CON 12-15 Brownfields—Coralville

CON 12-15
Doc #14463

March 5, 2003

Terracon
5855 Willow Creek Drive Southwest
Cedar Rapids, Iowa 52404-4312
(319) 366-8321 Fax: (319) 366-0032

Iowa Department of Natural Resources
Waste Management Assistance Division
Contaminated Sites Section
502 East 9th Street
Wallace State Office Building
Des Moines, Iowa 50319-0034

Attention: Mr. Robert Drustrup
Senior Environmental Engineer

RE: Arsenic Background Clarification
Lowe's Home Center Project
Northwest of Coral Ridge Avenue and US Route 6
Coralville, Iowa
Terracon Project No. 06027731

Dear Mr. Drustrup:

Per our conversation on December 30, 2002, enclosed you will find a copy of the Phase 2 Environmental Site Assessment (ESA) conducted on the Hill Hardwood portion of the Lowe's Home Center. Two soil borings from the site were analyzed for arsenic and found to contain 2.28 milligrams/kilogram (mg/kg) (B-1) and 10.2 mg/kg (B-3). These concentrations exceed the statewide default standard for arsenic in soil of 1.4 mg/kg under Iowa Administrative Code 567, Chapter 137.

Literature reviewed by Terracon for the Phase 2 ESA indicated that the concentration of arsenic in natural soils could range from 0.1 to 40 mg/kg, with an average concentration of 5 mg/kg.[1] Another source[2], reported that the average concentration of arsenic in typical soils is 11 mg/kg.

Terracon also reviewed Public Health Assessments (PHAs) performed by the Iowa Department of Public Health (Department of Health) and the Agency for Toxic Substances and Disease Registry (ATSDR) for information about arsenic in Iowa soils. PHAs performed in Woodbury County and Fairfield County evaluated arsenic concentrations at off site locations and found surface concentrations of 14 and 94 mg/kg and subsurface concentrations of 14 and 21 mg/kg, respectively.

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[1] Chemical Element Content of Natural Soils; Edward J. Shields, Pollution Control Engineer's Handbook, Second Printing, p. 101.

[2] McClanahan, Cancer Risk in Chemicals in Soils, Report to EPA 1745C, 1984.

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DEPT. OF
NATURAL RESOURCES

DATE STAMP

Based upon this information, Terracon believes that the elevated arsenic concentrations found on the subject site are likely within occurring background levels in the area.

We appreciate the Iowa Department of Natural Resources attention to this matter. Terracon respectively requests that the Iowa Department of Natural Resources provide a letter concurring with our conclusions, if appropriate.

Sincerely,
Terracon

Ed D. Bertch, PG, REM
Environmental Project Manager

Sean D. Brown, PE
Principal

EDB/SDB/cab:\\06SERVER1\DATA\PROJECTS2002.FIN\06027731\WP\06027731.IDNR.DOC

Attachment: Phase 2 Environmental Site Assessment

Copies to: Addressee (1)
Mr. Dan Moylan, Lowe's Home Center (1)

FILE COPY

PHASE 2 ENVIRONMENTAL SITE ASSESSMENT
PROPOSED LOWE'S HOME CENTER PROJECT
HILL HARDWOODS FACILITY
2871 SECOND STREET
CORALVILLE, IOWA

December 19, 2001
Project No. 42017093

Prepared for:
Lowe's Home Centers, Inc.
P.O. Box 1111
North Wilkesboro, NC 28656

Prepared by:
Terracon
Bettendorf, Iowa

Terracon

Form 101—1-87

December 19, 2001

Terracon
870 40th Avenue
Bettendorf, Iowa 52722
(563) 355-0702 Fax: (563) 355-4789

Mr. Thomas H. Wilkinson
Lowe's Home Centers, Inc.
P.O. Box 1111
North Wilkesboro, NC 28656

RE: Phase 2 Environmental Site Assessment
Proposed Lowe's Home Center Project
2871 Second Street
Coralville, Iowa
Project No. 42017093

Dear Mr. Wilkinson:

Terracon submits herewith our report addressing Phase 2 Environmental Site Assessment (Phase 2 ESA) activities completed at the above-referenced site. The purpose of this assessment was to assess potential environmental concerns identified during a Phase I Environmental Site Assessment conducted at the site. This report presents data from the Phase 2 ESA field activities that included the completion of soil borings and the collection of soil samples for chemical analysis.

Terracon appreciates this opportunity to provide environmental engineering services to Lowe's Home Centers, Inc. Should you have any questions or require additional information, please, do not hesitate to contact our office.

Sincerely,
TERRACON

Prepared By:

David J. Smith
Environmental Technician

Reviewed By:

Gregg P. Olberts, PG
Senior Project Manager

DJS/GPO/cb4
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PHASE 2 ENVIRONMENTAL ASSESSMENT
PROPOSED LOWE'S HOME CENTER PROJECT
HILL HARDWOODS FACILITY
2871 SECOND STREET
CORALVILLE, IOWA
Project No. 42017093
December 19, 2001

1.0 INTRODUCTION

Terracon has completed Phase 2 environmental site assessment (Phase 2 ESA) activities at the above-referenced location as described in our proposal dated November 2, 2001. Written authorization to proceed with the assessment was provided by Mr. Thomas H. Wilkes, for Lowe's Home Centers, Inc. on November 7, 2001.

The purpose of this assessment was to assess potential historical environmental concerns identified during a Phase I Environmental Site Assessment conducted at the site (reference Terracon Report No. 42017750, September 21, 2001). Please refer to Figures 1 and 2 of Appendix A.

The parcel was located within the NE ¼ of the NW ¼ of Section 36, Township 80 North, Range 7 West, in Johnson County, Iowa. The property's address was 2871 2nd Street, in Coralville, Iowa.

2.0 SCOPE OF SERVICES

The following scope of services was intended to determine subsurface soil conditions in the vicinity of the former automotive repair facility, associated on-site septic system and former farmstead foundation. From Terracon's geotechnical Investigation (report # 06015653, September 28, 2001), groundwater was generally not encountered in borings extending to a depth of 70 feet below ground surface. Therefore, groundwater was not assessed under this workscope. The elements of the environmental assessment were as follows:

- Drilled one (1) soil boring, using a hand auger, to a depth of approximately ten (10) feet below the finished floor level within the former automotive facility's floor drain vault. Obtained soil samples at one (1) foot intervals from the stainless steel auger bucket. Auger cuttings were returned to the borehole.

- Drilled two (2) soil borings using a truck-mounted drill, to a depth of approximately twenty (20) feet below ground surface. Soil samples were obtained at two (2) foot intervals using a split-spoon sampler. Auger cuttings were returned to the borehole.

- Soil samples collected were screened using a photoionization detector (PID).

- Three (3) soil samples were analyzed, one (1) from boring B-2 for benzene, ethylbenzene, toluene, and xylenes (BETX) by Iowa analytical method OA-1, and from borings B-1, B-2, and B-3 for total extractable hydrocarbons (TEH) by Iowa analytical method OA-2. Additionally, the samples collected from the floor drain vault (B-3) and septic leach field (B-1) areas were analyzed for volatile organic compounds (VOCs) which includes BETX and chlorinated solvents using EPA method 8260A and Resource Conservation and Recovery Act (RCRA) metals using EPA method 6010A.

3.0 INTRUSIVE ASSESSMENT METHODOLOGIES

3.1 Drilling

The rig used for the field exploration was a truck-mounted auger drill that employs a hydraulic head for drilling and sampling. Drilling equipment was three and one-quarter (3¼)-inch inside diameter hollow stem augers. Soil borings were abandoned with soil cuttings mixed with commercial bentonite sealant upon completion of sampling activities.

3.2 Soil Sampling

Soil samples were logged by the field crew based on visual classification and apparent textural properties of the recovered samples. Boring logs detailing observed soil sample lithologies are presented in Appendix B.

Split-spoon samplers were cleaned prior to each sampling event by hand washing in potable water and Alconox solution and rinsing in potable water. Cleaning fluids were not collected.

3.3 Soil Sample Screening

Soil samples were field screened for organic vapors using a PID. This device provides a direct reading in parts per million isobutylene equivalents (ppmi), generally a 1:1 response correlation to benzene. Upon removal of the sampler from the borehole, approximately five hundred (500) grams of sample were cut from the total sample and sealed in a resealable bag. After an approximate fifteen (15)-minute stabilization period, the headspace above the soil was screened using the PID equipped with a 10.2 eV ultraviolet lamp source. The unit was gas calibrated in accordance with manufacturer's recommendations. The PID results are shown on the boring logs, Appendix B.

3.4 Soil Sampling for Analytical Characterization

Three (3) soil samples were analyzed, one (1) from each boring for OA-2; OA-1 for B-2; and VOCs and RCRA metals for B-1 and B-3, using the methods previously described.

Soil sample selection was based on PID screening. Soil samples for analytical characterization were transferred to laboratory-prepared, four (4)-ounce glass jars with Teflon-lined caps and placed in an ice-packed cooler for transport to the laboratory. Samples were relinquished under standard Chain of Custody (COC) procedures to Prairie Analytical Systems, Inc. (Prairie) in Springfield, Illinois.

3.5 Groundwater Sampling

Groundwater samples were not collected, as each of the boreholes did not produce water.

3.6 Surveying

Soil boring elevations are approximate and were measured relative to a convenient reference benchmark using an engineer's level by Terracon personnel. The reference benchmark for the site was the finished floor of the existing Hill Hardwoods building at the south door (assumed 100.0). Elevation data is presented on the boring logs, Appendix B. The location and elevation of the borings should be considered accurate only to the degree implied by these methods.

3.7 Health and Safety

Field services were performed under Level D safety precautions. Level D safety attire for this project consisted of a washable work uniform including safety shoes, hardhat, rubber gloves, and appropriate eye and ear protection. A health and safety plan was developed prior to mobilization.

4.0 ANALYTICAL DATA

4.1 Iowa Administrative Code Chapter 135

Though Terracon did not identify the presence of current or former underground storage tanks (USTs) during previous Phase I ESA activities, the comparative application of petroleum cleanup standards was considered appropriate to the scope of services and client needs within the limitations discussed below.

In 1995-1996, the state of Iowa developed Risk Based Corrective Action (RBCA) rules for evaluating and cleaning up petroleum releases from USTs based on chemical risk. This assessment does not constitute either a Tier 1 or Tier 2 RBCA evaluation as defined by Iowa Administrative Code Chapter 135 (IAC135) and although this assessment makes use of methods and draws comparisons to IAC135 rules and guidance, its limitations must be recognized by users of this document. To conduct a site-specific RBCA evaluation, full delineation of plume boundaries would be necessary to estimate potential future contaminant transport.

If Action Levels are exceeded at UST closure under IAC135, the site must proceed to Tier 1 or Tier 2 RBCA assessment and evaluation. Tier 1 has calculated a table of values representing chemical concentrations adequately protective of the public with regard to residual petroleum concentrations. These values do not consider site specific conditions (i.e., actual groundwater hydraulic conductivity) except in identifying receptors. The IAC135 Tier 1 RBCA process calculates values for the evaluation of seven (7) pathways involving soil and groundwater:

- Actual and potential groundwater ingestion;
- Groundwater residuals vaporizing to enclosed spaces;
- Groundwater to plastic drinking water lines;
- Surface water impacts by groundwater residuals;
- Soil residuals leaching to groundwater;
- Soil residuals vaporizing to enclosed spaces; and
- Soil residuals impact to plastic drinking water lines

Soil and groundwater chemistry is then compared to the Tier 1 Look-up Table in IAC135.9 for appropriate pathways of completion. Tier 1 look-up values represent specific pathways and conservative conditions of public exposure for evaluating added chemical risk from UST petroleum release sites. The values are calculated as if a public receptor occupies the location of the maximum concentration for full exposure. If pathways are not complete or site concentrations do not exceed Tier 1 values, the UST site does not require further exploration or corrective action. The site is then eligible for closure and a No Further Action certificate from IDNR.

Terracon applied the IAC135 RBCA concepts to the chemistry reported by the laboratory as a qualitative screen. This comparison is made with the understanding:

- The rules of IAC135 only apply to regulated releases from regulated leaking underground storage tanks. Although the comparison appears quantitative, its use is purely qualitative for internal evaluation relative to property negotiations;
- The application of IAC135 RBCA concepts is general and does not purport to be an extensive exposure/risk analysis for compliance under any Iowa program. For more than qualitative evaluation, a more extensive site assessment, detailed exposure analysis and/or direct quantitative application of either Tier 2 or traditional risk assessment would be required; and
- The application of risk-based concepts for qualitative evaluation does not constitute a risk assessment as defined by CERCLA.

4.2 Iowa Administrative Code Chapter 137

Iowa Administrative Code 567-455H, Chapter 137: Iowa Land Recycling Program and Response Action Standards (IAC137), went before the Environmental Protection Commission for final adoption on October 19, 1998. On October 27, 1998, IAC137 became effective.

This administrative code was developed from a voluntary risk-based cleanup program for Iowa properties with environmental impacts. The 1997 Iowa Legislature established the "Iowa Land Recycling and Environmental Remediation Standards Act" requiring the Commission to adopt rules developed jointly by the IDNR and a Technical Advisory Committee (TAC). IDNR designed the program to meet the dual objectives of addressing contaminated sites and promoting the redevelopment of these sites. The primary means of meeting these objectives was through a program which encouraged voluntary participation

to address contamination, establish a set of risk-based response action standards and provide a measure of liability protection to participants and future property owners.

IAC 137 provides statewide standards, which represent concentrations of contaminants in specific media of an affected area at which normal, unrestricted exposure through a specific exposure pathway is considered unlikely to pose a threat to human health, safety, or the environment. Risk-based contaminant concentrations for soil and groundwater are calculated using a formula that takes into account chemical specific properties concerning toxicity and assumptions about human exposure. The formula is used for each contaminant at a site, except for lead, which has default values specified in the regulations.

IAC 137 provides that the IDNR calculate and publish current tables for statewide standards in soil and groundwater. The IDNR periodically updates the tables of standards as toxicity and chemical information changes. The comparisons used in this report are to the most recent IDNR update, which occurred on October 4, 1999. Generally, the equation used to calculate the risk-based concentrations for compounds other than lead is as follows:

$$C = \frac{RF \times AT \times 365\ days/year}{Abs \times [(ER_C \times EF_C \times ED_C) / BW_C + (ER_A \times EF_A \times ED_A) / BW_A] \times CF}$$

Where:

C = Risk-based concentration of contaminant
RF = Risk factor, which differs for carcinogenic and non-carcinogenic effects
AT = Averaging time
Abs = Absorption factor
ER_C = Exposure rate by a child
EF_C = Exposure frequency by a child
ED_C = Exposure duration by a child
BW_C = Body weight of exposed child
ER_A = Exposure rate by an adult
EF_A = Exposure frequency by an adult
ED_A = Exposure duration by an adult
BW_A = Body weight of exposed adult
CF = Conversion Factor

IAC 137 lists several sets of values for the above-referenced variables, depending on site use and the depth below surface. These variables are modified accordingly to calculate either statewide or site-specific response action objectives. The statewide calculation does

not consider the site-specific potential for impacted soils to come in contact with receptors (i.e., impacts at depth are considered to have the same likelihood of exposure by ingestion of impacts at the surface).

The actual standards for IAC 137 are determined based on the formulae and instructions presented in the regulations. IDNR maintains and publishes the table of calculated standards based on IAC 137 for the benefit of participants in the program. The table is not the standard. Various risk-related inputs used in the calculation of the standards are periodically updated. As a consequence, standards are subject to periodic change.

4.3 Soil Sample BETX, TEH and VOCs Analysis

The laboratory tested one (1) soil sample, B-2, for BETX by OA-1 analysis. BETX compounds were not identified. The laboratory tested three (3) soil samples submitted for TEH by OA-2 analysis. TEH as motor oil was identified in B-3 at a concentration of 104 milligrams per kilogram (mg/kg) generally equivalent to parts per million. Statewide standards have not been established for motor oil I soil under IAC135 guidelines. The remaining TEH compounds were not detected at or above laboratory reporting limits (LRL) in the soil samples collected from borings B-1, B-2 and B-3. The laboratory tested two (2) soil samples, B-1 and B-3, submitted for VOCs by EPA analytical method 8260A analysis. VOCs were not measured above the LRLs in the samples from B-1 or B-3.

The Prairie laboratory reports and COCs are also in Appendix C.

4.4 Soil Sample Inorganic Analysis

The laboratory tested the soil samples submitted from borings B-1 and B-3 for inorganic analysis for the presence of the eight (8) RCRA metals. With the exception of silver and mercury, the results of the analysis indicated that, each of the metals were present in both soil samples.

Table 1 attached after text summarizes the analytical results along with IDNR statewide standards. The Prairie laboratory reports and COCs are also in Appendix C.

4.4.1 Comparison of Property Chemistry to IAC 137

Table 1 depicts a summary of the analytical results for the property and provides comparisons to the IAC 137 statewide response action standards. With the exception of arsenic in soil, the maximum detected concentrations did not exceed statewide standards.

The statewide default standard for arsenic in soil, 1.4 mg/kg, was exceeded by the concentrations detected in the samples from B-1 and B-3 (2.28 and 10.2 mg/kg, respectively).

IAC137 recognizes that the most conservative level of protection calculated as a default statewide response action standard may conflict with widespread man-made distribution or naturally occurring levels of chemical impacts. IAC137.2 defines an alternative background standard as representing concentrations of contaminants, which are naturally occurring or are generally present and not related to a readily identifiable release. IAC137.4 allows enrolled properties in the Iowa Land Recycling Program (LRP) to determine a site-specific background concentration for comparison to site chemistry. Generally this requires collection and analysis of a minimum of ten (10) samples taken from a reference area outside the area of evaluation. The values are statistically evaluated to determine a background standard. The LRP participant then collects a minimum of twelve samples per three thousand cubic yards (12/3,000 CY) of evaluated soil. These values are then compared to the background standard and must meet certain statistical limits set forth in IAC137.10(4).

This property is not enrolled in the LRP. A statistical determination of a property-specific background standard is not within this limited scope of services. However, the client requires a point of reference for purposes of risk management. Terracon conducted a review of readily available literature within the agreed budget. A more extensive evaluation is beyond this scope of services.

According to literature reviewed by Terracon, the concentration of arsenic in natural soils can range from 0.1 to 40 mg/kg, with an average concentration of 5 mg/kg.[1] According to another source[2], the average concentration of arsenic in typical soils is 11 mg/kg.

The U.S. Public Health Service[3] indicates the following information regarding arsenic occurrence. Because arsenic is a natural component of the earth's crust, low levels are found in all environmental media. Arsenic released to land is relatively immobile due to binding to soil particles. Arsenic is an element that occurs naturally in a variety of sulfidic ores. Arsenic can be released to the environment from natural sources (e.g., volcanoes,

[1] Chemical Element Content of Natural Soils; Edward J. Shields, Pollution Control Engineer's Handbook, Second Printing, pg. 101.

[2] McClanahan, Cancer Risk in Chemicals in Soils, Report to EPA 1745C, 1984

[3] Toxicological Profiles on CD-ROM, Agency For Toxic Substances And Disease Registry, CRC-Lewis Publishers, 1997.

erosion from mineral deposits). Natural levels of arsenic in soil usually range from 1 to 40 parts per million (ppm), but pesticide application or waste disposal can produce much higher values. Arsenic is also found in many foods at concentrations that usually range from 20 to 140 ppb.

Releases from human activities (e.g., metal smelting, chemical production and use, coal combustion, waste disposal) can lead to substantial environmental contamination. Approximately eighty percent (80%) of the total arsenic released to the environment from human activities is released to soil (EPA 1982). Application of pesticides and disposal of solid wastes from fossil fuel combustion and industrial processes are the major sources. USEPA reported releases to land from industrial processes totaled about 5.6 million pounds in 1988 (TRI88 1990), accounting for nearly 95% of total reported environment releases. Of this, nearly all was to permitted facilities (EPA 1990e). Land application of sewage sludge is another source of arsenic in soil. Arsenic has been detected in sewage sludge samples from 23 cities at concentrations of 0.3-53 ppm.

Arsenic has been detected in soil at 16% of 385 hazardous waste sites where it has been measured, at a geometric mean concentration of 5 ppm (CLPSD 1990). The maximum reported soil concentration from the CLPSD was 5,000. Based on comparison with average background levels of arsenic in soil, this data appears to indicate that arsenic detected in soil samples may be natural and not the result of waste disposal or release.

5.0 FINDINGS

Terracon identified through historical research that a former heating oil tank and former automotive repair operations, in combination with an unlined floor drain and a septic leach field were the primary on-site issues. The concern was due to possible leaks and spills that may have occurred.

Soil boring B-1 was drilled where an on-site septic system was reported to be located, according to the property owner. The soil sample from B-1 was analyzed for VOC's, TEH, and the eight (8) RCRA metals. Neither VOC nor TEH compounds were identified in the soil sample from B-1. Arsenic was detected above the Statewide Standard of 1.4 mg/kg. Other inorganic compounds detected were below the Statewide Standards.

Terracon advanced boring B-2 near the foundation of a former building. B-2 was intended to address possible heating oil impacts. The soil sample from B-2 was analyzed for BTEX and TEH. Neither BETX nor TEH compounds were identified in the soil sample from B-2.

Soil boring B-3 was drilled within the Hill Hardwoods building, through a floor drain pit, to address possible impacts from the former automotive repair operations. The soil sample from B-3 was analyzed for VOCs, TEH and the eight (8) RCRA metals. Neither VOCs nor TEH were identified in the soil sample from B-3. Arsenic was detected above the Statewide Standard of 1.4 mg/kg. Other inorganic compounds detected were below the Statewide Standards.

Groundwater was not encountered and therefore, not collected from the borings.

6.0 CONCLUSIONS

Obvious petroleum impacts were not identified, based on PID readings, visual observations and limited chemical analysis performed.

Arsenic was identified in the soil samples from B-1 and B-3 at concentrations above the Statewide Standard. The levels measured fall within the range of typical soils, however, and may be considered background and not indicative of chemical impairment to the property.

7.0 GENERAL COMMENTS

The analysis presented in this report is based upon data obtained from field activities and from other information discussed in this report. This report does not reflect any variations in subsurface stratigraphy that may occur between borings or across the site. Actual subsurface conditions may vary. The extent of such variations may not become evident without additional exploration.

This report is prepared for the exclusive use of our client for the specific application to the project discussed and has been prepared in accordance with generally accepted environmental engineering practices. No warranties, either express or implied are intended or made. In the event any changes in nature or location of subsurface conditions as outlined in this report are observed, the conclusions contained in this report cannot be considered valid unless the changes are reviewed and the conclusions of this report are modified or verified in writing by the environmental engineer.

Table 1. Soil Analytical Results
Phase 2 ESA
Proposed Lowe's Home Center Project
Project No. 42017093

CAS Number	Compound	Units	Detection Limit	Sample Location (Depth, in Feet)			IAC 137 Statewide Standard	IAC 135 Action Level
				B-1 (16-18)	B-2 (14-16)	B-3 (0-1)		
	VOCs		**None Detected**					
	TEH (OA-2)							
--	Mineral Spirits	mg/kg	3.0	ND	ND	ND	NE	3,800
--	Kerosene	mg/kg	3.0	ND	ND	ND	NE	3,800
--	Diesel Fuel #2	mg/kg	3.0	ND	ND	ND	NE	3,800
--	Fuel Oil #3	mg/kg	3.0	ND	ND	ND	NE	3,800
--	Fuel Oil #5	mg/kg	3.0	ND	ND	ND	NE	3,800
--	Motor Oil	mg/kg	3.0	ND	ND	104	NE	NE
--	Hydraulic Fluid	mg/kg	3.0	ND	ND	ND	NE	NE
	Inorganic Analyses							
7440-47-3	Chromium (^{53}Cr), Total	mg/kg	0.05	4.46		9.04	230	NE
7440-38-2	Arsenic (^{75}As), Total	mg/kg	0.05	2.28		10.2	1.4	NE
7782-49-2	Selenium (^{82}Se), Total	mg/kg	0.05	0.386		0.396	390	NE
7440-22-4	Silver (^{107}Ag), Total	mg/kg	0.05	ND		ND	390	NE
7440-43-9	Cadmium (^{111}Cd), Total	mg/kg	0.05	0.269		3.42	39	NE
7440-39-3	Barium (^{137}Ba), Total	mg/kg	0.05	55.6		201.0	5,500	NE
7439-97-6	Mercury (^{202}Hg), Total	mg/kg	0.004	ND		ND	23	NE
7439-92-1	Lead (^{208}Pb), Total	mg/kg	0.05	4.7		93.7	400	NE

Notes:
mg/kg = milligrams per kilogram, generally equivalent to parts per million (ppm)
ND = Not Detected above the Laboratory Reporting Limit (LRL)

APPENDIX A - Figures

Figure 1 - Topographic Vicinity Map
Figure 2 - Site Diagram

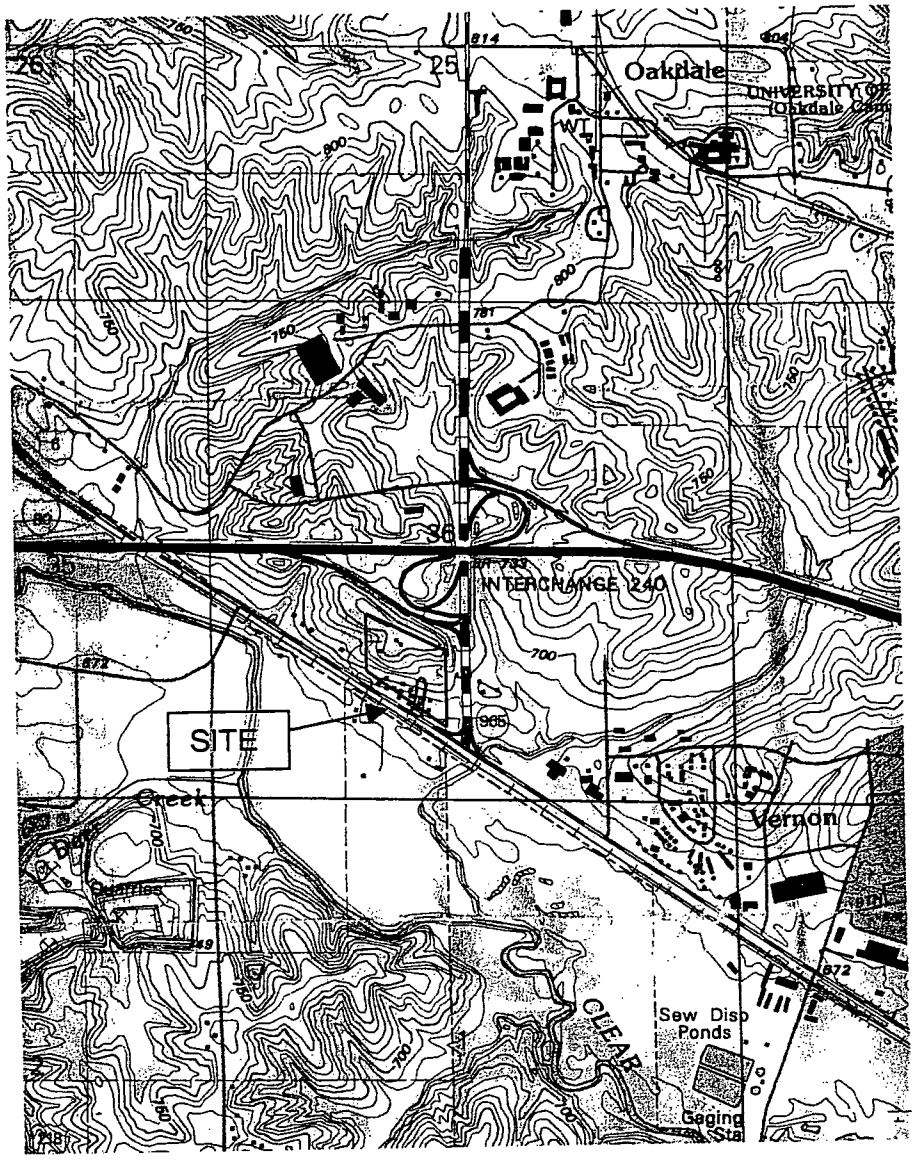
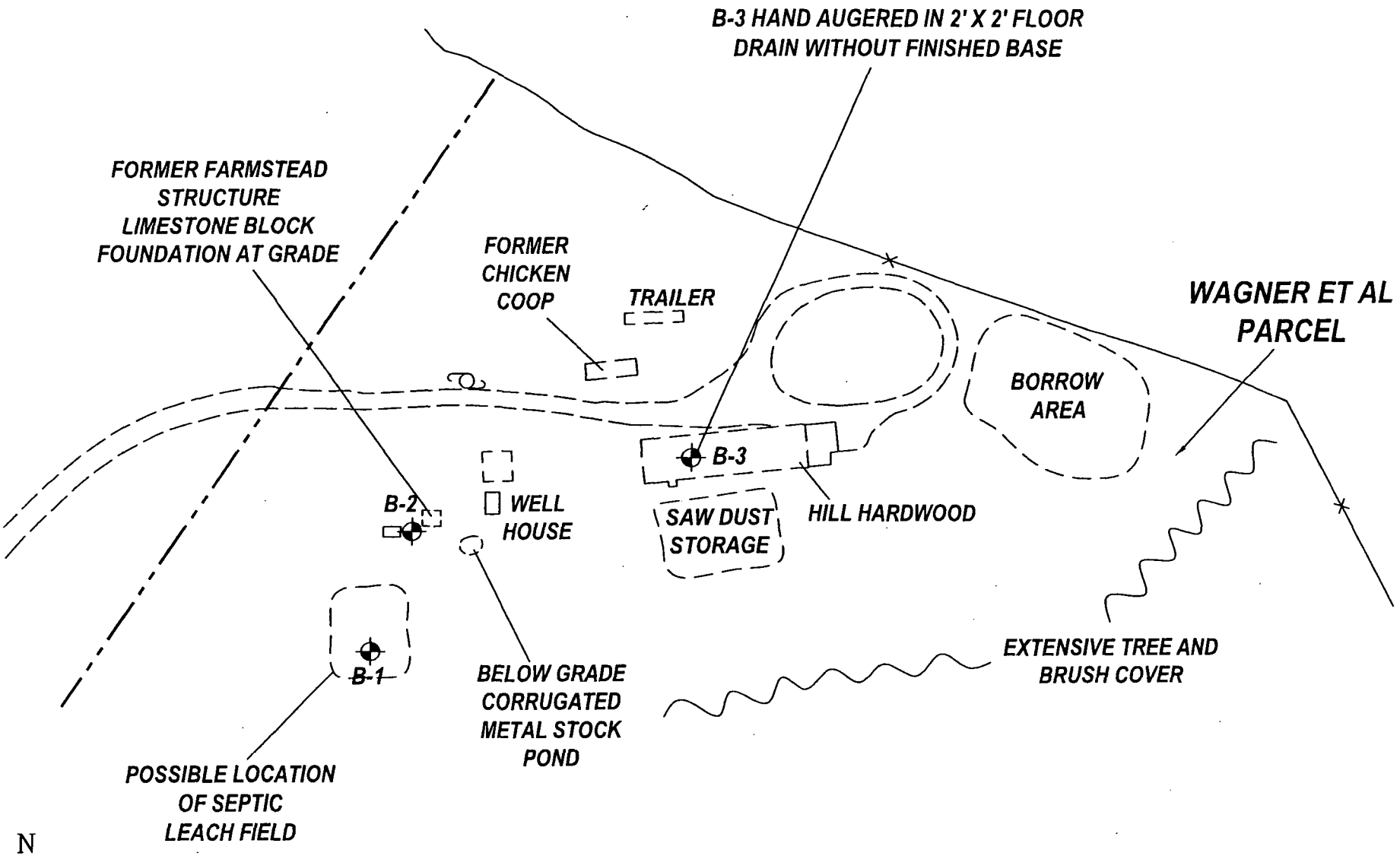


Figure 1 – Topographic Map
Proposed Lowe's Home Center Project
Northwest of Coral Ridge Avenue and US Route 6
Coralville, Iowa
Project No. 42017093



N

NOT TO SCALE

LEGEND

APPROXIMATE BORING LOCATION

APPROXIMATE PROPERTY BOUNDARY

UTILITY POLE

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

SITE DIAGRAM
PHASE 2 ESA
PROPOSED LOWE'S HOME CENTER

CORALVILLE, IOWA

Project Mngr: GPO	Terracon	Project No.	42017093
Designed By: GPO		Scale:	NONE
Drawn By: KJR	870 40th Avenue	File No.	42017093-2
Checked By: GPO	Bettendorf, Iowa 52722	Date:	DEC 2001
Approved By: GPO		Figure No.	2

APPENDIX B – Boring Logs

GENERAL NOTES

DRILLING & SAMPLING SYMBOLS:

SS	:	Split Spoon - 1⅜" I.D., 2" O.D., unless otherwise noted	PS	:	Piston Sample
ST	:	Thin-Walled Tube - 2" O.D., Unless otherwise noted	WS	:	Wash Sample
PA	:	Power Auger	FT	:	Fish Tail Bit
HA	:	Hand Auger	RB	:	Rock Bit
DB	:	Diamond Bit - 4", N, B	BS	:	Bulk Sample
AS	:	Auger Sample	PM	:	Pressuremeter
HS	:	Hollow Stem Auger	DC	:	Dutch Cone
			WB	:	Wash Bore

Standard "N" Penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2 inch OD split spoon, except where noted.

WATER LEVEL MEASUREMENT SYMBOLS:

WL	:	Water Level	WS	:	While Sampling
WCI	:	Wet Cave In	WD	:	While Drilling
DCI	:	Dry Cave In	BCR	:	Before Casing Removal
AB	:	After Boring	ACR	:	After Casing Removal

Water levels indicated on the boring logs are the levels measured in the borings at the times indicated. In pervious soils, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of ground water levels is not possible with only short term observations.

DESCRIPTIVE SOIL CLASSIFICATION:

Soil Classification is based on the Unified Soil Classification System and ASTM Designations D-2487 and D-2488. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; they are described as: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are described as: clays, if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse grained soils are defined on the basis of their relative in-place density and fine grained soils on the basis of their consistency. Example: Lean clay with sand, trace gravel, stiff (CL); silty sand, trace gravel, medium dense (SM).

CONSISTENCY OF FINE-GRAINED SOILS:

Unconfined Compressive Strength, Qu, psf	Consistency
< 500	Very Soft
500 - 1,000	Soft
1,001 - 2,000	Medium
2,001 - 4,000	Stiff
4,001 - 8,000	Very Stiff
8,001 -16,000	Hard
> -16,000	Very Hard

RELATIVE DENSITY OF COARSE-GRAINED SOILS:

N-Blows/ft.	Relative Density
0-3	Very Loose
4-9	Loose
10-29	Medium Dense
30-49	Dense
50-80	Very Dense
80 +	Extremely Dense

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) (of Components Also Present in Sample)	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component Of Sample	Size Range
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) (of Components Also Present in Sample)	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

Terracon

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification	
				Group Symbol	Group Name[B]
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$[E]	GW	Well-graded gravel[F]
			$Cu < 4$ and/or $1 > Cc > 3$[E]	GP	Poorly graded gravel[F]
		Gravels with Fines More than 12% fines[C]	Fines classify as ML or MH	GM	Silty gravel[F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel[F, G, H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[E]	$Cu \geq 6$ and $1 \leq Cc \leq 3$[E]	SW	Well-graded sand[I]
			$Cu < 6$ and/or $1 > Cc > 3$[E]	SP	Poorly graded sand[I]
		Sands with Fines More than 12% fines[D]	Fines classify as ML or MH	SM	Silty sand[G, H, I]
			Fines classify as CL or CH	SC	Clayey sand[G, H, I]
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	inorganic	PI > 7 and plots on or above "A" line[J]	CL	Lean clay[K, L, M]
			PI < 4 or plots below "A" line[J]	ML	Silt[K, L, M]
		organic	Liquid limit — oven dried / Liquid limit — not dried < 0.75	OL	Organic clay[K, L, M, N] / Organic silt[K, L, M, O]
	Silts and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line	CH	Fat clay[K, L, M]
			PI plots below "A" line	MH	Elastic silt[K, L, M]
		organic	Liquid limit — oven dried / Liquid limit — not dried < 0.75	OH	Organic clay[K, L, M, P] / Organic silt[K, L, M, Q]
Highly organic soils		Primarily organic matter, dark in color, and organic odor		PT	Peat

[A]Based on the material passing the 3-in. (75-mm) sieve.

[B]If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C]Gravels with 5 to 12% fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay

[D]Sands with 5 to 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay

[E]$Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F]If soil contains ≥ 15% sand, add "with sand" to group name.

[G]If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H]If fines are organic, add "with organic fines" to group name.

[I]If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J]If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K]If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel", whichever is predominant.

[L]If soil contains ≥ 30% plus. No. 200 predominantly sand, add "sandy" to group name.

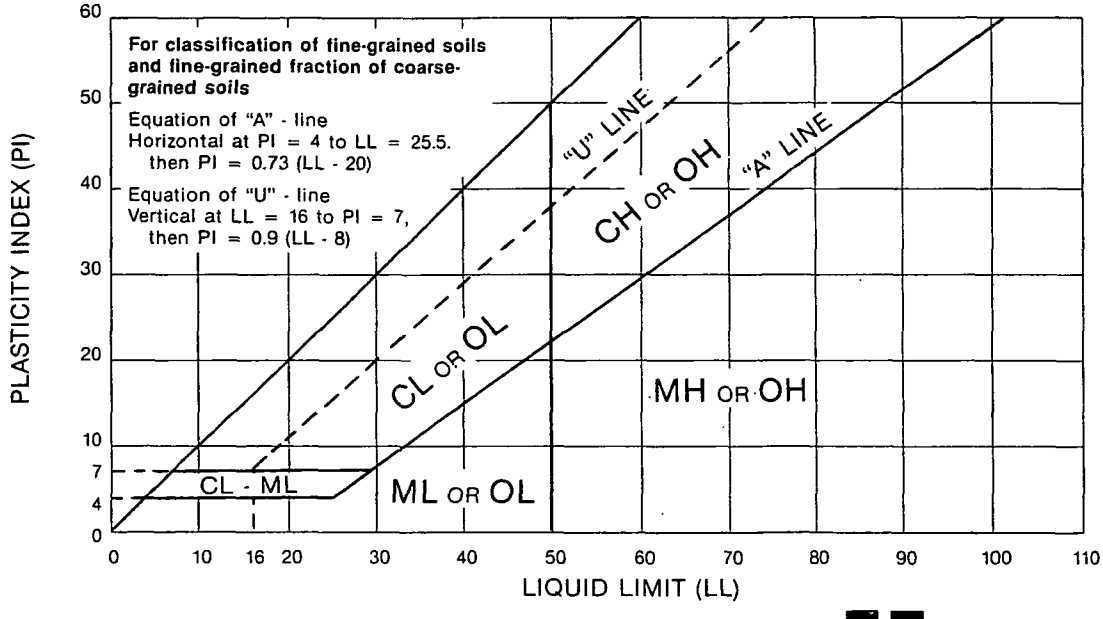
[M]If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N]PI ≥ 4 and plots on or above "A" line.

[O]PI < 4 or plots below "A" line.

[P]PI plots on or above "A" line.

[Q]PI plots below "A" line.



Terracon

Form 111—6-85

BORING NO. B-1

CLIENT: LOWE'S HOME CENTER

SITE: 2871 SECOND STREET, CORALVILLE, IOWA

PROJECT: WOOLPERT, LLC — LOWE'S PHASE 2 ESA (HILL HARDWOODS)

Approx. Surface Elev.: 87.6 ft

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS FIELD VAPOR TEST (PPM)*	TESTS SOIL SAMPLE SENT TO LABORATORY
	0.7 **BROWN SANDY, LEAN CLAY, TRACE ORGANICS** 87			1	SS	18			<1	
	LIGHT BROWN CLAYEY SILT			2	SS	12			<1	
		5		3	SS	20			<1	
				4	SS	17			1	
				5	SS	15			<1	
	6 inch thick light brown fine sand seam at 9.5 feet	10		6	SS	17			2	
				7	SS	21			2	
		15		8	SS	21			1	
				9	SS	18			2	X
				10	SS	16			2	
	20 67.5	20								
	BOTTOM OF BORING									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

* ND indicates a reading of less than the field detection limit (FDL) of one (1) part per million isobutylene equivalents (ppmi).

WATER LEVEL OBSERVATIONS, ft		
WL	▽ DRY	▼
WL	▼	▼
WL		

Terracon

BORING STARTED	11-28-01		
BORING COMPLETED	11-28-01		
RIG		FOREMAN	TM
APPROVED	GPO	JOB #	42017093

BOREHOLE 99 42017093.GPJ TERRACON.GDT 12/19/01

BORING NO. B-2

CLIENT: LOWE'S HOME CENTER

WOOLPERT, LLC

SITE: 2871 SECOND STREET
CORALVILLE, IOWA

PROJECT: LOWE'S PHASE 2 ESA (HILL HARDWOODS)

GRAPHIC LOG	DESCRIPTION		DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS FIELD VAPOR TEST (PPM)*	TESTS SOIL SAMPLE SENT TO LABORATORY
	Approx. Surface Elev.: 93.7 ft										
	0.5	93									
	FILL Crushed limestone and brown fine to coarse sand				1	SS	16			1	
	BROWN LEAN CLAY				2	SS	12			2	
	5	88.5			3	SS	18			1	
	LIGHT BROWN FINE SAND		5		4	SS	10			2	
	9	84.5			5	SS	13			1	
	LIGHT BROWN CLAYEY SILT		10		6	SS	15			2	
					7	SS	14			2	
			15		8	SS	12			2	X
					9	SS	15			2	
					10	SS	14			2	
	20	73.5	20								
	BOTTOM OF BORING										

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

* ND indicates a reading of less than the field detection limit (FDL) of one (1) part per million isobutylene equivalents (ppmi).

WATER LEVEL OBSERVATIONS, ft		
WL	▽ DRY	▼
WL	▼	▼
WL		

Terracon

BORING STARTED	11-28-01		
BORING COMPLETED	11-28-01		
RIG		FOREMAN	TM
APPROVED	GPO	JOB #	42017093

BOREHOLE 99 42017093.GPJ TERRACON.GDT 12/19/01

BORING NO. B-3

CLIENT: WOOLPERT, LLC

GREGG P. OLBERTS

SITE: 2871 SECOND STREET
CORALVILLE, IOWA

PROJECT: LOWE'S PHASE 2 ESA (HILL HARDWOODS)

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: SPT - N BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: FIELD VAPOR TEST (PPM)*	TESTS: SOIL SAMPLE SENT TO LABORATORY
	Approx. Surface Elev.: 99.1 ft									
	0.5 **FILL** 98.5			1	HA				<1	X
	Sawdust and gray silty clay			2	HA				<1	
	LIGHT BROWN SILTY CLAY			3	HA				<1	
				4	HA				<1	
				5	HA				<1	
		5		6	HA				<1	
				7	HA				<1	
				8	HA				<1	
				9	HA				<1	
	10 89			10	HA				<1	
	BOTTOM OF BORING	10								

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

* ND indicates a reading of less than the field detection limit (FDL) of one (1) part per million isobutylene equivalents (ppmi).

WATER LEVEL OBSERVATIONS, ft		
WL	▽ DRY	▼
WL	▽	▼
WL		

Terracon

BORING STARTED	11-28-01		
BORING COMPLETED	11-28-01		
RIG	HA	FOREMAN	TM
APPROVED	GPO	JOB #	42017093

APPENDIX C – Analytical Report and COC

An Analytical Testing Laboratory

Prairie Analytical Systems, INCORPORATED

1265 Capital Airport Drive
Springfield, IL 62707-8490

Phone: 217-753-1148
FAX: 217-753-1152
E-Mail: IL100323@aol.com

12 December 2001

Mr. Gregg Olberts
Terracon Environmental, Inc.
870 40th Avenue
Bettendorf, IA 52722

RE: PAS Project Code **TER-586**

Dear Mr. Olberts,

This report contains the analytical results for **42017093- Coralville, Iowa** samples received under chain of custody by Prairie Analytical Systems, Inc. on 29-Nov-01.

All applicable quality control procedures met method specific acceptance criteria.

This report shall not be reproduced, except in full, without the prior written consent of Prairie Analytical Systems, Inc.

If you have any questions, please feel free to call me at (217) 753-1148.

Sincerely,

Stephen R. Johnson

Stephen R. Johnson
Laboratory Director

CC: Project File

DEC 13 2001

Certificate of Analysis

Prairie Analytical Systems, INCORPORATED

Terracon Environmental, Inc.
870 40th Avenue
Bettendorf, IA 52722
(563)355-0702

1265 Capital Airport Drive
Springfield, IL 62707-8490
Phone: 217-753-1148
Facsimile: 217-753-1152
E-Mail: IL100323@aol.com

Client Project:	**42017093 - Coralville, Iowa**
PAS Project Code:	TER-586
Sampler(s):	David Smith
Sampler(s) Phone number:	(563)355-0702

Sample Description:	B-1	B-2	B-3	—
PAS Sample Number:	01112914216	01112914217	01112914218	—
Matrix:	Solid	Solid	Solid	—
Date Sampled:	28-Nov-01	28-Nov-01	28-Nov-01	—
Date Received	29-Nov-01	29-Nov-01	29-Nov-01	—
Date Analyzed:	11-Dec-01	11-Dec-01	11-Dec-01	—
Date Reported:	12-Dec-01	12-Dec-01	12-Dec-01	—

Organic Compound(s) Analysis

Parameter(s)	RL / Unit	Result	Result	Result	Result	Analyst	Method
OA-1							
Benzene	0.002 mg/kg	—	U	—	—	PEG	OA-1(6)
Toluene	0.002 mg/kg	—	U	—	—	PEG	OA-1(6)
Ethylbenzene	0.002 mg/kg	—	U	—	—	PEG	OA-1(6)
Total Xylenes	0.005 mg/kg	—	U	—	—	PEG	OA-1(6)
MTBE	0.005 mg/kg	—	U	—	—	PEG	OA-1(6)
OA-2							
Mineral Spirits	3.0 mg/kg	U	U	U	—	CMG	OA-2(7)
Kerosene	3.0 mg/kg	U	U	U	—	CMG	OA-2(7)
Diesel Fuel #2	3.0 mg/kg	U	U	U	—	CMG	OA-2(7)
Fuel Oil #3	3.0 mg/kg	U	U	U	—	CMG	OA-2(7)
Fuel Oil #5	3.0 mg/kg	U	U	U	—	CMG	OA-2(7)
Motor Oil	3.0 mg/kg	U	U	104	—	CMG	OA-2(7)
Hydraulic Fluid	3.0 mg/kg	U	U	U	—	CMG	OA-2(7)

IDNR Laboratory #130

Certificate of Analysis

Prairie Analytical Systems, INCORPORATED

Terracon Environmental, Inc.
870 40th Avenue
Bettendorf, IA 52722

1265 Capital Airport Drive
Springfield, IL 62707-8490
Phone: 217-753-1148
Facsimile: 217-753-1152
E-Mail: IL100323@aol.com

Client Project: **42017093 - Coralville, Iowa**
PAS Project Code: TER-586

Sample Description:	B-1	B-2	B-3	—
PAS Sample Number:	01112914216	01112914217	01112914218	—
Matrix:	Solid	Solid	Solid	—
Date Sampled:	28-Nov-01	28-Nov-01	28-Nov-01	—
Date Received	29-Nov-01	29-Nov-01	29-Nov-01	—
Date Analyzed:	11-Dec-01	11-Dec-01	11-Dec-01	—
Date Reported:	12-Dec-01	12-Dec-01	12-Dec-01	—

Organic Compound(s) Analysis

Parameter(s)	RL / Unit	Result	Result	Result	Result	CAS #	Method
Volatile Organic Compounds by GC/MS							
Dichlorodifluormethane	0.010 mg/kg	U	—	U	—	75-71-8	5030B/8260B(1)
Chloromethane	0.010 mg/kg	U	—	U	—	74-87-3	5030B/8260B(1)
Vinyl Chloride	0.010 mg/kg	U	—	U	—	75-01-4	5030B/8260B(1)
Bromomethane	0.010 mg/kg	U	—	U	—	74-83-9	5030B/8260B(1)
Chlorethane	0.010 mg/kg	U	—	U	—	75-00-3	5030B/8260B(1)
Trichlorofluoromethane	0.010 mg/kg	U	—	U	—	75-69-4	5030B/8260B(1)
1,1-Dichloroethene	0.005 mg/kg	U	—	U	—	75-35-4	5030B/8260B(1)
Methylene Chloride	0.005 mg/kg	U	—	U	—	75-09-2	5030B/8260B(1)
trans-1,2-Dichloroethene	0.005 mg/kg	U	—	U	—	156-60-5	5030B/8260B(1)
1,1-Dichloroethane	0.005 mg/kg	U	—	U	—	75-34-3	5030B/8260B(1)
cis-1,2-Dichloroethene	0.005 mg/kg	U	—	U	—	156-59-2	5030B/8260B(1)
2,2-Dichloropropane	0.005 mg/kg	U	—	U	—	590-20-7	5030B/8260B(1)
Chloroform	0.005 mg/kg	U	—	U	—	67-66-3	5030B/8260B(1)
Bromochloromethane	0.005 mg/kg	U	—	U	—	74-97-5	5030B/8260B(1)
1,1,1-Trichloroethane	0.005 mg/kg	U	—	U	—	71-55-6	5030B/8260B(1)
1,2-Dichloroethane	0.005 mg/kg	U	—	U	—	107-06-2	5030B/8260B(1)
1,1-Dichloropropene	0.005 mg/kg	U	—	U	—	563-58-6	5030B/8260B(1)
Carbon Tetrachloride	0.005 mg/kg	U	—	U	—	56-23-5	5030B/8260B(1)
Benzene	0.005 mg/kg	U	—	U	—	71-43-2	5030B/8260B(1)
1,2-Dichloropropane	0.005 mg/kg	U	—	U	—	78-87-5	5030B/8260B(1)
Trichloroethene	0.005 mg/kg	U	—	U	—	79-01-6	5030B/8260B(1)
Dibromomethane	0.005 mg/kg	U	—	U	—	74-95-3	5030B/8260B(1)
Bromodichloromethane	0.005 mg/kg	U	—	U	—	75-27-4	5030B/8260B(1)
Toluene	0.005 mg/kg	U	—	U	—	108-88-3	5030B/8260B(1)
1,1,2-Trichloroethane	0.005 mg/kg	U	—	U	—	79-00-5	5030B/8260B(1)
1,3-Dichloropropane	0.005 mg/kg	U	—	U	—	142-28-9	5030B/8260B(1)
Dibromochloromethane	0.005 mg/kg	U	—	U	—	124-48-1	5030B/8260B(1)
Tetrachloroethene	0.005 mg/kg	U	—	U	—	127-18-4	5030B/8260B(1)

Certificate of Analysis

Prairie Analytical Systems, INCORPORATED

1265 Capital Airport Drive
Springfield, IL 62707-8490
Phone: 217-753-1148
Facsimile: 217-753-1152
E-Mail: IL100323@aol.com

Terracon Environmental, Inc.
870 40th Avenue
Bettendorf, IA 52722

Client Project: **42017093 - Coralville, Iowa**
PAS Project Code: TER-586

Sample Description:	B-1	B-2	B-3	---
PAS Sample Number:	01112914216	01112914217	01112914218	---
Matrix:	Solid	Solid	Solid	---
Date Sampled:	28-Nov-01	28-Nov-01	28-Nov-01	---
Date Received	29-Nov-01	29-Nov-01	29-Nov-01	---
Date Analyzed:	11-Dec-01	11-Dec-01	11-Dec-01	---
Date Reported:	12-Dec-01	12-Dec-01	12-Dec-01	---

Organic Compound(s) Analysis

Parameter(s)	RL / Unit	Result	Result	Result	Result	CAS #	Method
trans-1,3,-Dichloropropene	0.005 mg/kg	U	---	U	---	10061-02-6	5030B/8260B(1)
Acetone	0.050 mg/kg	U	---	U	---	67-64-1	5030B/8260B(1)
1,1,1,2-Tetrachloroethane	0.005 mg/kg	U	---	U	---	630-20-6	5030B/8260B(1)
Ethylbenzene	0.005 mg/kg	U	---	U	---	100-41-4	5030B/8260B(1)
Chlorobenzene	0.005 mg/kg	U	---	U	---	108-90-7	5030B/8260B(1)
Total Xylenes	0.005 mg/kg	U	---	U	---	***	5030B/8260B(1)
Bromoform	0.005 mg/kg	U	---	U	---	75-25-2	5030B/8260B(1)
Styrene	0.005 mg/kg	U	---	U	---	100-42-5	5030B/8260B(1)
1,1,2,2-Tetrachloroethane	0.005 mg/kg	U	---	U	---	79-34-5	5030B/8260B(1)
1,2,3-Trichloropropane	0.005 mg/kg	U	---	U	---	96-18-4	5030B/8260B(1)
Bromobenzene	0.005 mg/kg	U	---	U	---	108-86-1	5030B/8260B(1)
2-Chlorotoluene	0.005 mg/kg	U	---	U	---	95-49-8	5030B/8260B(1)
4-Chlorotoluene	0.005 mg/kg	U	---	U	---	106-43-4	5030B/8260B(1)
1,3-Dichlorobenzene	0.005 mg/kg	U	---	U	---	541-73-1	5030B/8260B(1)
1,4-Dichlorobenzene	0.005 mg/kg	U	---	U	---	106-46-7	5030B/8260B(1)
1,2-Dichlorobenzene	0.005 mg/kg	U	---	U	---	95-50-1	5030B/8260B(1)
1,2,4-Trichlorobenzene	0.005 mg/kg	U	---	U	---	120-82-1	5030B/8260B(1)
Hexachlorobutadiene	0.010 mg/kg	U	---	U	---	87-68-3	5030B/8260B(1)
1,2,3-Trichlorobenzene	0.005 mg/kg	U	---	U	---	87-61-6	5030B/8260B(1)
Acrolein	0.050 mg/kg	U	---	U	---	107-02-8	5030B/8260B(1)
Acrylonitrile	0.050 mg/kg	U	---	U	---	107-13-1	5030B/8260B(1)
2-Chloroethyl Vinyl Ether	0.005 mg/kg	U	---	U	---	110-75-8	5030B/8260B(1)
cis-1,3-Dichloropropene	0.005 mg/kg	U	---	U	---	10061-01-5	5030B/8260B(1)
2-Butanone (MEK)	0.010 mg/kg	U	---	U	---	78-93-3	5030B/8260B(1)
Carbon Disulfide	0.010 mg/kg	U	---	U	---	75-15-0	5030B/8260B(1)
2-Hexanone (MBK)	0.005 mg/kg	U	---	U	---	591-78-6	5030B/8260B(1)
4-Methyl-2-Pentanone (MIBK)	0.005 mg/kg	U	---	U	---	108-10-1	5030B/8260B(1)
Vinyl Acetate	0.010 mg/kg	U	---	U	---	108-05-4	5030B/8260B(1)

Certificate of Analysis

Prairie Analytical Systems, INCORPORATED

1265 Capital Airport Drive
Springfield, IL 62707-8490
Phone: 217-753-1148
Facsimile: 217-753-1152
E-Mail: IL100323@aol.com

Terracon Environmental, Inc.
870 40th Avenue
Bettendorf, IA 52722

Client Project: **42017093 - Coralville, Iowa**
PAS Project Code: TER-586

Sample Description:	B-1	B-2	B-3	—
PAS Sample Number:	01112914216	01112914217	01112914218	—
Matrix:	Solid	Solid	Solid	—
Date Sampled:	28-Nov-01	28-Nov-01	28-Nov-01	—
Date Received	29-Nov-01	29-Nov-01	29-Nov-01	—
Date Analyzed:	11-Dec-01	11-Dec-01	11-Dec-01	—
Date Reported:	12-Dec-01	12-Dec-01	12-Dec-01	—

Element(s) Analysis

Paramater(s)	RL / Unit	Result	Result	Result	Result	CAS #	Method
Chromium (^{53}Cr), Total	0.05 mg/kg	4.46	—	9.04	—	7440-47-3	200.8(3)
Arsenic (^{75}As), Total	0.05 mg/kg	2.28	—	10.2	—	7440-38-2	200.8(3)
Selenium (^{82}Se), Total	0.05 mg/kg	0.386	—	0.396	—	7782-49-2	200.8(3)
Silver (^{107}Ag), Total	0.05 mg/kg	U	—	U	—	7440-22-4	200.8(3)
Cadmium (^{111}Cd), Total	0.05 mg/kg	0.269	—	3.42	—	7440-43-9	200.8(3)
Barium (^{137}Ba), Total	0.05 mg/kg	55.6	—	201	—	7440-39-3	200.8(3)
Mercury (^{202}Hg), Total	0.004 mg/kg	U	—	U	—	7439-97-6	200.8(3)
Lead (^{208}Pb), Total	0.05 mg/kg	4.70	—	93.7	—	7439-92-1	200.8(3)

***o-Xylene-95-47-6; m-Xylene-108-38-3; p-Xylene-106-42-3

End of Report

(1) - Analysis performed using SW846 "Test Methods for Evaluating Solid Waste"
(6) - Analysis performed using "University Hygienic Laboratory - Method OA-1"
(7) - Analysis performed using "University Hygienic Laboratory - Method OA-2"

Chain of Custody Record

1265 Capital Airport Drive - Springfield, IL 62707-8490 - Phone (217) 753-1148 - Facsimile (217) 753-1152 - E-mail IL100323@aol.com

Prairie Analytical Systems, INCORPORATED

Client	Terracon	Client Project	42017023
Address	820 40th Ave.	Project Location	Coralville, Iowa
City, State Zip Code	Bettendorf, IA 52722	Sampler(s) / Phone No.	[signature] 355-0702
Phone / Facsimile No.	(563) 355-0702 / (563) 355-4789	Turnaround Time	Standard [X] Rush [ ] Date Required:
Contact Person	Gregg Olberts	P.O. # or Invoice To	

Sample Description (10 Characters Only)	Sampling Date	Sampling Time	[1] Container Size	[2] Container Type / No.	[3] M / [4] P Code	Analysis and / or Method Requested (If there are any questions, please call.)	PAS Sample Number Accepted / Rejected
B-1	11/28/01	10:12	4oz	G / 2	S / A	VOC's, OA-2, RCRA Metals	14215 A[ ]R[ ]
B-2	"	9:07	"	"	"	OA-1, OA-2	14217 A[ ]R[ ]
B-3	"	10:52	"	"	"	VOC's, OA-2, RCRA Metals	14218 A[ ]R[ ]
				/	/		A[ ]R[ ]
				/	/		A[ ]R[ ]
				/	/		A[ ]R[ ]
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				/	/		A[ ]R[ ]
				/	/		A[ ]R[ ]
				/	/		A[ ]R[ ]

[1] Size of Conatiner	40 mL	125 mL	250 mL	500 mL	1000 mL	O - Other (Specify)
[2] Type of Container	G - Glass (Clear)	AG - Glass (Amber)	P - HDPE	VC - Volatile Core	SC - Soil Core	O - Other (Specify)
[3] M = Matrix Code	A - Aqueous	DW - Drinking Water	NA - Non-aqueous Liquid	SE - Saline Water	S - Solids	O - Other (Specify)
[4] P = Preservative Code	A - None	B - HNO_3	C - H_2SO_4	D - NaOH	E - HCl	O - Other (Specify)

Relinquished By	Date	Time	Received By	Date	Time	Method of Shipment
[signature]	11/28/01	15:15	[signature]	11/29/01	10:20	FEDEX

Special Instructions:

PAS Project Code: 186

Copies: White - Client Yellow - PAS, Inc. Pink - Sampler