



009  
twin city testing  
corporation

4444 AIRPARK BOULEVARD  
DULUTH, MN 55811  
PHONE 218/722-8433  
FAX 218/722-1786

November 21, 1990

RECEIVED

NOV 23 1990

NORTHWEST DISTRICT  
HEADQUARTERS

Mr Tom Kendzierski  
WI Dept of Natural Resources  
Highway 70 West  
Spooner, WI 54801

RE: Union 76 Station/Bob Smith  
Solon Springs, Wisconsin  
8400-91-025

Dear Mr Kendzierski

Twin City Testing Corporation has completed the field work and chemistry analysis for the above mentioned project. Attached herewith are copies of the boring logs, a sketch indicating their location, and copies of the chemistry results.

Before we address remediation at the site, I would like to discuss our findings with you. Please review this at your earliest convenience. I will attempt to contact you the week of November 26, 1990.

If you have any questions, please contact me.

TWIN CITY TESTING CORPORATION

Les Conway, CE  
Branch Manager

LC/rb

CC: Bob Smith

# LOG OF TEST BORING

 JOB NO. 8400-91-025

 VERTICAL SCALE 1" = 4'

 BORING NO. SB-1

 PROJECT UNION 76 STATION - SOLON SPRINGS, WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL SURFACE ELEVATION <u>100.1</u>	GEOLOGIC ORIGIN	N OF CR	WL	SAMPLE		TESTS		ORGANIC VAPOR	
					NO.	TYPE	W	D	hNu (ppm)	bkgd (ppm)
0.3	ASPHALT	Fill	4		1	SB			0.0	
	SAND, poorly graded, some gravel, medium grained, brown, dry, loose to medium dense (SP)									
6.0		Coarse Alluvium	9		2	SB			0.0	
	SILTY SAND, some gravel, medium grained, brown, moist, very dense (SM)		30		3	SB			0.0	
			31		4	SB			0.0	
11.0			13		5	SB			0.5	
	SAND, poorly graded, coarse grained, brown, waterbearing, medium dense (SP)			▼ =						
14.0	END OF BORING									

### WATER LEVEL MEASUREMENTS

 START 10-22-90 COMPLETE 10-22-90

 at 11:30

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL	METHOD
10/22	11:30	14'	None	None		11.5	3 1/4" H.S.A
CREW CHIEF							<b>D Dallman</b>

**twin city testing  
corporation**

# LOG OF TEST BORING

JOB NO. 8400-91-025

VERTICAL SCALE 1" = 4'

BORING NO. SB-2



PROJECT UNION 76 STATION - SOLON SPRINGS, WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL SURFACE ELEVATION <u>99.9</u>	GEOLOGIC ORIGIN	N OF CR	WL	SAMPLE		TESTS		ORGANIC VAPOR	
					NO.	TYPE	W	D	hNu (ppm)	bkgd (ppm)
0.4	CONCRETE	Fill	7		1	SB			0.0	
	SAND, poorly graded, some gravel, some organics, brown, dry to moist to waterbearing, loose to medium dense (SP)	Coarse Alluvium	6		2	SB			0.0	
			4		3	SB			25.0	
			12		4	SB			20.0	
			11		5	SB			20.0	
			11		6	SB			20.0	
			14		7	SB			18.0	
17.0	END OF BORING									

**WATER LEVEL MEASUREMENTS**

START 10-22-90 COMPLETE 10-22-90

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL	METHOD	TIME	
10/22	1:00	17'	17'	17'		16'	3 1/4" H.S.A.	at 1:00	
CREW CHIEF							<b>D Dallman</b>		

# LOG OF TEST BORING

 JOB NO. 8400-91-025

 VERTICAL SCALE 1" = 4'

 BORING NO. SB-3

 PROJECT UNION 76 STATION - SOLON SPRINGS, WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL SURFACE ELEVATION <u>99.4</u>	GEOLOGIC ORIGIN	N OF CR	WL	SAMPLE		TESTS		ORGANIC VAPOR	
					NO.	TYPE	W	D	hNu (ppm)	bkgd (ppm)
2.0	FILL, silty sand, gravel, organics, brown	Fill	13		1	SB			0.0	
	SAND, poorly graded, some gravel, medium to coarse grained, brown, dry to moist to waterbearing, loose to very dense (SP)	Coarse Alluvium	50		2	SB			0.0	
			26		3	SB			0.0	
			22		4	SB			20.0	
			40		5	SB			100.0	
			7	▼	6	SB			250.0	
			12		7	SB			60.0	
19.0	END OF BORING									

### WATER LEVEL MEASUREMENTS

 START 10-22-90 COMPLETE 10-22-90

 @ 4:00

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL	METHOD
10/22	4:00	19'	17'	16'		15.4'	3 1/4" H.S.A.

 CREW CHIEF D Dallman

**twin city testing corporation**

# LOG OF TEST BORING

 JOB NO. 8400-91-025

 VERTICAL SCALE 1" = 4'

 BORING NO. SB-4

 PROJECT UNION 76 STATION - SOLON SPRINGS, WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL SURFACE ELEVATION <u>98.6</u>	GEOLOGIC ORIGIN	N OF CR	WL	SAMPLE		TESTS		ORGANIC VAPOR	
					NO.	TYPE	W	D	hNu (ppm)	bkgd (ppm)
2.0	FILL, sand, gravel, silt, organics, brown	Fill	6		1	SB			0.0	
	SAND, poorly graded, some gravel, medium grained, brown, moist (SP)	Coarse Alluvium	8		2	SB			0.0	
			15		3	SB			0.0	
9.0			42		4	SB			0.0	
	SILTY SAND, some gravel, medium grained, brown, moist, very dense (SM)		63		5	SB			0.0	
14.0			7	▼	6	SB			0.0	
16.0	SAND, poorly graded, coarse grained, brown, waterbearing, loose (SP)									
	END OF BORING									

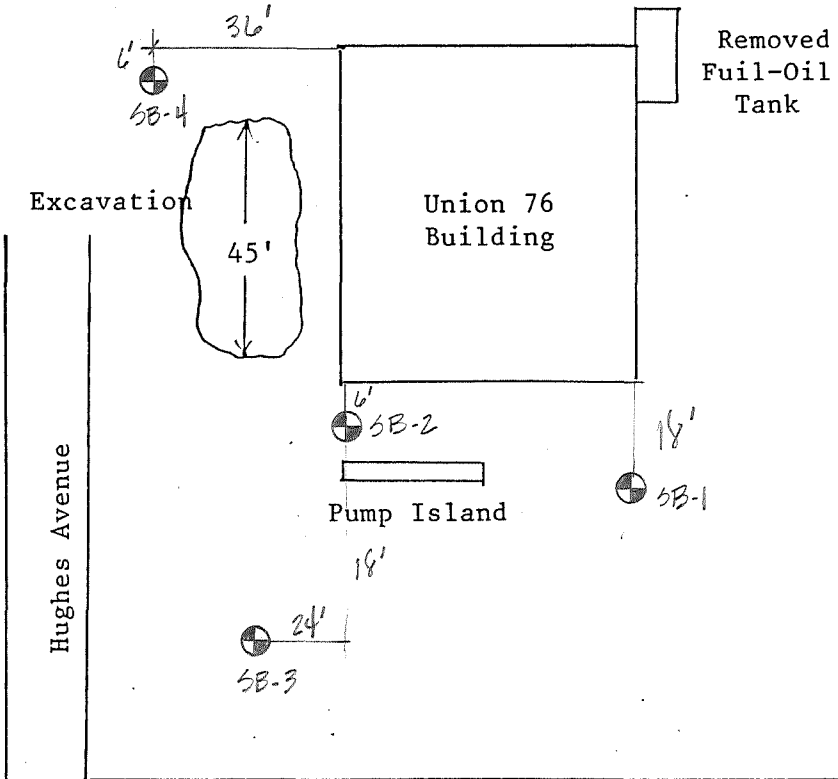
### WATER LEVEL MEASUREMENTS

 START 10-22-90 COMPLETE 10-22-90

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL	METHOD	COMPLETE
<u>10/22</u>	<u>2:15</u>	<u>16'</u>	<u>None</u>	<u>14'</u>		<u>13'</u>	<u>3 1/4" H.S.A.</u>	<u>10-22-90</u> a <u>2:15</u>

 CREW CHIEF D Dallman

**twin city testing**  
corporation



Highway 53



**twin city testing**  
corporation

781 INDUSTRIAL AVENUE  
RAPID CITY, SD 57702  
PHONE 605/348-5850

JOB #: 6110-01-16

RUSH

REPORT DATE: 11/13/90

NORMAL X

CHEMISTRY LABORATORY  
1854 LOMBARDY DRIVE  
RAPID CITY, SD 57701  
PHONE 605/341-7284

COMPANY: Twin City Testing/Les

ADDRESS: 4444 Airpark Boulevard

CITY-STATE: Duluth, MN 55811

PROJECT DESCRIPTION: Union 76 Solon Spring

WORK ORDER NO: 8400-91-025

SAMPLE DESCRIPTION: TH-1

SAMPLE MATRIX:  X  SOIL   WATER   OTHER  
RESULTS REPORTED IN:  X  ug/kg   ug/l

**VOLATILE ANALYSIS**

LAB #: 1174

PARAMETER	RESULTS	MDL -Method Detection Limit
TOTAL HYDROCARBONS AS GASOLINE	<10 (0.010ppm)	10 (0.010 ppm)
BENZENE	<1	1
TOLUENE	<1	1
ETHYL BENZENE	<1	1
XYLENES	<1	1
MTBE	<1	

DATE SAMPLED: 10/22/90

DATE FAXED:

DATE RECEIVED: 10/25/90

DATE RESULTS PHONED:

DATE ANALYZED & ANALYST: 11/02/90, KH

LAB COMMENTS:

**METHODOLOGY:**

Gasoline concentrations were determined using EPA Method  X  8015 (modified)  X  8020   602   Other with a Tekmar Liquid Sample Concentrator on a Varian Model 3700 Gas Chromatograph equipped with a flame ionization detector. Compounds were identified by column retention time and quantified by peak area comparisons to those of known standards. Extraction method used 5030.

REVIEWED BY:

REVISED 1/90

LABORATORY # : 1174

JOB # : 6110-01-16  
REPORT DATE: 11/13/90

RUSH  
NORMAL X



**twin city testing**  
corporation

781 INDUSTRIAL AVENUE  
RAPID CITY, SD 57702  
PHONE 605/348-5850

COMPANY: Twin City Testing/Les  
ADDRESS: 4444 Airpark Boulevard  
CITY-STATE: Duluth, MN 55811

CHEMISTRY LABORATORY  
1854 LOMBARDY DRIVE  
RAPID CITY, SD 57701  
PHONE 605/341-7284

PROJECT DESCRIPTION: Union 76 Solon Spring  
SAMPLE DESCRIPTION: TH-1

WORK ORDER #: 8400-91-025

**METALS ANALYSIS**

**SAMPLE MATRIX**

RESULTS REPORTED IN: mg/kg

SAMPLE DESCRIPTION  
METHOD SW846 3050

**SOIL**

SEDIMENT

SLUDGE

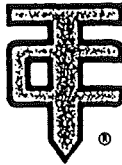
PARAMETER	RESULT	FLAME LDL	FURNACE LDL	SW846 METHOD	ANALYZED
Antimony (Sb)	_____	25.0	0.13	7040	_____
Aluminum (Al)	_____	2.5	0.13	7020	_____
Arsenic (As)	_____	25.0	0.13	7060	_____
Barium (Ba)	_____	25.0	1.25	7080	_____
Beryllium (Be)	_____	0.75	0.013	7090	_____
Cadmium (Cd)	_____	0.75	0.013	7130	_____
Calcium (Ca)	_____	2.5	N/A	7140	_____
Chromium (Cr)	_____	_____	_____	_____	_____
Total	_____	2.5	0.13	7190	_____
Chromium (Cr)	_____	_____	_____	_____	_____
Hexavalent	_____	0.25	N/A	7196	_____
Chromium (Cr)	_____	_____	_____	_____	_____
Trivalent	_____	0.25	N/A	** Cal.	_____
Cobalt (Co)	_____	0.75	0.13	7200	_____
Copper (Cu)	_____	0.25	0.13	7210	_____
Gold (Au)	_____	12.5	0.13	_____	_____
Iron (Fe)	_____	1.25	N/A	7380	_____
Lead (Pb)	<2.5	2.5	0.13	7420	11/13 KE
Lithium (Li)	_____	2.5	0.13	3111B	_____
_____	_____	_____	_____	* St.Meth.	_____
Magnesium (Mg)	_____	2.5	N/A	7450	_____
Manganese (Mn)	_____	0.75	N/A	7460	_____
Mercury (Hg)	_____	0.05	N/A	7470	_____
Molybdenum (Mo)	_____	250.0	1.25	7480	_____
Nickel (Ni)	_____	1.25	0.13	7520	_____
Potassium (K)	_____	25.0	N/A	7610	_____
Selenium (Se)	_____	0.50	N/A	7741	_____
Silicon (Si)	_____	25.0	N/A	3111D	_____
_____	_____	_____	_____	* St.Meth.	_____
Silver (Ag)	_____	0.25	0.013	7760	_____
Sodium (Na)	_____	25.0	N/A	7770	_____
Sodium Absorption	_____	_____	_____	_____	_____
Ratio	_____	N/A	N/A	** Cal.	_____
Vanadium (V)	_____	250.0	0.13	7910	_____
Zinc (Zn)	_____	0.13	N/A	7950	_____

\* - Standard Methods  
DATE SAMPLED: 10/22/90  
DATE RECEIVED: 10/25/90  
REVIEWED BY: *J. [Signature]*

\*\* - Calculation  
FAXED:  
RESULTS PHONED:  
REVISED 2/90

COMMENTS:





**twin city testing**  
corporation

781 INDUSTRIAL AVENUE  
RAPID CITY, SD 57702  
PHONE 605/348-5850

JOB #: 6110-01-16

RUSH

REPORT DATE: 11/13/90

NORMAL X

CHEMISTRY LABORATORY  
1854 LOMBARDY DRIVE  
RAPID CITY, SD 57701  
PHONE 605/341-7284

COMPANY: Twin City Testing/Les

ADDRESS: 4444 Airpark Boulevard

CITY-STATE: Duluth, MN 55811

PROJECT DESCRIPTION: Union 76 Solon Spring

WORK ORDER NO: 8400-91-025

SAMPLE DESCRIPTION: TH-2

SAMPLE MATRIX:  X  SOIL   WATER   OTHER  
RESULTS REPORTED IN:  X  ug/kg   ug/l

**VOLATILE ANALYSIS**

LAB #: 1175

PARAMETER	RESULTS	MDL	-Method Detection Limit
TOTAL HYDROCARBONS AS GASOLINE	3,400 ( 3.4 ppm)	10	(0.010 ppm)
BENZENE	14	1	
TOLUENE	7	1	
ETHYL BENZENE	6	1	
XYLENES	90	1	

MTBE

DATE SAMPLED: 10/22/90

DATE FAXED:

DATE RECEIVED: 10/25/90

DATE RESULTS PHONED:

DATE ANALYZED & ANALYST: 11/02/90, KH

LAB COMMENTS:

**METHODOLOGY:**

Gasoline concentrations were determined using EPA Method  X  8015 (modified)  X  8020   602   Other with a Tekmar Liquid Sample Concentrator on a Varian Model 3700 Gas Chromatograph equipped with a flame ionization detector. Compounds were identified by column retention time and quantified by peak area comparisons to those of known standards. Extraction method used 5030.

REVIEWED BY:

REVISED 1/90

LABORATORY # : 1175

JOB # : 6110-01-16  
REPORT DATE: 11/13/90

RUSH  
NORMAL X



**twin city testing**  
corporation

781 INDUSTRIAL AVENUE  
RAPID CITY, SD 57702  
PHONE 605/348-5850

COMPANY: Twin City Testing/Les  
ADDRESS: 4444 Airpark Boulevard  
CITY-STATE: Duluth, MN 55811

CHEMISTRY LABORATORY  
1854 LOMBARDY DRIVE  
RAPID CITY, SD 57701  
PHONE 605/341-7284

PROJECT DESCRIPTION: Union 76 Solon Spring  
SAMPLE DESCRIPTION: TH-2

WORK ORDER #: 8400-91-025

**METALS ANALYSIS**

**SAMPLE MATRIX**

RESULTS REPORTED IN: mg/kg

SAMPLE DESCRIPTION  
METHOD SW846 3050

SOIL

SEDIMENT

SLUDGE

PARAMETER	RESULT	FLAME LDL	FURNACE LDL	SW846 METHOD	ANALYZED
Antimony (Sb)	_____	25.0	0.13	7040	_____
Aluminum (Al)	_____	2.5	0.13	7020	_____
Arsenic (As)	_____	25.0	0.13	7060	_____
Barium (Ba)	_____	25.0	1.25	7080	_____
Beryllium (Be)	_____	0.75	0.013	7090	_____
Cadmium (Cd)	_____	0.75	0.013	7130	_____
Calcium (Ca)	_____	2.5	N/A	7140	_____
Chromium (Cr)	_____	_____	_____	_____	_____
Total	_____	2.5	0.13	7190	_____
Chromium (Cr)	_____	_____	_____	_____	_____
Hexavalent	_____	0.25	N/A	7196	_____
Chromium (Cr)	_____	_____	_____	_____	_____
Trivalent	_____	0.25	N/A	** Cal.	_____
Cobalt (Co)	_____	0.75	0.13	7200	_____
Copper (Cu)	_____	0.25	0.13	7210	_____
Gold (Au)	_____	12.5	0.13	_____	_____
Iron (Fe)	_____	1.25	N/A	7380	_____
Lead (Pb)	<2.5	2.5	0.13	7420	11/13 KE
Lithium (Li)	_____	2.5	0.13	3111B	_____
_____	_____	_____	_____	* St.Meth.	_____
Magnesium (Mg)	_____	2.5	N/A	7450	_____
Manganese (Mn)	_____	0.75	N/A	7460	_____
Mercury (Hg)	_____	0.05	N/A	7470	_____
Molybdenum (Mo)	_____	250.0	1.25	7480	_____
Nickel (Ni)	_____	1.25	0.13	7520	_____
Potassium (K)	_____	25.0	N/A	7610	_____
Selenium (Se)	_____	0.50	N/A	7741	_____
Silicon (Si)	_____	25.0	N/A	3111D	_____
_____	_____	_____	_____	* St.Meth.	_____
Silver (Ag)	_____	0.25	0.013	7760	_____
Sodium (Na)	_____	25.0	N/A	7770	_____
Sodium Absorption	_____	_____	_____	_____	_____
Ratio	_____	N/A	N/A	** Cal.	_____
Vanadium (V)	_____	250.0	0.13	7910	_____
Zinc (Zn)	_____	0.13	N/A	7950	_____

\* - Standard Methods  
DATE SAMPLED: 10/22/90  
DATE RECEIVED: 10/25/90  
REVIEWED BY:

\*\* - Calculation  
FAXED:  
RESULTS PHONED:  
REVISED 2/90

COMMENTS:



**twin city testing**  
corporation

781 INDUSTRIAL AVENUE  
RAPID CITY, SD 57702  
PHONE 605/348-5850

JOB #: 6110-01-16

RUSH

REPORT DATE: 11/13/90

NORMAL X

CHEMISTRY LABORATORY  
1854 LOMBARDY DRIVE  
RAPID CITY, SD 57701  
PHONE 605/341-7284

COMPANY: Twin City Testing/Les

ADDRESS: 4444 Airpark Boulevard

CITY-STATE: Duluth, MN 55811

PROJECT DESCRIPTION: Union 76 Solon Spring

WORK ORDER NO: 8400-91-025

SAMPLE DESCRIPTION: TH-3

SAMPLE MATRIX:  X  SOIL   WATER   OTHER  
RESULTS REPORTED IN:  X  ug/kg   ug/l

**VOLATILE ANALYSIS**

LAB #: 1173

PARAMETER	RESULTS	MDL	-Method Detection Limit
TOTAL HYDROCARBONS AS GASOLINE	1,500,000 (1500 ppm)	10	(0.010 ppm)
BENZENE	20,000	1	
TOLUENE	27,000	1	
ETHYL BENZENE	16,000	1	
XYLENES	90,000	1	

MTBE

DATE SAMPLED: 10/22/90

DATE FAXED:

DATE RECEIVED: 10/25/90

DATE RESULTS PHONED:

DATE ANALYZED & ANALYST: 11/02/90, KH

LAB COMMENTS:

**METHODOLOGY:**

Gasoline concentrations were determined using EPA Method  X  8015 (modified)  X  8020   602   Other with a Tekmar Liquid Sample Concentrator on a Varian Model 3700 Gas Chromatograph equipped with a flame ionization detector. Compounds were identified by column retention time and quantified by peak area comparisons to those of known standards. Extraction method used 5030.

REVIEWED BY: *J. [Signature]*

REVISED 1/90

LABORATORY # : 1173

JOB # : 6110-01-16  
REPORT DATE: 11/13/90

COMPANY: Twin City Testing/Les  
ADDRESS: 4444 Airpark Boulevard  
CITY-STATE: Duluth, MN 55811



**twin city testing**  
corporation

RUSH  
NORMAL X

781 INDUSTRIAL AVENUE  
RAPID CITY, SD 57702  
PHONE 605/348-5850

CHEMISTRY LABORATORY  
1854 LOMBARDY DRIVE  
RAPID CITY, SD 57701  
PHONE 605/341-7284

PROJECT DESCRIPTION: Union 76 Solon Spring  
SAMPLE DESCRIPTION: TH-3

WORK ORDER #: 8400-91-025

**METALS ANALYSIS**

SAMPLE DESCRIPTION  
METHOD SW846 3050

SOIL

**SAMPLE MATRIX**

SEDIMENT SLUDGE

RESULTS REPORTED IN: mg/kg

PARAMETER	RESULT	FLAME LDL	FURNACE LDL	SW846 METHOD	ANALYZED
Antimony (Sb)	_____	25.0	0.13	7040	_____
Aluminum (Al)	_____	2.5	0.13	7020	_____
Arsenic (As)	_____	25.0	0.13	7060	_____
Barium (Ba)	_____	25.0	1.25	7080	_____
Beryllium (Be)	_____	0.75	0.013	7090	_____
Cadmium (Cd)	_____	0.75	0.013	7130	_____
Calcium (Ca)	_____	2.5	N/A	7140	_____
Chromium (Cr)	_____	_____	_____	_____	_____
Total	_____	2.5	0.13	7190	_____
Chromium (Cr)	_____	_____	_____	_____	_____
Hexavalent	_____	0.25	N/A	7196	_____
Chromium (Cr)	_____	_____	_____	_____	_____
Trivalent	_____	0.25	N/A	** Cal.	_____
Cobalt (Co)	_____	0.75	0.13	7200	_____
Copper (Cu)	_____	0.25	0.13	7210	_____
Gold (Au)	_____	12.5	0.13	_____	_____
Iron (Fe)	_____	1.25	N/A	7380	_____
Lead (Pb)	<2.5	2.5	0.13	7420	11/13 KE
Lithium (Li)	_____	2.5	0.13	3111B	_____
_____	_____	_____	_____	* St.Meth.	_____
Magnesium (Mg)	_____	2.5	N/A	7450	_____
Manganese (Mn)	_____	0.75	N/A	7460	_____
Mercury (Hg)	_____	0.05	N/A	7470	_____
Molybdenum (Mo)	_____	250.0	1.25	7480	_____
Nickel (Ni)	_____	1.25	0.13	7520	_____
Potassium (K)	_____	25.0	N/A	7610	_____
Selenium (Se)	_____	0.50	N/A	7741	_____
Silicon (Si)	_____	25.0	N/A	3111D	_____
_____	_____	_____	_____	* St.Meth.	_____
Silver (Ag)	_____	0.25	0.013	7760	_____
Sodium (Na)	_____	25.0	N/A	7770	_____
Sodium Absorption	_____	_____	_____	_____	_____
Ratio	_____	N/A	N/A	** Cal.	_____
Vanadium (V)	_____	250.0	0.13	7910	_____
Zinc (Zn)	_____	0.13	N/A	7950	_____

\* - Standard Methods  
DATE SAMPLED: 10/22/90  
DATE RECEIVED: 10/25/90  
REVIEWED BY: *J. [Signature]*

\*\* - Calculation  
FAXED:  
RESULTS PHONED:  
REVISED 2/90

COMMENTS:



**twin city testing**  
corporation

781 INDUSTRIAL AVENUE  
RAPID CITY, SD 57702  
PHONE 605/348-5850

JOB #: 6110-01-16

RUSH

REPORT DATE: 11/13/90

NORMAL X

CHEMISTRY LABORATORY  
1854 LOMBARDY DRIVE  
RAPID CITY, SD 57701  
PHONE 605/341-7284

COMPANY: Twin City Testing/Les

ADDRESS: 4444 Airpark Boulevard

CITY-STATE: Duluth, MN 55811

PROJECT DESCRIPTION: Union 76 Solon Spring

WORK ORDER NO: 8400-91-025

SAMPLE DESCRIPTION: TH-4

SAMPLE MATRIX:  X  SOIL   WATER   OTHER  
RESULTS REPORTED IN:  X  ug/kg   ug/l

**VOLATILE ANALYSIS**

LAB #: 1176

PARAMETER	RESULTS	MDL -Method Detection Limit
TOTAL HYDROCARBONS AS GASOLINE	720 (0.72 ppm)	10 (0.010 ppm)
BENZENE	<1	1
TOLUENE	<1	1
ETHYL BENZENE	<1	1
XYLENES	11	1

MTBE

DATE SAMPLED: 10/22/90

DATE FAXED:

DATE RECEIVED: 10/25/90

DATE RESULTS PHONED:

DATE ANALYZED & ANALYST: 11/02/90, KH

LAB COMMENTS:

**METHODOLOGY:**

Gasoline concentrations were determined using EPA Method  X  8015 (modified)  X  8020   602   Other with a Tekmar Liquid Sample Concentrator on a Varian Model 3700 Gas Chromatograph equipped with a flame ionization detector. Compounds were identified by column retention time and quantified by peak area comparisons to those of known standards. Extraction method used 5030.

REVIEWED BY: *J. [Signature]*

REVISED 1/90

LABORATORY # : 1176

JOB # : 6110-01-16

REPORT DATE: 11/13/90



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corporation

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COMPANY: Twin City Testing/Les  
ADDRESS: 4444 Airpark Boulevard  
CITY-STATE: Duluth, MN 55811

CHEMISTRY LABORATORY  
1854 LOMBARDY DRIVE  
RAPID CITY, SD 57701  
PHONE 605/341-7284

PROJECT DESCRIPTION: Union 76 Solon Spring  
SAMPLE DESCRIPTION: TH-4

WORK ORDER #: 8400-91-025

**METALS ANALYSIS**

SAMPLE DESCRIPTION  
METHOD SW846 3050

SAMPLE MATRIX  
SOIL SEDIMENT SLUDGE

RESULTS REPORTED IN: mg/kg

PARAMETER	RESULT	FLAME LDL	FURNACE LDL	SW846 METHOD	ANALYZED
Antimony (Sb)	_____	25.0	0.13	7040	_____
Aluminum (Al)	_____	2.5	0.13	7020	_____
Arsenic (As)	_____	25.0	0.13	7060	_____
Barium (Ba)	_____	25.0	1.25	7080	_____
Beryllium (Be)	_____	0.75	0.013	7090	_____
Cadmium (Cd)	_____	0.75	0.013	7130	_____
Calcium (Ca)	_____	2.5	N/A	7140	_____
Chromium (Cr)	_____	_____	_____	_____	_____
Total	_____	2.5	0.13	7190	_____
Chromium (Cr)	_____	_____	_____	_____	_____
Hexavalent	_____	0.25	N/A	7196	_____
Chromium (Cr)	_____	_____	_____	_____	_____
Trivalent	_____	0.25	N/A	** Cal.	_____
Cobalt (Co)	_____	0.75	0.13	7200	_____
Copper (Cu)	_____	0.25	0.13	7210	_____
Gold (Au)	_____	12.5	0.13	_____	_____
Iron (Fe)	_____	1.25	N/A	7380	_____
Lead (Pb)	<2.5	2.5	0.13	7420	11/13 KE
Lithium (Li)	_____	2.5	0.13	3111B	_____
	_____	_____	_____	* St.Meth.	_____
Magnesium (Mg)	_____	2.5	N/A	7450	_____
Manganese (Mn)	_____	0.75	N/A	7460	_____
Mercury (Hg)	_____	0.05	N/A	7470	_____
Molybdenum (Mo)	_____	250.0	1.25	7480	_____
Nickel (Ni)	_____	1.25	0.13	7520	_____
Potassium (K)	_____	25.0	N/A	7610	_____
Selenium (Se)	_____	0.50	N/A	7741	_____
Silicon (Si)	_____	25.0	N/A	3111D	_____
	_____	_____	_____	* St.Meth.	_____
Silver (Ag)	_____	0.25	0.013	7760	_____
Sodium (Na)	_____	25.0	N/A	7770	_____
Sodium Absorption	_____	_____	_____	_____	_____
Ratio	_____	N/A	N/A	** Cal.	_____
Vanadium (V)	_____	250.0	0.13	7910	_____
Zinc (Zn)	_____	0.13	N/A	7950	_____

\* - Standard Methods  
DATE SAMPLED: 10/22/90  
DATE RECEIVED: 10/25/90  
REVIEWED BY: *J. [Signature]*

\*\* - Calculation  
FAXED:  
RESULTS PHONED:  
REVISED 2/90

COMMENTS: