UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Gravity survey data of the Stillwater Complex and vicinity, Montana

by

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Open-File Report 85-209

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Introduction

This report presents part of the work undertaken by the U.S. Geological Survey to evaluate the mineral-resource potential of the Stillwater Complex area. During the summer field seasons previous to 1984, 308 gravity stations were established in the Stillwater Complex and vicinity, Carbon, Park, Stillwater, and Sweetgrass Counties, Montana. The Stillwater Complex is located in Custer and Gallatin National Forests (fig. 1). This report presents the principal facts for these data.

Data Collection

Gravity observations were made using LaCoste-Romberg gravity meter G-550. The gravity stations were referenced to the U.S. Department of Defense (DOD) bases at Three Forks, Mt., (appendix C) and Columbus, Mt., (appendix D), which are part of the International Gravity Standardization Net (IGSN-71). Secondary bases at Fishtail and Frombert, Mt., (appendices A and B) were tied to the DOD base. Gravity loops were started and closed daily by making repeat observations at the secondary bases. Access was by helicopter and ground traverses into the roadless areas and by vehicle along highways and secondary roads outside of the wilderness area. Data collected previously (Peterson, USGS, unpub. data) are included in Appendix E.

Elevation Control

The survey area is bound by lat. 45°15′-46° N and long. 108°30°-110°30′W. The station elevations were obtained from benchmarks, spot elevations, and section corners on 1:24,000-scale and 1:62,500-scale USGS topographic maps, and 1:6,000-scale maps prepared by the Anaconda Minerals Company. Stations labeled with e (e.g. est2) use estimated elevations from the 1:6,000-scale maps. The uncertainty of elevations based on benchmarks is assumed to be 0.5 ft. For spot elevations and section corners with elevations in black, on 1:24,000-scale maps with a 40-ft contour interval, the uncertainty is assumed to be three ft. At a density of 2.67 g/cm^3, this elevation uncertainty translates to a maximum uncertainty in the Bouguer anomaly value of 0.18 mgals.

However, errors in the estimation of terrain corrections give rise to the greatest uncertainty in Bouguer values. Computer-generated terrain corrections in mountainous areas like the Stillwater Complex are generally accurate to within 1.5 mgal.

Data Reduction

Computer programs existing on the USGS DEC VAX 11-750 computer system were used to obtain principal facts and terrain-corrected gravity values. A program written by D. Dansereau and R. Wahl (USGS, unpub. program, 1979) 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 using the 1967 formula of the Geodetic Reference System (International Association of Geodesy, 1967). Hand terrain corrections were determined for Hammer's D-F zones (Hammer, 1939) for all stations, except those beginning with the prefix "SW." These stations, established in regionally flatter terrain, were determined to have low values (generally less than 0.1) for zones D-F. Complete terrain corrections were

computed using a program by R. H. Godson (USGS, unpub. program, 1978), correcting for the gravity effects of terrain from zone F (0.895 km) to a radius 166.7 km away using the method of Plouff (1977). Godson's program also calculates earth curvature corrections and complete (terrain-corrected) Bouguer anomaly values. These computed terrain corrections use mean elevation data digitized on a 30-second grid for corrections from .895 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. A density of 2.67 g/cm^3 was used to calculate terrain corrections, giving the complete Bouguer anomaly value. Other equations used in calculation the complete Bouguer anomaly are given in Cordell (1982). The corrections and anomaly values are listed in Appendix E.

References

Cordell, Lindrith, Keller, G. R., and Hildenbrand, T. G., 1982, Bouguer gravity map of the Rio Grande Rift, Colorado, New Mexico, and Texas: U.S. Geological Survey Geophysical Investigations Series, Map GP-949, scale 1:1,000,000.

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.

Hammer, Sigmund, 1939, Terrain corrections for gravimeter stations: Geophysics, v. 4, p. 184-194.

International Association of Geodesy, 1967, Geodetic Reference System, 1967: International Association of Geodesy Special Publication 3, 74 p.

Plouff, Donald, 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.

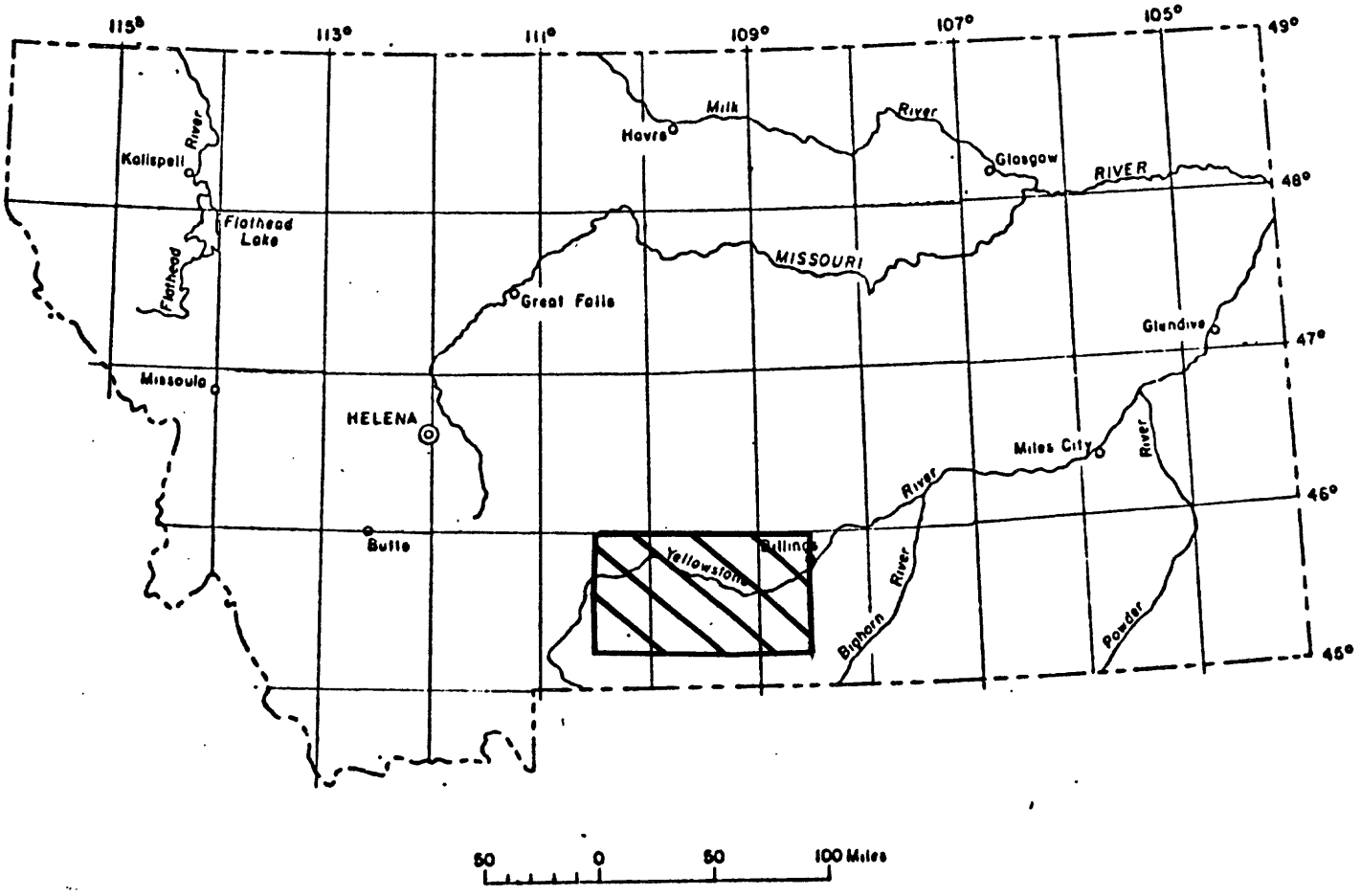


Figure 1--Map showing location of the Stillwater Complex gravity study area.

Appendix A

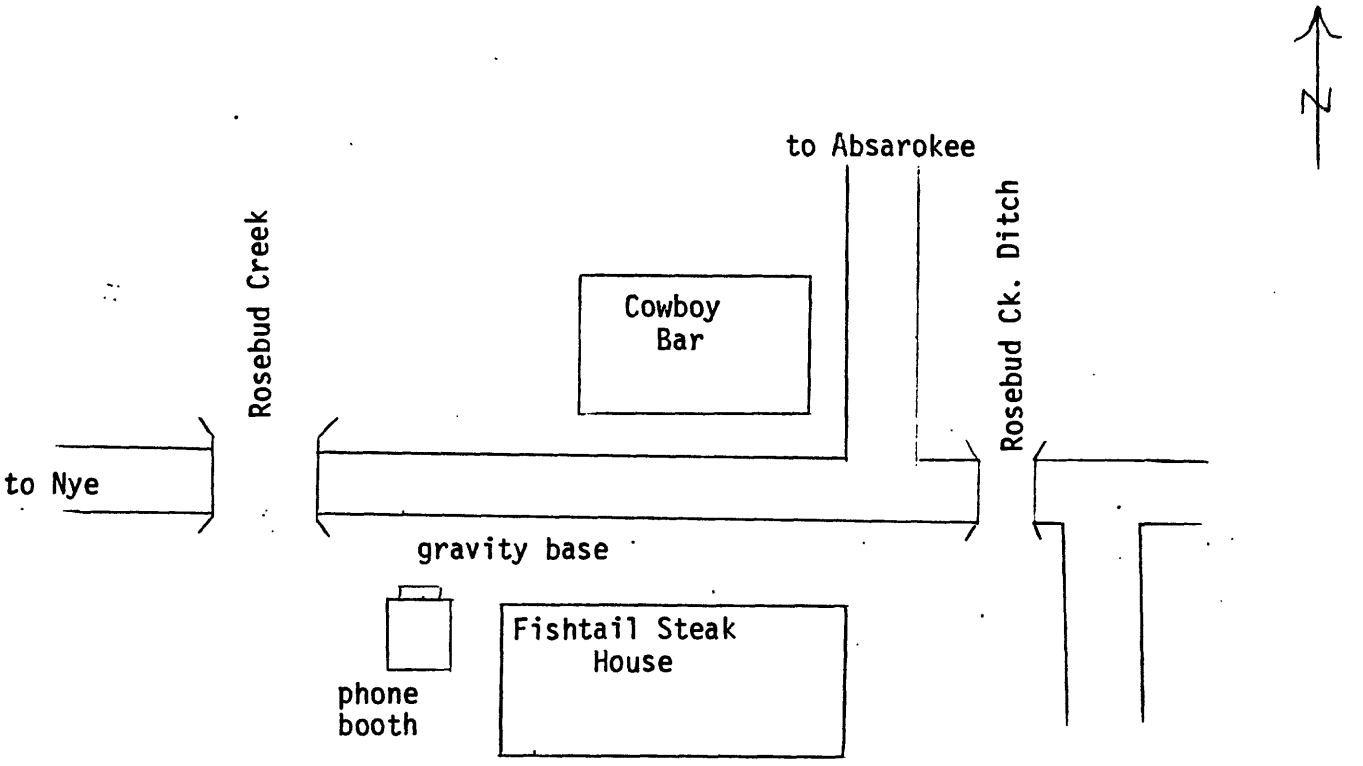
U.S. GEOLOGICAL SURVEY
GRAVITY BASE STATION

STATE/COUNTRY	STATION DESIGNATION	OBSERVED GRAVITY
Montana	Fishtail	980247.29 mgal.
NEAREST TOWN	LONGITUDE	LATITUDE
Fishtail	109° 30.50'	45° 27.50'
ELEVATION	TOPOGRAPHIC MAP(S)	
1337 m (4455') est.	Bozeman 1° x 2° ; Fishtail 7 1/2'	

DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
9/2/79	McBride	g-235	Columbus DOD	980316.58 mgal

DESCRIPTION/SKETCH

The gravity base is located on the concrete floor of a public telephone booth on the west side of the Fishtail Steak House. The base is in the northeast corner of the booth (inside).



Appendix B

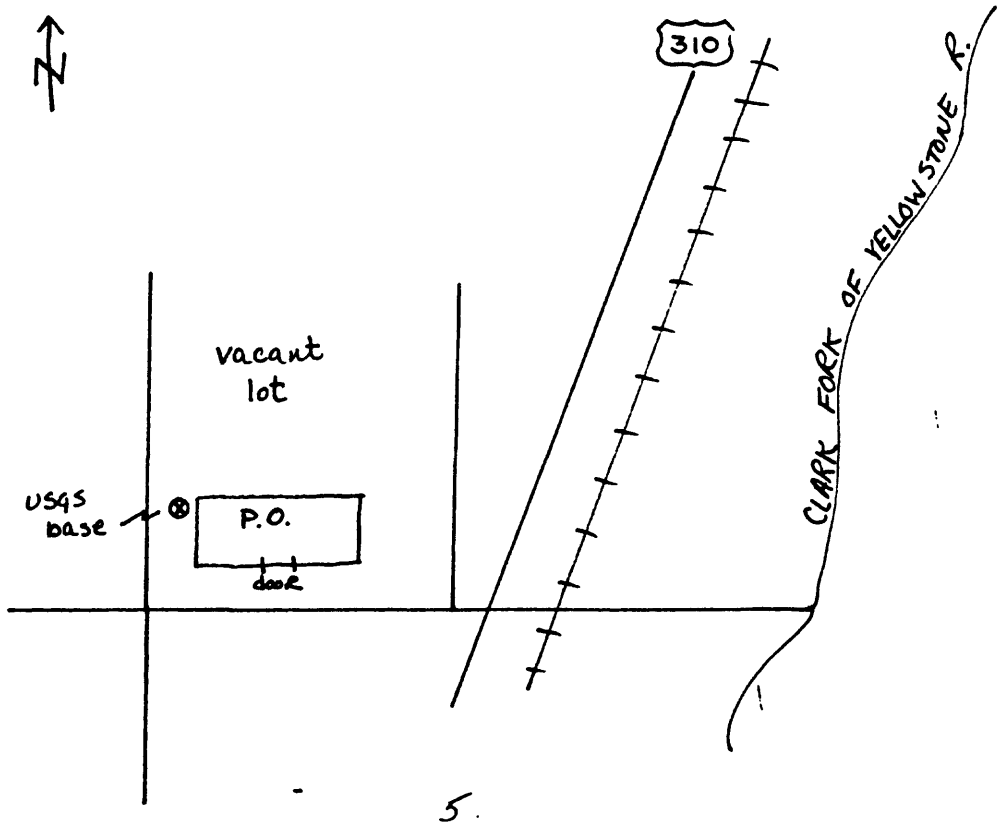
GRAVITY BASE STATION
U.S. GEOLOGICAL SURVEY

STATE/COUNTRY	STATION DESIGNATION	OBSERVED GRAVITY
Montana	Fromberg Post Office	980326.57 mgals
NEAREST TOWN	**LONGITUDE**	**LATITUDE**
Fromberg	108° 54.51'	45° 23.53'
ELEVATION	**TOPOGRAPHIC MAP(S)**	
3527 ft (1075. m)	Fromberg 7 1/2', Billings 2°	

DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
8/83	Kleinkopf	G-550	Columbus DOD	980316.58 mgals

DESCRIPTION/SKETCH

Fromberg USGS base is found at the post office in the city of Fromberg. The post office is at the corner of U.S. 310 and the main street in Fromberg. The base is located on the concrete sidewalk at the northwest corner of the building.



Appendix C

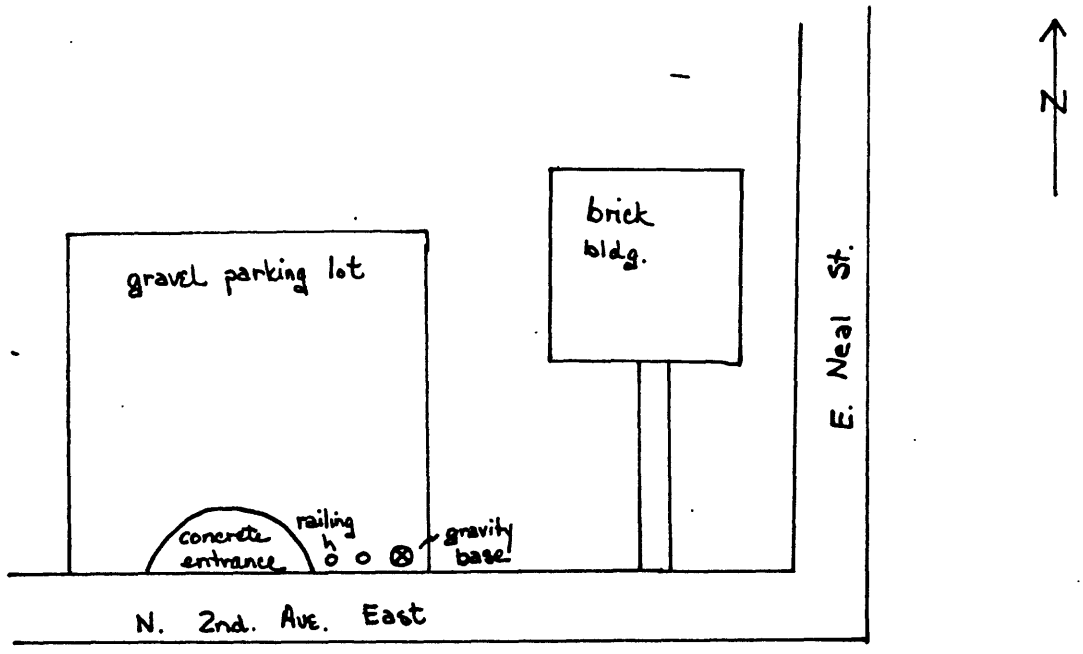
U.S. GEOLOGICAL SURVEY
GRAVITY BASE STATION

STATE/COUNTRY	STATION DESIGNATION	OBSERVED GRAVITY
MONTANA	THREE FORKS DOD	980290.09 mgal
NEAREST TOWN	LONGITUDE	LATITUDE
THREE FORKS	111°33.25'	45°53.75'
ELEVATION	TOPOGRAPHIC MAP(S)	
4080 ft. (1243.8 m)	Bozeman 2°	

DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
			ACIC 1231-O	
			IGC 15651-J	

DESCRIPTION/SKETCH

Station is located in front of the remains of the Three Forks consolidated school in Three Forks, MT, at the northwest corner of North 2nd Ave. East and East Neal St. Base is 0.6 m east of the iron railing posts at the concrete entrance.



Appendix D

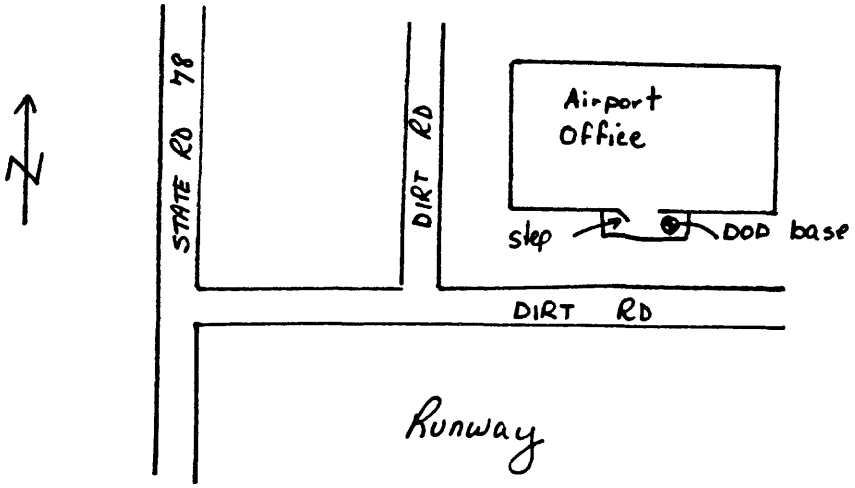
GRAVITY BASE STATION
U.S. GEOLOGICAL SURVEY

STATE/COUNTRY	STATION DESIGNATION	OBSERVED GRAVITY
Montana	Columbus DOD	980316.58 mgals
NEAREST TOWN	**LONGITUDE**	**LATITUDE**
Columbus	109° 15.00'	45° 38.00'
ELEVATION	**TOPOGRAPHIC MAP(S)**	
3574 ft (1089.7 m)	Columbus West 1:24,000 Bozeman 1:250,000	

DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
	ACIC 0676-0			
	IGC 155590			

DESCRIPTION/SKETCH

Station is located at the airport in Columbus, Montana, on the concrete step at the entrance to the ariport office, directly beneath the wall telephone (1968 description).



Appendix E: Principal Facts of Gravity Data

Explanation of headings

Identification	
sta-id	Gravity station identification number.
Location	
latitude	North latitude in degrees, decimal minutes.
longitude	West longitude in degrees, decimal minutes.
ele	Station elevation in feet.
st	State where station is located.
Gravity	
observed	Observed gravity in milligals.
theoretical	Theoretical gravity in milligals.
Corrections	
Terrain	Terrain correction, 166.7 km radius, in milligals.
Bouguer	Simple Bouguer slab 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 density dl.

Stillwater Complex, Mt., Gravity Stations
USGS 1972-83
Meter used: var.

STATION IDENTIFICATION sta-id	LOCATIONS LATITUDE deg min	LONGITUDE deg min	ELE (in ft)	ST	GRAVITY OBSERVED	THEORETICAL	CORRECTIONS TERRAIN	BOUGUER (d1=2.67)	CURV	ANOMALIES SPECIAL	FREE AIR	COMPLETE-BOUGUER d1=2.67
st1	45 23.32	-109 52.71	5154.00	mt	980187.72	980654.23	7.68	-175.79	-1.43	0.00	18.02	-151.51
est2	45 24.29	-109 52.76	5980.00	mt	980138.72	980655.69	5.13	-203.96	-1.49	0.00	45.18	-155.14
st3	45 24.87	-109 53.82	6420.00	mt	980115.72	980656.56	3.39	-218.97	-1.51	0.00	62.65	-154.44
st4	45 25.28	-109 54.82	6252.00	mt	980129.73	980657.18	3.16	-213.24	-1.51	0.00	60.26	-151.33
st5	45 23.75	-109 53.30	6400.00	mt	980115.72	980654.88	6.57	-218.29	-1.51	0.00	62.46	-150.77
st6	45 23.48	-109 53.65	6575.00	mt	980108.72	980654.46	5.11	-224.25	-1.52	0.00	72.31	-148.35
st7	45 23.47	-109 54.00	6790.00	mt	980097.72	980654.45	3.34	-231.59	-1.52	0.00	81.52	-148.24
est8	45 23.37	-109 54.38	7060.00	mt	980076.71	980654.30	5.10	-240.80	-1.51	0.00	86.03	-151.18
est9	45 23.09	-109 54.40	7500.00	mt	980045.71	980653.88	5.89	-255.80	-1.50	0.00	96.79	-154.62
est10	45 22.90	-109 54.86	7840.00	mt	980024.70	980653.59	5.25	-267.40	-1.48	0.00	108.01	-155.62
st11	45 23.22	-109 55.51	8787.00	mt	979970.69	980654.08	6.27	-299.70	-1.39	0.00	142.47	-152.35
st1	45 23.32	-109 52.71	5154.00	mt	980187.63	980654.23	6.67	-175.79	-1.43	0.00	17.94	-152.61
st12	45 22.80	-109 52.43	4991.00	mt	980184.63	980653.45	8.11	-170.23	-1.41	0.00	0.40	-163.13
st13	45 22.00	-109 53.35	5045.00	mt	980154.62	980652.23	8.91	-172.07	-1.42	0.00	-23.33	-187.91
st14	45 24.12	-109 51.61	4869.00	mt	980200.61	980655.43	6.74	-166.07	-1.39	0.00	2.93	-157.80
st15	45 27.17	-109 55.23	5591.00	mt	980170.60	980660.03	3.54	-190.69	-1.47	0.00	36.17	-152.46
st16	45 26.28	-109 55.37	5818.00	mt	980158.61	980658.69	3.59	-198.44	-1.49	0.00	46.85	-149.48
est17	45 26.65	-110 0.50	7970.00	mt	980035.62	980659.25	4.64	-271.83	-1.47	0.00	125.48	-143.18
est18	45 26.94	-110 0.68	8150.00	mt	980025.62	980659.69	5.07	-277.97	-1.46	0.00	131.95	-142.41
est19	45 27.40	-110 1.20	8460.00	mt	980008.63	980660.38	5.61	-288.55	-1.43	0.00	143.39	-140.97
est20	45 27.57	-110 1.75	8890.00	mt	979978.63	980660.64	6.24	-303.21	-1.37	0.00	153.52	-144.82
est21	45 27.12	-110 2.33	9135.00	mt	979965.64	980659.96	7.79	-311.57	-1.34	0.00	164.22	-140.89
est22	45 26.76	-110 2.35	9380.00	mt	979949.64	980659.41	6.93	-319.92	-1.30	0.00	171.78	-142.51
est23	45 26.57	-110 3.25	9350.00	mt	979952.65	980659.13	6.40	-318.90	-1.30	0.00	172.26	-141.55
est24	45 25.89	-110 3.12	9128.00	mt	979965.66	980658.10	5.17	-311.33	-1.34	0.00	165.44	-142.06
st25	45 25.56	-110 3.13	9244.00	mt	979955.67	980657.60	5.57	-315.29	-1.32	0.00	166.85	-144.19
st26	45 25.44	-110 2.53	9278.00	mt	979952.68	980657.42	6.13	-316.45	-1.32	0.00	167.23	-144.40
est27	45 25.26	-110 3.94	9470.00	mt	979940.69	980657.16	6.48	-322.99	-1.28	0.00	173.54	-144.26
est28	45 24.84	-110 3.98	9578.00	mt	979926.69	980656.52	6.48	-326.68	-1.26	0.00	170.32	-151.14
est29	45 24.67	-110 4.54	9380.00	mt	979933.70	980656.27	5.99	-319.92	-1.30	0.00	158.99	-156.24
est30	45 24.77	-110 5.23	8920.00	mt	979957.71	980656.41	4.72	-304.24	-1.37	0.00	139.65	-161.24
est31	45 25.30	-110 5.28	8745.00	mt	979979.72	980657.22	3.82	-298.27	-1.39	0.00	144.42	-151.42
est32	45 25.68	-110 6.51	9030.00	mt	979961.72	980657.79	4.84	-307.99	-1.35	0.00	152.61	-151.89
est33	45 25.84	-110 7.95	9433.00	mt	979934.73	980658.03	6.24	-321.73	-1.29	0.00	163.23	-153.56
est34	45 25.69	-110 8.59	9650.00	mt	979914.73	980657.80	7.14	-329.13	-1.25	0.00	163.83	-159.41
st35	45 26.16	-110 8.62	9822.00	mt	979910.74	980658.51	8.51	-335.00	-1.22	0.00	175.30	-152.41
st36	45 26.35	-110 6.91	9487.00	mt	979940.76	980658.80	6.80	-323.57	-1.28	0.00	173.56	-144.49
st37	45 26.56	-110 9.08	10158.00	mt	979886.76	980659.12	11.50	-346.46	-1.15	0.00	182.26	-153.85
est38	45 26.76	-110 9.24	9600.00	mt	979924.76	980659.41	7.66	-327.43	-1.26	0.00	167.56	-153.47
est39	45 27.15	-110 9.14	9700.00	mt	979927.76	980660.00	8.08	-330.84	-1.24	0.00	179.36	-144.64

Stillwater Complex, Mt., Gravity Stations
USGS 1972-83
Meter used: var.

STATION IDENTIFICATION sta-id	LOCATIONS LATITUDE deg	min	LONGITUDE deg	min	ELE (in ft)	GRAVITY ST	OBSERVED	THEORETICAL	CORRECTIONS TERRAIN	BOUGUER (d1=2.67)	CURV	ANOMALIES SPECIAL	FREE AIR	COMPLETE-BOUGUER d1=2.67
st40	45	27.50	-110	9.52	9625.00	mt	979934.76	980660.53	7.83	-328.28	-1.26	0.00	178.79	-142.92
est41	45	27.27	-110	8.71	9090.00	mt	979971.76	980660.19	6.51	-310.03	-1.35	0.00	165.89	-138.98
st43	45	24.31	-110	3.83	10081.00	mt	979884.73	980655.73	8.48	-343.83	-1.16	0.00	176.40	-160.12
st44	45	24.07	-110	3.08	9781.00	mt	979903.73	980655.36	7.08	-333.60	-1.23	0.00	167.58	-160.17
st45	45	23.79	-110	2.72	9558.00	mt	979916.72	980654.94	5.92	-326.00	-1.27	0.00	160.05	-161.29
est46	45	23.48	-110	2.20	9200.00	mt	979935.71	980654.46	4.95	-313.79	-1.33	0.00	145.89	-164.27
st47	45	27.38	-109	51.94	5296.00	mt	980191.63	980660.34	2.89	-180.63	-1.44	0.00	29.16	-150.03
st48	45	27.05	-109	49.68	5006.00	mt	980205.63	980659.85	3.05	-170.74	-1.41	0.00	16.40	-152.70
est49	45	21.38	-109	48.39	8400.00	mt	979990.57	980651.30	6.41	-286.50	-1.43	0.00	128.78	-152.74
est50	45	21.66	-109	48.65	8800.00	mt	979965.57	980651.72	8.69	-300.14	-1.39	0.00	140.93	-151.91
st51	45	21.82	-109	49.10	9346.00	mt	979922.57	980651.97	11.58	-318.77	-1.30	0.00	148.97	-159.52
st52	45	21.56	-109	49.54	9110.00	mt	979935.58	980651.57	8.24	-310.72	-1.34	0.00	140.20	-163.61
est53	45	22.18	-109	48.63	8850.00	mt	979968.58	980652.51	8.24	-301.85	-1.38	0.00	147.85	-147.14
st54	45	22.44	-109	48.41	9002.00	mt	979949.58	980652.90	10.21	-307.03	-1.36	0.00	142.73	-155.45
est55	45	22.08	-109	49.19	8480.00	mt	979985.59	980652.36	9.12	-289.23	-1.42	0.00	130.26	-151.28
est56	45	22.29	-109	50.06	7850.00	mt	980021.59	980652.67	8.16	-267.74	-1.48	0.00	106.76	-154.30
est57	45	22.26	-109	49.58	8140.00	mt	980005.59	980652.63	8.16	-277.63	-1.46	0.00	118.05	-152.88
est58	45	21.85	-109	48.54	8575.00	mt	979983.60	980652.02	8.16	-292.47	-1.41	0.00	137.54	-148.18
est59	45	21.95	-109	48.09	8260.00	mt	980007.60	980652.16	7.21	-281.72	-1.45	0.00	131.80	-144.16
est60	45	22.14	-109	47.66	8063.00	mt	980017.60	980652.45	6.09	-275.01	-1.46	0.00	123.01	-147.37
st61	45	22.57	-109	47.08	7745.00	mt	980028.61	980653.10	7.58	-264.16	-1.49	0.00	103.49	-154.57
est62	45	22.89	-109	46.96	7600.00	mt	980036.61	980653.58	5.22	-259.21	-1.50	0.00	97.39	-158.10
est63	45	22.58	-109	46.39	7140.00	mt	980063.61	980653.11	6.14	-243.52	-1.51	0.00	81.64	-157.26
est64	45	23.22	-109	46.71	6727.00	mt	980087.61	980654.08	5.60	-229.44	-1.52	0.00	65.87	-159.49
est65	45	23.75	-109	47.13	6420.00	mt	980109.62	980654.88	4.18	-218.97	-1.51	0.00	58.24	-158.06
est66	45	23.47	-109	46.02	5990.00	mt	980135.62	980654.45	3.64	-204.30	-1.50	0.00	44.25	-157.90
est67	45	23.59	-109	45.18	5790.00	mt	980149.62	980654.63	3.62	-197.48	-1.48	0.00	39.28	-156.06
est68	45	23.88	-109	44.32	5715.00	mt	980154.62	980655.07	3.41	-194.92	-1.48	0.00	36.80	-156.19
est69	45	24.63	-109	52.79	5987.00	mt	980132.63	980656.20	4.28	-204.20	-1.50	0.00	39.24	-162.18
est70	45	23.92	-109	58.06	6570.00	mt	980104.63	980655.13	4.39	-224.08	-1.52	0.00	67.09	-154.12
est71	45	24.24	-109	57.33	6210.00	mt	980127.63	980655.62	4.55	-211.81	-1.51	0.00	55.78	-152.98
est72	45	24.68	-109	56.84	6157.00	mt	980133.63	980656.27	4.58	-210.00	-1.50	0.00	56.13	-150.79
est73	45	25.24	-109	56.00	6067.00	mt	980139.63	980657.13	4.83	-206.93	-1.50	0.00	52.83	-150.76
f1	45	25.20	-110	5.19	8737.00	mt	979978.57	980657.06	4.02	-297.99	-1.39	0.00	142.67	-152.70
f2	45	26.89	-110	3.30	9647.00	mt	979933.57	980659.62	8.38	-329.03	-1.25	0.00	180.59	-141.31
f3	45	28.08	-110	2.74	8968.00	mt	979976.57	980661.41	9.67	-305.87	-1.36	0.00	158.02	-139.54
f4	45	30.72	-110	1.49	9295.00	mt	979934.57	980665.39	15.46	-317.03	-1.31	0.00	142.75	-160.13
f5	45	26.56	-109	48.41	4845.00	mt	980216.58	980659.12	3.53	-165.25	-1.39	0.00	12.95	-150.16
f6	45	25.46	-109	50.65	4898.00	mt	980204.58	980657.45	5.18	-167.06	-1.40	0.00	7.60	-155.68
f7	45	23.31	-109	52.39	4931.00	mt	980190.58	980654.21	8.38	-168.18	-1.40	0.00	-0.06	-161.26

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Stillwater Complex, Mt., Gravity Stations
USGS 1972-83
Meter used: var.

STATION IDENTIFICATION sta-id	LOCATIONS LATITUDE deg	min	LONGITUDE deg	min	ELE (in ft)	ST	GRAVITY OBSERVED	THEORETICAL	CORRECTIONS TERRAIN	BOUGUER (d1=2.67)	CURV	ANOMALIES SPECIAL	FREE AIR	COMPLETE-BOUGUER d1=2.67
f8	45	21.62	-109	53.66	5354.00	mt	980141.58	980651.66	8.83	-182.61	-1.45	0.00	-6.76	-181.99
f9	45	29.66	-110	2.02	6861.00	mt	980098.60	980663.79	3.05	-234.01	-1.52	0.00	79.74	-152.74
f10	45	32.29	-110	1.06	8472.00	mt	979989.60	980667.76	12.13	-288.96	-1.43	0.00	118.11	-160.14
f11	45	31.82	-110	1.23	8700.00	mt	979973.60	980667.05	13.32	-296.73	-1.40	0.00	124.24	-160.57
f12	45	37.50	-110	8.11	4916.00	mt	980211.59	980675.62	1.97	-167.67	-1.40	0.00	-1.86	-168.96
f13	45	34.52	-110	11.90	4931.00	mt	980208.59	980671.12	3.09	-168.18	-1.40	0.00	1.05	-165.45
f14	45	31.90	-110	12.82	5170.00	mt	980191.60	980667.17	5.67	-176.33	-1.43	0.00	10.46	-161.63
f15	45	28.88	-110	12.64	5270.00	mt	980173.60	980662.61	8.74	-179.74	-1.44	0.00	6.42	-166.03
f16	45	20.49	-110	13.89	6142.00	mt	980069.61	980649.96	7.15	-209.49	-1.50	0.00	-2.98	-206.82
f17	45	17.26	-110	14.52	6439.00	mt	980046.61	980645.09	6.42	-219.62	-1.51	0.00	6.80	-207.90
hdk1	45	28.14	-110	8.20	10056.00	mt	979900.65	980661.50	13.00	-342.98	-1.17	0.00	184.19	-146.96
hdk2	45	29.08	-110	8.38	9614.00	mt	979928.66	980662.91	12.06	-327.91	-1.26	0.00	169.27	-147.83
hdk3	45	29.03	-110	9.33	9780.00	mt	979920.67	980662.84	12.01	-333.57	-1.23	0.00	176.96	-145.83
hdk4	45	27.44	-110	10.26	8628.00	mt	979981.67	980660.44	20.42	-294.28	-1.41	0.00	132.16	-143.11
hdk5	45	28.63	-110	6.91	9528.00	mt	979933.67	980662.24	13.93	-324.97	-1.27	0.00	166.89	-145.43
hdk6	45	28.32	-110	5.49	8649.00	mt	979984.68	980661.77	17.49	-294.99	-1.40	0.00	135.81	-143.10
hdk7	45	26.34	-110	6.53	9581.00	mt	979937.68	980658.78	8.23	-326.78	-1.26	0.00	179.33	-140.48
hdk8	45	26.98	-110	3.01	10000.00	mt	979904.68	980659.75	12.38	-341.07	-1.18	0.00	184.71	-145.16
hdk9	45	24.75	-110	3.55	9987.00	mt	979900.68	980656.38	9.72	-340.63	-1.18	0.00	182.86	-149.23
hdk10	45	26.80	-110	0.27	9032.00	mt	979952.68	980659.48	14.23	-308.06	-1.35	0.00	142.07	-153.11
hdk11	45	24.16	-109	57.94	7580.00	mt	980042.69	980655.50	10.08	-258.53	-1.50	0.00	99.67	-150.28
hdk12	45	23.02	-109	55.70	8457.00	mt	979994.69	980653.77	8.34	-288.44	-1.43	0.00	135.78	-145.76
hdk16	45	22.41	-109	48.34	9002.00	mt	979949.68	980652.85	12.87	-307.03	-1.36	0.00	142.88	-152.64
hdk17	45	21.80	-109	49.03	9345.00	mt	979921.68	980651.93	14.50	-318.73	-1.30	0.00	148.01	-157.53
hdk18	45	21.33	-109	47.64	8680.00	mt	979969.68	980651.23	9.21	-296.05	-1.40	0.00	134.26	-153.98
hdk19	45	20.60	-109	45.90	8126.00	mt	979996.68	980650.12	7.27	-277.15	-1.46	0.00	110.32	-161.02
hdk20	45	26.74	-109	54.90	6102.00	mt	980140.68	980659.39	4.41	-208.12	-1.50	0.00	54.91	-150.30
hdk21	45	30.07	-109	46.16	5646.00	mt	980179.67	980664.41	3.28	-192.57	-1.47	0.00	46.03	-144.73
hdk23	45	28.75	-109	43.83	4660.00	mt	980236.63	980662.42	2.12	-158.94	-1.37	0.00	12.32	-145.86
hdk24	45	27.77	-109	45.80	4797.00	mt	980225.62	980660.94	2.46	-163.61	-1.39	0.00	15.66	-146.88
hdk25	45	29.49	-109	40.63	4523.00	mt	980245.61	980663.53	2.23	-154.27	-1.35	0.00	7.31	-146.08
hdk26	45	30.31	-109	38.93	4451.00	mt	980251.61	980664.77	1.37	-151.81	-1.34	0.00	5.30	-146.48
hdk27	45	32.61	-109	39.86	4761.00	mt	980234.67	980668.24	1.26	-162.38	-1.38	0.00	14.03	-148.48
hdk28	45	33.08	-109	42.32	5024.00	mt	980218.71	980668.95	1.38	-171.35	-1.41	0.00	22.08	-149.31
hdk29	45	34.72	-109	42.32	5234.00	mt	980203.77	980671.42	0.80	-178.52	-1.44	0.00	24.40	-154.75
hdk30	45	35.69	-109	45.34	5028.00	mt	980211.81	980672.88	1.14	-171.49	-1.41	0.00	11.62	-160.15
hdk31	45	37.69	-109	45.64	4536.00	mt	980236.84	980675.91	1.77	-154.71	-1.35	0.00	-12.61	-166.89
hdk32	45	39.11	-109	46.28	4372.00	mt	980245.86	980678.04	1.39	-149.12	-1.32	0.00	-21.15	-170.20
hdk33	45	40.95	-109	43.83	4170.00	mt	980258.90	980680.82	0.92	-142.23	-1.29	0.00	-29.87	-172.47
hdk34	45	42.03	-109	41.77	4048.00	mt	980267.92	980682.45	0.87	-138.07	-1.27	0.00	-33.94	-172.41

Stillwater Complex, Mt., Gravity Stations
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Meter used: var.

STATION IDENTIFICATION	LOCATIONS				GRAVITY			CORRECTIONS			ANOMALIES		
	LATITUDE		LONGITUDE		ELE	ST	OBSERVED	THEORETICAL	TERRAIN	BOUGUER (d1=2,67)	CURV	SPECIAL	FREE AIR	COMPLETE-BOUGUER d1=2.67
sta-id	deg	min	deg	min	(in ft)									
hdk35	45	43.49	-109	41.06	3877.00	mt	980281.96	980684.65	0.55	-132.23	-1.24	0.00	-38.18	-171.10
st74	45	27.58	-109	47.88	4901.00	mt	980217.62	980660.66	2.61	-167.16	-1.40	0.00	17.71	-148.23
st75	45	27.82	-109	46.76	4848.00	mt	980221.61	980661.02	2.40	-165.35	-1.39	0.00	16.37	-147.98
st76	45	28.14	-109	45.08	4797.00	mt	980229.61	980661.50	2.06	-163.61	-1.39	0.00	19.09	-143.85
sw80	45	31.86	-109	29.70	4160.00	mt	980265.58	980667.11	0.52	-141.89	-1.29	0.00	-10.42	-153.07
sw81	45	33.16	-109	31.87	4300.00	mt	980256.56	980669.07	0.46	-146.66	-1.31	0.00	-8.24	-155.75
sw82	45	33.90	-109	33.80	4458.00	mt	980247.56	980670.19	0.45	-152.05	-1.34	0.00	-3.51	-156.44
sw83	45	34.81	-109	35.60	4648.00	mt	980234.55	980671.56	0.44	-158.53	-1.37	0.00	-0.03	-159.49
sw84	45	36.16	-109	36.76	5005.00	mt	980210.55	980673.59	0.58	-170.71	-1.41	0.00	7.48	-164.06
sw85	45	37.95	-109	36.78	4855.00	mt	980216.55	980676.30	0.47	-165.59	-1.39	0.00	-3.32	-169.83
sw86	45	39.68	-109	37.39	4714.00	mt	980222.55	980678.90	0.39	-160.78	-1.37	0.00	-13.18	-174.95
sw87	45	40.74	-109	36.03	4330.00	mt	980248.55	980680.50	0.22	-147.68	-1.32	0.00	-24.87	-173.65
sw88	45	42.38	-109	33.68	3816.00	mt	980280.55	980682.97	0.32	-130.15	-1.22	0.00	-43.65	-174.71
sw89	45	41.09	-109	33.79	4592.00	mt	980232.55	980681.02	0.29	-156.62	-1.36	0.00	-16.77	-174.46
sw90	45	39.80	-109	34.07	4629.00	mt	980229.55	980679.08	0.35	-157.88	-1.36	0.00	-14.35	-173.24
sw91	45	38.72	-109	32.47	4562.00	mt	980234.55	980677.45	0.30	-155.60	-1.35	0.00	-14.01	-170.66
sw92	45	38.28	-109	28.74	4155.00	mt	980260.56	980676.79	0.19	-141.72	-1.29	0.00	-25.59	-168.40
sw93	45	38.62	-109	23.22	3815.00	mt	980287.57	980677.30	0.14	-130.12	-1.22	0.00	-31.05	-162.26
sw94	45	39.16	-109	25.07	4387.00	mt	980250.57	980678.13	0.19	-149.63	-1.33	0.00	-15.10	-165.87
sw95	45	33.08	-109	25.06	3979.00	mt	980276.59	980668.95	0.36	-135.71	-1.26	0.00	-18.25	-154.86
sw96	45	34.17	-109	19.79	3841.00	mt	980289.59	980670.59	0.25	-131.01	-1.23	0.00	-19.87	-151.86
sw97	45	35.68	-109	17.70	3749.00	mt	980299.59	980672.88	0.18	-127.87	-1.21	0.00	-20.79	-149.69
sw98	45	36.97	-109	12.46	3551.00	mt	980319.57	980674.82	0.18	-121.11	-1.17	0.00	-21.37	-143.48
sw99	45	35.03	-109	11.22	3732.00	mt	980308.56	980671.89	0.13	-127.29	-1.21	0.00	-12.45	-140.81
sw100	45	34.19	-109	9.65	3681.00	mt	980310.56	980670.62	0.20	-125.55	-1.20	0.00	-13.97	-140.52
sw101	45	33.13	-109	7.11	4032.00	mt	980288.56	980669.02	0.08	-137.52	-1.27	0.00	-1.38	-140.09
sw102	45	32.16	-109	6.28	4181.00	mt	980279.55	980667.56	0.11	-142.60	-1.29	0.00	5.07	-138.72
sw103	45	30.73	-109	4.88	4207.00	mt	980277.55	980665.41	0.11	-143.49	-1.30	0.00	7.67	-137.01
sw104	45	35.18	-109	16.83	3968.00	mt	980288.54	980672.11	0.11	-135.34	-1.25	0.00	-10.51	-147.00
sw105	45	33.85	-109	16.33	4355.00	mt	980264.54	980670.11	0.20	-148.54	-1.32	0.00	3.87	-145.79
sw106	45	32.31	-109	15.17	4407.00	mt	980262.55	980667.79	0.22	-150.31	-1.33	0.00	9.08	-142.34
sw107	45	30.82	-109	16.27	4359.00	mt	980262.55	980665.54	0.21	-148.67	-1.32	0.00	6.82	-142.96
esw108	45	33.70	-109	26.96	4190.00	mt	980260.55	980669.88	0.28	-142.91	-1.29	0.00	-15.41	-159.33
sw109	45	34.81	-109	28.75	4682.00	mt	980229.56	980671.56	0.39	-159.69	-1.37	0.00	-1.82	-162.49
sw110	45	35.25	-109	26.57	4614.00	mt	980234.56	980672.22	0.35	-157.37	-1.36	0.00	-3.88	-162.26
sw111	45	35.69	-109	24.45	4422.00	mt	980248.56	980672.88	0.25	-150.82	-1.33	0.00	-8.59	-160.49
sw112	45	36.35	-109	23.49	4398.00	mt	980251.57	980673.88	0.24	-150.00	-1.33	0.00	-8.83	-159.92
sw113	45	36.94	-109	20.40	3896.00	mt	980286.58	980674.77	0.11	-132.88	-1.24	0.00	-21.90	-155.91
sw114	45	37.46	-109	19.25	3727.00	mt	980298.58	980675.55	0.14	-127.12	-1.21	0.00	-26.57	-154.75
sw115	45	37.40	-109	17.28	3632.00	mt	980309.58	980675.46	0.18	-123.88	-1.19	0.00	-24.40	-149.29

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Stillwater Complex, Mt., Gravity Stations
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Meter used: var.

STATION IDENTIFICATION sta-id	LOCATIONS LATITUDE deg min	LONGITUDE deg min	ELE (in ft)	ST	GRAVITY OBSERVED	GRAVITY THEORETICAL	CORRECTIONS TERRAIN (d1=2.67)	BOUGUER	CURV	ANOMALIES SPECIAL	FREE AIR	COMPLETE-BOUGUER d1=2.67
sw116	45 39.51	-109 15.15	3702.00	mt	980308.60	980678.65	0.07	-126.26	-1.20	0.00	-21.99	-149.38
sw117	45 39.88	-109 12.66	4087.00	mt	980289.60	980679.21	0.01	-139.40	-1.28	0.00	-5.35	-146.01
sw118	45 40.94	-109 11.44	4121.00	mt	980289.60	980680.80	0.01	-140.56	-1.28	0.00	-3.76	-145.59
sw119	45 41.74	-109 9.24	4116.00	mt	980293.60	980682.02	-0.01	-140.38	-1.28	0.00	-1.43	-143.11
sw120	45 43.45	-109 8.07	4132.00	mt	980295.60	980684.59	-0.01	-140.93	-1.28	0.00	-0.51	-142.73
sw121	45 46.15	-109 7.95	4253.00	mt	980292.60	980688.66	0.03	-145.06	-1.30	0.00	3.79	-142.55
sw122	45 47.93	-109 5.37	4310.00	mt	980295.60	980691.34	0.08	-147.00	-1.31	0.00	9.46	-138.77
sw123	45 48.39	-109 2.84	4188.00	mt	980305.60	980692.04	0.02	-142.84	-1.29	0.00	7.30	-136.81
sw124	45 48.37	-109 0.34	4164.00	mt	980308.60	980692.02	0.10	-142.02	-1.29	0.00	8.08	-135.13
sw125	45 46.17	-109 0.44	4163.00	mt	980305.60	980688.70	0.08	-141.99	-1.29	0.00	8.30	-134.90
sw126	45 46.19	-108 56.74	4050.00	mt	980316.60	980688.72	0.10	-138.13	-1.27	0.00	8.65	-130.65
sw127	45 43.07	-109 17.36	3922.00	mt	980297.57	980684.02	0.02	-133.77	-1.25	0.00	-17.71	-152.70
sw128	45 46.16	-109 17.70	4523.00	mt	980267.57	980688.67	0.16	-154.27	-1.35	0.00	4.12	-151.34
sw129	45 46.15	-109 20.10	4417.00	mt	980269.57	980688.66	0.09	-150.65	-1.33	0.00	-3.83	-155.72
sw130	45 46.14	-109 22.63	4384.00	mt	980269.56	980688.65	0.08	-149.53	-1.33	0.00	-6.92	-157.70
sw131	45 45.34	-109 25.28	4267.00	mt	980270.56	980687.45	0.05	-145.54	-1.31	0.00	-15.71	-162.50
sw132	45 46.14	-109 27.46	4112.00	mt	980279.56	980688.65	0.05	-140.25	-1.28	0.00	-22.49	-163.97
sw133	45 46.17	-109 29.99	4108.00	mt	980277.56	980688.70	0.07	-140.11	-1.28	0.00	-24.91	-166.23
sw134	45 46.51	-109 33.39	4101.00	mt	980278.56	980689.21	0.13	-139.87	-1.28	0.00	-25.08	-166.10
sw135	45 48.75	-109 34.05	4288.00	mt	980275.56	980692.59	0.15	-146.25	-1.31	0.00	-13.89	-161.30
sw136	45 47.22	-109 36.20	4339.00	mt	980265.56	980690.27	0.12	-147.99	-1.32	0.00	-16.78	-165.97
sw137	45 47.76	-109 39.63	4867.00	mt	980235.56	980691.09	0.40	-166.00	-1.39	0.00	2.03	-164.96
sw138	45 47.90	-109 42.65	4290.00	mt	980269.56	980691.30	0.13	-146.32	-1.31	0.00	-18.41	-165.91
sw139	45 47.89	-109 45.21	4102.00	mt	980278.56	980691.29	0.19	-139.91	-1.28	0.00	-27.07	-168.07
sw140	45 49.75	-109 56.01	4095.00	mt	980278.58	980694.09	0.31	-139.67	-1.28	0.00	-30.52	-171.15
sw141	45 47.78	-109 57.20	4245.00	mt	980265.58	980691.12	0.31	-144.78	-1.30	0.00	-26.44	-172.22
sw142	45 46.73	-109 56.42	4487.00	mt	980248.59	980689.53	0.29	-153.04	-1.34	0.00	-19.10	-173.19
esw143	45 45.73	-109 57.01	4790.00	mt	980225.59	980688.03	0.39	-163.37	-1.38	0.00	-12.12	-176.49
sw145	45 49.40	-109 53.53	4049.00	mt	980280.61	980693.56	0.28	-138.10	-1.27	0.00	-32.28	-171.37
sw146	45 46.68	-109 48.64	3965.00	mt	980281.61	980689.46	0.33	-135.23	-1.25	0.00	-35.07	-171.23
sw147	45 45.36	-109 50.15	4157.00	mt	980266.62	980687.47	0.35	-141.78	-1.29	0.00	-30.03	-172.75
sw148	45 44.25	-109 51.50	4274.00	mt	980257.62	980685.80	0.43	-145.77	-1.31	0.00	-26.36	-173.01
sw149	45 41.73	-109 54.31	5045.00	mt	980208.62	980681.99	0.60	-172.07	-1.42	0.00	0.91	-171.98
sw150	45 40.15	-109 54.99	5197.00	mt	980200.63	980679.62	0.74	-177.25	-1.43	0.00	9.59	-168.36
sw151	45 38.29	-109 55.72	5851.00	mt	980170.63	980676.81	1.23	-199.56	-1.49	0.00	43.85	-155.96
sw152	45 46.34	-109 46.41	3889.00	mt	980287.63	980688.95	0.39	-132.64	-1.24	0.00	-35.68	-169.17
sw153	45 49.64	-109 45.12	4063.00	mt	980284.63	980693.92	0.19	-138.58	-1.27	0.00	-27.30	-166.96
sw154	45 51.90	-109 45.24	4138.00	mt	980285.62	980697.34	0.15	-141.14	-1.28	0.00	-22.68	-164.95
sw155	45 51.39	-109 47.58	4272.00	mt	980274.62	980696.56	0.10	-145.71	-1.31	0.00	-20.31	-167.22
sw156	45 51.40	-109 50.08	4242.00	mt	980275.62	980696.58	0.12	-144.68	-1.30	0.00	-22.15	-168.01

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Stillwater Complex, Mt., Gravity Stations
USGS 1972-83
Meter used: var.

STATION IDENTIFICATION sta-id	LOCATIONS LATITUDE deg min	LONGITUDE deg min	ELE (in ft)	GRAVITY ST OBSERVED	THEORETICAL	CORRECTIONS TERRAIN (d1=2.67)	BOUGUER	CURV	ANOMALIES SPECIAL	FREE AIR	COMPLETE-BOUGUER d1=2.67
sw157	45 51.41	-109 52.56	4105.00 mt	980282.62	980696.59	0.20	-140.01	-1.28	0.00	-28.04	-169.13
sw158	45 51.30	-109 56.31	4038.00 mt	980285.62	980696.43	0.36	-137.72	-1.27	0.00	-31.17	-169.80
sw159	45 41.37	-108 46.25	3455.00 mt	980353.58	980681.45	0.11	-117.84	-1.15	0.00	-3.03	-121.91
sw160	45 42.84	-108 47.41	3649.00 mt	980343.58	980683.67	-0.01	-124.46	-1.19	0.00	2.99	-122.67
sw161	45 43.15	-108 50.13	4032.00 mt	980318.57	980684.14	0.39	-137.52	-1.27	0.00	13.51	-124.89
sw162	45 43.39	-108 53.00	4024.00 mt	980317.57	980684.50	0.31	-137.25	-1.26	0.00	11.40	-126.80
sw163	45 44.45	-108 48.13	3533.00 mt	980353.57	980686.09	0.24	-120.50	-1.17	0.00	-0.35	-121.78
sw164	45 46.54	-108 47.74	3427.00 mt	980362.57	980689.25	0.46	-116.89	-1.14	0.00	-4.47	-122.04
sw165	45 46.17	-108 45.05	3407.00 mt	980366.57	980688.70	-0.01	-116.20	-1.14	0.00	-1.79	-119.15
sw166	45 39.02	-108 44.71	3262.00 mt	980363.56	980677.91	-0.03	-111.26	-1.11	0.00	-7.64	-120.04
sw167	45 37.77	-108 42.81	3425.00 mt	980352.56	980676.02	0.12	-116.82	-1.14	0.00	-1.44	-119.28
sw168	45 37.57	-108 40.70	3710.00 mt	980334.56	980675.73	0.19	-126.54	-1.20	0.00	7.66	-119.89
sw169	45 35.70	-108 40.09	4147.00 mt	980303.56	980672.90	1.43	-141.44	-1.29	0.00	20.55	-120.75
sw170	45 33.95	-108 39.44	4445.00 mt	980277.56	980670.26	0.86	-151.61	-1.34	0.00	25.20	-126.88
sw171	45 32.64	-108 39.12	4613.00 mt	980256.56	980668.28	0.85	-157.34	-1.36	0.00	21.97	-135.88
sw172	45 30.68	-108 39.36	4271.00 mt	980268.56	980665.33	0.51	-145.67	-1.31	0.00	4.78	-141.69
sw173	45 32.43	-108 38.32	4795.00 mt	980239.56	980667.97	2.66	-163.54	-1.39	0.00	22.38	-139.88
sw174	45 23.53	-108 54.51	3527.00 mt	980326.57	980654.55	0.40	-120.30	-1.17	0.00	3.64	-117.42
sw175	45 27.85	-109 32.09	4621.00 mt	980237.59	980661.06	0.83	-157.61	-1.36	0.00	10.97	-147.17
sw176	45 27.61	-109 33.59	4710.00 mt	980230.59	980660.70	0.94	-160.64	-1.37	0.00	12.70	-148.38
sw177	45 28.95	-109 32.33	4475.00 mt	980247.59	980662.72	0.79	-152.63	-1.34	0.00	5.59	-147.59
sw178	45 30.04	-109 31.07	4263.00 mt	980261.59	980664.37	0.70	-145.40	-1.31	0.00	-1.97	-147.98
sw179	45 29.61	-109 33.93	4473.00 mt	980248.59	980663.71	0.82	-152.56	-1.34	0.00	5.41	-147.67
sw180	45 30.47	-109 34.32	4449.00 mt	980250.59	980665.01	0.76	-151.74	-1.34	0.00	3.86	-148.46
sw181	45 28.84	-109 26.99	4215.00 mt	980264.59	980662.55	0.62	-143.76	-1.30	0.00	-1.68	-146.12
sw182	45 27.85	-109 26.81	4308.00 mt	980257.60	980661.06	0.65	-146.93	-1.31	0.00	1.56	-146.04
sw183	45 26.63	-109 26.85	4402.00 mt	980248.60	980659.22	0.74	-150.14	-1.33	0.00	3.24	-147.49
sw184	45 25.23	-109 26.03	4504.00 mt	980238.60	980657.11	0.82	-153.62	-1.34	0.00	4.94	-149.21
sw185	45 23.65	-109 26.49	4618.00 mt	980226.60	980654.73	0.99	-157.51	-1.36	0.00	6.03	-151.84
sw186	45 25.36	-109 24.78	4717.00 mt	980227.60	980657.30	0.69	-160.88	-1.37	0.00	13.76	-147.81
sw187	45 24.74	-109 23.79	4841.00 mt	980217.60	980656.37	0.72	-165.11	-1.39	0.00	16.35	-149.43
sw188	45 31.87	-109 25.06	4029.00 mt	980274.60	980667.13	0.41	-137.42	-1.27	0.00	-13.73	-152.00
sw189	45 30.48	-109 24.72	4130.00 mt	980270.60	980665.02	0.43	-140.86	-1.28	0.00	-6.13	-147.85
sw190	45 28.95	-109 24.08	4213.00 mt	980265.59	980662.72	0.48	-143.69	-1.30	0.00	-1.03	-145.54
sw191	45 28.75	-108 59.18	3771.00 mt	980313.58	980662.42	0.19	-128.62	-1.22	0.00	5.71	-123.93
sw192	45 27.25	-108 57.42	3745.00 mt	980315.58	980660.16	0.39	-127.73	-1.21	0.00	7.53	-121.03
sw193	45 26.56	-108 55.40	3680.00 mt	980321.58	980659.12	0.33	-125.51	-1.20	0.00	8.46	-117.93
sw194	45 25.03	-108 54.74	3633.00 mt	980322.57	980656.61	0.27	-123.91	-1.19	0.00	7.34	-117.49
sw195	45 23.95	-108 54.74	3574.00 mt	980324.57	980655.18	0.36	-121.90	-1.18	0.00	5.42	-117.29
sw196	45 23.52	-108 52.87	3558.00 mt	980329.57	980654.53	0.42	-121.35	-1.17	0.00	9.57	-112.54

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Stillwater Complex, Mt., Gravity Stations
USGS 1972-83
Meter used: var.

STATION IDENTIFICATION sta-id	LOCATIONS LATITUDE deg	min	LONGITUDE deg	min	ELE (in ft)	GRAVITY ST	OBSERVED	THEORETICAL	CORRECTIONS TERRAIN	BOUGUER	CURV	ANOMALIES SPECIAL	FREE AIR	COMPLETE-BOUGUER d1=2.67
									(d1=2.67)					
sw197	45	22.42	-108	52.88	3604.00	mt	980325.57	980652.88	0.37	-122.92	-1.18	0.00	11.55	-112.18
sw198	45	21.76	-108	51.67	3658.00	mt	980322.57	980651.88	0.52	-124.76	-1.19	0.00	14.62	-110.81
sw199	45	19.93	-108	50.22	3855.00	mt	980305.57	980649.12	0.65	-131.48	-1.23	0.00	18.91	-113.16
sw200	45	19.59	-108	48.70	3982.00	mt	980291.57	980648.60	0.82	-135.81	-1.26	0.00	17.35	-118.90
sw201	45	18.16	-108	51.00	4112.00	mt	980278.57	980646.45	0.57	-140.25	-1.28	0.00	18.73	-122.23
sw202	45	17.92	-108	53.38	3629.00	mt	980308.57	980646.09	0.61	-123.77	-1.19	0.00	3.69	-120.66
sw203	45	27.86	-108	52.89	3555.00	mt	980335.56	980661.07	0.17	-121.25	-1.17	0.00	8.73	-113.52
sw204	45	27.87	-108	55.36	3651.00	mt	980326.56	980661.09	0.21	-124.53	-1.19	0.00	8.75	-116.76
sw205	45	27.88	-108	51.00	3462.00	mt	980344.56	980661.11	0.24	-118.08	-1.15	0.00	8.96	-110.03
sw206	45	27.87	-108	49.24	3529.00	mt	980342.57	980661.09	0.48	-120.36	-1.17	0.00	13.29	-107.76
sw207	45	27.45	-108	47.66	3609.00	mt	980337.57	980660.45	0.30	-123.09	-1.18	0.00	16.44	-107.54
sw208	45	27.65	-108	45.85	3790.00	mt	980323.57	980660.76	0.23	-129.27	-1.22	0.00	19.15	-111.11
sw209	45	33.37	-108	50.45	3390.00	mt	980348.57	980669.39	0.24	-115.62	-1.14	0.00	-2.08	-118.60
sw210	45	33.53	-108	48.97	3425.00	mt	980347.57	980669.63	0.11	-116.82	-1.14	0.00	-0.03	-117.88
sw211	45	33.84	-108	46.77	3747.00	mt	980328.57	980670.09	0.23	-127.80	-1.21	0.00	10.77	-118.01
sw212	45	32.88	-108	44.85	4246.00	mt	980296.57	980668.65	1.06	-144.82	-1.30	0.00	27.12	-117.95
sw213	45	32.66	-108	42.64	4270.00	mt	980292.57	980668.31	0.63	-145.64	-1.31	0.00	25.71	-120.61
159	45	37.11	-110	23.98	5803.00	mt	980157.56	980675.02	2.18	-197.92	-1.48	0.00	28.08	-169.15
161	45	36.92	-110	21.52	5358.00	mt	980181.56	980674.73	3.57	-182.75	-1.45	0.00	10.51	-170.12
162	45	36.24	-110	20.01	5335.00	mt	980170.50	980673.72	3.26	-181.96	-1.45	0.00	-1.71	-181.86
163	45	36.38	-110	18.35	6142.00	mt	980139.00	980673.92	1.80	-209.49	-1.50	0.00	42.44	-166.75
164	45	36.39	-110	17.37	5940.00	mt	980151.25	980673.94	1.64	-202.60	-1.49	0.00	35.72	-166.73
165	45	36.41	-110	16.21	5771.00	mt	980163.00	980673.97	1.80	-196.83	-1.48	0.00	31.51	-165.01
166	45	36.63	-110	14.11	5379.00	mt	980187.25	980674.30	1.39	-183.46	-1.45	0.00	18.61	-164.91
167	45	35.27	-110	15.30	5452.00	mt	980178.81	980672.25	2.53	-185.95	-1.46	0.00	19.10	-165.78
168	45	34.39	-110	16.40	5472.00	mt	980174.06	980670.93	2.85	-186.63	-1.46	0.00	17.56	-167.68
169	45	33.68	-110	17.40	5524.00	mt	980166.94	980669.85	3.42	-188.41	-1.46	0.00	16.41	-170.04
170	45	32.86	-110	18.37	5539.00	mt	980163.38	980668.62	4.21	-188.92	-1.46	0.00	15.48	-170.69
172	45	27.64	-110	19.25	10385.00	mt	979849.88	980660.74	15.65	-354.20	-1.10	0.00	165.08	-174.56
173	45	21.60	-110	18.61	10697.00	mt	979793.00	980651.63	19.23	-364.84	-1.02	0.00	146.58	-200.06
174	45	21.70	-110	16.42	10404.00	mt	979814.88	980651.79	16.33	-354.85	-1.09	0.00	140.81	-198.80
175	45	18.44	-110	16.21	9214.00	mt	979889.75	980646.86	5.15	-314.26	-1.33	0.00	108.84	-201.60
176	45	18.58	-110	11.65	10036.00	mt	979833.94	980647.08	13.26	-342.30	-1.17	0.00	130.03	-200.19
177	45	15.84	-110	12.13	9525.00	mt	979863.88	980642.95	4.78	-324.87	-1.27	0.00	116.10	-205.26
178	45	17.18	-110	18.74	9928.00	mt	979836.13	980644.96	9.71	-338.62	-1.20	0.00	124.16	-205.94
181	45	26.91	-110	26.78	10125.00	mt	979866.75	980659.64	17.63	-345.33	-1.15	0.00	158.62	-170.24
182	45	28.19	-110	21.98	6238.00	mt	980103.19	980661.57	6.51	-212.76	-1.51	0.00	28.00	-179.76
b72	45	16.64	-109	58.98	10147.00	mt	979829.88	980644.15	12.14	-346.08	-1.15	0.00	139.29	-195.80
b73	45	19.61	-109	59.89	10583.00	mt	979816.81	980648.63	12.55	-360.96	-1.05	0.00	162.75	-186.71
b74	45	19.89	-110	5.00	10130.00	mt	979637.94	980649.05	11.41	-345.51	-1.15	0.00	140.90	-194.35

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Stillwater Complex, Mt., Gravity Stations
USGS 1972-83
Meter used: var.

STATION IDENTIFICATION sta-id	LOCATIONS LATITUDE deg	min	LONGITUDE deg	min	ELE (in ft)	GRAVITY ST	OBSERVED	THEORETICAL	CORRECTIONS TERRAIN	BOUGUER (d1=2.67)	CURV	ANOMALIES SPECIAL	FREE AIR	COMPLETE-BOUGUER d1=2.67
b75	45	19.55	-110	7.26	10936.00	mt	979781.13	980648.54	14.24	-373.00	-0.96	0.00	160.28	-199.43
b76	45	21.60	-110	8.92	9399.00	mt	979897.25	980651.63	4.53	-320.57	-1.30	0.00	128.96	-188.38
b77	45	17.09	-110	7.97	9638.00	mt	979869.19	980644.83	4.87	-328.72	-1.25	0.00	130.12	-194.98
b84	45	16.12	-109	45.89	9580.00	mt	979875.88	980643.37	7.59	-326.75	-1.26	0.00	132.87	-187.55
b85	45	18.48	-109	53.24	10082.00	mt	979846.44	980646.92	13.26	-343.87	-1.16	0.00	146.98	-184.79
b86	45	19.42	-109	51.00	10251.00	mt	979837.44	980648.34	11.46	-349.63	-1.13	0.00	152.47	-186.83
b120	45	16.28	-109	55.08	10187.00	mt	979830.19	980643.60	13.52	-347.45	-1.14	0.00	143.91	-191.16
b121	45	17.99	-109	49.69	11356.00	mt	979765.06	980646.18	16.49	-387.32	-0.84	0.00	186.01	-185.66
b122	45	16.94	-110	4.28	9270.00	mt	979896.81	980644.60	7.31	-316.17	-1.32	0.00	123.47	-186.71
101	45	35.67	-110	27.32	8300.00	mt	980004.19	980672.85	10.14	-283.09	-1.44	0.00	111.43	-162.97
102	45	34.12	-110	26.32	9180.00	mt	979942.81	980670.52	13.45	-313.10	-1.33	0.00	135.07	-165.91
103	45	33.21	-110	24.39	9180.00	mt	979941.06	980669.15	12.21	-313.10	-1.33	0.00	134.69	-167.53
104	45	33.66	-110	22.86	9300.00	mt	979922.31	980669.82	16.74	-317.20	-1.31	0.00	126.56	-175.21
105	45	32.85	-110	19.71	6755.00	mt	980092.19	980668.60	5.79	-230.39	-1.52	0.00	58.54	-167.58
106	45	30.82	-110	20.17	5761.00	mt	980135.13	980665.54	7.61	-196.49	-1.48	0.00	11.16	-179.20
107	45	30.38	-110	16.24	8526.00	mt	979992.69	980664.88	6.95	-290.80	-1.42	0.00	129.13	-156.14
108	45	28.32	-110	17.68	10170.00	mt	979866.63	980661.77	12.23	-346.87	-1.14	0.00	160.58	-175.20
109	45	25.75	-110	18.01	9456.00	mt	979906.31	980657.90	10.56	-322.52	-1.29	0.00	137.09	-176.15
110	45	31.18	-110	18.91	6280.00	mt	980116.44	980666.09	3.91	-214.19	-1.51	0.00	40.69	-171.11
142	45	30.49	-110	26.92	9112.00	mt	979944.44	980665.05	9.62	-310.78	-1.34	0.00	135.80	-166.70
143	45	29.89	-110	23.73	9125.00	mt	979936.25	980664.14	8.05	-311.23	-1.34	0.00	129.71	-174.81
144	45	29.22	-110	28.01	8932.00	mt	979949.38	980663.13	8.45	-304.64	-1.37	0.00	125.74	-171.82
145	45	25.56	-110	29.00	9030.00	mt	979921.63	980657.60	10.61	-307.99	-1.35	0.00	112.71	-186.02
146	45	24.39	-110	28.25	9122.00	mt	979919.44	980655.84	9.75	-311.13	-1.34	0.00	120.95	-181.77
147	45	21.90	-110	24.82	9975.00	mt	979856.50	980652.09	9.24	-340.22	-1.19	0.00	141.88	-190.28
148	45	23.14	-110	21.68	8947.00	mt	979924.00	980653.96	6.52	-305.16	-1.37	0.00	110.96	-189.04
149	45	20.52	-110	21.60	9325.00	mt	979899.69	980650.00	5.21	-318.05	-1.31	0.00	126.05	-188.09
150	45	25.98	-110	24.27	6857.00	mt	980048.19	980658.24	7.75	-233.87	-1.52	0.00	34.49	-193.15

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