

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc. Client: COCORP

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE				
6/6/79		G. Cotcamp		W. Krof		6834		W. Krof			2	1 of 27				
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Minnesota		Henning SF 7 1/2		Minnesota	Otter Tail		132N	37W		L. O. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS		
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y	X
				7°54'						1451.0				462,450	1,736,810	→ scaled.
	950		82°39.6' + 180°	+7.9°	+4.1	TH	-4.8	-0.7	1450.3		BS	+9	-950			trail (south) R 1451
	950				+4.8	89°40'	-5.5	-0.7			BS					
1	1650		263°7.6'	+7.9°	2.9	-		-2.9		1447.4		+30	-1650	462,489	1,734,210	
2	1320		" "	"	6.8	-		-6.8		1443.5		+24	-1320	462,483	1,734,540	
3	990		" "	"	11.0	-		-11.0		1439.3		+18	-990	462,477	1,734,870	
4	660		" "	"	4.4	-		-4.4		1445.9		+12	-660	462,471	1,735,200	
5	330		" "	"	10.2	-		-10.2		1440.1		+6	-330	462,465	1,735,530	
6	0		" "	"	5.4	-		-5.4		1449.9	TP	0	0	462,459	1,735,860	
7	330		82°51.3'	+7.9°	4.1	-		-4.1		1446.2		-4	+330	462,454	1,736,190	
8	660		" "	"	3.9	-		-3.9		1446.4		-9	+660	462,450	1,736,520	
	950		82°39.6'	+7.9°	4.1	TH	+4.8	+0.7		1451.0		-9	+950	462,450	1,736,810	trail (south) R 1451
9	990		82°51.3'	+7.9°	3.8	TH	+5.0	+1.2		1451.5		-13	+990	462,446	1,736,850	
10	1320		82°51.3'	+7.9°	4.1	TH	+6.6	+2.5			TP	-17	+1320	462,442	1,737,180	
10	1320		" "	"	4.5	89°42'	+6.9	+2.4		1452.7	TP					
	1650		260°20.2' - 180°	+7.9°	+1.4	TH	-8.3	-6.9	1445.8		BS	+51	+1649			
	1650		" "	"	+5.7	89°34'	-12.5	-6.8				BS				
11	1320		260°20.2'	+7.9°	2.6	-		-2.6		1443.2		-41	-1319	462,452	1,737,510	
12	990		" "	"	12.9	-		-12.9		1432.9		-30	-990	462,463	1,737,839	
13	660		" "	"	12.7	-		-12.7		1433.1		-20	-660	462,473	1,738,169	
14	330		" "	"	9.4	-		-9.4		1436.4		-10	-330	462,483	1,738,499	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 6/6/79	INSTRUMENT MAN G. Cotcamp	ROD MAN W. Krol	PARTY NUMBER 6834	NOTES CHECKED BY W. Krol	LINE NO. 2	PAGE 2
AREA Minnesota	TOPO MAP Henning SE	STATE Minnesota	COUNTY Otter Tail	TWP 132N	RANGE 37W/36W	PPM
					PARTY MANAGER L. O. Davis	

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	NORTH + SOUTH -		EAST + WEST -		COORDINATES		REMARKS	
												LAT.	DEP.	Y	X				
									1445.8										
15	0				5.4	-		-5.4		1440.4	TP	0	0	462.493	1.738.829				
16	330		80° 21'	+7.9°	8.6	-		-8.6		1437.2		+10	+330	462.503	1.739.159				
17	563		79° 34.8'	+7.9°	9.4	-		-9.4	1	1436.4		+25	+562	462.518	1.739.391				462.515 + 1.739.400 S. 4-Way Intersect. R35.
17	660		80° 21'	+7.9°	10.3	-		-10.3		1435.5		+20	+660	462.513	1.739.489				
18	990		" "	"	12.7	-		-12.7		1433.1		+30	+990	462.523	1.739.819				
19	1320		" "	"	13.6	-		-13.6		1432.2		+40	+1319	462.533	1.740.148				
20	1650		80° 21'	+7.9°	14.5	-	S	-14.5			TP	+50	+1649	462.543	1.740.478				
20	1650				6.3	BH	-8.3	-14.6		1431.2	TP								
	1650		260° 14' - 180°	+7.9°	+10.4	-		+10.4		1441.6	BS	+54	+1649						
	1650				12.2	BH	-8.3	+10.5			BS								
21	1320		260° 14'	+7.9°	9.2	-		-9.2		1432.4		-43	-1319	462.554	1.740.808				
22	990		" "	"	9.1	-		-9.1		1432.5		-32	-989	462.565	1.741.138				
23	660		" "	"	5.1	-		-5.1		1436.5		-21	-660	462.576	1.741.467				
24	330		" "	"	4.0	-		-4.0		1437.6		-11	-330	462.586	1.741.797				
24	120		264° 45'	+7.9°	33	-		-3.3		1438.3		+6	-120	462.603	1.742.007				R37 W 462,600 + 1,742,010 S Tence line (south) of R36
25	0				5.4	-		-5.4		1436.2	TP	0	0	462.597	1.742.127				R36 W
26	330		83° 6.5'	+7.9°	8.6	-		-8.6		1433.0		-6	+330	462.591	1.742.457				
27	660		" "	"	10.2	-		-10.2		1431.4		-12	+660	462.585	1.742.787				
28	990		" "	"	10.9	-		-10.9		1430.7		-17	+990	462.580	1.743.117				
29	1320		" "	"	10.2	-		-10.2		1431.4		-23	+1320	462.574	1.743.447				

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 6/6/79	INSTRUMENT MAN G. Cotcamp	ROD MAN W. Krol	PARTY NUMBER 6834	NOTES CHECKED BY W. Krol	LINE NO. 2	PAGE 3
AREA Minnesota	TOPO MAP Hennig SE/Wrightstown	STATE Minnesota	COUNTY Otter Tail	TWP 132 N	RANGE 36W	PPM
					PARTY MANAGER L. O. Davis	

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1441.6					
30	1640		80°37'	+7.9°	8.0	-		-8.0		1433.6	TP	+42	+1639	462,639 1,743,766 Shooting across curve
30	1640				14.7	89°46'	+6.7	-8.0			TP			
	658		224°59.6'-180°	+7.9°	+8.8	-		+8.8	1442.4		BS	+397	+525	
	658				12.1	TH	-3.3	+8.8			BS			
31	330		227°52'	+7.9°	6.7	-		-6.7		1435.7		-186	-273	462,850 1,744,018
32	0				5.4	-		-5.4		1437.0	X	0	0	463,036 1,744,291
33	330		63°15.2'	+7.9°	11.8	-		-11.8		1430.6	TP	+107	+312	463,143 1,744,603
33	330				13.5	TH	+1.7	-11.8			TP			
	1320		244°55.4'-180°	+7.9°	+11.7	TH	-6.6	+5.1	1435.7		BS	+390	+1261	
	1320				9.0	89°50'	-3.8	+5.2			BS			
34	990		244°55.4'	+7.9°	4.2	-		-4.2		1431.5		-292	-946	463,241 1,744,918
35	660		" "	"	3.8	-		-3.8		1431.9		-195	-631	463,338 1,745,233
36	330		" "	"	4.1	-		-4.1		1431.6		-97	-315	463,436 1,745,549
37	0				5.4	-		-5.4		1430.3	X	0	0	463,533 1,745,864
38	330		90°29.5'	+7.9°	5.9	-		-5.9		1429.8		-48	+326	463,485 1,746,190 ↑
39	660		" "	"	5.9	-		-5.9		1429.8		-96	+653	463,437 1,746,517 Hennig SE
40	990		" "	"	5.9	-		-5.9		1429.8		-144	+979	463,389 1,746,843
FL	1138		89°46.3'	+7.9°	5.5	-		-5.5		1430.2		-152	+1128	463,381 1,746,992 463,375+1,747,000(s) 4-Way Intersect Elev. 1428
41	1320		90°27.2'	+7.9°	6.8	-		-6.8		1,428.9	TP	-192	+1306	463,341 1,747,170 Wrightstown Quad
41	1320				4.5	90°6'	-2.3	-6.8			TP			↓

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GEO-445

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DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
6/7/79		G. Cotcamp		W. Krol		6834		W. Krol		2	4					
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE	PPM	PARTY MANAGER				
Minnesota		Wrightstown		Minnesota		Otter Tail		132 N		36W		L.O. Davis				
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
41	1270		238°54.5'-180°	+7.9°	+7.8	-		+7.8	1.436.7	1.428.9	BS	+500	+1167			Shooting thru S curve
	1270				+4.1	TH	-6.3	+7.8			BS					
42	970		232°43'	+7.9°	7.6	-		-7.6		1429.1		-476	-845	463,365	1,747,992	}
43	650		235°55'	+7.9°	7.5	-		-7.5		1429.2		-287	-583	463,554	1,747,754	
44	325		248°22'	+7.9°	6.0	-		-6.0		1430.7		-77	-316	463,764	1,748,021	
45	0				5.4	-		-5.4		1431.3	TP	0	0	463,841	1,748,337	
46	330		83°3'	+7.9°	6.5	-		-6.5		1430.2		-5	+330	463,836	1,748,667	
47	660		" "	"	2.1	-		-2.1		1434.6		-11	+660	463,830	1,748,997	
48	990		" "	"	3.2	-		-3.2		1433.5		-16	+990	463,825	1,749,327	
49	1320		83°3'	+7.9°	-1.6	-		-1.6		1.435.1	TP	-22	+1320	463,819	1,749,657	
49	1320				-8.2	TH	+6.6	-1.6			TP					
	2640		261°51.6'-180°	+7.9°	+3.0	-		+3.0	1.438.2		BS	+11	+2640			
	2640				+14.0	89°46'	-10.7	+3.3	(+3.1)		BS					
50	2310		261°51.6'	+7.9°	5.2	-		-5.2		1433.0		-10	-2310	463,820	1,749,987	
51	1980		" "	"	11.3	-		-11.3		1426.9		-8	-1980	463,822	1,750,317	
52	1650		" "	"	8.9	90°6'	-2.9	-11.8		1426.4		-7	-1650	463,823	1,750,647	
53	1320		" "	"	9.1	90°6'	-2.3	-11.4		1426.8		-6	-1320	463,824	1,750,977	
54	990		" "	"	7.0	-		-7.0		1431.2		-4	-990	463,826	1,751,307	
55	660		" "	"	4.3	-		-4.3		1433.9		-3	-660	463,827	1,751,637	
56	330		" "	"	4.6	-		-4.6		1433.6		-1	-330	463,829	1,751,967	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

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DATE	6/7/79	INSTRUMENT MAN	G. Cotcamp	ROD MAN	W. Krol	PARTY NUMBER	6834	NOTES CHECKED BY	W. Krol	LINE NO.	2	PAGE	5	
AREA	Minnesota	TOPO MAP	Wrightstown	STATE	Minnesota	COUNTY	Oter Tail	TWP	132N	RANGE	36W	PPM	PARTY MANAGER	L.O. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1438.2					
57	0				5.4	-		-5.4		1432.8	T	0	0	463,830, 1,752,277
<u>IL</u>	11		45°58'	+79°	5.0	-		-5.0		1433.2		+6	+9	463,836, 1,752,306 road (north) elev. 1433'
58	330		89°25.6'	+8.0°	8.0	-		-8.0		1430.2		-14	+330	463,816, 1,752,227
59	660		" "	"	7.6	-		-7.6		1430.6		-28	+659	463,802, 1,752,956
60	990		" "	"	9.9	-		-9.9		1428.3		-42	+989	463,788, 1,752,286
61	1320		" "	"	10.6	-		-10.6		1427.6		-56	+1319	463,774, 1,753,616
62	1650		" "	"	5.0	-		-5.0		1433.2		-70	+1649	463,760, 1,753,946
63	1980		" "	"	7.4	-		-7.4		1430.8		-84	+1978	463,746, 1,754,275
64	2310		" "	"	9.8	-		-9.8		1428.4		-98	+2308	463,732, 1,754,605
65	2640		89°25.6'	+8.0°	13.7	-		-13.7		1,424.5	TF	-112	+2638	463,718, 1,754,935
65	2640				10.6	90°4'	-3.1	-13.7			TF			
	2640		269°04.0'-20"	+8.0°	+12.8	-		+12.8	1.437.3		GS	-111	+2638	
	2640				+14.4	89°58'	-1.5	+12.9			GS			
66	2310		269°24.3'	+8.0°	12.0	-		-12.0		1425.3		+97	-2308	463,704, 1,755,265
67	1980		" "	"	10.6	-		-10.6		1426.7		+83	-1978	463,690, 1,755,595
68	1650		" "	"	9.7	-		-9.7		1427.6		+69	-1649	463,676, 1,755,924
69	1320		" "	"	8.7	-		-8.7		1428.6		+55	-1319	463,662, 1,756,254
70	990		" "	"	11.1	-		-11.1		1426.2		+42	-989	463,649, 1,756,584
71	660		" "	"	11.7	-		-11.7		1425.6		+28	-659	463,635, 1,756,914
72	330		" "	"	10.5	-		-10.5		1426.8		+14	-330	463,621, 1,757,243

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GEO-445

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DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
6/7/79		G. Cotcamp		W. Krol		5834		W. Krol		2	6					
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Minnesota		Wrightstown		Minnesota	Otter Tail		132 N	36 W		L.O. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS		
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y	X
									1437.3							
73	0				5.4	-		-5.4		1431.9	TP	0	0	463,607	1,757,573	
74	50		77° 5'	+8.0°	3.3	-		-3.3		1434.0		+4	+50	463,611	1,757,623	463,610 + 1,757,620 (s) 4-Way T. In Assoc. 1434 Elev.
74	330		89° 8'	+8.0°	4.1	-		-4.1		1433.2		-12	+330	463,595	1,757,903	
75	660		" "	"	4.7	-		-4.7		1432.6		-25	+660	463,582	1,758,233	
76	990		" "	"	5.7	-		-5.7		1431.6		-37	+989	463,570	1,758,562	
77	1320		" "	"	9.9	-		-9.9		1427.4		-49	+1319	463,558	1,758,892	
78	1650		" "	"	4.0	CH	8.3	-12.3		1425.0		-61	+1649	463,546	1,759,222	
79	1980		" "	"	11.9	-		-11.9		1425.4		-74	+1979	463,533	1,759,552	
80	2310		" "	"	6.8	-		-6.8		1430.5		-86	+2308	463,521	1,759,881	
81	2640		89° 8'	+8.0°	3.1	-		-3.1		1434.2	TP	-98	+2638	463,509	1,760,211	
81	2640				4.6	89° 58'	+1.5	-3.1			TP					
	2640		263° - 180°	+8.0°	+14.1	TH	-13.2	+0.9	1435.1		BS	-46	+2640			
	2640				+13.3	89° 44'	-12.3	+1.0			BS					
82	2310		263° -	+8.0°	8.3	89° 54'	+4.0	-4.3		1430.8		+40	-2310	463,503	1,760,541	
83	1980		" "	"	7.2	89° 54'	+3.5	-3.7		1431.4		+35	-1980	463,498	1,760,871	
84	1650		" "	"	8.3	TH	+8.3	± 0.0		1435.1		+29	-1650	463,492	1,761,201	
85	1320		" "	"	0.3	-		-0.3		1434.8		+23	-1320	463,486	1,761,531	
86	990		" "	"	1.4	-		-1.4		1433.7		+17	-990	463,480	1,761,861	
87	660		" "	"	3.1	-		-3.1		1432.0		+12	-660	463,475	1,762,191	
88	330		" "	"	5.1	-		-5.1		1430.0		+6	-330	463,469	1,762,521	

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GEO-445

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DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
6/7/79		G. Co. comp		W. Kroh		6834		Walt Kroh		2	7				
AREA		TOPO MAP	STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Minnesota		Wrightstown	Minnesota	Otter Tail		132N	36W		L.O. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1435.1						
89	0				54	-		-5.4		1429.7	T	0	0	463,463	1,762,851
90	28		66°-	+8.0°	50	-		-5.0		1430.1		+8	+27	463,471	1,762,878
90	330		83°12.6'	+8.0°	7.4	-		-7.4		1427.7		-7	+330	463,456	1,763,181
91	660		"	"	6.2	-		-6.2		1428.9		-14	+660	463,499	1,763,511
92	990		"	"	4.3	-		-4.3		1430.8		-21	+990	463,442	1,763,891
93	1320		"	"	3.0	-		-3.0		1432.1		-28	+1320	463,435	1,764,171
94	1650		"	"	6.1	TH	+8.3	+2.2		1437.3		-35	+1650	463,428	1,764,501
95	1980		"	"	5.0	89°30'	+17.3	+12.3		1447.4		-42	+1979	463,421	1,764,830
96	2310		83°12.6'	+8.0°	3.0	89°30'	+20.2	+17.2	+17.4	1452.5	IF	-49	+2309+3	463,414	1,765,162
96	2310				14.6	89°12'	+32.2	+17.6			IF				
	1650		263°25' -180°	+8.0°	+12.9	-		+12.9	+12.9	1465.4	BS	+41	+1699+3		
	1650				+4.6	OH	+8.3	+12.9			BS				
97	1320		263°25'	+8.0°	10.0	-		-10.0		1455.4		+33	-1320	463,406	1,765,493
98	990		" "	"	9.4	-		-9.4		1456.0		+24	-990	463,397	1,765,823
99	660		" "	"	8.0	-		-8.0		1457.4		+16	-660	463,389	1,766,153
100	330		" "	"	7.1	-		-7.1		1458.3		+8	-330	463,381	1,766,483
101	0				5.4	-		-5.4		1460.0	T	0	0	463,373	1,766,813
102	330		83°10'	+8.0°	1.0	-		-1.0		1464.4		-7	+330	463,366	1,767,143
103	660		" "	"	2.2	TH	+3.3	+1.1		1466.5		-13	+660	463,360	1,767,473
104	990		" "	"	1.7	TH	+5.0	+3.3		1468.7		-20	+990	463,353	1,767,803

SURVEY NO. 1 - HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 6/7/11	INSTRUMENT MAN S. Sottrup	ROD MAN W. Krol	PARTY NUMBER 6834	NOTES CHECKED BY W. Krol	LINE NO. 2	PAGE 8
AREA Minnesota	TOPO MAP Wrightstown	STATE Minnesota	COUNTY Dufferin	TWP 132N	RANGE 36W	PPM
				PARTY MANAGER L.O. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1465.4					
105	1320		83° 10'	+8.0°	2.0	TH	+6.6	+4.6		1470.0		-27	+1320	463,346 / 1,768,133
△	1340		84° 25.6'	+8.0°	4.0	TH	+6.7	+2.7		1468.1		-57	+1339	463,315 / 1,768,152
≡	1379		82° 47.5'	+8.0°	2.0	TH	+6.9	+4.9		1470.3	TP	-19	+1379+3	463,354 / 1,768,194
≡	1379				5.6	89° 34'	+10.4	+4.8			TP			
	2845		354° 35.3' - 180°	+8.0°	+13.9	TH	-14.2	-0.3	1470.1		BS	-2842	-128+3	
	2845				+19.8	89° 42'	-14.9	-0.1	0.2		BS			
X	0				54	-		-5.4		1464.7	X	0	0	460,512 / 1,768,069
≡	2415		172° 26.1'	+8.0°	8.9	-		-8.9		1461.1	TP	-2415	-18	458,097 / 1,768,051
≡	2415				14.7	89° 52'	+5.6	-9.1	9.0		TP			
	1921		264° 13.6' - 180°	+8.0°	+14.9	89° -	-33.5	-18.6	1442.5		BS	-75	+1920+3	
	1921				+13.8	89° 2'	-32.4	-18.6			BS			
106	1650		264° 3'	+8.0°	8.2	89° 10'	+24.0	+15.8		1458.3		+59	-1649	458,081 / 1,768,325
107	1320		" "	"	6.9	89° 10'	+19.2	+12.3		1454.8		+47	-1319	458,069 / 1,768,655
108	990		" "	"	3.1	89° 20'	+11.5	-8.4		1450.9		+35	-989	458,057 / 1,768,985
109	660		" "	"	3.0	89° 20'	+7.7	+4.7		1447.2		+24	-660	458,046 / 1,769,314
110	330		" "	"	1.8	TH	+1.7	-0.1		1442.4		+12	-330	458,034 / 1,769,644
111	0				54	-		-5.4		1437.1	X	0	0	458,022 / 1,769,974
112	330		89° 0.2'	+8.0°	5.5	-		-5.5		1437.0		-12	+330	458,010 / 1,770,304
113	660		" "	"	1.7	TH	+3.3	+1.6		1444.1		-23	+660	457,999 / 1,770,634
114	990		" "	"	4.5	89° -	+17.3	+12.8		1455.3		-35	+989	457,987 / 1,770,963

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
6/7/79		G. Cotcamp		W. Krol		6834		W. Krol		2		9			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Minnesota		Wrightstown		Minnesota		Otter Tail/Todd		132 N		36 W/35 W				L.O. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1442.5						
115	1320		84° 0.2'	+8.0°	6.5	TH	+6.6	+0.1		1442.6		-46	+1319	457,976	1,771,293
116	1650		84° 0.2'	+8.0°	14.8	88° 40'	+38.4	+23.6		1466.1	TP	-58	+1649+2	457,964	1,771,625
116	1650				13.8	88° 42'	+37.4	+23.6			TP				
	1650		264° 8.7' -180°	+8.0°	+11.5	89°	-28.8	-17.3	1448.8		BS	-62	+1649+3		
	1650				+5.7	89° 12'	-23.0	-17.3			BS				
117	1320		264° 8.7'	+8.0°	2.5	89° 30'	+11.5	+9.0		1457.8		+49	-1319	457,951	1,771,958
118	990		" "	"	0.4	-		-0.4		1448.4		+37	-989	457,939	1,772,288
119	660		" "	"	7.4	-		-7.4		1441.4		+25	-660	457,927	1,772,617
120	330		" "	"	8.1	-		-8.1		1440.7		+12	-330	457,914	1,772,947
121	0				5.4	-		-5.4		1443.4	X	0	0	457,902	1,773,277
121	120		79° 4.7'	+8.0°	2.6	-		-2.6		1446.2		+6	+120	457,908	1,773,397
122	330		82° 20.2'	+7.5°	4.8	-		-4.8		1444.0		+1	+330	457,903	1,773,607
123	660		" "	"	7.3	-		-7.3		1441.5		+2	+660	457,904	1,774,937
124	990		" "	"	4.9	-		-4.9		1443.9		+3	+990	457,905	1,774,267
125	1320		82° 20.2'	+7.5°	3.0	TH	+6.6	+3.6		1452.4	TP	+4	+1320	457,906	1,774,597
125	1320				7.9	89° 30'	+11.5	+3.6			TP				
	2640	2639	262° 50.3' -180°	+7.5°	+3.8	88° 50'	-53.8	-50.0			BS	-16	+2639		
	2640				+5.2	88° 48'	-55.3	-50.1	1402.3		BS				
126	2310		262° 50.3'	+7.5°	12.9	89° 10'	+33.6	+20.7		1423.0		+14	-2310	457,906	1,774,926
127	1980		" "	"	8.4	TH	+9.9	+1.5		1403.8		+12	-1980	457,904	1,775,256

R 36 W
 ↑
 horiz. correct. y=0, x=-20'
 Otter Tail Co.
 457,910+1, 1,784,000(s)
 4 Way Intersect. el. 1445.
 line #1 tie page 29.
 ↓
 R 35 W

Todd Co

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 6/8/79	INSTRUMENT MAN G. Cotcamp	ROD MAN W. Krof	PARTY NUMBER 6834	NOTES CHECKED BY W Krof	LINE NO. 2	PAGE 10
AREA Minnesota	TOPO MAP Bertha/Wrightstown	STATE Minnesota	COUNTY Todd	TWP 132 N	RANGE 35W	PPM
				PARTY MANAGER L.D. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -		EAST + WEST -		COORDINATES		REMARKS
												LAT.	DEP.	Y	X			
									1402.3									
128	1650		262°50.3'	+7.5°	2.1	-		-2.1		1400.2		+10	-1650	457.910	1.775.586			
129	1320		" "	"	2.9	-		-2.9		1399.4		+8	-1320	457.908	1.775.916			
130	990		" "	"	3.5	-		-3.5		1398.8		+6	-990	457.896	1.776.246			
131	660		" "	"	3.6	-		-3.6		1398.7		+4	-660	457.894	1.776.576			
132	330		" "	"	5.0	-		-5.0		1397.3		+2	-330	457.892	1.777.906			
133	0				5.4	-		-5.4		1396.9	TP	0	0	457.890	1.777.236			
134	330		82°48'	+7.5°	5.9	-		-5.9		1396.4		-2	+330	457.888	1.777.566			
135	660		" "	"	5.5	-		-5.5		1396.8		-3	+660	457.887	1.777.896			
136	990		" "	"	5.2	-		-5.2		1397.1		-5	+990	457.885	1.778.226			↑
137	1320		" "	"	4.0	-		-4.0		1398.3		-7	+1320	457.883	1.778.556			Wrightstown Road
138	1650		" "	"	5.8	-		-5.8		1396.5		-9	+1650	457.881	1.778.886			Bertha. Road
139	1980		" "	"	5.7	-		-5.7		1396.6		-10	+1980	457.880	1.779.216			↓
140	2310		83°11.5'	+7.5°	14.0	89°50'	+6.7	-7.3			TP	-28	+2310	457.862	1.779.546			
140	2310				11.4	89°54'	4.0	-7.4		1394.9	TP							
	2640		263°57.3'-180°	+7.5°	+3.4	-		+3.4	1398.3		BS	-67	+2639					
	2640				+14.1	89°46'	-10.7	+3.4			BS							
141	2310		263°57.3'	+7.5°	4.2	-		-4.2		1394.1		+59	-2309	457.854	1.779.876			
142	1980		" "	"	4.6	-		-4.6		1393.7		+50	-1979	457.845	1.780.206			
143	1650		" "	"	5.0	-		-5.0		1393.3		+42	-1649	457.837	1.780.536			
144	1320		" "	"	4.9	-		-4.9		1393.4		+34	-1320	457.829	1.780.866			

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 6/8/79	INSTRUMENT MAN G. Cotcamp	ROD MAN W. Krol	PARTY NUMBER 6837	NOTES CHECKED BY W Krol	LINE NO. 2	PAGE 11
AREA Minnesota	TOPO MAP Bertha	STATE Minnesota	COUNTY Todd	TWP 132 N	RANGE 35W	PPM
				PARTY MANAGER L.O. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1398.3						
145	990		263° 57.3'	+7.5°	4.7	-		-4.7		1393.6		+25	-990	457.820	1.781,195
146	660		" "	"	5.1	-		-5.1		1393.2		+17	-660	457.812	1.781,525
≡	522		269° 4'	+7.5°	4.0	-		-4.0		1394.3		+14	-522	457.809	1.781,663 bridge elev. 1394'
147	330		263° 57.3'	+7.5°	5.0	-		-5.0		1393.3		+8	-330	457.803	1.781,855
148	0				5.4	-		-5.4		1392.9	TP	0	0	457.795	1.782,105
149	330		83° 48.1'	+7.5°	4.1	-		-4.1		1394.2		-7	+330	457.788	1.782,515
150	660		" "	"	2.0	-		-2.0		1396.3		-15	+660	457.780	1.782,845
151	990		" "	"	2.0	TH	+5.0	+3.0		1401.3		-22	+990	457.773	1.783,175
152	1320		" "	"	10.3	89°-	+23.0	+12.7		1411.0		-30	+1320	457.765	1.783,605
153	1650		" "	"	10.5	89°-	+28.8	+18.3		1416.6		-37	+1650	457.758	1.783,835
≡	1770		83° 48.3'	+7.5°	8.4	89°-	+30.9	+22.5		1420.8		-40	+1769	457.755	1.783,954 4-Way Intersect. Elev 1420
154	1980		83° 48.1'	+7.5°	8.0	89°-	+34.6	+26.6		1424.9		-45	+1979	457.750	1.784,164
155	2310		" "		7.8	89°-	+40.3	+32.5		1430.8		-52	+2309	457.743	1.784,494
156	2640		83° 48.1'	+7.5°	13.9	89°02'	+44.5	+30.6			TP	-60	+2639	457.735	1.784,824
156	2640				12.2	89°04'	+43.0	+30.8	+30.7	1429.0	TP				
	2310		262° 42.5'-180°	+7.5°	+3.7	-		+3.7			BS	-8	+2310		
	2310				+14.5	89°44'	-10.7	+3.8	1.432.8		BS				
157	1980		262° 42.5'	+7.5°	4.6	-		-4.6		1428.2		+7	-1980	457.734	1.785,154
158	1650		" "	"	4.4	-		-4.4		1428.4		+6	-1650	457.733	1.785,484
159	1320		" "	"	3.4	-		-3.4		1429.4		+5	-1320	457.732	1.785,814

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
6/8/79		G. Cotcamp		W. Krol		6834		W. Krol		2	12				
AREA		TOPO MAP		STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER						
Minnesota		Bertha		Minnesota	Todd	132 N	35W		L.O. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1432.8						
160	990		262°42.5'	+7.5°	7.0	-		-7.0		1425.8		+4	-990	457731	1.786,144
161	660		" "	"	9.1	-		-9.1		1423.7		+2	-660	457.729	1.786,474
162	330		" "	"	7.8	-		-7.8		1425.0		+1	-330	457.728	1.786,804
163	0				54	-		-54		14274	TP	0	0	457.727	1.787,134
164	330		82°55.8'	+7.5°	6.2	-		-6.2		1426.6		-2	+330	457.725	1.787,464
165	660		" "	"	14.2	-		-14.2		1418.6		-5	+660	457.722	1.787,794
166	990		" "	"	11.8	-		-11.8		1421.0		-7	+990	457.720	1.788,124
167	1320		" "	"	11.2	-		-11.2		1421.6		-10	+1320	457.717	1.788,454
168	1650		" "	"	12.5	BH	-8.3	-20.8		1412.0		-12	+1650	457.715	1.788,784
169	1980		82°55.8'	+7.5°	14.2	BH	-9.9	-24.1		1408.7	TP	-15	+1980	457.712	1.789,114
169	1980				15.0	90°16'	-9.2	-24.2			TP				
	1320		263°11.6'-180°	+7.5°	+6.3	TH	-6.6	-0.3	1408.4		BS	-16	+1320		
	1320				+5.1	89°46'	-5.4	-0.3			BS				
≡	1220		263°36'	+7.5°	5.2	TH	+6.1	+0.9		1409.3		+23	-1220	457.719	1.789,214 457,705+1,789,200(s) N-S fence line
170	990		263°11.6'	+7.5°	3.0	TH	+5.0	+2.0		1410.4		+12	-990	457.708	1.789,444
≡	802		263°47'	+7.5°	1.8	TH	+4.0	+2.2		1410.6		+18	-802	457.714	1.789,632 driveway (north) elev. 1411'
171	660		263°11.6'	+7.5°	0.5	-		-0.5		1407.9		+8	-660	457.704	1.789,774
172	330		" "	"	4.8	-		-4.8		1403.6		+4	-330	457.700	1.790,104
173	0				54	-		-54		1403.0	TP	0	0	457.696	1.790,434
174	330		83°30.2'	+7.5°	5.6	-		-5.6		1402.8		-6	+330	457.690	1.790,764

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
6/9/79		G. Cotcamp		W. Krol		6834		W. Keel		2	13					
AREA		TOPO MAP		STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER							
Minnesota		Bertha		Minnesota	Todd	132 N	35 W		L.O. Davis							
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH+ SOUTH - LAT.	EAST+ WEST - DEP.	COORDINATES Y X		REMARKS
									1.408.4							
175	660		83°30.2'	+7.5°	5.8	-		-5.8		1.402.6		-12	+660	457.684	1.791.094	
176	990		" "	"	3.9	-		-3.9		1.404.5		-17	+990	457.679	1.791.924	
177	1320		" "	"	1.9	TH	+6.6	+4.7		1.413.1		-23	+1320	457.673	1.791.754	
178	1375		83°5'	+7.5°	8.7	89°20'	+16.0	+7.3		1.415.7		-14	+1375	457.682	1.791.809	road (south) elev. 1418'
178	1650		83°30.2'	+7.5°	6.0	89°20'	+19.2	+13.2		1.421.6	TP	-29	+1650	457.667	1.792.084	
178	1650				1.2	89°30'	+14.4	+13.2			TP					
	2310		262°16'-180°	+7.5°	+5.5	89°39'	-17.5	-12.0	1.409.6		BS	+9	+2310			
	2310				+14.8	89°20'	-26.9	-12.1			BS					
179	1980		262°16'	+7.5°	2.3	-		-2.3		1.407.3		-8	-1980	457.668	1.792.414	
180	1650		" "	"	13.3	-		-13.3		1.396.3		-7	-1650	457.669	1.792.744	
181	1320		" "	"	14.6	-		-14.6		1.395.0		-5	-1320	457.671	1.793.074	
182	990		" "	"	11.1	BH	-5.0	-16.1		1.393.5		-4	-990	457.672	1.793.404	
183	660		" "	"	12.0	BH	-3.3	-15.3		1.394.3		-3	-660	457.673	1.793.734	
184	330		" "	"	11.3	-		-11.3		1.398.3		-1	-330	457.675	1.794.064	
185	0				5.4	-		-5.4		1.404.2	π	0	0	457.676	1.794.394	
186	106		76°10'	+7.5°	4.0	-		-4.0		1.405.6		+12	+105	457.688	1.794.499	457.680+1.794.490(s) 4-way Intersect elev. 1406 (RT #71)
186	330		82°44.5'	+7.5°	6.9	-		-6.9		1.402.7		-1	+330	457.675	1.794.724	
187	388		82°47'	+7.5°	6.4	-		-6.4		1.403.2		-2	+388	457.674	1.794.782	railroad
187	660		82°44.5'	+7.5°	11.8	-		-11.8		1.397.8		-3	+660	457.673	1.795.054	
188	990		" "	"	12.4	-		-12.4		1.397.2		-4	+990	457.672	1.795.384	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
6/8/77		S. Camp		W. Krol		5834		W. Krol		2		17			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Minnesota		Bertha		Minnesota		Todd		132 N		35W				L.O. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1.409.6						
189	1320		82°44.5'	+7.5°	11.3	-		-11.3		1.398.3		-6	+1320	457.670	1.795.714
190	1650		" "	"	7.7	-		-7.7		1.401.9		-7	+1650	457.669	1.796.044
191	1980		82°44.5'	+7.5°	0.0	-		±0.0		1.409.6	TP	-8	+1980	457.668	1.796.374
191	1980		" "	"	9.9	TH	+9.9	±0.0			TP				
	1650		263°6.2'-180°	+7.5°	+5.2	TH	-8.3	-3.1			BS	-17	+1650		
	1650		" "	"	+4.7	89°44'	-7.7	-3.0	1.406.6		BS				
192	1320		263°6.2'	+7.5°	3.7	-		-3.7		1.402.9		+14	-1320	457.665	1.796.704
193	990		" "	"	11.0	-		-11.0		1.395.6		+10	-990	457.661	1.797.034
194	660		" "	"	12.8	-		-12.8		1.393.8		+7	-660	457.658	1.797.364
195	330		" "	"	10.5	-		-10.5		1.396.1		+3	-330	457.654	1.797.694
196	0		" "	"	5.4	-		-5.4		1.401.2	TP	0	0	457.651	1.798.024
197	330		83°14.6'	+7.5°	13.7	BH	-1.7	-15.4		1.391.2		-4	+330	457.647	1.798.354
198	660		" "	"	13.8	90°30'	-5.8	-19.6		1.387.0		-9	+660	457.642	1.798.684
199	990		" "	"	11.5	90°30'	-8.6	-20.1		1.386.5		-13	+990	457.638	1.799.014
200	1320		" "	"	12.1	BH	-6.6	-18.7		1.387.9		-17	+1320	457.634	1.799.344
201	1650		" "	"	12.8	-		-12.8		1.393.8		-21	+1650	457.630	1.799.674
TP	1780		83°1'	+7.5°	7.6	-		-7.6		1.399.0		-16	+1780	457.635	1.799.804
202	1980		83°14.6'	+7.5°	9.8	TH	+9.9	+0.1		1.406.7		-26	+1980	457.625	1.800.004
203	2310		83°14.6'	+7.6°	7.4	89°30'	+20.2	+12.8		1.419.4	TP	-42	+2310	457.609	1.800.331
203	2310		" "	"	4.6	89°34'	+17.5	+12.9			TP				

457.635 + 1.799.804(s)
4-Way Intersect elev. 1399

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
6/9/79		G. Cotcamp		W. Krol		5834		W. Krol		2	15						
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER									
Minnesota		Bertha	Minnesota	Todd	132 N	35W		L.O. Davis									
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
203										1,419.4							
	990		262° 7.6' - 180°	+7.8°	+4.0	89° 0'	-17.3	-13.3	1406.1		BS	+1	+990 -3				
	990				+5.2	88° 56'	-18.4	-13.2			BS						
204	660		262° 7.6'	+7.8°	-4.8	89° 0'	+11.5	+6.7		1,412.8		-1	-660	457,609	1,800,658		
205	330		" "	"	3.2	-		-3.2		1,402.9		0	-330	457,610	1,800,988		
206	0				5.4	-		-5.4		1,400.7	TP	0	0	457,610	1,800,318		
207	330		82° 34.5'	+7.8°	4.8	-		-4.8		1,401.3		-2	+330	457,608	1,801,698		
208	660		" "	"	2.7	TH	+3.3	+0.6		1,406.7		-4	+660	457,606	1,801,978		
209	990		" "	"	2.3	89° -	+17.3	+15.0		1,421.1		-6	+990	457,604	1,802,308		
210	1320		82° 34.5'	+7.8°	8.2	88° 52'	+26.1	+17.9		1,424.0	TP	-9	+1320 -3	457,601	1,802,635		
210	1320				10.5	88° 46'	+28.4	+17.9			TP						
	2970		261° 45.4' - 180°	+7.8°	+4.5	89° 20'	-34.5	-30.0	1,394.0		BS	+23	+2970 -3				
	2970				+6.2	89° 18'	-36.3	-30.0			BS						
211	2640		261° 45.4'	+7.8°	7.4	89° 30'	+23.0	+15.6		1,409.6		-20	-2640	457,604	1,802,962		
212	2310		" "	"	8.2	TH	+11.6	+3.4		1,397.4		-18	-2310	457,606	1,803,292		
213	1980		" "	"	2.2	-		-2.2		1,391.8		-15	-1980	457,609	1,803,622		
214	1650		" "	"	3.6	-		-3.6		1,390.4		-13	-1650	457,611	1,803,952		
215	1320		" "	"	4.0	-		-4.0		1,390.0		-10	-1320	457,614	1,804,282		
216	990		" "	"	3.8	-		-3.8		1,390.2		-7	-990	457,617	1,804,612		
217	660		" "	"	5.0	-		-5.0		1,389.0		-5	-660	457,619	1,804,942		
1/1	555		262° 48.7'	+7.8°	3.8	-		-3.8		1,390.2		+6	-555	457,630	1,805,047	4-Way Intersect. 1388 elev.	

35W

457,630 ↑ 1,805,047 (6)
4-Way Intersect. 1388 elev.

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
6/9/79		G. Cotcamp		W. Krol		6834		W. Krol		2	16				
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER							
Minnesota		Bertha Aldrich South	Minnesota	Todd	132 N	34W		L.O. Davis							
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1.394.0						start 34W
218	330		261°454'	+7.8°	6.6	-		-6.6		1.387.4		-3	-330	457,621	1,805,272
219	0				5.4	-		-5.4		1.388.6	TP	0	0	457,624	1,805,602
220	330		82°41.2'	+8.0°	0.4	-		-0.4		1.393.6		-4	+330	457,620	1,805,932
221	660		" "	"	3.1	89°30'	+5.8	+2.7		1.396.7		-8	+660	457,616	1,806,262
222	990		" "	"	17.9	89°30'	+8.6	-9.3		1.384.7		-12	+990	457,612	1,806,592
223	1320		" "	"	19.3	89°30'	+11.5	-7.8		1.386.2		-16	+1320	457,608	1,806,922
224	1650		" "	"	11.8	89°40'	+9.6	-2.2		1.391.8		-20	+1650	457,604	1,807,252
225	1980		" "	"	8.2	89°30'	+17.3	+9.1		1.403.1		-24	+1980	457,600	1,807,582
226	2310		82°41.2'	+8.0°	3.8	89°30'	+20.2	+16.4		1.410.4	TP	-28	+2310-3	457,596	1,807,909
226	2310				5.1	89°28'	+21.5	+16.4			TP				
	2640		262°32.8'-180°	+8.0°	+11.3	TH	-13.2	-1.9			BS	-25	+2640-3		
	2640				+5.9	89°50'	-7.7	-1.8	1.408.6		BS				
227	2310		262°32.8'	+8.0°	8.1	-		-8.1		1.400.5		+22	-2310	457,593	1,808,236
228	1980		" "	"	12.3	BH	-9.9	-22.2		1.386.4		+19	-1980	457,590	1,808,566
229	1650		" "	"	14.1	BH	-8.3	-22.4		1.386.2		+16	-1650	457,587	1,808,896
230	1320		" "	"	12.1	BH	-6.6	-18.7		1.389.9		+13	-1320	457,584	1,809,226
231	990		" "	"	12.0	90°50'	-14.4	-26.4		1.382.2		+9	-990	457,580	1,809,556
232	660		" "	"	13.1	BH	-3.3	-16.4		1.392.2		+6	-660	457,577	1,809,886
233	330		" "	"	5.4	-		-5.4		1.403.2		+3	-330	457,574	1,810,216
7/7	159		264°55.5'	+8.0°	3.3	-		-3.3		1.405.3		+8	-159	457,579	1,810,387

457,5704 1,810,375(S)
4-Way Intersect elev. 1406

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
6/9/79		G. Cotcamp		W. Krol		6834		W. Krol		2	17				
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Minnesota		Aldrich South		Minnesota	Todd		132N	34W		L.O. Davis					
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1.4086						
234	0				5.4	-		-5.4		1.403.2	TP	0	0	457,571	1,810,546
235	330		83°12.6'	+7.6°	8.5	92°-	-11.5	-20.0		1.388.6		-5	+330	457,566	1,810,876
236	660		" "	"	9.7	92°-	-23.0	-32.7		1.375.9		-9	+660	457,562	1,811,206
237	990		" "	"	13.2	91°30'	-25.9	-39.1		1.369.5		-14	+990	457,557	1,811,536
238	1320		" "	"	7.8	91°30'	-34.5	-42.3		1.366.3		-19	+1320	457,552	1,811,866
239	1650		" "	"	12.8	91°10'	-33.6	-46.4		1.362.2		-23	+1650	457,548	1,812,196
240	1980		" "	"	10.1	91°10'	-40.3	-50.4		1.358.2		-28	+1980	457,543	1,812,526
241	2310		" "	"	11.6	91°-	-40.3	-51.9		1.356.7		-33	+2310	457,538	1,812,856
242	2640		83°12.6'	+7.6°	1.3	91°-	-46.7	-47.4	-47.5	1.361.1	TP	-37 +2	+2690.3	457,536	1,813,183
242	2640				13.8	90°44'	-33.8	-47.6			TP				
	660	659	263°25.3'-180°	+7.6°	+9.0	93°-	+34.5	+43.5	1.404.6		BS	-12 +2	+659 -1		
	660				+14.4	92°32'	+29.1	+43.5			BS				
243	330		263°25.3'	+7.6°	10.4	93°-	-17.2	-27.6		1.377.0		+6	-330	457,532	1,813,511
244	0				5.4	-		-5.4		1.399.2	TP	0	0	457,526	1,813,841
245	330		89°19.5'	+7.6°	10.7	89°-	+5.8	-4.9		1.399.7	TP	-11 +2	+330	457,517	1,814,171
245	330				9.4	89°14'	+4.4	-5.0			TP				
	2970		262°19.2'-180°	+7.5°	+14.0	89°2'	-50.1	-36.1	1.363.6		BS	+14 +2	+2970		
	2970				+7.1	89°10'	-43.2	-36.1			BS				
246	2640		262°19.2'	+7.5°	6.1	TH	+13.2	+7.1		1.370.7		-12	-2640	457,521	1,814,501
247	2310		" "		10.0	-		-10.0		1.353.6		-11	-2310	457,522	1,814,831

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
6/9/79		G. Cotcamp		W. Krol		6837		W. Krol		2	18						
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER									
Minnesota		Aldrich South	Minnesota	Todd	132 N	34W		L.O. Davis									
STATION NO.	SLOPE DISTANCE	PLOTting DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
									1.363.6								
248	1980		262° 14.2'	+7.5°	11.8	BH	-9.9	-21.7		1,341.9		-9	-1980	457,529	1,815,161		
249	1650		" "	"	10.8	90°30'	-14.4	-25.2		1,338.4		-8	-1650	457,525	1,815,491		
250	1320		" "	"	12.1	BH	-6.6	-18.7		1,344.9		-6	-1320	457,527	1,815,821		
251	990		" "	"	14.2	BH	-5.0	-19.2		1,344.4		-5	-990	457,528	1,816,151		
252	660		" "	"	9.9	91°-	-11.5	-21.4		1,342.2		-3	-660	457,530	1,816,481		
253	330		" "	"	14.4	-		-14.4		1,349.2		-2	-330	457,531	1,816,811		
$\frac{1}{2}$	118		263° 56'	+7.5°	6.3	-		-6.3		1,357.3		+3	-118	457,536	1,817,023	457,590+1,817,015(s) 4-Way Intersect. 1358' elev.	
254	0				5.9	-		-5.4		1,358.2	T	0	0	457,533	1,817,191		
255	330		82° 15.5'	+7.5°	7.3	TH	+1.7	-5.6		1,358.0		+1	+330	457,534	1,817,471		
256	660		" "	"	18.9	TH	+3.3	-15.6		1,348.0		+3	+660	457,536	1,817,801		
257	990		" "	"	8.9	TH	+5.0	-3.9		1,359.7		+4	+990	457,537	1,818,131		
258	1320		82° 15.5'	+7.5°	10.7	89°-	+23.0	+12.3		1,375.9	TP	+6 +2	+1320	457,541	1,818,461		
258	1320				5.4	89° 14'	+17.7	+12.3			TP						
	2640		262° 14.8' - 180°	+7.5°	+7.7	-		+7.7	1,383.6		BS	+12 +2	+2640				
	2640				+6.1	90° 2'	+1.5	+7.6			BS						
259	2310		262° 14.8'	+7.5°	9.5	-		-9.5		1,374.1		-10	-2310	457,545	1,818,791		
260	1980		" "	"	4.8	BH	-9.9	-14.7		1,368.9		-9	-1980	457,546	1,819,121		
261	1650		" "	"	11.9	90°30'	-14.4	-26.3		1,357.3		-7	-1650	457,548	1,819,451		
262	1320		" "	"	10.1	91°-	-23.0	-33.1		1,350.5		-6	-1320	457,549	1,819,781		
263	990		" "	"	7.3	91°30'	-25.9	-33.2		1,350.4		-4	-990	457,551	1,820,111		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 6/9/79	INSTRUMENT MAN G. Cotcamp	ROD MAN W. Krol	PARTY NUMBER 6834	NOTES CHECKED BY	LINE NO. 2	PAGE 19
AREA Minnesota	TOPO MAP Aldrich South	STATE Minnesota	COUNTY Todd	TWP 132 N	RANGE 34 W	PPM
				PARTY MANAGER I. D. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -		EAST + WEST -		COORDINATES		REMARKS	
												LAT.	DEP.	Y	X				
									1.383.6										
264	660		262°14.8'	+7.5°	9.2	92°	-23.0	-32.2		1351.4		-3	-660	457,552	1,820,441				
265	330		" "	"	8.9	92°	-11.5	-20.4		1363.2		-1	-330	457,559	1,820,771				
<u>IL</u>	57		267°21.8'	+7.5°	5.8	-		-5.8		1377.8		+5	-57	457,560	1,821,044				457,560+1,821,035(s) T-rd (north) elev. 1380
266	0				5.4	-		-5.4		1378.2	TP	0	0	457,555	1,821,101				
267	330		83°45.6'	+7.5°	9.8	-		-9.8		1373.8		-7	+330	457,548	1,821,431				
268	660		" "	"	10.9	-		-10.9		1372.7		-15	+660	457,540	1,821,761				
269	990		" "	"	10.0	-		-10.0		1373.6		-22	+990	457,533	1,822,091				
270	1320		" "	"	9.8	-		-9.8		1373.8		-29	+1320	457,526	1,822,421				
271	1650		" "	"	13.2	-		-13.2		1370.4		-36	+1650	457,519	1,822,751				
272	1980		" "	"	11.5	-		-11.5		1372.1		-44	+1979	457,511	1,823,080				
273	2310		83°45.6'	+7.5°	10.4	BH	-11.6	-22.0		1361.6	TP	-51 +2	+2309	457,506	1,823,410				last sta. on road
273	2310				13.9	90°12'	-8.1	-22.0			TP								
	1650		263°42.2' -180°	+7.5°	+10.0	89°26'	-16.3	-6.3	1355.3		BS	-35 +2	+1650						
	1650				+9.0	89°28'	-15.4	-6.4			BS								457,500+1,823,690(s)
<u>TL</u>	1370		263°50'	+7.5°	5.0	TH	+6.9	+1.9		1357.2		+32	-1370	457,505	1,823,690				90° bend (south) Elev. 1361
274	1320		263°42.2'	+7.5°	6.9	TH	+6.6	-0.3		1355.0		+28	-1320	457,501	1,823,740				in swamp (south side)
275	990		" "	"	5.6	-		-5.6		1349.7		+21	-990	457,497	1,824,070				E-W fence
276	660		" "	"	5.2	-		-5.2		1350.1		+14	-660	457,487	1,824,400				
277	330		" "	"	5.4	-		-5.4		1349.9		+7	-330	457,480	1,824,730				
278	0				5.4	-		-5.4		1349.9	TP	0	0	457,473	1,825,060				↓

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 6/9/79	INSTRUMENT MAN G. Cotcamp	ROD MAN W. Krol	PARTY NUMBER 6834	NOTES CHECKED BY W. Krol	LINE NO. 2	PAGE 20
AREA Minnesota	TOPO MAP Aldrich South	STATE Minnesota	COUNTY Todd	TWP 132 N	RANGE 34 W	PPM
			PARTY MANAGER L. O. Davis			

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS		
												NORTH + SOUTH - L.A.T.	EAST + WEST - DEP.		Y	X
									1,355.3							
279	330		80° 12'	+7.5°	5.0	89° -	+5.8	+0.8		1,356.1	TP	+13 +2	+330	457,488	1,825,390	in woods along
279	330				4.1	89° 10'	+4.8	+0.7			TP					south side (E-W fence)
	330		263° 22.6' - 180°	+7.5°	+6.4	-		+6.4			BS	-5 +2	+330			
	330				+4.6	BH	+1.7	+6.5	1,362.5		BS					
280	0				5.4	-		-5.4		1,357.2	TP	0	0	457,485	1,825,720	
281	330		86° 6'	+7.5°	7.0	-		-7.0		1,355.6	TP	-21	+329	457,467	1,826,099	
281	330				8.7	TH	+1.7	-7.0			TP					
	330		262° 16' - 180°	+7.5°	+5.5	88° -	-11.5	-6.0	1,349.6		BS	+1	+330			horiz. corner. Y = +20 X = -22'
	330				+4.9	88° 6'	-10.9	-6.0			BS					
-11-	39		270° 9'	+7.5°	1.3	-		-1.3		1,348.3		+5	-39	457,470	1,826,340	E-W fence + farm road.
282	0				5.4	-		-5.4		1,344.2	TP	0	0	457,465	1,826,379	
283	330		82° 33.6'	+7.5°	5.0	91° 14'	-7.1	-12.1		1,337.5	TP	0	+330	457,465	1,826,709	
283	330				3.1	91° 34'	-9.0	-12.1			TP					
	330		263° 34.6' - 180°	+7.5°	+5.8	-		+5.8			BS	-6	+330			
	330				+5.1	90° 8'	+0.8	+5.9	1,343.4		BS					
284	0				5.4	-		-5.4		1,338.0	TP	0	0	457,459	1,827,039	corner
285	330		82° 5'	+7.5°	8.9	88° -	+11.5	+2.6		1,346.0	TP	+2	+330	457,461	1,827,369	
285	330				8.1	88° 8'	+10.7	+2.6			TP					
	330		263° 10' - 180°	+7.5°	+8.2	-		+8.2	1,354.2		BS	-4	+330			↓
	330				+6.5 +7.5	BH	1.7	+8.2			BS					

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
6/9/79		G. Cotcamp		W. Krol		6834		W. Krol		2	21					
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE	PPM	PARTY MANAGER				
Minnesota		Aldrich South		Minnesota		Todd		132 N		34W						
STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
									1.354.2							
286	0				5.4	-		-5.4		1348.8	T	0	0	457,457	1,827,699	in woods
287	330		81°35'	+7.5°	14.5	TH	+1.7	-12.8		1,341.4	TP	+5	+330	457,462	1,828,029	
287	330				13.9	89°50'	+1.0	-12.9			TP					
	330		261°26.6'-180°	+7.5°	2.3	TH	-1.7	+0.6	1,342.0		BS	+6	+330-1			
	330				4.8	89°16'	-4.2	+0.6			BS					
288	0				5.4	-		-5.4		1,336.6	T	0	0	457,468	1,828,358	in swamp
289	330		82°30'	+7.5°	3.0	89°	+5.8	+2.8		1,344.8	TP	0	+330-1	457,468	1,828,687	
289	330				2.0	89°10'	+4.8	+2.8			TP					last sta - cross county
	330		261°1.8'-180°	+7.5°	+7.4	93°	+17.2	+24.6			BS	+8	+330-1			
	330				+5.5	93°20'	+19.2	+24.7	1,369.5		BS					
290	0				5.4	-		-5.4		1,364.1	T	0	0	457,476	1,829,016	90° bend
291	330		82°14'	+7.5°	6.7	-		-6.7		1,362.8		+2	+330	457,478	1,829,346	
292	660		82°14'	+7.5°	4.5	TH	+3.3	-1.2		1,368.3	TP	+3	+660-1	457,479	1,829,675	
292	660				5.0	89°40'	+3.8	-1.2			TP					
	660		262°8.5'-180°	+7.5°	+0.9	89°	-11.5	-10.6	1,357.7		BS	+4	+660-2			
	660				+4.8	88°40'	-15.4	-10.6			BS					
293	330		262°8.5'	+7.5°	4.3	-		-4.3		1,353.4		-2	-330	457,481	1,830,004	
294	0				5.4	-		-5.4		1,352.3	T	0	0	457,483	1,830,334	
295	330		82°57'	+7.5°	5.8	88°	11.5	-5.7		1,352.0		-4	+330	457,479	1,830,664	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 6/12/79	INSTRUMENT MAN G. Cotcamp	ROD MAN W. Krol	PARTY NUMBER 6834	NOTES CHECKED BY W. Krol	LINE NO. 2	PAGE 22
AREA Minnesota	TOPO MAP Aldrich South	STATE Minnesota	COUNTY Todd	TWP 132 N	RANGE 34 W	PARTY MANAGER L.O. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1.357.7					
296	660		82°57'	+7.5°	14.5	88°10'	+21.1	+6.6		1.364.3	TP	-5	+660-2	457,478 1,830,992
296	660				13.7	88°14'	+20.3	+6.6			TP			
	990		261°59.2'-180°	+7.5°	+1.2	89°-	-17.3	-16.1	1.348.2		BS	+9	+990-2	
	990				+5.8	88°44'	-21.9	-16.1			BS			
297	660		261°59.2'	+7.5°	1.7	-		-1.7		1.346.5		-6	-660	457,481 1,831,320
298	330		"		9.8	-		-9.8		1.338.4		-3	-330	457,487 1,831,650
TP	62		266°12'	+7.5°	7.7	-		-7.7		1.340.5		+4	-62	457,491 1,831,918
299	0				5.4	-		-5.4		1.342.8	TP	0	0	457,487 1,831,980
300	330		84°36.8'	+7.8°	1.6	87°-	+17.2	+15.6		1.363.8		-14	+330	457,473 1,832,310
301	660	659	84°36.8'	+7.8°	14.7	87°4'	+33.7	+19.0			TP	-28	+659-3	457,459 1,832,636
301	660				13.9	87°8'	+33.0	+19.1		1.367.3	TP			
	1650		263°43.2'-180°	+7.8°	+5.9	89°10'	-24.0	-18.1			BS	-44	+1650-3	
	1650				+10.8	89°	-28.8	-18.0	1.349.3		BS			
302	1320		263°43.2'	+7.8°	1.8	-		-1.3		1.348.0		+35	-1320	457,450 1,832,963
303	990		"	"	7.9	-		-7.9		1.341.4		+26	-990	457,441 1,832,293
304	660		"	"	7.1	-		-7.1		1.342.2		+18	-660	457,433 1,833,623
305	330		"	"	6.5	-		-6.5		1.342.8		+9	-330	457,424 1,833,953
306	0				5.4	-		-5.4		1.343.9	TP	0	0	457,415 1,834,283
307	330		84°4.6'	+7.8°	5.8	-		-5.8		1.343.5		-11	+330	457,404 1,834,613
308	660		"	"	2.5	-		-2.5		1.346.8		-22	+660	457,393 1,834,943

457,490 +1,831,720(s)
Fred (south) elev. 1341

RES-HIGH RESOLUTION DATA

Geosource Inc.

AREA		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
6/12/79		W. Krol		J. Cotcamp		6834		W. Krol		2	23				
M. Minnesota		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
		Aldrich South		Minnesota		Todd		132N		34W/33W				D.O. Davis	
STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1349.3						
309	990		84°46'	+7.8°	7.4	89°30'	+8.6	+1.2		1.3505		-32	+990	457.383	1.835.273
310	1320		84°46'	+7.8°	0.7	89°30'	+11.5	+10.8		1.360.1		-43	+1320	457.372	1.835.603
311	1650		0		7.8	89°40'	+24.0	+16.2		1.365.5	TP	-54	+1649-3	457.361	1.835.929
311	1650		84°46'	+7.8°	12.6	89°	+28.8	+16.2			TP				
	1320		263°50'-180	+7.8°	+12.7	89°10'	-19.2	-6.5	1.359.0		BS	-38	+1320-3		
	1320				+13.6	89°08'	-20.0	-6.4			BS				
312	990		263°50'	+7.8°	10.0	89°4'	+16.1	+6.1		1.365.1		+28	-990	457.351	1.836.256
313	660				4.0	89°4'	+10.8	+6.8		1.365.8		+19	-660	457.342	1.836.586
313	345		263°10'	+7.8°	1.2	89°4'	+5.6	+4.4		1.363.4		+6	-345	457.329	1.836.901
314	-330		"	"	3.0	88°48'	+6.9	+3.9		1.362.9		+9	-330	457.332	1.836.916
315	-0-				5.4	-		-5.4		1.353.6	TP	0	0	457.323	1.837.246
316	330		81°9.6'	+7.8°	8.8	-		-8.8		1.350.2		+5	+330	457.328	1.837.576
317	660		"	"	8.0	-		-8.0		1.351.0		+10	+660	457.333	1.837.906
318	990		"	"	10.5			-10.5		1.348.5		+15	+990	457.338	1.838.236
319	1320		"	"	14.0	90°24'	-9.2	-23.2		1.335.8		+20	+1320	457.343	1.838.566
320	1650		"	"	16.0	90°24'	-11.5	-27.5		1.331.5		+25	+1650	457.348	1.838.896
321	1980		"	"	15.0	90°24'	-13.8	-28.8		1.330.2		+30	+1980	457.353	1.839.226
322	2310		81°19.6'	+7.8°	4.2	90°24'	-16.1	-20.3		1.338.7		+35	+2310	457.358	1.839.556
323	2640		81°19.6'	+7.8°	3.2	90°2'	-1.5	-4.7	-4.8	1.354.2	TP	+40	+2640-3	457.363	1.839.883
323	2640		81°9.6'		0.3	90°6'	-4.6	-4.9			TP				

R34W
 457.315 + 1.836.905 (s)
 in with 1.363 elev.
 R33W

SURVEY NOTES-HIGH RESOLUTION DATA
GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
6-12-79		W. Krol		G. Cotcamp		6834		W. Krol		2	24					
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE	PPM	PARTY MANAGER				
Minnesota		Aldrich S. / Staples		Minnesota		Todd		132N		33W		L.O. Davis				
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
										1.354.2						
	2970		261°10' - 180°	+7.8	12.0	7H	-14.9	-2.9	(-2.7)		BS	+54	-2970-3			
	2970				6.1	89°50'	-8.6	-2.5	1.351.5		BS					
324	2640		261°10'	+7.8	3.6	-		-3.6		1.347.9		-48	-2640	457.369	1.840.210	
325	2310		"	"	13.8			-13.8		1.337.7		-42	-2310	457.375	1.840.540	
326	1980		"	"	9.8	BH	-9.9	-19.7		1.331.8		-36	-1980	457.381	1.840.870	
327	1650		"	"	10.3	90°28'	-13.4	-23.7		1.327.8		-30	-1650	457.387	1.841.200	
328	1320		"	"	7.9	90°46'	-17.7	-25.6		1.325.9		-24	+1320	457.393	1.841.530	
329	1050		262°4.3'	+7.8	10.1	90°50'	-15.3	-25.4		1.326.1		-2	-1050	457.415	1.841.900	+57,400 + 1,841,790(s) A way int elev. 1326
329	990		261°10'	+7.8	8.1	91°	-17.3	-25.4		1.326.1		-18	-990	457.399	1.841.860	Aldrich South Quad.
330	660		"	"	7.5	91°	-11.5	-19.0		1.332.5		-12	-660	457.405	1.842.190	Staples Quad.
331	330		"	"	10.8	-		-10.8		1.340.7		-6	-330	457.411	1.842.520	↓
332	-0-				5.4	-		-5.4		1.346.1	TP	0	0	457.417	1.842.850	
333	330		81°18'	+7.8	9.8	-		-9.8		1.341.7		+5	+330	457.422	1.843.180	
334	660		"	"	8.3	91°	-11.5	-19.8		1.331.7		+10	+660	457.427	1.843.510	
335	990		"	"	9.0	91°	-17.3	-26.3		1.325.2		+16	+990	457.433	1.843.840	
336	1320		"	"	7.6	91°20'	-30.7	-38.3		1.313.2		+21	+1320	457.438	1.844.170	
337	1650		"	"	9.4	91°20'	-38.4	-47.8		1.303.7		+26	+1650	457.443	1.844.500	
338	1980		"	"	1.0	91°20'	-46.1	-47.1		1.304.4		+31	+1980	457.448	1.844.830	
339	2310		"	"	9.7	91°04'	-43.0	-52.7		1.298.8	TP	+36	+2310-3	457.453	1.845.157	
339	2310		81°18'	+7.8	12.4	91°	-40.3	-52.7			TP					

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE			
6-12-79		W. Krol		G. Cotcamp		6834		W. Krol		2	25			
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER			
Minnesota		Staples		Minnesota		Todd		132N	33W		L.O. D. Co. 13			
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
										1,298.8				
	1650		261°35.6'-180°	+7.8°	+3.6	89°02'	-27.8	-24.2	1,274.6		BS	+17	+1650-3	
	1650				+4.6	89°	-28.8	-24.2			BS			
340	1320		261°35.6'	+7.8°	2.0	89°30'	+11.5	+9.5		1,284.1		-14	-1320	457,456 1,845,484
341	990		"	"	11.0	89°30'	+8.6	-2.4		1,272.2		-10	-990	457,460 1,845,814
342	660		"	"	3.2	-		-3.2		1,271.4		-7	-660	457,463 1,846,144
343	330		"	"	4.0	-		-4.0		1,270.6		-3	-330	457,467 1,846,474
344	-0-				5.4	-		-5.4		1,269.2	TP	0	0	457,470 1,846,804
345	179		78°13.3'	+7.8°	5.3	-		-5.3		1,269.3		+12	+179	457,482 1,846,983 N-S lev. elev. 1268'
346	330		83°19.6'	+7.7°	4.5	-		-4.5		1,270.1		-6	+330	457,464 1,847,134
347	660		"	"	2.4	-		-2.4		1,272.2		-12	+660	457,458 1,847,464
348	990		"	"	0.8	TH	+5.0	+4.2		1,278.8		-18	+990	457,452 1,847,794
349	1320		"	"	5.3	89°	+23.0	+17.7		1,292.3		-24	+1320	457,446 1,848,124
350	1650		"	"	11.2	88°30'	+43.2	+32.0		1,306.6		-30	+1650	457,440 1,848,454
351	1980		"	"	14.8	88°30'	+51.8	+37.0			TP	-35	+1980-3	457,435 1,848,781
352	1980		83°19.6'	+7.7°	6.9	88°44'	+43.8	+36.9		1,311.5	TP			
353	2310		263°25'-180°	+7.7°	+10.3	88°44'	-51.1	-40.8	1,270.7		BS	-45	+2309-3	
354	2310				+13.0	88°40'	-53.7	-40.7			BS			
355	1980		263°25'	+7.7°	2.0	88°50'	+40.3	+38.3		1,309.0		+39	-1980	457,429 1,849,107
356	1650		"	"	0.2	88°50'	+33.6	+33.4		1,304.1		+32	-1650	457,422 1,849,437
357	1320		"	"	7.3	88°50'	+26.9	+19.6		1,290.3		+26	-1320	457,416 1,849,767

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE		
6-12-79		W. Krol		G. Cotcamp		6834		W. Krol			2	26		
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER			
Minnesota		Staples		Minnesota		Todd		132 N	33 W		L.O. Devis			
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1270.7					
354	990		263°25'	+7.7°	0.2	-		-0.2		1270.5		+19	-990	457.409 1.850.097
355	752		264°0'	+7.7°	7.9	-		-7.9		1.262.8		+22	-752	457.412 1.850.335 bridge
355	660		263°25'	+7.7°	7.8	-		-7.8		1.262.9		+13	-660	457.403 1.850.427
356	330		" "	"	5.8	-		-5.8		1.264.9		+6	-330	457.396 1.850.757
357	-0-				5.4	-		-5.4		1.265.3	TP	0	0	457.390 1.851.087
358	330		82°39.3'	+7.7°	3.8	-		-3.8		1.266.9		-2	+330	457.388 1.851.417
359	660		" "	"	6.8	-		-6.8		1.263.9		-4	+660	457.386 1.851.747
360	990		" "	"	6.2	-		-6.2		1.264.5		-6	+990	457.384 1.852.077
361	1320		" "	"	4.2	TH	+6.6	+2.4		1.273.1		-8	+1320	457.382 1.852.407
361	1325		82°05'	+7.7°	3.8	TH	+6.6	+2.8		1.273.5		+5	+1325	457.395 1.852.412
362	1650		82°39.3'	+7.6°	7.0	89°16'	+21.1	+14.1		1.284.8		-10	+1650	457.380 1.852.737
363	1980		" "	"	7.1	89°16'	+25.3	+18.2	+18.3	1.289.0	TP	-9	+1980-3	457.381 1.853.064
363	1980		82°39.3'	+7.6°	10.4	89°10'	+28.8	+18.4			TP			
	2640		262°46.5'	+7.6°	+14.4	-		+14.4	1.303.4		BS	-17	+2640-3	
	2640				+6.7	90°10'	+7.7	+14.4			BS			
364	2310		262°46.5'	+7.6°	9.3	BH	-11.6	-20.9		1.282.5		+15	-2310	457.379 1.853.391
365	1980		" "	"	7.1	90°30'	-17.3	-24.4		1.279.0		+13	-1980	457.377 1.853.721
366	1650		" "	"	8.0	90°30'	-14.4	-22.4		1.281.0		+11	-1650	457.375 1.854.051
367	1320		" "	"	6.7	90°30'	-11.5	-18.2		1.285.2		+9	-1320	457.373 1.854.381
368	990		" "	"	9.8	BH	-5.0	-14.8		1.288.6		+6	-990	457.370 1.854.711

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 6-12-79	INSTRUMENT MAN W. Krol	ROD MAN G. Cotcamp	PARTY NUMBER 6834	NOTES CHECKED BY W. Krol	LINE 2	PAGE 27 of 27
AREA MINNESOTA	TOPO MAP Staples	STATE Minnesota	COUNTY Todd	TWP 132N	RANGE 33W	PPM
						PARTY MANAGER J.O. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -		EAST + WEST -		COORDINATES		REMARKS	
												LAT.	DEP.	Y	X				
									1,303.4										
369	660		262° 46.5'	+7.6°	10.9	-		-10.9		1,292.5		+4	-660	457,368	1,855.041				
370	330		" "	"	6.4	-		-6.4		1,297.0		+2	-330	457,366	1,855.371				
371	-0-				5.4	-		-5.4		1,298.0	X	0	0	457,364	1,855.701				
372	330		82° 46.4'	+7.6°	10.0	-		-10.0		1,293.4		-2	+330	457,362	1,856.031				
373	660		" "	"	9.1	91°	-11.5	-20.6		1,282.8		-4	+660	457,360	1,856.361				
374	990		" "	"	11.8	91°	-17.3	-29.1		1,274.3		-6	+990	457,358	1,856.691				
375	1320		" "	"	10.5	90° 46'	-17.7	-28.2		1,275.2		-9	+1320	457,355	1,857.021				
376	1650		" "	"	8.8	90° 30'	-14.4	-23.2		1,280.2		-11	+1650	457,353	1,857.351				
377	1980		" "	"	10.0	90° 16'	-9.2	-19.2				-13	+1980	457,351	1,857.681				
377	1980		82° 46.4'	+7.6°	13.5	90° 10'	-5.8	-19.3		1,284.1	E.O.L								E.O.L.
<u>377</u>	2000		82° 21.4'	+7.6°	13.4	90° 10'	-5.8	-19.2		1,284.2		+2	+2000	457,366	1,857,701				int., 1284' elev. 457,365 + 1,857,700(s)
																			horiz. correct. y=0' x=-46'