BRAUN[SM]
INTERTEC

Remedial Investigation

Boker's, Inc.
3104 Snelling Avenue
Minneapolis, Minnesota
MPCA Leaksite ID No. 8345

Prepared For

Boker's, Inc.

Project Number CMXX-95-0678
January 12, 1996

Braun Intertec Corporation

Engineers and Scientists Serving the Built and Natural Environments

BRAUN INTERTEC

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Engineers and Scientists Serving the Built and Natural Environments®

January 12, 1996

Project No. CMXX-95-0678

Mr. Mark Kersey
Boker's, Inc.
3104 Snelling Avenue South
Minneapolis, MN 55401

Dear Mr. Kersey:

Re: Remedial Investigation, Boker's Inc., 3104 Snelling Avenue, Minneapolis, Minnesota (MPCA Leaksite ID No. LEAK00008345).

In accordance with your written authorization, dated September 8, 1995, Braun Intertec Corporation (Braun Intertec) conducted a remedial investigation (RI) of the referenced property (***Site***). Information obtained during an environmental soils assessment (ESA) of the ***Site*** recently completed by Braun Intertec (Braun Intertec Project Number CMXX-95-0340) in association with a geotechnical evaluation (Braun Intertec Project Number BABX-95-268) indicated that a petroleum release, likely associated with the petroleum underground storage tanks formerly located at the ***Site,*** had occurred at the ***Site***.

Based on the results of the ESA, it appears that a petroleum release occurred at the ***Site*** in the vicinity of ST-2. The results of the chemical analyses for the ESA also indicated that relatively-low concentrations of non-petroleum-related solvent compounds and PCBs were also present with the petroleum constituents detected in the soil sample collected from ST-2. Metals were identified at concentrations above the average naturally occurring concentrations in soil (Bowen 1966). These results suggest that a used chlorinated solvent and/or used oil release may have occurred at this location.

Petroleum-like odors and organic vapors were also detected emanating from soil boring ST-3 during the field screening. However, BETX and TPH were not detected at concentrations greater than or equal to the laboratory method detection limit. In addition, as indicated in the Geotechnical Evaluation, petroleum-like odors were also noted during the advancement of soil borings ST-4 and ST-6.

The objectives of this RI were to evaluate the extent and magnitude of the soil and/or groundwater contamination associated with the identified petroleum release; identify the actual and potential impacts of the release; and obtain enough information so that a plan for corrective action could be designed, if the results of the RI indicated such a plan was warranted.

Please refer to the attached report for a descriptions of the scope of services, methods, results and conclusions of the RI.

We appreciate the opportunity to provide professional services to you for this project. If you have any questions or comments regarding the contents of this letter or the attached report, please call Tom Maertens at (612) 683-8777 or Jon Carlson at (612) 683-8760.

Sincerely,

Thomas J. Maertens
Project Manager/Environmental Scientist

for: Jon A. Carlson, CHMM
Supervisor, Environmental Site Assessments

Attachment: Remedial Investigation Report

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A. Introduction

A.1. Authorization

In accordance with the written authorization received from Mr. Mark Kersey of Boker's, Inc., dated September 8, 1995, Braun Intertec Corporation (Braun Intertec) conducted a remedial investigation (RI) at the Boker's, Inc. facility located at 3104 Snelling Avenue, Minneapolis, Minnesota (***Site***). A ***Site*** Location Map is contained in Appendix A.

A.2. Project Background

Braun Intertec recently conducted an environmental soils assessment (ESA) in association with a geotechnical evaluation of the ***Site*** for use in planning for a proposed addition to the existing ***Site*** building. Braun Intertec was requested by Boker's, Inc. to evaluate soils for potential petroleum contamination at the ***Site*** in two areas where petroleum underground storage tanks (USTs) were formerly located.

Based on the results of the ESA, it appears that a petroleum release occurred at the ***Site*** in the vicinity of ST-2. The results of the chemical analyses for the ESA also indicated that relatively-low concentrations of non-petroleum-related solvent compounds and PCBs were also present with the petroleum constituents detected in the soil sample collected from ST-2. Metals were identified at concentrations above the average naturally occurring concentrations in soil (Torrey). These results suggest that a used chlorinated solvent and/or used oil release may have occurred at this location.

On May 5, 1995, Braun Intertec notified Tillitt & Associates, Inc. of an apparent release at the ***Site***. Tillitt & Associates, Inc. authorized Braun Intertec to notify Boker's Inc. and the MPCA of the apparent release. Those parties were notified on May 5, 1995. The MPCA assigned Leaksite ID Number LEAK00008345 to the ***Site***.

For additional information regarding the results of the ESA, please refer to Braun Intertec report *Environmental Soils Assessment, Proposed Addition to the Boker's, Inc. Building, 3104 Snelling Avenue, Minneapolis, Minnesota*, (Braun Intertec Project Number CMXX-95-0340, report dated August 31, 1995). For additional information regarding the results of the geotechnical evaluation, please refer to Braun Intertec report *Geotechnical Evaluation Report, Proposed Addition to the Boker's, Inc. Building, 3104 Snelling Avenue, Minneapolis, Minnesota* (Braun Intertec Project Number BABX-95-268, report dated May 25, 1995).

A.3. Project Objectives

The objectives of this RI were the following:

- to evaluate the extent and magnitude of the soil and/or groundwater contamination associated with the identified petroleum release;
- identify the actual and potential impacts of the release; and
- obtain enough information so that a plan for corrective action could be designed, if the results of the RI indicated such a plan was warranted.

A.4. Scope of Services

The following work tasks were conducted at the ***Site*** as part of this assessment:

- evaluation of soil samples collected from soil borings ST-10, ST-11, ST-12, and ST-13 for indications of petroleum contamination, including screening of the soil samples in the field for the presence of organic vapors with a photoionization detector (PID);
- laboratory chemical analyses of soil samples for the presence of petroleum constituents;
- collection of a groundwater sample from soil boring ST-10* using a Hydropunch™ groundwater sampling tool;
- completion of a vapor-risk survey of the ***Site*** and adjacent areas;
- completion of a groundwater-receptor survey; and
- preparation of a report detailing the methods and results of our assessment.

*Note: **Collection of groundwater samples was also attempted at soil borings ST-11, ST-12 and ST-13 using the Hydropunch™; however, due to insufficient flow of groundwater into the Hydropunch™, groundwater samples could not be collected at those locations.**

B. Soils Evaluation

B.1. Methods

B.1.a. Soil Boring Locations. Four standard penetration test borings (labeled ST-10 through ST-13) were completed at the ***Site*** during the RI. Soil boring ST-10 was completed at the eastern end of the proposed addition in the assumed downgradient direction from the previously identified contamination. Soil borings ST-11 and ST-12 were completed in areas where petroleum-like odors were noted during the Geotechnical Evaluation (near soil borings ST-6 and ST-4 respectively). Soil boring ST-13 was completed in the central portion of the proposed addition (between soil boring ST-3 and ST-11). A Soil Boring Locations Map is contained in Appendix B.

B.1.b. Soil Boring Procedures. The penetration test borings were performed on September 26, 1995 with a truck-mounted core and auger drill unit. All down-hole equipment was steam-cleaned prior to its use at the ***Site***. Sampling for the borings was conducted in accordance with ASTM D 1586 "Penetration Test and Split-Barrel Sampling of Soils." Using this method, the bore hole was advanced with the hollow-stem auger to the desired test depth. Then a 140-pound hammer falling 30 inches drove a standard, 2-inch OD, split-barrel sampler a total penetration of 1 1/2 feet below the tip of the hollow-stem auger. The blows for the last foot of penetration were recorded and were used as an index of soil strength characteristics. Soil samples were collected from the drill cuttings and/or at 2 1/2-foot vertical intervals to the termination depths of the borings, which ranged from 10.0 feet below land surface (bls) to 22.5 feet bls.

B.1.c. Soil Classification. Soils encountered in the borings were visually and manually classified in the field by the crew chief in accordance with ASTM D 2487 "Standard Test Method for Classification of Soils for Engineering Purposes" and ASTM D 2488 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)." A copy of ASTM D 2487 is contained in Appendix C.

B.1.d. Soil Contamination Screening. The soil samples retrieved from the split-barrel sampler were examined visually by an environmental geologist for unusual staining, odors and other apparent signs of petroleum contamination. In addition, the soil samples from the soil borings were screened for the presence of organic vapors using a photoionization detector

(PID). The PID was equipped with a 10.6 electron-volt lamp and calibrated to a isobutylene standard. The PID was used to test fresh surfaces of soil retrieved in the split-barrel sampler and to perform a jar-headspace method of analyses.

The jar-headspace analytical procedure is used to field-screen organic vapor levels in soils. The procedure consists of half-filling a clean, 250-milliliter jar with a soil sample. The jar is quickly covered with a sheet of clean aluminum foil and tightly sealed with a threaded cap. Headspace development proceeds for at least 10 minutes. The jar is shaken vigorously for 15 seconds, both at the beginning and the end of the headspace development period. After headspace development, the jar lid is removed and the PID probe is inserted through the foil seal to one-half the headspace depth. The highest reading observed on the PID is then recorded.

B.1.e. Soil Sampling Procedures. Soil samples were collected from each of the soil borings for laboratory chemical analyses. The samples were placed in clean, laboratory-supplied jars and sealed with Teflon®-lined threaded caps. The jars were then labeled and transported to the Braun Intertec laboratory under refrigerated conditions using Braun Intertec chain-of-custody procedures.

Six soil samples were collected from the four soil borings completed at the ***Site***. The soil samples were analyzed at the Braun Intertec laboratory for the presence and concentrations of benzene, ethyl benzene, toluene and xylenes (BETX), gasoline range organics (GRO), diesel range organics (DRO), methyl tertiary butyl ether (MTBE), and total lead. All of the analyses were performed using United States Environmental Protection Agency or other recognized standard procedures. The laboratory data were reviewed prior to release and all quality control guidelines were met. Specific information regarding the standard operating procedures, detection limits and the quality control measures is available upon request.

B.2. Results

B.2.a. Soils Encountered. Soil boring logs with descriptions of the various soil strata encountered during the soil boring operations, penetration resistances and water level information are contained in Appendix D. The depths shown as changes between the soil types are approximate. The actual changes may be transitional and the depths of the transitions likely vary horizontally.

In general, the soils encountered at the ***Site*** consisted of fill material to depths ranging from 4 feet bls to 9 feet bls. The fill material consisted of organic clay, sandy clay, lean clay with sand and poorly graded sand with silt and crushed limestone aggregate. Groundwater was encountered in three of the nine borings completed during the Geotechnical Evaluation and ESA at depths ranging from 10.5 feet bls to 13.5 feet bls. During the RI, measurable groundwater was encountered in only soil boring ST-10 at a depth of approximately 14 feet bls. No groundwater was encountered in soil borings ST-11, ST-12 or ST-13. The groundwater observed may consist of perched pockets of water located in sand lenses above the less permeable soils. For additional information regarding the soils encountered at the ***Site***, please refer to the Geotechnical Evaluation report.

Yes

B.2.b. Soil Contamination Observations. No petroleum-like odors were noted in any of the soil samples collected for the RI. However, organic vapors were detected emanating from soil borings ST-11 and ST-12 when screened with the PID. The variable nature of the results may be due to prior excavation activities conducted at the ***Site*** that may have distributed the contaminated soils to different areas. Organic Vapor Field Data Sheets are contained in Appendix E, and a summary of the headspace PID readings is contained in Table 1 below.

Table 1
Organic Vapor Data
(headspace PID readings in ppm)

Sample Depth (feet)	ST-10	ST-11	ST-12	ST-13
2.5	ND	113	ND	ND
5.0	ND	ND	ND	ND
7.5	ND	ND	ND	ND
10.0	ND	ND	379	ND
12.5	ND	NS	NS	NS
15.0	NS	NS	4.1	NS
17.5	NS	NS	NS	NS
20.0	NS	NS	ND	NS
22.5	NS	NS	ND	NS

Chem data + H.C.

NS = no sample collected from that depth
ND = no organic vapors detected

sampled but one.

B.2.c. Laboratory Chemical Analyses. Laboratory chemical analyses of the soil samples detected the presence of petroleum constituents in the soil samples collected from ST-11 at 2.5 feet bls, ST-12 at 10 feet bls and ST-13 at 10.0-feet bls. Chemical analyses of the soil samples collected from ST-10 did not detect the presence of GRO, DRO, BETX, MTBE or total lead at concentrations greater than or equal to the laboratory detection limits. Lead was detected in all of the soil samples except for ST-10; however, the total lead concentrations detected are typical of the naturally occurring lead concentrations found in soils in this region (Torrey).

A summary of the laboratory chemical analyses results is provided below in Table 2. The complete laboratory analyses results are contained in Appendix F.

Table 2
Summary of Soil Chemical Analysis Results
(all results in mg/kg)

Compound	ST-10	ST-11		ST-12		ST-13
	12.5'	2.5'	10.0'	10.0'	22.5'	10.0'
Benzene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethyl Benzene	<0.05	0.19	<0.05	<0.05	<0.05	<0.05
MTBE	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Toluene	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenes	<0.5	0.09	<0.05	0.05	<0.05	<0.05
Diesel Range Organics	<10	340	<10	1200	<10	16
Gasoline Range Organics	<10	<10	<10	<10	<10	<10
Lead, Total	<2.5	15	11	3.7	7.5	4.2

mg/kg = parts per million

Background

C. Groundwater Evaluation

C.1. Methods

C.1.a. Groundwater Sampling Procedures. A groundwater sample was collected for laboratory chemical analyses from soil boring ST-10 using a Hydropunch™ groundwater sampling instrument (Hydropunch™). Collection of groundwater samples was also attempted at soil borings ST-11, ST-12 and ST-13 using the Hydropunch™; however, due to insufficient flow of groundwater into the Hydropunch™, groundwater samples could not be collected at those locations.

The Hydropunch™ consists of a 4 1/2-foot, 0.01-inch slotted PVC screen which is inserted inside a stainless-steel drive casing. The drive casing is lowered through the hollow-stem auger and advanced approximately 3 feet below the measurable groundwater surface. The drive casing is then retracted approximately 4 feet, exposing the PVC well screen, which remains in place and intersects the groundwater surface. The groundwater sample was collected using dedicated Teflon® tubing with a stainless-steel check valve. The sample was placed in clean, laboratory supplied jars and sealed with Teflon®-lined threaded caps. The jars were then labeled and transported to our laboratory under refrigerated conditions using Braun Intertec chain-of-custody procedures.

C.1.b. Groundwater Chemical Analyses. The groundwater sample was analyzed at the Braun Intertec laboratory for the presence and concentrations of VOCs, DRO and dissolved lead.

C.2. Groundwater Evaluation Results

C.2.a. Groundwater Chemical Analyses. Chemical analyses of the groundwater sample collected from the Hydropunch™ at ST-10 detected 3 of the 70 VOC parameters included in the Minnesota Department of Health (MDH) 465E list of analytical parameters. In addition, DRO was detected at concentrations greater than or equal to the method detection limits. A summary of the laboratory chemical analyses results and applicable MDH Health Risk Limits (HRLs) or Recommended Allowable Limits (RALs) are provided below in Table 3. The concentration of 1,1,2-Trichloroethylene detected in the groundwater sample was above the established HRL. The complete laboratory analyses results are contained in Appendix F.

Where are the PCBs? IN THE SOIL.

Table 3
Summary of Groundwater Chemical Analysis Results
(all results in µg/l)

Compound	Concentration	HRLs	RALs
cis-1,2-Dichloroethylene	17	70	*
trans-1,2-Dichloroethylene	0.4	100	*
1,1,2-Trichloroethylene	92	30	*
DRO	0.9	*	*

µg/l = micrograms per liter (approximately parts per billion)
* = no HRL or RAL has been established for this compound

D. Vapor-Risk Survey

Braun Intertec performed a vapor-risk survey in the vicinity of the ***Site*** on October 31, 1995 to evaluate whether organic vapors from the identified subsurface petroleum contamination were present in nearby underground utilities or structures. The basement of the Boker's building was surveyed using an explosimeter and a PID, which was equipped with an 11.7 electron-volt lamp and calibrated to an isobutylene standard. No organic vapors were detected above 4 parts per million in the areas tested. The relatively low organic vapor readings were likely due to moisture from the water used in the facility operations. No lower explosive limit (LEL) readings above zero percent were detected in any of the tested areas in the basement. There were no indications of seeps or odors detected.

Why so high? It was 10.6 last time,

No sewer manholes or utility trenches were observed in the vicinity of the identified subsurface petroleum contamination. The closest building to the ***Site*** was the Aspen Medical building about 15 feet north of the ***Site***.

Based on the available information, it is our professional opinion that there are no vapor impacts or risks posed by the apparent petroleum release at the ***Site***.

E. Groundwater Receptor Survey

The Minnesota Geological Survey (MGS) County Well Index (CWI) water well database was searched for wells located within a 1-mile radius of the ***Site***. Seventeen water wells were identified within 1 mile of the ***Site***. The information obtained from the MGS well records for wells located within one-mile of the ***Site*** is attached in Appendix G and graphically presented in the ***Site*** and Well Locations Map attached in Appendix A. As indicated in the ***Site*** and Well Locations Map there are no known wells in the assumed downgradient groundwater flow direction (to the east) within 1/2 mile of the ***Site***.

F. Conclusions

F.1. Soil Contamination

Laboratory chemical analyses detected the presence of petroleum constituents in the soil samples collected from ST-11 at 2.5-feet bls, ST-12 at 10-feet bls and ST-13 at 10.0-feet bls. Organic vapors were detected emanating from the soil samples collected from ST-11 and ST-13. Based on our conversations with Mr. Tillitt of Tillitt and Associates, we understand that the soils in the area of this RI were intermixed during the UST removal operations and demolition of a building formerly located in that portion of the ***Site***. This information may explain why relatively small discontinuous areas of petroleum contaminated soils were identified during the RI.

Based on the results of the environmental soils assessment and this RI it appears that the soil contaminations is limited in vertical and horizontal extent. Based on the available information, it is our professional opinion that there are no vapor impacts or risks posed by the apparent petroleum release at the ***Site***.

F.2. Groundwater Contamination

Chemical analyses of the groundwater sample collected from the Hydropunch™ at ST-10 detected 3 VOC compounds and DRO at concentrations greater than the method detection limits. The concentration of 1,1,2-Trichloroethylene detected in the groundwater sample collected from ST-10 was greater that the HRL established for that compound. The results of this RI are insufficient to determine a source of the identified groundwater contamination.

Based on the information reviewed in the groundwater receptor survey it does not appear that there are groundwater wells in the assumed downgradient direction (to the east) within 1/2 mile of the ***Site***. A Remedial Investigation Report worksheet in attached in Appendix H.

G. Recommendations

G.1. Soil Contamination

We understand that the soils in the area of the proposed ***Site*** building addition will need to be excavated and recompacted in order to be usable as structural fill for the proposed building. We recommend that the excavated soils be screened for discoloration, odor and the presence of organic vapors during the excavation process. We also recommend that petroleum contaminated soils excavated for the proposed addition be transported to an off-***Site*** facility for thermal treatment.

Why if MPCA pays

Braun Intertec recommends that after the construction activities and associated excavation activities are completed and documented, the MPCA consider the ***Site*** for closure with regard to the identified petroleum contamination.

Should be now

G.2. Groundwater Contamination

We recommend that a Phase I ESA be conducted to evaluate the ***Site*** and surrounding area for the presence of potential sources of the groundwater contamination identified by this RI. We recommend that the results of the proposed Phase I ESA, our previously conducted ESA and this RI be submitted to the MPCA VIC Program for review and comment with respect to the presence of the chlorinated solvents detected in the groundwater. Written assurances regarding the environmental conditions of the ***Site*** may be available to Boker's Inc. from the MPCA VIC Program as provided by Minnesota state statutes.

No VIC if anything

H. Assessment Limitations

The analyses and conclusions submitted in this report are based on our field observations and the results of laboratory chemical analysis of the soil samples and groundwater sample collected from the soil borings completed for this project. The ***Site***-specific groundwater flow direction was not determined, as that service was beyond the Scope of Services for this project.

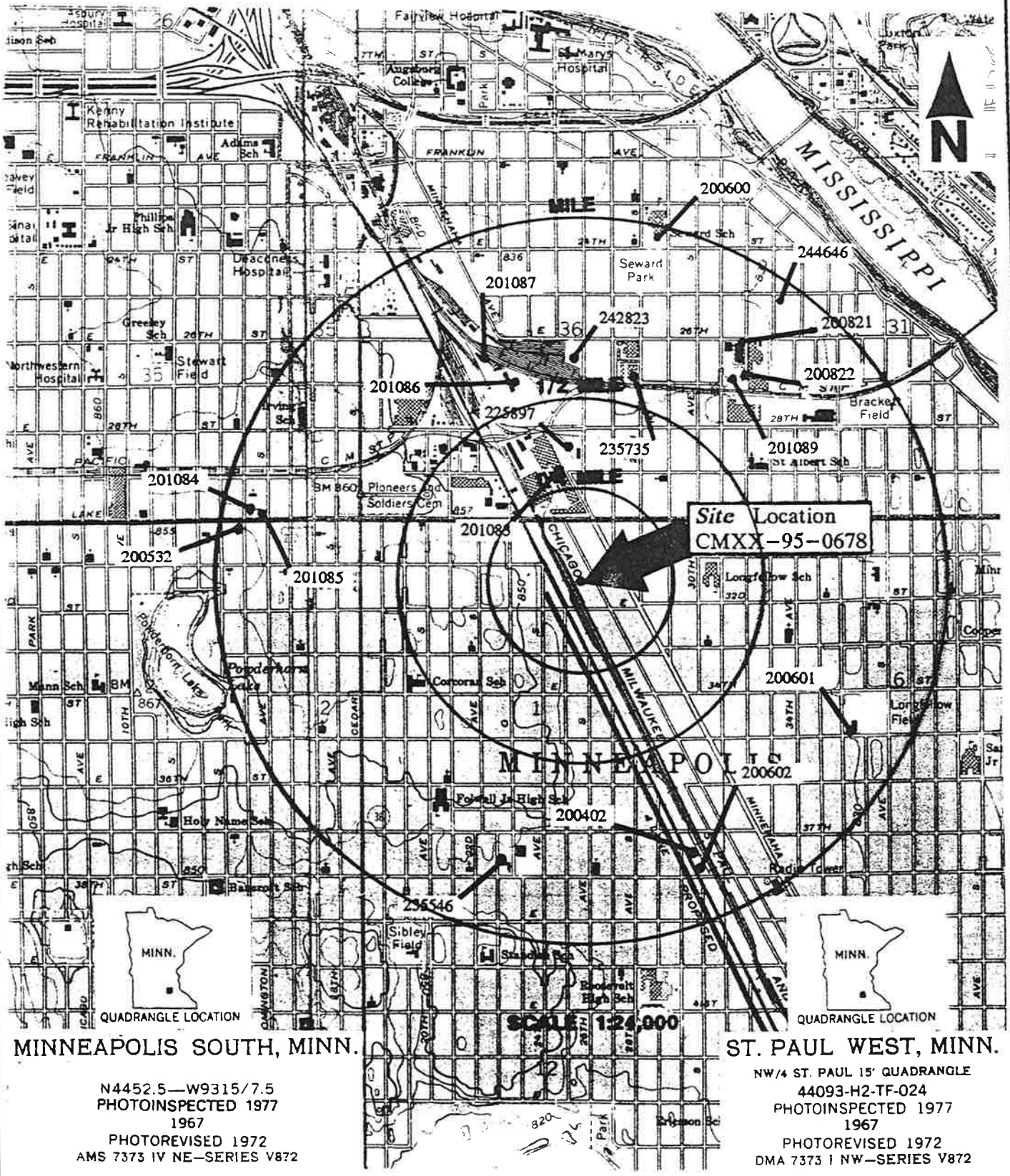
In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession practicing in the same location. No other warranty is made or intended.

I. References

Bowen, 1966. Design of Land Treatment Systems.

Appendix A

Site and Well Locations Map



MINNEAPOLIS SOUTH, MINN.

N4452.5—W9315/7.5
PHOTOINSPECTED 1977
1967
PHOTOREVISED 1972
AMS 7373 IV NE—SERIES V872

ST. PAUL WEST, MINN.

NW/4 ST. PAUL 15' QUADRANGLE
44093-H2-TF-024
PHOTOINSPECTED 1977
1967
PHOTOREVISED 1972
DMA 7373 I NW—SERIES V872

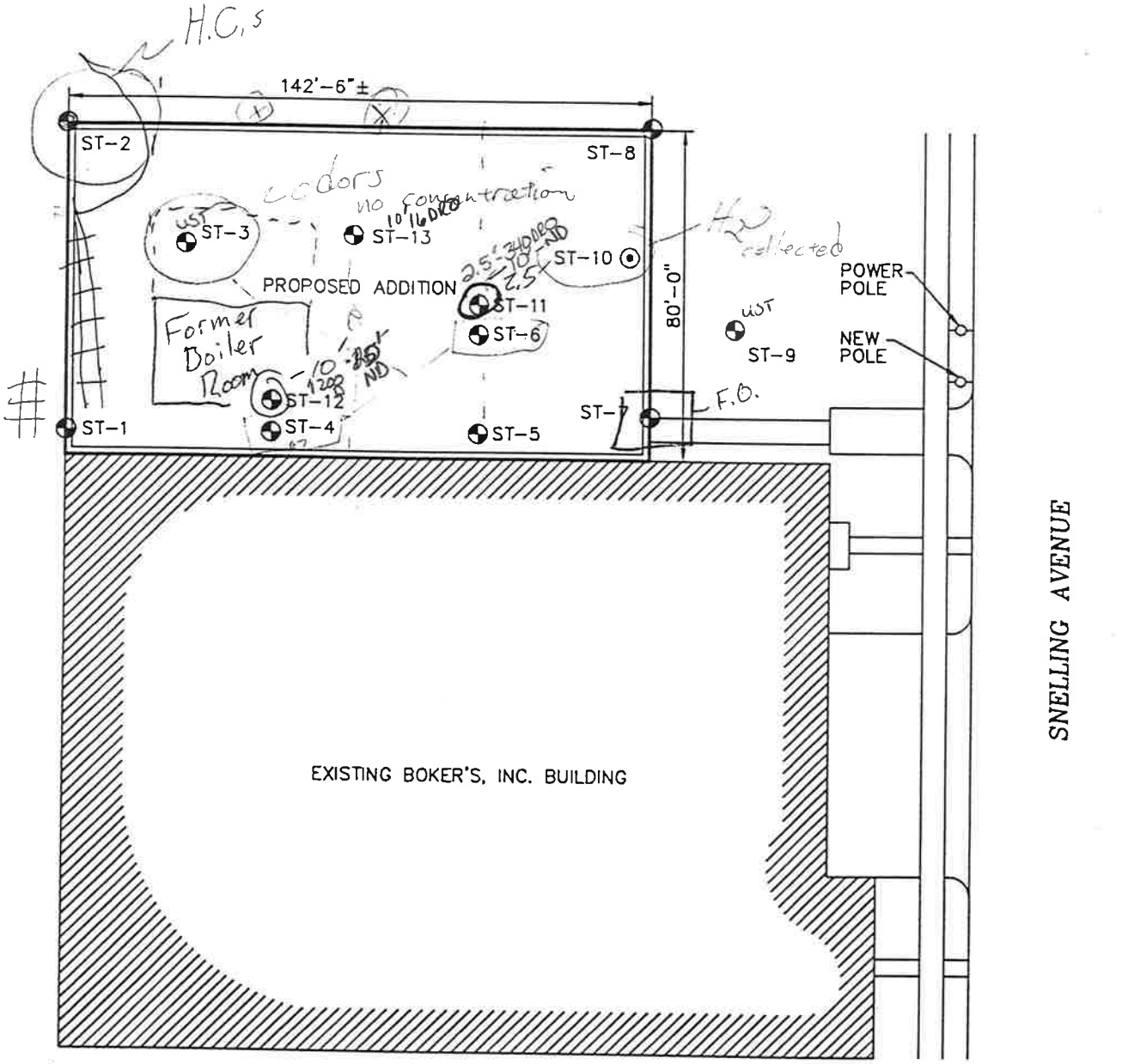
BRAUN INTERTEC

***Site* Location & Well Location Map**
Environmental Soils Assessment
Proposed Addition to the Boker's, Inc. Building
3104 Snelling Avenue
Minneapolis, MN

INT	DATE	SHEET
DRAWN BY: KLB	11-17-95	
APP'D BY: TJM		OF
JOB NO. CMXX-95-0678		
DWG. NO. 1	FIGURE NO.	
SCALE 1:24,000	1	

Appendix B

Soil Boring Locations Map



LEGEND

- SOIL BORING LOCATION
- HYDROPUNCH WATER SAMPLE/SOIL BORING LOCATION

N

20' 0 40'

SCALE 1"=40'

BRAUN INTERTEC

SOIL BORING LOCATION SKETCH
REMEDIAL INVESTIGATION
PROPOSED BOKER'S ADDITION – 3104 SNELLING AVENUE
MINNEAPOLIS, MINNESOTA 55406

INT	REVISION	SHEET
DRAWN BY: JAG	5-9-95	1
APP'D BY: TJM	10-31-95	OF
JOB No. CMXX-95-0678		1
DWG. No. AB5268		FIGURE NO.
SCALE 1"=40'		1