

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Field notes for a gravity survey in Dinosaur National Monument,  
Moffat County, Colorado and Uintah County, Utah

by

Dolores M. Kulik

Open-File Report 88-579

1988

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards. Any use of trade names is for descriptive purposes only and does not imply endorsement by the USGS.

Field Notes for a gravity survey in Dinosaur National monument, Moffat County, Colorado, and Uintah County, Utah

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This Open-File Report presents the field notes for a gravity survey along part of the road from the Dinosaur National Monument headquarters near Dinosaur, Colorado, to its junction with the road descending Iron Springs Wash.

Gravity meter readings were measured with La Coste-Romberg meter G-670; meter constants are given in Appendix A. Base descriptions are included in Appendix B. Terrain corrections were estimated in the field for three zones corresponding to 55 ft, 175 ft, and 558 ft from the station, and are included in Appendix C along with the applicable correction table. Latitude, longitude, and elevation values are given in Appendix D.

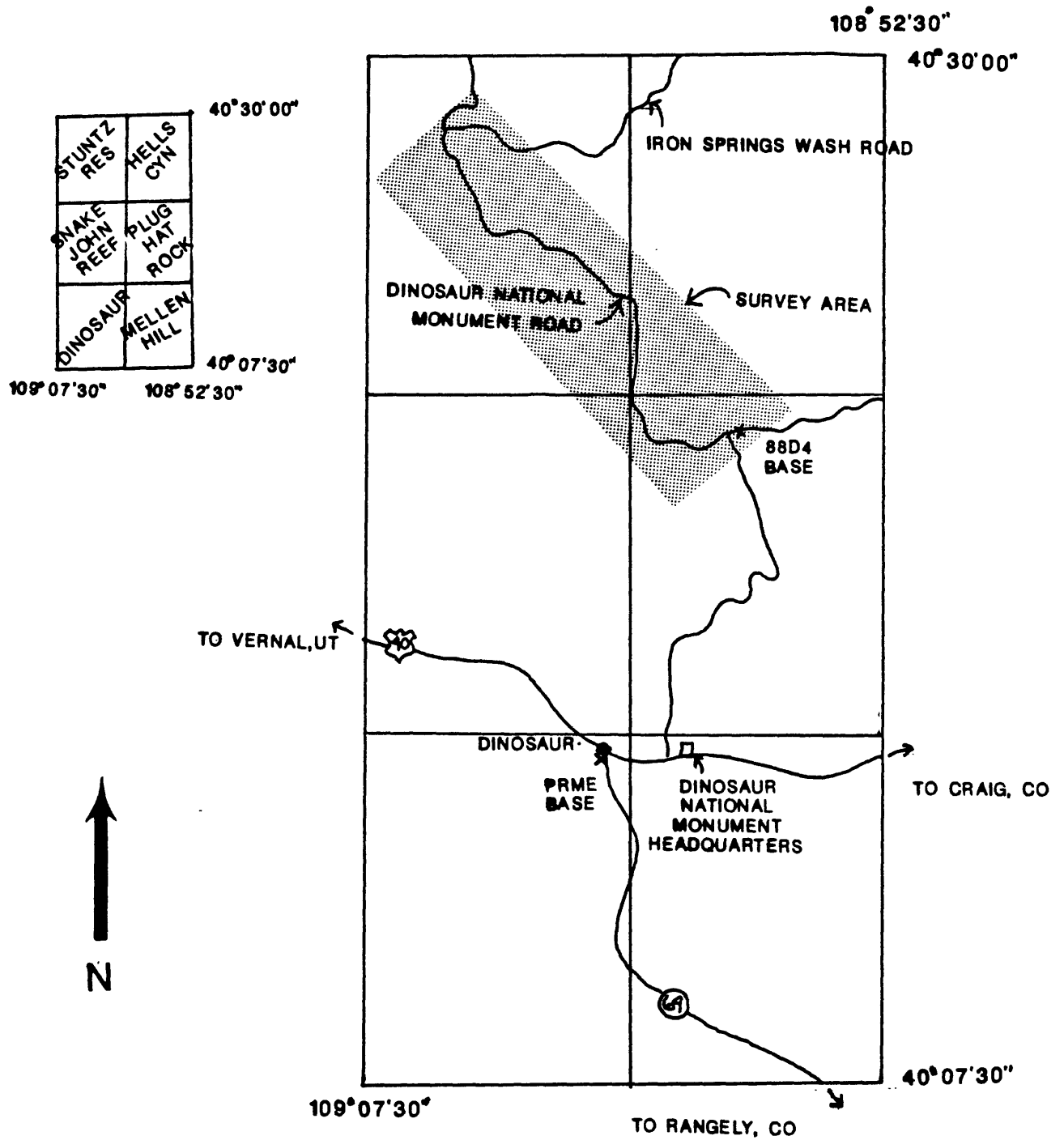


Figure 1. Index map showing location of Dinosaur National Monument headquarters and topographic quadrangles in survey area.

GRAVITY FIELD NOTES & CALCULATION SHEET

(B) (S) (R)	LINE No.	STATION No.	METER READING	TIME (24 hour)	OBSERVED GRAVITY	DRIFT	BASE IDENTITY & REMARKS	ODOMETER
A	122	PRIME	3125070	08:57			PRIME BASE	
B	122	818104	3114669	09:58			FIELD BASE	
R	122	114	3114889	10:10			TIE STATION	
S	122	115	3114321	10:27			70.3	
							(10)	
S	↓	117	3113974	10:55			70.9	
S		118	3113812	11:03			71.2	
S		119	3113676	11:10			71.5	
S		120	3113382	11:22			71.8	
S		121	3113156	11:30			72.15	
S		122	3113513	11:41			72.45	
S		123	3113726	11:50			72.8	

GRAVITY FIELD NOTES & CALCULATION SHEET

(B) (S) (R)	LINE No.	STATION No.	METER READING	TIME (24 hour)	OBSERVED GRAVITY	DRIFT	BASE IDENTITY & REMARKS	ODOMETER
S	122	124	3113488	11:59			73.1	
S	↓	125	3113244	12:07			73.45	
S		126	3112814	12:16			73.8	
S		127	3112044	12:25			74.2	
S		128	3111835	12:35			74.45	
S		129	3112349	12:44			74.75	
S		130	3112734	12:50			75.05	
S		131	3112834	13:00			75.5	
S		132	3112627	13:07			75.8	
S		133	3112936	13:18			76.1	
S		134	3113137	13:28			76.4	

B=Base station S=Data station R=Repeat station

GRAVITY FIELD NOTES & CALCULATION SHEET

(B) (S) (R)	LINE No.	STATION No.	METER READING	TIME (24 hour)	OBSERVED GRAVITY	DRIFT	BASE IDENTITY & REMARKS
S	22	35	3113251	113:36			76.7
S	22	36	3113818	113:44			77.05
R	22	114	31149017	114:08			REPEAT TIE STATION
B		818104	31146813	114:15			FIELD BASE
S		317	31134982	114:34			91.35
S		318	31130818	114:43			91.65
S		319	31127224	114:55			92.0 reset 92.55
S		340	31125984	115:02			<del>92.9</del> 92.9
S		341	3112632	115:08			93.2
S		342	31128966	115:15			93.55
S		343	3112770	115:20			93.8

GRAVITY FIELD NOTES & CALCULATION SHEET:

(B) (S) (R)	LINE No.	STATION No.	METER READING	TIME (24 hour)	OBSERVED GRAVITY	DRIFT	BASE IDENTITY & REMARKS
S	22	44	31127959	115:26			94.1
S	22	45	3113121	115:36			94.4
S		416	311311817	115:43			94.75
S		417	31134555	115:49			95.05
S		418	31134118	115:56			95.35
S		419	3113271	116:04			95.7
S		50	3113343	116:09			96.0
S		51	3113382	116:14			96.3
S		52	3113291	116:20			96.6
S		53	3113378	116:25			96.9
S		54	3113303	116:31			97.25 BM 7754 (-50) STA READ ON RD BELOW BM

B=Base station R=repeat station S=Data station

GRAVITY FIELD NOTES & CALCULATION SHEET

(B) (S) (R)	LINE No.	STATION No.	METER READING	TIME (24 hour)	OBSERVED GRAVITY	DRIFT	BASE IDENTITY & REMARKS ODOMETER
S	122	155	31131965	16:40			97.5
S		156	31132317	16:45			97.8
S		157	31132932	16:51			98.1
S		158	31138112	16:57			98.55
S		159	31139711	17:08			98.8
R	122	114	31149119	18:18			REPEAT TIE STATION
B		818 D 4	31146916	18:25			FIELD BASE
E		PRIME	32151093	18:57			PRIME BASE

B=Base station S=Data station R=Repeat station

APPENDIX A

Meter constants for LaCoste-Romberg gravity meter G-670.

<u>Counter Reading</u>	<u>Milligal Reading</u>	<u>Internal Factor</u>
3000	3056.71	1.01908
3100	3158.61	1.01906
3200	3260.52	1.01915
3300	3362.43	1.01927

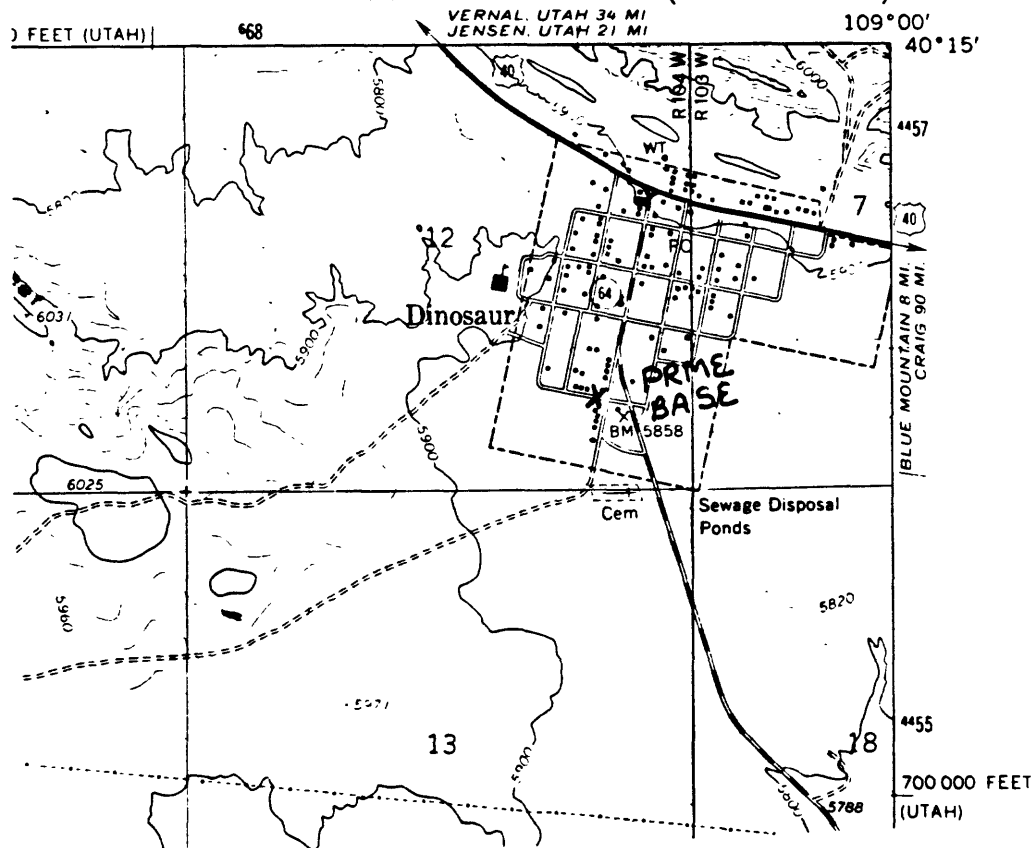
APPENDIX B

GRAVITY BASE STATION  
U.S. GEOLOGICAL SURVEY -

STATE/COUNTRY USA		STATION DESIGNATION PRME (PRIME)		OBSERVED GRAVITY 979648.78
NEAREST TOWN Dinosaur, Co.		LONGITUDE 109° 00' 60"		LATITUDE 40° 14' 40"
ELEVATION 5857 ft		TOPOGRAPHIC MAP(S) Dinosaur 1:24,000		
DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
7/88	Kulik	G-670	ACIC 4636-1	979650.18

DESCRIPTION/SKETCH

DINOSAUR QUADRANGLE  
UTAH-COLORADO  
7.5 MINUTE SERIES (TOPOGRAPHIC)



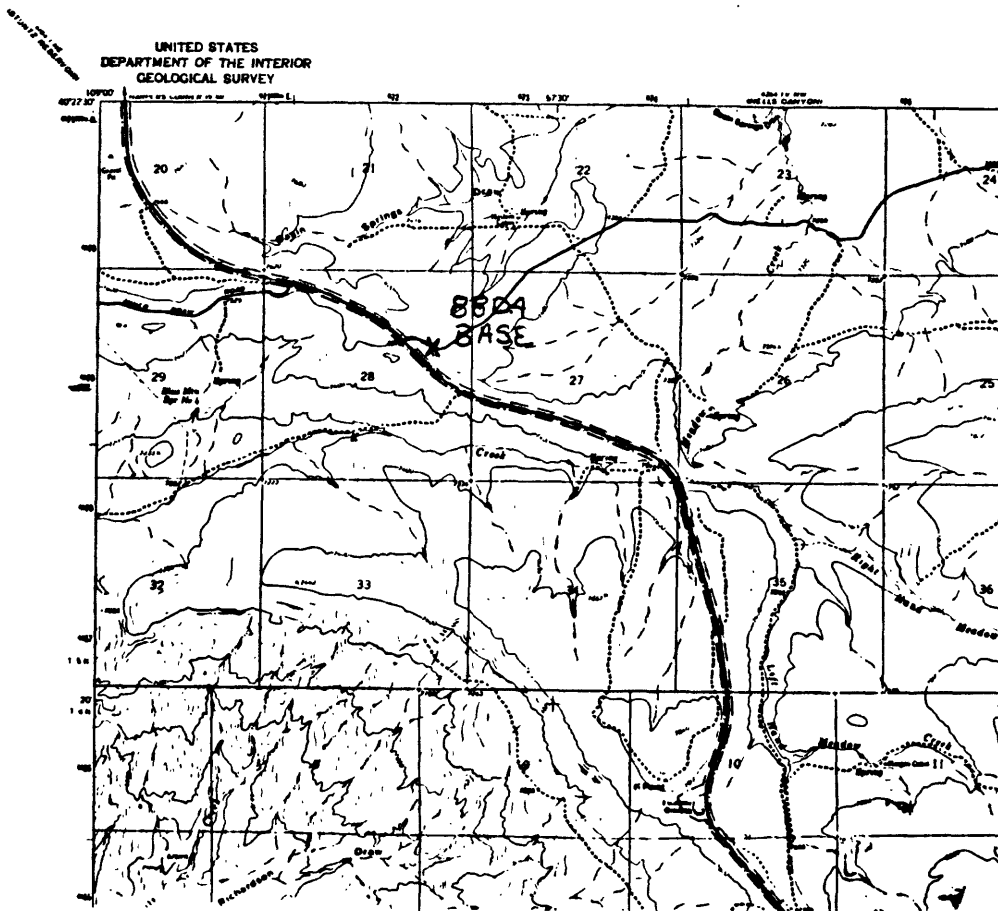
PRME (PRIME) Base is located on the sidewalk at the north side of the street indicated on the map in Dinosaur, Co. It is 30 ft. west of the corner at a red spot painted on the sidewalk.



**GRAVITY BASE STATION  
U.S. GEOLOGICAL SURVEY**

<b>STATE/COUNTRY</b> USA		<b>STATION DESIGNATION</b> 88D4		<b>OBSERVED GRAVITY</b> 979542.73
<b>NEAREST TOWN</b> Dinosaur, Co.		<b>LONGITUDE</b> 108° 58' 20"		<b>LATITUDE</b> 40° 21' 60"
<b>ELEVATION</b> 7520 ft		<b>TOPOGRAPHIC MAP(S)</b> Plug Hat Rock 1:24,000		
<b>DATE</b>	<b>OBSERVER</b>	<b>METER</b>	<b>REFERENCE STATION</b>	<b>REFERENCE VALUE</b>
7/88	Kulik	G-670	ACIC 4636-1	979650.18

**DESCRIPTION/SKETCH**



Base 88D4 is located between 2 steel posts on the south side of a dirt road approximately .1 mi. east of its intersection with the Dinosaur National Monument road in T5N, R103W, Sec. 28.

22  
Line #

Dinosaur  
Area

Zone B - 55' Zone C - 175' Zone D - 55'

STA.	14		
B	-2	-1	2
C	-3	-5	8
D	-40	-60	-50
STA.	15		
B	/	-2	-2
C	8	-3	8
D	-20	-40	-25
STA.	17		
B	/	/	/
C	3	/	/
D	-10	-10	-50
STA.	18		
B	-3	-4	-4
C	-4	-4	-4
D	-10	-20	-20
STA.	19		
B	3	/	4
C	-4	-2	/
D	-10	-10	10
STA.	20		
B	1	-14	-1
C	2	-10	-15
D	5	/	-50
STA.	21		
B	-1	6	4
C	-3	6	4
D	30	/	-10
STA.	22		
B	/	10	3
C	-1	5	10
D	/	-40	10

22  
Line #

Area

Zone B - 55' Zone C - 175' Zone D - 55'

STA.	23		
B	2	10	-3
C	3	15	-3
D	/	-20	-25
STA.	24		
B	-10	-15	/
C	-12	-10	-16
D	50	20	-40
STA.	25		
B	2	10	/
C	3	24	20
D	5	80	60
STA.	26		
B	/	15	/
C	/	25	25
D	5	40	60
STA.	27		
B	2	2	-1
C	4	6	3
D	30	60	30
STA.	28		
B	/	-3	2
C	-5	/	3
D	-20	20	60
STA.	29		
B	-3	-2	/
C	/	12	6
D	/	20	80
STA.	30		
B	-10	-15	/
C	-10	-10	-6
D	-10	/	20

1

22

Line #

Area

Zone B - 55' Zone C - 175' Zone D - 558'

Zone B - 55' Zone C - 175' Zone D - 558'

STA.	B	C	D
31	-3	3	10
	-4	-6	80
		-20	15
32	8	2	5
	8	12	5
	15	20	10
33	5	5	4
	5	8	8
	5	15	5
34	-3	1	1
	-5		3
35	6	4	4
	4	4	3
	5	6	3
36	-10	-8	-8
	-15	-12	-15
	-20	-20	-20
37	10	-4	-5
	10	10	2
	15	-20	-10
38	2	3	3
		4	4
	-5	3	10

STA.	B	C	D
39	-24	-5	5
	-25	-40	20
	-25	-70	20
40	-3	1	
	-4	-4	2
	-10		40
41			5
			8
			10
42	-6	2	-2
	-6		-6
	2		20
43	12	4	10
	10	8	4
	15	15	10
44	2	1	4
	5		6
	30		-15
45			-2
			4
	10	10	-10
46			-10
			-6
	10	15	10



ZONE B			ZONE C			ZONE D		
T	M		T	M		T	M	
0.01 MGAL.	FT.		0.01 MGAL.	FT.		0.01 MGAL.	FT.	
.1	1.1	1.9	.1	4.3	7.5	.1	7.7	13.4
.2	1.9	2.5	.2	7.6	9.7	.2	13.4	17.3
.3	2.5	2.9	.3	9.7	11.5	.3	17.3	20.5
.4	2.9	3.4	.4	11.5	13.1	.4	20.5	23.2
.5	3.4	3.5	.5	13.1	13.8	.5	23.2	24.5
1.0	3.8	6.6	1.0	13.8	24.5	1.0	24.5	42.7
2.0	6.6	9.1	2.0	24.5	32.3	2.0	42.7	55.6
3.0	9.1	11.5	3.0	32.3	39.1	3.0	55.6	66.2
4.0	11.5	13.9	4.0	39.1	45.3	4.0	66.2	75.6
5.0	13.9	16.3	5.0	45.3	51.2	5.0	75.6	84.1
6.0	16.3	18.8	6.0	51.2	57.0	6.0	84.1	92.1
7.0	18.8	21.3	7.0	57.0	62.7	7.0	92.1	99.6
8.0	21.3	24.1	8.0	62.7	68.3	8.0	99.6	106.8
9.0	24.1	26.9	9.0	68.3	73.9	9.0	106.8	113.7
10.0	26.9	30.0	10.0	73.9	79.6	10.0	113.7	120.4
11.0	30.0	33.3	11.0	79.6	85.4	11.0	120.4	126.9
12.0	33.3	36.8	12.0	85.4	91.3	12.0	126.9	133.2
13.0	36.8	40.6	13.0	91.3	97.3	13.0	133.2	139.4
14.0	40.6	44.8	14.0	97.3	103.5	14.0	139.4	145.5
15.0	44.8	49.5	15.0	103.5	109.9	15.0	145.5	151.5
16.0	49.5	54.7	16.0	109.9	116.5	16.0	151.5	157.5
17.0	54.7	60.5	17.0	116.5	123.3	17.0	157.5	163.3
18.0	60.5	67.2	18.0	123.3	130.4	18.0	163.3	169.1
19.0	67.2	74.9	19.0	130.4	137.8	19.0	169.1	174.9
20.0	74.9	84.0	20.0	137.8	145.5	20.0	174.9	180.6
21.0	84.0	94.9	21.0	145.5	153.7	21.0	180.6	186.3
22.0	94.9	108.2	22.0	153.7	162.2	22.0	186.3	192.0
23.0	108.2	125.0	23.0	162.2	171.3	23.0	192.0	197.7
24.0	125.0	147.0	24.0	171.3	180.9	24.0	197.7	203.3
25.0	147.0	177.2	25.0	180.9	191.1	25.0	203.3	208.9
26.0	177.2	221.6	26.0	191.1	202.0	26.0	208.9	214.6
27.0	221.6	293.4	27.0	202.0	213.6	27.0	214.6	220.2
28.0	293.4	400.7	28.0	213.6	226.1	28.0	220.2	226.8
29.0	400.7	501.9	29.0	226.1	239.7	29.0	226.8	231.5
30.0	501.9	5590.6	30.0	239.7	254.4	30.0	231.5	237.2
			31.0	254.4	270.4	31.0	237.2	242.8
			32.0	270.4	288.0	32.0	242.8	248.5
			33.0	288.0	307.4	33.0	248.5	254.2
			34.0	307.4	329.0	34.0	254.2	260.0
			35.0	329.0	353.1	35.0	260.0	265.8
			36.0	353.1	380.3	36.0	265.8	271.6
			37.0	380.3	411.3	37.0	271.6	277.4
			38.0	411.3	447.0	38.0	277.4	283.3
			39.0	447.0	488.7	39.0	283.3	289.2
			40.0	488.7	537.9	40.0	289.2	295.1
			41.0	537.9	597.0	41.0	295.1	301.1
			42.0	597.0	669.6	42.0	301.1	307.2
			43.0	669.6	761.0	43.0	307.2	313.2
			44.0	761.0	879.8	44.0	313.2	319.4
			45.0	879.8	1040.5	45.0	319.4	325.6
			46.0	1040.5	1270.8	46.0	325.6	331.8
			47.0	1270.8	1629.0	47.0	331.8	338.1
			48.0	1629.0	2263.5	48.0	338.1	344.5
			49.0	2263.5	3698.8	49.0	344.5	350.9
			50.0	3698.8	10068.6	50.0	350.9	357.4
						51.0	357.4	364.0
						52.0	364.0	370.7
						53.0	370.7	377.4
						54.0	377.4	384.2
						55.0	384.2	391.0
						56.0	391.0	398.0
						57.0	398.0	405.1
						58.0	405.1	412.2
						59.0	412.2	419.4
						60.0	419.4	426.8
						61.0	426.8	434.2
						62.0	434.2	441.7
						63.0	441.7	449.4
						64.0	449.4	457.1
						65.0	457.1	465.0
						66.0	465.0	473.0
						67.0	473.0	481.1
						68.0	481.1	489.3
						69.0	489.3	497.7
						70.0	497.7	506.2

## APPENDIX D

Latitude, longitude and elevation for stations included in survey.

Station	Latitude	Longitude	Elev. (in feet)
88D4	40.35794400	108.96877300	7520
15	40.35863900	108.97196200	7573
16	40.36075600	108.97595200	7614
17	40.36243400	108.98188000	7615
18	40.36320900	108.98723600	7631
19	40.36519600	108.99250000	7647
20	40.36857600	108.99610900	7685
21	40.37318000	108.99761200	7724
22	40.37789200	108.99777200	7678
23	40.38306400	108.99890900	7642
24	40.38678700	109.00025200	7701
25	40.39151400	109.00170900	7752
26	40.39667500	108.99897800	7818
27	40.40211100	108.99745900	7945
28	40.40604000	108.99730700	7976
29	40.41028200	108.99709300	7900
30	40.41331900	108.99401900	7844
31	40.41863600	108.99710100	7834
32	40.42258100	108.99414100	7865
33	40.42628500	108.99072300	7815
34	40.43062200	108.99096700	7778
35	40.43460800	108.99317200	7756
36	40.43625300	108.99901600	7657
37	40.43902600	109.00307500	7717
38	40.44105900	109.00795700	7773
39	40.44387100	109.01429700	7820
40	40.44319500	109.02062200	7808
41	40.44254700	109.02677900	7838
42	40.44585000	109.03169300	7792
43	40.44833400	109.03526300	7797
44	40.44900100	109.04066500	7802
45	40.44592300	109.04476900	7753
46	40.44259600	109.04875200	7747
47	40.44065100	109.05431400	7703
48	40.43945700	109.05973800	7705
49	40.43979600	109.06565900	7720
50	40.44302000	109.06959500	7707
51	40.44721200	109.07178500	7703
52	40.45005800	109.07578300	7716
53	40.45290400	109.07990300	7700
54	40.45668800	109.08284000	7709
55	40.45707700	109.08480800	7730
56	40.46421800	109.08759300	7716
57	40.46734600	109.09167500	7715
58	40.47213000	109.09677100	7620
59	40.47523100	109.09761000	7593