



December 21, 1995

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FEB 14 1996

MPCA, HAZARDOUS  
WASTE DIVISION

Mr. Brian Kamnikar  
Project Manager  
Office of Environmental Services  
Minnesota Department of Transportation  
3485 Hadley Avenue North  
Oakdale, MN 55128

STS Project 96194-XB

Re: Groundwater Monitoring Progress Report for the Petroleum Release at the MnDOT Winona Truck Station in Winona, Minnesota (MPCA Leak #6612)

Dear Mr. Kamnikar:

STS Consultants, Ltd. (STS) has completed the Groundwater Monitoring Progress Report for the above-referenced project. This work order was performed in general accordance with the scope of work established in MnDOT's Work Order #11 approved by Mr. John E. Sandahl, Director of MnDOT Engineering Services, on June 20, 1995.

No groundwater impacts associated with the petroleum release were identified by the two rounds of groundwater sampling. However, a down-gradient groundwater monitoring point does not appear to exist on the project site based on interpretation of groundwater contour diagrams. Additional sampling and analysis of groundwater from the site monitoring wells is recommended. Geoprobe sampling of groundwater at a down-gradient location is also recommended to evaluate site groundwater conditions. Details of the groundwater monitoring results and STS' recommendations are included in the report.

We have appreciated the opportunity to provide you with environmental engineering services on this project. If you or any other MnDOT representatives have questions with regard to the information contained in this report, please feel free to call us.

Respectfully,

STS CONSULTANTS, LTD.

William B. Tepley  
Senior Project Manager

Robert L. DeGroot, CPG PE  
Principal Engineer

GJR/pb

Encs.  
C194XB01.DOC

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**PETROLEUM TANK RELEASE REPORT CHECKLIST**

In order to facilitate report review, the MPCA staff requests your assistance in completing this form which should be attached to all incoming reports. The form will be used to screen reports for completeness and to characterize the degree of contamination at the site.

**SITE CHARACTERIZATION**

YES                      NO

*Emergency:*

- Vapor or explosive hazard? X
- if yes, has this been addressed?
- Actual drinking water supply impacts? X
- if yes, has alternate supply been provided?

*Ground Water and Soil:*

- Has ground water been impacted? X
- Is there free product? X
- if yes, has recovery been initiated?
- Are there down-gradient receptors at risk? X
- Did you answer "yes" to any question, 7 through 14, on the Hydrogeologic Setting and Ground Water Characterization Worksheet? X

- Is this a progress report? X
- if yes, is it quarterly or annual?

**REPORT CONTENTS**

Check the appropriate report type and completed sections (as outlined in the "Petroleum Tank Release Reports" document).

- |  |   |   |   |
|--|---|---|---|
| <input type="checkbox"/> Excavation Report Form                  | <input type="checkbox"/> RI Report                                | <input type="checkbox"/> CAD Report                         | <input checked="" type="checkbox"/> Progress Reports                |
| <input type="checkbox"/> All applicable sections completed       | <input type="checkbox"/> Introduction                             | <input type="checkbox"/> Proposed CAD                       | <input checked="" type="checkbox"/> Introduction                    |
| <input type="checkbox"/> Figures                                 | <input type="checkbox"/> Background, incl. Twp/Rng, Lat/Long      | <input type="checkbox"/> Appropriate sections of appendices | <input checked="" type="checkbox"/> Background                      |
| <input type="checkbox"/> Lab reports with chain of custody forms | <input type="checkbox"/> Excavation Form                          | <input type="checkbox"/> Figures                            | <input type="checkbox"/> Corrective action                          |
|  | <input type="checkbox"/> RI Results                               |   | <input checked="" type="checkbox"/> Ground water monitoring results |
|  | <input type="checkbox"/> Discussion                               |   | <input checked="" type="checkbox"/> Discussion                      |
|  | <input type="checkbox"/> Conclusions                              |   | <input checked="" type="checkbox"/> Conclusions                     |
|  | <input type="checkbox"/> Recommendations                          |   | <input checked="" type="checkbox"/> Recommendations                 |
|  | <input type="checkbox"/> Proposed CAD                             |   | <input checked="" type="checkbox"/> Appendices                      |
|  | <input type="checkbox"/> Appendices, incl. IGWIS form             |   | <input checked="" type="checkbox"/> Tables, figures                 |
|  | <input type="checkbox"/> Tables, figures                          |   |   |
|  | <input type="checkbox"/> Hydrogeologic Characterization Worksheet |   |   |

If recommendations are included in the report, provide a brief description (e.g., no further action, modification of ground water recovery system, additional monitoring, etc.): STS recommends that an additional round of groundwater sampling from the site monitoring wells be completed.

Geoprobe sampling and analysis of groundwater from a down-gradient location is also recommended to evaluate site groundwater conditions.

If a CAD is proposed, provide a brief description (e.g., soil venting, pump and treat, bioremediation, etc.):

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**Groundwater Monitoring Progress Report for the  
Petroleum Release at the MnDOT Winona Truck Station  
in Winona, Minnesota (MPCA Leak #6612)**

**1.0 INTRODUCTION**

STS Consultants, Ltd. was contracted by the Minnesota Department of Transportation (MnDOT) to perform groundwater sampling at the MnDOT Winona Truck Station. The site is located in the northwest quadrant of the intersection of Trunk Highway No. 61 and 54th Avenue in the City of Goodview, Minnesota (Figure 1). A Remedial Investigation report dated July 13, 1995 was prepared by STS and submitted to MnDOT. The remedial investigation work included soil borings, installation of three monitoring wells and one groundwater sampling event.

The scope of work for this project consisted of sampling three existing monitoring wells in August of 1995 and preparing a groundwater monitoring report which summarizes the historical groundwater quality data. The scope of work for this project was outlined in MnDOT's Work Order No. 11 to STS Consultants, Ltd. The purpose of this work was to obtain groundwater quality information and assess this information relative to the previous groundwater data.

## **2.0 BACKGROUND**

### **2.1 Underground Storage Tank Removals**

Two underground storage tanks (USTs) were removed from the site on August 3, 1993 by MnDOT personnel. One UST, a 4,000 gallon capacity STI-P<sub>3</sub> tank which contained unleaded gasoline (gasohol), was installed in 1987. The other UST, a 6,000 gallon capacity asphalt coated steel tank which contained diesel fuel, was installed in 1971. Both USTs were reported to be in good condition upon removal based on to a report prepared by Huntingdon (Underground Storage Tank Excavation Observations, MnDOT Truck Station, Winona, Minnesota dated October 29, 1993). No replacement tanks were installed.

Residual petroleum contamination remained in place in the soils at the east end of the gasoline UST basin, based on analytical results presented in the Huntingdon report. Low concentrations of benzene, toluene, and xylene were also identified in groundwater sampled from the base of the gasoline UST basin. Minor residual contamination was noted to be present in the soils at the base of the diesel UST basin excavation.

The causes of petroleum impacts as identified in the Huntingdon report included:

- Product spilled during removal of the gasoline UST and existing impacts.
- Overfilling or fuel dispensing at the diesel fuel UST and pump island.

### **2.2 Remedial Investigation**

MnDOT contracted with STS in November of 1994 to perform a Remedial Investigation. A total of seven soil borings were performed and three monitoring wells were installed. Monitoring well MW-1 was placed southwest of the gasoline UST basin along the south property fence. Monitoring

well MW-2 was placed north of the diesel UST basin adjacent to a storage shed. Monitoring well MW-3 was placed east of the diesel UST basin near the northwest corner of the maintenance shop. The locations of the soil borings and monitoring wells are illustrated on Figure 2, see Appendix. The subsurface exploration and monitoring well installation work was performed between February 14 to 16, 1995. Groundwater sampling was performed on February 16, 1995.

No residual soil impacts were identified at the former diesel fuel UST basin, based on the results of the remedial investigation work.

Residual petroleum impacts to soils were identified immediately below the former gasoline UST and at depth near the soil/groundwater interface. The soil impacts near the former gasoline UST basin appeared to be associated with spillage during tank removal and a former dry well connected to floor drains within the building. The soil impacts appeared to be limited in extent.

No groundwater impacts were identified by the February 16, 1994 sampling event. The results of the two groundwater sampling events are discussed in Section 5.0 of this report.

### 3.0 GROUNDWATER SAMPLING

The monitoring wells were purged and sampled by STS personnel in general accordance with MPCA sampling protocols. A minimum of five well volumes of water were removed from each well prior to sampling. Well sampling information forms are included in the Appendix. Trip blanks accompanied the technician in the field and were returned to the laboratory for analysis. Field blank samples were also prepared at the time of sampling. Water samples from each well were obtained using dedicated HDPE disposable bailers. The water samples were placed in clean glass containers with Teflon septum and screw-on closures. The samples were placed in a cooler with ice and transported to Legend Technical Services, Inc. in St. Paul, Minnesota for analysis. A chain of custody record was used to document sample delivery.

The water samples obtained on February 16, 1995 were analyzed for volatile organic compounds (VOCs) by MDH Method 465-D, diesel range organics (DRO) and gasoline range organics (GRO). The second round of water samples obtained on August 3, 1995 were analyzed for benzene, toluene, ethylbenzene and total xylenes (BTEX), methyl-tert-butyl ether (MTBE), GRO, DRO and dissolved lead. A duplicate analysis of all parameters was performed on the water sample obtained from monitoring well MW-2 (laboratory blind run) for the August 1995 sampling event. Copies of the laboratory results and chain of custody records for both of the groundwater sampling events are included in the Appendix.

#### **4.0 GROUNDWATER MONITORING DATA SUMMARY**

An MPCA site monitoring work sheet (Fact Sheet #7) was completed and is included in the Appendix. A water level summary table is included as Table 1. Groundwater contour maps for the sampling dates are included as Figures 2 and 3 in the Appendix.

Water levels in the monitoring wells varied approximately 0.5 to 2.0 feet between the February 1995 and August 1995 sampling dates. Groundwater flow direction changed from north northwest to west-northwest between these two dates. No apparent down-gradient monitoring well exists, based on review of the groundwater contour maps relative to the source area.

No hydrographs were prepared because the two measuring events provide too limited of a database to show water level fluctuation trends. No cumulative graphs of analytical results were prepared because no groundwater impacts were identified.



## **5.0 GROUNDWATER MONITORING RESULTS**

Table A on the following page summarizes the chemical analysis results of the two groundwater sampling events. No GRO, DRO, VOCs by MDH method 465-D and BTEX associated with the petroleum release were identified by either of the sampling events. In addition, MTBE and dissolved lead were not detected in the August 1995 sampling round. Methylene chloride was detected at 190 parts per billion (ppb) in the field blank of the February 1995 sampling event. The methylene chloride was likely due to laboratory contamination. 1,1,1-Trichloroethane was also detected in the field blank at a concentration of 1.0 ppb. The source for the detection of 1,1,1-Trichloroethane in the February 1995 field blank is unknown. Laboratory analytical reports for the two sampling events are included in the Appendix

Review of the groundwater flow directions shown on the groundwater contour maps indicates that groundwater flow down-gradient of the release area is not intercepted by a monitoring well. An additional monitoring point along the west property line in the vicinity of the salt shed would be required to evaluate down-gradient groundwater conditions.

**TABLE A**  
**Summary of Groundwater Chemical Analysis Results**  
**Sampling Events on 2/16/95 and 8/3/95**  
**STS Project 96194-XB**

Parameter	Sampling Date	(Sample) (Units)	MW-1	MW-2	MW-3	Duplicate	Field Blank	Trip Blank	Method Blank	PQL*	RAL
			ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
GRO	2/16/95		<	<	<	--	<	<	<	100	--
	8/3/95		<	<	<	<	<	<	<	100	--
DRO	2/16/95		<	<	<	--	<	<	<	70	--
	8/3/95		<	<	<	<	<	<	<	70	--
MTBE	8/3/95		<	<	<	<	<	<	--	5.0	--
Dissolved Lead (filtered)	8/3/95		<	<	<	<	<	<	--	10	20
VOCs by MDH 465-D	2/16/95		<	<	<	--	<	<	<	0.2-5.0**	Compound specific
Methylene chloride	2/16/95		<	<	<	--	190	<	<	5.0	50.0
	2/16/95		<	<	<	--	1	<	<	0.2	600.0
BTEX	8/3/95		<	<	<	<	<	<	<	1.0	compound specific

< = less than Practical Quantitation Limit

-- = not applicable

\*PQL - Practical Quantitation Limit

\*\*Varies, see laboratory report

RAL = Recommended Allowable Limit for Drinking Water Contaminants, Minnesota Department of Health Release No. 3, 1991

ppb = parts per billion

## 6.0 DISCUSSION/CONCLUSIONS

No petroleum compounds were identified in the water samples collected from the monitoring wells for the two sampling events conducted at the Winona MnDOT Truck Station. An elevated level of methylene chloride detected in the field blank for the February 1995 sampling event was likely due to laboratory contamination. 1,1,1-Trichloroethane was also detected in the field blank associated with the February 1995 sampling event at a concentration of 1.0 parts per billion. The source of the 1,1,1-trichloroethane in the blank is unknown. Groundwater flow direction is generally to the north-northwest to west-northwest towards the Mississippi River.

No impacts to groundwater have occurred at the Winona MnDOT Truck Station based on the chemical analysis results from the two groundwater sampling events. However, none of the existing monitoring wells are located directly down-gradient of the release area. Additional groundwater sampling would be required to confirm that no groundwater impacts occurred from the identified release.

## 7.0 RECOMMENDATIONS

STS recommends that a “geoprobe” evaluation including groundwater sampling and analysis be performed in the vicinity of the salt shed on the project site to determine whether groundwater impacts down-gradient of the release exist. Additional sampling and analysis of groundwater from the site monitoring wells at the time of the geoprobe evaluation is also recommended.

## 8.0 GENERAL QUALIFICATIONS

The analysis and recommendations submitted herein are based on the data as presented in this report. This report has been prepared in accordance with generally accepted engineering practices to assist MnDOT in the evaluation of the site. No other warranty, expressed or implied, is made. The scope of this report is limited to the specific project and location described herein and represents our understanding of the significant aspects in reference to the site. Some interpretations in this report were made based on information obtained from other organizations. This information was assumed to be reliable and was not reviewed for accuracy.

## REFERENCES

Remedial Investigation for MnDOT Truck Station in Goodview, Minnesota (MPCA Leak #6612), STS Project 96194-XA dated July 13, 1995.

"Underground Storage Tank Excavation Observations, MnDOT Truck Station, Winona, Minnesota", Huntingdon Report TCT No. 4700 93-185 dated October 29, 1993.

## APPENDIX

Site Monitoring Worksheet (MPCA Fact Sheet #7)

Figure 1 - Site Location Diagram

Figure 2 - Groundwater Contour Map - 2/16/95

Figure 3 - Groundwater Contour Map - 8/3/95

Table 1 - Water Level Summary

Sampling Information Forms

Laboratory Analysis Reports and Chain of Custody Records

**SITE MONITORING WORKSHEET**  
**Fact Sheet #7**  
**Minnesota Pollution Control Agency**  
**LUST Clean-Up Program**  
**April 1993**

The Minnesota Pollution Control Agency (MPCA) staff expect this worksheet to simplify the required post-investigation site monitoring reports. Submit this worksheet:

- \* quarterly, after the remedial investigation (RI) is complete but before corrective action is taken;
- \* quarterly, during corrective action design (CAD) installation; and
- \* quarterly, after CAD is operational, along with "CAD System Monitoring Worksheet," (fact sheet #11).

Completion and submittal according to the above schedule fulfills your quarterly site monitoring report requirements. You may include a short cover letter whenever circumstances require. However, you must still submit an annual progress report as described in "Petroleum Tank Release Reports" (Fact Sheet #3). [NOTE: MPCA staff may reduce the frequency of progress reporting on a site specific basis.]

Where attachments are requested (tables, maps, graphs, etc.), please check off those items attached. The only table not mandatory is that for dissolved oxygen.

MPCA Leak Number:         6612        

I. Groundwater Monitoring

Please attach the following:

- |               |   |
|---------------|---|
| <u>  X  </u>  | Cumulative table of groundwater monitoring results, including all sample blanks.  |
| <u>  X  </u>  | Copies of most recent laboratory reports for groundwater analyses, including a copy of the Chain of Custody.  |
| <u>  X  </u>  | Cumulative table of groundwater elevation and product thickness results.  |
| <u>      </u> | Hydrograph for all monitoring and recovery wells. <b>(Hydrographs not included due to limited data associated with two sampling events.)</b>  |
| <u>      </u> | Graph(s) showing contaminant concentrations over time for all monitoring and recovery wells. <b>(No impacts were observed in the water samples obtained from the monitoring wells.)</b> |
| <u>  X  </u>  | Groundwater contour map based on the most recent groundwater elevation data.  |
| <u>      </u> | Table of dissolved oxygen sample results (if collected)   |



Please describe unusual circumstances that may have influenced the sampling results: None

---

Please detail significant observations made at the site: None

---

**II. Vapor Impact Monitoring** - No vapor impacts have been observed.

If vapor impacts were detected during the remedial investigation, please attach:

- a cumulative table of vapor monitoring results. The table should identify the location of all vapor monitoring points (i.e., sewer manholes, basements, etc.)
- a map of vapor monitoring locations.

Sampling instrument used: \_\_\_\_\_

Sampling method: \_\_\_\_\_

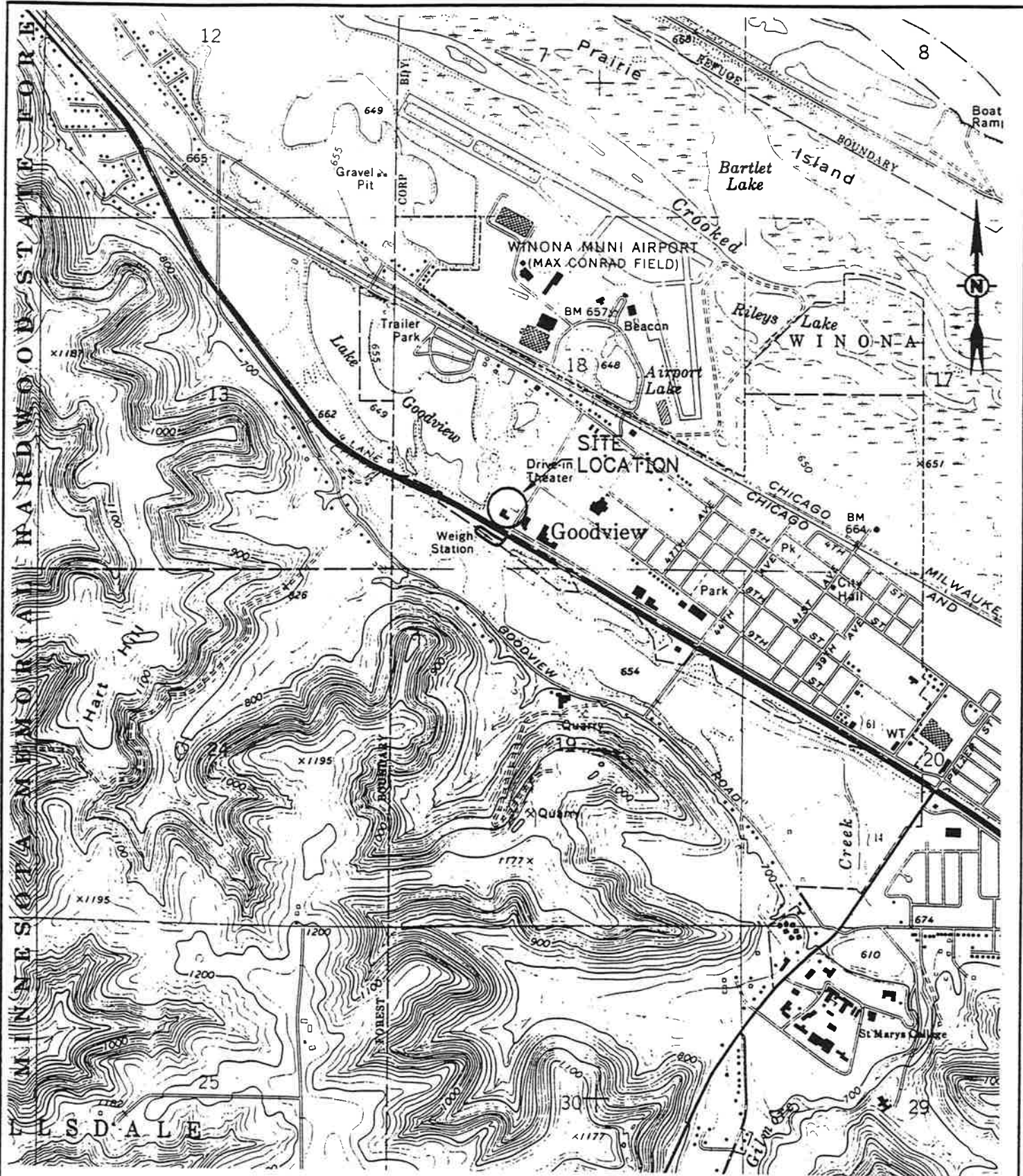
NOTE: If vapor concentrations exceed 10 percent of the lower explosive limit, exit the building and contact the local fire department immediately. Then contact the MPCA spills unit at voice 612/297-8610, TDD 612/297-5353 or Greater Minnesota TDD 1-800-627-3529.

Vapor mitigation is required.

**III. Recommendations**

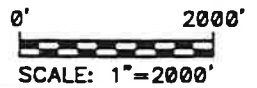
Use this space to detail any recommendations for modifying the current monitoring schedule:

STS recommends that an additional round of water sampling be performed to evaluate site groundwater conditions. Additionally, a geoprobe evaluation of groundwater should also be performed at a down-gradient location from the release area .



**LEGEND**

BASE MAP: U.S.G.S. WINONA WEST QUADRANGLE,  
7.5 MINUTE SERIES  
1972



**SITE LOCATION DIAGRAM**



Project: WELL RECEPTOR SURVEY  
Client: MnDOT - WINONA TRUCK STATION  
Location: WINONA, MN

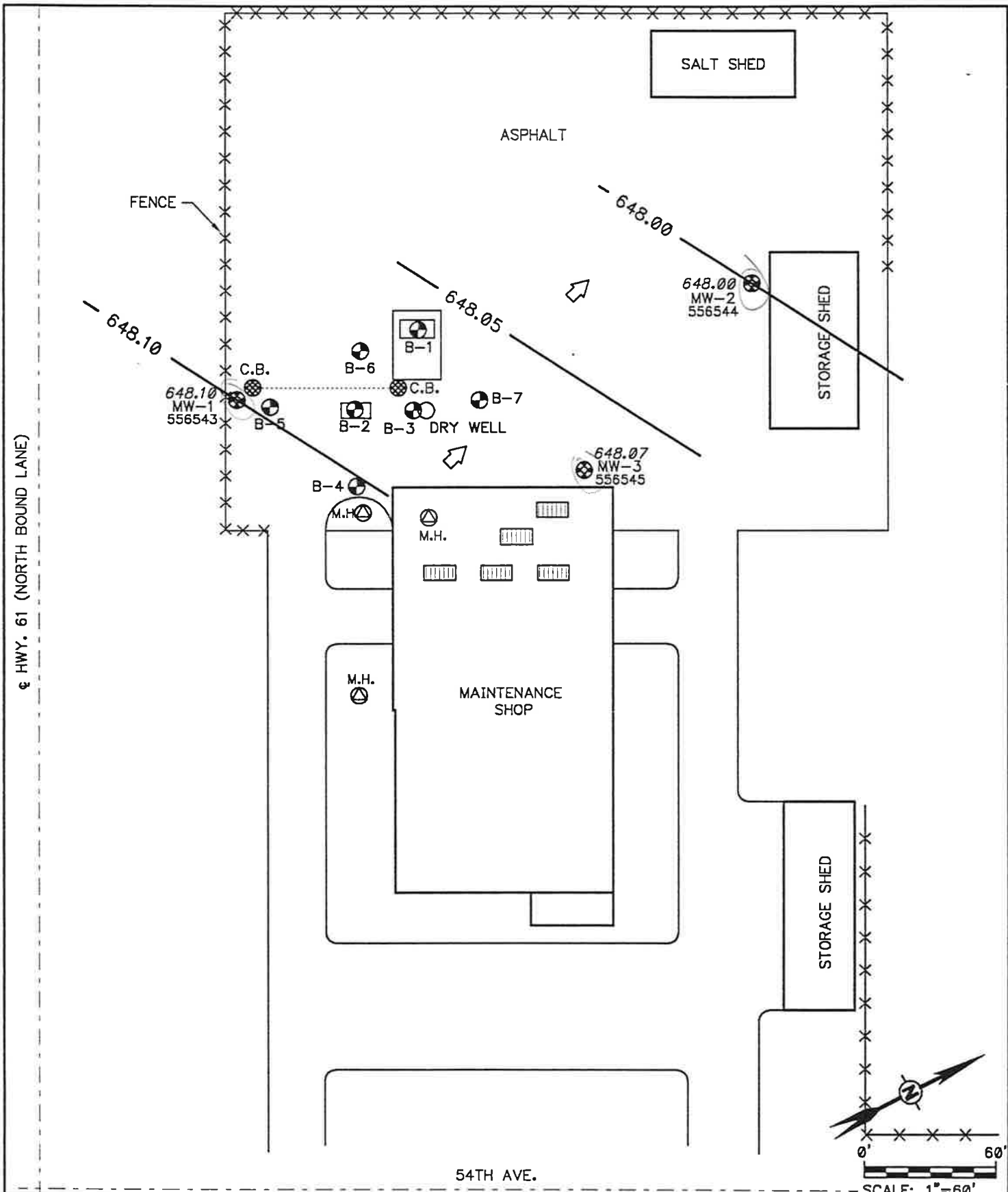
AutoCAD File: 96194LOC  
STS Project No: 96194-AX  
Client Proj. No:

Checked by: GJR  
Approved by: RLD

CAD Operator: SNS Plot Date: 01-20-1995

Revision No:

Figure: 1



**LEGEND**

- CATCH BASIN
- TRENCH GRATES
- GROUNDWATER ELEVATION
- SOIL BORING
- MAN HOLE
- MONITORING WELL UNIQUE WELL NO.
- FLOW DIRECTION

BASE MAP: TWIN CITY TESTING  
 DRAWING 93185-2  
 DATED 10/11/93.

**GROUNDWATER CONTOUR DIAGRAM - ON 2/16/95**



Project: MnDOT - WINONA TRUCK STATION  
 Client: MnDOT  
 Location: GOODVIEW, MN

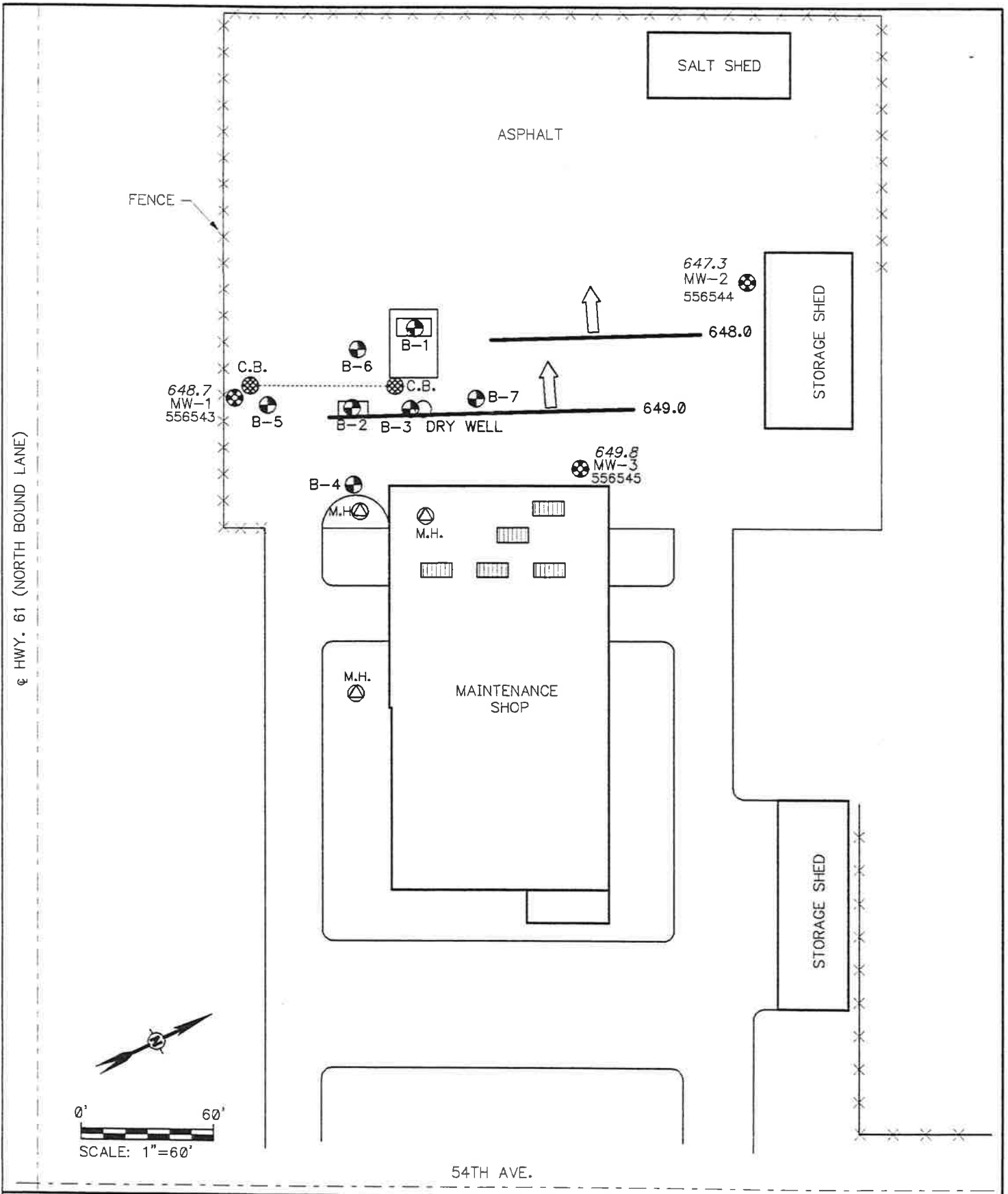
AutoCAD File: 96194L02  
 STS Project No: 96194-XA  
 Client Proj. No:

Checked by: GJR  
 Approved by: RLD

CAD Operator: SNS Plot Date: 04-11-1995

Revision No:

Figure: **2**



<b>LEGEND</b> CATCH BASIN SOIL BORING TRENCH GRATES MAN HOLE MONITORING WELL GROUNDWATER ELEVATION FLOW DIRECTION	Unique Well No.	BASE MAP: TWIN CITY TESTING DRAWING 93185-2 DATED 10/11/93.
	<b>GROUNDWATER CONTOUR DIAGRAM - ON 08/03/95</b>	
	Project: MnDOT - WINONA TRUCK STATION Client: MnDOT Location: GOODVIEW, MN	AutoCAD File: 96194LO2 STS Project No: 96194-XA Client Proj. No:
CAD Operator: NTM Plot Date: 10-31-1995	Revision No:	Checked by: GJR Approved by: RLD Figure: <b>3</b>

