

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
8/1/78		G. Cotcamp		R. Hulsey		6834		G.V.C.		1		1 of 83			
AREA		TOPO. MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Pleasant Valley 7 1/2		Michigan		Midland		14N		2W				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									674.0						
	1420		3° 5' +180°	-3.0°	+4.6	-		+4.6	678.6		BS	-1420	-2		→ scaled 90° bend (east) TR 674.0 topo
	1420				+117	TH	-7.1	+4.6			BS				
①	1320		3° -	-3.0°	3.9	-		-3.9	674.7			+1320	0	758,885	1,948,308 22   23
2	1100		" "	-3.0°	3.9	-		-3.9	674.7			+1100	0	758,665	1,948,308 27   26
3	880		" "	-3.0°	5.2	-		-5.2	673.4			+880	0	758,445	1,948,308
4	660		" "	-3.0°	4.9	-		-4.9	673.7			+660	0	758,225	1,948,308
⑤	440		" "	-3.0°	4.8	-		-4.8	673.8			+440	0	758,005	1,948,308
6	220		" "	-3.0°	4.6	-		-4.6	674.0			+220	0	757,785	1,948,308
7	0			-3.0°	5.3	-		-5.3	673.3		X	0	0	757,565	1,948,308
8	220		182° 57.6'	-3.0°	4.9	-		-4.9	673.7			-220	0	757,345	1,948,308
9	440		" "	-3.0°	4.7	-		-4.7	673.9			-440	0	757,125	1,948,308
⑩	660		" "	-3.0°	5.4	-		-5.4	673.2			-660	+1	756,905	1,948,309
H	880			-3.0°											
≡	840		182° 34'	-3.0°	6.2	-		-6.2	672.4			-840	+6	756,725	1,948,314 T-rd (west)
11	880		182° 57.6'	-3.0°	7.2	-		-7.2	671.4			-880	+1	756,685	1,948,309
12	1100		" "	-3.0°	4.4	BH	-5.5	-9.9	668.7			-1100	+1	756,465	1,948,309 last sta. on pavement
X	1220		182° 36'	-3.0°	10.1	-		-10.1	668.5			-1220	+9	756,345	1,948,317
13	1320		182° 57.6'	-3.0°	9.8	-		-9.8	668.8		TP	-1320	+1	756,245	1,948,309 (bridge) elev. 669.
13	1320				11.4	89° 56'	+1.5	-9.9			TP				first sta. on dirt road

SURVEY NOTES-HIGH RESOLUTION DATA

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Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE			
8/2/78		G. Cotcamp		R. Hulsey		6834		GWC.		1	2			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE	PPM	PARTY MANAGER		
Michigan		Pleasant Valley		Michigan		Midland		14N		2w		L.O. Davis		
STATION NO.	SLOPE DISTANCE	PLOTING 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.	
13										668.8				
BS	2200		3° 0.8' + 180°	-3.0°	+12.1	-		+12.1			BS	-2200	-1	
BS	2200				+1.2	BH	+11.0	+12.2	681.0		BS			
14	1980		3° 0.8'	-3.0°	3.6	BH	-9.9	-13.5		667.5		+1980	0	756,025 1,948,308
15	1760		" "	-3.0°	4.6	BH	-8.8	-13.4		667.6		+1760	0	755,805 1,948,308
16	1540		" "	-3.0°	5.3	BH	-7.7	-13.0		668.0		+1540	0	755,585 1,948,308
17	1320		" "	-3.0°	5.5	BH	-6.6	-12.1		668.9		+1320	0	755,365 1,948,308
18	1100		" "	-3.0°	8.4	-		-8.4		672.6		+1100	0	755,145 1,948,308
19	880		" "	-3.0°	6.0	-		-6.0		675.0		+880	0	754,925 1,948,308
20	660		" "	-3.0°	5.8	-		-5.8		675.2		+660	0	754,705 1,948,308
21	440		" "	-3.0°	5.3	-		-5.3		675.7		+440	0	754,485 1,948,308
22	220		" "	-3.0°	5.0	-		-5.0		676.0		+220	0	754,265 1,948,308
23	0				5.4	-		-5.4		675.6	TP	0	0	754,045 1,948,308 horizontal tie
24	220		183° 04'	-3.0°	4.9	-		-4.9		676.1		-220	0	753,825 1,948,308 y=-10' x=-3'
#F	345		182° 22'	-3.0°	4.9	-		-4.9		676.1		-345	+4	753,700 1,948,312 4-Way Intersect.
25	440		183° 04'	-3.0°	5.0	-		-5.0		676.0		-440	-1	753,605 1,948,307
26	660		" "	-3.0°	5.0	-		-5.0		676.0		-660	-1	753,385 1,948,307
27	880		" "	-3.0°	5.0	-		-5.0		676.0		-880	-1	753,165 1,948,307
28	1100		" "	-3.0°	4.3	-		-4.3		676.7		-1100	-1	752,945 1,948,307
29	1320		" "	-3.0°	3.7	-		-3.7		677.3		-1320	-2	752,725 1,948,306
30	1540		" "	-3.0°	3.6	-		-3.6		677.4		-1540	-2	752,505 1,948,306

SURVEY NOTES-HIGH RESOLUTION DATA

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Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
8/2/78		G. Cotcamp		R. Hulsey		6834		RH		1	3				
AREA		TOPO MAP	STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Michigan		Pleasant Valley	Michigan	Midland		14N	2W		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
									681.0						
31	1760		183° 04'	-3.0°	3.4	-		-3.4		677.6		-1760	-2	752,285	1,948,306
32	1980		" "	-3.0°	3.5	-		-3.5		677.5		-1980	-2	752,065	1,948,306
33	2200		" "	-3.0°	2.8	-		-2.8		678.2		-2200	-3	751,845	1,948,305
34	2420		183° 04'	-3.0°	2.7	-		-2.7		678.3	TP	-2420	-3	751,625	1,948,305
34	2420				14.8	TH	+12.1	-2.7			TP				
	1540		3° 05.3' +180°	-3.0°	+3.5	-		+3.5	681.8		BS	-1540	-2		
	1540				+11.2	TH	-7.7	+3.5			BS				
35	1320		3° 05.3'	-3.0°	3.7	-		-3.7		678.1		+1320	+2	751,405	1,948,305
36	1100		" "	-3.0°	4.1	-		-4.1		677.7		+1100	+2	751,185	1,948,305
37	880		" "	-3.0°	3.6	-		-3.6		678.2		+880	+1	750,965	1,948,304
38	660		" "	-3.0°	3.5	-		-3.5		678.3		+660	+1	750,745	1,948,304
39	440		" "	-3.0°	5.1	-		-5.1		676.7		+440	+1	750,525	1,948,304
40	220		" "	-3.0°	5.1	-		-5.1		676.7		+220	0	750,305	1,948,303
41	0		" "		5.4	-		-5.4		676.4	X	0	0	750,085	1,948,303
42	220		182° 57.6'	-3.0°	5.3	-		-5.3		676.5		-220	0	749,865	1,948,303
43	440		" "	-3.0°	5.3	-		-5.3		676.5		-440	0	749,645	1,948,303
44	660		" "	-3.0°	4.8	-		-4.8		677.0		-660	0	749,425	1,948,303
45	880		" "	-3.0°	5.2	-		-5.2		676.6		-880	0	749,205	1,948,303
46	1100		" "	-3.0°	5.4	-		-5.4		676.4		-1100	+1	748,985	1,948,304
47	1320		" "	-3.0°	5.0	-		-5.0		676.8		-1320	+1	748,765	1,948,304

SURVEY NOTES-HIGH RESOLUTION DATA

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Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
8/2/78		G. CoTcamp		R. Hulsey		6834		RH		1	4					
AREA		TOPO MAP		STATE		COUNTY		RANGE		PPM		PARTY MANAGER				
Michigan		Pleasant Valley		Michigan		Midland		14N/13N		2W		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
									681.8							
48	1540		182°57.6'	-3.0°	5.0	-		-5.0		676.8	TP	-1540	+1	748,545	1,948,304	T14N
48	1540			-3.0°	12.7	TH	+7.7	-5.0			TP					unable to locate B.M.
	432		11°24.4'+180°	-3.0°	+5.3	-		+5.3	682.1		BS	-427	-63			shooting thru slight
	432				+7.5	TH	-2.2	+5.3			BS					jog to west
<del>48</del>	300		15°14'	-3.0°	4.6	-		-4.6		677.5		+293	+64	748,411	1,948,305	offset 4-way (scaled)
<del>48</del>	298		5°20'	-3.0°	4.5	-		-4.5		677.6		+298	+12	748,416	1,948,253	
49	220		3°22'	-3.0°	5.6	-		-5.6		676.5		+220	+1	748,338	1,948,242	T13N
50	0				5.4	-		-5.4		676.7	TP	0	0	748,118	1,948,241	
51	220		184°11.3'	-3.0°	5.3	-		-5.3		676.8		-220	-5	747,898	1,948,236	
52	440		" "	-3.0°	5.3	-		-5.3		676.8		-440	-9	747,678	1,948,232	
53	660		" "	-3.0°	4.8	-		-4.8		677.3		-660	-14	747,458	1,948,227	
54	880		" "	-3.0°	4.8	-		-4.8		677.3		-880	-18	747,238	1,948,223	
55	1100		184°11.3'	-3.0°	3.3	-		-3.3		678.8	TP	-1100	-23+1	747,023	1,948,219	T-rd (west)
55	1100				8.8	TH	+5.5	-3.3			TP		+5			
	2640		3°31'+180°	-3.0°	+14.4	89°50'	-7.7	+6.7	685.5		BS	-2640	-24+2			
	2640				+12.9	89°52'	-6.2	+6.7			BS		+5			
56	2420		3°31'	-3.0°	6.9	-		-6.9		678.6		+2420	+22	746,808	1,948,219	
57	2200		" "	-3.0°	6.4	-		-6.4		679.1		+2200	+20	746,588	1,948,217	
58	1980		" "	-3.0°	6.3	-		-6.3		679.2		+1980	+18	746,368	1,948,215	
59	1760		" "	-3.0°	6.4	-		-6.4		679.1		+1760	+16	746,148	1,948,213	

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
8/2/78		G. Cotcamp		R. Hulsey		6834		RH		1	5				
AREA		TOPO MAP		STATE		COUNTY		RANGE		PARTY MANAGER					
Michigan		Pleasant Valley		Michigan		Midland		2W		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
									685.5						
60	1540		3°31'	-3.0°	6.0	-		-6.0	679.5	+1540	+14	745,928	1,948,211		
61	1320		" "	-3.0°	6.0	-		-6.0	679.5	+1320	+12	745,708	1,948,209		
1F	1210		3°42'	-3.0°	5.7	-		-5.7	679.8	+1210	+15	745,598	1,948,212	T-rd (east) elev. 680	
62	1100		3°31'	-3.0°	6.0	-		-6.0	679.5	+1100	+10	745,488	1,948,207		
63	880		" "	-3.0°	5.9	-		-5.9	679.6	+880	+8	745,268	1,948,205		
64	660		" "	-3.0°	5.1	-		-5.1	680.4	+660	+6	745,048	1,948,203		
65	440		" "	-3.0°	5.1	-		-5.1	680.4	+440	+4	744,828	1,948,201		
66	220		" "	-3.0°	4.8	-		-4.8	680.7	+220	+2	744,608	1,948,199		
67	0				5.4	-		-5.4	680.1	TP	0	744,388	1,948,197		
68	220		183°39.7'	-3.0°	5.0	-		-5.0	680.5		-220	-3	744,168	1,948,194	
69	440		" "	-3.0°	4.5	-		-4.5	681.0		-440	-5	743,948	1,948,192	
70	660		" "	-3.0°	4.9	-		-4.9	680.6		-660	-8	743,728	1,948,189	
71	880		" "	-3.0°	4.8	-		-4.8	680.7		-880	-10	743,508	1,948,187	
72	1100		" "	-3.0°	4.5	-		-4.5	681.0		-1100	-13	743,288	1,948,184	
73	1320		" "	-3.0°	3.9	-		-3.9	681.6		-1320	-15	743,068	1,948,182	T-rd (east) elev. 685? <sup>rechecked</sup>
74	1540		" "	-3.0°	3.9	-		-3.9	681.6		-1540	-18	742,848	1,948,179	
75	1760		" "	-3.0°	4.1	-		-4.1	681.4		-1760	-20	742,628	1,948,177	
76	1980		" "	-3.0°	3.8	-		-3.8	681.7		-1980	-23	742,408	1,948,174	
77	2200		183°39.7'	-3.0°	3.9	-		-3.9	681.6	TP	-2200 <sup>+5</sup>	-25H	742,193	1,948,173	
77	2200				14.9	TH	11.0	-3.9		TP					

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN			ROD MAN			PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE			
8/2/78		G. Coatsop			R. Hulsey			6837		RH		1	6			
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER								
Michigan		Pleasant Valley	Michigan	Midland	13N	2W		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	
77										681.6						
	2640		3°6' +180°	-3.0°	+4.5	-		+4.52			BS	-2640	-5+2			
	2640				+139	89°48'	-9.2	+4.75	686.3		BS					
78	2420		3°6'	-3.0°	4.1	-		-4.1		682.2		+2420	+4	741,979	1,948,174	
79	2200		" "	-3.0°	3.4	-		-3.4		682.9		+2200	+4	741,759	1,948,174	
80	1980		" "	-3.0°	3.7	-		-3.7		682.6		+1980	+3	741,539	1,948,173	
81	1760		" "	-3.0°	3.5	-		-3.5		682.8		+1760	+3	741,319	1,948,173	
82	1540		" "	-3.0°	4.5	-		-4.5		681.8		+1540	+3	741,099	1,948,173	
83	1320		" "	-3.0°	5.1	-		-5.1		681.2		+1320	+2	740,879	1,948,172	
84	1100		" "	-3.0°	5.0	-		-5.0		681.3		+1100	+2	740,659	1,948,172	
85	880		" "	-3.0°	5.8	-		-5.8		680.5		+880	+2	740,439	1,948,172	
86	660		" "	-3.0°	6.8	-		-6.8		679.5		+660	+1	740,219	1,948,171	
87	470		3°29'	-3.0°	6.8	-		-6.8		679.5		+470	+4	740,029	1,948,174	bridge elev. 680.
88	440		3°6'	-3.0°	7.3	-		-7.3		679.0		+440	+1	739,999	1,948,171	
88	220		" "	-3.0°	7.2	-		-7.2		679.1		+220	0	739,779	1,948,170	
89	0				5.4	-		-5.4		680.9	X	0	0	739,559	1,948,170	
90	220		183°06'	-3.0°	4.0	-		-4.0		682.3		-220	0	739,339	1,948,170	
91	440		" "	-3.0°	3.9	-		-3.9		682.4		-440	-1	739,119	1,948,169	
92	660		" "	-3.0°	2.5	-		-2.5		683.8		-660	-1	738,899	1,948,169	
93	880		" "	-3.0°	1.8	-		-1.8		684.5		-880	-2	738,679	1,948,168	
94	1100		" "	-3.0°	1.7	-		-1.7		684.6		-1100	-2	738,459	1,948,168	

**SURVEY NOTES-HIGH RESOLUTION DATA**

GEO-445

**Geosource Inc.**

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
8/2/78		G. Cotcamp		R. Hulsey		6834		RH		1	7				
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Michigan		Pleasant Valley		Michigan	Midland		13N	2W		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 A TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									686.3						
95	1320		183°06'		1.2	-		-1.2		685.1		-1320	-2	738,239	1,948,168
96	1540		" "		0.7	-		-0.4		685.9		-1540	-3	738,019	1,948,167
97	1760		" "		2.4	-		-2.4		683.9		-1760	-3	737,799	1,948,167
97	1860		182°51'		11.9	TH	+9.3	-2.6		683.7		-1860	+5	737,699	1,948,175 4-way Intersect.
98	1980		183°6'		2.8	-		-2.8		683.5		-1980	-3	737,579	1,948,167
99	2200		183°6'		134	TH	+11.0	-2.4		683.9	TP	-2200	-4+1	737,364	1,948,167
99	2200				14.1	89°42'	+11.5	-2.6			TP	+5			
	2200		2°55.4'+180°		+10.2	-		+10.2	694.1		BS	-2200	+3+2		
	2200				+14.1	89°54'	-3.9	+10.2			BS	+5			
100	1980		2°55.9'		1.2	BH	-9.9	-11.1		683.0		+1980	-3	737,149	1,948,169
101	1760		" "		3.3	BH	-8.8	-12.1		682.0		+1760	-2	736,929	1,948,170
102	1540		" "		3.1	BH	-7.7	-10.8		683.3		+1540	-2	736,709	1,948,170
103	1320		" "		3.7	BH	-6.6	-10.3		683.8		+1320	-2	736,489	1,948,170
104	1100		" "		4.4	BH	-5.5	-9.9		684.2		+1100	-1	736,269	1,948,171
105	880		" "		9.3	-		-9.3		684.8		+880	-1	736,049	1,948,171
106	660		" "		8.7	-		-8.7		685.4		+660	-1	735,829	1,948,171
107	440		" "		7.2	-		-7.2		686.9		+440	-1	735,609	1,948,171
108	220		" "		5.9	-		-5.9		688.2		+220	0	735,389	1,948,172
109	0		" "		5.4	-		-5.4		688.7	π	0	0	735,169	1,948,172
110	220		183°1.8'		5.9	-		-5.9		688.2		-220	0	734,949	1,948,172

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE				
8/2/78		G. Cotcamp		R. Hulsey		6834		R.H.		1		8				
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER		
Michigan		Pleasant Valley		Michigan		Midland		13N		2W				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
									694.1					735,169	1,948,172	
111	440		183° 1.8'	-3.0°	6.5	-		-6.5		687.6		-440	0	734,729	1,948,172	
112	660		" "	-3.0°	5.3	-		-5.3		688.8		-660	0	734,509	1,948,172	
113	880		" "	-3.0°	5.1	-		-5.1		689.0		-880	0	734,289	1,948,172	
114	1100		" "	-3.0°	4.7	-		-4.7		689.4		-1100	-1	734,069	1,948,171	
115	1320		" "	-3.0°	5.2	-		-5.2		688.9		-1320	-1	733,849	1,948,171	
116	1540		" "	-3.0°	5.3	-		-5.3		688.8		-1540	-1	733,629	1,948,171	
117	1760		" "	-3.0°	5.0	-		-5.0		689.1		-1760	-1	733,409	1,948,171	
118	1980		" "	-3.0°	4.7	-		-4.7		689.4		-1980	-1	733,189	1,948,171	
119	2200		" "	-3.0°	3.9	-		-3.9		690.2		-2200	-1	732,969	1,948,171	
120	2420		183° 1.8'	-3.0°	4.4	-		-4.4		689.7	TP	-2420	-1+1	732,754	1,948,172	unable to locate BM.
120	2420				10.1	89° 52'	+5.6	-4.5			TP	+5				
	2200		3° 11.7' + 180°	-3.0°	+9.8	-		+9.8			BS	-2200	-7+2			
	2200				15.0	89° 32'	-5.1	+9.9	699.6		BS	+6				
121	1980		3° 11.7'		8.9	-		-8.9		690.7		+1980	+7	732,540	1,948,174	
#	1900		3° 23.5'	-3.0°	7.8	-		-7.8		691.8		+1900	+13	732,460	1,948,180	4-way
122	1760		3° 11.7'		8.1	-		-8.1		691.5		+1760	+6	732,320	1,948,173	
123	1540		" "		8.1	-		-8.1		691.5		+1540	+5	732,100	1,948,172	
124	1320		" "		7.5	-		-7.5		692.1		+1320	+4	731,880	1,948,171	
125	1100		" "		6.9	-		-6.9		692.7		+1100	+4	731,660	1,948,171	
126	880		" "		6.0	-		-6.0		693.6		+880	+3	731,440	1,948,170	

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
8/2/78		G. Cotcamp		R. Hulse		6834		RH		1	9				
AREA		TOPO MAP		STATE		COUNTY		RANGE		PARTY MANAGER					
Michigan		Pleasant Valley		Michigan		Midland		2W		L.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 TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									699.6						
127	660		3°11.7'	-3.0°	5.7	-		-5.7		693.9		+660	+2	731,220	1,948,157
128	440		" "	-3.0°	5.1	-		-5.1		694.5		+440	+1	731,200	1,948,158
129	220		" "	-3.0°	4.6	-		-4.6		695.0		+220	+1	730,780	1,948,168
130	0				5.4	-		-5.4		694.2	TP	0	0	730,560	1,948,167
131	220		182°55.7'	-3.0°	4.9	-		-4.9		694.7		-220	+1	730,340	1,948,167
132	440		" "	-3.0°	3.8	-		-3.8		695.8		-440	+2	730,120	1,948,158
133	660		" "	-3.0°	3.2	-		-3.2		696.4		-660	+1	729,700	1,948,158
134	750		182°25'	-3.0°	3.1	-		-3.1		696.5		-750	+8	729,800	1,948,175 elev. 698 c/L E-W fence line
134	880		182°55.7'	-3.0°	3.3	-		-3.3		696.3		-880	+1	729,580	1,948,130
135	1100		" "	-3.0°	3.3	-		-3.3		696.3		-1100	+1	729,460	1,948,158
136	1320		" "	-3.0°	3.3	-		-3.3		696.3		-1320	+2	729,240	1,948,159
137	1540		" "	-3.0°	3.1	-		-3.1		696.5		-1540	+2	729,020	1,948,157
138	1760		" "	-3.0°	3.0	-		-3.0		696.6		-1760	+2	728,800	1,948,157
139	1980		" "	-3.0°	2.8	-		-2.8		696.8		-1980	+2	728,580	1,948,157
140	2200		182°55.7'	-3.2°	2.4	-		-2.4		697.2	TP	-2200	+10+1	728,359	1,948,178
140	2200				134	TH	110	-2.4			TP	-1			
	1320		3°16' +180°	-3.2°	+4.5	-		+4.5	701.7		BS	-1320	-2+1		
	1320				+11.1	TH	66	+4.5			BS	-1			
141	1100		3°16'	-3.2°	4.5	-		-4.5		697.2		+1100	+1	728,138	1,948,178
142	880		" "	-3.2°	3.6	-		-3.6		698.1		+880	+1	727,918	1,948,178

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN			ROD MAN			PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE			
8/2/78		G. Cotcamp			R. Hulsey			6834		G.W.C.			1	10			
AREA		TOPO MAP		STATE	COUNTY			TWP	RANGE	PPM	PARTY MANAGER						
Michigan		Pleasant V.		Michigan	Midland			13N	2W		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		
									701.7								
143	660		3°16'	-3.2°	4.2	-		-4.2		697.5		+660	+1	727,698	1,948,178		
144	440		" "	-3.2°	4.4	-		-4.4		697.3		+440	+1	727,478	1,948,178		
145	220		" "	-3.2°	4.5	-		-4.5		697.2		+220	0	727,258	1,948,177		last sta. on sand road
X	170		357°23'	-3.2°	3.1	-		-3.1		698.6		+169	-17	727,207	1,948,160		nail washer (power pole)
↵	131		8°14'	-3.2°	3.9	-		-3.9		697.8		+130	+11	727,168	1,948,188		T-intersect.
146	0				5.4	-		-5.4		696.3	TP	0	0	727,038	1,948,177		in field (cut across)
147	220		183°27.2'	-3.2°	3.9	-		-3.9		697.8		-220	-1	726,818	1,948,176		first sta on pavement
148	440		" "	-3.2°	4.1	-		-4.1		697.6		-440	-2	726,598	1,948,175		
149	660		" "	-3.2°	4.9	-		-4.9		696.8		-660	-3	726,378	1,948,174		
150	880		" "	-3.2°	5.7	-		-5.7		696.0		-880	-4	726,158	1,948,173		
151	1100		" "	-3.2°	8.1	-		-8.1		693.6		-1100	-5	725,938	1,948,172		
152	1320		183°27.2'	-3.2°	6.2	-		-6.2		695.5	TP	-1320	-6	725,717	1,948,171		
152	1320				12.8	TH	+66	-6.2			TP	-1					

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE			
8/7/78		G. Co Kamp		R. Hulsey		6834		G.W.C.		1	11			
AREA		TOPO MAP		STATE		COUNTY		RANGE		PPM		PARTY MANAGER		
Michigan		St. Louis		Michigan		Midland		2W		13N		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.	
152										695.5				
	437		14°45.5' +180°	-3.2°	+4.3	-		+4.3	699.8		BS	-428	-88	curve
	437				+6.5	TH	-2.2	+4.3			BS	-1		
153	220		19°22'	-3.2°	4.1	-		-4.1		695.7		+211	+61	725,499 1,948,144
154	0				5.3	-		-5.3		694.5	TP	0	0	725,288 1,948,083
155	217		213°10.5'	-3.2°	5.1	-		-5.1		694.7	TP	-188	-108	725,099 1,947,975 curve
(155)	217				6.2	TH	+1.1	-5.1			TP	-1		
	660		55°44' +180°	-3.2°	+9.3	-		+9.3	704.0		BS	-401	-524	
	660				+12.6	TH	-3.3	+9.3			BS	-1		
156	440		55°44'	-3.2°	7.7	-		-7.7		696.3		+268	+349	724,965 1,947,800
157	220		" "	-3.2°	6.8	-		-6.8		697.2		+134	+175	724,831 1,947,626
158	0				5.3	-		-5.3		698.7	TP	0	0	724,697 1,947,451 last sta. on pavement
159	220		214°56.4'	-3.2°	5.8	-		-5.8		698.2	TP	-187	-116 <sup>+</sup>	724,509 1,947,336 in field
159	220				6.9	TH	+1.1	-5.8			TP	-1		
	220	219	6°34' +180°	-3.2°	+11.9	86°	-15.3	-3.4	694.8		BS	-219	-13	
	220				+13.2	85°40'	-16.6	-3.4			BS	-1		
(160)	0				5.3	-		-5.3		689.5	TP	0	0	724,289 1,947,323 in field
161	220		167°22'	-3.2°	12.6	-		-12.6		682.2	TP	-212	+60	724,077 1,947,383 corner of corn field
161	220				11.5	8H	-1.1	-12.6			TP			sharp bend due to
	220		282°40' -180°	-3.2°	+7.0	89°36'	-1.5	+5.5	687.7		BS	-36	+217	corn.
	220				+3.5	70°32'	+2.0	+5.5			BS			

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/7/78		G. Lotcamp		R. Hulsey		6834		G.W.C.		1	12						
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Michigan		St. Louis		Michigan	Midland		13N	2W		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		
									687.7								
162	0				5.3	-		-5.3		682.4	X	0	0	724,041	1,947,600	first sta. on dirt road	
163	220		109°8'	-3.2°	3.7	90°30'	-1.9	-5.6			TP	-60	+212	723,981	1,947,812	on road	
163	220				3.1	90°40'	-2.6	-5.7		682.0	TP						
	218		7°58'+180°	-3.2°	+2.9	-		+2.9	684.9		BS	-216	-26				
	218				+4.0	TH	-1.1	+2.9			BS						
164	0				5.3	-		-5.3		679.6	X	0	0	723,765	1,947,786	south bank of river	
165	220		207°19'	-3.2°	4.0	-		-4.0		680.9	TP	-201	-90	723,564	1,947,696	in field	
165	220				5.1	TH	+1.1	-4.0			TP						
	145		30°55'+180°	-3.2°	+3.5	-		+3.5	684.4		BS	-128	-67				
	145				+4.2	TH	-0.7	+3.5			BS						
X	0				5.3	-		-5.3		679.1	X	0	0	723,436	1,947,629	split sta. due to corn	
166	82		266°-	-3.2°	4.7	-		-4.7		679.7		-10	-81	723,426	1,947,548		
			2		5.1	TH										sta. 166-174 follow	
167	305		269°02'	-3.2°	13.9	88°17'	+9.1	-4.8		679.6	TP	-22	-304	723,414	1,947,325	crooked farm trail	
167	305				14.8	88°26'	+10.1	-4.7			TP						
	100		73°15'+180°	-3.2°	+6.5	-		+6.5	686.1		BS	-34	-94				
	100				+7.0	TH	-0.5	+6.5			BS						
X	0				5.3	-		-5.3		680.8	X	0	0	723,380	1,947,231		
168	127		191°26'	-3.2°	4.9	-		-4.9		681.2		-126	-18	723,254	1,947,213		

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/7/78		G. Co. Camp		R. Hulsey		6834		GWC.			13						
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Michigan		St. Louis		Michigan		Midland		13N	2W		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		
									686.1								
169	341		201° 11'	-3.2°	3.5	TH	+1.7	-7.8			TP	-324	-105	723,056	1,947,126		
169	341				4.7	89° 30'	+3.0	-1.7		684.4	TP						
	220		40° 45' + 180°	-3.2°	+5.5	-		+5.5		689.9	BS	-174	-134				
	220				+6.6	TH	-1.1	+5.5			BS						
(170)	0				5.3	-		-5.3		684.6	X	0	0	722,882	1,946,992		
171	210	209	155° 17'	-3.2°	6.1	86°	+14.6	+8.5		698.4	TP	-185	+98	722,697	1,947,090	curve	
171	210				4.9	86° 20'	+13.5	+8.6			TP						
	212		349° 26.5' - 180°	-3.2°	+4.6	-		+4.6	703.0		BS	-206	+50			curve	
	212				+5.7	TH	-1.1	+4.6			BS						
172	0				5.3	-		-5.3		697.7	X	0	0	722,491	1,947,140		
173	220		183° 7.2'	-3.2°	5.3	-		-5.3		697.7		-220	0	722,271	1,947,140		
174	440		" "	-3.2°	4.4	-		-4.4		698.6		-440	+1	722,051	1,947,141	last sta. on dirt road	
	610		183° 7.2'	-3.2°	4.7	-		-4.7		698.3	TP	-610	+1	721,881	1,947,141	cll intersect. (line jags east)	
	610				1.6	BT	-3.1	-4.7			TP						
	910		274° 4.8' - 180°	-3.2°	+5.2	-		+5.2			BS	-14	+910				
	910				13.2	89° 30'	-7.9	+5.3	703.6		BS						
(175)	880		273° 13'	-3.2°	5.5	-		-5.5		698.1		0	-880	721,867	1,947,171	first sta. on pavement	
176	660		" "	-3.2°	5.0	-		-5.0		698.6		0	-660	721,867	1,947,391		
177	440		" "	-3.2°	5.8	-		-5.8		697.8		0	-440	721,867	1,947,611		
178	220		" "	-3.2°	5.6	-		-5.6		698.0		0	-220	721,867	1,947,831		

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
8/8/78		G. Cotcamp		R. Hulsey		6834		G.W.C.		1	14					
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Michigan		St. Louis		Michigan		Midland		13 N	2 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	X
									703.6						horizontal correct. y = -7'	
179	0				5.3	-		-5.3		698.3	X	0	0	721,867	1,948,051	x = +2'
<u>179</u>	130		87° 25.4'	-34°	4.5	-		-4.5		699.1		+13	+129	721,880	1,948,180	-721,880 + 1,948,180 (scaled south) T-intersect. (line jugs)
<u>180</u>	159		136° 23.6'	-34°	5.5	-		-5.5		698.1	TP	-108.2	+116	721,757	1,948,167	shooting across 90° T-rd bend Elev. 698'
180	159				6.3	TH	+0.8	-5.5			TP					
	2640		3° 8.8' + 180°	-34°	+9.2	-		+9.2			BS	-2640	+12			
	2640				139	89° 34'	-4.6	+9.3	707.4		BS		-2			
181	2420		3° 8.8'	-34°	9.0	-		-9.0		698.4		+2420	-11	721,535	1,948,168	
182	2200		" "	-34°	8.6	-		-8.6		698.8		+2200	-10	721,315	1,948,169	
183	1980		" "	-34°	8.3	-		-8.3		699.1		+1980	-9	721,095	1,948,170	
184	1760		" "	-34°	8.7	-		-8.7		698.7		+1760	-8	720,875	1,948,171	
<u>185</u>	1540		" "	-34°	8.4	-		-8.4		699.0		+1540	-7	720,655	1,948,172	
186	1320		" "	-34°	9.3	-		-9.3		698.1		+1320	-6	720,435	1,948,173	
187	1100		" "	-34°	9.0	-		-9.0		698.4		+1100	-5	720,215	1,948,174	
<u>187</u>	1060		3° 22'	-34°	7.5	-		-7.5		699.9		+1060	-1	720,175	1,948,178	c/L bridge
188	880		3° 8.8'	-34°	9.1	-		-9.1		698.3		+880	-4	719,995	1,948,175	
189	660		" "	-34°	7.8	-		-7.8		699.6		+660	-3	719,775	1,948,176	
<u>190</u>	440		" "	-34°	6.8	-		-6.8		700.6		+440	-2	719,555	1,948,177	
191	220		" "	-34°	5.9	-		-5.9		701.5		+220	-1	719,335	1,948,178	
192	0				5.4	-		-5.4		702.0	X	0	0	719,115	1,948,179	
193	220		183° 23'	-34°	5.7	-		-5.7		701.7		-220	0	718,895	1,948,179	

DATE		INSTRUMENT MAN			ROD MAN			PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE			
8/8/78		G. Cotcamp			R. Hulsey			6834		G.W.C.			1	15			
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Michigan		St. Louis		Michigan	Midland/Gratiot		13N/12N	2W		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		
									707.4								
194	440		183°23'	-3.4°	5.2	-		-5.2		702.2		-440	0	718,675	1,948,179		
195	660		" "	-3.4°	4.8	-		-4.8		702.6		-660	0	718,455	1,948,179		
196	880		" "	-3.4°	3.8	-		-3.8		703.6		-880	0	718,235	1,948,179		
197	1100		" "	-3.4°	4.0	-		-4.0		703.4		-1100	0	718,015	1,948,179		
198	1320		" "	-3.4°	3.5	-		-3.5		703.9		-1320	0	717,795	1,948,179		
199	1540		" "	-3.4°	3.4	-		-3.4		704.0		-1540	0	717,575	1,948,179		
200	1760		" "	-3.4°	3.2	-		-3.2		704.2		-1760	+1	717,355	1,948,180	Hor. Corr. 4-way	
201	1980		" "	-3.4°	3.2	-		-3.2		704.2	✓	-1980	+1	717,135	1,948,180	4-4' x-0'	
202	2200		" "	-3.4°	2.4	-		-2.4		705.0		-2200	+1	716,915	1,948,180		
203	2420		" "	-3.4°	2.2	-		-2.2		705.2		-2420	+1	716,695	1,948,180	13N Last sta. Midland Co.	
TP	2520		183°12.6'	-3.4°	1.3	-		-1.3		706.1		-2520	+8	716,595	1,948,188	716,580+1,948,200 4-way intersect	
204	2640		183°8.6'	-3.4°	2.2	-		-2.2		705.2	TP	-2640	+12	716,473	1,948,191	12N First sta. Gratiot Co.	
204	2640				14.5	89°44'	+12.3	-2.2			TP		-2				
	2420		2°58' +180°	-3.4°	+7.2	-		+7.2			BS	-2420	+18				
	2420				+14.3	89°30'	-7.0	+7.3	712.5		BS		-2				
205	2200		2°58'	-3.4°	6.9	-		-6.9		705.6		+2200	-17	716,251	1,948,192		
206	1980		" "	-3.4°	6.7	-		-6.7		705.8		+1980	-15	716,031	1,948,194		
207	1760		" "	-3.4°	6.9	-		-6.9		705.6		+1760	-13	715,811	1,948,196		
208	1540		" "	-3.4°	6.8	-		-6.8		705.7		+1540	-12	715,591	1,948,197		
209	1320		" "	-3.4°	6.1	-		-6.1		706.4		+1320	-10	715,371	1,948,199		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
8/8/78		G. Cotcamp		R. Hulsey		6834		G.W.C.		1	16				
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Michigan		St. Louis		Michigan	Gratiot		12N	2W		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
									712.5						
<del>210</del>	1100		2°58'	-3.4°	5.4	-		-5.4		707.1		+1100	-8	715151	1,948,201
211	880		" "	-3.4°	5.9	-		-5.9		706.6		+880	-7	714,931	1,948,202
212	660		" "	-3.4°	6.6	-		-6.6		705.9		+660	-5	714,711	1,948,204
213	440		" "	-3.4°	7.1	-		-7.1		705.4		+440	-3	714,491	1,948,206
214	220		" "	-3.4°	6.2	-		-6.2		706.3		+220	-2	714,271	1,948,207
<del>215</del>	0				5.4	-		-5.4		707.1	π	0	0	714,051	1,948,209
-#	168		180°58'	-3.4°	4.5	-		-4.5		708.0		-168	+7	713,883	1,948,216 <i>c/L E-W drainage ditch elev. 710.</i>
216	220		183°19.8'	-3.4°	4.5	-		-4.5		708.0		-220	0	713,831	1,948,209
217	440		" "	-3.4°	6.0	-		-6.0		706.5		-440	+1	713,611	1,948,210
218	660		" "	-3.4°	6.6	-		-6.6		705.9		-660	+1	713,391	1,948,210
219	880		" "	-3.4°	4.9	-		-4.9		707.6		-880	+1	713,171	1,948,210
<del>220</del>	1100		" "	-3.4°	5.7	-		-5.7		706.8		-1100	+1	712,951	1,948,210
221	1320		" "	-3.4°	5.2	-		-5.2		707.3		-1320	+2	712,731	1,948,211
222	1540		" "	-3.4°	5.0	-		-5.0		707.5		-1540	+2	712,511	1,948,211
223	1760		" "	-3.4°	5.6	-		-5.6		706.9		-1760	+2	712,291	1,948,211
224	1980		" "	-3.4°	5.1	-		-5.1		707.4		-1980	+2	712,071	1,948,211
<del>225</del>	2200		183°19.8'	-3.4°	5.4	-		-5.4			TP	-2200	+3	711,849	1,948,212
225	2200				14.3	89°46'	+9.0	-5.3		707.2	TP		-2		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
8/9/78		G. Cotcamp		R. Hulsey		6834		GWC		1		17			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		St. Louis		Michigan		Gratiot		12N		2W				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
225										707.2					
	2420		3°10.3' + 180°	-3.4°	+12.1	-		+12.1			BS	-2420	+10		
	2420				+15.0	89°36'	-2.8	+12.2	719.4		BS		-2		
226	2200		3°10.3'	-3.4°	1.0	BH	-11.0	-12.0		707.4		+2200	-9	711,627	1,948,213
227	1980		"	-3.4°	1.9	BH	-9.9	-11.8		707.6		+1980	-8	711,407	1,948,214
227	1815		3°24'	-3.4°	10.4	-		-10.4		709.0		+1815	0	711,242	1,948,224
228	1760		3°10.3'	-3.4°	2.4	BH	-8.8	-11.2		708.2		+1760	-7	711,187	1,948,215
229	1540		"	-3.4°	3.3	BH	-7.7	-11.0		708.4		+1540	-6	710,967	1,948,216
230	1320		"	-3.4°	8.2	-		-8.2		711.2		+1320	-5	710,747	1,948,217
231	1100		"	-3.4°	7.5	-		-7.5		711.9		+1100	-4	710,527	1,948,218
232	880		"	-3.4°	6.8	-		-6.8		712.6		+880	-4	710,307	1,948,218
233	660		"	-3.4°	7.1	-		-7.1		712.3		+660	-3	710,087	1,948,219
234	440		"	-3.4°	6.8	-		-6.8		712.6		+440	-2	709,867	1,948,220
235	220		"	-3.4°	5.8	-		-5.8		713.6		+220	-1	709,647	1,948,221
236	0				5.4	-		-5.4		714.0	π	0	0	709,427	1,948,222
237	220		183°31'	-3.4°	4.2	-		-4.2		715.2		-220	0	709,207	1,948,222
238	440		"	-3.4°	3.8	-		-3.8		715.6		-440	-1	708,987	1,948,221
239	660		"	-3.4°	3.4	-		-3.4		716.0		-660	-1	708,767	1,948,221
240	880		"	-3.4°	3.4	-		-3.4		716.0		-880	-2	708,547	1,948,220
241	1100		"	-3.4°	3.9	-		-3.9		715.5		-1100	-2	708,327	1,948,220
242	1320		"	-3.4°	5.7	-		-5.7		713.7		-1320	-3	708,107	1,948,219

x=0'  
 Hor. Corr. y=8'  
 711,240 + 1,948,220 (scaled)  
 4-Way Intersect. elev. 710.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/9/78		G. Cotcamp		R. Hulsey		6834		G.W.C.		1	18						
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Michigan		St. Louis		Michigan	Gratiot		12N	2W		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		
									719.4								
243	1540		183°31'	-3.4°	7.0	-		-7.0		712.4		-1540	-3	707,887	1,948,219		
244	1760		" "	-3.4°	5.9	-		-5.9		713.5		-1760	-4	707,667	1,948,218		
245	1980		" "	-3.4°	4.2	-		-4.2		715.2		-1980	-4	707,447	1,948,218		
246	2200		" "	-3.4°	3.9	-		-3.9		715.5		-2200	-4	707,227	1,948,218		
247	2420		183°31'	-3.3°	3.4	-		-3.4			TP	-2420	-9-3	707,008	1,948,210		
247	2420				4.9	89°58'	+1.4	-3.5		715.9	TP						
	2200		3°4'+180°	-3.3°	+4.8	-		+4.8			BS	-2200+1	+9-3				
	2200				13.7	89°46'	-9.0	+4.7	720.6		BS						
248	1980		3°8'	-3.3°	4.5	-		-4.5		716.1		+1980	-6	706,789	1,948,210		
249	1760		" "	-3.3°	5.8	-		-5.8		714.8		+1760	-5	706,569	1,948,211		
250	1540		" "	-3.3°	5.8	-		-5.8		714.8		+1540	-4	706,349	1,948,212		
251	1320		" "	-3.3°	5.3	-		-5.3		715.3		+1320	-4	706,129	1,948,212		
IF	1150		4°34'	-3.3°	4.6	-		-4.6		716.0		+1150	+2.5	705,959	1,948,241	1,948,220 + 705,950 (scaled) 4-way Intersect elev 716	
252	1100		3°8'	-3.3°	5.7	-		-5.7		714.9		+1100	-3	705,909	1,948,213		
253	880		" "	-3.3°	6.0	-		-6.0		714.6		+880	-3	705,689	1,948,213		
254	660		" "	-3.3°	5.7	-		-5.7		714.9		+660	-2	705,469	1,948,214		
255	440		" "	-3.3°	3.8	-		-3.8		716.8		+440	-1	705,249	1,948,215		
256	220		" "	-3.3°	4.5	-		-4.5		716.1		+220	-1	705,029	1,948,215		
257	0				5.4	-		-5.4		715.2		0	0	704,809	1,948,216		
258	220		183°11.7'	-3.3°	4.3	-		-4.3		716.3		-220	0	704,589	1,948,216		

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/9/78		G. Cotcamp		R. Hulsey		6834		G.W.C.		1	19						
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER									
Michigan		St. Louis	Michigan	Gratiot	12N	2W		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 +	EAST +	COORDINATES		REMARKS	
												SOUTH -	WEST -	Y	X		
									720.6								
259	440		183°11.7'		3.3	-		-3.3		717.3		-440	+1	704,369	1,948,217		
260	660		" "		3.8	-		-3.8		716.8		-660	+1	704,149	1,948,217		
261	880		" "		3.5	-		-3.5		717.1		-880	+2	703,929	1,948,218		
262	1100		" "		3.2	-		-3.2		717.4		-1100	+2	703,709	1,948,218		
263	1320		" "		3.4	-		-3.4		717.2		-1320	+2	703,489	1,948,218		
264	1490		182°45'		2.5	-		-2.5		718.1		-1490	+14	703,319	1,948,230	Frd(west) Elev 718'	
264	1540		183°11.7'		2.5	-		-2.5		718.1		-1540	+3	703,269	1,948,219		
265	1760		" "		2.4	-		-2.4		718.2		-1760	+3	703,049	1,948,219		
266	1980		" "		1.8	-		-1.8		718.8		-1980	+4	702,829	1,948,220		
267	2200		183°11.7'		12.2	TH	+11.0	-1.2			TP	-2200	+4-3	702,610	1,948,217		
267	2000				14.1	89°40'	+12.8	-1.3		719.3	TP	+1					
	2200		3°18.4' +180°		+4.2	-		+4.2	723.5		BS	-2200	0-1				
	2200				+14.5	89°44'	-10.2	+4.3			BS	+2					
268	1980		3°18.4'		4.2	-		-4.2		719.3		+1980	0	702,392	1,948,216		
269	1760		" "		3.0	-		-3.0		720.5		+1760	0	702,172	1,948,216		
270	1540		" "		3.2	-		-3.2		720.3		+1540	0	701,952	1,948,216		
271	1320		" "		5.0	-		-5.0		718.5		+1320	0	701,732	1,948,216		
272	1100		" "		4.6	-		-4.6		718.9		+1100	0	701,512	1,948,216		
273	880		" "		4.8	-		-4.8		718.7		+880	0	701,292	1,948,216		
274	660		" "		5.7	-		-5.7		717.8		+660	0	701,072	1,948,216		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/9/78		G. Cotcamp		R. Hulsey		6834		Gwf.		1	20						
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER									
Michigan		St. Louis	Michigan	Gratiot	12N	2W		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		
									723.5								
275	440		3°18.4'	-3.3°	5.2	-		-5.2		718.3		+440	0	700,852	1,948,216	horizontal correct. y=+5', x=-10'	
⊕	265		4°10'	-3.3°	4.1	-		-4.1		719.4		+265	+4	700,677	1,948,220	700,690 + 1,948,220 (scaled) 4-Way Intersect elev. 719	
276	220		3°18.9'	-3.3°	4.8	-		-4.8		718.7		+220	0	700,632	1,948,216		
277	0				5.3	-		-5.3		718.2	π	0	0	700,412	1,948,216		
278	220		183°30.3'	-3.3°	5.3	-		-5.3		718.2		-220	-1	700,192	1,948,215		
279	440		" "	-3.3°	4.9	-		-4.9		718.6		-440	-2	699,972	1,948,214		
280	660		" "	-3.3°	4.8	-		-4.8		718.7		-660	-2	699,752	1,948,214		
281	880		" "	-3.3°	4.7	-		-4.7		718.8		-880	-3	699,532	1,948,213		
282	1100		" "	-3.3°	4.2	-		-4.2		719.3		-1100	-4	699,312	1,948,212		
283	1320		" "	-3.3°	4.1	-		-4.1		719.4		-1320	-5	699,092	1,948,211		
284	1540		" "	-3.3°	3.2	-		-3.2		720.3		-1540	-6	698,872	1,948,210		
285	1760		" "	-3.3°	2.4	-		-2.4		721.1		-1760	-6	698,652	1,948,210		
286	1980		" "	-3.3°	1.9	-		-1.9		721.6		-1980	-7	698,432	1,948,209		
287	2200		183°30.3'	-3.3°	1.9	-		-1.9			TP	-2200	-8	698,212	1,948,208		
287	2200				12.8	TH	+11.0	-1.8		721.7	TP						
	198		359°57'-180°	-3.3°	+6.4	-		+6.4	728.1		BS	-198	+12	698,014			
	198				+7.4	TH	-1.0	+6.4			BS						
⊕	10		302°41'	-3.3°	5.2	-		-5.2		722.9		+5	-9	698,019	1,948,219	+6' -4' 698,025-1,948,215 Elev. 725 T-Intersect. (line jog east)	
288	0				5.4	-		-5.4		722.7	π	0	0	698,014	1,948,220	Note-no permit for	
289	220		94°15.2'	-3.3°	5.9	-		-5.9		722.2		-4	+220	698,010	1,948,448	cut across.	

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/9/78		G. Cotcamp		R. Hulsey		6834		G.w.C.		1	21						
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER									
Michigan		St. Louis	Michigan	Gratiot	12N	2W		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		
									728.1								
290	440		94°15.2'	-3.1°	7.3	-		-7.3		720.8		-9	+440	698,005	1,948,668	Sta. 290 is 150' west	
291	660		" "	-3.1°	7.8	-		-7.8		720.3		-13	+660	698,001	1,948,888	of bridge	
292	880		" "	-3.1°	7.8	-		-7.8		720.3		-18	+880	697,996	1,949,108		
293	1100		" "	-3.1°	5.9	-		-5.9		722.2		-22	+1100	697,992	1,949,328		
294	1320		94°15.2'	-3.1°	2.1	-		-2.1		726.0	TP	-27+6	+1320-?	697,993	1,949,546	Sta. 294 is at center	
294	1320				8.7	TH	+6.6	-2.1			TP					of T-rd (south)	
	1320		3°48.7'+180°	-3.1°	+2.6	-		+2.6	728.6		BS	-1320+6	-16-2				
	1320				+9.2	TH	-6.6	+2.6			BS					line jogs south	
295	1100		3°48.7'	-3.1°	5.5	-		-5.5		723.1		+1100	+14	697,779	1,949,512	1/4 mile offset	
296	880		" "	-3.1°	5.7	-		-5.7		722.9		+880	+11	697,559	1,949,539		
297	660		" "	-3.1°	5.2	-		-5.2		723.4		+660	+8	697,339	1,949,536		
298	440		" "	-3.1°	5.8	-		-5.8		722.8		+440	+5	697,119	1,949,533		
299	220		" "	-3.1°	5.7	-		-5.7		722.9		+220	+3	696,899	1,949,531		
300	0				5.4	-		-5.4		723.2	X	0	0	696,679	1,949,528		
301	220		183°09'	-3.1°	3.4	-		-3.4		725.2		-220	0	696,459	1,949,528		
302	440		" "	-3.1°	5.9	89°	7.7	+1.8		730.4		-440	0	696,239	1,949,528		
303	660		" "	-3.1°	8.0	89°30'	+5.8	-2.2		726.4		-660	-1	696,019	1,949,527		
304	880		" "	-3.1°	9.0	89°40'	+5.1	-3.9		724.7		-880	-1	695,799	1,949,527		
305	1100		" "	-3.1°	8.8	89°44'	+5.1	-3.7		724.9		-1100	-1	695,579	1,949,527		

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE				
8/10/78		G. Cotcamp		R. Hulsey		6834		G.W.C.		1		22				
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER		
Michigan		ST. Louis		Michigan		Gratiot		12N		2W				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 -	EAST + WEST -		Y	X
												LAT.	DEP.			
									728.6							
<u>IL</u>	1315		182°33.2'	-3.1°	14.3	89°28'	+12.3	-2.0			TP	-1316+6	+13-2	695,369	1,949,539	T-intersect.
<u>IL</u>	1316				13.7	89°30'	+11.5	-2.2		726.4	TP					line jogs west
	1340		92°37.4' +180°	-3.1°	+3.6	-		+3.6	730.0		BS	-11+6	-1340-2			
	1340				+10.3	TH	-6.7	+3.6			BS					
306	1280		91°41'	-3.1°	4.5	-		-4.5		725.5		+32	+1280	695,396	1,949,477	
307	1060		" "	-3.1°	4.5	-		-4.5		725.5		+26	+1050	695,390	1,949,247	
308	840		91°6'	-3.1°	5.0	-		-5.0		725.0		+29	+839	695,393	1,949,036	
309	620		90°17'	-3.1°	5.3	-		-5.3		724.7		+30	+619	695,394	1,948,816	
<u>310</u>	400		88°25'	-3.1°	5.3	-		-5.3		724.7		+33	+399	695,397	1,948,596	
311	180		82°6'	-3.1°	5.8	-		-5.8		724.2		+34	+177	695,398	1,948,314	
<u>TI</u>	25		27°36'	-3.1°	5.3	-		-5.3		724.7		+23	+10	695,387	1,948,207	1,948,190 + 695,380 (scaled) c/l T-intersect. el. 724.
312	0				5.3	-		-5.3		724.7		0	0	695,364	1,948,197	line jogs south
313	220		183°29'	-3.1°	4.2	-		-4.2		725.8		-220	-1	695,144	1,948,196	
314	440		" "	-3.1°	3.9	-		-3.9		726.1		-440	-3	694,924	1,948,194	
<u>315</u>	660		" "	-3.1°	3.5	-		-3.5		726.5		-660	-4	694,704	1,948,193	
316	880		" "	-3.1°	0.3	-		-0.3		729.7		-880	-6	694,484	1,948,191	railroad (E-W)
#	895		182°44'	-3.1°	4.3	TH	+4.5	+0.2		730.2		-895	+6	694,469	1,948,203	
317	1100		183°29'	-3.1°	7.3	TH	+5.5	-1.8		728.2		-1100	-7	694,264	1,948,190	
318	1320		" "	-3.1°	8.0	TH	+6.6	-1.4		728.6		-1320	-9	694,044	1,948,188	
319	1540		" "	-3.1°	9.0	TH	+7.7	-1.3		728.7		-1540	-10	693,824	1,948,187	

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/10/78		G. Cotcamp		R. Hulsey		6834		GWC.		1	23						
AREA		TOPO MAP		STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER								
Michigan		St. Louis		Michigan	Gratiot	12N	2W		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		
									730.0								
320	1760		183°29'	-3.1°	6.8	89°30'	+5.1	-1.7		728.3		-1760	-12	693,604	1,948,185		
321	1980		" "	-3.1°	7.1	89°50'	+5.8	-1.3		728.7		-1980	-13	693,384	1,948,184		
322	2200		183°29'	-3.1°	8.0	89°50'	+6.4	-1.6		728.4	TP	-2200+6	-15-2	693,170	1,948,180		
322	2200				12.5	TH	+11.0	-1.5			TP						
	2200		2°59.7'+180°	-3.1°	+6.0	-		+6.0	734.4		BS	-2200+6	+4-2				
	2200				+13.9	89°48'	-7.7	+6.2			BS						
323	1980		2°59.7'	-3.1°	5.8	-		-5.8		728.6		+1980	-4	692,956	1,948,178		
324	1800		3°17'	-3.1°	5.4	-		-5.4		729.0		+1800	+6	692,776	1,948,188	E-W Fenceline - elev. 728	
324	1760		2°59.7'	-3.1°	5.2	-		-5.2		729.2		+1760	-3	692,736	1,948,179		
325	1540		" "	-3.1°	5.2	-		-5.2		729.2		+1540	-3	692,516	1,948,179		
326	1320		" "	-3.1°	5.6	-		-5.6		728.8		+1320	-2	692,296	1,948,180		
327	1100		" "	-3.1°	5.8	-		-5.8		728.6		+1100	-2	692,076	1,948,180		
328	880		" "	-3.1°	5.6	-		-5.6		728.8		+880	-2	691,856	1,948,180		
329	660		" "	-3.1°	5.5	-		-5.5		728.9		+660	-1	691,636	1,948,181		
330	440		" "	-3.1°	5.4	-		-5.4		729.0		+440	-1	691,416	1,948,181		
331	220		" "	-3.1°	5.4	-		-5.4		729.0		+220	0	691,196	1,948,182		
332	0			-3.1°	5.3	-		-5.3		729.1		0	0	690,976	1,948,182		
333	220		183°28.5'	-3.1°	5.2	-		-5.2		729.2		-220	-1	690,756	1,948,181		
334	440		" "	-3.1°	5.1	-		-5.1		729.3		-440	-3	690,536	1,948,179		
335	660		" "	-3.1°	5.1	-		-5.1		729.3		-660	-4	690,316	1,948,178		

DATE		INSTRUMENT MAN			ROD MAN		PARTY NUMBER		NOTES CHECKED BY			LINE NO.		PAGE			
8/10/78		G. Cotcamp			R. Hulsey		6834		R. J. H.			1		24			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER			
Michigan		St. Louis		Michigan		Gratiot		12N		2W				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		
									7344								
<del>335</del>	865		182°39'	-3.1°	3.7	-		-3.7		730.7		-865	+7	690,111	1,948,189		Correction Y <sup>-24'</sup> 690,110 + 1,948,190 (scaled) 4-Way Intersect elev. 730.
336	880		183°28.6'	-3.1°	3.8	-		-3.8		730.6		-880	-6	690,096	1,948,176		
337	1100		" "	-3.1°	4.5	-		-4.5		729.9		-1100	-7	689,876	1,948,175		
338	1320		" "	-3.1°	4.9	-		-4.9		729.5		-1320	-9	689,656	1,948,173		
339	1540		" "	-3.1°	4.8	-		-4.8		729.6		-1540	-10	689,436	1,948,172		
340	1760		" "	-3.1°	4.7	-		-4.7		729.7		-1760	-12	689,216	1,948,170		
341	1980		" "	-3.1°	4.0	-		-4.0		730.4		-1980	-13	688,996	1,948,169		
342	2200		183°28.6'	-3.1°	4.0	-		-4.0		730.4	TP	-2200 <sub>+3</sub>	-14 <sub>+2</sub>	688,776	1,948,168		
342	2200				14.9	TH	+11.0	-3.9			TP						
	2640		3°12.3'+180°	-3.4°	+5.7	-		+5.7	736.1		BS	-2640 <sub>+3</sub>	+9 <sub>+2</sub>				
	2640				+13.5	89°30'	-7.7	+5.8			BS						
343	2420		3°12.3'	-3.4°	4.8	-		-4.8		731.3		+2420	-8	688,559	1,948,171		
344	2200		" "	-3.4°	5.1	-		-5.1		731.0		+2200	-7	688,339	1,948,172		
345	1980		" "	-3.4°	6.0	-		-6.0		730.1		+1980	-7	688,119	1,948,172		
346	1760		" "	-3.4°	4.5	-		-4.5		731.6		+1760	-6	687,899	1,948,173		
347	1540		" "	-3.4°	3.4	-		-3.4		732.7		+1540	-5	687,679	1,948,174		
348	1320		" "	-3.4°	4.1	-		-4.1		732.0		+1320	-4	687,459	1,948,175		
349	1100		" "	-3.4°	5.0	-		-5.0		731.1		+1100	-4	687,239	1,948,175		
350	880		" "	-3.4°	5.4	-		-5.4		730.7		+880	-3	687,019	1,948,176		
351	660		" "	-3.4°	5.3	-		-5.3		730.8		+660	-2	686,799	1,948,177		

SURVEY NOTES-HIGH RESOLUTION DATA

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
8/11/78		G. Cotcamp		R. Hulsey		6834		R.J.H.		1	25					
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Michigan		St. Louis		Michigan		Gratiot		12N/11N	2W		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
352	440		3°12.3'	-3.4°	5.5	-		-5.5		730.6		+440	-1	686,579	1,948,178	
353	220		"	-3.4°	5.4	-		-5.4		730.7		+220	-1	686,359	1,948,178	
354	0				5.4	-		-5.4		730.7		0	0	686,139	1,948,179	
355	220		183°30'	-3.4°	4.8	-		-4.8		731.3		-220	0	685,919	1,948,179	
356	440		"	-3.4°	3.9	-		-3.9		732.2		-440	-1	685,699	1,948,178	
357	660		"	-3.4°	4.1	-		-4.1		732.0		-660	-1	685,479	1,948,178	
358	880		"	-3.4°	4.0	-		-4.0		732.1		-880	-2	685,259	1,948,177	
359	1100		"	-3.4°	4.1	-		-4.1		732.0		-1100	-4	685,039	1,948,175	T 12 N x=11 y=14'
360	1310		183°6'	-3.4°	3.2	-		-3.2		732.9		-1310	+7	684,829	1,948,186	1,948,200 + 684,840 offset 4 way Intersect.
361	1540		183°16'	-3.4°	3.2	-		-3.2		732.9		-1320	+3	684,819	1,948,182	Elev. 734'
362	1760		"	-3.4°	4.1	-		-4.1		732.0		-1540	+4	684,599	1,948,183	T 11 N
363	1980		"	-3.4°	3.8	-		-3.8		732.3		-1760	+4	684,379	1,948,183	
364	2200		"	-3.4°	2.9	-		-2.9		733.2		-1980	+5	684,159	1,948,184	
365	2420		"	-3.4°	2.8	-		-2.8		733.3		-2200	+5	683,939	1,948,184	
366	2640		"	-3.4°	2.6	-		-2.6		733.5		-2420	+6	683,719	1,948,185	
366	2640		183°16'	-3.4°	2.1	-		-2.1		734.0	TP	-2640	+6+2	683,502	1,948,187	
366	2640				14.4	89°44'	+12.3	-2.1			TP					
	2640		3°13.5' + 180°	-3.4°	+9.1	-		+9.1	743.1		BS	-2640	+8+2			
	2640				+10.6	89°58'	-1.5	+9.1			BS					
367	2420		3°13.5'	-3.4°	8.4	-		-8.4		734.7		+2420	-7	683,282	1,948,190	

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/11/78		G. CoCamp		R. Hulsey		6834		R. J. H.		1	26						
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER									
Michigan		Ithaca	Michigan	Gratiot	T 11N	2W		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		
										743.1							
368	2200		3° 13.5'	-34°	7.9	-		-7.9		735.2		+2200	-7	683,062	1,948,190		
369	1980		" "	-34°	6.8	-		-6.8		736.3		+1980	-6	682,842	1,948,191		
370	1760		" "	-34°	6.8	-		-6.8		736.3		+1760	-5	682,622	1,948,192		
371	1540		" "	-34°	6.3	-		-6.3		736.8		+1540	-5	682,402	1,948,192		
372	1320		" "	-34°	4.8	-		-4.8		738.3		+1320	-4	682,182	1,948,193		
373	1100		" "	-34°	3.4	-		-3.4		739.7		+1100	-3	681,962	1,948,194		
374	880		" "	-34°	5.0	-		-5.0		738.1		+880	-3	681,742	1,948,194		
375	660		" "	-34°	5.0	-		-5.0		738.1		+660	-2	681,522	1,948,195		
376	440		" "	-34°	5.9	-		-5.9		737.2		+440	-1	681,302	1,948,196		
377	220		" "	-34°	5.8	-		-5.8		737.3		+220	-1	681,082	1,948,196		
378	0				5.4	-		-5.4		737.7	π	0	0	680,862	1,948,197		
379	220		183° 9.4'	-34°	4.8	-		-4.8		738.3		-220	0	680,642	1,948,197		
380	440		" "	-34°	4.2	-		-4.2		738.9		-440	+1	680,422	1,948,198		
381	660		" "	-34°	4.0	-		-4.0		739.1		-660	+1	680,202	1,948,198		
382	880		" "	-34°	4.9	-		-4.9		738.2		-880	+1	679,982	1,948,198		
383	1100		" "	-34°	4.1	-		-4.1		739.0		-1100	+1	679,762	1,948,198		
384	1320		" "	-34°	4.7	-		-4.7		738.4		-1320	+2	679,542	1,948,199		
385	1390		182° 48'	-34°	3.9	-		-3.9		739.2		-1390	+15	679,472	1,948,212	679,475+1,948,220 (scaled) 4-Way Intersect elev. 739.	
385	1540		183° 19.4'	-34°	5.3	-		-5.3		737.8		-1540	+2	679,322	1,948,199		
386	1760		" "	-34°	5.8	-		-5.8		737.3		-1760	+2	679,102	1,948,199		

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/11/78		G. Cotcamp		R. Hulsey		6834		R. J. H		1	27						
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Michigan		Ithaca		Michigan	Gratiot		T 11 N	R 2 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 -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
										743.1							
387	1980		183°19.4'	-34°	6.9	-		-6.9		736.2		-1980	+3	678,882	1,948,200		
388	2200		" "	-34°	7.0	-		-7.0		736.1		-2200	+3	678,662	1,948,200		
389	2420		" "	-34°	7.1	-		-7.1		736.0		-2420	+3	678,442	1,948,200		
390	2640		183°19.4'	-34°	6.7	-		-6.7		736.4	TP	-2640	+3	678,225	1,948,202		
390	2640			-34°	14.4	89°50'	+7.7	-6.7			TP						
	2200		3°29'+180°	-34°	+4.1	-		+4.1	740.6	+4.2	BS	-2200	+3				
	2200				+4.5	89°49'	-10.2	+4.3			BS						
391	1980		3°29'	-34°	4.4	-		-4.4		736.2		+1980	+3	678,008	1,948,202		
392	1760		" "	-34°	4.0	-		-4.0		736.6		+1760	+3	677,788	1,948,202		
393	1540		" "	-34°	4.0	-		-4.0		736.6		+1540	+2	677,568	1,948,201		
394	1320		" "	-34°	3.9	-		-3.9		736.7		+1320	+2	677,348	1,948,201		
395	1100		" "	-34°	4.5	-		-4.5		736.1		+1100	+2	677,128	1,948,201		
396	880		" "	-34°	4.5	-		-4.5		736.1		+880	+1	676,908	1,948,200		
397	660		" "		4.6	-											
-11	800		4°12'	-34°	4.6	-		-4.6		736.0		+800	+1	676,828	1,948,210	Fence line	
397	660		3°29'	-34°	4.8	-		-4.8		735.8		+660	+1	676,688	1,948,200	Elev. 737'	
398	440		" "	-34°	5.2	-		-5.2		735.4		+440	+1	676,468	1,948,200		
399	220		" "	-34°	5.2	-		-5.2		735.4		+220	0	676,248	1,948,199		
400	0				5.4	-		-5.4		735.2	TP	0	0	676,028	1,948,199		
401	220		183°35'	-34°	4.7	-		-4.7		735.9		-220	-1	675,808	1,948,198		

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
8/11/78		G. Cotcamp		R. Hulsey		6834		R.F.H.		9		28			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Ithaca		Michigan		Gratiot		T 11 N		R 2 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 -	EAST + WEST -		Y
									740.6						
402	440		183°35'	-3.4°	4.3	-		-4.3		736.3		-440	-1	675,588	1,948,198
403	660		" "	-3.4°	5.3	-		-5.3		735.3		-660	-2	675,368	1,948,197
404	880		" "	-3.4°	5.8	-		-5.8		734.8		-880	-3	675,148	1,948,196
405	1100		" "	-3.4°	5.8	-		-5.8		734.8		-1100	-4	674,928	1,948,195
406	1320		" "	-3.4°	5.8	-		-5.8		734.8		-1320	-4	674,708	1,948,195
407	1540		" "	-3.4°	6.2	-		-6.2		734.4		-1540	-5	674,488	1,948,194
408	1760		" "	-3.4°	6.7	-		-6.7		733.9		-1760	-6	674,268	1,948,193
FF	1855		183°22'	-3.4°	5.3	-		-5.3		735.3		-1855	+1	674,173	1,948,200 <sup>674,180+1,948,200(scaled)</sup> 4-Way Intersect.
409	1980		183°35'	-3.4°	6.9	-		-6.9		733.7		-1980	-6	674,048	1,948,193 Elev. 736'
410	2200		183°35'	-3.4°	6.9	-		-6.9		733.7	TP	-2200.3	-7	673,825	1,948,192
410	2200				14.7	89°48'	+7.7	-7.0			TP				
	2200		3°123'+180°	-3.4°	11.8	TH	-11.0	+0.8			BS	-2200.3	+7		
	2200				15.0	89°38'	-14.1	+0.9	734.6		BS				
411	1980		3°123'	-3.4°	1.2	-		-1.2		733.4		+1980	-7	673,602	1,948,192
412	1760		" "	-3.4°	1.2	-		-1.2		733.4		+1760	-6	673,382	1,948,193
413	1540		" "	-3.4°	1.4	-		-1.4		733.2		+1540	-5	673,162	1,948,194
414	1320		" "	-3.4°	1.3	-		-1.3		733.3		+1320	-4	672,942	1,948,195
415	1100		" "	-3.4°	0.8	-		-0.8		733.8		+1100	-4	672,722	1,948,195
416	880		" "	-3.4°	1.0	-		-1.0		733.6		+880	-3	672,502	1,948,196
417	660		" "	-3.4°	1.8	-		-1.8		732.8		+660	-2	672,282	1,948,197

SURVEY NOTES-HIGH RESOLUTION DATA  
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DATE 8/11/78	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Hulsey	PARTY NUMBER 6834	NOTES CHECKED BY R. J. H.	LINE NO. 1	PAGE 29
AREA Michigan	TOPO MAP Ithaca	STATE Michigan	COUNTY Gratiot	TWP T 11N	RANGE R 2W	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	NORTH + SOUTH - EAST + WEST -		COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
418	440		3° 12.3'	-34°	3.1	-		-3.1		731.5		+440	-1	672,062	1,948,198	
419	220		" "	-34°	4.1	-		-4.1		730.5		+220	-1	671,842	1,948,198	
420	0				5.4	-		-5.4		729.2	TP	0	0	671,622	1,948,199	
-11-	112		181° 43'	-34°	6.0	-		-6.0		728.6		-112	+3	671,510	1,948,202	Field line (E-W)
421	220		183° 39.8'	-34°	6.3	-		-6.3		728.3		-220	-1	671,402	1,948,198	Elev. 729'
422	440		" "	-34°	4.9	-		-4.9		729.7		-440	-2	671,182	1,948,197	
423	660		" "	-34°	4.5	-		-4.5		730.1		-660	-3	670,962	1,948,196	
424	880		" "	-34°	4.2	-		-4.2		730.4		-880	-4	670,742	1,948,195	
425	1100		" "	-34°	4.6	-		-4.6		730.0		-1100	-5	670,522	1,948,194	
426	1320		" "	-34°	5.0	-		-5.0		729.6		-1320	-6	670,302	1,948,193	
427	1540		" "	-34°	5.4	-		-5.4		729.2		-1540	-7	670,082	1,948,192	
428	1760		" "	-34°	6.0	-		-6.0		728.6		-1760	-8	669,862	1,948,191	
429	1980		" "	-34°	6.1	-		-6.1		728.5		-1980	-9	669,642	1,948,190	
430	2200		183° 39.8'	-34°	6.9	-		-6.9		727.7	TP	-2200-3	-10	669,419	1,948,189	
430	2200				14.7	89° 48'	+7.7	-7.0			TP					
	1320		3° 41' + 180°	-34°	76.5	-		+6.5		734.2	BS	-1320-3	-7			
	1320				<del>HA</del>	TH	-6.6	+6.5			BS					rechecked rod reading
431	1100		3° 41'	-34°	5.9	-		-5.9		728.3		+1100	+5	669,196	1,948,187	8-12-78
432	880		" "	-34°	6.4	-		-6.4		727.8		+880	+4	668,976	1,948,186	

SURVEY NOTES-HIGH RESOLUTION DATA

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DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE				
8/11/78		R. Hulsey		G. Cotcamp		6834		R.S.H.		1		30				
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER		
Michigan		Ithaca		Michigan		Gratiot		T 11N		R 2W				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 -	EAST + WEST -		Y	X
									734.2						Correct. y = -12', x = 0'	
FF	780		4° 23.2'	-34°	4.7	-		-4.7	729.5			+780	+13	668,876	1,948,195	4-way int.
433	660		3° 41'	-34°	6.0	-		-6.0	728.2			+660	+3	668,756	1,948,185	Elev. 730'
434	440		" "	-34°	5.6	-		-5.6	728.6			+440	+2	668,536	1,948,184	
435	220		" "	-34°	5.2	-		-5.2	729.0			+220	+1	668,316	1,948,183	
436	0				5.4	-		-5.4	728.8	TP	0	0		668,096	1,948,182	
437	220		183° 46.4'	-34°	5.0	-		-5.0	729.2			-220	-1	667,876	1,948,181	
438	440		" "	-34°	5.3	-		-5.3	728.9			-440	-3	667,656	1,948,179	
439	660		" "	-34°	5.1	-		-5.1	729.1			-660	-4	667,436	1,948,178	
440	880		" "	-34°	5.1	-		-5.1	729.1			-880	-6	667,216	1,948,176	
441	1100		" "	-34°	4.8	-		-4.8	729.4			-1100	-7	666,996	1,948,175	
442	1320		183° 46.4'	-33°	5.6	-		-5.6	728.6	TP		-1320	-11	666,776	1,948,171	
442	1320				9.6	89° 50'	+3.8	-5.8			TP					
	1320		3° 33.4' + 180°	-33°	3.9	-		+3.9	732.5		BS	-1320	-6			
	1320				+10.4	TH	-6.6	+3.8			BS					
443	1100		3° 33.4'	-33°	3.8	-		-3.8	728.7			+1100	+5	666,556	1,948,170	
444	880		" "	-33°	3.5	-		-3.5	729.0			+880	+4	666,336	1,948,169	
445	758		4° 11.9'	-33°	3.6	-		-3.6	728.9			+758	+12	666,214	1,948,177	Fence line
445	660		3° 33.4'	-33°	4.1	-		-4.1	728.4			+660	+3	666,116	1,948,168	Elev. 729'
446	440		" "	-33°	4.9	-		-4.9	727.6			+440	+2	665,896	1,948,167	

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/11/78		R. Halsey		G. Cotcamp		6834		R. J. H.		1	31						
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE	PPM	PARTY MANAGER					
Michigan		Ithaca		Michigan		Gratiot		T11N		R 2W		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		
									732.5								
447	220		3° 33.4'	-33°	5.5	-		-5.5		727.0		+220	+1	665,676	1,948,166		
448	0				5.4	-		-5.4		727.1	X	0	0	665,456	1,948,165		
449	220		183° 20.3'	-33°	5.4	-		-5.4		727.1		-220	0	665,236	1,948,165		
450	440		" "	-33°	5.3	-		-5.3		727.2		-440	0	665,016	1,948,165		
451	660		" "	-33°	5.5	-		-5.5		727.0		-660	0	664,796	1,948,165		
452	880		" "	-33°	5.0	-		-5.0		727.5		-880	-1	664,576	1,948,164		
453	1100		" "	-33°	4.6	-		-4.6		727.9		-1100	-1	664,356	1,948,164		
454	1320		183° 20.3'	-33°	5.0	-		-5.0			TP	-1320	-1	664,138	1,948,164		
454	1320			-33°	6.6	89° 56'	+1.5	-5.1		727.4	TP						
	2640		3° 33.3' + 180°	-33°	5.9	-		+5.9	733.3		BS	-2640	-12				
	2640				13.6	89° 30'	-7.7	+5.9			BS						
455	2420		3° 33.3'	-33°	6.1	-		-6.1		727.2		+2420	+11	663,910	1,948,163		
456	2200		" "	-33°	6.1	-		-6.1		727.2		+2200	+10	663,690	1,948,162		
457	2090		3° 45'	-33°	5.0	-		-5.0		728.3		+2090	+16	663,580	1,948,168	663,580 + 1,948,150 (scale) 4-Way Intersect.	
457	1980		3° 33.3'	-33°	6.0	-		-6.0		727.3		+1980	+9	663,470	1,948,161	Elev. 727' (Park Rd.)	
458	1760		" "	-33°	5.3	-		-5.3		728.0		+1760	+8	663,250	1,948,160		
459	1540		" "	-33°	5.2	-		-5.2		728.1		+1540	+7	663,030	1,948,159		
460	1320		" "	-33°	5.3	-		-5.3		728.0		+1320	+6	662,810	1,948,158		
461	1100		" "	-33°	5.0	-		-5.0		728.3		+1100	+5	662,590	1,948,157		
462	880		" "	-33°	4.8	-		-4.8		728.5		+880	+4	662,370	1,948,156		

SURVEY NOTES-HIGH RESOLUTION DATA

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DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/14/78		G. Cotcamp		R. Hulsey		6834		R. G. H.		1	32						
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Michigan		Ithaca		Michigan		Gratiot		T 11N	R 2W		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		
									733.3								
463	660		3°33.3'	-3.3°	5.3	-		-5.3		728.0		+660	+3	662,150	1,948,155		
464	440		" "	-3.3°	5.1	-		-5.1		728.2		+440	+2	661,930	1,948,154		
465	220		" "	-3.3°	4.9	-		-4.9		728.4		+220	+1	661,710	1,948,153		
466	0				5.3	-		-5.3		728.0	TP	0	0	661,490	1,948,152		
467	220		183°25'	-3.3°	5.1	-		-5.1		728.2		-220	0	661,270	1,948,152		
468	440		" "	-3.3°	5.3	-		-5.3		728.0		-440	-1	661,050	1,948,151		
469	565		182°52'	-3.3°	4.8	-		-4.8		728.5		-565	+4	660,925	1,948,156	4-Way Intersect.	
470	660		183°25'	-3.3°	5.8	-		-5.8		727.5		-660	-1	660,830	1,948,151	Elev. 729'	
471	880		" "	-3.3°	6.1	-		-6.1		727.2		-880	-2	660,610	1,948,150		
472	1100		" "	-3.3°	6.6	-		-6.6		726.7		-1100	-2	660,390	1,948,150		
473	1320		" "	-3.3°	6.9	-		-6.9		726.4		-1320	-3	660,170	1,948,149		
474	1540		" "	-3.3°	7.1	-		-7.1		726.2		-1540	-3	659,950	1,948,149		
475	1760		" "	-3.3°	7.1	-		-7.1		726.2		-1760	-4	659,730	1,948,148		
476	1980		" "	-3.3°	7.4	-		-7.4		725.9		-1980	-4	659,510	1,948,148		
477	2200		" "	-3.3°	7.6	-		-7.6		725.7		-2200	-4	659,290	1,948,148		
478	2420		" "	-3.3°	7.5	-		-7.5		725.8		-2420	-5	659,070	1,948,147		
479	2640		" "	-3.3°	6.9	-		-6.9		726.4		-2640	-5	658,850	1,948,147		
479	2860		183°25'	-3.3°	6.7	-		-6.7			TP	-2860	-4 -6	658,626	1,948,146		
479	2860				13.5	89°52'	+6.7	-6.8		726.5	TP						

SURVEY NOTES-HIGH RESOLUTION DATA

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Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY			LINE NO.		PAGE		
8/14/78		G. Colcamp		R. Hulsey		6834		R. Q. H.			1		33		
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Tthaca		Michigan		Gratiot		T11N		R 2W				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 -	EAST + WEST -		Y
479										726.5					
	2640		3°33.2' +180°	-3.3°	+4.3	-		+4.3			BS	-2640.5	-12		
	2640				+14.8	89°46'	-10.7	+4.1	730.6		BS				
480	2420		3°33.2'	-3.3°	3.4	-		-3.4	727.2			+2420	+11	658,401   1,948,145	658,275 + 1,948,140 scaled
481	2300		3°48'	-3.3°	2.7	-		-2.7	727.9			+2300	+20	658,281   1,948,154	4-Way Intersect.
481	2200		3°33.2'	-3.3°	3.4	-		-3.4	727.2			+2200	+10	658,181   1,948,144	Elev. 727' (St. Charles)
482	1980		" "	-3.3°	3.4	-		-3.4	727.2			+1980	+9	657,961   1,948,143	
483	1760		" "	-3.3°	3.0	-		-3.0	727.6			+1760	+8	657,741   1,948,142	
484	1540		" "	-3.3°	3.7	-		-3.7	726.9			+1540	+7	657,521   1,948,141	
485	1320		" "	-3.3°	4.2	-		-4.2	726.4			+1320	+6	657,301   1,948,140	
486	1100		" "	-3.3°	4.2	-		-4.2	726.4			+1100	+5	657,081   1,948,139	
487	880		" "	-3.3°	4.5	-		-4.5	726.1			+880	+4	656,861   1,948,138	
488	660		" "	-3.3°	4.5	-		-4.5	726.1			+660	+3	656,641   1,948,137	
489	440		" "	-3.3°	4.0	-		-4.0	726.6			+440	+2	656,421   1,948,136	
490	220		" "	-3.3°	4.5	-		-4.5	726.1			+220	+1	656,201   1,948,135	
491	0				5.3	-		-5.3	725.3		X	0	0	655,981   1,948,134	
492	220		183°37'	-3.4°	5.0	-		-5.0	725.6			-220	-1	655,761   1,948,133	
493	440		" "	-3.4°	5.0	-		-5.0	725.6			-440	-2	655,541   1,948,132	
494	660		" "	-3.4°	5.1	-		-5.1	725.5			-660	-3	655,321   1,948,131	
495	880		" "	-3.4°	5.1	-		-5.1	725.5			-880	-3	655,101   1,948,131	
496	1100		" "	-3.4°	5.3	-		-5.3	725.3			-1100	-4	654,881   1,948,130	

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
8/14/78		G. Cotcamp		R. Hulsey		6834		R. J. H.		1		34			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Ithaca		Michigan		Gratiot		T 11N/10N		R 2W				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
									730.6						
497	1320		183°37'	-3.4°	5.1	-	-5.1		725.5			-1320	-5	654,661	1,948,129
498	1540		" "	-3.4°	4.6	-	-4.6		726.0			-1540	-6	654,441	1,948,128
499	1760		" "	-3.4°	4.9	-	-4.9		725.7			-1760	-6	654,221	1,948,128
500	1980		" "	-3.4°	4.9	-	-4.9		725.7			-1980	-7	654,001	1,948,127
501	2000		" "	-3.4°	4.7	-	-4.7		725.9			-2200	-8	653,781	1,948,126
502	2420		" "	-3.4°	4.9	-	-4.9		725.7			-2420	-9	653,561	1,948,125
503	2640		183°37'	-3.4°	4.5	-	-4.5				TP	-2640	-10	653,337	1,948,124
503	2640				9.3	89°59'	+4.6	-4.7		725.9					(T 11N)
	382		355°-180°	-3.4°	+5.3	-	+5.3		731.2		BS	-378	+56		shooting across 90° bend
	382				+7.2	TH	-1.9	+5.3			BS				correct -y=-23 x=0
504	170		342°29'	-3.4°	6.0	-	-6.0		725.2			+159	-61	653,114	1,948,119
505	52		290°-	-3.4°	4.7	-	-4.7		726.5			+15	-50	652,970	1,948,130
505	0				5.3	-	-5.3		725.9		π	0	0	652,955	1,948,180
506	220		93°24.3'	-3.4°	5.1	-	-5.1		726.1			0	+220	652,955	1,948,160
507	440		" "	-3.4°	5.1	-	-5.1		726.1			0	+440	652,955	1,948,620
508	660		" "	-3.4°	5.1	-	-5.1		726.1			0	+660	652,955	1,948,840
509	880		" "	-3.4°	4.8	-	-4.8		726.4			0	+880	652,955	1,949,060
510	1100		93°24.3'	-3.4°	4.8	-	-4.8		726.4		TP	0	+1100	652,955	1,949,280
510	1100				10.3	TH	+5.5	-4.8			TP				last sta. on jog east

**SURVEY NOTES-HIGH RESOLUTION DATA**  
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**Geosource Inc.**

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/14/78		G. Cotcamp		R. Hulsey		6834		R. J. H.			35						
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE	PPM	PARTY MANAGER					
Michigan		Ithaca		Michigan		Gratiot		T 10 N		R 2 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 -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
510										726.4							
	857		359° 47' - 180°	-3.4°	+4.7	-		+4.7	731.1		BS	-855	+54				Shooting across 90°
	857			-	+9.0	TH	-4.3	+4.7			BS						
TP	870		3° 51'	-3.4°	3.8	-		-3.8		727.3		+870	+7	652,970	1,949,341		T-intersect
511	660		3° 16'	-3.4°	5.7	-		-5.7		725.4		+660	-2	652,760	1,949,332		Elev. 726' (Washington)
512	440		" "	-3.4°	5.4	-		-5.4		725.7		+440	-1	652,540	1,949,333		
513	220		" "	-3.4°	5.6	-		-5.6		725.5		+220	-1	652,320	1,949,333		
514	0			-3.4°	5.4	-		-5.4		725.7	TP	0	0	652,100	1,949,334		
515	220		183° 37'	-3.4°	5.5	-		-5.5		725.6		-220	-1	651,880	1,949,333		
516	440		" "	-3.4°	6.9	-		-6.9		724.2		-440	-2	651,660	1,949,332		
517	660		" "	-3.4°	7.8	-		-7.8		723.3		-660	-2	651,440	1,949,332		
518	880		" "	-3.4°	7.9	-		-7.9		723.2		-880	-3	651,220	1,949,331		
519	1100		" "	-3.4°	8.2	-		-8.2		722.9		-1100	-4	651,000	1,949,330		
520	1320		183° 37'		9.9	-		-9.9		721.2	TP	-1320.4	-5	650,784	1,949,329		
520	1320				14.5	89° 48'	+4.6	-9.9			TP						

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE		
8/15/78		G. CoTcamp		R. Huisey		6834		R. F. H.		1		36		
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		
Michigan		Ithaca		Michigan		Gratiot		T 10 N		R 2 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.	
520										721.2				
	2860		3°28.2' +180°	-34°	+149	TH	-14.3	+0.6	721.8		BS	-2860	-3	
	2860				+14.1	89°44'	-13.3	+0.8		BS			+4	
521	2640		3°28.2'	-34°	1.0	-		-1.0		720.8		+2640	+3	659,568 1,949,329
521	2400		3°42'	-34°	12.5	TH	+12.0	-0.5		721.3		+2400	+13	659,328 1,949,339 T-intersect
522	2420		3°28.2'	-34°	0.4	-		-0.4		721.4		+2420	+3	659,348 1,949,329 Elev. 721'
523	2200		" "	-34°	0.3	-		-0.3		721.5		+2200	+3	650,128 1,949,329
524	1980		" "	-34°	0.2	-		-0.2		721.6		+1980	+2	649,908 1,949,328
525	1760		" "	-34°	0.2	-		-0.2		721.6		+1760	+2	649,688 1,949,328
526	1540		" "	-34°	0.7	-		-0.7		721.1		+1540	+2	649,468 1,949,328
527	1320		" "	-34°	1.0	-		-1.0		720.8		+1320	+2	649,248 1,949,328
528	1100		" "	-34°	2.0	-		-2.0		719.8		+1100	+1	649,028 1,949,327
529	880		" "	-34°	2.0	-		-2.0		719.8		+880	+1	648,808 1,949,327
530	660		" "	-34°	3.2	-		-3.2		718.6		+660	+1	648,588 1,949,327
531	440		" "	-34°	6.5	-		-6.5		715.3		+440	+1	648,368 1,949,327
532	220		" "	-34°	8.2	-		-8.2		713.6		+220	0	648,148 1,949,326
533	0				5.4	-		-5.4		716.4		0	0	647,928 1,949,326
534	200		181°17'	-34°	2.4	-		-2.4		719.4		-200	+7	647,728 1,949,333 4-Way Intersect. (scaled)
534	220		183°17'	-34°	2.4	-		-2.4		719.4		-220	0	647,708 1,949,326 Fillmore Rd + Grapo
535	440		" "	-34°	3.6	-		-3.6		718.2		-440	+1	647,488 1,949,327
536	660		" "	-34°	3.6	-		-3.6		718.2		-660	+1	647,268 1,949,327

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE		
8/15/78		G. Cotcamp		R. Hulsey		6834		R. F. H.		1		37		
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		
Michigan		Ithaca		Michigan		Gratiot		T10N		R2W		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.	
									721.8					
537	880		183° 17'	-3.4°	4.7	-		-4.7		717.1		-880	+2	647,048 1,949,328
538	1100		" "	-3.4°	4.0	-		-4.0		717.8		-1100	+2	646,828 1,949,328
539	1320		" "	-3.4°	4.5	-		-4.5		717.3		-1320	+3	646,608 1,949,329
540	1540		" "	-3.4°	5.7	-		-5.7		716.1		-1540	+3	646,388 1,949,329
541	1760		" "	-3.4°	5.1	-		-5.1		716.7		-1760	+4	646,168 1,949,330
542	1980		" "	-3.4°	6.2	-		-6.2		715.6		-1980	+4	645,948 1,949,330
543	2200		" "	-3.4°	6.2	-		-6.2		715.6		-2200	+4	645,728 1,949,330
544	2420		" "	-3.4°	6.4	-		-6.4		715.4		-2420	+5	645,508 1,949,331
545	2640		" "	-3.4°	6.8	-		-6.8		715.0		-2640	+5	645,288 1,949,331
546	2860		183° 17'	-3.4°	7.5	-		-7.5			TP	-2860	+6	645,072 1,949,332
546	2860				14.3	89° 52'	+6.7	-7.6		714.2	TP			
	2860		3° 10' + 180°	-3.4°	+1.3	-		+1.3	715.5		BS	-2860	+12	
	2860				+14.6	89° 44'	-13.3	+1.3			BS		+4	
547	2640		3° 10'	-3.4°	1.6	-		-1.6		713.9		+2640	-11	644,856 1,949,333
548	2420		" "	-3.4°	2.1	-		-2.1		713.4		+2420	-10	644,636 1,949,334
549	2200		" "	-3.4°	2.2	-		-2.2		713.3		+2200	-9	644,416 1,949,335
550	1980		" "	-3.4°	3.0	-		-3.0		712.5		+1980	-8	644,196 1,949,336
551	1760		" "	-3.4°	3.3	-		-3.3		712.2		+1760	-7	643,976 1,949,337
552	1540		" "	-3.4°	3.2	-		-3.2		712.3		+1540	-6	643,756 1,949,338
553	1320		" "	-3.4°	3.8	-		-3.8		711.7		+1320	-5	643,536 1,949,339

SURVEY NOTES-HIGH RESOLUTION DATA

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Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY			LINE NO.		PAGE		
8/15/78		G. Co. To camp		R. Hulsey		6834		R. F. H.			1		38		
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Ithaca		Michigan		Gratiot		T10N		R2W				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 -	EAST + WEST -		Y
									715.5						
554	1100		3°10'	-3.4°	4.3	-		-4.3	711.2			+1100	-4	643,316	1,949,340
555	880		" "	-3.4°	4.3	-		-4.3	711.2			+880	-4	643,096	1,949,340
556	660		" "	-3.4°	4.5	-		-4.5	711.0			+660	-3	642,876	1,949,341
557	440		" "	-3.4°	5.1	-		-5.1	710.4			+440	-2	642,656	1,949,342
557	223		4°19'	-3.4°	3.7	-		-3.7	711.8			+223	+4	642,439	1,949,348
558	220		3°10'	-3.4°	3.7	-		-3.7	711.8			+220	-1	642,436	1,949,343
559	0				5.4	-		-5.4	710.1	X	O	O		642,216	1,949,344
560	220		183°53.4'	-3.4°	6.1	-		-6.1	709.4			-220	-2	641,996	1,949,342
561	440		" "	-3.4°	8.7	-		-8.7	706.8			-440	-4	641,776	1,949,340
562	660		" "	-3.4°	6.7	BH	-3.3	-10.0	705.5			-660	-6	641,556	1,949,338
563	810		183°44'	-3.4°	8.8	-		-8.8	706.7			-810	-5	641,406	1,949,339
563	880		183°53.4'	-3.4°	9.4	-		-9.4	706.1			-880	-8	641,336	1,949,336
564	1100		" "	-3.4°	4.5	BH	-5.5	-10.0	705.5			-1100	-9	641,116	1,949,335
565	1320		" "	-3.4°	9.0	-		-9.0	706.5			-1320	-11	640,896	1,949,333
566	1540		" "	-3.4°	7.0	-		-7.0	708.5			-1540	-13	640,676	1,949,331
567	1760		" "	-3.4°	6.6	-		-6.6	708.9			-1760	-15	640,456	1,949,329
568	1980		" "	-3.4°	6.2	-		-6.2	709.3			-1980	-17	640,236	1,949,327
569	2200		" "	-3.4°	7.1	-		-7.1	708.4			-2200	-19	640,016	1,949,325
570	2420		" "	-3.4°	8.1	-		-8.1	707.4			-2420	-21	639,796	1,949,323
571	2640		" "	-3.4°	7.8	-		-7.8	707.7			-2640	-23	639,576	1,949,321

x=+4' y=-12'  
642,435 + 1,949,340  
(scaled)

4-Way Intersect.

Pierre + Crapo

Elev. 712'

drainage ditch

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/15/78		G. Cotcamp		R. Hulsey		6834		R. F. H.		1	39						
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER									
Michigan		Ithaca/Pompeii	Michigan	Gratiot	T10N	R2W		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		
									715.5								
572	2860		183°53.4'	-3.4°	8.0	-		-8.0			TP	-2860	-24	639,360	1,949,320		
572	2860				14.8	89°52'	+6.7	-8.1		707.4	TP	+4					
	2640		3°43.2'+180°	-3.4°	+7.2	-		+7.2	714.6		BS	-2640	-15				
	2640				+7.9	89°50'	-7.7	+7.2			BS	+3					
573	2420		3°43.2'	-3.4°	7.8	-		-7.8		706.8		+2420	+14	639,143	1,949,319		
574	2200		" "	-3.4°	7.3	-		-7.3		707.3		+2200	+12	638,923	1,949,317		
575	1980		" "	-3.4°	6.9	-		-6.9		707.7		+1980	+11	638,703	1,949,316		
576	1760		" "	-3.4°	6.4	-		-6.4		708.2		+1760	+10	638,483	1,949,315		
577	1540		" "	-3.4°	6.3	-		-6.3		708.3		+1540	+9	638,263	1,949,314		
578	1320		" "	-3.4°	6.2	-		-6.2		708.4		+1320	+7	638,043	1,949,312		
579	1100		" "	-3.4°	6.8	-		-6.8		707.8		+1100	+6	637,823	1,949,311	last sta. in Ithaca Quad.	
580	880		" "	-3.4°	6.5	-		-6.5		708.1		+880	+5	637,603	1,949,310	first sta. in Pompeii Quad.	
581	660		" "	-3.4°	5.4	-		-5.4		709.2		+660	+4	637,383	1,949,309		
582	440		" "	-3.4°	3.7	-		-3.7		710.9		+440	+2	637,163	1,949,307	y = +3' x = +1' 637,140 + 1,949,310 (scaled) + Day = ... sh. 711.	
583	220		3°43.2'	-3.4°	4.7	-		-4.7		709.9		+220	+1	636,943	1,949,306	Buchanan + Crapp	
584	0				5.4	-		-5.4		709.2	π	0	0	636,723	1,949,305		
585	220		183°30'	-3.4°	6.6	-		-6.6		708.0		-220	0	636,503	1,949,305		
586	440		" "	-3.4°	8.2	-		-8.2		706.4		-440	-1	636,283	1,949,304		
587	660		" "	-3.4°	8.4	-		-8.4		706.2		-660	-1	636,063	1,949,304		

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE					
8/15/78		G. Cotcamp		R. Hulsey		6834		R. S. H.		1		40					
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM					
Michigan		Pompeii		Michigan		Gratiot		T 10 N		R 2 W							
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		
									714.6								
588	880		183°30'	-3.4°	8.2	-		-8.2		706.4		-880	-2	635,843	1,949,303		
589	1100		" "	-3.4°	8.0	-		-8.0		706.6		-1100	-2	635,623	1,949,303		
590	1320		" "	-3.4°	7.4	-		-7.4		707.2		-1320	-2	635,403	1,949,303		
591	1540		" "	-3.4°	6.8	-		-6.8		707.8		-1540	-3	635,183	1,949,302		
592	1760		" "	-3.4°	6.7	-		-6.7		707.9		-1760	-3	634,963	1,949,302		
593	1980		" "	-3.4°	6.7	-		-6.7		707.9		-1980	-3	634,743	1,949,302		
594	2200		" "	-3.4°	6.7	-		-6.7		707.4		-2200	-4	634,523	1,949,301		
595	2420		" "	-3.4°	7.2	-		-7.2		707.4		-2420	-4	634,523	1,949,301		
596	2640		183°30'	-3.4°	9.4	-		-9.4		705.2		-2420	-4	634,303	1,949,301		
596	2640			-3.4°	9.3	-		-9.3	-9.4	705.2	TP	-2640	-5	634,086	1,949,300		
596	2640				14.1	89°51'	+4.6	-9.5			TP						
	2640		3°32' +180°	-3.4°	+11.0	TH	-13.2	-2.2	703.1	-2.1	BS	-2640	-6				
	2640				+14.9	89°38'	-16.9	-2.0			BS		+3				
597	2420		3°32'	-3.4°	9.3	TH	+12.1	+2.8		705.9		+2420	+6	633,869	1,949,300		
598	2200		" "	-3.4°	6.4	TH	+11.0	+4.6		707.7		+2200	+5	633,649	1,949,299		
599	1980		" "	-3.4°	6.1	TH	+9.9	+3.8		706.9		+1980	+5	633,429	1,949,299		
600	1760		" "	-3.4°	6.1	TH	+8.8	+2.7		705.8		+1760	+4	633,209	1,949,298		
601	1540		" "	-3.4°	6.1	TH	+8.8	+2.7		705.8		+1760	+4	633,209	1,949,298		
602	1320		" "	-3.4°	6.5	TH	+7.7	+1.2		704.3		+1540	+4	632,989	1,949,298		
603	1100		" "	-3.4°	6.1	TH	+6.6	+0.5		703.6		+1320	+3	632,769	1,949,297		
604	880		" "	-3.4°	6.1	TH	+6.6	+0.5		703.6		+1320	+3	632,769	1,949,297		
			" "	-3.4°	0.4	-		-0.4		702.7		+1100	+3	632,549	1,949,297		
			" "	-3.4°	1.0	-		-1.0		702.1		+880	+2	632,329	1,949,296		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
8/15/78		G. Cotcamp		R. Hulsey		6834		R. S. H.		1		41			
AREA		TOPG MAP		STATE		COUNTY		TWP		RANGE		PPM			
Michigan		Pompeii		Michigan		Gratiot		T 10 N		R 2 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
									703.1						
605	660		3°32'	-3.4°	1.6	-		-7.6		701.5		+660	+2	632,109	1,949,296
606	440		" "	-3.4°	1.3	-		-1.3		701.8		+440	+1	631,889	1,949,295
#	415		3°45'	-3.4°	1.1	-		-1.1		702.0		+415	+3	631,864	1,949,297 4-Way Intersect.
607	220		3°32'	-3.4°	3.4	-		-3.4		699.7		+220	+1	631,669	1,949,295 (Johnson) Elev. 702'
608	0				5.4	-		-5.4		697.7	π	0	0	631,449	1,949,294
#	163		181°47'	-3.4°	3.8	-		-3.8		699.3		-163	+5	631,286	1,949,299 railroad
609	220		183°24.5'	-3.4°	5.2	-		-5.2		697.9		-220	0	631,229	1,949,294
610	440		" "	-3.4°	8.1	-		-8.1		695.0		-440	0	631,009	1,949,294
611	660		" "	-3.4°	8.8	-		-8.8		694.3		-660	0	630,789	1,949,294
612	880		" "	-3.4°	9.5	-		-9.5		693.6		-880	0	630,569	1,949,294
613	1100		" "	-3.4°	9.5	-		-9.5		693.6		-1100	0	630,349	1,949,294
614	1320		" "	-3.4°	5.0	BH	-6.6	-11.6		691.5		-1320	0	630,129	1,949,294
615	1540		" "	-3.4°	4.2	BH	-7.7	-11.9		691.2		-1540	0	629,909	1,949,294
616	1760		" "	-3.4°	3.5	BH	-8.8	-12.3		690.8		-1760	0	629,689	1,949,294
617	1980		" "	-3.4°	2.0	BH	-9.9	-11.9		691.2		-1980	0	629,469	1,949,294
618	2200		" "	-3.4°	1.1	BH	-11.0	-12.1		691.0		-2200	0	629,249	1,949,294
619	2420		" "	-3.4°	8.1	90°04'	-2.8	-10.9		692.2		-2420	0	629,029	1,949,294
620	2640		183°24.5'	-3.4°	12.8	-		-12.8		690.3	TP	-2640	0	628,812	1,949,294
620	2640				14.4	89°58'	+1.5	-12.9			TP		+3		

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
8/15/78		R. Halsey		G. Cotcamp		6834		R. J. H.		1	42					
AREA		TOPO MAP		STATE		COUNTY		RANGE		PPM		PARTY MANAGER				
Michigan		Pompeii		Michigan		Gratiot		2 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 -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
620	1540		3° 42.5' + 180° - 3.4'	-3.4°	+6.4	—		+6.4	690.3	696.7	BS	-1540	-8			
	1540				+14.1	TH	-7.7	+6.4			BS	+3				
621	1320		3° 42.5'	-3.4°	6.6	—		-6.6	690.1			+1320	+7	628,595	1,949,293	
622	1100		" "	-3.4°	4.0	—		-4.0	692.7			+1100	+6	628,375	1,949,292	
623	880		" "	-3.4°	5.8	—		-5.8	690.9			+880	+5	628,155	1,949,291	
624	660		" "	-3.4°	6.7	—		-6.7	690.0			+660	+4	627,935	1,949,290	
625	440		" "	-3.4°	6.0	—		-6.0	690.7			+440	+2	627,715	1,949,288	
626	220		" "	-3.4°	6.5	—		-6.5	690.2			+220	+1	627,495	1,949,287	
627	0				5.3	—		-5.3	691.4		TP	0	0	627,275	1,949,286	
628	220		183° 29.8'	-3.4°	4.0	—		-4.0	692.7			-220	0	627,055	1,949,286	
629	440		" "	-3.4°	3.7	—		-3.7	693.0			-440	-1	626,835	1,949,285	
630	660		" "	-3.4°	3.1	—		-3.1	693.6			-660	-1	626,615	1,949,285	
631	690		182° 45.3'	-3.4°	2.5	—		-2.5	694.2			-690	+8	626,585	1,949,284	626,585 + 1,949,300 (scaled) 4-way int. 694'
632	880		183° 29.8'	-3.4°	6.3	—		-6.3	690.4			-880	-1	626,395	1,949,285 (Hayes)	
633	1100		" "	-3.4°	6.5	—		-6.5	690.2			-1100	-2	626,175	1,949,284	
634	1320		" "	-3.4°	6.4	—		-6.4	690.3			-1320	-2	625,955	1,949,284	
634	1540		183° 29.8'	-3.4°	7.0	—		-7.0	689.7		TP	-1540-2	-3-1	625,733	1,949,282	
634	1540				14.7	TH	+7.7	-7.0			TP					

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/15/78		R. Hulsey		G. Cotcamp		6834		R. G. H.		1	23						
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER									
Michigan		Pompeii	Michigan	Gratiot	T 10N	R 2W		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		
634										689.7							
	1760		3° 20.6'	-34°	+4.3	-		+4.3			BS	-1760-2	+2-1				
	1760				+13.0	TH	-8.8	+4.2	693.9		BS						
635	1540		3° 20.6'	-34°	4.0	-		-4.0	689.9			+1540	-2	625,511	1,949,281		
636	1320		" "	-34°	4.8	-		-4.8	689.1			+1320	-1	625,291	1,949,282		
637	1100		" "	-34°	4.7	-		-4.7	689.2			+1100	-1	625,071	1,949,282		
638	880		" "	-34°	4.0	-		-4.0	689.9			+880	-1	624,851	1,949,282		
639	660		" "	-34°	4.9	-		-4.9	689.0			+660	-1	624,631	1,949,282		
640	440		" "	-34°	4.9	-		-4.9	689.0			+440	0	624,411	1,949,283		
641	220		" "	-34°	4.7	-		-4.7	689.2			+220	0	624,191	1,949,283		
642	0				5.4	-		-5.4	688.5		X	0	0	623,971	1,949,283		
643	220		183° 11.6'	-34°	5.9	-		-5.9	688.0			-220	+1	623,751	1,949,284		
644	440		" "	-34°	6.7	-		-6.7	687.2			-440	+2	623,531	1,949,285		
645	660		" "	-34°	7.2	-		-7.2	686.7			-660	+2	623,311	1,949,285		
646	880		" "	-34°	7.3	-		-7.3	686.6			-880	+3	623,091	1,949,286		
647	1100		" "	-34°	7.0	-		-7.0	686.9			-1100	+4	622,871	1,949,287		
648	1320		" "	-34°	6.8	-		-6.8	687.1			-1320	+5	622,651	1,949,288		
649	1540		" "	-34°	7.7	-		-7.7	686.2			-1540	+6	622,431	1,949,289		
650	1760		183° 11.6'	-34°	8.3	-		-8.3	685.6		TP	-1760-2	+6-1	622,209	1,949,288		
650	1760				10.3	89° 56'	+2.0	-8.3			TP						

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosurvey Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
8/17/78		G. Cotcamp		R. Hulsey		6834		R. G. H.				44			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Pompeii		Michigan		Grant		10N/9N		2W				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
650										685.6					
	1320		2°12' +180°	-34°	+4.7	-		+4.7	690.3		BS	-1320-3	+28-1		
	1320			-	+11.3	TH	-6.6	+4.7			BS				
651	1100		2°12'	-34°	3.9	-		-3.9		686.4		+1100	-23	621,986	1,949,292
652	880		" "	-34°	4.2	-		-4.2		686.1		+880	-18	621,766	1,949,297
653	660		1°54'	-34°	4.3	-		-4.3		686.0		+660	-14	621,546	1,949,301
654	440		1°38'	-34°	3.5	-		-3.5		686.8		+440	-9	621,326	1,949,306
655	392		4°27'	-34°	2.6	-		-2.6		687.7		+392	+7	621,278	1,949,322
656	220		" "	-34°	4.3	-		-4.3		686.0		+220	-5	621,106	1,949,310
657	0				5.3	-		-5.3		685.0	π	0	0	620,886	1,949,315
657	220		183°37.7'	-34°	4.6	-		-4.6		685.7		-220	-1	620,666	1,949,314
658	440		" "	-34°	4.8	-		-4.8		685.5		-440	-2	620,446	1,949,313
659	660		" "	-34°	5.4	-		-5.4		684.9		-660	-3	620,226	1,949,312
660	880		" "	-34°	5.5	-		-5.5		684.8		-880	-4	620,006	1,949,311
661	1100		" "	-34°	4.9	-		-4.9		685.4		-1100	-4	619,786	1,949,311
662	1320		183°37.7'	-34°	5.2	-		-5.2		685.1	TP	-1320-3	-5-1	619,563	1,949,309
662	1320				11.8	TH	+6.6	-5.2			TP				
	2640		3°35' +180°	-34°	+5.5	-		+5.5	690.7	+5.6	BS	-2640-3	-8-1		
	2640				+14.9	89°48'	-9.2	+5.7				BS			
663	2420		3°35'	-34°	4.8	-		-4.8		685.9		+2420	+8	619,340	1,949,308
664	2200		" "	-34°	5.0	-		-5.0		685.7		+2200	+7	619,120	1,949,307

T 10 N  
621,280 + 1,949,315  
Offset 4-Way Intersect.  
(Grant + Crapo) Elev. 688'

T 9 N

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
8/17/78		G. Cotcamp		R. Hulsey		6834		R. J. H.		1	45					
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Michigan		Pompeii		Michigan	Gratiot		9 N	2 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 +	EAST +	COORDINATES		REMARKS
												SOUTH -	WEST -	Y	X	
									690.7							
665	1980		3°35'	-34°	6.8	-		-6.8		683.9		+1980	+6	618,900	1,949,306	
666	1760		" "	-34°	9.5	-		-9.5		681.2		+1760	+6	618,680	1,949,306	
H	1610		3°43'	-34°	7.6	-		-7.6		683.1		+1610	+9	618,530	1,949,309	7-Ton bridge - c/L
667	1590		3°35'	-34°	8.1	-		-8.1		682.6		+1540	+5	618,460	1,949,305	Elev. 682'
668	1320		" "	-34°	7.7	-		-7.7		683.0		+1320	+4	618,240	1,949,304	
669	1100		" "	-34°	5.8	-		-5.8		684.9		+1100	+4	618,020	1,949,304	
670	880		" "	-34°	5.7	-		-5.7		685.0		+880	+3	617,800	1,949,303	
671	660		" "	-34°	5.4	-		-5.4		685.3		+660	+2	617,580	1,949,302	
672	440		" "	-34°	5.2	-		-5.2		685.5		+440	+1	617,360	1,949,301	
673	220		" "	-34°	5.4	-		-5.4		685.3		+220	+1	617,140	1,949,301	
674	0				5.4	-		-5.4		685.3	π	0	0	616,920	1,949,300	
675	220		183°53.5'	-34°	4.5	-		-4.5		686.2		-220	-2	616,700	1,949,298	
676	440		" "	-34°	4.3	-		-4.3		686.4		-440	-4	616,480	1,949,296	
677	660		" "	-34°	4.8	-		-4.8		685.9		-660	-6	616,260	1,949,294	
678	880		" "	-34°	5.4	-		-5.4		685.3		-880	-8	616,040	1,949,292	
JT	900		183°34°	-34°	5.3	-		-5.3		685.4		-900	-3	616,020	1,949,297	616,010 + 1,949,290 (scaled) 4-Way Intersect. 685.0
679	1100		183°53.5'	-34°	6.2	-		-6.2		684.5		-1100	-9	615,820	1,949,291	Garfield + Crapo
680	1320		" "	-34°	6.9	-		-6.9		683.8		-1320	-11	615,600	1,949,289	
681	1540		" "	-34°	7.5	-		-7.5		683.2		-1540	-13	615,380	1,949,287	
682	1760		" "	-34°	8.2	-		-8.2		682.5		-1760	-15	615,160	1,949,285	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN			ROD MAN			PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE			
8/17/78		G. Cotcamp			R. Hulsey			6834		R. J. H.			1	46			
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Michigan		Pompeii		Michigan	Gratiot		9 N	2 W		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		
									690.7								
683	1980		183°53.5'	-34°	8.4	-		-8.4		682.3		-1980	-17	614,940	1,949,283		
684	2200		" "	-34°	8.2	-		-8.2		682.5		-2200	-19	614,720	1,949,281		
685	2420		" "	-34°	8.2	-		-8.2		682.5		-2420	-21	614,500	1,949,279		
686	2640		183°53.5'	-34°	7.5	-		-7.5			TP	-2640-3	-23-1	614,277	1,949,276		
686	2640				13.8	89°52'	+6.2	-7.6		683.1	TP						
	2640		3°37'+180°	-34°	+15.0	89°44'	-12.3	+2.7	685.8		BS	-2640-3	-10-1				
	2640				+10.4	89°50'	-7.7	+2.7			BS						
687	2420		3°37'	-34°	6.1	89°39'	+4.2	-1.9		683.9		+2420	+9	614,054	1,949,274		
688	2200		" "	-34°	5.2	89°54'	+3.9	-1.4		684.4		+2200	+8	613,834	1,949,273		
689	1980		" "	-34°	4.7	89°59'	+3.5	-1.2		684.6		+1980	+7	613,614	1,949,272		
690	1760		" "	-34°	3.5	89°59'	+3.1	-0.4		685.4		+1760	+7	613,394	1,949,272		
<del>691</del>	1700		4° -	-34°	2.7	89°59'	+3.0	+0.3		686.1		+1700	+18	613,334	1,949,283	Railroad	
691	1540		3°37'	-34°	1.4	-		-1.4		684.4		+1540	+6	613,174	1,949,271		
692	1320		" "	-34°	2.2	-		-2.2		683.6		+1320	+5	612,954	1,949,270		
693	1100		" "	-34°	2.9	-		-2.9		682.9		+1100	+4	612,734	1,949,269		
694	880		" "	-34°	2.7	-		-2.7		683.1		+880	+3	612,514	1,949,268		
695	660		" "	-34°	2.6	-		-2.6		683.2		+660	+2	612,294	1,949,267		
696	440		" "	-34°	3.6	-		-3.6		682.2		+440	+2	612,074	1,949,267		
697	220		" "	-34°	4.6	-		-4.6		681.2		+220	+1	611,854	1,949,266		
698	0				5.4	-		-5.4		680.4	π	0	0	611,634	1,949,265		

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
8/17/78		G. Cotcamp		R. Hulsey		6834		R.S.H.		1		47			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Pompeii		Michigan		Gratiot		9 N		2 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 -	EAST + WEST -		Y
									685.8						
699	220		183° 26.6'	-3.4°	4.9	-		-4.9	680.9			-220	0	611,414	1,949,265
700	440		" "	-3.4°	6.9	-		-6.9	678.9			-440	0	611,194	1,949,265
701	660		" "	-3.4°	9.3	-		-9.3	676.5			-660	0	610,974	1,949,265
702	880		" "	-3.4°	6.0	-		-6.0	679.8			-880	-1	610,754	1,949,264
+	885		183° 09'	-3.4°	6.0	-		-6.0	679.8			-885	+4	610,749	1,949,269
703	1100		183° 26.6'	-3.4°	6.2	BH	-5.5	-11.7	674.1			-1100	-1	610,534	1,949,264 (m-57)
704	1320		" "	-3.4°	6.5	BH	-6.6	-13.1	672.7			-1320	-1	610,314	1,949,264
705	1540		" "	-3.4°	5.7	BH	-7.7	-13.4	672.4			-1540	-1	610,094	1,949,264
706	1760		" "	-3.4°	5.0	BH	-8.8	-13.8	672.0			-1760	-1	609,874	1,949,264
707	1980		" "	-3.4°	4.0	BH	-9.9	-13.9	671.9			-1980	-1	609,654	1,949,264
708	2200		" "	-3.4°	3.9	BH	-11.0	-14.9	670.9			-2200	-2	609,434	1,949,263
709	2420		" "	-3.4°	3.6	BH	-12.1	-15.7	670.1			-2420	-2	609,214	1,949,263
710	2640		183° 26.6'	-3.4°	35	BH	-13.2	-16.7	669.2		TP	-2640-2	-2-1	608,992	1,949,262
710	2640				150	90° 02'	-1.5	-16.5			TP				
	1540		3° 54.7' +180°	-3.4°	+7.1	TH	-7.7	-0.6	668.7		BS	-1540-2	-14-1		
	1540				+3.2	89° 52'	-3.6	-0.4			BS				
711	1320		3° 54.7'	-3.4°	6.8	TH	+6.6	-0.2	668.5			+1320	+12	608,770	1,949,259
712	1100		" "	-3.4°	6.0	TH	+5.5	-0.5	668.2			+1100	+10	608,550	1,949,257
713	880			-3.4°	6.1	TH	+4.4	-1.7	667.0			+880	+8	608,330	1,949,255

610,750 + 1,949,280  
4-way Intersect. el. 680

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE							
8/17/78		R. Hulsey		G. Cotcamp		6834		R. J. H.		1		48							
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER					
Michigan		Pompeii		Michigan		Gratiot		9N		2W				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				
									668.7										
714	660		3° 54.7	-34°	4.1	TH	+3.3	-0.8		667.9		+660	+6	608,110	1,949,253				
715	440		" "	-34°	0.2	-		-0.2		668.5		+440	+4	607,890	1,949,251				
716	220		" "	-34°	2.9	-		-2.9		665.8		+220	+2	607,670	1,949,249				
717	0				5.3	-		-5.3		663.4	TP	0	0	607,450	1,949,247				
718	220		183° 44.4'	-34°	5.7	-		-5.7		663.0		-220	-1	607,230	1,949,246				
719	440		" "	-34°	6.2	-		-6.2		662.5		-440	-3	607,010	1,949,244				
720	660		" "	-34°	6.6	-		-6.6		662.1		-660	-4	606,790	1,949,243				
721	880		" "	-34°	7.9	-		-7.9		660.8		-880	-5	606,570	1,949,242				
722	1100		" "	-34°	8.0	-		-8.0		660.7		-1100	-7	606,350	1,949,240				
723	1320		" "	-34°	8.7	-		-8.7		660.0		-1320	-8	606,130	1,949,239				
724	1540		183° 44.4'	-34°	9.0	-		-9.0		659.7	TP	-1540-2	-9	605,908	1,949,238				
724	1540				1.3	BH	-7.7	-9.0			TP								
	1540		2° 49.5' + 180°	-34°	+4.4	-		+4.4	664.1		BS	-1540	+15						
	1540				+12.1	TH	-7.7	+4.4			BS								
725	1320		2° 49.5'	-34°	4.9	-		-4.9		659.2		+1320	-13	605,688	1,949,240				horiz. correct. y = -23 x = -10'
FF	1110		3° 0'	-34°	3.7	-		-3.7		660.4		+1110	-8	605,478	1,949,245				4-way int.
726	1100		2° 49.5'	-34°	4.0	-		-4.0		660.1		+1100	-11	605,468	1,949,242				(Roosevelt) Elev. 65'
727	880		" "	-34°	5.3	-		-5.3		658.8		+880	-9	605,248	1,949,244				
728	660		" "	-34°	5.0	-		-5.0		659.1		+660	-7	605,028	1,949,246				

DATE 8/17/78	INSTRUMENT MAN R. Hulsey	ROD MAN G. Cotcamp	PARTY NUMBER 6834	NOTES CHECKED BY R. J. H.	LINE NO. 1	PAGE 49
AREA Michigan	TOPO MAP Pompeii	STATE Michigan	COUNTY Gratiot	TWP 9 N	RANGE 2 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	NORTH+	EAST+	COORDINATES		REMARKS
												SOUTH-	WEST-	Y	X	
												LAT.	DEP.			
728									664.1							
729	440		2° 49.5'	-3.4°	5.2	-		-5.2		658.9		+440	-4	604,808	1,949,249	
730	220		" "	-3.4°	5.5	-		-5.5		658.6		+220	-2	604,588	1,949,251	
731	0				5.4	-		-5.4		658.7	TP	0	0	604,368	1,949,253	
732	220		182° 53'	-3.2°	4.5	-		-4.5		659.6		-220	+1	604,148	1,949,254	
733	440		" "	-3.2°	5.5	-		-5.5		658.6		-440	+2	603,928	1,949,255	
734	660		" "	-3.2°	5.2	-		-5.2		658.9		-660	+3	603,708	1,949,256	
735	880		" "	-3.2°	5.6	-		-5.6		658.5		-880	+5	603,488	1,949,258	
736	1100		" "	-3.2°	5.8	-		-5.8		658.3		-1100	+6	603,268	1,949,259	
737	1320		" "	-3.2°	5.7	-		-5.7		658.4		-1320	+7	603,048	1,949,260	
738	1540		" "	-3.2°	4.5	-		-4.5		659.6		-1540	+9	602,828	1,949,262	602,820+1,949,260
±	1550		182° 31.6'	-3.2	4.4	-		-4.4		659.7	TP	-1550+2	+18-4	602,820	1,949,267	4-way int.
±	1550				12.1	TH	+7.8	-4.4			TP					(Ranger) Elev. 659'

DATE		INSTRUMENT MAN			ROD MAN		PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE			
8/18/78		G. C. Tcamp			R. Hulsey		6834		R. V. H.			1	50			
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Michigan		Pompeii		Michigan	Gratiot		9 N	2 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 -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
739	2640		273° 30.3'	-3.2°	3.0	-	-3.0	658.9	659.7			+14	-2640	602,821	1,949,458	line jogs east
740	2420		" "	-3.2°	3.7	-	-3.7	658.2	661.9			+13	-2420	602,820	1,949,678	no permit for cross-
741	2200		" "	-3.2°	4.7	-	-4.7	657.2				+12	-2200	602,819	1,949,878	country
742	1980		" "	-3.2°	4.8	-	-4.8	657.1				+11	-1980	602,818	1,950,118	
743	1760		" "	-3.2°	4.6	-	-4.6	657.3				+9	-1760	602,816	1,950,338	
744	1540		" "	-3.2°	4.0	-	-4.0	657.9				+8	-1540	602,815	1,950,558	
745	1320		" "	-3.2°	3.6	-	-3.6	658.3				+7	-1320	602,814	1,950,778	
746	1100		" "	-3.2°	3.9	-	-3.9	658.0				+6	-1100	602,813	1,950,998	
747	880		" "	-3.2°	3.8	-	-3.8	658.1				+5	-880	602,812	1,951,218	
748	660		" "	-3.2°	3.4	-	-3.4	658.5				+4	-660	602,811	1,951,438	
749	440		" "	-3.2°	3.4	-	-3.4	658.5				+2	-440	602,809	1,951,658	
750	220		" "	-3.2°	4.0	-	-4.0	657.9				+1	-220	602,808	1,951,878	
751	0				5.4	-	-5.4	656.5			T	0	0	602,807	1,952,098	
752	220		93° 45'	-3.2°	5.0	-	-5.0	656.9				-2	+220	602,805	1,952,318	
753	440		" "	-3.2°	5.1	-	-5.1	656.8				-4	+440	602,803	1,952,538	
754	660		" "	-3.2°	5.8	-	-5.8	656.1				-6	+660	602,801	1,952,758	
755	880		" "	-3.2°	4.6	-	-4.6	657.3				-8	+880	602,799	1,952,978	
756	1100		" "	-3.2°	5.0	-	-5.0	656.9				-11	+1100	602,796	1,953,198	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
8/18/78		G. Cotcamp		R. Hulsey		6834		R. S. H.		1	51				
AREA		TOPO MAP		STATE		COUNTY		RANGE		TWP		PARTY MANAGER			
Michigan		Pompeii		Michigan		Gratiot		2 W		9 N		L. 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
									661.9						
757	1320		93°45'	-32°	4.8	-		-4.8		657.1		-13	+1320	602,794	1,953,418
758	1540		" "	-32°	3.9	-		-3.9		658.0		-15	+1540	602,792	1,953,638
759	1760		" "	-32°	4.1	-		-4.1		657.8		-17	+1760	602,790	1,953,858
760	1980		" "	-32°	3.9	-		-3.9		658.0		-19	+1980	602,788	1,954,078
761	2200		" "	-32°	3.5	-		-3.5		658.4		-21	+2200	602,786	1,954,298
762	2420		" "	-32°	4.0	-		-4.0		657.9		-23	+2420	602,784	1,954,518
TL	2485		93°34.3'	-32°	2.8	-		-2.8	-2.9	659.0	TP	-16+2	+2485-4	602,793	1,954,579
TL	2485				14.6	89°44'	+11.6	-3.0			TP				602,785+1,954,570(scaled), 4-Way Intersect. Fl. 659
-	2615		3°325' 180°	-32°	+2.3	-		+2.3	661.4	+2.4	BS	-2615+2	-16-4		line jogs south
	2615				+14.7	89°44'	-12.2	+2.5			BS				
763	2420		3°325'	-32°	3.2	-		-3.2		658.2		+2420	+14	602,600	1,954,573
764	2200		" "	-32°	3.8	-		-3.8		657.6		+2200	+13	602,380	1,954,572
765	1980		" "	-32°	4.1	-		-4.1		657.3		+1980	+12	602,160	1,954,571
766	1760		" "	-32°	4.2	-		-4.2		657.2		+1760	+10	601,940	1,954,569
767	1540		" "	-32°	4.6	-		-4.6		656.8		+1540	+9	601,720	1,954,568
768	1320		" "	-32°	4.9	-		-4.9		656.5		+1320	+8	601,500	1,954,567
769	1100		" "	-32°	4.9	-		-4.9		656.5		+1100	+7	601,280	1,954,566
770	880		" "	-32°	4.6	-		-4.6		656.8		+880	+6	601,060	1,954,565
771	660		" "	-32°	4.2	-		-4.2		657.2		+660	+4	600,840	1,954,563
772	440		" "	-32°	5.1	-		-5.1		656.3		+440	+3	600,620	1,954,562

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/18/78		G. Cotcamp		R. Hulsey		6834		R. J. H.		1	52						
AREA		TOPO MAP	STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER								
Michigan		Pompeii	Michigan	Gratiot		T 9 N	2 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 -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
									661.4								
773	220		3°32.5'	-3.2°	5.2	-		-5.2		656.2		+220	+1	600,400	1,954,560		
774	0				5.3	-		-5.3		656.1	TP	0	0	600,180	1,954,559		
775	220		182°34.3'	-3.2°	4.1	-		-4.1		657.3		-220	+2	599,960	1,954,561		
776	440		" "	-3.2°	2.6	-		-2.6		658.8		-440	+5	599,740	1,954,564		
777	640		182°59'	-3.2°	1.7	-		-1.7		659.7		-640	+2	599,540	1,954,561	bridge	
777	660		182°34.3'	-3.2°	1.7	-		-1.7		659.7		-660	+7	599,520	1,954,566		
778	880		" "	-3.2°	1.5	-		-1.5		659.9		-880	+10	599,300	1,954,569		
779	1100		" "	-3.2°	2.8	-		-2.8		658.6		-1100	+12	599,080	1,954,571		
780	1320		" "	-3.2°	3.2	-		-3.2		658.2		-1320	+14	598,860	1,954,573		
781	1540		" "	-3.2°	3.2	-		-3.2		658.2		-1540	+16	598,640	1,954,575		
782	1760		" "	-3.2°	3.2	-		-3.2		658.2		-1760	+19	598,420	1,954,578		
783	1980		" "	-3.2°	4.6	-		-4.6		656.8		-1980	+22	598,200	1,954,581		
784	2200		182°34.3'	-3.2°	7.0	-		-7.0		654.4		-2200	+24	597,980	1,954,583		
785	2430		182°44'	-3.2°	6.5	-		-6.5		654.9	TP	-2430	+20	597,750	1,954,575	note: T.P. is 10' off	
785	2430				138	89°50'	+7.1	-6.7			TP					station - pin flag was	
	1310		3°15.8' + 180°	-3.2°	+8.2	-		+8.2	663.1		BS	-1310	-1.4			reset by someone else	
	1310				+19.7	71°	-6.6	+8.2			BS						
786	1100		3°11.6'	-3.2°	7.1	-		-7.1		656.0		+1100	0	597,540	1,954,570		
787	1080		3°20'	-3.2°	7.1	-		-7.1		656.0		+1080	+3	597,520	1,954,573	T-rod (west)	
787	880		3°11.6'	-3.2°	6.4	-		-6.4		656.7		+880	0	597,320	1,954,570		

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE					
8/18/78		G. Cotcamp		R. Hulsey		6834		R. J. H.			1	53					
AREA		TOPO. MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Michigan		Pompeii		Michigan		Gratiot		9N	2W		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		
									663.1								
788	660		3°11.6'	-32°	5.9	-		-5.9	657.2			+660	0	597,100	1,954,570		
789	440		" "	-32°	5.8	-		-5.8	657.3			+440	0	596,880	1,954,570		
790	220		" "	-32°	6.0	-		-6.0	657.1			+220	0	596,660	1,954,570		
791	0			-32°	5.4	-		-5.4	657.7		X	0	0	596,440	1,954,570		
792	220		183°3'	-32°	4.0	-		-4.0	659.1			-220	+1	596,220	1,954,571		
793	440		" "	-32°	3.8	-		-3.8	659.3			-440	+1	596,000	1,954,571		
794	660		" "	-32°	5.1	-		-5.1	658.0			-660	+2	595,780	1,954,572		
795	880		" "	-32°	5.1	-		-5.1	658.0			-880	+2	595,560	1,954,572		
796	1100		" "	-32°	4.1	-		-4.1	659.0			-1100	+3	595,340	1,954,573		
797	1320		" "	-32°	3.4	-		-3.4	659.7			-1320	+3	595,120	1,954,573		
TP	1540		182°47.3'	-32°	0.6	-		-0.6	662.5		TP	-1540	+11.4	594,900	1,954,577	594,900 + 1,954,560 (scaled) 4-Way Intersect.	
TP	1540				8.3	TH	+7.7	-0.6			TP					line jogs west (Wilson)	
											BS						

SURVEY NOTES-HIGH RESOLUTION DATA  
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DATE		INSTRUMENT MAN			ROD MAN		PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE				
8/21/78		G. Cotcamp			R. Hulsey		6834		R. J. H.			1	54				
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Michigan		Pompeii		Michigan	Gratiot		9 N	2 W									
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		
1/1										662.5							
	1130		93°54.3' +180°	-3.2°	+3.1	-		+3.1	665.6		BS	+14	-1130-3				
	1130				8.7	TH	-5.7	+3.1			BS						
798	1100		93°17'	-3.2°	3.3	-		-3.3		662.3		-2	+1100	594,912	1,954,544		
BM	957		95°28'	-3.2°	4.5	-		-4.5		661.1		-38	+956	594,876	1,954,400		4008 elev. 660.7 U.S. D. I. G. S. 1964
799	880		93°17'	-3.2°	3.9	-		-3.9		661.7		-1	+880	594,913	1,954,324		
800	660		" "	-3.2°	4.8	-		-4.8		660.8		-1	+660	594,913	1,954,104		
801	440		" "	-3.2°	5.5	-		-5.5		660.1		-1	+440	594,913	1,953,884		
802	220		" "	-3.2°	4.9	-		-4.9		660.7		0	+220	594,914	1,953,664		
803	0			-3.2°	5.4	-		-5.4		660.2	TP	0	0	594,914	1,953,444		
804	220		273°13'	-3.2°	5.3	-		-5.3		660.3		0	-220	594,914	1,953,224		
805	440		" "	-3.2°	5.8	-		-5.8		659.8		0	-440	594,914	1,953,004		
806	660		" "	-3.2°	5.8	-		-5.8		659.8		0	-660	594,914	1,952,784		
807	880		" "	-3.2°	5.8	-		-5.8		659.8		0	-880	594,914	1,952,564		
808	1100		" "	-3.2°	6.0	-		-6.0		659.6		0	-1100	594,914	1,952,344		
809	1320		273°13'	-3.2°	5.7	-		-5.7		659.9	TP	0	-1320-3	594,914	1,952,121		
809	1320				12.3	TH	+6.6	-5.7			TP						
	1320		93°19' +180°	-3.2°	+5.7	-		+5.7	665.6		BS	+3	-1320-3				
	1320				12.3	TH	-6.6	+5.7			BS						
810	1100		93°19'	-3.2°	5.4	-		-5.4		660.2		-2	+1100	594,915	1,951,898		
811	880		" "	-3.2°	5.0	-		-5.0		660.6		-2	+880	594,915	1,951,678		

SURVEY NOTES-HIGH RESOLUTION DATA

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Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/21/78		G. Cotcamp		R. Hulse		6834		R. J. H.		1	55						
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Michigan		Pompeii		Michigan	Gratiot		9N	2W		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		
									665.6								
812	660		93°19'	-32°	5.1	-		-5.1		660.5		-1	+660	594,916	1,951,458		
813	440		" "	-32°	4.3	-		-4.3		661.3		-1	+440	594,916	1,951,238		
814	220		" "	-32°	5.0	-		-5.0		660.6		0	+220	594,917	1,951,018		
815	0			-32°	5.4	-		-5.4		660.2	TP	0	0	594,917	1,950,798		
816	220		273°9.3'	-32°	4.5	-		-4.5		661.1		0	-220	594,917	1,950,578		
817	440		" "	-32°	4.7	-		-4.7		660.9		0	-440	594,917	1,950,358		
818	660		" "	-32°	5.2	-		-5.2		660.4		0	-660	594,917	1,950,138		
819	880		" "	-32°	5.0	-		-5.0		660.6		-1	-880	594,916	1,949,918		
820	1100		" "	-32°	5.8	-		-5.8		659.8		-1	-1100	594,916	1,949,698		
821	1320		" "	-32°	5.3	-		-5.3		660.3		-1	-1320	594,916	1,949,478		
822	1540		273°9.3'	-32°	5.6	-		-5.6		660.0	TP	-1	-1540	594,916	1,949,255		
822	1540				13.3	TH	+7.7	-5.6			TP						
	2200		3°6.6' +180°	-32°	+14.4	89°48'	-7.7	+6.7			BS	-2200	+3				
	2200				+2.7	90°06'	+3.9	+6.6	666.6		BS					horiz. corred. y = +8' x = -40'	
TF	2185		2°51'	-32°	6.5	-		-4.5		660.1		+2185	-13	594,901	1,949,245	-rd Elev. 660	
823	1980		2°27'	-32°	6.8	-		-6.8		659.8		+1980	-26	594,696	1,949,232	line jogs south	
824	1760		" "	-32°	6.1	-		-6.1		660.5		+1760	-23	594,976	1,949,235		
825	1540		" "	-32°	5.3	-		-5.3		661.3		+1540	-20	594,256	1,949,238		
826	1320		" "	-32°	6.2	-		-6.2		660.4		+1320	-17	594,036	1,949,241		
827	1100		" "	-32°	6.5	-		-6.5		660.1		+1100	-14	593,816	1,949,244		

SURVEY NOTES-HIGH RESOLUTION DATA  
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DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
8/21/78		G. Cotcamp		R. Hulsey		6834		R. Y. H.		1	56				
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE	PPM	PARTY MANAGER			
Michigan		Pompeii/St. John N		Michigan		Gratiot		9N		2W		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
									666.6						
828	880		2°27'	-32°	6.1	-		-6.1		660.5		+880	-12	593,596	1,949,246
829	660		" "	-32°	5.3	-		-5.3		661.3		+660	-9	593,376	1,949,249
830	440		" "	-32°	6.0	-		-6.0		660.6		+440	-6	593,156	1,949,252
831	220		" "	-32°	5.4	-		-5.4		661.2		+220	-3	592,936	1,949,255
832	0				5.3	-		-5.3		661.3	X	0	0	592,716	1,949,258
833	220		182°29'	-28°	4.5	-		-4.5		662.1		-220	+1	592,496	1,949,259
834	440		" "	-28°	2.9	-		-2.9		663.7		-440	+2	592,276	1,949,260
835	660		" "	-28°	2.2	-		-2.2		664.4		-660	+4	592,056	1,949,262
836	880		" "	-28°	1.7	-		-1.7		664.9		-880	+5	591,836	1,949,263
837	1100		" "	-28°	1.6	-		-1.6		665.0		-1100	+6	591,616	1,949,264
838	1320		" "	-28°	0.6	-		-0.6		666.0		-1320	+7	591,396	1,949,265
839	1540		" "	-28°	6.9	TH	+7.7	+0.8		667.4		-1540	+9	591,176	1,949,267
840	1760		" "	-28°	5.8	TH	+8.8	+3.0		669.6		-1760	+10	590,956	1,949,268
841	1980		" "	-28°	6.8	TH	+9.9	+3.1		669.7		-1980	+11	590,736	1,949,269
842	2200		182°29'	-28°	7.9	TH	+11.0	+3.1			TP	-2200	+12	590,512	1,949,270
842	2200				13.7	89°34'	+16.6	+2.9		669.5	TP				
	1760		3°47.4' + 180°	-28°	+10.5	-		+10.5	680.0		BS	-1760	-30		
	1760				14.6	89°52'	-4.1	+10.5			BS				
843	1540		3°47.4'	-28°	10.0	-		-10.0		670.0		+1540	+27	590,288	1,949,267
844	1320			-28°	9.3	-		-9.3		670.7		+1320	+23	590,068	1,949,263

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE								
8/21/78		G. Cotcamp		R. Hulsey		6834		R. J. H.			57								
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE	PPM	PARTY MANAGER							
Michigan		St. Johns North		Michigan		Gratiot/Clinton		9N/8N		2W		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				
									680.0										
845	1100		4°28'	-28°	8.5	-		-8.5		671.5		+1100	+32	589,848	1,949,272			↑	↑
846	880		4°38'	-28°	7.3	-		-7.3		672.7		+880	+28	589,628	1,949,268				Gratiot Co. T9N
7/5	840		4°38'	-28°	6.6	-		-6.6		673.4		+840	+27	589,588	1,949,267				589,570, 1,949,265 4-Way Intersect. El. 673
847	660		4°30'	-28°	6.1	-		-6.1		673.9		+660	+20	589,408	1,949,260				Clinton Co. T8N
848	440		" "	-28°	5.5	-		-5.5		674.5		+440	+13	589,188	1,949,253			↓	↓
849	220		" "	-28°	6.3	-		-6.3		673.7		+220	+7	588,968	1,949,247				
850	0				5.4	-		-5.4		674.6	TP	0	0	588,748	1,949,240				
851	220		184°09.3'	-28°	4.5	-		-4.5		675.5		-220	-5	588,528	1,949,235				
852	440		" "	-28°	2.1	-		-2.1		677.9		-440	-10	588,308	1,949,230				
853	660		" "	-28°	2.3	TH	+3.3	+1.0		681.0		-660	-16	588,088	1,949,224				
854	880		" "	-28°	10.3	89°	+15.4	+5.1		685.1		-880	-21	587,868	1,949,219				
855	1100		" "	-28°	10.2	89°	+19.2	+9.0		689.0		-1100	-26	587,648	1,949,214				
856	1320		" "	-28°	7.9	89°	+23.0	+15.1		695.1		-1320	-31	587,428	1,949,209				
857	1540		" "	-28°	7.0	89°	+26.9	+19.9		699.9		-1540	-36	587,208	1,949,204				
858	1760		184°09.3'	-28°	6.2	89°	+30.7	+24.5			TP	-1760	-42	586,987	1,949,198				
858	1760				14.6	88°44'	+38.9	+24.3		704.3	TP								
	660		3°40.7'	-28°	+12.3	91°30'	+17.3	+29.6		733.9	BS	-660	-10						
	660				10.4	91°40'	+19.2	+29.6			BS								
859	440		3°40.7'	-28°	11.2	91°30'	-11.5	-22.7		711.2		+440	+7	586,766	1,949,195				

DATE: 8/12/78 INSTRUMENT MAN: R. Hulsey ROD MAN: G. Cotcamp PARTY NUMBER: 6834 NOTES CHECKED BY: R. J. H. LINE NO.: 1 PAGE: 58  
 AREA: Michigan TOPO MAP: St. Johns North STATE: Michigan COUNTY: Clinton TWP: 8 N RANGE: 2 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 TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
859									733.9							
860	220		3° 40.7'	-28°	7.5	91°30'	-5.8	-13.3		720.6		+220	+3	586,546	1,949,191	
861	0				5.4	-		-5.4		728.5	TP	0	0	586,326	1,949,188	
862	220		182° 54'	-28°	4.5	-		-4.5		729.4		-220	0	586,106	1,949,188	
863	440		" "	-28°	4.7	-		-4.7		729.2		-440	-1	585,886	1,949,187	
864	660		182° 54'	-28°	2.3	-		-2.3		731.6	TP	-660	-1	585,665	1,949,187	
864	660			-	5.6	TH	+3.3	-2.3			TP					
	1540		3° 19.8'	-28°	4.9	90°22'	+9.9	+14.8	746.3	+14.7	BS	-1540	-14			
	1540				3.0	90°26'	+11.6	+14.6			BS					
865	1320		3° 19.8'	-28°	8.8	BH	-6.6	-15.4		730.9		+1320	+12	585,444	1,949,185	
866	1100		" "	-28°	10.5	BH	-5.5	-16.0		730.3		+1100	+10	585,224	1,949,183	
867	880		" "	-28°	13.0	BH	-4.4	-17.4		728.9		+880	+8	585,004	1,949,181	
868	660		" "	-28°	7.8	90°50'	-9.6	-17.4		728.9		+660	+6	584,784	1,949,179	
869	440		" "	-28°	7.8	90°50'	-6.4	-14.2		732.1		+440	+4	584,564	1,949,177	
77	335		4° 26.1'	-28°	7.3	90°26'	-2.5	-9.8		736.5		+335	+10	584,459	1,949,183	584,450 + 1,949,180 4-way int. E. 1. 734
870	220		3° 19.8'	-28°	10.2	-		-10.2		736.1		+220	+2	584,344	1,949,175	(Maple Rapids)
871	0				5.4	-		-5.4		740.9	TP	0	0	584,124	1,949,173	
872	220		183° 23.4'	-29°	6.0	-		-6.0		740.3		-220	-2	583,904	1,949,171	
873	440		" "	-29°	8.3	-		-8.3		738.0		-440	-4	583,684	1,949,169	
874	660		" "	-29°	9.0	-		-9.0		737.3		-660	-6	583,464	1,949,167	

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
8/12/78		R. Hulsey		G. Cotcamp		6834		R.J.H.		1		59			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		St. Johns N.		Michigan		Clinton		8N		2W				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
874									746.3						
875	880		183° 23.4'	-29°	9.5	-		-9.5	736.8			-880	-8	583,244	1,949,165
876	1100		" "	-29°	8.1	-		-8.1	738.2			-1100	-9	583,024	1,949,164
877	1320		" "	-29°	8.1	-		-8.1	738.2			-1320	-11	582,804	1,949,162
878	1540		183° 23.4'	-29°	7.4	-		-7.4	738.9	TP		-1540-1	-13	582,583	1,949,160
878	1540				8.3	89° 58'	+0.9	-7.4		TP					
	1760		3° 25.5' 7180°	-29°	74.0	BH	+8.8	+12.8	751.7		BS	-1760-1	-16		
	1760				4.6	90° 16'	+8.2	+12.8			BS				
879	1540		3° 25.5'	-29°	4.5	BH	-7.7	-12.2	739.5			+1540	+14	582,362	1,949,158
880	1320		" "	-29°	4.0	BH	-6.6	-10.6	741.1			+1320	+12	582,142	1,949,156
881	1100		" "	-29°	7.6	BH	-5.5	-13.1	738.6			+1100	+10	581,922	1,949,154
FF	975		3° 47'	-29°	14.1	-		-14.1	737.6			+975	+15	581,797	1,949,159
882	880		3° 25.5'	-29°	5.8	90° 30'	-7.7	-13.5	738.2			+880	+8	581,702	1,949,152 (Hyde)
883	660		" "	-29°	7.4	90° 30'	-5.8	-13.2	738.5			+660	+6	581,482	1,949,150
884	440		" "	-29°	5.1	91° -	-7.7	-12.8	738.9			+440	+4	581,262	1,949,148
885	220		" "	-29°	5.8	91° -	-3.8	-9.6	742.1			+220	+2	581,042	1,949,146
886	0				5.4	-		-5.4	746.3	TP		0	0	580,822	1,949,144
887	220		183° 13.2'	-29°	5.4	-		-5.4	746.3			-220	-1	580,602	1,949,143
888	440		" "	-29°	5.0	-		-5.0	746.7			-440	-2	580,382	1,949,142
889	660		" "	-29°	4.2	-		-4.2	747.5			-660	-4	580,162	1,949,140
890	880		" "	-29°	2.9	-		-2.9	748.8			-880	-5	579,942	1,949,139

581,800 + 1,949,160  
4-Way Intersect E1.738

## SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

## Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
8/22/78		G. Cotcamp		R. Hulsey		6837		R. S. H.				60			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		St. John North		Michigan		Clinton		8 N		2 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
									751.7						
891	1100		183° 13.2'	-29°	1.8	-		-1.8		749.9		-1100	-6	579,722	1,949,138
892	1320		" "	-29°	3.3	TH	+6.6	+3.3		755.0		-1320	-7	579,502	1,949,137
893	1540		183° 13.2'	-29°	6.6	TH	+7.7	+1.1		752.8	TP	-1540	-9	579,281	1,949,135
893	1540				5.2	89° 46'	+6.3	+1.1			TP				
	2640		3° 6.5' + 180°	-29°	+7.1	TH	-13.2	-6.1	746.7		BS	-2640	-10		
	2640				738	89° 31'	-20.0	-6.2			BS				
894	2420		3° 6.5'	-29°	5.0	89° 50'	+7.0	+2.0		748.7		+2420	+9	579,060	1,949,134
895	2200		" "	-29°	4.4	89° 50'	+6.4	+2.0		748.7		+2200	+8	578,840	1,949,133
896	1980		" "	-29°	3.8	89° 50'	+5.8	+2.0		748.7		+1980	+7	578,620	1,949,132
897	1760		" "	-29°	3.4	89° 50'	+5.1	+1.7		748.4		+1760	+6	578,400	1,949,131
898	1540		" "	-29°	1.8	-		-1.8		744.9		+1540	+5	578,180	1,949,130
899	1320		" "	-29°	3.2	-		-3.2		743.5		+1320	+5	577,960	1,949,130
900	1100		" "	-29°	3.2	-		-3.2		743.5		+1100	+4	577,740	1,949,129
901	880		" "	-29°	6.0	-		-6.0		740.7		+880	+3	577,520	1,949,128
902	660		" "	-29°	7.7	-		-7.7		739.0		+660	+2	577,300	1,949,127
903	440		" "	-29°	6.2	BT	-2.2	-8.4		738.3		+440	+1	577,080	1,949,126
904	220		" "	-29°	7.4	-		-7.4		739.3		+220	+1	576,860	1,949,126
905	0		" "		5.4	-		-5.4		741.3	TP	0	0	576,640	1,949,125
906	220		183° 25.3'	-29°	4.9	-		-4.9		741.8		-220	-2	576,420	1,949,123
907	440		" "	-29°	5.9	-		-5.9		740.8		-440	-4	576,200	1,949,121

DATE 8/22/78	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Hulsey	PARTY NUMBER 6837	NOTES CHECKED BY R. S. H.	LINE NO. 1	PAGE 61
AREA Michigan	TOPO MAP St. John North	STATE Michigan	COUNTY Clinton	TWP 8N	RANGE 2W	PPM
			PARTY MANAGER L. O. Paris			

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		REMARKS
														Y	X	
									746.7							
908	660		183°25.3'	-2.9°	6.1	-		-6.1		740.6		-660	-6'	575,980	1,949,119	
909	880		" "	-2.9°	6.2	-		-6.2		740.5		-880	-8	575,760	1,949,117	
910	1100		" "	-2.9°	6.0	-		-6.0		740.7		-1100	-10.	575,540	1,949,115	
911	1320		" "	-2.9°	4.8	-		-4.8		741.9		-1320	-12	575,320	1,949,113	
912	1540		" "	-2.9°	4.0	-		-4.0		742.7		-1540	-14	575,100	1,949,111	
913	1760		" "	-2.9°	4.0	-		-4.0		742.7		-1760	-16	574,880	1,949,109	
914	1980		" "	-2.9°	4.0	-		-4.0		742.7		-1980	-18	574,660	1,949,107	
915	2200		" "	-2.9°	3.3	-		-3.3		743.4		-2200	-20	574,440	1,949,105	
916	2420		" "	-2.9°	3.4	-		-3.4		743.3		-2420	-22	574,220	1,949,103	
917	2640		183°25.3'	-2.9°	3.3	-		-3.3		743.4	TP	-2640-2	-24-1	573,998	1,949,100	
917	2640				4.1	89°46'	+10.7	-3.4			TP					
	2640		3°15.3' +180°	-2.9°	+11.6	-		+11.6	755.1	+11.7	BS	-2640-2	-16-2			
	2640				13.3	89°58'	-1.5	+11.8			BS					
71	2460		3°19'	-2.9°	11.4	-		-11.4		743.7		+2460	+18	573,816	1,949,100	573,820 + 1,949,100 road (west) El. 743
918	2420		3°15.3'	-2.9°	4.5	90°10'	-7.0	-11.5		743.6		+2420	+15	573,776	1,949,097	(Mead)
919	2200		" "	-2.9°	4.6	90°10'	-6.4	-11.0		744.1		+2200	+14	573,556	1,949,096	paved road
920	1980		" "	-2.9°	4.8	90°10'	-5.8	-10.6		744.5		+1980	+12	573,336	1,949,094	
921	1760		" "	-2.9°	5.3	90°10'	-5.1	-10.4		744.7		+1760	+11	573,116	1,949,093	
922	1540		" "	-2.9°	6.0	90°10'	-4.5	-10.5		744.6		+1540	+10	572,896	1,949,092	
923	1320		" "	-2.9°	3.1	BH	-6.6	-9.7		745.4		+1320	+8	572,676	1,949,090	

**SURVEY NOTES-HIGH RESOLUTION DATA**

GEO-448

**Geosource Inc.**

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
8/22/78		G. Cotcamp		R. Hulsey		6834		R. Y. H.		1	62					
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE	PPM	PARTY MANAGER				
Michigan		St. Johns North		Michigan		Clinton		BN		2W		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	
924	1100		395.3'	-29°	4.1	BH	-5.5	-9.6		745.5		+1100	+7	572,456	1,949,089	
925	880		" "	-29°	4.1	BH	-4.4	-8.5		746.6		+880	+5	572,236	1,949,087	
926	660		" "	-29°	6.5	-		-6.5		748.6		+660	+3	572,016	1,949,085	
927	440		" "	-29°	6.8	-		-6.8		748.3		+440	+3	571,796	1,949,085	
928	220		" "	-29°	6.3	-		-6.3		748.8		+220	+1	571,576	1,949,083	
929	0				5.4	-		-5.4		749.7	TP	0	0	571,356	1,949,082	
IF	209		181° 2'	-29°	4.4	-		-4.4		750.7		-209	+7	571,147	1,949,089	road (east) E1.749
930	220		183° 23.2'	-29°	4.4	-		-4.4		750.7		-220	-2	571,136	1,949,080	(Lowe)
931	440		" "	-29°	5.5	-		-5.5		749.6		-440	-4	570,916	1,949,078	
932	660		" "	-29°	6.4	-		-6.4		748.7		-660	-6	570,696	1,949,076	
933	880		" "	-29°	7.4	-		-7.4		747.7		-880	-7	570,476	1,949,075	
934	1100		" "	-29°	8.0	-		-8.0		747.1		-1100	-9	570,256	1,949,073	
935	1320		" "	-29°	3.8	BH	-6.6	-10.4		744.7		-1320	-11	570,036	1,949,071	
936	1540		" "	-29°	2.8	BH	-7.7	-10.5		744.6		-1540	-13	569,816	1,949,069	
937	1760		" "	-29°	2.1	BH	-8.8	-10.9		744.2		-1760	-15	569,596	1,949,067	
938	1980		" "	-29°	2.1	BH	-9.9	-12.0		743.1		-1980	-17	569,376	1,949,065	
939	2200		" "	-29°	5.9	BH	-11.0	-16.9		738.2		-2200	-19	569,156	1,949,063	
940	2420		183° 23.2'	-29°	8.3	BH	-12.1	-20.4	} 734.9	-20.2	TP	-2420.3	-21 -2	568,933	1,949,059	
940	2420				14.5	90° 08'	-5.6	-20.1				TP				

DATE 8/22/78	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Fulsey	PARTY NUMBER 6834	NOTES CHECKED BY R. G. H.	LINE NO. 1	PAGE 63
AREA Michigan	TOPO MAP St. Johns North	STATE Michigan	COUNTY Clinton	TWP 8N	RANGE 2W	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	NORTH + SOUTH -		EAST + WEST -		COORDINATES		REMARKS
												LAT.	DEP.	Y	X			
940										734.9								
	880		2°26.5' + 180°	-2.9°	+9.7	-		+9.7	744.6		BS	-880.3	+7	-2				
	880				5.3	BH	+4.4	+9.7		BS								
941	660		2°26.5'	-2.9°	6.1	BH	-3.3	-9.4		735.2		+660	-5		568,710	1,949,059		
942	440		" "	-2.9°	9.1	BH	-2.2	-11.3		733.3		+440	-4		568,490	1,949,060		
$\frac{IL}{75}$	430		2°24.2'	-2.9°	11.3	-		-11.3		733.3		+430	-4		568,480	1,949,060		
943	220		2°26.5'	-2.9°	6.9	91°-	-3.8	-10.7		733.9		+220	-2		568,270	1,949,062		
944	0				5.4	-		-5.4		739.2	TP	0	0		568,050	1,949,064		
945	220		182°34.3'	-2.9°	7.0	-		-7.0		737.6		-220	+1		567,830	1,949,065		
946	440		" "	-2.9°	5.4	91°-	-7.7	-13.1		731.5		-440	+3		567,610	1,949,067		
947	660		" "	-2.9°	5.8	91°-	-11.5	-17.3		727.3		-660	+4		567,390	1,949,068		
948	880		182°34.3'	-2.7°	12.2	90°30'	-7.7	-19.9		724.7	TP	-880.4	+2		567,174	1,949,066		
948	880				4.5	91°-	-15.4	-19.9			TP							

#942 - last sta. on paved road.  
horiz. correct. y = -26'  
x = 568,480 + 1,949,060  
4-Way Intersect E. 17th

SURVEY NOTES-HIGH RESOLUTION DATA  
GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN			ROD MAN		PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE				
8/23/78		G. Cotcamp			R. Hulsey		6834		R. J. H.			1	64				
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Michigan		St. Johns North		Michigan		Clinton		8N	2W		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		
948										724.7							
	2640		2°55.4' +180°	-2.7°	+1.24	TH	-13.2	-0.8	724.2		BS	-2640.4	-10				
	2640				+1.34	89°42'	-13.8	-0.4	70.5		BS						
949	2420		2°55.4'	-2.7°	1.2	-		-1.2		723.0		+2420	+9	566,958	1,949,065		
950	2200		" "	-2.7°	2.6	-		-2.6		721.6		+2200	+9	566,738	1,949,065		
951	1980		" "	-2.7°	3.9	-		-3.9		720.3		+1980	+8	566,518	1,949,064		
952	1760		" "	-2.7°	5.4	-		-5.4		718.8		+1760	+7	566,298	1,949,063		
953	1540		" "	-2.7°	6.0	-		-6.0		718.2		+1540	+6	566,078	1,949,062		
954	1320		" "	-2.7°	6.1	-		-6.1		718.1		+1320	+5	565,858	1,949,061		
955	1310		3°21'	-2.7°	6.0	-		-6.0		718.2		+1310	+5	565,848	1,949,061	T-rd (west)	
955	1100		2°55.4'	-2.7°	7.2	-		-7.2		717.0		+1100	+4	565,638	1,949,060	(silvers)	
956	880		" "	-2.7°	7.8	-		-7.8		716.4		+880	+3	565,418	1,949,059		
957	660		" "	-2.7°	8.0	-		-8.0		716.2		+660	+3	565,198	1,949,059		
958	440		" "	-2.7°	6.8	-		-6.8		717.4		+440	+2	564,978	1,949,058		
959	220		" "	-2.7°	5.9	-		-5.9		718.3		+220	+1	564,758	1,949,057		
960	0		" "	-2.7°	5.4	-		-5.4		718.8	π	0	0	564,538	1,949,056		
961	220		182° 53.6'	-2.7°	4.9	-		-4.9		719.3		-220	-1	564,318	1,949,055		
962	440		" "	-2.7°	4.6	-		-4.6		719.6		-440	-1	564,098	1,949,055		
963	660		" "	-2.7°	4.1	-		-4.1		720.1		-660	-2	563,878	1,949,054		
964	880		" "	-2.7°	5.0	-		-5.0		719.2		-880	-3	563,658	1,949,053		
965	1100		" "	-2.7°	6.4	-		-6.4		717.8		-1100	-4	563,438	1,949,052		

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/23/78		G. CoCamp		R. Hulsey		6834		R. J. H.		1	65						
AREA		TOPO MAP		STATE		COUNTY		RANGE		PPM		PARTY MANAGER					
Michigan		ST. Johns North		Michigan		Clinton		2W				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		
									724.2								
JL	1316		182°51.6'	-2.7°	7.7	-		-7.7		716.5		-1316	-4	563,222	1,949,052	563230+1,949,050	4-way Intersect. El. 716
966	1320		182°53.6'	-2.7°	7.8	-		-7.8		716.4		-1320	-4	563,218	1,949,052	(Colony)	
967	1540		" "	-2.7°	8.9	-		-8.9		715.3		-1540	-5	562,998	1,949,051		
968	1760		" "	-2.7°	9.3	-		-9.3		714.9		-1760	-6	562,778	1,949,050		
969	1980		" "	-2.7°	6.8	-		-6.8		717.4		-1980	-7	562,558	1,949,049		
970	2200		" "	-2.7°	8.0	-		-8.0		716.2		-2200	-7	562,338	1,949,049		
971	2420		" "	-2.7°	8.0	-		-8.0		716.2		-2420	-8	562,118	1,949,048		
972	2640		182°53.6'	-2.6°	6.3	-		-6.3		717.9	TP	-2640.2	-14	561,900	1,949,042	s.w. corner of 11-	
972	2640				14.1	89°50'	+7.7	-6.4			TP					ton bridge El. 718	
	2640		2°36.7'+180°	-2.6°	+2.3	-		+2.3	720.2		BS	-2640.2	-1				
	2640				+14.7	89°44'	-12.3	+2.4			BS						
973	2420		2°36.7'	-2.6°	3.3	-		-3.3		716.9		+2420	0	561,682	1,949,041		
974	2200		" "	-2.6°	4.4	-		-4.4		715.8		+2200	0	561,462	1,949,041		
975	1980		" "	-2.6°	4.8	-		-4.8		715.4		+1980	0	561,242	1,949,041		
976	1760		" "	-2.6°	5.5	-		-5.5		714.7		+1760	0	561,022	1,949,041		
977	1540		" "	-2.6°	6.1	-		-6.1		714.1		+1540	0	560,802	1,949,041		
978	1320		" "	-2.6°	6.1	-		-6.1		714.1		+1320	0	560,582	1,949,041		
979	1100		" "	-2.6°	6.5	-		-6.5		713.7		+1100	0	560,362	1,949,041		
980	880		" "	-2.6°	6.3	-		-6.3		713.9		+880	0	560,142	1,949,041		
981	660		" "	-2.6°	6.3	-		-6.3		713.9		+660	0	559,922	1,949,041		

SURVEY NOTES-HIGH RESOLUTION DATA  
GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
8/23/78		G. Cotcamp		R. Hulsey		6834		R.S.H.		1		66			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		St. Johns North		Michigan		Clinton		8N/7N		2W				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
									720.2						
982	440		2° 36.7'	-2.6°	6.1	-		-6.1		714.1		+440	0	559,702	1,949,041
983	220		" "	-2.6°	5.7	-		-5.7		714.5		+220	0	559,482	1,949,041
984	0			-	5.4	-		-5.4		714.8	π	0	0	559,262	1,949,041
985	220		182° 24.2'	-2.6°	4.9	-		-4.9		715.3		-220	+1	559,042	1,949,042
986	440		" "	-2.6°	3.5	-		-3.5		716.7		-440	+2	558,822	1,949,043
987	660		" "	-2.6°	1.2	-		-1.2		719.0		-660	+2	558,602	1,949,043
988	880		" "	-2.6°	0.3	TH	+4.4	+4.1		724.3		-880	+3	558,382	1,949,044
989	1100		182° 24.2'	-2.6°	1.5	TH	+5.5	+4.0		724.2	TP	-1100+2	+4	558,164	1,949,045
989	1100				5.5	89° 30'	+9.6	+4.1			TP				
	1318		6° 7.2' +180°	-2.6°	+6.3	TH	-6.6	-0.3	723.9		BS	-1317+2	+57		
	1318				+11.3	89° 30'	-11.5	-0.2			BS				
990	1100		1° 6'	-2.6°	2.8	-		-2.8		721.1		+1100	-29	557,949	1,949,073
991	880		1° 41'	-2.6°	6.4	-		-6.4		717.5		+880	-14	557,729	1,949,088
992	660		" "	-2.6°	6.3	-		-6.3		717.6		+660	-11	557,509	1,949,091
993	440		" "	-2.6°	6.8	-		-6.8		717.1		+440	-7	557,289	1,949,095
994	220		" "	-2.6°	7.3	-		-7.3		716.6		+220	-4	557,069	1,949,098
995	0				5.3	-		-5.3		718.6	π	0	0	556,849	1,949,102
996	220		181° 54'	-2.6°	3.8	-		-3.8		720.1		-220	+3	556,629	1,949,105
997	440		" "	-2.6°	2.3	-		-2.3		721.6		-440	+5	556,409	1,949,107
998	660		" "	-2.6°	1.6	-		-1.6		722.3		-660	+8	556,189	1,949,110

↑  
T 8 N  
↓  
T 7 N

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
8/23/78		G. Cotcamp		R. Hulsey		6834		R.S.H.		1		67			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM			
Michigan		St. Johns North		Michigan		Michigan		7N		2W		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 -	EAST + WEST -		Y
												LAT.	DEP.		
									723.9						
999	880		181°54'	-26°	0.6	-		-0.6		723.3		-880	+11	555,969	1,949,113
1000	1100		"	-26°	3.3	TH	+5.5	+2.2		726.1		-1100	+13	555,749	1,949,115
1001	1320		"	-26°	6.3	TH	+6.6	+0.3		724.2		-1320	+16	555,529	1,949,118
1002	1330		181°56.6'	-26°	6.1	TH	+6.7	+0.6		724.5		-1330	+15	555,519	1,949,117
1002	1540		181°54'	-26°	4.2	TH	+7.7	+3.5		727.4		-1540	+19	555,309	1,949,121 (Avery)
1003	1760		"	-26°	5.8	89°30'	+15.4	+9.6		733.5		-1760	+22	555,089	1,949,124
1004	1980		181°54'	-26°	6.4	89°30'	+17.3	+10.9			TP	-1980.3	+24	554,872	1,949,126
1004	1980		"	-	14.3	89°16'	+25.3	+11.0		734.9	TP				
	1320		1°44.5' + 180°	-26°	7.12	BH	+6.6	+17.8	752.7		BS	-1320.3	+20		
	1320		"	-	7.47	90°8'	+3.1	+17.8			BS				
1005	1100		1°44.5'	-26°	3.8	91°-	-19.2	-23.0		729.7		+1100	-16	554,655	1,949,130
1006	880		"	-26°	4.7	91°-	-15.4	-20.1		732.6		+880	-13	554,435	1,949,133
1007	660		"	-26°	3.2	91°-	-11.5	-14.7		738.0		+660	-10	554,215	1,949,136
1008	440		"	-26°	7.7	BH	-2.2	-9.9		742.8		+440	-7	553,995	1,949,139
1009	220		"	-26°	7.2	-		-7.2		745.5		+220	-3	553,775	1,949,143
1010	0		"	-	5.3	-		-5.3		747.4	TP	0	0	553,555	1,949,146
1011	220		181°26.1'	-26°	2.1	-		-2.1		750.6		-220	+4	553,335	1,949,150
1012	440		"	-26°	1.9	-		-1.9		750.8		-440	+9	553,115	1,949,155
1013	660		"	-26°	2.9	TH	+3.3	+0.4		753.1		-660	+13	552,895	1,949,159
1014	880		"	-26°	3.5	TH	+4.4	+0.9		753.6		-880	+18	552,675	1,949,164

555,515 + 1,949,120 (scale)  
4-way Intersec. El. 724



SURVEY NOTES-HIGH RESOLUTION DATA  
GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
8/30/78		G. Cotcamp		R. Hulsey		6834		R. J. H.		1	69					
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE	PPM	PARTY MANAGER				
Michigan		St. Johns South		Michigan		Clinton		7 N		2 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 -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
<u>1064</u>	1760		1°56'	-2.0°	5.1	89°30'	+15.4	+10.3		762.8		+1760	-2	541,725	1,949,212	
	1890		2°11.6' +180°	-2.0°	+5.1	89°30'	-16.5	-11.4	752.5		BS	-1890	-6			→ scaled
	1890				+14.8	89°12'	-26.4	-11.6	-11.5		BS					F-intersect. elev. 764 K Townsend Rd + Williams
1065	1540		" "	-2.0°	3.1	89°30'	+13.4	+10.3		762.8		+1540	-2	541,505	1,949,212	note: 38 station
<u>1066</u>	1320		" "	-2.0°	3.8	89°30'	+11.5	+7.7		760.2		+1320	-2	541,285	1,949,212	gap in line due
1067	1100		" "	-2.0°	2.5	89°30'	+9.6	+7.1		759.6		+1100	-1	541,065	1,949,213	to no permit for
1068	880		" "	-2.0°	2.3	89°30'	+7.7	+5.4		757.9		+880	-1	540,845	1,949,213	cross-country work.
1069	660		" "	-2.0°	2.0	89°30'	+5.8	+3.8		756.3		+660	-1	540,625	1,949,213	
1070	440		" "	-2.0°	1.9	TH	+2.2	+0.3		752.8		+440	-1	540,405	1,949,213	
<u>1071</u>	220		" "	-2.0°	3.4	-	-	-3.4		749.1		+220	0	540,185	1,949,214	
1072	0				5.4	-	-	-5.4		747.1	TP	0	0	539,965	1,949,214	
1073	220		181°44.2'	-2.0°	6.4	-	-	-6.4		746.1		-220	+1	539,745	1,949,215	
1074	440		" "	-2.0°	7.3	-	-	-7.3		745.2		-440	+2	539,525	1,949,216	
1075	660		" "	-2.0°	6.9	-	-	-6.9		745.6		-660	+3	539,305	1,949,217	
<u>1076</u>	880		" "	-2.0°	5.8	-	-	-5.8		746.7		-880	+4	539,085	1,949,218	
1077	1100		" "	-2.0°	4.1	-	-	-4.1		748.4		-1100	+5	538,865	1,949,219	
1078	1320		" "	-2.0°	1.9	-	-	-1.9		750.6		-1320	+6	538,645	1,949,220	
1079	1540		" "	-2.0°	6.1	TH	+7.7	+1.6		754.1		-1540	+7	538,425	1,949,221	
1080	1760		181°44.2'	-2.0°	8.3	TH	+8.8	+0.5		753.0	TP	-1760	+8	538,205	1,949,222	
1080	1760				9.8	89°40'	+10.2	+0.4			TP					

DATE 8/30/78	INSTRUMENT MAN G. C. Camp	ROD MAN R. Hulsey	PARTY NUMBER 6834	NOTES CHECKED BY R. J. H.	LINE NO. 1	PAGE 70
AREA Michigan	TOPO MAP St. Johns South	STATE Michigan	COUNTY Clinton	TWP 7 N	RANGE 2 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	NORTH + SOUTH -		EAST + WEST -		COORDINATES		REMARKS
												LAT.	DEP.	Y	X			
1080										753.0								
	1540		2°14.3' +180°	-2.0°	0.6	TH	-7.7	-7.1	745.9		BS	-1540	-6					
	1540				1.9	8940'	-9.0	-7.1			BS							
1081	1320		2°14.3'	-2.0°	5.3	TH	+6.6	+1.3		747.2		+1320	+5	537,985	1,949,221			
1082	1100		" "	-2.0°	3.1	-		-3.1		742.8		+1100	+5	537,765	1,949,221			
1083	880		" "	-2.0°	5.2	-		-5.2		740.7		+880	+4	537,545	1,949,220			
1084	660		" "	-2.0°	5.6	-		-5.6		740.3		+660	+3	537,325	1,949,219			
1085	440		" "	-2.0°	5.1	-		-5.1		740.8		+440	+2	537,105	1,949,218			
1086	220		" "	-2.0°	5.3	-		-5.3		740.6		+220	+1	536,885	1,949,217			
1087	0				5.4	-		-5.4		740.5	X	0	0	536,665	1,949,216			
II	110		181°51'	-2.0°	2.6	-		-2.6		743.3		-110	0	536,555	1,949,216	bridge (8-Ton)		
II	143		181°52'	-2.0°	2.6	-		-2.6		743.3		-143	0	536,522	1,949,216	536,525 + 1,949,215 (scaled) 4-Way Intersect. El. 744		
1088	220		182°09'	-2.0°	3.8	-		-3.8		742.1		-220	-1	536,445	1,949,215	(Parks)		
1089	440		" "	-2.0°	3.1	-		-3.1		742.8		-440	-1	536,225	1,949,215			
1090	660		" "	-2.0°	3.9	-		-3.9		742.0		-660	-2	536,005	1,949,214			
1091	880		" "	-2.0°	3.8	-		-3.8		742.1		-880	-2	535,785	1,949,214			
1092	1100		" "	-2.0°	4.4	-		-4.4		741.5		-1100	-3	535,565	1,949,213			
1093	1320		" "	-2.0°	3.2	-		-3.2		742.7		-1320	-3	535,345	1,949,213			
1094	1540		" "	-2.0°	1.8	-		-1.8		744.1		-1540	-4	535,125	1,949,212			
1095	1760		182°9'	-2.0°	7.8	TH	+8.8	+1.0	746.9		AP	-1760	-5	534,905	1,949,211			
1095	1760				4.2	8930'	+5.1	+0.9			AP							

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
8/30/78		G. Lokamp		R. Hulsey		6834		R. P. H.				71			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		St. Johns South		Michigan		Clinton		7 N		2 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
1095										746.9					
	7640		2°20.7' +180°	-2.0°	+5.0	-		+5.0	751.9						
	2640				+8.0	89%'	-3.1	+4.9		BS	-2640	-16			
1096	2420		2°20.7'	-2.0°	5.7	-		-5.7		746.2		+2420	+15	534,685	1,949,210
1097	2200		" "	-2.0°	6.1	-		-6.1		745.8		+2200	+13	534,465	1,949,208
1098	1980		" "	-2.0°	6.9	-		-6.9		745.0		+1980	+12	534,245	1,949,207
1099	1760		" "	-2.0°	8.3	-		-8.3		743.6		+1760	+11	534,025	1,949,206
1100	1540		" "	-2.0°	7.3	-		-7.3		744.6		+1540	+9	533,805	1,949,204
1101	1320		" "	-2.0°	7.5	-		-7.5		744.4		+1320	+8	533,585	1,949,203
1102	1100		" "	-2.0°	7.1	-		-7.1		744.8		+1100	+7	533,365	1,949,202
1103	880		" "	-2.0°	5.7	-		-5.7		746.2		+880	+5	533,145	1,949,200
1104	660		" "	-2.0°	4.8	-		-4.8		747.1		+660	+4	532,925	1,949,199
1105	440		" "	-2.0°	3.7	-		-3.7		748.2		+440	+3	532,705	1,949,198
1106	220		" "	-2.0°	4.4	-		-4.4		747.5		+220	+1	532,485	1,949,196
1107	0				5.4	-		-5.4		746.5	X	0	0	532,265	1,949,195
1108	220		181°27.8'	-2.0°	5.0	-		-5.0		746.9		-220	+2	532,045	1,949,197
1109	440		" "	-2.0°	4.1	-		-4.1		747.8		-440	+4	531,825	1,949,199
1110	660		" "	-2.0°	2.2	-		-2.2		749.7		-660	+6	531,605	1,949,201
1111	880		" "	-2.0°	1.2	-		-1.2		750.7		-880	+8	531,385	1,949,203
1111	1065		<del>89°30'</del> 181°22'	-2.0°	5.3	TH	+5.3	0		751.9		-1065	+12	531,200	1,949,207
1112	1100		181°27.8'	-2.0°	5.8	TH	+5.5	-0.3		751.6		-1100	+10	531,165	1,949,205 (Taft)

531,205 + 1,949,200  
4-way Intersect. El. 753

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
8/30/78		G. Co. Conf		R. Hulsey		6834		R. V. H.		1	72				
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER				
Michigan		S. Johns South		Michigan		Clinton		7N	2W		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
									751.9						
1113	1320		181°27.8'	-20°	6.8	TH	+6.6	-0.2		751.7		-1320	+12	530,945	1,949,207
1114	1540		" "	-20°	7.8	TH	+7.7	-0.1		751.8		-1540	+14	530,725	1,949,209
1115	1760		" "	-20°	9.1	TH	+8.8	-0.3		751.6		-1760	+16	530,505	1,949,211
1116	1980		" "	-20°	9.7	TH	+9.9	+0.2		752.1		-1980	+19	530,285	1,949,214
1117	2200		" "	-20°	10.0	TH	+11.0	+1.0		752.9		-2200	+21	530,065	1,949,216
1118	2420		" "	-20°	10.1	TH	+12.1	+2.0		753.9		-2420	+23	529,845	1,949,218
1119	2640		181°27.8'	-20°	5.3	89°50'	+7.7	+2.4			TP	-2640	+25	529,625	1,949,220
1119	2640				9.8	89°44'	+12.3	+2.5		754.4	TP				
	1980		2°16.9' +180°	-20°	+2.5	90°46'	+26.5	+29.0	783.3	+28.9	BS	-1980	-10		
	1980				+1.2	90°48'	+27.6	+28.8			BS				
1120	1760		2°16.9'	-20°	8.3	90°40'	-20.5	-28.8		754.5		+1760	+9	529,405	1,949,219
1121	1540		" "	-20°	9.4	90°40'	-17.9	-27.3		756.0		+1540	+8	529,185	1,949,218
1122	1320		" "	-20°	11.3	90°40'	-15.4	-26.7		756.6		+1320	+6	528,965	1,949,216
1123	1100		" "	-20°	11.5	90°40'	-12.8	-24.3		759.0		+1100	+5	528,745	1,949,215
1124	880		" "	-20°	12.1	90°30'	-7.7	-19.8		763.5		+880	+4	528,525	1,949,214
1125	660		" "	-20°	13.4	8H	-3.3	-16.7		766.6		+660	+3	528,305	1,949,213
1126	440		" "	-20°	13.3	-	-	-13.3		770.0		+440	+2	528,085	1,949,212
1127	220		" "	-20°	9.4	-	-	-9.4		773.9		+220	+1	527,865	1,949,211
1128	0		" "	-20°	5.4	-	-	-5.4		777.9	π	0	0	527,645	1,949,210
1129	220		181°37.7'	-20°	3.2	-	-	-3.2		780.1		-220	+1	527,425	1,949,211

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/30/78		G. Cotcamp		E. J. Jacey		6834		R. J. H.		1	73						
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Michigan		St. Johns South		Michigan	Clinton		7 N/6 N	2 W		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		
									783.3								
1130	440		181°37.7'	-2.0°	2.1	-		-2.1		781.2		-440	+3	527,205	1,949,213		
1131	660		" "	-2.0°	3.0	TH	+3.3	+0.3		783.6		-660	+4	526,985	1,949,214		
1132	880		" "	-2.0°	2.8	TH	+4.4	+1.6		784.9		-880	+6	526,765	1,949,216		
1133	1100		" "	-2.0°	4.0	TH	+5.5	+1.5		784.8		-1100	+8	526,545	1,949,218		
1134	1320		" "	-2.0°	6.2	TH	+6.6	+0.4		783.7		-1320	+9	526,325	1,949,219		
1135	1540		" "	-2.0°	6.0	TH	+7.7	+1.7		785.0		-1540	+10	526,105	1,949,220		
1136	<del>1760</del> <sup>1770</sup>		181°37.7'	-2.0°	7.3	TH	+8.9	+1.6		<del>784.9</del>	TP	-1770	+11	525,875	1,949,221	↑	
1136	<del>1760</del> <sup>1770</sup>				14.0	89°30'	+15.5	+1.5			TP					T 7N	
	1530		3°29.6' +180°	-2.0°	+10.1	-		+10.1		795.0	BS	-1529	-40				
	1530				+2.4	BH	+7.7	+10.1			BS						
<del>1137</del>	1545		3°10.5'	-2.0°	9.7	-		-9.7		785.3		+1545	+32	525,891	1,949,213	525,890 + 1,949,200 4-way Intersect. E1.786	
1137	1320		" "	-2.0°	8.0	-		-8.0		787.0		+1320	+27	525,666	1,949,208	(centerline)	
1138	1100		" "	-2.0°	10.3	-		-10.3		784.7		+1100	+23	525,446	1,949,204	T 6 N	
1139	880		" "	-2.0°	13.7	-		-13.7		781.3		+880	+18	525,226	1,949,199	↓	
1140	660		" "	-2.0°	13.0	BH	-3.3	-16.3		778.7		+660	+14	525,006	1,949,195		
1141	440		" "	-2.0°	12.3	-		-12.3		782.7		+440	+9	524,786	1,949,190		
1142	220		" "	-2.0°	4.5	-		-4.5		790.5		+220	+5	524,566	1,949,186		
1143	0				5.4	-		-5.4		789.6	X	0	0	524,346	1,949,181		
1144	220		182°2'	-2.0°	6.3	-		-6.3		788.7		-220	0	524,126	1,949,181		
1145	440		" "	-2.0°	7.3	-		-7.3		787.7		-440	0	523,906	1,949,181		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE							
8/30/78		G. Co. camp		R. Hulsey		5834		R. P. H.		1		74							
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER					
Michigan		St. Johns South		Michigan		Clinton		6 N		2 W				J. J. J.					
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				
									795.0										
1146	660		182° 2'	-2.0°	5.7	-		-5.7		789.3		660	0	523,686	1,949,181				
1147	880		" "	-2.0°	3.6	-		-3.6		791.4		-880	-1	523,466	1,949,180				
1148	1100		" "	-2.0°	3.2	-		-3.2		791.8		-1100	-1	523,246	1,949,180				
1149	1320		" "	-2.0°	13.7	-		-13.7		781.3		-1320	-1	523,026	1,949,180				
1150	1540		" "	-2.0°	12.9	90° 10'	-4.5	-17.4		777.6		-1540	-1	522,806	1,949,180				
1151	1760		182° 2'	-1.9°	9.6	-		-9.6		785.4	TP	-1760	-4	522,586	1,949,177				
1151	1760				14.8	89° 50'	+5.1	-9.7			TP								
	1760		2° 49.6' +180°	-1.9°	+11.8	TH	-8.8	+3.0	788.4		BS	-1760	-28						
	1760				+14.2	89° 38'	-11.3	+2.9			BS								
1152	1540		2° 49.6'	-1.9°	9.1	TH	+7.7	-1.4		787.0		+1540	+25	522,366	1,949,174				
1153	1320		" "	-1.9°	7.2	TH	+6.6	-0.6		787.8		+1320	+21	522,146	1,949,170				
1154	-1100		" "	-1.9°	4.3	TH	+5.5	+1.2		789.6	-	+1100	+18	521,926	1,949,167				
1155	880		" "	-1.9°	4.4	TH	+4.4	0		788.4		+880	+14	521,706	1,949,163				
1156	660		" "	-1.9°	3.2	TH	+3.3	+0.1		788.5		+660	+11	521,486	1,949,160				
1157	440		" "	-1.9°	0.0	-		0		788.4		+440	+7	521,266	1,949,156				
1158	220		" "	-1.9°	2.1	-		-2.1		786.3		+220	+4	521,046	1,949,153				
1159	0				5.4	-		-5.4		783.0	X	0	0	520,826	1,949,149				
<u>IL</u>	21		158° 4'	-1.9°	5.4	-		-5.4		783.0		-19	+8	520,807	1,949,157			520,800 + 1,949,170 T-intersect. El. 783'	
1160	190		103° -	-1.9°	8.0	-		-8.0		780.4		-37	+186	520,789	1,949,335			line jogs east	
1161	410		97° 17'	-1.9°	8.4	-		-8.4		780.0		-38	+408	520,788	1,949,557			(Price)	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
8/30/78		G. Cotcamp		R. Hulsey		6834		R. J. H.		1	75				
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Michigan		St. Johns South		Michigan	Clinton		6 N	2 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 -	EAST + WEST -		Y
									788.4						
1162	630		95°47'	-1.9°	8.0	-		-8.0		780.4		-43	+629	520,783	1,949,778
1163	850		94°37'	-1.9°	3.0	-		-3.0		785.4		-40	+899	520,786	1,949,998
1164	<del>1290</del> 1070		94°13'	-1.9°	2.1	TH	+5.4	+3.3		791.7		-43	+1069	520,783	1,950,218
1165	1290		93°52'	-1.9°	3.9	89°30'	+11.3	+7.4		795.8		-44	+1289	520,782	1,950,438
TP	1330		93°12.2'	-1.9°	3.6	89°30'	+11.6	+8.0			TP	-30-1	+1330-3	520,795	1,950,470
TP	1330				11.2	89°0'	+19.3	+8.1		796.5	TP				
	1755		1°58' + 180°	-1.9°	+9.2	89°20'	-20.4	-11.2	785.3		BS	-1755-3	-2 -2		
	1755				14.2	89°0'	-25.5	-11.3			BS				
1166	1540		1°44'	-1.9°	11.2	89°20'	+17.9	+6.7		792.0		+1540	-4	520,577	1,950,468
1167	1320		" "	-1.9°	2.0	TH	+6.6	+4.6		789.9		+1320	-4	520,357	1,950,468
1168	1100		" "	-1.9°	2.6	TH	+5.5	+2.9		788.2		+1100	-3	520,137	1,950,469
1169	880		" "	-1.9°	0.6	-		-0.6		784.7		+880	-3	519,917	1,950,469
1170	660		" "	-1.9°	3.1	-		-3.1		782.2		+660	-2	519,697	1,950,470
1171	440		" "	-1.9°	4.5	-		-4.5		780.8		+440	-1	519,477	1,950,471
1172	220		" "	-1.9°	5.6	-		-5.6		779.7		+220	-1	519,257	1,950,471
1173	0				5.4	-		-5.4		779.9	TP	0	0	519,037	1,950,472
1174	220		182° 1'		2.8	-		-2.8		782.5		-220	0	518,817	1,950,472
1175	→ 440		" "		0.8	-		-0.8		784.5		-440	-1	518,597	1,950,471
1176	660		" "		0.7	-		-0.7		784.6		-660	-1	518,377	1,950,471
1177	880		" "		4.1	TH	+4.4	+0.3		785.6		-880	-2	518,157	1,950,470

520,800 + 1,950,470  
T-intersect.  
line jogs south

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE						
8/30/78		G. Cotcamp		R. Hulsey		6834		R. J. H.		1		76						
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER				
Michigan		St. Johns South		Michigan		Clinton		6 N		2 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 -		EAST + WEST -		COORDINATES		REMARKS
												LAT.	DEP.	Y	X			
1178	1100		182° 1'	-1.9°	4.5	TH	+5.5	+1.0		786.3		-1100	-2	517,937	1,950,470			
1179	1320		1° "	-1.9°	4.2	TH	+6.6	+2.4		787.7		-1320	-3	517,717	1,950,469			
1180	1540		182° 1'	-1.9°	4.3	TH	+7.7	+3.4	+3.3	788.6	TP	-1540-3	-3	517,494	1,950,469			
1180	1540				11.1	89° 28'	+14.3	+3.2								TP		
	1083		2° 58' +180°	-1.9°	+7.8	-		+7.8	796.4		BS	-1083-3	-4					
	1083				2.4	B4	+5.4	+7.8						BS				
1181	863		2° 58'	-1.9°	8.0	-		-8.0		788.4		+863	+3	517,271	1,950,468			
1182	643		" "	-1.9°	7.8	-		-7.8		788.6		+643	+2	517,051	1,950,467			
1183	423		" "	-1.9°	7.0	-		-7.0		789.4		+423	+1	516,831	1,950,466			
1184	203		" "	-1.9°	6.8	-		-6.8		789.6		+203	+1	516,611	1,950,466			
<del>1185</del>	0				5.4	-		-5.4		791.0	X	0	0	516,408	1,950,465		90° bend (west)	
1185	40		272° 13'	-1.9°	6.8	-		-6.8		789.6		0	-40	516,408	1,950,425		line jags west	
1186	260		" "	-1.9°	7.9	-		-7.9		788.5		+1	-260	516,409	1,950,205			
1187	480		" "	-1.9°	9.9	-		-9.9		786.5		+3	-480	516,411	1,949,985			
1188	700		" "	-1.9°	8.5	-		-8.5		787.9		+4	-700	516,412	1,949,765			
1189	920		" "	-1.9°	8.0	-		-8.0		788.4		+5	-920	516,413	1,949,545			
1190	1140		272° 13'	-1.9°	5.8	-		-5.8			TP	+6-3	-1140	516,411	1,949,325			
1190	1140				11.4	TH	+5.7	-5.7								TP		
	199		74° 02' +180°	-1.9°	+12.6	89° -		-3.5	799.9		BS	-61-3	-189				shooting across 90° bend	
	199				13.0	88° 34'		-3.8						+9.2	BS			

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY:		LINE NO.		PAGE				
8/28/78		G. Cotcamp		R. Hulsey		6834		R. G. H.		1		77				
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER		
Michigan		St. Johns South		Michigan		Clinton		6 N		2 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 -	EAST + WEST -		Y	X
												LAT.	DEP.			
1191	48		26°10'	-1.9°	6.0	-		-6.0		793.9		+44	+20	516,391	1,949,156	90° bend - line jogs
1192	0				5.4			-5.4		794.5	TP	0	0	516,347	1,949,136	south
1192	220		182°23.2'	-1.9°	6.1	-		-6.1		793.8		-220	-2	516,127	1,949,134	
1193	440		" "	-1.9°	9.9	-		-9.9		790.0		-440	-4	515,907	1,949,132	
1194	660		" "	-1.9°	13.7	BH	-3.3	-17.0		782.9		-660	-6	515,687	1,949,130	horiz. correct. $y = -5'$ $y = -16'$
1194	832		182°18'	-1.9°	14.6	90°20'	-4.8	-19.4		780.5		-832	-6	515,515	1,949,130	Trd (west) El. 781
1195	880		182°23.2'	-1.9°	11.9	70°30'	-7.7	-19.6		780.3		-880	-7	515,467	1,949,129	(Jason)
1196	1100		" "	-1.9°	9.9	BH	-5.5	-15.4		784.5		-1100	-9	515,247	1,949,127	
1197	1320		" "	-1.9°	8.1	-		-8.1		791.8		-1320	-11	515,027	1,949,125	
1198	1540		182°23.2'	-1.9°	1.2	-		-1.2		798.7	TP	-1540+3	-13	514,810	1,949,123	
1198	1540				9.0	TH	+7.7	-1.3			TP					
	2200		1°45.3' +180°	-1.9°	5.1	90°22'	+14.1	+19.2	817.9		BS	-2200+4	+6			
	2200			-1	7.6	90°18'	+11.5	+19.1			BS					
1199	1980		1°45.3'	-1.9°	11.3	BH	-9.9	-21.2		796.7		+1980	-5	514,594	1,949,124	
1200	1760		" "	-1.9°	11.4	BH	-8.8	-20.2		797.7		+1760	-4	514,374	1,949,125	
1201	1540		" "	-1.9°	10.8	BH	-7.7	-18.5		799.4		+1540	-4	514,154	1,949,125	
1202	1320		" "	-1.9°	11.2	BH	-6.6	-17.8		800.1		+1320	-3	513,934	1,949,126	
1203	1100		" "	-1.9°	11.8	BH	-5.5	-17.3		800.6		+1100	-3	513,714	1,949,126	
1204	880		" "	-1.9°	11.1	BH	-4.4	-15.5		802.4		+880	-2	513,494	1,949,127	
1205	660		" "	-1.9°	13.7	-		-13.7		804.2		+660	-2	513,274	1,949,127	

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
9/5/78		G. Catcamp		R. Hulsey		6834		R. G. H.		1	78						
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Michigan		St. Johns South		Michigan	Clinton		6 N	2 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 +	EAST +	COORDINATES		REMARKS	
												SOUTH -	WEST -	Y	X		
									817.9								
1206	440		1°45.3'	-1.9°	11.6	-		-11.6		806.3		+440	-1	513,059	1,949,128		
1F	265		3°16'	-1.9°	9.9	-		-9.9		808.0		+265	+6	512,879	1,949,135	512,870+1,949,130 Intersect (east) El. 808	
1207	220		1°45.3'	-1.9°	8.7	-		-8.7		809.2		+220	-1	512,834	1,949,128		
1208	0				5.4	-		-5.4		812.5	X	0	0	512,614	1,949,129		
1209	220		181°49.7'	-1.9°	9.1	-		-9.1		808.8		-220	0	512,394	1,949,129		
1210	440		" "	-1.9°	10.8	-		-10.8		807.1		-440	+1	512,174	1,949,130		
1211	660		" "	-1.9°	9.1	-		-9.1		808.8		-660	+1	511,954	1,949,130		
1212	880		" "	-1.9°	8.9	-		-8.9		809.0		-880	+1	511,734	1,949,130		
1213	1100				2	-											
7	1050		181°27'	-1.9°	2.8	-		-2.8		815.1		-1050	+8	511,564	1,949,137	F-intersec 7 (west)	
1213	1100		181°49.7'	-1.9°	0.6	-		-0.6		817.3		-1100	+1	511,514	1,949,130		
1214	1320		" "	-1.9°	39	89°30'	+11.5	+7.6		825.5		-1320	+2	511,294	1,949,131		
1215	1540		181°49.7'	-1.9°	8.0	89°30'	+13.4	+5.4		823.3	TP	-1540+3	+2	511,077	1,949,131		
1215	1540				14.3	89°16'	+19.7	+5.4			TP						
	1100		2°1' +180°	-1.9°	+11.8	91°-	+19.2	+31.0	854.3		BS	-1100+3	-2				
	1100		"		+15.0	90°50'	+16.0	+31.0			BS						
1216	880	879	2°1'	-1.9°	35	92°-	-30.7	-34.2		820.1		+879	+2	510,859	1,949,131		
1217	660		" "	-1.9°	10.8	92°-	-23.0	-33.8		820.5		+660	+1	510,640	1,949,130		
1218	440		" "	-1.9°	9.1	92°-	-15.3	-24.4		829.9		+440	+1	510,420	1,949,130		
1219	220		" "	-1.9°	3.8	92°-	-7.7	-11.5		842.8		+220	0	510,200	1,949,129		

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
9/6/78		G. Cotcamp		R. Hulsey		6834		R. J. H.		1	79				
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER				
Michigan		St. Johns South		Michigan		Clinton		6 N	2 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
									854.3						
1220	0				5.3	-		-5.3		849.0	X	0	0	509,980	1,949,121
1221	220		181° 11'	-19°	5.0	-		-5.0		849.3		-220	+3	509,760	1,949,132
1222	440			-19°	7.8	-		-7.8		846.5		-440	+6	509,540	1,949,135
1223	660			-19°	10.7	-		-10.7		843.6		-660	+8	509,320	1,949,137
1224	880		181° 11'	-19°	10.6	BH	-4.4	-15.0		839.3	TP	-880.2	+11	509,102	1,949,140
1224	880				12.5	90° 10'	-2.6	-15.1			TP				
	660		1° 49.2' + 180°	-19°	+10.2	88°	-23.0	-12.8	826.5		BS	-660	+1		
	660				+2.6	88° 40'	-15.4	-12.8			BS				
1225	440		1° 49.2'	-19°	3.8	89°	+7.7	+3.9		830.4		+440	-1	508,882	1,949,140
1226	220		" "	-19°	4.1	89°	+3.8	-0.3		826.2		+220	0	508,662	1,949,141
1227	0				5.4	-		-5.4		821.1	X	0	0	508,442	1,949,141
1228	220		182° 45.3'	-19°	7.3	-		-7.3		819.2		-220	-3	508,222	1,949,138
1229	440		" "	-19°	2.7	-		-2.7		823.8		-440	-7	508,007	1,949,139
1230	660			-19°	11.8	88°	+23.0	+11.2		837.7		-660	-10	507,782	1,949,131
TP	833	832	181° 44.2'	-19°	7.3	88°	+29.1	+21.8		848.3		-832	+2	507,610	1,949,143
1231	880	879	182° 45.3'	-18°	9.1	88°	+30.7	+21.6		848.1	TP	-879-2	-15	507,561	1,949,126 (Alward)
1231	880			-1	5.0	88° 16'	+26.6	+21.6			TP				
	1100	1099	0° 33.7' + 180°	-18°	+10.0	88°	-38.4	-28.4			BS	-1099.-2	+24		
	1100				14.5	87° 46'	-42.8	-28.3	819.8		BS				
1232	880	879	0° 33.7'	-18°	9.7	88°	+30.7	+21.0		840.8		+879	-19	507,339	1,949,131

horizontal correct. x=0  
y=+11'  
507,610 + 1,949,150  
4-Way Intersect El. 850

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
9/6/78		G. Cotcamp		R. Hulsey		6834		R. V. H.		1	80						
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Michigan		St. Johns South		Michigan		Clinton		6 N	2 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 -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
									819.8								
1233	660		0°33.7'	-1.8°	9.1	88°-	+23.0	+13.9		833.7		+660	-14	507,120	1,949,136		
1234	440		" "	-1.8°	7.2	88°-	+15.3	+8.1		827.9		+440	-10	506,900	1,949,140		
1235	220		" "	-1.8°	6.6	89°-	+3.8	-2.8		817.0		+220	-5	506,680	1,949,145		
1236	0				5.4	-		-5.4		814.4	X	0	0	506,460	1,949,150		
1237	220		182°43'	-1.8°	3.9	89°-	+3.8	-0.1		819.7		-220	-1	506,240	1,949,149		
1238	440		" "	-1.8°	2.7	88°-	+15.3	+12.6		832.4		-440	-2	506,020	1,949,148		
1239	660		" "	-1.8°	5.0	88°-	+23.0	+18.0		837.8		-660	-3	505,800	1,949,147		
1240	880	879	182°43'	-1.8°	133	88°-	+30.7	+17.4		837.2	TP	-879-2	-4	505,579	1,949,146		
1240	880				108	88°10'	+28.1	+17.3			TP						
	880		2°17.6'+180°	-1.8°	+8.1	89°-	-15.4	-7.3			BS	-880-2	-8				
	880				+13.3	88°40'	-20.5	-7.2	830.0		BS						
1241	660		2°17.6'	-1.8°	4.7	-		-4.7		825.3		+660	+6	505,357	1,949,144		
1242	440		" "	-1.8°	12.3	-		-12.3		817.7		+440	+4	505,137	1,949,142		
1243	220		" "	-1.8°	11.7	-		-11.7		818.3		+220	+2	504,917	1,949,140		
1244	0				5.4	-		-5.4		824.6	X	0	0	504,697	1,949,138		
1245	220		181°48.5'	-1.8°	8.1	-		-8.1		821.9		-220	0	504,477	1,949,138		
1246	440		" "	-1.8°	9.5	-		-9.5		820.5		-440	0	504,257	1,949,138		
1247	660		" "	-1.8°	12.7	-		-12.7		817.3		-660	0	504,037	1,949,138		
1248	880		" "	-1.8°	9.8	BH	-4.4	-14.2		815.8		-880	0	503,817	1,949,138		
1249	1100		" "	-1.8°	10.8	BH	-5.5	-16.3		813.7		-1100	0	503,597	1,949,138		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
9/6/78		G. Cateamp		R. Hickey		683-1		R. G. H.		1	81						
AREA		TOPO MAP	STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER								
Michigan		St. Johns S./Lansing	Michigan	Clinton		6 N	2 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 +	EAST +	COORDINATES		REMARKS	
												SOUTH -	WEST -	Y	X		
									830.0								
1250	1320		181°48.5'	-1.8°	9.9	BH	-6.6	-16.5	813.5	TP	-1320-2	0	563,375	1,949,138			
1250	1320				9.6	90°18'	-6.9	-16.5									TP
	1540		2°26'+180°	-1.8°	+13.9	90°04'	+1.8	+15.7	829.2	BS	-1540-2	-17					
	1540				+13.0	90°06'	+2.7	+15.7									BS
1251	1320		2°26'	-1.8°	8.7	-		-8.7	820.5		+1320	+15	563,153	1,949,136			
1252	1100		"	-1.8°	2.5	-		-2.5	826.7		+1100	+12	562,933	1,949,133			
1253	880		"	-1.8°	2.2	-		-2.2	827.0		+880	+10	562,713	1,949,131			
1254	660		"	-1.8°	3.6	-		-3.6	825.6		+660	+7	562,493	1,949,128			
1255	440		"	-1.8°	5.8	-		-5.8	823.4		+440	+5	562,273	1,949,126			
1256	220		"	-1.8°	5.7	-		-5.7	823.5		+220	+2	562,053	1,949,123			
1257	0				5.4	-		-5.4	823.8	X	0	0	561,833	1,949,121			
1258	220		181°56.4'	-1.8°	12.9	-		-12.9	816.3		-220	-1	561,613	1,949,120			
1259	440		"	-1.8°	11.8	-		-11.8	817.4		-440	-1	561,393	1,949,120			
1260	660		"	-1.8°	7.3	-		-7.3	821.9		-660	-2	561,173	1,949,119			
1261	880		"	-1.8°	13.7	-		-13.7	815.5		-880	-2	560,953	1,949,119			
1262	1100		"	-1.8°	13.2	-		-13.2	816.0		-1100	-3	560,733	1,949,118			
1263	1320		"	-1.8°	12.9	-		-12.9	816.3		-1320	-3	560,513	1,949,118			
1264	1540		181°56.4'	-1.8°	8.1	BH	-7.7	-15.8	813.4	TP	-1540-2	-4	560,291	1,949,117			
1264	1540				14.0	90°04'	-1.8	-15.8									TP



DATE: 9/7/78  
 INSTRUMENT MAN: G. Cotcamp  
 ROD MAN: R. Hulsey  
 PARTY NUMBER: 6834  
 NOTES CHECKED BY: R.S.H.  
 LINE NO.: 1  
 PAGE: 83 of 83  
 AREA: Michigan  
 TOPO MAP: Lansing N.  
 STATE: Michigan  
 COUNTY: Clinton  
 TWP: 6N  
 RANGE: 2W  
 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.	
1280	1320		1°31.6' +180°	-1.8°	+4.5	91°-	+23.0	+27.5	844.9	+27.6	BS	-1320-2	+6	
	1320				+10.0	90°46'	+17.7	+27.7			BS			
1281	1100		1°31.6'	-1.8°	5.5	91°-	-19.2	-24.7	820.2			+1100	-5	496,545, 1,949,078
1282	880		" "	-1.8°	13.3	90°30'	-7.7	-21.0	823.9			+880	-4	496,325, 1,949,079
1283	660		" "	-1.8°	13.4	90°30'	-5.8	-19.2	825.7			+660	-3	496,165, 1,949,080
1284	440		" "	-1.8°	10.9	90°30'	-3.8	-14.7	830.2			+440	-2	495,885, 1,949,081
1285	220		" "	-1.8°	12.7	-	-	-12.7	832.2			+220	-1	495,665, 1,949,082
1286	0				5.4	-	-	-5.4	839.5		π	0	0	495,445, 1,949,083
1287	220		183° 2.6'	-1.8°	13.8	-	-	-13.8	831.1			-220	-5	495,225, 1,949,078
1288	440		" "	-1.8°	12.3	BH	-2.2	-14.5	830.4			-440	-10	495,005, 1,949,073
1289	660		" "	-1.8°	12.0	-	-	-12.0	832.9			-660	-14	494,785, 1,949,069
1290	880		183° 2.6'	-1.8°	6.5	-	-	-6.5	838.4			-880	-19	494,565, 1,949,064
FF	1060		182° 32.2'	-1.8°	5.1	-	-	-5.1	839.8			-1060	-14	494,385, 1,949,069
" "	1060				10.4	TH	+5.3	-5.1						(Round lake)
														sta. 1290 is 187 (taped)
														north of 4-way
														Intersect.

horiz. correct.  
 E.O.L. x=0, y=+20'  
 494,385, 1,949,070 (Scale)  
 4-way Intersect. El. 840