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February 7, 1994

MPCA HAZARDOUS
WASTE DIVISION

Project No. CMKX-93-0202

Ms. Jennifer Bredenberg
Hennepin County Property Management Division
Floor A - 2208 Government Center
Minneapolis, MN 55487-0228

Dear Ms. Bredenberg:

Re: Phase II Environmental Site Assessment, South Minneapolis Transfer Station Area,
21st Avenue South and East 29th Street, Minneapolis, Minnesota.

In accordance with authorization received from the Hennepin County Property Management Division, Braun Intertec Corporation (Braun Intertec) has completed a phase II environmental site assessment of the referenced property. The objective of the assessment was to evaluate soil and groundwater conditions at the site.

As part of the phase II site assessment, seven soil borings were completed at the site. Monitoring wells were installed in three of the borings. One round of groundwater sampling was performed. The results indicate that petroleum compounds and arsenic are present in groundwater at the site. The source of these contaminants appears to be off site.

Our recommendations include the option of a second round of groundwater sampling to confirm the results of the initial sampling. The cost to complete the additional groundwater sampling is estimated to be \$2,400.00. At your request, we can provide you with a more detailed work plan and cost estimate.

We appreciate the opportunity to provide our professional services to you. If you have questions regarding this report, please call Patricia Terhaar at (612) 683-8756.

Sincerely,

Patricia M. Terhaar, CPG
Project Manager

Earl W. Windahl
Supervisor, Remedial Investigations

Attachment: Phase II Environmental Site Assessment Report

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WASTE DIVISION

A. Introduction

In accordance with the authorization received from the Hennepin County Property Management Division, Braun Intertec Corporation (Braun Intertec) has completed a phase II environmental site assessment of the South Minneapolis Transfer Station area located at 21st Avenue South and 29th Street East, Minneapolis, Minnesota. The objective of the phase II assessment was to evaluate soil and groundwater conditions at the site.

B. Background Information

B.1. Site Location

The site is located within the southwest quarter of Section 36, Township 29 North, Range 24 West, in the city of Minneapolis, Hennepin County, Minnesota (Figure 1). The site is located within the city blocks bounded on the north by 28th Street East, on the south by 29th Street East, on the east by 22nd Avenue South, and on the west by 20th Avenue South. The boundaries of the site are shown on Figure 2. The current distribution of property owners is also shown on Figure 2.

B.2. Area Geology and Hydrogeology

The unconsolidated sedimentary deposits in the vicinity of the site are Holocene and Pleistocene upper terrace deposits. These deposits contain sand, gravelly sand, and loamy sand, overlain by thin deposits of silt, loam, or organic sediment (Meyer and Hobbs, 1989). The unconsolidated sedimentary deposits range in thickness from 50 feet to 150 feet (Bloomgren, et al., 1989).

The uppermost bedrock unit in the vicinity of the site consists of the middle-Ordovician Platteville Formation and Glenwood Shale (Olsen and Bloomgren, 1989). The Platteville Formation consists of fine-grained limestone containing thin shale partings near the top and base, underlain by green, sandy shale of the Glenwood.

According to leaksite reports provided by the Minnesota Pollution Control Agency (MPCA), the groundwater flow direction in the vicinity of the site is to the northwest. However, published geologic and hydrologic information indicate that the regional groundwater flow direction within the unconsolidated sedimentary deposits is eastward, toward the Mississippi

River (Kanivetsky, 1989a). The general groundwater flow direction within the uppermost bedrock aquifer (Prairie du Chien-Jordan) in the vicinity of the site is also eastward, toward the Mississippi River (Kanivetsky, 1989b).

B.3. Previous Investigation

Braun Intertec previously completed a phase I environmental assessment of the site for the Minneapolis Community Development Agency (Braun Intertec project number CMKX-93-0045, report dated May 7, 1993). The phase I assessment identified numerous commercial and industrial facilities that previously operated at or near the site. Most of these facilities are shown on Figure 3 of this phase II investigation report. Of particular note are the following facilities:

- Bareco Oil Company, 2800-2828 22nd Avenue South;
- Soo Line Marshalling Yards, southwest of 26th Avenue South and 26th Street East;
- Chicago-Milwaukee Corporation/Rollins Oil, 2000-2020 28th Street East;
- filling station, 2800 Hiawatha Avenue South;
- Minn Oil and Refining Company, 2802 Hiawatha Avenue South;
- chemical manufacturing facility, 2859 20th Avenue South;
- foundries, 2831-2833 and 2847-2849 20th Avenue South;
- scrap metal and junk dealers, 2810 22nd Avenue South; and
- a machine shop, 2828 21st Avenue South.

Aerial photographs dated 1940 of the Bareco Oil Company facility identified several large aboveground storage tanks (ASTs). The approximate locations of the former ASTs are shown on Figure 3. However, Braun Intertec did not encounter specific documentation to indicate that petroleum or hazardous materials were stored at this site.

The Soo Line Marshalling Yards Site is located about 1/8 mile east of the site. Substances found in the soil and groundwater at this site include diesel fuel, fuel oil, gasoline, coal tar derivatives, and metals. According to MPCA file information, the groundwater flow direction at this site is to the northwest.

The Chicago-Milwaukee Corporation/Rollins Oil Site is located about 200 feet north of the site. This site is designated as MPCA Leaksite Number 1583. Gasoline compounds have

been detected in groundwater at this site. Groundwater flow at the site was reported to be to the northwest.

Based on the historic and current land use in the area, Braun Intertec recommended that an environmental subsurface investigation be completed at the site to evaluate soil and groundwater conditions.

C. Scope of Work

The following is a chronological listing of services provided by Braun Intertec for the phase II site assessment. The work was completed following the standard methods described in Appendix A.

December 14-16, 1993. Seven soil borings were conducted at the site. Soil samples from the borings were field-screened for organic vapors. Soil samples were collected from selected borings and submitted for laboratory analysis. Three of the borings were completed as monitoring wells. The well elevations were surveyed.

December 21, 1993. The three monitoring wells were developed.

December 22, 1993. The monitoring wells were sampled and the samples submitted for laboratory analysis. Groundwater elevations in the wells were measured.

January 27, 1993. Groundwater elevations in the wells were measured.

D. Results

D.1. Site Geology and Hydrogeology

The locations of the seven soil borings are shown on Figure 2. The borings are labelled ST-1 through ST-4 and MW-1 through MW-3. The depths of the borings range from 25 to 33 feet. Boring logs for each soil boring are contained in Appendix B. Soils at the site consist primarily of terrace deposits overlying glacial till. The terrace deposits are composed

primarily of fine to medium grained, poorly graded sand extending to a depth of up to 33 feet. Glacial till, composed of lean clay and silty, clayey sand was encountered in borings ST-2, MW-1 and MW-3 at depths ranging from 24 to 29 feet.

During drilling, groundwater was encountered in the soil borings at depths ranging from 23 to 29 feet. The locations of the three monitoring wells (MW-1, MW-2, and MW-3) are shown on Figure 2. Monitoring well construction diagrams are contained in Appendix C. The City of Minneapolis monitoring well permit and the Minnesota Department of Health (MDH) water well records are also contained in Appendix C. A summary of the well construction data is given in Table 1. Groundwater elevation data from the wells are contained in Appendix D and summarized in Table 2. Based on the water table contour maps on Figures 4 and 5, the groundwater flow direction at the site ranges from south-southeasterly to south-southwesterly. Based on these two maps, the average horizontal hydraulic gradient at the site is 0.0026.

Table 1
 Monitoring Well Construction Data

	Well MW-1	Well MW-2	Well MW-3
Top of Riser	848.76	849.19	847.33
Ground Surface	846.5	846.4	845.1
Top of Filter Pack Seal	829.5	829.4	827.5
Top of Filter Pack	827.7	827.4	826.1
Top of Screen	823.6	824.8	824.1
Bottom of Screen	813.6	814.8	814.1

Elevations in feet referenced to top of hydrant located on southwest corner of 28th Street East and 21st Avenue South; elevation = 847.022 feet AMSL

Table 2
Groundwater Elevation Data

Date	Well MW-1	Well MW-2	Well MW-3
12-22-93	820.95	822.03	821.51
1-27-94	820.61	821.69	821.52

Elevations in feet referenced to top of hydrant located on southwest corner of 28th Street East and 21st Avenue South; elevation = 847.022 feet AMSL

D.2. Soil Conditions

Organic vapor field data sheets from the borings are contained in Appendix E. The only organic vapors detected at the site were at a depth of 27.5 feet in boring MW-3. The organic vapor concentration at this depth was 5.3 parts per million (ppm) measured from the soil in the split barrel sampler. There was not enough sample in the split barrel to conduct a jar headspace analysis. No unusual odors or staining were observed in the soils retrieved from the borings.

Soil samples were collected in borings MW-1, MW-2 and MW-3 at depths ranging from 25 to 27.5 feet. The samples were analyzed in the laboratory for volatile organic compound (VOCs), diesel range organics (DRO), gasoline range organics (GRO), polychlorinated biphenyls (PCBs), and the metals arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver. The laboratory reports are contained in Appendix F. VOCs, PCBs, DRO and GRO were not detected in the soil samples. The metals arsenic, barium, cadmium, and chromium were detected in one or more of the soil samples at concentrations of up to 36 milligrams per kilogram (mg/Kg).

D.3. Groundwater Conditions

Groundwater samples were collected from each of the monitoring wells and analyzed in the laboratory for VOCs, PCBs, polynuclear aromatic hydrocarbons (PAHs), DRO, GRO, and dissolved concentrations of arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver. Water sampling data sheets are contained in Appendix G. The laboratory report is contained in Appendix F. VOCs, PCBs, PAHs, and GRO were not detected in the

Sampled 12/22/94

groundwater samples. Diesel range organics were detected in the sample from monitoring well MW-3 at a concentration of 300 micrograms per liter ($\mu\text{g/L}$). Cadmium, chromium, lead, mercury, selenium and silver were not detected in the water samples. Barium was detected in all three wells at concentrations of 70 to 150 $\mu\text{g/L}$. Arsenic was detected in well MW-3 at a concentration of 4 $\mu\text{g/L}$.

E. Discussion and Conclusions

According to published literature, the regional groundwater flow direction within the water table aquifer in this area is easterly toward the Mississippi River. At other leaksites in the area, groundwater is reportedly flowing toward the northwest. This suggests the presence of local variations in the groundwater flow pattern. Groundwater flow at the site was determined to be south-southeasterly to south-southwesterly based on data from the three wells. This apparent inconsistency in flow direction may be related to variations in geology or the influence of pumping wells.

Elevated organic vapor concentrations were only detected in boring MW-3 at a depth of 27.5 feet. However, laboratory analyses of soil from the same interval in boring MW-3 detected no organic compounds. The concentrations of arsenic, barium, cadmium and chromium detected in the soil samples from borings MW-1, MW-2 and MW-3 appear to be within the range of naturally occurring concentrations.

No organic compounds were detected in groundwater samples from wells MW-1 and MW-2. Diesel range organics were detected in well MW-3, suggesting a diesel fuel or fuel oil release. However, the laboratory report notes that the chromatogram included higher boiling hydrocarbons than in a typical diesel chromatogram, possibly indicating the presence of degraded gasoline.

Because barium was detected in all three monitoring wells, it may reflect the naturally occurring concentrations in this area. The concentrations of barium at the site are well below the Recommended Allowable Limit (RAL) of 2,000 $\mu\text{g/L}$ established by the MDH for barium concentrations in drinking water. The 4 $\mu\text{g/L}$ arsenic detected in well MW-3 exceeds the RAL for arsenic of 0.2 $\mu\text{g/L}$. The source for the arsenic is unknown.

Because well MW-3 is located at the upgradient boundary of the site, the diesel range organics and arsenic detected in the well are most likely from an off-site source. The phase I site assessment identified several facilities upgradient of the site that are potential source areas.

F. Recommendations

Braun Intertec recommends that the reports for this site be referred to the Property Assessment Unit of the MPCA Tanks and Spills Section for review. It is our understanding that this unit has an estimated four month backlog of reports for review. It is possible that the MPCA would request a second round of groundwater sampling to confirm the results of the first. To avoid potential additional delays, you may wish to proceed with a second round of sampling in approximately two months and present the results to the MPCA before the original report is reviewed. If a second round of sampling is conducted, we recommend analyzing for diesel range organics and arsenic.

G. General

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 locality. No other warranty is made or intended.

H. References

- Bloomgren, Bruce A., Jane M. Cleland, and Bruce M. Olsen, 1989, *Depth to Bedrock and Bedrock Topography*, in Balaban, N. H., ed., *Geologic Atlas - Hennepin County, Minnesota: Minnesota Geological Survey, County Atlas Series, Atlas C-4, Plate 4, scale 1:100,000.*
- Kanivetsky, Roman, 1989a, *Quaternary Hydrogeology*, in Balaban, N. H., ed., *Geologic Atlas - Hennepin County, Minnesota: Minnesota Geological Survey, County Atlas Series, Atlas C-4, Plate 5, scale 1:100,000 and 1:133,333.*

Kanivetsky, Roman, 1989b, *Bedrock Hydrogeology*, in Balaban, N. H., ed., Geologic Atlas - Hennepin County, Minnesota: Minnesota Geological Survey, County Atlas Series, Atlas C-4, Plate 6, scale 1:100,000 and 1:133,333.

Meyer, Gary N., and Howard C. Hobbs, 1989, *Surficial Geology*, in Balaban, N. H., ed., Geologic Atlas - Hennepin County, Minnesota: Minnesota Geological Survey, County Atlas Series, Atlas C-4, Plate 3, scale 1:100,000.

Olsen, Bruce M., and Bruce A. Bloomgren, 1989, *Bedrock Geology*, in Balaban, N. H., ed., Geologic Atlas - Hennepin County, Minnesota: Minnesota Geological Survey, County Atlas Series, Atlas C-4, Plate 2, scale 1:100,000.

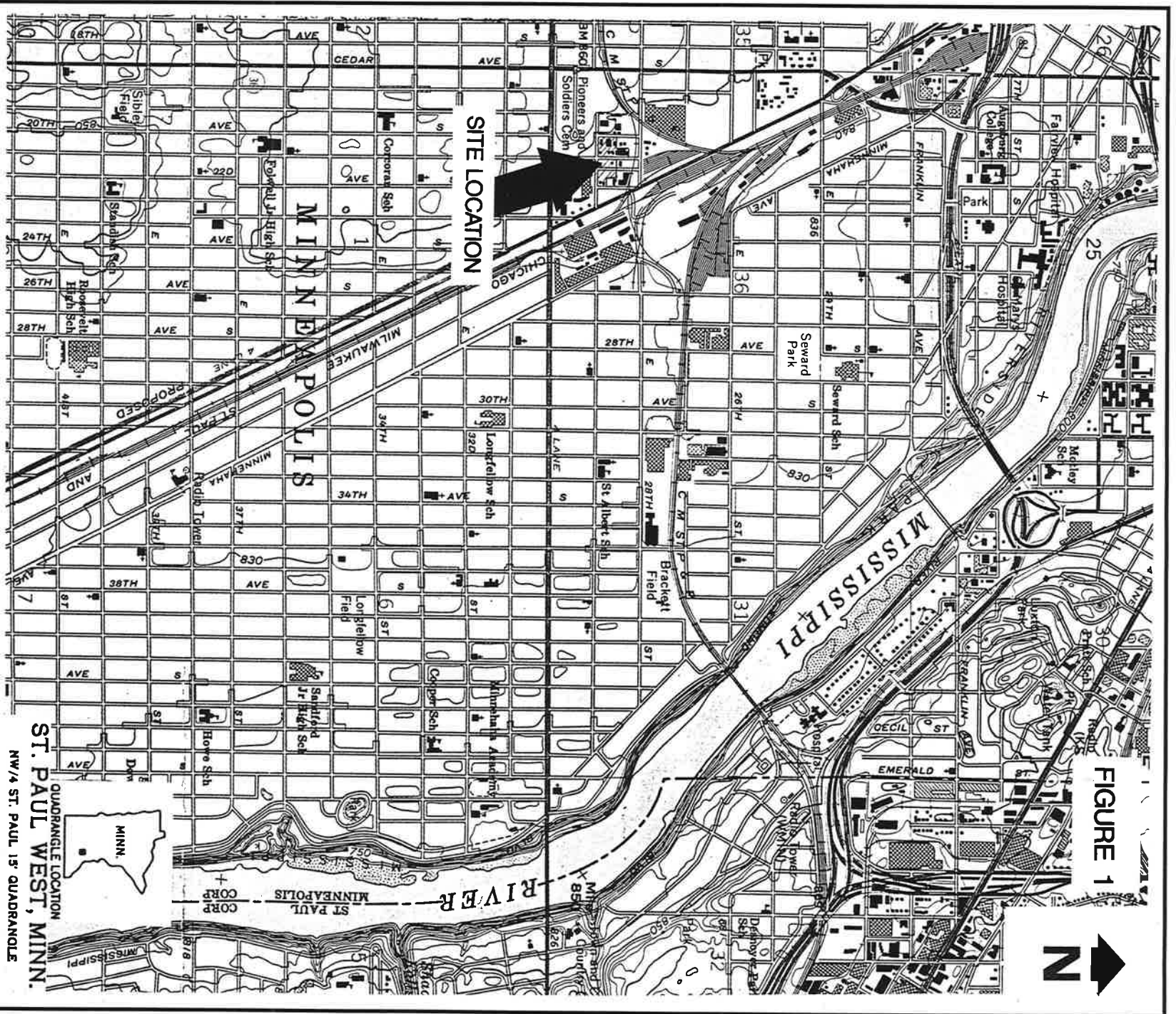


FIGURE 1



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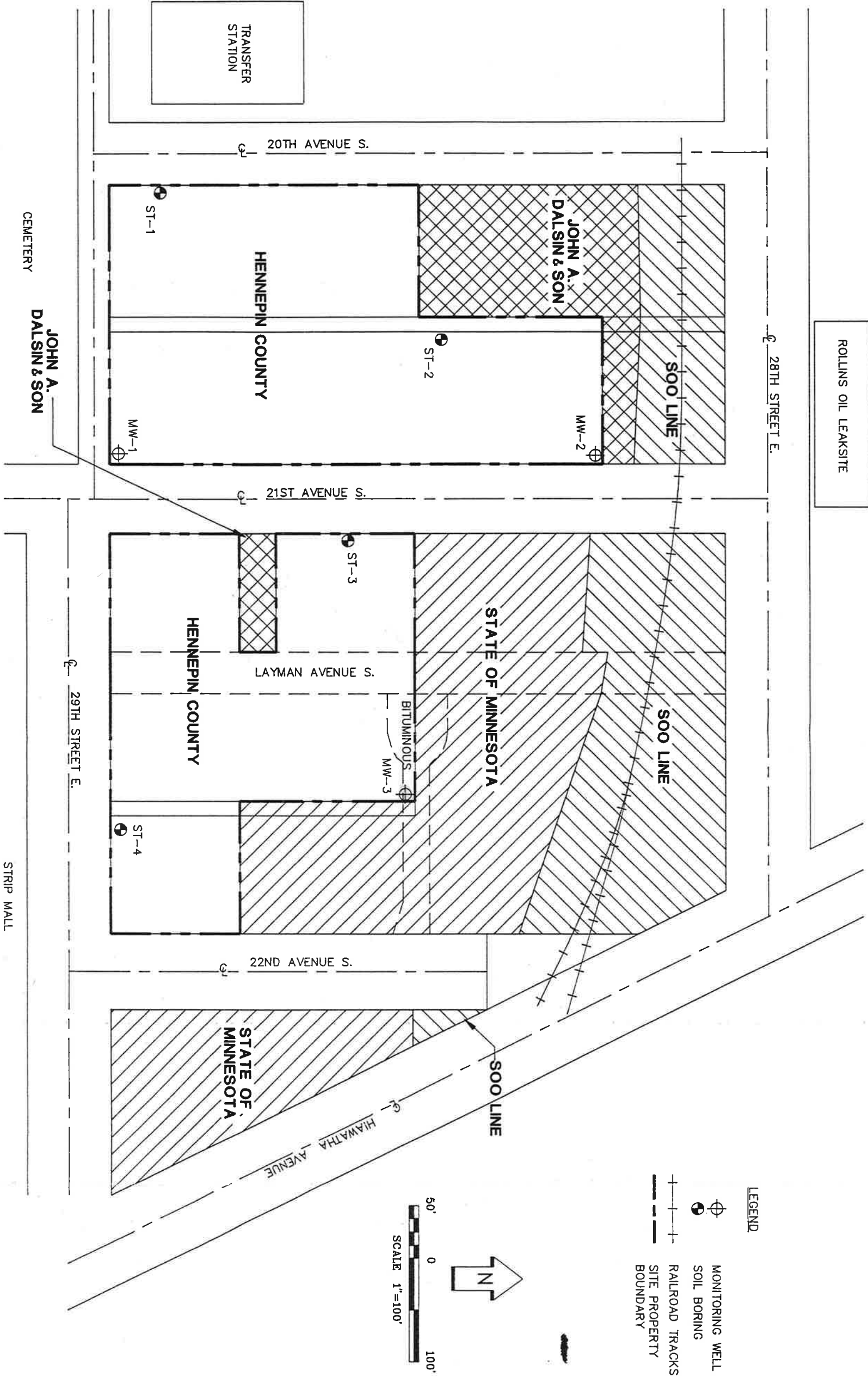
SITE LOCATION MAP
Phase II Environmental Site Assessment
Hennepin County Property Management Division
South Minneapolis Transfer Station Area

INT	DATE	SHEET
DRAWN BY: SJT	1-31-94	1
APP'D BY: PMT	1-31-94	OF
JOB NO. OMCX-93-022		5
DWG NO.	FIGURE NO.	
SCALE: 1:24,000	1	

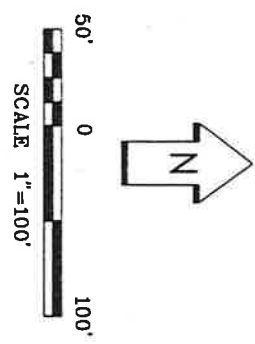
QUADRANGLE LOCATION
ST. PAUL WEST, MINN.
NW 1/4 ST. PAUL 15' QUADRANGLE

ROLLINS OIL LEAKSITE

FIGURE 2



- LEGEND
- MONITORING WELL
 - SOIL BORING
 - RAILROAD TRACKS
 - SITE PROPERTY BOUNDARY



INT	DATE
DRAWN BY: KMR	12-15-93
APP'D BY: PAT	02-03-94
JOB No. CMKX-93-0202	
DWG.No. MK30202	SHEET OF 2 5
SCALE 1"=100'	

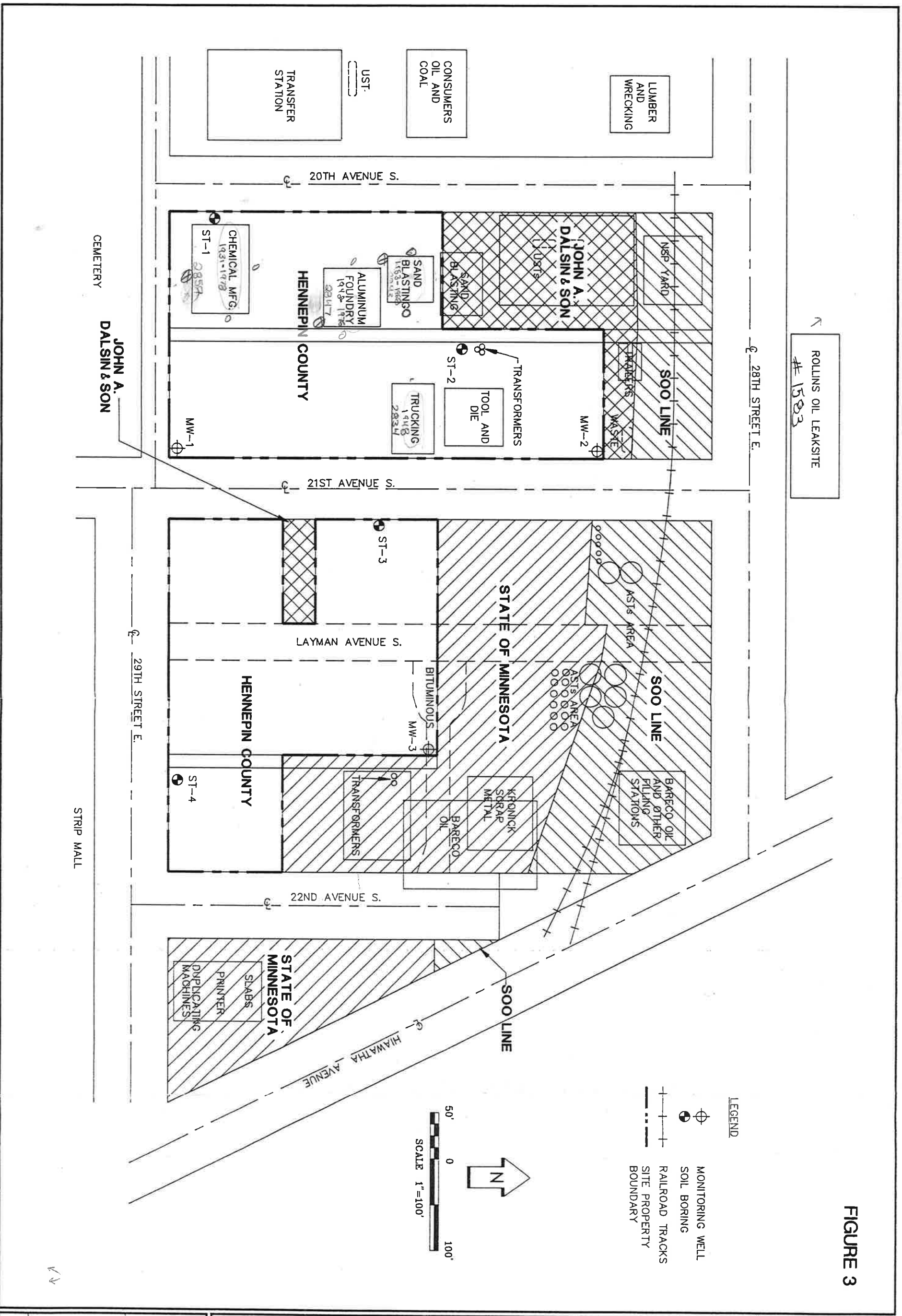
SITE MAP
 Phase II Environmental Site Assessment
 Hennepin County Property Management Division
 South Minneapolis Transfer Station Area

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Property boundaries for Phase I were altered

ROLLINS OIL LEAKSITE
1583

FIGURE 3



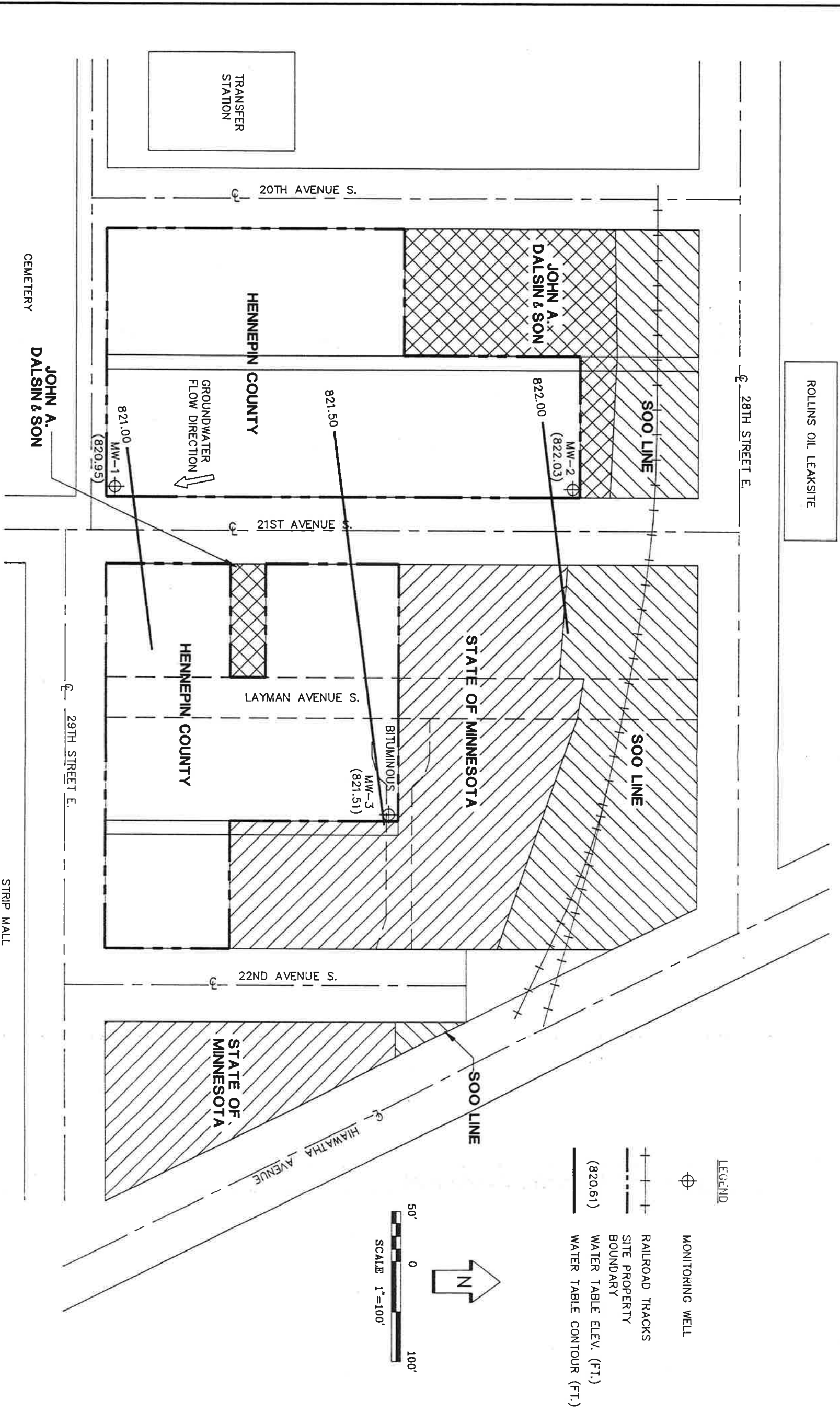
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PREVIOUS PROPERTY USE
Phase II Environmental Site Assessment
Hennepin County Property Management Division
South Minneapolis Transfer Station Area

INT	DATE
DRAWN BY: KMR	12-15-93
APP'D BY: PAT	02-03-94
JOB No. CMKX-93-0202	
DWG.No. MK30202	SHEET OF
SCALE 1"=100'	3 5

FIGURE # 3

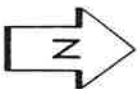
FIGURE 4



ROLLINS OIL LEAKSITE

LEGEND

- ⊕ MONITORING WELL
- +—+—+ RAILROAD TRACKS
- SITE PROPERTY BOUNDARY
- (820.61) WATER TABLE ELEV. (FT.)
- WATER TABLE CONTOUR (FT.)



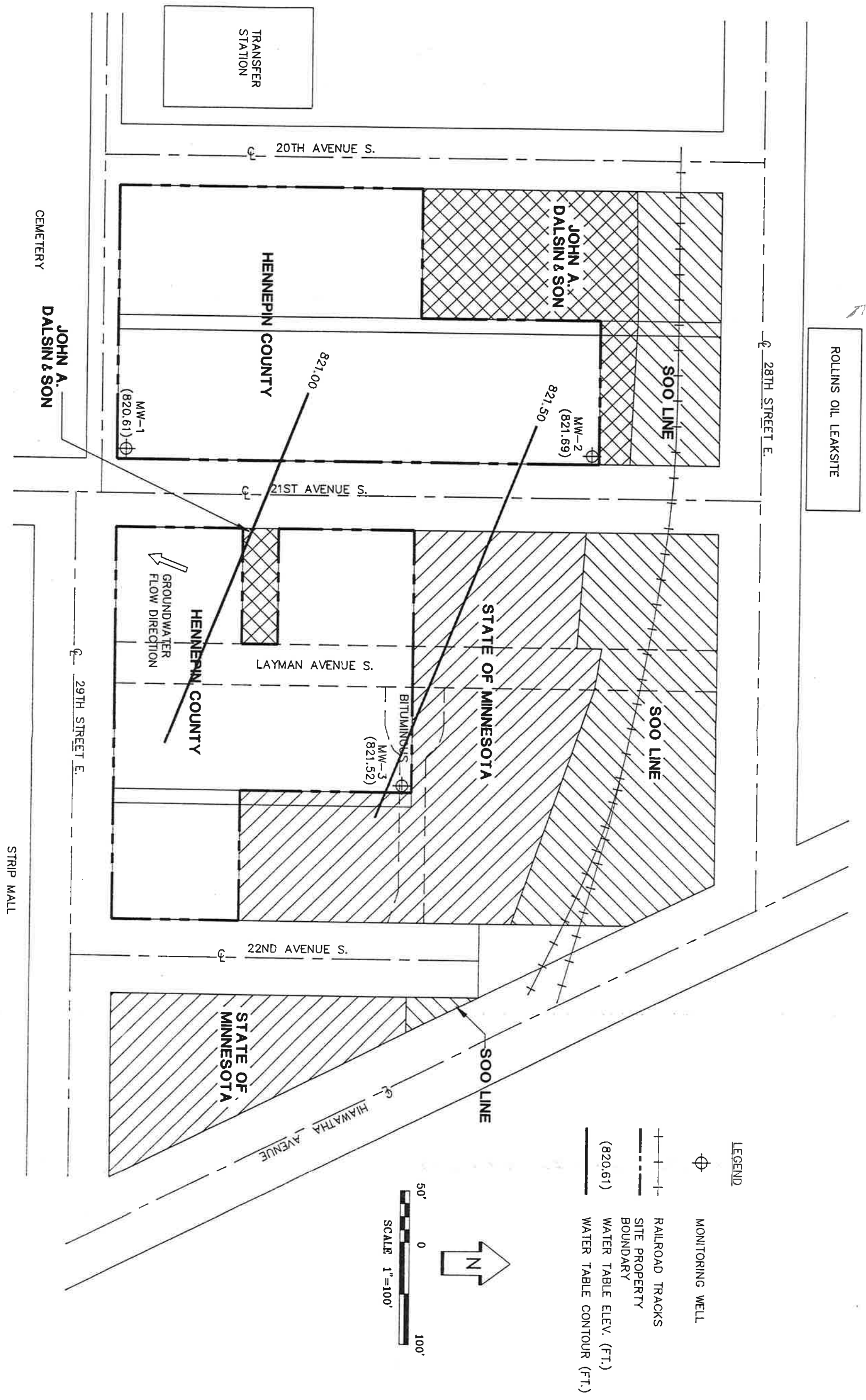
WATER TABLE CONTOUR MAP (12-22-93)
 Phase II Environmental Site Assessment
 Hennepin County Property Management Division
 South Minneapolis Transfer Station Area

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INT	DATE
DRAWN BY: KMR	12-15-93
APP'D BY: PAT	02-03-94
JOB No. CMKX-93-0202	
DWG.No. MK30202	SHEET OF 4 5
SCALE 1"=100'	

FIGURE # 4

FIGURE 5



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WATER TABLE CONTOUR MAP (01-27-94)
Phase II Environmental Site Assessment
Hennepin County Property Management Division
South Minneapolis Transfer Station Area

INT	DATE
DRAWN BY: KMR	12-15-93
APP'D BY: PAT	02-03-94
JOB No. CMKX-93-0202	
DWG.No. MK30202	SHEET OF 5 5
SCALE 1"=100'	

FIGURE # 5