4. citations (at least four) to substantiate your review of existing literature.

It might include:

1. an explanation of how you came upon this particular research problem.
2. limitations and/or scope of the investigation.
3. acknowledgment of assistance from persons, or organizations.

IMPORTANT: You will be required to submit an outline of the topic sentences from the paragraphs which will comprise the introduction section before you begin writing. This list of topics is subject to the teacher's approval, and it will be graded.

The first topic sentence to appear on the INTRODUCTION OUTLINE is a statement of your hypothesis in a non-question form. The outline is intended to help you map, order, organize, and rank what you will write about in the introduction section.

Methods and Materials

Describes how the experimental techniques test the hypothesis.

40%

It must include:

1. a preliminary description of the experimental methods and materials.
2. how your experimental method tests your hypothesis:
   Ex: If the gravity is higher, then a subsurface feature of higher than normal density exists...if not, then...
3. a description of the apparatus/subjects, age of subjects, length of experiment, etc., involved.
4. an outline of the experimental procedure in terms of variable, control(s), number of measurements, frequency of measurements, range of measurements, etc.

Literature Cited

Describes the sources of information, ideas, prior research, similar experiments or experimental methods, earlier hypothesis, etc., that you must credit to someone else because they are not your own. (See examples)

20%

It must include citings of four types:

1. a book bulletin
2. an article in a book

3. an article from a professional journal
4. personal communication of information (interview)

INTRODUCTION

Location

The study area is located in northwest Huspeth County, Texas. It is approximately 45 mi (72 km) east of downtown El Paso (Fig. 1). The Carlsbad Highway, U.S. Route 62-180, passes through the area, which is bounded by the United States Geological Survey (USGS) 7.5 minute Phone Line Canyon quadrangle. The southeastern portion of the Hueco Fanch is in the northern study area, and the northwestern portion of the Spike "S" Ranch is in the southern study area.

The western edge of the Diablo Plateau of West Texas is formed by the scarp of the Hueco Mountains. This is also the eastern boundary of the Rio Grande Rift (Seager and Morgan, 1979). The study area is in the Sacramento section of the Basin and Range physiographic province (Fenneman, 1931) and occupies a portion of the northeastern Chihuahuan Desert.

Previous Work

No previous geophysical studies have been made specifically within the study area. Many geological

BOOK

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Dickerson, P. W., 1980, Structural zones transecting the southern Rio Grande rift--preliminary observations: in Trans-Pecos Region: New Mexico Geol. Soc.Guidebook, 31st Field Conf., pp. 63-70.

Fenneman, N. M., 1931, Physiography of the Western United States. McGraw-Hill Book Company, Inc., New York, 534 p.

Galley, J. E., 1958, Oil and geology in the Permain Basin of Texas and New Mexico: in Habitat of Oil: AAPG Spec. Pub., p. 395-446.

Gries, J. C., and Haenggi, W. T., 1971, Structural evolution

of the Chihuahau Tectonic Belt: in Geologic Framework of the Chihuahua Tectonic Belt: West Texas Geol. Soc., pp. 119-138.

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ARTICLE IN A BOOK

Hardie,H., 1958, The Pennsylvanian Rocks of the Northern Hueco Mountains: in Franklin and Hueco Mountains, Texas: West Texas Geol. Soc. Field Trip Guidebook, p. 43-45.

Hills, J. M., 1984 Proffessor of Geology, Emeritus, Univ. Texas El Paso, pers. comm.

ARTICLE IN A PROF, JOURNAL

Howe, J. J., 1959 Montoya Group stratigraphy (ordovician) of Trans-Oecos, Texas: Bull. Amer. Assoc. Petrol. Geol., v. 43, p. 2855-2332.

PERSONAL COMMUNICATION

Xeller, G.R., 1984 Professor of Geophysics, Univ. Texas El Paso. pers. comm.

Outline of Introduction

TRACI ANGELICA & NICKI SMITH

PRESENTED TO MR. MCKINNEY
HONORS PHYSIOLOGY AND
ANATOMY

FEBRUARY 17, 1995

Outline of Introduction

TRACI ANGELICA & NICKI SMITH

PRESENTED TO MR. MCKINNEY
HONORS PHYSIOLOGY AND
ANATOMY
FEBRUARY 17, 1995

DARLA GRADE 100 FANTASTIC!

OUTLINE OF INTRODUCTION

I. **Hypothesis:** After exercising, the cool down technique in which the heart will return to its resting rate the fastest will include the listening of Yanni's, A Night at the Acropolis while walking for 5 minutes.

II. **Background Information**

A. Physical fitness and exercise is the basis of beginning our experimental study for our exercise program.

B. To obtain the maximum benefits of exercise the body must be in an aerobic zone for at least twenty minutes.

C. Target heart rate is the zone your heart rate must be in for your body to be aerobic. Anything above or below this zone is considered anaerobic activity.

D. Overall, to be physically fit one must exercise for periods of twenty minutes or longer, three or more days per week, performed at an intensity requiring 60% or more of an individual's cardiorespiratory capacity.

III. **Contemporary Relevance**

A. Today, it has been estimated that over 35% of adults aged 18-65 exercise regularly.

B. About one-third of children and adolescents ages 10-17 participate in daily school physical education programs; this figure is declining.

C. It is known that increased levels of physical fitness may contribute to reduce many diseases, for example, coronary disease and pulmonary diseases.

D. Past statistics stated that the proportion of children and adolescents ages 10-17 participating in daily school physical education programs was greater than 60%.

IV. **Target Heart Rate and its Relevance**

A. In order to find the target (optimal) heart rate:

1. Subtract subject's age from 200 (maximum heart rate)
2. Multiply maximum heart rate by .6 and also .8
   a. .6 will determine the lower platform
   b. .8 will determine the upper platform

B. In finding this, we will be able to maintain an aerobic zone during exercise of each subject.

V. **Proper Cool Down Technique and Relevance**

A. When completing vigorous activity, it is important to cool down gradually as opposed to abruptly, since energy reserves must be replenished and lactic acid be removed from muscles.

B. Other side effects of sudden termination of exercise are:

1. Pooling of blood in veins to lower extremities; reducing blood return to the heart.
2. Higher demands of oxygen by myocardium.
3. Hypotension which results in decreased blood flow to the brain causing light-headedness, dizziness and fainting.

VI. **Personal Interest in Project**

A. Both of us are athletically inclined and are concerned with maintaining a high level of physical fitness.

B. Traci is also in a wellness class and has been studying target heart rate and how to determine it.

VII. **Limitations and Scope of Investigation**

A. Keeping each subject winthin their specific target zone for a certain amount of time will pose to be a problem.

B. Being able to use the appropriate materials and finding available materials for our project.

C. The scope of our project will include determining each subject's target heart rate and caloric needs in being able to classify them as athletic or non-athletic.

D. Our study will also include a 15 minute aerobic activity period and concluding with a 5-minute cool down.

VIII. **Acknowledgment of Assistance from Persons and Organizations**

A. *We would like to thank the library staff of* Texas Tech Health Sciences Center for helping us in finding information for our project.

B. A special thaks to our mentor Mark Scott for working closely with us during our research and providing us with the proper facilities.

VI. **Personal Interest in Project**

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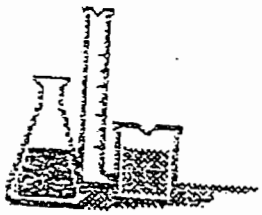

GUIDELINES

For

Results, Conclusion, Appendix, Abstract, and Title Page Sections

of the Technical Paper for the Science Project

J. M. Hanks High School

Honors Anatomy and Physiology
Honors Physics I
Honors Physics II

Developed By

Chip Burrows
Kathy Head
Karen Morrow

OBJECTIVE

The student will successfully complete the Results, Conclusion, Appendix, Abstract, and Title Page sections of the technical paper after physical research of the testing of the hypothesis has been completed. The corrected versions of the INTRODUCTION, METHODS and MATERIALS, and LITERATURE CITED sections will be included to comprise the complete technical report.

PURPOSE

During the testing of your hypothesis, data is collected. These data (measurements) are included in the technical paper. They are to be tabulated and placed in the APPENDIX section.

Analyzing these measurements is necessary in order to assess the effectiveness of the experimental design and technique. The analysis of the data you have assembled (Appendix) occurs in the RESULTS section. Results of a scientific study are always depicted graphically. Results also include findings of importance that are not depicted graphically. A terse text is found in the RESULTS section, where you reference your graphs as figures.

3 RESULTS

Findings, Analysis of Data

1. State what your findings are.
2. Show examples of any calculations that you made, including observed vs theoretical values and relative error computations.
3. Two graphs (minimum) in complete form (variables positioned correctly on the x and y axes, proper scales, colors, key, label, on lines and axes, best-fit lines, titles for each).
4. Findings which are ungraphical in nature (trends, anomalies, contradictory findings, unusual circumstances during data acquisition).

4 CONCLUSION

Interpretation /Products of your analysis of the results

1. State whether your hypothesis was supported or negated, according to the results.
2. Draw a supportable conclusion linking your results to it. (According to the slope of the line in figure 2, one must conclude that....)
3. Improvements to the experimental design or analysis or additional/ suggested areas of further research.

2 ABSTRACT

One paragraph, a terse summary of all sections

1. Hypothesis
2. Methods and Materials
3. Results
4. Conclusion

5 APPENDIX

Data tables, photos, maps, etc.

1 TITLE PAGE

Title of research, your name, class, date, my name

The CONCLUSION is based upon the interpretation of the results. Although one could argue that numerous conclusions are possible, many of these are unacceptable. Your conclusion must be supported by your results. A conclusion which is supported by data is valid. A conclusion which is unsupported by your experimentally-derived data, based upon incomplete or inconclusive results or faulty test design is invalid. A conclusion which is based upon subjectivity (expectations, feelings, etc.) is also invalid and unacceptable. The CONCLUSION section also includes areas of testing or analysis which could be improved.

An ABSTRACT is written after the body of the technical paper is complete, It is written so that a reader can determine whether your research is relevent to their needs. It contains all sections of the technical paper, in terse summary form.

The TITLE PAGE includes the research topic, your name, class, date, and my name.

GRAVITY AND MAGNETIC ANOMALIES

A total of 1,399 gravity station values were used to construct a regional Bouguer anomaly map (Fig. 5). Along the western edge of Figure 5, west of the closures, the decreasing gravity values reflect the fill in the Hueco Bolson. The closed highs immediately east approximate the scarp of the Hueco Mountains. These highs may reflect the proximity of higher density basement rock at the edge of the plateau and/or the presence of buried intrusive bodies.

The study area is on the northeast flank of the broad, northwest-trending, central gravity high. Gravity values decrease towards the north-northeast to the boundary of the map. This trend may be interpreted as an increasing depth to basement and thickening of Paleozoic sediments owing to the presence of an embayment of the Middle Mississippian Orogrande basin.

A Bouguer anomaly map of the study area was constructed using 232 gravity values, of which 228 were established by the author (Fig. 6). The north-northeast decreasing trend of Figure 5 is reflected here, also. An important feature is that the gradient decreases by approximately one-half near the northern boundary of Figure 6.

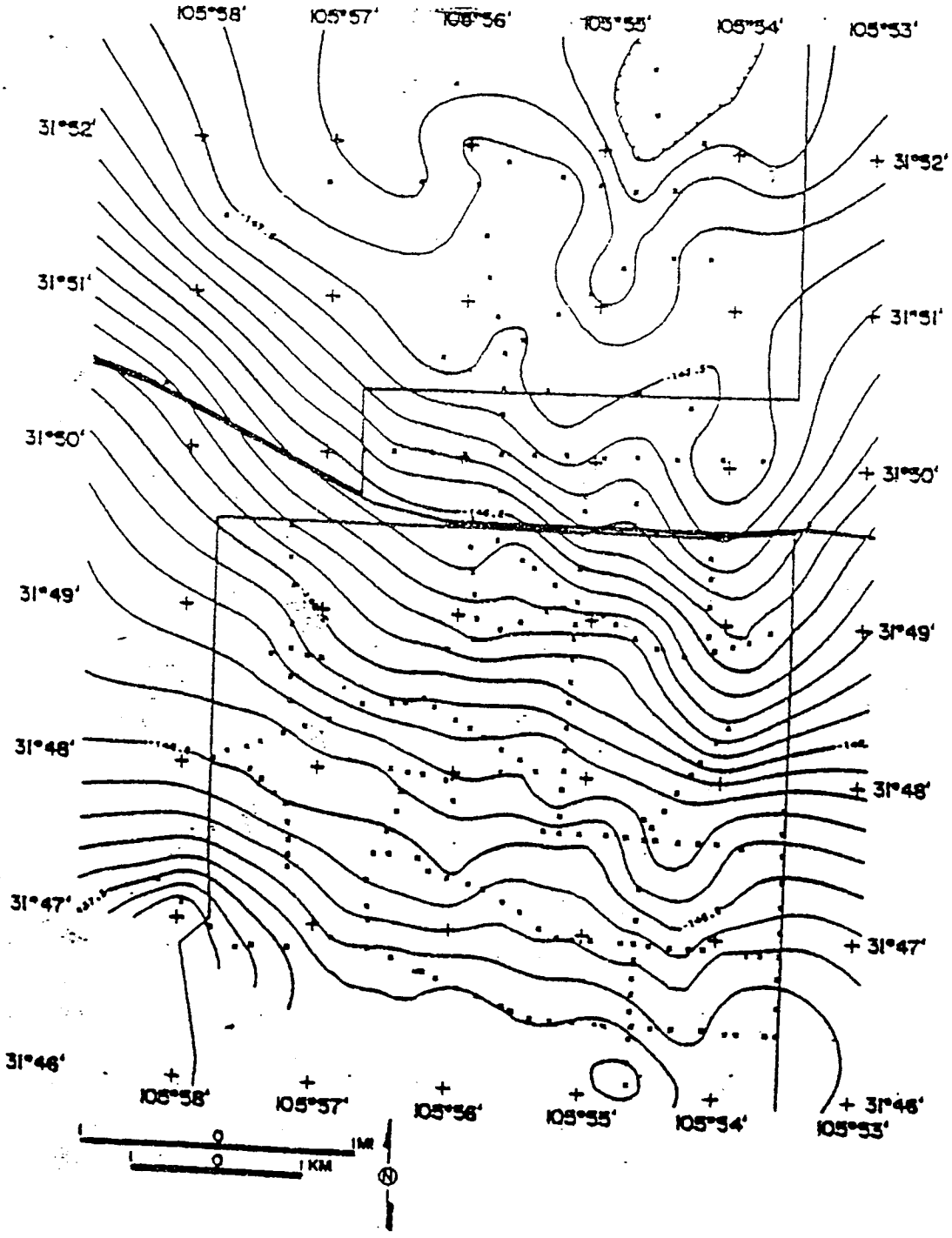

Figure 6. Bouguer anomaly map of the study area with 0.5 milligal contour intervals showing gravity stations.

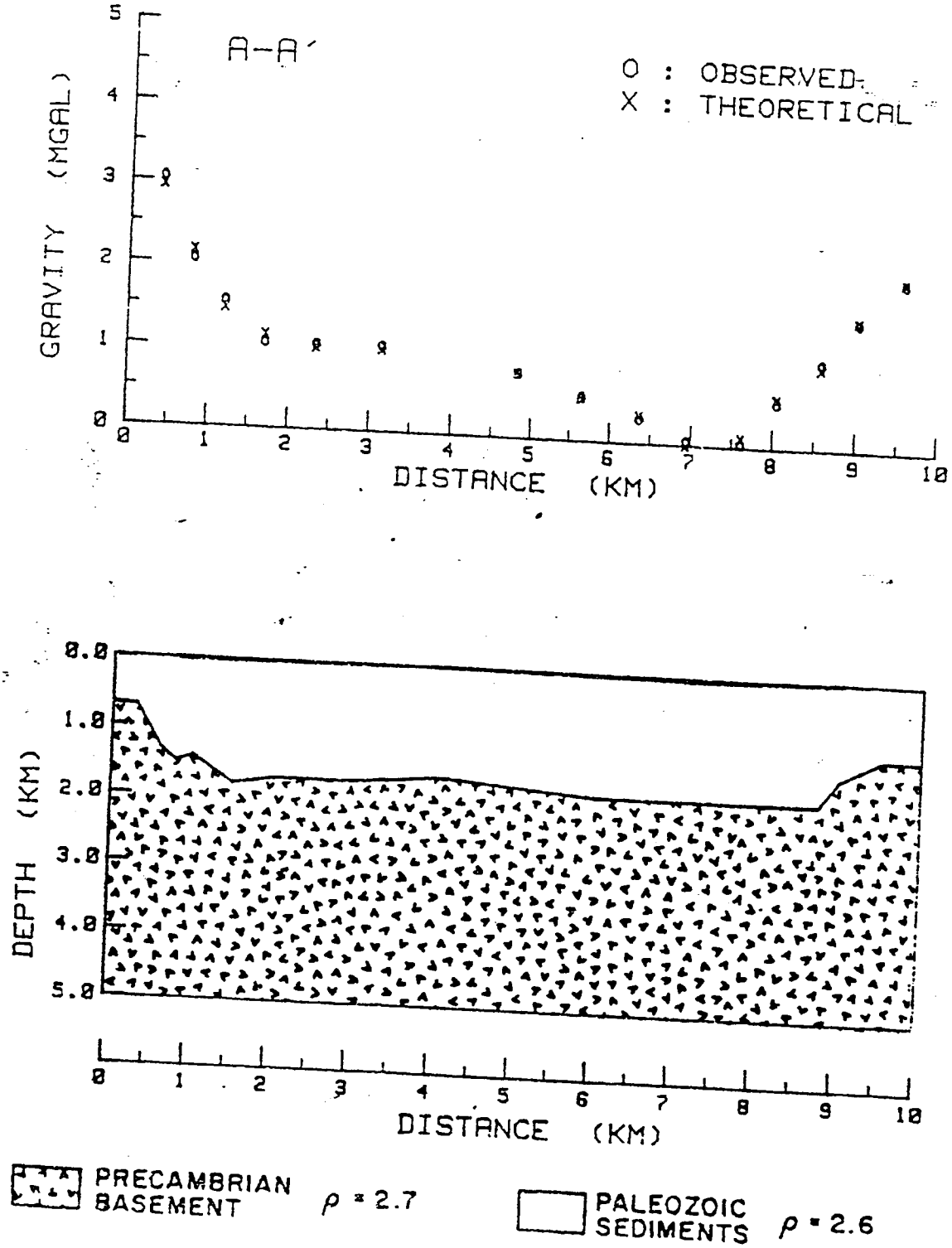

Figure 10. Gravity profile and earth model A-A'.

CONCLUSIONS

The preferred models are those exhibited in Figures 10 and 11. It is unlikely that lower density alluvial and lacustrine deposits account for the gravity anomaly because they would have to be at least 1,000 ft (300 m) thick. If schists belonging to the Precambrian Carrizo Mountain Group or the schist reported in the Dell City area underlie the gravity profiles, the corresponding earth models would not exhibit such a pronounced thickening in the Paleozoic section. Younger Precambrian metasedimentary rocks such as those exhibited in the Franklin Mountains and Van Horn areas might also underlie the study area and could contribute to the gravity anomaly. Lateral changes in magnetic susceptibility could account for high theoretical values near the ends of the magnetic profile.

The subsidence in association with the formation of the Orogrande basin during the Middle Mississippian could have influenced sedimentation in the area with respect to depth to basement. Subsequent subsidence movements may have continued into Permian time with the consequent thickening of Late Paleozoic rocks exhibited by the two gravity profiles. This Late Paleozoic sedimentary sequence may contain algal mounds and/or other bioherms which have proven to be both reservoir and source rocks in adjacent basins.

Portion of Appendix section

ID	LATITUDE	LONGITUDE	ELEV	OBSERVED GRAVITY	FREE-AIR ANOMALY	BOUGUER ANOMALY	CHIEN CORR.	ISOST CORR.
C384-102	31.8080	105.9192	5155.2	979017.52	38.80	-142.73	0.12	0.01
C384-161	31.8297	105.9178	5124.4	979017.18	29.81	-146.67	0.12	0.01
C384-160	31.8282	105.9178	5117.8	979017.80	29.89	-146.35	0.12	0.0
C384-159	31.8257	105.9182	5109.8	979018.27	29.41	-146.15	0.13	0.0
C384-158	31.8220	105.9183	5113.5	979018.91	30.73	-144.97	0.12	0.01
C384-157	31.8185	105.9185	5126.2	979018.52	31.82	-144.31	0.12	0.01
C384-156	31.8162	105.9187	5129.3	979018.55	32.33	-143.91	0.12	0.01
C384-155	31.8147	105.9188	5138.9	979018.53	33.33	-143.23	0.12	0.01
C384-154	31.8125	105.9190	5150.8	979018.00	34.10	-142.87	0.12	0.02
C384-153	31.8102	105.9190	5157.3	979017.68	34.58	-142.61	0.12	0.02
C384-73	31.7940	105.9198	5168.3	979017.94	37.18	-140.33	0.16	0.03
C384-112	31.7958	105.9198	5146.3	979018.35	35.37	-141.43	0.14	0.01
C384-110	31.7987	105.9197	5127.7	979019.66	34.71	-141.87	0.13	0.01
C384-71	31.7942	105.9218	5231.1	979013.98	39.11	-140.12	0.25	0.37
C384-108	31.8007	105.9195	5126.8	979020.25	35.05	-141.10	0.13	0.01
C384-106	31.8028	105.9195	5144.0	979019.43	35.67	-141.05	0.13	0.02
C384-104	31.8053	105.9193	5156.9	979018.03	35.29	-141.89	0.13	0.01
C384-152	31.8005	105.9626	5077.6	979023.92	34.11	-140.21	0.23	0.05
C384-151	31.8013	105.9612	5073.8	979024.29	34.05	-140.11	0.21	0.10
C384-146	31.8018	105.9588	5200.8	979016.17	37.83	-140.03	0.35	0.60
C384-147	31.8025	105.9572	5135.5	979020.66	36.13	-140.08	0.28	0.17
C384-150	31.8035	105.9543	5091.3	979023.18	34.81	-140.81	0.19	0.06
C384-148	31.8052	105.9487	5053.6	979024.97	32.52	-141.05	0.16	0.05
C384-149	31.8043	105.9517	5080.1	979023.77	33.88	-140.58	0.17	0.05
C384-175	31.8070	105.9537	5089.6	979023.08	33.97	-140.93	0.18	0.03
C384-176	31.8095	105.9537	5082.2	979023.11	33.00	-141.57	0.17	0.02
C384-135	31.8005	105.9220	5117.9	979020.72	34.70	-141.12	0.13	0.03
C384-136	31.8017	105.9250	5104.5	979021.77	34.39	-140.93	0.13	0.07
C384-137	31.8027	105.9273	5085.5	979022.40	33.16	-141.53	0.14	0.05
C384-138	31.8040	105.9297	5069.2	979023.57	32.69	-141.43	0.15	0.05
C384-139	31.8048	105.9313	5069.1	979023.81	32.84	-141.65	0.15	0.06
C384-134	31.8057	105.9332	5079.1	979022.70	32.61	-141.87	0.14	0.03
C384-141	31.8070	105.9358	5072.9	979023.19	32.81	-141.82	0.15	0.06
C384-140	31.8078	105.9372	5083.7	979022.49	32.66	-141.98	0.14	0.07
C384-145	31.8073	105.9393	5087.3	979022.58	31.27	-141.99	0.16	0.05
C384-144	31.8072	105.9410	5036.8	979025.08	30.86	-142.09	0.16	0.09
C384-142	31.8070	105.9447	5025.8	979026.19	30.95	-141.66	0.17	0.08
C384-177	31.8253	105.9582	5098.8	979021.82	31.99	-143.53	0.17	0.04
C384-178	31.8220	105.9580	5082.9	979022.78	31.73	-142.95	0.17	0.04
C384-179	31.8190	105.9537	5061.2	979024.34	31.89	-142.38	0.18	0.03
C384-180	31.8150	105.9537	5067.0	979024.09	32.11	-141.98	0.17	0.02
C384-174	31.8125	105.9537	5087.1	979022.72	32.83	-141.92	0.17	0.01
C384-173	31.8118	105.9517	5068.3	979024.01	32.03	-141.92	0.17	0.03
C384-172	31.8117	105.9498	5052.7	979024.39	31.33	-142.28	0.17	0.01
C384-167	31.8182	105.9313	5108.1	979017.58	32.91	-143.21	0.13	0.02
C384-166	31.8130	105.9345	5165.1	979017.13	34.53	-142.89	0.15	0.02
C384-168	31.8153	105.9280	5127.1	979018.92	32.56	-143.59	0.13	0.01
C384-169	31.8162	105.9255	5118.8	979019.41	32.17	-143.71	0.12	0.0
C384-170	31.8173	105.9223	5105.7	979019.57	31.04	-144.80	0.13	0.0
C384-171	31.8178	105.9202	5119.9	979019.41	32.08	-143.82	0.12	0.0