

# **Environmental Assessment Report**

Basset Creek Valley Area  
Minneapolis, Minnesota

*Prepared for*

**Minneapolis Community Development Agency**

**and**

**The City of Minneapolis**

Project No. CMXX-01-0004  
April 6, 2001

Braun Intertec Corporation

**BRAUN<sup>SM</sup>**  
**INTERTEC**

**Braun Intertec Corporation**  
6875 Washington Avenue South  
Minneapolis, Minnesota 55439-1500  
952-941-5600 Fax: 833-4701

*Engineers and Scientists Serving  
the Built and Natural Environments®*

April 6, 2001

Project No. CMXX-01-0004

Mr. Larry Heinz  
Coordinator, Engineering  
Minneapolis Community Development Agency  
Crown Roller Mill, Suite 200  
105 Fifth Avenue South  
Minneapolis, MN 55401-2534

Dear Mr. Heinz:

Re: Environmental Assessment Report, Northwest Portion of the Bassett Creek Valley Area,  
Minneapolis, Minnesota.

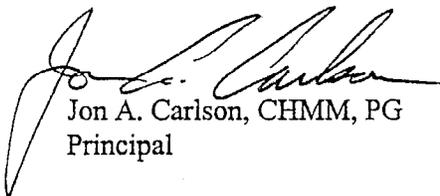
In accordance with your written authorization (Contract #14564, Release #6), Braun Intertec Corporation (Braun Intertec) conducted a geotechnical and environmental assessment of the referenced site (site). The objective of the assessment was to evaluate the general geotechnical and environmental conditions at the site with respect to possible redevelopment of the site for residential purposes. For a complete discussion of our environmental evaluation, please refer to the attached Environmental Assessment Report. For a complete discussion of the geotechnical evaluation, please refer to the Preliminary Geotechnical Evaluation Report.

We appreciate the opportunity to provide our professional services to you for this project. If you have any questions or comments regarding the attached environmental assessment report, or the project in general, please call Mike Bratrud at (952) 833-4786 or Jon A. Carlson at (952) 833-4750.

Sincerely,



Michael L. Bratrud, PG  
Senior Scientist



Jon A. Carlson, CHMM, PG  
Principal

Attachment:  
Environmental Assessment Report

c: Mr. Tom Leighton, City of Minneapolis  
Mr. Darrell Washington, MCDA

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## **A. Introduction**

### **A.1. Authorization**

In accordance with the written authorization received from Larry Heinz of the Minneapolis Community Development Agency (MCDA) (Contract No. 14564, Release No. 6), Braun Intertec Corporation (Braun Intertec) conducted an environmental assessment of the referenced site (site). This Environmental Assessment was prepared for the MCDA and City of Minneapolis (Users). A Site Location Map is attached as Figure 1.

### **A.2. Site Description**

The site is an irregular-shaped area that is roughly bordered by Basset Creek on the south, Cedar Lake Road on the west, 2nd Avenue on the north and Irving Avenue, Humboldt Avenue and Girard Avenue on the east. The site boundaries are illustrated on Figure 1.

The majority of the site consists of commercial and light industrial development with some residential properties on the west and northern portions of the site.

### **A.3. Project Background**

In 1998, Braun Intertec conducted a Phase I environmental site assessment (Phase I ESA) of the site and surrounding Basset Creek Valley area. The results of the Phase I ESA indicated a number of documented and potentially contaminated areas throughout the Basset Creek Valley Area, including several within the borders of the site.

The Phase I ESA indicated that the site was developed for residential and commercial use prior to 1912. The Phase I ESA revealed the following recognized environmental conditions in connection with site and areas adjacent to the site:

- Available historical-use information indicated that railroad tracks and warehouse buildings historically occupied portions of the site where potentially hazardous chemical storage and use activities may have occurred. It is possible that these prior uses may have adversely impacted soil and groundwater at the site.
- Leef Brothers had an unknown quantity of stoddard solvent released at the facility on October 12, 1989 and approximately 40 gallons of petroleum were released from the facility on October 18, 1994. MPCA records indicate the followings USTs were installed at the facility in 1974: (1) 12,000-gallon solvent; (1) 2,500-gallon solvent; (4) 900-gallon solvent

- The former Chemical Marketing facility (180 Humboldt), located adjacent to and east of the site, was identified as a RCRIS small-quantity generator of hazardous waste. The facility was also reported to have numerous ASTs that contained miscellaneous solvents. The facility was identified on the CERCLIS-NFRAP database, but was not on the NPL. Based on previous investigations, soil and groundwater in the vicinity of former ASTs are impacted by volatile organic compounds.
- The Warden Oil facility (187 Humboldt Avenue) was listed as a RCRIS large-quantity generator of hazardous waste and a LUST facility. It is reported that there were at least 45 storage tanks (ASTs/USTs) located at the facility. Based on previous investigations, soil and groundwater at the site are impacted by petroleum related compounds and other volatile organic compounds.
- Wunder Klein Donahue (179 Irving Avenue) was identified as a former LUST facility and was also listed as a site enrolled in the MPCA VIC program. Based on previous investigations, soil and groundwater at the site are impacted by petroleum related compounds and other volatile organic compounds.
- It was reported that an unknown amount of fuel oil was released from a UST at the West Weld Supply (1307 2nd Avenue) facility.
- Scrap Metal Processors (150 Girard) was listed as RCRIS small-quantity generator of hazardous waste. Also various spills and releases of petroleum products have been identified at this facility.
- The Bassett Creek/Irving Avenue Dump, located adjacent to and south of the site was listed as a CERCLIS-NFRAP facility. The site began operating as an open dump in the 1930s, receiving unknown quantities of sludges, oily waste, various organic and inorganic compounds and heavy metals.
- The intersection of Currie and Girard Avenues was identified as a former spill site. An unknown quantity of contaminated soil was reported in 1994.
- Pioneer Paper (155 Irving) had two USTs installed in 1956. The USTs are reported to have been removed, but no additional information is available.
- Up to eight former oil companies have occupied the areas southeast of the site.
- The current Precision Plating located at 230 Girard Avenue was identified as a RCRIS-generator of hazardous waste.

#### **A.4. Project Objective**

The objective of this assessment was to evaluate the general environmental conditions at the site with respect to possible redevelopment of the site for residential purposes.

#### **A.5. Scope of Services**

##### **A.5.1. Soils Assessment**

A soil-boring program was performed to obtain soil samples for visual inspection, on-site monitoring, geotechnical analyses, and chemical analyses. Based on the site history and geologic information available, 22 soil borings were completed at the site. The soil borings were completed within the available right-of-way and within the parcel occupied by Pioneer Paper for which an access agreement was arranged by the City of Minneapolis and the MCDA. The soil boring locations were determined by Braun Intertec based on the locations of the potential sources of contamination, the accessibility of drilling equipment, the locations of utilities and other structures, and the general coverage needed for the geotechnical portion of the evaluation.

The soil borings were advanced to depths ranging from 50 to 135 feet below land surface (bls). A truck-mounted core and auger drill unit was used to complete the soil borings. The drill rig and all down-hole equipment was steam cleaned prior to its use at the site. Soil samples were collected according to ASTM D 1586 "Penetration Test and Split-Barrel Sampling of Soils." The split-barrel sampler was cleaned with soap and water prior to collection of each sample.

A Braun Intertec environmental technician was at the site during the soil boring activities to monitor the subsurface materials encountered at each soil boring location. Soil discoloration and odors were documented if detected. In addition, soil samples were screened for the presence of organic vapors with a photoionization detector (PID) using both direct readings from each split-barrel sample and a bag-headspace method of analysis recommended by the MPCA.

Six soil samples were collected from the soil borings for chemical analyses. The soil samples were collected from zones of elevated PID readings, soil staining and/or the sampling depth most likely to contain contamination based on the site land-use history.

The samples were transported under refrigerated conditions and accompanied by Braun Intertec chain-of-custody records. All analyses were performed within U.S. Environmental Protection Agency (EPA) holding times.

### **A.5.2. Groundwater Assessment**

Braun Intertec also collected groundwater samples using temporary groundwater monitoring wells installed within 13 of the 22 borings conducted at the site. The wells were installed in locations to evaluate the general groundwater quality at the site, and in the assumed downgradient direction from possible sources of soil and groundwater contamination within accessible portions of the site.

Prior to the collection of the groundwater samples, the groundwater entering into the temporary monitoring wells was stabilized according to "Procedures for Groundwater Monitoring" (MPCA Guidelines, December 1986). After the groundwater samples were collected, the boreholes were properly abandoned in accordance with Minnesota Department of Health guidelines. All groundwater sampling equipment was cleaned with soap and water prior to the collection of each sample.

All samples were transported under refrigerated conditions and accompanied by Braun Intertec chain-of-custody records. All analyses were performed within U.S. Environmental Protection Agency (EPA) holding times.

The field work relating to the Environmental Assessment was conducted from January 22 to February 19, 2001. Descriptions of our field and laboratory methods are contained in Appendix A.

## **B. Environmental Results**

### **B.1. Soils Encountered**

As part of this environmental assessment and the geotechnical evaluation, 22 standard penetration test borings (designated ST-01-1 through ST-01-22) were completed at the site by Braun Intertec. All of the standard penetration test borings were completed with a truck-mounted, core-and-auger drill rig. The approximate locations of the soil borings completed as part of previous projects and the locations of the 22 new soil borings are depicted on the boring location map included as Figure 2.

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 B. 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.

Geologic origins presented for each stratum on the Log of Boring sheets are based on the soil types, blows per foot, and available common knowledge of the depositional history of the site. Because of the complex glacial and post-glacial depositional environments, geologic origins can be difficult to ascertain. A detailed investigation of the geologic history of the site was not performed.

Throughout the majority of the site there is a cap of fill. The fill consists primarily of silty-sand or clays mixed with some debris consisting of concrete, bituminous, ashes, cinders, and glass. The fill ranges from 1 to 19 feet across the site with an average of 4 to 7 feet.

Organic swamp deposits underlie the fill in the southeastern portion of the site. The organic swamp deposits consist of peat and organic clays intermixed with some shells. The organic soils extended to depths of 9 to 64 feet.

Below the fill and organic soils, the predominant soil across the site is lacustrine and alluvial clay. The clays consist primarily of fat clay with occasional layers of lean clay and silt. The clays extend to depths ranging from 4 feet to as much as 100 feet.

Below the clays, the majority of the borings encountered alluvial silts and sands. The sands were encountered near the surface in the northwest portions of the site and encountered at depths as great as 100 feet bls in the southeastern portion of the site.

Below the lacustrine clays and the alluvial soils, the majority of the borings encountered glacially deposited soils (till). The till consisted of sandy lean clay, clayey-sand, silty-sand, or sand.

Bedrock was not encountered in any of the borings during drilling. Bedrock maps of the area indicate that an old glacial river channel flowed through this site with bedrock ranging from 230 to 280 feet below existing grade. The uppermost bedrock is anticipated to be the Prairie du Chien limestone that ranges from 80 to over 100 feet thick.

## **B.2. Soil Contamination Observations**

The soil samples retrieved from the soil borings were examined by a Braun Intertec environmental technician for staining and other apparent signs of contamination. In addition, the soil samples were screened for the presence of organic vapors using a PID. The PID was equipped with a 10.6 electron-volt lamp. The PID was calibrated to an isobutylene standard. The PID was used to test fresh surfaces of soil retrieved in the split-barrel sampler and to perform headspace analyses, as recommended by the MPCA.

Low concentrations of organic vapors were detected in the soil samples collected from the following borings: ST-01-02, -06, -08, -12, and -22. No visual or olfactory indications of contamination were observed in these soil samples. As a result, the organic vapor concentrations detected may be due to moisture in the headspace samples rather than organic vapors from possible contaminants.

High concentrations of organic vapors were detected near the surface in the soil samples collected from ST-01-03, -14, -20, and -21. High concentrations of organic vapors were detected in soil samples collected below the water table from ST-01-04, -14, -15, and -20. The complete PID screening results are summarized in Table 1.

### **B.3. Laboratory Chemical Analyses of Soil Samples**

Soil samples were collected from ST-01, -03, -15, -19, and -20 for analyses at the Braun Intertec laboratory. The samples were analyzed for the presence and concentrations of volatile organic compounds (VOCs), diesel range organics (DRO), and gasoline-range organics (GRO). A soil sample collected from ST-01-14 was analyzed for the presence and concentrations of benzene, toluene, ethylbenzene, xylenes (BTEX), GRO, and DRO. A soil sample collected from ST-01-11 was analyzed for the presence and concentration of the eight RCRA metals. The chemical parameters were selected based on the potential environmental conditions and field observations. Specifically, soil samples were analyzed for VOCs, GRO and DRO because land-use history in the areas where these sample were collected indicate use and/or storage of petroleum products or solvents. The soil sample collected from ST-01-11 was analyzed for RCRA metals because the fill material in the vicinity of the Basset Creek near the impound lot is reported to contain high lead concentrations and potentially other metals.

A summary of the soil analytical results is included on Figure 3 and in Table 2. Copies of the complete laboratory analytical reports received from the Braun Intertec laboratory are attached in Appendix C.

As indicated by the analytical results, relatively low concentrations of diesel range organics (DRO) were identified in the soil samples collected from ST-01-03, -14, -19, and -20. Relatively low gasoline-range organic (GRO) concentrations also were identified in soil samples collected from ST-01-03, -15, and -20. Cis-1,2-dichloroethylene and trichloroethylene were detected in soil sample ST-01-15 @ 45 feet at concentrations of 1.1 and 120 milligrams per kilogram (mg/kg), respectively. Naphthalene; toluene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; and xylenes were detected in the soil sample ST-01-20 @ 0.5 feet, at concentrations of 0.14, 0.08, 0.23, 0.07, and 0.31 mg/kg, respectively. Petroleum-related compounds n-butylbenzene, sec-butylbenzene, isopropylbenzene, naphthalene, and n-propylbenzene were detected in the soil sample ST-01-03 @ 5.0 feet at concentrations of 0.51, 0.54, 0.48, 0.58, and 0.75 mg/kg, respectively. With the exception of the

trichloroethylene and arsenic concentrations identified in soil samples collected from ST-01-15 and ST-01-19, respectively, none of these parameters were detected at concentrations that exceed the MPCA unrestricted land-use Soil Reference Values (SRVs). Although there are no SRVs established for GRO and DRO, these compounds were detected at concentrations above the MPCA's typical criteria for unrestricted land-use, based on our experience with similar sites.

#### **B.4. Laboratory Chemical Analysis of Groundwater Samples**

Bore-hole groundwater samples were collected at the site from 13 soil borings including ST-01-03, -04, -05, -10, -11, -12, -14, -15, -16, -19, -20, -21, and -22. The groundwater samples were analyzed for the presence and concentrations of VOCs, GRO, and DRO. The groundwater samples collected from ST-01-11 and ST-01-15 also were analyzed for the 8 RCRA metals.

The parameters detected above the laboratory method detection limits in at least one sample were 1,1-dichloroethane; 1,1-dichloroethylene; cis-1,2-dichloroethylene; trans-1,2-dichloroethylene; isopropyltoluene; naphthalene; toluene; xylenes; vinyl chloride; GRO; DRO; barium; chromium; lead; and mercury. The parameters 1,1-dichloroethylene; cis-1,2-dichloroethylene; trans-1,2-dichloroethylene; and vinyl chloride were detected in the sample from ST-01-04 at concentrations of 27; 120,000; 260; and 61 micrograms per liter ( $\mu\text{g/L}$ ), respectively, all of which were all above the Minnesota Department of Health (MDH) Health Risk Limits (HRLs). The sample collected from ST-01-15 had a concentration of cis-1,2-dichloroethylene at 70  $\mu\text{g/L}$ , which is equal to the HRL. None of the other parameters detected exceeded the HRLs.

The groundwater chemical analyses results are summarized on Figure 4 and in Table 3. Copies of the complete laboratory analytical reports received from the Braun Intertec laboratory are attached in Appendix C.

### **C. Conclusions**

Organic vapors were detected near the surface only in the soil samples collected from ST-01-03, -14, -20, and -21. High concentrations of organic vapors were detected only in the soil samples collected below the water table from ST-01-04, -14, -15, and -20. However, it should be noted that the soil borings were completed within the available right-of-way and within the parcel occupied by Pioneer Paper. Therefore, we were not able to assess possible source areas of contamination within privately owned parcels other than Pioneer Paper.

The soil analytical results indicate relatively low concentrations of petroleum-related contamination in the soil samples collected from ST-01-03, -14, -15, -19, and -20. Chlorinated compounds were detected in the soil sample collected from ST-01-15. With the exception of trichloroethylene and arsenic concentrations identified in soil samples collected from ST-01-15 and ST-01-19, respectively, no other parameters exceeded the MPCA unrestricted land-use SRVs.

Groundwater impacts were observed across the site. Petroleum hydrocarbons were detected in the samples collected from ST-01-04, -11, -12, -14, -15, -21, and -22; however, none of those parameters exceeded their respective HRLs. The chlorinated compounds 1,1-dichloroethylene; cis-1,2-dichloroethylene; trans-1,2-dichloroethylene; and vinyl chloride were detected in the groundwater sample collected from ST-01-04 at concentrations that exceed the applicable HRLs.

Based on the locations of the identified soil and groundwater contamination, the land-use history of the site and the estimated groundwater flow direction (southeastward), potential sources of the contamination include:

- Leef Brothers (borings ST-01-03, ST-01-12 and ST-01-14).
- Warden Oil (borings ST-01-11 and ST-01-14).
- Precision Plating, West Welding Supply, Architectural Sheet Metal, Scrap Metal Processors and Import Auto Parts (borings ST-01-04 and ST-01-15).
- Pioneer Paper (ST-01-11 and ST-01-21).
- Pioneer Paper and Triad Automation (borings ST-01-19, ST-01-20 and ST-01-22).

The results of this assessment indicate releases of regulated substances have occurred at the site, which threaten the waters of the state. According to Minnesota Statute §115.061, the property owners and/or responsible parties associated with these releases may have a duty to notify the MPCA via the Minnesota Department of Public Safety, Division of Emergency Management (DEM) Duty Officer.

#### **D. Discussion**

Environmental conditions that may affect redevelopment of the site include the presence of known soil and groundwater contamination in the areas described above. In addition, although relatively little contamination was detected around Leef Brothers and Warden Oil as part of this assessment, these sites are likely to have a negative impact on potential redevelopment of the site, especially for residential purposes. Additional assessment of the extent and magnitude of the identified contamination and the potential contaminant source areas would be required to more fully understand the redevelopment challenges of this site.

Although not insurmountable, environmental issues including petroleum-contaminated soil detected on the Pioneer Paper property, and the petroleum and chlorinated compounds detected in soil and groundwater in the eastern portion of the site would require special handling and disposal procedures. If the site were to be redeveloped for commercial or light industrial purposes, MPCA Commercial/Industrial SRVs would apply to soil remediation efforts. Contaminated soils excavated during construction, would either have to be reused on the site (with MPCA approval), treated and disposed of off site, or directly disposed of off site at an appropriately permitted facility. Earthwork at the site would require the use of 40-hour HAZWOPER-trained workers. If the site were to be redeveloped for residential purposes, the same conditions would apply except that MPCA Residential SRVs would apply to soil efforts. The MPCA likely would not allow residential development with hazardous concentrations of any contaminants in soil. Where impacted soils are left in-place or reused on site, the MPCA likely would require a restrictive covenant be placed on the deed, which will concern future actions to be taken if soils are disturbed during construction or other intrusive activities.

Although additional assessment of the source areas and possible source-area remediation may be required, the identified groundwater contamination might not pose a significant obstacle to redevelopment considering it is unlikely the impacted groundwater would be utilized as part of the redevelopment or encountered during the redevelopment activities.

It is likely that a portion of the site resides within the 100-year floodplain of Bassett Creek, which may pose limitations on development. City of Minneapolis floodplain regulations may require that development not decrease the 100-year flood storage.

## **E. Recommendations**

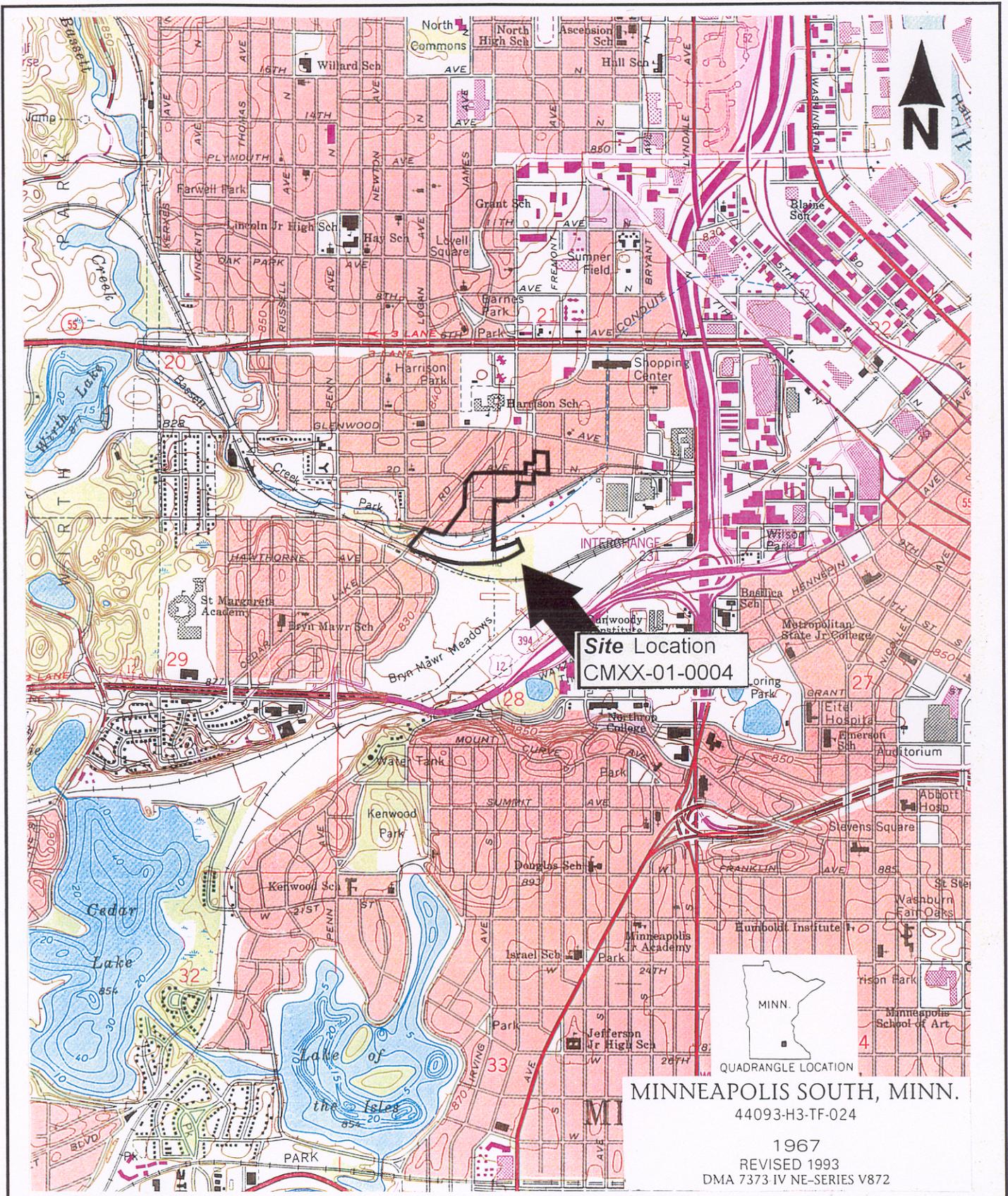
A Construction Contingency Plan and Response Action Plan (CCP/RAP) should be prepared and approved by the MPCA prior to conducting any earthwork associated with site redevelopment activities. The CCP/RAP should outline provisions for the proper management of contaminated soil and groundwater, which may be encountered during the redevelopment activities.

## **F. Assessment Limitations**

The analyses and conclusions submitted in this report are based on our field observations and the results of laboratory chemical analyses of soil samples and groundwater samples collected from the soil borings and monitoring wells completed 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.

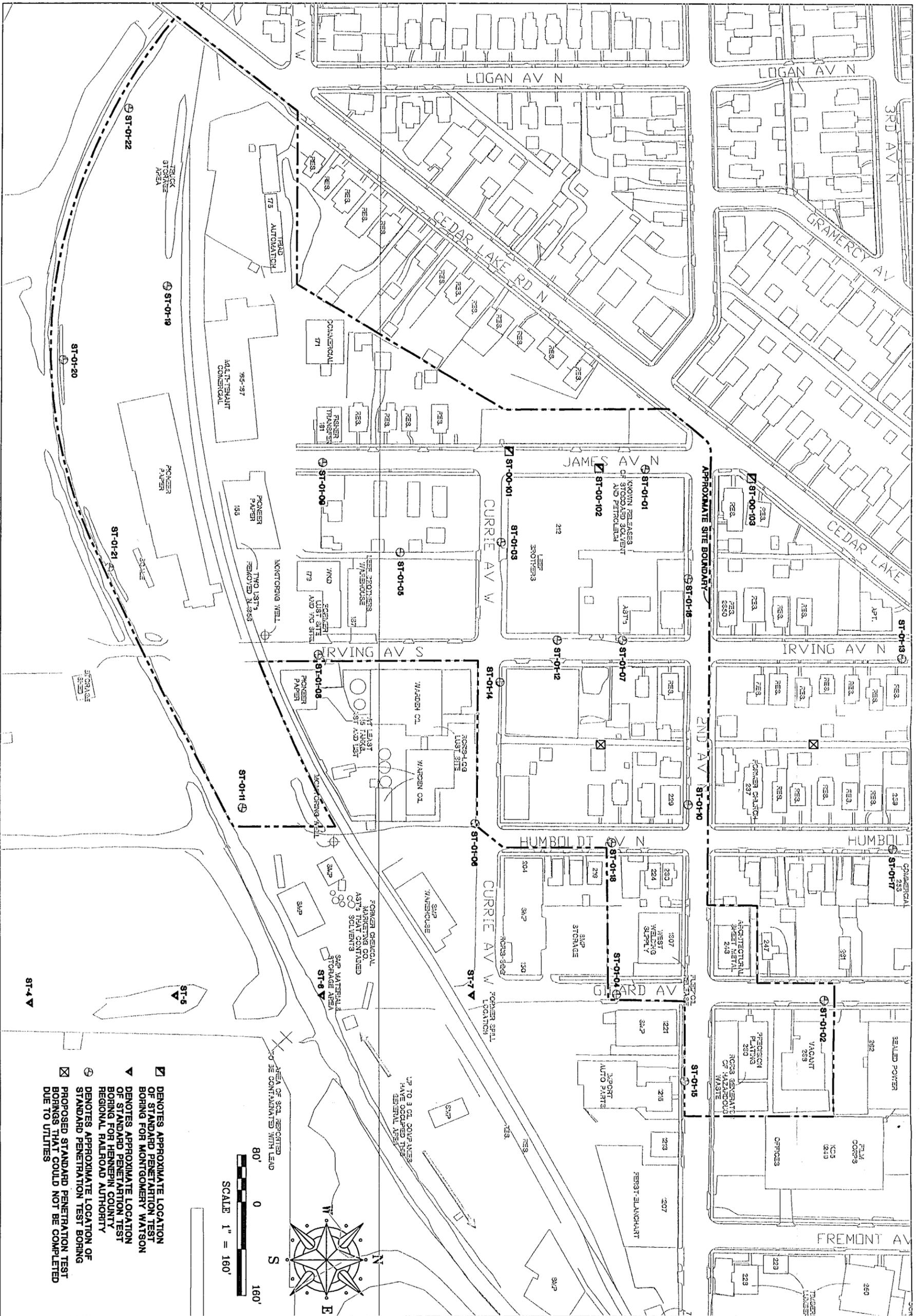
## Figures



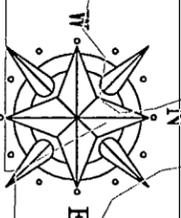
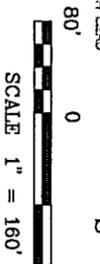
**BRAUN**  
**INTERTEC**

Site Location Map  
Geotechnical and Environmental Assessment  
MCDA - Bassett Creek Valley  
Minneapolis, Minnesota

INT	DATE	Sheet
DRAWN BY: KLB	03/14/01	1
APP'D BY:		of
JOB NO:	CMXX-01-0004	
DWG. NO. 1	FIGURE NO:	1
Scale 1:24,000		



- ☑ DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING FOR MONTGOMERY WATSON
- ▴ DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING FOR HENNEPIN COUNTY REGIONAL RAILROAD AUTHORITY
- ⊕ DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING
- ⊗ PROPOSED STANDARD PENETRATION TEST BORINGS THAT COULD NOT BE COMPLETED DUE TO UTILITIES



AREA OF SOIL SUSPECTED TO BE CONTAMINATED WITH LEAD

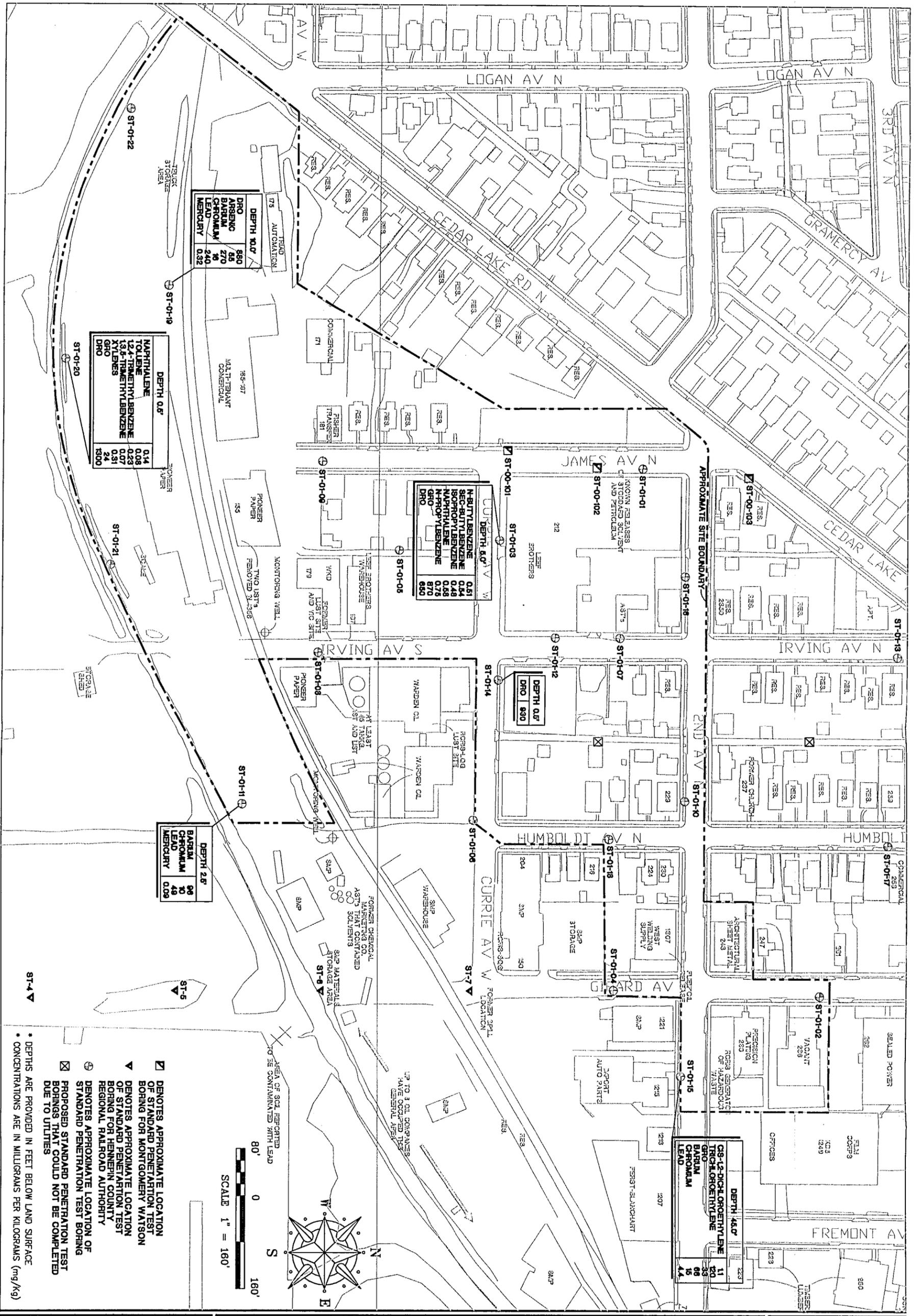
UP TO 3.0% COPPER ASSES HAVE OCCUPIED THESE ESSENTIAL AREAS

INT	DATE
DRAWN BY: BJB	1-4-01
APP'D BY: MB	3-13-01
JOB NO. CMXX-01-0004	
DWG. NO. MX10004	SHEET OF
SCALE 1" = 160'	

BORING LOCATION MAP  
 GEOTECHNICAL AND ENVIRONMENTAL ASSESSMENT  
 MCDA - BASSET CREEK VALLEY  
 MINNEAPOLIS, MINNESOTA



FIGURE NO. 2



INT	DATE
DRAWN BY: BJB	1-4-01
APP'D BY: MB	3-13-01
JOB NO. CMXX-01-0004	
DWG. NO. MX10004	SHEET OF
SCALE 1" = 160'	3

**SUMMARY OF SOIL ANALYTICAL RESULTS (mg/kg)**  
 GEOTECHNICAL AND ENVIRONMENTAL ASSESSMENT  
 MCDA - BASSET CREEK VALLEY  
 MINNEAPOLIS, MINNESOTA



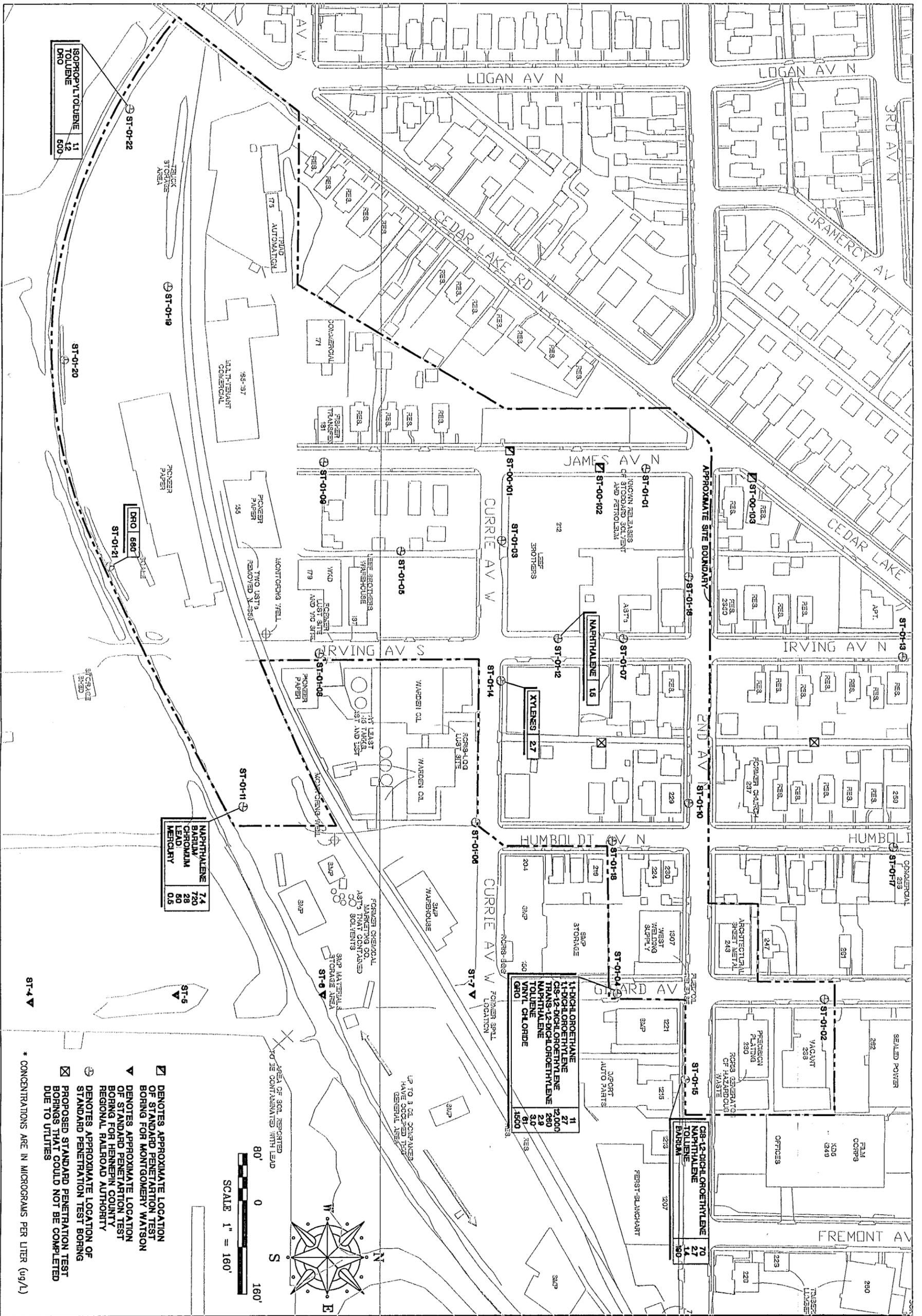


FIGURE NO. 4	INT	DATE
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	APP'D BY: MB	3-13-01
	JOB NO. CMXX-01-0004	
	DWG. NO. MX10004	SHEET OF
	SCALE 1" = 160'	

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (ug/L)  
 GEOTECHNICAL AND ENVIRONMENTAL ASSESSMENT  
 MCDA - BASSET CREEK VALLEY  
 MINNEAPOLIS, MINNESOTA



## Tables

Table 1

**Minneapolis Community Development Agency  
Basset Creek Valley Area  
Minneapolis, Minnesota**

**Soil Screening Results**

(photoionization detector readings in parts per million)

Sample Depth (feet)	ST-01-01	ST-01-02	ST-01-03	ST-01-04	ST-01-05	ST-01-06	ST-01-07	ST-01-08	ST-01-09	ST-01-10	ST-01-11	ST-01-12	ST-01-13	ST-01-14	ST-01-15	ST-01-16	ST-01-17	ST-01-18	ST-01-19	ST-01-20	ST-01-21	ST-01-22
0		0		0		0								15.1	3.3			0	8.3	81	10.4	
2.5	0	0.4	19	0.4	0	2.4	0	0	0	0	0	0	0	0	1.6	0	0	0	3.8	0	12.7	
5	0	0.4	46	0	0	3.6	0	0	0	0	0	0	0	0	1.6	0	0	0	9.7	0	8.1	
7.5	0	0	1.8	0.4	0		0	0	0	0	0	1.6	0	0	5.6	0	0	0	9.7	8.7	9.9	
10	0	0	0	0.4	0	0.4	0	0	0	0	0	3.3	0	0	3.3	0	0	0	3.8	6.0	7.8	
12.5	0	0	0	0.4	0	0.4	0	5.6	0	0	0	3.3	0	0	3.3	0	0	0	3.8	9.4	3.3	
15	0	0	0	0.4	0	0.4	0	5	0	0	0	1.6	0	3.3	3.3	0	0	0	3.8	10.2	2.2	3.4
20	0	0	0	0.4	0	0.4	0	6.7	0	0	0		0	3.3	3.3	0	0	0	5.8	8.2	3.4	3.6
25	0	0.4	0	0.4	0	0.4	0	6.7	0	0	0		0	5.6	3.3	0	0	0	3.8	11.2	6.1	1.3
30	0	0	0	16	0	0.4	0	6.7	0	0	0		0	11.7	3.3	0	0	0	3.8	9.0	3.1	0
35	0	0	0	0.4	0	0.4	0	5	0		0		0	5	3.3	0	0	0	3.8	10.2	4.6	0
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45	0	0	0		0	0.4	0	3.3	0		0			3.3	31			0	3.8	5.4	5.1	
50	0	0	0	0	0	0.4	0	6.7	0		0			5	6.7			0				
55						0.4		8.4	0		0			6.7								
60						0			0		0			3.3								
65									0		0			3.3								
70									0		0											
75									0		0											
80									0		0											
85									0		0											
90									0		0											
95											0											

Notes: Relatively low PID readings (<10) may be due to moisture in the headspace samples rather than organic vapors from possible contaminants.  
Because two different PIDs were used, there is a variation in background readings between the two instruments.  
A blank box indicates no sample was collected.

Table 2

Minneapolis Community Development Agency  
Basset Creek Valley Area  
Minneapolis, Minnesota

Soil Analytical Results

(Results in milligrams per kilogram, mg/kg)

Sample Location	Sample Depth (feet)	Sample Date	n-Butylbenzene	sec-Butylbenzene	Cis-1,2-Dichloroethylene	Isopropylbenzene	Naphthalene	n-Propylbenzene	Toluene	Trichloroethylene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Xylenes	GRO	DRO	Arsenic	Barium	Chromium	Lead	Mercury
Residential SRV			30	25	8	30	10	30	107	29	5	4	110	NA	NA	10	1200	71	400	0.7
Industrial SRV			92	70	22	87	28	93	305	46	5	10	248	NA	NA	25	12500	425	700	2
SLV			NA	NA	0.14	18	7.5	NA	6.4	0.14	NA	NA	45	NA	NA	15.1	842	18	525	1.6
ST-01-03	5.0	1/23/01	0.51	0.54	<0.05	0.48	0.58	0.75	<0.05	<0.05	<0.05	<0.05	<0.10	870	650	NS	NS	NS	NS	NS
ST-01-11	2.5	1/25/01	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<6.4	96	10	49	0.09
ST-01-14	0.5	1/30/01	NS	NS	NS	NS	NS	NS	<0.05	NS	NS	NS	<0.10	<10	930	NS	NS	NS	NS	NS
ST-01-15	45	1/31/01	<0.05	<0.05	1.1	<0.05	<0.05	<0.05	<0.05	120	<0.05	<0.05	<0.10	33	<10	<6.4	66	15	4.4	<0.030
ST-01-19	10	2/12/01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.10	<10	880	55	270	16	240	0.32
ST-01-20	0.5	2/13/01	<0.05	<0.05	<0.05	<0.05	0.14	<0.05	0.08	<0.05	0.23	0.07	0.31	24	1300	NS	NS	NS	NS	NS

GRO - Gasoline Range Organics

DRO - Diesel Range Organics

Industrial SRV - Minnesota Pollution Control Agency Industrial Soil Reference Value (1999)

Residential SRV - Minnesota Pollution Control Agency Tier 1 Soil Reference Value (1999)

SLV - Minnesota Pollution Control Agency Soil Leaching Value (11/2/99)

< - Less than the laboratory method detection limit.

NS - Not sampled for this parameter.

Table 3

Minneapolis Community Development Agency  
Basset Creek Valley Area  
Minneapolis, Minnesota

## Groundwater Analytical Results

(Results in micrograms per liter, ug/L)

Sample Location	Sample Date	1,1-Dichloroethane	1,1-Dichloroethylene	cis-1,2-Dichloroethylene	trans-1,2-Dichloroethylene	Isopropyltoluene	Naphthalene	Toluene	Vinyl Chloride	Xylenes	GRO	DRO	Barium	Chromium	Lead	Mercury
	HRL	70	6	70	100	NA	300	1000	0.2	10000	NA	NA	2000	100	NA	NA
ST-01-03	1/23/01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<100	<100	NS	NS	NS	NS
ST-01-04	1/23/01	11	27	12000	260	<1.0	2.9	3.0	61	<2.0	1500	<100	NS	NS	NS	NS
ST-01-05	1/23/01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<100	<100	NS	NS	NS	NS
ST-01-10	1/29/01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<100	<100	NS	NS	NS	NS
ST-01-11	1/26/01	<1.0	<1.0	<1.0	<1.0	<1.0	7.4	<1.0	<1.0	<2.0	<100	<100	720	28	50	0.5
ST-01-12	2/1/01	<1.0	<1.0	<1.0	<1.0	<1.0	1.5	<1.0	<1.0	<2.0	<100	<100	NS	NS	NS	NS
ST-01-14	1/30/01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.7	<100	<100	NS	NS	NS	NS
ST-01-15	2/2/01	<1.0	<1.0	70	<1.0	<1.0	2.7	1.4	<1.0	<2.0	<100	<100	190	<10	<40	<0.4
ST-01-16	1/31/01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<100	<100	NS	NS	NS	NS
ST-01-19	2/12/01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<100	<100	NS	NS	NS	NS
ST-01-20	2/13/01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<100	<100	NS	NS	NS	NS
ST-01-21	2/15/01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<100	560	NS	NS	NS	NS
ST-01-22	2/19/01	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	1.2	<1.0	<2.0	<100	500	NS	NS	NS	NS

GRO - Gasoline Range Organics

DRO - Diesel Range Organics

HRL - Minnesota Department of Health - Health Risk Limit

&lt; - Less than the laboratory method detection limit.

NS - Not sampled for this parameter.

Note: Only parameters that were detected in at least one sample are included in this table.

## **Appendix A**

### **Field and Laboratory Methods**

## **Appendix A**

### **Field and Laboratory Methods**

#### **Field Testing and Sampling**

The penetration test borings were performed with a truck-mounted core and auger drill. All down-hole equipment was steam cleaned prior to use, and clean augers were used for each borehole. Sampling of the penetration test borings were conducted in accordance with ASTM D 1586 "Penetration Test and Split-Barrel Sampling of Soils." Using this method, the borehole 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 1 1/2 feet below the tip of the lead flight of the hollow-stem auger. The blows for the last foot of penetration were recorded and are used as an index of soil strength characteristics and for stratigraphic correlation. Samples were taken at 2 1/2-foot vertical intervals to the termination depth of the borings.

#### **Classification**

Soils were visually and manually classified in the field by an environmental technician in accordance with ASTM D 2487 "Classification of Soils for Engineering Purposes" and ASTM D 2488 "Description and Identification of Soils (Visual and Manual Procedure)."

#### **Organic Vapor Screening**

During the field investigation, soil samples were examined visually by an environmental geologist for staining or other signs of contamination. In addition, soils were scanned for the presence of organic vapors using a photoionization detector (PID). The PID was equipped with a 10.6 eV lamp and was calibrated to an isobutylene standard.

#### **Headspace Procedures**

Soils were additionally analyzed with a PID using headspace procedures. The headspace procedure consisted of placing the soil into a clean quart-sized resealable plastic bag. The bag was vigorously shaken for 15 seconds. After a minimum of ten minutes, the bag was again vigorously shaken for 15 seconds. The PID probe was inserted into the bag. The highest reading observed on the PID was then recorded.

#### **Chemical Soil Sampling**

Soil samples were collected for chemical analysis from the depth interval exhibiting the highest organic vapors and/or at the apparent water table. The samples were placed in clean, amber glass screw-top vials with Teflon®-lined caps, correctly preserved, labeled and transported to our laboratory under refrigerated conditions using Braun Intertec chain-of-custody procedures.

#### **Groundwater Sampling Procedures**

Bore hole groundwater samples were collected from temporary monitoring wells constructed within the hollow-stem auger. The groundwater samples were collected with clean polyethylene tubing fitted with a stainless steel check valve. New polyethylene tubing was used at each sample location. Groundwater samples collected in the polyethylene tubing were transferred into glass, laboratory-cleaned, VOA vials with Teflon®-lined caps which contained hydrochloric acid (HCL) as a preservative. The sample containers were then labeled and placed on ice. The containers were transported to the Braun Intertec laboratory under refrigerated conditions using Braun Intertec chain-of-custody procedures.

#### **Chemical Analysis**

All analyses were performed using USEPA, WDNR or other recognized standard procedures. Data were reviewed prior to release and all quality control guidelines were met. Specific information on standard operating procedures is available upon request.

**Appendix B**

**Boring Logs**

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota				BORING: ST-01-01		
CREW CHIEF: S. McLean				METHOD: 3 1/4" HSA Autohmr.		
DATE: 1/22/01				SCALE: 1" = 4'		
Elev.	Depth	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
	0.0	FILL	FILL: 6 1/2 inches of bituminous overlying approximately 2 feet of aggregate base.			
	2.5	FILL	FILL: Lean Clay. brown, wet.	4		
	4.0	OL	ORGANIC CLAY, black, wet. (Topsoil)	7		MC = 37%
	7.0	CL	LEAN CLAY, gray, wet, medium. (Alluvium)	8		
	9.0	CH	FAT CLAY. with seams of Sand. gray, wet, rather soft to medium. (Lacustrine)	6		
	14.0	ML	SANDY SILT, with Sand and Clay seams, gray, wet, very loose to loose. (Alluvium)	9		
					▽	An open triangle in the water level (WL) column indicates the depth at which groundwater was observed while drilling. A solid triangle indicates the groundwater level in the boring on the date indicated. Groundwater levels fluctuate.
					8	
					6	
					4	
	32.0					

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota	BORING: ST-01-01 (cont.)
	LOCATION: See attached sketch.

CREW CHIEF: S. McLean	METHOD: 3 1/4" HSA Autohmr.	DATE: 1/22/01	SCALE: 1" = 4'
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Elev.	Depth	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
			SANDY SILT. (Continued from previous page)			
				7		
				9		
				8		
49.0		CL	SANDY LEAN CLAY, with layers of Poorly Graded Sand with Silt, gray, wet, stiff. (Alluvium)	14		
50.5			END OF BORING.			
			Water observed at 19 feet with 49 feet of hollow-stem auger in the ground.			
			Boring immediately backfilled with bentonite grout.			

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota				BORING: ST-01-02		
CREW CHIEF: G. Hanson				METHOD: 3 1/4" HSA Autohmr.		
DATE: 1/22/01				SCALE: 1" = 4'		
Elev.	Depth 0.0	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
	1.0	FILL	FILL: Bituminous over aggregate base.			
	4.0	FILL	FILL: Silty Sand, fine- to medium-grained, with Gravel and cinders, brown, moist.	5		
		CH	FAT CLAY, gray, wet, rather soft to very soft. (Lacustrine)	4		
				2		
				WH*		* WH = Weight of Hammer
				WH		
				WH		
	19.0	CH	FAT CLAY, with lenses of Silty Sand, gray, wet, very soft. (Lacustrine)	2		
	24.0	SP	POORLY GRADED SAND, fine-grained, brownish-gray, waterbearing, loose to medium dense. (Alluvium)	5		
				15		
	32.0					

An open triangle in the water level (WL) column indicates the depth at which groundwater was observed while drilling. A solid triangle indicates the groundwater level in the boring on the date indicated. Groundwater levels fluctuate.

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota				BORING: ST-01-02 (cont.)		
				LOCATION: See attached sketch.		
CREW CHIEF: G. Hanson		METHOD: 3 1/4" HSA Autohmr.		DATE: 1/22/01	SCALE: 1" = 4'	
Elev.	Depth	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
	34.0		POORLY GRADED SAND. (Continued from previous page)			
		CL	SANDY LEAN CLAY, with Gravel. reddish-brown, wet, medium to rather stiff. (Glacial Till)	7		
				8		
				8		
	50.5		END OF BORING.	10		
			Water observed at 17 1/2 feet with 49 feet of hollow-stem auger in the ground.			
			Boring immediately backfilled with bentonite grout.			

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota				BORING: ST-01-03		
CREW CHIEF: S. McLean				METHOD: 3 1/4" HSA Autohmr.		
DATE: 1/23/01				SCALE: 1" = 4'		
Elev.	Depth 0.0	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
	1.0	FILL	FILL: 4 inches of bituminous overlying 8 inches of aggregate base.			
	2.0	FILL	FILL: Silty Sand, fine- to medium-grained, dark brown, frozen.			
	4.0	CL	LEAN CLAY, black mixed with some gray, moist. (Topsoil/Fill)	5		MC = 23%
	7.0	CL	LEAN CLAY, gray, wet, very soft. (Lacustrine)	3		
	12.0	CL	LEAN CLAY, with Sand seams, gray, wet, very soft. (Lacustrine)	3		
				2		
					▽	
		CH	FAT CLAY, gray, wet, very soft. (Lacustrine)	WH		
				WH		MC = 76%
				WH		
				WH		
				WH		
	32.0					

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota			BORING: ST-01-03 (cont.)		
CREW CHIEF: S. McLean			METHOD: 3 1/4" HSA Autohmr.		DATE: 1/23/01
Elev.			DEPTH		SCALE: 1" = 4'
ASTM Symbol			Description of Materials		BPF WL Tests or Notes
			FAT CLAY. (Continued from previous page)		
34.0			SM	SILTY SAND, fine-grained, gray, wet, loose. (Alluvium)	10
39.0			ML	SANDY SILT with seams of Clay and Sand, gray, wet, loose to medium dense. (Alluvium)	16
50.5					9 8
			END OF BORING.  Water observed at 11 feet with 49 feet of hollow-stem auger in the ground.  Boring immediately backfilled with bentonite grout.		

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota				BORING: ST-01-04		
				LOCATION: See attached sketch.		
CREW CHIEF: G. Hanson		METHOD: 3 1/4" HSA Autohmr.		DATE: 1/23/01	SCALE: 1" = 4'	
Elev.	Depth	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
	0.0					
	1.0	FILL	FILL: Bituminous over aggregate base.			
		FILL	FILL: Lean Clay mixed with Fat Clay, non to slightly organic, gray and black, moist.			
	4.0			13		
		FILL	FILL: Silty Sand, fine-grained, with Gravel, brown, moist.			
	6.0			4		
		CH	FAT CLAY, with shells, slightly organic, gray, wet. (Swamp Deposit)			
	9.0			3		
		CH	FAT CLAY, gray, wet, very soft. (Lacustrine)			
				WH		
				WH		
				WH		
				WH		
				WH		
				WH		
				WH		
	29.0					
		SP	POORLY GRADED SAND, fine-grained, gray, waterbearing, loose to medium dense. (Alluvium)			
	32.0					

PROJECT: <b>CMXX-01-0004</b> Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota				BORING: <b>ST-01-04 (cont.)</b>		
				LOCATION: See attached sketch.		
CREW CHIEF: G. Hanson		METHOD: 3 1/4" HSA Autohmr.		DATE: 1/23/01	SCALE: 1" = 4'	
Elev.	Depth	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
			POORLY GRADED SAND. (Continued from previous page)			
				8		
				20		
				14		
49.0		SC	CLAYEY SAND, fine-grained, with Gravel, brownish-gray, wet, rather stiff. (Glacial Till)	10		
50.5			END OF BORING.			
			Water observed at 16 feet with 49 feet of hollow-stem auger in the ground.			
			Boring immediately backfilled with bentonite grout.			

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota			BORING: ST-01-05			
CREW CHIEF: S. McLean			METHOD: 3 1/4" HSA Autohmr.			
DATE: 1/23/01			SCALE: 1" = 4'			
Elev.	Depth	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
	0.0					
	1.0	FILL	FILL: 2 inches of Bituminous over Silty Sand, fine- to medium-grained, dark brown, frozen.			
	2.0	OL	ORGANIC CLAY, black, frozen. (Topsoil)			
		CL	LEAN CLAY, gray, wet, medium. (Alluvium)	7		
	4.0	CH	FAT CLAY, gray, wet, very soft to soft. (Lacustrine)	6		
				2		
				1		MC = 88%
				WH		
				WH		
					▽	
	19.0	SP-SM	POORLY GRADED SAND with SILT, fine-grained, gray, waterbearing, loose. (Alluvium)	5		
	24.0	ML	SANDY SILT, gray, waterbearing, very loose to loose. (Alluvium)	7		
				3		
	32.0					

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota				BORING: ST-01-05 (cont.)		
				LOCATION: See attached sketch.		
CREW CHIEF: S. McLean		METHOD: 3 1/4" HSA Autohmr.		DATE: 1/23/01	SCALE: 1" = 4'	
Elev.	Depth	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
	39.0	ML	CLAYEY SILT, with Clay and Sand seams, gray, wet, rather soft. (Alluvium)	5		
	50.5	CL	SANDY LEAN CLAY, with a trace of Gravel and layers of Sand, gray, wet, medium to stiff. (Glacial Till)	8 16 14		
			END OF BORING.  Water observed at 16 1/2 feet with 49 feet of hollow-stem auger in the ground.  Boring immediately backfilled with bentonite grout.			

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota				BORING: ST-01-06		
				LOCATION: See attached sketch.		
CREW CHIEF: G. Hanson		METHOD: 3 1/4" HSA Autohmr.		DATE: 1/23/01	SCALE: 1" = 4'	
Elev.	Depth 0.0	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
	1.0	FILL	FILL: Bituminous over aggregate base.			
	4.0	FILL	FILL: Silty Sand, with cinders and fine Gravel, dark brown, moist.	21		
	6.0	FILL	FILL: Sandy Lean Clay, brown and gray, wet.	3		
	6.0	OL	ORGANIC CLAY, with shells, gray, wet, very soft to soft. (Swamp Deposit)	2		
				WH		
				WH		
				WH		
				WH		
	19.0	CH	FAT CLAY, gray, wet, very soft. (Lacustrine)	WH		
				WH		
				WH		
	32.0					

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota				BORING: ST-01-06 (cont.)			
CREW CHIEF: G. Hanson				METHOD: 3 1/4" HSA Autohmr.		DATE: 1/23/01	SCALE: 1" = 4'
LOCATION: See attached sketch.							
Elev.	Depth	ASTM Symbol	Description of Materials	BPF	WL	Tests	or Notes
			FAT CLAY. (Continued from previous page)				
				WH			
				WH			
				WH			
				WH			
			Dark gray below 55 feet.	WH			
	59.0	CL	SANDY LEAN CLAY, gray, wet, very soft. (Lacustrine)	WH			
	64.0						

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota			BORING: ST-01-06 (cont.)			
			LOCATION: See attached sketch.			
CREW CHIEF: G. Hanson		METHOD: 3 1/4" HSA Autohmr.		DATE: 1/23/01	SCALE: 1" = 4'	
Elev.	Depth	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
	65.5	SP-SM	POORLY GRADED SAND with SILT, fine- to medium-grained. gray, waterbearing, medium dense. (Alluvium)	28		
			END OF BORING.			
			Water observed at 18 feet with 64 feet of hollow-stem auger in the ground.			
			Boring immediately backfilled with bentonite grout.			

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota				BORING: ST-01-07		
CREW CHIEF: S. McLean				METHOD: 3 1/4" HSA Autohmr.		
DATE: 1/24/01				SCALE: 1" = 4'		
Elev.	Depth	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
	0.0	FILL	FILL: 7 inches of Bituminous overlying 7 inches of aggregate base.			
	1.2	CL	LEAN CLAY, grayish-brown, frozen. (Alluvium)	8		
	4.0	CL	LEAN CLAY, brown to dark brown, wet, medium. (Alluvium)	8		
	7.0	SC	CLAYEY SAND, fine-grained, with a trace of Gravel. brownish-gray, wet, rather soft. (Glacial Till)	5		
	9.0	SM	SILTY SAND, fine-grained, wet, loose. (Glacial Till)	6		
	12.0	SM-SC	SILTY TO CLAYEY SAND, fine-grained, with a trace of Gravel, wet, loose. (Glacial Till)	6		
	14.0	CL	SANDY LEAN CLAY, with a trace of Gravel, brownish-gray to gray, wet, medium. (Glacial Till)	6		
	19.0	SC	CLAYEY SAND, fine-grained, with a trace of Gravel, reddish brown, wet, medium. (Glacial Till)	6		
				6		
				8		
	32.0					

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota				BORING: ST-01-07 (cont.)	
				LOCATION: See attached sketch.	
CREW CHIEF: S. McLean		METHOD: 3 1/4" HSA Autohmr.		DATE: 1/24/01	SCALE: 1" = 4'
Elev.	Depth	ASTM Symbol	Description of Materials	BPF WL	Tests or Notes
			CLAYEY SAND. (Continued from previous page)	8	
	39.0	ML	SANDY SILT, with a trace of Gravel, brown, waterbearing, medium dense. (Glaciofluvium)	14	
	48.0	ML	SANDY SILT, with seams of Sand, brown, waterbearing, medium dense. (Glaciofluvium)	12	
	50.5		END OF BORING.  Water observed at 40 feet with 49 feet of hollow-stem auger in the ground.  Boring immediately backfilled with bentonite grout.	17	

PROJECT: CMXX-01-0004 Preliminary Geotechnical Evaluation Bassett Creek Valley Study Area Cedar Lake Road and 1st Avenue North Minneapolis, Minnesota				BORING: ST-01-08		
				LOCATION: See attached sketch.		
CREW CHIEF: G. Hanson		METHOD: 3 1/4" HSA Autohmr.		DATE: 1/26/01	SCALE: 1" = 4'	
Elev.	Depth 0.0	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
	1.0	FILL	FILL: Bituminous over aggregate base.			
		FILL	FILL: Poorly Graded Sand with Silt. with fine Gravel, brown, moist.	36		
	6.5	OL	ORGANIC CLAY, with shells (muck), gray, waterbearing, soft to very soft. (Swamp Deposit)	2	▽	
	11.5	CL	LEAN CLAY, non to slightly organic, gray, wet, very soft. (Lacustrine)	WH		
	14.0	CH	FAT CLAY, gray, wet, very soft. (Lacustrine)	WH		
				WH		
				WH		
				WH		
				WH		
	32.0			WH		