

*Orig. Final*

UNITED STATES DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

Principal Facts for Gravity Stations in the Cut Bank  
1° X 2° Quadrangle, Montana

by

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This report is preliminary and has not been  
edited or reviewed for conformity with the  
U.S. Geological Survey standards.

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## Principle Facts for Gravity Stations in the Cut Bank

1° X 2° Quadrangle, Montana

### Introduction

Gravity stations were collected in an area of the Cut Bank 1° x 2° quadrangle to provide information for a regional structural study and a mineral evaluation in northwestern Montana.

### Data Collection

During September and October, 1979, 132 gravity stations were collected using a LaCoste-Romberg gravity meter, G-235.\* The stations were referenced to gravity bases at Cut Bank, Browning and East Glacier, all of which are tied to the datum of the International Gravity Standardization Net, (IGSN), 1971 established by the Defense Mapping Agency Aerospace Center (1974). Base descriptions are given in detail at the end of this report.

### Elevation Control

Most of the station elevations are from benchmarks or spot elevations at road intersections turns, section markers, creek crossings, and fence crossings as shown on USGS topographic maps of 1:24,000 or 1:62,500 scale. The remaining elevations used were interpolated from locations between contour intervals ranging from 10 to 40 ft, most of which were 20 ft spacing. Many station elevations could be determined to an accuracy of 5 ft (1.5 m); the maximum error however, assuming accuracy to half of a contour interval, would be a 20 ft (6 m) difference. This results in a maximum error of about 1.3 mgal in the Bouguer anomaly, based on assumed density of 2.67 g/cm<sup>3</sup>.

\*Use of brand names in this report is for descriptive purposes only and does not constitute endorsement by the U.S. Geological Survey.

## Data Reduction

Two unpublished computer programs written at the U.S. Geological Survey were used to reduce the gravity data. First, an unpublished program written by D. A. Dansereau and R. R. Wahl (1975) was used to reduce gravity meter readings to observed gravity values by calculating and correcting for earth tide and linear meter-drift. The theoretical gravity value was calculated by using the 1967 formula of the Geodetic Reference System (International Association of Geodesy, 1967). A second unpublished program by R. H. Godson (1978) computed complete Bouguer anomalies, correcting for the terrain to a radius of 166.7 km from each station using the method of Plouff (1977). These computer terrain corrections are based on mean elevation data digitized on a 15 second grid for corrections from 0 to 5 km; 1 minute terrain data for corrections from 5 to 21 km; and 3 minute terrain data for corrections from 21 to 166.7 km. Corrections for terrain ranged from 0.05 to 4.23 mgal, but averaged 0.57 mgal. Two complete Bouguer anomaly values per station were obtained using average rock densities of  $2.67 \text{ g/cm}^3$  and  $2.45 \text{ g/cm}^3$ . The corrections and anomaly values are listed in Appendix E.

## References

- Defense Mapping Agency Aerospace Center, 1974, World Relative Gravity Reference Network, North America, Part 2: DMAAC Reference Publication 25, with supplement updating gravity values to the International Gravity Standardization Net 1971, 1635 p.
- International Association of Geodesy, 1967, Geodetic Reference System, 1967, International Association of Geodesy Special Publication 3, 74 p.
- Plouff, D., 1977, Preliminary documentation for a FORTRAN program to compute gravity terrain corrections based on topography digitized on a geographic grid: U.S. Geological Survey Open-File Report 77-535.

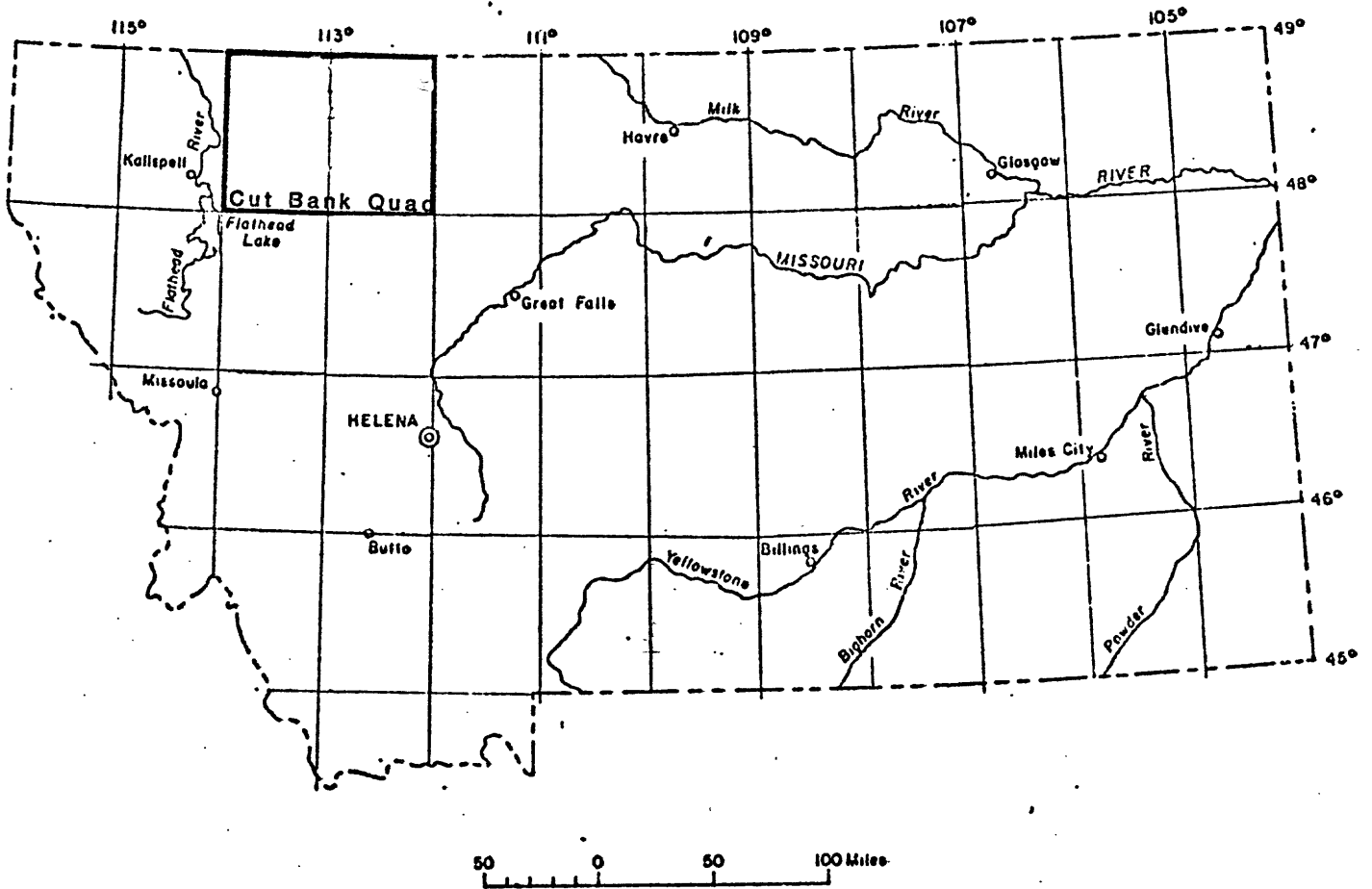


Fig. 1: Location of Cut Bank 1° X 2° Quadrangle, northwestern Montana

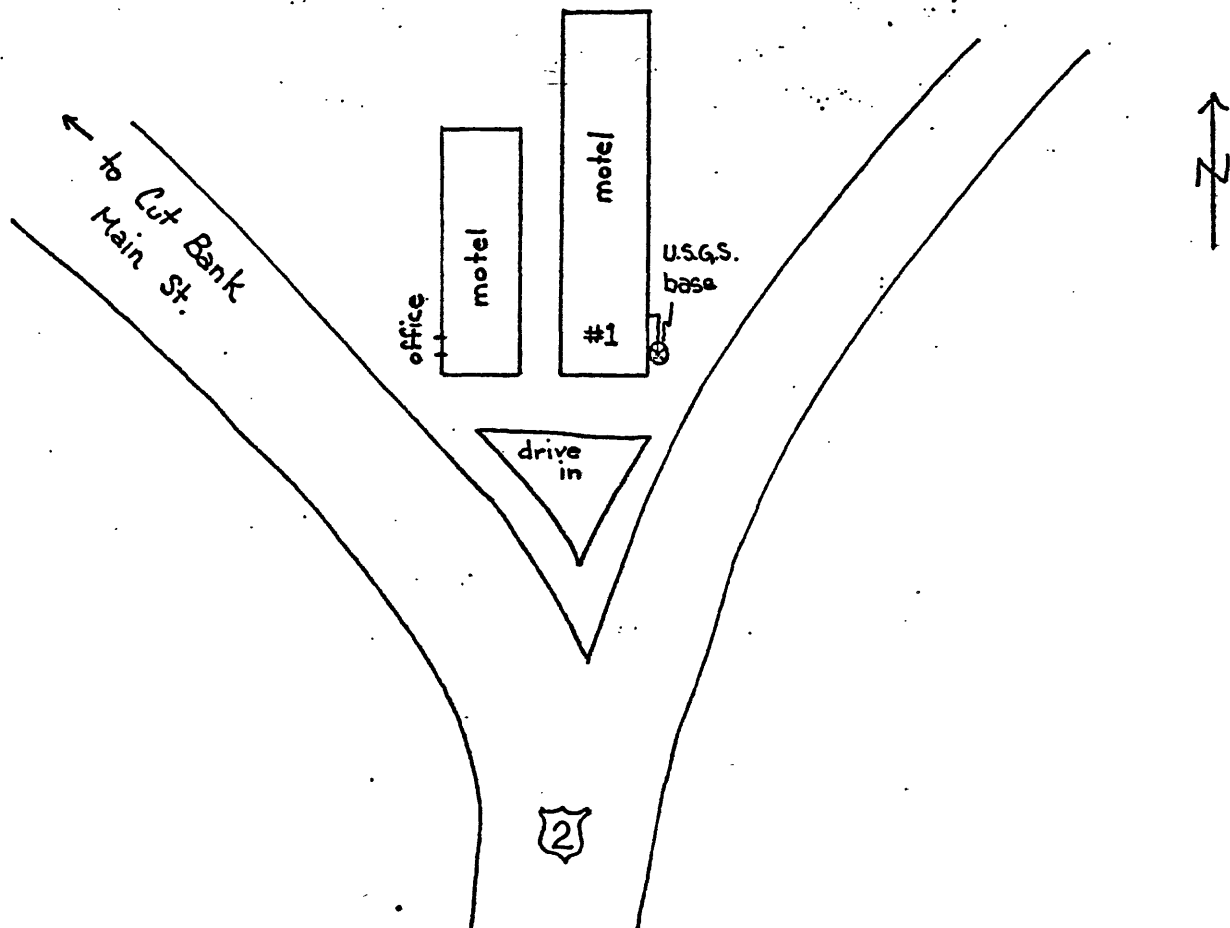
Appendix A

U.S. GEOLOGICAL SURVEY  
GRAVITY BASE STATION

STATE/COUNTRY MONTANA		STATION DESIGNATION Point Motel		OBSERVED GRAVITY 980601.07 mgal
NEAREST TOWN CUT BANK		LONGITUDE 112°19'05		LATITUDE 48°37'30
ELEVATION 1155 m. (3850 ft)		TOPOGRAPHIC MAP(S) Cut Bank 7 1/2', Cut Bank 2°		
DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
9/20	McBride	G-235	Cut Bank DOD	980593.82 mgal
9/30	McBride	G-235	Cut Bank DOD	"

DESCRIPTION/SKETCH

Base is located at the Point Motel in south Cut Bank. Base is on the top step, SE corner, in front of unit #1.



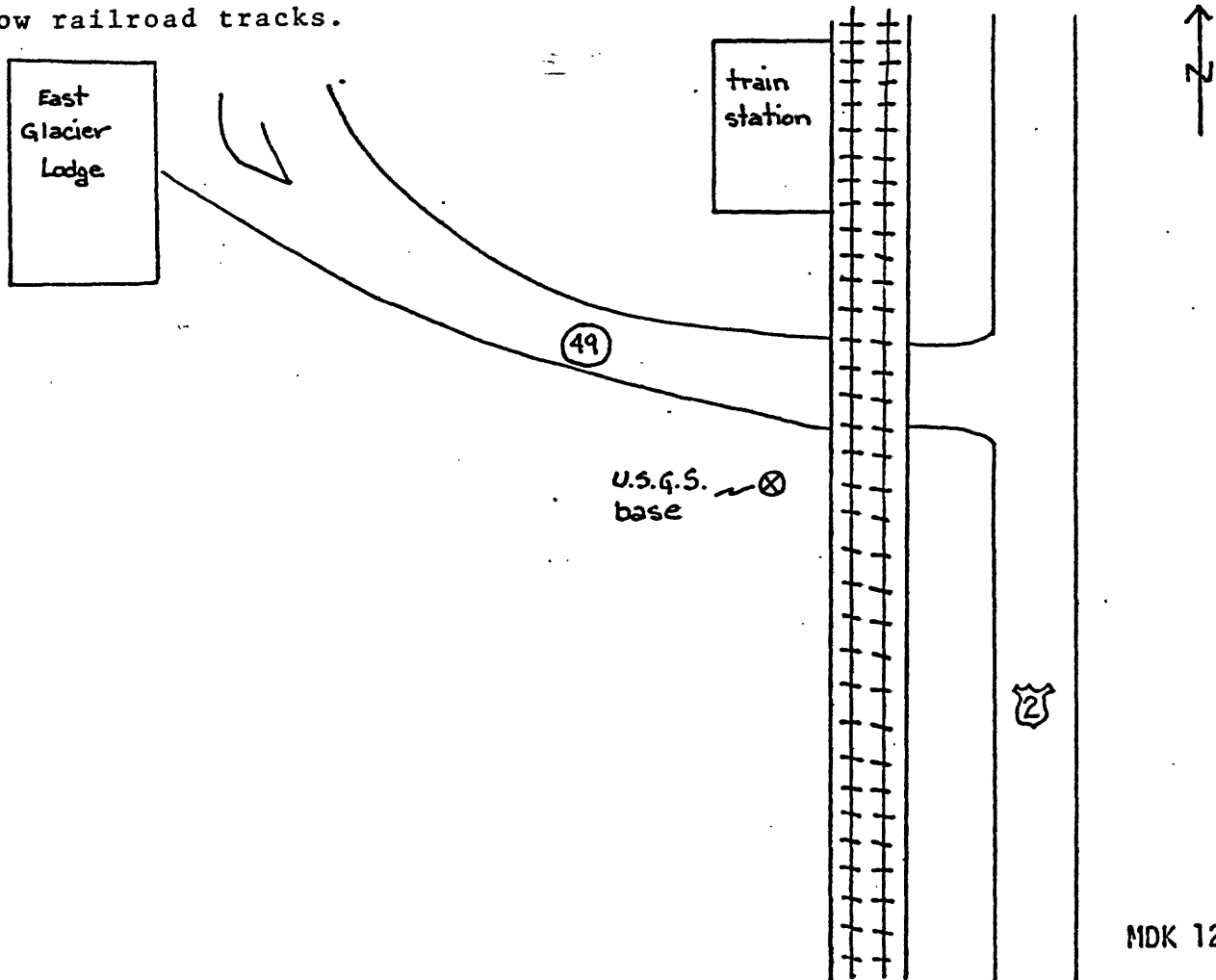
Appendix B

U.S. GEOLOGICAL SURVEY  
GRAVITY BASE STATION

STATE/COUNTRY MONTANA/USA		STATION DESIGNATION East Glacier Park		OBSERVED GRAVITY 980502.62 mgal
NEAREST TOWN East Glacier		LONGITUDE 113°13.25'		LATITUDE 48°26.50'
ELEVATION 4795' (1438.5 m)		TOPOGRAPHIC MAP(S) East Glacier Quad                      Cut Bank 2°		
DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
1977	D. Wilson	G-235	Browning	980540.56 mgal
1977	D. Wilson	G-235	Cut Bank	980593.83 mgal

DESCRIPTION/SKETCH

At BM elev. 4795' but BM missing. West of "Gateway to Glacier" sign on tunnel under railroad tracks. Base is on hill, south of road, near arch below railroad tracks.



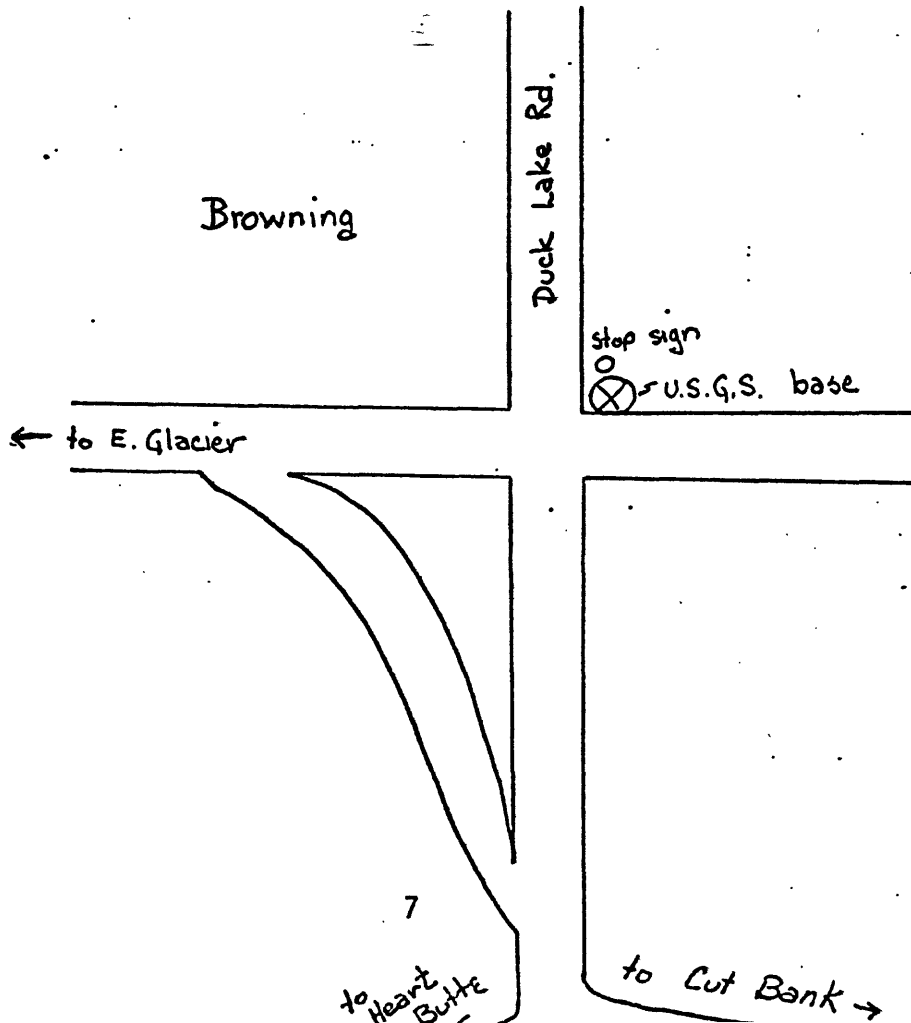


Appendix C

U.S. GEOLOGICAL SURVEY  
GRAVITY BASE STATION

STATE/COUNTRY MONTANA		STATION DESIGNATION Browning		OBSERVED GRAVITY 980 540.56 mgal
NEAREST TOWN Browning		LONGITUDE 113°00.54'		LATITUDE 48°33.37'
ELEVATION 1330 m.		TOPOGRAPHIC MAP(S) Cut Bank AMT		
DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
7/22/76	D. Wilson	E-134	Cut Bank, E. Glacier	

DESCRIPTION/SKETCH At topographic elevation 4362'. At right angle intersect where U.S. Highway 89 turns west. Base is at corner northeast of curve taken by through traffic.



MDK 12/1/78

Appendix D

GRAVITY BASE STATION			
LATITUDE	48° 37.0' N	(1)	STATION DESIGNATION
LONGITUDE	112° 22.5' W	(1)	CUT BANK
ELEVATION	1188.4	METERS (1)	COUNTRY/STATE
			USA/Montana
REFERENCE CODE NUMBERS		ADOPTED GRAVITY VALUE	
ACIC 0508-2		$g = 980\,593.83$ mgals	
IGC 15682B			
GW 13			
		ESTIMATED ACCURACY	DATE
		± 0.1      mgals	MONTH/YEAR
			Aug/1971
DESCRIPTION AND/OR SKETCH			
<p>Station is on the south side of the Western Airlines Administration Building, on a 1.4 x 2.1 meter concrete slab at the rear (south) entrance to the southwest wing of the building. Building is constructed of red brick, and has a control tower on top of it. The concrete slab is approximately at the surrounding ground level. <span style="float: right;">(1)</span></p>			
<p>Parking Area <span style="float: right;">(2)</span></p>			
8			
REFERENCE SOURCE			
(1) 05100      (2) 05100			

## Appendix E: Principal Facts of Gravity Data

### Explanation of headings

#### identification

proj Project name.

sta-id Gravity station identification.

#### location

latitude North latitude in degrees, minutes,  
and hundredths of minutes.

longitude West longitude in degrees, minutes  
and hundredths of minutes.

elev, f Station elevation in feet.

st State where location is located.

observed gravity Observed gravity in milligals.

theoretical gravity Theoretical gravity.

#### corrections

terrain Terrain correction out to 166.7 km  
in milligals.

Bouguer Elevation correction in milligals.

curv Curvature correction in milligals.

special Not used.

#### anomalies

free air Free-air anomaly in milligals.

complete-Bouguer Complete Bouguer anomaly in milligals  
for designated densities.

spec fields Not used.

STATION IDENTIFICATION proj sta-id	LATITUDE		LONGITUDE	ELEVATION (in ft)	STATION	OBSERVED GRAVITY	THEORETICAL GRAVITY	CORRECTIONS		SPECIAL AIR	ANOMALIES			
	deg	min						TERRAIN BOUGUER CURV	FREE COMPLETE-BOUGUER		d1=2.67	d2=2.45		
north :	b11	48 41.53	-112 57.15	4292.0	mt	980560.66	980952.40	0.20	-146.39	-1.31	0.00	11.75	-135.75	-123.59
north :	b12	48 43.54	-112 58.41	4444.0	mt	980552.97	980955.41	0.31	-151.57	-1.33	0.00	15.33	-137.26	-124.69
north :	b13	48 42.07	-112 57.07	4349.0	mt	980558.59	980954.10	0.23	-148.33	-1.32	0.00	13.33	-136.09	-123.78
north :	b14	48 43.53	-112 54.51	4277.0	mt	980565.93	980955.39	0.19	-145.88	-1.31	0.00	12.61	-134.38	-122.27
north :	b15	48 44.59	-112 53.21	4278.0	mt	980569.28	980956.68	0.20	-145.91	-1.31	0.00	14.77	-132.25	-120.13
north :	b16	48 44.40	-112 52.33	4304.0	mt	980569.83	980956.70	0.18	-146.97	-1.31	0.00	18.22	-129.88	-117.68
north :	b17	48 25.21	-113 8.31	4805.0	mt	980501.30	980927.95	1.16	-163.88	-1.39	0.00	25.04	-139.07	-125.55
north :	b18	48 25.13	-113 7.03	4798.0	mt	980500.52	980927.84	1.93	-163.65	-1.39	0.00	23.73	-139.37	-125.93
north :	b19	48 24.40	-113 4.10	4420.0	mt	980518.38	980927.49	0.77	-150.75	-1.33	0.00	6.41	-144.90	-132.43
north :	b110	48 24.71	-113 11.18	5310.0	mt	980474.10	980927.20	2.51	-181.11	-1.44	0.00	46.05	-133.99	-119.16
north :	b111	48 24.47	-113 11.97	5404.0	mt	980467.92	980926.84	2.51	-184.31	-1.45	0.00	49.06	-134.19	-119.09
north :	b112	48 23.77	-113 12.71	5510.0	mt	980460.45	980925.80	2.33	-187.93	-1.46	0.00	52.60	-134.46	-119.04
north :	b113	48 23.48	-113 12.55	5020.0	mt	980452.06	980926.11	3.61	-191.68	-1.47	0.00	54.24	-135.31	-119.69
north :	b114	48 24.59	-113 10.28	4980.0	mt	980491.39	980927.02	1.68	-169.85	-1.41	0.00	32.51	-137.07	-123.10
north :	b115	48 23.39	-113 8.61	5160.0	mt	980477.24	980925.23	1.74	-175.99	-1.43	0.00	37.07	-138.61	-124.13
north :	b116	48 23.51	-113 9.19	5000.0	mt	980488.18	980925.41	1.62	-170.54	-1.41	0.00	32.80	-137.33	-123.31
north :	b117	48 23.14	-113 9.55	5330.0	mt	980469.15	980924.85	2.91	-181.79	-1.45	0.00	45.33	-135.00	-120.14
north :	b118	48 22.85	-113 9.57	5370.0	mt	980467.43	980924.41	1.80	-183.16	-1.45	0.00	47.81	-135.00	-119.94
north :	b119	48 21.61	-113 6.46	5227.0	mt	980469.17	980922.86	1.48	-178.28	-1.44	0.00	37.67	-140.57	-125.88
north :	b120	48 20.79	-113 8.56	5362.0	mt	980465.22	980921.33	4.23	-182.88	-1.45	0.00	47.93	-132.17	-117.33
north :	b121	48 22.38	-113 10.13	5040.0	mt	980486.80	980923.71	2.56	-171.90	-1.42	0.00	36.87	-133.89	-119.82
north :	b122	48 22.17	-113 8.65	5240.0	mt	980471.56	980923.40	2.41	-178.72	-1.44	0.00	40.74	-137.01	-122.36
north :	b123	48 22.22	-113 7.54	5580.0	mt	980447.02	980923.48	2.72	-190.32	-1.47	0.00	48.07	-140.99	-125.41
north :	b124	48 20.32	-112 56.64	4506.0	mt	980498.61	980920.63	0.62	-153.69	-1.34	0.00	1.59	-152.83	-140.10
north :	b125	48 20.33	-112 54.11	4472.0	mt	980501.42	980920.64	0.73	-152.53	-1.34	0.00	1.19	-151.95	-139.33
north :	b126	48 21.18	-112 54.05	4467.0	mt	980503.65	980921.91	0.50	-152.36	-1.34	0.00	1.67	-151.53	-138.90
north :	b127	48 22.28	-112 53.21	4303.0	mt	980516.57	980923.56	0.68	-146.76	-1.31	0.00	-2.47	-149.87	-137.72
north :	b128	48 22.06	-112 56.49	4715.0	mt	980488.97	980923.23	0.69	-160.81	-1.37	0.00	8.98	-152.52	-139.22
north :	b129	48 21.65	-112 58.39	4605.0	mt	980495.69	980922.62	0.58	-157.06	-1.36	0.00	5.97	-151.87	-138.86
north :	b130	48 22.46	-112 55.41	4675.0	mt	980494.15	980924.59	0.56	-159.45	-1.37	0.00	9.05	-151.21	-138.01
north :	b130a	48 57.72	-112 50.01	4220.0	mt	980603.87	980976.62	0.33	-143.93	-1.30	0.00	23.97	-120.93	-108.99
north :	b131	48 55.73	-112 51.74	4338.0	mt	980594.30	980973.64	0.34	-147.96	-1.32	0.00	28.46	-120.47	-108.20
north :	b132	48 55.19	-112 53.04	4350.0	mt	980589.66	980972.84	0.29	-148.37	-1.32	0.00	25.76	-123.63	-111.32
north :	b133	48 56.14	-112 53.05	4475.0	mt	980585.53	980974.26	0.50	-152.63	-1.34	0.00	31.96	-121.51	-108.87
north :	b134	48 56.52	-112 50.52	4150.0	mt	980608.19	980974.82	0.31	-141.54	-1.29	0.00	23.50	-119.02	-107.27
north :	b135	48 54.66	-112 50.36	4173.0	mt	980604.14	980972.34	0.20	-142.33	-1.29	0.00	24.10	-119.32	-107.50
north :	b136	48 53.56	-112 51.24	4270.0	mt	980594.63	980970.40	0.23	-145.64	-1.31	0.00	25.65	-121.06	-108.97
north :	b138	48 53.55	-112 52.53	4262.0	mt	980594.01	980970.38	0.25	-145.36	-1.31	0.00	24.35	-122.07	-110.00
north :	b139	48 52.43	-112 56.51	4298.0	mt	980584.97	980968.70	0.26	-146.59	-1.31	0.00	20.26	-127.39	-115.22
north :	b140	48 51.34	-112 58.43	4465.0	mt	980569.86	980967.08	0.27	-152.29	-1.34	0.00	22.53	-130.83	-118.19

BOUGUER GRAVITY DATA

blackfoot reservation gravity stations summer 1979  
 Tracy McBrine  
 Meter ID: a-255 Date: 02/05/80

STATION	L U C A T I O N S	G R A V I T Y	C O R R E C T I O N S	A N O M A L I E S								
IDENTIFICATION	L A T I T U D E	O B S E R V E D	T E R R A I N	FREE								
proj	deg min sec	THEORETICAL	BOUGUER CURV	AIR								
sta-10	deg min	ST	BOUGUER	COMPLETE-BOUGUER								
		ELE	CURV	SPECIAL								
		(in ft)										
north :	b141 48 40.70	-112 48.48	4036.0 mt	980578.22	980951.16	0.30	-137.72	-1.27	0.00	6.68	-132.01	-120.59
north :	b142 48 40.93	-112 50.58	4109.0 mt	980573.12	980951.50	0.13	-140.15	-1.28	0.00	7.90	-133.39	-121.75
north :	b143 48 42.09	-112 49.80	4253.0 mt	980567.46	980953.23	0.22	-145.06	-1.30	0.00	14.04	-132.10	-120.06
north :	b144 48 43.52	-112 50.50	4263.0 mt	980570.63	980955.38	0.19	-145.40	-1.31	0.00	16.02	-130.50	-118.43
north :	b145 48 43.53	-112 49.26	4149.0 mt	980578.45	980955.39	0.29	-141.51	-1.29	0.00	13.11	-129.40	-117.66
north :	b146 48 39.63	-112 41.60	3907.0 mt	980587.33	980949.55	0.16	-133.26	-1.24	0.00	5.08	-129.26	-118.19
north :	b147 48 39.98	-112 43.46	3955.0 mt	980585.02	980950.08	0.17	-134.89	-1.25	0.00	6.76	-129.22	-118.01
north :	b148 48 41.36	-112 42.32	4105.0 mt	980577.81	980952.14	0.14	-140.01	-1.28	0.00	11.58	-129.57	-117.94
north :	b149 48 38.77	-112 43.93	4115.0 mt	980570.62	980948.27	0.17	-140.35	-1.28	0.00	9.20	-132.26	-120.60
north :	b150 48 43.95	-112 47.29	4265.0 mt	980574.46	980956.02	0.24	-145.47	-1.31	0.00	19.39	-127.14	-115.07
north :	b151 48 45.25	-112 43.36	4228.0 mt	980581.16	980957.96	0.23	-144.20	-1.30	0.00	20.67	-124.61	-112.64
north :	b152 48 44.44	-112 42.66	4217.0 mt	980579.87	980956.75	0.23	-143.83	-1.30	0.00	19.55	-125.35	-113.41
north :	b153 48 42.91	-112 41.46	4305.0 mt	980570.33	980954.46	0.69	-146.83	-1.31	0.00	20.57	-126.88	-114.73
north :	b154 48 45.99	-112 41.45	4390.0 mt	980574.74	980959.07	0.40	-149.73	-1.33	0.00	28.36	-122.29	-109.88
north :	b155 48 50.01	-112 42.76	4150.0 mt	980596.65	980965.09	0.22	-141.54	-1.29	0.00	21.70	-120.91	-109.16
north :	b156 48 49.14	-112 29.62	3841.0 mt	980612.31	980963.78	0.53	-131.01	-1.23	0.00	9.63	-122.08	-111.23
north :	b157 48 46.11	-112 52.23	3901.0 mt	980607.68	980959.25	0.05	-133.05	-1.24	0.00	15.16	-119.08	-108.02
north :	b158 48 47.07	-112 33.55	3964.0 mt	980607.46	980961.88	0.12	-135.20	-1.25	0.00	18.24	-118.10	-106.87
north :	b159 48 46.23	-112 36.84	4063.0 mt	980595.64	980959.43	0.12	-138.58	-1.27	0.00	18.17	-121.56	-110.04
north :	b160 48 47.65	-112 36.83	4035.0 mt	980601.55	980961.85	0.11	-137.62	-1.27	0.00	19.02	-119.75	-108.32
north :	b161 48 48.74	-112 38.82	4054.0 mt	980601.57	980963.19	0.18	-138.27	-1.27	0.00	19.50	-119.86	-108.38
north :	b162 48 47.44	-112 40.31	4175.0 mt	980589.49	980961.24	0.34	-142.40	-1.29	0.00	20.74	-122.61	-110.80
north :	b163 48 49.49	-112 40.12	4048.0 mt	980603.26	980964.31	0.30	-138.07	-1.27	0.00	19.50	-119.53	-108.08
north :	b164 48 48.74	-112 43.38	4184.0 mt	980592.04	980963.19	0.17	-142.70	-1.29	0.00	22.19	-121.64	-109.79
north :	b165 48 36.15	-112 26.99	3920.0 mt	980586.16	980944.34	0.11	-133.70	-1.24	0.00	10.35	-124.49	-113.38
north :	b166 48 34.05	-112 25.73	3846.0 mt	980585.30	980941.20	0.10	-131.18	-1.23	0.00	5.67	-126.64	-115.74
north :	b167 48 34.66	-112 27.46	3868.0 mt	980582.92	980941.21	0.07	-131.93	-1.23	0.00	5.35	-127.74	-116.78
north :	b168 48 33.20	-112 29.77	4040.0 mt	980568.81	980939.92	0.23	-137.79	-1.27	0.00	8.69	-130.14	-118.70
north :	b169 48 30.65	-112 29.04	3964.0 mt	980569.90	980936.41	0.10	-135.20	-1.25	0.00	6.16	-130.20	-118.96
north :	b170 48 28.74	-112 26.80	3575.0 mt	980588.92	980933.24	0.24	-121.93	-1.18	0.00	-8.22	-131.09	-120.97
north :	b171 48 28.21	-112 26.81	3655.0 mt	980583.11	980932.45	0.13	-124.66	-1.19	0.00	-5.72	-131.45	-121.09
north :	b172 48 29.94	-112 28.66	3685.0 mt	980573.23	980935.04	0.16	-132.51	-1.24	0.00	3.43	-130.15	-119.15
north :	b173 48 36.13	-112 24.39	3915.0 mt	980587.30	980944.31	0.21	-133.53	-1.24	0.00	11.04	-123.52	-112.44
north :	b174 48 39.23	-112 36.55	3954.0 mt	980585.96	980948.91	0.07	-134.86	-1.25	0.00	8.77	-127.27	-116.06
north :	b175 48 39.23	-112 38.75	3944.0 mt	980585.46	980948.95	0.07	-134.52	-1.25	0.00	7.29	-128.41	-117.23
north :	b176 48 38.60	-112 40.62	4002.0 mt	980579.72	980946.31	0.09	-136.50	-1.26	0.00	7.64	-130.03	-118.68
north :	b177 48 55.36	-112 43.17	4225.0 mt	980604.87	980973.09	0.18	-144.10	-1.30	0.00	28.97	-116.26	-104.29
north :	b178 48 54.28	-112 41.78	4208.0 mt	980604.60	980971.35	0.24	-143.52	-1.30	0.00	28.84	-115.74	-103.83
north :	b179 48 50.42	-112 40.00	4203.0 mt	980610.43	980974.67	1.11	-143.35	-1.30	0.00	30.87	-112.66	-100.84
north :	b180 48 55.04	-112 32.24	4065.0 mt	980614.08	980969.62	0.15	-138.65	-1.27	0.00	26.61	-113.16	-101.64

blackfoot reservation gravity stations summer 1979  
 treacy schriber  
 water ID: q-235 Date: 02/05/80

STATION IDENTIFICATION	LATITUDE		LONGITUDE		ELEVATION (ft)	STATION	OBSERVED	GRAVITY	THEORETICAL	CORRECTION		SPECIAL	FREE AIR	ANOMALY	SPECFIELD
	deg	min	deg	min						TERRAIN	BOUGUER CURV				
bf01	48	55.21	-112	32.09	4022.0	mt	980621.09	980972.67	0.45	-137.18	-1.26	0.00	26.34	-111.65	-100.28
bf02	48	56.67	-112	34.11	3908.0	mt	980630.18	980975.05	0.69	-133.29	-1.24	0.00	22.53	-111.32	-100.29
bf03	48	54.62	-112	37.32	4422.0	mt	980593.84	980971.98	0.59	-150.62	-1.33	0.00	37.56	-114.00	-101.51
bf04	48	54.86	-112	35.20	4310.0	mt	980603.87	980972.34	0.37	-147.00	-1.31	0.00	36.70	-111.24	-94.05
bf05	48	53.53	-112	34.86	4138.0	mt	980610.67	980970.35	0.19	-141.13	-1.28	0.00	29.33	-112.90	-101.18
bf06	48	49.64	-112	35.51	4025.0	mt	980607.92	980964.53	0.13	-137.28	-1.26	0.00	21.78	-116.63	-105.23
bf07	48	35.75	-112	42.68	4164.0	mt	980559.54	980943.74	0.26	-142.02	-1.29	0.00	7.25	-135.80	-124.01
bf08	48	34.65	-112	45.68	4190.0	mt	980553.78	980942.40	0.14	-142.91	-1.29	0.00	5.29	-138.78	-126.91
bf09	48	34.19	-112	44.35	4122.0	mt	980557.08	980941.41	0.13	-140.59	-1.28	0.00	3.18	-138.56	-126.88
bf10	48	33.97	-112	41.05	4154.0	mt	980557.30	980941.08	0.24	-141.68	-1.29	0.00	6.74	-135.99	-124.23
bf11	48	32.78	-112	43.28	4060.0	mt	980558.35	980939.30	0.27	-138.48	-1.27	0.00	0.74	-138.74	-127.24
bf12	48	30.91	-112	42.08	4000.0	mt	980560.57	980936.54	0.29	-136.43	-1.26	0.00	0.08	-137.32	-126.00
bf13	48	29.02	-112	44.57	3906.0	mt	980560.37	980933.66	0.29	-133.29	-1.24	0.00	-5.90	-140.14	-129.08
bf14	48	29.21	-112	42.33	3961.0	mt	980560.36	980933.95	0.14	-135.10	-1.25	0.00	-1.21	-137.42	-126.20
bf15	48	29.16	-112	45.57	3932.0	mt	980558.52	980933.88	0.66	-134.11	-1.25	0.00	-5.70	-140.39	-129.29
bf16	48	29.40	-112	46.64	4178.0	mt	980534.52	980926.74	0.30	-142.50	-1.29	0.00	0.56	-142.93	-131.11
bf17	48	29.72	-112	47.56	4161.0	mt	980531.75	980924.91	0.38	-141.92	-1.29	0.00	-1.99	-144.81	-133.05
bf18	48	28.72	-112	52.31	4021.0	mt	980500.11	980924.23	1.48	-157.61	-1.36	0.00	10.29	-147.20	-134.22
bf19	48	29.80	-112	50.14	4464.0	mt	980512.96	980925.84	0.56	-152.25	-1.34	0.00	6.77	-146.26	-133.65
bf100	48	25.00	-112	50.46	4423.0	mt	980517.93	980927.64	0.38	-150.86	-1.33	0.00	6.09	-145.72	-133.21
bf101	48	26.05	-112	46.88	4210.0	mt	980536.25	980929.21	0.26	-143.59	-1.30	0.00	2.82	-141.81	-129.89
bf102	48	24.62	-112	42.80	3964.0	mt	980552.26	980927.37	0.29	-135.37	-1.25	0.00	-1.98	-138.32	-127.08
bf103	48	24.23	-112	44.59	4064.0	mt	980542.84	980926.48	0.43	-138.78	-1.27	0.00	-1.11	-140.74	-129.23
bf104	48	22.08	-112	50.69	4357.0	mt	980511.06	980923.27	0.99	-148.60	-1.32	0.00	-2.60	-151.54	-139.27
bf105	48	17.18	-112	47.55	4405.0	mt	980501.52	980915.91	0.59	-150.24	-1.33	0.00	-0.29	-151.27	-138.83
bf106	48	16.85	-112	45.60	4490.0	mt	980502.93	980918.42	0.46	-153.14	-1.34	0.00	6.61	-147.42	-134.73
bf107	48	20.26	-112	47.28	4210.0	mt	980521.54	980920.54	0.48	-143.59	-1.30	0.00	-3.21	-147.62	-135.72
bf108	48	20.83	-112	39.29	3853.0	mt	980567.16	980930.38	0.28	-131.41	-1.23	0.00	-0.99	-133.36	-122.45
bf109	48	20.30	-112	36.46	3769.0	mt	980576.77	980932.59	0.34	-128.55	-1.22	0.00	-1.48	-130.90	-120.24
bf110	48	27.18	-112	35.94	4050.0	mt	980559.12	980930.91	0.17	-138.13	-1.27	0.00	8.96	-130.28	-118.81
bf111	48	26.15	-112	36.61	4020.0	mt	980558.80	980929.36	0.22	-137.11	-1.26	0.00	7.36	-130.79	-119.41
bf112	48	25.28	-112	36.52	4070.0	mt	980553.75	980928.06	0.27	-138.82	-1.27	0.00	8.32	-131.50	-119.98
bf113	48	23.63	-112	36.04	4193.0	mt	980542.10	980925.59	0.83	-143.01	-1.29	0.00	10.70	-132.77	-120.95
bf114	48	30.30	-112	30.68	3937.0	mt	980571.32	980935.58	0.09	-134.28	-1.25	0.00	5.86	-129.57	-118.41
bf115	48	28.49	-112	31.84	3680.0	mt	980585.31	980932.87	0.24	-125.51	-1.20	0.00	-1.59	-128.06	-117.64
bf116	48	28.57	-112	33.84	3728.0	mt	980581.23	980932.99	0.48	-127.15	-1.21	0.00	-1.27	-129.15	-118.62
bf117	48	27.72	-112	34.67	4013.0	mt	980562.76	980931.72	0.17	-136.87	-1.26	0.00	8.31	-129.65	-118.29
bf118	48	27.00	-112	33.35	3818.0	mt	980574.67	980930.64	0.38	-130.22	-1.23	0.00	2.98	-128.09	-117.29
bf119	48	25.11	-112	33.64	4062.0	mt	980555.86	980927.80	0.28	-138.54	-1.27	0.00	9.93	-129.61	-118.11
bf120	48	25.45	-112	31.45	4257.0	mt	980545.72	980928.31	0.72	-145.19	-1.30	0.00	17.60	-128.18	-116.16

## BOUGUER GRAVITY DATA

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blackfoot reservation gravity stations summer 1979

tracy mchrice

Meter ID: G-235

Date: 02/05/80

STATION IDENTIFICATION	L U C A T I O N S	G R A V I T Y	C O R R E C T I O N S	A N O M A L I E S									
proj	LATITUDE deg min	LONGITUDE deg min	TEKRAIN BOUGUER CURV	FREE AIR									
	deg min	(in ft)	SPECIAL	d1=2.67 d2=2.45 FIELDS									
north :	bf121	48 24.23	-112 34.57	4128.0 mt	980549.27	980926.48	0.39	-140.79	-1.28	0.00	10.86	-130.82	-119.15
north :	bf122	48 21.66	-112 39.73	4555.0 mt	980510.41	980922.63	1.69	-155.36	-1.35	0.00	15.98	-139.03	-126.26
north :	bf123	48 23.36	-112 39.95	4241.0 mt	980534.88	980925.18	0.59	-144.65	-1.30	0.00	8.40	-136.96	-124.99
north :	bf124	48 23.20	-112 38.57	4485.0 mt	980520.39	980924.95	0.83	-152.97	-1.34	0.00	17.08	-136.41	-123.76
north :	bf125	48 22.83	-112 16.28	3673.0 mt	980576.76	980924.39	-0.01	-125.28	-1.20	0.00	-2.32	-128.80	-118.38
north :	bf126	48 24.55	-112 16.28	3649.0 mt	980583.07	980926.97	0.09	-124.46	-1.19	0.00	-0.84	-126.40	-116.05
north :	bf127	48 22.82	-112 18.84	3694.0 mt	980574.66	980924.38	0.01	-125.99	-1.20	0.00	-2.42	-124.60	-119.13
north :	bf128	48 24.84	-112 19.60	3701.0 mt	980578.34	980927.16	0.02	-126.23	-1.20	0.00	-0.87	-128.29	-117.79
north :	bf129	48 25.87	-112 17.33	3610.0 mt	980585.61	980928.95	0.01	-123.13	-1.18	0.00	-3.94	-128.24	-118.00
north :	bf130	48 26.42	-112 20.91	3725.0 mt	980577.18	980929.77	0.02	-127.05	-1.21	0.00	-2.39	-130.62	-120.06
north :	bf131	48 35.69	-112 16.53	3983.0 mt	980587.36	980943.66	0.29	-135.85	-1.26	0.00	18.15	-118.66	-107.39
north :	bf132	48 34.54	-112 16.41	3640.0 mt	980588.30	980941.93	0.23	-130.97	-1.23	0.00	7.37	-124.60	-113.73