UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRINCIPAL FACTS AND PROFILES OF GRAVITY DATA FROM PARTS OF MEADE, PENNINGTON, HAAKON, AND JACKSON COUNTIES, SOUTH DAKOTA

by

Donald L. Peterson and Jerry H. Hassemer

Open-File Report 78-198

1978

Principal facts and profiles of gravity data from parts of Meade, Pennington, Haakon, and Jackson Counties, South Dakota

by Donald L. Peterson and Jerry H. Hassemer

During August of 1977, 291 gravity stations were obtained along east-west and north-south profiles in parts of Meade, Pennington, Haakon, and Jackson Counties, South Dakota. The location of the profiles are shown in figure 3.

The subsurface geology of the area is not well known. The crystalline basement complex, probably Precambrian in age, is concealed by several thousand feet of younger sedimentary rocks. Pierre Shale and Fox Hills Sandstone of Late Cretaceous age are exposed over most of the surveyed area. This preliminary study was undertaken to determine if gravity anomalies could be detected which reflect density variations within the sedimentary rocks.

The gravity stations were spaced at approximately 150 meters, 300 meters, and one-kilometer intervals. Vertical and horizontal positions for stations spaced at 150 and 300 meter intervals were obtained by rod and transit surveying. Vertical positions for these stations are considered to be accurate to about $\pm$0.5 meter. Horizontal positions are probably accurate to within 5 meters.

Positions for stations at one-kilometer intervals were taken from bench marks and spot elevations shown on U.S. Geological Survey topographic maps at scales of 1:24,000. Terrain effects were considered negligible. Gravity observations were made with a thermostated Worden Master meter having a scale factor of 0.0756 milligal per division.[1/] For meter drift control a base station was occupied at the beginning of each day, at mid-day,

---

1/ Use of brand names in this report is for descriptive purposes only, and in no way constitutes endorsement by the U.S. Geological Survey.

and at the end of the day. The earth tide correction was used in drift reduction. Maximum drift for any four-hour period was 0.33 milligal. Observed gravity values are referenced to the International Gravity Standardization Net 1971 (Defense Mapping Agency Aerospace Center, 1974). The Geodetic Reference System 1967 formula (International Association of Geodesy, 1967) was used to compute theoretical gravity.

The overall accuracy of observed gravity values is estimated to be ±0.1 milligal. The largest source of error is due to vertical elevation control, and is about ±0.1 milligal.

The gravity profiles are shown in figures 4-7. The regional gravity field is apparent on most of the profiles. Along profiles A-A' and B-B' in Meade and Pennington Counties the regional field decreases northward at an approximate rate of 2 to 4 milligals per kilometer, however, along profile C-C' the field reverses and increases to the north. This reversal in the regional field may reflect some large, deeply buried feature. In Haakon and Jackson Counties the regional field decreases southeasterly at an approximate rate of 2 to 4 milligals per kilometer.

Superimposed on the regional field are residual or local anomalies which are believed to originate at or near the top of the Precambrian basement complex or within the overlying sedimentary rocks.

Small, local anomalies with amplitudes of as much as 0.3 milligal are predominant along the southern portions of profiles B-B', F-F', and G-G'. These anomalies undoubtedly have a relatively shallow source. These smaller anomalies were detected only along profiles having 150 meter gravity station spacing.

Regional gravity maps which include the area of this report or are located adjacent to this area have been published by Kleinkopf and Redden (1975), Lum (1961), Tullis (1963), and Woollard and Joesting (1964).

REFERENCES

Defense Mapping Agency Aerospace Center, 1974, World Relative Gravity Reference Network, North America, Part 2: DMAAC Ref. Pub. no. 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 Spec. Pub. no. 3, 74 p.

Kleinkopf, M. D., and Redden, J. A., 1975, Bouguer gravity, aeromagnetic, and generalized geologic maps of part of the Black Hills of South Dakota and Wyoming: U.S. Geol. Survey Geophys. Inv. Map GP-903.

Lum, Daniel, 1961, Gravity measurements east of the Black Hills and along a line from Rapid City to Sioux Falls, South Dakota; State Geol. Survey, Vermillion, So. Dak., Rept. 88.

Tullis, E. L., 1963, Gravity survey of southwestern South Dakota: State Geol. Survey, Vermillion, So. Dak., Rept. 94.

Woollard, G. P., and Joesting, H. R., 1964, Bouguer gravity anomaly map of the United States (exclusive of Alaska and Hawaii): U.S. Geol. Survey, 2 sheets.

PRINCIPAL FACTS FOR GRAVITY STATIONS

Explanation of the headings of the accompanying table of principal facts:

STATION IDENTIFICATION	Gravity station number.
LATITUDE	North latitude in degrees, minutes, and hundredths of minutes.
LONGITUDE	West longitude in degrees, minutes, and hundredths of minutes.
ELEV	Elevation in feet (to convert to meters, multiply by 0.3048).
ST	State in which gravity station is located (South Dakota).
OBSERVED GRAVITY	Observed gravity in milligals.
STD GRAVITY	Standard (or theoretical) gravity in milligals.
FREE-AIR	Free-air anomaly in milligals.
BOUGUER	Elevation and curvature correction in milligals.
BOUGUER ANOMALY	Bouguer anomaly in milligals for assumed density of 2.67 G per CC.

Stations with a "W" prefix are referenced to a gravity base station in Rapid City, South Dakota, with an observed gravity value of 980257.16 milligals (see fig. 1); stations with a "K" prefix are referenced to a base station in Kadoka, South Dakota, with an oberved gravity value of 980266.59 milligals (see fig. 2).

station identification	location latitude	location longitude	elev.	st.	observed gravity	std. grv.	corrections free-air	corrections bouguer	bouguer anomaly
W001	44 1.30	102 35.48	2512.0	SD	980300.48	-980530.52	236.21	-86.59	-80.42
W002	44 1.31	102 35.16	2515.0	SD	980300.51	-980530.54	236.49	-86.69	-80.23
W003	44 1.51	102 35.12	2593.1	SD	980295.62	-980530.84	243.83	-89.38	-80.77
W004	44 1.72	102 35.23	2653.7	SD	980291.85	-980531.15	249.53	-91.46	-81.23
W005	44 1.92	102 35.28	2667.7	SD	980291.31	-980531.46	250.84	-91.94	-81.25
W006	44 2.01	102 35.28	2674.8	SD	980291.24	-980531.59	251.51	-92.19	-81.03
W007	44 2.20	102 35.28	2680.3	SD	980291.06	-980531.88	252.03	-92.38	-81.17
W008	44 2.19	102 35.28	2685.0	SD	980290.98	-980531.86	252.47	-92.54	-80.95
W009	44 2.28	102 35.28	2689.7	SD	980290.81	-980532.00	252.91	-92.70	-80.98
W010	44 2.38	102 35.28	2706.2	SD	980289.91	-980532.15	254.46	-93.27	-81.05
W011	44 2.49	102 35.28	2738.1	SD	980287.87	-980532.32	257.46	-94.36	-81.35
W012	44 2.57	102 35.28	2743.0	SD	980287.71	-980532.44	257.93	-94.53	-81.33
W013	44 2.72	102 35.28	2745.1	SD	980287.95	-980532.66	258.12	-94.61	-81.20
W014	44 2.81	102 35.28	2745.2	SD	980288.09	-980532.80	258.13	-94.61	-81.19
W015	44 2.89	102 35.28	2745.5	SD	980288.17	-980532.92	258.16	-94.62	-81.21
W016	44 2.99	102 35.28	2746.9	SD	980288.26	-980533.07	258.29	-94.67	-81.19
W017	44 3.07	102 35.28	2757.2	SD	980287.73	-980533.19	259.26	-95.02	-81.22
W018	44 3.16	102 35.28	2776.1	SD	980286.58	-980533.33	261.04	-95.67	-81.38
W019	44 3.27	102 35.28	2793.8	SD	980285.61	-980533.49	262.70	-96.28	-81.46
W020	44 3.37	102 35.28	2807.6	SD	980284.91	-980533.64	264.00	-96.75	-81.48
W021	44 3.47	102 35.28	2816.7	SD	980284.41	-980533.79	264.85	-97.07	-81.60
W022	44 3.56	102 35.28	2818.6	SD	980284.53	-980533.93	265.03	-97.13	-81.50
W023	44 3.66	102 35.28	2815.7	SD	980284.93	-980534.08	264.76	-97.03	-81.42
W024	44 3.77	102 35.28	2815.4	SD	980285.08	-980534.25	264.73	-97.02	-81.46
W025	44 3.86	102 35.28	2820.4	SD	980284.90	-980534.38	265.20	-97.19	-81.47
W026	44 3.95	102 35.28	2828.1	SD	980284.48	-980534.52	265.92	-97.46	-81.58
W027	44 4.02	102 35.28	2833.5	SD	980284.16	-980534.62	266.43	-97.64	-81.67
W028	44 4.11	102 35.28	2844.1	SD	980283.67	-980534.76	267.43	-98.01	-81.67
W029	44 4.20	102 35.28	2850.4	SD	980283.38	-980534.89	268.02	-98.22	-81.71
W030	44 4.29	102 35.28	2860.8	SD	980282.78	-980535.03	269.00	-98.58	-81.83
W031	44 4.39	102 35.28	2882.9	SD	980281.47	-980535.18	271.08	-99.34	-81.97
W032	44 4.48	102 35.28	2901.0	SD	980280.34	-980535.32	272.78	-99.96	-82.16
W033	44 4.57	102 35.28	2905.3	SD	980280.19	-980535.45	273.18	-100.11	-82.19
W034	44 4.66	102 35.28	2905.4	SD	980280.35	-980535.59	273.19	-100.11	-82.16
W035	44 4.79	102 35.28	2904.7	SD	980280.58	-980535.78	273.12	-100.09	-82.17
W036	44 4.99	102 35.28	2918.5	SD	980279.67	-980536.08	274.42	-100.56	-82.55
W037	44 5.18	102 35.28	2942.6	SD	980278.40	-980536.37	276.69	-101.39	-82.67
W038	44 5.38	102 35.28	2948.8	SD	980278.14	-980536.67	277.27	-101.61	-82.87
W039	44 5.55	102 35.28	2898.1	SD	980281.91	-980536.93	272.50	-99.86	-82.38
W040	44 5.73	102 35.28	2891.9	SD	980282.53	-980537.20	271.92	-99.65	-82.40

station identification	location latitude	location longitude	elev.	st.	observed gravity	std. grv.	corrections free-air	corrections bouguer	bouguer anomaly
W041	44 5.88	102 35.28	2909.8	SD	980281.50	-980537.43	273.61	-100.27	-82.59
W042	44 6.07	102 35.28	2891.3	SD	980282.99	-980537.71	271.87	-99.63	-82.48
W043	44 6.28	102 35.28	2881.2	SD	980283.90	-980538.03	270.92	-99.28	-82.49
W044	44 6.47	102 35.28	2890.1	SD	980283.60	-980538.32	271.75	-99.59	-82.56
W045	44 6.63	102 35.28	2906.4	SD	980282.71	-980538.56	273.28	-100.15	-82.72
W046	44 6.80	102 35.28	2949.6	SD	980279.85	-980538.81	277.35	-101.63	-83.24
W047	44 7.00	102 35.28	2967.9	SD	980278.90	-980539.11	279.07	-102.26	-83.40
W048	44 7.18	102 35.28	2980.8	SD	980278.05	-980539.39	280.28	-102.71	-83.77
W049	44 7.36	102 35.28	2999.4	SD	980277.03	-980539.66	282.03	-103.34	-83.94
W050	44 7.50	102 35.28	2960.1	SD	980279.84	-980539.87	278.33	-101.99	-83.69
W051	44 7.70	102 35.28	2952.6	SD	980280.58	-980540.17	277.63	-101.74	-83.70
W052	44 7.93	102 35.28	2953.9	SD	980280.65	-980540.52	277.75	-101.78	-83.90
W053	44 14.19	102 35.28	2683.0	SD	980300.48	-980549.95	252.28	-92.47	-89.66
W054	44 13.59	102 35.29	2667.0	SD	980301.06	-980549.05	250.78	-91.92	-89.13
W055	44 12.72	102 35.28	2705.0	SD	980298.13	-980547.74	254.35	-93.23	-88.49
W056	44 12.29	102 35.28	2716.0	SD	980297.34	-980547.09	255.39	-93.61	-87.97
W057	44 11.86	102 35.29	2744.0	SD	980295.43	-980546.44	258.02	-94.57	-87.56
W058	44 11.86	102 37.08	2768.0	SD	980292.56	-980546.44	260.27	-95.39	-89.00
W059	44 11.86	102 36.29	2735.0	SD	980295.78	-980546.44	257.17	-94.26	-87.75
W060	44 11.86	102 34.69	2747.0	SD	980295.54	-980546.44	258.30	-94.67	-87.27
W061	44 11.86	102 34.08	2717.0	SD	980297.54	-980546.44	255.48	-93.64	-87.06
W062	44 11.86	102 33.48	2753.0	SD	980295.47	-980546.44	258.86	-94.88	-86.99
W063	44 11.86	102 32.87	2765.0	SD	980294.77	-980546.44	259.99	-95.29	-86.97
W064	44 11.85	102 32.28	2737.0	SD	980296.86	-980546.43	257.36	-94.33	-86.54
W065	44 11.85	102 31.65	2733.0	SD	980297.32	-980546.43	256.98	-94.19	-86.32
W066	44 11.85	102 30.94	2696.0	SD	980300.31	-980546.43	253.50	-92.92	-85.54
W067	44 11.85	102 31.03	2704.0	SD	980298.75	-980546.43	254.26	-93.19	-86.61
W068	44 11.44	102 35.28	2734.0	SD	980296.05	-980545.81	257.08	-94.22	-86.90
W069	44 10.98	102 35.29	2747.0	SD	980295.13	-980545.11	258.30	-94.67	-86.35
W070	44 10.54	102 35.29	2776.0	SD	980293.22	-980544.45	261.02	-95.67	-85.88
W071	44 10.12	102 35.29	2790.0	SD	980292.16	-980543.82	262.34	-96.15	-85.47
W072	44 9.68	102 35.29	2804.0	SD	980291.11	-980543.15	263.66	-96.63	-85.01
W073	44 9.23	102 35.29	2820.0	SD	980290.01	-980542.48	265.16	-97.18	-84.49
W074	44 8.80	102 35.29	2867.0	SD	980286.76	-980541.83	269.58	-98.79	-84.28
W075	44 8.37	102 35.29	2976.0	SD	980279.45	-980541.18	279.83	-102.54	-84.44
W076	44 24.09	102 33.69	2530.0	SD	980322.75	-980564.88	237.90	-87.21	-91.44
W077	44 24.17	102 33.70	2536.7	SD	980322.29	-980565.00	238.53	-87.44	-91.62
W078	44 24.23	102 33.70	2544.7	SD	980321.86	-980565.09	239.28	-87.71	-91.66
W079	44 24.32	102 33.70	2548.4	SD	980321.70	-980565.23	239.63	-87.84	-91.74
W080	44 24.42	102 33.70	2550.7	SD	980321.54	-980565.38	239.84	-87.92	-91.92

station identification	location latitude	location longitude	elev.	st.	observed gravity	std. grv.	corrections free-air	corrections bouguer	bouguer anomaly
W081	44 24.52	102 33.70	2553.3	SD	980321.55	-980565.53	240.09	-88.01	-91.90
W082	44 24.60	102 33.70	2557.2	SD	980321.37	-980565.65	240.45	-88.14	-91.97
W083	44 24.68	102 33.70	2563.7	SD	980321.03	-980565.77	241.07	-88.37	-92.04
W084	44 24.78	102 33.70	2565.0	SD	980321.10	-980565.92	241.19	-88.41	-92.04
W085	44 24.87	102 33.70	2571.1	SD	980320.77	-980566.06	241.76	-88.62	-92.15
W086	44 24.97	102 33.70	2576.5	SD	980320.61	-980566.21	242.27	-88.81	-92.14
W087	44 25.05	102 33.70	2578.8	SD	980320.52	-980566.33	242.49	-88.89	-92.21
W088	44 25.14	102 33.70	2583.4	SD	980320.37	-980566.47	242.92	-89.05	-92.23
W089	44 25.23	102 33.70	2584.7	SD	980320.46	-980566.60	243.04	-89.09	-92.19
W090	44 25.32	102 33.70	2592.6	SD	980320.02	-980566.74	243.78	-89.36	-92.30
W091	44 25.42	102 33.70	2584.5	SD	980320.71	-980566.89	243.02	-89.08	-92.24
W092	44 25.52	102 33.70	2598.6	SD	980319.88	-980567.04	244.35	-89.57	-92.38
W093	44 25.60	102 33.70	2595.3	SD	980320.22	-980567.16	244.04	-89.46	-92.36
W094	44 25.71	102 33.70	2588.7	SD	980320.78	-980567.33	243.42	-89.23	-92.36
W095	44 25.81	102 33.71	2604.4	SD	980319.86	-980567.48	244.89	-89.77	-92.50
W096	44 25.93	102 33.70	2609.0	SD	980319.80	-980567.66	245.32	-89.93	-92.47
W097	44 26.02	102 33.70	2614.8	SD	980319.51	-980567.79	245.87	-90.13	-92.54
W098	44 26.12	102 33.70	2607.6	SD	980320.24	-980567.94	245.19	-89.88	-92.39
W099	44 26.20	102 33.70	2610.3	SD	980320.15	-980568.06	245.45	-89.97	-92.43
W100	44 26.30	102 33.70	2600.8	SD	980320.99	-980568.22	244.55	-89.64	-92.32
W101	44 26.40	102 33.70	2602.3	SD	980321.06	-980568.37	244.69	-89.70	-92.32
W102	44 26.50	102 33.70	2612.7	SD	980320.56	-980568.52	245.67	-90.05	-92.34
W103	44 26.59	102 33.70	2617.4	SD	980320.36	-980568.65	246.11	-90.21	-92.39
W104	44 26.69	102 33.70	2618.6	SD	980320.52	-980568.80	246.23	-90.26	-92.31
W105	44 26.88	102 33.70	2626.9	SD	980320.49	-980569.09	247.01	-90.54	-92.13
W106	44 27.06	102 33.70	2633.7	SD	980320.27	-980569.36	247.65	-90.78	-92.22
W107	44 27.27	102 33.70	2656.0	SD	980319.05	-980569.68	249.74	-91.54	-92.43
W108	44 27.44	102 33.70	2666.1	SD	980318.69	-980569.93	250.69	-91.89	-92.44
W109	44 27.57	102 33.70	2670.0	SD	980318.62	-980570.13	251.06	-92.02	-92.47
W110	44 27.75	102 33.71	2676.6	SD	980318.33	-980570.40	251.68	-92.25	-92.64
W111	44 27.92	102 33.71	2687.2	SD	980317.88	-980570.66	252.68	-92.61	-92.71
W112	44 28.12	102 33.71	2685.2	SD	980318.24	-980570.96	252.49	-92.55	-92.78
W113	44 28.31	102 33.71	2688.4	SD	980318.25	-980571.25	252.79	-92.66	-92.87
W114	44 28.50	102 33.71	2704.4	SD	980317.38	-980571.53	254.29	-93.21	-93.07
W115	44 28.68	102 33.71	2705.2	SD	980317.51	-980571.80	254.37	-93.23	-93.15
W116	44 28.87	102 33.71	2705.2	SD	980317.78	-980572.09	254.37	-93.23	-93.17
W117	44 29.04	102 33.71	2717.5	SD	980317.13	-980572.35	255.52	-93.66	-93.36
W118	44 29.22	102 33.72	2719.6	SD	980317.16	-980572.62	255.72	-93.73	-93.47
W119	44 29.31	102 33.72	2721.2	SD	980317.14	-980572.75	255.87	-93.78	-93.52
W120	44 43.15	102 33.11	2828.0	SD	980342.17	-980593.63	265.91	-97.45	-83.00

station identification	location latitude	location longitude	elev.	st.	observed gravity	std. grv.	corrections free-air	corrections bouguer	bouguer anomaly
W121	44 42.71	102 33.11	2779.0	SD	980344.60	-980592.97	261.30	-95.77	-82.84
W122	44 42.28	102 33.12	2775.0	SD	980344.29	-980592.32	260.93	-95.63	-82.73
W123	44 41.88	102 33.13	2746.0	SD	980345.35	-980591.71	258.20	-94.64	-82.80
W124	44 41.40	102 33.61	2782.0	SD	980342.09	-980590.99	261.59	-95.87	-83.18
W125	44 40.99	102 33.77	2768.0	SD	980341.17	-980590.37	260.27	-95.39	-84.32
W126	44 40.60	102 33.77	2812.0	SD	980338.06	-980589.78	264.41	-96.90	-84.21
W127	44 40.05	102 33.75	2884.0	SD	980331.78	-980588.95	271.17	-99.38	-85.38
W128	44 39.74	102 33.77	2870.0	SD	980332.05	-980588.49	269.86	-98.90	-85.48
W129	44 39.31	102 33.77	2921.0	SD	980327.40	-980587.84	274.65	-100.65	-86.44
W130	44 38.88	102 33.77	2970.0	SD	980322.85	-980587.19	279.26	-102.33	-87.41
W131	44 38.44	102 33.77	2986.0	SD	980320.69	-980586.53	280.76	-102.88	-87.96
W132	44 37.82	102 33.76	3044.0	SD	980315.28	-980585.59	286.22	-104.88	-88.97
W133	44 37.58	102 33.76	3038.0	SD	980315.44	-980585.23	285.65	-104.67	-88.81
W134	44 37.14	102 33.73	2990.0	SD	980317.43	-980584.56	281.14	-103.02	-89.01
W135	44 36.69	102 33.74	2972.0	SD	980317.39	-980583.89	279.45	-102.40	-89.45
W136	44 17.06	102 37.08	2664.0	SD	980305.02	-980554.28	250.50	-91.82	-90.58
W137	44 17.07	102 36.48	2655.0	SD	980305.56	-980554.30	249.65	-91.51	-90.60
W138	44 17.07	102 35.89	2638.0	SD	980306.46	-980554.30	248.05	-90.92	-90.71
W139	44 17.07	102 35.28	2636.0	SD	980306.38	-980554.30	247.86	-90.85	-90.91
W140	44 17.07	102 34.68	2629.0	SD	980306.57	-980554.30	247.21	-90.61	-91.13
W141	44 17.06	102 34.08	2624.0	SD	980306.60	-980554.28	246.74	-90.44	-91.38
W142	44 17.06	102 33.74	2621.0	SD	980306.73	-980554.28	246.45	-90.34	-91.44
W143	44 17.06	102 32.86	2617.0	SD	980306.71	-980554.28	246.08	-90.20	-91.69
W144	44 17.05	102 32.28	2568.0	SD	980310.01	-980554.27	241.47	-88.52	-91.31
W145	44 17.07	102 31.67	2601.0	SD	980307.84	-980554.30	244.57	-89.65	-91.54
W146	44 17.05	102 31.03	2596.0	SD	980308.23	-980554.27	244.10	-89.48	-91.42
W147	44 17.06	102 30.43	2600.0	SD	980308.26	-980554.28	244.48	-89.62	-91.16
K001	43 48.42	101 31.30	2447.0	SD	980265.10	-980511.11	230.10	-84.36	-100.27
K002	43 48.50	101 31.32	2454.7	SD	980264.79	-980511.23	230.82	-84.62	-100.24
K003	43 48.58	101 31.32	2456.4	SD	980264.77	-980511.35	230.98	-84.68	-100.28
K004	43 48.68	101 31.32	2454.0	SD	980265.08	-980511.50	230.76	-84.60	-100.26
K005	43 48.78	101 31.32	2450.8	SD	980265.52	-980511.65	230.45	-84.49	-100.17
K006	43 48.87	101 31.32	2442.9	SD	980266.04	-980511.79	229.71	-84.21	-100.25
K007	43 48.98	101 31.32	2442.7	SD	980266.37	-980511.95	229.69	-84.21	-100.10
K008	43 49.05	101 31.32	2446.7	SD	980266.32	-980512.06	230.07	-84.34	-100.01
K009	43 49.16	101 31.32	2454.0	SD	980265.97	-980512.22	230.76	-84.60	-100.09
K010	43 49.23	101 31.32	2452.5	SD	980266.21	-980512.33	230.61	-84.54	-100.05
K011	43 49.33	101 31.32	2450.7	SD	980266.50	-980512.48	230.44	-84.48	-100.02
K012	43 49.42	101 31.32	2451.1	SD	980266.79	-980512.62	230.48	-84.50	-99.85
K013	43 49.49	101 31.30	2451.3	SD	980266.94	-980512.72	230.50	-84.50	-99.78

station identification	location latitude	location longitude	elev.	st.	observed gravity	observed std. grv.	corrections free-air	corrections bouguer	bouguer anomaly
K014	43 49.57	101 31.32	2453.6	SD	980266.90	-980512.84	230.72	-84.58	-99.80
K015	43 49.68	101 31.32	2464.0	SD	980266.40	-980513.01	231.70	-84.94	-99.85
K016	43 49.77	101 31.32	2469.3	SD	980266.24	-980513.14	232.19	-85.12	-99.83
K017	43 49.87	101 31.32	2473.7	SD	980266.26	-980513.29	232.61	-85.27	-99.69
K018	43 49.99	101 31.32	2476.7	SD	980266.26	-980513.47	232.89	-85.38	-99.70
K019	43 50.14	101 31.33	2478.5	SD	980266.03	-980513.70	233.06	-85.44	-100.05
K020	43 50.58	101 31.32	2471.0	SD	980267.92	-980514.36	232.35	-85.18	-99.27
K021	43 50.73	101 31.32	2411.7	SD	980272.18	-980514.59	226.78	-83.14	-98.77
K022	43 50.91	101 31.32	2399.5	SD	980273.46	-980514.86	225.63	-82.72	-98.49
K023	43 51.06	101 31.32	2405.4	SD	980273.52	-980515.09	226.19	-82.93	-98.31
K024	43 51.21	101 31.33	2441.9	SD	980271.47	-980515.31	229.62	-84.18	-98.40
K025	43 51.39	101 31.33	2450.7	SD	980271.42	-980515.58	230.44	-84.48	-98.20
K026	43 51.57	101 31.33	2444.8	SD	980272.26	-980515.86	229.88	-84.28	-97.99
K027	43 51.77	101 31.34	2401.1	SD	980275.57	-980516.16	225.78	-82.78	-97.59
K028	43 51.89	101 31.34	2438.2	SD	980273.33	-980516.34	229.27	-84.05	-97.79
K029	43 52.08	101 31.34	2422.4	SD	980274.86	-980516.63	227.79	-83.51	-97.49
K030	43 52.24	101 31.34	2441.1	SD	980274.16	-980516.87	229.54	-84.15	-97.32
K031	43 52.41	101 31.34	2466.1	SD	980272.89	-980517.12	231.89	-85.01	-97.35
K032	43 52.58	101 31.34	2454.8	SD	980274.09	-980517.38	230.83	-84.62	-97.06
K033	43 52.76	101 31.32	2433.6	SD	980275.97	-980517.65	228.84	-83.89	-96.73
K034	43 52.93	101 31.32	2452.8	SD	980274.96	-980517.91	230.64	-84.55	-96.86
K035	43 53.12	101 31.33	2437.1	SD	980276.44	-980518.19	229.17	-84.02	-96.60
K036	43 53.32	101 31.33	2445.9	SD	980276.06	-980518.49	229.99	-84.32	-96.76
K037	43 53.49	101 31.33	2403.1	SD	980279.26	-980518.75	225.97	-82.85	-96.37
K038	43 53.62	101 31.33	2393.5	SD	980280.09	-980518.95	225.07	-82.52	-96.31
K039	43 53.69	101 31.33	2350.0	SD	980283.04	-980519.05	220.98	-81.02	-96.05
K040	43 53.78	101 31.33	2338.9	SD	980284.11	-980519.19	219.75	-80.57	-95.90
K041	43 53.88	101 31.33	2338.3	SD	980284.15	-980519.34	219.88	-80.62	-95.93
K042	43 53.97	101 31.32	2361.0	SD	980282.66	-980519.47	222.01	-81.40	-96.20
K043	43 54.04	101 31.32	2374.6	SD	980281.88	-980519.58	223.29	-81.87	-96.28
K044	43 54.18	101 31.33	2350.4	SD	980283.73	-980519.79	221.01	-81.03	-96.08
K045	43 54.27	101 31.33	2375.6	SD	980282.15	-980519.92	223.38	-81.90	-96.29
K046	43 54.37	101 31.33	2385.6	SD	980281.60	-980520.08	224.32	-82.24	-96.40
K047	43 54.45	101 31.33	2351.8	SD	980284.05	-980520.20	221.15	-81.08	-96.08
K048	43 54.53	101 31.33	2329.4	SD	980285.95	-980520.32	219.04	-80.31	-95.64
K049	43 54.62	101 31.33	2316.9	SD	980286.97	-980520.45	217.86	-79.88	-95.50
K050	43 54.71	101 31.33	2320.1	SD	980286.82	-980520.59	218.17	-79.99	-95.59
K051	43 54.81	101 31.33	2340.2	SD	980285.57	-980520.74	220.05	-80.68	-95.80
K052	43 54.91	101 31.33	2341.1	SD	980285.06	-980520.89	220.14	-80.71	-96.40
K053	43 55.02	101 31.33	2349.1	SD	980284.80	-980521.06	220.89	-80.99	-96.36

station identification	location latitude	location longitude	elev.	st.	observed gravity	std. grv.	corrections free-air	corrections bouguer	bouguer anomaly
K054	43 55.10	101 31.33	2353.9	SD	980284.60	-980521.18	221.34	-81.15	-96.39
K055	43 55.18	101 31.33	2384.0	SD	980282.69	-980521.30	224.17	-82.19	-96.63
K056	43 55.23	101 31.33	2372.8	SD	980283.50	-980521.37	223.12	-81.80	-96.55
K057	43 55.30	101 31.34	2346.1	SD	980285.29	-980521.48	220.61	-80.88	-96.46
K058	43 55.86	101 31.34	2325.4	SD	980286.77	-980522.32	218.66	-80.17	-97.06
K059	43 56.22	101 32.49	2255.0	SD	980293.61	-980522.86	212.04	-77.75	-94.96
K060	43 56.22	101 33.08	2301.0	SD	980290.52	-980522.86	216.37	-79.33	-95.30
K061	43 56.22	101 33.68	2317.0	SD	980289.90	-980522.86	217.87	-79.88	-94.97
K062	43 56.19	101 34.29	2403.0	SD	980284.27	-980522.82	225.96	-82.84	-95.43
K063	43 56.21	101 34.89	2438.0	SD	980282.57	-980522.85	229.25	-84.05	-95.08
K064	43 56.22	101 35.48	2446.0	SD	980282.15	-980522.86	230.00	-84.32	-95.03
K065	43 56.22	101 36.08	2435.0	SD	980283.39	-980522.86	228.97	-83.94	-94.44
K066	43 56.22	101 36.69	2451.0	SD	980282.44	-980522.86	230.47	-84.49	-94.44
K067	43 56.22	101 37.29	2410.0	SD	980285.42	-980522.86	226.62	-83.08	-93.90
K068	43 56.22	101 37.88	2458.0	SD	980282.30	-980522.86	231.13	-84.73	-94.16
K069	43 56.22	101 38.49	2455.0	SD	980282.53	-980522.86	230.85	-84.63	-94.11
K070	43 56.22	101 39.08	2487.0	SD	980279.43	-980522.86	233.86	-85.73	-95.30
K071	43 56.22	101 39.62	2497.0	SD	980279.99	-980522.86	234.80	-86.08	-94.15
K072	43 56.22	101 40.11	2502.0	SD	980279.95	-980522.86	235.27	-86.25	-93.89
K073	43 56.22	101 40.83	2528.0	SD	980278.60	-980522.86	237.71	-87.14	-93.69
K074	43 56.22	101 41.44	2566.0	SD	980276.71	-980522.86	241.29	-88.45	-93.31
K075	43 56.22	101 42.03	2581.0	SD	980276.34	-980522.86	242.70	-88.96	-92.78
K076	43 46.67	101 42.07	2296.0	SD	980284.49	-980508.47	215.90	-79.16	-87.24
K077	43 47.10	101 42.06	2320.0	SD	980283.47	-980509.12	218.16	-79.99	-87.48
K078	43 47.53	101 42.06	2334.0	SD	980283.25	-980509.77	219.47	-80.47	-87.52
K079	43 47.98	101 42.06	2345.0	SD	980282.95	-980510.45	220.51	-80.85	-87.84
K080	43 48.40	101 42.05	2360.0	SD	980282.69	-980511.08	221.92	-81.36	-87.83
K081	43 48.40	101 41.46	2371.0	SD	980280.98	-980511.08	222.95	-81.74	-88.89
K082	43 49.02	101 41.49	2405.0	SD	980279.70	-980512.01	226.15	-82.91	-89.07
K083	43 49.45	101 41.62	2415.0	SD	980279.60	-980512.66	227.09	-83.25	-89.22
K084	43 50.14	101 42.03	2512.0	SD	980273.85	-980513.70	236.21	-86.59	-90.23
K085	43 50.58	101 39.64	2474.0	SD	980274.48	-980514.36	232.64	-85.28	-92.52
K086	43 51.02	101 39.63	2466.0	SD	980275.75	-980515.03	231.88	-85.01	-92.41
K087	43 51.45	101 39.63	2459.0	SD	980277.41	-980515.67	231.22	-84.77	-91.81
K088	43 51.88	101 39.64	2451.0	SD	980278.86	-980516.32	230.47	-84.49	-91.48
K089	43 52.31	101 39.64	2434.0	SD	980280.97	-980516.97	228.87	-83.91	-91.04
K090	43 52.76	101 39.64	2428.0	SD	980281.72	-980517.65	228.31	-83.70	-91.32
K091	43 53.18	101 39.65	2446.0	SD	980281.94	-980518.28	230.00	-84.32	-90.66
K092	43 52.76	101 39.04	2406.0	SD	980282.93	-980517.65	226.24	-82.95	-91.43
K093	43 52.75	101 38.48	2415.0	SD	980281.93	-980517.63	227.09	-83.25	-91.86

station identification	location latitude	location longitude	elev.	st.	observed gravity	std. grv.	corrections free-air	corrections bouguer	bouguer anomaly
K094	43 52.75	101 37.88	2492.0	SD	980276.06	-980517.63	234.33	-85.90	-93.14
K095	43 52.73	101 37.29	2492.0	SD	980275.54	-980517.60	234.33	-85.90	-93.63
K096	43 52.74	101 36.62	2425.0	SD	980279.39	-980517.62	228.03	-83.60	-93.80
K097	43 52.74	101 36.08	2462.0	SD	980276.68	-980517.62	231.51	-84.87	-94.30
K098	43 52.75	101 34.89	2340.0	SD	980284.13	-980517.63	220.04	-80.67	-94.13
K099	43 52.75	101 33.99	2325.0	SD	980284.70	-980517.63	218.63	-80.16	-94.46
K100	43 52.80	101 33.68	2327.0	SD	980284.61	-980517.71	218.82	-80.23	-94.51
K101	43 52.75	101 33.08	2388.0	SD	980279.95	-980517.63	224.55	-82.33	-95.46
K102	43 52.74	101 32.54	2438.0	SD	980276.54	-980517.62	229.25	-84.05	-95.88
K103	43 50.99	101 37.28	2437.0	SD	980275.32	-980514.98	229.16	-84.01	-94.51
K104	43 51.07	101 37.29	2426.8	SD	980276.25	-980515.10	228.20	-83.66	-94.31
K105	43 51.14	101 37.29	2427.6	SD	980276.20	-980515.21	228.27	-83.69	-94.43
K106	43 51.22	101 37.29	2410.7	SD	980277.61	-980515.33	226.68	-83.11	-94.15
K107	43 51.36	101 37.29	2419.3	SD	980277.21	-980515.54	227.49	-83.40	-94.24
K108	43 51.44	101 37.29	2398.7	SD	980278.87	-980515.66	225.56	-82.69	-93.92
K109	43 51.52	101 37.29	2400.8	SD	980278.84	-980515.78	225.75	-82.77	-93.96
K110	43 51.60	101 37.29	2415.3	SD	980278.10	-980515.90	227.12	-83.26	-93.94
K111	43 51.68	101 37.29	2440.0	SD	980276.54	-980516.02	229.44	-84.11	-94.15
K112	43 51.78	101 37.29	2443.7	SD	980276.46	-980516.17	229.79	-84.24	-94.16
K113	43 51.88	101 37.29	2450.8	SD	980276.16	-980516.32	230.45	-84.49	-94.20
K114	43 51.96	101 37.29	2416.6	SD	980278.65	-980516.44	227.24	-83.31	-93.86
K115	43 52.04	101 37.29	2436.5	SD	980277.52	-980516.56	229.11	-83.99	-93.92
K116	43 52.12	101 37.29	2438.4	SD	980277.58	-980516.68	229.29	-84.06	-93.87
K117	43 52.22	101 37.29	2457.2	SD	980276.51	-980516.84	231.05	-84.71	-93.99
K118	43 52.31	101 37.29	2473.6	SD	980275.65	-980516.97	232.60	-85.27	-93.99
K119	43 52.36	101 37.29	2483.3	SD	980274.97	-980517.05	233.51	-85.60	-94.17
K120	43 52.43	101 37.29	2458.9	SD	980276.76	-980517.15	231.22	-84.76	-93.93
K121	43 52.52	101 37.29	2470.2	SD	980276.34	-980517.29	232.28	-85.15	-93.82
K122	43 52.60	101 37.29	2463.5	SD	980276.97	-980517.41	231.65	-84.92	-93.71
K123	43 52.67	101 37.29	2483.8	SD	980275.77	-980517.51	233.56	-85.62	-93.80
K124	43 52.71	101 37.29	2485.6	SD	980275.71	-980517.57	233.73	-85.68	-93.81
K125	43 52.82	101 37.29	2496.4	SD	980275.30	-980517.74	234.74	-86.05	-93.75
K126	43 52.90	101 37.29	2480.7	SD	980276.52	-980517.86	233.27	-85.51	-93.58
K127	43 53.00	101 37.29	2481.7	SD	980276.65	-980518.01	233.36	-85.55	-93.55
K128	43 53.08	101 37.29	2484.3	SD	980276.61	-980518.13	233.60	-85.64	-93.56
K129	43 53.18	101 37.29	2485.5	SD	980276.74	-980518.28	233.72	-85.68	-93.50
K130	43 53.26	101 37.29	2486.8	SD	980276.81	-980518.40	233.84	-85.72	-93.47
K131	43 53.34	101 37.29	2484.0	SD	980277.21	-980518.52	233.57	-85.63	-93.37
K132	43 53.43	101 37.29	2488.2	SD	980277.15	-980518.66	233.97	-85.77	-93.31
K133	43 53.51	101 37.29	2495.3	SD	980276.85	-980518.78	234.64	-86.02	-93.31

station identification	location latitude	location longitude	elev.	st.	observed gravity	std. grv.	corrections free-air	corrections bouguer	bouguer anomaly
K134	43 53.61	101 37.29	2483.0	SD	980277.53	-980518.93	233.48	-85.59	-93.51
K135	44 3.60	101 36.39	2234.0	SD	980309.16	-980533.99	210.07	-77.03	-91.79
K136	44 4.02	101 36.40	2296.0	SD	980306.52	-980534.62	215.90	-79.16	-91.36
K137	44 4.47	101 36.40	2245.0	SD	980311.01	-980535.30	211.11	-77.41	-90.59
K138	44 4.88	101 36.39	2289.0	SD	980309.05	-980535.92	215.24	-78.92	-90.55
K139	44 5.32	101 36.40	2292.0	SD	980309.65	-980536.58	215.52	-79.02	-90.43
K140	44 5.76	101 36.40	2333.0	SD	980307.67	-980537.25	219.38	-80.43	-90.63
K141	44 6.17	101 36.40	2331.0	SD	980308.49	-980537.86	219.19	-80.37	-90.55
K142	44 6.61	101 36.41	2316.0	SD	980310.61	-980538.53	217.78	-79.85	-89.99
K143	44 7.07	101 36.40	2309.0	SD	980311.44	-980539.22	217.12	-79.61	-90.27
K144	44 7.50	101 36.40	2338.0	SD	980309.94	-980539.87	219.85	-80.61	-90.69

GRAVITY BASE STATION

LATITUDE	STATION DESIGNATION
44° 04.90' N (1)	RAPID CITY
LONGITUDE	
103° 12.90' W (1)	
ELEVATION	**COUNTRY/STATE**
976.00 METERS (1)	USA/South Dakota

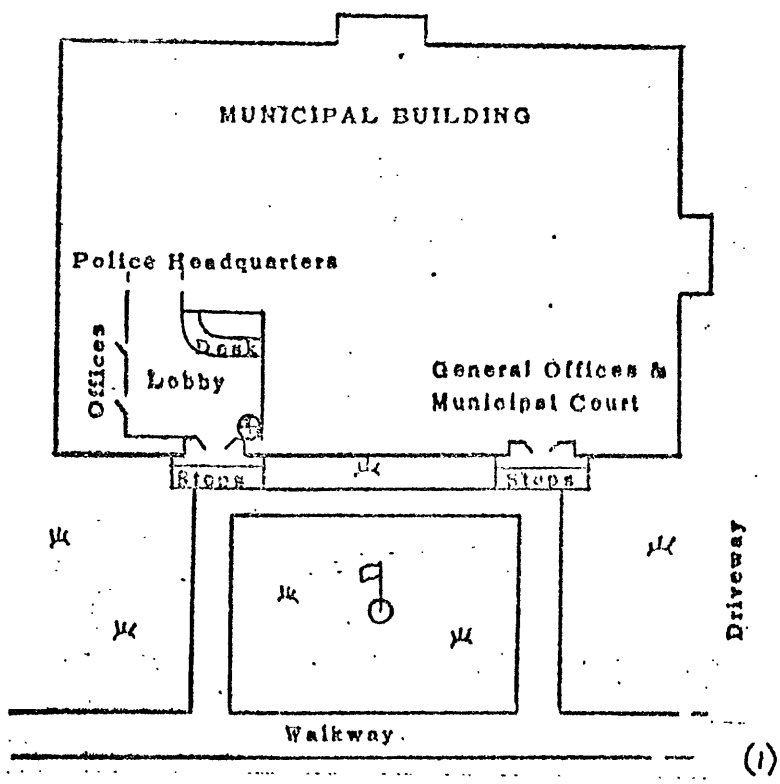
REFERENCE CODE NUMBERS	ADOPTED GRAVITY VALUE
ACIC 0200-1	980 257.16 IGSN 71
IGC 15543B	g= mgals

ESTIMATED ACCURACY	DATE
± 0.1 mgals	MONTH/YEAR July/1967

DESCRIPTION AND/OR SKETCH

The station is in Rapid City at the Municipal Building, 22 Main Street, at the Police Headquarters entrance (westernmost of two Main St. entrances), inside and about 0.6 meter east of the doors, in the corner on the tile floor.

Station is monumented with a U. S. National Gravity Base Disk. (1)



(1)

REFERENCE SOURCE

(1) 02733

Figure 1

GRAVITY BASE STATION

LATITUDE	STATION DESIGNATION
43° 49.95' N (1)	KADOKA
LONGITUDE	
101° 30.60' W (1)	
ELEVATION	**COUNTRY/STATE**
749.81 METERS (1)	USA/South Dakota

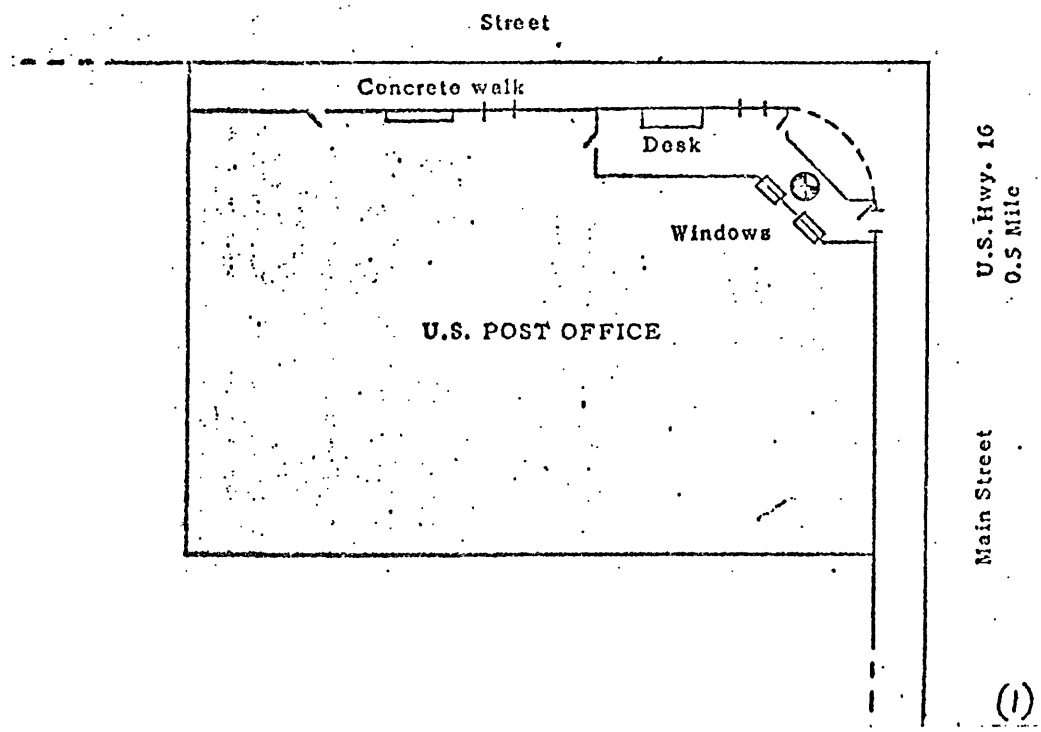
REFERENCE CODE NUMBERS		ADOPTED GRAVITY VALUE	
ACIC 1633-1		980 266.59 IGSN 71	
IGC 15531B		g =	mgals
		ESTIMATED ACCURACY	DATE
		± 0.1 mgals	MONTH/YEAR Jan/1968

DESCRIPTION AND/OR SKETCH

The station is in Kadoka, South Dakota, on the main street at the Post Office.

Observations were made inside the Post Office, at the window between the two northeast corner entrances, on the tile floor.

The station is monumented with a USAF Gravity Disk. (1)



REFERENCE SOURCE

(1) 05112

Figure 2