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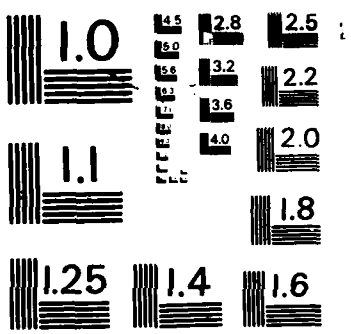

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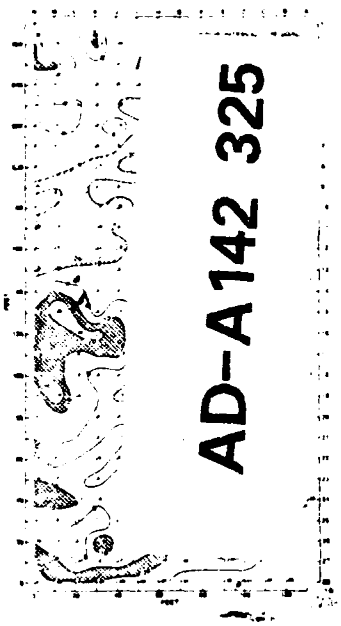

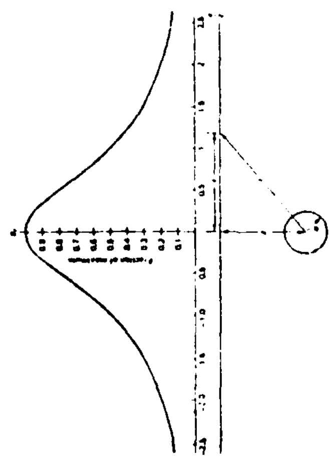

GEOTECHNICAL LABORATORY

MISCELLANEOUS PAPER GL-84-2

MICROGRAVITY SURVEY OF WILSON DAM POWERPLANT SWITCHYARDS, FLORENCE, ALABAMA

by

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US ARMY ENGINEER WATERWAYS EXPERIMENT STATION

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Results of a microgravity survey at Wilson Dam Power Plant Switchyard, Florence, Alabama, are presented. The survey consisted of 288 gravity stations, with approximately 25% of the stations reoccupied during the survey. Objectives of the survey were to detect any anomalous zones in the switchyard foundation which might be indicative of shallow cavities. At least 75% of the downstream switchyard area has no significant gravity anomalies. In the remaining area, several gravity anomalies are identified which could be indicative of subsurface

(Continued)

20. ABSTRACT (Continued)

cavities. If the anomalies are due to cavities, the probable depth range is 5 to 18 ft to the center of the feature. Most of the switchyard structures are in the area free from significant anomalies.

Preface

This investigation was performed by personnel of the Earthquake Engineering and Geophysics Division (EEGD), Geotechnical Laboratory (GL), U. S. Army Engineer Waterways Experiment Station (WES) for the Tennessee Valley Authority (TVA) during the period June 1983 to January 1984. The work was authorized and funded by TVA Contract No. TV-61722A, dated 24 June 1983.

This report was prepared by Dr. Dwain K. Butler and Mr. Donald E. Yule, EEGD. Mr. Stafford S. Cooper, EEGD, was involved during the initial feasibility assessment phase of the investigation. The work was performed under the general supervision of Drs. Arley G. Franklin, Chief, EEGD, and William F. Marcuson III, Chief, GL.

COL Tilford C. Creel, CE, was Commander and Director, WES, and Mr. Fred R. Brown was Technical Director.

Contents

Conversion Factors, U. S. Customary to Metric (SI) Units of Measurement

U. S. customary units of measurement used in this report can be converted to metric (SI) units as follows:

Multiply	By	To Obtain
feet	0.3048	metres
inches	2.54	centimetres

MICROGRAVITY SURVEY OF WILSON DAM POWERPLANT SWITCHYARDS, FLORENCE, ALABAMA

1. At the request of the Tennessee Valley Authority (TVA), personnel of the Earthquake Engineering and Geophysics Division (EEGD), Geotechnical Laboratory (GL), U. S. Army Engineer Waterways Experiment Station (WES) conducted a microgravity survey of portions of the upstream and downstream switchyards of the Wilson Dam powerplant located on the Tennessee River near Florence, Alabama, during the period 26 September - 1 October 1983. The purpose of the survey was to detect the presence of any subsurface cavities which might threaten the foundation stability of switchyard structures. The work was authorized and funded by TVA Contract No. TV-61722A dated 24 June 1983 and Supplement No. 1 dated 6 September 1983.

Background

2. In 1974, a cavity was discovered beneath the upstream switchyard of Wilson Dam powerplant. The cavity was about 10 ft* in diameter and extended to within 2 ft of the surface. The presence of the cavity was suspected due to the development of a surface depression and was confirmed by drilling. The cavity was filled with concrete, and subsequent exploratory angle drilling revealed no additional cavities within the soil beneath the original cavity. Rock (limestone) was encountered at depths ranging from 38 ft to 57 ft. Cavities up to 1-1/2 ft in vertical extent were encountered in the limestone.

3. Subsequently, periodic surface elevation surveys were conducted to detect anomalous settlement, and the powerplant superintendent requested additional studies to confirm or refute the presence of additional cavities beneath the switchyards. On 29-30 June 1983, WES personnel met with TVA personnel at Wilson Dam to determine which, if any, geophysical methods could be applied to the problem. Gravity, seismic, and electrical resistivity measurements were made at several locations in and around the switchyards. The switchyards presented rather severe physical and geometrical constraints to geophysical surveys due to vibration levels, above and below ground concrete and metallic

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* A table of factors for converting U. S. customary units of measurements to metric (SI) units is presented on page 3.

structures, and topographic "dropoffs" surrounding the switchyard areas. It was determined, from an assessment of the trial measurements, that gravity and seismic measurements could be made in the switchyards within the constraints imposed by the surface structures; while electrical resistivity measurements seemed suspect, presumably due to the large number of surface and subsurface metallic structures.

4. TVA decided to carry out a complementary geophysical survey program, consisting of microgravity and seismic surveys. WES was to perform the microgravity survey and TVA was to conduct the seismic survey. Due to maintenance activities in the downstream switchyard, the surveys there would be limited to the immediate vicinity of the known, filled cavity. Surveys in the upstream switchyard would cover the complete area of concern. Survey reference grids would be established and surface elevations determined by a TVA survey party.

5. The purpose of this short report is to document the field procedures, data corrections, interpretation procedures, and results of the WES microgravity survey. On the basis of this report, the results of the TVA seismic surveys, and a joint WES/TVA meeting held at Knoxville on 8 December 1983 to discuss the program results, TVA personnel will recommend verification drilling and remedial measures if needed.

Survey Details and Procedures

6. The microgravity survey consisted of 265 stations in the downstream switchyard and 23 stations in the upstream switchyard. A basic grid dimension of 10 ft was used, modified as required by surface switchyard structures, such as concrete foundation pads and cable trenches. Grid points were located horizontally to better than 0.1 ft accuracy relative to each other and the switchyard structures. At each grid point, a 2 x 2 in. stake was driven flush with the ground surface and elevations of the tops of the stakes were determined with an accuracy of 0.01 ft. Figure 1 illustrates the downstream switchyard grid area giving pertinent details for later reference.

7. Details of microgravity survey field procedures are given in Butler (1980, 1983) and Butler et al (1982, 1983) and will only be briefly summarized here. The survey was conducted in "zigzag" loops or segments called programs. A program consists typically of 8-10 gravity station measurements between two successive occupations of the base stations (0,150). Each program was

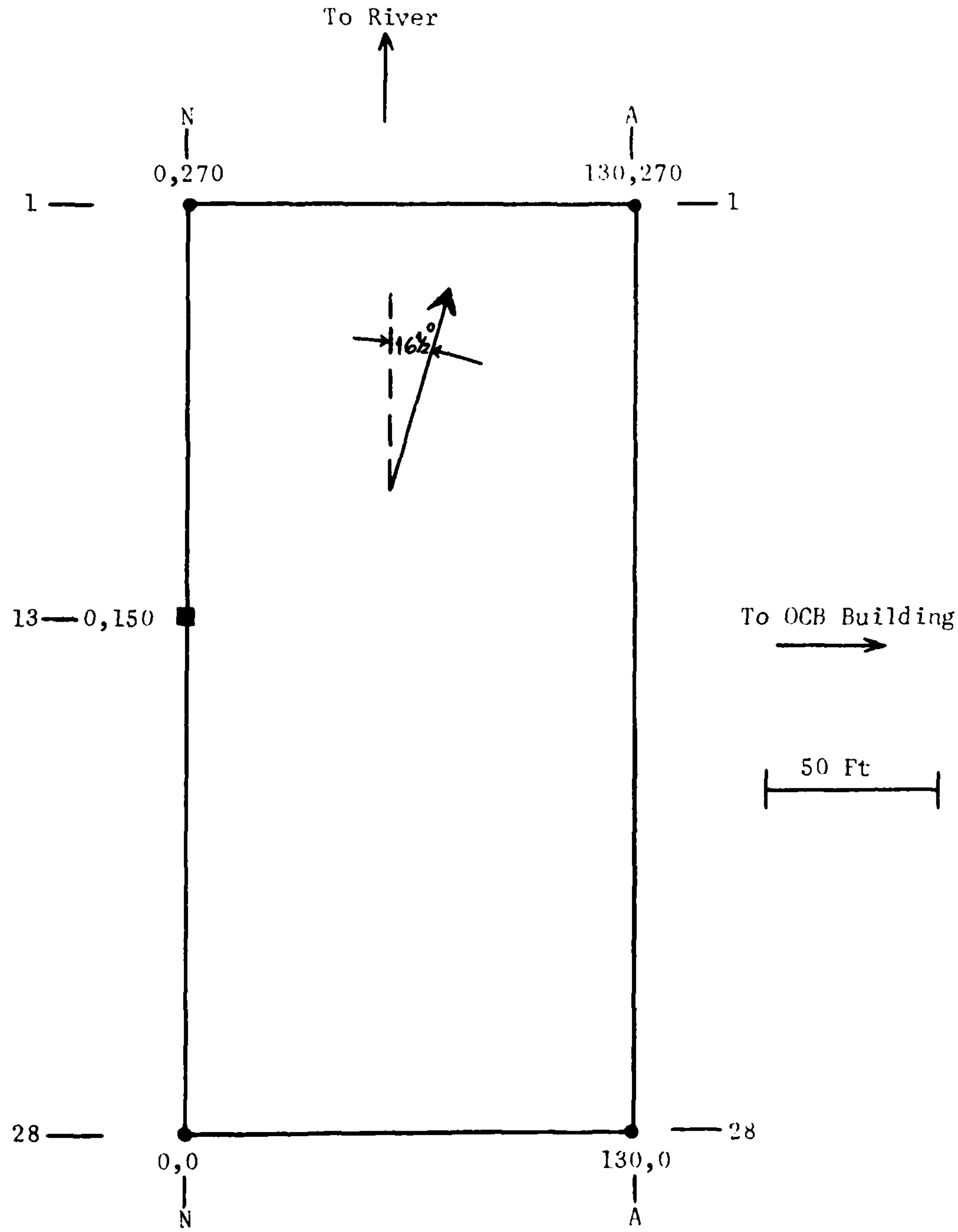

Figure 1. Microgravity survey area, downstream switchyard. Comparison of (x,y) location coordinate system and surveyor's designation. For example, the Base Station is at location (0,150) and is designated N13.

completed in 30-45 minutes. The base station reoccupations are used to correct the survey data for time varying gravity values due to earth tides and instrument drift. Each program includes one or more stations which were occupied on previous programs; 25 percent of the stations were reoccupied during the survey. Comparison of the repeat values after the corrections described in the following section allowed the quality and accuracy of the data to be monitored during the course of the survey. The data acquisition required 4 days for the two-man crew.

Data Corrections

8. Required corrections to gravity are thoroughly discussed in Butler (1980) and will only be summarized here. Briefly the corrections are necessary due to time variations of gravity, latitude and elevation differences between gravity stations, and the effects of topographic features.

Meter factor

9. The meter factor for the LaCoste and Romberg Model D-57 gravimeter used for the survey is 1.1003. The meter factor is multiplied by each station reading to convert from meter units to gravity units (mgal*).

Correction for time variations

10. The gravity variation with time for the entire site is assumed to be the same as at the base station. All stations in a program are corrected for gravity time variations by linear interpolation using the base station values at the beginning and end of the program.

Latitude correction

11. This correction compensates for the normal variation in gravity over the earth in a N-S direction. A reference latitude of 34.5° is used for the site; and the correction is $\mp$ 0.23 μgal per ft NS distance from the base station, where the correction is subtracted if a station is N of the base station and added if S .

Free-air correction

12. The free-air correction accounts for the normal variation of gravity with elevation. The correction is given by $\pm$ 94.04 x Δh μgal for Δh in ft, where Δh is the elevation difference of a station relative to a reference

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* 1 mgal = 10^{-3} gal = 10^{-3} cm/S^2 = 10^{-5} m/S ; 1 μgal = 10^{-6} gal

elevation. For this survey, the elevation of the base station, 553.87 ft, is used as the reference elevation; the correction is added if a station is higher than the base station, and substracted if lower.

Bouguer correction

13. The Bouguer correction accounts for the fact that there are differing masses of material beneath gravity station due solely to elevation differences. The correction is calculated using $\mp 12.77 \times \rho \times \Delta h$ μgal for Δh in ft and ρ in g/cm^3, where ρ is the density of the near surface material (1.8 g/cm^3 selected for this survey). Subtract the correction if the station is higher than the base station, and add if lower.

Terrain correction

14. The terrain correction compensates station gravity values for the attraction of nearby topographic variations and other terrain features. Within the downstream switchyard gravity grid area, the only corrections are for the switchyard structures, including the transfer track trench, since the area is otherwise relatively flat. Outside the grid area, there are dropoffs (≈6.5 ft) to the south and east which have a small effect on portions of the grid. The transfer track trench and the two dropoffs are modeled as approximately two-dimensional features, and their effects on station gravity values are calculated with a computer program (Butler et al, 1982). The large dropoff at the bluff of the Tennessee River, which begins about 90 ft N of the grid area, has a major effect on the station gravity values. Corrections for the river bluff and switchyard structures within the survey area will be discussed later.

Data processing

15. Each of the above steps in the data correction process is applied to each gravimeter reading at each station. The data acquired each day of the survey were processed at night using a microcomputer. This prompt processing of the data allowed the data quality and repeat gravity values to be continually monitored during the course of the survey.

16. Appendix A contains the computer outputs for the survey. Each output segment is for a single program and is identified by a letter and number, such as J/29, where J refers to the specific program or loop and 29 indicates that the program was conducted on 29 September 1983. The first section of the output summarizes the basic reference data for the survey which is the same for all programs. Next in the output is the field data: station coordinates (x, y); time of reading; station elevation (leading '5' in all

elevations is suppressed); and the field reading. The final output section contains the data which has been processed to include all the above corrections except the terrain corrections.

17. Subsequent data processing included sorting of corrected data into rows (grid lines running approximately E-W) and columns (grid lines running approximately N-S), averaging acceptable repeat readings, editing or deleting unacceptable readings*, adding or subtracting values to rows and columns, and finding averages of rows, columns, or the whole grid. Only one station value was deleted, due to single occupation; editing of five other station values was possible using repeat occupations.

Survey Results and Analysis

Residual gravity map - downstream switchyard

18. A contour plot of the corrected gravity data was made and examined for any evidence of regional trends. A strong trend of decreasing gravity values from south to north in the grid for the downstream switchyard was immediately evident. The trend was characterized by a plot of row averages as shown in Figure 2. Since the decrease is typical of the expected effect of the nearby river bluff, two additional single gravity measurements were made at (50,300) and (50,350), outside the survey grid, and these values are also shown in Figure 2.

19. In an effort to predict the effects of the river bluff, a two-dimensional model was developed as shown in Figure 3, and the calculated gravity anomaly due to the bluff is presented in Figure 4. It is clear from a comparison of Figures 2 and 4, that the decrease in gravity observed in the row averages (Figure 2) must be due to the river bluff. Calculations such as shown in Figure 4 were made for various rock densities and bluff slopes (since the bluff slope is not known). The best fit to the data in Figure 2 is for a rock density of $\rho_R = 2.5\ g/cm^3$ and a bluff slope of 45^o. Including the small dropoff to the south of the survey area in the model gives a nearly exact fit to the measured data.

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* Unacceptable readings are those that seem inconsistent with nearby station values or are physically suspect (e.g., >100 μgal change over 10 ft horizontal distance). One possible source of unacceptable readings is transposition of numbers when recording data. Another possible source is biased nulling of the gravimeter, such as during the passage of long period surface waves.

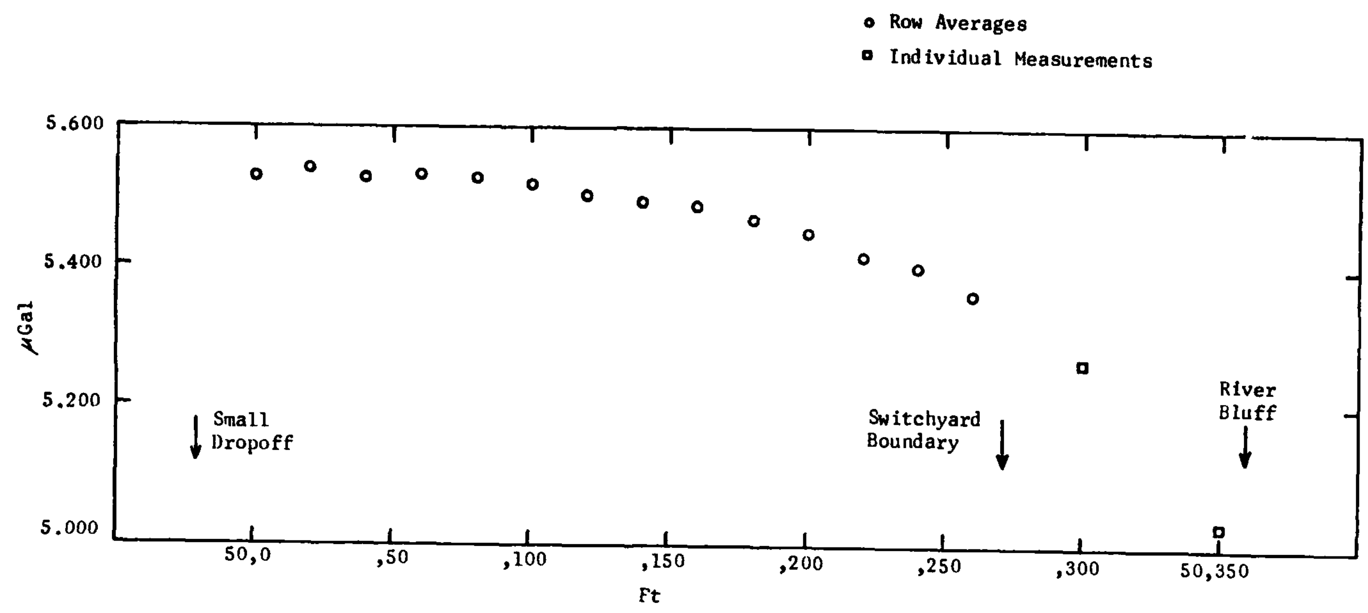

Figure 2. Profile of gravity row averages within survey area and individual measurements outside survey area showing the terrain gravity effect of the dropoff at the river bluff.

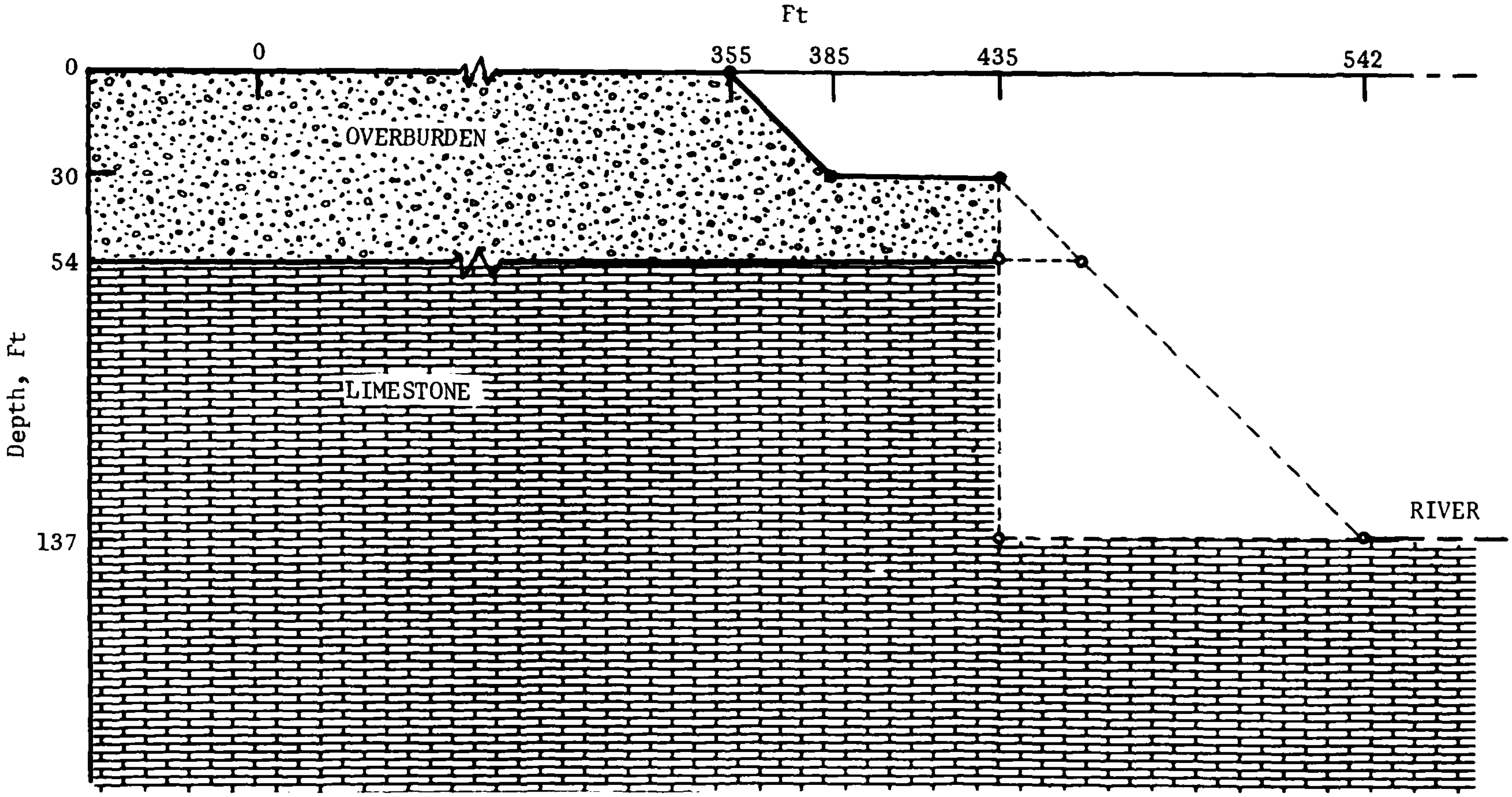

Figure 3. Model used for river bluff terrain gravity effect calculations. Overburden density--1.8 g/cm^3. Limestone density--2.5 g/cm^3. Slope of lower part of bluff varied from 90° to 45° in calculations. Effect of varying river channel depth neglected. Top of rock assumed at 500 ft msl.

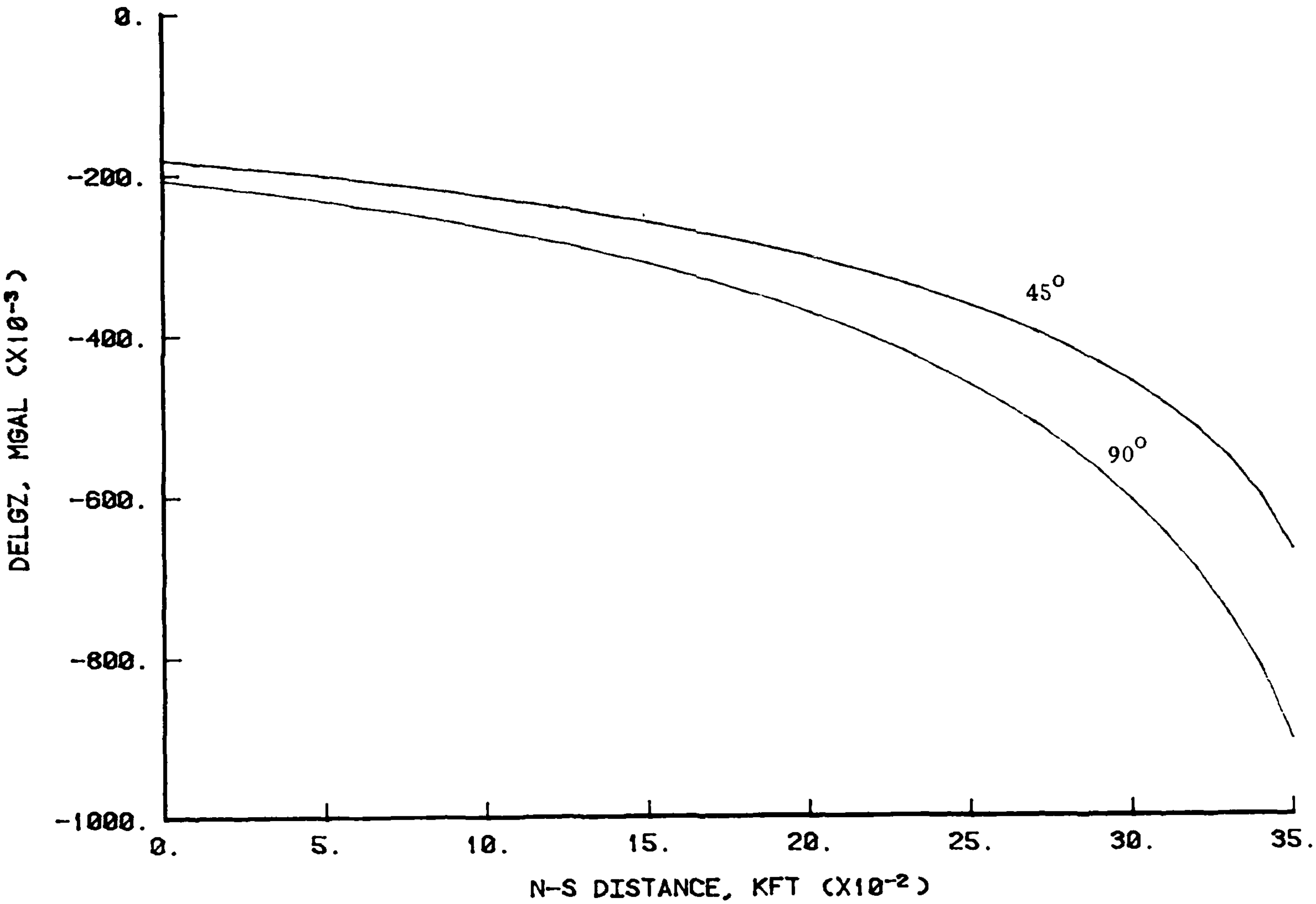

Figure 4. Gravity anomaly for model in Figure 3.

20. Correcting the gravity data for all the above mentioned terrain effects and then subtracting the average value for the whole grid from each corrected value yields a set of gravity data which will be called the residual gravity anomaly. Figure 5 is a contour plot of the residual gravity anomaly and is appropriately shaded to differentiate positive and negative anomaly areas.

21. The first step in analyzing the residual anomaly map was to determine if the gravity values were effected by the switchyard structures. A transparent overlay residual anomaly map was prepared to the same scale as a downstream switchyard plan map. A careful examination of the superimposed maps failed to reveal any systematic correlation between residual gravity lows* and the locations of switchyard structures. It is concluded then that no correction is required to account for the gravity effect of switchyard structures. Evidently, the distribution of structures is such that the net gravity effect is approximately constant over the survey area.

<u>Assessment of downstream switchyard results</u>

22. Subsurface cavities, whether filled with air or water (or clay, if the cavity is in rock), will produce a negative residual gravity anomaly. Likewise, areas of the switchyard foundation with low densities relative to the normal condition of the foundation, which might be indicative of weak foundation conditions, will produce negative anomalies. Thus negative gravity anomalies are the indicators of areas of possible concern. Using the criterion that a gravity anomaly with magnitude $\gtrsim$ 10 μgal is significant (Butler, 1980), it is noteworthy that at least 75 percent of the downstream switchyard area has a residual gravity anomaly value > -10 μgal (i.e., more positive than -10 μgal). The majority of the switchyard structures are within the area free from significant negative anomalies.

23. There are, however, several closed negative anomaly features which could be indicative of cavities or other low density anomalous conditions; these features as well as others are labeled A - J in Figure 5. Anomalies A, B, and C are typical of the type anomalies produced by shallow cavities. Assuming that the anomalies are caused by a compact feature, such as a spheroid-shaped cavity, it is possible to make depth estimates. Several profile lines are selected across each anomaly, and each gravity profile is analyzed to give

* A low would be expected since the gravity effect of a terrain feature is to lower gravity values of nearby gravity measurements.

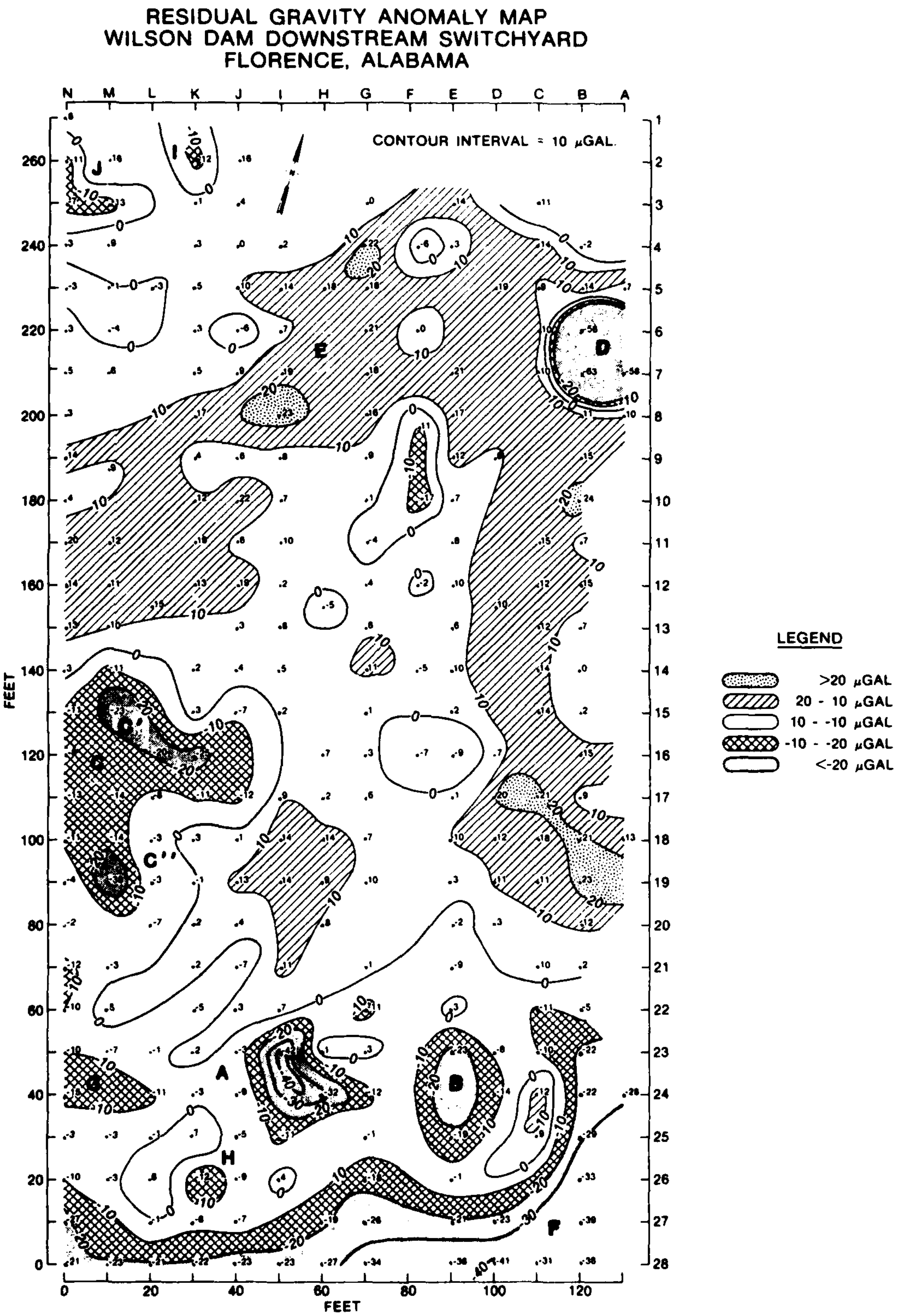

Figure 5. Residual gravity map for the downstream switchyard.

the depth to center of the feature. Also, maximum depth rules are applied to each profile. These interpretive procedures are discussed in Butler (1980, 1983). The results of the profile interpretations are presented in the table below.

Anomaly	A	B	C: C'	C: C"
Most Probable Depth (ft)	7	12	5	10
Probable Depth Range (ft)	5-12	8-18	4-9	6-17
Maximum Depth (ft)	12	18	9	17

A geometrically less compact feature would have to be located at a shallower depth than the maximum depth listed above to produce the measured anomaly.

24. Anomaly D is a significant negative anomaly feature due to its large magnitude relative to the positive anomaly region around it. The large increase in a short distance at the periphery of the anomaly indicates a shallow feature. The only simple model which could account for an anomaly such as D is a vertical, cylindrical-shaped feature with considerable depth extent. A vertical cylinder feature with diameter ≈ 10 ft, density contrast with soil of $-1.8\ g/cm^3$, and depth to its top of 3-5 ft could account for the gravity anomaly.

25. Anomaly E is a positive anomaly area with relatively small magnitude but large spatial extent. This type anomaly could be caused, for example, by an extended limestone pinnacle or a shallow zone of higher soil density. If the depth to limestone is typically 50 ft (as shown in borings in the upstream switchyard), an elevated limestone feature ≈ 6 ft high and 10-15 ft in width could account for the gravity anomaly.

26. Anomaly F appears to be an artifact of the terrain correction. The two-dimensional approximations to the terrain corrections of the S and E sides meet at the SE corner and fail to correctly approximate the true three-dimensional conditions there.

27. Anomalies G, H, I, and J are small negative anomaly features which might be due to small, shallow cavities.

<u>Residual gravity map - upstream switchyard</u>

28. Figure 6 is the residual gravity anomaly map for the small survey conducted in the upstream switchyard. The location of the borehole used to fill the cavity with concrete is indicated in Figure 6. The striking aspect of the residual anomaly map is the absence of an anomaly feature concentric to

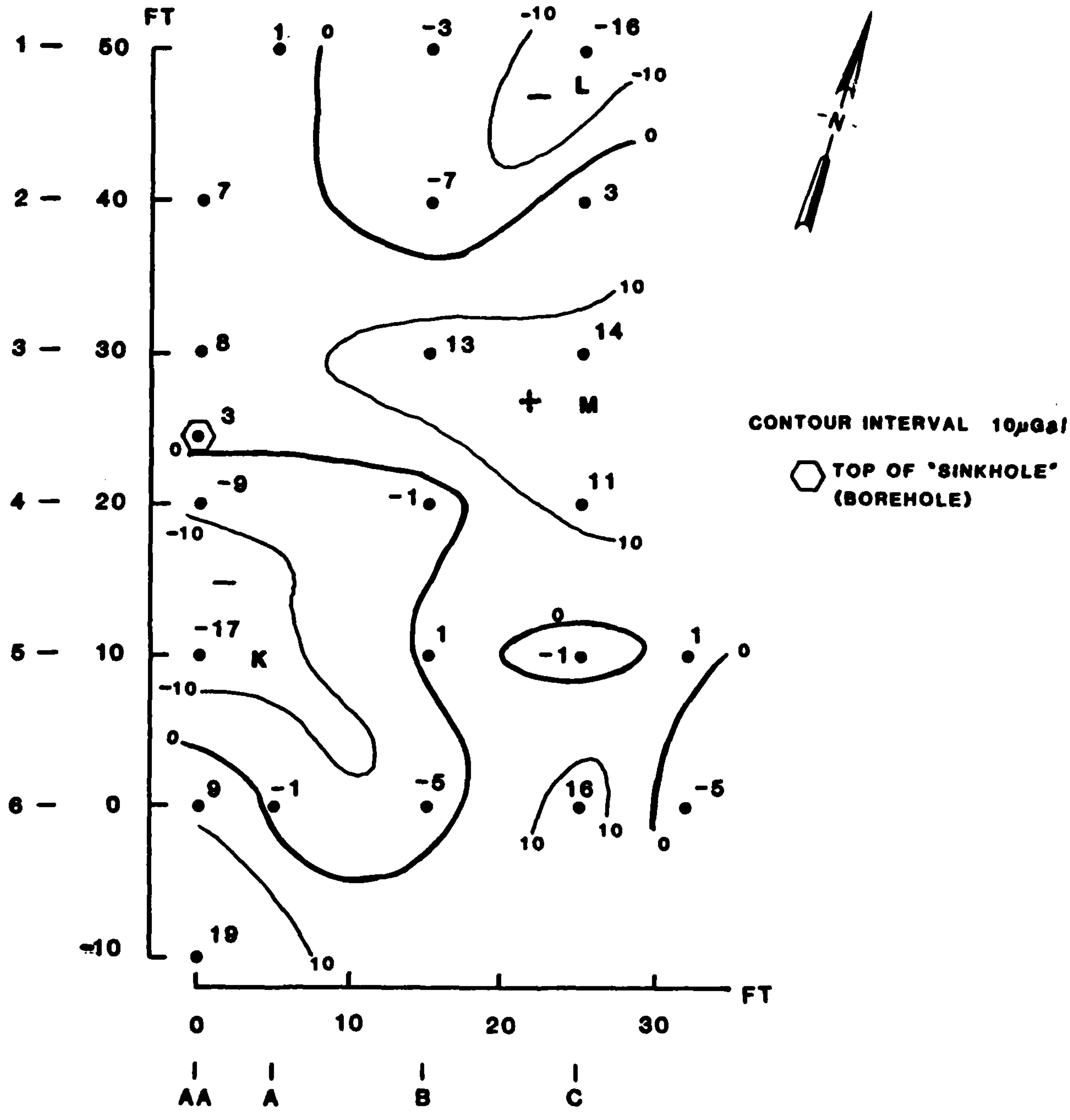

Figure 6. Residual gravity map for the Upstream Switchyard survey.

the borehole location. If the concrete completely filled the void space, a small positive gravity anomaly would be observed above the concrete filled cavity, since the concrete should represent a positive density contrast relative to the soil (0.4 - 0.6 g/cm^3 , depending on the concrete mixture). Observing the locations of the negative anomalies K and L and the positive anomaly M, a "story" or model could be developed to explain the absence of a positive anomaly above the cavity; however, the "story" would be entirely speculative. A verification boring in the vicinity of location (0, 12) in anomaly K would allow the logical development of a model as well as investigating the possibility of a cavity at this location.

Recommendations

29. It is emphasized that the interpretation of various gravity anomalies as indicative of cavities must be selectively verified by drilling. The following is a relative significance ranking of gravity anomalies for the downstream switchyard:

a. 1st - Anomaly D, Location (125, 215)
Anomaly A, Location (50, 50)
Anomaly B, Location (90, 40)
Anomaly C", Location (30, 210)

b. 2nd - Anomaly F, Location (120, 20)

c. 3rd - Anomalies G, H, I, and J

It is recommended that this significance ranking be considered along with the results of the TVA seismic investigations in planning any subsequent investigations for the downstream switchyard.

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Butler, Dwain K. 1980. "Microgravimetric Techniques for Geotechnical Applications," Miscellaneous Paper GL-80-13, U. S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

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Appendix A

Wilson Dam Microgravity Survey

Field Data and Corrected Data

DATA SUMMARY

WILSON DAM A/27

BASE STATION= 0 150
REF. ELV= 53.87
REF LAT= 34.5
REF READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X,Y)		TIME	ELV	READING
1	0	150	908	53.870	5.025
2	10	140	912	53.730	5.025
3	20	155	915	53.820	5.036
4	30	140	918	53.790	5.036
5	40	150	924	53.880	5.033
6	50	140	927	53.700	5.048
7	60	155	929	53.860	5.028
8	70	140	933	53.800	5.043
9	90	150	939	53.750	5.048
10	0	150	940	53.870	5.047

RESULTS

PT	STA(X,Y)		G(b)(MGALS)
1	0	150	5.496
2	10	140	5.495
3	20	155	5.498
4	30	140	5.497
5	40	150	5.493
6	50	140	5.497
7	60	155	5.481
8	70	140	5.494
9	90	150	5.488
10	0	150	5.496

DATA SUMMARY

WILSON DAM B/27

BASE STATION= 0 150
REF ELV= 53.87
REF LAT= 34.5
REF READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X,Y)		TIME	ELV	READING
1	0	150	948	53.870	5.047
2	0	140	956	53.910	5.042
3	10	150	1000	53.720	5.055
4	30	150	1004	53.810	5.049
5	40	140	1008	53.840	5.052
6	50	150	1012	53.750	5.057
7	70	150	1017	53.780	5.058
8	90	140	1021	53.740	5.069
9	100	155	1024	53.840	5.060
10	110	140	1027	53.740	5.075
11	120	150	1030	53.920	5.050
12	0	150	1037	53.870	5.058

RESULTS

PT	STA(X,Y)		G(b)(MGALS)
1	0	150	5.496
2	0	140	5.493
3	10	150	5.490
4	30	150	5.488
5	40	140	5.494
6	50	150	5.489
7	70	150	5.490
8	90	140	5.499
9	100	155	5.491
10	110	140	5.503
11	120	150	5.484
12	0	150	5.496

DATA SUMMARY

WILSON DAM C/27

BASE STATION= 0 150
REF. ELV= 53.87
REF LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X,Y)		TIME	ELV	READING
1	0	150	1037	53.870	5.058
2	0	130	1043	53.800	5.056
3	10	140	1046	53.730	5.050
4	30	130	1050	53.750	5.068
5	40	140	1054	53.840	5.058
6	50	130	1057	53.720	5.070
7	60	120	1100	53.810	5.072
8	70	130	1103	53.810	5.064
9	90	120	1107	53.760	5.068
10	110	130	1109	53.710	5.084
11	120	140	1113	53.910	5.053
12	0	150	1118	53.870	5.059

RESULTS

PT	STA(X,Y)		G(b)(MGALS)
1	0	150	5.496
2	0	130	5.496
3	10	140	5.478
4	30	130	5.500
5	40	140	5.493
6	50	130	5.499
7	60	120	5.509
8	70	130	5.497
9	90	120	5.499
10	110	130	5.509
11	120	140	5.497
12	0	150	5.496

DATA SUMMARY

WILSON DAM D/27

BASE STATION= 0 150
REF ELV= 53.87
REF LAT= 34.5
REF READING= 5.5290075
DENSITY= 1.8
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X,Y)		TIME	ELV	READING
1	0	150	1118	53.870	5.059
2	0	120	1124	53.770	5.054
3	10	130	1127	53.750	5.041
4	20	120	1130	53.860	5.041
5	30	140	1132	53.790	5.053
6	40	130	1134	53.770	5.055
7	50	140	1138	53.700	5.061
8	90	130	1142	53.720	5.063
9	110	140	1145	53.740	5.070
10	110	150	1147	53.750	5.060
11	0	150	1152	53.870	5.051

RESULTS

PT	STA(X,Y)		G(b)(MGALS)
1	0	150	5.496
2	0	120	5.491
3	10	130	5.474
4	20	120	5.484
5	30	140	5.487
6	40	130	5.490
7	50	140	5.430
8	90	130	5.494
9	110	140	5.501
10	110	150	5.489
11	0	150	5.496

DATA SUMMARY

WILSON DAM E/27

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	,Y)	TIME	ELV.	READING
1	0	150	1347	53.870	5.022
2	0	110	1352	53.900	5.013
3	10	100	1356	53.800	5.021
4	20	110	1359	53.840	5.032
5	30	120	1401	53.850	5.003
6	40	110	1405	53.930	5.013
7	50	100	1409	53.770	5.047
8	60	110	1414	53.880	5.030
9	70	120	1416	53.760	5.034
10	90	110	1420	53.850	5.031
11	100	120	1422	53.780	5.038
12	0	150	1429	53.870	5.019

RESULTS

PT	STA(X	,Y)	G(b)(MGALS)
1	0	150	5.496
2	0	110	5.497
3	10	100	5.501
4	20	110	5.502
5	30	120	5.479
6	40	110	5.498
7	50	100	5.526
8	60	110	5.512
9	70	120	5.506
10	90	110	5.510
11	100	120	5.510
12	0	150	5.496

DATA SUMMARY

WILSON DAM F27

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.6
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	,Y)	TIME	ELV.	READING
1	0	150	1429	53.870	5.019
2	0	100	1434	53.940	5.010
3	10	110	1436	53.790	5.015
4	20	100	1440	53.890	5.020
5	30	110	1443	53.880	5.011
6	40	100	1446	53.929	5.032
7	50	110	1448	53.860	5.030
8	60	100	1451	53.850	5.038
9	70	110	1454	53.850	5.027
10	60	120	1457	53.810	5.028
11	0	150	1504	53.870	5.009

RESULTS

PT	STA(X	,Y)	G(b)(MGALS)
1	0	150	5.496
2	0	100	5.504
3	10	110	5.496
4	20	100	5.512
5	30	110	5.499
6	40	100	5.516
7	50	110	5.519
8	60	100	5.529
9	70	110	5.515
10	60	120	5.513
11	0	150	5.496

DATA SUMMARY

WILSON DAM G/27

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT. = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	,Y)	TIME	ELV.	READING
1	0	150	1504	53.870	5.009
2	0	90	1511	53.880	5.016
3	30	100	1514	53.900	5.020
4	50	90	1517	53.750	5.045
5	70	100	1520	53.940	5.024
6	90	90	1524	53.830	5.032
7	100	100	1527	53.840	5.037
8	110	110	1537	53.720	5.051
9	120	120	1531	53.880	5.027
10	120	130	1534	53.770	5.022
11	70	150	1543	53.780	5.020
12	0	150	1550	53.870	5.014

RESULTS

PT	STA(X	,Y)	G(b)(MGALS)
1	0	150	5.496
2	0	90	5.517
3	30	100	5.518
4	50	90	5.535
5	70	100	5.522
6	90	90	5.523
7	100	100	5.526
8	110	110	5.529
9	120	120	5.512
10	120	130	5.496
11	70	150	5.492
12	0	150	5.496

DATA SUMMARY

WILSON DAM H/29

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.6
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	,Y)	TIME	ELV.	READING
1	0	150	753	53.870	4.856
2	10	90	801	53.650	4.850
3	20	80	804	53.820	4.871
4	30	90	811	53.810	4.878
5	40	80	814	53.760	4.889
6	60	90	820	53.900	4.886
7	70	80	825	53.740	4.995
8	90	100	831	53.720	4.898
9	100	110	835	53.970	4.892
10	90	120	839	53.760	4.871
11	0	150	847	53.870	4.874

RESULTS

PT	STA(X	,Y)	G(b)(MGALS)
1	0	156	5.496
2	16	90	5.483
3	20	80	5.519
4	30	90	5.520
5	40	80	5.530
6	60	90	5.530
7	70	80	5.639
8	90	100	5.523
9	100	110	5.529
10	90	120	5.488
11	0	150	5.496

DATA SUMMARY

WILSON DAM I/29

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	Y)	TIME	ELV.	READING
1	0	150	847	53.870	4.874
2	0	70	851	53.870	4.891
3	20	90	855	53.900	4.886
4	30	80	857	53.790	4.902
5	40	90	904	53.860	4.909
6	60	80	907	53.710	4.920
7	70	90	910	53.830	4.906
8	90	80	901	53.790	4.903
9	100	90	913	53.830	4.917
10	70	100	916	53.940	4.901
11	0	150	923	53.870	4.894

RESULTS

PT	STA(X	Y)	G(b)(MGALS)
1	0	150	5.496
2	0	70	5.519
3	20	90	5.518
4	30	80	5.528
5	40	90	5.534
6	60	80	5.534
7	70	90	5.530
8	90	80	5.523
9	100	90	5.531
10	70	100	5.519
11	0	150	5.496

DATA SUMMARY

WILSON DAM J/29

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	Y)	TIME	ELV.	READING
1	0	150	923	53.870	4.894
2	0	80	926	53.840	4.906
3	30	70	929	53.780	4.921
4	50	60	932	53.750	4.934
5	70	70	935	53.760	4.923
6	90	60	939	53.670	4.936
7	110	70	942	53.790	4.934
8	110	90	948	53.500	4.951
9	120	100	951	53.900	4.931
10	50	100	957	53.770	4.939
11	0	120	1000	53.770	4.909
12	0	150	1005	53.870	4.906

RESULTS

PT	STA(X	Y)	G(b)(MGALS)
1	0	150	5.496
2	0	80	5.524
3	30	70	5.533
4	50	60	5.545
5	70	70	5.529
6	90	60	5.537
7	110	70	5.539
8	110	90	5.530
9	120	100	5.533
10	50	100	5.535
11	0	120	5.500
12	0	150	5.496

DATA SUMMARY

WILSON DAM K/29

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	Y)	TIME	ELV.	READING
1	0	150	1125	53.870	4.951
2	0	60	1132	53.840	4.964
3	10	70	1135	53.740	4.976
4	20	80	1138	53.820	4.966
5	30	60	1141	53.776	4.977
6	40	70	1144	53.870	4.968
7	70	60	1148	53.770	4.973
8	90	70	1152	53.700	4.981
9	100	60	1157	53.840	4.991
10	110	100	1159	53.710	4.996
11	120	110	1203	53.860	4.979
12	0	150	1208	53.870	4.962

RESULTS

PT	STA(X	Y)	G(b)(MGALS)
1	0	150	5.496
2	0	60	5.526
3	10	70	5.528
4	20	80	5.519
5	30	60	5.531
6	40	70	5.524
7	70	60	5.522
8	90	70	5.521
9	100	80	5.527
10	110	100	5.528
11	120	110	5.516
12	0	150	5.496

DATA SUMMARY

WILSON DAM L/29

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	Y)	TIME	ELV.	READING
1	0	150	1005	53.870	4.906
2	10	60	1011	53.730	4.942
3	20	50	1016	53.770	4.939
4	40	60	1023	53.930	4.936
5	60	50	1028	53.860	4.944
6	90	60	1037	53.670	4.962
7	0	150	1050	53.870	4.931
8	100	80	1055	53.840	4.957
9	120	90	1102	53.940	4.969
10	130	100	1109	53.980	4.958
11	120	120	1113	53.860	4.967
12	0	150	1125	53.870	4.951

RESULTS

PT	STA(X	Y)	G(b)(MGALS)
1	0	150	5.496
2	10	60	5.541
3	20	50	5.539
4	40	60	5.539
5	60	50	5.541
6	90	60	5.538
7	0	150	5.496
8	100	80	5.528
9	120	90	5.541
10	130	100	5.524
11	120	120	5.520
12	0	150	5.496

DATA SUMMARY

WILSON DAM M/28

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT,ST(X,Y),TIME, ELV., READING

1	0	150	1615	53.870	4.964
2	0	50	1622	53.870	4.974
3	20	40	1624	53.800	4.980
4	40	50	1629	53.880	4.981
5	60	40	1634	53.700	4.968
6	90	50	1638	53.710	4.974
7	110	60	1641	53.770	4.979
8	120	70	1644	53.880	4.981
9	120	80	1648	53.860	4.988
10	70	80	1652	53.740	4.979
11	0	150	1657	53.870	4.957

RESULTS

PT,STA(X,Y),G(b)(MGALS)

1	0	150	5.496
2	0	50	5.530
3	20	40	5.533
4	40	50	5.537
5	60	40	5.512
6	90	50	5.516
7	110	60	5.523
8	120	70	5.530
9	120	80	5.535
10	70	80	5.521
11	0	150	5.496

DATA SUMMARY

WILSON DAM N/28

BASE STATION= 0 150
REF ELV= 53.87
REF LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1 6
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT,ST(X,Y),TIME, ELV., READING

1	0	150	1454	53.870	4.959
2	10	50	1510	53.720	4.982
3	30	50	1516	53.740	4.990
4	50	70	1524	53.700	4.997
5	70	50	1535	53.680	4.995
6	0	150	1546	53.720	4.956
7	50	100	1550	53.770	4.986
8	100	50	1556	53.770	4.983
9	120	60	1600	53.950	4.973
10	90	80	1604	53.790	4.961
11	60	80	1608	53.710	4.996
12	0	150	1615	53.870	4.964

RESULTS

PT,STA(X,Y),G(b)(MGALS)

1	0	150	5.496
2	10	50	5.533
3	30	50	5.542
4	50	70	5.542
5	70	50	5.542
6	0	150	5.485
7	50	100	5.528
8	100	50	5.531
9	120	60	5.528
10	90	80	5.522
11	60	80	5.533
12	0	150	5.496

DATA SUMMARY

WILSON DAM O\28

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT,ST(X,Y),TIME, ELV., READING

1	0	150	1406	53.870	4.963
2	0	40	1411	53.710	4.981
3	10	30	1414	53.590	5.002
4	30	40	1418	53.620	4.999
5	40	30	1423	53.810	4.987
6	50	50	1426	53.210	4.989
7	70	40	1429	53.740	4.980
8	90	30	1433	53.780	4.977
9	110	50	1437	53.830	4.979
10	120	80	1440	53.860	4.992
11	90	100	1449	53.720	4.999
12	0	150	1454	53.870	4.959

RESULTS

PT,STA(X,Y),G(b)(MGALS)

1	0	150	5.496
2	0	40	5.529
3	10	30	5.545
4	30	40	5.541
5	40	30	5.543
6	50	50	5.498
7	70	40	5.527
8	90	30	5.528
9	110	50	5.528
10	120	80	5.538
11	90	100	5.534
12	0	150	5.496

DATA SUMMARY

WILSON DAM P\28

BASE STATION= 0 150
REF ELV= 53.87
REF LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT,ST(X,Y),TIME, ELV., READING

1	0	150	1318	53.870	4.970
2	0	30	1322	53.620	5.006
3	10	20	1326	53.590	5.009
4	20	30	1331	53.620	5.008
5	40	40	1335	53.830	4.986
6	50	30	1340	53.840	4.985
7	70	20	1344	53.760	4.983
8	100	40	1348	53.770	4.968
9	120	30	1352	53.980	4.959
10	120	41	1354	53.930	4.967
11	120	50	1358	54.010	4.960
12	0	150	1406	53.870	4.963

RESULTS

PT,STA(X,Y),G(b)(MGALS)

1	0	150	5.496
2	0	30	5.545
3	10	20	5.540
4	20	30	5.547
5	40	40	5.535
6	50	30	5.537
7	70	20	5.531
8	100	40	5.531
9	120	30	5.516
10	120	41	5.519
11	120	50	5.515
12	0	150	5.496

DATA SUMMARY

WILSON DAM Q/28

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	Y)	TIME	ELV.	READING
1	0	150	1123	53.870	5.009
2	0	20	1126	53.650	5.035
3	20	10	1129	53.650	5.042
4	30	30	1132	53.600	5.049
5	50	20	1136	53.620	5.042
6	70	30	1140	53.710	5.028
7	90	20	1143	53.700	5.027
8	110	30	1148	53.650	5.034
9	110	41	1150	53.930	5.006
10	130	43	1153	53.540	5.037
11	130	100	1157	53.980	4.971
12	0	150	1205	53.870	4.966

RESULTS

PT	STA(X	Y)	G(b)(MGALS)
1	0	150	5.496
2	0	20	5.541
3	20	10	5.553
4	30	30	5.555
5	50	20	5.555
6	70	30	5.546
7	90	20	5.549
8	110	30	5.555
9	110	41	5.544
10	130	43	5.552
11	130	100	5.503
12	0	150	5.496

DATA SUMMARY

WILSON DAM R/28

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	Y)	TIME	ELV.	READING
1	0	150	906	53.870	4.968
2	0	0	920	53.690	4.999
3	20	20	935	53.660	5.023
4	40	10	943	53.620	5.016
5	70	20	954	53.760	5.001
6	0	150	1007	53.870	4.987
7	70	40	1017	53.740	5.019
8	50	60	1024	53.750	5.030
9	40	80	1032	53.760	5.022
10	20	100	1037	53.890	5.008
11	0	150	1046	53.870	5.009

RESULTS

PT	STA(X	Y)	G(b)(MGALS)
1	0	150	5.496
2	0	0	5.546
3	20	20	5.559
4	40	10	5.547
5	70	20	5.532
6	0	150	5.496
7	70	40	5.535
8	50	60	5.541
9	40	80	5.524
10	20	100	5.512
11	0	150	5.496

DATA SUMMARY

WILSON DAM S/28

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	Y)	TIME	ELV.	READING
1	0	150	1046	53.870	5.009
2	0	10	1052	53.660	5.023
3	20	0	1055	53.630	5.031
4	30	10	1057	53.560	5.048
5	40	20	1101	53.720	5.037
6	50	0	1103	53.680	5.028
7	60	10	1106	53.810	5.024
8	70	0	1109	53.660	5.019
9	90	10	1111	53.730	5.028
10	110	0	1115	53.700	5.021
11	70	60	1118	53.770	5.028
12	0	150	1123	53.870	5.009

RESULTS

PT	STA(X	Y)	G(b)(MGALS)
1	0	150	5.496
2	0	10	5.527
3	20	0	5.535
4	30	10	5.546
5	40	20	5.542
6	50	0	5.533
7	60	10	5.535
8	70	0	5.521
9	90	10	5.532
10	110	0	5.523
11	70	60	5.525
12	0	150	5.496

DATA SUMMARY

WILSON DAM T/28

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	Y)	TIME	ELV.	READING
1	0	150	825	53.870	4.946
2	0	0	834	53.690	4.965
3	10	0	837	53.700	4.968
4	30	20	839	53.600	4.966
5	40	0	842	53.610	4.978
6	70	10	845	53.710	4.971
7	100	0	849	53.700	4.962
8	120	10	853	53.900	4.953
9	100	40	857	53.770	4.982
10	70	80	901	53.740	4.993
11	0	150	906	53.870	4.968

RESULTS

PT	STA(X	Y)	G(b)(MGALS)
1	0	150	5.496
2	0	0	5.536
3	10	0	5.533
4	30	20	5.539
5	40	0	5.533
6	70	10	5.527
7	100	0	5.514
8	120	10	5.512
9	100	40	5.527
10	70	80	5.528
11	0	150	5.496

DATA SUMMARY

WILSON DAM U/28

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	,Y)	TIME	ELV.	READING
1	0	150	738	53.870	4.917
2	30	0	742	53.620	4.942
3	60	0	746	53.780	4.931
4	90	0	749	53.760	4.927
5	100	10	752	53.760	4.942
6	120	0	757	53.790	4.928
7	120	20	800	53.910	4.926
8	130	43	804	53.540	4.947
9	120	80	808	53.860	4.961
10	110	100	814	53 710	4.980
11	90	140	819	53.740	4.956
12	0	150	825	53.870	4.946

RESULTS

PT	STA(X	,Y)	G(b)(MGALS)
1	0	150	5.496
2	30	0	5.534
3	60	0	5.529
4	90	0	5.519
5	100	10	5.530
6	120	0	5.515
7	120	20	5.515
8	130	43	5.503
9	120	80	5.531
10	110	100	5.533
11	90	140	5.498
12	0	150	5.496

DATA SUMMARY

WILSON DAM AA/29

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34 5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	,Y)	TIME	ELV.	READING
1	0	150	1310	53.870	4.970
2	10	160	1313	53.760	4.973
3	20	155	1316	53.820	4.979
4	30	160	1319	53.810	4.974
5	40	150	1330	53.880	4 960
6	50	160	1333	53.760	4.971
7	60	155	1336	53.860	4.962
8	70	160	1338	53.750	4.961
9	100	155	1341	53.840	4 984
10	110	160	1344	53.800	4.982
11	120	150	1348	53.920	4 977
12	0	150	1352	53.870	4.980

RESULTS

PT	STA(X	,Y)	G(b)(MGALS)
1	0	150	5.496
2	10	160	5.510
3	20	155	5.498
4	30	160	5.489
5	40	150	5.478
6	50	160	5.478
7	60	155	5.475
8	70	160	5.485
9	100	155	5.493
10	110	160	5.486
11	120	150	5.489
12	0	150	5.496

DATA SUMMARY

WILSON DAM BB/29

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	,Y)	TIME	ELV .	READING
1	0	150	1352	53.870	4.980
2	0	160	1355	53.890	4.976
3	10	150	1359	53.720	4.990
4	30	150	1404	53.810	4.970
5	40	160	1411	53.880	4.983
6	50	150	1414	53 750	4.990
7	70	150	1417	53.780	4.987
8	90	160	1422	53.750	4.989
9	110	150	1427	53.750	5.007
10	120	160	1432	53.920	4.985
11	0	150	1438	53.870	4.986

RESULTS

PT	STA(X	,Y)	G(b)(MGALS)
1	0	150	5.496
2	0	160	5.490
3	10	150	5.495
4	30	150	5.477
5	40	160	5.492
6	50	150	5.492
7	70	150	5 489
8	90	160	5.485
9	110	150	5.505
10	120	160	5.489
11	0	150	5.496

DATA SUMMARY

WILSON DAM CC/29

BASE STATION= 0 150
REF. ELV= 53 87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	,Y)	TIME	ELV .	READING
1	0	150	1438	53.370	4 986
2	0	170	1448	53.820	4.987
3	10	180	1452	53.720	4.983
4	30	170	1455	53.800	4.990
5	40	180	1459	53.860	4.986
6	50	170	1503	53.740	4.988
7	70	160	1507	53.750	4.980
8	90	170	1514	53 740	4.989
9	110	180	1517	53.750	4.992
10	120	170	1520	53.920	4.977
11	0	150	1528	53.870	4.992

RESULTS

PT	STA(X	,Y)	G(b)(MGALS)
1	0	150	5.496
2	0	170	5.488
3	10	180	5 473
4	30	170	5 487
5	40	180	5.483
6	50	170	5.478
7	70	160	5.470
8	90	170	5.475
9	110	180	5 475
10	120	170	5.472
11	0	150	5.496

DATA SUMMARY

WILSON DAM DD/29

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	Y)	TIME	ELV.	READING
1	0	150	1551	53.870	4.989
2	0	180	1554	53.780	4.971
3	10	70	1618	53.790	4.982
4	30	180	1557	53.790	4.976
5	40	170	1600	53.860	4.975
6	50	180	1603	53.770	4.972
7	70	170	1606	53.790	4.971
8	90	180	1609	53.740	4.975
9	110	170	1612	53.770	4.991
10	120	160	1615	53.920	4.983
11	0	150	1623	53.870	4.985

RESULTS

PT	STA(X	Y)	G(b)(MGALS)
1	0	150	5.496
2	0	180	5.463
3	10	70	5.503
4	30	180	5.468
5	40	170	5.474
6	50	180	5.462
7	70	170	5.463
8	90	180	5.461
9	110	170	5.504
10	120	160	5.486
11	0	150	5.496

DATA SUMMARY

WILSON DAM EE/29

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	Y)	TIME	ELV.	READING
1	0	150	1623	53.870	4.985
2	0	190	1627	53.750	4.972
3	10	210	1630	53.700	4.953
4	30	190	1633	53.790	4.962
5	50	210	1636	53.750	4.964
6	50	190	1639	53.760	4.969
7	90	190	1645	53.760	4.974
8	110	180	1648	53.750	4.979
9	90	160	1651	53.750	4.989
10	0	150	1656	53.870	4.985

RESULTS

PT	STA(X	Y)	G(b)(MGALS)
1	0	150	5.496
2	0	190	5.454
3	10	210	5.435
4	30	190	5.454
5	50	210	5.448
6	50	190	5.458
7	90	190	5.461
8	110	180	5.457
9	90	160	5.484
10	0	150	5.496

DATA SUMMARY

WILSON DAM FF/29

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	Y)	TIME	ELV.	READING
1	0	150	1656	53.870	4.985
2	0	210	1700	53.710	4.951
3	10	187	1703	53.710	4.973
4	30	180	1706	53.790	4.977
5	40	190	1710	53.820	4.961
6	70	190	1713	53.870	4.961
7	90	180	1715	53.740	4.978
8	120	190	1719	53.840	4.968
9	120	180	1723	53.950	4.975
10	40	160	1727	53.890	4.986
11	0	150	1735	53.870	4.980
12	0	150	1738	53.870	4.982

RESULTS

PT	STA(X	Y)	G(b)(MGALS)
1	0	150	5.496
2	0	210	5.434
3	10	187	5.463
4	30	180	5.474
5	40	190	5.456
6	70	190	5.458
7	90	180	5.469
8	120	190	5.462
9	120	180	5.480
10	40	160	5.498
11	0	150	5.496
12	0	150	5.496

DATA SUMMARY

WILSON DAM GG/30

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	Y)	TIME	ELV.	READING
1	0	150	801	53.870	4.838
2	0	220	805	53.810	4.789
3	10	230	808	53.740	4.780
4	30	210	812	53.770	4.806
5	40	220	814	53.900	4.781
6	70	210	820	53.770	4.815
7	90	210	823	53.810	4.822
8	120	201	826	53.890	4.812
9	70	180	829	53.830	4.828
10	0	150	836	53.870	4.851

RESULTS

PT	STA(X	Y)	G(b)(MGALS)
1	0	150	5.496
2	0	220	5.421
3	10	230	5.402
4	30	210	5.434
5	40	220	5.412
6	70	210	5.438
7	90	210	5.446
8	120	201	5.439
9	70	180	5.459
10	0	150	5.496

DATA SUMMARY

WILSON DAM GG/30

BASE STATION= 0 150
REF. ELV= 53.87
REF LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X,Y)		TIME	ELV.	READING
1	0	150	936	53.870	4.851
2	0	230	839	53.820	4.787
3	10	220	842	53.730	4.802
4	20	230	845	53.790	4.791
5	30	220	848	53.780	4.807
6	40	210	850	53.880	4.810
7	50	220	853	53.770	4.814
8	70	230	857	53.780	4.816
9	110	210	901	53.770	4.825
10	50	180	904	53.770	4.849
11	0	150	910	53.870	4.859

RESULTS

PT	STA(X,Y)		G(b)(MGALS)
1	0	150	5.496
2	0	230	5.403
3	10	220	5.414
4	20	230	5.403
5	30	220	5.421
6	40	210	5.432
7	50	220	5.425
8	70	230	5.423
9	110	210	5.433
10	50	180	5.469
11	0	150	5.496

DATA SUMMARY

WILSON DAM II/30

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X,Y)		TIME	ELV.	READING
1	0	150	910	53.870	4.859
2	0	240	916	53.840	4.789
3	10	230	919	53.740	4.804
4	30	240	922	53.770	4.797
5	40	230	925	53.790	4.811
6	70	240	927	53.780	4.814
7	100	230	932	53.810	4.821
8	120	220	935	53.130	4.804
9	130	210	939	53.130	4.809
10	130	201	942	53.880	4.831
11	0	150	948	53.870	4.862

RESULTS

PT	STA(X,Y)		G(b)(MGALS)
1	0	150	5.496
2	0	240	5.396
3	10	230	5.407
4	30	240	5.398
5	40	230	5.416
6	70	240	5.414
7	106	230	5.424
8	120	220	5.357
9	130	210	5.364
10	130	201	5.443
11	0	150	5.496

DATA SUMMARY

WILSON DAM JJ/30

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X,Y)		TIME	ELV.	READING
1	0	150	948	53.870	4.862
2	10	240	952	53.740	4.807
3	30	230	956	53.760	4.812
4	50	240	1001	53.770	4.818
5	60	230	1004	53.770	4.834
6	70	220	1008	53.780	4.848
7	90	210	1012	53.810	4.861
8	110	220	1017	53.760	4.847
9	120	210	1022	53.030	4.839
10	130	201	1027	53.880	4.859
11	0	150	1035	53.870	4.896

RESULTS

PT	STA(X,Y)		G(b)(MGALS)
1	0	150	5.496
2	10	240	5.402
3	30	230	5.407
4	50	240	5.407
5	60	230	5.424
6	70	220	5.438
7	90	210	5.452
8	110	220	5.426
9	120	210	5.363
10	130	201	5.442
11	0	150	5.496

DATA SUMMARY

WILSON DAM KK/30

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X,Y)		TIME	ELV.	READING
1	0	150	1035	53.870	4.896
2	0	250	1043	53.940	4.801
3	30	240	1047	53.770	4.832
4	40	250	1050	53.920	4.816
5	50	240	1054	53.770	4.847
6	70	250	1058	53.740	4.827
7	90	240	1102	53.780	4.838
8	110	250	1106	53.720	4.821
9	120	240	1112	53.950	4.825
10	130	230	1118	53.980	4.841
11	120	210	1122	53.830	4.859
12	0	150	1133	53.870	4.909

RESULTS

PT	STA(X,Y)		G(b)(MGALS)
1	0	150	5.496
2	0	250	5.372
3	30	240	5.394
4	40	250	5.383
5	50	240	5.407
6	70	250	5.378
7	90	240	5.393
8	110	250	5.366
9	120	240	5.387
10	130	230	5.406
11	120	210	5.363
12	0	150	5.496

DATA SUMMARY

WILSON DAM LL/30

BASE STATION= 0 150
REF ELV= 53 87
REF LAT= 34 5
REF READING= 5 5290075
DENSITY= 1 6
GRID ROT = 16.5
METER FACTOR= 1 1003

FIELD DATA

PT	ST(X,	Y)	TIME	ELV	READING
1	0	150	1133	53 870	4.909
2	0	260	1139	53 910	4.801
3	10	250	1143	53.760	4.824
4	30	260	1146	53.810	4.812
5	50	250	1148	53 780	4 842
6	90	240	1151	53.780	4.856
7	110	230	1154	53.850	4.869
8	120	240	1157	53.950	4.644
9	110	210	1202	53 770	4.899
10	0	150	1208	53.870	4.928

RESULTS

PT	STA(X,	Y)	G(b)(MGALS)
1	0	150	5.496
2	0	260	5.352
3	10	250	5.366
4	30	260	5.351
5	50	250	5.381
6	90	240	5.397
7	110	230	5.413
8	120	240	5.388
9	110	210	5.440
10	0	150	5.496

DATA SUMMARY

WILSON DAM MM/30

BASE STATION= 0 150
REF ELV= 53 87
REF LAT= 34.5
REF READING= 5.5290075
DENSITY= 1.6
GRID ROT = 16 5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X,	Y)	TIME	ELV.	READING
1	0	150	1312	53.870	4 953
2	0	270	1318	53 770	4 855
3	10	260	1322	53.950	4.868
4	30	250	1325	53 790	4.880
5	40	240	1330	53 850	4.889
6	30	230	1334	53 760	4 913
7	40	210	1338	53 880	4.930
8	30	200	1342	53.790	4.947
9	50	200	1348	53 760	4.958
10	0	150	1354	53.870	4.970

RESULTS

PT	STA(X,	Y)	G(b)(MGALS)
1	0	150	5.496
2	0	270	5.352
3	10	260	5.379
4	30	250	5.300
5	40	240	5.393
6	30	230	5.415
7	40	210	5.444
8	30	200	5.457
9	50	200	5.463
10	0	150	5.496

DATA SUMMARY

WILSON DAM NN/30

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1.8
GRID ROT = 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X,	Y)	TIME	ELV	READING
1	0	150	1354	53.870	4.970
2	0	260	1401	53.830	4.937
3	60	270	1404	53.800	4.877
4	40	260	1410	53.940	4.890
5	90	250	1415	53 780	4.915
6	110	240	1419	53.750	4.929
7	120	250	1425	53.920	4 995
8	120	230	1429	53.990	4.927
9	70	210	1435	53.770	4.970
10	70	200	1440	53.770	4.971
11	40	180	1444	53.860	4.962
12	0	150	1452	53.870	4.992

RESULTS

PT	STA(X,	Y)	G(b)(MGALS)
1	0	150	5.496
2	0	200	5.443
3	60	270	5.354
4	40	260	5.379
5	90	250	5.392
6	110	240	5.405
7	120	250	5.484
8	120	230	5.417
9	70	210	5.454
10	70	200	5.455
11	40	180	5.478
12	0	150	5.496

DATA SUMMARY

WILSON DAM XX/30

BASE STATION= 5 50
REF. ELV= 49.09
REF. LAT= 34 5
REF. READING= 5.697600
DENSITY= 1.8
GRID ROT.= 11
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X,	Y)	TIME	ELV.	READING
1	5	50	1604	49.380	5.341
2	25	50	1608	49.290	5.363
3	25	40	1611	49.410	5.369
4	0	40	1614	49.170	5.350
5	0	30	1618	49.230	5.340
6	0	20	1621	49.180	5.333
7	0	10	1624	49 190	5.318
8	0	24	1628	49.190	5.338
9	0	0	1631	49.250	5.335
10	0	-10	1634	49.250	5.344
11	5	50	1638	49.380	5.333

RESULTS

PT	STA(X,	Y)	G(b)(MGALS)
1	5	50	5.907
2	25	50	5 925
3	25	40	5.943
4	0	40	5.907
5	0	30	5.903
6	0	20	5 895
7	0	10	5.882
8	0	24	5.902
9	0	0	5.909
10	0	-10	5.918
11	5	50	5.907

DATA SUMMARY

WILSON DAM X2/30

BASE STATION= 0 150
REF. ELV= 53.87
REF. LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1 6
GRID ROT.= 16.5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	,Y)	TIME	ELV	READING
1	0	150	1526	53.870	4.989
2	10	140	1530	53 730	4.982
3	30	140	1533	53.790	4.991
4	40	80	1537	53 760	5.020
5	70	140	1539	53.740	5.009
6	0	0	1542	53.690	5.006
7	50	140	1546	53.700	5.003
8	120	261	1551	53.890	4.970
9	90	200	1554	53.810	4.973
10	0	150	1559	53.870	4.990

RESULTS

PT	STA(X	,Y)	G(b)(MGALS)
1	0	150	5.496
2	10	140	5.480
3	30	140	5.492
4	40	80	5.535
5	70	140	5.506
6	0	6	5 534
7	50	140	5.497
8	120	201	5.456
9	90	200	5.456
10	0	150	5.496

DATA SUMMARY

WILSON DAM YY/1

BASE STATION= 0 150
REF ELV= 53.87
REF LAT= 34.5
REF. READING= 5.5290075
DENSITY= 1 8
GRID ROT.= 16 5
METER FACTOR= 1.1003

FIELD DATA

PT	ST(X	,Y)	TIME	ELV	READING
1	0	150	812	53.870	4 789
2	70	160	815	53 750	4.791
3	82	180	819	51.740	4.918
4	40	210	825	53.880	4 751
5	82	240	828	51 780	4.878
6	82	220	831	51.780	4 902
7	82	197	838	51.770	4.918
8	100	185	843	53.750	4.765
9	82	160	846	51.750	4.944
10	82	140	849	51.740	4.951
11	82	120	851	51.760	4.957
12	0	150	859	53.870	4.792

RESULTS

PT	STA(X	,Y)	G(b)(MGALS)
1	0	150	5.496
2	70	160	5.483
3	82	180	5.474
4	40	210	5.438
5	82	240	5.419
6	82	220	5.450
7	82	197	5.471
8	100	185	5.466
9	82	160	5.506
10	82	140	5.517
11	82	120	5.529
12	0	150	5.496

END

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