 25 feet bsl. (110 ppm) and 60 feet bsl. (40 ppm). While running overshot to depth, the casing became immobile due to the fact that the rig itself had sunk in the mud slightly causing the casing to become lodged in the formation. A significant amount of effort was expended trying to free the stuck casing but on 12/16 the drillers were able to free the tool and by 15:00 G104-S was completed (TD=60 feet bsl.).

On 12/17 the drill rig and water truck became stuck necessitating a bull dozer to tow them off site. Field activities were temporarily postponed as the towing equipment was not available till 12/20. On 12/20 the drillers were are able to free the stuck vehicles but damage to the drill rig required demobilization to the shop for repairs. It was decided that all field activities should cease until after the first of the year due to the impending holiday season and the unlikelihood that the rotary rig would be repaired soon. With cold temperatures returning to the area, the bull dozer was returned as it appeared that the ground would soon be frozen enough so that the rotary rig and the support vehicle would not continue to bog down in the mud.

Well G104-D and G104-S were developed on 12/28 by a driller's helper. The water was evacuated using the air lift method and the discharge was stored on site in marked 55 gallon drums. The volumes purged were calculated by the RES project manager to equate to 5 bore volumes per well. Water chemistry parameters were not monitored as per scope of work.

On 1/4/94 field activities resumed. The Agency project manager had received verbal permission to install monitoring wells on the IDOT property in question (along Hwy 251). The track mounted rig needed for this task was mobilized to the site and proceeded to set up to drill at location G107. With the track mounted rig and the rotary rig working simultaneously, the RES project manager was forced to divide his time between the two sites. This situation was discussed with and approved by the Agency project manager. It was further decided by RES that most of the project manager's time should be spent at the IDOT site due to its proximity to a public right of way and the potential for inquiries from interested citizens. This precluded the ability of the RES project manager from continually monitoring activities at the quarry field site.

G105-S was completed by 17:00 on 1/4. PID readings were not obtained from the well bore due to the preoccupation of the RES project manager at G107.

On 1/5 the rotary rig was having mechanical difficulties due to the weather conditions. At 14:00 the drillers were able to start the machinery and move into place to begin drilling G106-D. G106-D was drilled to 100 feet bsl. and secured. The weather conditions on this day were so severe that after consultation with the driller's operations manager, it was decided to abandon drilling activities until conditions improved. Since the storm was to persist for the next 25 to 48 hours, it was agreed that all personnel would demobilize from the site until 1/10.

G106-D was completed by 16:20 on 1/10.

G106-S was started at 7:30 on 1/11. No PID readings were taken during the drilling of G106-D for logistical reasons. By 16:10 G106-S was completed.

Wells G105-D and G105-S were developed by the rotary drilling crew on 1/12. The wells were purged by the air lift method with the discharge stored on site in marked 55 gallon drums. The purge volumes were calculated by the RES project manager to represent 5 bore volumes. Aqueous chemistry parameters were not recorded as per scope of work.

2.1.2 Ecolab Site

All monitoring wells at the ecolab site were drilled with an IR-TH60 rotary drill rig as described above. All drill cuttings were stored in marked 55 gallon drums and stored on site pending removal and storage by IEPA personnel. All down hole tools were decontaminated between each nested well location using a steam cleaner. All decontamination water was collected and in marked 55 gallon drums and stored on site pending removal and storage by IEPA personnel (as per scope of work).

On 12/9 drilling was initiated in the field area behind Ecolab. Well #G102-D was drilled first and the cuttings were logged by the RES project manager. PID levels were taken every 10 feet with no measurements exceeding 0 ppm. After the tool was advanced to 100 feet bsl. the Agency project manager informed RES that total depth for the deep wells was to be 65 feet bsl. The

drillers then ran overshot casing to 65 feet bsl., the drilling tool was removed and the hole was backfilled from 100 feet to 65 feet bsl. and the well was completed.

Static water level (obtained from G102-D) was measured to be 35.8 feet bsl. so G102-S was drilled to 45 feet bsl. (water table plus 10' as directed by the Agency project manager). Drilling at G102-S (approximately 6 feet away from G102-D) began on 12/10 with well construction completed by 12:00.

Upon investigation of the G103 well location by RES and Agency project managers, it was determined that the surface elevation was approximately 10 feet below the grade level of the G102 location. It was agreed that the TD of the wells at G103 should be 10 feet less than that of G102 so that they bottom at approximately the same level. Drilling started at 9:30 on 12/13 and G103-D was completed by 13:35 the same day. No PID readings exceeding 0 ppm were observed during the drilling of G103-D.

Static water level in G103-D was 32.8 feet bsl. so G103-S was drilled to a TD of 42 feet bsl. Drilling commenced at 14:30 on 12/13 and the well was completed by 14:55 the same day. No PID readings above 0 ppm were observed during the advancement of the drilling tool.

While conditions continued to be less than desirable for drilling in the quarry field area, it was decided (by the drillers and RES) to proceed to the field area and attempt to drill there (despite

muddy conditions) as the Agency project manager had not yet received clearance to drill on the IDOT property.

A drillers helper returned to the Ecolab site on 12/27 to develop the wells. The wells were purged using the air lift method with the discharge stored on site in marked 55 gallon drums. The purge volume was calculated by the RES project manager to represent 5 bore volumes. Aqueous chemistry parameters were not recorded as per scope of work.

2.1.3 IDOT Site

All monitoring wells along Hwy. 251 were drilled with a CME-850 track mounted rig due to the terrain at the site. The rig is equipped with 4.25" (O.D.) hollow stem augers. There were no analytical samples taken, and well logs were not recorded at the IDOT site (as per scope of work). All drill cuttings were stored in marked 55 gallon drums and stored on site pending removal and storage by IEPA personnel. All down hole tools were decontaminated between nested well locations using a steam cleaner. The decontamination water was collected and stored in marked 55 gallon drums and stored on site pending removal and storage by IEPA personnel (as per scope of work).

At 10:00 on 1/4 drilling started at G107-S. The RES project manager decided to drill the shallow well first in an attempt to ascertain the elevation of the IDOT site in reference to the elevations at the Ecolab site. G107-S was completed at a TD of 44 feet bsl. as swl. was measured to be 34 feet bsl. PID readings did not exceed 0 ppm. G107-S was completed at 15:15. The substrate at the IDOT site was considerably easier to drill into because of the absence of gravel. This contributed significantly to more rapid advancement of the augers.

On 1/5 at 7:40 drilling at G107-D was begun. Sub zero ambient air temperatures prohibited the use of the PID so air monitoring was temporarily discontinued. The well was drilled to a TD of 65 feet bsl. (as determined by swl.) and G107-D was completed by 13:10.

The weather conditions continued to deteriorate to the point that field activities had to be temporarily postponed. The drillers were concerned that working in close proximity to the roadside would constitute a significant safety risk. Blizzard conditions and sub zero temperatures were expected to persist for the next 24 to 48 hours so all personnel demobilized from the area until 1/10.

G108-S was started at 8:30 on 1/10. PID readings did not exceed 0 ppm. The well construction was completed by 13:30. The drill crew then proceeded to move the rig into position to begin G108-D (14:40).

By 9:15 on 1/11 G108-D was drilled to depth (TD=65 feet bsl.), and the well was completed by 10:25. PID levels did not exceed 0 ppm.

Drilling at G109-S was begun at 13:15 on 1/11. After allowing time for the well to recharge, G109-S was drilled to a TD of 50 feet bsl. as swl was determined to be approximately 41 feet bsl. Well construction was completed by 16:15. PID readings did not exceed o ppm.

Drilling at G109-D was begun at 9:00 on 1/12. It was evident from water table depth at G109-S and from visual inspection that the grade elevation at G109 is approximately 5 feet greater than that at Ecolab. In order for the wells to bottom at about the same depth as the deep wells at Ecolab the depth at G109-D was increased by 5 feet for a TD of 70 feet bsl. PID readings did not exceed 0 ppm as the augers were advanced, however, upon returning from a lunch break

(with the augers set at 70 feet bsl.) a level of 130 ppm was recorded downhole. The PID level in the breathing zone was 0 ppm so no ppe upgrade was necessary. By 13:30 well construction at G109-D was complete.

G110-S was started at 15:15 on 1/12. The elevation at the G110 well location is considerably below that of the other well locations at the IDOT and Ecolab sites. The augers were advanced to 24 feet bsl. and left in place till 1/13 in order to allow for recharge to take place through the front plate of the lead auger. Upon returning to G110-S the swl. was measured to be slightly less than 21 feet so the augers were advanced to 30 feet and the drillers began to construct well. Upon knocking out the front plate it discovered that 2 feet of heave had occurred so the drillers proceeded to wash out the formation materials with water. By 10:50 the sand pack and bentonite seal was in place. The drillers requested and were granted permission by the RES project manager to grout both G110-D and G110-S simultaneously in order to avoid having water and or grout to freeze in the pumps etc.

Drilling at well location G110-D started at 12:08 on 1/13. The RES project manager determined the TD at this location to be 50 feet bsl. so as to bottom at approximately the same depth as the other deep wells at the IDOT and Ecolab sites. By 14:00 well construction at G110-D was complete.

After the drillers decontaminated all down hole tools, the track mounted rig was driven to Quail Drive (off Rockton Rd.) where a trailer was able to receive the equipment for demobilization.

On 1/25 the drillers returned to the site to develop the wells at the IDOT site. They also developed the remaining wells at the quarry site.

On 2/2 the drillers returned to the IDOT site to move the drummed cuttings, decon water and development water to the side of the roadway (Hwy 251) in order to facilitate their removal by IEPA personnel.

Section 3

3.1 Conclusion

All tasks included in the initial scope of work have been completed with the exception of the surveying of the monitoring well. This task was omitted from the original cost estimate submitted by RES on 7/19/93 because at the time the proposed well locations were unknown (see assumptions, appendix D). Since completion of field activities, RES has retained the services of a registered land surveyor to accommodate IEPA's request to have the wells surveyed.

Appendix A

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

217/782-6761

Post-it® brand fax transmittal memo 7671	# of pages ▸ 9
To Jerry Linder	From Greg Dunn
Co. Riedel	Co. IEPA
Dept.	Phone # 782-3983
Fax # (314) 536-1655	Fax # 524-4193

July 9, 1993

Mr. Jerry Linder
Riedel Environmental Services, Inc.
18207 Edison Avenue
Chesterfield, Missouri 63005-3703

Refer to: 2010400015--Winnebago County
Evergreen Manor GW Contamination\Roscoe
SF/Fiscal

Dear Mr. Linder:

Pursuant to the terms of your State contract HW-3007 with this Agency, you have tentatively been awarded a project at the Evergreen Manor Subdivision Groundwater Contamination site in Roscoe, Illinois.

Please find attached a Scope of Work for conducting the groundwater investigation at the above referenced site per our conversation of July 8, 1993. Also included are monitoring well logs, private well logs and the contaminants of concern at the Evergreen Manor Subdivision site.

Please provide a Technical Work plan, a Health and Safety Plan and a Cost Proposal for conducting the work within five (5) working days of receipt of this notification. Costs associated with the development of the Technical Work Plan and the Health and Safety Plan should be included in the total cost of the project.

If you have any questions, please feel free to contact me at the above telephone number or directly at (217) 782-3983.

Sincerely,

Gregory W. Dunn

Gregory W. Dunn, Project Manager
Remedial Project Management Section
Division of Remediation Management
Bureau of Land

GWD:gwd
Enclosures

Printed on Recycled Paper

SCOPE OF WORK

A. EXECUTIVE SUMMARY

The contractor shall furnish all personnel, materials, services and equipment necessary to complete all the work specified below:

Task 1. Install approximately 25 - two (2) inch diameter stainless steel monitoring wells at locations determined by the Agency Project Manager. The contractor shall assume the maximum depth of the wells to be 65 feet, with 10 foot stainless steel screens. The monitoring well installation should be completed under Illinois Department of Public Health's Illinois Water Well Construction Code (77 Ill. Adm. Code, Part 920). A protective casing and lock will also be required.

Task 2. Develop monitor wells. Survey monitoring wells to the nearest 0.01 foot.

Appendix B

SITE SAFETY PLAN

A. SITE DESCRIPTION

JOB NAME: Evergreen Manor/IEPA

JOB NUMBER: #3936

PLAN REVISION NUMBER: _____

Date: December 2, 1993 Site Location (City): Roscoe, Illinois

Site Address: Winnebago County, Roscoe, Illinois

Additional Site/Project Information: _____

B. JOB SCOPE:

1. Identify well locations
2. Drill 28 holes ranging from 30 ft to 100 ft.
3. Drum all drill cuttings.
4. Decon all downhole tools.
5. Contain rinsates in drums
6. Install 28 monitoring wells

C. ONSITE ORGANIZATION AND COORDINATION - The following personnel are designated to carry out the stated job functions on site. (Note: One person may carry out more than one job function.)

RES RESPONSE MANAGER:	Steve Handley
GOVT. OFFICIAL:	Greg Dunn
RES FOREMAN:	N/A
SITE SAFETY OFFICER:	N/A
CONTRACTOR COMPANY:	Layne Northwest, Inc.
CONTACT:	Amy Pomeroi

The Project Manager has overall responsibility for all activities on site, including implementation of the site safety and health plan. The Project Manager may delegate this function to the Site Safety Officer.

The Site Safety Officer is responsible for ensuring that work crews comply with all site safety and health requirements.

All site empoyees are responsible for understanding and complying with this SSP.

D. SITE LAYOUT

The onsite Command Post and staging area will be located at To be determined on site. Support zone will be designated by site supervisor away from the immediate work zone.

Explain location of exclusion zone and method to identify: The exclusion zone will be the immediate work area capable of performing the necessary drilling. In populated areas, the hot zone will be designated by caution tape.

Explain where CRZ (decon line) will be located (attach site drawing) and method to identify: The CRZ will be located adjacent and upwind from the designated work area.

E. HAZARD EVALUATION

The following chemical substance(s) are known or suspected to be on site. The primary hazards of each are identified.

Chemical	Concentrations (If Known)	TLV/PEL	Primary Hazards
Tricloroethylene	90.9 ppb	50 ppm	Inh, Skin, Ing
Perchloroethylene	4.0 ppb	25 ppm	Inh, Skin, Ing
cis 1,2-Dichloroethylene	7.2 ppb	200 ppm	Inh, Skin, Ing
1,1-Dichloroethylene	10.9 ppb	200 ppm	Inh, Skin, Ing
Carbon Tetrachloride	2.5 ppb	2 ppm	Inh, Skin, Ing
1,1,1-Tricloroethane	51.5 ppb	350 ppm	Inh, Skin, Ing
1,1-Dichloroethane	3.2 ppb	100 ppm	Inh, Skin, Ing
1,1,2-Trichloroethane	0.5 ppb	10 ppm	Inh, Skin, Ing

The following physical hazards are expected on site:

HAZARD	PREVENTION
Various org vapor exposure.	Monitor durimg drilling. Wear respiratory protection if needed.
Moving drill parts.	Keep personnel away. Do not wear loose fit clothing.
Uneven terrain.	Use caution when working. Clear walkways when possible.
Utility lines.	Locate and mark all utilities in the surrounding work area.
Gen drill rig hazards.	See Appendix A

Hazardous substances information form(s) or Material Safety Data Sheets (MSDS) for the known chemicals onsite are attached.

F. PERSONAL PROTECTIVE EQUIPMENT

Based on evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work areas or tasks:

Location	Task/Activity	Level of Protection
Exclusion Zone	Drilling & well installation	A B C D - Modified
	_____	A B C D
	_____	A B C D
	_____	A B C D
Contamination	Decontamination	A B C D - Modified
Reduction Zone	_____	A B C D
	_____	A B C D
	_____	A B C D

Specific protective equipment for each level of protection is as follows:

PROTECTIVE GEAR - LEVEL A N/A		(Check those needed)
SCBA - MSA ULTRA-LIGHT		_____
SPARE AIR TANKS		_____
LEVEL A SUIT	(TYPE_____)	_____
LATEX GLOVES		_____
BOOT COVERS	(TYPE_____)	_____
OUTER CHEMICAL GLOVES	(TYPE_____)	_____
OUTER WORK GLOVES	(TYPE_____)	_____
HARD HAT		_____
CASCADE SYSTEM		_____

PROTECTIVE GEAR - LEVEL A (continued)		(Check those needed)
OTHER	(List_____)	_____
OTHER	(List_____)	_____
OTHER	(List_____)	_____
OTHER	(List_____)	_____
OTHER	(List_____)	_____
OTHER	(List_____)	_____
OTHER	(List_____)	_____

PROTECTIVE GEAR - LEVEL B N/A		(Check those needed)
SCBA - MSA ULTRA-LIGHT		_____
5-MINUTE EGRESS		_____
CHEMICAL RESISTANT		_____
OUTER SUIT	(TYPE_____)	_____
FULL BODY APRON	(TYPE_____)	_____
INNER LATEX GLOVES		_____
OUTER CHEMICAL GLOVES	(TYPE_____)	_____
OUTER WORK GLOVES	(TYPE_____)	_____
CHEMICAL STEEL TOE BOOTS		_____
BOOT COVERS	(TYPE_____)	_____
HARD HAT		_____
HEARING PROTECTION		_____
OTHER	(List_____)	_____
OTHER	(List_____)	_____
OTHER	(List_____)	_____
OTHER	(List_____)	_____
OTHER	(List_____)	_____
OTHER	(List_____)	_____
OTHER	(List_____)	_____

LEVEL C (Check those needed)

MSA ULTRA-TWIN RESPIRATOR		yes
MSA POWER AIR PURIFYING RESPIRATOR		
CARTRIDGES	(TYPE GMC-H)	
ESCAPE MASK	(TYPE)	
CHEMICAL RESISTANT OUTER SUIT	(TYPE Tyvek)	yes
FULL BODY APRON	(TYPE)	
LATEX GLOVES		yes
OUTER CHEMICAL GLOVES	(TYPE Nitrile)	yes
OUTER WORK GLOVES	(TYPE)	
CHEMICAL STEEL TOE BOOTS		yes
HARD HAT		yes
OTHER	(List)	
OTHER	(List)	
OTHER	(List)	
OTHER	(List)	
OTHER	(List)	

LEVEL D (Check those needed)

CHEMICAL RESISTANT OUTER SUIT	(TYPE Tyvek)	yes
RAIN SUIT		
CHEMICAL STEEL TOE BOOTS		yes
OUTER BOOT COVERS	(TYPE)	if necessary
WORK GLOVES		if necessary
HARD HAT WITH FACE SHIELD		yes
SAFETY GLASSES		yes
OTHER	(List)	
OTHER	(List)	
OTHER	(List)	
OTHER	(List)	

NO CHANGES TO THE SPECIFIED LEVELS OF PROTECTION SHALL BE MADE WITHOUT THE APPROVAL OF THE SITE SAFETY MANAGER AFTER REACHING AGREEMENT WITH THE REGIONAL HEALTH AND SAFETY PROFESSIONAL.

G. DECONTAMINATION PROCEDURES

Decon of personnel will consist of the following steps:

1. Dry decon - boot wash if necessary
2.
3.
4.

Equipment decontamination will consist of the following steps:

1. Drilling tools pressure washed & rinsed
2. Contain & drum decon water
3. NOTE: Downhole tools will be deconned after each 2 well locations (2 wells per area)
4.

Emergency decontamination will consist of the following steps:

1. N/A
2.
3.
4.

The following decontamination equipment is required:

1. Steam cleaner (pressure washer)
2. Decontamination tubs
3. Water source
4. Visqueen (plastic sheeting)

H. EMERGENCY AND CONTINGENCY PLANS

1. Steve Handley is the designated Site Safety Officer and is directly responsible to the Response Manager for safety recommendations on site.

2. _____ is the designated First Aid/CPR person onsite.

First-aid equipment is available on site at the following locations:

First-aid Kit: In support zone near work area

Emergency Eye Wash: In support zone near work area

Emergency Shower: N/A

Other

Emergency medical information for substance present:

Substance	Exposure Symptoms	First-Aid Instructions
Trichloroethylene	headache, cyanosis, dizziness	Fresh air/Resp support
Carbon Tetrachloride	Nausea, vomit, skin irrit	Resp support, flush skin w/water
1,1-Dichloroethane	Skin irrit, CNS depressant	Resp support, flush skin w/water
1,2-Dichloroethylene	Eye irrit, resp irrit	Fresh air/Resp support
1,1,2-Trichloroethane	Irrit nose & eyes, CNS	Fresh air/Resp support

Emergency Phone Numbers:

Agency/Facility	Phone #
Police	911
Fire	911
Hospital	Rockford Memorial Hospital (815) 961-6195
Address:	2400 N Rockton Rockford, Il 61103
Poison Control	

Rockton -> stop (3 miles) Left
Hwy 2 -> Rockton
1st large intersection (Riverside)
2nd light - Rockton

Rockford Memorial is the medical facility to be used in the event of illness or injury.

The route to the hospital is as follows: To be determined by site supervisor prior to job start up.

The following standard emergency procedures will be used by onsite personnel. The Site Safety Officer shall be notified of any onsite emergencies and be responsible for ensuring that the appropriate procedures are followed.

Perform the following in the event of fire: Upon notification of a fire or an explosion on site, the designated emergency signal of 3 horn blasts shall be sounded and all site personnel shall assemble at the decontamination line. The fire department shall be alerted and all personnel moved to a safe distance from the involved area.

Perform the following in the event of medical emergency.

In the Exclusion Zone: Upon notification of an injury in the exclusion zone, the designated emrgency signal of 3 horn blasts shall be sounded. All site personnel shall assemble at the decontamination line. The rescue team will enter the exclusion zone (if required) to remove the injured person to the hotline. The Site Safety Officer and Project Team Leader should evaluate the nature of the injury, and the affected person should be decontaminated as best possible prior to movement to the support zone. The onsite EMT shall initiate the appropriate first aid, and contact should be made for medical assistance if required. No persons shall re-enter the exclusion zone until the cause of the injury or symptoms is determined.

In the Support Zone: Upon notification of an injury in the support zone, the Project Team Leader and Site Safety Officer will assess the nature of the injury. If the cause of the injury or the loss of the injured person does not affect the performance and safety of site personnel, operations may continue, with the onsite EMT initiating the appropriate first aid procedures. If the injury increases the risk to others, the designated emergency signal of 3 horn blasts shal be sounded and personnel shall move to the decontamination line for further instructions.

Personal Protective Equipment Failure: If any site worker experiences a failure or alternation of protective equipment that affects the protection factor, that person and his/her buddy shall immediately leave the Exclusion Zone. Reentry shall not be permitted until the equipment has been repaired or replaced.

Other Equipment Failure: If any other equipment on site fails to operate properly, the Response Manager and Site Safety Officer shall be notified. They will determine the effect of this failure on continuing operations on site. If the failure affects the safety of personnel or prevents completion of the Work Plan tasks, all personnel shall leave the Exclusion Zone until the situation is evaluated and appropriate actions taken.

Perform the following in the event of chemical spill or vapor release.

If excessive vapors are present from drilling, cease drilling and vacate the work area.

Proper PPE must be donned (contact health & safety mgr.) if possible to re-evaluate scope of work.

I. SITE AIR MONITORING

Direct Reading Instrumentation:

The following environmental monitoring instruments shall be used on site (circle the appropriate interval) at the specified intervals.

Combustible Gas Indicator	continuous/hourly/daily/not needed	_____
0 2 Monitor	continuous/hourly/daily/not needed	_____
Calorimetric Tubes	continuous/hourly/daily/not needed	_____
_____	continuous/hourly/daily/not needed	_____
HNU/OVA	continuous/hourly/daily/not needed	during drilling and well installation.
Other_____	continuous/hourly/daily/not needed	_____

Personal Monitoring:

Personal monitoring breathing zone (if required) will consist of:

Type Required: HNu readings periodically in the breathing zone.

Sample Media: N/A

Frequency: Every 15 minutes

Analytical Procedure Required: N/A

J. EMPLOYEE TRAINING

All Field employees receive forty hours of classroom training on various health and safety topics regarding hazardous waste sites in accordance with 29 CFR 1910.120. Topics include:

Regulatory Compliance (OSHA, EPA, DOT)
Toxicology
Flammables
Corrosives Reactions
Respiratory Protection
Personal Protective Clothing
Environmental Monitoring
Site Safety Plans
Contingency Plans
Noise Stress
Heat/Cold Stress
Ionizing Radiation
Drum Handling
Confined Space Entry
Decontamination
Medical Surveillance
Hazard Communication

Annually thereafter, all field employees receive eight hours of refresher training on the above topics.

Managers and Supervisors receive an additional eight hours of training on safe management of hazardous waste sites. All training complies with 29 CFR 1910.120. All field employees receive initial and recertification training in first aid and CPR. All training is documented and kept on file at the district office. Copies of certification are also located on each jobsite.

Site specific training is held at the begining of each job. Daily safety meetings are conducted at the site and documented.

K. MEDICAL SURVEILLANCE

Pre-employment and periodic update medical examinations are required under 29 CFR 1910.120 for persons working at hazardous waste sites. The medical examination must have been completed within 12 months prior to on-site activity and repeated annually. A licensed physician issues a written opinion that the worker is fit-for-duty for hazardous waste site work activities and able to wear respiratory protection. Workers are informed of their right to accessibility of medical records. The RES written Medical Surveillance Program is on file the RES-Chicago office.

L. HAZARD COMMUNICATION

In accordance with 29 CFR 1910.1200, all siteworkers working with hazardous materials are provided with adequate information regarding their dangers and precautions. Containers of hazardous materials must be properly labeled and MSDS's be kept on site. Workers receive training on the information on the MSDS as part of the daily safety meetings. The RES written Hazard Communication Program is on file at the RES-Chicago office.

M. PLAN ACKNOWLEDGEMENTS

All site personnel have read the above plan and are familiar with its provisions.

	Name	Signature
Site Safety Officer		
Response Manager		
Other Site Personnel	Larry Stewart	Larry Stewart
	AMY POMEROY	Amy C. Pomeroy
	DOUG JONES	Doug Jones
	Henry Schnell	Henry Schnell
	David Wells	David Wells (12-04)
	[illegible]	[illegible]
	MARK BACKHAUS	
	LOUIS THEIN	
	SCOTT GRASKEI	Scott Graskei

Appendix A
Drill Rig Safety

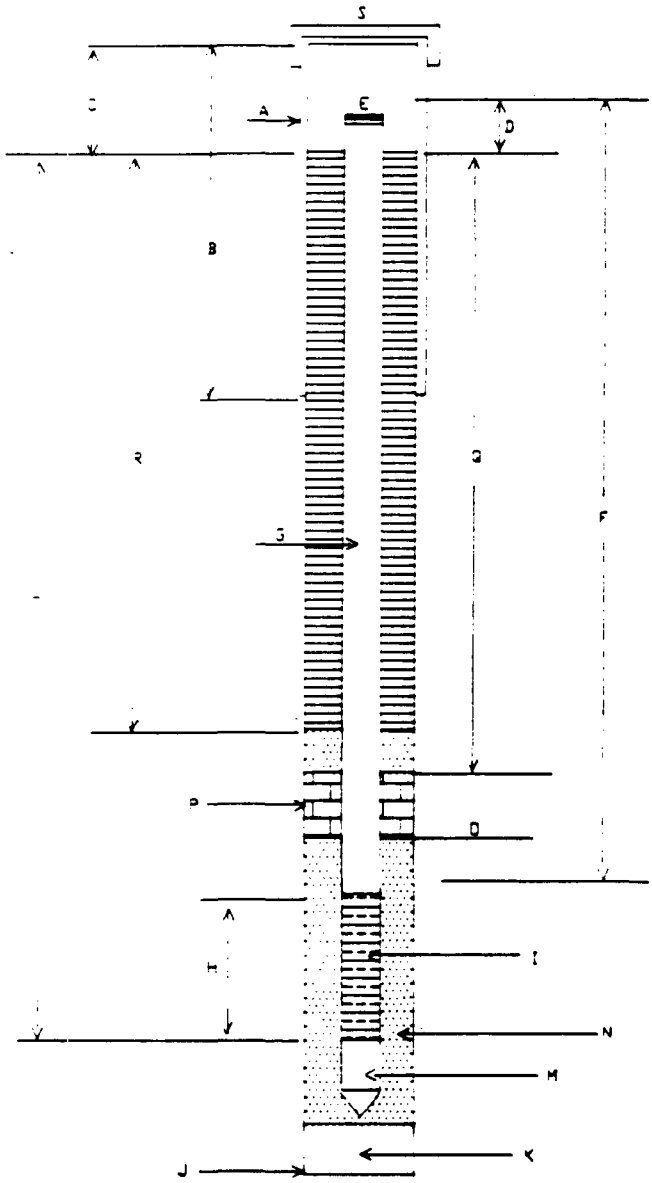
Drill Rig Safety

- Hard hats must be worn at all times.
- All team members must know the procedure to shut of the drill rig and the location of the "kill" switch.
- When moving a drill rig, pay attention to obstacles in route of travel. Walk the intended route first to locate hazards.
- Utilize a spotter whenever maneuvering the drill rig.
- Set the rig brakes and block the wheels when the rig is set up at the desired drilling location.
- The mast must be lowered when the rig is put in motion.
- Always consider overhead wires to be live, watch for sagging lines and do not operate rig within 20 feet of overhead lines.
- Make sure the site, platforms, and walkwaysare free of obstructions.
- Make sure proper housekeeping is practiced around and on the rig at all times. Tools should be stored in a manner that permits convenient access and provides for adequate safety.
- Store gasoline in approved containers that have a spark arrestor and keep them clear of the drilling work area.
- Check rig equipment prior to starting work. Repair or replace faulty and worn items.
- Handle augers with care. Use proper lifting techniques when picking up samplers and augers. Use a tool hoist if possible and stay clear of rotating augers. Keep cables and ropes secured when not in use.
- Level and stabilize the drill rig prior to raising the mast.
- Watch for slippery ground when working in the area of the rig.
- All un attended boreholes must be properly covered.
- Do not drill during an electical storm.
- Maintain a safe distance from the rig mechanisms during drive sampling and auger removal operations.

Appendix C

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	**Boring# G101-S**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:3.3' bsl***	**Date:12/08/93**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**

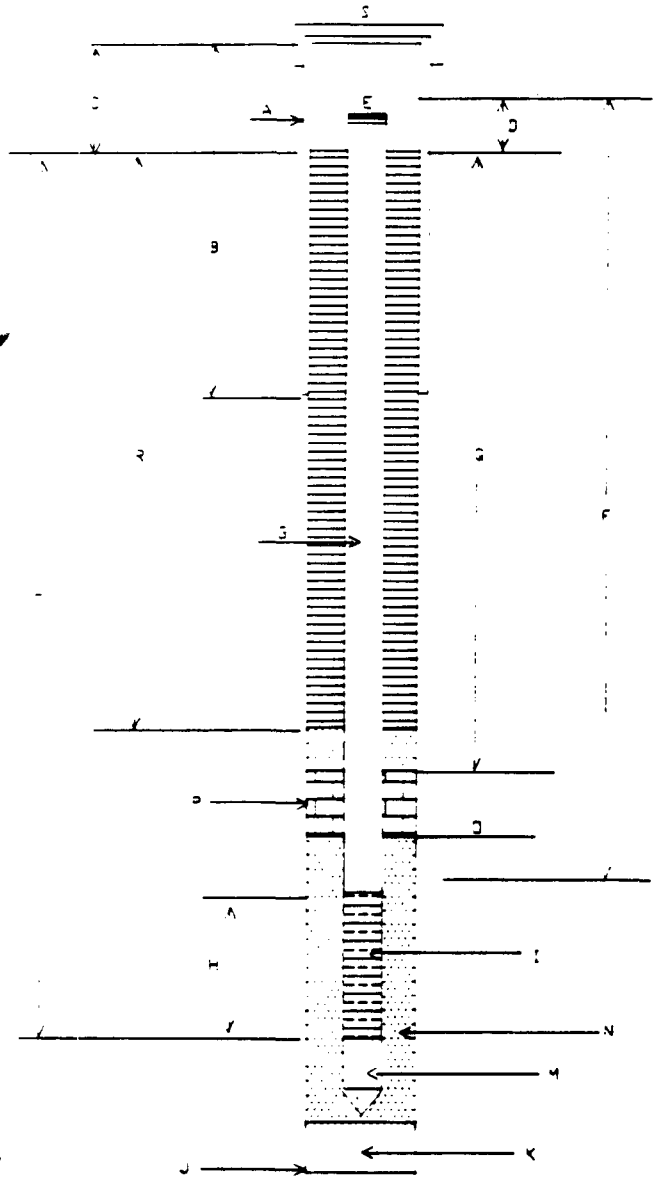


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 3.3'
E. Type of well cap PVC-Expandble
F. Total length of riser 30'S.S., 3.3'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 41
K. Type of material Formation
L. Depth to bottom of screen 40'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 28'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 25'
R. Depth length of grout column 25'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	**Boring# G101-D**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:3.0' TOC***	**Date:12/08/93**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**

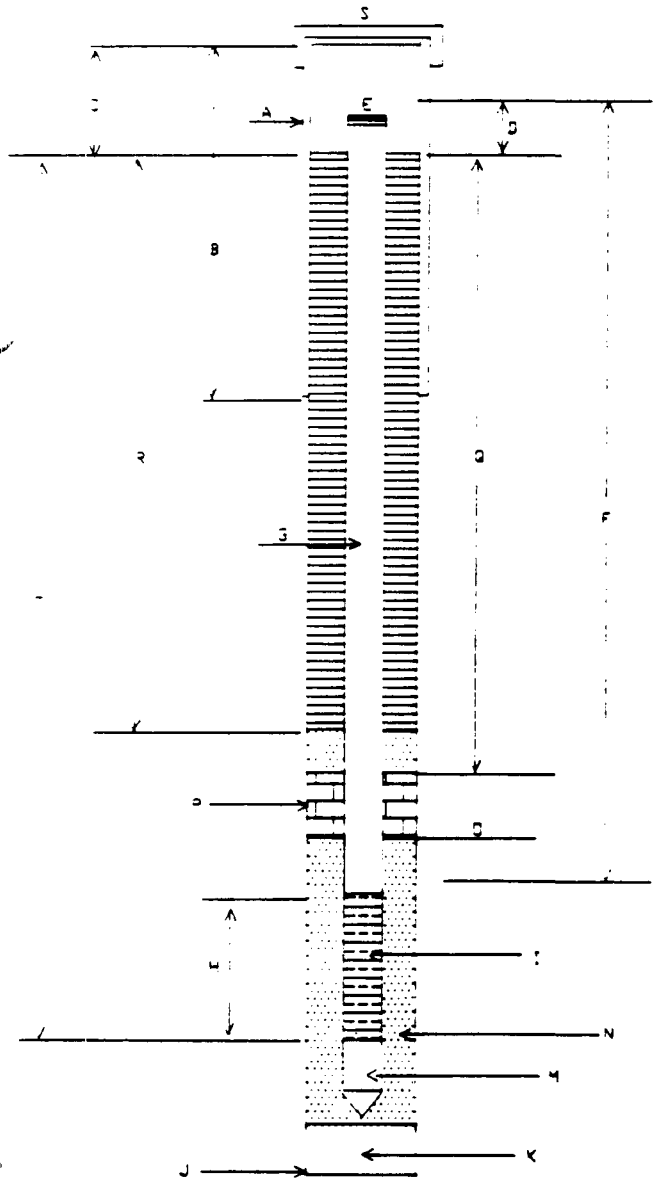


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 1.75'
E. Type of well cap PVC-Expandble
F. Total length of riser 70'S.S.,1.75'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 81'
K. Type of material Formation
L. Depth to bottom of screen 80'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 68'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 65'
R. Depth length of grout column 65'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	**Boring# G102-S**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:39.8' TOC***	**Date:12/10/93**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**

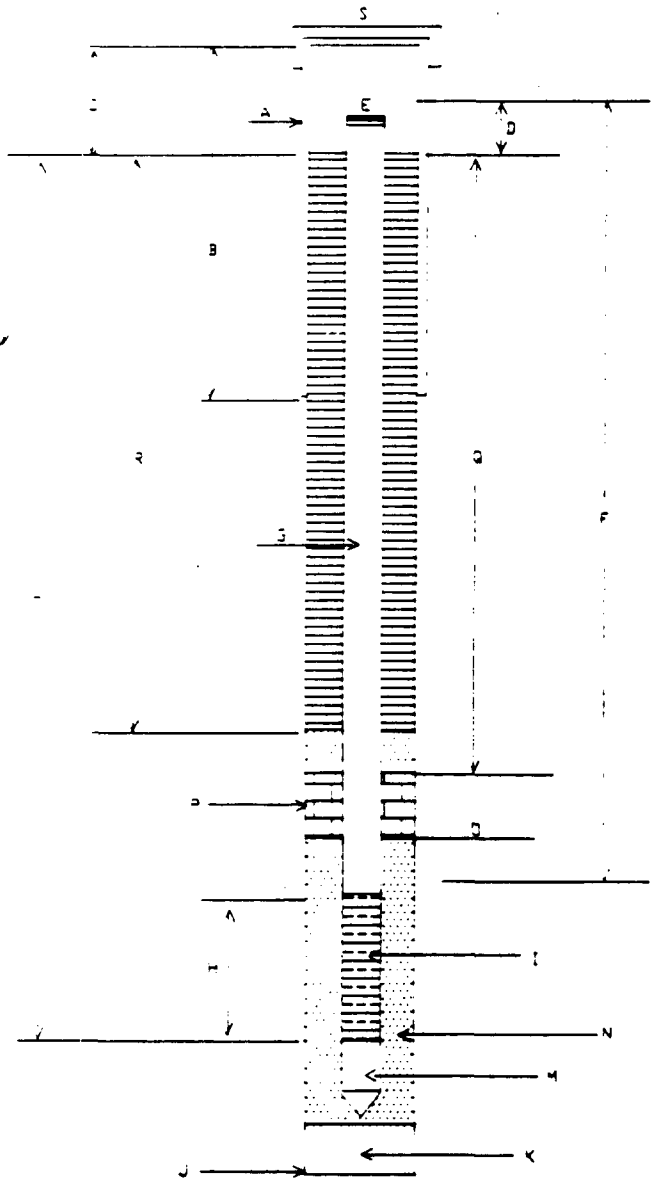


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 3.3'
E. Type of well cap PVC-Expandble
F. Total length of riser 10'S.S.,28.3'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 45'
K. Type of material Formation
L. Depth to bottom of screen 45'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 33'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 30'
R. Depth length of grout column 30'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	**Boring# G102-D**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:35.8' TOC***	**Date:12/09/93**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**

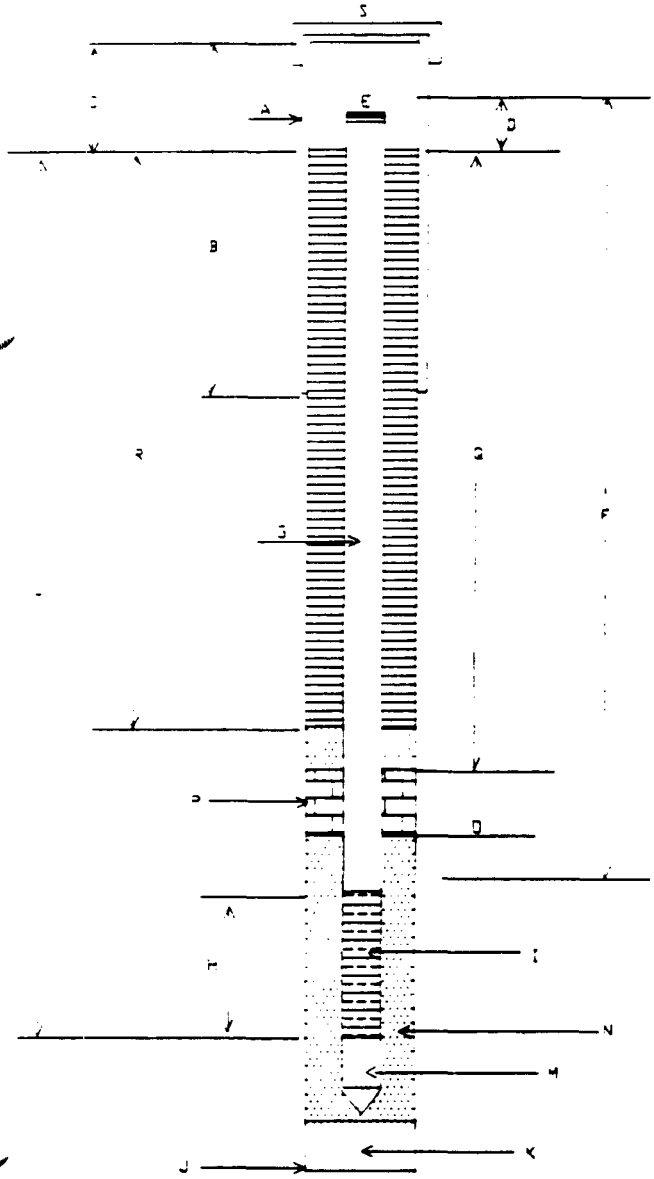


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 2.5'
E. Type of well cap PVC-Expandble
F. Total length of riser 25'S.S., 32.5'
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 100'**
K. Type of material Bentonite
L. Depth to bottom of screen 65'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 53'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 50'
R. Depth length of grout column 50'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.
** Mistakenly overdrilled hole, backfilled.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	**Boring# G103-S**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:31.7' TOC***	**Date:12/14/93**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**

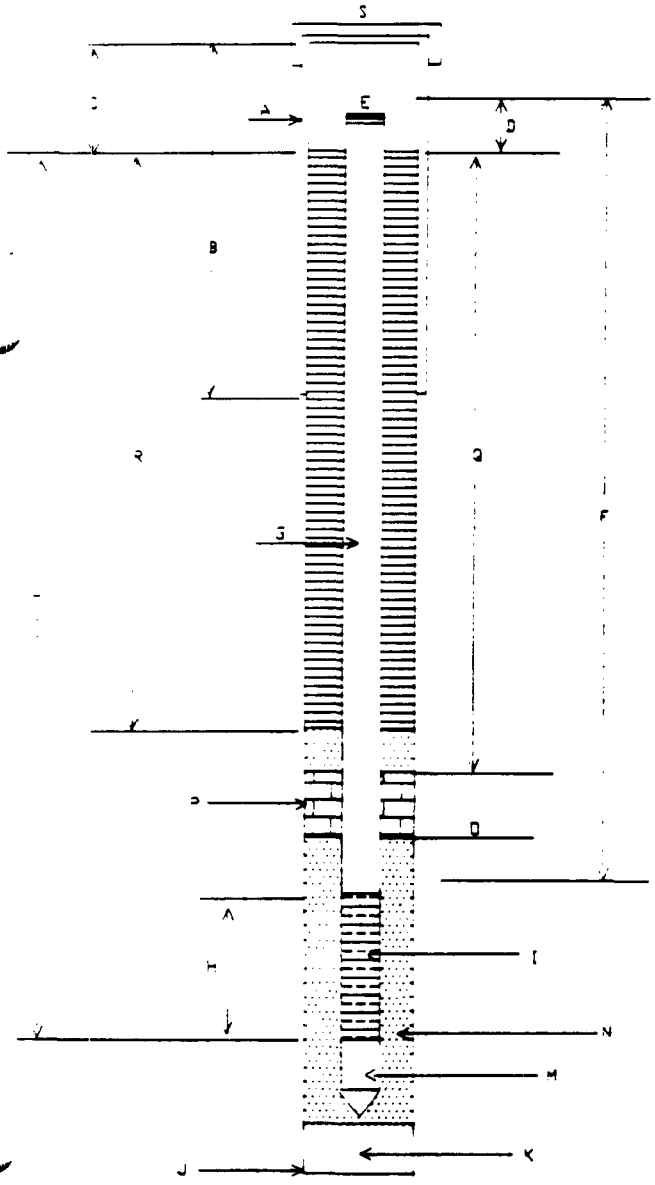


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 2.5'
E. Type of well cap PVC-Expandble
F. Total length of riser 10'S.S., 34.5'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 42'
K. Type of material Formation
L. Depth to bottom of screen 42'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 30'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 26'
R. Depth length of grout column 26'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	**Boring# G103-D**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:35.4' TOC***	**Date:12/13/93**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**

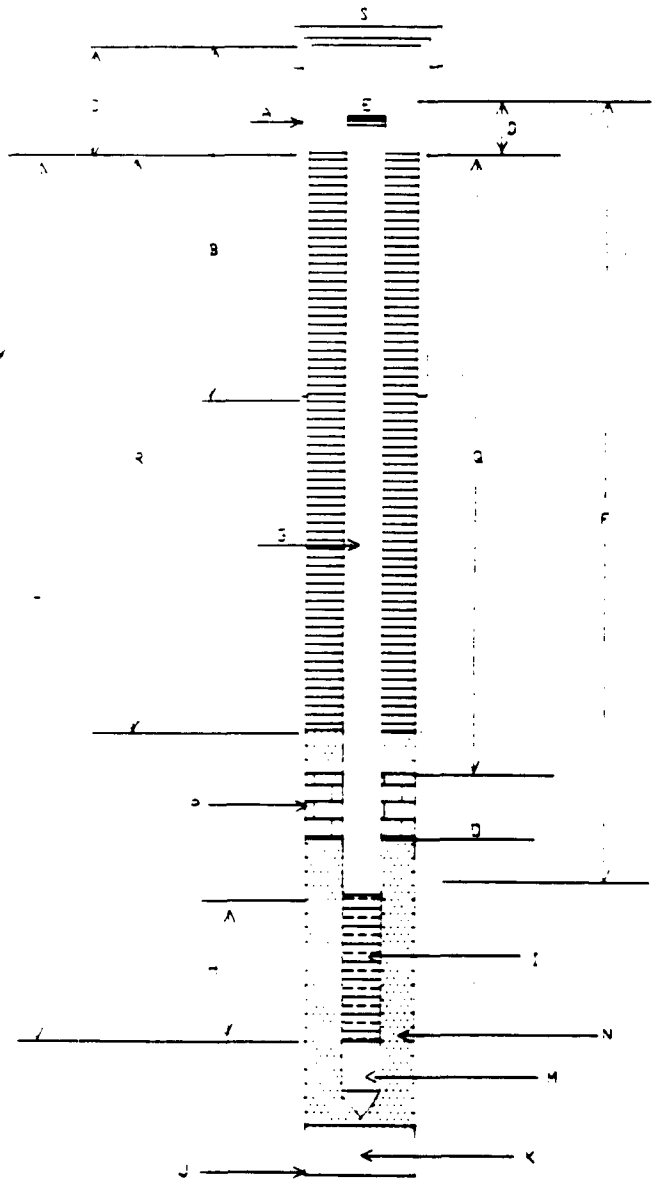


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 3.7'
E. Type of well cap PVC-Expandble
F. Total length of riser 20'S.S., 28.7'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 55'
K. Type of material Formation
L. Depth to bottom of screen 42'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 43'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 40'
R. Depth length of grout column 40'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	**Boring# G104-S**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:33.7' TOC***	**Date:12/16/93**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**

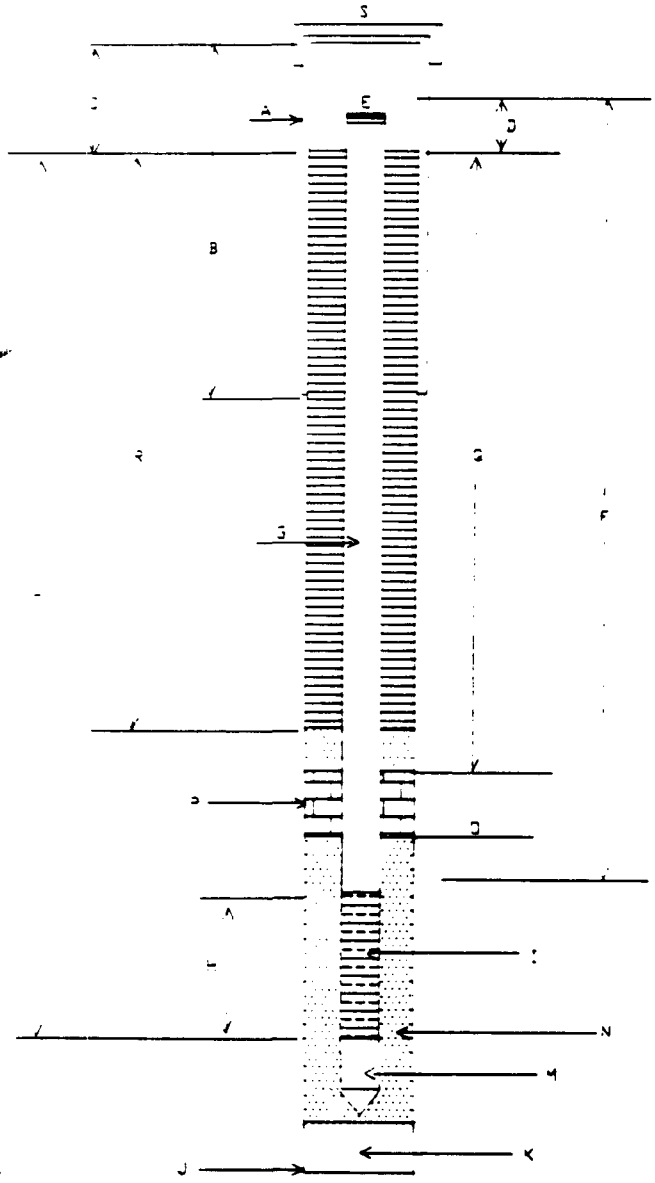


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 3.5'
E. Type of well cap PVC-Expandble
F. Total length of riser 20'S.S., 33.5'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 60'
K. Type of material Formation
L. Depth to bottom of screen 60'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 48'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 45'
R. Depth length of grout column 45'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	**Boring# G104-D**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:33.7' TOC***	**Date:12/14/93**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**

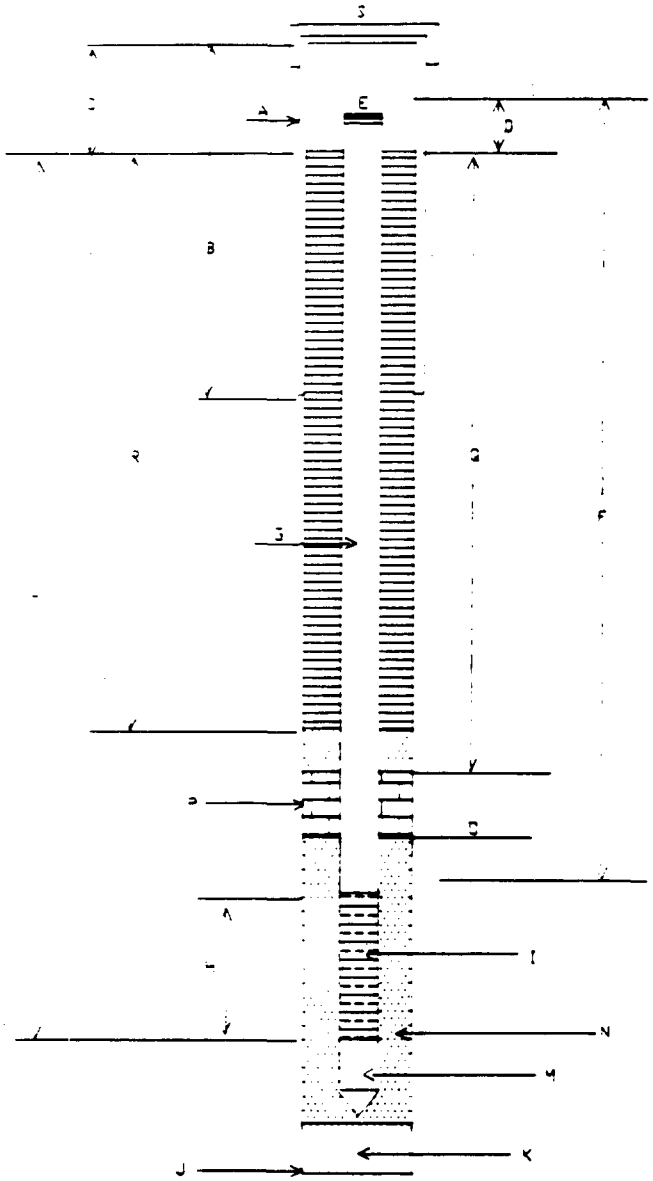


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 3.5'
E. Type of well cap PVC-Expandble
F. Total length of riser 60'S.S., 33.5P.V.C.'
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 100'
K. Type of material Formation
L. Depth to bottom of screen 100'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 88'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 85'
R. Depth length of grout column 85'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	**Boring# G105-S**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:35.9' TOC***	**Date:1/4/94**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**

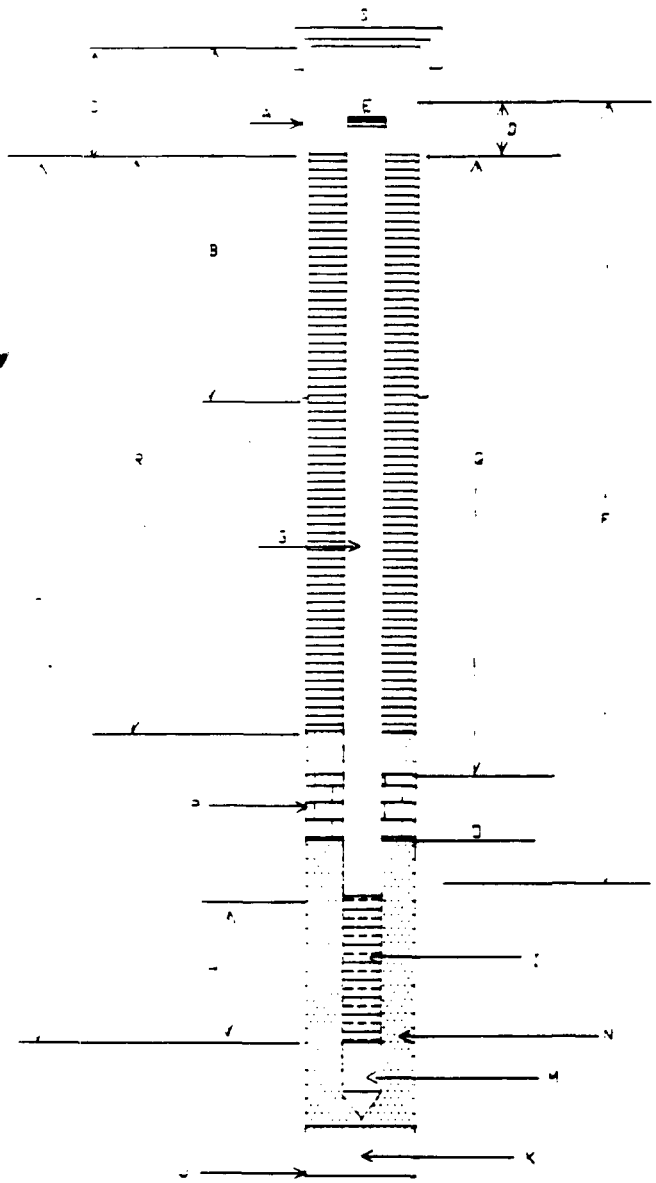


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 2.5'
E. Type of well cap PVC-Expandble
F. Total length of riser 30'S.S., 27.5'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 65'
K. Type of material Formation
L. Depth to bottom of screen 65'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 53'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 50'
R. Depth length of grout column 50'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	**Boring# G105-D**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:35.9' TOC***	**Date:1/4/94**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**



A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 2.5'
E. Type of well cap PVC-Expandble
F. Total length of riser 60'S.S., 32.5'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 100'
K. Type of material Formation
L. Depth to bottom of screen 100'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 88'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 85'
R. Depth length of grout column 85'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

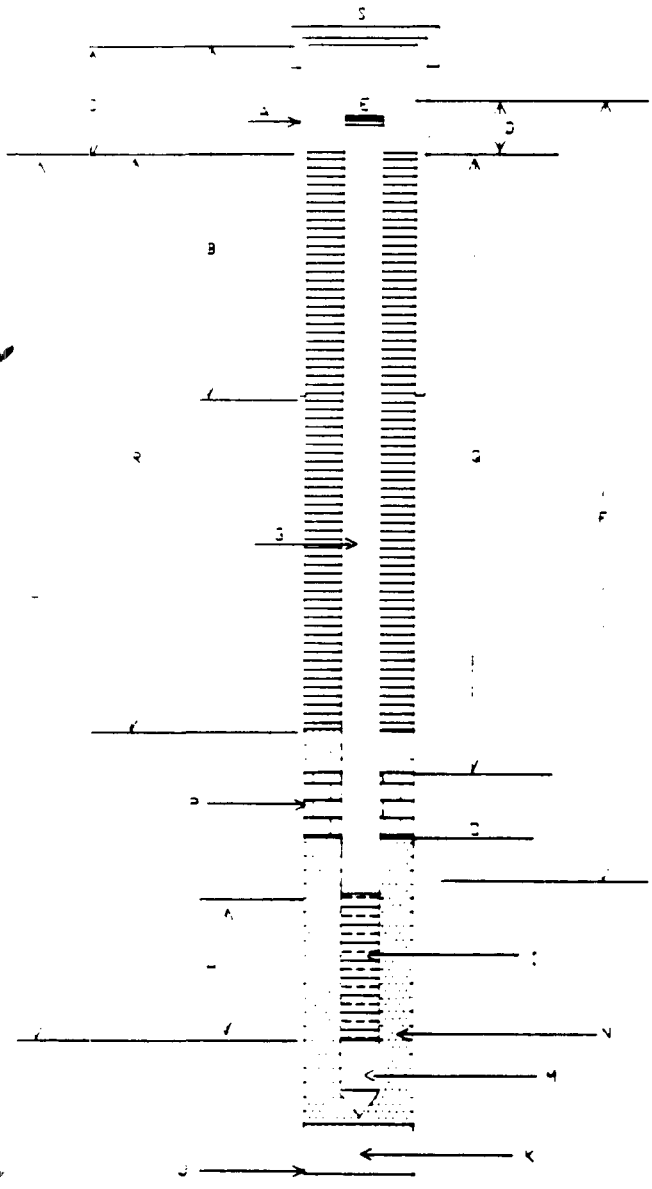
Project:Evergreen Manor	**Boring# G106-S**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:35.9' TOC***	**Date:1/4/94**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**

A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 2.5'
E. Type of well cap PVC-Expandble
F. Total length of riser 30'S.S., 27.5'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 65'
K. Type of material Formation
L. Depth to bottom of screen 65'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 53'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 50'
R. Depth length of grout column 50'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	**Boring# G106-D**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:35.9' TOC***	**Date:1/4/94**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**

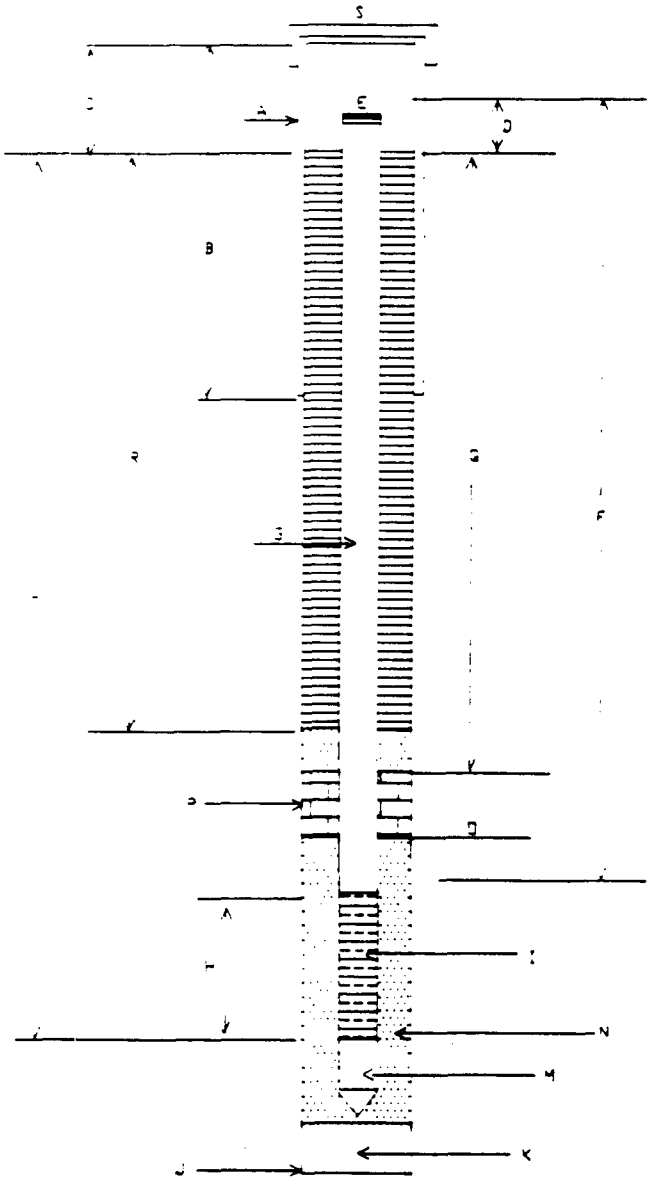


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 2.5'
E. Type of well cap PVC-Expandble
F. Total length of riser 70'S.S., 22.5'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 100'
K. Type of material Formation
L. Depth to bottom of screen 100'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 88'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 85'
R. Depth length of grout column 85'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	Boring# G107-S	Riedel Supervisor:Steve Handley
Location:Roscoe,IL	Static Water Level:36.5' TOC*	Date:1/4/94
Job:3936	Drilling Contractor:Layne	Development Method:Airlift
	Surface Elevation:-	Casing Elevation:-

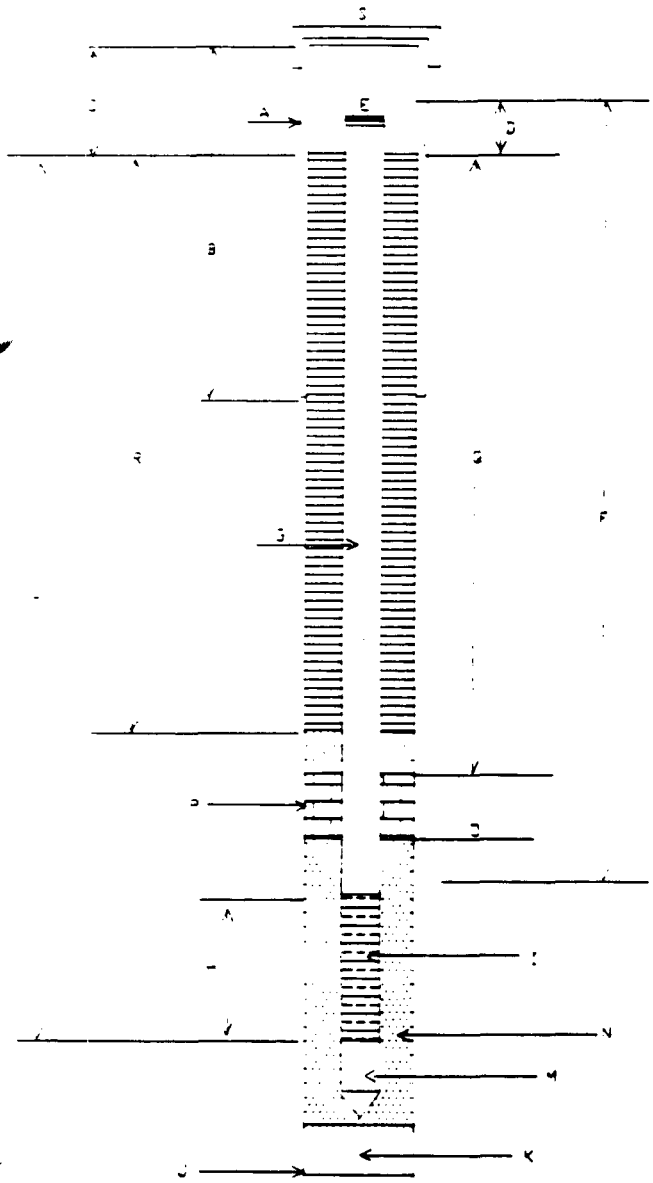


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 2.5'
E. Type of well cap PVC-Expandble
F. Total length of riser 37.5'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 45'
K. Type of material Formation
L. Depth to bottom of screen 45'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 33'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 30'
R. Depth length of grout column 30'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	**Boring# G107-D**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:36.5' TOC***	**Date:1/8/94**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**

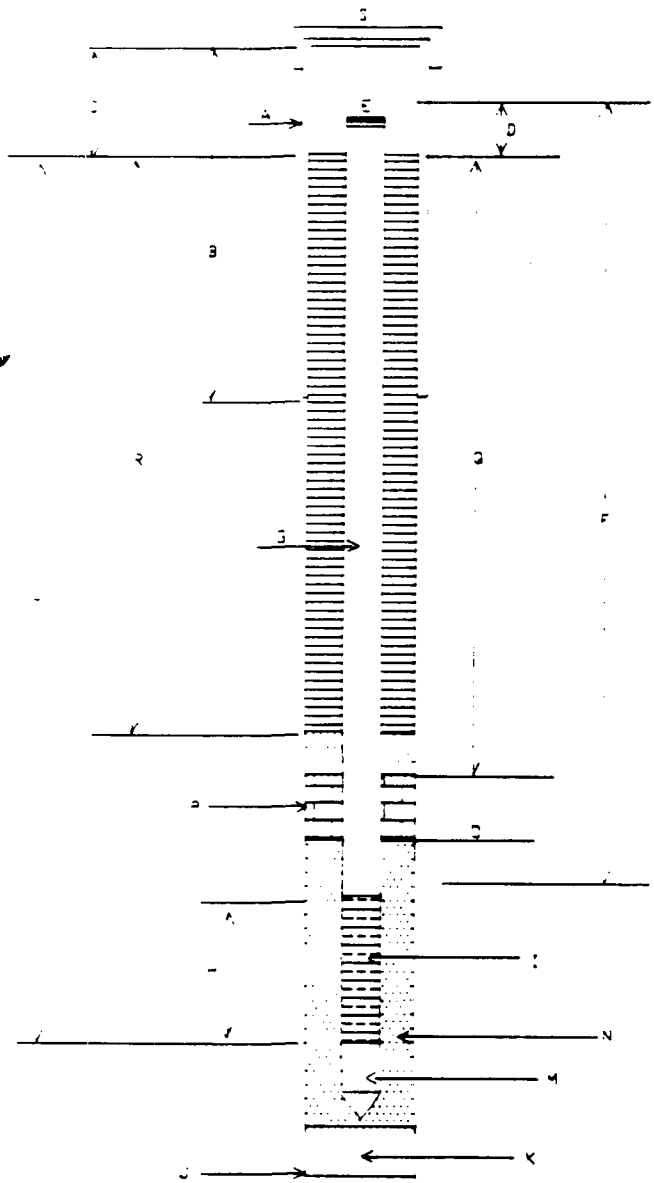


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 2.5'
E. Type of well cap PVC-Expandble
F. Total length of riser 30'S.S.,27.5'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 65'
K. Type of material Formation
L. Depth to bottom of screen 65'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 53'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 50'
R. Depth length of grout column 50'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	Boring# G108-S	Riedel Supervisor:Steve Handley
Location:Roscoe,IL	Static Water Level:38.5' TOC*	Date:1/8/94
Job:3936	Drilling Contractor:Layne	Development Method:Airlift
	Surface Elevation:-	Casing Elevation:-

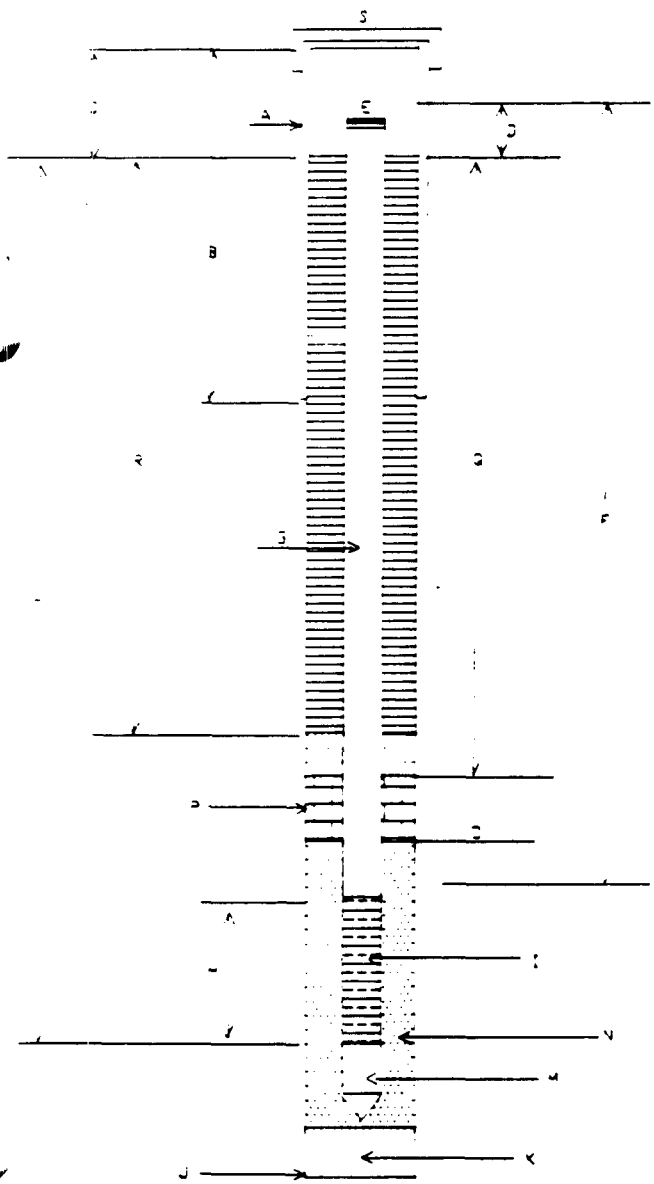


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 3'
E. Type of well cap PVC-Expandble
F. Total length of riser 10'S.S.,27.5'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 45'
K. Type of material Formation
L. Depth to bottom of screen 45'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 33'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 30'
R. Depth length of grout column 30'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	**Boring# G108-D**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:38.5' TOC***	**Date:1/8/94**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**

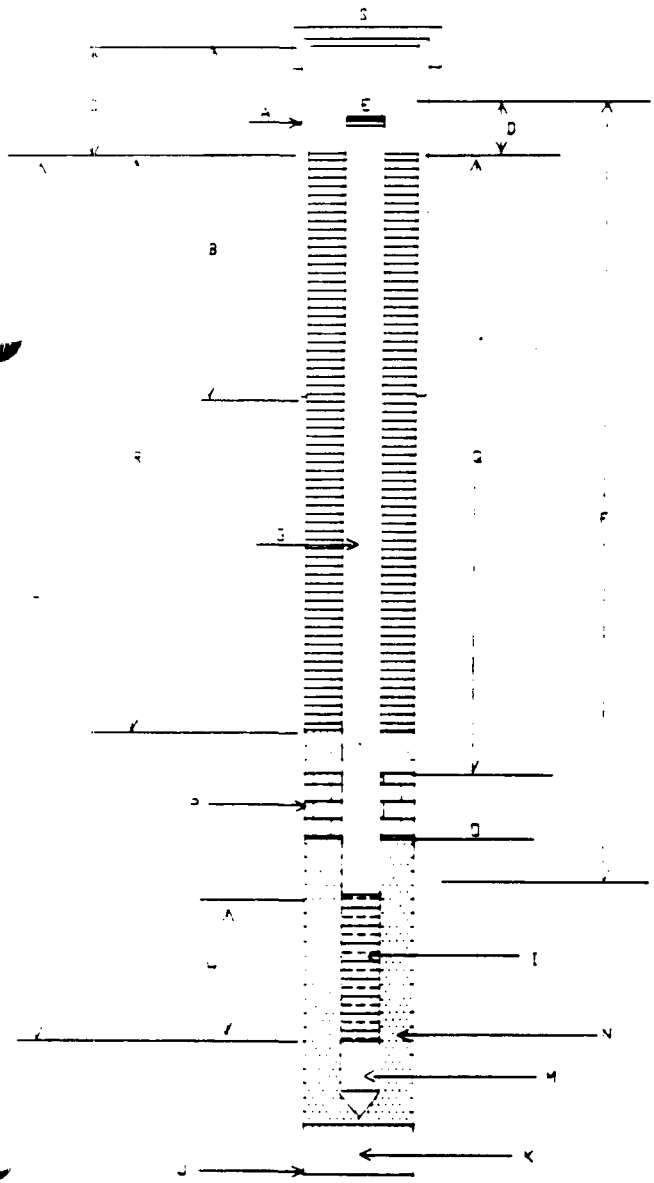


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 2.5'
E. Type of well cap PVC-Expandble
F. Total length of riser 30'S.S.,27.5'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 65'
K. Type of material Formation
L. Depth to bottom of screen 65'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 53'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 50'
R. Depth length of grout column 50'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	**Boring# G109-S**	**Riedel Supervisor:Steve Handley**
Location:Roscoe,IL	**Static Water Level:38.5' TOC***	**Date:1/11/94**
Job:3936	**Drilling Contractor:Layne**	**Development Method:Airlift**
	Surface Elevation:-	**Casing Elevation:-**

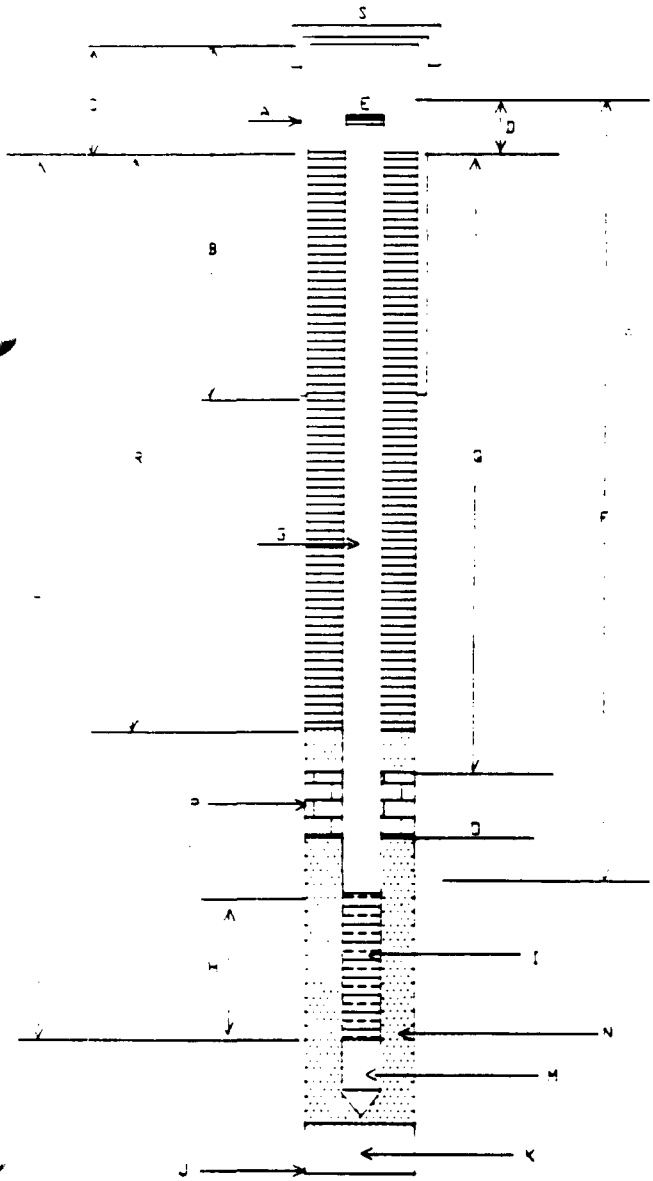


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 2.5'
E. Type of well cap PVC-Expandble
F. Total length of riser 5'S.S.,37.5'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 50'
K. Type of material Formation
L. Depth to bottom of screen 50'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 38'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 35'
R. Depth length of grout column 35'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	Boring# G109-D	Riedel Supervisor:Steve Handley
Location:Roscoe,IL	Static Water Level:40' TOC*	Date:1/12/94
Job:3936	Drilling Contractor:Layne	Development Method:Airlift
	Surface Elevation:-	Casing Elevation:-

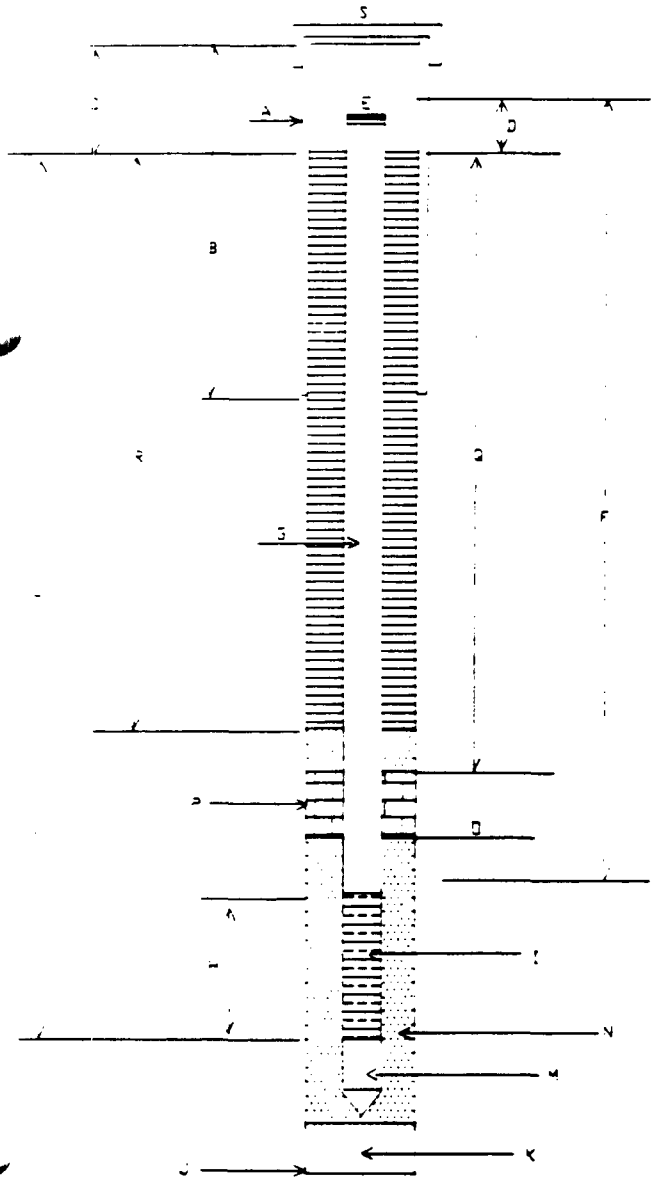


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 2.5'
E. Type of well cap PVC-Expandble
F. Total length of riser 30'S.S.,32.5'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 70'
K. Type of material Formation
L. Depth to bottom of screen 70'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 58'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 55'
R. Depth length of grout column 55'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	Boring# G110-S	Riedel Supervisor:Steve Handley
Location:Roscoe,IL	Static Water Level:21' TOC*	Date:1/13/94
Job:3936	Drilling Contractor:Layne	Development Method:Airlift
	Surface Elevation:-	Casing Elevation:-

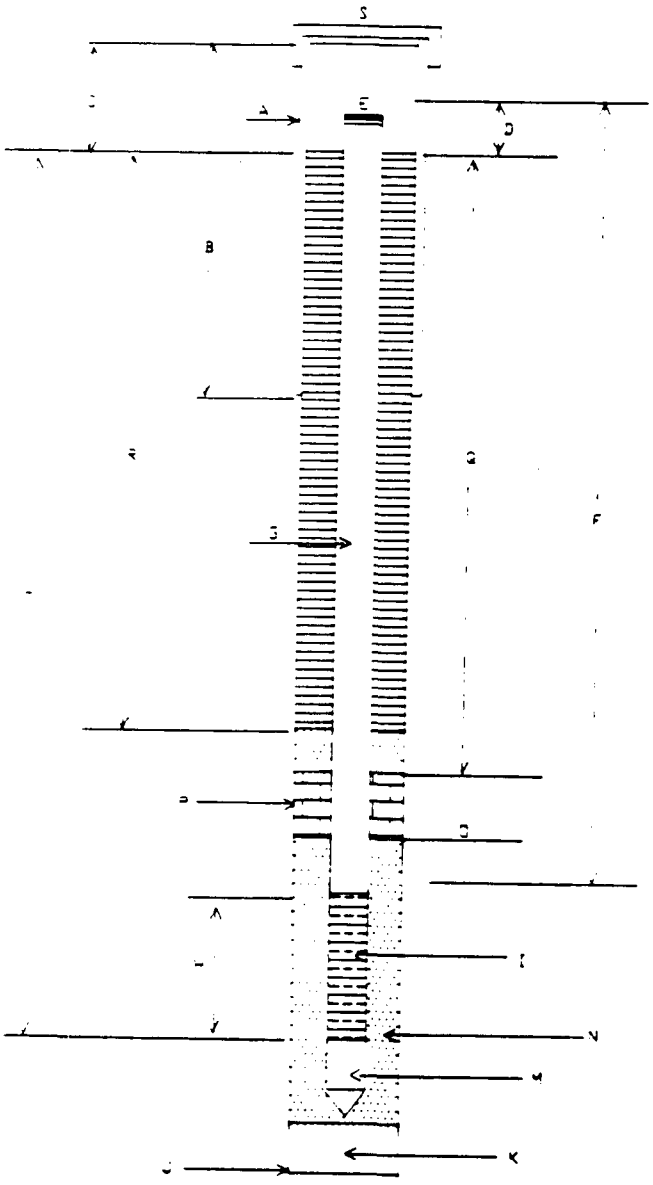


A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 2.75'
E. Type of well cap PVC-Expandble
F. Total length of riser 5'S.S.,18.75'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 31'
K. Type of material Formation
L. Depth to bottom of screen 31'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 19'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 16'
R. Depth length of grout column 16'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

RIEDEL ENVIRONMENTAL SERVICES, INC.
Well Completion Form

Project:Evergreen Manor	Boring# G110-D	Riedel Supervisor:Steve Handley
Location:Roscoe,IL	Static Water Level:21' TOC*	Date:1/13/94
Job:3936	Drilling Contractor:Layne	Development Method:Airlift
	Surface Elevation:-	Casing Elevation:-



A. Type of protective casting steel
B. Total length of protective casting 5'
C. Height of protective casting -
D. Height of standpipe 2.5'
E. Type of well cap PVC-Expandble
F. Total length of riser 20'S.S.,22.5'P.V.C.
G. Type of riser 2' O.D. Stainless
H. Length of screen 10'
I. Type of screen 2'x10' 0.01 slotted stainless
J. Total depth of borehole 50'
K. Type of material Formation
L. Depth to bottom of screen 50'
M. Well point length n/A
N. Type of filter pack Quartz Sand
O. Depth of filter pack 38'
P. Type of seal Hydrated bentonite chips
Q. Depth to top of seal 35'
R. Depth length of grout column 35'
S. Type of protective lid Hinged locking steel

COMMENTS: *water level measured at completion of construction of may not equal true swl.

Appendix D

HTW DRILLING LOG

1. COMPANY NAME: Fiedel Environmental Services, Inc.	2. DRILLING SUBCONTRACTOR: Layne
3. PROJECT: Evergreen Manor	4. LOCATION: Roscoe, Illinois
NAME OF DRILLER: Doug	6. MANUFACTURER'S DESIGNATION OF DRILL
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: IR-TH60	8. HOLE LOCATION: Kellys Quarry
	9. SURFACE ELEVATION
	10. DATE STARTED: 12/14/93 — 11. DATE COMPLETED: 12/14/93
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: See Well Const.
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
14. TOTAL DEPTH OF HOLE: 200' B.S.L.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
N/A	N/A	N/A	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
N/A						

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		G104-D		

DEPTH	DESCRIPTION OF MATERIALS	ANALYTICAL SAMPLE NO.	REMARKS
2	Top Soil		
	Light brown medium san with 30% gravel, (well rounded, poorly sorted, moist) some silt		
4			
6			
8			
10			

FORM081/1

TCT-St. Lou

HTW DRILLING LOG

1. PROJECT	2. INSPECTOR	
Evergreen Manor	SJH	SHEET 2

DEPTH	DESCRIPTION OF MATERIALS	ANALYTICAL SAMPLE NO	REMARKS
12	Light brown medium sand 80%, poorly sorted, well rounded gravel, some silt, moist		
14			
16			
18			
20			
22			
24			
26			
28			
30	Fine to medium light brown sand, clean, moist, dense, minor gravel, (well sorted, 0.5 - 1 cm)		
32			

FORM081/1

TCT St. Lo

HTW DRILLING LOG

PROJECT	INSPECTOR	SHEET
Evergreen Manor	SJH	

DEPTH	DESCRIPTION OF MATERIALS		ANALYTICAL SAMPLE NO.	REMARKS
34		17		
36		18		
38	Medium to coarse light brown sand, moist, dense, 20% gravel	19		
40	Medium to coarse light brown sand, trace gravel, dense, wet	20		
42		21		
44	Medium to coarse light brown sand, dense, 60% gravel (0.25 - 0.5 cm)	22		
46		23		
48	Coarse light brown sand 80% poorly sorted gravel, wet	24		
50		25		
52	medium to coarse light brown sand with 40% poorly sorted well rounded gravel (0.25 - 0.5 cm)	26		
54		27		

FORM081/1

TCT-St. Lou

HTW DRILLING LOG

HOLE NO. [illegible]

1. PROJECT	2. INSPECTOR	SHEET
Evergreen Manor	SJH	

DEPTH	DESCRIPTION OF MATERIALS		ANALYTICAL SAMPLE NO	REMARKS
56		28		
58		29		
60		30		
62		31		
64		32		
66		33		
68	Light grey coarse sand with 30% gravel, wet	34		
70		35		
72		36		
74		37		
76	Light brown coarse sand with trace gravel, dense, wet	38		

FORM081/1

TCT-St. Lo

HTW DRILLING LOG

1. PROJECT	2. INSPECTOR	SHEET
Evergreen Manor	SJH	5

DEPTH	DESCRIPTION OF MATERIALS	ANALYTICAL SAMPLE NO.	REMARKS
78			
80			
82			
84			
86	Fine to medium light brown sand with 10% gravel, some silt, wet, dense		
88	Fine to medium sand, clean, well sorted, some silt		
90			
92			
94	Same as above with trace gravel		
96			
98	Same as above with 20% gravel		
100	Finished running: 12:06 Drill stem, TD = 100'		

FORM081/1

TCT-St. Lou

HTW DRILLING LOG

1. COMPANY NAME: Fiedel Environmental Services, Inc	2. DRILLING SUBCONTRACTOR: Layne
3. PROJECT: Evergreen Manor	4. LOCATION: Roscoe, Illinois
5. NAME OF DRILLER: Doug	6. MANUFACTURER'S DESIGNATION OF DRILL:
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: IR-TH60	8. HOLE LOCATION: Ecolab
	9. SURFACE ELEVATION:
	10. DATE STARTED: 12/09/93 — 11. DATE COMPLETED: 12/09/93
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: See Well Const.
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:
14. TOTAL DEPTH OF HOLE: 100'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
N/A	N/A	N/A	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
N/A						

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		G102-D		

DEPTH	DESCRIPTION OF MATERIALS		ANALYTICAL SAMPLE NO.	REMARKS
2	Top Soil	1		
4	Medium dense brown sand 20% gravel, with silt	2		Upper water in hole is from circulation
6		3		
8	Coarse dense light sand with 50% gravel, some silt Wet	4		
10	Fine to medium dense sand Tan, wet, 10% gravel, trace silt	5		

FORM081/1

TCT-St. Lou

HTW DRILLING LOG

1. PROJECT	2. INSPECTOR	SHEET
Evergreen Manor	STH	2

DEPTH	DESCRIPTION OF MATERIALS		ANALYTICAL SAMPLE NO	REMARKS
12	Coarse gravel (tan-light brown) Dense sand with 20% gravel, some silt	6		
14	Wet	7		
16	Fine to medium sand (light brown) Dense, 10% gravel (well rounded, poorly sorted), some silt (moist), wet (surface water)	8		
18		9		
20		10		
22	Medium to fine sand, dense, light brown Moist, trace gravel	11		
24	Same as above with 20% gravel, well rounded, poorly sorted, moist	12		
26	Fine to medium sand (light brown) with trace gravel, moist	13		
28		14		
30		15		
32	Fine to medium sand (light brown) 20% gravel, moist, dense	16		
	Same with 50% gravel			

FORM081/1

TCT-St L.

HTW DRILLING LOG

1. PROJECT	2. INSPECTOR	
Evergreen Manor	SJH	SHEET

DEPTH	DESCRIPTION OF MATERIALS		ANALYTICAL SAMPLE NO.	REMARKS
30	Course sand (light brown) dense with some silt, trace gravel, wet	17		
	Fine to medium sand with trace gravel, some silt, wet	18		
36		19		
40		20		
42	Fine sand, clean, (light brown), well sorted, no gravel, some silt, wet	21		
44		22		
46		23		
48		24		
50		25		
52	Fine to medium sand (light brown), with trace medium gravel, wet (gravel poorly sorted, sand well sorted, dense)	26		
54	Poorly sorted gravel	27		
	Fine to medium sand, clean, well sorted, wet			

HTW DRILLING LOG

PROJECT	INSPECTOR	SHEET
Evergreen Manor	SJH	

DEPTH	DESCRIPTION OF MATERIALS		ANALYTICAL SAMPLE NO	REMARKS
56		28		
58		29		
60	Poorly sorted gravel (80 %) with fine to medium sand (light brown), some silt, wet, dense	30		
62	Poorly sorted gravel (rounded, with some subangular, 50%) with grey medium sand, some silt, wet	31		
64		32		
66	Medium light brown sand (dense) with trace gravel	33		
68	Medium light brown sand with 40% Poorly sorted gravel, wet	34		
70	Poorly sorted gravel with light brown to grey-brown medium sand Wet	35		
72		36		
74		37		
76		38		

FORM081/1

TCT-SL

HTW DRILLING LOG

1. PROJECT: Evergreen Manor
2. INSPECTOR: SJH
SHEET 2

DEPTH	DESCRIPTION OF MATERIALS		ANALYTICAL SAMPLE NO.	REMARKS
78		39		
80	Fine to medium grey sand, dense, wet, with trace gravel, some silt	40		
82		41		
84		42		
86	Medium sand (brown) with 30% poorly sorted gravel, some silt, wet	43		
88		44		
90	Fine to medium light brown sand with trace	45		
92		46		
94		47		
96		48		
98		49		
100	TD = 100' Finished 15:13	50		

FORM081/1

TCT-St. Louis

Appendix E

RIEDEL ENVIRONMENTAL
SERVICES INC

July 19, 1993

Mr Greg Dunn
State of Illinois
Environmental Protection Agency
Division of Remediation Management
2200 Churchill Road
Springfield, IL 62794-9276

RE: 2010400015 - Winnebago County
Evergreen Manor GW Contamination/Roscoe
SF/Fiscal
RES#3514-3611

Dear Mr Dunn:

Riedel Environmental Services Inc. (Riedel) is pleased to submit our cost proposal for the above reference project.

Due to the short time to submit this cost proposal Riedel has not had the opportunity to make a site visit , please see the attached list for assumptions.

At your request we are submitting our cost proposal in two options: Option "A" and Option "C". Neither option included the cost of analytical sampling.

The drilling method described in Option"C", offers the fastest and most dependable technique in that we can drill through obstructions in the substrate which would hamper the advancement of a hollow stem auger. Per our phone conversation of July 15, 1993, there will not be any sampling of the soils, so Option "B" of the attached cost proposal from our subcontract will not be considered at this time.

If you have any question concerning this cost proposal, please contact Michael Noble at (314) 532-7660.

Sincerely,

Riedel Environmental Services, Inc.

Michael Noble
Estimator

Steve Handley
Hydrogeologist

Attachments

MN#18:IEPA3514-4611/EVERGREEN MANOR/DUNN

ASSUMPTIONS

Evergreen Manor GW Contamination/Roscoe

1. In the event that an upgrade to Level C is necessary, the rates will change accordingly.

2. While we consider the estimated number of hours in our estimate to be average for projects of this type, the actual quantities could vary based on factors such as formations encountered, decontamination procedures, weather, site visit, etc.

3. No site security is necessary.

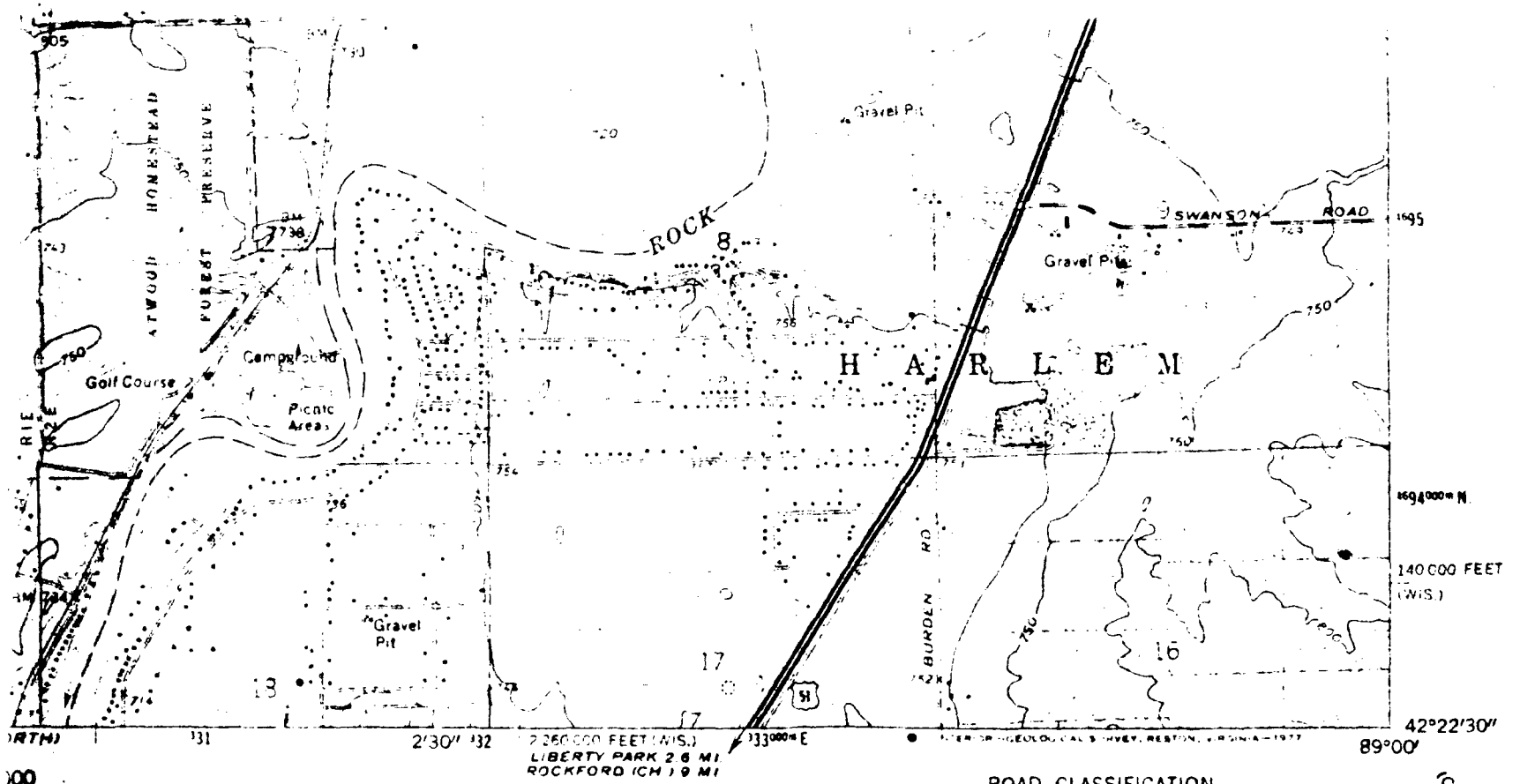
4. Should a decontamination pad be requires, the charge for construction would be in addition to the cost proposal.

5. We assume that the formations encountered will be drillable/augerable. Should down hole drilling and geologic conditions at a monitoring well borehole prevent the continued advancement of the borehole to the target depth, the decision to abandon the borehole shall be discussed. Should we be instructed to continue drilling against our judgement, all lost or damaged drill tools will be charged at invoice plus 15% (per our subcontractor contract). Attempts to recover stuck or broken tools will be charged at the hourly rate quoted(for rig and crew) in the subcontractor pricing.

6. Surveying of the well will be done per our HW-3007 contract. This is in addition the cost proposal. Once locations of well are known and the type of survey needed, Riedel will then be able to quote prices.

7. We assume the drilling will be through soil, asphalt and not through concrete, this will hamper the drilling time/schedule.

8. The handling of soil cutting and water relating (rinsates, decon, development) to this project will be the responsibility of IEPA and has not been included in our pricing.



1 MILE

4000 5000 6000 7000 FEET

1 KILOMETER

10 FEET
L DATUM OF 1929

MAP ACCURACY STANDARDS
EY, RESTON, VIRGINIA 22092
BANA, ILLINOIS 61801.
RY SURVEY, MADISON, WISCONSIN 53706
SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

Revisions shown in purple compiled from aerial photographs taken 1976. This information not field checked

Purple tint indicates extension of urban areas

ROAD CLASSIFICATION

Primary highway, hard surface

Light duty road, hard or improved surface

Secondary highway, hard surface

Unimproved road

Interstate Route

U. S. Route

State Route

SOUTH BELOIT, ILL.—WIS.

N4222.5—W8900/7.5

1971

PHOTOREVISED 1976

AMS 3168 I NE—SERIES V863

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

MEMORANDUM

DATE: July 22, 1996

TO: Bureau of Land File

FROM: Greg Dunn

SUBJECT: L2010400015 -- Winnebago County
Roscoe/Evergreen Manor
Superfund/Technical Reports

On October 19, 1994, the Illinois Environmental Protection Agency's (Agency) drill rig, support vehicle, and crew mobilized to Roscoe, Illinois for the installation of a monitoring well. The drill rig crew and the equipment arrived at the first boring location behind Ecolab at 1500. The drill rig crew consisted of Paul Mason (driller), Bob Mathis (driller's assistant), Bill Walkenbach (driller's assistant and decontamination), and Greg Dunn (geologist). The sky was clear, and a slight breeze blew. The temperature was approximately 60°F.

Setting up the drill rig began at 1520 at the first boring location (B-1), which is located southeast of Ecolab's main manufacturing building. This location will be known as monitoring well G111. Drilling began at 1545 using decontaminated (3 3/4 inch inside diameter) hollow stem augers, along with a decontaminated knock-out plate since the geology of the area consists of sands and sands and gravels. Air monitoring was completed using an HNu. The HNu background was 0.5 meter units; consequently, no readings were detected during drilling.

The geology of the borehole was completed by logging the auger cuttings. (See attached well completion report and field log boring form for the specific geology of this borehole). The drilling of B-1 was completed at 1655. The total depth of the boring was 49.1 feet.

The stainless steel casing was decontaminated and measured. The following measurements were made to reflect the actual casing lengths:

Quantity	Casing Type	Measurements
4	10' Riser	10.02' 10.03' 10.03' 10.02'
1	5' Screen	5.37'
1	5' Screen	5.69

Printed on Recycled Paper

SCREENED

The total casing measurement, including the screen, was 51.16 feet. We began placing casing in the borehole at 1705, and finished at 1710. We began pulling hollow stem augers at 1710, and finished at 1730. The borehole collapsed to 37.5 feet below ground surface. A 50 pound bag of sand was used to bring the natural sand pack up to 36.0 feet below ground surface. One 50 pound bucket of bentonite pellets was used to seal above the sand pack, bringing the depth of the borehole to 33.3 feet below ground surface. We began mixing cement at 1755, in order to cement the borehole from 33.3 feet to the surface. Nine 94 pound bags of cement and twelve 50 pound bags of sand were mixed and poured into the boring to seal the upper portion. Prior to leaving this location, a five foot long steel outer casing was placed around the monitoring well and locked. The drill rig demobilized from the site at 1840.

On October 31, 1994, the Illinois Environmental Protection Agency's (Agency) drill rig, support vehicle, and crew mobilized to Roscoe, Illinois for the installation of a single monitoring well. The drill rig crew and equipment arrived at the boring location behind American Freightways at 1130. The drill rig's crew consisted of Paul Mason (driller), Bob Mathis (driller's assistant), Bill Walkenbach (driller's assistant and decontamination), Sean Schnepper (decontamination), Jennifer Seul (assistant geologist), and Greg Dunn (geologist). The sky was overcast, and rain was predominant. A temperature was approximately 45°F.

We began setting up the drill rig at 1133 at boring location (B-2), which is located southeast of American Freightways main building. This location will be known as monitoring well G112. Drilling began at 1200 using decontaminated (3 3/4 inch inside diameter) hollow stem augers with a decontaminated knock-out plate since the geology of the area consists of sands and sands and gravels. Air monitoring was completed using an OVA, with the OVA background at 0.1 meter units. No readings were detected during drilling.

The geology of the borehole was completed by logging the auger cuttings. (See attached well completion report and field log boring form for the specific geology of this borehole). We finished drilling B-2 at 1240. The total depth of the boring was 48.8 feet.

The stainless steel casing was decontaminated and measured. The following measurements were made to reflect the actual casing lengths:

Quantity	Casing Type	Measurements
4	10' Riser	10.16' 10.03' 10.03' 10.02'
1	5' Screen	5.31'
1	5' Screen	5.70'

The total casing measurement, including the screen, was 51.25 feet. We began placing casing in the borehole at 1245, and finished at 1247. We began pulling hollow stem augers at 1250, and finished at 1315. The borehole collapsed to 38.8 feet below the

ground surface. Four 50 pound bags of sand were used to bring the natural sand pack up to 35.0 feet below ground surface. A 50 pound bucket of bentonite pellets was used to seal above the sand pack; however, the sand sloughed to 29.0 feet below ground surface. Another 50 pound bucket of bentonite pellets was placed in the hole bringing the depth of the borehole to 22.7 feet below ground surface. A 50 pound bag of benseal was added bringing the depth of the borehole to 20.0 feet below ground surface. We began mixing cement at 1320 to cement the borehole from 20.0 feet to the surface. Ten 94 pound bags of cement and six 50 pound bags of sand were mixed and poured into the boring to seal the upper portion. Prior to leaving this location, a five foot long steel outer casing was placed around the monitoring well and locked. The drill rig crew demobilized from the site at 1435.

On November 1, 1994, the Illinois Environmental Protection Agency's (Agency) drill rig, support vehicle, and crew mobilized to Roscoe, Illinois for the installation of two monitoring wells. The drill rig crew and equipment arrived at the first boring location on the northwest corner of Metric Road and Rockton Road at 0815. The drill rig crew consisted of Paul Mason (driller), Bob Mathis (driller's assistant), Bill Walkenbach (driller's assistant and decontamination), Sean Schnepper (decontamination), Jennifer Seul (assistant geologist), and Greg Dunn (geologist). The sky was clear, cool, and a brisk wind from the northwest blew. The temperature was around 40°F.

We began setting up the drill rig at 0850 at the first boring location of the day (B-3), which will also be known as monitoring well G113. Drilling began at 0910 using decontaminated (3 3/4 inch inside diameter) hollow stem augers with a decontaminated knock-out plate since the geology of the area consists of sand and gravel. Air monitoring was completed using an OVA, with the OVA background at 1.2 meter units. No readings were detected during drilling.

The geology of the borehole was completed by logging the auger cuttings. (See attached well completion report and the field log boring form for the specific geology of this borehole). We finished drilling B-3 at 0940. The total depth of the boring was 54.35 feet.

The stainless steel casing was decontaminated and measured. The following measurements were made to reflect the actual casing lengths:

Quantity	Casing Type	Measurements
4	10' Riser	10.16' 10.03' 10.03' 10.02'
1	5' Screen	5.36'
1	5' Screen	5.70'

The total casing measurement including the screen was 56.29 feet. We started placing casing in the borehole at 1005, and finished at 1015. We began pulling the hollow stem augers at 1015, and finished at 1035. The borehole collapsed to 24.4 feet below ground surface. A 50 pound bucket of bentonite pellets was used to seal above the sand pack, however, the sand sloughed to 15.7 feet below ground surface. A 50 pound bag of

benseal was added, bringing the depth of the borehole to 14.9 feet below ground surface. We began mixing cement at 1115 to cement the borehole from 14.9 feet to the surface. Ten 94 pound bags of cement and ten 50 pound bags of sand were mixed and poured into the boring to seal the upper portion. Prior to leaving this location, a flush mount outer casing was placed around the monitoring well and locked. (Bob Rogers with the IEPA arrived at the site at 1200).

We started setting up the drill rig at 1250 at the second boring location of the day (B-4), which is located along Rockton Road, southwest of the Regal-Beloit facility. This location will be known as monitoring well G114. Drilling began at 1315 using decontaminated (3 3/4 inch inside diameter) hollow stem augers with a decontaminated knock-out plate since the geology of the area consists of sand and gravel. Air monitoring was completed using an OVA, with the OVA background at 1.3 meter units. No readings were detected during drilling.

The geology of the borehole was completed by logging the auger cuttings. (See attached well completion report and the field log boring form for the specific geology of this borehole). We completed drilling B-4 at 1345. The total depth of the boring was 54.2 feet.

The stainless steel casing was decontaminated and measured. The following measurements were made to reflect the actual casing lengths:

Quantity	Casing Type	Measurements
4	10' Riser	10.20' 10.20' 10.02'
3	5' Riser	4.98' 5.00' 4.98'
1	5' Screen	5.37'
1	5' Screen	5.70'

The total casing measurement, including the screen, was 56.45 feet. We started placing casing in the borehole at 1410, and finished at 1425. We began pulling the hollow stem augers at 1425, and finished at 1445. The borehole collapsed to 39.7 feet below ground surface. A 50 pound bucket of bentonite pellets and two 50 bags of benseal were used to seal above the sand pack, bringing the depth of the borehole to 36.5 feet below ground surface. We began mixing cement at 1520 to cement the borehole from 36.5 feet to the surface. Eleven 94 pound bags of cement and eleven 50 pound bags of sand were mixed and poured into the boring to seal the upper portion. Prior to leaving this location, a flush mount outer casing was placed around the monitoring well and locked. The drill rig crew demobilized from the site at 1710.

On November 2, 1994, the Illinois Environmental Protection Agency's (Agency) drill rig, support vehicle, and crew mobilized to Roscoe, Illinois for the surveying of the four monitoring wells. The drill rig crew and equipment arrived at Ecolab to begin surveying at 0750. The drill rig's crew consisted of Paul Mason (driller), Bob Mathis (driller's assistant), and Greg Dunn (geologist). The sky was cloudy and cool, with a brisk wind from the south southeast blew. The temperature was around 45°F.

We began setting up to survey at 0755. A known elevation from monitoring well G103 was used to begin surveying. The following measurements were made (established from the top of the casing) for the following monitoring wells:

Well	Elevation
G111	770.70
G112	774.30
G113	771.29
G114	771.74

We finished surveying at 0940. The drill rig crew demobilized from the site at 0945. No photographs were taken during the drilling operations.

GWD:gwd/evergr3.ins

Attachments: Well Completion Report
Field Boring Log

cc: Rockford Regional Office (with attachments)
Stan Black, IEPA/Community Relations (with attachments)

Illinois Environmental Protection Agency **Field Boring Log** Page 1 of 1

Site File No.: 2010400015 County Winnebago Boring No. B-1 Monitor Well No. G111

Site File Name Evergreen Manor Surface Elev. 769.825 Completion Depth 49.1

Fed. ID. No. ILD 984836734 Auger Depth 49.1 Rotary Depth —

Quadrangle South Beloit, IL Sec. 21 T. 46 N R. 2 E Date: Start 10/19/94 Finish 10/19/94

Boring Location (See map)

Drilling Equipment CME 75 3¾"ID Hollow Stem Augers Knock-out Plate

Personnel: G - Greg Dunn; D - Paul Mason; H - Bob Mathis, Jr.; H - Bill Walkenbach

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	Penetrometer	N Values (Blows)	OVA or HNU readings	REMARKS
	0-4.8' Fill material consisting of concrete, rocks and gravel. No odor, no moisture			Drill Cuttings				0	HNU Background 0.5
	4.8-9.8' - Gravel, not well sorted, no odor No moisture, white to buff color.	5.0		Drill Cuttings				0	
	9.8'-49.1' Sand and gravel, yellow grading from a fine sand to a coarse sand No odor.	10.0, 15.0, 20.0, 25.0, 30.0, 35.0, 40.0, 45.0		Drill Cuttings				0	
	EOB - 49.1'	50.0							

Illinois Environmental Protection Agency **Well Completion Report**

Site # 2010400015 County Winnebago Well # G111

Site Name: Evergreen Manor Grid Coordinate: Northing ____ Easting ____

Drilling Contractor: IEPA Drill Rig Date Drilled Start: 10/19/94

Driller: Paul Mason Geologist: Greg Dunn Date Completed: 10/19/94

Drilling Method: CME 75 3 3/4" ID Hollow Stem Augers Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Cement

Amount of cement: # of bags 9 lbs. per bag 94

Amount of bentonite: # of bags ~~1~~ 0 lbs. per bag ~~50~~ 0

Type of Bentonite Seal (Granular, Pellet): 1/4" round Bentonite Pellets

Amount of bentonite: # of Bags 1 lbs. per bag 50

Type of Sand Pack: U.S. Silica Flint Shot Blasting Sands

Source of Sand: Ottawa, Illinois

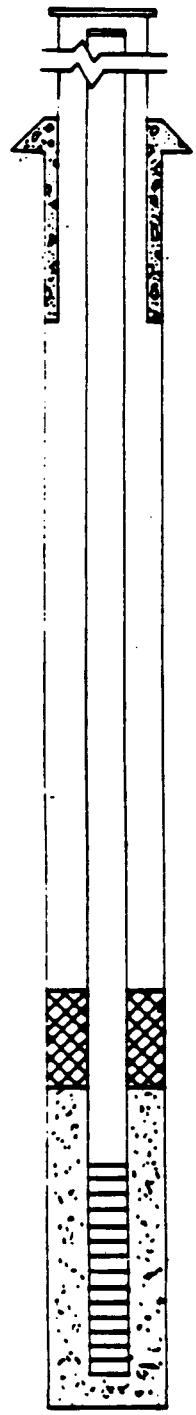
Amount of Sand: # of bags 1 lbs. per bag 50

Well Construction Materials

	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint	304			
Riser pipe above w.t.	304			
Riser pipe below w.t.	304			
Screen	304			
Coupling joint screen to riser	304			~~Steel~~ 0
Protective casing				Steel

Measurements to .01 ft. (where applicable)

Riser pipe length	40.10'
Protective casing length	5.00'
Screen length (total)	11.06'
Bottom of screen to end cap	0.28' 0.52' (cone)
Top of screen to first joint	0.08' 0.17'
Total length of casing	51.16'
Screen slot size	.01 Slot
# of openings in screen	Continuous Wire Wrap
Diameter of borehole (in)	7-8 inch
ID of riser pipe (in)	2 inch



Elevations — .01 ft.

		MSL Top of Protective Casing
770	70	MSL Top of Riser Pipe
0	875	ft. Casing Stickup
769	825	MSL Ground Surface
		~~ft. Top of annular sealant~~
736	525	ft. Top of Seal
2	70	ft. Total Seal Interval
733	825	ft. Top of Sand
731	12	ft. Top of Screen
10	00	ft. Total Screen Interval
720	06	ft. Bottom of Screen
719	54	ft. Bottom of Borehole (cone)

Completed by Greg Dunn Surveyed by Paul Mason Ill. registration # NA

Illinois Environmental Protection Agency **Field Boring Log** Page 1 of 1

Site File No.: 2010400015 County Winnebago Boring No. B-2 Monitor Well No. G 112

Site File Name Evergreen Manor Surface Elev. 772.34' Completion Depth 48.6'

Fed. ID. No. ILD 984 836 734 Auger Depth 48.6' Rotary Depth —

Quadrangle South Beloit, IL Sec. 21 T. 46N R. 2E Date: Start 10/31/94 Finish 10/31/94

Boring Location (See Map)

Drilling Equipment CME 75 3 3/4" Hollow Stem Augers Knock-out Plate

Personnel: G - Greg Dunn; D - Paul Mason; H - Bob Matlic, Jr.; H - Bill Walkenbach

Elev.	DESCRIPTION	Depth in feet	Sample No	Sample Type	Sample Recovery	Penetrometer	N Values (Blows)	OVA or HNU readings	REMARKS
	0'-2' Brown Loam			Drill Cuttings				0	OVA Background 0.1
	2'-4' Brown fine to medium sand, Dry			Drill Cuttings				0	
	4'-28' Brown, fine to medium gravel sand and gravel	5.0, 10.0, 15.0, 20.0, 25.0		Drill Cuttings				0	
	28'-48.6' Brown, fine to medium sand with some gravel	30.0, 35.0, 40.0, 45.0		Drill Cuttings				0	
	EOB - 48.6'	50.0							

Illinois Environmental Protection Agency **Well Completion Report**

Site # 2010400015 County Winnebago Well # G112

Site Name: Evergreen Manor Grid Coordinate: Northing ____ Easting ____

Drilling Contractor: IEPA Drill Rig Date Drilled Start: 10/31/94

Driller: Paul Mason Geologist: Greg Dunn Date Completed: 10/31/94

Drilling Method: CME 75 3¾" ID Hollow Stem Augers Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Cement

Amount of cement: # of bags 10 lbs. per bag 94

Amount of bentonite: # of bags ____ lbs. per bag ____

Type of Bentonite Seal (Granular, Pellet): 1/4" Round Bentonite Pellets

Amount of bentonite: # of Bags 2 lbs. per bag 50

Type of Sand Pack: U.S. Silica Flint Slot Blasting Sands

Source of Sand: Ottawa, Illinois

Amount of Sand: # of bags 4 lbs. per bag 50

Well Construction Materials

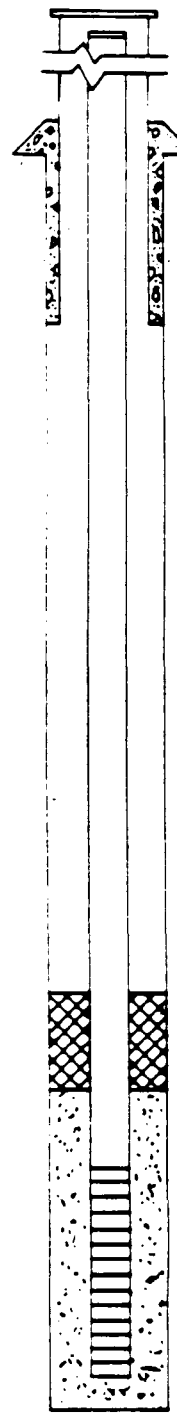
	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint	304			
Riser pipe above w.t.	304			
Riser pipe below w.t.	304			
Screen	304			
Coupling joint screen to riser	304			
Protective casing				Steel

Measurements

to .01 ft. (where applicable)

Riser pipe length	40.24'
Protective casing length	5.00'
Screen length (total)	11.01'
Bottom of screen to end cap	0.22' 0.52' (cone)
Top of screen to first joint	0.09' 0.18'
Total length of casing	51.25'
Screen slot size	.01 slot
of openings in screen	Continuous Wire Wrap
Diameter of borehole (in)	7-8 inch
ID of riser pipe (in)	2 inch

Elevations — .01 ft.



		~~MSL Top of Protective Casing~~
774	30	MSL Top of Riser Pipe
1	96	ft. Casing Stickup
772	34	MSL Ground Surface
		~~ft. Top of annular sealant~~
749	64	ft. Top of Seal
12	30	ft. Total Seal Interval
737	34	ft. Top of Sand
734	06	ft. Top of Screen
10	00	ft. Total Screen Interval
723	57	ft. Bottom of Screen
723	05	ft. Bottom of Borehole (cone)

Completed by Greg Dunn Surveyed by Paul Mason Ill. registration # NA

Illinois Environmental Protection Agency **Field Boring Log** Page 1 of 1

Site File No.: 2010400015 County Winnebago Boring No. B-3 Monitor Well No. G113

Site File Name Evergreen Manor Surface Elev. 770.39' Completion Depth 54.35'

Fed. ID. No. ILD 984836734 Auger Depth 54.35' Rotary Depth —

Quadrangle South Beloit, IL Sec. 21 T. 46N R. 2E Date: Start 11/1/94 Finish 11/1/94

Boring Location (See map)

Drilling Equipment CME 75 3 3/4" ID Hollow Stem Augers Knock-out Plate

Personnel: G - Greg Dunn; D - Paul Mason; H - Bob Matlix, Jr.; H - Bill Walkenbach

Elev	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	Penetrometer	N Values (Blows)	OVA or HNU readings	REMARKS
	0-4.5' Black Silty Loam			Drill Cuttings				0	OVA Background 1.2
	4.5-30' Brown sand and gravel pebble to boulder size	5.0, 10.0, 15.0, 20.0, 25.0, 30.0		Drill Cuttings				0	
	30-54.35' Brown Sand, fine to medium grain	35.0, 40.0, 45.0, 50.0, 55.0		Drill Cuttings				0	
	EOB - 54.35'								

Illinois Environmental Protection Agency — **Well Completion Report**

Site # 2010400015 County Winnebago Well # G13

Site Name: Evergreen Manor Grid Coordinate: Northing — Easting —

Drilling Contractor: IEPA Drill Rig Date Drilled Start: 11/1/94

Driller: Paul Mason Geologist: Greg Dunn Date Completed: 11/1/94

Drilling Method: CME 75 3 3/4" ID Hollow Stem Augers Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Cement

Amount of cement: # of bags 10 lbs. per bag 94

Amount of bentonite: # of bags ____ lbs. per bag ____

Type of Bentonite Seal (Granular, Pellet): 1/4" Round Bentonite Pellets

Amount of bentonite: # of Bags 2 lbs. per bag 50

Type of Sand Pack: Natural

Source of Sand: ____

Amount of Sand: # of bags ____ lbs. per bag ____

Well Construction Materials

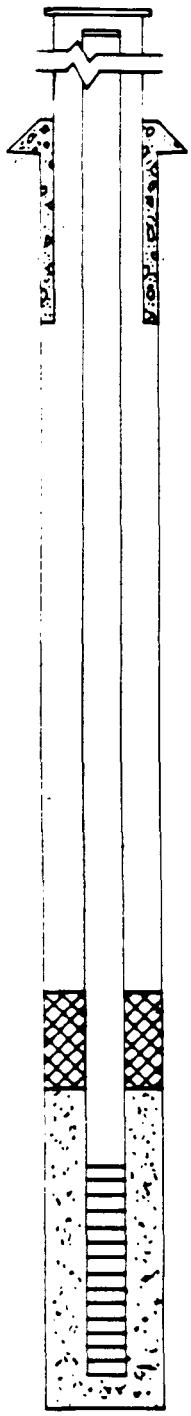
	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint	304			
Riser pipe above w.t.	304			
Riser pipe below w.t.	304			
Screen	304			
Coupling joint screen to riser	304			
Protective casing				Steel

Measurements

to .01 ft. (where applicable)

Riser pipe length	40.24'	
Protective casing length	5.00'	
Screen length (total)	11.06'	
Bottom of screen to end cap	0.27'	0.52' (cone)
Top of screen to first joint	0.09'	0.18'
Total length of casing	51.3'	
Screen slot size	.01 Slot	
of openings in screen	Continuous Wire Wrap	
Diameter of borehole (in)	7-8 inch	
ID of riser pipe (in)	2 inch	

Elevations — .01 ft.



____	____	MSL Top of Protective Casing
____	____	MSL Top of Riser Pipe
____	____	ft. Casing Stickup
772	19	MSL Ground Surface
771	29	ft. Top of ~~annular sealant~~ Casing
757	29	ft. Top of Seal
0	80	ft. Total Seal Interval
~~747~~ 756	~~79~~ 49	ft. Top of Sand
731	05	ft. Top of Screen
10	00	ft. Total Screen Interval
720	51	ft. Bottom of Screen
719	99	ft. Bottom of Borehole (cone)

Completed by Greg Dunn Surveyed by Paul Mason Ill. registration # NA

Illinois Environmental Protection Agency — Field Boring Log

Page 1 of 1

Site File No.: 2010400015 County: Winnebago Boring No. B-4 Monitor Well No. G114

Site File Name: Evergreen Manor Surface Elev. _____ Completion Depth 54.2'

Fed. ID. No. ILD 984836734 Auger Depth 54.2' Rotary Depth ——

Quadrangle South Beloit, IL Sec. 21 T. 46N R. 2E Date: Start 11/1/94 Finish 11/1/94

Boring Location (See Map)

Drilling Equipment CME 75 3¾" ID Hollow Stem Augers Knock-out Plate

Personnel:
G - Greg Dunn
D - Paul Mason
H - Bob Mathis, JR
H - Bill Walkenbach

Elev.	DESCRIPTION	Depth in feet	Sample No	Sample Type	Sample Recovery	Penetrometer	N Values (Blows)	OVA or HNU readings	REMARKS
	0-3' Black Silty Loam			Drill Cuttings				0	OVA Background 1.3
	3'-40' Brown sand/gravel cobble to boulder size	5.0, 10.0, 15.0, 20.0, 25.0, 30.0, 35.0, 40.0		Drill Cuttings				0	
	40'-54.2' Brown fine to medium grain sand some gravel	45.0, 50.0, 55.0		Drill Cuttings				0	
	ECB 54.2'								

Illinois Environmental Protection Agency **Well Completion Report**

Site #: 2010400015 County: Winnebago Well #: G-114

Site Name: Evergreen Manor Grid Coordinate: Northing — Easting —

Drilling Contractor: IEPA Drill Rig Date Drilled Start: 11/1/94

Driller: Paul Mason Geologist: Greg Dunn Date Completed: 11/1/94

Drilling Method: CME 75 3¾" ID Hollow Stem Augers Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Cement

Amount of cement: # of bags 11 lbs. per bag 94

Amount of bentonite: # of bags ____ lbs. per bag ____

Type of Bentonite Seal (Granular, Pellet): 1/4" Round Bentonite Pellets

Amount of bentonite: # of Bags 3 lbs. per bag 50

Type of Sand Pack: Natural

Source of Sand: ____

Amount of Sand: # of bags ____ lbs. per bag ____

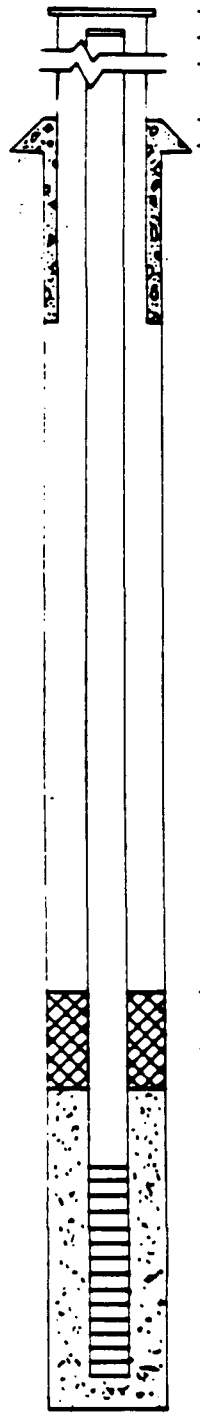
Well Construction Materials

	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint	304			
Riser pipe above w.t.	304			
Riser pipe below w.t.	304			
Screen	304			
Coupling joint screen to riser	304			
Protective casing				Steel

Measurements

to .01 ft. (where applicable)

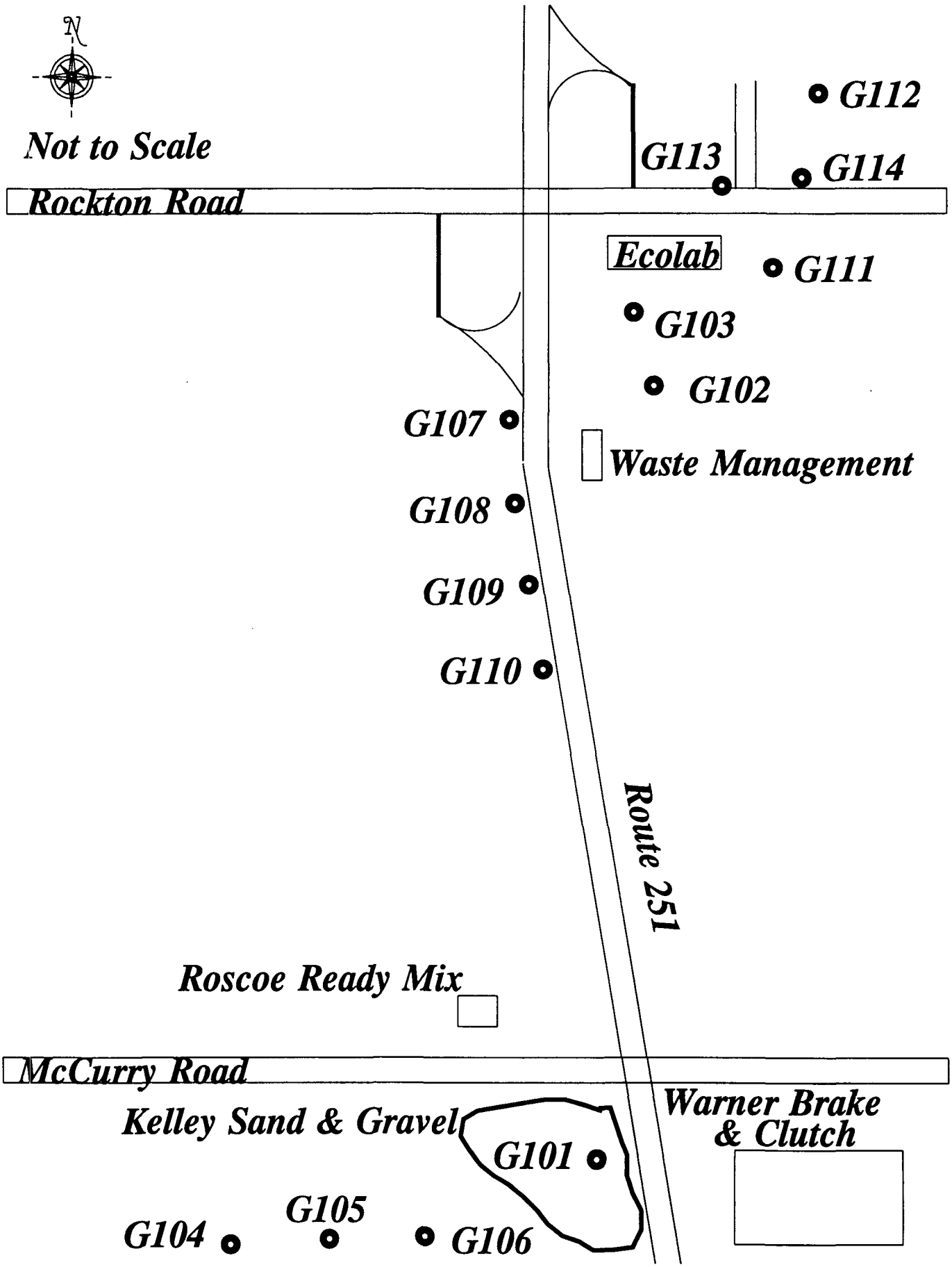
Riser pipe length	45.38'	
Protective casing length	5.00'	
Screen length (total)	11.07'	
Bottom of screen to end cap	0.27'	0.52' (cone)
Top of screen to first joint	0.09'	0.17'
Total length of casing	56.45'	
Screen slot size	.01 Slot	
of openings in screen	Continuous Wire Wrap	
Diameter of borehole (in)	7-8 inch	
ID of riser pipe (in)	2 inch	



Elevations — .01 ft.

—	—	MSL Top of Protective Casing
—	—	MSL Top of Riser Pipe
—	—	ft. Casing Stickup
772	49	MSL Ground Surface
771	74	ft. Top of ~~annular sealant~~ Casing
735	99	ft. Top of Seal
3	20	ft. Total Seal Interval
732	79	ft. Top of Sand
726	36	ft. Top of Screen
10	00	ft. Total Screen Interval
715	56	ft. Bottom of Screen
715	04	ft. Bottom of Borehole (cone)

Completed by: Greg Dunn Surveyed by: Paul Mason Ill. registration #: NA


N
Not to Scale
Rockton Road
G112
G113
G114
Ecolab
G111
G103
G102
G107
Waste Management
G108
G109
G110
Route 251
Roscoe Ready Mix
McCurry Road
Kelley Sand & Gravel
Warner Brake & Clutch
G101
G105
G104
G106

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

BUREAU OF LAND
REMEDIAL PROJECT MANAGEMENT SECTION
SITE INSPECTION DOCUMENT

2010400015--Winnebago County
Roscoe/Evergreen Manor GW Contamination
Site Remediation/Technical Reports

Date: December 19, 1994-December 21, 1994

Time: Various

Samples Collected: Yes

Photographs Taken: Yes

Project Manager: Greg Dunn

Type of Site: Response Action Site

NARRATIVE

IEPA personnel sampled monitoring wells located northeast of the Evergreen Manor groundwater contamination study area. The monitoring wells were sampled between December 19 and December 21, 1994. The samples were collected according to IEPA sampling protocol. The samples were received by the laboratory, however the holding times were exceeded. The samples were not analyzed.

The following notebook pages describe the work completed during the December 19-21, 1994 sampling investigation. The photographs are attached.

Attachments: Photos (X) Map (X)
Chain of Custody (X)
Other:_____

cc: Bureau of Land File (with attachments)
Rockford Regional File (with attachments)
Stan Black, IEPA/Community Relations Unit (with attachments)
Jerry Wilman, IEPA/RPMS (with attachments)

SCREENED
ds

Printed on Recycled Paper

December 19, 1994 Arrived Evergreen Manor at 0955
Weather: Overcast, Cold, ≈ 35°F, windy from South
IEPA Personnel – Jim Salch, Sean Schneppor, Neelu Reddy, Gary Dunn

GD G113
~~G123~~ – Corner of Metric Drive and Rockton Road 10¾" below surface TOC
GD G113
~~G123~~ – 12.39 meters to water 16.26 meters
40.65 feet 53.35 ~~feet~~ meters ~~00~~ deep
12.7 feet of water ÷ 6.13 ft/gallon = 2.1 gallons × 3 well volumes = 6.3 gallons
Sean Schneppor developed using a disposable bailer & nylon cord
12 gallons purged.

G114 GD ~~G121~~ – SW of Regal Beloit – east of the westernmost entrance
12.33 meters to H_2O 16.35 ~~feet~~ meters ~~00~~ deep
40.45 feet. 53.64 feet
13.19 feet of water ÷ 6.13 ft/gallon = 2.15 × 3 well volumes = 6.45 gallons
Jim Salch bailed using a disposable bailer & Nylon cord.
TOC – 9" below ground surface. 10 gallons were removed

GD G112
~~G122~~ – on American Freightways property
12.71 meters to H_2O 15.55 meters total depth 1'11½" TOC from N side of concrete base
41.70 feet to H_2O 51.02 depth feet
9.32 feet of H_2O ÷ 6.13 ft/gallons = 1.52 × 3 well volumes = 4.56 gallons
Neelu Reddy Developed well using a disposable bailer & nylon cord

GD G111
~~G121~~ – on Ecolab Property 10½" TOC from N side of concrete base
12.36 meters to H_2O 15.52 meters total depth
40.55 feet to H_2O 50.92 feet total depth
10.37 feet of H_2O ÷ 6.13 feet/gallons = 1.69 × 3 well volumes = 5.07 gallons
Jim Salch developed using a disposable bailer & nylon cord.

Opened G103D at 1225. Well was ~~un~~ locked TVA 1000 used to monitor well – PID – 126
FID 2.29 – Background PID – 0.03 FID 1.00
Top of casing is 2' 10.25" above ground surface. Water was at 12.58 meters or 41.40 feet below top of casing. Total depth was at 18.01 meters or 59.09 feet below top of casing, 17.69 feet of water in well, which is 2.86 gallons. Purge 3 well volumes which is 9 gallons. Nylon cord with a disposable bailer will be used by Jim Salch to purge the well.

Opened G107D at 1600. PID - 0.15 - Background 0.00 - FID - 1.14 - Background 0.75. Top of Casing 3' 0.5" above ground surface - Water was at Water was at 11.92 meters or 39.11 feet below top of casing. Total depth was 20.57 meters or 67.49 feet below top of casing. 28.38 feet of water, which is 4.63 gallons. Purge 3 well volumes or 13.90 gallons. Nylon cord with a disposable bailer were used by Steve Schweppe to purge the well.

	Start	After 4.5 gallons	After 9.0 gallons	After 13.5 gallons
pH	7.20	6.83	6.92	6.98
Temp	9.6	8.5	8.3	8.5
Cond	.023	.011	.011	.015

Sample was collected by Greg Dunn while Jim Sulak bailed the well. 2 Bottles were filled for G107D. Sample was cloudy. Sample was collected at 1735. Well was locked.

Opened G107S at 1600. PID 1.75 - Background 0.00 FID 2.34 Background 0.75. Top of casing at 2'5" above ground surface. Water was at 11.73 meters or 38.45 feet below top of casing. Total depth was 14.44 meters or 47.38 feet below top of casing. Total 8.93 feet of water, which is 1.46 gallons. Purge 3 well volumes or 4.4 gallons. Nylon cord with a disposable bailer was used by Jim Sulak to purge the well.

	Start	After 1.5 gallons	After 3.0 gallons	After 4.5 gallons
pH	6.92	7.05	6.98	6.99
Temp	10.40	9.7	9.6	9.5
Cond	.011	.018	.014	.015

Sample was collected by Greg Dunn, while Steve Schweppe bailed. 2 Bottles were filled for G107S. Sample was a reddish color. Sample was collected at 1640. 2 photos were taken at 1646 by Greg Dunn toward the north & toward the south at G107S & G107D. The well was locked.

Opened G108S at 1650 - PID - 0.74 - Background 0.00 FID - 0.99
Background was 0.86 Top of Casing is 2'6" above ground surface
Water was at 12.28 meters or 40.29 feet below the Top of casing. Total Depth
was at 14.38 meters or 47.18 feet below the surface. 6.89 feet of water, which is
1.12 gallons Purged 3 well volumes or 3.66 gallons. Nylon cord with a disposable
bailer was used by Sean Schnepper to purge the well.

	Start	After 1 gallon	After 2 gallon	After 3.5 gallons
pH	7.09	6.91	6.87	6.86
Cond	-016	-010	-009	-009
Temp	9.5	9.0	9.5	9.5

Sample was collected by Greg Dunn, while Sean Schnepper bailed the
well. 2 Bottles were filled for G108S. Sample was a reddish
color. Sample was collected at ~~1500~~ 1720. The well was
locked.

Temporary seals were placed on cooler at 1738. Left the area
at 1740.

December
~~November~~ 20, 1994 Weather: Overcast, ≈35°F
IEPA Personnel: Sean Schnepper, Jim Salch, Neelu Reddy, Greg Dunn
Arrived G106S and G106D at 0735. Cooler was reopened by Neelu Reddy
at 0745. Seals were intact.
Opened G106D at 0740 PID - 0.34 Background 008 FID - 1.18 Background 0.40
Top of Casing is 2'4" above ground Surface. Water is at 10.96 meters or 35.96
feet below top of casing. Total Depth is 100 feet. 64.04 feet of water, which is
10.45 gallons. Purge 3 well volumes or 31.5 gallons. Nylon cord with a disposable
bailer was used by Jim Salch to bail the well.

	Start	After 10 gallons	After 20 gallons	After 30 gallons
pH	5.66	6.43	6.90	6.97
Cond	066	032	007	004
Temp	3.6	9.2	08.2	8.0

Sample was collected by Greg Dunn, while Jim Salch bailed the well. 2
bottles were filled. Sample was clear. The sample was collected at
1005. Well was locked.

Opened G106s at 0740 PID-0.19 Background 0.03 FID 1.45 Background 1.20
Top of casing 2'4½" above ~~top~~ ground surface. Water is at 11.96 meters or
39.57 feet below the top of casing. Total depth was 31.6 meters or 70.57 feet
below the top of casing 31.3 feet of water, which is 5.11 gallons. Purged 3
well volumes or 15.33 gallons. Nylon cord with a disposable bailer
was used by Sean Schroeppel to bail the well.

	Start	After 5.5 gallons	After 11 gallons	After 15.5 gallons	After 20 gallons
pH	5.83	5.89	6.26	6.60	6.63
Temp	9.1	10.2	10.2	8.5	8.7
Cond.	0.1	0.56	0.41	0.23	0.21

Two photos taken at 0910 toward the Southwest and southeast by Greg Dunn at G106s and
G106D. Sample was collected by Greg Dunn at 0930, while Sean Schroeppel
bailed the well. 2 bottles were filled. Sample was clear. The well
was locked.

Opened G105D at 0937. PID - 0.17 Background 0.03 · FID-1.54 Background 0.9
Top of casing 2'6" above ground surface. Water is at 11.33 meters or 37.17 feet
below ~~surface~~ top of casing Total depth is 100 feet below top of casing 62.83 feet of
water, which is 10.25 gallons. Purge 3 well volumes or 31 gallons. Nylon cord
with a disposable bailer was used by Sean Schroeppel to bail the well.

	Start	After 10 gallons	After 20 gallons	After 31 gallons
pH	6.76	7.11	7.23	7.26
Temp	8.4	9.0	8.4	8.6
Cond	0.14	-0.03	-0.09	-0.11

Sample was collected by Greg Dunn, while Sean Schroeppel bailed. Sample
was collected at 1140. 2 bottles were filled. Sample was clear. Well
was locked.

Opened G105S at 0955. PID-2.12 Background 0.0 FID 5.34 - Background 1.30
Top of casing at 8'9½" above ground surface. Water is at 11.38 meters or 37.34 feet below the top of casing. Total depth is 20.7 meters or 67.92 feet below top of casing. 30.58 feet of water, which is 4.99 gallons. Purged 3 well volumes or 15 gallons. Nylon cord with a disposable bailer was used by Neelu Reddy to purge the well.

	Start	After 5 gallons	After 10 gallons	After 15 gallons	After 18 gal.
pH	6.98	7.14	7.23	7.36	7.38
Temp	9.7	10.3	8.6	6.6	6.7
Cond	.003	-.003	-.009	-.016	-.018

Sample was collected by Greg Dunn, while Neelu Reddy bailed. 2 bottles were filled. Sample was collected at 1130. Sample was clear. Well was locked.

Opened G104D at 0955 PID-1.24 - Background 0.0 FID 4.04 - Background at 1.3
Top of casing at 2'6½" above ground surface. Water is at 10.74 meters or 35.24 feet below top of casing. Total depth is 100 feet. 64.76 feet of water, which is 10.56 gallons. Purged 3 well volumes or 32 gallons. Nylon cord with a disposable bailer was used by Jim Salek to purge the well.

	Start	After 10.5 gallons	After 21 gallons	After 32 gallons
pH	7.21	7.36	7.42	7.44
Temp	7.5	9.1	10.1	9.8
Cond	-.008	-.016	-.019	-.019

Sample was collected by Greg Dunn, while Jim Salek bailed. 2 bottles were filled. Sample was collected at 1225. Sample was clear. Well was locked.
Two photos were taken by Greg Dunn at 1235 at wells G104S and G104D. Photos toward the southwest and southeast.

Opened G104s at 1020. PID -.13 Background 0.0 FID 0.79 - Background was 0.50
Top of casing is 2'10" above ground surface. ~~Total~~ Water depth is 10.91 meters or 35.80 feet below top of casing. Total depth is 19 meters or 62.34 feet below top of casing. 26.54 feet of water, which is 4.33 gallons. Purged 3 well volumes or 13 gallons. Nylon cord with a disposable bailer was used by Sean Schroeder to purge the well.

	Start	After 4.5 gallons	After 9.0 gallons	After 13.5 gallons
pH	7.41	7.52	7.44	7.41
Temp	9.7	10.0	8.7	9.0
Cond.	-018	-024	-020	-018

Sample was collected by Greg Dunn, while Sean Schroeder bailed. 2 bottles were filled. Sample collected at 1245. Sample was clear. Well was locked. Left for lunch at 1250

Arrived back at 1330

Opened G108d at 1345 PID-3.20 Background-0.01 FID-7.26 Background 0.80
Top of Casing (TOC) is 2'7" above ground surface. Water is at 12.26 meters or 40.23 feet. Total depth is 20.52 meters or 67.33 feet below TOC. 27.1 feet of water, which is 4.42 gallons. ~~3 gallons will~~ Purged 3 well volumes or 13.3 gallons. Nylon cord with disposable bailer was used by Tim Salch to purge well.

	Start	After 4.5 gallons	After 9.0 gallons	After 13.5 gallons.
pH	7.40	7.24	7.18	7.20
Cond	-018	-009	-006	-008
Temp	8.1	6.1	8.2	8.4

Two photos taken at G108D and G108S by Greg Dunn at 1441. One photo faced the southeast and faced the north. Sample collected by Greg Dunn, while Tim Salch bailed the well. 2 bottles for G108S and 2 bottles for G111 the duplicate were collected at 1455. Sample was clear. Well was locked.

Opened G109D at 1405. PID - 1.73 · Background 0.02 FID 505 Background 1.10
Top of Casing (TOC) is 2'4" above ground surface. Water at 13.22 meters or
43.37 feet below TOC. Total depth is 22.06 meters or 72.38 below TOC.
Water in well is 29.0 or 4.73 gallons. Purge 3 well volumes or 14.5 gallons
Nylon cord with a disposable bailer will be used by Sean Schroeppen to bail the

	Start	After 5 gallons	After 10 gallons	After 14.5 gallons
pH	7.24	7.25	7.23	7.26
Temp	9.2	5.6	4.4	4.7
Cond	-010	-008	-009	-010

Sample collected at 1525 by Greg Dunn, while Sean Schroeppen bailed. 2
bottles were filled. Sample was collected at 1525 and was cloudy.
Well was locked.

Opened G109S at 1412. PID - 3.54 Background 0.02 FID 3.75 Background at
1.07. Top of Casing at 2'6" above ground surface. Water is at 13.33 meters or 43.74
feet below TOC. Total depth is 15.99 meters or 52.46 feet. 8.72 feet of
water in well or 1.42 gallons. Purge 3 well volumes or 4.5 gallons.
Nylon cord with a disposable bailer was used by Neale Reddy to bail the
well.

	Start	After 1.5 gallons	After 3 gallons	After 4.5 gallons	After 5.5 gallons
pH	7.18	7.18	7.14	7.19	7.23
Temp	6.1	5.9	04.2	6.1	6.2
Cond.	-006	-007	-005	-007	-008

Sample collected by Greg Dunn, while Neale Reddy bailed. 2 bottles were
filled. Sample was collected at 1515. Sample was cloudy. Well
was locked.

Two photos were taken by Greg Dunn at 1526 toward wells
G109S and G109D. Photo was taken toward the north and toward
the south

Opened G-110D. ~~20~~ 00 at 1532. PID read 1.21 - Background 0.0 FID 585 Background 110
Top of Casing (TOC) was 2'9" above ground surface. Water at 6.95 meters or
22.80 feet. Total depth at 15.97 meters or 52.40 feet below TOC.
29.6 ~~19.59~~ 19.50 feet of water in well or ~~3.20~~ 4.23 00 gallons. Purge 3 well volumes or ~~10~~ 14.5 00 gallons
Nylon cord with a disposable bailer will be used by Jim Salch to bail well

	Start	After ~~3.5~~ 5.0 00 gallons	After ~~7.0~~ 10.0 00 gallons	After ~~10.0~~ 15.0 00 gallons
pH	7.26	7.22	7.28	7.24
Temp	6.0	6.7	7.2	7.0
Cond	-010	-009	-009	-011

Two photos taken at 1557 of G-110D and G-110S. Photos taken by Greg Dunn
toward the west and toward the east. Sample collected by Greg Dunn,
while ~~Sean Schnappen~~ 09 Jim Salch bailed. 2 Bottles filled for G-110D and 2
bottles filled for G-112, a duplicate. Sample was clear. Well was locked.
Sample collected at 1635.

Opened G-110S at 1537. PID read 0.03 - Background at 0.00 FID read 154 Background
at 1.38. Top of Casing (TOC) at 2'8½" above ground surface. Water at 6.92
meters or 22.70 feet below TOC. Total depth at 9.92 meters or 32.55 feet
Below TOC. 9.85 feet of water in well. 1.61 gallons. Purge 3 well volumes
or 5 gallons. Nylon cord with a disposable bailer will be used by
Sean Schnappen to bail well.

	Start	After 1.5 gallons	After 3.0 gallons	After 5.0 gallons	After 7.0 gallons
pH	7.20	7.16	7.24	7.18	7.19
Temp	5.3	4.7	4.1	~~8.8~~ 09 4.8	~~8~~ 00 4.6
Cond	-004	-005	-008	-008	-006

Sample collected by Greg Dunn, while Sean Schnappen bailed. 2
bottles were filled for G-110S. Sample was clear. Well was locked.
Sample collected at 1625.

Opened GD ~~G122~~ G112 at 1652 - No readings above background. Top of casing box is 1'11½" above Ground surface. Water: at 12.68 meters or 41.60 feet below TOC. Depth is 15.47 meters or 50.76 feet below TOC. 9.16 feet of water, which is 1.49 gallons. Purge 3 well volumes or 4.5 gallons. Nylon cord with disposable bailer will be used by Jim Salch to purge well.

	Start	After 1.5 gallon	After 3.0 gallon	After 4.5 gallon	After 6 gallon
pH	7.28	7.60	7.46	7.55	7.49
Temp	2.7	2.7	6.0	2.8	2.9
Cond.	-017	-025	-021	-023	-019

Sample collected by Greg Dunn, while Jim Salch bailed. 2 Bottles were filled. Sample was collected at 1735. and was cloudy. Well was locked. 2 photos taken by Greg Dunn at 1742. One towards the south and one toward the northwest.
Left the area at 1750.

GD ~~November~~ December 21, 1994 Weather: Clear, ≈35°F IEPA Personnel: Greg Dunn, Neelu Reddy, Sean Schnepper, Jim Salch. Arrived in area at 0800.

Opened G101D at 0823 PID - 0.21 Background 0.02 FID 0.83 Background - 2.10
Top of casing is 2'8½" above ground surface. Water at 2.43 meters or 7.97 feet below TOC. Total depth is 25 meters or 32.28 feet below TOC, 74.32 feet of water, which is 12.12 gallons. Purge 3 well volumes or 37 gallons. Nylon cord with disposable bailer will be used by Sean Schnepper to purge the well.

GD ~~pH~~	Start	After 12 gallons	After 24 gallon	After 37 gallon.
Temp	3.5	6.1	8.2	8.4
Cond	091	077	058	055
pH	4.88	5.25	5.86	5.89

Two photos taken by Greg Dunn at 0855 toward the north and south at G101S and G101D. Sample collected by Greg Dunn, while Sean Schnepper bailed. 2 bottles were filled for G101D and for G113, which is a duplicate. Sample was clear. Well was locked. Sample collected at 1020

Opened G-1015 at 0335 PID 0.21 Background 0.02 FID 1.84 Background at 1.41
Top of Casing (TOC) at 2'10" above ground surface. Water at 2.42 meters or
7.94 feet below TOC. Total depth is 13.06 meters or 42.72 feet below TOC.
34.78 feet of water in well, which is 5.67 gallons. Purge 3 well volumes or
17 gallons. Nylon cord with disposable bailer will be used by Jim Sulak
to bail the well.

	Start	After 5.5 gallons	After 11 gallons	After 17 gallons
pH	5.65	5.69	5.95	6.00
Temp	4.5	3.0	8.3	8.7
Cond	068	064	054	051

Sample collected by Greg Dunn, while Jim Sulak bailed. Sample was collected at
1005 & 2 bottles were filled. Sample was clear. Well was locked.

Opened ~~G-113~~ GD G-113 at 1030. PID-0.15 Background 0.05 FID 1.94 Background 1.38
Top of casing is 10¾" below ground surface. Water at 12.28 meters or 40.29
feet below TOC. Total depth is 16.18 meters or 53.09 feet below TOC.
12.8 feet of water or 2.09 gallons. Purge 3 well volumes or 6.5 gallons.
Nylon cord with disposable bailer will be used by Sean Schroppen to
bail the well.

	Start	After 2 gallons	After 4 gallons	After 6.5 gallons	After 8.0 gallons
pH	6.69	6.72	6.83	6.93	6.98
Temp	6.9	7.8	11.4	10.4	10.2
Cond	018	016	011	005	00[illegible]

Two photos taken by Greg Dunn at 1046 toward the southwest and northeast of
G-113 GD G-113. Sample collected by Greg Dunn at 1135, while Sean Schroppen
bailed 2 bottles were filled. Sample was slightly cloudy. Well was
locked.

Opened ~~6124~~ 6114 at 1050. PID 0.10 Background -0.05 FID 1.34 Background 1.17
Top of Casing (TOC) 9" below ground surface. Water at 12.34 meters or 40.49 feet below TOC. Total depth was 16.3 meters or 53.48 feet below TOC. 12.99 feet of water or 2.12 gallons. Purge 3 well volumes or 6.5 gallons. Nylon cord with disposable bailer were used by Jim Sabel to bail well.

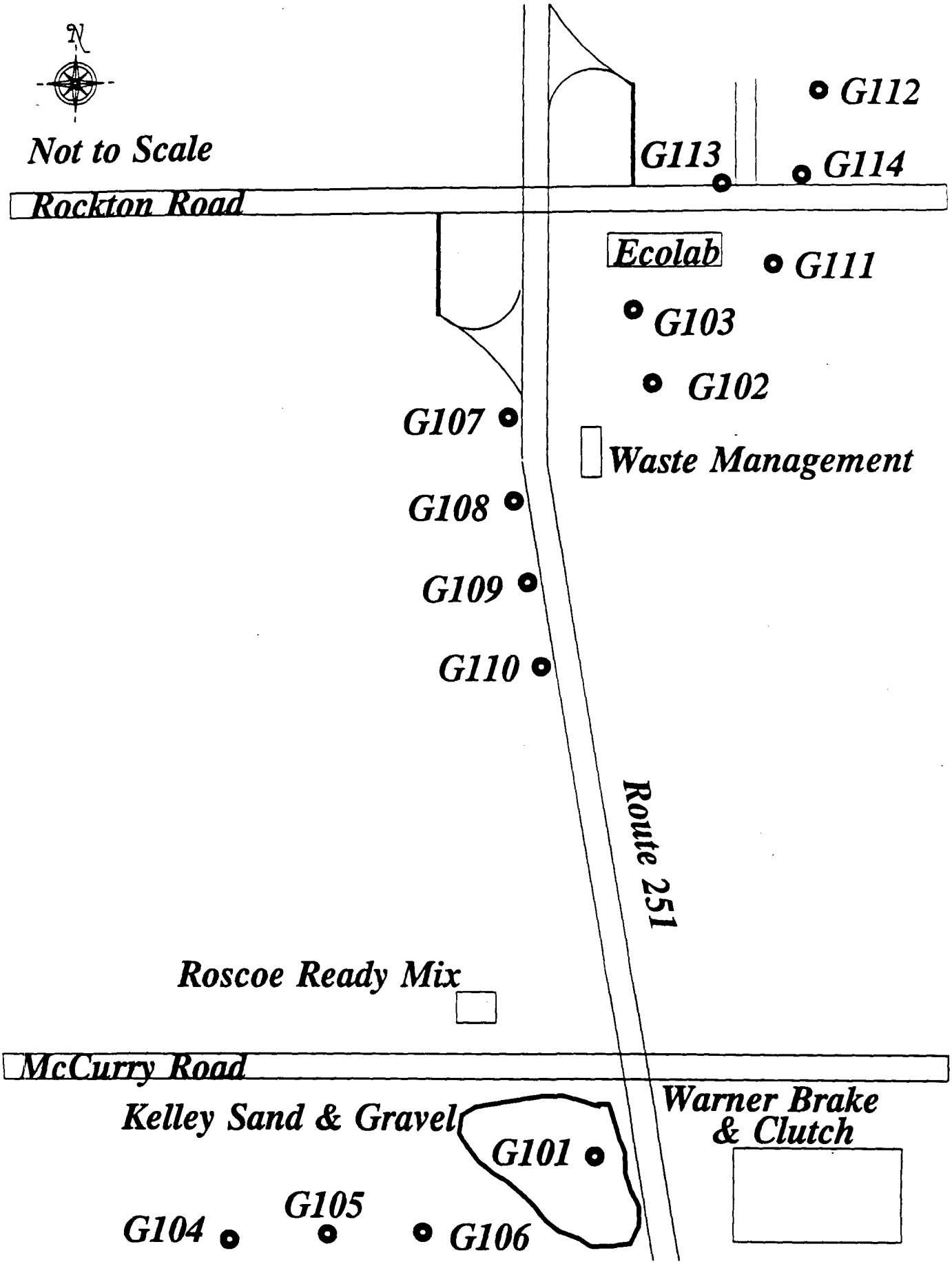
	Start	After 2 gallons	After 4 gallons	After 6.5 gallons	After 8.0
pH	6.78	6.91	6.98	7.08	7.14
Temp	16.0	12.5	9.3	12.4	12.5
Cond	.016	.007	.003	-.001	-.005

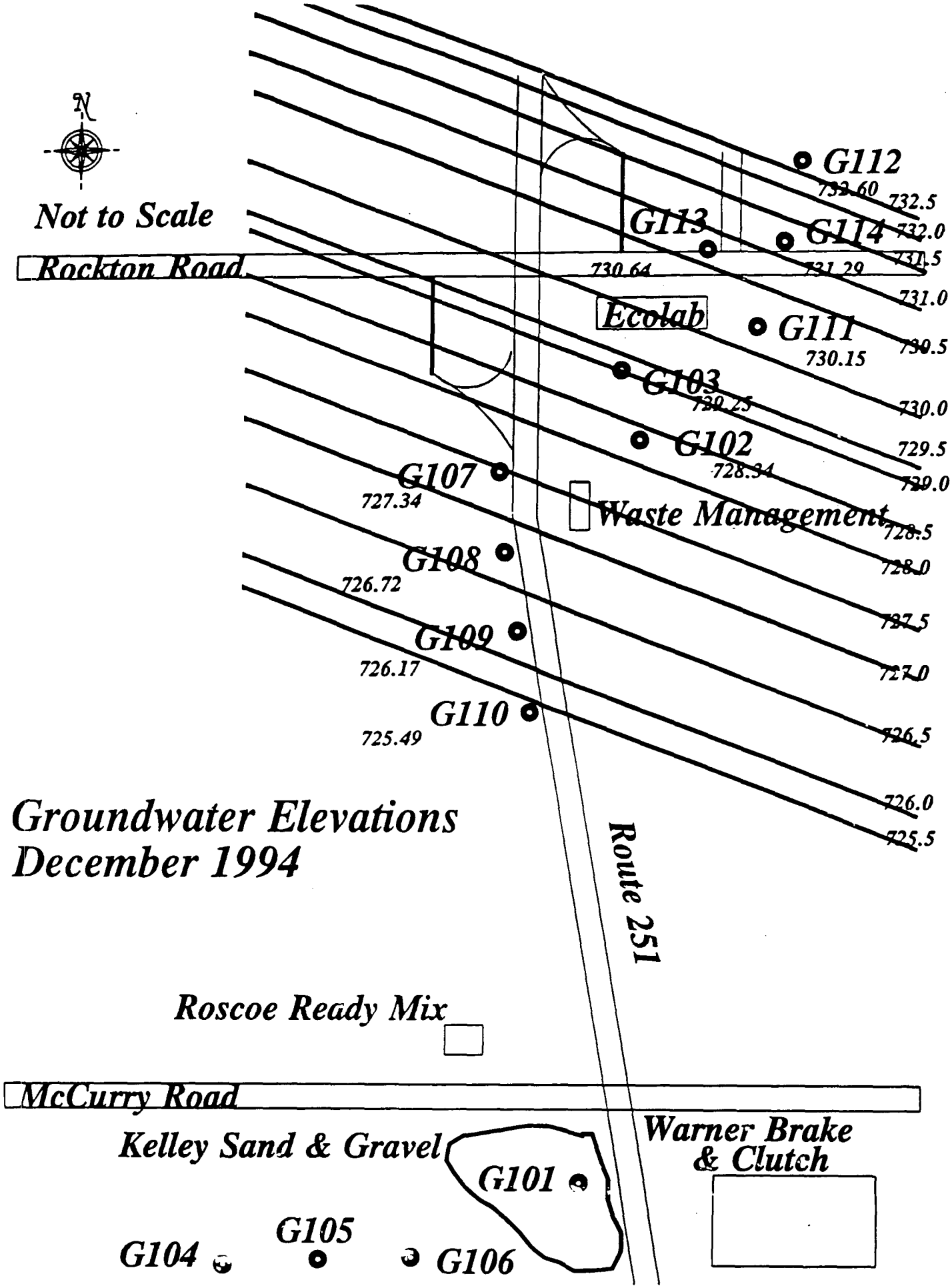
Two photos taken at 1118 by Greg Dunn toward the northeast and west at ~~6134~~ 6114 UP. Sample was collected by Greg Dunn at 1155 while Jim Sabel bailed. 2 bottles were filled. Sample was collected at 1155. Sample was ~~clear~~ slightly cloudy. Well was locked.

Opened ~~6127~~ 6111 at 1248. PID 5.38 Background 0.03 FID 6.35 Background 1.00
Top of Casing (TOC) 10 1/2" above ground surface. Water at 12.37 meters or 40.59 feet. Total depth was 15.44 meters or 50.66 feet below TOC. 10.07 feet of water in well or 1.65 gallons. Purge 3 well volumes or 5 gallons. Nylon cord with disposable bailer were used by Jim Sabel to bail the well.

	Start	After 2 gallons	After 4 gallons	After gallon 5
pH	7.35	7.39	7.39	7.39
Temp	14.7	14.5	14.3	14.5
Cond	.013	.011	.015	.015

Two photos taken at 1234 by Greg Dunn toward the northwest and southeast. Sample was collected by Greg Dunn at 1250, while Jim Sabel bailed the well. 2 bottles were filled. Sample was clear. Well was locked. Sealed cooler at 1300. Left the area at 1305


N
Not to Scale
Rockton Road
G112
G113
G114
Ecolab
G111
G103
G102
G107
Waste Management
G108
G109
G110
Route 251
Roscoe Ready Mix
McCurry Road
Warner Brake & Clutch
Kelley Sand & Gravel
G101
G105
G104
G106



Groundwater Elevations
December 1994

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10006

Date Sealed: 11/16/94 By: [illegible]

Facility
Name: EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory #: 2010400019
Site Billing Code: LP52-909
Project Manager: GREG DUNN

Laboratory	Sample I.D.	Sample Date	Sample Time
[redacted]	TB1	12/19/94	12:21pm

Sample Appearance: Clear

Collector Comments:

Sampler Signature: [signature] Division/Company IEPA/SSU

CONTAINER				ANALYSIS	FILTERED		
No.	Code	Size	Preser		(Y/N)	Date	Time
2	15	40ml	HCL	TRIP BLANK		12/19/94	[illegible]

CHAIN OF CUSTODY CHRONICLE

I certify that I [illegible] the sample shipping container with the shipping container sealed and intact.

Opened by (print): Nesh Reddy Signature: [signature]

Date: 12/21/94 Time: 12:21pm Seal #: 10003 Intact?: Y / N

I certify that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

Sealed by (print): Nesh Reddy Signature: [signature]

Date: 12/21/94 Time: 1pm Seal # 10004

Courier & Sample Pickup:

[redacted]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10006

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	TB2	12/19/94	13:21pm

Sample Appearance : Clear

Collection Comments :

Sampler Signature : [illegible] Division/Company IEPA/SSU

CONTAINER				ANALYSIS	FILTERED		
No.	Code	Size	Preser		(Y/N)	Date	Time
2	15	40ml	HCL	TRIP BLANK	12/19/[illegible]	[illegible]	[illegible]

CHAIN OF CUSTODY CHRONICLE

I certify that I [illegible] the sample shipping container with the shipping container sealed and intact.

Upon [illegible] Nicole Reddy Signature: Nicole Reddy

Date: 12/19/94 Time: 12:21pm Seal #: 10003 Intact: Y/N

I certify that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

[illegible] Nicole Reddy Signature: Nicole Reddy

Date: 12/21/94 Time: pm Seal # 10004

Courier - Sample Pickup:

Courier - Sample Delivery
I certify that I received the sample shipping container from the courier listed above with the [illegible] that each bottle in the shipping container was intact. After recording the sample in the [illegible] custody of competent laboratory [illegible] locked in a [illegible]

Signed by (print): Signature:

Date: Time: Seal #:

Lab Name: Comments:

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IEPA - CLP
CHAIN OF CUSTODY

Seal # 10006

Date Sealed: 12/16/94 By: [illegible]

Facility
[illegible] : EVERGREEN MANOR
[illegible] : ROCKFORD
County: CINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LPS2-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	TB3	12/19/94	12:21pm

[illegible] Clear

[illegible] Division/Company IEPA/SSU

CONTAINER				ANALYSIS			
[illegible]	Code	Size	Preser		(Y/N)	[illegible]	[illegible]
		40ml	HCL	TRIP BLANK		[illegible]	[illegible]

[illegible]
[illegible] shipping container with the shipping container sealed and intact.

[illegible] Nadia Reddy Signature: Wheeler Reddy

[illegible] Time: 12:21pm [illegible] 10003 Intact [illegible]

[illegible] above was collected and placed in bottles in my presence, that each bottle was placed intact in the [illegible] that I sealed the sample shipping container at the date and time listed below.

[illegible] Nadia Reddy Signature: Wheeler Reddy

12/21/94 Time: 1pm [illegible] 10004

[illegible] Pickup:

Courier - Sample Delivery
I certify that I received the sample shipping container from the courier listed above with the shipping container [illegible] that each bottle in the shipping container was intact. After recording the sample [illegible] the custody of competent laboratory personnel at all times or locked in a secured area.

[illegible]ned by (print): _____ Signature: _____

Date: _____ Time: _____ Seal #: _____ Intact: _____

Lab Name: _____ Comments: _____

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory	Sample I.D.	Sample Date	Sample Time
	1035	12/19/94	1:22pm

Sample Appearance : Slightly Cloudy

Comments/Comments:

Sampler Signature : [illegible] Division/Company IEPA/[illegible]

CONTAINER				ANALYSIS		[illegible]	
No.	Code	Size	Preser		(Y/N)	[illegible]	[illegible]
2	1	40ml	HCL	VOA		12/19/94	1:22pm

CHAIN OF CUSTODY CHRONICLE

I [illegible] the sample shipping container with the shipping container sealed and intact.

Upon [illegible] Neelu Reddy Signature: Neelu Reddy

Date: 12/19/94 Time: 12:21pm Seal #: 10003 Intact: (Y) / N

I certify that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

Upon [illegible] Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal #: 10004

Courier Sample Pickup:

Courier / Sample [illegible]
I certify that I received [illegible]
that each bottle in the [illegible]
the custody of [illegible]

Signed by (print): [illegible]

Date: [illegible]

Lab Name: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name: EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory #: 2010400015
Site Billing Code: LP52-909
Project Manager: GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	103D	12/19/94	[illegible]

Appearance: Slight [illegible]

Comments:

Sampler: Gregg W D Division/Company IEPA/SSU

CONTAINER				ANALYSIS		FILTERING	
No.	Code	Size	Preser		(Y/N)	Date	Time
		10ml	HCL	VOA		12/19/94	1:45pm

CHAIN OF CUSTODY CHRONICLE

[illegible] sample shipping container with the shipping container sealed and intact.

Name: Neelu Reddy Signature: Neelu Reddy

Date: 12/16/94 Time: 12:21pm Seal #. 10003 Intact?: (Y)/ N

[illegible] that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the [illegible] and that I sealed the sample shipping container at the date and time listed below.

Name: Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

[illegible] Sample Pickup:

Courier - Sample [illegible]
I certify that I received [illegible]
that each bottle in the [illegible]
the custody of competent [illegible]

Signed by (print): [illegible]

Date:

Lab Name:

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	[illegible]S	12/11/94	2:55 pm

Sample Appearance : Slightly Cloudy

Collector Comments:

Signature : Gregory D[illegible] Division/Company IEPA/SSU

CONTAINER				ANALYSIS		FILTERING	
No.	Code	Size	Preser		(Y/N)	Date	Time
2	1	40ml	HCL	VOA		12/13/94	2:55

CHAIN OF CUSTODY CHRONICLE

I certify that I received the sample shipping container with the shipping container sealed and intact.

Operator Name: Neelu Reddy Signature: Neelu Reddy

Date: 12/16/94 Time: 12:21pm Seal #: 10003 Intact?: (Y) / N

I certify that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

Operator Name: Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

Courier's Sample Pickup:

Courier - Sample [illegible]
I certify that I received [illegible]
that each bottle in the [illegible]
the custody of [illegible]

Signed by (print) [illegible]

Date: [illegible]

Lab Name: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name: EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory #: 2010400015
Site Billing Code: LP52-909
Project Manager: GREG DUNN

Laboratory	Sample I.D.	Sample Date	Sample Time
[illegible]	10 x D	12/11/94	3:50pm

Sample Appearance: Slightly Cloudy

Collector Comments:

Sampler Signature: Gregory N D Division/Company IEPA/[illegible]

CONTAINER				ANALYSIS		FILTERING	
No.	Code	Size	Preser		(Y/N)	Date	Time
2	1	40ml	HCL	VOA		12/11/94	3:50pm

CHAIN OF CUSTODY CHRONICLE

I certify that I [illegible] the sample shipping container with the shipping container sealed and intact.

Operator [illegible]: [illegible] Signature: [illegible]

Date: 12/11/94 Time: 12:21pm Seal #: 10003 Intact?: (Y) / N

I certify that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

Sealer [illegible]: [illegible] Signature: [illegible]

Date: 12/21/94 Time: 1pm Seal # 10004

Courier - Sample Pickup:

[redacted]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name: EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory #: 2010400015
Site Billing Code: EP52-909
Project Manager: GREG DUNN

Laboratory	Sample I.D.	Sample Date	Sample Time
	1075	12/19/94	[illegible]

Sample Appearance: Reddish color

Collector Comments:

Sample Signature: Gregory D Division/Company IEPA/SSU

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
2	1	40ml	HCL	VOA		12/19/94	1:40pm

CHAIN OF CUSTODY CHRONICLE

I certify that I received the sample shipping container with the shipping container sealed and intact.

Opening Date: Neelu Reddy Signature: Neelu Reddy

Date: 12/19/94 Time: 12:21pm Seal #: 10003 Intact? (Y) / N

I certify that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

Sample Preprint: Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

Courier - Sample Pickup:

Courier - Sample [illegible]
I certify that I received [illegible]
that each bottle in the [illegible]
the custody of [illegible]

Opened by (print) [illegible]

Date: [illegible]

Lab Name: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	1083	12/11/94	[illegible]

Sample Appearance : Reddish color

[illegible] Comments:

Sampler's Signature: Gregory W. D[illegible] Division/Company IEPA/SSU

CONTAINER				ANALYSIS		FILTERED	
No.	Code	Size	Preser		(Y/N)	Date	Time
2	1	40ml	HCL	VOA		12/11/94	[illegible]

CHAIN OF CUSTODY CHRONICLE

I [illegible] the sample shipping container with the shipping container sealed and intact.

[illegible] Neelu Reddy Signature: Neelu Reddy

Date: 12/11/94 Time: 12:21pm Seal #: 10003 Intact: (Y) / N

I [illegible] that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

[illegible] Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

[illegible] Sample Pickup:

Courier [illegible]
I certify that [illegible]
that each bottle [illegible]
the custody [illegible]

[illegible] by [illegible]

Date:

Lab Name:

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory	Sample I.D.	Sample Date	Sample Time
[redacted]	107 D	12/19/94	5:35 pm

Sample Appearance : Cloudy

Collector Comments:

Sampler Signature : Gregory W D Division/Company IEPA/SSU

CONTAINER				ANALYSIS		FILTERING	
No.	Code	Size	Preser		(Y/N)	Date	Time
2	1	40ml	HCL	VOA		12/19/94	5:[illegible]

CHAIN OF CUSTODY CHRONICLE

I [illegible] that I received the sample shipping container with the shipping container sealed and intact.

Operator (print): Neelu Reddy Signature: Neelu Reddy

Date: 12/19/94 Time: 12:21pm Seal #: 10003 Intact: Y / N

I [illegible] that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

Operator (print): Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

Courier - Sample Pickup:

[redacted]

IEPA - CLP
CHAIN OF CUSTODY

Seal # ~~[illegible]~~ 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Location: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	1065	12/20/94	9:30am

[illegible] : Clear

[illegible] :

[illegible] Division/Company IEPA/SSU

CONTAINER			ANALYSIS		[illegible]	
[illegible]	Code	Size	Preser		(Y/N)	Date	Time
[illegible]	[illegible]	40ml	HCL	VOA		[illegible]	[illegible]

CHAIN OF CUSTODY CHRONICLE

[illegible] sample shipping container with the shipping container sealed and intact.

[illegible] Neelu Reddy Signature: Neelu Reddy

[illegible] Time: 12:21pm Seal #: 10003 Intact: Y / N

[illegible] listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the [illegible] container and that I sealed the sample shipping container at the date and time listed below.

[illegible] Neelu Reddy Signature: Neelu Reddy

12/21/94 Time: 1pm Seal # 10004

[illegible] Pickup:

Courier - Sample Deliver[illegible]
I certify that I received the [illegible]
that each bottle in the shipping [illegible]
the custody of competent laboratory [illegible]

C[illegible]ned by (print): [illegible]

Date: [illegible] Time: [illegible] Seal # [illegible]

Lab Name: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Location: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	106D	12/20/94	[illegible]

Sample Appearance : Clear

Comments:

Signature : [illegible] Division/Company IEPA/SSU

CONTAINER				ANALYSIS		[illegible]	
No.	Code	Size	Preser		(Y/N)	Date	Time
	1	40ml	HCL	VOA		[illegible]	[illegible]

CHAIN OF CUSTODY CHRONICLE

I [illegible] the sample shipping container with the shipping container sealed and intact.

[illegible] Neelu Reddy Signature: Neelu Reddy

[illegible]/14/94 Time: 12:21pm Seal #: 10003 Intact: (Y) / N

[illegible] that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the [illegible] shipping container and that I sealed the sample shipping container at the date and time listed below.

[illegible] Neelu Reddy Signature: Neelu Reddy

[illegible] 12/21/94 Time: 1pm Seal # 10004

[illegible] Sample Pickup:

Courier - Sample Delivery
I certify that I received the sample [illegible]
that each bottle in the shipping container [illegible]
the custody of competent laboratory [illegible]

Signed by (print): [illegible]

Date: [illegible] Time: [illegible]

Lab Name: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10002

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Location: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	1055	12/20/94	11:30am

[illegible] : Clear

[illegible] :

[illegible] : Greg W D Division/Company IEPA/SSU

CONTAINER			ANALYSIS	FILTERING		
[illegible]	Size	Preser		(Y/N)	Date	Time
	Coml	HCL	VOA			

CHAIN OF CUSTODY CHRONICLE

[illegible] sample shipping container with the shipping container sealed and intact.

Neelu Reddy Signature: Neelu Reddy

[illegible]/94 Time: 12:21 p.m. Seal #: 10003 Intact: Y / N

[illegible] above was collected and placed in bottles in my presence, that each bottle was placed intact in the [illegible] and that I sealed the sample shipping container at the date and time listed below.

[illegible]: Neelu Reddy Signature: Neelu Reddy

12/21/94 Time: 1pm Seal # 10004

[illegible] Pickup:

Courier - Sample De[illegible]
I certify that I received the [illegible]
that each bottle in the shipping [illegible]
the custody of competent laboratory [illegible]

O[illegible]ned by (print): [illegible] Signature: [illegible]

Date: [illegible] Time: [illegible]

Lab Name: [illegible]

IEPA — CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	105D	12/20/94	11:40am

Sample Appearance : Clear

Comments:

Signature : [signature] Division/Company IEPA/[illegible]

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
		40ml	HCL	VOA			

CHAIN OF CUSTODY CHRONICLE

I [illegible] the sample shipping container with the shipping container sealed and intact.

[illegible] Neelu Reddy Signature: Neelu Reddy

[illegible] 12/21/94 Time: 12:21pm Seal #: 10003 Intact: (Y) N

I [illegible] that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

[illegible] Neelu Reddy Signature: Neelu Reddy

12/21/94 Time: 1pm Seal # 10004

[illegible] Sample Pickup:

Courier — Sample Delivery

I certify that I received the sample shipping container from the courier listed above [illegible] that each bottle in the shipping container was intact. After recording the sample [illegible] the custody of competent laboratory personnel [illegible]

Signed by (print): [illegible]

Date: Time: Seal #:

Lab Name: Comments:

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name: EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	104D	12/20/94	NVR 12:25pm

Sample Appearance : (Clear)

[illegible] Comments:

[illegible] Signature : Gregory W D[illegible] Division/Company IEPA/[illegible]

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
[illegible]	[illegible]	40ml	HCL	VOA		12/20/94	12:25pm

CHAIN OF CUSTODY CHRONICLE

I [illegible] the sample shipping container with the shipping container sealed and intact.

[illegible] Neelu Reddy Signature: Neelu Reddy

[illegible] 12/[illegible]/94 Time: 12:21pm Seal #: 10003 Intact?: Y / N

I [illegible] that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the [illegible] shipping container and that I sealed the sample shipping container at the date and time listed below.

[illegible] (print): Neelu Reddy Signature: Neelu Reddy

[illegible] 12/21/94 Time: 1pm Seal # 10004

[illegible] Sample Pickup: 14

Courier - Sample Delivery
I certify that I received the sample shipping container from the courier [illegible] that each bottle in the shipping container was intact after recording the sample [illegible] the custody of competent laboratory personnel at all times or locked in a [illegible]

[illegible]ned by (print): [illegible] Signature: [illegible]

Date: [illegible] Time: [illegible] Seal #: [illegible]

Lab Name: [illegible] Comments: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #

Sample I.D.	Sample Date	Sample Time
104S	12/20/94	

Sample Appearance : (Clear)

Collector Comments:

Sampler Signature : Gregory W D Division/Company IEPA/BOW

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
2	1	40ml	HCL	VOA		12/20/94	13:45pm

CHAIN OF CUSTODY CHRONICLE

I certify that I received the sample shipping container with the shipping container sealed and intact.

Opened by: Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 12:21pm Seal #: 10003 Intact? (Y) / N

I certify that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

Sealed by (print): Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

Courier - Sample Pickup:

Courier - Sample Delivery:
I certify that I received the sample [illegible]
that each bottle in the shipping container [illegible] after receiving the sample [illegible]
the custody of competent laboratory personnel [illegible]

Opened by (print): [illegible] Signature: [illegible]

Date: [illegible] Time: [illegible] Seal #: [illegible]

Lab Name: [illegible] Comments: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name: EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory #: 2010400015
Site Billing Code: LP52-909
Project Manager: GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	108D	12/20/94	3:55pm

Sample Appearance: Clear

Collector Comments:

Sampler Signature: [illegible] Division/Company IEPA/SSU

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
2	1	40ml	HCL	VOA		12/20/94	3:55pm

CHAIN OF CUSTODY CHRONICLE

I certify that I received the sample shipping container with the shipping container sealed and intact.

Operator (print): Neelu Reddy Signature: Neelu Reddy

Date: 12/19/94 Time: 12:21pm Seal #: 10003 Intact?: Y / N

I certify that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

Sampler (print): Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

Courier - Sample Pickup:

Courier - Sample De[illegible]
I certify that I received [illegible]
that each bottle in the shipping [illegible]
the custody of competent laboratory [illegible]

Owned by (print): [illegible]

Date: [illegible] Time: [illegible]

Lab Name: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	G111	12/20/94	1:55 p.

Sample Appearance :

Collector Comments :

Sampler Signature : [illegible] Division/Company IEPA/SSS

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
2	1	40ml	HCL	VOA		12/20/94	1:55

CHAIN OF CUSTODY CHRONICLE

I certify that I received the sample shipping container with the shipping container sealed and intact.

Received by (print): Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 12:21pm Seal #: 10003 Intact?: (Y) N

I certify that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

Relinquished by (print): Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

Courier - Sample Pickup:

Courier - Sample Delivery
I certify that I received the samples [illegible]
that each bottle in the shipping container [illegible]
the custody of competent laboratory [illegible]

Received By (print): [illegible]

Date: [illegible] Time [illegible] Seal # [illegible]

Lab Name: [illegible]

IEPA -- CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	1095	12/20/94	3:15pm

Sample Appearance : Cloudy

Collector Comments:

Sampler Signature: [illegible] Division/Company IEPA/SSU

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
2	1	40ml	HCL	VOA		12/20/94	3:15pm

CHAIN OF CUSTODY CHRONICLE

I [illegible] the sample shipping container with the shipping container sealed and intact.

[illegible] Neelu Reddy Signature: Neelu Reddy

Date: [illegible] Time: 12:21 pm Seal #: 10003 Intact?: Y / N

I [illegible] that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

[illegible] Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

[illegible] Sample Pickup:

Courier -- Sample [illegible]
I certify that I received the [illegible] from the courier listed [illegible] that each bottle in the shipping container was intact, after recording the sample [illegible] the custody of competent laboratory [illegible] or locked in a [illegible]

[illegible]ed By (print): [illegible] Signature: [illegible]

Date: [illegible] Time: [illegible] Seal # [illegible]

Lab Name: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10002

Date Sealed: 12/16/94 By: [illegible]

Facility
Name: EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory #: 2010400015
Site Billing Code: LPS2-909
Project Manager: GREG DUNN

[redacted]

Sample I.D.	Sample Date	Sample Time
109D	12/20/94	3:25pm

Sample Appearance: cloudy

Collector Comments:

Sampler Signature: [illegible] Division/Company IEPA/[illegible]

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
2	1	40ml	HCL	VOA		12/20/94	3:25pm

CHAIN OF CUSTODY CHRONICLE

I certify that I received the sample shipping container with the shipping container sealed and intact.

Opened by (print): Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 12:21pm Seal #: 10003 Intact? (Y) / N

I certify that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

Sealed by (print): Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

Courier - Sample Pickup:

[redacted]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Location: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	1105	12/20/94	4:25 pm

Appearance: Clear

Comments:

Sampler: [illegible] Division/Company: IEPA/[illegible]

CONTAINER				ANALYSIS			
[illegible]	[illegible]	Size	Preser		(Y/N)	[illegible]	[illegible]
		10ml	HCL	VOA		12/20/94	4:25 pm

CHAIN OF CUSTODY CHRONICLE

[illegible] sample shipping container with the shipping container sealed and intact.

N - [illegible] Reddy Signature: [illegible] Reddy

[illegible] Time: 12:21 pm Seal #: 10003 Intact: (Y) / N

[illegible] above was collected and placed in bottles in my presence, that each bottle was placed intact in the [illegible] and that I sealed the sample shipping container at the date and time listed below.

[illegible] Reddy Signature: [illegible] Reddy

12/31/94 Time: 1pm Seal # 10004

[illegible] Pickup:

Courier - Sample [illegible]
I certify that I received the [illegible]
that each bottle in the shipping [illegible]
the custody of competent laboratory [illegible]

[illegible]ned by (print): [illegible]

Date: [illegible] Time: [illegible] Seal #: [illegible]

Lab Name: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/18/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Location: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	G112	12/20/94	4:35pm

[illegible] Clear

[illegible]

[illegible] Division/Company IEPA/SSU

CONTAINER				ANALYSIS		[illegible]	
[illegible]	Code	Size	Preser		(Y/N)	[illegible]	Time
		10ml	HCL	VOA		12/[illegible]/94	4:35pm

CHAIN OF CUSTODY CHRONICLE

[illegible] sample shipping container with the shipping container sealed and intact.

[illegible] Neelu Reddy Signature: Neelu Reddy

[illegible]/94 Time: 12:21pm Seal #: 10003 Intact: Y / N

[illegible] above was collected and placed in bottles in my presence, that each bottle was placed intact in the [illegible] and that I sealed the sample shipping container at the date and time listed below.

[illegible] Neelu Reddy Signature: Neelu Reddy

12/21/94 Time: 1pm Seal # 10004

[illegible] Pickup:

Courier - Sample Del[illegible]
I certify that I received the sample [illegible]
that each bottle in the shipping container [illegible]
the custody of competent laboratory personnel [illegible]

O[illegible]ed by (print): [illegible] Signature: [illegible]

Date: [illegible] Time: [illegible] Seal #: [illegible] Intact: [illegible]

Lab Name: [illegible] Comments: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/11/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	110D	12/20/94	1:35pm

Sample Appearance : Clear

Collector Comments:

Sample Signature : [illegible] Division/Company IEPA/SSU

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
2	1	40ml	HCL	VOA		12/20/94	1:35pm

CHAIN OF CUSTODY CHRONICLE

I certify that I received the sample shipping container with the shipping container sealed and intact.

Original (print): Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 12:21pm Seal #: 10003 Intact: Y / N

I certify that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

Original (print): Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

Courier - Sample Pickup:

Courier - Sample De[illegible]
I certify that I received the [illegible]
that each bottle in the shipping [illegible]
the custody of competent laboratory [illegible]

Q[illegible]ed by (print) [illegible]

Date: [illegible] Time: [illegible]

Lab Name: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	122	12/20/94	5:35 pm

Sample Appearance : Cloudy

Collector Comments:

Collector Signature : [illegible] Division/Company IEPA/OSU

CONTAINER				ANALYSIS		FILTERING	
No.	Code	Size	Preser		(Y/N)	Date	Time
2	1	40ml	HCL	VOA		12/20/94	5:35pm

CHAIN OF CUSTODY CHRONICLE

I [illegible] the sample shipping container with the shipping container sealed and intact.

[illegible] Neelu Reddy Signature: Neelu Reddy

[illegible] 12/[illegible]/94 Time: 12:21pm Seal #: 10003 Intact: Y / N

I [illegible] that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

[illegible] Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

[illegible] - Sample Pickup:

Courier - Sample [illegible]
I certify that I received the sample [illegible]
that each bottle in the shipping container [illegible]
the custody of competent laboratory personnel [illegible]

[illegible]ned by (print): [illegible]

Date: [illegible] Time: [illegible]

Lab Name: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	1015	12/21/94	10:05am

[illegible] Appearance : Clear

[illegible] Comments:

[illegible] Division/Company IEPA/SSU

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
	1	40ml	HCL	VOA		12/21/94	10:05am

CHAIN OF CUSTODY CHRONICLE

[illegible] sample shipping container with the shipping container sealed and intact.

[illegible] Neelu Reddy Signature: Neelu Reddy

[illegible] 12/19/94 Time: 12:21pm Seal #: 10003 Intact?: (Y) / N

[illegible] listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the [illegible] and that I sealed the sample shipping container at the date and time listed below.

[illegible] Neelu Reddy Signature: Neelu Reddy

12/21/94 Time: 1pm Seal # 10004

[illegible] Sample Pickup:

Courier - Sample De[illegible]
I certify that I received the sa[illegible]
that each bottle in the shipping [illegible]
the custody of competent laborator[illegible]

[illegible]ned by (print): [illegible]

Date: [illegible]

Lab Name: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	101D	12/21/94	4 PM 10:20am

Sample Appearance : Clear

[illegible] Comments :

[illegible] : Division/Company IEPA/SSU

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
2	1	40ml	HCL	VOA		12/21/94	10:20am

CHAIN OF CUSTODY CHRONICLE

I [illegible] the sample shipping container with the shipping container sealed and intact.

[illegible] Neelu Reddy Signature: Neelu Reddy

Date: 12/11/94 Time: 12:21pm Seal #: 10003 Intact? Y / N

[illegible] sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the [illegible] container and that I sealed the sample shipping container at the date and time listed below.

[illegible] Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

[illegible] Sample Pickup:

Courier - Sample De[illegible]
I certify that I received the sample [illegible]
that each bottle in the shipping [illegible]
the custody of competent laboratory [illegible]

Owned by (print): [illegible]

Date: Time: Seal #

Lab Name: Comments

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	G113	12/21/94	10:30am

[illegible] : Clear

[illegible] Comments:

[illegible] : Division/Company IEPA/SSU

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
[illegible]	[illegible]	40ml	HCL	VOA		12/21/94	10:30am

CHAIN OF CUSTODY CHRONICLE

[illegible] sample shipping container with the shipping container sealed and intact.

[illegible] Neelu Reddy Signature: Neelu Reddy

[illegible]/94 Time: 12:21pm Seal #: 10003 Intact? (Y) / N

[illegible] listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the [illegible] container and that I sealed the sample shipping container at the date and time listed below.

[illegible] Neelu Reddy Signature: Neelu Reddy

12/21/94 Time: 1pm Seal # 10004

[illegible] Sample Pickup:

Courier - Sample Del[illegible]
I certify that I received the [illegible]
that each bottle in the shipping [illegible]
the custody of competent laborat[illegible]

D[illegible]ed by (print): [illegible]

Date: [illegible] Time: [illegible]

Lab Name: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	~~[illegible]~~ NVR 123	12/21/94	11:35am

Sample Appearance : Slightly Cloudy

Collection Comments:

Sampler Signature : [illegible] Division/Company IEPA/SSU

	CONTAINER				ANALYSIS		FILTERING	
	No.	Code	Size	Preser		(Y/N)	Date	Time
	2	1	40ml	HCL	VOA		12/21/94	11:35am

CHAIN OF CUSTODY CHRONICLE

I [illegible] the sample shipping container with the shipping container sealed and intact.

Operator [illegible] Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 12:21pm Seal #: 10003 Intact? Y / N

I [illegible] that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

Operator (print): Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

Location of Sample Pickup:

Courier - Sample Delivery
I certify that I received the sample [illegible] that each bottle in the shipping container [illegible] the custody of competent laboratory personnel [illegible]

Opened by (print): [illegible] Signature: [illegible]

Date: [illegible] Time: [illegible] Seal # [illegible]

Lab Name: [illegible]

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	124	12/21/94	11:55am

Sample Appearance: Shipping cloudy

Comments:

Division/Company: IEPA/[illegible]

CONTAINER				ANALYSIS		
No.	Code	Size	Preser		(Y/R)	Date / Time
[illegible]	1	40ml	HCL	VOA		12/21/94 11:55am

[illegible]
[illegible] shipping container with the shipping container sealed and intact.

Neelu Reddy Signature: Neelu Reddy
12/21/94 Time: 12:21pm Seal #: 10003 Intact: (Y)/R

[illegible] above was collected and placed in bottles in my presence, that each bottle was placed intact in the [illegible] container and that I sealed the sample shipping container at the date and time listed below.

Neelu Reddy Signature: Neelu Reddy
12/21/94 Time: 1pm Seal #: 10004

[illegible] Sample Pickup:

Courier - Sample Delivery:
I certify that I received the sample shipping container from the courier listed above with the shipping container [illegible] that each bottle in the shipping container was intact. After recording the sample in the official record [illegible] the custody of competent laboratory personnel at all times or locked in a secured area.

Opened by (print): _____ Signature: _____

Date: _____ Time: _____ Seal #: _____ Intact: _____

Lab Name: _____ Comments: _____

IEPA - CLP
CHAIN OF CUSTODY

Seal # 10003

Date Sealed: 12/16/94 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	121	12/21/94	12:50pm

Sample Appearance:

Collector Comments:

Sampler Signature: Division/Company IEPA/SSU

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
2	1	40ml	HCL	VOA		12/21/94	12:50pm

CHAIN OF CUSTODY CHRONICLE

I certify that I received the sample shipping container with the shipping container sealed and intact.

Opened by (print): Neelu Reddy Signature: Neelu Reddy

Date: 12/19/94 Time: 12:21pm Seal #: 10003 Intact: (Y) / N

I certify that the sample listed above was collected and placed in bottles in my presence, that each bottle was placed intact in the sample shipping container and that I sealed the sample shipping container at the date and time listed below.

Sealed by (print): Neelu Reddy Signature: Neelu Reddy

Date: 12/21/94 Time: 1pm Seal # 10004

Courier - Sample Pickup:

Courier - Sample Delivery

I certify that I received the sample shipping container from the courier listed above with the shipping container [illegible] that each bottle in the shipping container was intact. After recording the sample in the [illegible] the custody of competent laboratory personnel at all times or locked in a secured area.

Opened by (print): Signature:

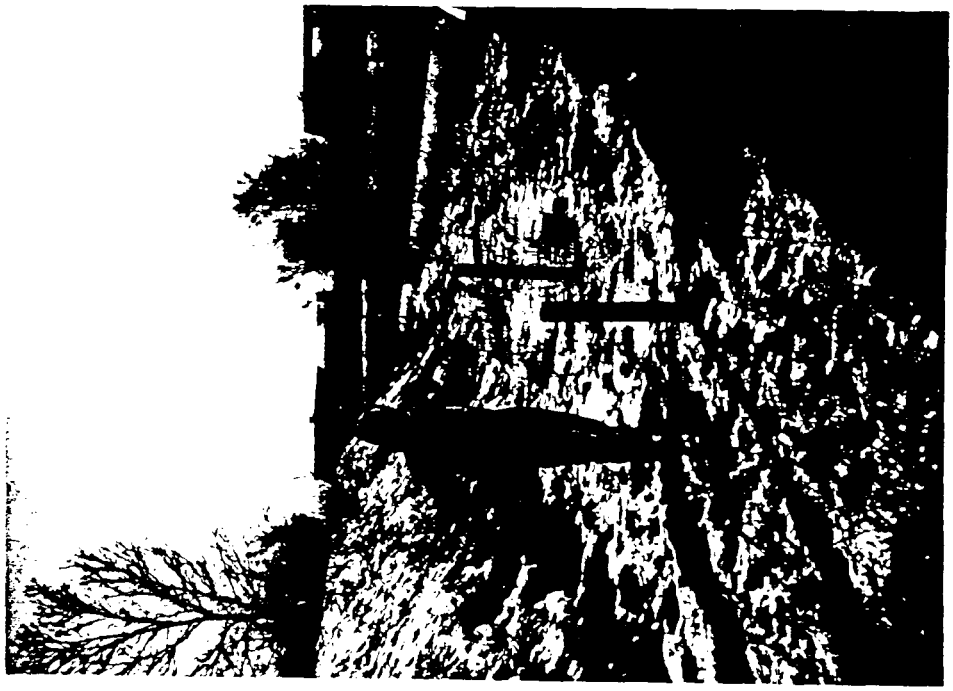
Date: Time: Seal #: Intact:

Lab Name: Comments:

INSPECTION PHOTOS

DATE: 12 / 19 / 94	SITE #: 2010400015
TIME: 1333	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the north at monitoring wells G103s (in background) and G103d (in foreground). Ecolab is in the background.	
ROLL#: 1 PHOTO#: 1	

DATE: 12 / 19 / 94	SITE #: 2010400015
TIME: 1333	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the south at monitoring wells G103d (in background) and G103s (in foreground).	
ROLL#: 1 PHOTO#: 2	



INSPECTION PHOTOS

DATE: 12 / 19 / 94	SITE #: 2010400015
TIME: 1503	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the southwest at monitoring well G102s (on right side of photo) and G102d (on left side of photo). Waste Management Transfer Station is in the background.	
ROLL#: 1 PHOTO#: 3	

DATE: 12 / 19 / 94	SITE #: 2010400015
TIME: 1503	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the northwest at monitoring wells G102d (in foreground) and G102s (in background). State Line Foundries is located in background of photo.	
ROLL#: 1 PHOTO#: 4	

INSPECTION PHOTOS

DATE: 12 / 19 / 94	SITE #: 2010400015
TIME: 1646	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the north at monitoring wells G107s (in foreground) and G107d (in background).	
ROLL#: 1 PHOTO#: 5	

DATE: 12 / 19 / 94	SITE #: 2010400015
TIME: 1646	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the south at monitoring wells G107d (in foreground) and G107s (in background).	
ROLL#: 1 PHOTO#: 6	

INSPECTION PHOTOS

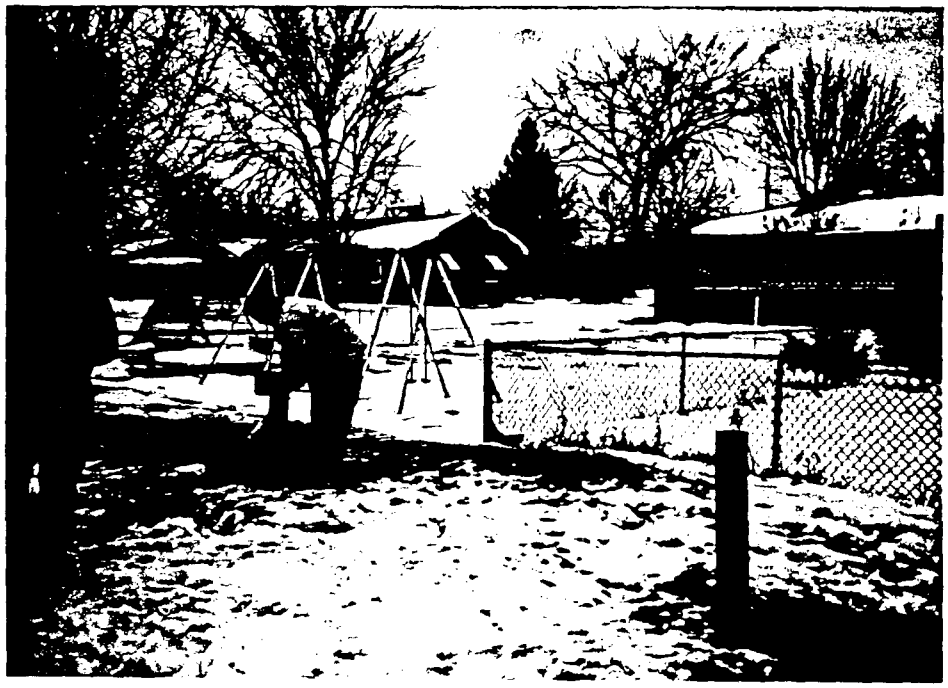
DATE: 12 / 20 / 94	SITE #: 2010400015
TIME: 0910	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the southwest at monitoring well G106s (on left side of photo) and G106d (on right side of photo).	
ROLL#: 1 PHOTO#: 7	

DATE: 12 / 20 / 94	SITE #: 2010400015
TIME: 0910	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the southeast at monitoring wells G106d (on right side of photo) and G106s (on left side of photo).	
ROLL#: 1 PHOTO#: 8	

INSPECTION PHOTOS

DATE: 12 / 20 / 94	SITE #: 2010400015
TIME: 1235	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the southwest at monitoring well G104s (on left side of photo) and G104d (on right side of photo).	
ROLL#: 1 PHOTO#: 9	

DATE: 12 / 20 / 94	SITE #: 2010400015
TIME: 1235	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the southeast at monitoring wells G104d (on right side of photo) and G104s (on left side of photo).	
ROLL#: 1 PHOTO#: 10	



INSPECTION PHOTOS

DATE: 12 / 20 / 94	SITE #: 2010400015
TIME: 1441	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the south at monitoring wells G108s (in foreground) and G108d (in background).	
ROLL#: 1 PHOTO#: 11	

DATE: 12 / 20 / 94	SITE #: 2010400015
TIME: 1441	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the north at monitoring wells G108d (in foreground) and G108s (in background).	
ROLL#: 1 PHOTO#: 12	

INSPECTION PHOTOS

DATE: 12 / 20 / 94	SITE #: 2010400015
TIME: 1526	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the north at monitoring wells G109s (in foreground) and G109d (in background).	
ROLL#: 1 PHOTO#: 13	

DATE: 12 / 20 / 94	SITE #: 2010400015
TIME: 1526	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the south at monitoring wells G109d (in foreground) and G109s (in background).	
ROLL#: 1 PHOTO#: 14	

INSPECTION PHOTOS

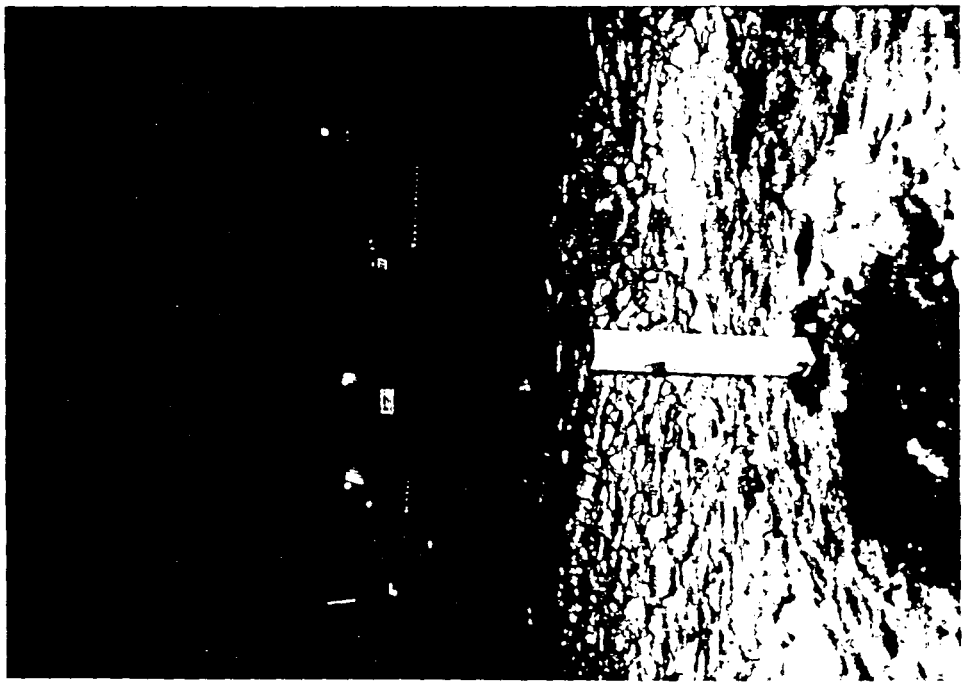
DATE: 12 / 20 / 94	SITE #: 2010400015
TIME: 1557	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the west at monitoring well G110s (on left side of photo) and G110d (on right side of photo).	
ROLL#: 1 PHOTO#: 15	

DATE: 12 / 20 / 94	SITE #: 2010400015
TIME: 1557	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the east at monitoring wells G110d (on left side of photo) and G110s (on right side of photo).	
ROLL#: 1 PHOTO#: 16	

INSPECTION PHOTOS

DATE: 12 / 20 / 94	SITE #: 2010400015
TIME: 1735	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the south at monitoring well G112.	
ROLL#: 1 PHOTO#: 17	

DATE: 12 / 20 / 94	SITE #: 2010400015
TIME: 1735	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the northwest at monitoring well G112. American Freightways terminal is in the background.	
ROLL#: 1 PHOTO#: 18	



INSPECTION PHOTOS

DATE: 12 / 21 / 94	SITE #: 2010400015
TIME: 0855	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the north at monitoring wells G101d (in background) and G101s (in foreground).	
ROLL#: 1 PHOTO#: 19	

DATE: 12 / 21 / 94	SITE #: 2010400015
TIME: 0855	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the south at monitoring wells G101d (on right side of photo) and G101s (on left side of photo).	
ROLL#: 1 PHOTO#: 20	

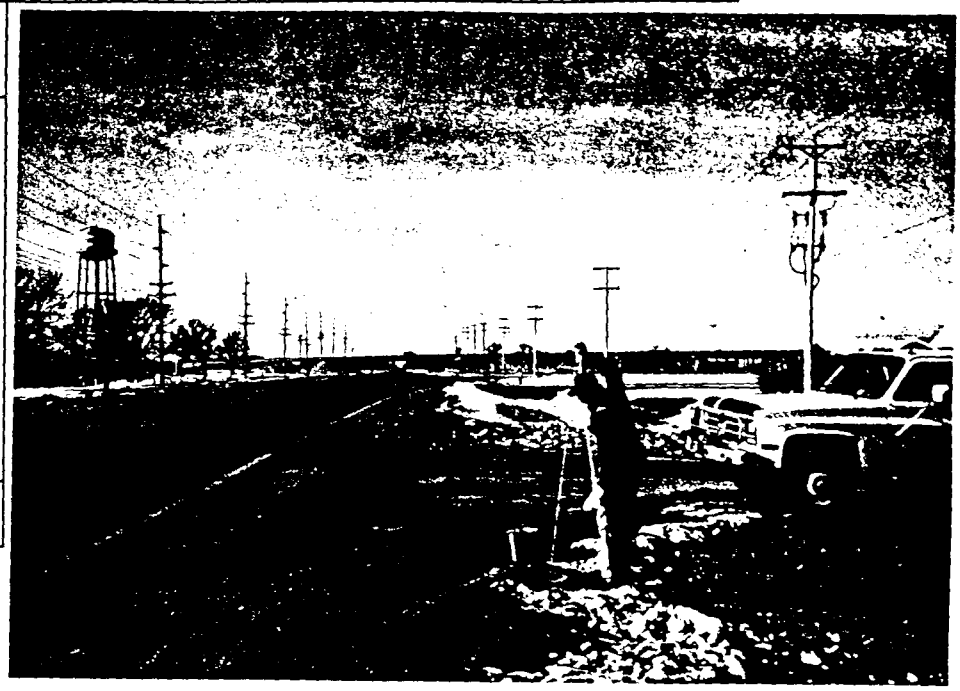
INSPECTION PHOTOS

DATE: 12 / 21 / 94	SITE #: 2010400015
TIME: 1046	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the southwest at monitoring well G113. Ecolab is in the background.	
ROLL#: 1 PHOTO#: 21	

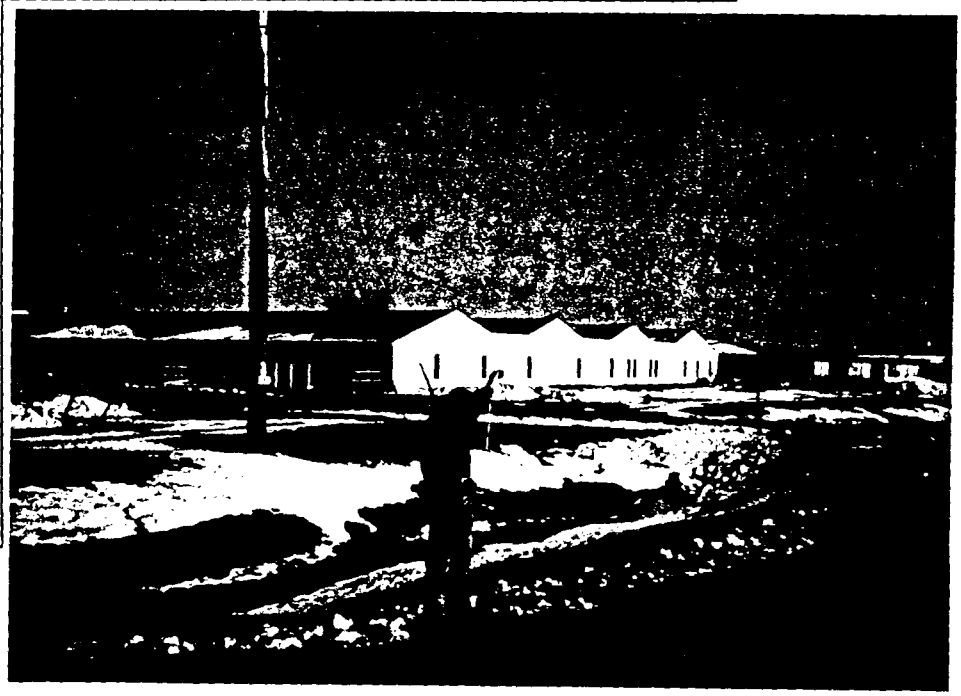
DATE: 12 / 21 / 94	SITE #: 2010400015
TIME: 1046	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the northeast at monitoring well G113. McGuire Auto Body is in background. Water tower is located on Regal Beloit property	
ROLL#: 1 PHOTO#: 22	

INSPECTION PHOTOS

DATE: 12 / 21 / 94	SITE #: 2010400015
TIME: 1118	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the west at monitoring well G114. Rockton Road is located on left side of photo.	
ROLL#: 1 PHOTO#: 23	



DATE: 12 / 21 / 94	SITE #: 2010400015
TIME: 1118	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the northeast at monitoring well G114. Regal Beloit is located in background.	
ROLL#: 1 PHOTO#: 24	



INSPECTION PHOTOS

DATE: 12 / 21 / 94	SITE #: 2010400015
TIME: 1234	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the northwest at monitoring well G111. Ecolab is seen in the background.	
ROLL#: 1 PHOTO#: 25	

DATE: 12 / 21 / 94	SITE #: 2010400015
TIME: 1234	SITE NAME: Evergreen Manor
PHOTOGRAPH TAKEN BY: Greg Dunn	
COMMENTS: Picture taken toward the south southeast at monitoring well G111.	
ROLL#: 1 PHOTO#: 26	

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY MEMORANDUM

DATE: January 10, 1994

TO: Division File

FROM: Daniel Wells - Rockford FOS

SUBJECT: 2010400015 - Winnebago County
Evergreen Manor\Roscoe
Superfund - Technical Report

On December 28, 1993 I collected three (3) VOC samples from private residential wells located in the immediate vicinity of the subject site. I arrived on site at 1:30p.m. and left the site around 5:30p.m.. The following is a brief overview of the sampling event:

Sample #	Location	Time	Filter Type
G187	Olson Residence 4411 Straw lane, Roscoe	3:25pm	Softener\sediment
G188	Anderson Residence 4246 Straw Lane, Roscoe	2:40pm	softener
G189	Grabow Residence 12055 Tresemer, Roscoe	4:20pm	softener

Prior to the collection of each sample, the PH, temperature, and conductivity of the well water was tested. The results of the PH, temperature, and conductivity is indicated on the enclosed photo forms. The samples were mailed to The ESE lab in Peoria Il. on 12-28-93. Analytical results are forthcoming.

cc: DLPC - Rockford
Greg Dunn

IL 532-0570
EPA-90 (Rev. 6 75-20M)

SCREENED

INSPECTION PHOTOS

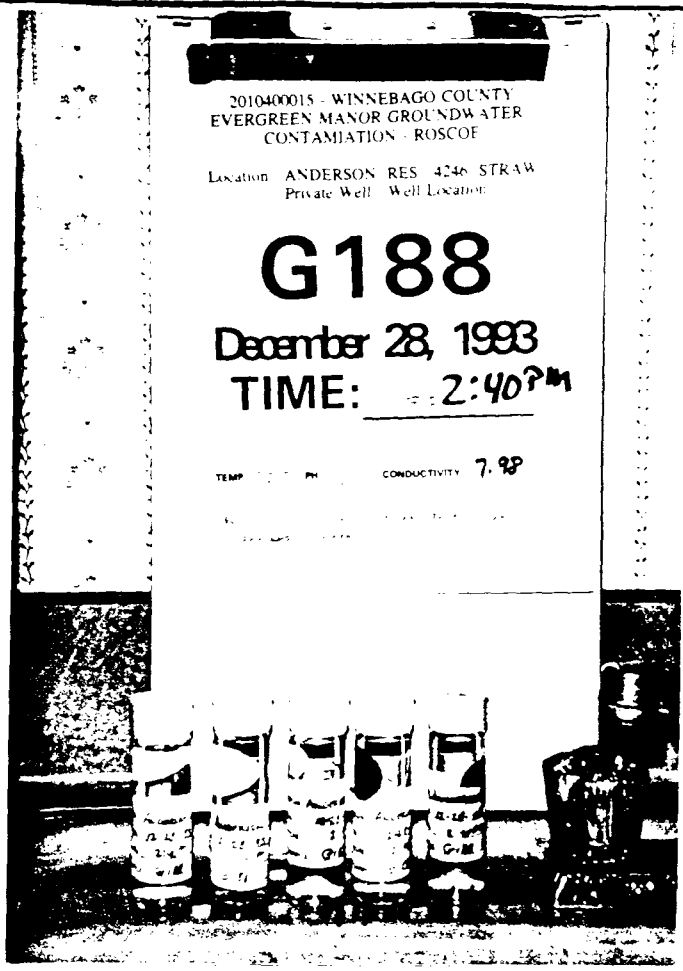
DATE: 12 / 28 / 93	SITE #: 2 0 1 0 4 0 0 0 1 5 CO.: Winnebago
TIME: 2:40 p.m.	SITE NAME: Roscoe/Evergreen Manor GW Contamination

PHOTOGRAPH TAKEN BY: Dan Wells DW

COMMENTS: Pictures taken toward: Anderson residence

VOC Sample 188

ROLL #: 1037 PHOTO #: 1



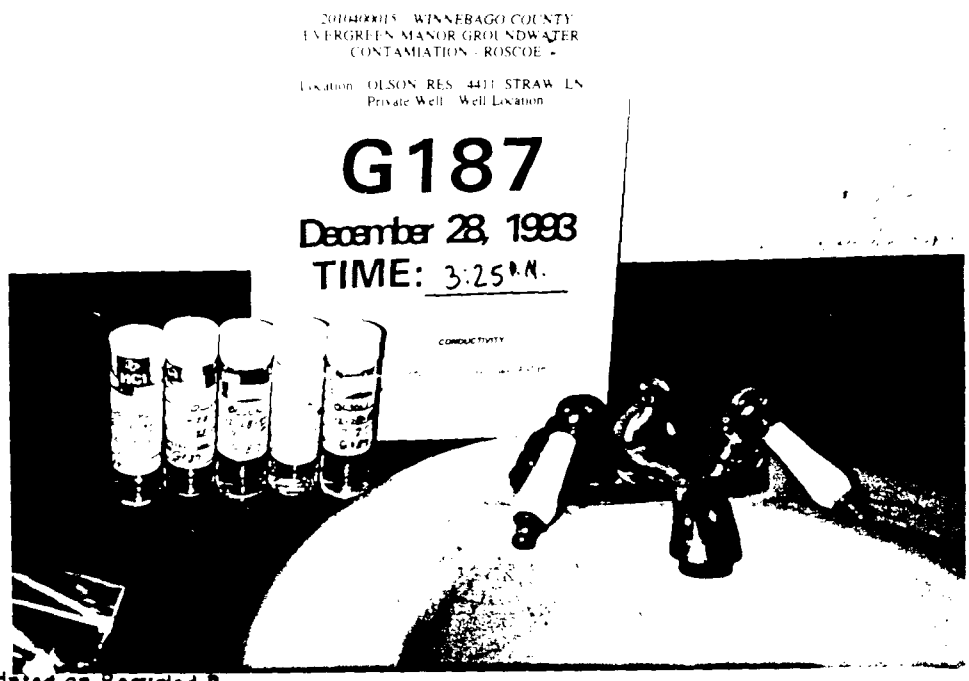
DATE: 12 / 28 / 93	
TIME: 3:25 p.m.	

PHOTOGRAPH TAKEN BY: Dan Wells DW

COMMENTS: Pictures taken toward: Olson residence

VOC Sample 187

ROLL #: 1037 PHOTO #: 2

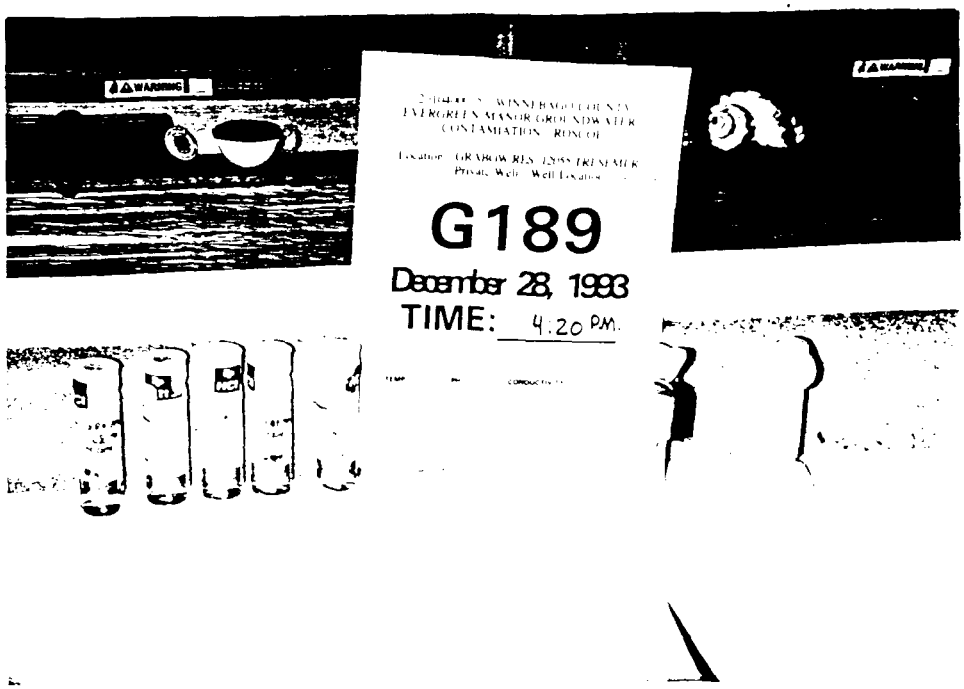


IL 532 1910
LPC 375 08/90

Printed on Recycled Paper

INSPECTION PHOTOS

DATE: 12 / 28 / 93	SITE #: 2 0 1 0 4 0 0 0 1 5 CO.: Winnebago
TIME: 4:20 p.m.	SITE NAME: Roscoe/Evergreen Manor GW Contamination
PHOTOGRAPH TAKEN BY: Dan Wells DW	
COMMENTS: Pictures taken toward: Grabow residence	
VOC Sample 189	
ROLL #: 1037 PHOTO #: 3	



IEPA - CLP
CHAIN OF CUSTODY

Seal # 9231

Date Sealed: 12/27/93 By: RKM

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	6187	12-28-93	3:25PM

Sample Appearance : CLEAR NO COLOR

Collector Comments: OLSONS RES.

Sampler Signature : Daniel Wells Division/Company IEPA - DCL

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N	Date	Time
5	2	40ml	HCL	VOA-ATTN.TO LDL REQUESTED			

CHAIN OF CUSTODY CHRONICLE

[illegible] shipping container with the shipping container sealed and intact.

Sealed by (print): DANIEL WELLS Signature: Daniel Wells

Date: 12-28-93 Time: 12:40PM Seal #: 9231 Intact?: (Y) / N

[illegible] listed above was collected and placed in bottles in my presence, [illegible] was placed intact in the [illegible] sealed the sample shipping [illegible] at the date and time listed below.

Sealed by (print): DANIEL WELLS Signature: Daniel Wells

Date: 12-28-93 Time: 4:45PM Seal # 9232

Courier - Sample Pickup: FED EXP.

Courier - Sample Delivery:
I certify that I received the sample shipping container from the courier listed above with the shipping container and seal [illegible] that each bottle in the shipping container was intact. After recording the sample in the official record book, the sample [illegible] the custody of competent laboratory personnel at all times or locked in a secured area.

Opened by (print): _____ Signature: _____

Date: _____ Time: _____ Seal #: _____ Intact?: Y / N

Lab Name: _____ Comments: _____

2010400015 - WINNEBAGO COUNTY
EVERGREEN MANOR GROUNDWATER
CONTAMINATION - ROSCOE

Location: OLSON RES. 4411 STRAW LN.
Private Well - Well Location :

G187

December 28, 1993

TIME: 3:25 P.M.

TEMP. 59.9 PH 7.55 CONDUCTIVITY 8.79

PURGE START : 305 PM PURGE END 315 pm
GPM UNKNOWN

IEPA - CLP
CHAIN OF CUSTODY

Seal # 9231

Date Sealed: 12/27/93 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	G188	12-20-93	2:40PM

Sample Appearance : CLEAR [illegible]

Collector Comments: ANDERSONS RES.

Sampler Signature : Daniel Wells Division/Company IEPA ROL

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
5	2	40ml	HCL	VOA-ATTN.TO LDL REQUESTED			

CHAIN OF CUSTODY CHRONICLE

[illegible] with the shipping container sealed and intact

[illegible] : DANIEL WELLS Signature: Daniel Wells

[illegible] 12-2[illegible]-93 Time: 12:45pm Seal #: 9231 Intact?: Y / N

[illegible] was [illegible] in my presence, that each bottle was placed intact in the [illegible] I sealed the sample shipping container at the date and time listed below.

[illegible] (print): DANIEL WELLS Signature: Daniel Wells

Date: 12-28-93 Time: 4:45PM Seal # 9232

Courier - Sample Pickup: FED. EXP.

Courier - Sample Delivery:
I certify that I received the sample shipping container from the courier listed above with the shipping container and seal [illegible] that each bottle in the shipping container was intact. After recording the sample in the official record book, the sample [illegible] the custody of competent laboratory personnel at all times or locked in a secured area.

Opened by (print): _____ Signature: _____

Date: _____ Time: _____ Seal #: _____ Intact?: Y / N

Lab Name: _____ Comments: _____

2010400015 - WINNEBAGO COUNTY EVERGREEN MANOR GROUNDWATER CONTAMINATION - ROSCOE

Location: ANDERSON RES. 4246 STRAW
Private Well - Well Location : [illegible]

G188

December 28, 1993

TIME: 2:40 PM

TEMP. 54°f PH 3.54 CONDUCTIVITY 7.98

PURGE START : 2:20pm PURGE STOP @ 2:40pm
PURGE RATE : ~3.2 gpm

IEPA - CLP
CHAIN OF CUSTODY

Seal # 9231

Date Sealed: 12/27/93 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	G189	12-28-93	[illegible]

RECEIVED
JAN 14 1994
IEPA-DLPC

[illegible] : CLEAR - NO COOR
[illegible] Comments: GRADOW RES.
[illegible] : Daniel Wells Division/Company [illegible]

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
[illegible]	[illegible]	40ml	HCL	VOA-ATTN.TO LDL REQUESTED			

[illegible]

[illegible] DANIEL WELLS Signature: Daniel Wells
[illegible] 93 [illegible] 12:40 PM [illegible] 9231 [illegible] ① N

[illegible]

[illegible] DANIEL WELLS Signature: Daniel Wells
[illegible] Time: 4 [illegible] ~~9293~~ DW
[illegible] - Sample Pickup: FED EXP. 9232

Courier - Sample Delivery:
I certify that I received the sample shipping container from the courier listed above with the shipping container and seal intact and that each bottle in the shipping container was intact. After recording the sample in the official record book, the sample will be in the custody of competent laboratory personnel at all times or locked in a secured area.

Opened by (print): _____ Signature: _____

Date: _____ Time: _____ Seal #: _____ Intact?: Y / N

Lab Name: _____ Comments: _____

2010400015 - WINNEBAGO COUNTY
EVERGREEN MANOR GROUNDWATER
CONTAMINATION - ROSCOE

Location: GRABOW RES. 12055 TRESEMER.
Private Well - Well Location : FRONT YARD

G189

December 28, 1993

TIME: 4:20 P.M.

TEMP. 56 PH 8.7 CONDUCTIVITY 6.23

PURGE START 4:00pm END PURGE 4:20pm

6pm - unknown

IEPA - CLP
CHAIN OF CUSTODY

Seal # 9231

Date Sealed: 12/27/93 By: [illegible]

Facility
Name : EVERGREEN MANOR
Region: ROCKFORD
County: WINNEBAGO

Site Inventory # : 2010400015
Site Billing Code: LP52-909
Project Manager : GREG DUNN

Laboratory #	Sample I.D.	Sample Date	Sample Time
	TRIP BLANK	12/28/93	

Sample Appearance : Clear

Collector Comments:

Sampler Signature : Daniel Wells Division/Company IEPA

CONTAINER				ANALYSIS	FILTERING		
No.	Code	Size	Preser		(Y/N)	Date	Time
2	15	40ml		TRIP BLANK			

CHAIN OF CUSTODY CHRONICLE

[illegible] container with the shipping container sealed and intact

Operator Print: DANIEL WELLS Signature: Daniel Wells

Date: 12-28-93 Time: 12:40PM Seal #: 9231 Intact?: Y / N

[illegible] I sealed the sample shipping container at the date and time listed below.

Sealed by (print): DANIEL WELLS Signature: Daniel Wells

Date: 12-28-93 Time: 4:45pm Seal # 9232

Courier - Sample Pickup: FED - EXP.

Courier - Sample Delivery:
I certify that I received the sample shipping container from the courier listed above with the shipping container and seal [illegible] that each bottle in the shipping container was intact. After recording the sample in the official record book, the sample will [illegible] the custody of competent laboratory personnel at all times or locked in a secured area.

Opened by (print): _____ Signature: _____

Date: _____ Time: _____ Seal #: _____ Intact?: Y / N

Lab Name: _____ Comments: _____

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QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 0715177621

0715177621

SENDER'S FEDERAL EXPRESS ACCOUNT NUMBER

1600-0085-6 27Dec93

Randy K Martin 217 529-0539
Weston-Gulf Coast Lab
1215 Bunn Ave.
Springfield IL 62703

RECIPIENT'S NAME PLEASE PRINT

Dan Wells 815 987-7404
I.E.P.A. - B.O.L.
4302 N. Main
Rockford IL 61103

REVISION DATE 12/92

158

RECEIVED 12-28-93 11 AM Dan Wells IEPA

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QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 0715177621

0715177621

RECIPIENT'S COPY

1 Date 27Dec93

From (Your Name) Please Print: Randy K Martin — Your Phone Number (Very important): (217) 529-0539
Company: Weston-Gulf Coast Lab — Department/Floor No.:
Street Address: 1215 Bunn Ave.
City: Springfield — State: IL — ZIP Required: 62703

2 To (Recipient's Name) Please Print: Dan Wells — Recipient's Phone Number (Very Important): (815) 987-7404
Company: I.E.P.A. - B.O.L. — Department/Floor No.:
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 4302 N. Main
City: Rockford — State: IL — ZIP Required: 61103

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.)

H IF HOLD AT FEDEX LOCATION, Print FEDEX Address Here
Street Address
City — State — ZIP Required

3 PAYMENT 1 [✓] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card 5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning)
11 [✓] OTHER PACKAGING
16 [ ] FEDEX LETTER*
12 [ ] FEDEX PAK*
[ ] FEDEX BOX
[ ] FEDEX TUBE

Standard Overnight (Delivery by next business afternoon. No Saturday delivery!)
51 [ ] OTHER PACKAGING
56 [ ] FEDEX LETTER*
52 [ ] FEDEX PAK*
53 [ ] FEDEX BOX
54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day !)
30 [ ] ECONOMY*
* Economy Letter Rate not available. Minimum Charge One pound Economy rate.

Government Overnight (Restricted for authorized users only)
46 [ ] GOVT LETTER
41 [ ] GOVT PACKAGE

Freight Service (for packages over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT**
80 [ ] TWO-DAY FREIGHT**
(Contract rates/discounts required)

5 DELIVERY AND SPECIAL HANDLING (Check services required)

Weekday Service
1 [ ] HOLD AT FEDEX LOCATION WEEKDAY (Fill in Section H)
2 [✓] DELIVER WEEKDAY

Saturday Service
31 [ ] HOLD AT FEDEX LOCATION SATURDAY (Fill in Section H)
3 [ ] DELIVER SATURDAY (Extra charge) (Not available to all locations)
9 [ ] SATURDAY PICK-UP (Extra charge)

Special Handling
4 [ ] DANGEROUS GOODS (Extra charge)
6 [ ] DRY ICE Dangerous Goods Shipper's Declaration not required
Dry Ice, 9, UN 1845 ____ x ____ kg. 904 III
[ ] DESCRIPTION
[ ] HOLIDAY DELIVERY (If offered)

6

PACKAGES	WEIGHT in Pounds Only	YOUR DECLARED VALUE (See right)
1	11	
Total 1	Total 11	Total

DIM SHIPMENT (Chargeable Weight) [ ] ____ lbs.
L x W x H
Received At: 1 [ ] Regular Stop 3 [ ] Drop Box

7 Release

Emp. No. — Date
[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold
Street Address
City — State — Zip
Received By: X
Date/Time Received — FedEx Employee Number

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 12/92
PART #137205 GBFE
FORMAT #158

158

RECEIVED 12-28-93 11 AM Dan Wells IEPA

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QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 0744032450

0744032450

DROP 6:PM

SENDER'S COPY

SENDER'S COPY
DROP OFF YOUR PACKAGE AND SAVE

1 SENDER'S FEDERAL EXPRESS ACCOUNT NUMBER: 0616-0451-0 | Date: 12-28-93

From (Your Name) Please Print: DANIEL WELLS | Your Phone Number (Very Important): (815) 987-7760

Company: IEPA - BOL | Department/Floor No.

Street Address: 4302 N. MAIN

City: ROCKFORD | State: IL | ZIP Required: 61103

2 To (Recipient's Name) Please Print: ESE LAB JANNELL WOODEN | Recipient's Phone Number (Very Important): ( )

Company: ESE LAB | Department/Floor

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 8901 N. INDUSTRIAL Rd.

City: PEORIA | State: IL | ZIP Required: 61615

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.)

H IF HOLD AT FEDEX LOCATION, Print FEDEX Address Here: Street Address | City | State | ZIP Required

3 PAYMENT: 1 [ ] Bill Sender 2 [X] Bill Recipient's FedEx Acct. No 3 [ ] Bill 3rd Party FedEx Acct. No 4 [ ] Bill Credit Card 5 [ ] Cash/Check

Acct./Credit Card No: 0616-0451-0 Exp Date

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning)
11 [X] OTHER PACKAGING
16 [ ] FEDEX LETTER*
12 [ ] FEDEX PAK*
13 [ ] FEDEX BOX
14 [ ] FEDEX TUBE

Standard Overnight (Delivery by next business afternoon. No Saturday delivery.)
51 [ ] OTHER PACKAGING
56 [ ] FEDEX LETTER*
52 [ ] FEDEX PAK*
53 [ ] FEDEX BOX
54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day.)
30 [ ] ECONOMY*

Government Overnight (Restricted to authorized users only.)
46 [ ] GOVT LETTER
41 [ ] GOVT PACKAGE

*Economy Letter rate not available. Minimum charge: One pound at economy rate.

Freight Service (For packages over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT** (Confirmed reservation required)
80 [ ] TWO-DAY FREIGHT**

1 Delivery commitment may be later in some areas. *Declared Value Limit $500. **Call for delivery schedule.

5 DELIVERY AND SPECIAL HANDLING (Check services required)

Weekday Service
1 [ ] HOLD AT FEDEX LOCATION WEEKDAY (Fill in Section H)
2 [X] DELIVER WEEKDAY

Saturday Service
31 [ ] HOLD AT FEDEX LOCATION SATURDAY (Fill in Section H)
3 [ ] DELIVER SATURDAY (Extra charge) (Not available to all locations)
9 [ ] SATURDAY PICK-UP (Extra charge)

Special Handling
4 [ ] DANGEROUS GOODS (Extra charge)
6 [ ] DRY ICE Dangerous Goods Shipper's Declaration not required
Dry Ice 9 UN 1845 _____ X _____ kg 904 III
[ ]
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE (See right)
Total	Total 112	Total

DIM SHIPMENT (Chargeable Weight) [ ] _____ lbs

L x W x H

Received At: 1 [ ] Regular Stop 2 [ ] On-Call Stop 3 [ ] Drop Box 4 [ ] B.S.C. 5 [ ] Station

SERVICE CONDITIONS, DECLARED VALUE AND LIMIT OF LIABILITY

Use of this airbill constitutes your agreement to the service conditions in our current Service Guide, available upon request. See back of sender's copy of this airbill for information. Service conditions may vary for Government Overnight Service. See U.S. Government Service Guide for details.

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Sender authorizes Federal Express to deliver this shipment without obtaining a delivery signature and shall indemnify and hold harmless Federal Express from any claims resulting therefrom.

7 Release Signature: Daniel Wells

Federal Express Charges
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 12 93
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FORMAT #158
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Query the Private Well Database through the World Wide Web
http://gwinfo.sws.uiuc.edu/gwdb-query.html

County: Winnebago

Township Code: 46N
Range Code: 2E
Section Codes: 29

452 records were found for the specified locations.

Questions : Contact the Illinois State Water Survey's Ground Water Division @ (217)333-9043
Publication: Please cite the Illinois State Water Survey's Private-Well Database in all publications based wholly or partially on this information.

Please Note:

The data in the Private Well Inventory Database is a listing of those non-municipal wells which are known to the Illinois State Water Survey (ISWS). This information has been entered verbatim from well logs submitted by the driller, chemical analysis reports, well sealing forms, well inventory forms from the 1930-1934 well survey, and other special projects. The accuracy of this data is controlled by those who submitted the form. Information in the private well database has not been verified.

Winnebago County - Private Well Database - Page 2 Thursday May 29 1997 10:36:45

{ OFFICE } {USE ONLY}	FIPS	TWN	RNG	SC	PL	OWNER	DRILLER	DATE	PERMIT	DPTH	REC	US	TY	AQ
167627	201	46N	02E	29		LINDA CONLEY	ALBRECHT	00/00/0000		60	A	DO	--	--
167618	201	46N	02E	29		ROSCOE TAPLEY	ALBRECHT	00/00/0000		66	A	DO	--	--
167619	201	46N	02E	29		VINCENT COMO	ALBRECHT	00/00/0000		64	A	DO	--	--
167620	201	46N	02E	29		WILLIAM DOWNEY	ALBRECHT	00/00/0000		63	A	DO	--	--
167621	201	46N	02E	29		GEORGE REGNER	ALBRECHT	00/00/0000		65	A	DO	--	--
167622	201	46N	02E	29		EUGENE SPICKLER	ALBRECHT	00/00/0000		65	A	DO	--	--
167623	201	46N	02E	29		CHARLES O'KEEFE	ALBRECHT	00/00/0000		66	A	DO	--	--
167624	201	46N	02E	29		KURT WEBER	ALBRECHT	00/00/0000		64	A	DO	--	--
167625	201	46N	02E	29		CHARLES LINDQUIST	ALBRECHT	00/00/0000		65	A	DO	--	--
167626	201	46N	02E	29		DELLBERT CLARK	ALBRECHT	00/00/0000		66	A	DO	--	--
167615	201	46N	02E	29		WARNER ELECTRIC	ALBRECHT	00/00/0000		62	A	IC	--	--
167629	201	46N	02E	29		DANIEL VARGAS	ALBRECHT	00/00/0000		61	A	DO	--	--
167630	201	46N	02E	29		ROBERT CLINE	ALBRECHT	00/00/0000		45	A	DO	--	--
167631	201	46N	02E	29		CHARLES HAGSTROM	ALBRECHT	00/00/0000		62	A	DO	--	--
167632	201	46N	02E	29		THOMAS QUINN	ALBRECHT	00/00/0000		64	A	DO	--	--
167628	201	46N	02E	29		FRANK JOHNSON	ALBRECHT	00/00/0000		64	A	DO	--	--
167633	201	46N	02E	29		RICHARD BALCITIS	ALBRECHT	00/00/0000		65	A	DO	--	--
167636	201	46N	02E	29		DONALD LOOMIS	ALBRECHT	00/00/0000		63	A	DO	--	--
167634	201	46N	02E	29		STEVE MURPHY	ALBRECHT	00/00/0000		64	A	DO	--	--
167635	201	46N	02E	29		SCOTT EISCHEID	ALBRECHT	00/00/0000		63	A	DO	--	--
169169	201	46N	02E	29		LAVERN STALLER	ALBRECHT	00/00/0000		63	A	DO	--	--
169167	201	46N	02E	29		KEVIN TISSOT	ALBRECHT	00/00/0000		6	A	DO	--	--
169179	201	46N	02E	29		CMF DEVELOPMENT CORP	ALBRECHT	00/00/0000		63	A	DO	--	--
167637	201	46N	02E	29		RALPH FULTON	BLOYER	00/00/1965		67	RG	DO	--	--
169067	201	46N	02E	29		ARNDT REALTOR	HINKLE	00/00/1976	042903	64	RG	DO	--	--
228028	201	46N	02E	29		ROBERT BRAMEL LOT 178	ALBRECHT	00/00/1984		61	A	DO	--	UN
REMARKS: contaminated														
228029	201	46N	02E	29		LARRY GARBOR	MARTIN & SONS WELL	01/29/1991		60	A	DO	--	--
169105	201	46N	02E	29		TERRY ARNDT	OLSON	02/23/1978	071470	63	RG	DO	--	--
169116	201	46N	02E	29		TERRY ARNDT	OLSON	02/23/1978	071468	63	RG	DO	--	--
169137	201	46N	02E	29		TERRY ARNDT/G & L GROSSE	OLSON	02/23/1978	071474	63	RGA	DO	--	--
169126	201	46N	02E	29		TERRY ARNDT/TIMOTHY FIDDER	OLSON	02/23/1978	071471	63	RGA	DO	--	--
169130	201	46N	02E	29		TERRY ARNDT/PAUL SHIMONDLE	OLSON	02/23/1978	071469	63	RGA	DO	--	--
169134	201	46N	02E	29		TERRY ARNDT	OLSON	02/23/1978	071473	63	RG	DO	--	--
169136	201	46N	02E	29		TERRY ARNDT/L LINDQUIST	OLSON	02/23/1978	071472	63	RGA	DO	--	--
169092	201	46N	02E	29		TERRY ARNDT	OLSON	02/23/1979	071467	63	RG	DO	--	--
167662	201	46N	02E	29		DAVE TRESEMER	OLSON	02/24/1977	057039	63	RG	DO	--	--
167659	201	46N	02E	29		DAVE TRESEMER	OLSON	02/24/1977	057938	63	RG	DO	--	--
167653	201	46N	02E	29		JOHN OWEN	HINKLE	02/27/1976	044934	67	RG	DO	--	--
167652	201	46N	02E	29		JOHN OWEN	HINKLE	03/01/1976	044993	65	RG	DO	--	--
169081	201	46N	02E	29		ARNDT REALTOR	HINKLE	03/01/1976	044989	65	RG	DO	--	--
169128	201	46N	02E	29		TERRY ARNDT/DAN UNDERHILL	OLSON	03/10/1978	072746	63	RGA	DO	--	--
167663	201	46N	02E	29		TERRY ARNDT	OLSON	03/18/1977	057915	63	RG	DO	--	--
169118	201	46N	02E	29		TERRY ARNDT	OLSON	03/24/1977	058154	63	RG	DO	--	--
169101	201	46N	02E	29		TERRY ARNDT	OLSON	03/24/1977	058153	62	RG	DO	--	--

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(OFFICE) (USE ONLY)	FIPS	TWN	RNG	SC	PL	OWNER	DRILLER	DATE	PERMIT	DPTH	REC	US	TY	AQ
169102	201	46N	02E	29		TERRY ARNDT/GARY MENZIES	OLSON	03/24/1977	058152	62	RGA	DO	--	--
169088	201	46N	02E	29		TERRY ARNDT	OLSON	03/24/1977	058155	63	RG	DO	--	--
169090	201	46N	02E	29		TERRY ARNDT	OLSON	03/24/1977	058156	63	RG	DO	--	--
169087	201	46N	02E	29		TERRY ARNDT	OLSON	03/24/1977	058159	63	RG	DO	--	--
169084	201	46N	02E	29		TERRY ARNDT	OLSON	03/24/1977	058151	63	RG	DO	--	--
169085	201	46N	02E	29		TERRY ARNDT	OLSON	03/24/1977	058158	63	RG	DO	--	--
169124	201	46N	02E	29		TERRY ARNDT/CARL RANDALL	OLSON	04/10/1978	072748	63	RGA	DO	--	--
169122	201	46N	02E	29		TERRY ARNDT/RANDY OLSON	OLSON	04/10/1978	072742	61	RGA	DO	--	--
169125	201	46N	02E	29		TERRY ARNDT	OLSON	04/10/1978	072747	63	RG	DO	--	--
169140	201	46N	02E	29		TERRY ARNDT	OLSON	04/10/1978	072744	63	RG	DO	--	--
169135	201	46N	02E	29		TERRY ARNDT/WM EBERMAN	OLSON	04/10/1978	072745	63	RGA	DO	--	--
169123	201	46N	02E	29		TERRY ARNDT/DAVID QUEEN	OLSON	04/10/1978	072743	63	RGA	DO	--	--
252680	201	46N	02E	29		LIFE TIME BLDRS.	GREENFIELD	04/10/1990	6330	70	RG	DO	--	UN
REMARKS: LOT 79 EVERGREEN MANOR														
169141	201	46N	02E	29		TERRY ARNDT/ARNE HOLM	OLSON	04/14/1977	069208	63	RGA	DO	--	--
169109	201	46N	02E	29		TERRY ARNDT	OLSON	04/14/1978	069213	63	RG	DO	--	--
167649	201	46N	02E	29		SUNGATE CONST	HINKLE	04/22/1971	012343	80	RG	DO	--	--
169073	201	46N	02E	29		TERRY ARNDT	OLSON	04/26/1977	059406	63	RG	DO	--	--
167650	201	46N	02E	29		JOHN OWEN	HINKLE	04/29/1975	037332	62	RG	DO	--	--
167667	201	46N	02E	29		DAVE TRESEMER	OLSON	04/29/1977	059762	63	RG	DO	--	--
169079	201	46N	02E	29		ARNDT REALTOR	HINKLE	05/00/1976	047047	65	RG	DO	--	--
167668	201	46N	02E	29		DAN JARVIS	BEAMAN	05/04/1977	059997	62	RG	DO	--	--
167666	201	46N	02E	29		DAN JARVIS	BEAMAN	05/04/1977	059998	62	RG	DO	--	--
167665	201	46N	02E	29		DAN JARVIS	BEAMAN	05/04/1977	059999	63	RG	DO	--	--
167664	201	46N	02E	29		DAN JARVIS	BEAMAN	05/04/1977	060000	63	RG	DO	--	--
169083	201	46N	02E	29		ARNDT REALTOR	HINKLE	05/10/1976	047043	65	RG	DO	--	--
169078	201	46N	02E	29		ARNDT REALTOR	HINKLE	05/10/1976	047045	65	RG	DO	--	--
169086	201	46N	02E	29		ARNDT REALTOR	HINKLE	05/10/1976	047042	65	RG	DO	--	--
169192	201	46N	02E	29		RICK FRIEND	LIVINGSTON	05/23/1983	106261	64	RG	DO	--	--
169115	201	46N	02E	29		TERRY ARNDT	OLSON	05/24/1977	058150	63	RG	DO	--	--
169119	201	46N	02E	29		TERRY ARNDT	OLSON	06/21/1977	062420	63	RG	DO	--	--
169099	201	46N	02E	29		TERRY ARNDT	OLSON	06/21/1977	062419	63	RG	DO	--	--
169094	201	46N	02E	29		TERRY ARNDT	OLSON	06/21/1977	062422	63	RG	DO	--	--
169100	201	46N	02E	29		TERRY ARNDT	OLSON	06/21/1977	062425	63	RG	DO	--	--
169097	201	46N	02E	29		TERRY ARNDT	OLSON	06/21/1977	062424	64	RG	DO	--	--
167670	201	46N	02E	29		DAVE TRESEMER	OLSON	06/30/1977	063105	63	RG	DO	--	--
167669	201	46N	02E	29		DAVE TRESEMER	OLSON	06/30/1977	063104	63	RG	DO	--	--
167671	201	46N	02E	29		DAVE TRESEMER	OLSON	06/30/1977	063110	65	RG	DO	--	--
167677	201	46N	02E	29		DAVE TRESEMER	OLSON	06/30/1977	063101	63	RG	DO	--	--
169082	201	46N	02E	29		ARNDT REALTOR	HINKLE	07/02/1976	049243	65	RG	DO	--	--
169107	201	46N	02E	29		ARNDT REALTOR/H WINNEBAUGH	HINKLE	07/08/1977	063368	79	RGA	DO	--	--
167672	201	46N	02E	29		ROBERT YOUNG	OLSON	07/14/1977	063498	63	RG	DO	--	--
169074	201	46N	02E	29		TERRY ARNDT/ELIZABETH HOBBS	OLSON	07/18/1977	063575	63	RGA	DO	--	--
167658	201	46N	02E	29		DANN JARVIS	BEAMAN	07/28/1976	050237	64	RG	DO	--	--
167651	201	46N	02E	29		JOHN OWEN	HINKLE	08/13/1975	040119	64	RG	DO	--	--

(OFFICE) (USE ONLY)	FIPS	TWN	RNG	SC	PL	OWNER	DRILLER	DATE	PERMIT	DPTH	REC	US	TY	AQ
169111	201	46N	02E	29		TERRY ARNDT	OLSON	08/25/1977	062421	65	RG	DO	--	--
169095	201	46N	02E	29		TERRY ARNDT	OLSON	08/26/1977	062423	64	RG	DO	--	--
228032	201	46N	02E	29		DAVE TRESEMER #756-7787 LOT 70	OLSON WELL CO	08/26/1977	063102	65	RG	DO	--	UN
169056	201	46N	02E	29		ARNT RRALTOR	HINKLE	08/29/1975	040692	65	RG	DO	--	--
228025	201	46N	02E	29		FIRST SAVINGS & LOAN LOT 138	ALBRECHT WELL DRLG	08/30/1984		62	A	DO	--	UN
	REMARKS: contaminated													
228027	201	46N	02E	29		CMF CONSTRUCTION CO LOT 170	ALBRECHT WELL DRLG	08/30/1984		63	A	DO	--	UN
	REMARKS: contaminated													
228023	201	46N	02E	29		KENNETH PENNEY LOT 90	ALBRECHT WELL DRLG	08/30/1984		65	A	DO	--	UN
	REMARKS: contaminated													
228022	201	46N	02E	29		WILLIAM NEALAND LOT 85	ALBRECHT WELL DRILG	08/30/1984		62	A	DO	--	UN
	REMARKS: contaminated													
228021	201	46N	02E	29		JOSEPH KRUEL LOT 0	ALBRECHT WELL DRLG	08/30/1984		63	A	DO	--	UN
	REMARKS: contaminated													
228026	201	46N	02E	29		JAMES RUSSELL LOT 142	ALBRECHT WELL DRLG	08/30/1984		64	A	DO	--	UN
	REMARKS: continated													
169077	201	46N	02E	29		ARNDT REALTOR	HINKLE	09/02/1976	051754	65	RG	DO	--	--
169080	201	46N	02E	29		ARNDT REALTOR	HINKLE	09/02/1976	051756	65	RG	DO	--	--
169058	201	46N	02E	29		ARNDT REALTOR	HINKLE	09/05/1975	040885	65	RG	DO	--	--
169069	201	46N	02E	29		TERRY ARNDT/ED ANDERSON	OLSON	09/09/1977	066564	63	RGA	DO	--	--
169064	201	46N	02E	29		TERRY ARNDT	OLSON	09/09/1977	066563	63	RG	DO	--	--
169093	201	46N	02E	29		TERRY ARNDT	OLSON	09/09/1977	066562	63	RG	DO	--	--
169072	201	46N	02E	29		TERRY ARNDT	OLSON	09/09/1977	066560	63	RG	DO	--	--
169113	201	46N	02E	29		TERRY ARNDT	OLSON	09/09/1977	066557	63	RG	DO	--	--
169110	201	46N	02E	29		TERRY ARNDT	OLSON	09/09/1977	066558	63	RG	DO	--	--
169112	201	46N	02E	29		TERRY ARNDT	OLSON	09/09/1977	066556	63	RG	DO	--	--
169120	201	46N	02E	29		TERRY ARNDT	OLSON	09/09/1977	066559	63	RG	DO	--	--
228031	201	46N	02E	29		WAYNE BRAKE #8739 LOT #206	MARTIN	09/28/1987	135454	70	RG	DO	--	UN
169098	201	46N	02E	29		TERRY ARNDT	OLSON	10/10/1977	066553	63	RG	DO	--	--
167657	201	46N	02E	29		DAN JARVIS	BEAMAN	10/14/1967	053512	65	RG	DO	--	--
167656	201	46N	02E	29		DAN JARVIS	BEAMAN	10/14/1976	053511	65	RG	DO	--	--
167655	201	46N	02E	29		DAN JARVIS	BEAMAN	10/14/1976	053510	65	RG	DO	--	--
228033	201	46N	02E	29		WAYNE BRAKE #8742 LOT #79	MARTIN	10/21/1987	135451	67	RG	DO	--	UN
169063	201	46N	02E	29		ARNDT REALTOR	HINKLE	10/22/1975	042195	65	RG	DO	--	--
169060	201	46N	02E	29		ARNDT REALTOR	HINKLE	10/22/1975	042194	65	RG	DO	--	--
169091	201	46N	02E	29		TERRY ARNDT/RICHARD BALCITIS	OLSON	10/24/1977	068506	63	RGA	DO	--	--
169076	201	46N	02E	29		TERRY ARNDT	OLSON	10/24/1977	068505	63	RG	DO	--	--
169096	201	46N	02E	29		TERRY ARNDT	OLSON	10/24/1977	068510	63	RG	DO	--	--
169104	201	46N	02E	29		TERRY ARNDT/LOUIS BECKER	OLSON	10/24/1977	068507	63	RGA	DO	--	--
169114	201	46N	02E	29		TERRY ARNDT	OLSON	10/24/1977	068508	63	RG	DO	--	--
169121	201	46N	02E	29		TERRY ARNDT/RICHARD BOTSFORD	OLSON	10/24/1977	068509	63	RGA	DO	--	--
169106	201	46N	02E	29		TERRY ARNDT	OLSON	10/28/1977	066555	63	RG	DO	--	--
169062	201	46N	02E	29		TERRY ARNDT	OLSON	10/28/1977	066561	63	RG	DO	--	--
169108	201	46N	02E	29		TERRY ARNDT	OLSON	11/09/1977	066554	63	RG	DO	--	--
169103	201	46N	02E	29		TERRY ARNDT/KENNETH LUTGEN	OLSON	11/14/1977	069207	63	RGA	DO	--	--

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(OFFICE) (USE ONLY)	FIPS	TWN	RNG	SC	PL	OWNER	DRILLER	DATE	PERMIT	DPTH	REC	US	TY	AQ
169131	201	46N	02E	29		TERRY ARNDT/CARL WATSON	OLSON	11/14/1977	069211	63	RGA	DO	--	--
169117	201	46N	02E	29		TERRY ARNDT	OLSON	11/14/1977	069209	63	RG	DO	--	--
169075	201	46N	02E	29		TERRY ARNDT	OLSON	11/14/1977	069212	63	RG	DO	--	--
169142	201	46N	02E	29		TERRY ARNDT/R SHIKENJANSKI	OLSON	11/14/1977	069210	63	RGA	DO	--	--
169196	201	46N	02E	29		RICK FRIEND	LIVINGSTON	11/17/1982	105652	65	RG	DO	--	--
169066	201	46N	02E	29		GRANT ROBERT	HINKLE	11/18/1976	054904	65	RG	DO	--	--
169054	201	46N	02E	29		ARNDT REALTOR	HINKLE	11/24/1975	043314	65	RG	DO	--	--
167673	201	46N	02E	29		WAYNE BRAKE	OLSON	11/30/1984	116025	63	RG	DO	--	--
167660	201	46N	02E	29		DAN JARVIS	BEAMAN	12/10/1976	055578	63	RG	DO	--	--
167661	201	46N	02E	29		DAN JARVIS	BEAMAN	12/10/1976	055579	62	RG	DO	--	--
209706	201	46N	02E	29		LIFETIME	GREENFIELD	12/26/1989	X6329	60	RG	DO	--	UN
167343	201	46N	02E	29	1B	MRS I ATWOOD		03/00/1934		43	RG	DO	--	--
167747	201	46N	02E	29	1B	DOUGLAS GEBHARDT	MCKINNEY	05/02/1977	059827	64	RG	DO	--	--
167758	201	46N	02E	29	1B	MIKE GREGG	MCKINNEY	10/11/1974	033792	84	RG	DO	--	--
167679	201	46N	02E	29	1D	WAYNE BRAKE	OLSON	04/20/1982	103118	63	RG	DO	--	--
167680	201	46N	02E	29	1D	WAYNE BRAKE	OLSON	06/09/1983	107537	63	RG	DO	--	--
169166	201	46N	02E	29	1H	TERRY ARNDT/PETER SARITSKI	OLSON	08/08/1978	077923	60	RGA	DO	--	--
169158	201	46N	02E	29	1H	TERRY ARNDT	OLSON	08/08/1978	077921	60	RG	DO	--	--
169180	201	46N	02E	29	2A	B & W CONST/GARY DIECKBERND	BEAMAN	03/06/1981	098615	63	RGA	DO	--	--
167759	201	46N	02E	29	2B	RICHARD HEASLIP	MCKINNEY	04/15/1977	059030	62	RG	DO	--	--
169187	201	46N	02E	29	2C	WAYNE SONNESON	GREENFIELD	07/18/1985	119048	68	RG	DO	--	--
169185	201	46N	02E	29	2F	THREE HAMMERS	BEAMAN	01/24/1986	122059	65	RG	DO	--	--
169172	201	46N	02E	29	3C	PROFESSIONAL CONT/D SCHERSCHEL	BEAMAN	01/25/1982	102576	65	RGA	DO	--	--
169171	201	46N	02E	29	3C	PROFESSIONAL CONT	BEAMAN	01/25/1982	102575	65	RG	DO	--	--
167682	201	46N	02E	29	3E	MARTHA HART	GREENFIELD	03/21/1978	072191	65	RG	DO	--	--
167685	201	46N	02E	29	4A	THREE HAMMERS	BEAMAN	02/09/1987	128400	70	RG	DO	--	--
167686	201	46N	02E	29	4A	THREE HAMMERS	BEAMAN	03/27/1987	130226	70	RG	DO	--	--
167684	201	46N	02E	29	4A	THREE HAMMERS	BEAMAN	04/28/1987	131417	75	RG	DO	--	--
167639	201	46N	02E	29	4A	THREE HAMMERS	BEAMAN	04/28/1987	131418	70	RG	DO	--	--
169186	201	46N	02E	29	4A	THREE HAMMERS	BEAMAN	10/26/1984	115581	67	RG	DO	--	--
167638	201	46N	02E	29	4B	DAVE TRESEMER	MCKINNEY	01/30/1984	111095	74	RG	DO	--	--
167683	201	46N	02E	29	4B	DAVE TRESEMER	MCKINNEY	01/30/1984	111996	66	RG	DO	--	--
194405	201	46N	02E	29	4B	LIFETIME BLDRS LOT 76	GREENFIELD	07/11/1989	X12792	60	RG	DO	--	UN
194406	201	46N	02E	29	4B	LIFETIME BLDRS LOT 80	GREENFIELD	07/13/1989	X12791	60	RG	DO	--	UN
194404	201	46N	02E	29	4B	LIFETIME BLDRS LOT 72	GREENFIELD	07/13/1989	X12793	60	RG	DO	--	UN
194407	201	46N	02E	29	4B	LIFETIME BLDRS LOT 71	GREENFIELD	07/28/1989	X12794	59	RG	DO	--	UN
228034	201	46N	02E	29	4B	LIFETIME BLDRS LOT 74	GREENFIELD	08/23/1989	013473	60	RG	DO	--	UN
167674	201	46N	02E	29	4C	DAVE TRESEMER	MCKINNEY	08/20/1984	114260	64	RG	DO	--	--
169183	201	46N	02E	29	4D	WAYNE SONNESON	GREENFIELD	03/22/1985	116937	68	RG	DO	--	--
167687	201	46N	02E	29	4D	STAN MANNINO	OLSON	04/12/1979	084571	63	RG	DO	--	--
169199	201	46N	02E	29	4D	THREE HAMMERS	BEAMAN	04/20/1984	112019	69	RG	DO	--	--
194445	201	46N	02E	29	4D	PETRY CONST LOT 56	GREENFIELD	05/02/1989	X9407	60	RG	DO	--	UN
169194	201	46N	02E	29	4D	WAYNE SONNESON	GREENFIELD	05/14/1985	117827	68	RG	DO	--	--
167688	201	46N	02E	29	4D	MIKE FISCHER	OLSON	06/03/1981	099969	63	RG	DO	--	--
169133	201	46N	02E	29	4D	TERRY ARNDT	OLSON	08/04/1978	077864	63	RG	DO	--	--

{ OFFICE } (USE ONLY)	FIPS	TWN	RNG	SC	PL	OWNER	DRILLER	DATE	PERMIT	DPTH	REC	US	TY	AQ
209773	201	46N	02E	29	4D	THREE HAMMERS LOT 75	BEAMAN	08/14/1989	X12351	71	RGX	DO	--	UN
167689	201	46N	02E	29	4D	KEN FISCHER	OLSON	09/09/1981	101243	60	RG	DO	--	--
167690	201	46N	02E	29	4D	LARRY THOMAS	BULL	11/22/1982	105712	70	RG	DO	--	--
167337	201	46N	02E	29	4E	J C MCAFFEE		03/00/1934		48	RG	DO	--	--
241597	201	46N	02E	29	5A	STEVE NEBLOCK	BULL	01/28/1993	D742-92	65	RG	DO	--	UN
REMARKS: Evergreen Manor Subd. Lot 58														
167691	201	46N	02E	29	5A	STAN MANNINO	BEAMAN	07/28/1982	104284	67	RG	DO	--	--
167678	201	46N	02E	29	5A	STAN MANNINO	BEAMAN	07/28/1982	104282	67	RG	DO	--	--
167676	201	46N	02E	29	5A	KENNETH FISCHER	OLSON	07/29/1981	100754	60	RG	DO	--	--
167597	201	46N	02E	29	5A	DAN JARVIS	BEAMAN	08/24/1979	089095	65	RG	DO	--	--
167692	201	46N	02E	29	5A	STAN MANNINO	BEAMAN	08/28/1982	104283	67	RG	DO	--	--
169184	201	46N	02E	29	5A	STAN MANNINO	BEAMAN	09/23/1982	104784	65	RG	DO	--	--
228030	201	46N	02E	29	5A	STAN MANNINO LOT 189	BEAMAN	11/01/1982	104784	65	RG	DO	--	UN
169414	201	46N	02E	29	5B	DAN JARVIS	BEAMAN	08/04/1977	064721	62	RG	DO	--	--
169413	201	46N	02E	29	5B	DAN JARVIS	BEAMAN	08/04/1977	064720	62	RG	DO	--	--
169415	201	46N	02E	29	5B	DAN JARVIS	BEAMAN	08/04/1977	064722	62	RG	DO	--	--
169417	201	46N	02E	29	5B	DAN JARVIS	BEAMAN	11/23/1977	069611	62	RG	DO	--	--
169416	201	46N	02E	29	5B	DAN JARVIS	BEAMAN	11/23/1977	069609	62	RG	DO	--	--
169418	201	46N	02E	29	5B	DAN JARVIS	BEAMAN	11/23/1977	069612	62	RG	DO	--	--
169471	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	00/00/1979	089091	62	RG	DO	--	--
169472	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	02/08/1978	071604	62	RG	DO	--	--
169433	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	02/08/1978	071607	62	RG	DO	--	--
169443	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	02/25/1978	071605	62	RG	DO	--	--
169427	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	02/28/1978	071608	62	RG	DO	--	--
169444	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	02/28/1978	071606	62	RG	DO	--	--
169435	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	02/28/1978	071612	62	RG	DO	--	--
169428	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	02/28/1978	071610	62	RG	DO	--	--
169424	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	02/28/1978	071609	62	RG	DO	--	--
169423	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	02/28/1978	071613	62	RG	DO	--	--
169422	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	02/28/1978	071614	62	RG	DO	--	--
169473	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	02/28/1978	071615	62	RG	DO	--	--
169469	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/12/1978	072931	62	RG	DO	--	--
169429	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/12/1978	072932	62	RG	DO	--	--
169431	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/12/1978	072926	62	RG	DO	--	--
169468	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/12/1978	072930	62	RG	DO	--	--
169467	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/12/1978	072929	62	RG	DO	--	--
169466	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/12/1978	072927	62	RG	DO	--	--
169463	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/24/1978	084878	62	RG	DO	--	--
169453	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/24/1979	084881	62	RG	DO	--	--
169454	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/24/1979	084882	62	RG	DO	--	--
169460	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/24/1979	084883	62	RG	DO	--	--
169462	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/24/1979	084886	62	RG	DO	--	--
169452	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/24/1979	084885	62	RG	DO	--	--
169451	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/24/1979	084888	62	RG	DO	--	--
169461	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/24/1979	084884	62	RG	DO	--	--

(OFFICE) (USE ONLY)	FIPS	TWN	RNG	SC	PL	OWNER	DRILLER	DATE	PERMIT	DPTH	REC	US	TY	AQ
169465	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/24/1979	084880	62		RG	DO	-- --
169464	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/24/1979	084879	62		RG	DO	-- --
169440	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/24/1979	084887	64		RG	DO	-- --
169438	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/24/1979	084890	62		RG	DO	-- --
169470	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	04/24/1979	084889	62		RG	DO	-- --
167748	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	05/10/1977	060288	63		RG	DO	-- --
167600	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	07/00/1979	089089	62		RG	DO	-- --
169425	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	07/13/1978	076792	62		RG	DO	-- --
169436	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	08/24/1979	089094	62		RG	DO	-- --
169447	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	08/24/1979	089097	62		RG	DO	-- --
169448	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	08/24/1979	089096	62		RG	DO	-- --
167601	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	08/24/1979	089090	62		RG	DO	-- --
167602	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	08/24/1979	089092	62		RG	DO	-- --
167599	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	08/24/1979	089088	62		RG	DO	-- --
167603	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	08/24/1979	089093	62		RG	DO	-- --
169432	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	09/13/1978	076793	62		RG	DO	-- --
169437	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	09/15/1978	079492	62		RG	DO	-- --
169439	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	09/15/1978	079493	62		RG	DO	-- --
169441	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	09/15/1978	079495	62		RG	DO	-- --
169426	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	10/18/1977	068228	62		RG	DO	-- --
169445	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	10/20/1978	081047	62		RG	DO	-- --
167598	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	10/20/1978	081051	62		RG	DO	-- --
169193	201	46N	02E	29	5C	BRAD TOET	BEAMAN	10/22/1985	121018	65		RG	DO	-- --
169430	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	11/12/1978	072928	62		RG	DO	-- --
169420	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	11/23/1977	069608	62		RG	DO	-- --
169421	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	11/23/1977	069615	62		RG	DO	-- --
169419	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	11/23/1977	069616	62		RG	DO	-- --
169476	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	11/23/1977	069607	62		RG	DO	-- --
169475	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	11/23/1977	069613	62		RG	DO	-- --
169474	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	11/23/1977	069617	62		RG	DO	-- --
169188	201	46N	02E	29	5C	STAN MANNINO	BEAMAN	11/30/1983	110618	62		RG	DO	-- --
169434	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	12/01/1978	082618	62		RG	DO	-- --
169442	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	12/01/1978	082625	62		RG	DO	-- --
169446	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	12/01/1978	082619	62		RG	DO	-- --
169457	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	12/01/1978	082622	62		RG	DO	-- --
169455	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	12/01/1978	082624	62		RG	DO	-- --
169458	201	46N	02E	29	5C	DAN JARVIS	BEAQMAN	12/01/1978	082621	62		RG	DO	-- --
169456	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	12/01/1978	082623	62		RG	DO	-- --
169459	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	12/01/1978	082620	62		RG	DO	-- --
169450	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	12/01/1978	082616	62		RG	DO	-- --
169449	201	46N	02E	29	5C	DAN JARVIS	BEAMAN	12/01/1978	082617	62		RG	DO	-- --
167694	201	46N	02E	29	5D	WAYNE BRAKE	OLSON	03/30/1982	102950	60		RG	DO	-- --
167693	201	46N	02E	29	5D	WAYNE BRAKE	OLSON	04/29/1980	093571	63		RG	DO	-- --
167695	201	46N	02E	29	5D	WAYNE BRAKE	OLSON	04/29/1980	093569	63		RG	DO	-- --
167699	201	46N	02E	29	5D	GARRY COZZI	MCKINNEY	06/17/1983	107711	70		RG	DO	-- --

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(OFFICE) (USE ONLY)	FIPS	TWN	RNG	SC	PL	OWNER	DRILLER	DATE	PERMIT	DPTH	REC	US	TY	AQ
167640	201	46N	02E	29	5D	RICH HOPPE	BULL	08/22/1986	|126232	62	RG	DO	--	--
167696	201	46N	02E	29	5D	WAYNE BRAKE	OLSON	09/29/1980	|096339	63	RG	DO	--	--
167697	201	46N	02E	29	5D	WAYNE BRAKE	OLSON	10/09/1980	|096596	63	RG	DO	--	--
167698	201	46N	02E	29	5D	WAYNE SONNESON	GREENFIELD	12/29/1980	|098015	65	RG	DO	--	--
167338	201	46N	02E	29	5E	CHICAGO JOINT STOCK & LAND BK		03/00/1934	|	70	RG	DO	--	--
228035	201	46N	02E	29	5E	WAYNE BRAKE #86-03-03 LOT #35	MARTIN	03/28/1986	122154	60	RG	DO	--	UN
167641	201	46N	02E	29	5E	VERN CLAUSON	OLSON	04/04/1984	|111727	63	RG	DO	--	--
167709	201	46N	02E	29	5E	WAYNE BRAKE	OLSON	04/10/1981	|099181	63	RG	DO	--	--
167713	201	46N	02E	29	5E	STAN MANNINO	BEAMAN	04/23/1982	|104785	65	RG	DO	--	--
167712	201	46N	02E	29	5E	WAYNE BRAKE	OLSON	04/28/1981	|098178	63	RG	DO	--	--
167710	201	46N	02E	29	5E	WAYNE BRAKE	OLSON	04/29/1980	|093570	63	RG	DO	--	--
228038	201	46N	02E	29	5E	WAYNE BRAKE #8607 LOT #34	MARTIN	05/07/1986	122813	62	RG	DO	--	UN
228036	201	46N	02E	29	5E	WAYNE BRAKE #8643 LOT #20	MARTIN	07/08/1986	123812	63	RG	DO	--	UN
167701	201	46N	02E	29	5E	WAYNE BRAKE	OLSON	07/13/1983	|108055	62	RG	DO	--	--
167702	201	46N	02E	29	5E	WAYNE BRAKE	OLSON	07/13/1983	|108056	62	RG	DO	--	--
167706	201	46N	02E	29	5E	WAYNE BRAKE	OLSON	08/04/1980	|095335	63	RG	DO	--	--
228037	201	46N	02E	29	5E	WAYNE BRAKE #8627 LOT #37	MARTIN	08/07/1986	122812	62	RG	DO	--	UN
167703	201	46N	02E	29	5E	WAYNE BRAKE	OLSON	08/12/1983	|108776	63	RG	DO	--	--
167704	201	46N	02E	29	5E	WAYNE BRAKE	OLSON	08/12/1983	|108777	63	RG	DO	--	--
228040	201	46N	02E	29	5E	WAYNE BRAKE #8737 LOT #29	MARTIN	09/14/1987	133848	65	RG	DO	--	UN
167705	201	46N	02E	29	5E	DAVE TRESEMER	OLSON	09/27/1979	|089834	64	RG	DO	--	--
167700	201	46N	02E	29	5E	STAN MANINO	OLSON	09/27/1979	|089833	63	RG	DO	--	--
167714	201	46N	02E	29	5E	WAYNE BRAKE	OLSON	10/13/1983	|109930	63	RG	DO	--	--
167642	201	46N	02E	29	5E	WAYNE BRAKE	OLSON	10/25/1985	|121142	60	RG	DO	--	--
167711	201	46N	02E	29	5E	DAVE TRESEMER	OLSON	11/07/1980	|097227	63	RG	DO	--	--
167749	201	46N	02E	29	5E	WAYNE BRAKE	OLSON	11/07/1980	|097230	63	RG	DO	--	--
228039	201	46N	02E	29	5E	WAYNE BRAKE #8652-52 LOT #13	MARTIN	11/28/1986	128371	61	RG	DO	--	UN
167707	201	46N	02E	29	5E	WAYNE BRAKE	OLSON	12/10/1980	|097713	63	RG	DO	--	--
167708	201	46N	02E	29	5E	WAYNE BRAKE	OLSON	12/10/1980	|097712	63	RG	DO	--	--
167643	201	46N	02E	29	5F	KEN KOTHE	GREENFIELD	02/06/1984	|111160	67	RG	DO	--	--
241674	201	46N	02E	29	5F	MIKE GUZZARDO	GREENFIELD	12/10/1992	684	105	RG	DO	--	UN
REMARKS: Hononegah Ests. Lot 4A														
167604	201	46N	02E	29	5G	DAN JARVIS	BEAMAN	09/00/1978	|079494	62	RG	DO	--	--
167605	201	46N	02E	29	5G	DAN JARVIS	BEAMAN	09/00/1978	|079496	62	RG	DO	--	--
167607	201	46N	02E	29	5G	DAN J ARVIS	BEAMAN	09/15/1978	|079491	62	RG	DO	--	--
167608	201	46N	02E	29	5G	DAN JARVIS	BEAMAN	09/15/1978	|079495	62	RG	DO	--	--
167606	201	46N	02E	29	5G	DAN JARVIS	BEAMAN	09/15/1978	|079497	62	RG	DO	--	--
167760	201	46N	02E	29	5H	GEORGE FRANZEN	OLSON	11/11/1971	|012837	70	RG	DO	--	--
169190	201	46N	02E	29	6A	STAN MANNINO	OLSON	01/10/1986	|121998	60	RG	DO	--	--
228045	201	46N	02E	29	6A	STAN MANNINO #8603-1475 L 196	MARTIN	01/21/1986	121998	62	RG	DO	--	UN
167718	201	46N	02E	29	6A	COMMERICAL MORTGAGE	OLSON	04/28/1981	|098661	63	RG	DO	--	--
228042	201	46N	02E	29	6A	WAYNE BRAKE #8709 LOT #188	MARTIN	05/00/1987	129608	63	RG	DO	--	UN
228046	201	46N	02E	29	6A	WAYNE BRAKE #8619 LOT #95	MARTIN	05/08/1986	122811	61	RG	DO	--	UN
228047	201	46N	02E	29	6A	WAYNE BRAKE #8613-13 LOT #185	MARTIN	06/11/1986	123813	62	RG	DO	--	UN
167719	201	46N	02E	29	6A	DAVE TRESEMER	MCKINNEY	06/17/1983	|107710	70	RG	DO	--	--

(OFFICE) (USE ONLY)	FIPS	TWN	RNG	SC	PL	OWNER	DRILLER	DATE	PERMIT	DPTH	REC	US	TY	AQ
228043	201	46N	02E	29	6A	STAN MANNINO #8653 LOT #201	MARTIN	07/10/1986	124641	61	RG	DO	--	UN
169191	201	46N	02E	29	6A	WAYNE BRAKE	OLSON	07/12/1985	|118984	60	RG	DO	--	--
228048	201	46N	02E	29	6A	WAYNE BRAKE #8628	MARTIN	08/07/1986	125169	60	RG	DO	--	UN
228050	201	46N	02E	29	6A	WAYNE BRAKE #8629 LOT #203	MARTIN	08/08/1986	125647	60	RG	DO	--	UN
169197	201	46N	02E	29	6A	WAYNE BRAKE	OLSON	08/14/1984	|114097	63	RG	DO	--	--
228051	201	46N	02E	29	6A	WAYNE BRAKE #8729 LOT #211	MARTIN	08/16/1987	133847	64	RG	DO	--	UN
228049	201	46N	02E	29	6A	WAYNE BRAKE #8636 LOT #212	MARTIN	08/29/1986	125646	62	RG	DO	--	UN
228052	201	46N	02E	29	6A	WAYNE BRAKE #8637 LOT #180	MARTIN	09/02/1986	125648	63	RG	DO	--	UN
167720	201	46N	02E	29	6A	TERRY ARNDT	OLSON	10/05/1979	|090078	63	RG	DO	--	--
167716	201	46N	02E	29	6A	TERRY ARNDT	OLSON	10/05/1979	|090077	63	RG	DO	--	--
167717	201	46N	02E	29	6A	TERRY ARNDT	OLSON	10/05/1979	|090079	63	RG	DO	--	--
169189	201	46N	02E	29	6A	WAYNE BRAKE	OLSON	10/25/1985	|121144	57	RG	DO	--	--
169198	201	46N	02E	29	6A	WAYNE BRAKE	OLSON	10/26/1984	|115587	63	RG	DO	--	--
228044	201	46N	02E	29	6A	WAYNE BRAKE #86-19 LOT #187	MARTIN	11/14/1986	127276	61	RG	DO	--	UN
228041	201	46N	02E	29	6A	STAN MANNINO #8651 LOT #202	MARTIN	11/26/1986	127275	62	RG	DO	--	UN
169182	201	46N	02E	29	6A	WAYNE BRAKE	OLSON	12/18/1985	|121837	60	RG	DO	--	--
167750	201	46N	02E	29	6B	DAN JARVIS	BEAMAN	01/24/1978	|070912	62	RG	DO	--	--
167722	201	46N	02E	29	6B	WAYNE BRAKE	OLSON	04/27/1984	|112066	63	RG	DO	--	--
167675	201	46N	02E	29	6B	WAYNE BRAKE	OLSON	08/14/1984	|114096	63	RG	DO	--	--
167721	201	46N	02E	29	6B	DAN JARVIS	BEAMAN	10/05/1977	|067748	62	RG	DO	--	--
169478	201	46N	02E	29	6B	DAN JARVIS	BEAMAN	10/18/1977	|068226	62	RG	DO	--	--
169477	201	46N	02E	29	6B	DAN JARVIS	BEAMAN	10/18/1977	|068227	62	RG	DO	--	--
167762	201	46N	02E	29	6B	DAN JARVIS	BEAMAN	11/00/1976	|054401	62	RG	DO	--	--
167761	201	46N	02E	29	6B	BUSTER SMITH	BEAMAN	11/04/1976	|054402	65	RG	DO	--	--
167755	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	02/18/1977	|056893	63	RG	DO	--	--
167763	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	02/18/1977	|056896	63	RG	DO	--	--
167754	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	02/18/1977	|056894	63	RG	DO	--	--
167753	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	02/18/1977	|056895	63	RG	DO	--	--
167644	201	46N	02E	29	6C	WAYNE SONNESON	GREENFIELD	03/01/1984	|111369	67	RG	DO	--	--
167751	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	03/03/1977	|057341	63	RG	DO	--	--
167752	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	03/03/1977	|057342	63	RG	DO	--	--
169479	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	03/03/1977	|057344	63	RG	DO	--	--
194436	201	46N	02E	29	6C	PETRY CONST LOT 52	GREENFIELD	05/02/1989	X10473	60	RG	DO	--	UN
167766	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	06/07/1977	|061773	62	RG	DO	--	--
167765	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	06/07/1977	|061774	62	RG	DO	--	--
167768	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	06/08/1977	|061780	62	RG	DO	--	--
167767	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	06/08/1977	|061781	62	RG	DO	--	--
167737	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	06/08/1977	|061783	62	RG	DO	--	--
167769	201	46N	02E	29	6C	MYRON FISCHER	BEAMAN	06/28/1977	|062901	62	RG	DO	--	--
167821	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	08/22/1977	|065661	62	RG	DO	--	--
167822	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	10/05/1977	|067749	62	RG	DO	--	--
167725	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	10/05/1977	|067747	62	RG	DO	--	--
167724	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	10/05/1977	|067750	62	RG	DO	--	--
167723	201	46N	02E	29	6C	GARY SUMNER	MCKINNEY	10/05/1979	|090047	68	RG	DO	--	--
167757	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	10/13/1976	|053497	60	RG	DO	--	--

(OFFICE) (USE ONLY)	FIPS	TWN	RNG	SC	PL	OWNER	DRILLER	DATE	PERMIT	DPTH	REC	US	TY	AQ
167764	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	10/13/1976	053498	62	RG	DO	--	--
169481	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	10/18/1977	068231	62	RG	DO	--	--
169482	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	10/18/1977	068229	62	RG	DO	--	--
169480	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	10/18/1977	068230	62	RG	DO	--	--
167756	201	46N	02E	29	6C	DAN JARVIS	BEAMAN	10/20/1976	053814	62	RG	DO	--	--
167738	201	46N	02E	29	6C	CEDRIC EICKHORST	BEAMAN	11/16/1977	069296	62	RG	DO	--	--
167739	201	46N	02E	29	6E	GLEN STOCKWELL	BEAMAN	06/28/1978	076238	64	RG	DO	--	--
167715	201	46N	02E	29	6E	WAYNE SONNESON	GREENFIELD	08/18/1980	095596	70	RG	DO	--	--
167770	201	46N	02E	29	6F	RICHARD DWYER	BLOYER	02/08/1971	010130	69	RG	DO	--	--
167339	201	46N	02E	29	6F	L BUCHANAN		03/00/1934		75	RG	DO	--	--
167340	201	46N	02E	29	6F	L BUCHANAN		03/00/1934		51	RG	DO	--	--
167771	201	46N	02E	29	6F	JIM SARS	GREENFIELD	03/21/1978	072189	67	RG	DO	--	--
167726	201	46N	02E	29	6F	JOHN BETTS	GREENFIELD	05/03/1977	059957	70	RG	DO	--	--
167772	201	46N	02E	29	6F	DAVE GUNDERSON	GREENFIELD	10/13/1978	080788	71	RG	DO	--	--
292306	201	46N	02E	29	6G	TOM MASSY	BEAMAN	07/20/1996	1803	85	RG	DO	DL	UN
167773	201	46N	02E	29	6H	MCGILL CONST CO	HINKLE	00/00/1968	005409	65	RG	DO	--	--
167681	201	46N	02E	29	7A	THREE HAMMERS	BEAMAN	04/13/1983	106746	68	RG	DO	--	--
167774	201	46N	02E	29	7A	NICK RALLO	GREENFIELD	06/07/1978	075192	63	RG	DO	--	--
167727	201	46N	02E	29	7A	WILLIAM REED	ROSENQUIST	07/28/1983	108439	81	RG	DO	--	--
167645	201	46N	02E	29	7A	GERALD NORDMOE	BEAMAN	08/20/1986	126154	65	RG	DO	--	--
209776	201	46N	02E	29	7A	HARKIN HOUSE LOT 61	HINKLE	08/30/1989	X12134	81	RGX	DO	--	UN
167775	201	46N	02E	29	7B	MIKE FENGER	GREENFIELD	11/01/1978	081483	65	RG	DO	--	--
167776	201	46N	02E	29	7C	DAVE TRESEMER	OLSON	04/23/1974	029167	64	RG	DO	--	--
209789	201	46N	02E	29	7D	THREE HAMMERS LOT 51	BEAMAN	08/12/1989	X11091	71	RGX	DO	--	UN
167728	201	46N	02E	29	7D	HOMESTEAD BUILDERS	HINKLE	09/22/1982	104943	65	RG	DO	--	--
167730	201	46N	02E	29	7F	WAYNE BRAKE	OLSON	03/12/1985	116766	63	RG	DO	--	--
167777	201	46N	02E	29	7F	DAVE TRESEMER	OLSON	03/24/1977	058149	63	RG	DO	--	--
167729	201	46N	02E	29	7F	DAVE TRESEMER	OLSON	08/15/1979	088745	63	RG	DO	--	--
167740	201	46N	02E	29	7F	FRANCIS PAULEY	BULL	09/21/1978	079803	70	RG	DO	--	--
167342	201	46N	02E	29	7G	E GLEASMAN		03/00/1934		45	RG	DO	--	--
167341	201	46N	02E	29	7G	JOHN B UNTZ		03/00/1934		80	RG	DO	--	--
167732	201	46N	02E	29	7G	JOHN OWEN	GREENFIELD	03/11/1977	057602	65	RG	DO	--	--
167780	201	46N	02E	29	7G	AMWOOD BLDRS	GREENFIELD	03/20/0000	028230	65	RG	DO	--	--
167779	201	46N	02E	29	7G	GEORGE FRANZEN	OLSON	03/20/1973	018208	64	RG	DO	--	--
167778	201	46N	02E	29	7G	GEORGE FRANZEN	OLSON	03/20/1973	018209	64	RG	DO	--	--
167731	201	46N	02E	29	7G	NED CARTER	GREENFIELD	05/02/1979	085116	70	RG	DO	--	--
167784	201	46N	02E	29	7G	JOHN OWEN	GREENFIELD	05/26/1976	047789	66	RG	DO	--	--
167783	201	46N	02E	29	7G	JOHN OWEN	GREENFIELD	05/26/1976	047788	66	RG	DO	--	--
167827	201	46N	02E	29	7G	BENNETT CONST	BEAMAN	06/15/1978	075555	65	RG	DO	--	--
167823	201	46N	02E	29	7G	DELBERT BENNETT	RANEY	08/02/1977	064512	69	RG	DO	--	--
167742	201	46N	02E	29	7G	LARRY HAMMACK	BEAMAN	08/18/1977	065473	72	RG	DO	--	--
167788	201	46N	02E	29	7G	BENNETT COONST	BEAMAN	09/23/1977	067198	64	RG	DO	--	--
167786	201	46N	02E	29	7G	BENNETT CONST	BEAMAN	09/23/1977	067197	66	RG	DO	--	--
167741	201	46N	02E	29	7G	BENNETT CONST	BEAMAN	10/26/1978	081264	65	RG	DO	--	--
167785	201	46N	02E	29	7G	JOHN OWEN	GREENFIELD	10/27/0000	054074	65	RG	DO	--	--

{ OFFICE } {USE ONLY}	FIPS	TWN	RNG	SC	PL	OWNER	DRILLER	DATE	PERMIT	DPTH	REC	US	TY	AQ
167787	201	46N	02E	29	7G	BOB YOUNG	OLSON	11/07/1980	|097231	63	RG	DO	--	--
167790	201	46N	02E	29	7G	THREE HAMMERS CONST	BEAMAN	11/16/1977	|069295	65	RG	DO	--	--
167789	201	46N	02E	29	7G	THREE HAMMERS CONST	BEAMAN	11/16/1977	|069294	65	RG	DO	--	--
167781	201	46N	02E	29	7G	CARL BREITLOW	GREENFIELD	11/17/0000	|043094	65	RG	DO	--	--
167782	201	46N	02E	29	7G	DUANE PAUTSCH	GREENFIELD	12/04/1975	|043541	65	RG	DO	--	--
167791	201	46N	02E	29	8A	JOOHN GESSNER BLDR	HINKLE	03/31/1978	|072477	69	RG	DO	--	--
167792	201	46N	02E	29	8A	ROSCOE REALTOR	HINKLE	04/16/1986	|123058	73	RG	DO	--	--
228055	201	46N	02E	29	8A	ROSCOE REALTOR LOT #166	HINKLE	04/20/1987	130736	66	RG	DO	--	UN
209684	201	46N	02E	29	8A	ROSCOE REALTOR LOT 166	HINKLE	04/20/1987	X130736	66	RGX	DO	--	UN
167733	201	46N	02E	29	8A	RICHARD NOVONBTY	HINKLE	05/27/1983	|107377	82	RG	DO	--	--
247443	201	46N	02E	29	8A	DON SWANSON BLDRS.	GREENFIELD	10/08/1991	171	60	RG	DO	--	UN
REMARKS: LOT 169 OLD FARM														
228056	201	46N	02E	29	8A	HARKIN HOUSE BUILDER LOT #170	HINKLE	11/11/1987	134603	63	RG	DO	--	UN
167819	201	46N	02E	29	8B	DON STENGER	BEAMAN	03/24/1977	|058137	60	RG	DO	--	--
167798	201	46N	02E	29	8B	WAYNE BREAK	OLSON	06/10/1976	|048365	63	RG	DO	--	--
167799	201	46N	02E	29	8B	ROBERT YOUNG	OLSON	06/25/1976	|048964	63	RG	DO	--	--
167793	201	46N	02E	29	8B	BOB YOUNG	OLSON	06/30/1978	|076379	63	RG	DO	--	--
167796	201	46N	02E	29	8B	DVAE TRESEMER	OLSON	09/09/1974	|032833	63	RG	DO	--	--
167797	201	46N	02E	29	8B	ROBERT SCHLENSKER	OLSON	09/09/1974	|032831	63	RG	DO	--	--
167743	201	46N	02E	29	8C	FRANCIS PAULEY	BULL	03/13/1978	|071940	71	RG	DO	--	--
167800	201	46N	02E	29	8C	DAVE TRESEMER	OLSON	04/23/1974	|029169	64	RG	DO	--	--
167801	201	46N	02E	29	8C	DAVE TRESEMER	OLSON	04/23/1974	|029168	64	RG	DO	--	--
167646	201	46N	02E	29	8C	DAVE TRESEMER	OLSON	05/06/1976	|046906	63	RG	DO	--	--
167805	201	46N	02E	29	8C	DAVE TRESEMER	OLSON	05/20/1976	|047565	63	RG	DO	--	--
167803	201	46N	02E	29	8C	ALVIN BUTLER	OLSON	06/10/1976	|048367	63	RG	DO	--	--
167804	201	46N	02E	29	8C	WAYNE BREAK	OLSON	06/10/1976	|048366	63	RG	DO	--	--
167647	201	46N	02E	29	8C	ART THOMPSON	OLSON	06/10/1976	|048372	63	RG	DO	--	--
167806	201	46N	02E	29	8C	DAVE TRESEMER	OLSON	07/16/1976	|049782	63	RG	DO	--	--
167811	201	46N	02E	29	8C	THREE HAMMERS	BEAMAN	08/05/1986	|125761	57	RG	DO	--	--
167802	201	46N	02E	29	8C	DAVE TRESEMER	OLSON	12/17/1975	|035376	63	RG	DO	--	--
167807	201	46N	02E	29	8D	DAVE TRESEMER	OLSON	04/23/1974	|029166	64	RG	DO	--	--
167809	201	46N	02E	29	8D	DAVE TRESEMER	OLSON	04/23/1974	|029170	64	RG	DO	--	--
167648	201	46N	02E	29	8D	DAVE TRESEMER	OLSON	05/06/1976	|046907	64	RG	DO	--	--
167810	201	46N	02E	29	8D	BOB COURTRIGHT	MCKINNEY	05/20/1977	|060997	65	RG	DO	--	--
167808	201	46N	02E	29	8E	MRS RICHARD BELT		00/00/0000	|	68	C	DO	--	--
167744	201	46N	02E	29	8E	BENNETT CONST	BEAMAN	04/11/1979	|084558	65	RG	DO	--	--
167745	201	46N	02E	29	8E	BENNETT CONST	BEAMAN	04/11/1979	|084559	65	RG	DO	--	--
242236	201	46N	02E	29	8E	KOTHE CONST./KEN KOTHE	GREENFIELD	09/29/1992	458	71	RG	DO	--	UN
REMARKS: Tresemer Lot 118														
242235	201	46N	02E	29	8E	KOTHE CONST./KEN KOTHE	GREENFIELD	09/29/1992	455	67	RG	DO	--	UN
REMARKS: Tresemer Lot 103														
167817	201	46N	02E	29	8G	TIM MCDONNELL	BULL	07/18/1985	|119057	66	RG	DO	--	--
167816	201	46N	02E	29	8G	DICK WELLS	GREENFIELD	07/23/0000	|050074	65	RG	DO	--	--
167814	201	46N	02E	29	8G	DAN LARSON JR	GREENFIELD	08/25/1976	|051320	65	RG	DO	--	--
167815	201	46N	02E	29	8G	WAYNE SONNESON	GREENFIELD	08/25/1976	|051319	65	RG	DO	--	--

(OFFICE) (USE ONLY)	FIPS	TWN	RNG	SC	PL	OWNER	DRILLER	DATE	PERMIT	DPTH	REC	US	TY	AQ
167825	201	46N	02E	29	8G	JOHN OWEN	GREENFIELD	09/14/1977	066772	65	RG	DO	--	--
167794	201	46N	02E	29	8G	ART THOMPSON	OLSON	09/24/1976	052669	63	RG	DO	--	--
167734	201	46N	02E	29	8G	BILL THURMOND	RANEY	10/18/1979	090665	66	RG	DO	--	--
167735	201	46N	02E	29	8G	DAVE TRESEMER	OLSON	11/14/1977	069206	63	RG	DO	--	--
167795	201	46N	02E	29	8G	DAVE TRESEMER	OLSON	11/15/1976	054680	63	RG	DO	--	--
167812	201	46N	02E	29	8G	DOYLE PERRIS	GREENFIELD	12/04/1975	043539	65	RG	DO	--	--
167824	201	46N	02E	29	8G	DAVE TRESEMER	OLSON	12/08/1977	070028	63	RG	DO	--	--
167813	201	46N	02E	29	8G	ROBT PARSEK	GREENFIELD	12/09/1975	043679	65	RG	DO	--	--
167746	201	46N	02E	29	8G	DAVE TRESEMER	OLSON	12/22/1977	070385	63	RG	DO	--	--
167826	201	46N	02E	29	8G	DAVE TRESEMER	OLSON	12/22/1977	070386	63	RG	DO	--	--
167736	201	46N	02E	29	8H	MACKTOWN STATE BANK	GREENFIELD	05/08/1979	085369	57	RG	IC	--	--
167828	201	46N	02E	29	8H	TERRY ARNDT	OLSON	08/00/1987	077922	60	RG	DO	--	--
167818	201	46N	02E	29	8H	JOHN OWEN	GREENFIELD	08/05/1976	050622	65	RG	DO	--	--
167820	201	46N	02E	29	8H	BUTCH COURTRIGHT	MCKINNEY	08/24/1977	065802	69	RG	DO	--	--
169412	201	46N	02E	29	__	DAN JARVIS	BEAMAN	11/23/1978	069610	62	RG	DO	--	--

Query the PICS Database through the World Wide Web
http://gwinfo.sws.uiuc.edu/gwdb-query.html

County: Winnebago

Township Code: 46N
Range Code: 2E
Section Codes: 29

3 records were found for the specified locations.

Questions : Contact the Illinois State Water Survey's Ground Water Division @ (217)333-7223
Publication: Please cite the Illinois State Water Survey's PICS (Public-Industrial-Commercial) Database in all publications based wholly or partially on this information.

Please Note:

The data in the PICS Database is a listing of municipal and large industrial and commercial wells which are known to the Illinois State Water Survey (ISWS). The information was initially entered from public water supply data and supplemented with the Illinois Water Inventory Project data. This database is updated as additional information is received and verified.

Winnebago County - PICS Database - Page 2 Thursday May 29 1997 10:37:36

SWS ID	Name	No.	Status	Location	Depth	Type log	Year constructed	Driller
20131930	ROSCOE ROCK AND GRAVEL	1	I	20146N02E291H	70	D	1992	EDWIN D GREENFIELD
20195500	NORTH PARK PWD	7	E	20146N02E291B	780	D	1984	ALBRECHT WELL DRLG
20195500	NORTH PARK PWD	6	E	20146N02E291B	780	D	1984	ALBRECHT WELL DRLG

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

MEMORANDUM

To: Tom Crause
BOL #24

From: Chris Bridges
Division of Laboratories/QAS

Date: December 8, 1994

Re: Contract Required Quantitation Limit and Instrument Detection Limit determination.

Tom,

On November 8, 1994 I mailed you a document outlining the procedures for determining CRQLs and IDLs. Since then, Judy Triller informed me that she was having problems using the CRQL procedure for some of her data. After reviewing the data that Judy was using, we realized the problem. Some of the data your staff may be looking at may be older data that was analyzed using older versions of the USEPA CLP-SOW. These older versions of the SOW had some different target compounds and different CRQLs than the more recent versions of the SOW. The original procedures I developed for determining the CRQLs will not work on samples that were analyzed by older versions of the SOW. What I have done is developed a new document on how to determine CRQLs and IDLs. I have taken the procedures I already developed and added a section on how to determine CRQLs for samples analyzed by older versions of the SOW (Section 1B). Section 1A and Section 2 of the document are actually the same procedures that I had already developed and given you. This document is enclosed with this memo.

I hope that with the added information this document will cover all data that your staff is using. If you or your staff have any questions please contact me.

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Contract Required Quantitation Limits (CRQLs) for Organic Compounds
and
Instrument Detection Limits (IDLs) for Inorganic Compounds

The following document gives the procedure for determining CRQLs and IDLs. The document is divided into the following three sections: Section 1A: Determining CRQLS for Organic Compounds analyzed via recent versions of the SOW, Section 1B: Determining CRQLs for Organic Compounds analyzed via older versions of the SOW, and Section 2: Determinings IDLs for Inorganic Compounds. The three sections are described below.

Section 1A and 1B: These sections are used to determine the CRQL for an organic compound in a particular sample. Some analyses that were completed under older versions of the USEPA Contract Laboratory Scope of Work (SOW) will have different CRQLs than analysis completed under more current versions of the SOW. For this reason, two separate sections are needed for determining the CRQLs (one for older versions and one for newer versions of the SOW). The two sections differ only in the way the compounds are grouped together. Section 1A is to be used if the samples were analyzed using a more current version of the SOW and Section 1B is to be used if the samples were analyzed using an older version of the SOW.

An easy way to determine if a sample was anlayzed by an older version of the SOW as compared to a newer version of the SOW is by the target compounds listed on the Form 1s. Older versions of the SOW contained certain target compounds that are no longer target compounds. If the target compounds listed below are present on the Form 1s, this indicates that the analysis were completed under an older version of the SOW. In this situation Section 1B should be used to determine the CRQLs. If these target compounds are not present on the Forms 1s, this indicates that the analysis were completed under a more current version of the SOW. In this situation Section 1A should be used to determine the CRQLs.

<u>Target compounds present in older versions of the SOW:</u>

Volatile Compounds:

Vinyl Acetate	CAS No. 10805-4
2-Cloroethyl Vinyl Ether	CAS No. 110-75-8

Semivolatile Compounds:

Benzyl Alcohol	CAS No. 100-51-6
bis(2-chloroisopropyl)ether	CAS No. 398638-32-9
Benzoic Acid	CAS No. 65-85-0

Section 2: This section is used to determine the IDLs for analytes in a particular sample. The procedures in this section are to be used regardless of whether the analyses were completed under an older version of the SOW or a more recent version of the SOW.

Section 1A: Determining Contract Required Quantitation Limits (CRQLs) for Organic Compounds analyzed via recent versions of the SOW

If an organic compound is not detected in a sample the result for that compound is reported as its' CRQL on the Form 1. Pages four and five of this section contain a list of the organic target compounds. Target compounds with the same CRQL are grouped together. By using these groups and the following steps, the CRQL for a compound in a particular sample can be determined.

Situation 1: Locate the result on the Form 1 (same sample) for a non-detected compound that is in the same group as the detected compound of interest. The result reported on the Form 1 for the non-detect compound is the CRQL for all compounds in that group.

Situation 2: If all compounds in a group are detected, a non detected compound from another group in the same fraction (same sample) can be used to determine the CRQL of the detected compound of interest. To do this either multiply or divide the result reported on the Form 1 of the non detected compound by the value listed in the charts below. The value obtained after multiplying or dividing the result is the CRQL of the compound of interest (and all compounds within that group).

Semivolatile compounds:

To group #

		2	3
From group #	2	--	X2.5
	3	÷2.5	--

Pesticide/Aroclors:

To group #

		4	5	6	7	8	9
	4	--	X2	X20	X10	X100	X40
	5	÷2	--	X10	X5	X50	X20
From group #	6	÷20	÷10	--	÷2	X5	X2
	7	÷10	÷5	X2	--	X10	X4
	8	÷100	÷50	÷5	÷10	--	÷2.5
	9	÷40	÷20	÷2	÷4	X2.5	--

Example of Situation 1 in the volatile fraction:

Compound of interest: Chloroethane (group 1)
Result reported on Form 1: 4300 'B' ug/kg.

Compound in group 1 that was a non detect on the Form 1: Carbon Disulfide
Result reported on Form 1: 2035 'U' ug/kg

All compounds in group 1 for <u>that sample</u> have a CRQL of 2035 ug/kg.

Example of Situation 2 in the semivolatile fraction:

Compound of interest: Nitrobenzene (group 2)
Result reported on Form 1: 620 'B' ug/kg.

All compounds in group 2 are detects on the Form 1. 3-Nitroaniline (group 3) is reported on the Form 1 as 800 'U' ug/kg. According to the semivolatile chart on page 2, to convert the CRQL from group 3 to group 2 the result from group 3 must be divided by 2.5 (800/2.5 = 320). All compounds in group 2 for <u>that sample</u> have a CRQL of 320 ug/kg.

Example of Situation 2 in the pesticide fraction:

Compound of interest: Aroclor 1232 (group 6)
Result reported on the Form 1: 82 'B' ug/kg

All compounds in group 6 are detects on the Form 1. Gamma-Chlordane (group 4) is reported as 3 'U' ug/kg on the Form 1. According to the pesticide/aroclor chart on page 2, to convert the CRQL from group 4 to 6 the result from group 4 must be multiplied by 20 (3 X 20 = 60). All compounds in group 6 for <u>that sample</u> have a CRQL of 60 ug/kg.

Group 1: *Volatile Organic Compounds*

Chloromethane	1,2-Dichloroethene (total)	cis-1,3-Dichloropropene	2-Hexanone
Bromomethane	Chloroform	Trichloroethene	Tetrachloroethene
Vinyl Chloride	1,2-Dichloroethane	Dibromochloromethane	Toluene
Chloroethane	2-Butanone	1,1,2-Trichloroethane	1,1,2,2-Tetrachloroethane
Methylene Chloride	1,1,1-Trichloroethane	Benzene	Chlorobenzene
Acetone	Carbon Tetrachloride	trans-1,3-Dichloropropene	Ethyl Benzene
Carbon Disulfide	Bromodichloromethane	Bromoform	Styrene
1,1-Dichloroethene	1,2-Dichloropropane	4-Methyl-2-pentanone	Xylenes (Total)
1,1-Dichloroethane			

Group 2: *Semivolatile Compounds*

Phenol	2,4-Dimethylphenol	Dibenz(a,h)anthracene	1,2,4-Trichlorobenzene
Naphthalene	bis(2-Chloroethoxy) methane	Fluorene	Phenanthrene
2-Chlorophenol	2,4-Dichlorophenol	Indeno(1,2,3-cd)pyrene	Hexachlorobenzene
1,3-Dichlorobenzene	Anthracene	4-Chlorophenyl-phenyl ether	Benzo(g,h,i)perylene
1,4-Dichlorobenzene	bis(2-Chloroethyl) ether	Benzo(a)pyrene	4-Bromophenyl-phenylether
1,2-Dichlorobenzene	4-Chloroaniline	Diethylphthalate	N-nitrosodiphenylamine
2-Methylphenol	Carbazole	Chrysene	Benzo(k)fluoranthene
2,2'-oxybis (1-Chloropropane)	2,4,6-Trichlorophenol	Acenaphthylene	2,4-Dinitrotoluene
4-Methylphenol	Hexachlorocyclopentadiene	4-Chloro-3-methylphenol	Benzo(b)fluoranthene
N-Nitroso-di-n-propylamine	Pyrene	Benzo(a)anthracene	Dibenzofuran
Hexachloroethane	Fluoranthene	Dimethylphthalate	Di-n-octylphthalate
Nitrobenzene	2-Methylnaphthalene	3,3'-Dichlorobenzidine	Acenaphthene
Isophorone	Di-n-butylphthalate	2-Chloronaphthalene	bis(2-Ethylhexyl)phthalate
2-Nitrophenol	Hexachlorobutadiene	Butylbenzylphthalate	2,6-Dinitrotoluene

Group 3: *Semivolatile compounds*

2,4,5-Trichlorophenol	2-Nitroaniline	3-Nitroaniline	2,4-Dinitrophenol
4-Nitrophenol	4-Nitroaniline	4,6-Dinitro-2-Methylphenol	Pentachlorophenol

Group 4: *Pesticides/Aroclors*

alpha-BHC	beta-BHC	delta-BHC	gamma-BHC (Lindane)
Aldrin	Heptaclor epoxide	alpha-Chlordane	gamma-Chlordane
Heptachlor	Endosulfan I		

Group 5: *Pesticides/Aroclors*

Dieldrin	4,4'-DDE	Endosulfan II	Endrin
4,4'-DDD	Endosulfan sulfate	4,4'-DDT	Endrin ketone
Endrin aldehyde			

Group 6: *Pesticides/Aroclors*

Arochlor 1016	Arochlor 1232	Arochlor 1242	Arochlor 1248
Arochlor 1254	Arochlor 1260		

Group 7: *Pesticides/Aroclors*

Methoxychlor

Group 8: *Pesticides/Aroclors*

Toxaphene

Group 9: *Pesticides/Aroclors*

Arochlor 1221

Section 1B: Determining Contract Required Quantitation Limits (CRQLs) for Organic Compounds analyzed via older versions of the SOW

If an organic compound is not detected in a sample the result for that compound is reported as its' CRQL on the Form 1. Pages eight through ten of this section contain a list of the organic target compounds. Target compounds with the same CRQL are grouped together. By using these groups and the following steps, the CRQL for a compound in a particular sample can be determined.

Situation 1: Locate the result on the Form 1 (same sample) for a non-detected compound that is in the same group as the detected compound of interest. The result reported on the Form 1 for the non-detect compound is the CRQL for all compounds in that group.

Situation 2: If all compounds in a group are detected, a non detected compound from another group in the same fraction (same sample) can be used to determine the CRQL of the detected compound of interest. To do this either multiply or divide the result reported on the Form 1 of the non detected compound by the value listed in the charts below. The value obtained after multiplying or dividing the result is the CRQL of the compound of interest (and all compounds within that group).

Volatile compounds

		To group #	
		1	2
From group #	1	--	X2
	2	÷2	--

Semivolatile compounds:

		To group #		
		3	4	5
	3	--	÷5	÷2.5
From group #	4	X5	--	X2
	5	÷2.5	÷2	--

Pesticide/Aroclors:

		To group #		
		6	7	8
	6	--	X2	X20
From group #	7	÷2	--	X10
	8	÷20	÷10	--

Example of Situation 1 in the volatile fraction:

Compound of interest: Chloroethane (group 1)
Result reported on Form 1: 5000 'B' ug/kg.

Compound in group 1 that was a non detect on the Form 1: 2-Hexanone
Result reported on Form 1: 2035 'U' ug/kg

All compounds in group 1 for <u>that sample</u> have a CRQL of 2035 ug/kg.

Example of Situation 2 in the semivolatile fraction:

Compound of interest: 4-Nitophenol (group 3)
Result reported on Form 1: 6000 'B' ug/kg.

All compounds in group 3 are detects on the Form 1. 2,4-Dichlorophenol (group 4) is reported on the Form 1 as 1100 'U' ug/kg. According to the semivolatile chart on page 6, to convert the CRQL from group 4 to group 3 the result from group 4 must be multiplied by 5 (1100X5 = 5500). All compounds in group 3 for <u>that sample</u> have a CRQL of 5500 ug/kg.

Example of Situation 2 in the pesticide fraction:

Compound of interest: Aroclor 1232 (group 6)
Result reported on the Form 1: 82 'B' ug/kg

All compounds in group 6 are detects on the Form 1. 4,4-DDT (group 7) is reported as 18 'U' ug/kg on the Form 1. According to the pesticide/aroclor chart on page 6, to convert the CRQL from group 7 to 6 the result from group 7 must be divided by 2 (18/2 = 9). All compounds in group 6 for <u>that sample</u> have a CRQL of 9 ug/kg.

Group 1: *Volatile Organic Compounds*

Chloromethane	2-Chloroethyl Vinyl Ether	Bromomethane	2-Butanone
Chloroethane	2-Hexanone	Acetone	Vinyl Acetate
Vinyl Chloride	4-Methyl-2-pentanone		

Group 2: *Volatile Organic Compounds*

Methylene Chloride	1,1,1-Trichloroethane	Trichloroethene	Chlorobenzene
Carbon Tetrachloride	Chloroform	1,2-Dichloropropane	Ethyl Benzene
Carbon Disulfide	Bromoform	Bromodichloromethane	Styrene
1,1-Dichloroethane	1,2-Dichloroethene (total)	Toluene	Benzene
1,2-Dichloroethane	cis-1,3-Dichloropropene	Tetrachloroethene	Dibromochloromethane
1,1,2-Trichloroethane	trans-1,3-Dichloropropene	Xylenes (Total)	1,1-Dichloroethene

Group 3: *Semivolatile Comounds*

2,4,5-Trichlorophenol	2-Nitroanaline	3-Nitroanaline	2,4-Dinitrophenol
4-Nitrophenol	4,6-Dinitro-2-Methylphenol	4-Nitroanaline	Pentachlorophenol

Group 4: *Semivolatile Compounds*

Phenol	2,4-Dimethylphenol	Dibenz(a,h)anthracene	1,2,4-Trichlorobenzene
Naphthalene	bis(2-Chloroethoxy) methane	Fluorene	Phenanthrene
2-Chlorophenol	2,4-Dichlorophenol	4-Chloroaniline	Hexachlorobenzene
1,3-Dichlorobenzene	4-Chlorophenyl-phenyl ether	Anthracene	Benzo(g,h,i)perylene
1,4-Dichlorobenzene	bis(2-Chloroethyl) ether	Benzo(a)pyrene	4-Bromophenyl-phenylet
1,2-Dichlorobenzene	Indeno(1,2,3-cd)pyrene	Diethylphthalate	N-nitrosodiphenylamine
2-Methylphenol	2,2'-oxybis (1-Chloropropane)	Chrysene	Benzo(k)fluoranthene
Carbazole	2,4,6-Trichlorophenol	Acenaphthylene	2,4-Dinitrotoluene
4-Methylphenol	Hexachlorocyclopentadiene	Fluoranthene	Benzo(b)fluoranthene
Pyrene	N-Nitroso-di-n-propylamine	Benzo(a)anthracene	Dibenzofuran
Hexachloroethane	4-Chloro-3-methylphenol	Dimethylphthalate	Di-n-octylphthalate
Nitrobenzene	2-Methylnaphthalene	3,3'-Dichlorobenzidine	Acenaphthene
Isophorone	Di-n-butylphthalate	2-Chloronaphthalene	bis(2-Ethylhexyl)phthala
2-Nitrophenol	Hexachlorobutadiene	Butylbenzylphthalate	2,6-Dinitrotoluene

Group 5: *Semivolatile Compounds*

3,3'-Dichlorobenzidine

Group 6: *Pesticides/Aroclors*

alpha-BHC	beta-BHC	delta-BHC	gamma-BHC (Lindane)
Aldrin	Heptaclor epoxide	Methoxychlor	Chlordane
Heptachlor	Endosulfan I	Arochlor 1248	Arochlor 1016
Arochlor 1221	Arochlor 1232	Arochlor 1242	

Group 7: *Pesticides/Aroclors*

Dieldrin	4,4'-DDE	Endosulfan II	Endrin
4,4'-DDD	Endosulfan sulfate	4,4'-DDT	Endrin Ketone

Group 8: *Pesticides/Aroclors*

Aroclor 1254	Aroclor 1260	Toxaphene

Section 2: Instrument Detection Limits (IDLs) for Inorganic Analytes

If an inorganic analyte is not detected in a sample the result for that analyte is report as the IDL on the Form 1. Inorganic analytes can not be grouped together by IDLs as organic compounds are grouped by CRQLs. Each individual analyte has its own IDL.

To determine the IDL of a water sample the Form 10 (for water samples) from the data package is required. This form list the laboratories IDLs for each analyte. For water samples the IDLs listed on the Form 10 are the IDLs that would be reported on the Form 1 if analytes were non detects. A copy of a Form 1 and Form 10 for a water sample is attached.

To determine the IDL of a soil sample a units conversion must be done and the percent solids must be taken into account. The following equation can be used to determine the IDL for an analyte in a soil sample.

$$IDL = \frac{I \times V}{W \times S}$$

Where:

I	=	IDL on the Form 10
V	=	Volume in **liters** on the Form 13
W	=	Weight of sample indicated on Form 13
S	=	% Solids on the Form 1 divided by 100

As indicated in the equation, three forms are required to calculate the IDL for an analyte in a particular sample. The three forms are described below.

Form 1: Result report form. The % solids are listed in the header of the form.

Form 10: Instrument Detection Limits form. This form lists the laboratories IDLs for each analyte in either a water or soil matrix.

Form 13: Preparation Log for each sample. This form reports the sample weights and volumes used for digestion. The method by which the sample was prepared and analyzed is indicated on the Form 1 in the column marked 'M' (method column). The method column will be marked with either a P, PM, F, FM, AV, AS or T. The header of the Form 13 will also indicate what method the preparation log is describing. If the analyte on the Form 1 has a PM in the method column use the Form 13 with a PM in the header. Make sure that the volume and weight used from the Form 13 is for the correct sample. There may be two Form 13s for a method code (i.e. two Form 13s with the method code PM). One Form 13 is for water and one is for soil. The Form 13 for waters will not have sample weights indicated. The Form 13 for soils will have sample weights indicated.

Example of IDL determination for a soil sample:

A copy of the Form 1, Form 10s, and Form 13s used for the example are attached at the end of this section.

Analyte of interest: Barium in X104
Result reported on the Form 1: 69.7 mg/kg

IDL listed on the soil Form 10 for Barium: 7 ug/l
Volume of sample used on the Form 13 for X104: 200 ml
Weight of sample used on the Form 13 for X104: 1.3 grams
% Solids listed on the Form 1: 79.8

$$IDL = \frac{7 \times 0.2}{1.3 \times .798}$$

Barium IDL for X104 = 1.35 mg/kg

U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

G101

Lab Name: ILLINOIS EPA CHAMPAIGN LAB Contract: JAMES DAY PAINTS

Lab Code: Case No.: SAS No.: SDG No.: 113

Matrix (Water): Lab Sample ID: B410369

Level (Low/Med): Date Received: 07/15/94

% Solids:

Concentration Units (ug/L):

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	33.0	U		PM
7440-36-0	Antimony	56.0	U		PM
7440-38-2	Arsenic	1.0	U		FM
7440-39-3	Barium	39.4	B		PM
7440-41-7	Beryllium	1.0	U		PM
7440-43-9	Cadmium	4.0	U		PM
7440-70-2	Calcium	89900			PM
7440-47-3	Chromium	2.0	U		PM
7440-48-4	Cobalt	12.0	U		PM
7440-50-8	Copper	3.6	B		PM
7439-89-6	Iron	6.7	B		PM
7439-92-1	Lead	1.6	B		FM
7439-95-4	Magnesium	54400			PM
7439-96-5	Manganese	1.7	B		PM
7439-97-6	Mercury				AV
7440-02-2	Nickel	14.0	U		PM
7440-09-7	Potassium	1570	B		PM
7782-49-2	Selenium	1.0	U		FM
7440-22-4	Silver	4.0	U		PM
7440-23-5	Sodium	14900			PM
7440-28-0	Thallium	1.0	U		FM
7440-62-2	Vanadium	2.0	U		PM
7440-66-6	Zinc	15.1	B		PM
	Cyanide	10.0	U		AS
	Sulfide	1000	U		T
	Sulfate	66700			AS
	Boron				PM

Color Before: Colorless Clarity Before: Clear Texture:

Color After: Colorless Clarity After: Clear Artifacts:

Comments: SULFIDE SW846 METHODOLOGY

SULFATE IEPA METHODOLOGY

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

X104

Lab Name: ILLINOIS EPA CHAMPAIGN LAB Contract: JAMES DAY PAINTS

Lab Code: Case No.: SAS No.: SDG No.: 113

Matrix (Soil): Lab Sample ID: B410375

Level (Low/Med): Date Received: 07/15/94

% Solids: 79.8 *

Concentration Units (mg/kg dry weight):

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	19800			P
7440-36-0	Antimony	9.6	U	N	P
7440-38-2	Arsenic	6.9		S	FM
7440-39-3	Barium	69.7			P
7440-41-7	Beryllium	0.98			P
7440-43-9	Cadmium	0.77	U		P
7440-70-2	Calcium	63500			P
7440-47-3	Chromium	29.5			P
7440-48-4	Cobalt	12.0			P
7440-50-8	Copper	22.3			P
7439-89-6	Iron	24500			P
7439-92-1	Lead	14.5			FM
7439-95-4	Magnesium	32000			P
7439-96-5	Manganese	458			P
7439-97-6	Mercury	0.03	U		AV
7440-02-2	Nickel	32.4			P
7440-09-7	Potassium	4950			P
7782-49-2	Selenium	0.28	U	W,N	FM
7440-22-4	Silver	0.77	U		P
7440-23-5	Sodium	157	B		P
7440-28-0	Thallium	0.28	U		FM
7440-62-2	Vanadium	39.7			P
7440-66-6	Zinc	56.1			P
	Cyanide	1.0	U		AS
					AS

Color Before: Brown Clarity Before: Opaque Texture: Fine

Color After: Colorless Clarity After: Clear Artifacts:

Comments:

U.S. EPA - CLP

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ILLINOIS EPA CHAMPAIGN LAB Contract: JAMES DAY PAINTS

Lab Code: Case No.: SAS No.: SDG No.: 113

ICP ID Number: 03 Date: 07/01/94 ICP

Flame AA ID Number:

Furnace AA ID Number: (As-4) (Pb-3) (Se-4) (Tl-3) 05/01/94 FURNACE (Hg-1) 07/01/94

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.21		200	33.0	PM
Antimony	206.81		60	56.0	PM
Arsenic	193.60	BZ	10	1.0	FM
Barium	493.41		200	8.0	PM
Beryllium	313.107		5	1.0	PM
Cadmium	226.50		5	4.0	PM
Calcium	317.93		5000	164.0	PM
Chromium	267.71		10	2.0	PM
Cobalt	228.61		50	12.0	PM
Copper	324.75		25	3.0	PM
Iron	259.94		100	5.0	PM
Lead	220.353	BZ	3	1.0	FM
Magnesium	279.08		5000	197.0	PM
Manganese	257.61		15	1.0	PM
Mercury	253.70		0.2	0.05	AV
Nickel	231.60		40	14.0	PM
Potassium	766.49		5000	889.0	PM
Selenium	196.00	BZ	5	1.0	FM
Silver	328.06		10	4.0	PM
Sodium	588.99		5000	170.0	PM
Thallium	276.80	BZ	10	1.0	FM
Vanadium	292.40		50	2.0	PM
Zinc	213.86		20	3.0	PM

Comments: THE IDLs HAVE BEEN ADJUSTED TO REFLECT THE 1.11 MICROWAVE DIGESTION FACTOR FOR WATERS.

FORM X - IN WATER

ILM03.0

B000044

U.S. EPA - CLP

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ILLINOIS EPA CHAMPAIGN LAB Contract: JAMES DAY PAINTS

Lab Code: Case No.: SAS No.: SDG No.: 113

ICP ID Number: 03 Date: 07/01/94 ICP

Flame AA ID Number:

Furnace AA ID Number: (As-4) (Pb-3) (Se-4) (Tl-3) 05/01/94 FURNACE
(Hg-1) 07/01/94

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.21		200	30.0	P
Antimony	206.81		60	50.0	P
Arsenic	193.60	BZ	10	1.0	FM
Barium	493.41		200	7.0	P
Beryllium	313.107		5	1.0	P
Cadmium	226.50		5	4.0	P
Calcium	317.93		5000	148.0	P
Chromium	267.71		10	2.0	P
Cobalt	228.61		50	11.0	P
Copper	324.75		25	3.0	P
Iron	259.94		100	4.0	P
Lead	220.353	BZ	3	1.0	FM
Magnesium	279.08		5000	177.0	P
Manganese	257.61		15	1.0	P
Mercury	253.70		0.2	0.05	AV
Nickel	231.60		40	12.0	P
Potassium	766.49		5000	800.0	P
Selenium	196.00	BZ	5	1.0	FM
Silver	328.06		10	4.0	P
Sodium	588.99		5000	153.0	P
Thallium	276.80	BZ	10	1.0	FM
Vanadium	292.40		50	2.0	P
Zinc	213.86		20	3.0	P

Comments:

FORM X - IN ILM03.0

SOIL

B000045

U.S. EPA - CLP
13
PREPARATION LOG

LAB NAME: ILLINOIS EPA CHAMPAIGN LAB CONTRACT: JAMES DAY PAINTS
LAB CODE: ——— CASE NO.: ——— SAS NO: ——— SDG NO.: 113
METHOD: PM

LAB SAMPLE ID	EPA SAMPLE NO.	PREPARATION DATE	WEIGHT (gram)	VOLUME (mL)
PBW		7-22-94		50
LCSW		7-22-94		50
B410369	G101	7-22-94		50
B410369D	G101	7-22-94		50
B410369S	G101	7-22-94		50
B410370	G102	7-22-94		50
B410371	G103	7-22-94		50
B410377	G501	7-22-94		50
B410378	G104	7-22-94		50
B410379	G105	7-22-94		50
B410380	G106	7-22-94		50
B410381	G107	7-22-94		50

FORMXIII - IN 3/90

B000053

U.S. EPA - CLP
13
PREPARATION LOG

LAB NAME: ILLINOIS EPA CHAMPAIGN LAB CONTRACT: JAMES DAY PAINTS
LAB CODE: _____ CASE NO.: _____ SAS NO: _____ SDG NO.: 113
METHOD: FM

LAB SAMPLE ID	EPA SAMPLE NO.	PREPARATION DATE	WEIGHT (gram)	VOLUME (mL)
PBW		7-22-94		50
LCSW		7-22-94		50
B410369	G101	7-22-94		50
B410369D	G101	7-22-94		50
B410369S	G101	7-22-94		50
B410370	G102	7-22-94		50
B410371	G103	7-22-94		50
B410377	G501	7-22-94		50
B410378	G104	7-22-94		50
B410379	G105	7-22-94		50
B410380	G106	7-22-94		50
B410381	G107	7-22-94		50

FORMXIII - IN 3/90

B000054

U.S. EPA - CLP
13
PREPARATION LOG

LAB NAME: ILLINOIS EPA CHAMPAIGN LAB CONTRACT: JAMES DAY PAINTS
LAB CODE: _____ CASE NO.: _____ SAS NO: _____ SDG NO.: 113
METHOD: P (*)

LAB SAMPLE ID	EPA SAMPLE NO.	PREPARATION DATE	WEIGHT (gram)	VOLUME (mL)
PBS		7-19-94		200
LCSS		7-19-94	1.00	200
B410372	X101	7-19-94	1.00	200
B410372D	X101	7-19-94	1.00	200
B410372S	X101	7-19-94	1.00	200
B410373	X102	7-19-94	1.03	200
B410374	X103	7-19-94	1.46	200
B410375	X104	7-19-94	1.30	200 *
B410376	X105	7-19-94	1.27	200

FORMXIII - IN 3/90

B000055

U.S. EPA - CLP
13
PREPARATION LOG

LAB NAME: ILLINOIS EPA CHAMPAIGN LAB CONTRACT: JAMES DAY PAINTS
LAB CODE: _____ CASE NO.: _____ SAS NO: _____ SDG NO.: 113
METHOD: FM

LAB SAMPLE ID	EPA SAMPLE NO.	PREPARATION DATE	WEIGHT (gram)	VOLUME (mL)
PBS		7-19-94		100
LCSS		7-19-94	0.50	100
B410372	X101	7-19-94	0.50	100
B410372D	X101	7-19-94	0.50	100
B410372S	X101	7-19-94	0.50	100
B410373	X102	7-19-94	0.47	100
B410374	X103	7-19-94	0.46	100
B410375	X104	7-19-94	0.45	100
B410376	X105	7-19-94	0.52	100

FORMXIII - IN 3/90

B000056

U.S. EPA - CLP
13
PREPARATION LOG

LAB NAME: ILLINOIS EPA CHAMPAIGN LAB CONTRACT: JAMES DAY PAINTS
LAB CODE: ——— CASE NO.: ——— SAS NO: ——— SDG NO.: 113
METHOD: AV

LAB SAMPLE ID	EPA SAMPLE NO.	PREPARATION DATE	WEIGHT (gram)	VOLUME (mL)
3.0		7-28-94		137
2.0		7-28-94		137
1.0		7-28-94		137
0.5		7-28-94		137
0.2		7-28-94		137
0.1		7-28-94		137
0.0		7-28-94		137
ICV= 1.5ppb		7-28-94		137
CCV= 1.0ppb		7-28-94		137
LCSS		7-28-94	0.20	137
B410372	X101	7-28-94	0.20	137
B410372 D	X101	7-28-94	0.20	137
B410372S	X101	7-28-94	0.20	137
B410373	X102	7-28-94	0.20	137
B410374	X103	7-28-94	0.20	137
B410375	X104	7-28-94	0.20	137
B410376	X105	7-28-94	0.20	137

FORMXIII - IN 3/90

U.S. EPA - CLP
13
PREPARATION LOG

LAB NAME: ILLINOIS EPA CHAMPAIGN LAB CONTRACT: JAMES DAY PAINTS
LAB CODE: _____ CASE NO.: _____ SAS NO: _____ SDG NO.: 113
METHOD: Cyanide

LAB SAMPLE ID	EPA SAMPLE NO.	PREPARATION DATE	WEIGHT (gram)	VOLUME (mL)
Blank		07/25/94		250
0.005		07/25/94		250
0.010		07/25/94		250
0.050		07/25/94		250
0.100		07/25/94		250
0.180		07/25/94		250
0.200		07/25/94		250
ICV		07/25/94		250
ICB		07/25/94		250
PB		07/25/94		250
LCS (Aqueous)		07/25/94		250
LCS (Solids)		07/25/94	5.00	250
B410369	G101	07/25/94		250
B410369 D	G101	07/25/94		250
B410369 S	G101	07/25/94		250
B410370	G102	07/25/94		250
B410371	G103	07/25/94		250
B410377	G501	07/25/94		250
B410378	G104	07/25/94		250
B410379	G105	07/25/94		250
B410380	G106	07/25/94		250
B410381	G107	07/25/94		250
B410372	X101	07/25/94	3.00	250
B410372 D	X101	07/25/94	3.00	250
B410372 S	X101	07/25/94	3.00	250
B410373	X102	07/25/94	3.00	250
B410374	X103	07/25/94	3.00	250
B410375	X104	07/25/94	3.00	250
B410376	X105	07/25/94	3.00	250

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

MEMORANDUM
DRAFT

DATE: May 28, 1997

TO: Ali Hyderi and Judy Triller

FROM: Jerry Willman, JW Project Manager

SUBJECT: Information on 104(e) responses and potential liability

SITE NUMBER: L2010400015 Winnebago
Evergreen Manor Groundwater Contamination Site
Superfund/Tech

Please find attached Tables 1 and 2. According to the information currently in my possession, Table 1 includes those parties who the Illinois EPA feels are responsible for the groundwater contamination, and Table 2 includes those parties who the Illinois EPA feels are not responsible.

TABLE 1

PRP NAME	DESCRIPTION OF ACTIVITIES	EVIDENCE FOR RESPONSIBILITY	FIRM LIKELY A PRP
Ecolab, Inc.	Manufacture of detergents began on-site in 1956 under the name of Klenzade. *(104E #7)* In 1973 the chemical plant shut down and the mechanical plant started operations in 1975. *(104E #8)* Prior to 1973 the plant had a release of an acid/caustic mixture to the waste lagoon. A waste survey in 1980 identified that Ecolab dumped 9000 gallons/day of cooling water into their drainage pond and used 1,1,1 trichloroethane (1,1,1-TCA) in a vapor degreaser. *(104E #8 Attachment)* Soils and sludge were removed from the lagoon in 1979. **The IEPA representative who was present for the removal noted that contaminants had leached through the clay liner into the underlying soils. The representative also noted that the underlying soils had a definite chemical odor and were largely comprised of surfical sand deposits providing a migration pathway to the groundwater.** *(12/11/79 Memorandum, Attached)* The IEPA has no record of any organics analyses performed on the soils or sludges. The Vapor degreaser was removed in 1987. *(104E #8 attachment)* Interesting fact: In May 1992, the law offices of Chapmen and Cutler filed a FOIA regarding all public records pertaining to Ecolab and AAA Disposal Systems, Inc.	Several wastestreams created by the facility include 1,1,1 trichloroethane and Tetrachloroethylene (PCE) indicating that they were used throughout the facility. Wastewater lagoon improperly maintained, contaminated soils had chemical odor, likely due to volatile organics. Sand beneath the lagoon provided likely pathway to groundwater. The Agency's monitoring well #103, installed immediately downgradient of the facility contained the highest readings obtained among all monitoring wells for both 1,1,1-TCA, and Tetrachloroethylene (PCE). *(IEPA groundwater investigation 03/23/94 and 02/21/95)* Bureau of Water (Chuck Corley) noted that Ecolab had a questionable wastewater disposal program prior to 1980 and discharges probably contained organics. *(Telephone conversation 12/95)*	**YES**

PRP NAME	DESCRIPTION OF ACTIVITIES	EVIDENCE FOR RESPONSIBILITY	FIRM LIKELY A PRP
Waste Management of Wisconsin, Inc.	On September 30, 1988 WMI purchased certain of the business assets of AAA Disposal Systems. *(104E #5)* On September 23, 1988 WMI took several soil samples on the property that showed elevated levels of benzene, xylene and toluene. *(104E #13)* In May and June of 1989 AAA Disposal systems and WMI conducted further investigations on the property including soil borings and groundwater samples. *(104E #13)* **Soil borings F7, F2, performed on their property in May of 1989 identified soils as having a "chemical odor". *(104E Attachment 2 Soil Boring Logs)* Groundwater samples taken on the property from well number G103 and G104 in 1989 identified PCE, 1,1,1-TCA, and trichloroethene (TCE). *(104E Attachment 2 Analytical Reports)* Soil samples R-8, F-1, F-8 taken on the property in 1989 identified TCE and PCE. *(104E Attachment 2 Analytical Reports)* Soil samples F-4 and F-7 identified toluene and xylene. *(104E Attachment 2 Analytical Reports)* PCBs were identified in soil samples F-7 and F-2. *(104E Attachment 2 Analytical Reports)* Landfilling of septic sludge, oily wastes, and general refuse occurred at the property prior to WMI's involvement as was established by IEPA personnel during site visits in 1974, 1975, and 1976. *(File Excerpts, attached)* On April 30, 1990 two crushed 55-gallon drums and cardboard boxes containing glass vials full of flammable liquid were uncovered on the property. A removal was conducted later, on August 27, 1990. The removal occurred over a 19 day period and during that time, 1,380 cubic yards of material was excavated including more of the glass vials. The glass vials were repackaged for shipment in 162, 16-gallon capacity drums. The expansion of the excavation was limited on the north, west and east by structures and the property line. OVM readings on the walls which were left in place were 82 ppm, 82 ppm and 154 ppm on the north, west and east walls respectively. *(104E Attachment 4)*** An investigation was carried out by WMI during January of 1990 prior to the purchase of property south of the existing facility. The investigations were carried out because WMI suspected that the properties had fill material on them consisting of waste. **The property had soil concentrations which were estimated at between 3-5ppb PCE and 1-2 ppb 1,1,1-TCA. *(104E Attachment 5* Samples taken by IDPH and IEPA of WMI's private well were among the most highly contaminated with 10.9 ppb cis-1,2 Dichloroethene (cis-1,2-DCE) and 8.8 ppb of 1,1-Dichloroethane (1,1-DCA). The well was also contaminated with 40.8ppb 1,1,1-Trichloroethane. *SSI Report***	Soil borings performed on the property in 1989 identified PCE and TCE. Groundwater samples taken on the property identified PCE, 1,1,1-TCA, and TCE. PCBs were also identified in soil samples. Landfilling of oily wastes, septic sludge and an unknown flammable liquid has occurred at the property. Samples taken by IDPH and IEPA of WMI's private well were among the most highly contaminated for cis-1,2 DCE and 1,1-DCA. Soil samples taken at the facility have shown the presence of these contaminants as well.	**YES**

PRP NAME	DESCRIPTION OF ACTIVITIES	EVIDENCE FOR RESPONSIBILITY	FIRM LIKELY A PRP
AAA Disposal Systems, Inc (Jack Ter Maat, Registered Agent/ Richard Ter Maat)	Jack Ter Matt was the registered agent and owner of the property now owned by WMI. Richard Ter Maat was the President of AAA. *(Jack's 104E #2)* **Site visit conducted by IEPA personnel on March 5, 1974 established that Richard Ter Maat was operating a sanitary landfill without a permit, illegally accepting liquid wastes comprised of 18% (sewage/septic tank) sludge.** *(Attached file Excerpts)* **An October 3, 1974 inspection established that AAA was now accepting waste oil as well,** still without a permit. *(Attached file Excerpts)* **On March 24, 1976, an IEPA inspection of the AAA facility identified a newly excavated area in which a rather large volume of oily waste material (resembling used motor oil) as well as concrete refuse was placed.** *(Attached file Excerpts)* In 1982, IEPA issued a permit for the development of a municipal waste transfer station. **Inspections conducted after the facility was built identified a floor drain with a floor trap, septic tank and drain field.** The facility also had three (3), 1500 gallon underground storage tanks which may have been used to store waste as was indicated in an 1984 letter from Richard Ter Mat to Thomas Cavanaugh of the IEPA. *(Attached file Excerpts)*	Richard Ter Maat operated a landfill without a permit, illegally accepting liquid wastes comprised of 18% sewage/septic tank sludge, as well as general refuse, and waste oil periodically from March 5, 1974 through September 20, 1977. Despite the IEPA's requests to halt such operations, AAA Disposal continued to accept waste.	YES

PRP NAME	DESCRIPTION OF ACTIVITIES	EVIDENCE FOR RESPONSIBILITY	FIRM LIKELY A PRP
Regal-Beloit Corp.	Regal Beloit is a manufacturer of steel cutting tools and has operated on the site since 1955.*(104E # 8)* **They generate numerous wastestreams including: 1,1,1-TCA, Mineral Spirits, TCE, and waste oil.***(104E Appendix A)* **Since 1978 Regal Beloit claims it has used 1,1,-TCA and TCE in a closed loop system, manifesting out approximately 100 gallons of spent solvent per year.***(104E Request for Additional Information #3 and 104E #3 and #7)* In 1984 Bob Wengrow (IEPA) requested a study of the company's septic system because Regal Beloit was discharging wastewaters containing cyanide, barium, and chromium to the system. In addition to the above metals, **sample 31029 from the water table near the septic field identified 40.9 ppb of 1,1,1-TCA, trace amounts of TCE, and 42.2 ppb of carbon tetrachloride.***(104E Appendix D, D1-D17)* Regal Beloit had 5 USTs on-site which they claim contained used oil and mineral spirits. The tanks were removed in 1986 and had no signs of leakage *(104E Appendix D, D18-D25*. In 1987 the waste storage building went through RCRA closure. **Twelve (12) soil samples were taken from 4 borings around the area. 9/12 samples contained TCE ranging from 1.7 ppb to 7.2 ppb. Three samples contained 1,1,1-TCA at levels ranging from 1.7 ppb to 2.3 ppb.***(104E Appendix D, D26-D59* **It is important to note that the detection limits for these tests were 5 ppb.** The IEPA granted a request from Regal Beloit moving the clean-up level for TCE from 5.0 ppb to 7.2 ppb so that no clean-up was required.*(104E Appendix D, D26-D59*	Regal Beloit generates numerous wastestreams including 1,1,1-TCA and TCE. Analysis performed on sample 31029 from the water table near the septic field identified 40.9 ppb of 1,1,1-TCA, trace amounts of TCE, and 42.2 ppb of carbon tetrachloride. Samples taken during RCRA closure of Regal Beloit's waste storage area identified TCE and 1,1,1-TCA at levels below 7.2 ppb. Monitoring Well Sample from G114, located next to the facility contained 3ppb 1,1,1-TCA. Also, residential well #5207 on Rockton Road, immediately south of the facility had 24ppb 1,1,1-TCA.*(CERCLA Expanded Site Investigation Report)*	**YES**

TABLE 2

PRP NAME	DESCRIPTION OF ACTIVITIES	EVIDENCE FOR RESPONSIBILITY	FIRM LIKELY A PRP
Private citizen (Dayle's Welding Service, Armour Specialty, Ker-Son Machine Shop, Roscoe VW Service, Oscar Auto Clinic, Greenberg Furniture, Rockford Steam Boiler, McGuire Auto Body.)	Since approximately 1978 a private citizen has owned and operated Dayle's Welding Service and Armour Specialty (plastic crafting) as well as renting out several small business and storage units which included the following: Ker-Son Machine Shop, Roscoe VW Service, Oscar Auto Clinic, Greenberg Furniture, Rockford Steam Boiler, McGuire Auto Body. **Claims that no chemical waste was produced at his properties, no parts washing occurred, and only human waste entered the septic systems.**	No probable link between company and groundwater contamination was identified.	NO
Makerite Manufacturing Company, Inc.	Makerite started operations in 1978 and provides precision machining service for aerospace industry. **Makerite has operated two 250 gallon parts washers on-site since 1989. The spent mineral spirits is picked up by Safety Kleen. One manifest description included D039 and D040, Tetrachloroethylene and Trichloroethylene respectively. 104E indicated that Safety Kleen installed and continues to service the parts washers.** A 1000 gallon Diesel UST was removed in May 1992 (soil analysis revealed only Toluene at 79.5 ppb). Makerite claims that only human waste goes into septic system.	No probable link between company and groundwater contamination was identified.	NO
State Line Foundries Inc.	State line began manufacturing grey and ductile iron castings on-site in 1967. Stateline has generated a non-hazardous foundry sand sine 1986. Two USTs are located on-site and still in operation. One is 500 gallon gas tank for company vehicles and the other, a 2000 gallon water tank for machine operation. Stateline started using a parts washer system in April of 1995. The solvent used is Petroleum Naphtha. The only connection to the septic system is through the bathroom.	No probable link between company and groundwater contamination was identified.	NO
Private citizen	Place of residence at what is now owned by Waste Management	No link identified between citizen and groundwater contamination identified.	NO
Private citizens	Place of residence at what is now owned by State Line Foundries.	No link identified between citizens and groundwater contamination identified.	NO
Private citizen	None	Responded indicating no involvement. Never lived within the area of concern.	NO

PRP NAME	DESCRIPTION OF ACTIVITIES	EVIDENCE FOR RESPONSIBILITY	FIRM LIKELY A PRP
Electro-Cam Corp.	Electro Cam Corp. has operated since 1979 as a manufacturer of electronic rotary cam limit switches. Electro Cam has used isopropyl alcohol to perform small stainless steel parts washing prior to the cam's assembly (generates approximately 25 gallons per year). **Electro Cam did use 1,1,1 TCA in 12 to 16oz aerosol cans prior to their outlaw. Small amounts of the spray cans were bought at the local hardware store.** The cans were used at the worker's stations to clean stainless steel parts prior to assembly in the cam and finally, shipment to customers. Electro Cam does have a septic system and claims that only human waste and potable water is put into the system. **No floor drains are located within the main manufacturing area, only within the bathrooms and shipping areas.**	No probable link between company and groundwater contamination was identified.	NO

1990 CP-1-15

1990 Census of Population

General Population Characteristics

Illinois

Issued June 1992

U.S. Department of Commerce
Barbara Hackman Franklin, Secretary
Rockwell A. Schnabel, Deputy Secretary

Economics and Statistics Administration
Mark W. Plant, Acting Under Secretary
for Economic Affairs and Administrator

BUREAU OF THE CENSUS
Barbara Everitt Bryant, Director

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Table 2. Summary of General Characteristics of Households and Families: 1990—Con.

[For definitions of terms and meanings of symbols, see text]

State Urban and Rural and Size of Place Inside and Outside Metropolitan Area County Place and [In Selected States] County Subdivision [1,000 or More Persons]	All households	Percent of all households												Persons per—	
		Family households						Nonfamily households							
				Married-couple family		Female householder, no husband present			Householder living alone						
											65 years and over				
		Total	With own children under 18 years	Total	With own children under 18 years	Total	With own children under 18 years	Total	Total	Female	Total	Female	Householder 65 years and over	Household	Family
COUNTY—Con.															
Lawrence County	6 320	70.4	30.6	58.8	24.1	9.0	5.3	29.6	27.4	18.4	16.3	13.3	32.5	2.43	2.95
Lee County	12 475	71.6	34.3	60.6	28.0	8.0	4.7	28.4	25.1	15.5	12.7	10.3	26.5	2.59	3.10
Livingston County	13 737	72.7	34.0	62.2	28.0	7.8	4.6	27.3	24.7	15.5	12.8	10.4	27.9	2.58	3.09
Logan County	11 033	70.3	33.2	59.1	26.6	8.6	5.3	29.7	26.9	18.2	14.4	12.1	28.6	2.49	3.02
McDonough County	12 255	61.9	27.9	52.4	22.4	7.5	4.6	38.1	29.6	18.2	13.4	10.9	26.1	2.35	2.92
McHenry County	62 940	79.1	42.1	69.0	37.0	7.1	3.8	20.9	16.9	9.6	6.9	5.4	16.8	2.89	3.28
McLean County	46 796	64.8	32.7	54.1	26.3	8.3	5.2	35.2	26.1	15.7	8.7	7.1	18.3	2.52	3.06
Macon County	45 996	70.3	33.1	56.3	24.4	11.4	7.4	29.7	26.4	16.0	11.4	9.2	24.2	2.49	3.01
Macoupin County	18 176	73.4	34.0	61.7	27.3	8.9	5.3	26.6	24.3	16.0	15.0	11.9	30.8	2.56	3.05
Madison County	94 857	72.1	34.1	57.9	26.3	11.2	6.5	27.9	23.9	15.0	11.2	9.1	24.1	2.59	3.08
Marion County	16 272	70.9	34.5	57.2	26.2	10.7	6.8	29.1	26.7	17.7	14.3	11.7	28.8	2.51	3.04
Marshall County	4 900	74.3	32.7	65.4	28.1	6.0	3.2	25.7	23.6	14.9	14.2	11.3	31.6	2.57	3.05
Mason County	6 342	73.2	33.7	62.1	27.0	7.9	5.1	26.8	24.2	14.9	13.5	10.3	29.7	2.54	3.01
Massac County	5 908	71.7	31.9	58.7	24.9	10.2	5.8	28.3	26.7	17.6	15.0	11.9	31.1	2.44	2.94
Menard County	4 199	76.0	37.1	65.4	30.7	8.0	5.0	24.0	22.0	14.4	12.3	10.1	25.2	2.61	3.06
Mercer County	6 572	75.0	35.3	65.7	29.6	6.8	4.3	25.0	22.8	14.4	13.8	10.9	27.9	2.60	3.05
Monroe County	8 189	76.2	36.9	67.5	32.8	6.4	3.3	23.8	21.0	13.0	10.8	8.4	23.2	2.70	3.16
Montgomery County	11 480	72.0	34.0	61.2	27.7	8.0	4.7	28.0	25.8	17.4	15.9	12.7	32.0	2.53	3.05
Morgan County	13 678	67.9	31.8	56.5	25.1	8.8	5.4	32.1	28.6	18.5	14.0	11.4	27.5	2.44	3.02
Moultrie County	5 122	75.4	35.0	66.2	29.8	7.0	3.9	24.6	23.0	15.4	13.4	11.0	29.4	2.61	3.07
Ogle County	17 132	74.6	36.0	64.6	30.2	7.1	4.3	25.4	22.2	13.4	10.8	8.6	24.1	2.65	3.11
Peoria County	70 797	67.5	32.4	52.5	23.0	12.3	8.2	32.5	28.1	16.9	11.3	9.0	23.8	2.49	3.08
Perry County	8 306	72.5	34.6	60.7	28.2	9.1	5.2	27.5	25.5	16.7	15.1	12.3	30.0	2.54	3.06
Piatt County	5 934	75.8	34.9	67.1	29.9	6.5	3.9	24.2	21.7	14.1	11.6	9.9	25.6	2.58	3.02
Pike County	7 016	71.3	31.1	61.7	26.2	6.9	3.7	28.7	26.5	17.5	16.8	13.3	34.4	2.47	2.99
Pope County	1 611	71.9	31.3	62.6	25.8	7.3	4.5	28.1	26.3	15.5	14.4	10.2	31.8	2.45	2.95
Pulaski County	2 957	68.5	32.0	51.3	21.7	14.1	8.8	31.5	29.4	18.3	17.6	13.2	34.2	2.52	3.13
Putnam County	2 204	75.2	34.8	65.5	29.1	6.8	4.4	24.8	22.9	12.9	12.2	9.3	27.9	2.60	3.06
Randolph County	11 949	72.4	35.5	61.2	28.9	8.3	5.0	27.6	25.3	15.6	13.9	10.7	28.4	2.57	3.09
Richland County	6 503	71.9	33.2	61.0	27.1	8.1	4.8	28.1	26.0	17.5	13.8	11.6	28.8	2.49	3.00
Rock Island County	59 317	67.3	31.8	53.0	22.7	11.5	7.7	32.7	28.6	17.5	12.6	10.1	25.3	2.44	3.01
St. Clair County	95 333	72.1	36.2	52.1	24.7	16.4	9.9	27.9	24.4	14.5	10.3	8.1	22.7	2.71	3.24
Saline County	10 839	67.9	30.7	55.4	24.1	10.0	5.6	32.1	30.1	20.6	18.5	14.9	33.9	2.36	2.94
Sangamon County	72 146	65.9	32.1	51.9	23.9	11.3	6.8	34.1	29.4	18.7	11.3	9.3	22.7	2.43	3.04
Schuyler County	3 002	72.2	31.5	63.1	25.9	7.0	4.5	27.8	25.1	16.0	14.7	11.7	31.9	2.46	2.94
Scott County	2 190	73.5	34.5	62.4	28.2	8.4	4.6	26.5	24.3	16.5	14.8	12.2	30.8	2.55	3.04
Shelby County	8 563	75.1	34.0	66.1	28.8	6.1	3.5	24.9	22.7	14.9	14.3	11.3	31.0	2.58	3.03
Stark County	2 512	72.9	32.2	64.1	27.6	6.2	3.3	27.1	25.3	17.1	14.8	12.3	32.0	2.55	3.08
Stephenson County	18 920	70.3	32.9	59.4	26.4	8.3	5.2	29.7	26.0	16.3	12.7	10.2	26.6	2.50	3.03
Tazewell County	47 171	74.1	35.6	63.3	29.0	8.3	5.3	25.9	22.8	14.0	10.3	8.3	22.5	2.59	3.06
Union County	6 838	71.0	31.9	60.2	25.9	8.0	4.7	29.0	27.0	17.8	15.4	12.3	31.4	2.43	2.95
Vermilion County	34 072	70.2	33.1	55.9	24.3	11.2	7.1	29.8	27.0	17.3	13.6	10.9	27.1	2.50	3.03
Wabash County	5 032	71.6	34.0	61.0	28.2	7.9	4.5	28.4	25.3	16.3	13.9	11.0	27.8	2.56	3.09
Warren County	7 393	70.0	32.8	59.1	25.8	8.4	5.6	30.0	27.5	17.1	14.9	11.9	29.7	2.48	3.03
Washington County	5 658	73.1	34.4	64.4	30.1	5.8	3.1	26.9	25.3	15.8	15.1	11.5	32.3	2.59	3.13
Wayne County	6 935	73.0	32.3	63.9	27.3	7.1	4.2	27.0	25.4	17.5	15.9	13.0	33.2	2.46	2.95
White County	6 845	70.3	30.4	60.4	25.0	7.3	4.1	29.7	28.0	18.9	16.6	13.6	33.4	2.36	2.87
Whiteside County	22 740	73.6	35.2	62.4	28.2	8.3	5.3	26.4	23.6	14.8	11.8	9.6	25.6	2.60	3.09
Will County	116 933	79.2	43.3	66.1	36.3	9.9	5.6	20.8	17.7	9.9	6.8	5.4	16.1	2.98	3.40
Williamson County	23 120	69.7	32.5	57.9	25.8	9.4	5.4	30.3	27.5	18.2	14.7	12.1	28.7	2.44	2.97
Winnebago County	96 727	71.0	34.5	57.0	26.1	10.9	6.8	29.0	24.5	14.3	9.5	7.5	21.2	2.57	3.08
Woodford County	11 395	78.6	40.0	70.1	34.9	6.0	3.8	21.4	19.5	11.9	10.5	8.4	24.6	2.78	3.21
PLACE AND COUNTY SUBDIVISION															
Abingdon city	1 383	70.8	35.9	58.4	27.4	9.3	6.2	29.2	25.9	17.2	14.6	12.3	27.0	2.55	3.08
Addison village	10 722	78.5	40.3	63.9	33.2	10.3	5.7	21.5	17.5	9.1	4.1	3.3	11.6	2.98	3.39
Albion city	911	63.2	28.2	53.2	22.1	7.7	4.8	36.8	35.0	25.6	22.3	18.6	40.5	2.27	2.93
Aledo city	1 444	67.4	30.6	58.5	24.4	6.9	5.0	32.6	30.1	22.4	20.7	17.5	36.6	2.39	2.99
Algonquin village	3 875	84.3	49.6	77.2	45.9	5.2	3.0	15.7	12.5	6.4	3.0	2.3	9.1	3.01	3.32
Alorton village	886	79.1	49.5	26.3	12.4	46.3	34.1	20.9	17.4	9.0	4.7	2.9	14.7	3.34	3.69
Alsip village	6 716	71.3	37.7	56.7	30.5	11.0	5.8	28.7	24.0	13.3	7.8	6.2	17.1	2.71	3.28
Altamont city	867	71.0	37.4	57.3	28.0	11.2	7.7	29.0	27.0	17.5	14.5	11.2	28.8	2.54	3.10
Alton city	12 969	65.3	30.7	46.4	19.6	15.4	9.4	34.7	30.5	19.3	15.3	12.5	29.5	2.47	3.10
Amboy city	901	66.5	34.1	53.6	26.6	9.2	5.5	33.5	30.5	19.9	16.8	13.9	29.4	2.55	3.22
Andalusia village	372	83.1	40.9	69.1	33.6	10.5	6.2	16.9	14.2	8.6	5.6	4.8	14.5	2.83	3.12
Anna city	2 131	60.3	25.5	47.2	17.6	10.8	6.6	39.7	38.2	27.8	23.1	19.6	39.9	2.09	2.75
Antioch village	2 234	72.4	40.7	57.5	31.4	11.2	7.6	27.6	22.5	14.4	10.9	8.7	19.7	2.73	3.24
Arcola city	1 009	70.4	33.7	60.2	27.6	6.9	4.6	29.6	26.1	17.0	15.2	12.6	28.1	2.54	3.06
Arlington Heights village	28 810	71.7	31.4	63.4	28.3	6.2	2.5	28.3	23.7	15.2	8.4	7.0	19.0	2.58	3.11
Arthur village	858	71.0	31.9	61.7	27.5	6.9	3.3	29.0	27.4	20.0	17.0	14.1	33.2	2.38	2.90
Ashland village	483	73.9	35.4	63.8	30.8	7.7	3.5	26.1	24.0	15.7	12.8	10.1	29.8	2.60	3.11
Ashton village	408	72.5	34.6	60.5	27.7	8.6	5.4	27.5	24.0	16.7	13.0	11.8	26.7	2.55	3.05
Assumption city	535	66.0	29.0	55.7	23.2	8.6	4.7	34.0	32.3	23.9	21.7	18.5	39.6	2.33	2.95
Astoria village	493	64.7	27.8	53.8	21.5	8.1	4.7	35.3	32.7	22.5	22.3	18.3	36.9	2.34	2.94
Athens city	552	71.2	35.1	59.6	27.2	9.6	6.7	28.8	25.9	19.4	15.2	13.4	27.9	2.54	3.09
Atlanta city	629	72.7	38.5	59.9	30.8	10.5	6.0	27.3	25.4	18.0	15.4	12.9	28.5	2.57	3.10
Atwood village	505	74.7	33.7	62.2	25.7	10.1	6.7	25.3	22.8	15.4	11.7	10.1	24.4	2.48	2.92
Auburn city	1 330	75.9	42.9	60.1	32.9	13.3	8.5	24.1	20.6	13.5	10.2	8.8	22.0	2.75	3.20
Aurora city	33 710	72.1	41.0	55.4	30.9	12.2	7.8	27.9	22.7	12.7	7.8	6.3	15.9	2.90	3.45
Bannockburn village	301	90.0	46.5	86.0	44.9	2.3	1.0	10.0	7.0	4.3	1.3	.3	11.6	3.06	3.22
Barrington village	3 508	76.2	35.9	66.0	31.4	8.2	3.8	23.8	20.6	13.9	9.6	8.3	21.2	2.68	3.12
Barrington Hills village	1 366	89.9	38.6	83.4	35.7	3.7	1.6	10.1	8.3	3.8	3.2	1.9	14.6	3.07	3.22
Barry city	544	67.8	29.8	56.6	23.7	9.9	5.9	32.2	29.8	21.9	21.3	17.6	39.5	2.39	2.98
Bartlett village	6 365	82.9	49.4	73.5	44.3	7.0	4.1	17.1	13.2	6.6	2.9	2.3	7.9	3.03	3.36

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Reference 31

STATE OF ILLINOIS 1975
DEPARTMENT OF REGISTRATION AND EDUCATION

Handbook Of Illinois Stratigraphy

H. B. Willman
Elwood Atherton
T. C. Buschbach
Charles Collinson
John C. Frye
M. E. Hopkins
Jerry A. Lineback
Jack A. Simon

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ILLINOIS STATE GEOLOGICAL SURVEY

URBANA, ILLINOIS 61801

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Urbana, Illinois 61801 **1975**

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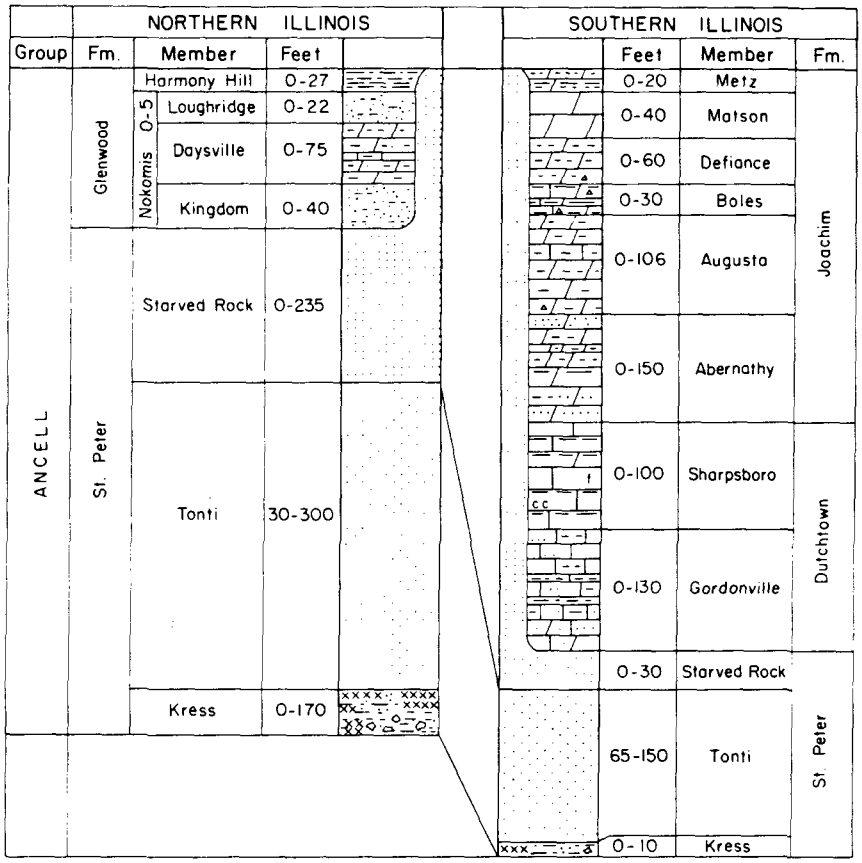

Fig. O-15—Columnar section of the Ancell Group (after Templeton and Willman, 1963).

nantly dolomite Dutchtown and Joachim Formations in the upper part of the Ancell Group. At the base in northern Illinois it locally includes the Daysville Dolomite Member of the Glenwood Formation. The Ottawa Megagroup underlies most of the state and thickens from about 300 feet in northern Illinois to 1300 feet in southern Illinois (fig. O-14). In local areas where the St. Peter Sandstone is absent, the Ottawa Megagroup rests on the Knox Dolomite Megagroup but generally is readily distinguished from it.

Ancell Group

The Ancell Group (Templeton and Willman, 1963, p. 29), named for Ancell in southeastern Missouri, consists of the sandstone and the argillaceous and sandy limestone and dolomite formations that overlie the Everton Dolomite and underlie the Platteville Group, which is relatively pure limestone. The type section is a composite of several sections in the bluffs north of Ancell, between Dutchtown and Rock Levee, Missouri. As the Everton is present only in southern Illinois, the Ancell Group overlies Canadian strata in most of the state or Cambrian strata locally. Ancell strata underlie most of Illinois, and they vary in thickness from a few feet to as much as 900 feet. The St. Peter Sandstone is the basal formation in the group. North of a line roughly extending from Chicago to Quincy, the Ancell strata above the St. Peter Sandstone consist of the members of the Glenwood Formation, but south of that line they consist of the Joachim and Dutchtown Formations (fig. O-15). The Glenwood, Dutchtown, and Joachim Formations all appear to have a facies relation to the upper part (Starved Rock Member) of the St. Peter Sandstone (fig. O-16).

St. Peter Sandstone

The St. Peter Sandstone (Owen, 1847, p. 169-170; Calvin, 1906, p. 73; Bevan, 1926, p. 6) is named for the St. Peter River in Minnesota, now called the Minnesota

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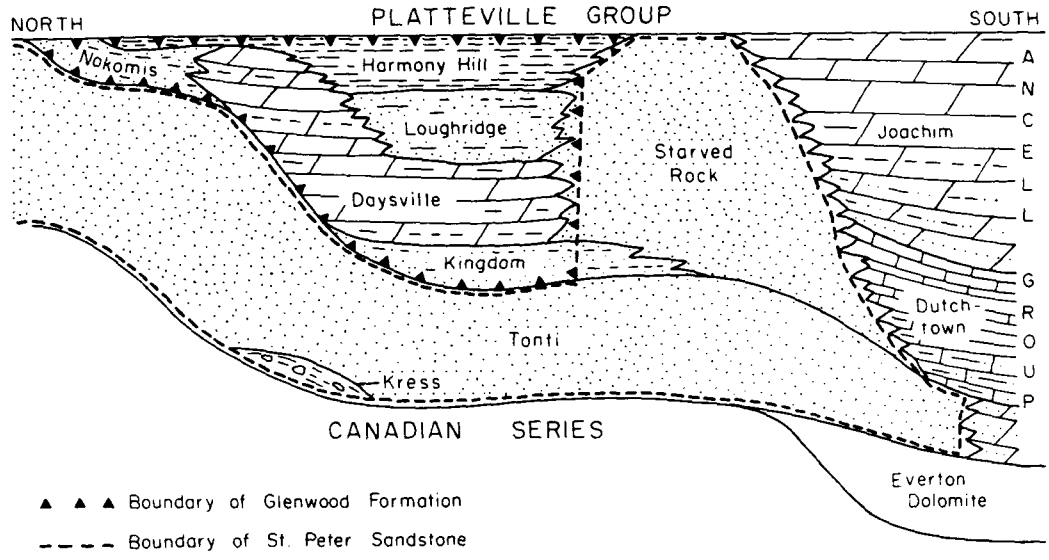

Fig. O-16—Diagrammatic cross section of the Ancell Group (after Templeton and Willman, 1963).

River. The type section is in the river bluffs at Fort Snelling on the southeast edge of Minneapolis. The St. Peter Sandstone is present in most of Illinois (fig. O-17). Because of a major unconformity at its base, the St. Peter truncates formations as old as the Cambrian Franconia Formation (fig. O-13). It is generally overlain by the Glenwood Formation in northern Illinois, the Joachim Dolomite in the central part of the state, and the Dutchtown Limestone in the extreme south, and it has a facies relation to these formations (fig. O-16). The St. Peter is well exposed along the Illinois and Fox Rivers near Ottawa (fig. O-2A), the Rock River near Oregon, and the Mississippi River near West Point Landing in Calhoun County. The St. Peter Sandstone varies from only a few feet to more than 700 feet thick, but commonly it is 100-200 feet thick. The greater thicknesses occur in northern Illinois, where the pre-St. Peter surface had sharp relief on a strongly developed karst topography and a north-facing escarpment of early Ordovician and late Cambrian dolomite formations (Buschbach, 1961). The St. Peter consists largely of fine to medium, well sorted, well rounded, frosted grains of quartz sand that is friable or weakly cemented. Except in a few local areas, the St. Peter is exceptionally pure quartz sand, essentially free from clay, carbonates, and heavy minerals. Some beds have low-angle cross bedding, but the bedding is largely horizontal (Lamar, 1928a; Willman and Payne, 1942; Buschbach, 1964). The St. Peter includes three members, the Kress Member at the base (chert, sand, clay, and shale), the Tonti Sandstone Member, and the Starved Rock Sandstone Member (fig. O-15). The St. Peter is nonfossiliferous, except for local worm borings (*Scolithus*) and a few scolecodonts in the upper part of the formation. The St. Peter is generally considered to be a marine sand deposited near the shore of a sea advancing from the south (Dapples, 1955). It is equivalent to a sandy zone at the base of the Pamelia Formation in New York and to a light-colored dolomite at the base of the Murfreesboro Limestone in Tennessee. The St. Peter

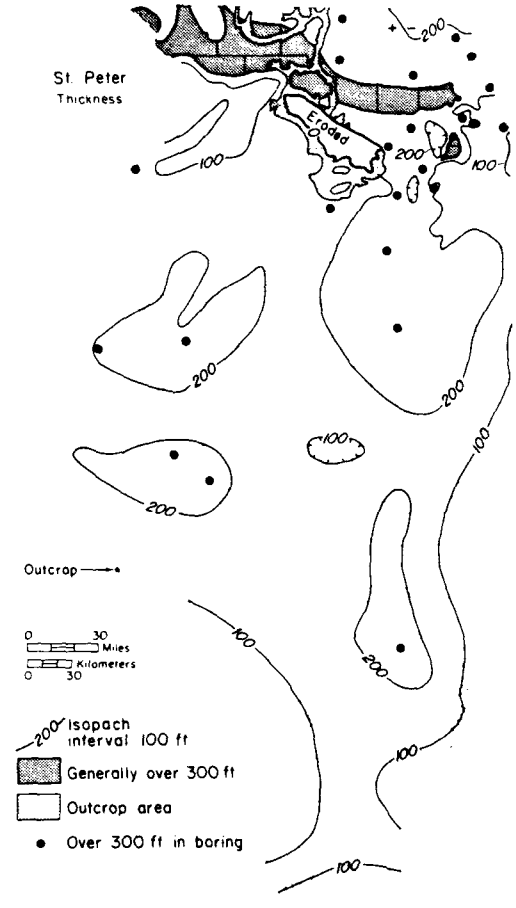

Fig. O-17—Thickness of the St. Peter Sandstone.

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Sandstone is extensively quarried for silica sand and is one of the major aquifers in Illinois.

Kress Member—The Kress Member of the St. Peter Sandstone (Buschbach, 1964, p. 51), the basal member, is named for Kress Creek, a stream northwest of West Chicago, Du Page County, near which a well (NW NE SE 32, 40N-9E) encountered 64 feet of conglomerate at the base of the St. Peter, the top at a depth of 940 feet. The type section is represented by samples from the well (SS 1169). The Kress Member is very irregular in occurrence but has been encountered in many wells. Its maximum thickness is 170 feet in a well in Ogle County, where a thin layer of bentonite occurs near its base. The Kress in some places is a coarse rubble or conglomerate of chert in a matrix of clay or sand, a residue from the solution of the underlying cherty dolomites and sandstones. At other places the Kress is largely red sandy clay, red and green shale, and argillaceous sandstone that represent reworking of the residual materials by the advancing St. Peter sea. The conglomerate is locally exposed in the Oregon region, Ogle County, and the shale is exposed at Utica, La Salle County.

Tonti Sandstone Member—The Tonti Sandstone Member of the St. Peter Sandstone (Templeton and Willman, 1963, p. 45), the middle member, is named for Tonti Canyon in Starved Rock State Park. The top of the sandstone is exposed in the canyon, but the type section is at Starved Rock, La Salle County (SW NW NW 22, 33N-2E), where the contact with the overlying Starved Rock Sandstone Member and the upper 40 feet of the Tonti Member are exposed. The Tonti is entirely exposed in the bluffs at Split Rock, 4 miles northwest of Starved Rock. The Tonti Member generally forms the greater part of the St. Peter Sandstone, and in many areas all the St. Peter is Tonti. Although commonly from 100-200 feet thick, it is locally over 500 feet thick. The Tonti Member is chiefly fine-grained, well sorted, friable, highly porous sandstone, but locally in western Illinois it is even finer grained, silty, less porous, and partly cemented by secondary silica. It is noncalcareous, except in southern Illinois where it contains some dolomitic beds.

Starved Rock Sandstone Member—The Starved Rock Sandstone Member of the St. Peter Sandstone (Templeton and Willman, 1963, p. 46), the uppermost member, is named for Starved Rock in Starved Rock State Park, La Salle County. The type section is in Starved Rock and French Canyon (W1/2 NW 22, 33N-2E), where the member is 90 feet thick. All except the upper few feet of the member is exposed in Starved Rock. The Starved Rock Sandstone differs from the Tonti Member in being largely medium grained rather than fine grained and somewhat more cross bedded. It has a sharp contact with the Tonti Sandstone in most exposures (Willman and Payne, 1942). It is commonly 60-100 feet thick and occurs in a broad band, extending southwestward from the Chicago area to the Mississippi River in the Quincy area (fig. O-18). It is locally present in extreme southern Illinois. The Starved Rock Member is believed to represent an offshore bar that separated Glenwood sedimentation on the north from Joachim sedimentation on the south, and it has a facies relation to both. At Starved Rock the lower part of the member contains thin beds with the poor sorting characteristic of the sandstones in the Glenwood Formation.

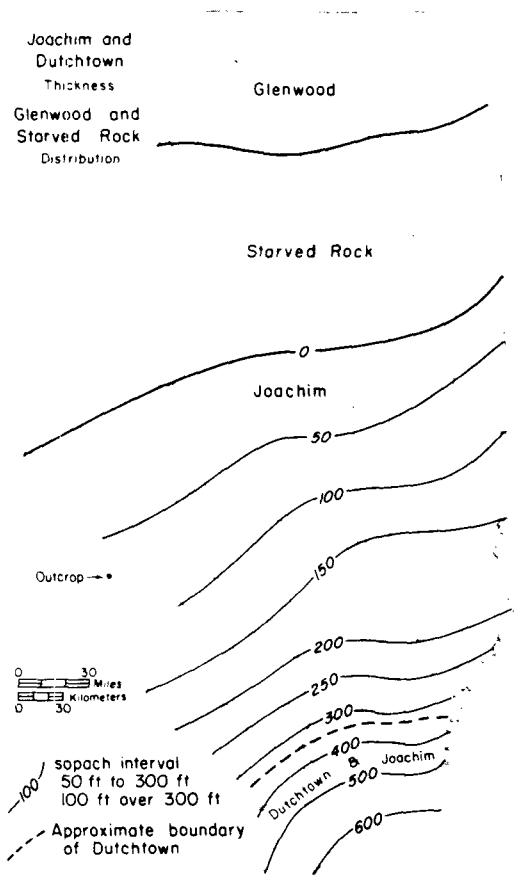

Fig. O-18—Thickness of the Dutchtown Limestone and Joachim Dolomite and the distribution of the Starved Rock Sandstone Member of the St. Peter Sandstone and the Glenwood Formation.

Glenwood Formation

The Glenwood Formation (Calvin, 1906, p. 60-61; Bevan, 1926, p. 6), a highly varied unit of sandstone, dolomite, and shale overlying the St. Peter Sandstone, is named for Glenwood Township, Winneshiek County, northeastern Iowa. The type section is in a ravine 3 miles northeast of Decorah (SE SW 6, 98N-7W). The Glenwood Formation is widely present in northern Illinois (fig. O-18). It underlies the Platteville Group, from which it is separated by an unconformity that is widespread and sharp but has only minor relief. It is exposed in Illinois only in the Rock River region above Dixon. Although absent in some localities, especially near the Wisconsin state line, thicknesses of 25-50 feet are common and the formation is as much as 75 feet thick in places. The Glenwood Formation is characteristically poorly sorted sandstone, impure dolomite, and green shale. The sandstones have a distinctive bimodal, or "pudding stone," texture, with medium grains of well rounded quartz sand, like those of the St. Peter Sandstone, in a matrix of very fine sand and coarse silt. This is frequently referred to as Glenwood texture, in contrast to the well sorted St. Peter texture. The Glenwood sandstones also contain a variety of heavy minerals, including abundant garnet, whereas the St. Peter has a very low content of a limited suite of heavy minerals, consisting largely of tourmaline and zircon. The Glenwood Formation is subdivided into five members—the Kingdom Sandstone Member at the base is overlain by the Daysville Dolomite Member, the Loughridge Sandstone Member, and the Harmony Hill Shale Member. The lower three have gradational contacts and

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generally thicken and thin at the expense of each other. Locally in northwestern Illinois the Daysville Dolomite Member is absent, and the name "Nokomis Sandstone Member" is applied to all the sandstone of Glenwood type underlying the Harmony Hill Shale. In extreme western Illinois the St. Peter Sandstone is overlain by a green shale, above which a well sorted St. Peter-like sandstone is informally called the "Re-Peter" sandstone. In Illinois the green shale has been correlated with the Kingdom Sandstone and the "Re-Peter" with the Starved Rock Sandstone (Templeton and Willman, 1963). In Iowa the green shale has been correlated (Agnew, 1955) with type Glenwood Shale, which is the Harmony Hill Shale. If the latter is correct, the "Re-Peter" may correlate with the Hennepin Sandstone Member, which in places is a St. Peter-like sandstone at the base of the overlying Pecatonica Formation. The Glenwood Formation contains a few worm borings, a few scolecodonts, and, in places, dark red algae or spores.

Kingdom Sandstone Member—The Kingdom Sandstone Member of the Glenwood Formation (Templeton and Willman, 1963, p. 49), the basal member, is named for Kingdom, Lee County, which is 3 miles south of the type section (ravine in NE SE NW 36, 23N-9E, Ogle County), where it is 7.9 feet thick. It commonly is 5-20 feet thick but has a maximum thickness of 40 feet. It has the poor sorting typical of the Glenwood texture. In most of the outcrops it has a sharp contact with the underlying Tonti Sandstone Member of the St. Peter. It thins northward and westward as it grades into the overlying Daysville Member, and farther north it is equivalent to the lower part of the Nokomis Member.

Daysville Dolomite Member—The Daysville Dolomite Member of the Glenwood Formation (Templeton and Willman, 1963, p. 50), which commonly overlies the Kingdom Sandstone Member, is named for Daysville, Ogle County, which is 3 miles southwest of the type section (ravine in NW NW SW 6, 23N-11E), where it is 23.8 feet thick. It is commonly 15-25 feet thick in the outcrop area but is about 45 feet thick, and locally 75 feet thick, in subsurface in an area extending from De Kalb County eastward to Lake Michigan. It thins rapidly northward, and southward it grades into the Starved Rock Member of the St. Peter Sandstone. The Daysville is the only calcareous member of the Glenwood. It is largely argillaceous, silty, sandy, greenish gray to white, chalky to dense dolomite and occurs in irregular beds. Locally it is conglomeratic with intraformational dolomite pebbles, and, where it directly overlies the Tonti Sandstone Member of the St. Peter, the basal part contains interbedded layers of sandstone of the St. Peter type. Worm borings are the only fossils known.

Loughridge Sandstone Member—The Loughridge Sandstone Member of the Glenwood Formation (Templeton and Willman, 1963, p. 51), the upper sandstone member, is named for Loughridge School, which is 5 miles northwest of the type section, a ravine 4 miles north of Grand Detour, Ogle County (N1/2 NW NE NE 25, 23N-9E), where it is 9.8 feet thick. It is differentiated only in the area where the Daysville Dolomite is present. The Loughridge is commonly less than 10 feet thick in the outcrop area but is 22 feet thick in a well at Dixon. It has the typical Glenwood texture. It merges westward and northward with the upper part of the Nokomis Sandstone Member and southward in subsurface with the Starved Rock Sandstone Member of the St. Peter Sandstone.

Nokomis Sandstone Member—The Nokomis Sandstone Member of the Glenwood Formation (Templeton and Willman, 1963, p. 51), which commonly includes all the sandstone of the formation in extreme northern Illinois and farther north, is named for Lake Nokomis, 1.5 miles west of the type section in the bluff on the west side of the Mississippi River at Lock and Dam No. 1 in Minneapolis, Minnesota, where the member is 10.8 feet thick. It rests on the St. Peter Sandstone and is overlain by the Harmony Hill Shale Member. The Nokomis Member results from the merger northward of the Kingdom and Loughridge Sandstone Members beyond the margin of the intervening Daysville Dolomite Member. It has the typical Glenwood texture and generally rests sharply on the underlying St. Peter Sandstone. It has a maximum thickness of 11 feet in Illinois but is generally less than 5 feet and is absent in places.

Harmony Hill Shale Member—The Harmony Hill Shale Member of the Glenwood Formation (Templeton and Willman, 1963, p. 52), the uppermost member, is named for Harmony Hill School, which is 1 mile northwest of the type section, a ravine 5 miles north of Grand Detour, Ogle County (W1/2 SE SE NE 24, 23N-9E), where the member is 5.9 feet thick. It is the most widely distributed member of the Glenwood Formation but is locally absent in the outcrop area and is generally absent in subsurface in northeastern Illinois. It is commonly 1-5 feet thick but has a maximum thickness of 27 feet in southwestern Ogle County. The Harmony Hill Member is a green, pyritic, finely laminated shale containing thin laminae of silt and very fine sand, but in places it becomes very sandy, and locally it is black. Phosphatic pellets are common near the top. It contains a few fragments of scolecodonts, *Lingula*, and minute, dark red algae or spores. It is conformable, usually gradational, with the underlying members, but it locally rests unconformably on the St. Peter Sandstone. It is unconformably overlain by the Pecatonica Formation. In some areas in the Upper Mississippi Valley it is the only unit included in the Glenwood and is called the Glenwood Shale.

Dutchtown Limestone

The Dutchtown Limestone (McQueen, 1937, p. 12), which overlies the St. Peter Sandstone and underlies the Joachim Dolomite in extreme southern Illinois (fig. O-18), is named for Dutchtown, Cape Girardeau County, Missouri. The type section is in a bluff 1 mile east of Dutchtown. The Dutchtown Limestone is not exposed in Illinois, but it has been penetrated in wells as far north as southern Jackson County, thinning in that direction from a known thickness of about 150 feet in the Cape Girardeau area (fig. O-18). However, drilling near by in Kentucky suggests it is as much as 200 feet thick in southeastern Illinois (DuBois, 1945; Templeton and Willman, 1963). The Dutchtown is largely dark gray (nearly black), argillaceous, lithographic limestone and dolomite. When freshly broken it has a strongly fetid odor. It contains beds of gray and brown shaly limestone and dolomite, calcareous siltstone, and dolomitic sandstone. Its dark color and prevalence of limestone differentiates it from the overlying Joachim Dolomite. It is differentiated into two members, the Gordonville below (largely dolomite) and the Sharpsboro above (largely limestone). The Dutchtown is fossiliferous, and mollusks, ostracodes, and conodonts are the most abundant fossils. It appears to grade laterally into the St. Peter Sandstone. The Dutchtown Limestone is correlated with similar dark limestone in the Murfreesboro Limestone in Tennessee and the Pamelia Limestone in New York.

Gordonville Member—The Gordonville Member of the Dutchtown Limestone (Templeton and Willman, 1963, p. 54), the lower member, is named for Gordonville, Cape Girardeau County, Missouri, 4.5 miles northwest of the type sec-

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tion, which is in the Geiser Quarry, 1.25 miles east of Dutchtown (SW NW NW 20, projected, 30N-13E), where the upper 5 feet is exposed. In wells in Illinois the Gordonville Member ranges from 130 feet thick in southern Pulaski County to 45 feet in southwestern Jackson County, north of which it thins out rapidly. It does not extend as far north as the overlying Sharpsboro Member. The Gordonville Member normally consists of dolomite with subordinate amounts of limestone, but in southern Jackson County, close to the transition into the St. Peter Sandstone, it is composed mainly of dolomite-cemented, medium-grained sandstone. The dolomite and limestone are mostly sandy, silty, greenish gray to dark gray, and a few layers are dark brown to black.

Sharpsboro Member—The Sharpsboro Member of the Dutchtown Limestone (Templeton and Willman, 1963, p. 55), the upper member, is named for Sharpsboro, Cape Girardeau County, Missouri, a railroad station 5.5 miles southeast of the type section, the same as that for the Gordonville Member, where the lower 10.5 feet of the Sharpsboro is exposed. The Sharpsboro Member is 65 feet thick in a well in Pulaski County, but it is 100 feet in the type locality, as shown by a well at Cape Girardeau, Missouri. It apparently thins out rapidly in Jackson County, Illinois, extending only a short distance north of the limit of the Gordonville Member. The Sharpsboro Member is largely a dark gray, dark brown, or black lithographic limestone. It contains beds of dark gray dolomite, sandy limestone, and dark brown shale. A few beds of light gray dolomite, like that found in the Joachim above, occur near the top. The contact with the Joachim is conformable. The fauna of the Dutchtown Limestone comes largely from the Sharpsboro Member.

Joachim Dolomite

The Joachim Dolomite (Winslow, 1894, p. 331, 352; McQueen, 1937, p. 12), the uppermost formation in the Ancell Group in southern Illinois, is named for Joachim Creek in Jefferson County, Missouri, along which the lower part is partially exposed. A more complete section in the bluffs between Cape Girardeau and Dutchtown, Missouri, has been suggested as a supplementary reference section (Templeton and Willman, 1963, p. 55). The Joachim Dolomite is exposed in Illinois only in Calhoun County (fig. O-2D), where the Mississippi River cuts through the Lincoln Anticline. However, it underlies all of Illinois south of a line extending from near Quincy to Kankakee (fig. O-18). North of there it has a gradational contact with the Starved Rock Member of the St. Peter Sandstone. The Joachim thins northward by progressive termination of the basal Joachim strata. It is as much as 385 feet thick in extreme southern Illinois. The Joachim Dolomite has a highly varied lithology, but individual units are widely persistent. Although largely light gray, argillaceous, silty or sandy dolomite, it contains beds of brownish gray, relatively pure dolomite, beds of sandstone and limestone, some thin shale beds, and numerous algal domes of pure dolomite. In the outcrop area, chert occurs only near the middle, but it is more common in the subsurface in Illinois. Layers of anhydrite in the subsurface appear to have been dissolved in the outcrop area, producing the brecciated layers that are common in the dolomite. Mud cracks and ripple marks are common in some beds. The general absence of marine fossils suggests that the Joachim was deposited in a shallow, closed basin. The Joachim contains much more clastic material than the Platteville strata above, which are dominantly limestone in the area where the Joachim is present. It is lighter colored than the Dutchtown below. The Joachim Dolomite is best exposed on the flanks of the Ozark Dome in Missouri, and it is differentiated into six members on the basis of exposures in that area. The Abernathy Member (at the base) is sandy, the Augusta is thick bedded and silty, the Boles is thin bedded and shaly, the Defiance is thick bedded and silty, the Matson is brown, pure, and massive, and the Metz (at the top) is thin bedded and silty. Only the Metz, Matson, and the top of the Defiance are exposed in Illinois, but all the members can generally be recognized in samples from wells. All are successively overlapped northward. In Missouri the name "Joachim" is restricted to the units below the Boles, and the overlying beds are included in the Rock Levee Formation. The Joachim Dolomite is correlated with the upper part of the Pamelia Formation in New York.

Abernathy Member—The Abernathy Member of the Joachim Dolomite (Templeton and Willman, 1963, p. 58), the basal member, is named for Abernathy School, 2 miles north of the type section, which is 1.5 miles east of Dutchtown, Missouri (SE NW NE 20, projected, 30N-13E). The upper 25.6 feet is exposed at the type section. In southern Illinois the Abernathy is present in the subsurface, extending northward as far as Jackson County. It is as much as 150 feet thick in a well in Pulaski County but more commonly is 50-100 feet thick. The Abernathy Member is largely silty, sandy, thick-bedded dolomite containing layers of dolomitic, medium-grained sandstone. It contains some dark brown layers of limestone and dolomite. A persistent layer of sandstone of St. Peter type 1.5-14 feet thick occurs at the top. Chert is common just below the sandstone.

Augusta Member—The Augusta Member of the Joachim Dolomite (Templeton and Willman, 1963, p. 59), which overlies the Abernathy Member, is named for Augusta, Franklin County, Missouri, 5 miles west of the type section, which is a railroad cut on the south side of the Missouri Valley a mile southwest of St. Albans (SW NE SW 10, 44N-2E), where the member is 29 feet thick. It extends northward in subsurface as far as southern Calhoun County, Illinois, where it is 16 feet thick. It thickens southward, is generally 50-75 feet thick in the outcrops in Missouri, and is 106 feet thick in a well in Pulaski County, Illinois. The Augusta Member consists of relatively pure to very silty, light gray, white-weathering dolomite, generally in thick beds. The member contains layers of pure, brown, algal dolomite or limestone. Many individual beds are distinctive and can be widely traced. Locally the basal part is a siltstone or contains layers of green shale, indicative of its facies relation to the upper part of the St. Peter Sandstone. The Augusta is less sandy and the sand is finer grained than that in the Abernathy Member below; it is thicker bedded and less shaly than the Boles above.

Boles Member—The Boles Member of the Joachim Dolomite (Templeton and Willman, 1963, p. 60), which overlies the Augusta Member, is named for Boles, Franklin County, Missouri, 6 miles southwest of the type section, a quarry on the north side of the Missouri Valley 1 mile southwest of Matson, St. Charles County (NE cor. SE NE SW 4, 44N-2E), where the member is 19.1 feet thick. The Boles Member is commonly about 20 feet thick, ranging from 15-30 feet. It consists largely of thin to medium beds of dense silty dolomite and vuggy pure dolomite, separated by layers of dark red-brown to gray-green shale as much as 5 inches thick. Many bedding surfaces are ripple marked, and mud cracks are common. It contains several bands of white to black chert nodules and is the only persistent chert zone in the outcropping Joachim. However, chert is absent in places, and in subsurface in Illinois it occurs in other members of the Joachim. The Boles is distinguished from both the Augusta below and the Defiance above by its thin bedding, abundance of shale, and the chert bands.

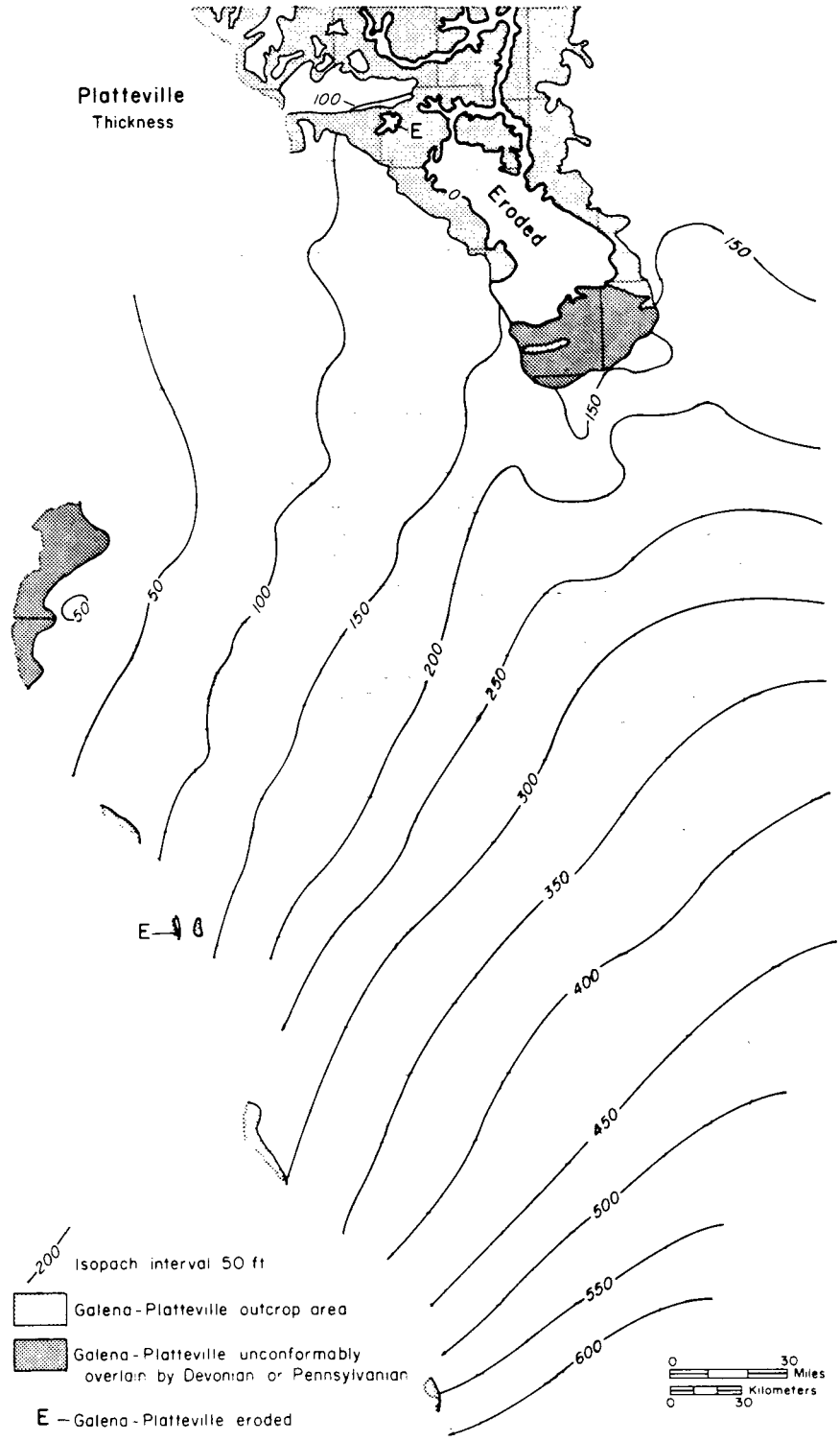

Fig. O-19—Thickness of the Platteville Group.

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Defiance Member—The Defiance Member of the Joachim Dolomite (Templeton and Willman, 1963, p. 60), which overlies the Boles Member, is named for Defiance, St. Charles County, Missouri, 3 miles northeast of the type section, the same exposure as the Boles Member type section, where the Defiance is 20.5 feet thick. The Defiance Member is exposed in Illinois only in the Mississippi bluffs at West Point Landing, Calhoun County. The Defiance Member is usually 20-40 feet thick and dominantly silty dolomite. It contains numerous algal domes, and beds of limestone are common in the southern part of the outcrop area. The Defiance Member is similar in lithology to the Augusta Member.

Matson Member—The Matson Member of the Joachim Dolomite (Templeton and Willman, 1963, p. 61), which overlies the Defiance Member, is named for Matson, St. Charles County, Missouri, just east of the type section in the north bluff of the Missouri Valley (NE NE NE 4, projected, 44N-2E), where the member is 29.8 feet thick. The Matson Member persists throughout the area of the Joachim. In Illinois it is exposed only at West Point Landing in Calhoun County, where it is 21 feet thick. It is about 30 feet thick in the outcrop area, but in subsurface in Illinois it commonly is 15-40 feet thick. The Matson Member differs from the other Joachim Members in being relatively pure, brown, finely porous dolomite that generally appears to be massive but is finely laminated, the laminae separated by thin films of dark brown clay. Locally it contains a few thin beds of the lithologic types common in the Defiance and Augusta Members. The Matson appears to be largely algal in origin. Ostracodes occur locally in the basal beds, and a marine fauna with corals, brachiopods, and trilobites has been observed in the basal beds at one locality near Zell, Missouri.

Metz Member—The Metz Member of the Joachim Dolomite (Templeton and Willman, 1963, p. 62), which overlies the Matson Member, is named for Metz Lake, 5 miles north of the type section, a quarry in the east bluffs of the Mississippi River, just north of West Point Landing, Calhoun County (SE NE SE 19, 7N-2W), where the member is 9.5 feet thick. The Metz Member is present throughout the area of the Joachim Dolomite and commonly is about 15 feet thick, ranging from 7-20 feet. The Metz consists of light gray, silty, thin- to medium-bedded dolomite but has a few beds of pure, darker dolomite. It contains algal domes, mud-cracked surfaces, and scour surfaces. It differs from the underlying relatively pure Matson Member, but many of the beds have a lithology similar to that of the Defiance and Augusta Members. The dominance of dolomite differentiates it from the relatively pure, lithographic limestone of the Platteville Group, which overlies it unconformably.

Platteville Group

The Platteville Group (Bain, 1905, p. 18-21; Calvin, 1906, p. 60-61; Templeton and Willman, 1963, p. 63) is named for Platteville, Wisconsin, which is 4 miles east of the type exposures along the Little Platte River. For a specific type section, Kay (1931, p. 369, 371) designated a ravine exposure (SW NW NW 20, 3N-1W, Grant County, Wis.), but Templeton and Willman (1963) suggested as an alternate a more accessible roadcut 5 miles southwest of Platteville (SE SW SE 1, 2N-2W), where the group is 53.6 feet thick. In the type region, the Platteville Group includes the dominantly limestone formations that overlie the Glenwood Formation of the Ancell Group and underlie the Spechts Ferry or Guttenberg Formations of the Galena Group. In an east-west area through central Illinois it overlies the St. Peter Sandstone, and south of there it overlies the Joachim Dolomite. The Platteville Group is widely exposed in northern Illinois—in the Rock and Pecatonica Valleys above Dixon, in a small area near Galena in Jo Daviess County, and near Ottawa and La Salle in La Salle County (fig. O-19). The southern outcrop area, largely in Missouri on the east flank of the Ozark Dome, extends from Cape Girardeau north to St. Louis and, beyond a short covered interval, to exposures on the Lincoln Anticline. In Illinois the Platteville crops out at West Point Landing in Calhoun County (fig. O-2D). The group is only about 30 feet thick in extreme western Illinois, but it thickens to 135 feet in the Dixon outcrop area and southward to over 600 feet in subsurface in the extreme southern part of the state. In northern Illinois the Platteville Group is largely blue-gray, lithographic, partly dolomite-mottled limestone, but in some areas, such as that near Dixon, it is gray, very fine-grained, cherty dolomite. In southern Illinois it is largely brown, lithographic, partly dolomite-mottled, slightly shaly limestone. It is subdivided (fig. O-20) into the Plattin Subgroup (above) which is dominated by the typical limestone facies, and the Pecatonica Formation, a persistent dolomite except where it grades to limestone in southern Illinois. The units are separated by a widespread corrosion surface, probably a diastem. The Plattin Subgroup is subdivided into the Mifflin (at the base), Grand Detour, Nachusa, and Quimbys Mill Formations on the basis of differences in purity, bedding, and texture. The Platteville formations and members have great lateral continuity and many of them are recognized in samples from borings (Buschbach, 1964). The Platteville Group is generally fossiliferous, containing a large and varied fauna. The Platteville Group was incorrectly correlated in early reports with the Trenton Limestone of New York. It is equivalent to the Lowville and Chaumont Formations of the Black River Group in New York, the upper part of the Stones River Group in Tennessee, the upper part of the High Bridge Group in Kentucky, and the Black River Limestone in Indiana and Michigan.

Pecatonica Formation

The Pecatonica Formation (Hershey, 1894, p. 175; 1897), the basal formation of the Platteville Group, is named for exposures along the Pecatonica River north of

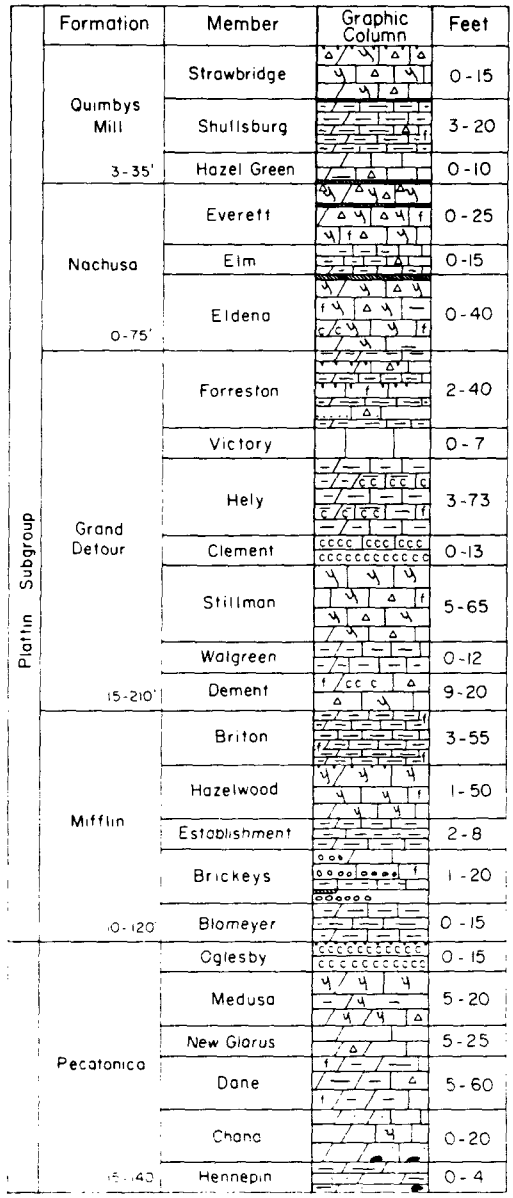

Fig. O-20—Columnar section of the Platteville Group (after Templeton and Willman, 1963).

the Illinois-Wisconsin state line. A section in the quarries and a roadcut on the East Branch of the Pecatonica River just north of Woodford, Lafayette County, Wisconsin (W 1/2 NW NE 14, 2N-5E), where it is 22.2 feet thick, has been designated the type section (Templeton and Willman, 1963, p. 73). The Pecatonica Formation overlies the Glenwood Formation or the St. Peter Sandstone in northern Illinois and the Joachim Dolomite in southern Illinois. It is overlain by the Mifflin Formation and is separated from both overlying and underlying units by sharp contacts that are at least regional diastems, perhaps unconformities. In Illinois the Pecatonica Formation is exposed only in the northern area, but it is a distinctive unit widely recognized in subsurface (Buschbach, 1964). It is locally absent in northern Illinois over anticlines, in extreme western Illinois, and in the southern outcrop area north of Perry County, Missouri. It is commonly about 20 feet thick in northern Illinois, but it thickens to 150 feet in extreme southern Illinois. North of a line from southeastern Missouri, through north-central Illinois, and into northwestern Indiana, the Pecatonica Formation is mainly brown, finely vuggy dolomite in medium to thick beds and has large chert nodules at a few horizons. South of there it is largely brownish gray lithographic limestone mottled with dolomite. The Pecatonica is subdivided into six members: the Hennepin (at the base) varies but is generally dolomitic siltstone, the Chana is sandy, the Dane is argillaceous, the New Glarus is pure, the Medusa is weakly argillaceous and strongly fucoidal, and the Oglesby at the top is coarse calcarenite. The Pecatonica has a dominantly brachiopod-molluscan fauna but generally is less fossiliferous than the overlying Platteville formations. The Pecatonica is a widely distributed unit in the Mississippi Valley, and it is equivalent to the Ridley Formation in Tennessee and to the lower beds in the Lowville of New York.

Hennepin Member—The Hennepin Member of the Pecatonica Formation (Templeton and Willman, 1963, p. 75) is named for Hennepin County, eastern Minnesota. The type section is in a bluff on the west side of the Mississippi River at Lock and Dam No. 1 in Minneapolis (NE SW NW 17, 28N-23W), where the member is 2.3 feet thick. It varies from a dolomitic sandstone to a siltstone and to very sandy silty dolomite, which differentiates it from the relatively pure, although sandy, Chana Member above. It is locally present in extreme northern Illinois, where it is a dolomitic sandstone containing phosphate pebbles and is commonly 2-4 feet thick. It differs from the sandstone in the Glenwood Formation below in that it contains carbonates and its sands have a texture like that of the St. Peter. It appears in places to be a reworking of Glenwood sediments at the beginning of Platteville carbonate deposition.

Chana Member—The Chana Member of the Pecatonica Formation (Templeton and Willman, 1963, p. 76) is named for Chana, Ogle County, 9 miles east of the type section (ravine in W1/2 SE SE NE 24, 23N-9E), where it is 6.2 feet thick. In the northern outcrop area it is commonly less than 5 feet thick, but it reaches 20 feet in southern Illinois. In the northern area it is largely brown, thick-bedded, vuggy, pure dolomite that contains disseminated sand grains and, in places, thin beds of sandstone of the St. Peter texture. The basal part commonly has slightly argillaceous or shaly beds and phosphatic pebbles. In southern Illinois it is largely pure, thick-bedded limestone.

Dane Member—The Dane Member of the Pecatonica Formation (Templeton and Willman, 1963, p. 76) is named for Dane County, Wisconsin. The type section is a quarry and roadcut in Dane County, 4 miles north of New Glarus, Green County (SW NW NE 34, 5N-7E), where the member is 8.2 feet thick. The Dane Member commonly is 5-10 feet thick in the outcrop area, but it is as much as 60 feet in extreme southern Illinois. It consists of slightly argillaceous, partly cherty, brown dolomite or limestone in thin to medium beds separated by thin shale partings. The Dane is the most fossiliferous of the Pecatonica members, and it is characterized regionally by the abundance of *Opikina minnesotensis*.

New Glarus Member—The New Glarus Member of the Pecatonica Formation (Templeton and Willman, 1963, p. 77)

is named for New Glarus, Green County, Wisconsin, and the type section is in the same section as the Dane Member. The New Glarus is 5.7 feet thick at the type section, is generally about 5 feet thick in the northern outcrop area, and thickens to 25 feet in extreme southern Illinois. It is dolomite in northern Illinois and limestone in southern Illinois and is relatively pure, thick bedded, and locally cherty.

Medusa Member—The Medusa Member of the Pecatonica Formation (Templeton and Willman, 1963, p. 77) is named for the Medusa Cement Company plant, 2 miles northeast of Dixon, Lee County, which is 1.5 miles south of the type section, a quarry on the east side of the Rock River Valley (SW SW NW 22, 22N-9E), where the member is 5.2 feet thick. In the northern outcrop area it is commonly 5-7 feet thick, but it thickens to 20 feet in extreme southern Illinois. In the outcrop area it consists of dolomite or of limestone heavily mottled with dolomite. It is slightly argillaceous, very fucoidal, and thick bedded to massive. South of Ogle County it contains chert nodules.

Oglesby Member—The Oglesby Member of the Pecatonica Formation (Templeton and Willman, 1963, p. 77) is named for Oglesby, La Salle County, and the type section is in Matthiessen State Park east of Oglesby (NE NE NE 31, 33N-3E), where the member is 12 feet thick. It is absent in Illinois north of the type locality, but it is as much as 15 feet thick in southern Illinois. It is pure, light gray, white, or buff calcarenite that is laminated, rarely conglomeratic, and locally cross bedded. It is medium to coarse grained in the type locality but fine grained elsewhere. A strong iron-stained corrosion surface occurs on the top and is equivalent to a similar surface on the top of the Medusa Member in northern Illinois, where the Oglesby is absent.

Plattin Subgroup

The Plattin Subgroup (Ulrich, 1904, p. 111; Weller and St. Clair, 1928, p. 109-110) is named for Plattin Creek, Jefferson County, Missouri, near the mouth of which it is partially exposed. As originally defined, it included strata equivalent to the Decorah at the top but not the Pecatonica below. Weller and St. Clair removed the Decorah, and, as thus defined, the Plattin was long considered equivalent to the Platteville in northern Illinois. Because the Plattin did not include the Pecatonica Formation of the Platteville Group (the Pecatonica is not present in the Plattin Creek area), the Plattin was reclassified as a subgroup (Templeton and Willman, 1963, p. 78). The Plattin is a distinctive unit, particularly in the northern outcrop area and in other regions where it is dominantly fine-grained and lithographic limestone, separated by a minor unconformity from the dolomitic Pecatonica Formation below. The Plattin Subgroup includes the Mifflin (at the base), Grand Detour, Nachusa, and Quimbys Mill Formations. The Plattin Formation, as defined in Missouri, consists of the strata from the oolite in the Brickeys Member of the Mifflin Formation to the base of the Decorah Formation. The Plattin Subgroup is equivalent to the McGregor Formation in the Upper Mississippi Valley above Dubuque, Iowa, except in the lead-zinc district where the McGregor has been redefined to exclude the Quimbys Mill Formation (Agnew and Heyl, 1946).

Mifflin Formation

The Mifflin Formation (Bays, 1938, p. 269) is named for Mifflin, Iowa County, Wisconsin, just west of the type section, a roadcut and bluff on the east side of the Pecatonica River (NE NE NE 34, 5N-1E), where it is 17.8 feet thick. The Mifflin is a widespread, thin-bedded, relatively shaly limestone overlying the thick-bedded, generally more dolomitic Pecatonica Formation and underlying the medium-bedded, less shaly Grand Detour Formation. It is exposed widely in north-central Illinois and in a small area at West Point Landing in Calhoun County (fig. O-2D). It is commonly 15-25 feet thick in the northern area, but it thickens to 120 feet in subsurface in southern Illinois. The Mifflin Formation is dominantly gray, lithographic limestone, most of it thin bedded and shaly. Locally it grades to shaly fine-grained dolomite in the northern outcrop area and to sandy shale and sandstone in extreme western Illinois. The shale partings in the Mifflin are gray to green, in contrast to the generally brownish gray to red-brown partings in the Grand Detour. In the northern outcrop area the Mifflin is characterized by a persistent, massive, middle unit, and in Calhoun County and farther south it has a distinctive oolite in the lower part that is widely recognized in subsurface. The oolite forms the top of the Rock Levee Formation in Missouri. The Mifflin is differentiated into five members: the Blomeyer (at the base), is argillaceous; the Brickeys is pure; the Establishment is argillaceous; the Hazelwood is pure; and the Briton (at the top) is argillaceous. In the northern outcrop area the Blomeyer, Brickeys, and Establishment Members are thin and differ only slightly in clay content. Where these units are not differentiated, they are combined as the lower shaly unit and assigned to the Establishment Member. The Mifflin then consists of a threefold (shaly, massive, shaly) sequence. The Mifflin is the most fossiliferous formation in the Platteville Group, containing an abundant and varied brachiopod, moluscan, and bryozoan fauna. It is the lower, shaly part of the McGregor Limestone north of Illinois, and is correlated with strata in the upper part of the Camp Nelson Formation in Kentucky, the lower part of the Lebanon Limestone in Tennessee, and with the upper part of the lower division of the Lowville Limestone in New York.

Blomeyer Member—The Blomeyer Member of the Mifflin Formation (Templeton and Willman, 1963, p. 80) is named for Blomeyer, Cape Girardeau County, Missouri, about 6 miles southwest of the type section, which is a small quarry a quarter of a mile east of the highway junction at Rock Levee (NW cor. NE NW 24, 30N-13E), where the member is 12.1 feet thick. The Blomeyer is irregularly present, but it is as much as 15 feet thick in subsurface in southern Illinois. It is less than a foot to 3 feet thick in the northern outcrop area. The Blomeyer consists of argillaceous, fine-grained limestone, or locally dolomite, that weathers thin-bedded to shaly

Brickeys Member—The Brickeys Member of the Mifflin Formation (Templeton and Willman, 1963, p. 81) is named for Brickeys, Ste. Genevieve County, Missouri, which is 3 miles east of the type section, a quarry on the east side of

Missouri Highway 25 (SE SW SE 28, 39N-7E), where the member is 15.5 feet thick. The Brickeys Member is commonly 13-20 feet thick in the outcrop area in Missouri but is as much as 40 feet thick in subsurface in southern Illinois. Where locally differentiated in the northern outcrop area, it is 1-2 feet thick. In the southern area much of the Brickeys Member is relatively pure, brown, lithographic limestone, but it contains a few beds of gray to buff, argillaceous limestone and dolomite. Several beds are strongly oolitic; others are a fine conglomerate or breccia. The member also contains a few beds of green shale as much as 5 inches thick, domes of *Stromatocerium*, several scour surfaces with a relief of 2-8 inches, and, in one locality, a thin bentonite near the base. The shale beds are persistent from Calhoun County, Illinois, to Ste. Genevieve County, Missouri, but elsewhere the unit is dominantly a relatively pure limestone containing oolite beds. In the northern outcrop area the Brickeys is relatively pure but not oolitic.

Establishment Member—The Establishment Member of the Mifflin Formation (Templeton and Willman, 1963, p. 82) is named for Establishment Creek in Ste. Genevieve County, Missouri. The type section is an exposure in a tributary ravine just north of the village of Zell (W1/4 34, 38N-8E), where the member is 5.5 feet thick. The Establishment Member is 2-8 feet thick in southern Illinois, where it is a green shale with thin interbeds of argillaceous, chalky limestone. The shale facies appears to be limited to a region bordering the Ozarks and is a persistent marker bed; elsewhere the member is thin-bedded, shaly, brown lithographic limestone. In the northern area it is limestone, commonly about 5 feet thick, and is gray, dolomite mottled, argillaceous, thin bedded, and shaly. It contains a few thin beds of calcarenite.

Hazelwood Member—The Hazelwood Member of the Mifflin Formation (Templeton and Willman, 1963, p. 82) is named for Hazelwood School, Lee County, 2 miles west of the type section, a quarry on the east side of the Rock River Valley 3.5 miles north of Dixon (SW SW NW 22, 22N-9E), where it is 5.7 feet thick. The Hazelwood Member is widespread, but it is missing in Calhoun County. It is commonly 4-6 feet thick in the northern outcrop area, but it thickens southward and, judging from exposures near Cape Girardeau, Missouri, is probably as much as 50 feet thick in subsurface in southern Illinois. In the northern outcrop area, the Hazelwood is relatively pure, gray, thick-bedded to massive, lithographic limestone generally dolomite mottled, fucoidal, and with few fossils. A ferruginous corrosion surface occurs on the top. In the southern area, the Hazelwood is relatively pure, brown, fucoidal, fine-grained limestone, thicker bedded than the members above and below.

Briton Member—The Briton Member of the Mifflin Formation (Templeton and Willman, 1963, p. 83) is named for Briton School, 2 miles northeast of Dixon and 1.5 miles southwest of the type section, which is in the same quarry as the Hazelwood type section. The Briton is 10 feet thick in the type section. It is the uppermost shaly member of the Mifflin and is widely present. It is 3-12 feet thick in the northern outcrop area, but it thickens southward to as much as 55 feet in the southern outcrop area in Missouri and probably has a comparable thickness in subsurface in southern Illinois. In the northern outcrop area it is largely light gray, white-weathering, fossiliferous, lithographic, argillaceous limestone in thin wavy beds that have strong green shale partings. It grades to dolomite in a few places. In the southern area it is less argillaceous and only slightly shaly but is distinctly more impure than adjoining members.

Grand Detour Formation

The Grand Detour Formation (Templeton and Willman, 1963, p. 83) is named for Grand Detour, Ogle County, which is 3 miles east of the type section, a quarry in the west bluff of the Rock River, on the Walgreen estate 2 miles north of Dixon (NE 20, 22N-9E), where it is 52.3 feet thick. The Grand Detour Formation extends throughout most of Illinois, overlying the Mifflin Formation, underlying the Nachusa Formation, and conformable with both. It is generally about 50 feet thick in the northern outcrop area and in exposures in Calhoun County (fig. O-2D), but it thickens southward in subsurface to about 210 feet in southern Illinois. That it thickens rapidly south of Randolph County is suggested by the near-by exposures in Missouri. The Grand Detour consists largely of dolomite-mottled, lithographic, slightly argillaceous to pure limestone that contains thin beds of calcarenite; in places it is fine- to medium-grained dolomite. Most of it is medium bedded, with thin, brown-red, dark gray, or black shale partings, but it contains persistent units that are thick bedded to massive, fucoidal, and pure. The Dement Member (at the base) is pure; the Walgreen is argillaceous or shaly; the Stillman is pure, fucoidal, and massive; the Clement is calcarenite; the Hely is argillaceous; the Victory is pure and white or very light gray; and the Forreston (at the top) has alternating pure and argillaceous beds with red-brown shaly partings. Scour and corrosion surfaces occur between and within some of the members. The Grand Detour is generally fossiliferous, having a varied brachiopod-molluscan fauna and several species of corals, among which *Lambeophyllum* and *Tetradium* are particularly common. The medium bedding and the dark, generally red-brown, shale partings distinguish the Grand Detour from the Mifflin below with its thin beds and green shale partings, and from the Nachusa above, which is purer, more uniform, and thick bedded to massive. The Grand Detour is the upper part of the McGregor Limestone north of Illinois and is equivalent to strata in the upper part of the Camp Nelson Formation, the Oregon Formation, and the lower part of the lower member of the Tyrone Formation in Kentucky, the upper part of the Lebanon Formation in Tennessee, and the upper part of the Lowville Limestone in New York.

Dement Member—The Dement Member of the Grand Detour Formation (Templeton and Willman, 1963, p. 84) is named for Dement Avenue in Dixon, Lee County, 2 miles south of the type section (part of the Grand Detour type section), where the Dement is 8 feet thick. The Dement Member is generally 3-8 feet thick in the northern outcrop area and in the Calhoun County exposures, but it thickens southward to 20 feet in the Cape Girardeau area. In northern Illinois it is relatively pure, dolomite-mottled, gray, lithographic, thick-bedded limestone, but locally it is fine-grained dolomite. It contains a few thin calcarenitic layers and a few scattered chert nodules. In the southern area it is brown, fucoidal, and only locally cherty, but near St. Louis it is a conglomeratic, vuggy, very fine-grained calcarenite.

Walgreen Member—The Walgreen Member of the Grand Detour Formation (Templeton and Willman, 1963, p. 85) is named for the Walgreen estate, on which the type section (part of the Grand Detour type section) occurs. The Walgreen Member is 8.3 feet thick in the type section and is generally 5-10 feet thick in the outcrop areas in northern Illinois and eastern Missouri. Most of it is gray, thin- to medium-bedded, argillaceous, shaly limestone that contains disseminated fossil debris and thin beds of purplish gray calcarenite. In the southern outcrop area it is brown, thicker bedded, and less argillaceous than in northern Illinois.

Stillman Member—The Stillman Member of the Grand Detour Formation (Templeton and Willman, 1963, p. 85) is

named for Stillman's Run, a stream 1.5 miles east of the type section, which is a quarry just north of Byron, Ogle County (NE NE SE 30, 25N-11E), where it is 5.3 feet thick. The member is 5-8 feet thick in the northern outcrop area, but in the southern outcrop area it thickens from 5 feet in Calhoun County to 64 feet at Cape Girardeau, Missouri. The Stillman Member consists of dolomite-mottled, lithographic limestone, or, in places, vuggy, fine- to medium-grained dolomite. It is generally pure, cherty, fucoidal, and thick bedded or massive. In the southern area it is divisible into an upper fucoidal unit, a middle argillaceous to shaly, partly cherty unit, and a basal calcarenitic fucoidal unit.

Clement Member—The Clement Member of the Grand Detour Formation (Templeton and Willman, 1963, p. 86) is named for Clement Station, Ste. Genevieve County, Missouri, which is 7 miles north of the type section in a ravine 0.5 mile north of the village of Zell (W1/4 34, 38N-8E), where it is 13 feet thick. The Clement Member is only 1-4 inches thick where locally present in the northern outcrop area. It is 6 feet thick in outcrops near Cape Girardeau. The Clement consists of purplish gray, medium- to coarse-grained calcarenite. Where thick it occurs in 2-15 inch beds that are locally cross bedded. It grades to calcarenitic limestone in some areas.

Hely Member—The Hely Member of the Grand Detour Formation (Templeton and Willman, 1963, p. 86) is named for Hely's upper quarry on the south side of Cape Girardeau, Missouri, which, with the adjoining Federal and Marquette quarries is the type section (NW NE and SE NW 18, 30N-14E). It is 3-5 feet thick in the northern Illinois outcrop area and 5-8 feet in the northern part of the southern outcrop area, but south of Ste. Genevieve it thickens rapidly, and in the type section it is 73 feet thick. The Hely Member consists of argillaceous, lithographic limestone in thin to medium beds with thin shale partings. Much of the member is calcarenitic or contains thin calcarenite layers. It is locally cherty and generally not fucoidal.

Victory Member—The Victory Member of the Grand Detour Formation (Templeton and Willman, 1963, p. 86) is named for Mt. Victory School, Calhoun County, 4.5 miles north of the type section, a quarry north of West Point Landing (SE NE SE 19, 7N-2W), where it is 5.5 feet thick. The Victory Member is commonly only a foot or less thick in the northern outcrop area but is 3 feet thick in La Salle County, and in the southern outcrop area it ranges from 3.5 feet near St. Louis to 7 feet at Cape Girardeau. The Victory Member is a distinctive, white to light gray lithographic limestone containing calcite flecks that give it the "bird's-eye" appearance typical of limestones equivalent to Platteville limestones in other regions. Many of the calcite flecks are fillings of corallites of *Tetradium*. The Victory Member is massive to thick bedded and locally contains a little chert. In northern Illinois it locally grades to light gray, white-weathering dolomite, and it is not as distinctive as it is in the southern area, where it is the most easily identified member of the Platteville Group. Although generally absent north of Illinois, beds similar to the Victory occur in Kentucky, Tennessee, and New York.

Forreston Member—The Forreston Member of the Grand Detour Formation (Templeton and Willman, 1963, p. 87) is named for Forreston, Ogle County, which is 7 miles northeast of the type section, a quarry in Carroll County on the north side of a ravine 1 mile northwest of Brookville (NE SE NW 21, 24N-7E), where it is 17.9 feet thick. The Forreston Member is commonly 5-25 feet thick in the northern outcrop area and in the northern part of the southern outcrop area, but it thickens southward to 40 feet at Cape Girardeau. It consists largely of dolomite-mottled lithographic limestone or fine-grained dolomite. It is commonly fossiliferous. In many exposures it can be differentiated into three cyclical units, each consisting of a thin-bedded, shaly unit at the base and a thicker bedded, purer unit at the top. The shaly units generally contain the thickest red-brown shale partings in the Grand Detour. The member contains some chert, and thin beds of calcarenite are common. In subsurface in west-central Illinois, a sandy zone about 5 feet thick is present at or near the base.

Nachusa Formation

The Nachusa Formation (Templeton and Willman, 1963, p. 87), which overlies the Grand Detour Formation, is named for the village of Nachusa, Lee County. The type section is a quarry on the east edge of Dixon (SE SE SW 33, 22N-9E), where the Nachusa is 17.8 feet thick. It is 15-20 feet thick in the northern part of the southern outcrop area, but south of Ste. Genevieve in the Cape Girardeau area it thickens rapidly to 75 feet. It thins to less than 5 feet in subsurface in central western and extreme northwestern Illinois. The Nachusa consists largely of fine- to medium-grained, vuggy dolomite in northern Illinois (fig. O-2F) and dolomite-mottled lithographic limestone in the southern area (fig. O-2D). It is pure to slightly argillaceous, cherty, fucoidal, and thick bedded to massive. The weathered surface is deeply etched. In parts of northern Illinois the Nachusa resembles the dolomite of the Galena Group, and in some areas it has been miscorrelated with the Galena. In the southern outcrop area it contains layers of bentonite, calcarenite, and conglomeratic limestone. A persistent argillaceous and thin-bedded zone in the Nachusa is used to subdivide the formation into three members; the Eldena (at the base) is thick bedded and slightly argillaceous; the Elm is thin bedded and argillaceous; and the Everett (at the top) is massive and pure. The Nachusa is moderately fossiliferous; corals, brachiopods, and gastropods are the most common fossils. In the northern area, the Nachusa is characterized by the abundance of *Foerstephyllum halli*, but a few specimens also are found in upper Grand Detour strata. *Foerstephyllum* is present but not common in the southern outcrop area. The Nachusa has a sharp contact with the overlying Quimbys Mill Formation but a gradational contact with the Grand Detour below. The Nachusa is absent in the Mississippi Valley northwest of Illinois, but it occurs in northern Michigan. It is correlated with the Chaumont Formation of New York and Ontario because of striking similarities in fauna and lithology, with the upper part of the lower member of the Tyrone Formation in Kentucky, and with the lower member of the Carters Limestone in Tennessee.

Eldena Member—The Eldena Member of the Nachusa Formation (Templeton and Willman, 1963, p. 89) is named for Eldena, Lee County, 6 miles southeast of the type section (part of the Nachusa type section), where it is 7.5 feet thick. It is commonly 5-10 feet thick in the northern outcrop area and in Calhoun County, but south of there it thickens to 14 feet in Ste. Genevieve County, Missouri, and to 40 feet at Cape Girardeau, Missouri. It has the typical Nachusa lithology, except that the lower part has thin partings of blue-gray to gray-green or brown shale, and it is slightly more argillaceous than the Everett Member. In the southern area it contains finely conglomeratic and pseudo-oolitic beds, and a bentonite as much as 6 inches thick occurs at or near the top. It is equivalent to the Leray Member of the Chaumont Formation in New York.

Elm Member—The Elm Member of the Nachusa Formation (Templeton and Willman, 1963, p. 89) is named for Elm

Street in Dixon, Lee County, just southwest of the type section (part of the Nachusa type section), where the member is 2.8 feet thick. It is widely present, but it is absent in subsurface in western Illinois. It is 1-4.5 feet thick in the northern outcrop area, is 7 feet thick in Calhoun County and near Ste. Genevieve, Missouri, and it thickens southward to 15 feet at Cape Girardeau. It consists of argillaceous, gray, cherty dolomite or limestone and is mainly nonfucoidal. It is thin bedded and has thin shale partings. It commonly weathers to a smooth surface, which distinguishes it from the members above and below that have pitted surfaces. It is equivalent to the Glenburnie Member, a similar shaly unit, in the Chaumont Formation in New York.

Everett Member—The Everett Member of the Nachusa Formation (Templeton and Willman, 1963, p. 90) is named for Everett Street in Dixon, Lee County, near the type section (part of the Nachusa type section), where the member is 7.5 feet thick. It averages about 7 feet thick in the northern outcrop area, and is commonly about 20 feet thick in the southern area. The Everett has the typical Nachusa lithology, differing from the Eldena Member in being more massive, very abundantly fucoidal, and generally purer. At the top of the member there is a distinctive bed of fine-grained, dense dolomite or limestone 3-8 inches thick that has a smooth, white-weathering surface and overlies a band of very large chert nodules. A thin bed of bentonite occurs 8-9 feet below the top in the southern outcrop area. The Everett is equivalent to the Watertown Member of the Chaumont Formation in New York.

Quimbys Mill Formation

The Quimbys Mill Formation (Agnew and Heyl, 1946, p. 1585), which overlies the Nachusa Formation, is named for Quimby's Mill near Etna, Lafayette County, Wisconsin (SE SE 11, 1N-1E) (Templeton and Willman, 1963, p. 235). The type section is a small quarry near the mill where the formation is 12 feet thick. The Quimbys Mill is close to 12 feet thick throughout the northern outcrop area in Illinois and 30-35 feet thick in the southern outcrop area in Illinois and Missouri, but it locally thins in subsurface and in Sangamon County is only 3 feet thick. In the type area and in a small exposure in extreme northwestern Illinois, the Quimbys Mill is brown lithographic limestone with brown shale partings. Because of its pronounced conchoidal fracture it is known as the "Glassrock." In the outcrop area in central northern Illinois, it is light brown, dense, very fine-grained, slightly argillaceous dolomite that weathers yellow-buff (fig. O-2F). It is thin to medium bedded and has thin brown shale partings. In the southern outcrop area the formation is fine-grained to lithographic limestone, the shale partings are greenish gray, the bedding and weathered surfaces are relatively smooth, and it contains some thin layers of conglomerate, fossil debris, and bentonite. The Quimbys Mill Formation is differentiated into three members: the Hazel Green (at the base) is thick bedded, slightly shaly, and weathers white; the Shullsburg is thin bedded and shaly; and the Strawbridge (at the top) is thick bedded, slightly shaly, and finely fucoidal. The Quimbys Mill is generally fossiliferous, containing brachiopods (especially *Strophomena*), bryozoans, horn corals, trilobites, and the ostracode *Eoleperditia*. The Quimbys Mill has a sharp contact, probably a diastem, with the underlying Nachusa, and its top is a ferruginous, pitted surface that is a regional unconformity with low relief. The Quimbys Mill is overlain by the Spechts Ferry Formation, the basal formation of the Galena Group, in extreme northwestern Illinois and in Calhoun County, but the Spechts Ferry thins out eastward and is not present in the northern outcrop area or in subsurface in eastern Illinois, where the Guttenberg Formation overlies the Quimbys Mill Formation. The Quimbys Mill extends eastward into Ontario, but it appears to be absent in the New York section. It is equivalent to the upper member of the Tyrone Formation in Kentucky and the upper member of the Carters Limestone in Tennessee.

Hazel Green Member—The Hazel Green Member of the Quimbys Mill Formation (Templeton and Willman, 1963, p. 91), the basal member, is named for Hazel Green, Grant County, Wisconsin, 6 miles southwest of the type section (part of the Quimbys Mill type section), where the Hazel Green is 1.7 feet thick. It is as much as 2.5 feet thick in the northern outcrop area in Illinois and 10 feet in the southern outcrop area at Cape Girardeau, Missouri. The Hazel Green Member consists of lithographic limestone or fine-grained dolomite, mainly pure and thick bedded. It has a smooth, light buff to white, weathered surface. A bentonite at the base near Cape Girardeau extends as far north as Lincoln County, Missouri.

Shullsburg Member—The Shullsburg Member of the Quimbys Mill Formation (Templeton and Willman, 1963, p. 92), which overlies the Hazel Green Member, is named for Shullsburg, Lafayette County, Wisconsin, 5 miles east of the type section (part of the Quimbys Mill type section), where the Shullsburg is 2.5 feet thick. It is as much as 5 feet thick in the northern outcrop area in Illinois and 7 feet in Calhoun County, but it thickens to about 20 feet near St. Louis and commonly is about 15 feet thick in outcrops south of there. The Shullsburg consists of brown to buff, slightly argillaceous, lithographic limestone or fine-grained dolomite. It is thin to medium bedded, strongly shaly in the north, but only slightly shaly in the southern outcrop area. In Missouri it contains some white, "glassy" beds. In northern Illinois the bedding surfaces at some places are mud-cracked or ripple-marked.

Strawbridge Member—The Strawbridge Member at the top of the Quimbys Mill Formation (Templeton and Willman, 1963, p. 92) is named for Strawbridge, Lafayette County, Wisconsin, 3 miles southwest of the type section (part of the Quimbys Mill type section), where the Strawbridge is 7.8 feet thick. It is about 7 feet thick in the northern outcrop area in Illinois and 10-15 feet thick in the southern outcrop area. It is similar in lithology to the Shullsburg Member but is less argillaceous, generally thicker bedded, and has fewer and thinner shale partings. It is partly cherty, especially at the top, in northern Illinois. It contains numerous fucoids, which are scarce in the older members of the formation and much smaller than those in the underlying Nachusa Formation.

Trentonian Stage

The Trentonian Stage (Vanuxem, 1838, p. 257, 276, 283; Kay, 1948, p. 1411), named for Trenton Falls in New York State, is represented in Illinois by the strata of the Galena Group. These rocks are present throughout most of Illinois (fig. O-21). They are correlated with the type Trentonian of New York on the bases of both faunal and lithologic similarity (Templeton and Willman, 1963). Trentonian strata are generally fossiliferous and the fauna contains many forms not found in

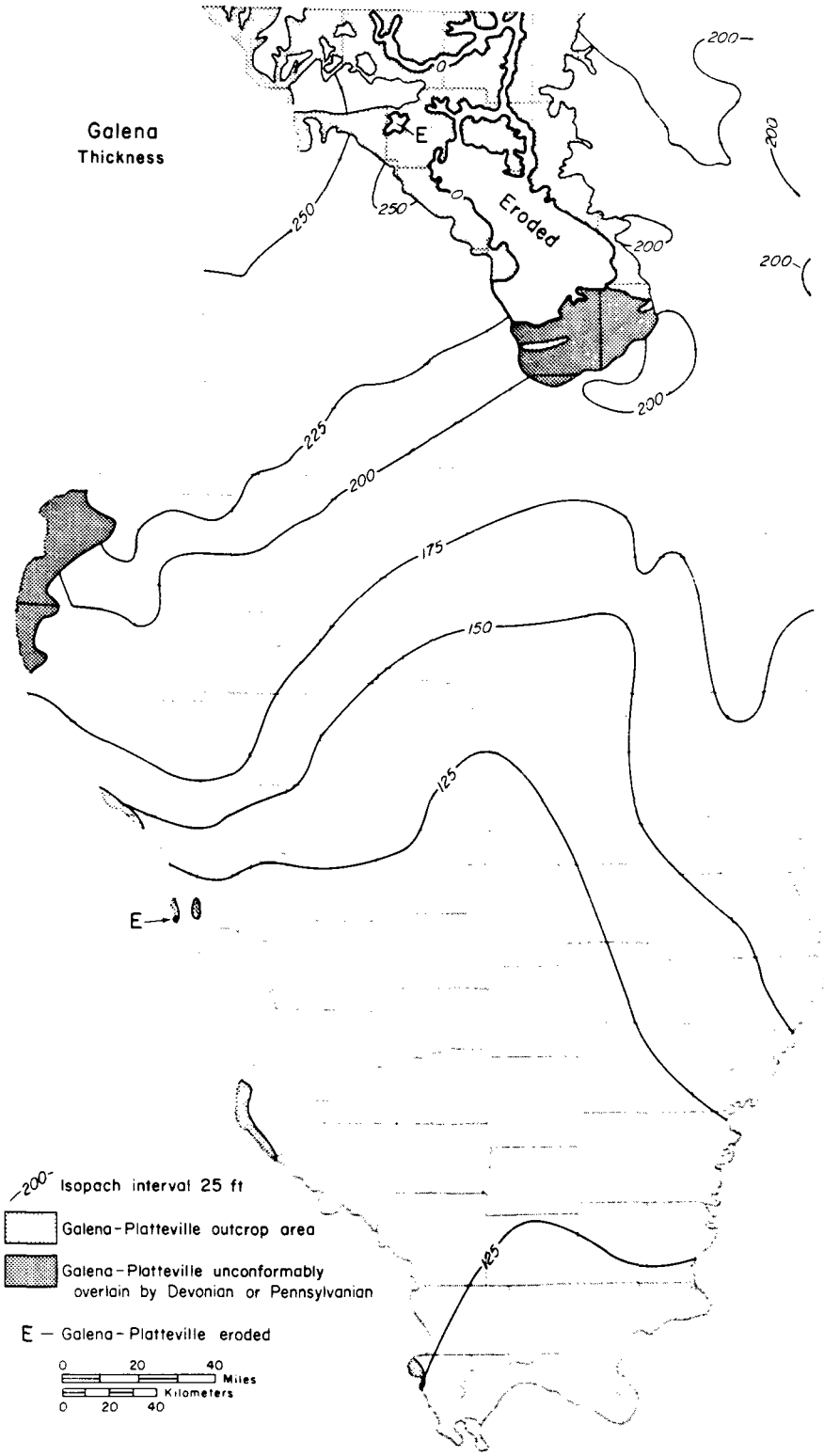

Fig. O-21—Thickness of the Galena Group.

the Blackriveran below or the Cincinnatian above.

Galena Group

The Galena Group (Hall, 1851, p. 146-148; Kay, 1935b, p. 289; Templeton and Willman, 1963, p. 93) consists of limestone and dolomite formations overlying the Platteville Group and underlying the Maquoketa Group of the Cincinnatian Series. The Galena Group is named for Galena in Jo Daviess County, and several sections in the vicinity of Galena have been designated the type section. Hall put the base of the Galena in the Decorah Subgroup, either at the top or the base of the Guttenberg Formation; Kay raised it to the top of the Decorah; and Templeton and Willman lowered it to the base of the Decorah, which is the present usage in Illinois. The Galena Group is present in all of Illinois (fig. O-21) except (1) the areas where the older rocks are exposed in central northern Illinois and in Calhoun County and (2) an area along the crest of the La Salle Anticline, largely in La Salle County, where Galena strata were eroded before deposition of the Pennsylvanian rocks. The Galena is extensively exposed in northern Illinois (fig. O-2B, C), but elsewhere it crops out only in small areas on anticlinal structures in Calhoun, Monroe, and Alexander Counties. The Galena Group is 250-275 feet thick in the northern outcrop area, but the upper part is truncated by the Cincinnatian Series in central Illinois, and south of there the group is only 100-125 feet thick. The group is divided into two subgroups (fig. O-22)—the Decorah at the base is a shaly unit and the Kimmswick above it is relatively pure limestone and dolomite. The shaly Dubuque Formation, although included as the top of the Galena Group in northwestern Illinois, is not included in the Kimmswick Subgroup. The Galena Group has three major facies (fig. O-23). A fine-grained limestone facies is present only in extreme northwestern Illinois, where as much as 50 feet of limestone at the base of the group changes rapidly to dolomite southward and eastward. In most of northern Illinois, the group is entirely dolomite. Southward, the lower part becomes limestone, and a short distance south of La Salle only the uppermost part is dolomite. The lower part is largely coarse calcarenite, overlain by fine-grained limestone. Still farther south, the fine-grained limestone is truncated so that the group is entirely calcarenite and calcarenitic limestone. Galena Group strata are generally fossiliferous (fig. O-5), but fossils are poorly preserved in the dolomite facies. *Receptaculites oweni*, an alga (fig. O-5), is perhaps the most characteristic fossil, but several zones characterized by abundance of certain species of brachiopods and bryozoans are persistent (fig. O-24). The Galena Group is equivalent to the Trenton Group of New York, the Lexington Limestone of Kentucky, and the Nashville Group of Tennessee.

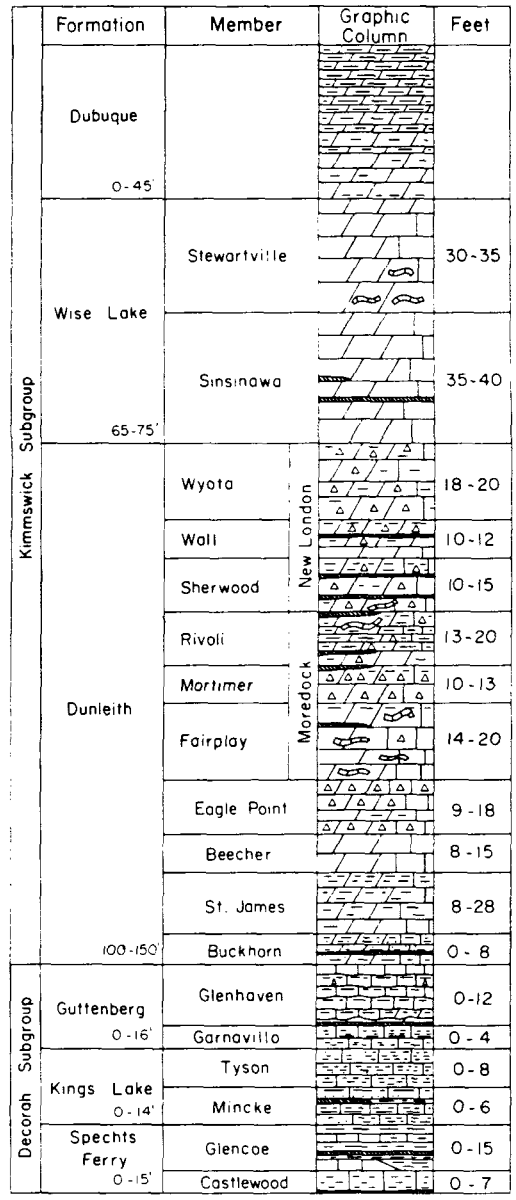

Fig. O-22—Columnar section of the Galena Group (after Templeton and Willman, 1963).

Decorah Subgroup

The Decorah Subgroup (Calvin, 1906, p. 84; Kay, 1935b, p. 289; Herbert, 1949) consists of the shaly limestone and dolomite formations at the base of the Galena Group. It is named for exposures at Decorah, Winneshiek County, Iowa. At Decorah it is called the Decorah Formation and includes the Spechts Ferry, Guttenberg, and Ion Members. Kay took the Spechts Ferry out of the Decorah and put it in the Platteville, but Herbert showed that the Spechts Ferry belonged in the Decorah. Templeton and Willman (1963) removed the strata equivalent to the Ion from the Decorah in Illinois because they are not shaly. The Decorah is extensive in Illinois and is exposed in central northern and extreme northwestern Illinois in a small area near West Point Landing in Calhoun County, and at Valmeyer in Monroe County. It is 15-30 feet thick in western Illinois, but it thins eastward and is generally only 1-5 feet thick in the central and eastern parts of the state. The Decorah consists of three formations—the Spechts Ferry (at the base) is green shale and limestone; the overlying Kings Lake is largely limestone, partly silty and sandy; and the Guttenberg (at the top) is limestone with beds of brown-red shale. The Kings Lake thins out northward and is not present in northern Illinois. Both the Kings Lake and the Spechts Ferry thin out eastward, and in central and eastern Illinois the Decorah consists only of the Guttenberg Formation. The Decorah strata in Illinois are very fossiliferous, containing abundant bryozoans and brachiopods. *Refinesquina*, *Sowerbyella*, and *Pionodema* (fig. O-5) are especially abundant. Decorah strata in Illinois correlate with the Rockland Formation in New York, the Curdsville and Logana Members of the Lexington Limestone in Kentucky, and the lower part of the Hermitage Limestone in Tennessee.

Spechts Ferry Formation

The Spechts Ferry Formation (Kay, 1928, p. 16; 1935b, p. 287) consists of as much as 15 feet of interbedded shale and limestone. It is the basal formation of the Galena Group, underlying the Kings Lake or Guttenberg Formations and unconformably overlying various Platteville formations. The type section is in a ravine at Spechts Ferry, Dubuque County, Iowa (SW NW 4, 90N-2E), where it is 7.8 feet thick (Agnew et al., 1956, p. 307; Templeton and Willman, 1963, p. 106). The Spechts Ferry Formation is exposed in northwestern Illinois along the Galena River in Jo Daviess County (cen. 34, 29N-1E) and in small areas near West Point Landing in Calhoun County, and Valmeyer, Monroe County. It is commonly 5-10 feet thick in wells in western Illinois but is absent in the central and eastern parts of the state. Limestone is dominant in the south and shale in the north. Much of the shale is bright green, but it is locally greenish gray and the basal few inches is dark brown. The formation is characterized by two bentonites and by the persistence of distinctive thin beds of dense, fine-grained to earthy limestone, coquinite, and dark purplish gray, coarse-grained calcarenite. It is subdivided into the Castlewood Member (at the base), which is dominantly limestone, and the Glencoe Member (at the top), which is limestone and shale—in places dominantly shale. In the mining district in northwestern Illinois, it is called the "Clay bed." *Pionodema subaequata* (fig. O-5) is abundant in the Spechts Ferry. Other Trentonian fossils are common, particularly bryozoans (Perry, 1962). The Spechts Ferry Formation is the *Stictoporella* bed of early reports. It rests on a distinctive, pitted, ferruginous, and phosphatic surface on the top of the Quimbys Mill Formation, and the basal beds locally contain fragments of that formation. In northwestern Illinois, where the Kings Lake is absent, the Spechts Ferry is overlain by the Guttenberg Formation, the basal beds of which contain phosphate nodules. The Spechts Ferry Formation is correlated with the Selby Member of the Rockland Formation in New York and the Curdsville Limestone in Kentucky and Tennessee.

Castlewood Member—The Castlewood Member of the Spechts Ferry Formation (Templeton and Willman, 1963, p. 107), the basal member, is largely limestone in its type section near Castlewood, St. Louis County, Missouri (NE SE SE 21, 44N-4E), where it is 6.9 feet thick. It is a massive bed 3-7 feet thick in the type region, but it is only a few inches to 1.5 feet thick in northwestern Illinois. The limestone commonly overlies a thin bentonite, generally less than an inch thick, which rests on dark brown shale up to 3 inches thick. The limestone is fine grained, slightly argillaceous, and more like limestone beds in the Glencoe Member above than the pure lithographic limestone of the Plattin below, from which it is separated by a widespread unconformity. Fossils are not abundant, but *Pionodema subaequata* and other Trentonian fossils are present. It has been called the *Lingula elderi* bed in Minnesota, where it is equivalent to the lower part of the Carimona Limestone (Weiss, 1955).

Glencoe Member—The Glencoe Member of the Spechts Ferry Formation (Templeton and Willman, 1963, p. 110), which overlies the Castlewood Member, is named for Glencoe, St. Louis County, Missouri, which is 3 miles west of the type section, the same as that for the Castlewood Member, where the Glencoe is 5.3 feet thick. It is commonly 5-8 feet thick in the area near the Mississippi River, but it thins to the east. The most persistent and thickest Ordovician bentonite, commonly 1-3 inches thick and locally as much as 8 inches thick, occurs in the lower part of the Glencoe Member, interbedded with green, gray, or brown shale. Locally the bentonite is altered to a distinctive, hard, pink bed, which is almost entirely potash feldspar. The Glencoe is largely green shale, but it contains beds of calcarenite, greenish gray argillaceous limestone, and dark purplish gray coarse-grained limestone. Some beds are a coquina of *Pionodema subaequata*. In the Upper Mississippi Valley, the trilobite *Isotelus gigas* (fig. O-5) is common in an argillaceous limestone bed near the base.

Kings Lake Formation

The Kings Lake Formation (Herbert, 1949; Templeton and Willman, 1963, p. 110) overlies the Spechts Ferry

Formation, underlies the Guttenberg Formation, and is conformable with both. It is named for Kings Lake, a village in Lincoln County, Missouri, a mile east of the type section in the Mississippi River bluffs (SE SE NE 26, 50N-2E), where it is 9.2 feet thick. The Kings Lake Formation is exposed in Illinois only near West Point Landing in Calhoun County, but it is widely exposed in eastern Missouri. It is locally missing on the flanks of the Ozarks, where it is overlapped by the Dunleith Formation. It is commonly 5-10 feet thick but is locally as much as 15 feet thick. It thins out northward and does not extend to the northern outcrop area of the Decorah. The Kings Lake Formation consists largely of argillaceous, very silty, dolomitic limestone with a few thin beds of shale, calcarenite, and bentonite. It locally contains fine sand. It is subdivided into two members. The Mincke Member, at the base, contains more shale and calcarenite than the overlying Tyson Member. Many of the characteristics of the Kings Lake are transitional from those of the Spechts Ferry to those of the Guttenberg, but the Kings Lake is more silty and sandy than either of them. It contains a mixture of Spechts Ferry and Guttenberg fossils—the most abundant being *Pionodema subaequata*, *Zygospira recurvirostris*, and locally *Sowerbyella curdsvillensis* (fig O-5). Strata lithologically similar to the Kings Lake appear to be missing in the New York section but are widely present in Kentucky in the lower part of the Logana Formation and in Tennessee in the Hermitage Formation.

Mincke Member—The Mincke Member of the Kings Lake Formation (Templeton and Willman, 1963, p. 111), the lower member, is named for Mincke Hollow, a small tributary of the Meramec Valley in St. Louis County, Missouri. The mouth of the hollow is a quarter of a mile southwest of the type section, which is in a railroad cut in the Meramec Valley bluff (near cen. E1/2 SE SE 21, 44N-4E), where the member is 6.3 feet thick. In Illinois it is exposed only near West Point Landing, Calhoun County. The Mincke Member thins northward from the type section to 4.9 feet in the Kings Lake type section and 3.6 feet at New London, Missouri. The Mincke Member consists of interbedded 1-5 inch beds of (1) silty argillaceous limestone that locally contains a small amount of fine sand, (2) very fossiliferous calcarenite, and (3) green to brown shale. A bed of yellow bentonite 0.5-2 inches thick is persistent in a bed of brown shale 1-1.5 feet below the top.

Tyson Member—The Tyson Member of the Kings Lake Formation (Templeton and Willman, 1963, p. 111), the upper member, is named for Tyson Hollow, St. Louis County, Missouri, the mouth of which is 0.5 mile northeast of the type section, the same section as the Mincke type section, where the Tyson is 7.5 feet thick. It thins northward to 4.3 feet in the Kings Lake type section and to 3.9 feet at New London, Missouri. The Tyson Member is largely dolomitic, silty, argillaceous limestone that weathers buff and chalky. It occurs in medium to thick beds and contains a few thin beds of buff to reddish brown shale, coarse calcarenite, and coquinite.

Guttenberg Formation

The Guttenberg Formation (Kay, 1928, p. 16; 1935b, p. 289) at the top of the Decorah Subgroup in Illinois, overlies the Spechts Ferry Formation in northwestern Illinois and the Kings Lake Formation in the southwestern part of the state. It is named for Guttenberg, Clayton County, Iowa, and the type section is in a ravine 0.5 mile north of the town. It is better exposed in a roadcut on U.S. Highway 52 on the northwest side of Guttenberg,

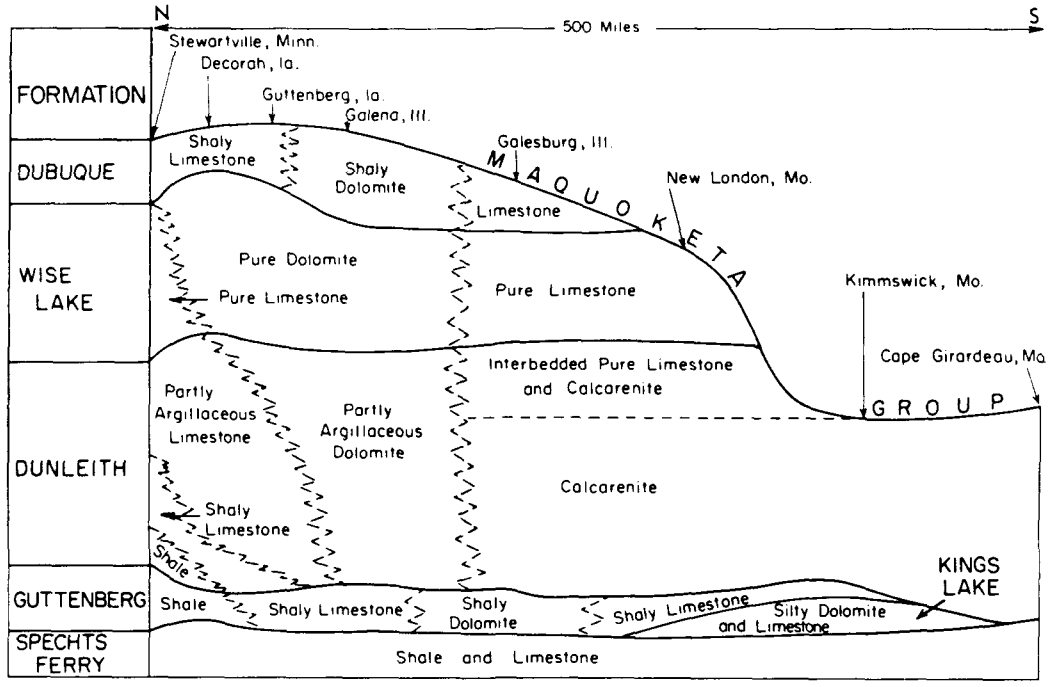

Fig. O-23—Diagrammatic cross section showing the facies in the Galena Group (after Templeton and Willman, 1963).

where the formation is 16.5 feet thick (Templeton and Willman, 1963, p. 236). The Guttenberg Formation is widely present in Illinois, and it is exposed in the localities described in the Decorah discussion. It is about 15 feet thick in the northwestern Illinois outcrop area and is 10-15 feet thick in southwestern Illinois. It thins eastward and is 3-5 feet thick in the outcrop area in central northern Illinois. In subsurface elsewhere it is only 1-3 feet thick and locally is missing. On the flanks of the Ozarks it is thinned and cut out in some localities by overlap of the Dunleith Formation. In the western part of Illinois, the Guttenberg consists of thin-bedded, tan, white-weathering, very fine-grained limestone interbedded with brown-red shale. Eastward it grades to brown, white-weathering, medium-grained, vuggy dolomite containing thin beds of brown-red shale. The dolomite facies is well exposed in the central northern outcrop area. The lower part, which is grayer, more argillaceous, and less shaly than the upper part, is differentiated as the Garnavillo Member, and the upper part is the Glenhaven Member. A thin but widely present bentonite occurs in a shale at the base of the Glenhaven. In the northwestern Illinois mining district the Guttenberg is locally thinned by solution of the limestone beds, largely in and close to the ore bodies, leaving a residue of brown-red shale called the "oilrock," which is only 2-4 feet thick. The reddish color of the Guttenberg is in part due to the abundance of minute resinous particles, probably the spores of algae. The Guttenberg has an abundant and varied fauna of brachiopods, bryozoans, mollusks, and, in places, a few trilobites. *Sowerbyella* (fig. O-5) is most abundant in the Guttenberg, which includes the *Rhinidictya* and *Ctenodonta* beds of early reports. The Guttenberg Formation is equivalent to the Napanee Member of the Rockland Formation in New York, the upper part of the Logana Formation in Kentucky, and the middle part of the Hermitage Formation in Tennessee.

Garnavillo Member—The Garnavillo Member of the Guttenberg Formation (Templeton and Willman, 1963, p. 113), the lower member, is named for Garnavillo, Clayton County, Iowa, 7.5 miles northwest of the type section in the roadcut of U.S. Highway 52 on the northwest side of Guttenberg (SW SW 5, 92N-2W), where the member is 1.7 feet thick. The Garnavillo is present throughout most of the area where Guttenberg strata occur, but it does not extend as far east as the overlying Glenhaven Member. It is 2-3 feet thick in southwestern Illinois. It consists of gray to gray-tan, white-weathering, argillaceous limestone in medium beds with thin gray-brown shale partings. Phosphatic nodules are widely present in the lower foot in the northwestern outcrop area, where the Kings Lake Formation is missing.

Glenhaven Member—The Glenhaven Member of the Guttenberg Formation (Templeton and Willman, 1963, p. 113), the upper member, is named for Glenhaven, Grant County, Wisconsin, 2.5 miles northeast of the type section, in the same exposure as the type section for the Garnavillo Member, where the Glenhaven is 14.8 feet thick. The Glenhaven Member thins southward from the type area to 10-12 feet in north-

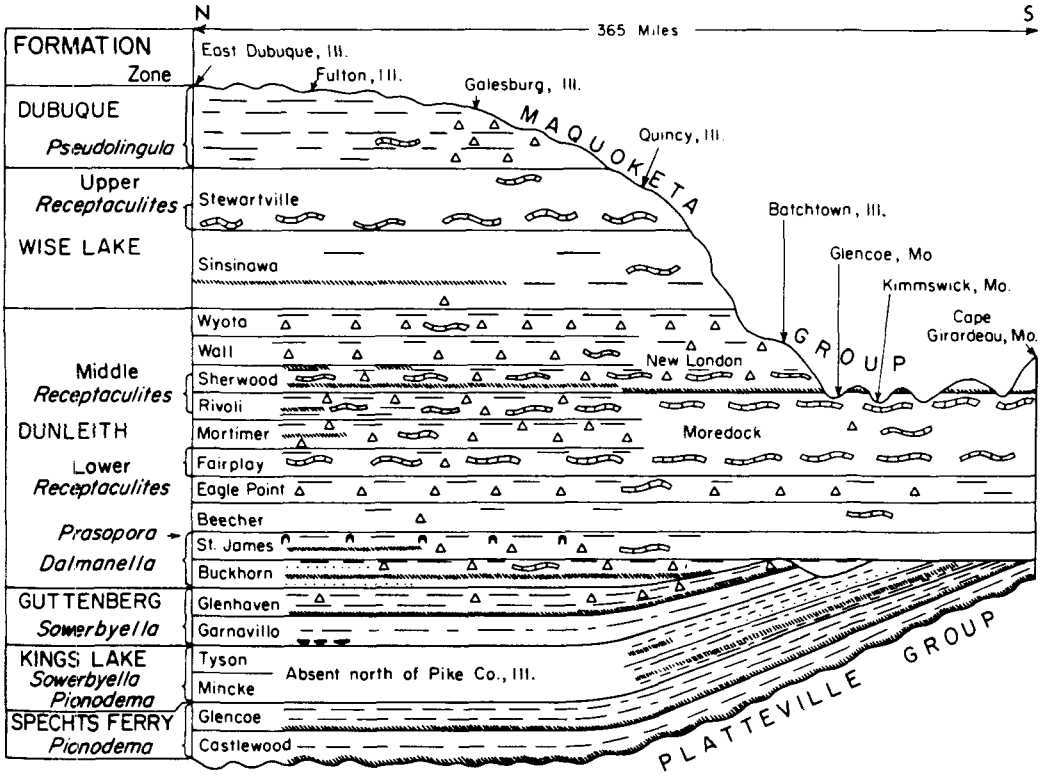

Fig. O-24—Diagrammatic cross section of the Galena Group showing the principal faunal zones and bentonite beds (after Templeton and Willman, 1963).

western Illinois and 7-9 feet in southwestern Illinois. In northwestern Illinois the Glenhaven is commonly separated from the overlying Dunleith Formation by a transition zone as much as a foot thick. The Glenhaven consists of tan, white-weathering, lithographic to very fine-grained limestone in beds 1-4 inches thick that are separated by layers of dark brown-red shale, generally thin but locally as much as 2 inches thick. The lower part is consistently more shaly, thinner bedded, and has wavier bedding planes than the upper part. The upper is purer and has more fossil debris and calcarenite layers. Lenses of chert are widely present in a single layer 1-2 feet above the base of the upper part and are scattered through the lower foot in the southwestern outcrops. In places in subsurface the entire formation is cherty. A bentonite bed up to 1 inch thick is widely present at the base of the Glenhaven in both northern and southern outcrop areas.

Kimmswick Subgroup

The Kimmswick Subgroup (Ulrich, 1904, p. 111; Templeton and Willman, 1963, p. 114) consists of the dominantly pure limestone and dolomite formations that compose the middle part of the Galena Group. It excludes the shaly strata of the Dubuque Formation at the top and the shaly formations of the Decorah Subgroup at the base. It is named for Kimmswick, Jefferson County, Missouri, and the type section is in a quarry about a mile west of Kimmswick on the north side of Rock Creek just west of the mouth of Black Creek (approximately SE NE 18, 42N-6E). The Kimmswick Subgroup occurs throughout the area of the Galena Group. It is about 250 feet thick in northern Illinois, thins rapidly in an east-west belt through the central part of the state, and it is only 90-125 feet thick in most of the southern half of the state. It is dominantly limestone in the southern two-thirds of the state and dolomite north of there. It is subdivided into the basal Dunleith Formation, which contains some argillaceous beds and is medium bedded and generally cherty, and the Wise Lake Formation, which is pure, massive, and not cherty. Only the Dunleith Formation is present in the Kimmswick type locality because the Wise Lake is truncated by the Cincinnatian Series south of the belt through the central part of the state where the Galena Group thins.

Dunleith Formation

The Dunleith Formation (Templeton and Willman, 1963, p. 114), which overlies the Guttenberg Formation and underlies the Wise Lake Formation in the Galena Group, is named for Dunleith Township, Jo Daviess County. The type section is an exposure in the Mississippi River bluffs on the north side of East Dubuque (SE 19, 29N-2W), where the formation is 132 feet thick, including the unexposed lower 20 feet (fig. O-2B). The type section for the lowest strata (the St. James and Buckhorn Members) is at Buena Vista, Stephenson County. The Dunleith Formation is exposed (fig. O-2C) in most of the area described in the discussion of the Galena Group. It is commonly 120-125 feet thick in the northern outcrop area and is 135 feet thick near New London, Missouri, where it is overlain by the Wise Lake Formation. South of New London, where the Wise Lake and upper Dunleith beds are missing, the formation is only about 100 feet thick. At East Dubuque the lower 27 feet is dolomite-mottled lithographic limestone and the upper 85 feet is dolomite. South and east of there, the limestone is progressively replaced by dolomite from the top down, and at Galena and farther east the formation is all dolomite, except for local areas such as north of Morris, Grundy County, in which it is dolomite-mottled limestone. In northwestern Illinois the Dunleith consists of alternating pure and argillaceous units. The pure units are medium to thick bedded and vuggy and the argillaceous units thin to medium bedded and dense. Chert nodules are common, particularly in the argillaceous units. The formation is subdivided into 10 conformable members, most of them consisting of a pure unit overlain by a thinner argillaceous unit. The Buckhorn (at the base) is overlain by the St. James, Beecher, Eagle Point, Fairplay, Mortimer, Rivoli, Sherwood, Wall, and Wyota Members. In Illinois the upper six members are recognized only in the northern dolomite and limestone facies. The argillaceous content decreases eastward and southward, and the member differentiation is less useful in the central northern outcrop area, although most of the members can be identified by such minor characteristics as abundance and types of chert, persistent thin bentonite beds, corrosion zones, fucoidal zones, and common fossils. In subsurface in northeastern Illinois the formation is even purer, contains little or no chert, and its members have not been differentiated (Buschbach, 1964). The southern limestone facies occurs throughout central and southern Illinois but is exposed only at Lowell, La Salle County, at Valmeyer, Monroe County, and near West Point Landing, Calhoun County. The lower four members are recognizable in the outcrops but rarely in subsurface. The overlying part of the Dunleith is divided into only two members, a lower massive calcarenite (Moredock Member) and an upper cherty, thin- to medium-bedded, calcarenitic limestone (New London Member). The Dunleith is sparsely fossiliferous in the dolomite facies, although *Paucicrura* [*Dalmanella*], *Prasopora*, and *Receptaculites* (fig. O-5) characterize certain zones. Bryozoans and crinoidal debris are particularly abundant in the southern limestone facies. The Dunleith Formation is called the "Drab" in the lead-zinc district, and it is equivalent to the upper part of the Decorah Shale and the lower part of the Prosser Limestone in the Mississippi Valley north of Illinois, to the Jessamine, Benson, and Brannon Members of the Lexington Limestone in Kentucky, to the upper part of the Hermitage and most of the Bigby-Cannon Formations in Tennessee, and to the Kirkfield Formation, the Sherman Fall Formation, and the Rust Member of the Coburg Formation in New York.

Buckhorn Member—The Buckhorn Member of the Dunleith Formation (Templeton and Willman, 1963, p. 119), the basal member, is named for Buckhorn Corners, Stephenson County, 2 miles east of the type section in a quarry at Buena Vista (NW SW NE 15, 28N-7E), where the member is 8.3 feet thick. It is commonly 5-8 feet thick but is generally absent in southwestern Illinois, where it is overlapped by the St. James Member. The Buckhorn consists of argillaceous, medi-

um to coarse, blue-gray dolomite heavily speckled with black, particularly at the top. It contains green shale partings and in the northwestern area is slightly sandy. It locally contains several very thin layers of bentonite. *Paucicrura* [*Dalmanella*] *rogata* is especially common. The Buckhorn is called the "Blue" in the lead-zinc district. With the overlying St. James Member, it is equivalent to the Ion Member at the top of the Decorah in the region northwest of Illinois.

St. James Member—The St. James Member of the Dunleith Formation (Templeton and Willman, 1963, p. 119), which overlies the Buckhorn Member, is named for St. James Cemetery in Stephenson County, 3 miles northwest of the type section, in the same exposure as the Buckhorn type section, where the St. James is 13.3 feet thick. It is called the "Gray" in the lead-zinc district. The St. James Member commonly is about 14 feet thick in the dolomite facies in northern Illinois and 8-12 feet thick in the southern limestone facies. In northern Illinois it is light tan, pure, medium-bedded, vuggy dolomite, but thin green shale partings are common in the upper 2-4 feet. It has black speckles but not as many as the Buckhorn. *Prasopora simulatrix* (fig. O-5) is common in the upper few inches in the extreme northwestern part of the state but has been found eastward only as far as Rockford, where it is rare. In the southern area the St. James is a coarse-grained, gray to brown, faintly gray-speckled calcarenite that locally has a few inches of conglomerate at the base.

Beecher Member—The Beecher Member of the Dunleith Formation (Templeton and Willman, 1963, p. 120) overlies the St. James Member and is named for Beecher Street in East Dubuque, Jo Daviess County, which is near the type section (part of the Dunleith type section), where the member is 6.3 feet thick. It commonly is about 8 feet thick in the northern outcrop area and 12 feet in the southern area. In the type section the Beecher is lithographic to fine-grained, dolomite-mottled limestone, typical of the northern limestone facies, but in most of northern Illinois it is relatively pure, noncherty, mainly massive, vuggy dolomite. High purity and massiveness differentiate it from the cherty Eagle Point Member above and the more argillaceous St. James below. In the southern limestone facies it is coarse-grained, gray to pink, almost wholly massive, pure calcarenite.

Eagle Point Member—The Eagle Point Member of the Dunleith Formation (Templeton and Willman, 1963, p. 120) overlies the Beecher Member and is named for Eagle Point, a prominent bluff on the west side of the Mississippi Valley in Dubuque County, Iowa, 2 miles north of the type section (part of the Dunleith type section), where the member is 11.8 feet thick. It is commonly 12-18 feet thick in the northern outcrop area and 9-10 feet in the southern area. It is characterized by well defined bands of chert nodules. It consists of slightly argillaceous dolomite-mottled limestone in the type section, but it is dolomite in most of northern Illinois. In the southern outcrop area it is calcarenite containing bands of chert, is finer grained, denser, and more argillaceous than the members above and below.

Fairplay Member—The Fairplay Member of the Dunleith Formation (Templeton and Willman, 1963, p. 121) overlies the Eagle Point Member, and is named for the town of Fairplay, Grant County, Wisconsin, 6 miles northeast of the type section (part of the Dunleith type section), where the member is 19.8 feet thick. It is commonly 14-20 feet thick. In the type section it consists of relatively pure, lithographic limestone and is the top of the northern limestone facies. It is largely free of chert, but scattered nodules appear locally. The upper 1-3 feet is persistently argillaceous or shaly. *Receptaculites oweni* is common in many beds, and the Fairplay is the Lower *Receptaculites* Zone. These characteristics extend into the northern dolomite facies, but the member is not differentiated in the southern limestone facies.

Mortimer Member—The Mortimer Member of the Dunleith Formation (Templeton and Willman, 1963, p. 121) overlies the Fairplay Member and is named for Mortimer Street in East Dubuque, Jo Daviess County, near the type section (part of the Dunleith type section) (fig. O-2B), where the member is 11.3 feet thick. It is commonly 10-13 feet thick. It consists of thick-bedded vuggy dolomite that contains bands of large white chert nodules. Its purity is between that of the pure Fairplay Member below and the argillaceous Rivoli above. It has a 2.2-foot argillaceous zone at the top in the type section, which thins to 5-6 inches in the Dixon and Rockford areas. It contains a few dense argillaceous beds. Thin lenses of bentonite occur along a prominent bedding plane at the top.

Rivoli Member—The Rivoli Member of the Dunleith Formation (Templeton and Willman, 1963, p. 122) overlies the Mortimer Member and is named for Rivoli Street in East Dubuque, Jo Daviess County, near the type section (part of the Dunleith type section) (fig. O-2B), where the member is 19 feet thick. The Rivoli Member thins eastward from the type section and is 13 feet thick in central northern Illinois. It is the most argillaceous of the Dunleith members. The upper 5 feet is a persistent argillaceous zone that is very cherty in the type section. The lower 5-6 feet contains bands of large chert nodules. Corrosion surfaces are strongly developed in the Rivoli. Thin lenses of bentonite are locally present at or near the top and probably occur at other horizons, especially along sharp reentrants. *Receptaculites oweni* is abundant in upper Rivoli strata and the overlying Sherwood Member—the Middle *Receptaculites* Zone.

Sherwood Member—The Sherwood Member of the Dunleith Formation (Templeton and Willman, 1963, p. 123) overlies the Rivoli Member and is named for Sherwood Street in East Dubuque, Jo Daviess County, near the type section (part of the Dunleith type section) (fig. O-2B), where the Sherwood is 13.6 feet thick. The Sherwood Member is 10 feet thick in central northern Illinois. It consists of relatively pure, vuggy dolomite with a strong argillaceous zone in the top 3.6 feet in the type section. Chert is erratic in occurrence, except for an almost continuous bed of chert just above the base in some areas. One of the most persistent bentonites, as much as 3 inches thick, occurs about 3 feet above the base, and another occurs locally at the base of the upper argillaceous zone.

Wall Member—The Wall Member of the Dunleith Formation (Templeton and Willman, 1963, p. 123) overlies the Sherwood Member and is named for Wall Street in East Dubuque, Jo Daviess County, near the type section (part of the Dunleith type section) (fig. O-2B), where the Wall is 9.7 feet thick. The Wall Member is commonly 10-12 feet thick. It is less argillaceous than the Sherwood below and more argillaceous than the Wyota above. The argillaceous zone at the top is not prominent, but the upper 1-3 feet commonly has more argillaceous mottling and thin, wavy shale partings than the beds below. A widespread bentonite bed as much as 4 inches thick occurs near the middle of the member. Chert nodules are common, and the beds above the bentonite are more cherty than those below.

Wyota Member—The Wyota Member of the Dunleith Formation (Templeton and Willman, 1963, p. 124), the uppermost member in northern Illinois, overlies the Wall Member, and is named for Wyota Street in East Dubuque, Jo Daviess County, near the type section (part of the Dunleith type section) (fig. O-2B), where the Wyota is 19.9 feet thick. The Wyota Member is commonly 18-20 feet thick. Most of it is purer than the Wall but less pure than the overlying Sinsinawa Member of the Wise Lake Formation. It is characterized by the persistence of thin beds with argillaceous flecks, particularly in the upper 10 feet, and by abundant chert nodules in well defined bands. The upper 2-4 feet is slightly ar-

gillaceous, locally shaly, and in many exposures makes a strong reentrant that marks the top of the Dunleith Formation.

Moredock Member—The Moredock Member of the Dunleith Formation (Templeton and Willman, 1963, p. 124) occurs in the southern limestone facies, overlying the Eagle Point Member. It is named for Moredock Lake, at Valmeyer, Monroe County, near the type section in the Mississippi River bluff (cen. N line SW 3, 3S-11W), where the member is 58.4 feet thick. The Moredock is commonly 60-70 feet thick where overlain by the New London Member, but in many exposures in the southern outcrop area the Moredock is overlain unconformably by Maquoketa Group strata, as it is at the type section, or by the Cape Limestone, and the upper few feet of the member are missing. The Moredock is exceptionally pure, coarse-grained calcarenite that is massive, cross-bedded, crinoidal, nearly white, and banded with pink, buff, and gray beds. Although the member is generally noncherty, large chert nodules or lenses of chert occur locally. It is distinguishable from the Eagle Point Member, which is finer grained, has bands of chert nodules, and is less pure.

New London Member—The New London Member of the Dunleith Formation (Templeton and Willman, 1963, p. 125) occurs in the southern limestone facies, overlying the Moredock Member and underlying the Wise Lake Formation. It is named for New London, Ralls County, Missouri, 2 miles south of the type section in a roadcut and in the bluff east of U.S. 61 on the north side of Salt River (NE SW 25, 56N-5W), where it is 32.8 feet thick. The top of the member is not exposed in the type section, but it occurs in a roadcut and bluff half a mile south of Frankford, Ralls County, on the north side of Peno Creek (SE NE and NE SE 2, 54N-4W). The New London consists of fine-grained to lithographic, calcarenitic, cherty limestone that contains beds of fine- to medium-grained calcarenite and some thin argillaceous and slightly shaly beds. Red-brown shale partings occur locally. It is finer grained than the Moredock below, coarser than the Wise Lake above, and less pure and thinner bedded than either. A persistent bentonite, as much as 2 inches thick, commonly marks the base of the member. It is believed to be equivalent to the bentonite near the base of the Sherwood Member in the northern area. The entire member is exposed only in the extreme northern part of the southern outcrop area, where it is 35-45 feet thick. South of there it is generally overlapped by Cincinnatian strata, but the lower 3-5 feet, identified by the bentonite at its base, is present locally.

Wise Lake Formation

The Wise Lake Formation (Templeton and Willman, 1963, p. 125) consists of relatively pure dolomite and limestone overlying the cherty Dunleith Formation and underlying the shaly Dubuque Formation. It is named for Wise Lake, a lake on the Mississippi River floodplain near the type section at the north end of a prominent bluff, 6 miles south of Galena, Jo Daviess County (cen. NE 21, 27N-1E), where the formation is 70.9 feet thick. The Wise Lake Formation, persistently 67-75 feet thick, occurs throughout the northern outcrop area (fig. O-2B, C) and southward in subsurface to the central part of the state, where it is sharply truncated by Cincinnatian strata. The Wise Lake consists of noncherty, medium- to thick-bedded, vuggy, pure dolomite in the northern outcrop area. The southern limestone facies is not exposed in Illinois, but in outcrops near New London, in Ralls County, Missouri, it is thick-bedded, fine-grained, to lithographic, pure limestone. The Wise Lake is subdivided into two members; the basal Sinsinawa Member is thinner bedded and slightly less pure than the Stewartville above it. *Receptaculites oweni* (fig. O-5) is abundant and persistently present in the lower 10-15 feet of the Stewartville, called the Upper *Receptaculites* Zone, and is associated with a gastropod-cephalopod fauna. *Maclurites cuneata* and *Hormatoma major* (fig. O-5) are common in some localities. The Sinsinawa Member is less fossiliferous but contains gastropods and, in places, a few *Receptaculites*. The Wise Lake Formation is the purest of the carbonate formations in the Galena Group and is equivalent and lithologically similar to relatively pure formations throughout much of the continent. The Wise Lake is thought to represent the greatest submergence of the continent during Paleozoic time. The Wise Lake Formation consists of strata formerly included in the Stewartville Formation and in the upper part of the Prosser Formation in the Upper Mississippi Valley. It is equivalent to the Steuben Member of the Cobourg Limestone in New York and Ontario, the upper part of the Lexington Limestone in Kentucky, and the upper part of the Bigby-Cannon Formation in Tennessee.

Sinsinawa Member—The Sinsinawa Member of the Wise Lake Formation (Templeton and Willman, 1963, p. 126), the lower member, is named for the Sinsinawa River in Jo Daviess County, along which it is well exposed. The type section is a roadcut along U.S. Highway 20 on the east side of the Galena River at Galena (SW SE NE 20, 28N-1E), where the Wise Lake type section) is missing. The Sinsinawa Member is 33 feet thick, although a few feet at the top (exposed in the Wise Lake type section) is missing. The Sinsinawa Member is 35-40 feet thick. Where exposed in the northern outcrop area (fig. O-2B), most of it is medium- to thick-bedded, pure, vuggy dolomite, but it contains a few dense, slightly argillaceous beds. A 1-2 inch bed of bentonite is widely present about 17 feet above the base, and a thin bentonite occurs locally about 7 feet higher. The Sinsinawa Member is equivalent to the upper, noncherty part of the Prosser Limestone of Minnesota.

Stewartville Member—The Stewartville Member of the Wise Lake Formation (Ulrich, 1911, pl. 27), the upper member (originally the Stewartville Formation), is named for Stewartville, Olmstead County, Minnesota, which is half a mile east of the type section, a quarry on the north side of the Root River, where 28 feet of dolomite in the lower part of the member is exposed (Kay, 1935a, p. 567). The Stewartville Member is about 60 feet thick in the type locality, but only 30-35 feet thick in northern Illinois. It is largely thick-bedded, pure dolomite, and many samples from the lower 10-15 feet (the Upper *Receptaculites* Zone) contain almost no insoluble residue. The bedding becomes thinner upward as a gradual transition to the shaly Dubuque Formation above takes place. The top of the Stewartville is placed at the lowest definitely argillaceous or shaly bedding plane. Above this position is the first occurrence of *Pseudolingula iowensis*, which is common in the higher, more shaly part of the Dubuque Formation. The Stewartville Member is the *Maclurea* bed of early reports.

Dubuque Formation

The Dubuque Formation (Sardeson, 1907, p. 193) is the shaly dolomite at the top of the Galena Group. It is named for Dubuque, Dubuque County, Iowa, and the type section is a quarry in Dubuque, east of Columbia College at the top of the West 14th Street hill, where 33 feet of Dubuque, its top eroded, is exposed. In Illinois the Dubuque Formation occurs only in the northwestern part of the state, where it is 40-45 feet thick (Templeton and Willman, 1963, p. 128). It is truncated by Maquoke-

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276 Mary A. Gade, Director

MEMORANDUM

Ref 32

DATE: March 9, 1998

TO: Pete Sorenson

FROM: Chris Bridges

SUBJECT: Katalyst Method Detection Limits for EPA 524.2

Enclosed are Katalyst Analytical Technology method detection limits (MDL) for EPA 524.2 from 1993, 1994 and 1995. These MDLs were used during the analysis of the Evergreen Manor samples. Please note that during the time frame when the Evergreen Manor samples were analyzed the laboratory's name was Environmental Science and Engineering, however, since then the laboratory's name changed to QST and then to Katalyst Analytical Technology.

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KATALYST

ANALYTICAL TECHNOLOGIES, INC.

FACSIMILE

DATE: 19 Dec 97 TIME:

TO: Jim Shaw / IEPA FROM: Chris Ohland.

FAX #: 217.524.0944 FAX #: (309) 692-5232

SUBJECT: MDL & RL for 524.2 1993 & 1995

No. of Pages (including this cover sheet) 11

MESSAGE: Jim, here are the MDL & RL for 524.2. As authorized by QST Environmental (Karen Jeason)

Fax Contains

1) Sept '93 MDL Study & IDC
2) Feb '94 MDL Study
3) Aug '95 MDL
4) 10/94 QAPP RL.

- Chris

If you have any questions or concerns, please call us immediately at (309) 589-8000

8901 N. Industrial Road, Suite 100 ✦ Peoria, IL 61615 ✦ Phone (309) 589-8000

Environmental Science & Engineering, Inc.
Peoria, IL - Laboratory
Method Detection Limits - Method 524.2
Instrument ID#: Extrel #6
September 19, 1993

Analyte	Amt Added (ug/L)	#1	#2	#4	#5	#6	#7	#8	Average	%True	STD	MDL	%RSD
1,2-Dichlorobenzene-D4	1.000	0.843	0.754	0.817	0.815	0.663	0.779	0.758	0.775	77.509	0.059	0.186	7.625
Dichlorodifluoromethane	0.500	0.414	0.453	0.403	0.418	0.446	0.331	0.463	0.418	83.634	0.045	0.140	10.667
Chloromethane	0.500	0.492	0.637	0.497	0.581	0.445	0.546	0.368	0.509	101.897	0.089	0.279	17.421
Vinyl chloride	0.500	0.542	0.559	0.556	0.408	0.467	0.454	0.531	0.502	100.463	0.059	0.186	11.776
Bromomethane	0.500	0.448	0.609	0.477	0.381	0.616	0.407	0.437	0.482	96.371	0.094	0.295	19.508
Chloroethane	0.500	0.542	0.487	0.370	0.400	0.460	0.406	0.443	0.444	88.760	0.059	0.184	13.203
Trichlorofluoromethane	0.500	0.568	0.495	0.527	0.493	0.600	0.434	0.429	0.507	101.363	0.064	0.201	12.617
1,1-Dichloroethene	0.500	0.487	0.505	0.489	0.479	0.531	0.466	0.475	0.490	98.063	0.022	0.069	4.449
Dichloromethane	0.500	0.508	0.524	0.594	0.576	0.525	0.618	0.584	0.561	112.246	0.042	0.132	7.501
t-1,2-Dichloroethene	0.500	0.478	0.484	0.510	0.511	0.507	0.503	0.506	0.500	99.963	0.033	0.042	2.660
1,1-Dichloroethane	0.500	0.524	0.526	0.579	0.595	0.545	0.573	0.550	0.556	111.197	0.027	0.085	4.847
2,2-Dichloropropane	0.500	0.479	0.429	0.431	0.451	0.477	0.406	0.345	0.431	86.214	0.046	0.145	10.717
c-1,2-Dichloroethene	0.500	0.527	0.493	0.529	0.525	0.523	0.523	0.497	0.517	103.343	0.015	0.047	2.919
Bromochloromethane	0.500	0.538	0.513	0.494	0.577	0.489	0.527	0.559	0.528	105.577	0.033	0.103	6.184
Chloroform	0.500	0.614	0.605	0.616	0.577	0.572	0.560	0.608	0.593	118.611	0.023	0.072	3.857
1,1,1-Trichloroethane	0.500	0.535	0.564	0.515	0.594	0.544	0.493	0.522	0.538	107.629	0.033	0.105	6.203
Carbon tetrachloride	0.500	0.505	0.534	0.517	0.534	0.550	0.496	0.501	0.520	103.911	0.020	0.064	3.912
1,1-Dichloropropene	0.500	0.516	0.511	0.521	0.560	0.530	0.521	0.472	0.518	103.689	0.026	0.082	5.004
Benzene	0.500	0.504	0.484	0.536	0.537	0.516	0.528	0.590	0.528	105.540	0.034	0.105	6.354
1,2-Dichloroethane	0.500	0.596	0.539	0.625	0.687	0.527	0.569	0.555	0.585	117.063	0.056	0.176	9.550
Trichloroethene	0.500	0.498	0.503	0.529	0.500	0.489	0.515	0.463	0.500	99.900	0.021	0.065	4.154
1,2-Dichloropropane	0.500	0.546	0.527	0.569	0.591	0.507	0.552	0.544	0.547	109.397	0.027	0.086	4.985
Dibromomethane	0.500	0.574	0.547	0.581	0.610	0.418	0.583	0.613	0.561	112.189	0.067	0.210	11.930
Bromodichloromethane	0.500	0.534	0.534	0.581	0.625	0.465	0.580	0.547	0.552	110.443	0.050	0.158	9.094
c-1,3-Dichloropropene	0.500	0.415	0.402	0.414	0.389	0.312	0.363	0.338	0.376	75.231	0.040	0.125	10.576
Toluene	0.500	0.457	0.427	0.436	0.421	0.402	0.398	0.360	0.414	82.863	0.031	0.098	7.547
t-1,3-Dichloropropene	0.500	0.393	0.367	0.377	0.408	0.279	0.338	0.377	0.363	72.509	0.043	0.135	11.864
1,1,2-Trichloroethane	0.500	0.438	0.550	0.515	0.582	0.399	0.495	0.518	0.500	99.903	0.063	0.198	12.589
Tetrachloroethene	0.500	0.444	0.389	0.450	0.405	0.439	0.432	0.386	0.418	83.694	0.027	0.086	6.501
1,3-Dichloropropane	0.500	0.504	0.490	0.519	0.540	0.406	0.464	0.468	0.485	96.989	0.044	0.139	9.125
Dibromochloromethane	0.500	0.464	0.480	0.508	0.494	0.373	0.481	0.433	0.462	92.369	0.046	0.144	9.920
1,2-Dibromoethane	0.500	0.446	0.451	0.465	0.465	0.340	0.427	0.421	0.429	85.820	0.044	0.138	10.197
Chlorobenzene	0.500	0.423	0.414	0.410	0.425	0.360	0.388	0.356	0.397	79.317	0.029	0.091	7.320
1,1,1,2-Tetrachloroethane	0.500	0.451	0.412	0.420	0.460	0.338	0.441	0.433	0.422	84.426	0.041	0.128	9.644
Ethylbenzene	0.500	0.461	0.423	0.433	0.442	0.359	0.409	0.368	0.414	82.703	0.038	0.119	9.156
m,p-Xylenes	1.000	1.115	1.104	1.104	1.106	0.999	1.048	0.935	1.059	105.869	0.069	0.217	6.520
o-Xylene	0.500	0.568	0.552	0.529	0.499	0.470	0.513	0.426	0.508	101.591	0.049	0.153	9.562
Styrene	0.500	0.394	0.405	0.389	0.388	0.331	0.393	0.363	0.380	76.054	0.025	0.079	6.611
Bromoform	0.500	0.362	0.364	0.492	0.482	0.334	0.402	0.462	0.414	82.760	0.064	0.201	15.491
Bromobenzene	0.500	0.423	0.404	0.439	0.409	0.335	0.415	0.381	0.401	80.169	0.034	0.107	8.513
n-Propylbenzene	0.500	0.378	0.377	0.374	0.367	0.369	0.376	0.336	0.368	73.620	0.015	0.046	3.990
1,2,3-Trichloropropane	0.500	0.578	0.578	0.611	0.514	0.355	0.499	0.536	0.524	104.877	0.084	0.265	16.067
1,1,2,2-Tetrachloroethane	0.500	0.515	0.509	0.435	0.532	0.413	0.461	0.488	0.479	95.803	0.044	0.140	9.275
Isopropylbenzene	0.500	0.387	0.371	0.358	0.355	0.350	0.334	0.326	0.354	70.851	0.021	0.065	5.832
2-Chlorotoluene	0.500	0.442	0.418	0.405	0.428	0.386	0.398	0.388	0.409	81.823	0.021	0.066	5.100
4-Chlorotoluene	0.500	0.425	0.446	0.426	0.407	0.357	0.359	0.392	0.402	80.314	0.034	0.108	8.546
1,3,5-Trimethylbenzene	0.500	0.446	0.405	0.441	0.452	0.438	0.413	0.402	0.428	85.637	0.021	0.065	4.865
t-Butylbenzene	0.500	0.364	0.368	0.355	0.356	0.360	0.320	0.322	0.349	69.849	0.020	0.062	5.645
1,2,4-Trimethylbenzene	0.500	0.522	0.519	0.470	0.493	0.453	0.460	0.432	0.479	95.837	0.035	0.109	7.216
sec-Butylbenzene	0.500	0.418	0.408	0.397	0.382	0.410	0.370	0.364	0.392	78.487	0.021	0.066	5.313
1,3-Dichlorobenzene	0.500	0.479	0.496	0.469	0.472	0.435	0.487	0.470	0.473	94.534	0.019	0.060	4.059

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Analyte	Amt. Added	#1	#2	#3	#4	#5	#6	#7	Average	% True	STD	MDL	%RSD
1,4-Dichlorobenzene	0.500	0.504	0.465	0.490	0.500	0.415	0.481	0.476	0.476	95.169	0.030	0.095	6.322
p-Isopropyltoluene	0.500	0.361	0.363	0.354	0.350	0.354	0.399	0.335	0.359	71.874	0.020	0.062	5.497
1,2-Dichlorobenzene	0.500	0.464	0.444	0.492	0.403	0.377	0.435	0.421	0.434	86.734	0.038	0.120	8.779
n-Butylbenzene	0.500	0.428	0.416	0.394	0.401	0.429	0.382	0.385	0.405	80.989	0.020	0.062	4.834
1,2-Dibromo-3-chloropropane	0.500	0.470	0.468	0.440	0.510	0.501	0.417	0.414	0.460	92.006	0.038	0.120	8.276
1,2,4-Trichlorobenzene	0.500	0.474	0.439	0.429	0.416	0.353	0.412	0.414	0.420	83.920	0.036	0.114	8.676
Naphthalene	0.500	0.593	0.565	0.645	0.564	0.435	0.471	0.512	0.541	108.117	0.073	0.228	13.443
Hexachlorobutadiene	0.500	0.388	0.416	0.403	0.411	0.418	0.409	0.429	0.410	82.080	0.013	0.040	3.139
1,2,3-Trichlorobenzene	0.500	0.516	0.443	0.440	0.456	0.363	0.434	0.463	0.445	88.991	0.045	0.143	10.218
Bromofluorobenzene	1.000	0.811	0.806	0.785	0.754	0.715	0.758	0.715	0.765	76.481	0.039	0.123	5.119
Total Trihalomethanes	2.000	1.874	1.983	2.197	2.178	1.744	2.023	2.050	2.021	101.065	0.151	0.475	7.471

Initial Demonstration of Capability - Method 524.2
Instrument ID#: Extrel #6
September 19, 1993

Analyte	Am't Added (ug/L)	#4	#5	#6	#7	#8	Average	% True	STD	% RSD
1,2-Dichlorobenzene-D4	1.000	0.817	0.815	0.663	0.779	0.758	0.766	76.626	0.063	8.202
Dichlorodifluoromethane	0.500	0.403	0.418	0.446	0.331	0.463	0.412	82.436	0.051	12.457
Chloromethane	0.500	0.497	0.581	0.445	0.546	0.368	0.487	97.488	0.084	17.267
Vinyl chloride	0.500	0.556	0.408	0.467	0.454	0.531	0.483	96.604	0.060	12.399
Bromomethane	0.500	0.477	0.381	0.616	0.407	0.437	0.463	92.664	0.092	19.922
Chloroethane	0.500	0.370	0.400	0.460	0.406	0.443	0.416	83.112	0.036	8.592
Trichlorofluoromethane	0.500	0.527	0.493	0.600	0.434	0.429	0.497	99.364	0.071	14.281
1,1-Dichloroethene	0.500	0.469	0.479	0.531	0.466	0.475	0.488	97.628	0.026	5.236
Dichloromethane	0.500	0.594	0.576	0.525	0.618	0.584	0.579	115.880	0.034	5.926
t-1,2-Dichloroethene	0.500	0.510	0.511	0.507	0.503	0.506	0.507	101.480	0.003	0.591
1,1-Dichloroethane	0.500	0.579	0.595	0.545	0.573	0.550	0.568	113.648	0.021	3.657
2,2-Dichloropropane	0.500	0.431	0.451	0.477	0.406	0.345	0.422	84.368	0.050	11.905
c-1,2-Dichloroethene	0.500	0.529	0.525	0.523	0.523	0.497	0.519	103.876	0.013	2.497
Bromochloromethane	0.500	0.494	0.577	0.488	0.527	0.559	0.529	105.788	0.039	7.353
Chloroform	0.500	0.616	0.577	0.572	0.560	0.608	0.586	117.288	0.024	4.120
1,1,1-Trichloroethane	0.500	0.515	0.594	0.544	0.493	0.522	0.534	106.728	0.038	7.196
Carbon tetrachloride	0.500	0.517	0.534	0.550	0.496	0.501	0.520	103.936	0.023	4.368
1,1-Dichloropropene	0.500	0.521	0.560	0.530	0.521	0.472	0.521	104.116	0.031	6.033
Benzene	0.500	0.536	0.537	0.516	0.528	0.590	0.541	108.264	0.029	5.310
1,2-Dichloroethane	0.500	0.625	0.687	0.527	0.569	0.555	0.592	118.484	0.064	10.745
Trichloroethene	0.500	0.529	0.500	0.489	0.515	0.463	0.499	99.844	0.025	5.076
1,2-Dichloropropane	0.500	0.569	0.591	0.507	0.552	0.544	0.552	110.492	0.031	5.613
Dibromomethane	0.500	0.581	0.610	0.418	0.583	0.613	0.561	112.224	0.081	14.504
Bromodichloromethane	0.500	0.581	0.625	0.465	0.580	0.547	0.560	111.916	0.060	10.641
c-1,3-Dichloropropene	0.500	0.414	0.389	0.312	0.363	0.338	0.363	72.656	0.040	11.107
Toluene	0.500	0.436	0.421	0.402	0.398	0.360	0.403	80.660	0.029	7.111
t-1,3-Dichloropropene	0.500	0.377	0.408	0.279	0.338	0.377	0.356	71.120	0.050	13.996
1,1,2-Trichloroethane	0.500	0.515	0.582	0.399	0.495	0.518	0.502	100.360	0.066	13.154
Tetrachloroethene	0.500	0.450	0.405	0.439	0.412	0.386	0.419	83.720	0.026	6.200
1,3-Dichloropropane	0.500	0.519	0.540	0.406	0.464	0.468	0.479	95.864	0.053	10.955
Dibromochloromethane	0.500	0.508	0.494	0.373	0.481	0.433	0.458	91.548	0.055	12.056
1,2-Dibromoethane	0.500	0.465	0.465	0.340	0.427	0.411	0.422	84.300	0.051	12.135
1,1,1,2-Tetrachloroethane	0.500	0.420	0.460	0.338	0.441	0.433	0.418	83.660	0.047	11.298
Ethylbenzene	0.500	0.433	0.442	0.359	0.409	0.368	0.402	80.424	0.037	9.317
m,p-Xylenes	1.000	1.104	1.106	0.999	1.048	0.935	1.038	103.834	0.073	7.023
o-Xylene	0.500	0.529	0.499	0.470	0.513	0.426	0.487	97.468	0.041	8.328
Bromoform	0.500	0.492	0.482	0.334	0.402	0.462	0.434	86.824	0.066	15.205
Analyte	Amt. Added	#3	#4	#5	#6	#7				
Bromobenzene	0.500	0.439	0.409	0.335	0.415	0.381	0.396	79.136	0.040	10.059

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n-Propylbenzene	0.500	0.374	0.367	0.369	0.376	0.336	0.364	72.864	0.016	4.434
1,2,3-Trichloropropane	0.500	0.611	0.514	0.355	0.499	0.536	0.503	100.608	0.093	18.493
1,1,2,2-Tetrachloroethane	0.500	0.435	0.532	0.413	0.461	0.488	0.466	93.140	0.047	10.027
Isopropylbenzene	0.500	0.358	0.355	0.350	0.334	0.326	0.345	68.904	0.014	4.030
2-Chlorotoluene	0.500	0.405	0.428	0.386	0.398	0.388	0.401	80.184	0.017	4.219
4-Chlorotoluene	0.500	0.426	0.407	0.357	0.359	0.392	0.388	77.588	0.030	7.733
1,3,5-Trimethylbenzene	0.500	0.441	0.452	0.438	0.413	0.402	0.429	85.844	0.021	4.831
t-Butylbenzene	0.500	0.355	0.356	0.360	0.320	0.322	0.343	68.516	0.020	5.737
1,2,4-Trimethylbenzene	0.500	0.470	0.498	0.453	0.460	0.432	0.463	92.524	0.024	5.257
sec-Butylbenzene	0.500	0.397	0.382	0.410	0.370	0.364	0.384	76.892	0.019	4.922
1,3-Dichlorobenzene	0.500	0.469	0.472	0.435	0.487	0.470	0.467	93.344	0.019	4.088
1,4-Dichlorobenzene	0.500	0.490	0.500	0.415	0.481	0.476	0.472	94.480	0.033	7.079
p-Isopropyltoluene	0.500	0.354	0.350	0.354	0.399	0.335	0.359	71.700	0.024	6.726
1,2-Dichlorobenzene	0.500	0.492	0.403	0.377	0.435	0.421	0.426	85.144	0.043	10.095
n-Butylbenzene	0.500	0.394	0.401	0.429	0.382	0.385	0.398	79.624	0.019	4.707
1,2-Dibromo-3-chloropropane	0.500	0.440	0.510	0.501	0.417	0.414	0.457	91.308	0.046	10.087
1,2,4-Trichlorobenzene	0.500	0.429	0.416	0.353	0.412	0.414	0.405	80.948	0.029	7.286
Naphthalene	0.500	0.645	0.564	0.435	0.471	0.512	0.525	105.016	0.082	15.673
Hexachlorobutadiene	0.500	0.403	0.411	0.418	0.409	0.429	0.414	82.780	0.010	2.393
1,2,3-Trichlorobenzene	0.500	0.440	0.456	0.363	0.434	0.463	0.431	86.224	0.040	9.275
Bromofluorobenzene	1.000	0.785	0.764	0.715	0.758	0.715	0.747	74.742	0.031	4.172
Total Trihalomethanes	2.000	2.197	2.178	1.744	2.023	2.050	2.038	101.920	0.181	8.901

November 17, 1993
Instrument ID#: Extrel #6

						Average % True		STD	%RSD
Chlorobenzene	0.500	0.528	0.399	0.372	0.377	0.419	83.800	0.073	17.538
Styrene	0.500	0.490	0.417	0.389	0.440	0.434	86.790	0.043	9.893

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Environmental Science & Engineering, Inc.
Peoria, IL - Laboratory
Method Detection Limits - Method 524.2
Instrument ID#: Extrel #6
February 23, 1994

Analyte	Amt Added (ug/L)	#1	#2	#3	#5	#6	#7	#9	Average	%True	Std	MDL	%RSD
1,2-Dichlorobenzene-D4	1.0000	0.3350	0.4794	0.3283	0.3940	0.2996	0.4718	0.3822	0.384	38.433	0.070	0.221	18.257
Dichlorodifluoromethane	1.0000	0.3500	0.3251	0.4153	0.3438	0.4277	0.4062	0.3969	0.381	38.071	0.040	0.126	10.569
Chloromethane	1.0000	0.4373	0.5304	0.7404	0.7582	0.8132	0.8607	0.6832	0.689	68.906	0.153	0.482	22.238
Vinyl chloride	1.0000	0.4221	0.4619	0.4757	0.4474	0.7120	0.4869	0.5114	0.502	50.269	0.097	0.304	19.240
Bromomethane	1.0000	0.4394	0.4666	0.6036	0.5291	0.5770	0.6786	0.7920	0.584	58.376	0.123	0.386	21.021
Chloroethane	1.0000	0.5658	0.6334	0.7535	1.0333	0.8350	0.8707	0.6834	0.768	76.787	0.159	0.500	20.714
Trichlorofluoromethane	1.0000	0.4387	0.4684	0.4272	0.4051	0.4369	0.4751	0.4853	0.448	44.810	0.029	0.091	6.458
1,1-Dichloroethene	1.0000	0.4479	0.5705	0.5883	0.5840	0.6326	0.6162	0.6238	0.580	58.047	0.063	0.197	10.809
Dichloromethane	1.0000	0.7342	0.9372	1.1085	0.9749	1.1296	1.1961	1.1917	1.039	103.889	0.168	0.527	16.127
t-1,2-Dichloroethene	1.0000	0.4954	0.5619	0.5627	0.5473	0.5655	0.6335	0.6463	0.573	57.323	0.052	0.162	9.009
1,1-Dichloroethane	1.0000	0.4702	0.5456	0.6522	0.6257	0.6231	0.6540	0.5788	0.593	59.280	0.067	0.210	11.259
2,2-Dichloropropane	1.0000	0.4038	0.4516	0.6532	0.7329	0.5940	0.6909	0.8124	0.620	61.983	0.148	0.466	23.900
c-1,2-Dichloroethene	1.0000	0.4329	0.4916	0.5513	0.7607	0.6348	0.7699	0.8734	0.645	64.494	0.163	0.511	25.205
Bromochloromethane	1.0000	0.4614	0.4427	0.5720	0.8728	0.7157	0.7937	0.7417	0.657	65.714	0.167	0.525	25.409
Chloroform	1.0000	0.6248	0.6882	0.6934	0.6299	0.7162	0.7192	0.7548	0.690	68.950	0.048	0.150	6.909
1,1,1-Trichloroethane	1.0000	0.4092	0.4475	0.5650	0.6173	0.6089	0.5962	0.6490	0.556	55.616	0.091	0.288	16.451
Carbon tetrachloride	1.0000	0.4197	0.4628	0.5026	0.6122	0.5854	0.5872	0.5853	0.536	53.646	0.074	0.234	13.886
1,1-Dichloropropene	1.0000	0.4383	0.4415	0.4599	0.5993	0.5364	0.5441	0.5243	0.506	50.626	0.061	0.192	12.038
Benzene	1.0000	0.4740	0.5007	0.5126	0.5160	0.5083	0.5679	0.5490	0.518	51.836	0.031	0.098	6.005
1,2-Dichloroethane	1.0000	0.4061	0.3937	0.5008	0.5917	0.5604	0.5572	0.5306	0.506	50.579	0.078	0.244	15.346
Trichloroethene	1.0000	0.4009	0.3780	0.4503	0.4790	0.4377	0.5452	0.5673	0.465	46.549	0.070	0.221	15.122
1,2-Dichloropropane	1.0000	0.3631	0.4001	0.4629	0.5145	0.4669	0.5085	0.5018	0.460	45.969	0.058	0.182	12.592
Dibromomethane	1.0000	0.3691	0.2873	0.4486	0.4298	0.4602	0.4604	0.4767	0.419	41.887	0.068	0.213	16.183
Bromodichloromethane	1.0000	0.3857	0.4349	0.4834	0.4479	0.4949	0.5636	0.4841	0.471	47.064	0.056	0.175	11.825
c-1,3-Dichloropropene	1.5000	0.3625	0.3539	0.3929	0.4970	0.4139	0.4414	0.3895	0.407	27.153	0.049	0.155	12.126
Toluene	1.0000	0.5044	0.5244	0.5196	0.5664	0.5322	0.5539	0.5164	0.531	53.104	0.022	0.069	4.121
t-1,3-Dichloropropene	0.5000	0.2379	0.3404	0.3000	0.4910	0.3070	0.3893	0.3266	0.342	68.349	0.080	0.252	23.441
1,1,2-Trichloroethane	1.0000	0.3375	0.3499	0.5281	0.4781	0.3886	0.3703	0.5224	0.425	42.699	0.082	0.258	19.344
Tetrachloroethene	1.0000	0.3609	0.3260	0.4143	0.4436	0.4695	0.5161	0.4372	0.424	42.394	0.064	0.202	15.162
1,3-Dichloropropane	1.0000	0.3122	0.3887	0.3568	0.4896	0.3309	0.3965	0.4661	0.392	39.154	0.066	0.208	16.937
Dibromochloromethane	1.0000	0.2702	0.2885	0.3938	0.4306	0.3652	0.3541	0.3935	0.357	35.656	0.058	0.183	16.355
1,2-Dibromoethane	1.0000	0.2390	0.3225	0.3285	0.4520	0.3025	0.3376	0.3531	0.334	33.360	0.064	0.201	19.147
Chlorobenzene	1.0000	0.3550	0.3688	0.3752	0.4048	0.4005	0.4162	0.4480	0.396	39.550	0.032	0.100	8.036
1,1,1,2-Tetrachloroethane	1.0000	0.3470	0.3598	0.4268	0.6055	0.4491	0.5733	0.6090	0.482	48.150	0.113	0.356	23.528
Ethylbenzene	1.0000	0.4137	0.4502	0.5075	0.5932	0.4424	0.5414	0.5438	0.499	49.889	0.065	0.205	13.096
m,p-Xylenes	2.0000	0.6426	0.6593	0.6775	0.8552	0.7226	0.7925	0.8385	0.741	37.059	0.087	0.275	11.804
o-Xylene	1.0000	0.4022	0.4722	0.5106	0.5554	0.4426	0.5274	0.5458	0.494	49.374	0.057	0.179	11.513
Styrene	1.0000	0.3271	0.3304	0.3826	0.4829	0.3513	0.4145	0.3615	0.379	37.861	0.055	0.173	14.545
Bromoform	1.0000	0.2215	0.1655	0.4277	0.3494	0.1474	0.2997	0.2190	0.261	26.146	0.102	0.321	39.020
Bromobenzene	1.0000	0.3780	0.1920	0.3451	0.3842	0.3420	0.4396	0.4135	0.356	35.634	0.080	0.253	22.562
n-Propylbenzene	1.0000	0.2845	0.3175	0.3848	0.4760	0.3756	0.4443	0.4486	0.390	39.019	0.071	0.224	18.242
1,2,3-Trichloropropane	1.0000	0.2858	0.4890	0.4832	0.6834	0.4846	0.6261	0.5269	0.511	51.129	0.126	0.397	24.726
1,1,2,2-Tetrachloroethane	1.0000	0.2904	0.3180	0.4382	0.5603	0.4472	0.5462	0.5855	0.455	45.511	0.117	0.369	25.787
Isopropylbenzene	1.0000	0.3122	0.3428	0.3942	0.4785	0.4010	0.4306	0.4483	0.401	40.109	0.058	0.183	14.552
2-Chlorotoluene	1.0000	0.3072	0.3753	0.3749	0.5077	0.3513	0.5174	0.4764	0.416	41.574	0.083	0.262	20.054
4-Chlorotoluene	1.0000	0.3155	0.3095	0.3757	0.4284	0.3671	0.4593	0.4912	0.392	39.239	0.070	0.219	17.790
1,3,5-Trimethylbenzene	1.0000	0.3086	0.3306	0.3662	0.4860	0.3836	0.4471	0.4746	0.400	39.953	0.070	0.221	17.628

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t-Butylbenzene	1.0000	0.3096	0.3634	0.3794	0.5541	0.3833	0.4606	0.4054	0.408	40.797	0.079	0.248	19.305
1,2,4-Trimethylbenzene	1.0000	0.2933	0.3106	0.3476	0.4461	0.3799	0.4159	0.4465	0.377	37.713	0.062	0.196	16.561
sec-Butylbenzene	1.0000	0.2888	0.3034	0.3725	0.4711	0.3815	0.4101	0.4139	0.377	37.733	0.064	0.201	16.952
1,3-Dichlorobenzene	1.0000	0.3084	0.3273	0.3878	0.5378	0.4443	0.5240	0.4612	0.427	42.726	0.090	0.283	21.086
1,4-Dichlorobenzene	1.0000	0.2842	0.3148	0.3921	0.5226	0.4559	0.5052	0.5358	0.430	43.009	0.102	0.320	23.647
p-Isopropyltoluene	1.0000	0.2694	0.3090	0.3361	0.4408	0.3682	0.4155	0.4195	0.366	36.550	0.064	0.200	17.442
1,2-Dichlorobenzene	1.0000	0.2791	0.3256	0.3551	0.5324	0.3508	0.4952	0.5217	0.409	40.856	0.104	0.328	25.570
n-Butylbenzene	1.0000	0.2685	0.2834	0.3391	0.4151	0.3426	0.3794	0.3853	0.345	34.477	0.054	0.169	15.623
1,2-Dibromo-3-chloropropane	1.0000	0.1514	0.2853	0.2483	0.1922	0.2502	0.2906	0.2305	0.236	23.550	0.050	0.156	21.138
1,2,4-Trichlorobenzene	1.0000	0.2683	0.2824	0.3530	0.4646	0.3817	0.4191	0.4547	0.375	37.483	0.078	0.246	20.898
Naphthalene	1.0000	0.2687	0.3392	0.3499	0.4940	0.4346	0.4247	0.4362	0.392	39.247	0.076	0.240	19.461
Hexachlorobutadiene	1.0000	0.2280	0.3155	0.3592	0.5051	0.4015	0.4566	0.5090	0.396	39.641	0.104	0.326	26.141
1,2,3-Trichlorobenzene	1.0000	0.2579	0.2971	0.3529	0.4987	0.4000	0.4280	0.4380	0.382	38.180	0.084	0.265	22.083
Bromofluorobenzene	1.0000	0.3622	0.5003	0.4094	0.5264	0.4060	0.4840	0.3445	0.433	43.326	0.071	0.222	16.316
Total Trihalomethanes	4.0000	1.5022	1.5771	1.8930	1.8578	1.7237	1.9366	1.8514	1.763	44.078	0.167	0.526	9.490

Environmental Science & Engineering, Inc.
Peoria, IL - Laboratory
Method Detection Limits - Method 524.2
Instrument ID#: Extrel #6
August 9, 1995
File Name:U:\123\14080995.WK1
Analyst Identification: MJL

Analyte	Amt. Added (ug/L)	#1	#2	#3	#5	#6	#7	#9	Average	%True	STD	MDL	%RSD
1,2-Dichlorobenzene-D4	2.0000	2.0079	1.8311	1.8071	1.7996	1.7713	1.6592	1.6350	1.787	89.366	0.123	0.387	6.890
Dichlorodifluoromethane	0.5000	0.5786	0.5196	0.4673	0.5010	0.5406	0.5216	0.5081	0.520	103.909	0.034	0.108	6.640
Chloromethane	0.5000	0.5696	0.5423	0.4148	0.5328	0.6702	0.8128	0.4834	0.575	115.026	0.131	0.411	22.731
Vinyl chloride	0.5000	0.5457	0.5029	0.4421	0.4565	0.5407	0.4934	0.5385	0.503	100.566	0.042	0.131	8.307
Bromomethane	0.5000	0.5517	0.4985	0.5074	0.4440	0.5198	0.5014	0.5054	0.504	100.806	0.032	0.101	6.365
Chloroethane	0.5000	0.5160	0.4619	0.4505	0.4585	0.6032	0.4698	0.5098	0.496	99.134	0.054	0.169	10.867
Trichlorofluoromethane	0.5000	0.6187	0.6194	0.5670	0.6070	0.6245	0.6155	0.6320	0.612	122.403	0.021	0.067	3.478
1,1-Dichloroethene	0.5000	0.6311	0.6435	0.5454	0.5775	0.6465	0.5501	0.5811	0.596	119.291	0.043	0.136	7.266
t-1,2-Dichloroethene	0.5000	0.6373	0.5946	0.5261	0.5164	0.6033	0.5807	0.5963	0.579	115.849	0.043	0.136	7.476
1,1-Dichloroethane	0.5000	0.6062	0.5684	0.5169	0.5291	0.5865	0.5578	0.5569	0.560	112.051	0.031	0.097	5.518
2,2-Dichloropropane	0.5000	0.2695	0.2981	0.3638	0.3343	0.4384	0.1090	0.2657	0.297	59.394	0.102	0.322	34.485
c-1,2-Dichloroethene	0.5000	0.5385	0.4989	0.4678	0.5112	0.5133	0.5073	0.4978	0.505	100.994	0.021	0.067	4.207
Bromochloromethane	0.5000	0.3913	0.2112	0.3199	0.3110	0.2840	0.3208	0.3249	0.309	61.803	0.054	0.170	17.466
Chloroform	0.5000	0.6177	0.5423	0.5153	0.5352	0.5824	0.5511	0.5678	0.559	111.766	0.034	0.106	6.063
1,1,1-Trichloroethane	0.5000	0.5703	0.5495	0.4998	0.5216	0.5717	0.5090	0.5301	0.536	107.200	0.029	0.090	5.340
Carbon tetrachloride	0.5000	0.5540	0.5367	0.4795	0.5215	0.5523	0.5207	0.4976	0.523	104.637	0.028	0.087	5.265
1,1-Dichloropropene	0.5000	0.5762	0.5438	0.4976	0.5268	0.5841	0.5584	0.5554	0.549	109.780	0.030	0.093	5.396
Benzene	0.5000	0.6063	0.5504	0.4891	0.5387	0.5683	0.5579	0.5570	0.553	110.506	0.035	0.110	6.359
1,2-Dichloroethane	0.5000	0.5852	0.5732	0.4874	0.5212	0.5661	0.5630	0.5327	0.547	109.394	0.035	0.109	6.328
Trichloroethene	0.5000	0.5843	0.5680	0.5119	0.4932	0.5951	0.5681	0.5180	0.548	109.674	0.040	0.125	7.274
1,2-Dichloropropane	0.5000	0.5605	0.5208	0.4456	0.4921	0.5114	0.5216	0.5365	0.513	102.529	0.036	0.114	7.089
Dibromomethane	0.5000	0.5528	0.3939	0.4345	0.4075	0.4500	0.4384	0.4637	0.449	89.737	0.052	0.163	11.535
Bromodichloromethane	0.5000	0.6120	0.5423	0.5156	0.5740	0.6328	0.6364	0.6349	0.593	118.514	0.049	0.155	8.297
c-1,3-Dichloropropene	0.5000	0.5748	0.4857	0.4616	0.5194	0.5288	0.4949	0.5067	0.510	102.054	0.036	0.113	7.072
Toluene	0.5000	0.7453	0.5356	0.5076	0.5122	0.5577	0.5414	0.5330	0.562	112.366	0.083	0.260	14.717
t-1,3-Dichloropropene	0.5000	0.4562	0.3968	0.3083	0.3460	0.3978	0.3473	0.3584	0.373	74.594	0.048	0.151	12.901
1,1,2-Trichloroethane	0.5000	0.5107	0.4398	0.3550	0.3916	0.3730	0.4365	0.4472	0.422	84.394	0.053	0.167	12.556
Tetrachloroethene	0.5000	0.5511	0.5199	0.4902	0.5056	0.5671	0.5586	0.5277	0.531	106.291	0.029	0.090	5.383
1,3-Dichloropropane	0.5000	0.4974	0.4684	0.4017	0.4007	0.4265	0.4501	0.4415	0.441	88.180	0.035	0.110	7.962
Dibromochloromethane	0.5000	0.5081	0.4294	0.3992	0.4168	0.3869	0.2995	0.4039	0.406	81.251	0.062	0.194	15.189
1,2-Dibromoethane	0.5000	0.4706	0.4235	0.2360	0.3863	0.3926	0.3764	0.4038	0.384	76.834	0.072	0.228	18.858
Chlorobenzene	0.5000	0.5918	0.5143	0.4636	0.4929	0.5301	0.5012	0.4937	0.513	102.583	0.041	0.127	7.909
1,1,1,2-Tetrachloroethane	0.5000	0.5128	0.4463	0.4008	0.4183	0.4191	0.4255	0.4636	0.441	88.183	0.038	0.119	8.559
Ethylbenzene	0.5000	0.5872	0.4943	0.4566	0.4869	0.5194	0.4894	0.4887	0.503	100.643	0.041	0.130	8.208
m,p-Xylenes	1.0000	1.1938	0.9293	0.8532	0.9018	0.9789	0.8988	0.9202	0.954	95.371	0.112	0.353	11.786
o-Xylene	0.5000	0.5377	0.4527	0.4057	0.4296	0.4509	0.4200	0.4413	0.448	89.654	0.043	0.135	9.566
Styrene	0.5000	0.4976	0.4443	0.4027	0.4229	0.4433	0.4099	0.406	0.432	86.477	0.033	0.105	7.721
Bromoform	0.5000	0.3251	0.3124	0.1109	0.0579	0.3145	0.2025	0.1382	0.209	41.757	0.110	0.346	52.762
Bromobenzene	0.5000	0.5265	0.4508	0.3909	0.4565	0.4542	0.4172	0.4461	0.449	89.777	0.042	0.131	9.314
n-Propylbenzene	0.5000	0.4576	0.4306	0.4010	0.3954	0.4650	0.4139	0.4129	0.425	85.040	0.027	0.085	6.380
1,2,3-Trichloropropane	0.5000	0.5981	0.4556	0.3473	0.4713	0.4506	0.4718	0.4040	0.457	91.391	0.077	0.241	16.766
1,1,2,2-Tetrachloroethane	0.5000	0.4863	0.4116	0.3800	0.4193	0.3866	0.4172	0.4096	0.416	83.160	0.035	0.109	8.317
Isopropylbenzene	0.5000	0.4820	0.4432	0.4151	0.4277	0.4661	0.4383	0.4476	0.446	89.143	0.023	0.071	5.066
2-Chlorotoluene	0.5000	0.4958	0.4365	0.4121	0.4368	0.4649	0.4172	0.4322	0.442	88.443	0.029	0.091	6.581
4-Chlorotoluene	0.5000	0.4951	0.4395	0.3842	0.3758	0.4445	0.4183	0.3928	0.421	84.291	0.042	0.132	9.965

1,3,5-Trimethylbenzene	0.5000	0.4630	0.4319	0.3930	0.4159	0.4484	0.4130	0.4279	0.428	85.517	0.023	0.073	5.444
t-Butylbenzene	0.5000	0.4763	0.4505	0.4019	0.4271	0.4580	0.4388	0.4401	0.442	88.363	0.024	0.074	5.347
1,2,4-Trimethylbenzene	0.5000	0.4716	0.4337	0.3876	0.4096	0.4444	0.3967	0.4080	0.422	84.331	0.030	0.093	7.029
sec-Butylbenzene	0.5000	0.4775	0.4450	0.4040	0.4226	0.4634	0.4291	0.4440	0.441	88.160	0.025	0.078	5.640
1,3-Dichlorobenzene	0.5000	0.5648	0.4860	0.4413	0.4652	0.5033	0.4489	0.4433	0.479	95.794	0.044	0.139	9.256
1,4-Dichlorobenzene	0.5000	0.5437	0.4889	0.4222	0.4521	0.4899	0.4473	0.4501	0.471	94.120	0.040	0.126	8.543
p-Isopropyltoluene	0.5000	0.4447	0.4048	0.3742	0.3952	0.4267	0.3891	0.4091	0.406	81.251	0.024	0.074	5.817
1,2-Dichlorobenzene	0.5000	0.5794	0.4841	0.4379	0.4660	0.4835	0.4648	0.4569	0.482	96.360	0.046	0.144	9.519
n-Butylbenzene	0.5000	0.5022	0.4651	0.4209	0.4542	0.4882	0.4511	0.4679	0.464	92.846	0.026	0.083	5.686
1,2,4-Trichlorobenzene	0.5000	0.5916	0.4747	0.4379	0.4789	0.5082	0.4540	0.4344	0.483	96.563	0.054	0.171	11.266
Naphthalene	0.5000	0.6514	0.5790	0.4843	0.4964	0.5432	0.4456	0.4823	0.527	105.491	0.073	0.231	13.934
Hexachlorobutadiene	0.5000	0.5407	0.5115	0.4741	0.5021	0.5208	0.5018	0.4800	0.504	100.886	0.023	0.072	4.551
1,2,3-Trichlorobenzene	0.5000	0.5938	0.4644	0.4239	0.4220	0.4588	0.4032	0.4072	0.453	90.666	0.066	0.208	14.625
Bromofluorobenzene	2.0000	2.1054	1.8640	1.8760	1.8265	1.8411	1.7353	1.6786	1.847	92.335	0.135	0.424	7.305
Total Trihalomethanes	2.0000	2.0629	1.8264	1.5410	1.5839	1.9166	1.6895	1.7448	1.766	88.322	0.185	0.580	10.453

August 16, 1995
Analyst Identification: ELP

Analyte	Amt. Added (ug/L)	#1	#2	#3	#5	#6	#7	#9	Average	%True	STD	MDL	%RSD
Methylene Chloride	1.0000	1.3301	1.3010	1.3529	1.1798	1.2304	1.3443	1.4147	1.308	130.760	0.079	0.249	6.063
1,2-Dibromo-3-chloropropane	1.0000	0.5852	0.8127	0.8000	0.8118	0.3704	0.4658	0.7873	0.662	66.189	0.187	0.587	28.219

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276 Mary A. Gade, Director

MEMORA

Ref. 33.

DATE: March 9, 1998

TO: Pete Sorenson

FROM: Chris Bridges

SUBJECT: ARDL Method Detection Limits for EPA 524.2

Enclosed are Applied Research and Development Laboratory (ARDL) method detection limits (MDL) for EPA 524.2 from 4/27/93. These MDLs were used during the analysis of the Evergreen Manor samples.

Printed on Recycled Paper

Method Detection Limit Data
For Method 524.2
(Run 4/27/93)
Units=µg/L

File#	>Z3246	>Z3247	>Z3248	>Z3249	>Z3252	>Z3254	>Z3246S	Average Recovery		
CPD	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	%	S.D.	MDL
Bromofluorobenzene (Surr 1)	0.810	0.831	0.885	0.878	0.872	0.815	0.845	84.80	0.031	0.097
1,2-Dichlorobenzene-d4 (Surr 2)	0.825	0.813	0.877	0.866	0.913	0.845	0.852	85.59	0.034	0.105
Dichlorodifluoromethane	2.022	1.686	1.914	1.870	1.712	1.864	1.471	89.56	0.182	0.573
Chloromethane	2.395	2.308	1.802	2.372	1.949	1.859	1.855	103.79	0.266	0.836
Vinyl Chloride	2.139	1.854	2.130	1.937	1.740	1.887	1.868	96.82	0.148	0.464
Bromomethane	2.455	2.250	2.526	2.267	1.810	1.917	1.860	107.75	0.292	0.918
Chloroethane	2.445	2.104	2.615	2.106	1.850	1.947	1.764	105.94	0.311	0.978
Trichlorofluoromethane	2.584	2.144	2.483	2.281	2.068	2.478	1.857	113.54	0.263	0.826
1,1-Dichloroethene	2.857	2.572	2.778	2.619	0.003	2.334	2.480	129.69	0.178	0.560
Methylene Chloride	2.305	2.145	2.319	2.177	2.362	1.938	2.261	110.76	0.145	0.455
trans-1,2-Dichloroeth--ne	2.125	1.995	2.136	1.995	1.898	1.759	2.078	99.90	0.135	0.423
1,1-Dichloroethane	2.169	2.063	2.244	2.039	2.030	1.862	2.192	104.26	0.128	0.402
2,2-Dichloropropane	2.308	2.193	2.023	2.079	1.984	1.668	2.109	102.60	0.201	0.632
cis-1,2-Dichloroethene	2.077	1.973	2.137	1.934	1.942	1.534	1.884	96.29	0.194	0.609
Bromochloromethane	1.993	1.927	2.032	1.841	1.759	1.359	1.665	89.83	0.232	0.729
Chloroform	2.109	2.070	2.286	2.049	2.001	1.848	1.932	102.11	0.139	0.438
1,1,1-Trichloroethane	2.209	1.907	2.094	1.957	1.938	1.877	1.932	99.38	0.119	0.374
1,1-Dichloropropene	2.102	1.768	2.066	1.867	1.648	1.608	1.827	92.19	0.189	0.593
Carbon Tetrachloride	0.000	1.802	2.020	1.815	1.759	1.758	1.943	93.69	0.117	0.369
Benzene	2.097	2.030	2.233	2.068	2.019	1.817	2.087	102.51	0.125	0.391
1,2-Dichloroethane	1.969	1.878	2.147	1.905	2.093	1.942	2.055	99.92	0.101	0.318
Trichloroethene	2.076	1.904	2.124	1.896	1.823	1.623	1.897	95.31	0.165	0.519
1,2-Dichloropropane	2.080	2.005	2.238	2.023	2.128	1.923	2.121	103.70	0.102	0.320
Bromodichloromethane	1.963	1.881	2.119	1.849	1.979	1.742	1.942	96.25	0.118	0.371
Dibromomethane	1.889	1.898	2.116	1.907	2.025	1.760	0.002	96.34	0.113	0.356
cis-1,3-Dichloropropene	0.002	1.821	2.045	1.847	1.930	1.715	1.850	93.64	0.102	0.321
Toluene	2.042	1.932	2.145	1.963	1.972	1.745	2.014	98.66	0.122	0.384
trans-1,3-Dichloropropene	1.814	1.762	1.943	1.766	1.820	1.667	1.875	90.34	0.088	0.277
1,1,2-Trichloroethane	1.961	1.909	2.100	1.879	1.992	1.737	1.873	96.01	0.112	0.352
Tetrachloroethene	2.016	1.830	2.054	1.865	1.736	1.591	1.829	92.29	0.158	0.497
1,3-Dichloropropane	1.934	1.900	2.072	1.853	2.013	1.768	1.922	96.16	0.100	0.314
Dibromochloromethane	1.794	1.693	1.902	1.656	1.759	1.462	1.621	84.91	0.140	0.441
1,2-Dibromoethane	1.845	1.827	1.991	1.787	1.924	1.657	1.805	91.69	0.106	0.333
Chlorobenzene	1.996	1.938	2.176	1.933	1.966	1.756	1.961	98.04	0.123	0.387
1,1,1,2-Tetrachloroethane	1.942	1.864	2.041	1.82	1.938	1.653	1.867	93.76	0.121	0.381
Ethylbenzene	2.006	1.980	2.174	1.995	1.942	1.750	2.013	99.00	0.125	0.393
m & p-Xylene	3.978	3.774	4.282	3.915	3.811	3.465	3.966	97.11	0.248	0.778
o-Xylene	1.949	1.890	2.148	1.921	1.940	1.753	1.984	97.04	0.118	0.370
Styrene	1.915	1.870	2.093	1.866	1.827	1.685	1.879	93.82	0.121	0.380
Bromoform	1.661	1.571	1.754	1.472	1.627	1.247	1.427	76.85	0.169	0.532
Isopropylbenzene	1.989	1.867	2.128	1.956	1.928	1.803	2.037	97.91	0.107	0.338
1,1,2,2-Tetrachloroethane	1.820	1.749	2.032	1.735	1.872	1.616	1.752	89.83	0.131	0.410
Bromobenzene	1.894	1.842	2.090	1.846	1.865	1.597	1.805	92.42	0.145	0.455
1,2,3-Trichloropropane	1.942	1.819	2.095	1.776	2.085	1.794	1.897	95.77	0.133	0.417
n-Propylbenzene	1.956	1.810	2.108	1.888	1.804	1.681	1.942	0.21	0.137	0.429
2-Chlorotoluene	2.004	1.913	2.146	1.934	1.896	1.752	1.935	97.00	0.119	0.373
4-Chlorotoluene	1.881	1.800	1.988	1.794	1.784	1.612	1.875	90.96	0.116	0.364
1,3,5-Trimethylbenzene	2.022	1.926	2.186	1.998	1.958	1.825	2.077	99.94	0.115	0.360
tert-Butyl-benzene	1.986	1.875	2.142	1.971	1.932	1.723	2.038	97.62	0.132	0.413
1,2,4-Trimethylbenzene	2.006	1.918	2.186	1.977	1.971	1.749	2.079	99.19	0.135	0.426
sec-Butylbenzene	1.997	1.826	2.122	1.941	1.860	1.680	2.015	96.01	0.145	0.456
p-Isopropyltoluene	1.977	1.825	2.152	1.948	1.845	1.714	2.023	96.31	0.144	0.454
1,3-Dichlorobenzene	1.926	1.882	2.078	1.882	1.862	1.570	1.877	93.41	0.151	0.475
1,4-Dichlorobenzene	1.935	1.832	2.125	1.927	1.898	1.609	1.898	94.46	0.153	0.482
1,2-Dichlorobenzene	1.952	1.856	2.130	1.923	1.951	1.642	1.914	95.49	0.145	0.457
n-Butylbenzene	2.005	1.807	2.162	1.972	1.837	1.812	2.126	98.01	0.148	0.464
1,2-Dibromo-3-chloropropane	2.283	2.167	2.033	1.843	2.314	2.110	2.521	109.08	0.218	0.685
1,2,4-Trichlorobenzene	1.911	1.785	1.989	1.783	1.689	1.472	1.728	88.26	0.166	0.522
Hexachlorobutadiene	1.988	1.713	2.058	1.840	1.572	1.534	1.816	89.44	0.197	0.620
Naphthalene	1.939	1.820	2.037	1.725	2.046	1.466	1.681	90.81	0.211	0.662
1,2,3-Trichlorobenzene	1.832	1.753	1.945	1.736	1.710	1.459	1.641	86.26	0.152	0.478