DEPARTMENT OF TRANSPORTATION - Office of Environmental Services - Room 124

STATE OF MINNESOTA
Office Memorandum

DATE: November 9, 1992

TO: Mark Koplitz
MPCA - Tanks and Spills Section

FROM: Brian Kamnikar
Environmental Compliance and Investigation Unit

PHONE: 297-2703

#1338

SUBJECT: PROGRESS REPORT, MNDOT JORDAN TRUCK STATION - LEAK #1388

Enclosed for your review is a copy of the groundwater monitoring progress report for the above mentioned site. Levels of petroleum contamination detected in the latest sampling rounds continue to be much less than peak contaminations observed at the site in earlier sampling events. However, recent groundwater elevation measurements have shown a variation in groundwater flow direction.

MNDOT will install an additional downgradient monitoring well to address the groundwater flow fluctuations. A minimum of two additional rounds of quarterly samples will be collected from the four wells. The results will be forwarded to you in an updated progress report for review.

Please call me with any questions concerning this project.

cc:
J. Lundy, MPCA
C. Hoffstedt, MNDOT - Golden Valley
C. Lucas, MNDOT - Golden Valley
B. Johnson/File, MNDOT - Environmental Services

Progress Report

6 November 1992

Groundwater Monitoring Well Sampling

Introduction:

Site: MNDOT Jordan Truck Station
MPCA Leak #: 1388
Sampling Dates: 8-20-90, 5-30-91, 9-5-91, 12-10-91, 3-16-92, 6-18-92, 9-21-92.

This progress report summarizes follow-up groundwater sampling results for the site mentioned above. This information will be used to determine future site actions. The work was authorized and completed by MNDOT personnel.

Background:

A 1,200 gallon regular/unleaded gasoline and a 3,000 gallon diesel fuel underground storage tanks were removed from the MNDOT Jordan Truck Station on October 20, 1989.

A remedial investigation was performed by Braun Intertec, including installation of monitoring wells on August 15 and 16, 1990. Braun describes native soils as being lean clay and organic silt to a depth of 7 to 10 feet below grade. Beneath these soils is a coarse alluvium of poorly graded sand to poorly graded sand with silt to a depth of at least 15 feet. The water table is approximately 7 to 8 feet below the ground surface.

WATER QUALITY DATA

Monitoring Well #2

Parameter	8-20-90	5-30-91	9-5-91	12-10-91	3-16-92	6-18-92	9-21-92
Benzene	2.5	4.8	1.4	<5	<5	<5	<5
Ethylbenzene	2.2	15	10	5	27	11	<5
Toluene	1.8	2.8	0.4	<5	<5	<5	<5
Xylene	1.9	6.7	3.3	<5	23	7	<5
THC as gas	[1]	700	800	850[2]	2100	680[3]	410
THC as fuel oil	1,600[4]	11,000	12,000	600	1000[5]	520[6]	710
MTBE	<5	<5	<5	<5	<5	<5	<1

All values in parts per billion.

[1] Total Hydrocarbons calculated as fuel oil.

[2] Chromatographic pattern not typical of gasoline.

[3] Chromatographic pattern not typical of #2 fuel oil.

[4] The chromatography of the sample is somewhat atypical of the fuel oil standard.

[5] Chromatographic profile also contains higher boiling hydro carbons.

[6] Chromatographic profile also contains lower boiling hydro carbons.

WATER QUALITY DATA

Monitoring Well #3

Parameter	8-20-90	5-30-91	9-5-91	12-10-91	3-16-92	6-18-92	9-21-92
Benzene	<1	<0.2	<0.2	<5	<5	<5	<5
Ethylbenzene	<1	<0.2	<0.2	<5	<5	<5	<5
Toluene	<1	<0.2	<0.2	<5	<5	<5	<5
Xylene	<1	<0.2	<0.2	<5	<5	<5	<5
THC as gas	<100	<30	<30	<30	<30	<30	<30
THC as fuel oil	<500	<200	<200	<200	<200	<200	<200
MTBE	<1	<5	<5	<5	<5	<5	<1

All values in parts per billion.

Water Level Measurements

Monitoring Well	Water Level Elevation (feet)						
	8-20-90	5-30-91	9-5-91	12-10-91	3-16-92*	6-18-92	9-21-92
MW-1	747.22	749.53	746.62	747.18	748.10	747.84	749.26
MW-2	747.04	749.23	746.36	747.08	750.96	747.66	748.52
MW-3	747.11	749.38	746.45	747.03	750.95	747.75	748.35

* Flow direction on this date is 90 degrees from the expected direction. It appears that there may be an error in the water level measurements on this date.

Discussion:

According to the results of both the tank removal and remedial investigations, low level petroleum contamination is present in soils near the south and west side of the former UST basin. Braun determined the soil contamination to be limited and relatively low in concentration.

Petroleum constituents have been detected in only one of three wells on site. This well is located downgradient of soil boring ST-5 which revealed the highest level of petroleum contaminated soil encountered on site. Therefore, MW-2 water samples should represent the greatest magnitude of petroleum impacted groundwater on site. However, groundwater elevations taken on 12-10-91 and 9-21-92 reveal a more northerly groundwater flow direction. In these instances, the location of MW-2 may actually be regarded as side gradient rather than downgradient.

BETX concentrations have not exceeded RAL's at any sampling event. MTBE has not been detected at any time above method detection limits. THC levels had risen in the first three sampling events but have shown a sharp decrease during the succeeding four sampling events.

As already mentioned, groundwater elevations show a slight variance in flow direction from northwest to north. Also, the elevations of 3-16-92 should probably be discounted. It appears likely that there was a recording error in the depth to groundwater in MW-1.

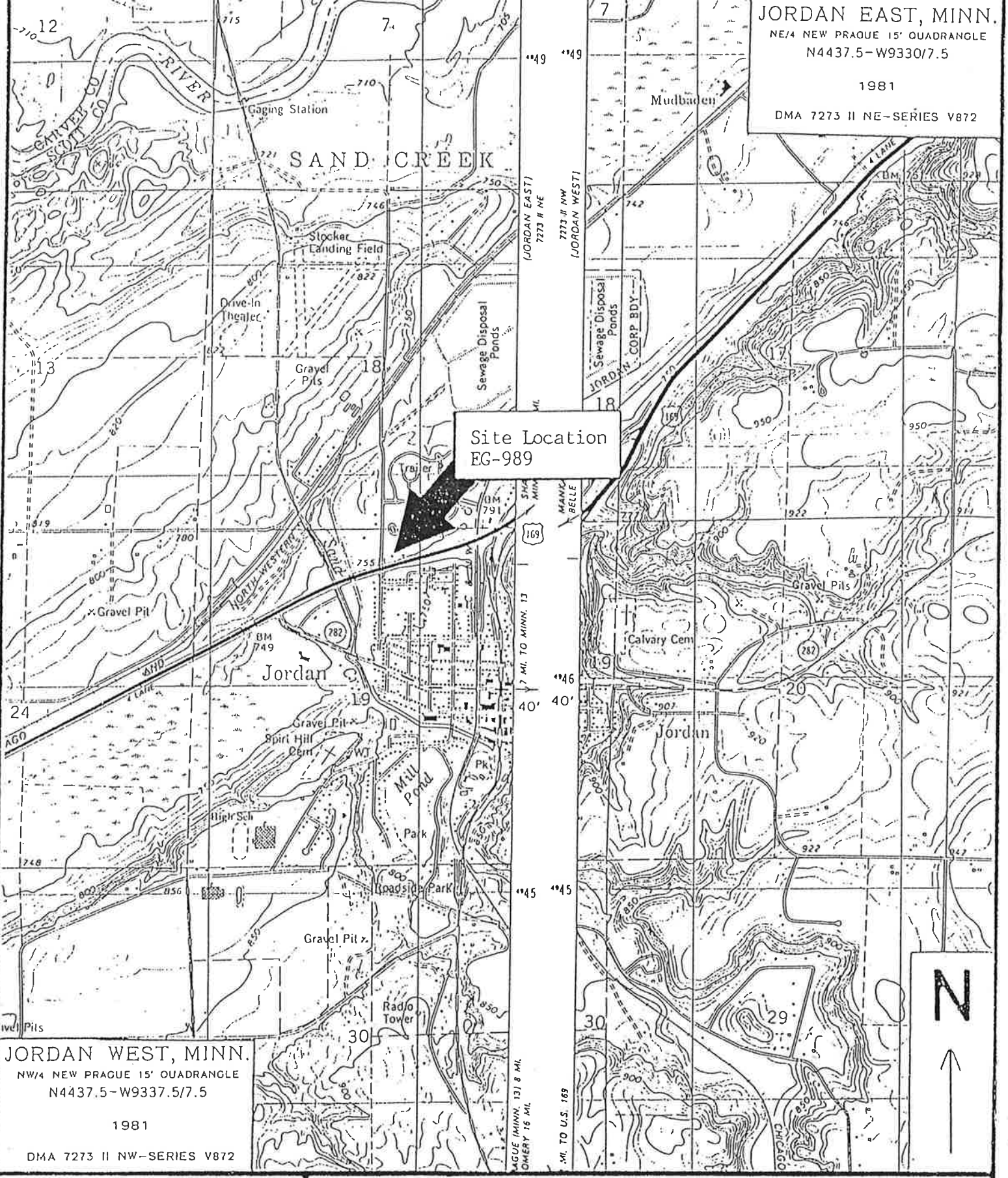
Conclusions:

Levels of petroleum contamination remaining in soils appear to be limited and low level. No free product has been detected in any of the wells. All petroleum constituents detected in monitoring well #2 have been below RAL's. There are no potential groundwater or vapor receptors identified in the area. The latest rounds of groundwater analyses shows a marked decrease in THC contamination as compared to peak contamination concentrations detected in the second and third sampling events.

However, the variation in groundwater flow direction observed at the site may be responsible, at least in part, for the lower contamination concentrations detected.

Recommendations:

Braun determined it unlikely that any impact to drinking water sources of potential groundwater receptors is likely from this petroleum release since no users of the unconsolidated aquifer were identified directly downgradient of the site. Also, the release should not pose a threat to nearby surface waters since petroleum compounds did not exceed RAL's. MNDOT will install a fourth groundwater monitoring well directly north of the former tank basin. This installation will be completed before the next scheduled quarterly round of sampling. This should insure that either this new well or MW-2 will be situated directly downgradient of the contamination source. MNDOT will collect groundwater samples and elevations for a minimum of two additional quarterly sampling events to further evaluate the site.

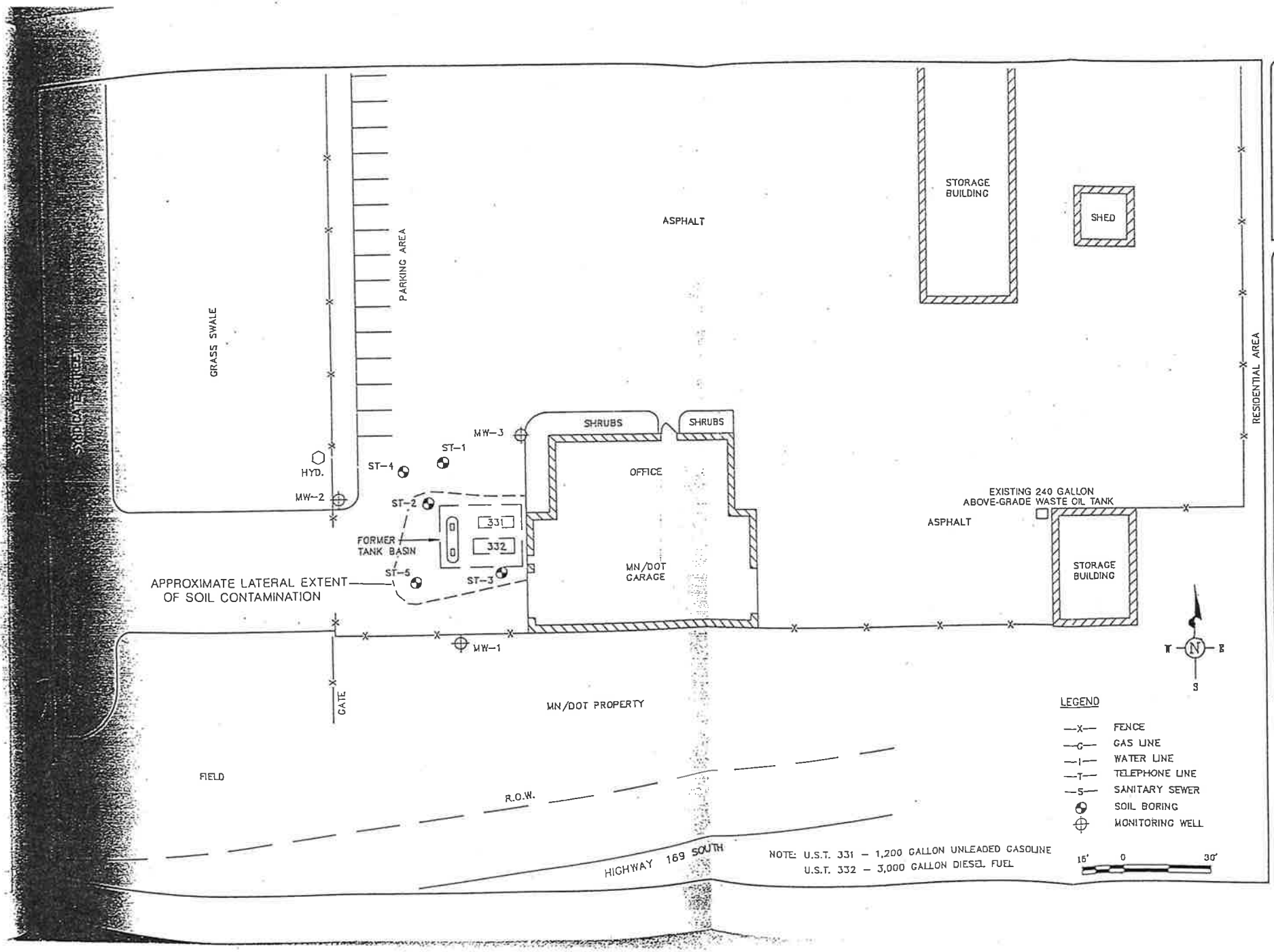


BRAUN

Figure 1
SITE Location Map
UST Remedial Investigation
EG-989

MN Dept. of Transportation
Jordan, MN

Date: 9-11-90	Revised:	Drawn: RCW	Scale: 1"=2000'



BRAUN ENVIRONMENTAL LABORATORIES INCORPORATED

SOIL CONTAMINATION MAP
U.S.T. Remedial Investigation
MN/DOT Jordan Truck Station
Jordan, Minnesota

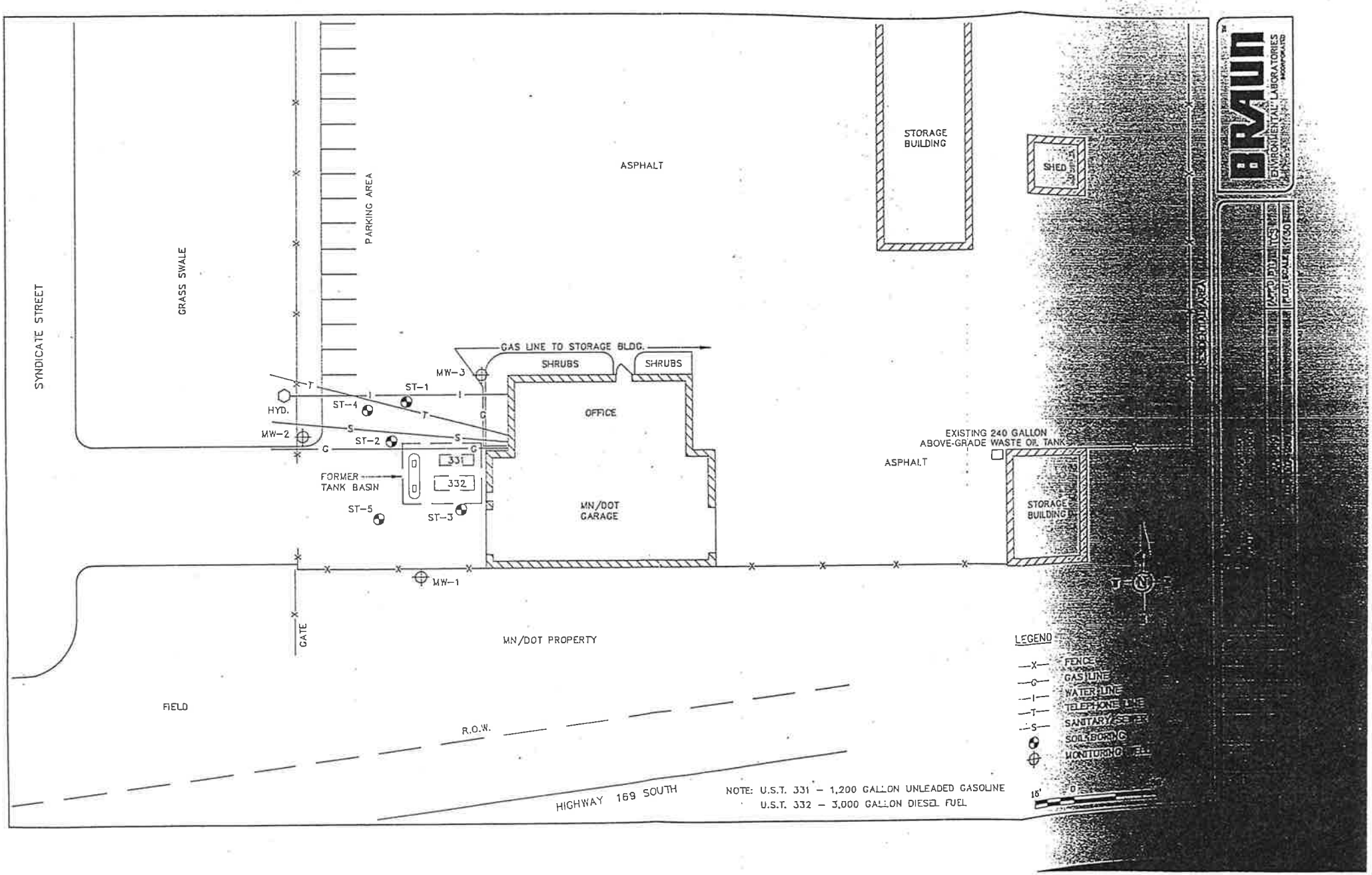
DRAWN BY: KMR | DWG.No. EC-989 | APP'D BY: TCS
PLOT TIME: | JOB I.D.# EC-989 | PLOT SCALE 1:30

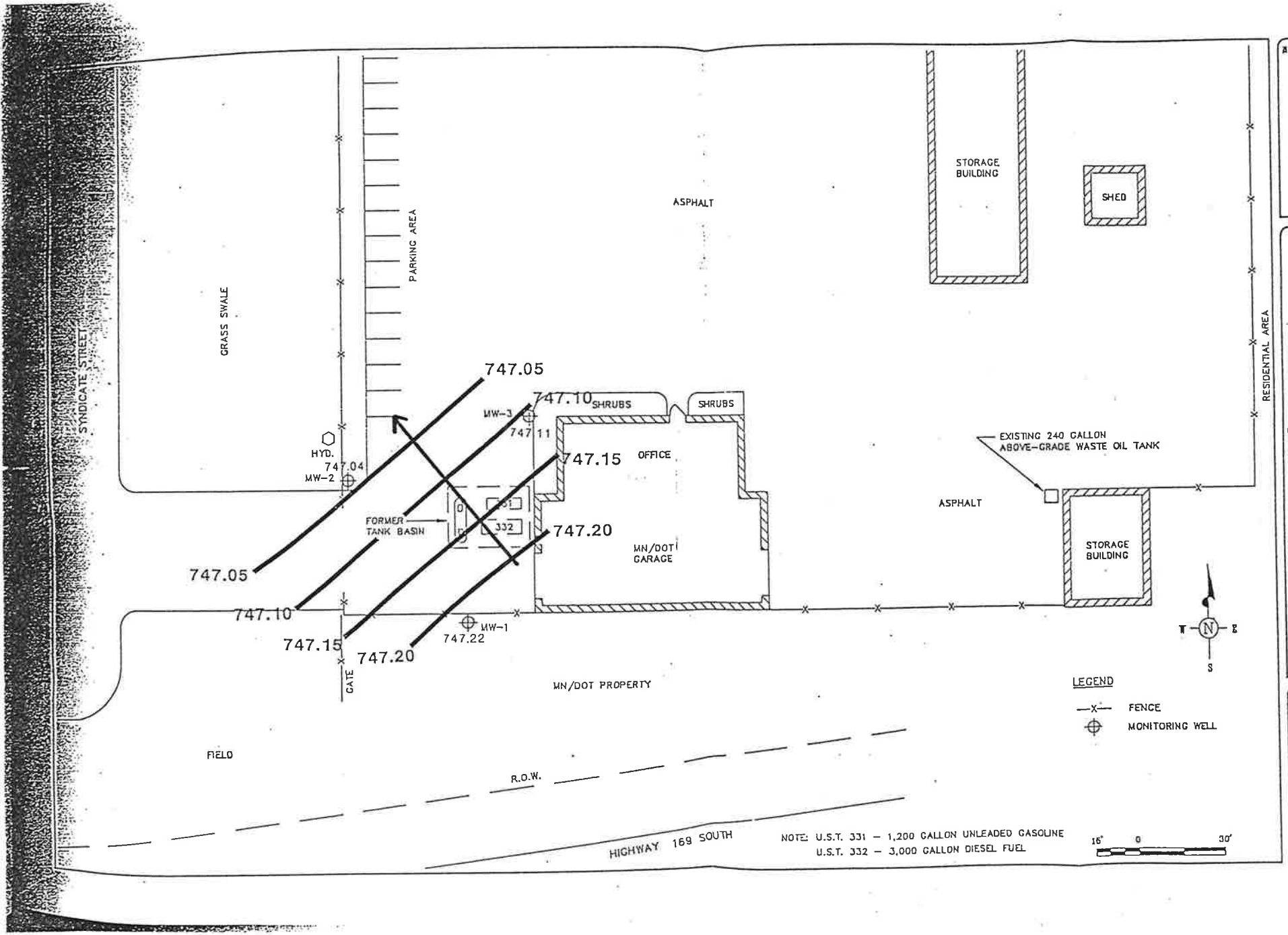
REVISED	
DATE	INT
10-14-98	KMR

SHEET	OF
1	1

SCALE 1"=30'

FIGURE # 7


SYNDICATE STREET
GRASS SWALE
PARKING AREA
ASPHALT
STORAGE BUILDING
SHED
GAS LINE TO STORAGE BLDG.
SHRUBS
SHRUBS
MW-3
ST-1
ST-4
HYD.
MW-2
ST-2
OFFICE
331
332
FORMER TANK BASIN
ST-5
ST-3
MN/DOT GARAGE
EXISTING 240 GALLON ABOVE-GRADE WASTE OIL TANK
ASPHALT
STORAGE BUILDING
MW-1
GATE
MN/DOT PROPERTY
FIELD
R.O.W.
HIGHWAY 169 SOUTH
LEGEND
FENCE
GAS LINE
WATER LINE
TELEPHONE LINE
SANITARY SEWER
SOIL BORING
MONITORING WELL
NOTE: U.S.T. 331 – 1,200 GALLON UNLEADED GASOLINE
U.S.T. 332 – 3,000 GALLON DIESEL FUEL
BRAUN
ENVIRONMENTAL LABORATORIES



BRAUN ENVIRONMENTAL LABORATORIES INCORPORATED

GROUNDWATER CONTOUR MAP 8-20-90
U.S.T. Remedial Investigation
MN/DOT Jordan Truck Station
Jordan, Minnesota

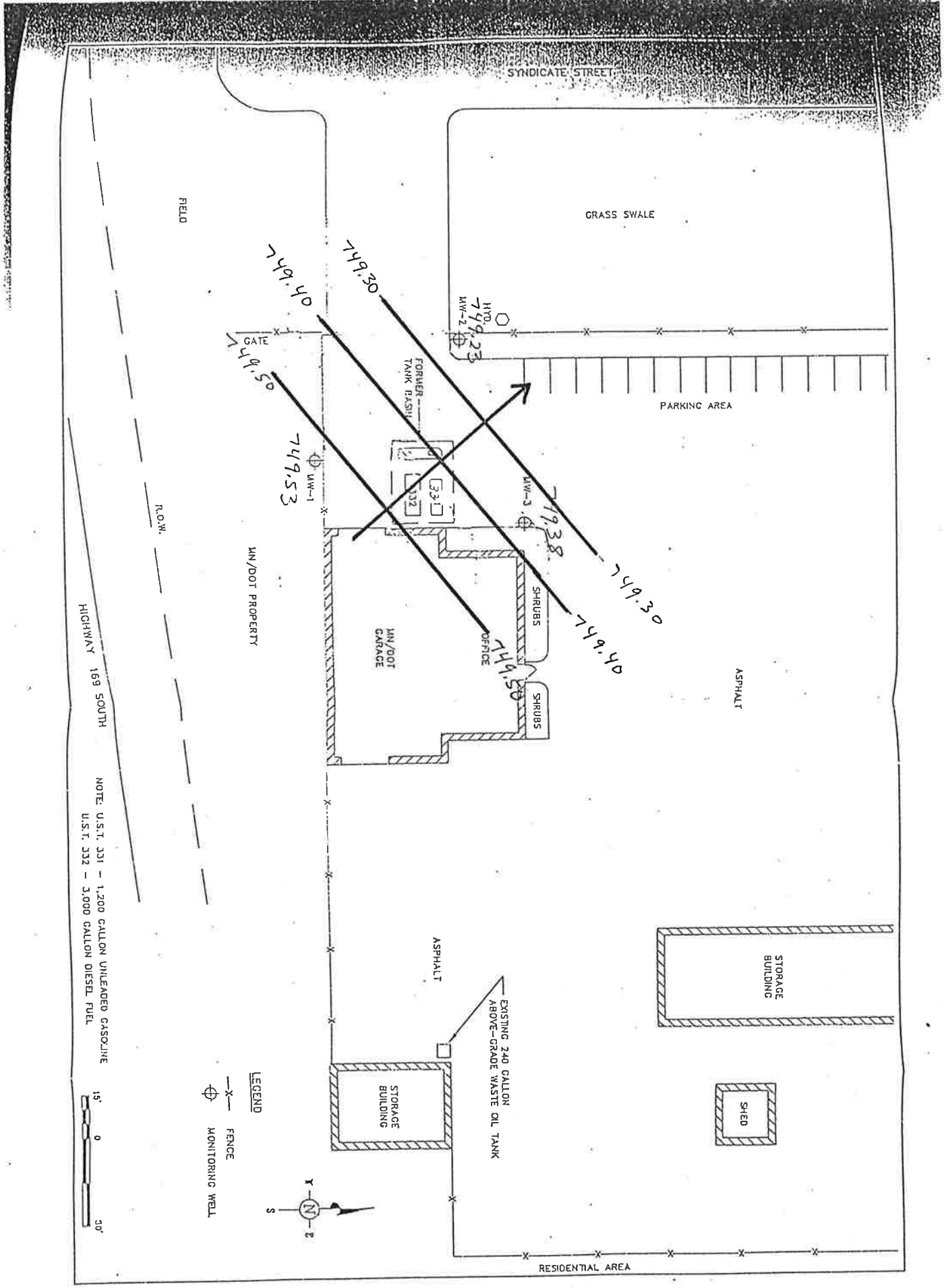
DRAWN BY: KMR | DWG.No. EG-989 | APP'D BY: TCS
PLOT TIME: | JOB I.D.# EG-880 | PLOT SCALE 1:30

REVISED	
DATE	INT
10-1-90	KMR

SHEET	OF
1	1

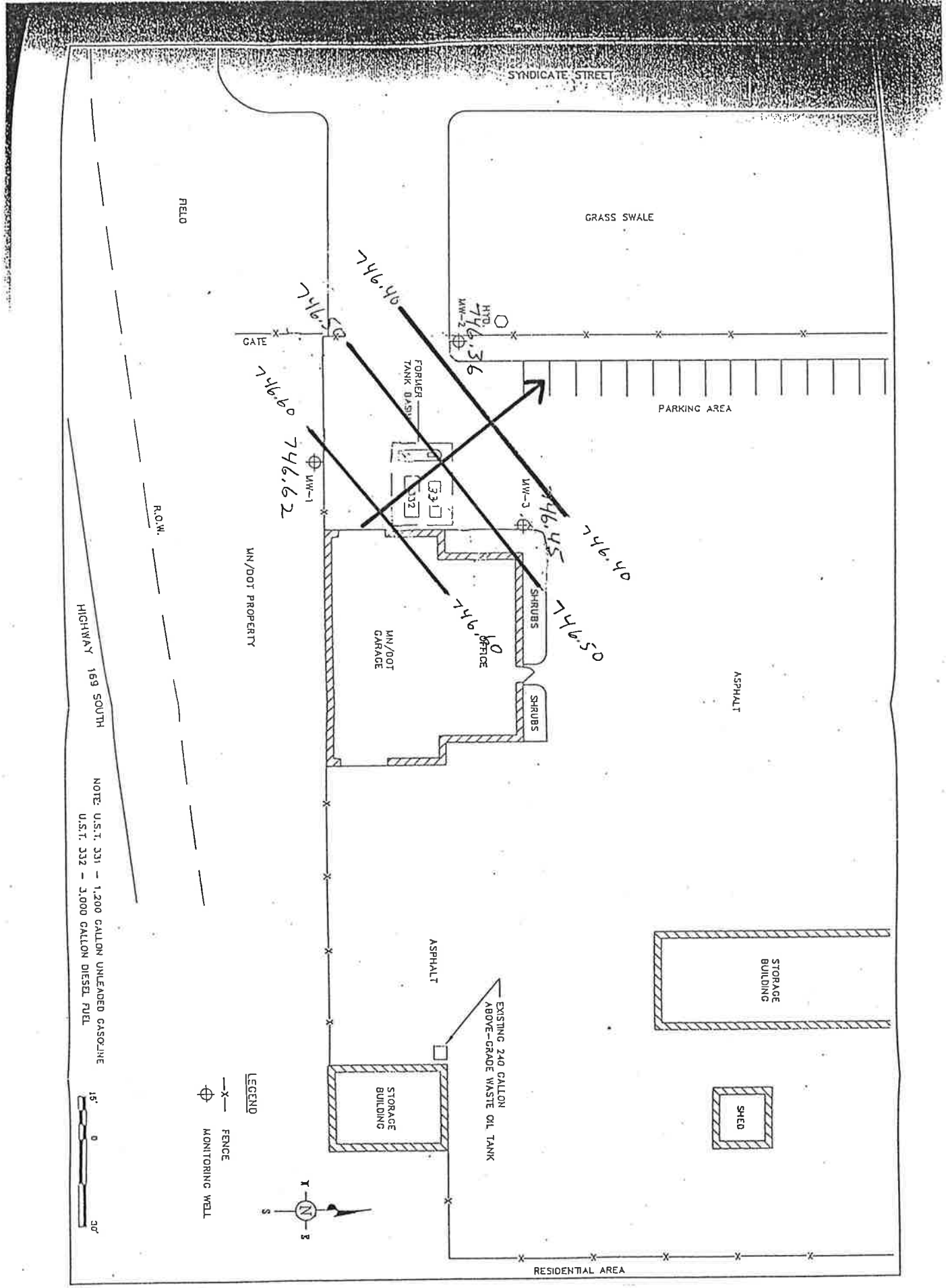
SCALE 1"=30'

FIGURE# 6



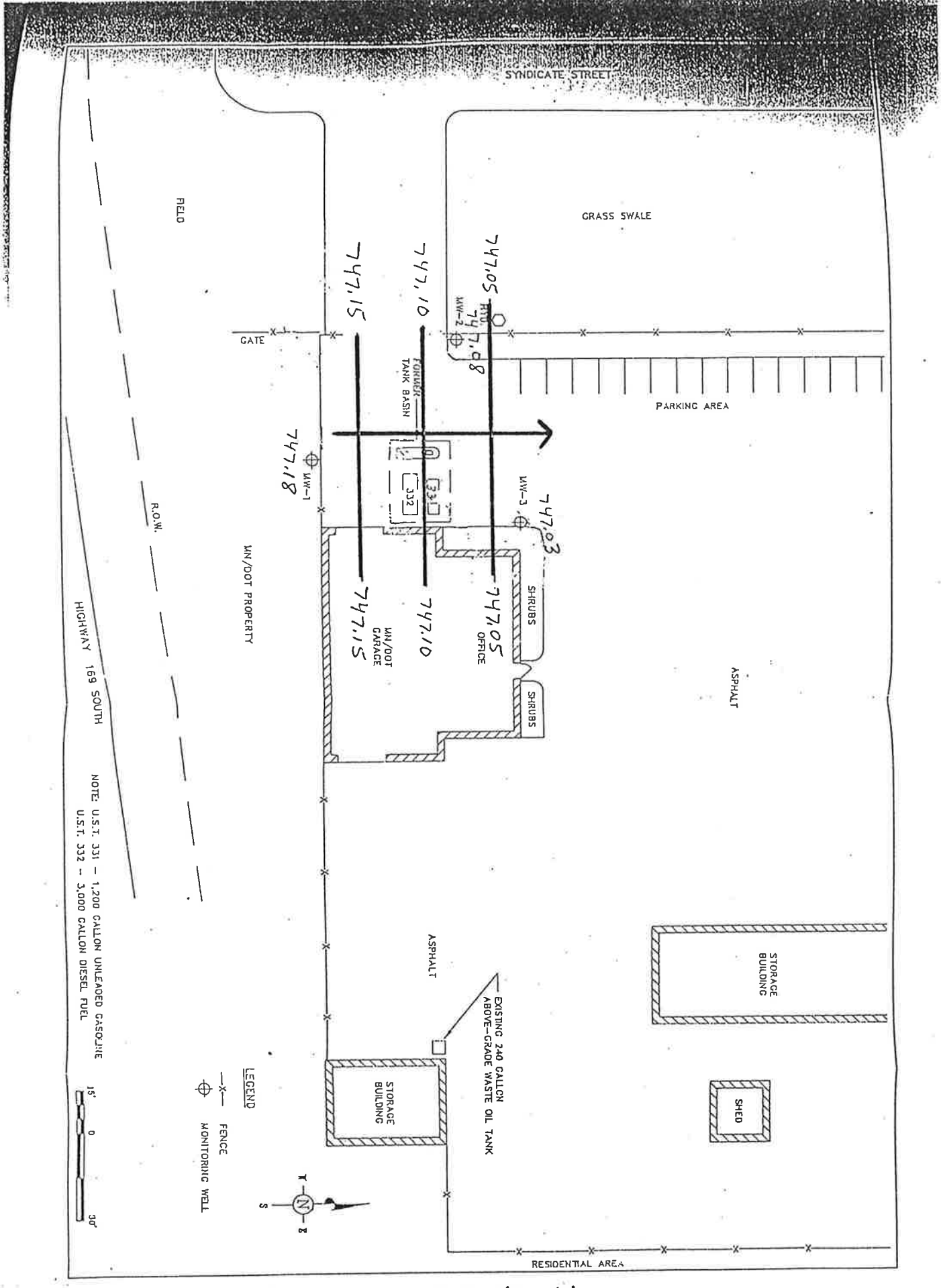
Groundwater Flow Direction

5-30-91



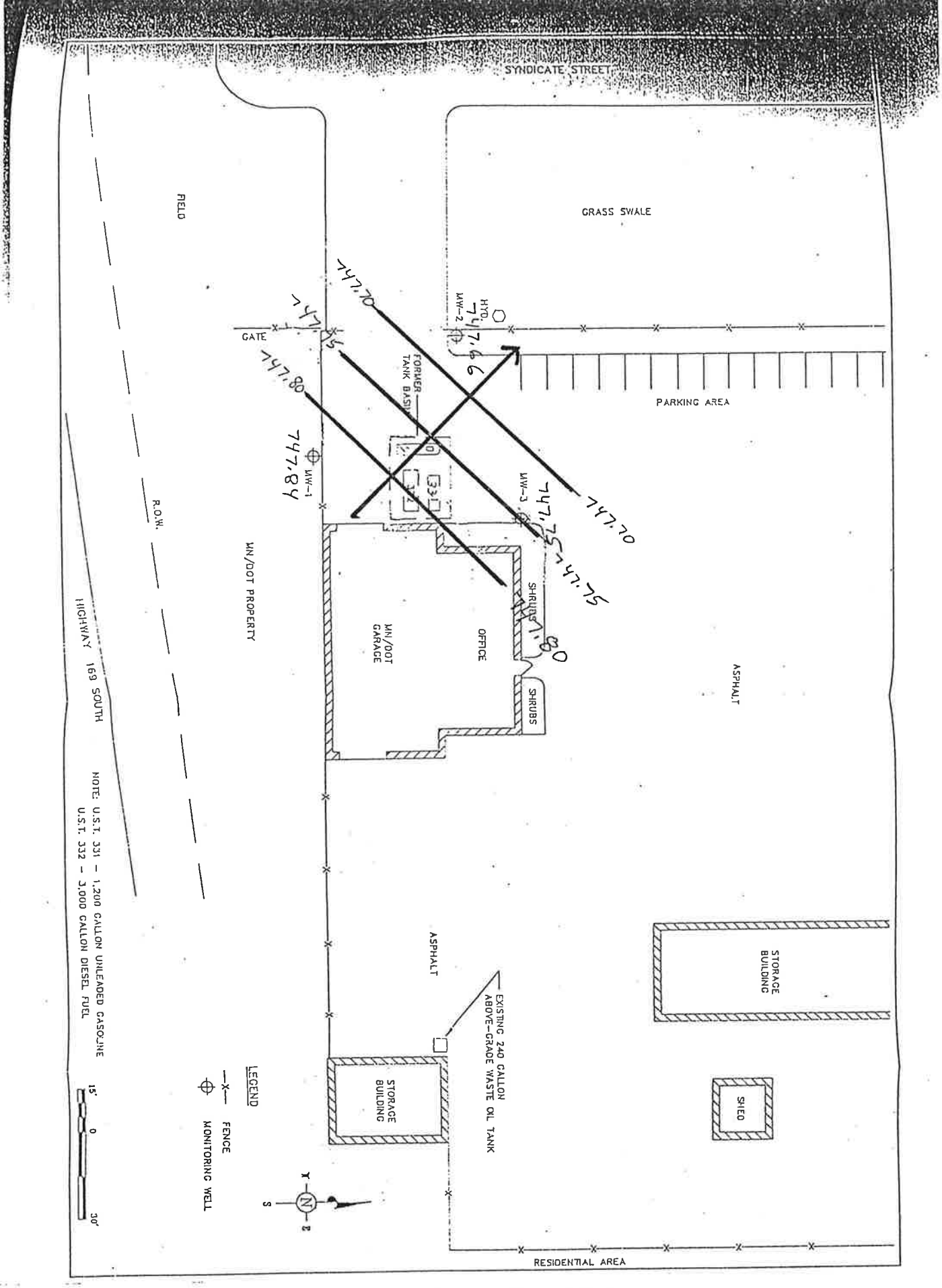
Groundwater Flow Direction

9-5-91



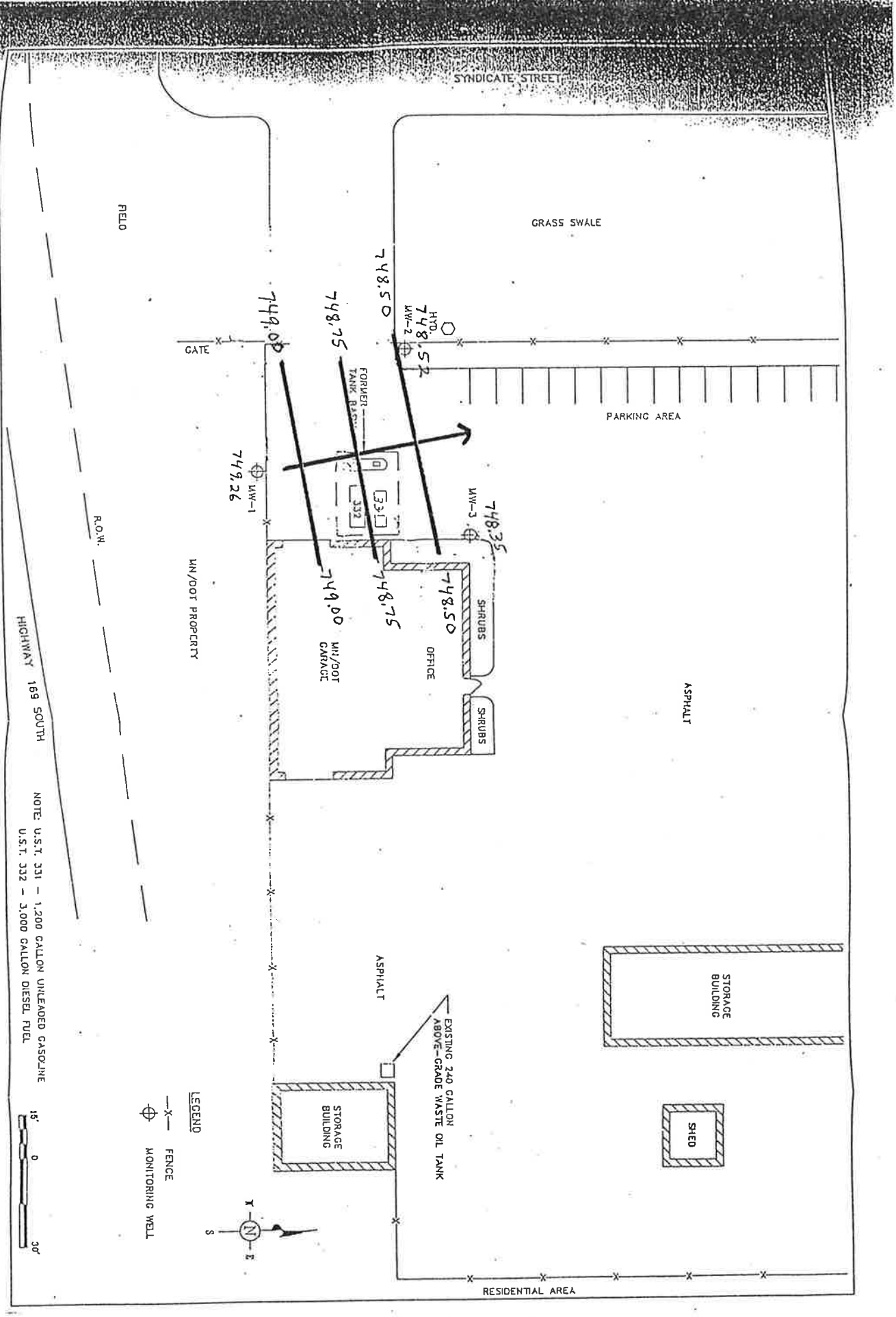
Groundwater Flow Direction

12-10-91



Groundwater Flow Direction

6-18-92



Groundwater Flow Direction

9-21-92

Appendix I

Field Stabilization Forms

note: bailer shows possible gw stratification
- bottom third lighter color
- water color grey greeny odor moderate

Site Jordan Truck Station

Date 5-30-91

Well number MW-2

STABILIZATION TEST

note: preserved samples with HCl
well volume = 1.5

Pumping rate (gallons/minute) ______
Type of pump Bailer (Teflon)
Water level before pumping (nearest 0.01 ft. below top of casing) gross level - 7.85
Approximate well location 70' W. of bldg. by entrance gate
Calculated volume of water in casing ______
Weather conditions cloudy, 65-70° sprinkles

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm) [temp. corrected]	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
12:50	6.66	141×10 [1639]	16		5 gal
12:57	6.71	142×10 [1651]	16.1		7 gal
1:03	6.73	141×10 [1602]	17		

Total Depth to bottom of well - 16.92'

Sample for: VOC's

Site	Jordan Truck Station
Date	5/30/91
Well number	MW-3

STABILIZATION TEST

Preservation: all samples w/ 1:1 HCl
Well volume: 1.1
Pumping rate (gallons/minute) _____
Type of pump Bailer Teflon Rinsed Bailer Prsm MW 1
Water level before pumping (nearest 0.01 ft. below top of casing) Gross Level – 7.87'
Approximate well location NW Corner of Bldg in parking Lot
Calculated volume of water in casing _____
Weather conditions Cloudy ~ 65-70°

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm) [corrected]	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
11:55	6.72	110x10 [1309]	15		3 gal
12:03	6.82	110x10 [1309]	15.1		6 gal
12:15	6.85	100x10 [1190]	15.1		8 gal
12:23	6.82	105x10 [1280]	15		10 gal

Total Depth To Bottom 17.05'

sample for: VOCs

Site	Jordan Truck Station
Date	5/30/91
Well number	MW1

STABILIZATION TEST

Note: All samples preserved w/ 1:1 HCl

1 well volume = 1.3 gal

Pumping rate (gallons/minute) _____

Type of pump Teflon Bailer

Water level before pumping (nearest 0.01 ft. below top of casing) Gross - 8.75' (Plumbed)

Approximate well location South Side of Bldg Next to fence

Calculated volume of water in casing 0

Weather conditions Cloudy, Humid ~ 65-70°

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm) raw [corrected]	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1030		67.5x10	8.1 (Cooler)		practice
~10:35	6.48	78x10 [950]	14 (use direct thermometer)		initial
10:47	6.58	83x10 [1037]	13		5 gal
10:55	6.83	85x10 [1062]	13		10 gal
11:00	6.62	85x10 [1062]	13		15 gal
11:06	6.60	85x10 [1062]	13		20 gal

Total depth To Bottom 17.05'

STABILIZATION TEST

Site Jordan
Date 9-5-91
Well number MW1

Pumping rate (gallons/minute) _____
Type of pump Field washed BailER
Water level before pumping (nearest 0.01 ft. below top of casing) 11.16'
Approximate well location _____
Calculated volume of water in casing 1.03 gal Bottom 17.46'
Weather conditions cloudy, windy 20°C

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1020				11.16	
1025	7.6	830	15		1.0
1027	7.5	830	15		2.0
1029	7.4	830	15		2.5
1031	7.4	850	14		3.0
1033	7.3	850	14		4.0
1035	sample			11.70	

- NO petrol odor
- water lt. Brown

STABILIZATION TEST

Site JORDAN
Date 9-5-91
Well number MW2

Pumping rate (gallons/minute) _____
Type of pump Dedicated Bailer
Water level before pumping (nearest 0.01 ft. below top of casing) 10.72'
Approximate well location _____
Calculated volume of water in casing 1.09 gal Bottom 17.40'
Weather conditions Cloudy, windy 20°C

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
0925				10.72	
0927	6.8	1400	17		1.0
0929	6.7	1250	17		2.0
0931	6.7	1250	17		3.0
0934	6.7	1200	17		4.5
0940	Sample			10.72	

- NOTICABLE petrol odor
- water blackish

STABILIZATION TEST

Site Jordan
Date 9-5-91
Well number MW3

Pumping rate (gallons/minute)
Type of pump Dedicated Bailer
Water level before pumping (nearest 0.01 ft. below top of casing) 10.80
Approximate well location
Calculated volume of water in casing 1.08 gal Bottom 17.43
Weather conditions cloudy, windy 20°C

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
0905				10.80	
0908	6.4	410	16		1.0
0911	6.6	450	16		1.5
0915	6.6	630	16		2.0
0918	Dry slow recharge			16.78	
	too slow to Bail				
0945	sample			11.20	
1000	Bailer BLANK				

- NO petrol odor
- water lt. Brown

STABILIZATION TEST

Site Jordan
Date 12-10-91
Well number JMW1

Pumping rate (gallons/minute) _____
Type of pump Field Waste/Bailer
Water level before pumping (nearest 0.01 ft. below top of casing) 10.60
Approximate well location 17.46
Calculated volume of water in casing 1.12 Gal
Weather conditions _____

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1200	7.3	780	11		1
1205	7.2	780	11		2
1208	7.1	780	11		3
1210	7.1	780	11		4
1215	Sample			11.24	

Brownish Gray in color
Skunky Smell

STABILIZATION TEST

Site Jordan
Date 12-10-91
Well number JMW2

Pumping rate (gallons/minute) _____
Type of pump _____
Water level before pumping (nearest 0.01 ft. below top of casing) 10.00
Approximate well location 120 gal 1940
Calculated volume of water in casing _____
Weather conditions _____

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1103				10.00	
1107	7.2	1500	12		1.0
1110	7.1	1400	12		2.0
1113	7.0	1300	12		3.0
1117	6.9	1300	12		4.0
1121	6.9	1300	12		5.0
1125	sample			10.04	
1145	BB.				

strong
~~NOTICEABLE~~ petrol odor

STABILIZATION TEST

Site Jordan
Date 12-10-91
Well number JMW3

Pumping rate (gallons/minute) _____
Type of pump _____
Water level before pumping (nearest 0.01 ft. below top of casing) 10.22
Approximate well location 1.18
Calculated volume of water in casing 1.18 17.43
Weather conditions _____

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1014				10.22	
1022	6.6	430	13		1.0
1024	6.7	500	13		1.5
- slow recharge				16.40	
1100	Sample			11.20	

Walter Burns

STABILIZATION TEST

Site JORDAN TRUCK STATION
Date 3-16-92
Well number JMW 1

Pumping rate (gallons/minute) _____
Type of pump Dedicated Line / Bailer
Water level before pumping (nearest 0.01 ft. below top of casing) 9.68
Approximate well location 17.46
Calculated volume of water in casing 1.26 gal
Weather conditions pc windy 40's

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1205				9.68	
	7.4	1000	8		1
	7.4	920	8		2
	7.3	920	8		3
	7.2	960	9		4
	7.1	960	9		5
	7.1	960	9		6
1220	Sample			9.82	

STABILIZATION TEST

Site _____

Date 3-16-92

Well number JMW2

Pumping rate (gallons/minute) _____

Type of pump Dedicated Line / Bailer

Water level before pumping (nearest 0.01 ft. below top of casing) 6.12 / 17.40

Approximate well location _____

Calculated volume of water in casing 1.8 gal

Weather conditions pc windy 40's

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1120				6.12	
	6.8	2300	8		1
	6.8	2000	8		2
	6.8	1800	8		3
	6.8	1700	8		4
	6.8	1600	8		5
	6.8	1500	8		6
	6.8	1400	8		7
	6.8	1500	8		8
1150 Sample				6.20	
1200	DI Blank				

Strong fuel oil odor

STABILIZATION TEST

Site _____

Date 3-16-92

Well number JMW3

Pumping rate (gallons/minute) _____

Type of pump Dedicated line / Bailer

Water level before pumping (nearest 0.01 ft. below top of casing) 6.30

Approximate well location 17.43

Calculated volume of water in casing 1.8 gal

Weather conditions PC windy 40's

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1100				6.30	
	7.0	1300	11		2
	7.0	1000	11		3
	7.0	1000	11		4
Recharge too low to purge				16.80	
1130	Sample			9.86	

STABILIZATION TEST

Site Jordan T.S.
Date 6-18-92
Well number JMW1

Pumping rate (gallons/minute) _____
Type of pump Dedicated Teflon / FW Bailer
Water level before pumping (nearest 0.01 ft. below top of casing) 9.94
Approximate well location _____ 17.46
Calculated volume of water in casing 1.23 gal
Weather conditions pc +19

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1100				9.94	
1	7.4	1000	13		1.0
	7.4	~~1000~~ 990	12		2.0
	7.3	990	12		3.0
1130 - Sample				11.54	

STABILIZATION TEST

Site _____

Date _____

Well number MW2

Pumping rate (gallons/minute) _____
Type of pump dedicated Line/Bailer
Water level before pumping (nearest 0.01 ft. below top of casing) 9.42
Approximate well location 17.40
Calculated volume of water in casing 1.30 gal
Weather conditions pc +19

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
11					
1025				9.42	
	7.1	1500	13		1.0
	7.1	1200	13		2.0
	7.1	1100	13		3.0
	7.1	1100	12		4.0
	7.1	1100	12		5.0
1035	Sample			10.58	
BG					
1045					

- Water Black at Beginning
- strong petrol odor

STABILIZATION TEST

Site _____

Date _____

Well number JMW3

Pumping rate (gallons/minute) _____
Type of pump dedicated Tube / Bailer
Water level before pumping (nearest 0.01 ft. below top of casing) 9.50
Approximate well location 17.43
Calculated volume of water in casing 1.29 gal
Weather conditions cloudy ~17

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
0950				9.50	
	6.6	370	17		1.5
	6.6	410	16		2.5
pumped down,		Let recharge		16.80	
1010	Sample			11.42	

STABILIZATION TEST

Site Jordan
Date 8-21-92
Well number JMW1

Pumping rate (gallons/minute)
Type of pump Redi-Flo 2 Submersible
Water level before pumping (nearest 0.01 ft. below top of casing) 8.52 11:46
Approximate well location
Calculated volume of water in casing 1.46 gal
Weather conditions cloudy windy +75

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1020	6.6	700	17		1
	6.6	930	16		2
	6.6	930	16		3
	6.6	930	16		4
	level	after	pumping		14.0'

8.50
17.40

Bailer
0.01 ft. below top of casing) Bottom
...ing - 1.44 gal

...	...erature-Corrected Conductance (umhos/cm) 18,150	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
	1760	17		1
...2	1400	16		2
.2	1200	16		~~4~~ 5
7.1	1200	16		6
7.0	1100	17		7
7.0	1100	17		8
7.0	1100	17		8.76
Level after pumping 8.76				
Black Tinge, Petro. oder				

STABILIZATION TEST

Site JORDAN
Date 9-21-92
Well number JMW3

Pumping rate (gallons/minute) _____
Type of pump Dedicated Tubing/Bailer
Water level before pumping (nearest 0.01 ft. below top of casing) _____
Approximate well location _____ 8.90
Calculated volume of water in casing 1.39 gal 17.43
Weather conditions _____

Time	pH (units)	Temperature-Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1130					
	7.1	830	15		1
	7.2	790	14		2
	7.1	790	14		3
	7.1	790	14		4
1145	Sample.			11.26	

Appendix II

Laboratory Analyses
Chain of Custody Forms

9.7.90
ORG.FORM.FY91.1

MINNESOTA DEPARTMENT OF HEALTH
Chemical Laboratory Section
Organic Chemistry Unit

WATER ANALYSES ONLY

Date Collected: 5/30/91
Date Received: 5-30-91
Collected by: BK

Budget #: DA
Report To: LANETTE ZAUGER (BRIAN KAMANIKAR)
Chain of Custody #: 012
Field Blank #:

RECD 26 JUN 91

Laboratory Number		Field Number	Sample Description	- Container - Number	Type
9111160	a	MW-1	JORDAN T.S.	4	40 mil
9111161	b	MW-2	PETRO ODORS JUN 24 1991	↓	↓
9111162	c	MW-3			
9111163	d	BLK	BAILER BLANK - FIELD CLEANING		
	e				

Analyses Request Options		ALL	a 9111160	b 9111161	c 9111162	d 9111163	e
VOLATILE ORGANICS	465						
VOLATILE HALOGENATED ORGANICS (THM)	464						
GASOLINE/FUEL OIL + HALOGENATED	463	X					
VOLATILE ORGANICS by GC/MS	468						
CHLOROPHENOXY ACID HERBICIDES (CPA)	574						
POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)	470						
POLYCHLORINATED BIPHENYLS (PCBs)	420						
PHTHALATE ESTERS	490						
PESTICIDES, CHLORINATED	502						
TOXAPHENE	520						
TECHNICAL CHLORDANE	530						
DDT GROUP	550						
PESTICIDES, NITROGEN/PHOSPHOROUS	571						
SPECIAL SAMPLE HOURS	560						

Field Notes:
TRIP BLANK ACCOMPANIED SAMPLES, WILL GO WITH SAMPLES ALSO ON 5-31-91

Laboratory Notes:
(NEW VLM TS)

Mn/DOT TP-03023-01 (8/90)

Minnesota Department of Transportation

Transportation Building
St. Paul, MN 55155

ENVIRONMENTAL COMPLIANCE AND INVESTIGATION UNIT

№ 012

CHAIN OF CUSTODY RECORD

Project Name: Jordan Truck Station

Name of Sampler: Brian Kamnikar, Bruce Johnson, Nancy Radle

Field Number	Date	Time	Sample Type (s): Monitoring well	Existing well	Surface water	Wastewater	Waste	Other	Sample Location	Analyses Requested	Comments on Samples
	5/30/91	12:30	X						MW-3	VOC's	-preserved w/ 2 drops 1:1 HCl -no sheen observed
	5/30/91	11:00	X						MW-1	VOC's	-preserved w/ 2 drops 1:1 HCl -no sheen observed
	5/30/91	1300	X						MW-2	VOC's	-preserved w/ 2 drops 1:1 HCl moderate odor, very silty
	5/30/91	1145						X	field blk; bailer rinse	VOC's	-taken between MW-3 and MW-1 sampling, preserved w/ 1:1 HCl

Remarks on Site
MW-2 - the inner casing threaded cap was not screwed in - outer casing was locked.

Samples Relinquished by: Brian Kamnikar	Samples Received by	Comments	Date/Time 5-30-91 3:00 PM
Samples Relinquished by	Samples Received by	Comments	Date/Time
Samples Relinquished by	Samples Received by	Comments	Date/Time
Means of Delivery		Seals Intact: ☐ YES ☐ NO ☐ N.A.	

Original and yellow copies to Lab. Pink copy to Mn/DOT. Lab forwards completed yellow copy to Mn/DOT with analytical results.

MINNESOTA DEPT OF HEALTH - CHEMICAL LABORATORY
VOLATILE HYDROCARBONS (code 463)

mw/

SAMPLED: 05/30/91
ANALYZED: 06/11/91
REPORTED: 06/19/91

LAB SAMPLE #: 9111160

FIELD BLANK #: NONE

COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)	COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)
Dichlorodifluoromethane	< 1.0		1122-Tetrachloroethane	< 0.2	
Chloromethane	< 2.0		123-Trichloropropane	< 0.5	
Vinyl Chloride	< 1.0		Bromobenzene	< 0.2	
Bromomethane	< 2.0		2-Chlorotoluene	< 0.5	
Chloroethane	< 1.0		4-Chlorotoluene	< 0.5	
Dichlorofluoromethane	< 1.0		1,3-Dichlorobenzene	< 0.2	
Trichlorofluoromethane	< 2.0		1,4-Dichlorobenzene	< 0.2	
Trichloro-trifluoroethane	< 0.2		1,2-Dichlorobenzene	< 0.2	
1,1-Dichloroethene	< 0.5		1,2-Dibromo-3-Chloropropane	< 2.0	
Allyl Chloride	< 0.5		124-Trichlorobenzene	< 0.5	
Methylene Chloride	< 0.5		Hexachlorobutadiene	< 0.5	
t-1,2-Dichloroethene	< 0.1		123-Trichlorobenzene	< 0.5	
1,1-Dichloroethane	< 0.2		Ethyl Ether	< 2.0	
2,2-dichloropropane	< 0.5		Acetone	< 20	
c-1,2 Dichloroethene	< 0.2		Methyl tertiary-Butyl Ether	< 2.0	
Chloroform	< 0.1		Methyl Ethyl Ketone	< 10	
Bromochloromethane	< 0.5		Tetrahydrofuran	< 10	
1,1,1-Trichloroethane	< 0.2		Benzene	< 0.2	0.6
1,1-Dichloropropene	< 0.2		Methyl Isobutyl Ketone	< 5.0	
Carbon Tetrachloride	< 0.2		Toluene	< 0.2	
1,2-Dichloroethane	< 0.2		Ethyl Benzene	< 0.2	
Trichloroethene	< 0.1		m+p-Xylene	< 0.2	
1,2-Dichloropropane	< 0.2		o-Xylene	< 0.2	
Bromodichloromethane	< 0.2		Styrene	< 0.5	
Dibromomethane	< 1.0		Isopropyl Benzene	< 0.5	
c-1,3-Dichloropropene	< 0.2		n-Propyl Benzene	< 0.5	
t-1,3-Dichloropropene	< 0.2		135-Trimethylbenzene	< 0.5	
1,1,2-Trichloroethane	< 0.2		tert-Butyl Benzene	< 0.5	
1,3-Dichloropropane	< 0.2		124-Trimethylbenzene	< 0.5	
Tetrachloroethene	< 0.2		sec-Butylbenzene	< 0.5	
Chlorodibromomethane	< 0.5		p-Isopropyltoluene	< 0.5	
1,2-Dibromoethane	< 1.0		n-Butylbenzene	< 0.5	
Chlorobenzene	< 0.2		Naphthalene	< 0.5	
1112-Tetrachloroethane	< 0.2				
Bromoform	< 1.0				

COMMENTS:

GASOLINE & FUEL OIL (463)

GASOLINE :	< 30. UG/L
FUEL OIL :	< 200. UG/L

Legend:
< = less than
PP = peak present

502.4G MINNESOTA DEPT OF HEALTH - CHEMICAL LABORATORY
VOLATILE HYDROCARBONS (code 463)

mw2

SAMPLED: 05/30/91
ANALYZED: 06/11/91
REPORTED: 06/19/91

LAB SAMPLE #: 9111161

FIELD BLANK #: NONE

COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)	COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)
Dichlorodifluoromethane	< 1.0		1122-Tetrachloroethane	< 0.2	
Chloromethane	< 2.0		123-Trichloropropane	< 0.5	
Vinyl Chloride	< 1.0		Bromobenzene	< 0.2	
Bromomethane	< 2.0		2-Chlorotoluene	< 0.5	
Chloroethane	< 1.0		4-Chlorotoluene	< 0.5	
Dichlorofluoromethane	< 1.0		1,3-Dichlorobenzene	< 0.2	
Trichlorofluoromethane	< 2.0		1,4-Dichlorobenzene	< 0.2	
Trichloro-trifluoroethane	< 0.2		1,2-Dichlorobenzene	< 0.2	
1,1-Dichloroethene	< 0.5		1,2-Dibromo-3-Chloropropane	< 2.0	
Allyl Chloride	< 0.5		124-Trichlorobenzene	< 0.5	
Methylene Chloride	< 0.5		Hexachlorobutadiene	< 0.5	
t-1,2-Dichloroethene	< 0.1		123-Trichlorobenzene	< 0.5	
1,1-Dichloroethane	< 0.2		Ethyl Ether	< 2.0	
2,2-dichloropropane	< 0.5		Acetone	< 20	
c-1,2 Dichloroethene	< 0.2		Methyl tertiary-Butyl Ether	< 2.0	
Chloroform	< 0.1		Methyl Ethyl Ketone	< 10	
Bromochloromethane	< 0.5		Tetrahydrofuran	< 10	
1,1,1-Trichloroethane	< 0.2		Benzene	< 0.2	4.8
1,1-Dichloropropene	< 0.2		Methyl Isobutyl Ketone	< 5.0	
Carbon Tetrachloride	< 0.2		Toluene	< 0.2	2.8
1,2-Dichloroethane	< 0.2		Ethyl Benzene	< 0.2	15
Trichloroethene	< 0.1		m+p-Xylene	< 0.2	5.4
1,2-Dichloropropane	< 0.2		o-Xylene	< 0.2	6.7
Bromodichloromethane	< 0.2		Styrene	< 0.5	
Dibromomethane	< 1.0		Isopropyl Benzene	< 0.5	12
c-1,3-Dichloropropene	< 0.2		n-Propyl Benzene	< 0.5	10
t-1,3-Dichloropropene	< 0.2		135-Trimethylbenzene	< 0.5	3.2
1,1,2-Trichloroethane	< 0.2		tert-Butyl Benzene	< 0.5	
1,3-Dichloropropane	< 0.2		124-Trimethylbenzene	< 0.5	25
Tetrachloroethene	< 0.2		sec-Butylbenzene	< 0.5	10
Chlorodibromomethane	< 0.5		p-Isopropyltoluene	< 0.5	4.7
1,2-Dibromoethane	< 1.0		n-Butylbenzene	< 0.5	7.1
Chlorobenzene	< 0.2		Naphthalene	< 0.5	1.1
1112-Tetrachloroethane	< 0.2				
Bromoform	< 1.0				

COMMENTS:

GASOLINE & FUEL OIL (463)

GASOLINE : 700 UG/L

FUEL OIL : 11000 UG/L

Legend:
< = less than
PP = peak present

502.4G MINNESOTA DEPT OF HEALTH - CHEMICAL LABORATORY 1
VOLATILE HYDROCARBONS (code 463)

mw 3

SAMPLED: 05/30/91
ANALYZED: 06/11/91
REPORTED: 06/19/91

LAB SAMPLE #: 9111162

FIELD BLANK #: NONE

COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)	COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)
Dichlorodifluoromethane	< 1.0		1122-Tetrachloroethane	< 0.2	
Chloromethane	< 2.0		123-Trichloropropane	< 0.5	
Vinyl Chloride	< 1.0		Bromobenzene	< 0.2	
Bromomethane	< 2.0		2-Chlorotoluene	< 0.5	
Chloroethane	< 1.0		4-Chlorotoluene	< 0.5	
Dichlorofluoromethane	< 1.0		1,3-Dichlorobenzene	< 0.2	
Trichlorofluoromethane	< 2.0		1,4-Dichlorobenzene	< 0.2	
Trichloro-trifluoroethane	< 0.2		1,2-Dichlorobenzene	< 0.2	
1,1-Dichloroethene	< 0.5		1,2-Dibromo-3-Chloropropane	< 2.0	
Allyl Chloride	< 0.5		124-Trichlorobenzene	< 0.5	
Methylene Chloride	< 0.5		Hexachlorobutadiene	< 0.5	
t-1,2-Dichloroethene	< 0.1		123-Trichlorobenzene	< 0.5	
1,1-Dichloroethane	< 0.2		Ethyl Ether	< 2.0	
2,2-dichloropropane	< 0.5		Acetone	< 20	
c-1,2 Dichloroethene	< 0.2		Methyl tertiary-Butyl Ether	< 2.0	
Chloroform	< 0.1		Methyl Ethyl Ketone	< 10	
Bromochloromethane	< 0.5		Tetrahydrofuran	< 10	
1,1,1-Trichloroethane	< 0.2		Benzene	< 0.2	
1,1-Dichloropropene	< 0.2		Methyl Isobutyl Ketone	< 5.0	
Carbon Tetrachloride	< 0.2		Toluene	< 0.2	
1,2-Dichloroethane	< 0.2		Ethyl Benzene	< 0.2	
Trichloroethene	< 0.1		m+p-Xylene	< 0.2	
1,2-Dichloropropane	< 0.2		o-Xylene	< 0.2	
Bromodichloromethane	< 0.2		Styrene	< 0.5	
Dibromomethane	< 1.0		Isopropyl Benzene	< 0.5	
c-1,3-Dichloropropene	< 0.2		n-Propyl Benzene	< 0.5	
t-1,3-Dichloropropene	< 0.2		135-Trimethylbenzene	< 0.5	
1,1,2-Trichloroethane	< 0.2		tert-Butyl Benzene	< 0.5	
1,3-Dichloropropane	< 0.2		124-Trimethylbenzene	< 0.5	
Tetrachloroethene	< 0.2		sec-Butylbenzene	< 0.5	
Chlorodibromomethane	< 0.5		p-Isopropyltoluene	< 0.5	
1,2-Dibromoethane	< 1.0		n-Butylbenzene	< 0.5	
Chlorobenzene	< 0.2		Naphthalene	< 0.5	
1112-Tetrachloroethane	< 0.2				
Bromoform	< 1.0				

COMMENTS:

GASOLINE & FUEL OIL (463)

GASOLINE : < 30 UG/L

FUEL OIL : < 200 UG/L

Legend:
< = less than
PP = peak present

502.4G MINNESOTA DEPT OF HEALTH - CHEMICAL LABORATORY 1
VOLATILE HYDROCARBONS (code 463)

SAMPLED: 05/30/91
ANALYZED: 06/11/91
REPORTED: 06/19/91

LAB SAMPLE #: 9111163

BB

FIELD BLANK #: NONE

COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)	COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)
Dichlorodifluoromethane	< 1.0		1122-Tetrachloroethane	< 0.2	
Chloromethane	< 2.0		123-Trichloropropane	< 0.5	
Vinyl Chloride	< 1.0		Bromobenzene	< 0.2	
Bromomethane	< 2.0		2-Chlorotoluene	< 0.5	
Chloroethane	< 1.0		4-Chlorotoluene	< 0.5	
Dichlorofluoromethane	< 1.0		1,3-Dichlorobenzene	< 0.2	
Trichlorofluoromethane	< 2.0		1,4-Dichlorobenzene	< 0.2	
Trichloro-trifluoroethane	< 0.2		1,2-Dichlorobenzene	< 0.2	
1,1-Dichloroethene	< 0.5		1,2-Dibromo-3-Chloropropane	< 2.0	
Allyl Chloride	< 0.5		124-Trichlorobenzene	< 0.5	
Methylene Chloride	< 0.5		Hexachlorobutadiene	< 0.5	
t-1,2-Dichloroethene	< 0.1		123-Trichlorobenzene	< 0.5	
1,1-Dichloroethane	< 0.2		Ethyl Ether	< 2.0	
2,2-dichloropropane	< 0.5		Acetone	< 20	
c-1,2 Dichloroethene	< 0.2		Methyl tertiary-Butyl Ether	< 2.0	
Chloroform	< 0.1		Methyl Ethyl Ketone	< 10	
Bromochloromethane	< 0.5		Tetrahydrofuran	< 10	
1,1,1-Trichloroethane	< 0.2		Benzene	< 0.2	
1,1-Dichloropropene	< 0.2		Methyl Isobutyl Ketone	< 5.0	
Carbon Tetrachloride	< 0.2		Toluene	< 0.2	0.2
1,2-Dichloroethane	< 0.2		Ethyl Benzene	< 0.2	
Trichloroethene	< 0.1		m+p-Xylene	< 0.2	
1,2-Dichloropropane	< 0.2		o-Xylene	< 0.2	
Bromodichloromethane	< 0.2		Styrene	< 0.5	
Dibromomethane	< 1.0		Isopropyl Benzene	< 0.5	
c-1,3-Dichloropropene	< 0.2		n-Propyl Benzene	< 0.5	
t-1,3-Dichloropropene	< 0.2		135-Trimethylbenzene	< 0.5	
1,1,2-Trichloroethane	< 0.2		tert-Butyl Benzene	< 0.5	
1,3-Dichloropropane	< 0.2		124-Trimethylbenzene	< 0.5	
Tetrachloroethene	< 0.2		sec-Butylbenzene	< 0.5	
Chlorodibromomethane	< 0.5		p-Isopropyltoluene	< 0.5	
1,2-Dibromoethane	< 1.0		n-Butylbenzene	< 0.5	
Chlorobenzene	< 0.2		Naphthalene	< 0.5	
1112-Tetrachloroethane	< 0.2				
Bromoform	< 1.0				

COMMENTS:

GASOLINE & FUEL OIL (463)

GASOLINE : < 30 UG/L

FUEL OIL : < 200 UG/L

Legend:
< = less than
PP = peak present

09120956 09120957 09120958 09120959

9120955
ORG.FORM.FY91.1

MINNESOTA DEPARTMENT OF HEALTH
Chemical Laboratory Section
Organic Chemistry Unit

WATER ANALYSES ONLY

RECD 15 OCT 91

Date Collected: 9-5-91
Date Received:
Collected by: Mn/DOT

Chain of Custody #: 031

Budget #: DA
Report To: Mn/DOT
Field Blank #: 9120959

Laboratory Number		Field Number	Sample Description	Container Number	Container Type
9120955	a	JMW1	Jordan, Scott. Mn/DOT Truckstation well 1035	4	40ml
9120956	b	JMW2	" " " 0940	"	"
9120957	c	JMW3	" " " 0945	"	"
9120958	d	BB	" " " Bailer Blank 1000	"	"
9120959	e		Field BLANK	3	"

Analyses Request Options		ALL	a 9120955	b 9120956	c 9120957	d 9120958	e 9120959
VOLATILE ORGANICS	465						
VOLATILE HALOGENATED ORGANICS (THM)	464						
GASOLINE/FUEL OIL + HALOGENATED	463	X					
VOLATILE ORGANICS by GC/MS	468						
CHLOROPHENOXY ACID HERBICIDES (CPA)	574						
POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)	470						
POLYCHLORINATED BIPHENYLS (PCBs)	420						
PHTHALATE ESTERS	490						
PESTICIDES, CHLORINATED	502						
TOXAPHENE	520						
TECHNICAL CHLORDANE	530						
DDT GROUP	550						
PESTICIDES, NITROGEN/PHOSPHOROUS	571						
SPECIAL SAMPLE HOURS C/C 990 ~~550~~		X					

OCT 11 1991

Field Notes:

Laboratory Notes:

Mn/DOT 03023-01 (8/90)

Minnesota Department of Transportation

Transportation Building
St. Paul, MN 55155

ENVIRONMENTAL COMPLIANCE AND INVESTIGATION UNIT

No. 031

CHAIN OF CUSTODY RECORD

Project Name: Mn/DOT Jordan Truck Station

Name of Sampler: TIC #3 Lonette Zaiger

Field Number	Date (1991)	Time	Sample Type (s): Monitoring well	Existing well	Surface water	Wastewater	Waste	Other	Sample Location	Analyses Requested	Comments on Samples
JMW1	9-5	1035	X						Jordan T.S.	463	TAN WATER COLOR
JMW2	9-5	0940	X						" "	463	NOTICABLE PETROL ODOR, BLACK
JMW3	9-5	0945	X						" "	463	TAN WATER COLOR
BB	9-5	1000						X	" "	463	
FB	-	-						X		463	

Remarks on Site: cloudy, 20°C, windy

Samples Relinquished by	Samples Received by	Comments	Date/Time
Lonette Zaiger 9-5-91 1135			9/5/91 @ 11:35
Samples Relinquished by	Samples Received by	Comments	Date/Time
Samples Relinquished by	Samples Received by	Comments	Date/Time

Means of Delivery

Seals intact: ☐ YES ☐ NO ☐ N.A.

Original and yellow copies to Lab. Pink copy to Mn/DOT. Lab forwards completed yellow copy to Mn/DOT with analytical results.

502.4G MINNESOTA DEPT OF HEALTH - CHEMICAL LABORATORY 1
VOLATILE HYDROCARBONS (code 463)

SAMPLED: 09/05/91
ANALYZED: 10/01/91
REPORTED: 10/08/91

LAB SAMPLE #: 9120955 MW1

FIELD BLANK #: 9120959

COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)	COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)
Dichlorodifluoromethane	< 1.0		1122-Tetrachloroethane	< 0.2	
Chloromethane	< 2.0		123-Trichloropropane	< 0.5	
Vinyl Chloride	< 1.0		Bromobenzene	< 0.2	
Bromomethane	< 2.0		2-Chlorotoluene	< 0.5	
Chloroethane	< 1.0		4-Chlorotoluene	< 0.5	
Dichlorofluoromethane	< 1.0		1,3-Dichlorobenzene	< 0.2	
Trichlorofluoromethane	< 2.0		1,4-Dichlorobenzene	< 0.2	
Trichloro-trifluoroethane	< 0.2		1,2-Dichlorobenzene	< 0.2	
1,1-Dichloroethene	< 0.5		1,2-Dibromo-3-Chloropropane	< 2.0	
Allyl Chloride	< 0.5		124-Trichlorobenzene	< 0.5	
Methylene Chloride	< 0.5		Hexachlorobutadiene	< 0.5	
t-1,2-Dichloroethene	< 0.1		123-Trichlorobenzene	< 0.5	
1,1-Dichloroethane	< 0.2		Ethyl Ether	< 2.0	
2,2-dichloropropane	< 0.5		Acetone	< 20	
c-1,2 Dichloroethene	< 0.2		Methyl tertiary-Butyl Ether	< 2.0	
Chloroform	< 0.1		Methyl Ethyl Ketone	< 10	
Bromochloromethane	< 0.5		Tetrahydrofuran	< 10	
1,1,1-Trichloroethane	< 0.2		Benzene	< 0.2	
1,1-Dichloropropene	< 0.2		Methyl Isobutyl Ketone	< 5.0	
Carbon Tetrachloride	< 0.2		Toluene	< 0.2	
1,2-Dichloroethane	< 0.2		Ethyl Benzene	< 0.2	
Trichloroethene	< 0.1		m+p-Xylene	< 0.2	
1,2-Dichloropropane	< 0.2		o-Xylene	< 0.2	
Bromodichloromethane	< 0.2		Styrene	< 0.5	
Dibromomethane	< 1.0		Isopropyl Benzene	< 0.5	
c-1,3-Dichloropropene	< 0.2		n-Propyl Benzene	< 0.5	
t-1,3-Dichloropropene	< 0.2		135-Trimethylbenzene	< 0.5	
1,1,2-Trichloroethane	< 0.2		tert-Butyl Benzene	< 0.5	
1,3-Dichloropropane	< 0.2		124-Trimethylbenzene	< 0.5	
Tetrachloroethene	< 0.2		sec-Butylbenzene	< 0.5	
Chlorodibromomethane	< 0.5		p-Isopropyltoluene	< 0.5	
1,2-Dibromoethane	< 1.0		n-Butylbenzene	< 0.5	
Chlorobenzene	< 0.2		Naphthalene	< 0.5	
1112-Tetrachloroethane	< 0.2				
Bromoform	< 1.0				

COMMENTS:
ANALYZED AFTER THE 14 DAYS HOLDING TIME.

GASOLINE & FUEL OIL (463)

GASOLINE : < 30.0 UG/L

FUEL OIL : < 200.0 UG/L

Legend:
< = less than
PP = peak present

ST

MINNESOTA DEPT OF HEALTH - CHEMICAL LABORATORY

VOLATILE HYDROCARBONS (code 463)

SAMPLED: 09/05/91
ANALYZED: 10/01/91
REPORTED: 10/08/91

LAB SAMPLE #: 9120956

MW2

FIELD BLANK #: 9120959

COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)	COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)
Dichlorodifluoromethane	< 2.0		1122-Tetrachloroethane	< 0.4	
Chloromethane	< 4.0		123-Trichloropropane	< 1.0	
Vinyl Chloride	< 2.0		Bromobenzene	< 0.4	
Bromomethane	< 4.0		2-Chlorotoluene	< 1.0	
Chloroethane	< 2.0		4-Chlorotoluene	< 1.0	
Dichlorofluoromethane	< 2.0		1,3-Dichlorobenzene	< 0.4	
Trichlorofluoromethane	< 4.0		1,4-Dichlorobenzene	< 0.4	
Trichloro-trifluoroethane	< 0.4	0.6	1,2-Dichlorobenzene	< 0.4	
1,1-Dichloroethene	< 1.0		1,2-Dibromo-3-Chloropropane	< 4.0	
Allyl Chloride	< 1.0		124-Trichlorobenzene	< 1.0	
Methylene Chloride	< 1.0		Hexachlorobutadiene	< 1.0	
t-1,2-Dichloroethene	< 0.2		123-Trichlorobenzene	< 1.0	
1,1-Dichloroethane	< 0.4		Ethyl Ether	< 4.0	
2,2-dichloropropane	< 1.0		Acetone	< 40	
c-1,2 Dichloroethene	< 0.4		Methyl tertiary-Butyl Ether	< 4.0	
Chloroform	< 0.2		Methyl Ethyl Ketone	< 20	
Bromochloromethane	< 1.0		Tetrahydrofuran	< 20	
1,1,1-Trichloroethane	< 0.4		Benzene	< 0.4	1.4
1,1-Dichloropropene	< 0.4		Methyl Isobutyl Ketone	< 10.0	
Carbon Tetrachloride	< 0.4		Toluene	< 0.4	0.4
1,2-Dichloroethane	< 0.4		Ethyl Benzene	< 0.4	10
Trichloroethene	< 0.2		m+p-Xylene	< 0.4	2.4
1,2-Dichloropropane	< 0.4		o-Xylene	< 0.4	3.3
Bromodichloromethane	< 0.4		Styrene	< 1.0	
Dibromomethane	< 2.0		Isopropyl Benzene	< 1.0	
c-1,3-Dichloropropene	< 0.4		n-Propyl Benzene	< 1.0	11
t-1,3-Dichloropropene	< 0.4		135-Trimethylbenzene	< 1.0	
1,1,2-Trichloroethane	< 0.4		tert-Butyl Benzene	< 1.0	
1,3-Dichloropropane	< 0.4		124-Trimethylbenzene	< 1.0	8.4
Tetrachloroethene	< 0.4		sec-Butylbenzene	< 1.0	13
Chlorodibromomethane	< 1.0		p-Isopropyltoluene	< 1.0	4.0
1,2-Dibromoethane	< 2.0		n-Butylbenzene	< 1.0	7.4
Chlorobenzene	< 0.4		Naphthalene	< 1.0	4.4
1112-Tetrachloroethane	< 0.4				
Bromoform	< 2.0				

COMMENTS:
ANALYZED AFTER THE 14 DAY HOLDING TIME.

GASOLINE & FUEL OIL (463)

GASOLINE : 800 UG/L

FUEL OIL : 12000 UG/L

Legend:
< = less than
PP = peak present

502.4G MINNESOTA DEPT OF HEALTH - CHEMICAL LABORATORY 1
VOLATILE HYDROCARBONS (code 463)

SAMPLED: 09/05/91
ANALYZED: 10/01/91
REPORTED: 10/08/91

LAB SAMPLE #: 9120957 mw3

FIELD BLANK #: 9120959

COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)	COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)
Dichlorodifluoromethane	< 1.0		1122-Tetrachloroethane	< 0.2	
Chloromethane	< 2.0		123-Trichloropropane	< 0.5	
Vinyl Chloride	< 1.0		Bromobenzene	< 0.2	
Bromomethane	< 2.0		2-Chlorotoluene	< 0.5	
Chloroethane	< 1.0		4-Chlorotoluene	< 0.5	
Dichlorofluoromethane	< 1.0		1,3-Dichlorobenzene	< 0.2	
Trichlorofluoromethane	< 2.0		1,4-Dichlorobenzene	< 0.2	
Trichloro-trifluoroethane	< 0.2		1,2-Dichlorobenzene	< 0.2	
1,1-Dichloroethene	< 0.5		1,2-Dibromo-3-Chloropropane	< 2.0	
Allyl Chloride	< 0.5		124-Trichlorobenzene	< 0.5	
Methylene Chloride	< 0.5		Hexachlorobutadiene	< 0.5	
t-1,2-Dichloroethene	< 0.1		123-Trichlorobenzene	< 0.5	
1,1-Dichloroethane	< 0.2		Ethyl Ether	< 2.0	
2,2-dichloropropane	< 0.5		Acetone	< 20	
c-1,2 Dichloroethene	< 0.2		Methyl tertiary-Butyl Ether	< 2.0	
Chloroform	< 0.1		Methyl Ethyl Ketone	< 10	
Bromochloromethane	< 0.5		Tetrahydrofuran	< 10	
1,1,1-Trichloroethane	< 0.2		Benzene	< 0.2	
1,1-Dichloropropene	< 0.2		Methyl Isobutyl Ketone	< 5.0	
Carbon Tetrachloride	< 0.2		Toluene	< 0.2	
1,2-Dichloroethane	< 0.2		Ethyl Benzene	< 0.2	
Trichloroethene	< 0.1		m+p-Xylene	< 0.2	
1,2-Dichloropropane	< 0.2		o-Xylene	< 0.2	
Bromodichloromethane	< 0.2		Styrene	< 0.5	
Dibromomethane	< 1.0		Isopropyl Benzene	< 0.5	
c-1,3-Dichloropropene	< 0.2		n-Propyl Benzene	< 0.5	
t-1,3-Dichloropropene	< 0.2		135-Trimethylbenzene	< 0.5	
1,1,2-Trichloroethane	< 0.2		tert-Butyl Benzene	< 0.5	
1,3-Dichloropropane	< 0.2		124-Trimethylbenzene	< 0.5	
Tetrachloroethene	< 0.2		sec-Butylbenzene	< 0.5	
Chlorodibromomethane	< 0.5		p-Isopropyltoluene	< 0.5	
1,2-Dibromoethane	< 1.0		n-Butylbenzene	< 0.5	
Chlorobenzene	< 0.2		Naphthalene	< 0.5	
1112-Tetrachloroethane	< 0.2				
Bromoform	< 1.0				

COMMENTS:
ANALYZED AFTER THE 14 DAYS HOLDING TIME.

GASOLINE & FUEL OIL (463)

GASOLINE : < 30. UG/L

FUEL OIL : < 200. UG/L

Legend:
< = less than
PP = peak present

DT

502.4G MINNESOTA DEPT OF HEALTH - CHEMICAL LABORATORY 1
VOLATILE HYDROCARBONS (code 463)

SAMPLED: 09/05/91 LAB SAMPLE #: 9120958 BB
ANALYZED: 10/01/91
REPORTED: 10/08/91 FIELD BLANK #: 9120959

COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)	COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)
Dichlorodifluoromethane	< 1.0		1122-Tetrachloroethane	< 0.2	
Chloromethane	< 2.0		123-Trichloropropane	< 0.5	
Vinyl Chloride	< 1.0		Bromobenzene	< 0.2	
Bromomethane	< 2.0		2-Chlorotoluene	< 0.5	
Chloroethane	< 1.0		4-Chlorotoluene	< 0.5	
Dichlorofluoromethane	< 1.0		1,3-Dichlorobenzene	< 0.2	
Trichlorofluoromethane	< 2.0		1,4-Dichlorobenzene	< 0.2	
Trichloro-trifluoroethane	< 0.2		1,2-Dichlorobenzene	< 0.2	
1,1-Dichloroethene	< 0.5		1,2-Dibromo-3-Chloropropane	< 2.0	
Allyl Chloride	< 0.5		124-Trichlorobenzene	< 0.5	
Methylene Chloride	< 0.5		Hexachlorobutadiene	< 0.5	
t-1,2-Dichloroethene	< 0.1		123-Trichlorobenzene	< 0.5	
1,1-Dichloroethane	< 0.2		Ethyl Ether	< 2.0	
2,2-dichloropropane	< 0.5		Acetone	< 20	
c-1,2 Dichloroethene	< 0.2		Methyl tertiary-Butyl Ether	< 2.0	
Chloroform	< 0.1	0.2	Methyl Ethyl Ketone	< 10	
Bromochloromethane	< 0.5		Tetrahydrofuran	< 10	
1,1,1-Trichloroethane	< 0.2		Benzene	< 0.2	0.4
1,1-Dichloropropene	< 0.2		Methyl Isobutyl Ketone	< 5.0	
Carbon Tetrachloride	< 0.2		Toluene	< 0.2	
1,2-Dichloroethane	< 0.2		Ethyl Benzene	< 0.2	
Trichloroethene	< 0.1		m+p-Xylene	< 0.2	
1,2-Dichloropropane	< 0.2		o-Xylene	< 0.2	
Bromodichloromethane	< 0.2		Styrene	< 0.5	
Dibromomethane	< 1.0		Isopropyl Benzene	< 0.5	
c-1,3-Dichloropropene	< 0.2		n-Propyl Benzene	< 0.5	
t-1,3-Dichloropropene	< 0.2		135-Trimethylbenzene	< 0.5	
1,1,2-Trichloroethane	< 0.2		tert-Butyl Benzene	< 0.5	
1,3-Dichloropropane	< 0.2		124-Trimethylbenzene	< 0.5	
Tetrachloroethene	< 0.2		sec-Butylbenzene	< 0.5	
Chlorodibromomethane	< 0.5		p-Isopropyltoluene	< 0.5	
1,2-Dibromoethane	< 1.0		n-Butylbenzene	< 0.5	
Chlorobenzene	< 0.2		Naphthalene	< 0.5	
1112-Tetrachloroethane	< 0.2				
Bromoform	< 1.0				

COMMENTS:
ANALYZED AFTER THE 14 DAYS HOLDING TIME.

GASOLINE & FUEL OIL (463)

GASOLINE : < 30. UG/L

FUEL OIL : < 200. UG/L

Legend:
< = less than
PP = peak present

DT

MINNESOTA DEPT OF HEALTH - CHEMICAL LABORATORY

VOLATILE HYDROCARBONS (code 463)

SAMPLED: 09/05/91
ANALYZED: 10/01/91
REPORTED: 10/08/91

LAB SAMPLE #: 9120959

FIELD BLANK #: 9120959

COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)	COMPOUND	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)
Dichlorodifluoromethane	< 1.0		1122-Tetrachloroethane	< 0.2	
Chloromethane	< 2.0		123-Trichloropropane	< 0.5	
Vinyl Chloride	< 1.0		Bromobenzene	< 0.2	
Bromomethane	< 2.0		2-Chlorotoluene	< 0.5	
Chloroethane	< 1.0		4-Chlorotoluene	< 0.5	
Dichlorofluoromethane	< 1.0		1,3-Dichlorobenzene	< 0.2	
Trichlorofluoromethane	< 2.0		1,4-Dichlorobenzene	< 0.2	
Trichloro-trifluoroethane	< 0.2		1,2-Dichlorobenzene	< 0.2	
1,1-Dichloroethene	< 0.5		1,2-Dibromo-3-Chloropropane	< 2.0	
Allyl Chloride	< 0.5		124-Trichlorobenzene	< 0.5	
Methylene Chloride	< 0.5		Hexachlorobutadiene	< 0.5	
t-1,2-Dichloroethene	< 0.1		123-Trichlorobenzene	< 0.5	
1,1-Dichloroethane	< 0.2		Ethyl Ether	< 2.0	
2,2-dichloropropane	< 0.5		Acetone	< 20	
c-1,2 Dichloroethene	< 0.2		Methyl tertiary-Butyl Ether	< 2.0	
Chloroform	< 0.1		Methyl Ethyl Ketone	< 10	
Bromochloromethane	< 0.5		Tetrahydrofuran	< 10	
1,1,1-Trichloroethane	< 0.2		Benzene	< 0.2	
1,1-Dichloropropene	< 0.2		Methyl Isobutyl Ketone	< 5.0	
Carbon Tetrachloride	< 0.2		Toluene	< 0.2	
1,2-Dichloroethane	< 0.2		Ethyl Benzene	< 0.2	
Trichloroethene	< 0.1		m+p-Xylene	< 0.2	
1,2-Dichloropropane	< 0.2		o-Xylene	< 0.2	
Bromodichloromethane	< 0.2		Styrene	< 0.5	
Dibromomethane	< 1.0		Isopropyl Benzene	< 0.5	
c-1,3-Dichloropropene	< 0.2		n-Propyl Benzene	< 0.5	
t-1,3-Dichloropropene	< 0.2		135-Trimethylbenzene	< 0.5	
1,1,2-Trichloroethane	< 0.2		tert-Butyl Benzene	< 0.5	
1,3-Dichloropropane	< 0.2		124-Trimethylbenzene	< 0.5	
Tetrachloroethene	< 0.2		sec-Butylbenzene	< 0.5	
Chlorodibromomethane	< 0.5		p-Isopropyltoluene	< 0.5	
1,2-Dibromoethane	< 1.0		n-Butylbenzene	< 0.5	
Chlorobenzene	< 0.2		Naphthalene	< 0.5	
1112-Tetrachloroethane	< 0.2				
Bromoform	< 1.0				

COMMENTS:
ANALYZED AFTER THE 14 DAY HOLDING TIME.

GASOLINE & FUEL OIL (463)

GASOLINE : < 30. UG/L

FUEL OIL : < 200. UG/L

Legend:
< = less than
PP = peak present

FIELD NOTES

CREW	LZ, MV	DATE	12-10-91
SITE NAME		LOCATION	Jonah

SITE NUMBER	JSP1	JSP2		
AIR TEMPERTURE (°C)				
SKY COVER				
WIND (DIRECTION & SPEED)				
METHOD (boat, wading, Etc.)				
ICE THICKNESS (inches)				
WATER TEMPERATURE				
D.O. METER CAL___ TEMP___				
DISSOLVED OXYGEN KIT				
D.O. % SATURATION				
MAXIMUM SITE DEPTH (FEET)				
SECCHI DISK READING (FEET)				
LABORATORY SAMPLES (TYPE)	G, FO BTEX	MTBE, Lead		
SAMPLE TIME	0945	1000		
SAMPLE DEPTH (FEET)				
FIELD SAMPLES				
SAMPLER TYPE				
LAB. NO.				
pH				
CONDUCTIVITY (mho's)				
TURBIDITY (NTU's)	Brown	Brn		
CHLORIDE (mg/l)	clay			
STREAM METERED	Defunkt			
TYPE OF METER	Natural			
VELOCITY (fps)	odor	Natural		
DISCHARGE (CFS)		Odor		
GAUGE HEIGHT*				
FINISH TIME				
	S	N		

* Discribe bench used

REMARKS:

Xtra Copy

twin city testing corporation
662 CROMWELL AVENUE
ST. PAUL, MN 55114
PHONE 612/645-3601

REPORT OF: CHEMICAL ANALYSES

for L.Z.

PROJECT: JORDAN, 68639

DATE: January 6, 1992

REPORTED TO: Minnesota Department of Transportation
Attn: John Sampson
6000 Minnehaha Avenue South
St. Paul, MN 55111

LABORATORY NO: 4410 92-0654

INTRODUCTION

This report presents the results of the analyses of seven samples received on December 10, 1991, from a representative of Minnesota Department of Transportation. The scope of our services was limited to the parameters listed in the attached tables.

METHODOLOGY

Analyses are performed according to Twin City Testing Standard Operating Procedures. The procedures are based on the references stated in the analytical results tables.

RESULTS

The results are listed in the attached tables.

REMARKS

The samples were collected on December 10, 1991, and were consumed in the analyses.

TWIN CITY TESTING CORPORATION

Stephanie Kidder

Stephanie A. Kidder
Project Manager

Susan D. Max, Director
Laboratory Operations

SAK\SDM\clj

Collected
12-10-91

VOLATILE ORGANIC COMPOUND RESULTS
EPA METHOD 8020

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID:	JMW1	JMW2	JMW3	
TCT ID:	271722	271723	271724	
Parameter:				PQL
Benzene	ND	ND	ND	5
Toluene	ND	ND	ND	5
Ethyl benzene	ND	5	ND	5
Total xylenes	ND	ND	ND	5
Methyl-tert-butyl ether	ND	ND	ND	5
Surrogate Recovery:				
α,α,α-Trifluorotoluene	97%	111%	86%	
Total hydrocarbons as gasoline	ND	850*	ND	30
Surrogate Recovery:				
α,α,α-Trifluorotoluene	96%	110%	90%	
Date Analyzed:	12/16/91 and 12/17/91	12/16/91 and 12/17/91	12/16/91 and 12/17/91	

*The chromatographic profile is not typical of gasoline.

PQL = Practical Quantitation Limit

ND = Not Detected

Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

Leaking Underground Fuel Tank (LUFT) Field Manual, California State Water Resources Control Board, Division of Water Quality, December 17, 1987

LABORATORY NO: 4410 92-0654

VOLATILE ORGANIC COMPOUND RESULTS
EPA METHOD 8020

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID:	**BB**	**FB**	**Method Blank**	
TCT ID:	271725	271726		
Parameter:				PQL
Benzene	ND	ND	ND	5
Toluene	ND	ND	ND	5
Ethyl benzene	ND	ND	ND	5
Total xylenes	ND	ND	ND	5
Methyl-tert-butyl ether	ND	ND	ND	5
Surrogate Recovery:				
α,α,α-Trifluorotoluene	97%	98%	109%	
Total hydrocarbons as gasoline	ND	ND	ND	30
Surrogate Recovery:				
α,α,α-Trifluorotoluene	97%	98%	109%	
Date Analyzed:	12/16/91	12/16/91	12/16/91	

PQL = Practical Quantitation Limit

ND = Not Detected

Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

Leaking Underground Fuel Tank (LUFT) Field Manual, California State Water Resources Control Board, Division of Water Quality, December 17, 1987

LABORATORY NO: 4410 92-0654

soil pile

VOLATILE ORGANIC COMPOUND RESULTS
EPA METHOD 8020

(All values are in µg/Kg which is equal to parts-per-billion)

Client ID:	JSP1	JSP2	
TCT ID:	271727	271728	
Parameter:			PQL
Benzene	ND	ND	5
Toluene	ND	6	5
Ethyl benzene	6	11	5
Total xylenes	15	16	5
Methyl-tert-butyl ether	ND	ND	5
Surrogate Recovery:			
α,α,α-Trifluorotoluene	90%	109%	
Total hydrocarbons as gasoline	3,100*	2,700*	30
Surrogate Recovery:			
α,α,α-Trifluorotoluene	102%	107%	
Date Analyzed:	12/18/91	12/18/91	

* The chromatographic profile is not typical of gasoline.

PQL = Practical Quantitation Limit

ND = Not Detected

Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

Leaking Underground Fuel Tank (LUFT) Field Manual, California State Water Resources Control Board, Division of Water Quality, December 17, 1987

LABORATORY NO: 4410 92-0654

FUEL OIL RESULTS
USGS METHOD 82-1004

(All values are in mg/L which is equivalent to parts-per-million)

Sample Identification	TCT ID	Total Hydrocarbons as #2 Fuel Oil	Pentacosane Recovery (%)
JMW1	271722	ND	98
JMW2	271723	0.6	102
JMW3	271724	ND	84
BB	271725	ND	105
Blank		ND	117
Spike		76% Recovery	119
Spike Duplicate		70% Recovery	122
Method Detection Limit		0.2	
Date Extracted:		12/16/91	
Date Analyzed:		12/18/91	

ND = Not Detected

Reference: Methods for the Determination of Organic Substances in Water and Fluvial Sediments, U.S. Geological Survey Techniques of Water-Resources Investigations, Book 5, Laboratory Analysis, Chapter A3.

Leaking Underground Fuel Tank (LUFT) Field Manual, California State Water Resources Control Board, Division of Water Quality, December 17, 1987.

LABORATORY NO: 4410 92-0654

FUEL OIL RESULTS
USGS METHOD 82-1004

(All values are in mg/Kg which is equal to parts-per-million)

Sample Identification	TCT ID	Total Hydrocarbons as #2 Fuel Oil	Pentacosane Recovery (%)
JSP1	271727	ND	116
JSP2	271728	27*	85
Blank		ND	85
Spike		76% Recovery	119
Spike Duplicate		70% Recovery	122
Method Detection Limit		2	
Date Extracted:		12/16/91	
Date Analyzed:		12/18/91	

---

* Chromatographic profile contains lower boiling hydrocarbons and is not typical of #2 fuel oil.

ND = Not Detected

Reference: Methods for the Determination of Organic Substances in Water and Fluvial Sediments, U.S. Geological Survey Techniques of Water-Resources Investigations, Book 5, Laboratory Analysis, Chapter A3.

Leaking Underground Fuel Tank (LUFT) Field Manual, California State Water Resources Control Board, Division of Water Quality, December 17, 1987.

LABORATORY NO: 4410 92-0654

soil pile

METAL RESULTS

(All values are in mg/Kg which is equal to parts-per-million)

Client ID:	JSP1	JSP2			
TCT ID:	271727	271728			
Parameter			LDL	Test Date	Test Method
Lead	12	9.0	2.5	01/02/92	7420

ND = Not Detected

LDL = Lower Detectable Limit

Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

LABORATORY NO: 4410 92-0654

twin city testing corporation
737 PELHAM AVENUE
DOCK 4
ST. PAUL, MN 55114
PHONE 612 659 7555

CHAIN-OF-CUSTODY RECORD

TCT NO. 34491

TCT CONTACT: Stephanie Kidder
PROJECT NAME: JordAN
CLIENT P.O. # / PROJECT NO.: Contract #63638?
BILL TO (CO. NAME, ADDRESS): John Sampson
REPORT TO: SAME

CLIENT NAME: Mn/DOT
CLIENT ADDRESS (STREET NUMBER, SUITE, ETC.): 6000 Minnehaha Ave S
CLIENT ADDRESS (CITY, STATE, ZIP): St. Paul MN
CLIENT CONTACT/ADDRESS IF DIFFERENT FROM ABOVE: Mark Vogel PHONE: 725-2384
SAMPLED BY PRINT NAME/SIGNATURE: MV 83

TCT USE ONLY
PROJ. MGR.: Stephanie
PRIORITY: Normal
INVOICE #: 4410 92-0654
JOB NAME: MN-DOT.5
CUSTODY SEAL INTACT/NUMBER Y/N: N
TEMPERATURE OF CONTAINER: Dropped off
SAMPLE CONDITION: OK

PREPAY Y/N: N
CHECK NO.:
CHECK AMOUNT:

POSSIBLE HAZARD: YES ____ UNKNOWN X (COMMENT BELOW)

SAMPLE DISPOSAL: RETURN TO CLIENT ____ DISPOSAL BY LAB X
(ADDITIONAL CHARGES MAY BE ASSESSED)

ANALYSES REQUEST

CODE A - NONE
B - HNO3
C - H_2SO_4
D - NaOH
E - HCl
F - ______

	Gas, BTEX, MTBE	Fuel Oil	Gas, BTEX, MTBE	Fuel Oil	Lead
FILTERED (YES/NO)	N	N	N	N	N
PRESERVED (CODE)	E	A	A	A	A
REFRIGERATED (Y/N)	Y	Y	Y	Y	Y

ITEM NO.	CLIENT SAMPLE ID.	MATRIX	DATE SAMPLED	TIME SAMPLED	Gas, BTEX, MTBE	Fuel Oil	Gas, BTEX, MTBE	Fuel Oil	Lead				NO. OF CONTAINERS	CONTAINER TYPE	TCT NO.
1	JMW1	WATER	12-10-91	1215	X	X							4	3 40 ml, 1 LT	27172[illegible]
2	JMW2	"		1125	X	X							"		27172[illegible]
3	JMW3	"		1100	X	X							"		2717[illegible]
4	BB	"		1145	X	X							"		2717[illegible]
5	FB	"		—	X	[illegible]							"	40 ml Vial	2717[illegible]
6	JSP1	SOIL		0945			X	X	X				4	2 250 ml, 2 4oz	2717[illegible]
7	JSP2	"		1000			X	X	X				4	2, 2	2717[illegible]
8															
9															
10															

Additional Comments: Internal chain of custody

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TI[ME]
[illegible signature]	12-10-91	1350	[illegible signature]	12/10/91	[illegible]

Original Copy

INTERNAL CHAIN-OF-CUSTODY FORM

MW-DOT-5

Sample Description: Water

Client Identification Number: JMW1, JMW2, JMW3 & BP

TCT Identification Number: 27122-25

Fuel-Oil (Dispose of samples 3 months upon Receipt as per stephanie. 12/1/91 PB)

Relinquished By	Received By	Date/Time	Sample Location

PARTIAL SAMPLE DISTRIBUTION

Description	Released To	Date/Time

Final Sample Disposition:

original

INTERNAL CHAIN-OF-CUSTODY FORM

MN-DOT 5

Sample Description: Water / Soil

Client Identification Number: Waters - JMW1, JMW2, JMW3 + BB, FB
Soils - JSP1 + JSP2

TCT Identification Number: Waters - 271722-26
Soils 271727-28
BTX + MTBE

Relinquished By	Received By	Date/Time	Sample Location
Paula [signature]	Craig S. Foxhoven	12-12-91/ 11:30 a.m.	Volatiles Lab
Craig S. Foxhoven	[signature]	12/18/91 4:00 pm	LOG-IN

PARTIAL SAMPLE DISTRIBUTION

Released By	Released To	Date/Time

Final Sample Disposition:

Original

INTERNAL CHAIN-OF-CUSTODY FORM

MN-DOT 5

Sample Description: Soil

Client Identification Number: JSP1 + JSP2

TCT Identification Number: 27727 + 27728

Fuel-oil (Dispose of sample 3 months upon Receipt. as per Stephanie. 12/16/91 DP)

Relinquished By	Received By	Date/Time	Sample Location
Paula Kramer	Charles J Mills	12-16-91 10:25	EXT
Charles J Mills	Buck A. Eggers	12/16/91 11:05	Reg. 4 Lobby

PARTIAL SAMPLE DISTRIBUTION

Description	Released To	Date/Time

Final Sample Disposition:

Original

INTERNAL CHAIN-OF-CUSTODY FORM

MN-DOT.5

Sample Description: Soil

Client Identification Number: JSP1 + JSP2

TCT Identification Number: 27727 + 27728

Metals Dispose-3 months upon Receipt as per Stephanie, 12/10/91 (PD)

Relinquished By	Received By	Date/Time	Sample Location
Paula Krause	J. Cebe	12-16-91	In Organic
J. Cebe	Paula Krause	1/3/92 2:00	Log-Cooler.

PARTIAL SAMPLE DISTRIBUTION

Relinquished By	Released To	Date/Time

Final Sample Disposition:

X

twin city testing corporation
662 CROMWELL AVENUE
ST. PAUL, MN 55114
PHONE 612/645-3601

REPORT OF: CHEMICAL ANALYSES

PROJECT: JORDON, #68639

DATE: April 6, 1992

REPORTED TO: Minnesota Department of Transportation
Attn: John Sampson
6000 Minnehaha Avenue South
St. Paul, MN 55111

LABORATORY NO: 4410 92-1267

INTRODUCTION

This report presents the results of the analyses of five samples received on March 17, 1992, from a representative of Minnesota Department of Transportation. The scope of our services was limited to the parameters listed in the attached tables.

METHODOLOGY

Analyses are performed according to Twin City Testing Standard Operating Procedures. The procedures are based on the references stated in the analytical results tables.

RESULTS

The results are listed in the attached tables.

REMARKS

The samples were collected on March 16, 1992, and were consumed in the analyses.

TWIN CITY TESTING CORPORATION

Stephanie A. Kidder
Project Manager

Susan D. Max, Director
Laboratory Operations

SAK\SDM\tlv

VOLATILE ORGANIC COMPOUND RESULTS
EPA METHOD 8020

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID:	JMW-1	JMW-3	JBB	Field Blank	Method Blank	
TCT ID:	279374	279376	279377	279378		
Parameter:						**PQL**
Benzene	ND	ND	ND	ND	ND	5
Toluene	ND	ND	ND	ND	ND	5
Ethyl benzene	ND	ND	ND	ND	ND	5
Total xylenes	ND	ND	ND	ND	ND	5
Methyl-tert-butyl ether	ND	ND	ND	ND	ND	5
Surrogate Recovery:						
α,α,α-Trifluorotoluene	118%	112%	120%	117%	118%	
Total hydrocarbons as gasoline	ND	ND	ND	ND	ND	30
Surrogate Recovery:						
α,α,α-Trifluorotoluene	114%	108%	116%	113%	112%	
Date Analyzed:	3/21/92	3/21/92	3/20/92	3/20/92	3/20/92	

PQL = Practical Quantitation Limit

ND = Not Detected

Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

Collected 3-16-92

LABORATORY NO: 4410 92-1267

VOLATILE ORGANIC COMPOUND RESULTS
EPA METHOD 8020

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID: JMW-2

TCT ID: 279375

Parameter:		**PQL**
Benzene	ND	17
Toluene	ND	17
Ethyl benzene	27	17
Total xylenes	23	17
Methyl-tert-butyl ether	ND	17
Surrogate Recovery:		
α,α,α-Trifluorotoluene	106%	
Total hydrocarbons as gasoline	2,100	100
Surrogate Recovery:		
α,α,α-Trifluorotoluene	101%	
Date Analyzed:	3/23/92	

PQL = Practical Quantitation Limit

ND = Not Detected

Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

collected 3-16-92

LABORATORY NO: 4410 92-1267

FUEL OIL RESULTS
USGS METHOD 82-1004

(All values are in mg/L which is equivalent to parts-per-million)

Sample Identification	TCT ID	Total Hydrocarbons as #2 Fuel Oil	Pentacosane Recovery (%)	Method Detection Limit
JMW-1	279374	ND	82	0.2
JMW-2	279375	1.0[1]	105	0.2
JMW-3	279376	ND	110	0.2
JBB	279377	ND	77	0.2
Field Blank	279378	ND	78	0.2
Blank		ND	82	0.2
Method Spike		79% Recovery	86	
Method Spike Duplicate		91% Recovery	104	

Date Extracted: 3/20/92

Date Analyzed: 3/26/92

---

[1] Chromatographic profile is not typical of #2 fuel oil.

ND = Not Detected

Reference: Methods for the Determination of Organic Substances in Water and Fluvial Sediments, U.S. Geological Survey Techniques of Water-Resources Investigations, Book 5, Laboratory Analysis, Chapter A3.

Leaking Underground Fuel Tank (LUFT) Field Manual, California State Water Resources Control Board, Division of Water Quality, December 17, 1987.

collected 3-16-92

LABORATORY NO: 4410 92-1267

twin city testing corporation
662 CROMWELL AVENUE
ST. PAUL, MN 55114
PHONE 612/645-3601

REPORT OF: CHEMICAL ANALYSES

PROJECT: JORDON TRUCK STATION, #68639 **DATE:** July 7, 1992

REPORTED TO: Minnesota Department of Transportation
Attn: John Sampson
6000 Minnehaha Avenue
St. Paul, MN 55111

LABORATORY NO: 4410 92-2031

INTRODUCTION

This report presents the results of the analyses of five samples received on June 18, 1992, from a representative of Minnesota Department of Transportation. The scope of our services was limited to the parameters listed in the attached tables.

METHODOLOGY

Analyses are performed according to Twin City Testing Standard Operating Procedures. The procedures are based on the references stated in the analytical results tables.

RESULTS

The results are listed in the attached tables.

REMARKS

The samples were collected on June 18, 1992. If samples are not consumed in the analysis, they are held for three months from the date of sample receipt and then disposed, unless written instructions to the contrary are received.

TWIN CITY TESTING CORPORATION

Stephanie A. Kidder
Project Manager

Susan D. Max for Sue Max
Director, Environmental Chemistry

SAK\SDM\lml

VOLATILE ORGANIC COMPOUND RESULTS
EPA METHOD 8020

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID:	JMW1	JMW2	JMW3	Bailer Blank	Field Blank	Method Blank	
TCT ID:	287930	287933*	287934	287935	287936		
Parameter:							PQL
Benzene	ND	ND	ND	ND	ND	ND	5
Toluene	ND	ND	ND	ND	ND	ND	5
Ethyl benzene	ND	11	ND	ND	ND	ND	5
Total xylenes	ND	7	ND	ND	ND	ND	5
Methyl-tert-butyl ether	ND	ND	ND	ND	ND	ND	5
Surrogate Recovery:							
α,α,α-Trifluorotoluene	89%	93%	93%	89%	92%	91%	
Same as Total HC as gasoline Gasoline Range Organics	ND	680*	ND	ND	ND	ND	30
Surrogate Recovery:							
α,α,α-Trifluorotoluene	101%	107%	108%	103%	105%	105%	
Date Collected:	6/18/92	6/18/92	6/18/92	6/18/92	6/18/92		
Date Analyzed:	6/23/92	6/24/92	6/24/92	6/24/92	6/23/92	6/23/92	

* Chromatographic profile also contains higher boiling hydrocarbons.

PQL = Practical Quantitation Limit
ND = Not Detected

Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

Wisconsin Department of Natural Resources, PUBL-SW-140, April 1992.

LABORATORY NO: 4410 92-2031

DIESEL RANGE ORGANIC RESULTS
MODIFIED DRO METHOD

(All values are in µg/L which is equivalent to parts-per-billion)

Sample Identification	TCT ID	Diesel Range Organics	Triacontane Recovery (%)	Practical Quantitation Limit
JMW1	287930	ND	74	200
JMW2	287933	520[1]	61	200
JMW3	287934	ND	79	200
Bailer Blank	287935	ND	92	200
Field Blank	287936	ND	98	200
Blank		ND	67	200
Method Spike		88% Recovery	96	
Method Spike Duplicate		100% Recovery	100	

Date Collected: 6/18/92

Date Extracted: 6/25/92

Date Analyzed: 6/29-30/92

---

[1] Chromatographic profile also contains lower boiling hydrocarbons.

ND = Not Detected

Reference: Wisconsin Department of Natural Resources, PUBL-SW-141, April 1992.

LABORATORY NO: 4410 92-2031

twin city testing corporation
662 CROMWELL AVENUE
ST. PAUL, MN 55114
PHONE 612/645-3601

REPORT OF: CHEMICAL ANALYSES

PROJECT: JORDAN, 69474

DATE: October 6, 1992

REPORTED TO: Minnesota Department of Transportation
Attn: John Sampson
6000 Minnehaha Avenue
St. Paul, MN 55111

LABORATORY NO: 4410 92-2768

INTRODUCTION

This report presents the results of the analyses of five samples received on September 21, 1992, from a representative of Minnesota Department of Transportation. The scope of our services was limited to the parameters listed in the attached tables.

METHODOLOGY

Analyses are performed according to Twin City Testing Standard Operating Procedures. The procedures are based on the references stated in the analytical results tables.

RESULTS

The results are listed in the attached tables.

REMARKS

The samples were collected on September 21, 1992. If samples are not consumed in the analysis, they are held for three months from the date of sample receipt and then disposed, unless written instructions to the contrary are received.

TWIN CITY TESTING CORPORATION

Stephanie A. Kidder
Project Manager

Susan D. Max
Director, Environmental Chemistry

SAK\SDM\lml

VOLATILE ORGANIC COMPOUND RESULTS
EPA METHOD 8020

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID:	JMW1 1040	JMW2 1115	JMW3 1145	BB	TB	Method Blank	
TCT ID:	296647	296648*	296649	296650	296651		
Parameter:							PQL
Benzene	ND	ND	ND	ND	ND	ND	5
Toluene	ND	ND	ND	ND	ND	ND	5
Ethyl benzene	ND	6	ND	ND	ND	ND	5
Total xylenes	ND	ND	ND	ND	ND	ND	5
Surrogate Recovery:							
α,α,α-Trifluorotoluene	93%	101%	94%	97%	116%	100%	
Gasoline Range Organics	ND	410	ND	ND	ND	ND	30
Surrogate Recovery:							
α,α,α-Trifluorotoluene	96%	104%	97%	101%	105%	104%	
Date Collected:	9/21/92	9/21/92	9/21/92	9/21/92	9/21/92		
Date Analyzed:	9/22/92	9/23/92	9/22/92	9/22/92	9/23/92	9/22/92	

* Chromatographic profile also contains higher boiling hydrocarbons.

PQL = Practical Quantitation Limit
ND = Not Detected

Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

Wisconsin Department of Natural Resources, PUBL-SW-140, April 1992.

LABORATORY NO: 4410 92-2768

VOLATILE ORGANIC COMPOUNDS
MNDH METHOD 465D

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID:	JMW1 1040	JMW2 115	JMW3 1145	BB	
TCT ID:	296647	296648*	296649	296650	
Compound:					**PQL**
Acetone	ND	ND	ND	200	10
Allyl Chloride	ND	ND	ND	ND	10
Benzene	ND	ND	ND	ND	1
Bromobenzene	ND	ND	ND	ND	1
Bromochloromethane	ND	ND	ND	ND	1
Bromodichloromethane	ND	ND	ND	ND	1
Bromoform	ND	ND	ND	ND	5
Bromomethane	ND	ND	ND	ND	2
n-Butylbenzene	ND	3	ND	ND	1
sec-Butylbenzene	ND	9	ND	ND	1
tert-Butylbenzene	ND	ND	ND	ND	1
Carbon tetrachloride	ND	ND	ND	ND	1
Chlorobenzene	ND	ND	ND	ND	1
Chloroethane	ND	ND	ND	ND	2
Chloroform	ND	ND	ND	ND	1
Chloromethane	ND	ND	ND	ND	5
2-Chlorotoluene	ND	ND	ND	ND	1
4-Chlorotoluene	ND	ND	ND	ND	1
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	5
Dibromochloromethane	ND	ND	ND	ND	1
1,2-Dibromoethane	ND	ND	ND	ND	2
Dibromomethane	ND	ND	ND	ND	1
1,2-Dichlorobenzene	ND	ND	ND	ND	1
1,3-Dichlorobenzene	ND	ND	ND	ND	1
1,4-Dichlorobenzene	ND	ND	ND	ND	1
Dichlorodifluoromethane	ND	ND	ND	ND	5
1,1-Dichloroethane	ND	ND	ND	ND	1
1,2-Dichloroethane	ND	ND	ND	ND	1
1,1-Dichloroethene	ND	ND	ND	ND	1
cis-1,2-Dichloroethene	ND	ND	ND	ND	1
trans-1,2-Dichloroethene	ND	ND	ND	ND	1
Dichlorofluoromethane	ND	ND	ND	ND	2
1,2-Dichloropropane	ND	ND	ND	ND	1
1,3-Dichloropropane	ND	ND	ND	ND	1
2,2-Dichloropropane	ND	ND	ND	ND	1

(continued)

* Unidentified high boiling hydrocarbons present.
PQL = Practical Quantitation Limit
ND = Not Detected

LABORATORY NO: 4410 92-2768

VOLATILE ORGANIC COMPOUNDS (continued)
MNDH METHOD 465D

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID:	**JMW1 1040**	**JMW2 1115**	**JMW3 1145**	**BB**	
TCT ID:	296647	296648	296649	296650	
Compound:					**PQL**
1,1-Dichloropropene	ND	ND	ND	ND	1
cis-1,3-Dichloropropene	ND	ND	ND	ND	1
trans-1,3-Dichloropropene	ND	ND	ND	ND	1
Ethyl Ether	ND	ND	ND	ND	5
Ethylbenzene	ND	5	ND	ND	1
Hexachlorobutadiene	ND	ND	ND	ND	1
Isopropylbenzene	ND	6	ND	ND	1
p-Isopropyltoluene	ND	2	ND	ND	1
Methyl Ethyl Ketone	ND	ND	ND	ND	5
Methyl Isobutyl Ketone	ND	ND	ND	ND	5
Methyl Tertiarty Butyl Ether	ND	ND	ND	ND	1
Methylene chloride	ND	ND	ND	ND	1
Naphthalene	ND	ND	ND	ND	1
n-Propylbenzene	ND	5	ND	ND	1
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	1
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	1
Tetrachloroethene	ND	ND	ND	ND	1
Tetrahydrofuran	ND	ND	ND	ND	10
Toluene	ND	ND	ND	ND	1
1,2,3-Trichlorobenzene	ND	ND	ND	ND	1
1,2,4-Trichlorobenzene	ND	ND	ND	ND	1
1,1,1-Trichloroethane	ND	ND	ND	ND	2
1,1,2-Trichloroethane	ND	ND	ND	ND	1
Trichloroethene	ND	ND	ND	ND	1
Trichlorofluoromethane	ND	ND	ND	ND	2
1,2,3-Trichloropropane	ND	ND	ND	ND	1
Trichlorotrifluoroethane	ND	ND	ND	ND	1
1,2,4-Trimethylbenzene	ND	ND	ND	ND	1
1,3,5-Trimethylbenzene	ND	ND	ND	ND	1
Vinyl chloride	ND	ND	ND	ND	2
o-Xylene, Styrene[1]	ND	ND	ND	ND	1
m-p-Xylenes[1]	ND	ND	ND	ND	1
Date Analyzed:	10/1/92	10/2/92	10/1-2/92	10/1-2/92	

[1]Compounds not separated by this method.

PQL = Practical Quantitation Limit
ND = Not Detected

Reference: Minnesota Department of Health, Method 465D.

LABORATORY NO: 4410 92-2768

VOLATILE ORGANIC COMPOUNDS
MNDH METHOD 465D

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID:	TB	Method Blank	Method Blank	
TCT ID:	296651			
Compound:				**PQL**
Acetone	220	ND	12	10
Allyl Chloride	ND	ND	ND	10
Benzene	ND	ND	ND	1
Bromobenzene	ND	ND	ND	1
Bromochloromethane	ND	ND	ND	1
Bromodichloromethane	ND	ND	ND	1
Bromoform	ND	ND	ND	5
Bromomethane	ND	ND	ND	2
n-Butylbenzene	ND	ND	ND	1
sec-Butylbenzene	ND	ND	ND	1
tert-Butylbenzene	ND	ND	ND	1
Carbon tetrachloride	ND	ND	ND	1
Chlorobenzene	ND	ND	ND	1
Chloroethane	ND	ND	ND	2
Chloroform	ND	ND	ND	1
Chloromethane	ND	ND	ND	5
2-Chlorotoluene	ND	ND	ND	1
4-Chlorotoluene	ND	ND	ND	1
1,2-Dibromo-3-chloropropane	ND	ND	ND	5
Dibromochloromethane	ND	ND	ND	1
1,2-Dibromoethane	ND	ND	ND	2
Dibromomethane	ND	ND	ND	1
1,2-Dichlorobenzene	ND	ND	ND	1
1,3-Dichlorobenzene	ND	ND	ND	1
1,4-Dichlorobenzene	ND	ND	ND	1
Dichlorodifluoromethane	ND	ND	ND	5
1,1-Dichloroethane	ND	ND	ND	1
1,2-Dichloroethane	ND	ND	ND	1
1,1-Dichloroethene	ND	ND	ND	1
cis-1,2-Dichloroethene	ND	ND	ND	1
trans-1,2-Dichloroethene	ND	ND	ND	1
Dichlorofluoromethane	ND	ND	ND	2
1,2-Dichloropropane	ND	ND	ND	1
1,3-Dichloropropane	ND	ND	ND	1
2,2-Dichloropropane	ND	ND	ND	1

(continued)

PQL = Practical Quantitation Limit
ND = Not Detected

LABORATORY NO: 4410 92-2768

VOLATILE ORGANIC COMPOUNDS (continued)
MNDH METHOD 465D

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID:	**TB**	**Method Blank**	**Method Blank**	
TCT ID:	296651			
Compound:				**PQL**
1,1-Dichloropropene	ND	ND	ND	1
cis-1,3-Dichloropropene	ND	ND	ND	1
trans-1,3-Dichloropropene	ND	ND	ND	1
Ethyl Ether	ND	ND	ND	5
Ethylbenzene	ND	ND	ND	1
Hexachlorobutadiene	ND	ND	ND	1
Isopropylbenzene	ND	ND	ND	1
p-Isopropyltoluene	ND	ND	ND	1
Methyl Ethyl Ketone	ND	ND	ND	5
Methyl Isobutyl Ketone	ND	ND	ND	5
Methyl Tertiarty Butyl Ether	ND	ND	ND	1
Methylene chloride	ND	1	ND	1
Naphthalene	ND	ND	ND	1
n-Propylbenzene	ND	ND	ND	1
1,1,1,2-Tetrachloroethane	ND	ND	ND	1
1,1,2,2-Tetrachloroethane	ND	ND	ND	1
Tetrachloroethene	ND	ND	ND	1
Tetrahydrofuran	ND	ND	ND	10
Toluene	ND	ND	ND	1
1,2,3-Trichlorobenzene	ND	ND	ND	1
1,2,4-Trichlorobenzene	ND	ND	ND	1
1,1,1-Trichloroethane	ND	ND	ND	2
1,1,2-Trichloroethane	ND	ND	ND	1
Trichloroethene	ND	ND	ND	1
Trichlorofluoromethane	ND	ND	ND	2
1,2,3-Trichloropropane	ND	ND	ND	1
Trichlorotrifluoroethane	ND	ND	ND	1
1,2,4-Trimethylbenzene	ND	ND	ND	1
1,3,5-Trimethylbenzene	ND	ND	ND	1
Vinyl chloride	ND	ND	ND	2
o-Xylene, Styrene[1]	ND	ND	ND	1
m-p-Xylenes[1]	ND	ND	ND	1
Date Analyzed:	10/1/92	10/1-2/92	10/2-3/92	

[1]Compounds not separated by this method.

PQL = Practical Quantitation Limit
ND = Not Detected

Reference: Minnesota Department of Health, Method 465D.

LABORATORY NO: 4410 92-2768

DIESEL RANGE ORGANIC RESULTS
MODIFIED DRO METHOD

(All values are in µg/L which is equivalent to parts-per-billion)

Sample Identification	TCT ID	Diesel Range Organics	Triacontane Recovery (%)	Practical Quantitation Limit
JMW1 1040	296647	ND	93	220
JMW2 1115	296648	710[1]	97	200
JMW3 1145	296649	ND	94	200
BB	296650	ND	128	220
TB	296651	ND	93	200
Blank		ND	96	200
Matrix Spike		78% Recovery	94	
Matrix Spike Duplicate		78% Recovery	93	

Date Collected: 9/21/92

Date Extracted: 9/25/92

Date Analyzed: 9/28-29/92

---

[1] Chromatographic profile also contains lower boiling hydrocarbons.

ND = Not Detected

Reference: Wisconsin Department of Natural Resources, PUBL-SW-141, April 1992.

LABORATORY NO: 4410 92-2768

twin city testing corporation
737 PELHAM AVENUE
DOCK 4
ST. PAUL, MN 55114
PHONE 612/659-7555

J64

CHAIN-OF-CUSTODY RECORD

TCT NO. 35723

CLIENT NAME: Mn/DOT
CLIENT ADDRESS (STREET NUMBER, SUITE, ETC.): 6000 Minnehaha Ave S
CLIENT ADDRESS (CITY, STATE, ZIP): St. Paul MN 55111
CLIENT CONTACT/ADDRESS IF DIFFERENT FROM ABOVE: Mark Vogel PHONE: 725-2384
SAMPLED BY PRINT NAME/SIGNATURE: MV

TCT CONTACT: Stephanie Kidder
PROJECT NAME: Jordan
CLIENT P.O. # / PROJECT NO.: Mn/DOT #68639
BILL TO (CO. NAME, ADDRESS): Same
REPORT TO: John Sampson 725-2365

TCT USE ONLY	
PROJ. MGR.	Steph
PRIORITY	Normal
INVOICE #	441D92-2768
JOB NAME	MN-DOT.10
CUSTODY SEAL INTACT/NUMBER Y/N	N/A
TEMPERATURE OF CONTAINER	ice / Dropped off
SAMPLE CONDITION	OK

PREPAY Y/N	N
CHECK NO.	✓
CHECK AMOUNT	

POSSIBLE HAZARD: YES ____ UNKNOWN X (COMMENT BELOW)

SAMPLE DISPOSAL: RETURN TO CLIENT ____ DISPOSAL BY LAB X
(ADDITIONAL CHARGES MAY BE ASSESSED)

ANALYSES REQUEST

	2 VOC kits	1 lt amber
FILTERED (YES/NO)	N	N
PRESERVED (CODE)	E	A
REFRIGERATED (Y/N)	Y	Y

CODE A - NONE
B - HNO3
C - H_2SO_4
D - NaOH
E - HCl
F - ____

ITEM NO.	CLIENT SAMPLE ID.	MATRIX	DATE SAMPLED	TIME SAMPLED	2 VOC kits	1 lt amber							NO. OF CONTAINERS	CONTAINER TYPE	TCT NO.
1	SMW1 1040	water	9-21-92		✓	✓							7	6 40 ml, 1 l lt.	
2	SMW2 1115	↓	↓										↓	↓	
3	SMW3 1145														
4	BB 1050														
5	TB														
6															
7															
8															
9															
10															

Additional Comments
BTEX + Gas EPA Method 8020
Total Hydrocarbons Mn bit ~~465C~~ 465D
Fuel oil DRO Method
Internal Chain of Custody

SK as per ? MV 9-22-92

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[illegible signature]	9/21/92	1330	Karla Kraus	9/21/92	13:40

* SEE REVERSE SIDE FOR INSTRUCTIONS

INTERNAL CHAIN-OF-CUSTODY FORM

MN-DOT.70

Sample Description: water

Client Identification Number: JMW1 1040, JMW2 1115, JMW3 1145, BB, TB

TCT Identification Number: 296647-651

Relinquished By	Received By	Date/Time	Sample Location
Erica A. Eggers	Craig S. Fox Rover	9-22-92 9:30a.m.	Volatiles Lab
Craig S. Fox Rover	Erica A. Eggers	9-10-92	V-64 Log. in

PARTIAL SAMPLE DISTRIBUTION

Description	Released To	Date/Time

Final Sample Disposition:

C-825 (5/90)

twin city testing corporation

INTERNAL CHAIN-OF-CUSTODY FORM

MN-DOT 70

Sample Description: water

Client Identification Number: JMW1 1040, JMW2 1115, JMW3 1145, BB, TB

TCT Identification Number: 296647 - 651

Relinquished By	Received By	Date/Time	Sample Location
E. Eggers	J. Ostl - (1)	9/21/92 14:10	EXT. LAB
J. Ostl	Tina A. Eggers	9/28/92 8:00 AM.	(1)

PARTIAL SAMPLE DISTRIBUTION

Description	Released To	Date/Time

Final Sample Disposition: (1) all samples were used up during extraction process HAO 9-28-92

C-825 (5/90)