

SUBSURFACE ENVIRONMENTAL INVESTIGATION REPORT

Willow Glen Golf Course
Naval Training Center Great Lakes
Rt. 137 Great Lakes, IL
Engineering Field Activity, Midwest

CHG Project No. OK07573016-0434

Prepared by:

C. H. GUERNSEY & COMPANY



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Senior Project Manager/Environmental Geologist
Illinois Licensed Professional Geologist No. 196-000172

February 2003

EXECUTIVE SUMMARY

C.H. Guernsey & Company (GUERNSEY) was tasked, by the Engineering Field Activity, Midwest (EFAMW), to perform a subsurface environmental investigation at the Willow Glen Golf Course located at the Naval Training Center, Great Lakes, IL (Site). This investigation was to consist of the installation of 22 soil bores (SBs) in order to locate possible underlying landfill material.

On February 6 and 7, 2003, GUERNSEY personnel, in association with Mid-America Drilling Services, Inc., installed 22 SBs (SB-43 through SB-62) at predetermined locations on the Site utilizing geoprobe technology. Each SB penetrated to a depth of approximately four feet below the ground surface.

Of the 22 SBs installed during this investigation, eight encountered landfill material. The landfill material varied in depth from 0.25 feet to 4 feet below the ground surface. The landfill material encountered in the SBs consisted of an assortment of black cinders, wood, concrete, gravel, and clay.

Per Navy instructions, soil samples were not obtained for headspace analysis or laboratory analysis.

Based on the current grading plans and information contained within this report, some areas of proposed cuts will require alteration to comply with the Navy's direction that no cuts are to be made where landfill is present. Of the eight cuts, only one requires no alternation. Detailed recommendations are provided in Section 5.0 of this report. It is recommended that prior to performing any additional excavation activities not covered in this report, a more detailed investigation be conducted in the proposed excavation areas.

1.0 INTRODUCTION

1.1 SCOPE AND PURPOSE

C.H. Guernsey & Company (GUERNSEY) was tasked, by the Engineering Field Activity, Midwest (EFAMW), to perform a subsurface environmental investigation at the Willow Glen Golf Course (Site) located at the Naval Training Center, Great Lakes, IL (NTC). A copy of the Scope of Services is provided in Appendix A. This investigation consisted of the installation of 22 soil bores (SBs) in order to locate possible underlying landfill material in areas of proposed cuts outside known landfill extents.

This report describes the installation of the SBs, provides findings from the field activities, and provides recommendations based on the findings.

1.2 SITE LOCATION AND DESCRIPTION

The Site is the current location of the Willow Glen Golf Course and is located approximately ½ mile east of Rt. 41 on Buckley Road, Great Lakes, Illinois (Figure 1).

2.0 FIELD ACTIVITIES

2.1 SOIL BORING LOCATIONS

- The locations of the SBs are in areas where construction activities and/or proposed cuts may penetrate into underlying landfill material. Due to the number and location of soil bores that detected landfill material in a previous subsurface investigation, it was determined that the known extent of the landfill may not be correct. The grading plans for the redesign of the back-nine holes depicts cuts outside the known landfill extent in the general area of the driving range and Holes #10 and #18. For the purpose of discussion and recommendation within this report, GUERNSEY has assigned each cut a designation of 'Cut-A' through 'Cut-H.'

In accordance with the January 28, 2003 request for proposal, GUERNSEY provided a recommendation for an additional 22 SBs to investigate these areas. The number and location of the SBs were agreed upon by the Navy and are depicted on the Site Map (Figure 2). GUERNSEY personnel utilized the Soil Boring Installation Plan and the Location Map to field-spot the boring locations on February 6, 2003. A copy of the Soil Boring Installation Plan is provided in Appendix B. A photographic log of field activities is presented in Appendix C.

2.2 INSTALLATION OF SOIL BORES

Prior to field activities, the Navy Technical Representative (NTR) coordinated with the Navy Public Works Center (PWC) to locate underground utilities in the general vicinity of the soil bores. The site was cleared for drilling at 0900 on Friday, February 7, 2003.

On February 7, 2003, GUERNSEY personnel, in association with Mid-America Drilling Services, Inc., installed 22 SBs (SB-43 through SB-62) at predetermined locations on the Site utilizing geoprobe technology (Appendix C, Photograph 1). Each SB penetrated to a depth of approximately four feet below the ground surface. The on-site geologist supervised the soil bore installation activities and prepared a Soil Bore Log for each of the 22 soil bores. The logs depict the soil type; thickness of the soil units; depth to ground water (if encountered); and type of landfill material encountered (if any). Per direction from the NTR, any soil removed from the soil bores during the installation activities, was returned to the boreholes.

The locations of the SBs are depicted on Figure 2. The Soil Bore Logs are provided in Appendix D.

2.3 COLLECTION OF SOIL SAMPLES

Per Navy direction, no samples were obtained for headspace analysis or laboratory analysis.

3.0 FINDINGS

3.1 SOIL SAMPLES

Of the 22 SBs installed during this investigation, 8 encountered landfill material. Figure 2, Site Map, depicts the soil bore locations where landfill materials were identified. Additionally, the soil bore logs in Appendix D provide information about the type and depth of landfill materials encountered at each soil bore location. The landfill material varied in depth from 0.25 feet to 4 feet below the ground surface. The landfill material encountered in the SBs consisted of an assortment of black cinders, concrete, gravel, and clay and was similar in nature to those materials encountered during previous SB activities at the Site. Photographs of some soil samples and landfill materials are contained in Appendix C.

4.0 CONCLUSIONS

Based on the information contained within this report, GUERNSEY concludes the following:

- Of the 22 SBs installed during this investigation, 8 encountered waste, debris, and/or other material congruent with those identified in the previous investigation. The landfill material generally contained less and fewer types of debris than samples obtained during the January 2003 subsurface investigation. Other non-debris landfill materials present in the SBs were similar if not identical in nature to the landfill materials previously encountered at the Site. Therefore, GUERNSEY concludes that the materials identified in this investigation provide evidence that the extent of the landfill is greater than previously delineated. The SBs exhibiting landfill materials were distributed throughout the general sampling area.
- The landfill material varied in depth from 0.25 feet to 4 feet below the ground surface.
- The landfill material encountered in the SBs consisted of an assortment of black cinders, wood, concrete, gravel, and clay.

5.0 RECOMMENDATIONS

GUERNSEY has analyzed the grading plans for Willow Glen Golf Course in conjunction with the information contained within this report. Figure 2 depicts the proposed cuts and the depth to landfill material, where encountered. The NTC Environmental Department has directed that no cuts should be made in areas with underlying landfill material. Based upon these conditions, GUERNSEY provides the following recommendations for the areas of proposed cuts at the Site:

- Cut A – The point at which the proposed 102-foot contour connects with the existing 102-foot contour should be revised so that SB-45 is outside the area of excavation.
- Cut B – No landfill was encountered in this area, therefore, the current design does not present any concern.
- Cut C – The proposed 103-foot and 104-foot contour lines should be revised so that SB-51 is outside the area of excavation.
- Cut D – The proposed cuts in this area cannot be made due to the presence of landfill material at SB-53 and SB-52. The contours in this area should be revised to maintain the existing grade or provide fill only.
- Cut E – The proposed cut cannot be made in this area due to the presence of landfill material in SB-50. Any changes in this area should be restricted to fill only.
- Cut F – The current grading plans require adjustment to avoid any excavation at SB-57. The proposed 102-foot contour line should be revised so that SB-57 is outside the area of excavation.
- Cut G – The current grading plans require adjustment to avoid any excavation at SB-60. The proposed 102-foot contour line should be revised so that SB-60 is outside the area of excavation.
- Cut H – The current plans require adjustment to avoid any excavation at SB-63. The proposed 103-foot and 104-foot contour lines should be revised so that SB-63 is outside the area of excavation.

If at any time during the project it is determined that additional excavation is required, GUERNSEY recommends that additional subsurface investigations be conducted in the proposed excavation areas.

SCOPE OF SERVICES

Environmental Investigations Willow Glen Golf Course Naval Training Center, Great Lakes, IL

January 29, 2003

Pursuant to the Scope of Work and a conference call on January 28, 2003, C.H. Guernsey & Company (GUERNSEY) is pleased to provide this scope of services and cost estimate (Proposal) for the modification to contract N68950-99-D-0186/Delivery Order 0016 Modification 03. This Proposal is in response to the Request for Proposal to conduct soil borings in a continuing effort to identify potential subsurface landfill materials at the Willow Glen Golf Course Site (Project Site).

SCOPE OF WORK

GUERNSEY has been tasked to analyze the final grading plans for the modifications to the back nine holes at the Project Site to identify areas of cuts outside the landfill extents. As requested, this proposal identifies those areas and provides a recommendation for the installation of additional soil bores. With the identification of landfill materials in GUERNSEY's recent sampling activities, it has been suggested that areas outside but in close proximity to the known landfill limits be sampled as well.

*Figure 1 depicts GUERNSEY's recommendations on the locations of soil bores. Cuts are represented on the final grading plans in three major areas. These areas include Hole 10, Hole 18, and the western edge of the driving range. The cuts identified on the grading plans are for the purposes of improved drainage in these areas of the Project Site. Once the Navy has approved the soil boring locations and a Notice to Proceed has been issued, GUERNSEY will commence sampling activities. As specified in the RFP and barring unforeseen weather conditions, results from the soil borings will be provided to the Navy within 10 days of contract adjudication. **GUERNSEY shall not be held responsible for delays incurred due to unforeseen weather or site conditions.***

Utilizing a 2" vehicle-mounted geoprobe, GUERNSEY will conduct soil borings at the Willow Glen Golf Course at the approved locations. A Boring Plan and Location Map will be generated prior to any sampling activities for the Project. Upon approval of the Boring Plan and Location Map, GUERNSEY will commence with field-spotting and sampling activities.

GUERNSEY will utilize a local drilling company to perform the soil borings at the Project Site. Well logs will be generated at each sampling location. No headspace analyses will be performed for this project. No samples will be taken of environmental media for the purposes of laboratory analysis; however, if requested GUERNSEY may provide the Navy Technical Representative (NTR) with samples of any encountered landfill media.

A GUERNSEY technical professional will analyze the Boring Plan and Location Map and field-spot the boring locations at the Project Site utilizing a global positioning system (GPS) instrument. Upon completion of field-spotting activities, borehole installation will begin. For the purposes of this proposal, it has been assumed that all 22 boreholes will be installed in one workday. This figure is largely dependant on weather, site conditions, subsurface conditions, efficiency of fieldwork associated with each hole, and the reliability of the drill rig.

GUERNSEY has identified specific tasks required to complete this project. These tasks have been discussed briefly above. The following provides more detail associated with each task. *It should be noted on accompanying spreadsheets that airfare and 8 hours total travel time have been included in the costs for Task 2. Per Diem and vehicle expenses have been separated between Task 2 and Task 3.*

- **Task 1: Revise Boring Plan and Location Map**

As with previous fieldwork, a Boring Plan should be prepared detailing the proposed Project activities. The Boring Plan will discuss methodologies, quality assurance/quality control (QA/QC) techniques, soil bore locations, and other pertinent information. A detailed map will be included in the Boring Plan.

The Boring Plan will be submitted electronically to the NTR for review and concurrence with the proposed technical approach.

- **Task 2: Conduct Field Survey to Spot Sampling Locations**

Prior to activities at the Project Site, the Boring Plan and Location Map will be utilized to determine reference points on the existing Project Site. Once reference points have been determined, coordinates will then be identified for each proposed sampling location. A global positioning system (GPS) device will be used in the field to aid in the accurate identification of proposed sample locations on the Project Site. *A GUERNSEY representative will utilize up to one full day to locate and flag each sampling location identified in the Boring Plan.*

- **Task 3: Conduct Sampling**

As discussed previously, all borings will be performed using a vehicle-mounted 2" diameter geoprobe. GUERNSEY will provide a geologist on-site to identify strata, observe and note groundwater conditions if encountered, and oversee all soil boring activities. For the purposes of this proposal it has been assumed that the Navy will approve 22 borings to assess the presence of landfill material in the general location of Hole 10, Hole 18, and the Driving Range. Borings will be made as noted on Figure 1 unless field conditions require slight deviations. This approach should provide knowledge of the nature and extent of underlying material in the general area of the proposed cuts. GUERNSEY will conduct borings to either a depth of 4 feet, or a depth of 2 feet below projected cuts, whichever is greater. Should underlying geology and/or

landfill materials prove too dense for the geoprobe at any one sample location, sample locations may need to be adjusted in the field.

Boring logs will be generated to depict soil type and thickness encountered at each boring location. Any soil removed during borehole installation will be returned to the boreholes once fieldwork has been completed. The Navy shall provide GUERNSEY with a means for proper disposal of sampling sleeves and other waste materials generated during borehole installation. *GUERNSEY has included one and one half days of labor and one full day of geoprobe time for soil borings.*

We, GUERNSEY, reserve the right to add costs if necessary in association with a possible extension of the project due to weather or other unexpected conditions beyond our control. Should additional days be required, such costs would include labor and expenses for the GUERNSEY representative on site, as well as additional daily geoprobe costs. Should any such circumstance arise or be foreseen, GUERNSEY will notify the Navy immediately.

- **Task 4: Generate Summary Report**

GUERNSEY will compile the information gathered from the field and from bore logs and prepare a Summary Report. Text, tables, figures, and appendices necessary to convey the findings of the Project will be developed. The Summary Report will generally be presented as follows:

- Executive Summary
- Introduction
- Site Description
- Study Methodology
- Findings
- Conclusions and Recommendations
- Appendices (laboratory data, photographs, field notes, etc.)

Upon completion, GUERNSEY will submit six copies of the Summary Report. Should additional copies of the Summary Report be necessary, such efforts will be considered out-of-scope.

- **Task 5: Participate in Teleconferences**

GUERNSEY will participate in teleconferences, as necessary, to discuss the results of fieldwork, conclusions of the Summary Reports, and provide recommendations to the Navy for the Project Site. This task includes hours incurred by GUERNSEY environmental personnel during the January 28, 2003 conference call, and anticipated hours for future teleconferences regarding this sampling effort.

SOIL BORING INSTALLATION PLAN

Willow Glen Golf Course
Great Lakes Naval Training Center, IL

INTRODUCTION

C.H. Guernsey & Company (GUERNSEY) has been tasked, by the Engineering Field Activity, Midwest (EFAMW), to perform an additional subsurface environmental investigation at the Willow Glen Golf Course located at the Naval Training Center, Great Lakes, IL (Site). This investigation will consist of the installation of 22 soil bores in order to confirm that underlying soils in areas of proposed cuts are devoid of landfill material. Figure 1 depicts the location of the Site. Figure 2 depicts the locations of the soil bores.

METHODOLOGY

SOIL BORING LOCATIONS

The locations of the soil bores are in areas where construction activities and/or proposed cuts are outside of known land fill limits. Based on the results of prior soil bore activities, the known extents of the landfill have come into question. The soil bore locations are in the general area of drainage improvements to Hole #10, Hole #18, and the area immediately west of the driving range. The soil bore locations have been predetermined and are depicted on the Location Map. GUERNSEY personnel will analyze the Soil Boring Installation Plan and the Location Map to field-spot the boring locations. Upon completion of the field-spotting activities, soil bore installation activities will begin. *It is the responsibility of the Navy to locate and mark, any and all utility lines and/or other obstacles that may hinder the installation activities prior to the arrival of GUERNSEY personnel.*

SOIL BORE INSTALLATION

Twenty-two soil bores will be installed at predetermined locations on the Site utilizing geoprobe technology. Each soil bore will penetrate to a maximum depth of four feet below the ground surface. In the event the underlying geology and/or landfill material prove too dense for the geoprobe at any one-sample location, the geoprobe unit will be moved a short distance and a replacement boring will be installed.

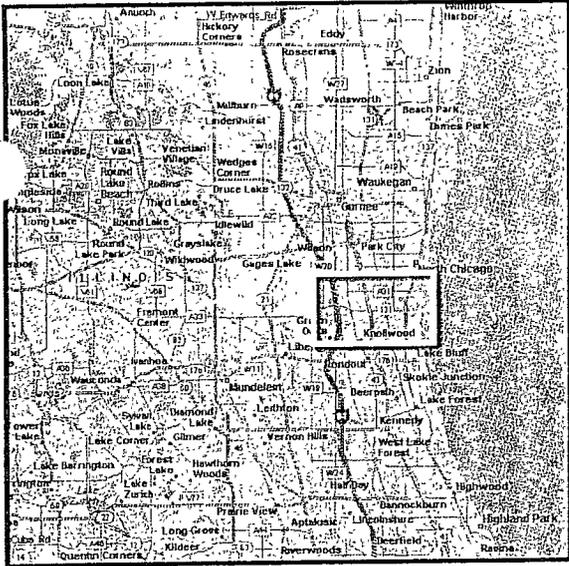
The on-site geologist will supervise the soil bore installation activities and prepare a soil bore log for each of the 22 soil bores. The logs will depict the soil type; thickness of the soil units; depth to ground water (if encountered); and a description of landfill material encountered (if any).

Per Navy instructions, any soil removed during from the soil bores during the installation activities will be returned to the boreholes. Navy will provide GUERNSEY

personnel with a means for proper disposal of waste generated during soil bore installation activities. *No samples will be taken for analytical purposes during field activities.*

SUMMARY REPORT

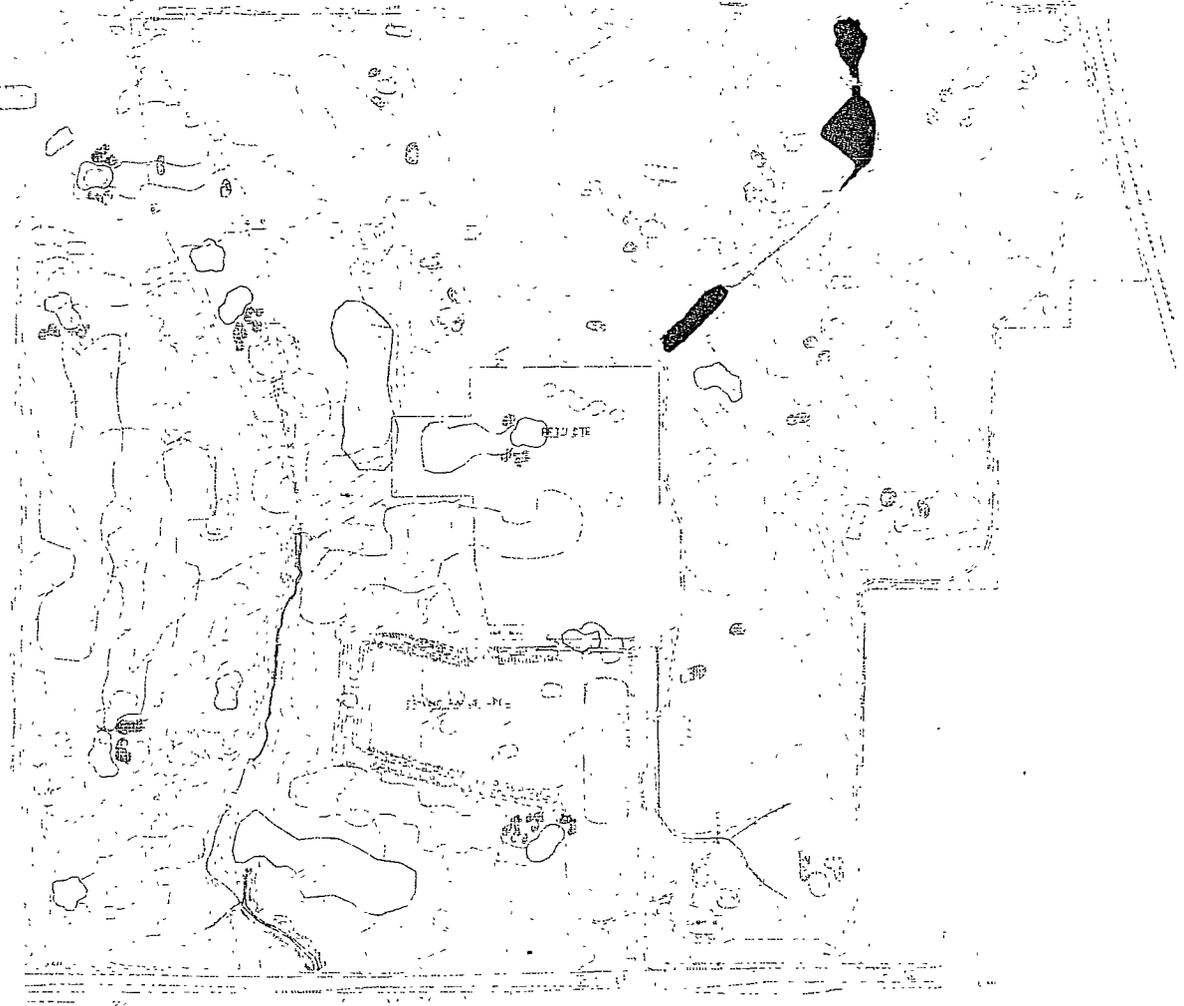
GUERNSEY will compile the information gathered from the field activities and prepare a Summary Report. This report will include an executive summary, introduction, site description, study methodology, findings, conclusions and recommendations, and associated appendices (laboratory data, photographs, etc.)



LOCAL AREA MAP



GENERAL VICINITY MAP



NOT TO SCALE

WILLOW GLEN GOLF COURSE SITE MAP

NORTH
ALL MAPS

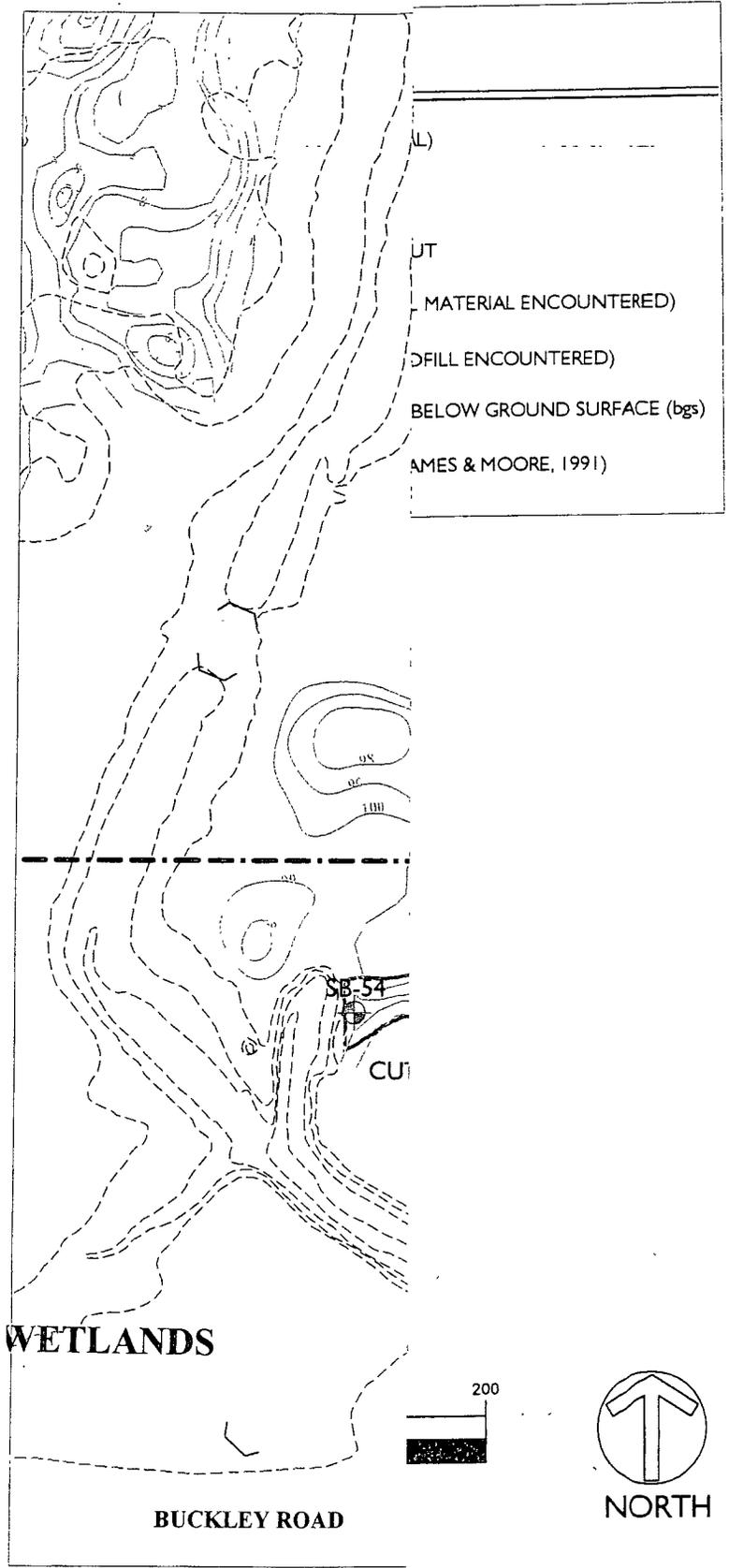


C.H. GUERNSEY & COMPANY
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Oklahoma City, OK 73112-5507
(405) 416-8100

SITE LOCATION MAP
WILLOW GLEN GOLF COURSE
GREAT LAKES NAVAL TRAINING CENTER, ILLINOIS

PREPARED BY: JH
APPROVED BY: CM
DATE: JANUARY 2 2003
JOB NO: OK07573016

FIGURE
1



C.H. GUERNSEY & COMPANY
 Engineers • Architects • Consultants
 5555 North Grand Boulevard
 Oklahoma City, OK 73112-5507
 405-418-8100 www.chguernsey.com

SITE MAP
WILLOW GLEN GOLF COURSE ENVIRONMENTAL INVESTIGATIONS
 NAVAL TRASSER CENTER, GREAT LAKES ILLINOIS

DRAWN BY: L-1
 APPROVED BY: C-2, J-1
 DATE: FEBRUARY 17, 2003
 JOB NO.: 000757318-C-034

FIGURE 2



PRACTICE RANGE

DS

SCALE: 1" = 100'

LEGEND

-  PROPOSED SOIL BORE LOCATION
-  APPROXIMATE AREA OF CUT
-  LANDFILL



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 Oklahoma City, OK 73112-5507
 405-416-8100

PROPOSED SOIL BORE LOCATIONS
 WILLOW GLEN GOLF COURSE
 NAVAL TRAINING CENTER GREAT LAKES, IL

PROJECT NO. 7573
 SHEET NO. 11
 DATE: JAN 29, 2003
 JOB NO.

FIGURE
 2

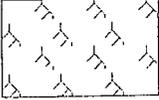


SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-43

TOTAL DEPTH:-4

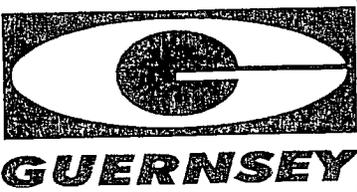
PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course SITE LOCATION: GLNTC, IL JOB NO.: OK07573016-0434 LOGGED BY: Carey Miller and Angela Riddles PROJECT MANAGER: Jimmie Hammontree DATES DRILLED: 2/7/03	DRILLING CO.: Mid-America DRILLER: Brian Lunardon RIG TYPE: Geoprobe METHOD OF DRILLING: Direct Push SAMPLING METHODS: Direct Push HAMMER WT./DROP Geoprobe
NOTES:	<input checked="" type="checkbox"/> Water level during drilling <input checked="" type="checkbox"/> Water level in completed well Page 1 of 2

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
0		SC	TOPSOIL: Dark brown color, silty clay loam, moist					
		GC	CLAY Yellow brown color, moist, lean, no odor					

SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-45

TOTAL DEPTH:-4



PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course SITE LOCATION: GLNTC, IL JOB NO.: OK07573016-0434 LOGGED BY: Carey Miller and Angela Riddles PROJECT MANAGER: Jimmie Hammontree DATES DRILLED: 2/7/03	DRILLING CO.: Mid-America DRILLER: Brian Lunardon RIG TYPE: Geoprobe METHOD OF DRILLING: Direct Push SAMPLING METHODS: Direct Push HAMMER WT./DROP Geoprobe
NOTES:	☒ Water level during drilling ☒ Water level in completed well Page 1 of 1

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC	TOPSOIL: Dark brown, silty clay loam, no odor					0
		GC	CLAY. Yellow brown color, moist, lean, no odor					
			LANDFILL MATERIAL Black cinders to sandy clay, small to large gravel, no odor					
			CLAY. Yellow brown color, moist, lean, no odor					



SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-46

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course SITE LOCATION: GLNTC, IL JOB NO.: OK07573016-0434 LOGGED BY: Carey Miller and Angela Riddles PROJECT MANAGER: Jimmie Hammontree DATES DRILLED: 2/7/03	DRILLING CO.: Mid-America DRILLER: Brian Lunardon RIG TYPE: Geoprobe METHOD OF DRILLING: Direct Push SAMPLING METHODS: Direct Push HAMMER WT./DROP Geoprobe
NOTES:	☒ Water level during drilling ☒ Water level in completed well Page 1 of 1

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
0		SC	TOPSOIL: Dark brown color, silty clay loam, frozen, no odor					
		GC	CLAY: Yellow brown color, lean, moist, no odor, some gravel, mud at 2 ft					



SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-47

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course SITE LOCATION: GLNTC, IL JOB NO.: OK07573016-0434 LOGGED BY: Carey Miller and Angela Riddles PROJECT MANAGER: Jimmie Hammontree DATES DRILLED: 2/7/03	DRILLING CO.: Mid-America DRILLER: Brian Lunardon RIG TYPE: Geoprobe METHOD OF DRILLING: Direct Push SAMPLING METHODS: Direct Push HAMMER WT./DROP Geoprobe
NOTES:	☒ Water level during drilling ☑ Water level in completed well

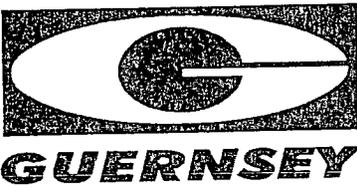
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC	TOPSOIL: Dark brown color, silty clay loam, frozen, no odor					
		GC	CLAY: Yellow brown color, lean, moist, no odor					

SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-48

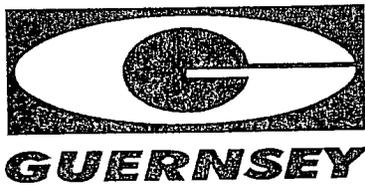
TOTAL DEPTH:-4



PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course SITE LOCATION: GLNTC, IL JOB NO.: OK07573016-0434 LOGGED BY: Carey Miller and Angela Riddles PROJECT MANAGER: Jimmie Hammontree DATES DRILLED: 2/7/03	DRILLING CO.: Mid-America DRILLER: Brian Lunardon RIG TYPE: Geoprobe METHOD OF DRILLING: Direct Push SAMPLING METHODS: Direct Push HAMMER WT./DROP Geoprobe
NOTES:	☒ Water level during drilling ☑ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC	TOPSOIL Dark brown color, silty clay loam, frozen, no odor					
		GC	CLAY Yellow brown color, lean, moist, no odor					



SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-49

TOTAL DEPTH:-4

PROJECT INFORMATION

DRILLING INFORMATION

PROJECT: Willow Glen Golf Course
 SITE LOCATION: GLNTC, IL
 JOB NO.: OK07573016-0434
 LOGGED BY: Carey Miller and Angela Riddles
 PROJECT MANAGER: Jimmie Hammontree
 DATES DRILLED: 2/7/03

DRILLING CO.: Mid-America
 DRILLER: Brian Lunardon
 RIG TYPE: Geoprobe
 METHOD OF DRILLING: Direct Push
 SAMPLING METHODS: Direct Push
 HAMMER WT./DROP Geoprobe

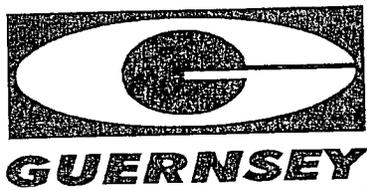
NOTES:

- ☒ Water level during drilling
- ☒ Water level in completed well

Page 1 of 1

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
0		SC	TOPSOIL: Dark brown color, silty clay loam, frozen, no odor					
		GC	CLAY: Yellow brown color, moist, lean, no odor					
		GC	CLAY AND SAND. Yellow brown color, saturated, no odor					

SOIL BORE/MONITORING WELL LOG



BOREHOLE NO.: SB-50

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course SITE LOCATION: GLNTC, IL JOB NO.: OK07573016-0434 LOGGED BY: Carey Miller and Angela Riddles PROJECT MANAGER: Jimmie Hammontree DATES DRILLED: 2/7/03	DRILLING CO.: Mid-America DRILLER: Brian Lunardon RIG TYPE: Geoprobe METHOD OF DRILLING: Direct Push SAMPLING METHODS: Direct Push HAMMER WT./DROP Geoprobe
NOTES:	☺ Water level during drilling ☹ Water level in completed well Page 1 of 1

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
0		SC	TOPSOIL. Dark brown color, silty clay loam, frozen, no odor					
			LANDFILL MATERIAL. Clay and black cinders, frozen, no odor, lean					
		GC	CLAY. Yellow brown color, moist, lean, no odor					



SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-51

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course	DRILLING CO.: Mid-America
SITE LOCATION: GLNTC, IL	DRILLER: Brian Lunardon
JOB NO.: OK07573016-0434	RIG TYPE: Geoprobe
LOGGED BY: Carey Miller and Angela Riddles	METHOD OF DRILLING: Direct Push
PROJECT MANAGER: Jimmie Hammontree	SAMPLING METHODS: Direct Push
DATES DRILLED: 2/7/03	HAMMER WT./DROP Geoprobe
NOTES:	☒ Water level during drilling ☒ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC	TOPSOIL: Dark brown color, silty clay loam, frozen, no odor					
		GC	CLAY: Yellow brown color, lean, moist, some small gravel					
			LANDFILL MATERIAL: Black clay, lean, moist, no odor, possible landfill material					



SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-52

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course SITE LOCATION: GLNTC, IL JOB NO.: OK07573016-0434 LOGGED BY: Carey Miller and Angela Riddles PROJECT MANAGER: Jimmie Hammontree DATES DRILLED: 2/7/03	DRILLING CO.: Mid-America DRILLER: Brian Lunardon RIG TYPE: Geoprobe METHOD OF DRILLING: Direct Push SAMPLING METHODS: Direct Push HAMMER WT./DROP Geoprobe
NOTES:	☒ Water level during drilling ☒ Water level in completed well Page 1 of 1

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC	TOPSOIL: Dark brown color, silty clay loam. LANDFILL MATERIAL: Dark brown to black clay, some gravel, possible landfill material					0
		GC	CLAY. Yellow brown color, lean, moist, no odor					



SOIL BORE/MONITORING WELL LOG

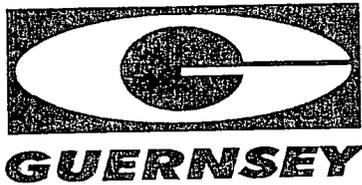
BOREHOLE NO.: SB-53

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course	DRILLING CO.: Mid-America
SITE LOCATION: GLNTC, IL	DRILLER: Brian Lunardon
JOB NO.: OK07573016-0434	RIG TYPE: Geoprobe
LOGGED BY: Carey Miller and Angela Riddles	METHOD OF DRILLING: Direct Push
PROJECT MANAGER: Jimmie Hammontree	SAMPLING METHODS: Direct Push
DATES DRILLED: 2/7/03	HAMMER WT./DROP Geoprobe
NOTES:	∞ Water level during drilling ✕ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC	TOPSOIL Dark brown color, silty clay loam, frozen, no odor					
		GC	CLAY Dark brown color, lean, moist, some small gravel, no odor					
			LANDFILL MATERIAL: Black clay, lean, moist, no odor, possible landfill material					
		GC	CLAY Yellow brown color, moist, lean, no odor					



SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-54

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course	DRILLING CO.: Mid-America
SITE LOCATION: GLNTC, IL	DRILLER: Brian Lunardon
JOB NO.: OK07573016-0434	RIG TYPE: Geoprobe
LOGGED BY: Carey Miller and Angela Riddles	METHOD OF DRILLING: Direct Push
PROJECT MANAGER: Jimmie Hammontree	SAMPLING METHODS: Direct Push
DATES DRILLED: 2/7/03	HAMMER WT./DROP Geoprobe
NOTES:	<input type="checkbox"/> Water level during drilling <input checked="" type="checkbox"/> Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC	TOPSOIL: Dark brown color, silty clay loam, frozen, no odor					
		GC	CLAY: Yellow brown color, lean, moist, no odor					



SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-55

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course	DRILLING CO.: Mid-America
SITE LOCATION: GLNTC, IL	DRILLER: Brian Lunardon
JOB NO.: OK07573016-0434	RIG TYPE: Geoprobe
LOGGED BY: Carey Miller and Angela Riddles	METHOD OF DRILLING: Direct Push
PROJECT MANAGER: Jimmie Hammontree	SAMPLING METHODS: Direct Push
DATES DRILLED: 2/7/03	HAMMER WT./DROP Geoprobe
NOTES:	☒ Water level during drilling ☑ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
0		SC	TOPSOIL: Dark brown color, silty clay loam, frozen, no odor					
		GC	CLAY: Yellow brown color, lean, moist, some small gravel, no odor					



SOIL BORE/MONITORING WELL LOG

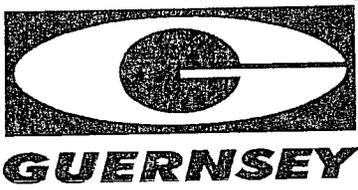
BOREHOLE NO.: SB-56

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course	DRILLING CO.: Mid-America
SITE LOCATION: GLNTC, IL	DRILLER: Brian Lunardon
JOB NO.: OK07573016-0434	RIG TYPE: Geoprobe
LOGGED BY: Carey Miller and Angela Riddles	METHOD OF DRILLING: Direct Push
PROJECT MANAGER: Jimmie Hammontree	SAMPLING METHODS: Direct Push
DATES DRILLED: 2/7/03	HAMMER WT./DROP Geoprobe
NOTES:	<div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Water level during drilling <input checked="" type="checkbox"/> Water level in completed well Page 1 of 1 </div>

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC GC	<p>TOPSOIL. Dark brown color, silty clay loam, frozen, no odor</p> <p>CLAY: Yellow brown color, lean, moist, some small to large gravel, no odor</p>					0
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SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-57

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course	DRILLING CO.: Mid-America
SITE LOCATION: GLNTC, IL	DRILLER: Brian Lunardon
JOB NO.: OK07573016-0434	RIG TYPE: Geoprobe
LOGGED BY: Carey Miller and Angela Riddles	METHOD OF DRILLING: Direct Push
PROJECT MANAGER: Jimmie Hammontree	SAMPLING METHODS: Direct Push
DATES DRILLED: 2/7/03	HAMMER WT./DROP Geoprobe
NOTES:	☐ Water level during drilling ▼ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC	TOPSOIL Dark brown color, silty clay loam, frozen, no odor					
		GC	CLAY: Yellow brown color, lean, moist, some small gravel, no odor					
			LANDFILL MATERIAL Black clay, lean, moist					



SOIL BORE/MONITORING WELL LOG

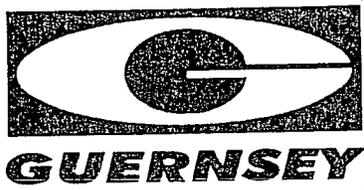
BOREHOLE NO.: SB-58

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course SITE LOCATION: GLNTC, IL JOB NO.: OK07573016-0434 LOGGED BY: Carey Miller and Angela Riddles PROJECT MANAGER: Jimmie Hammontree DATES DRILLED: 2/7/03	DRILLING CO.: Mid-America DRILLER: Brian Lunardon RIG TYPE: Geoprobe METHOD OF DRILLING: Direct Push SAMPLING METHODS: Direct Push HAMMER WT./DROP Geoprobe
NOTES:	☒ Water level during drilling ☒ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		GC	CLAY: Dark brown to black color, lean, moist, no odor, frozen to 1.5 ft					
		GC	CLAY: Yellow brown color, lean, moist, no odor					



SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-59

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course	DRILLING CO.: Mid-America
SITE LOCATION: GLNTC, IL	DRILLER: Brian Lunardon
JOB NO.: OK07573016-0434	RIG TYPE: Geoprobe
LOGGED BY: Carey Miller and Angela Riddles	METHOD OF DRILLING: Direct Push
PROJECT MANAGER: Jimmie Hammontree	SAMPLING METHODS: Direct Push
DATES DRILLED: 2/7/03	HAMMER WT./DROP Geoprobe
NOTES:	☒ Water level during drilling ☑ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC	TOPSOIL Dark brown color, silty clay loam, frozen					
		GC	CLAY Yellow brown color, lean, moist, no odor					



SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-60

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course	DRILLING CO.: Mid-America
SITE LOCATION: GLNTC, IL	DRILLER: Brian Lunardon
JOB NO.: OK07573016-0434	RIG TYPE: Geoprobe
LOGGED BY: Carey Miller and Angela Riddles	METHOD OF DRILLING: Direct Push
PROJECT MANAGER: Jimmie Hammontree	SAMPLING METHODS: Direct Push
DATES DRILLED: 2/7/03	HAMMER WT./DROP Geoprobe
NOTES:	☒ Water level during drilling ☒ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC	TOPSOIL Dark brown color, silty clay loam, frozen					
		GC	CLAY: Yellow brown color, lean, moist, no odor					
			LANDFILL MATERIAL Black clay, cinders, some wood					



SOIL BORE/MONITORING WELL LOG

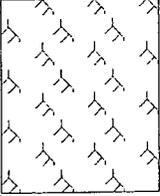
BOREHOLE NO.: SB-61

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course	DRILLING CO.: Mid-America
SITE LOCATION: GLNTC, IL	DRILLER: Brian Lunardon
JOB NO.: OK07573016-0434	RIG TYPE: Geoprobe
LOGGED BY: Carey Miller and Angela Riddles	METHOD OF DRILLING: Direct Push
PROJECT MANAGER: Jimmie Hammontree	SAMPLING METHODS: Direct Push
DATES DRILLED: 2/7/03	HAMMER WT./DROP Geoprobe
NOTES:	☒ Water level during drilling ☑ Water level in completed well

Page 1 of 1

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC	TOPSOIL: Dark brown color, silty clay loam, some medium gravel, frozen					
		GC	CLAY: Yellow brown color, lean, moist, no odor					



SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-62

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course	DRILLING CO.: Mid-America
SITE LOCATION: GLNTC, IL	DRILLER: Brian Lunardon
JOB NO.: OK07573016-0434	RIG TYPE: Geoprobe
LOGGED BY: Carey Miller and Angela Riddles	METHOD OF DRILLING: Direct Push
PROJECT MANAGER: Jimmie Hammontree	SAMPLING METHODS: Direct Push
DATES DRILLED: 2/7/03	HAMMER WT./DROP Geoprobe
NOTES:	☒ Water level during drilling ☒ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC	TOPSOIL: Dark brown color, silty clay loam, some small to medium gravel, frozen					0
		GC	CLAY: Yellow brown color, lean, moist, some small gravel, no odor					



SOIL BORE/MONITORING WELL LOG

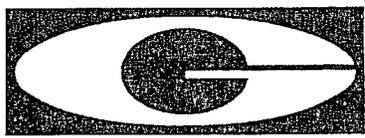
BOREHOLE NO.: SB-63

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course	DRILLING CO.: Mid-America
SITE LOCATION:- GLNTC, IL	DRILLER: Brian Lunardon
JOB NO.: OK07573016-0434	RIG TYPE: Geoprobe
LOGGED BY: Carey Miller and Angela Riddles	METHOD OF DRILLING: Direct Push
PROJECT MANAGER: Jimmie Hammontree	SAMPLING METHODS: Direct Push
DATES DRILLED: 2/7/03	HAMMER WT./DROP Geoprobe
NOTES:	sz Water level during drilling x Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC	<p>TOPSOIL: Dark brown color, silty clay loam, frozen</p> <p>LANDFILL MATERIAL: Tan to white color, small to large gravel, possible concrete.</p> <p>CLAY: Yellow brown color, lean, moist, no odor</p>					0
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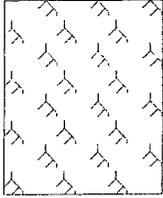
SOIL BORE/MONITORING WELL LOG

BOREHOLE NO.: SB-64

TOTAL DEPTH:-4

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT: Willow Glen Golf Course	DRILLING CO.: Mid-America
SITE LOCATION: GLNTC, IL	DRILLER: Brian Lunardon
JOB NO.: OK07573016-0434	RIG TYPE: Geoprobe
LOGGED BY: Carey Miller and Angela Riddles	METHOD OF DRILLING: Direct Push
PROJECT MANAGER: Jimmie Hammontree	SAMPLING METHODS: Direct Push
DATES DRILLED: 2/7/03	HAMMER WT./DROP Geoprobe
NOTES:	<input type="checkbox"/> Water level during drilling <input checked="" type="checkbox"/> Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	WELL COMPLETION	WELL DESCRIPTION
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0		SC	TOPSOIL. Dark brown color, silty clay loam, frozen					
		GC	CLAY. Yellow brown color, lean, moist, some small to large gravel, no odor					