METEOROLOGICAL AND CLIMATOLOGICAL
INVESTIGATION:

Review of July - December, 1979
Investigative Period

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INTRODUCTION

The specific goals of the meteorological and climatological investigations on the Geokinetics Incorporated (GKI) field research site (Section 2, T14S, R22E) in Uintah County, Utah, are to collect, reduce and analyze meteorological and microclimatological data for the purpose of:

1. Obtaining knowledge of the structure and flexibility of the local microclimate;
2. Evaluating any trends associated with the locale; and
3. Monitoring for project induced changes in the local microclimate.

These goals, while functionally discrete, are to be treated as a whole in this and all subsequent reports as data and interpretations become available.

The findings presented herein reflect the results of the collection, reduction and analysis of raw data acquired during the investigative period from July 1, 1979 through December 31, 1979. In addition, a composite profile summary of findings for the entire year (1979) are presented as an addendum to the report.

SUMMARY

During the latter six-months of 1979, the results were found to be consistent with those gathered during the same period the previous year. They are as follows:

1. Prevailing winds are predominantly from the south-southwest with an average wind speed of seven MPH at 33 feet (10m) and from the south with an average wind speed of 10 MPH at 100 feet (30m) during the summer months. Prevailing winds are predominantly from the south-southwest at 33 and 100 feet with an average wind speed of 5 and 8 MPH respectively during the fall months.
2. Net evaporation for the least six months of 1979 was recorded to be 36.3 inches with 76 percent occurring in the summer quarter.
3. Recorded precipitation for the same period was 10.03 inches with 72 percent falling in the fall quarter. Of the total, 1.72 inches came from rain and the remaining 8.32 inches came from 25.6 inches of snow.

4. Maximum and minimum temperatures during this period were 100 degrees and -10 degrees Fahrenheit respectively and the mean temperatures ranged from 26 degrees in December to 73 degrees Fahrenheit in July.
5. Nocturnal temperature inversions were readily observed during the six-month period. The presence of the inversion layer appears at dusk and lasts until one to two hours after sunrise. In the summer months, the duration is 9 to 11 hours on the average and in the fall months the average is 17 to 18 hours.

PROGRAM DESIGN

The continuous monitoring and collection network is comprised of two electrical weather stations and six additional stations housing mechanical microclimatological instrumentation. Specifics of the program design can be located in Section A1 of the restructured Environmental Research Plan for the Geokinetics Inc. Investigations of the Horizontal In Situ Oil Shale Retorting Process (Spradlin et al, 1979).

During these six months of study, various modifications to the existing data gathering network were instituted to improve the efficiency of the data collection system. Two of these were made early in the reporting period.

The first modification was a major change which involved the 100-foot electrical weather station A-04. It was converted from a paper chart data recording system to a new solar powered unit housing a magnetic tape cassette for data retrieval.

The second modification involved the replacement of the Meteorological Research Incorporated (MRI) 10-foot mechanical weather station with a 30-foot, easily transportable, electrical weather station. This new station (designated A-07) was installed to provide site specific data for future diffusion modeling near the new retort research area #2 located in the north-central part of the research site.

These two new systems are more reliable and less expensive than their predecessors. Data reduction is now computerized thereby realizing a major savings in labor costs.

In October, two additional modifications to the monitoring and collection network were made. Both changes involved the relocation of a station.

The 100-foot electrical weather station (A-04) was removed from its original site in the northeast corner of the section and relocated near the center of the research site. The move was designed to eliminate occasional erroneous readings due to negative bias noise from

radiophone interference around operational activities in the northeast corner of the section, and to improve the representativeness of the data with respect to the entire research site.

When station A-04 was relocated, the monitoring of surface soil temperatures was discontinued. The insignificance of soil temperature information after the completion of the two-year vegetation baseline studies was apparent.

Station A-01 was also moved from its original location near retort research area #1 in the northeast corner of the section to a new location near retort research area #2 located in the north-central portion of the section. The relocation enables station A-01 to collect site specific data usable as comparative data in order to assess dispersion capabilities about retort research area #2.

A map indicating the approximate locations of each station is included in Appendix C of this report.

STATION DESCRIPTIONS

Station A-01 is a standard meteorological equipment shelter housing a microbarograph (Belfort 800) and a set of max-min thermometers (Science Associates 111). Station location is 1380 feet south and 2445 feet west of the northeast corner section marker and at an elevation of 6705 feet. Barometric pressure is recorded in inches of mercury to an accuracy of ± 0.01 inch. Temperatures are given in degrees Fahrenheit to $\pm 0.5^\circ\text{F}$.

Station A-02 is a bench platform upon which is mounted an evaporation recorder (Belfort 6075) and a totalizing anemometer (Casella W1204/2). Station location is 850 feet south and 228 feet west of the northeast corner section marker at an elevation of 6690 feet. Net evaporation is obtained in kilograms per meter squared and then converted to inches of evaporation during reduction of raw data. Accuracy is ± 0.1 inch. Wind run is given in total statute miles at an accuracy of ± 0.01 miles.

Station A-03 is also a bench platform upon which sets a pyrheliometer. It is located at 200 feet south and 1368 feet west of the northeast corner section marker at an elevation of 6734 feet. Solar intensity is recorded in gram-calories per centimeter squared to an accuracy of ± 1.0 gram-calorie.

Station A-04 is a permanently based electrical weather station and also the largest station in the network. It is located at 2600 feet south and 3040 feet west of the northeast corner section marker at an elevation of 6774 feet. The tower is 100 feet high with sensors located at 100 feet, 33 feet and 10 feet above the surface and at the surface. The temperature probes (Yellow Springs Instruments 703) are located at 100 feet, 33 feet, 10 feet and at the surface. Wind

speed and direction sensors (Texas Electronics 2011 and 2010) are located at 100 and 33 feet and measured in miles per hour and degrees azimuth respectively. Precipitation (MRI304) is measured in inches. The accuracies for temperature, wind speed, wind direction and precipitation are $\pm 0.1^{\circ}\text{F}$, ± 0.1 MPH, ± 2 degrees and ± 0.01 inches respectively.

Station A-04B is a standard meteorological instrument shelter housing a set of max-min thermometers (Science Associates 111) and a hygrothermograph (Bendix 594). The station is located 730 feet south and 876 feet west of the northeast corner section marker at an elevation of 6713 feet. Temperatures are in degrees Fahrenheit ($\pm 0.5^{\circ}\text{F}$) and relative humidity is in percentage (± 2 percent). A manual reading precipitation gauge has been added as an addendum to this station. Snow is measured in inches to the nearest tenth and rain is in inches to the nearest hundredth of an inch.

Station A-05 is the calibration station housing a mercury barometer (Princo-U.S. Signal CorpType) accurate to ± 0.005 inches of mercury, a microbarograph (Belfort 800) accurate to ± 0.01 inches, a psychrometer (Bendix 566) and max-min thermometers accurate to $\pm 0.5^{\circ}\text{F}$. The station location is 300 feet south and 520 feet west of the northeast corner section marker at an elevation of 6695 feet. All meteorological instrumentation in the network is calibrated to station A-05.

Station A-06 is a bench platform on which is mounted a Campbell-Stokes solar duration recorder (MK3B). This is located on a south-facing slope at an approximate elevation of 6711 feet. The station location is 634 feet south and 1032 feet west of the northeast corner section marker.

The final station is a 30-foot electrical weather station (A-07) capable of being easily moved about to various areas of study. It is located at 1380 feet south and 2400 feet west of the northeast corner section marker and at an elevation of 6705 feet. Wind direction and speed (Texas Electronics 2010 and 2011) and temperature (Yellow Springs 703) sensors are located at the 30 foot point on the tower. Accuracies are $\pm 0.1^{\circ}\text{F}$, ± 0.1 MPH and ± 2 degrees for temperature, wind speed and wind direction respectively.

DISCUSSION

An important indicator of the relative degree of performance of the data acquisition process is the data sufficiency. The following formula calculates the data sufficiency (S) in percent:

$$S = \frac{100n}{n_p} ,$$

where S is the data sufficiency in percent; n is the number of mea-

surements recorded; n_p is the total number of measurements possible for the period in question. Individual sufficiencies are determined for each parameter being monitored at a station and the station sufficiency is the average of the sufficiency of each parameter at a given station.

Tabulated data sufficiencies for the stations and parameters from July through December, 1979, are presented by month in Table 2 and cumulatively in Table 3 of Appendix A.

Overall data sufficiencies were excellent for the investigative period; however, sufficiencies of some individual pieces of equipment and stations were less than 90 percent. Reasons for the lower data sufficiency values are discussed by individual station below.

Station A-01 - During the month of October the station was re-located during which time some maximum and minimum temperatures were not available.

Station A-02 - In November some data from the evaporimeter was not recorded due to temperature related malfunctions.

Station A-03 - Low data sufficiencies for the months of August, September, October and November were caused by a faulty motor assembly.

Station A-04B - During November it was necessary to install a new chart drive assembly on the hygrothermograph during which time some loss of data occurred. In December an improper calibration of the temperature recorder of the hygrothermograph produced some incorrect values.

Station A-04 - In July the electrical weather station A-04 was converted from a paper chart recording system to a new solar powered unit with a magnetic cassette tape recording system causing a slight reduction in the data base. During the month of August possible lightning damage as well as radio interference induced erroneous readings which affected the data sufficiency.

It should be noted that wind data sufficiency (direction and hourly travel) should be maintained above the 90 percent level to be considered applicable for dispersion and diffusion studies, and levels of 95 percent and above are preferred.

For September, October and December data sufficiencies for wind speed and direction from station A-04 were above 95 percent. The month of November recorded a data sufficiency slightly less than 95 percent due to relocation of the station at the beginning of the month. Data sufficiencies less than 90 percent were obtained during the months of July and August because of the change in the data acquisition system in July and lightning damage sustained to the system in August.

Ambient surface temperatures, including daily and monthly maximum, minimum and mean temperatures are recorded in Tables 4 through 16. The maximum temperature of 100°F was recorded at station A-04B during the month of August. Station A-01 recorded the minimum temperature of -10°F during the month of November. The mean temperatures ranged from 26°F in December to 73°F in July.

Nocturnal temperature inversions are readily observed in the middle latitudes and are caused by strong outgoing terrestrial radiation during the night which produces rapid cooling of the ground surface. Thus the air near the surface cools much faster than the overlying air. Inversions are especially prevalent when there is no cloud cover inhibiting this radiative cooling process.

Figures 5 through 12 in Appendix B graphically represent the daily average temperatures from 100 and 33 feet. It is interesting to note that for some of the days the average temperatures at 100 feet are warmer than at 33 feet. Such conditions indicate that not only are temperature inversions periodically present during all six months but that inversion conditions prevail over non-inversion conditions over a 24 hour period.

The presence of the inversion layer appears at dusk (as radiative cooling begins) and lasts until one to two hours after sunrise (surface solar heating begins). In the summer months, the duration is 9 to 11 hours on the average and in the fall months the average is 17 to 18 hours. Occasionally, during the morning hours the inversion layer between 100 and 10 feet will dissipate one to two hours sooner than the layer between 100 and 33 feet as thermal turbulence increases with the heating of surface air.

The relative strengths of the inversions between 100 and 10 feet did not vary greatly between the summer and fall quarters. The average inversion lapse rate (change in temperature with respect to height) for the six-month period was 0.27 degrees Celsius per foot. Any substantial inversion layer with a depth much greater than 90 feet has a stronger lapse rate in the lower regions than a lapse rate measured over the entire inversion zone.

Net evaporation and precipitation data is summarized on a daily and monthly basis in composite profiles (Tables 17 through 22). The total net evaporation measured for the six months was 36.33 inches with 76 percent of that occurring in the summer quarter. All months recorded positive values for net evaporation with the month of July registering a high of 13.2 inches.

Total precipitation for the reporting period was 10.03 inches with 72 percent coming in the summer quarter. September recorded the high with 4.41 inches. Of the total, 1.72 inches came from rain and the remaining 8.32 inches came from 25.6 inches of snow. Water content of the snow during the fall months averaged 32.5 percent water.

Wind speed and direction measurements between the summer and fall months varied insignificantly. Winds are predominantly from the south-southwest during both the summer and fall seasons at 33 feet. However, at 100 feet the prevailing winds do shift slightly between seasons, coming from the south in the summer and from the south-southwest in the fall. Wind speeds during the first three months averaged seven MPH and 10 MPH at 33 and 100 feet respectively and during the last three months averaged five MPH and eight MPH at 33 and 100 feet respectively. A maximum wind speed of 41 MPH was recorded at 100 feet in October. Wind roses and tabular wind data summaries are presented by month, by quarter and as a composite for the reporting period in Tables 23 through 49.

YEAR SUMMARY

The maximum temperature recorded for the year was noted at station A-04B in August with a value of 100°F. The minimum temperature recorded for the year was also obtained at station A-04B with a value of -17°F. Mean temperatures ranged from 16°F in January to 73°F in July.

Total precipitation for the year was 14.83 inches with the month of September accumulating the high of 4.41 inches and the third quarter receiving 49 percent of the total. Of the total 1.79 inches was in the form of rain and the remainder came from 65.7 inches of snow. Yearly average water content of the snow was 19.8 percent water with the average for the first and last six months of 1979 being 12.0 percent and 32.5 percent respectively.

Total net evaporation for the year was recorded to be 64.9 inches. All months except January recorded positive values for net evaporation with the month of July registering a high of 13.2 inches and with 43 percent of the total coming in the third quarter. Keeping with the norm, 85.3 percent of the total evapotranspiration for the year came during the period from April 1 through October 1, 1979.

Wind speeds averaged over three months revealed that the spring quarter averaged the highest winds at 17 MPH and the fall quarter averaged the lowest at five MPH. A maximum wind speed of 41 MPH was recorded at the 100-foot level in October, and at the 33-foot level a maximum of 48 MPH was recorded in June. Prevailing winds were from the south-southwest at 33 feet as indicated in the yearly composite, Appendix A, Table 50.

CONCLUSIONS AND RECOMMENDATIONS

The data sufficiencies and equipment performance were excellent during the reporting period. It is for this reason that the information provided in this report is felt to be quality data and highly representative of the local microclimate of the area.

Modifications made to the 100-foot electrical weather station have confirmed that nocturnal temperature inversions occur in the vicinity of the research facility on a regular basis. However, the actual thickness of these inversion layers is still unknown and relative strengths are only known for the lower 30 meters. It is therefore recommended that during the 1980-1981 investigative period that an effort be made to evaluate the inversion thickness and their overall strengths.

It is also recommended that prior to the beginning of the 1981 investigative period that station A-04 be extended to at least 60 meters and a sigma sensor installed in order to derive a meaningful frequency distribution for on-site data to be used in future dispersion modeling.

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APPENDIX A. TABLES

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49	Wind Roses, 6 Mo. Composite, Stations #1 & #1, 33 ft.
50	Wind Roses, Composite, Year 1979.

Table 1
ABBREVIATIONS, UNITS AND TERMS USED IN TABLES 2-22.

<u>Abbreviation</u>	<u>Parameter or Expression</u>	<u>Units</u>
	Data sufficiency	percent
	Temperature	degrees F.
STA	Station	
Comp	Composite	
MDBH4	Mean daily by hour, A-04	degrees F.
PPN	Precipitation	inches
Bar Pr	Barometric pressure	inches Hg.
Tmax	Maximum temperature	degrees F.
Tmin	Minimum temperature	degrees F.
Tmean	Mean temperature	degrees F.
RH%	Relative humidity	percent
DSD	Direct sunshine duration	hours
EVAP	Evaporation, net	inches
TSR	Total solar radiation	langleys
MDWS	Mean daily wind speed	miles per hour
LE	Less than or equal to	
GE	Greater than or equal to	

Table 2
DATA SUFFICIENCY BY MONTH

1979

<u>Station and Parameter</u>		<u>JULY</u>	<u>AUG</u>	<u>SEPT</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>
A-01	Barometric Pressure	100.0	100.0	100.0	94.4	94.7	96.2
	Maximum temperature	100.0	100.0	100.0	87.1	100.0	93.5
	Minimum temperature	100.0	100.0	100.0	87.1	100.0	93.5
	Overall	100.0	100.0	100.0	89.5	98.2	94.4
A-02	Evaporation	100.0	100.0	100.0	100.0	76.7	96.7
	Wind travel, Total	100.0	100.0	100.0	100.0	100.0	100.0
	Overall	100.0	100.0	100.0	100.0	88.4	98.3
A-03	Solar radiation	100.0	83.9	83.3	74.2	83.3	100.0
A-04B	Relative humidity	100.0	100.0	98.3	97.0	80.6	100.0
	Temperature	100.0	100.0	94.4	96.8	66.7	64.5
	Maximum temperature	100.0	100.0	100.0	100.0	100.0	93.5
	Minimum temperature	100.0	100.0	100.0	100.0	100.0	93.5
	Overall	100.0	100.0	98.2	98.5	86.8	87.9
A-06	Direct sunshine duration	100.0	100.0	100.0	100.0	100.0	100.0
A-04	Temperature (100 ft.)	82.7	83.6	98.1	98.9	94.4	100.0
	Temperature (30 ft.)	82.7	85.1	100.0	98.9	94.4	100.0
	Temperature (10 ft.)	82.7	85.3	100.0	98.9	94.4	100.0
	Temperature (0 ft.)	82.7	85.3	100.0	98.9	-	-
	Wind speed (100 ft.)	82.7	85.3	100.0	98.9	94.4	100.0
	Wind speed (30 ft.)	82.7	85.3	100.0	98.9	94.0	100.0
	Wind direction (100 ft.)	81.2	84.7	99.9	98.3	94.4	100.0
	Wind direction (30 ft.)	82.3	85.2	100.0	98.8	94.4	99.5
	Precipitation	82.7	85.3	100.0	98.9	94.4	100.0
	Overall	82.5	85.0	99.8	98.8	94.4	99.9
A-07	Wind speed (30 ft.)	-	81.9	100.0	100.0	100.0	100.0
	Wind direction (30 ft.)	-	81.9	100.0	100.0	100.0	100.0
	Temperature (30 ft.)	-	81.9	100.0	100.0	100.0	100.0
	Overall	-	81.9	100.0	100.0	100.0	100.0
ALL STATIONS		92.1	91.1	98.9	96.8	93.5	96.9

See Table 1 for abbreviations and units.

Table 3
DATA SUFFICIENCY, CUMULATIVE
1979

<u>Station and Parameter</u>		<u>JULY</u>	<u>AUG</u>	<u>SEPT</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>
A-01	Barometric pressure	100.0	100.0	100.0	98.6	97.8	97.6
	Maximum temperature	100.0	100.0	100.0	96.8	97.4	96.8
	Minimum temperature	100.0	100.0	100.0	96.8	97.4	96.8
	Overall	100.0	100.0	100.0	97.4	97.5	97.0
A-02	Evaporation	100.0	100.0	100.0	100.0	95.3	95.6
	Wind travel, Total	100.0	100.0	100.0	100.0	100.0	100.0
	Overall	100.0	100.0	100.0	100.0	97.7	97.8
A-03	Solar radiation	100.0	92.0	89.1	85.4	84.9	87.5
A-04B	Relative humidity	100.0	100.0	99.4	98.8	95.2	96.0
	Temperature	100.0	100.0	98.1	97.8	91.6	87.1
	Maximum temperature	100.0	100.0	100.0	100.0	100.0	98.9
	Minimum temperature	100.0	100.0	100.0	100.0	100.0	98.9
	Overall	100.0	100.0	99.4	99.2	96.7	95.2
A-06	Direct sunshine duration	100.0	100.0	100.0	100.0	100.0	100.0
A-04	Temperature (100 ft.)	82.7	83.2	88.1	90.8	91.5	93.0
	Temperature (30 ft.)	82.7	83.9	89.3	91.7	92.2	93.5
	Temperature (10 ft.)	82.7	84.0	89.3	91.7	92.3	93.6
	Temperature (0 ft.)	82.7	84.0	89.3	91.7	-	-
	Wind speed (100 ft.)	82.7	84.0	89.3	91.7	92.3	93.6
	Wind speed (30 ft.)	82.7	84.0	89.3	91.7	92.2	93.5
	Wind direction (100 ft.)	81.2	83.0	88.6	91.0	91.7	93.1
	Wind direction (30 ft.)	82.3	83.8	89.2	91.6	92.1	93.4
	Precipitation	82.7	84.0	89.3	91.7	92.3	93.6
	Overall	82.5	83.8	89.1	91.5	92.1	93.4
A-07	Wind speed (30 ft.)	-	81.9	91.0	94.0	95.5	96.4
	Wind direction (30 ft.)	-	81.9	91.0	94.0	95.5	96.4
	Temperature (30 ft.)	-	81.9	91.0	94.0	95.5	96.4
	Overall	-	81.9	91.0	94.0	95.5	96.4
ALL STATIONS		92.1	91.6	94.0	94.7	94.5	94.9

See Table 1 for abbreviations and units.

Table 4
MAXIMUM AND MINIMUM TEMPERATURES
JULY 1979

<u>Day</u>	<u>m a x i m a</u>			<u>m i n i m a</u>		
	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>
1	87	89	87	53	51	51
2	88	90	88	49	51	49
3	86	87	88	43	49	46
4	89	88	89	46	42	47
5	93	90	94	46	44	48
6	93	93	90	49	45	50
7	93	93	93	57	49	60
8	93	93	93	56	56	55
9	89	91	90	53	54	55
10	92	94	95	53	52	54
11	91	94	97	50	53	51
12	91	94	90	56	52	53
13	88	94	89	56	54	51
14	91	91	93	58	54	61
15	91	93	94	60	60	62
16	90	96	93	65	63	55
17	91	91	95	59	58	56
18	91	93	94	63	59	64
19	93	93	95	62	63	62
20	86	94	88	58	63	58
21	85	87	81	52	58	53
22	89	81	89	55	52	53
23	79	89	80	46	55	48
24	91	80	92	55	46	56
25	89	92	88	54	54	57
26	89	90	93	60	54	61
27	90	92	96	62	60	54
28	89	92	97	59	56	57
29	90	91	92	62	59	52
30	90	92	91	52	54	50
31	88	87	85	51	49	51
MEAN	90	91	91	55	54	54

See Table 1 for abbreviations and units.

Table 5
MAXIMUM AND MINIMUM TEMPERATURES
AUGUST 1979

<u>Day</u>	m a x i m a			m i n i m a		
	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>
1	91	88	92	51	48	52
2	90	90	92	51	51	51
3	90	90	90	52	51	52
4	90	90	90	53	52	54
5	93	90	95	55	54	54
6	98	94	98	55	55	56
7	98	100	98	52	56	56
8	95	96	86	56	55	55
9	86	92	85	58	54	53
10	81	91	79	54	51	51
11	87	84	89	54	52	60
12	83	84	86	56	60	55
13	77	88	77	56	54	52
14	70	78	75	52	50	48
15	72	73	73	52	47	53
16	72	71	74	45	49	45
17	73	72	76	47	44	49
18	74	74	75	49	48	50
19	62	74	63	48	49	50
20	62	63	65	46	48	45
21	77	62	77	46	46	48
22	79	77	77	46	47	47
23	80	81	79	51	48	51
24	81	83	80	53	50	48
25	81	83	79	50	47	47
26	79	83	80	53	49	50
27	83	83	85	53	53	55
28	85	85	85	59	58	54
29	82	86	83	59	58	58
30	74	87	80	59	57	60
31	80	83	81	46	52	46
MEAN	81	83	82	52	51	52

See Table 1 for abbreviations and units.

Table 6
MAXIMUM AND MINIMUM TEMPERATURES
SEPTEMBER 1979

Day	m a x i m a			m i n i m a		
	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>
1	83	81	84	48	46	52
2	84	82	85	49	49	50
3	84	84	86	50	50	51
4	85	85	85	50	50	50
5	87	85	87	55	50	48
6	88	90	83	54	51	50
7	88	91	87	57	54	57
8	88	92	88	61	59	56
9	86	90	86	59	58	57
10	85	87	85	59	56	47
11	82	86	80	49	49	38
12	78	84	72	41	39	38
13	75	75	68	39	40	38
14	72	72	63	38	39	35
15	72	68	70	38	37	38
16	74	75	78	38	40	44
17	76	81	74	41	40	44
18	81	82	80	48	48	50
19	79	86	77	59	50	49
20	75	80	72	50	49	42
21	76	78	73	45	43	38
22	79	77	79	54	44	51
23	81	81	79	52	50	51
24	80	83	79	54	52	51
25	78	81	79	56	53	54
26	79	81	80	54	50	50
27	80	82	78	51	51	48
28	79	80	78	47	48	45
29	79	78	79	46	45	48
30	80	80	80	48	48	45
MEAN	80	82	79	50	48	47

See Table 1 for abbreviations and units.

Table 7
MAXIMUM AND MINIMUM TEMPERATURES
OCTOBER 1979

<u>Day</u>	<u>m a x i m a</u>			<u>m i n i m a</u>		
	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>
1	78	80	75	44	45	42
2	79	80	79	53	46	43
3	-	80	67	-	41	37
4	-	72	73	-	38	40
5	-	77	73	-	41	40
6	77	79	75	35	41	44
7	78	80	77	-	46	43
8	81	83	73	42	48	35
9	78	79	62	32	35	36
10	66	66	66	32	38	35
11	75	76	75	41	43	43
12	75	76	69	44	46	41
13	72	74	72	39	43	46
14	71	73	68	38	42	41
15	71	72	72	38	42	32
16	74	72	68	27	35	32
17	59	61	65	31	33	33
18	-	65	64	37	38	38
19	64	65	66	41	40	38
20	66	66	40	35	35	30
21	36	37	40	26	26	25
22	40	41	49	22	24	27
23	51	52	52	28	26	29
24	54	55	55	24	28	31
25	57	58	63	33	34	37
26	67	69	63	41	39	26
27	62	63	60	25	27	26
28	53	55	53	27	28	28
29	52	52	34	30	30	22
30	34	34	36	22	21	21
31	34	36	35	02	07	13
MEAN	63	65	62	33	36	34

See Table 1 for abbreviations and units.

Table 8
MAXIMUM AND MINIMUM TEMPERATURES
NOVEMBER 1979

Day	m a x i m a			m i n i m a		
	A-01	A-04	A-05	A-01	A-04	A-05
1	32	32	37	07	10	15
2	39	37	41	11	12	21
3	45	46	46	16	20	27
4	48	49	46	19	26	23
5	48	47	43	21	22	25
6	46	46	47	23	26	29
7	49	49	47	29	30	30
8	43	45	45	27	28	26
9	47	48	44	22	25	23
10	44	45	38	20	21	26
11	42	42	40	22	24	17
12	40	42	41	16	17	23
13	45	45	44	24	25	20
14	45	46	43	15	19	20
15	44	45	44	13	19	20
16	46	47	49	16	19	21
17	47	48	49	18	20	33
18	50	51	47	30	31	18
19	45	44	31	10	15	20
20	26	26	28	19	19	18
21	25	26	29	12	13	06
22	31	32	28	-01	03	12
23	32	32	34	10	12	14
24	32	32	36	02	09	14
25	30	30	40	17	19	24
26	37	37	38	19	20	04
27	31	34	27	-02	01	00
28	30	32	18	-10	-03	-01
29	20	24	18	-08	-04	-02
30	22	21	18	-10	-04	00
MEAN	39	39	38	14	16	18

See Table 1 for abbreviations and units.

Table 9
MAXIMUM AND MINIMUM TEMPERATURES
DECEMBER 1979

<u>Day</u>	<u>m a x i m a</u>			<u>m i n i m a</u>		
	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>
1	24	21	24	-07	-01	07
2	31	27	37	01	06	20
3	38	39	38	16	19	20
4	46	43	48	10	18	22
5	53	53	38	16	23	20
6	42	42	38	14	19	23
7	43	42	40	18	16	24
8	42	41	40	17	16	23
9	44	45	41	14	15	20
10	44	46	44	15	16	08
11	47	47	20	01	05	03
12	22	23	24	-02	00	04
13	29	27	24	-04	02	06
14	27	27	30	01	05	10
15	33	33	37	06	12	17
16	44	47	45	17	18	18
17	51	50	39	11	17	05
18	44	42	37	09	16	17
19	43	41	37	08	11	18
20	42	44	44	19	20	21
21	43	44	40	19	20	30
22	38	38	34	30	30	12
23	38	38	38	08	10	18
24	37	37	40	20	20	16
25	40	40	44	14	12	31
26	41	42	-	30	31	-
27	-	-	-	-	-	-
28	-	-	37	-	-	18
29	37	38	38	22	23	23
30	38	38	39	23	23	08
31	36	34	29	-02	05	11
MEAN	39	39	37	12	15	16

See Table 1 for abbreviations and units.

Table 10
MONTHLY TEMPERATURE
MAXIMA AND MINIMA

<u>Maxima</u>							
<u>STA</u>	<u>JULY</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>MONTH</u>
A-01	93	98	88	81	50	53	AUG
A-04	96	100	92	83	51	53	AUG
A-05	97	98	88	77	49	48	AUG
	A-05	A-04	A-04	A-04	A-04	[A-04] [A-01]	

<u>Minima</u>							
<u>STA</u>	<u>JULY</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>MONTH</u>
A-01	43	45	38	02	-10	-07	NOV
A-04	42	44	37	07	-04	-01	NOV
A-05	46	45	35	13	00	04	NOV
	A-04	A-04	A-05	A-01	A-01	A-01	

See Table 1 for abbreviations and units.

Table 11
DAILY MEAN TEMPERATURES
JULY 1979

<u>Day</u>	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>	<u>MDBH4</u>	<u>Comp</u>
1	70	70	69	70	70
2	69	71	69	68	69
3	65	68	67	63	66
4	68	65	68	65	67
5	70	67	71	71	70
6	71	69	70	69	70
7	75	71	77	71	74
8	75	75	74	75	75
9	71	73	73	73	73
10	73	73	75	76	74
11	71	74	74	74	74
12	74	73	72	75	74
13	72	74	70	74	73
14	75	73	77	75	75
15	76	77	78	76	77
16	78	80	74	75	77
17	75	75	76	74	75
18	77	76	79	74	77
19	78	78	79	71	77
20	72	79	73	70	74
21	69	73	67	69	70
22	72	67	71	67	69
23	63	72	64	68	67
24	73	63	74	66	69
25	72	73	73	72	73
26	75	72	77	74	75
27	76	76	75	76	76
28	74	74	77	76	75
29	76	75	72	77	75
30	71	73	71	74	72
31	70	68	68	71	69
MEAN	72	72	73	72	73

See Table 1 for abbreviations and units.

Table 12
DAILY MEAN TEMPERATURES
AUGUST 1979

<u>Day</u>	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>	<u>MDBH4</u>	<u>Comp</u>
1	71	68	72	73	71
2	71	71	72	74	72
3	71	71	71	75	72
4	72	71	72	80	74
5	74	72	75	80	75
6	77	75	77	81	78
7	75	78	77	71	75
8	76	76	71	71	74
9	72	73	69	73	72
10	68	71	65	69	68
11	71	68	75	72	72
12	70	75	71	72	72
13	67	71	65	64	67
14	61	64	62	60	62
15	62	60	63	57	61
16	59	60	60	56	59
17	60	58	63	57	60
18	62	61	63	60	62
19	55	62	57	53	57
20	54	56	55	55	55
21	62	54	63	61	60
22	63	62	62	65	63
23	66	65	65	66	66
24	67	67	64	68	67
25	66	65	63	65	65
26	66	66	65	65	66
27	68	68	70	70	69
28	72	72	70	72	72
29	71	72	71	72	72
30	67	72	70	68	69
31	63	68	64	67	66
MEAN	67	67	67	67	68

See Table 1 for abbreviations and units.

Table 13
DAILY MEAN TEMPERATURES
SEPTEMBER 1979

<u>Day</u>	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>	<u>MDBH4</u>	<u>Comp</u>
1	66	64	68	67	66
2	67	66	68	69	68
3	67	67	69	72	69
4	68	68	68	70	69
5	71	68	68	72	70
6	71	71	67	72	70
7	73	73	72	73	73
8	75	76	72	76	75
9	73	74	72	71	73
10	72	72	66	72	71
11	66	68	59	67	65
12	60	62	55	58	59
13	57	58	53	56	56
14	55	56	49	52	53
15	55	53	54	54	54
16	56	58	61	63	60
17	59	61	59	76	64
18	65	65	65	-	65
19	69	68	63	67	67
20	63	65	57	64	62
21	61	61	56	61	60
22	67	61	65	65	65
23	67	66	65	66	66
24	67	68	65	66	67
25	67	67	67	67	67
26	67	66	65	64	66
27	66	67	63	58	64
28	63	64	62	60	62
29	63	62	64	61	63
30	64	64	63	63	64
MEAN	65	65	62	66	65

See Table 1 for abbreviations and units.

Table 14
MEAN DAILY TEMPERATURES
OCTOBER 1979

<u>Day</u>	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>	<u>MDBH4</u>	<u>Comp</u>
1	61	63	59	63	62
2	66	63	61	66	64
3	-	61	52	57	57
4	-	55	57	57	56
5	-	59	57	61	59
6	56	60	60	61	59
7	-	63	61	65	63
8	62	66	54	63	61
9	55	57	49	51	53
10	49	52	51	57	52
11	58	60	59	58	59
12	60	61	55	58	59
13	56	59	59	58	58
14	55	58	55	54	56
15	55	57	52	53	54
16	51	54	50	48	51
17	45	47	49	49	48
18	-	52	51	54	52
19	53	53	52	57	54
20	51	51	35	35	43
21	31	32	33	32	32
22	31	33	38	40	36
23	40	39	41	42	41
24	39	42	43	32	39
25	45	46	50	58	50
26	54	54	45	50	51
27	44	45	43	40	43
28	40	42	41	43	42
29	41	42	41	32	39
30	28	28	29	26	28
31	18	22	24	23	22
MEAN	48	51	49	50	50

See Table 1 for abbreviations and units.

Table 15
DAILY MEAN TEMPERATURES
NOVEMBER 1979

<u>Day</u>	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>	<u>MDBH4</u>	<u>Comp</u>
1	20	21	26	23	23
2	25	25	31	34	29
3	31	33	37	33	34
4	34	38	35	-	36
5	35	35	34	-	35
6	35	36	38	-	36
7	39	40	39	37	39
8	35	37	36	36	36
9	35	37	34	32	35
10	32	33	32	-	32
11	32	33	29	-	31
12	28	30	32	28	30
13	35	35	32	-	34
14	30	33	32	28	31
15	29	32	32	28	30
16	31	33	35	31	33
17	33	34	41	35	36
18	40	41	33	31	36
19	28	30	26	21	26
20	23	23	23	-	23
21	19	20	18	-	19
22	15	18	20	19	18
23	21	22	24	19	22
24	17	21	25	22	21
25	24	25	32	27	27
26	28	29	21	25	26
27	15	17	14	-	15
28	10	15	10	-	12
29	6	10	8	-	8
30	6	9	9	-	8
MEAN	26	28	28	28	27

See Table 1 for abbreviations and units.

Table 16
DAILY MEAN TEMPERATURES
DECEMBER 1979

<u>Day</u>	<u>A-01</u>	<u>A-04</u>	<u>A-05</u>	<u>MDBH4</u>	<u>Comp</u>
1	9	10	16	-	12
2	15	11	29	28	21
3	27	29	29	25	28
4	28	31	35	-	31
5	35	38	29	-	34
6	28	31	31	-	30
7	31	29	32	-	31
8	30	29	32	-	30
9	29	30	31	-	30
10	30	31	26	-	29
11	24	26	13	14	19
12	10	12	14	10	12
13	13	15	15	-	14
14	14	16	20	-	17
15	20	23	27	-	23
16	31	33	32	-	32
17	31	34	22	-	29
18	27	29	27	25	27
19	26	26	28	-	27
20	31	32	33	36	33
21	31	32	35	29	32
22	34	34	23	27	30
23	23	24	28	20	24
24	29	29	28	26	28
25	27	26	38	26	29
26	36	37	-	20	31
27	-	-	-	20	20
28	-	-	28	21	24
29	30	31	31	17	27
30	31	31	24	16	25
31	17	20	20	16	18
MEAN	26	26	27	22	26

See Table 1 for abbreviations and units.

Table 17

COMPOSITE PROFILE

JULY 1979

Day	BarPr	Tmax	Tmin	Tmean	RH%	DSD	TSR	EVAP	PPN
1	23.46	88	52	70	43	8.8	846	.70	-
2	23.50	89	50	69	22	8.5	906	.20	-
3	23.57	87	46	67	35	0	802	.36	-
4	23.61	89	45	67	37	13.2	820	.44	-
5	23.61	92	46	69	26	0	743	.28	-
6	23.63	92	48	70	35	9.5	700	.75	0
7	23.65	93	55	74	31	13.3	973	.47	0
8	23.63	93	56	74	27	13.8	982	.60	0
9	23.64	90	54	72	20	13.3	982	.50	0
10	23.55	94	53	74	17	12.4	820	.57	0
11	23.50	94	51	73	20	13.3	973	.37	0
12	23.51	92	54	73	15	13.2	948	.49	0
13	23.56	91	54	72	17	13.4	957	.49	0
14	23.58	92	58	75	15	10.8	973	.31	0
15	23.62	93	61	77	25	10.3	982	.21	.16
16	23.72	93	61	77	26	6.8	752	.58	0
17	23.74	92	58	75	26	8.1	708	.26	0
18	23.68	93	62	78	32	11.2	973	.44	0
19	23.64	94	62	78	24	9.3	820	.40	0
20	23.61	89	60	74	29	8.8	743	.26	0
21	23.58	84	54	69	35	8.8	923	.53	0
22	23.58	86	53	70	38	10.7	1051	.34	0
23	23.54	83	50	66	58	4.3	666	.29	.01
24	23.61	88	52	70	40	13.0	888	0	.01
25	23.59	90	55	73	26	11.5	896	.39	0
26	23.56	91	58	75	27	6.8	666	.50	.01
27	23.51	93	59	76	23	10.9	700	.43	0
28	23.52	93	57	75	12	13.3	940	.51	0
29	23.54	91	58	74	12	12.2	1238	.47	0
30	23.58	91	52	72	19	12.5	777	.56	0
31	23.67	87	50	69	16	13.3	871	.48	0
MEAN	23.59	91	54	72	27	10.2	872	.44	.01
TOTAL								13.18	.19

See Table 1 for abbreviations and units.

Table 18
COMPOSITE PROFILE
AUGUST 1979

Day	BarPr	Tmax	Tmin	Tmean	RH%	DSD	TSR	EVAP	PPN
1	23.62	90	50	70	13	13.0	820	.45	0
2	23.54	91	51	71	24	12.9	896	.39	0
3	23.54	90	52	71	22	13.2	906	.16	0
4	23.57	90	53	72	20	13.2	888	.33	0
5	23.60	93	54	74	13	9.2	743	.63	0
6	23.61	97	55	76	23	9.5	808	.12	0
7	23.60	99	55	77	52	8.0	785	.27	.06
8	23.62	92	55	74	54	6.2	854	-.11	0
9	23.64	88	55	72	33	10.5	743	.20	0
10	23.70	84	52	68	31	13.0	-	.40	0
11	23.58	87	55	71	26	10.8	-	.52	0
12	23.47	86	57	72	48	5.4	-	.14	0
13	23.52	81	54	68	67	10.7	-	.12	0
14	23.62	74	50	62	67	0.4	339	.04	0
15	23.62	73	51	62	63	2.3	545	.04	0
16	23.63	72	46	59	57	3.2	520	.18	0
17	23.63	74	47	60	47	5.6	624	.02	.03
18	23.56	74	49	62	56	7.8	768	0	.20
19	23.56	66	49	58	85	4.8	470	.26	2.11
20	23.56	63	46	55	69	0	426	.18	.21
21	23.63	72	47	59	61	12.2	-	.04	0
22	23.68	78	47	62	46	11.9	461	.07	.02
23	23.61	80	50	65	35	14.5	769	.04	0
24	23.54	81	50	66	23	12.1	948	.29	0
25	23.52	81	48	65	25	9.1	743	.08	0
26	23.54	81	51	66	32	8.6	743	.31	0
27	23.51	84	54	69	15	10.5	931	.53	0
28	23.45	85	57	71	18	10.4	718	.51	0
29	23.49	84	58	71	13	12.8	777	.04	0
30	23.50	80	59	69	28	7.4	547	.08	0
31	23.50	81	48	65	40	12.8	820	.14	0
MEAN	23.57	82	52	67	39	9.09	715	.22	.08
TOTAL								6.47	2.63

See Table 1 for abbreviations and units.

Table 19
COMPOSITE PROFILE
SEPTEMBER 1979

Day	BarPr	Tmax	Tmin	Tmean	RH%	DSD	TSR	EVAP	PPN
1	23.53	83	49	66	37	12.6	820	.14	0
2	23.57	84	49	66	34	12.8	854	.50	0
3	23.54	85	50	67	23	7.4	787	.60	.21
4	23.49	85	50	67	24	7.3	990	.35	0
5	23.59	86	51	69	18	7.3	837	-.28	0
6	23.66	87	52	69	10	12.3	802	.21	0
7	23.65	89	56	73	15	11.5	863	.02	0
8	23.63	89	59	74	15	7.6	666	.33	0
9	23.62	87	58	73	25	5.5	624	.03	.11
10	23.56	86	54	70	31	8.5	777	.44	2.31
11	23.54	83	45	64	23	11.3	-	.11	.09
12	23.61	78	39	59	20	12.0	769	.33	0
13	23.60	73	39	56	31	8.8	726	0	0
14	23.72	69	37	53	32	11.3	802	.30	0
15	23.74	70	38	54	22	11.3	760	.27	0
16	23.68	76	41	58	23	11.3	820	.27	0
17	23.65	77	42	59	19	11.3	812	.33	0
18	23.68	81	49	65	27	10.4	700	.39	0
19	23.61	81	53	67	32	6.2	728	.40	0
20	23.57	76	47	62	31	5.7	624	.39	0
21	23.60	76	42	59	34	8.8	598	.39	0
22	23.62	78	50	64	22	9.3	649	.12	0
23	23.66	80	51	66	19	11.0	760	.38	0
24	23.71	81	52	67	24	10.4	624	.39	0
25	23.71	79	54	67	25	5.3	700	.32	0
26	23.62	80	51	66	52	11.0	675	.14	1.69
27	23.66	80	50	65	45	9.8	-	.33	0
28	23.64	79	47	63	43	10.8	-	.37	0
29	23.73	79	46	63	41	9.8	-	.13	0
30	23.73	80	47	64	36	10.2	-	.31	0
MEAN	23.63	81	48	65	28	9.6	751	.27	0.15
TOTAL								8.01	4.41

See Table 1 for abbreviations and units.

Table 20
COMPOSITE PROFILE
OCTOBER 1979

Day	BarPr	Tmax	Tmin	Tmean	RH%	DSD	TSR	EVAP	PPN
1	23.75	78	44	61	23	11.0	-	.38	0
2	23.66	79	47	63	17	8.0	-	.30	0
3	23.72	74	39	57	28	10.8	-	.26	0
4	23.75	73	39	56	18	8.8	683	.25	0
5	23.71	75	41	58	11	10.8	691	.26	0
6	23.67	77	40	59	21	10.7	-	.33	0
7	23.59	78	45	61	12	10.6	-	.39	0
8	23.56	79	42	60	16	10.8	-	.26	0
9	23.71	73	34	54	43	10.5	708	.13	0
10	23.75	66	35	51	38	10.8	666	.05	0
11	23.65	75	43	59	38	7.3	624	.39	0
12	23.57	73	44	58	26	10.4	597	.07	0
13	23.57	73	43	58	39	8.1	649	.35	0
14	23.56	71	40	56	61	9.0	589	.24	.50
15	23.62	72	37	55	60	10.7	401	.25	0
16	23.69	71	31	51	55	10.0	1016	.06	0
17	23.57	62	32	47	38	6.2	597	.12	0
18	23.45	65	38	51	51	7.8	520	.46	0
19	23.18	65	40	52	37	7.4	538	.22	0
20	23.17	57	33	45	85	0	324	-.05	.11
21	23.42	38	26	32	73	7.8	564	.03	.22
22	23.64	43	24	34	46	9.7	683	.06	.05
23	23.69	52	28	40	61	9.0	718	.13	0
24	23.65	55	28	41	52	7.2	581	.03	.02
25	23.57	59	35	47	41	10.3	641	.39	0
26	23.54	66	35	51	52	7.8	581	.13	0
27	23.63	62	26	44	44	10.3	265	.06	0
28	23.42	54	28	41	49	6.9	-	.07	0
29	23.32	46	27	37	88	0	-	-.02	.05
30	23.49	35	21	28	59	5.8	470	.23	0
31	23.48	35	07	21	56	5.6	606	.04	0
MEAN	23.57	64	35	49	43	8.2	596	.19	.03
TOTAL								5.87	.95

See Table 1 for abbreviations and units.

Table 21
COMPOSITE PROFILE
NOVEMBER 1979

Day	BarPr	Tmax	Tmin	Tmean	RH%	DSD	TSR	EVAP	PPN
1	23.53	34	11	22	66	6.5	564	.02	-
2	23.65	39	15	27	62	7.3	555	.07	0
3	23.53	46	21	34	35	8.0	589	.13	0
4	23.41	48	23	35	46	9.3	453	.13	0
5	23.68	46	23	34	52	0.4	495	.03	0
6	23.70	46	26	36	68	7.3	240	-	.02
7	23.51	48	30	39	64	1.3	-	.04	0
8	23.29	44	27	36	64	0	-	.06	0
9	23.35	46	23	35	39	6.3	-	.06	0
10	23.46	42	22	32	41	1.8	-	.05	0
11	23.61	41	21	31	49	0	-	.08	0
12	23.75	41	19	30	34	0	564	.10	0
13	23.73	45	23	34	39	3.1	555	.04	0
14	23.78	45	18	32	42	3.0	538	.03	0
15	23.84	44	17	31	46	9.4	538	.04	0
16	23.74	47	19	33	40	9.5	538	.07	0
17	23.48	48	24	36	51	9.5	461	.30	0
18	23.40	49	26	38	79	9.6	384	-.22	.61
19	23.46	40	15	28	85	9.7	367	-.19	.07
20	23.49	27	19	23	89	8.3	444	-	.37
21	23.76	27	10	19	70	9.8	487	-	.21
22	23.69	30	05	17	50	4.0	547	-	.06
23	23.49	33	12	23	89	5.2	316	-	.12
24	23.50	33	08	21	45	1.4	401	-	0
25	23.41	33	20	27	63	6.6	547	-	0
26	23.31	37	14	26	73	6.3	393	-	.04
27	23.71	31	00	16	51	8.5	583	.02	0
28	23.96	27	-05	11	60	5.8	520	.08	0
29	23.87	21	-05	08	59	4.0	564	.74	0
30	23.76	20	-05	08	63	9.8	487	.23	0
MEAN	23.60	39	16	27	57	5.7	485	.09	.05
TOTAL								1.91	1.50

See Table 1 for abbreviations and units.

Table 22
COMPOSITE PROFILE
DECEMBER 1979

Day	BarPr	Tmax	Tmin	Tmean	RH%	DSD	TSR	EVAP	PPN
1	23.78	23	0	12	74	6.9	504	.01	0
2	23.74	32	9	21	60	3.3	470	.10	0
3	23.91	38	18	28	58	8.1	504	.05	0
4	23.81	46	17	31	50	6.3	418	.17	0
5	23.55	48	20	34	59	7.4	453	.06	0
6	23.50	41	19	30	59	8.1	487	.03	0
7	23.60	42	19	31	66	0	512	.04	0
8	23.75	41	19	30	62	5.4	453	.03	0
9	23.76	43	16	30	59	6.7	829	.05	0
10	23.43	45	13	29	57	8.1	846	.06	0
11	23.56	38	03	21	52	8.8	597	.03	0
12	23.64	23	01	12	62	8.8	461	.02	0
13	23.83	27	01	14	57	7.3	470	.02	0
14	23.78	28	05	17	63	8.8	495	.03	0
15	23.66	34	12	23	48	8.8	461	.08	0
16	23.78	45	18	32	38	8.8	495	.06	0
17	23.88	47	11	29	53	8.8	487	.06	0
18	23.73	41	14	28	55	8.8	466	.02	0
19	23.64	40	12	26	52	8.7	436	.04	0
20	23.61	43	20	32	48	3.3	358	.09	0
21	23.30	42	23	33	84	0.8	358	-.20	.01
22	23.24	37	24	31	79	0	299	.04	.33
23	23.54	38	12	25	57	8.3	316	-	0
24	23.66	38	19	28	55	0	436	-	0
25	23.65	41	19	20	47	0	401	.00	0
26	23.60	42	31	37	66	5.8	375	.00	0
27	23.62	-	-	-	72	0	324	.00	.01
28	23.76	37	18	27	63	3.7	358	.00	0
29	23.67	38	23	31	56	0	342	.00	0
30	23.69	38	18	28	60	0	384	.00	0
31	23.72	33	05	19	87	2.6	444	.00	0
MEAN	23.66	38	15	26	60	5.2	428	.03	.01
TOTAL								.89	.35

See Table 1 for abbreviations and units.

LEGEND

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SCALE: 1:50

Table 23
WIND ROSE, JULY 1979
Station #1, 100 feet
615 hours (82.7 percent)

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	0.3	1.6	2.8	1.1	5.9
NNE	0.2	1.5	1.5	0.5	3.6
NE	0.5	1.6	1.3	0.7	4.1
ENE	0.3	0.8	0.5	0.3	2.0
E	0.5	1.1	0.2	0.0	1.8
ESE	0.5	1.6	1.1	0.3	3.6
SE	0.2	1.8	1.5	1.1	4.6
SSE	0.5	2.8	1.1	2.8	7.2
S	0.3	1.3	3.7	9.1	14.5
SSW	0.3	2.4	6.7	6.7	16.1
SW	0.2	1.6	4.6	2.9	9.3
WSW	0.3	1.1	2.8	1.1	5.4
W	0.7	2.1	1.3	1.0	5.0
WNW	0.5	2.1	2.1	0.8	5.5
NW	0.5	2.4	2.1	1.0	6.0
NNW	0.5	2.3	2.6	0.3	5.7
TOTAL	6.2	28.3	35.8	29.8

LEGEND

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SCALE: 1:50

Table 24

WIND ROSE, AUGUST 1979
Station #1, 100 feet
633 hours (85.1 percent)

	LE 3.0	1.0 7.0	GE 7.0	GE 12.0	TOTAL
N	0.6	0.6	0.9	0.8	3.0
NNE	0.5	0.9	1.6	0.5	3.5
NE	0.3	1.4	1.9	0.8	4.4
ENE	0.6	1.9	0.3	0.0	2.8
E	0.5	0.6	0.3	0.3	1.7
ESE	0.3	0.5	1.4	0.2	2.4
SE	0.3	0.6	1.1	2.1	4.1
SSE	0.6	1.6	2.8	6.5	11.5
S	0.3	3.2	5.4	12.2	21.0
SSW	0.5	2.8	7.7	7.1	18.2
SW	0.3	2.1	3.2	2.4	7.9
WSW	0.6	0.6	1.3	0.5	3.0
W	0.3	1.4	1.4	0.6	3.8
WNW	0.0	2.2	1.7	1.4	5.4
NW	0.2	1.4	1.9	0.9	4.4
NNW	0.2	1.1	1.3	0.3	2.8
TOTAL	6.2	23.1	34.3	36.5

SCALE: 1:50

Table 25
WIND ROSE, SEPTEMBER 1979
Station #1, 100 feet
720 hours (100.0 percent)

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	0.1	1.0	0.6	0.4	2.1
NNE	0.0	2.5	2.5	1.2	6.2
NE	0.3	1.5	2.2	1.4	5.4
ENE	0.6	0.7	0.8	0.1	2.2
E	0.1	0.6	0.3	0.1	1.1
ESE	1.0	0.7	0.6	0.0	2.2
SE	0.7	1.4	0.6	0.6	3.2
SSE	0.1	1.9	0.7	3.4	6.2
S	0.1	1.2	6.6	14.4	22.4
SSW	0.6	1.8	8.5	10.3	21.2
SW	0.4	2.3	4.0	2.8	9.5
WSW	0.4	0.8	1.7	0.8	3.7
W	0.3	1.1	0.8	1.0	3.2
WNW	0.4	1.2	1.1	0.4	3.2
NW	0.3	1.8	2.3	0.7	5.1
NNW	0.4	1.5	1.2	0.1	3.3
TOTAL	5.8	22.0	34.4	37.8

LEGEND

SCALE: 1:50

Table 26
WIND ROSE, OCTOBER 1979
Station #1, 100 feet
738 hours (99.2 percent)

	LE	3.0	GE	GE	
	3.0	7.0	7.0	12.0	TOTAL
N	1.2	0.8	1.1	1.5	4.6
NNE	0.3	2.3	2.6	2.2	7.3
NE	0.3	2.6	2.3	0.8	6.0
ENE	1.5	2.0	1.1	0.1	4.7
E	1.1	0.9	0.3	0.1	2.4
ESE	0.3	0.5	0.3	0.0	1.1
SE	0.8	1.1	0.1	0.4	2.4
SSE	0.3	0.9	1.2	1.4	3.8
S	0.1	1.5	6.8	12.2	20.6
SSW	0.5	2.6	8.9	6.4	18.4
SW	0.4	1.5	2.3	1.5	5.7
WSW	0.4	1.9	1.1	0.7	4.1
W	0.7	1.4	1.1	0.4	3.5
WNW	0.4	1.9	2.6	0.4	5.3
NW	0.5	2.3	2.2	0.4	5.4
NNW	0.1	2.4	1.6	0.4	4.6
TOTAL	8.9	26.7	35.5	28.9

LEGEND

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- - - - -	7-12
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SCALE: 1:50

Table 27
WIND ROSE, NOVEMBER 1979
Station #1, 100 feet
680 hours (94.4 percent)

	LE	3.0	GE	GE	
	3.0	7.0	7.0	12.0	TOTAL
N	1.0	1.2	0.7	0.1	3.1
NNE	1.0	2.5	0.7	0.6	4.9
NE	0.6	4.3	0.6	0.3	5.7
ENE	1.6	1.6	0.1	0.0	3.4
E	0.3	0.4	0.0	0.0	0.7
ESE	1.8	1.2	0.1	0.1	3.1
SE	1.2	0.7	0.7	0.0	2.6
SSE	0.9	1.0	1.9	1.8	5.6
S	0.4	2.4	5.9	8.2	16.9
SSW	0.6	4.6	9.0	3.7	17.8
SW	0.4	3.7	3.2	0.6	7.9
WSW	0.6	1.5	0.9	0.6	3.5
W	0.4	0.7	1.6	0.7	3.5
WNW	0.1	2.6	2.6	1.6	7.1
NW	0.4	2.2	3.8	1.0	7.5
NNW	1.0	2.8	2.4	0.4	6.6
TOTAL	12.5	33.4	34.4	19.7

LEGEND

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=====	> 12

SCALE: 1:50

Table 28
WIND ROSE, DECEMBER 1979
Station #1, 100 feet
744 hours (100.0 percent)

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	1.7	1.7	0.4	3.9	
NNE	1.9	3.6	0.7	0.3	6.5
NE	1.2	4.3	0.3	0.1	5.9
ENE	2.6	2.2	0.3	0.1	5.1
E	2.7	3.0	0.1	0.0	5.8
ESE	1.3	2.3	0.3	0.0	3.9
SE	1.7	1.6	0.3	0.0	3.6
SSE	1.1	2.4	0.7	1.5	5.6
S	1.3	1.6	4.3	9.7	16.9
SSW	1.2	3.1	4.4	3.9	12.6
SW	1.2	3.8	1.3	0.3	6.6
WSW	1.5	2.7	0.7	0.3	5.1
W	0.5	3.0	0.9	0.3	4.7
WNW	0.9	2.0	1.1	0.4	4.4
NW	1.7	2.7	1.3	0.0	5.8
NNW	0.8	2.3	0.4	0.0	3.5
TOTAL	23.5	42.2	17.5	16.8

LEGEND

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- - - - -	3-7
- - - - -	7-12
=====	> 12

SCALE: 1:50

Table 29
WIND ROSE, JULY 1979
Station #1, 33 feet
615 hours (82.7 percent)

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	0.7	2.0	1.5	0.7	4.7
NNE	0.2	2.1	1.3	0.5	4.1
NE	0.2	1.0	0.5	0.3	2.0
ENE	0.3	0.3	0.8	0.0	1.5
E	0.7	0.8	0.3	0.0	1.8
ESE	0.3	0.8	0.7	0.0	1.8
SE	0.5	1.1	0.3	1.0	2.9
SSE	1.1	1.8	1.6	2.8	7.3
S	1.1	2.8	3.1	3.3	10.2
SSW	2.1	8.5	8.5	3.3	22.3
SW	1.1	7.2	4.1	1.8	14.1
WSW	1.0	2.6	1.0	0.8	5.4
W	0.5	2.4	2.3	0.5	5.7
WNW	0.7	2.9	1.8	0.0	5.4
NW	0.5	3.1	1.5	0.7	5.7
NNW	0.3	2.6	1.8	0.5	5.2

TOTAL 11.2 42.0 30.9 15.9

Table 30

WIND ROSE, AUGUST 1979
Station #1, 33 feet
633 hours (85.1 percent)

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	0.5	1.1	1.3	0.3	3.2
NNE	0.8	1.3	0.9	0.5	3.5
NE	0.2	1.7	0.5	0.5	2.8
ENE	0.8	1.7	0.0	0.0	2.5
E	0.2	0.8	0.2	0.0	1.1
ESE	0.3	0.6	0.2	0.0	1.1
SE	0.2	1.9	0.8	0.9	3.8
SSE	0.6	1.7	2.2	3.3	7.9
S	1.6	3.5	6.3	5.7	17.1
SSW	1.3	8.7	11.1	3.5	24.5
SW	1.1	7.0	3.2	1.7	13.0
WSW	0.5	1.9	0.9	0.2	3.5
W	0.9	1.4	2.1	0.3	4.7
WNW	0.0	2.2	2.1	0.3	4.6
NW	0.5	2.4	0.6	0.3	3.8
NNW	0.3	1.1	1.3	0.3	3.0
TOTAL	9.6	39.0	33.5	17.9	

LEGEND

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- - - - -	3-7
- - - - -	7-12
=====	> 12

SCALE: 1:50

LEGEND

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- - - - -	3-7
- - - - -	7-12
=====	> 12

SCALE: 1:50

Table 31

WIND ROSE, SEPTEMBER 1979
Station #1, 33 feet
720 hours (100.0 percent)

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	0.1	1.5	1.7	0.1	3.4
NNE	0.6	2.2	1.7	1.0	5.4
NE	0.4	1.8	1.2	0.7	4.1
ENE	0.6	0.8	0.6	0.0	1.9
E	0.7	0.4	0.1	0.3	1.5
ESE	0.3	0.3	0.3	0.0	0.8
SE	0.0	0.4	0.4	0.0	0.8
SSE	0.1	1.5	1.4	1.1	4.1
S	1.2	2.6	5.1	4.3	13.2
SSW	0.8	7.4	15.0	5.1	28.3
SW	0.8	7.7	6.7	1.8	17.1
WSW	0.7	1.2	1.4	0.7	4.0
W	0.7	1.9	1.4	0.6	4.5
WNW	0.3	1.9	0.7	0.1	3.0
NW	0.3	2.8	1.1	0.1	4.3
NNW	0.1	1.8	1.1	0.4	3.4
TOTAL	7.7	36.3	39.8	16.2

LEGEND

SCALE: 1:50

Table 32
WIND ROSE, OCTOBER 1979
Station #1, 33 feet
738 hours (99.2 percent)

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	0.1	1.4	1.2	1.1	3.8
NNE	0.3	3.5	2.8	1.2	7.9
NE	0.8	3.7	0.9	0.1	5.6
ENE	1.6	0.5	0.4	0.1	2.7
E	0.7	0.7	0.0	0.0	1.4
ESE	0.4	0.5	0.1	0.0	1.1
SE	0.8	0.1	0.0	0.1	1.1
SSE	0.9	0.4	0.7	1.1	3.1
S	1.4	3.1	3.3	3.9	11.7
SSW	0.9	8.3	10.6	4.1	23.8
SW	1.8	8.5	3.5	0.8	14.6
WSW	0.1	2.7	0.5	0.5	3.9
W	0.4	2.6	1.2	0.4	4.6
WNW	0.4	2.0	1.2	0.0	3.7
NW	0.8	4.1	1.1	0.1	6.1
NNW	0.9	2.2	1.4	0.5	5.0

TOTAL 12.5 44.3 29.0 14.2

LEGEND

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SCALE: 1:50

Table 33

WIND ROSE, NOVEMBER 1979
Station #1, 33 feet
680 hours (94.4 percent)

	LE	3.0	GE	GE	
	3.0	7.0	7.0	12.0	TOTAL
N	1.5	3.4	0.9	0.1	5.9
NNE	1.3	1.1	0.7	0.1	4.3
NE	1.2	2.6	0.1	0.1	4.1
ENE	1.0	1.5	0.0	0.0	2.5
E	1.5	0.4	0.0	0.0	1.9
ESE	0.9	0.4	0.0	0.0	1.3
SE	1.6	0.6	0.1	0.1	2.5
SSE	1.0	2.1	0.9	0.6	4.6
S	2.1	3.4	5.0	1.2	11.6
SSW	2.4	13.8	10.6	0.7	27.5
SW	1.0	5.9	4.0	0.0	10.9
WSW	0.9	1.6	0.7	0.1	3.4
W	0.9	1.0	0.7	0.0	2.6
WNW	0.4	2.4	1.5	0.3	4.6
NW	0.9	4.6	1.2	0.6	7.2
NNW	0.7	2.9	1.3	0.1	5.1
TOTAL	19.3	48.7	27.8	4.3

LEGEND

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- - - - -	7-12
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SCALE: 1:50

Table 34
WIND ROSE, DECEMBER 1979
Station #1, 33 feet
744 hours (100.0 percent)

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	1.5	3.0	0.1	0.0	4.6
NNE	2.7	2.8	0.1	0.1	5.8
NE	3.2	3.1	0.3	0.1	6.7
ENE	1.6	1.3	0.1	0.0	3.1
E	2.4	0.4	0.0	0.0	2.8
ESE	2.4	0.8	0.0	0.0	3.2
SE	3.2	1.3	0.1	0.1	4.8
SSE	3.8	1.2	0.7	0.5	6.2
S	3.0	3.2	5.4	3.4	14.9
SSW	3.0	7.4	6.2	1.3	17.9
SW	1.9	6.7	1.6	0.3	10.5
WSW	1.3	2.4	0.3	0.0	4.0
W	1.2	1.3	0.4	0.0	3.0
WNW	1.3	2.4	0.8	0.1	4.7
NW	1.7	2.8	0.3	0.1	5.0
NNW	1.2	1.3	0.3	0.0	2.8

TOTAL 35.5 41.7 16.7 6.2

LEGEND

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- - - - -	3-7
- - - - -	7-12
=====	> 12

SCALE: 1:50

Table 35
WIND ROSE, AUGUST 1979
Station #2, 33 feet
608 hours (81.7 percent)

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	0.3	1.0	0.7	0.3	2.3
NNE	0.7	1.3	1.2	0.3	3.5
NE	0.7	1.3	0.7	3.0	5.7
ENE	0.7	0.5	1.5	0.0	2.6
E	0.8	1.0	0.2	0.0	2.0
ESE	1.8	0.7	0.8	0.2	3.5
SE	0.8	1.3	1.2	0.3	3.6
SSE	0.5	1.2	1.8	1.0	4.4
S	3.1	5.1	3.1	1.6	13.0
SSW	1.6	12.5	11.2	0.8	26.2
SW	1.6	9.4	3.9	1.0	16.0
WSW	1.8	2.1	1.2	0.7	5.8
W	1.0	2.0	0.8	0.2	3.9
WNW	0.2	2.6	1.5	0.0	4.3
NW	1.0	0.8	1.2	0.2	3.1
NNW	1.0	1.0	0.8	0.2	3.0
TOTAL	17.6	43.8	31.6	7.1

LEGEND

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- - - - -	3-7
- · - · -	7-12
=====	> 12

SCALE: 1:50

Table 36

WIND ROSE, SEPTEMBER 1979
Station #2, 33 feet
722 hours (100.0 percent)

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	0.3	2.2	1.8	0.6	4.9
NNE	0.4	1.4	1.4	0.4	3.6
NE	0.4	1.1	1.1	0.4	3.1
ENE	0.7	0.6	0.4	0.0	1.7
E	0.1	0.4	0.1	0.0	0.7
ESE	0.4	0.1	0.1	0.0	0.7
SE	0.7	0.6	0.3	0.1	1.7
SSE	0.6	1.4	0.7	0.7	3.3
S	0.7	3.2	2.4	0.1	6.4
SSW	1.7	11.0	14.7	1.4	28.8
SW	3.3	7.8	8.2	1.0	20.3
WSW	2.8	1.7	1.4	1.1	6.9
W	2.1	2.2	1.7	0.6	6.5
WNW	1.1	2.4	0.4	0.4	4.3
NW	0.6	1.4	1.1	0.0	3.1
NNW	0.7	2.4	1.0	0.1	4.2
TOTAL	16.5	39.7	36.8	6.9

LEGEND

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- - - - -	3-7
- - - - -	7-12
=====	> 12

SCALE: 1:50

Table 37
WIND ROSE, OCTOBER 1979
Station #2, 33 feet
744 hours (100.0 percent)

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	1.3	1.7	1.1	1.1	5.2
NNE	1.1	2.8	1.6	0.1	5.6
NE	0.9	1.6	0.7	0.0	3.2
ENE	0.8	0.7	0.3	0.1	1.9
E	1.1	1.2	0.1	0.0	2.4
ESE	0.5	0.0	0.0	0.0	0.5
SE	0.4	0.3	0.0	0.3	0.9
SSE	0.8	0.5	0.4	0.5	2.3
S	1.5	3.4	1.1	1.2	7.1
SSW	1.5	0.5	11.0	1.3	23.4
SW	3.2	7.9	5.1	0.7	16.9
WSW	2.7	0.8	0.0	4.2	7.7
W	1.6	3.1	1.1	0.1	5.9
WNW	2.3	3.2	1.7	0.4	7.7
NW	2.3	3.6	1.5	0.0	7.4
NNW	1.6	3.0	0.7	0.0	5.2

TOTAL 23.7 43.4 27.0 5.9

LEGEND

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- - - - -	3-7
- - - - -	7-12
=====	> 12

SCALE: 1:50

Table 38
WIND ROSE, NOVEMBER 1979
Station #2, 33 feet
720 hours (100.0 percent)

	LE	3.0	GE	GE	
	3.0	7.0	7.0	12.0	TOTAL
N	2.1	1.5	0.6	0.0	4.2
NNE	1.3	1.9	0.3	0.0	3.5
NE	0.8	3.3	0.4	0.0	4.6
ENE	0.3	1.0	0.0	0.0	1.3
E	0.8	0.3	0.0	0.0	1.1
ESE	0.3	0.0	0.0	0.0	0.3
SE	0.8	0.1	0.0	0.0	1.0
SSE	1.1	1.8	0.7	0.0	3.6
S	1.7	2.6	1.4	0.3	6.0
SSW	4.7	12.9	9.9	0.3	27.8
SW	5.8	6.4	2.1	0.0	14.3
WSW	4.4	2.1	0.6	0.4	7.5
W	4.4	2.4	1.1	0.0	7.9
WNW	1.5	3.1	1.1	0.3	6.0
NW	1.4	3.9	1.1	0.1	6.5
NNW	1.1	2.4	1.0	0.1	4.6
TOTAL	32.6	45.7	20.1	1.5

LEGEND

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- - - - -	3-7
- - - - -	7-12
=====	> 12

SCALE: 1:50

Table 39
WIND ROSE, DECEMBER 1979
Station #2, 33 feet
744 hours (100.0 percent)

	LE	3.0	GE	GE	
	3.0	7.0	7.0	12.0	TOTAL
N	3.0	1.3	0.1	0.0	4.4
NNE	1.1	2.4	0.1	0.0	3.6
NE	3.2	3.6	0.3	0.1	7.3
ENE	1.2	0.9	0.0	0.0	2.2
E	0.9	0.1	0.3	0.0	1.3
ESE	1.1	0.3	0.1	0.0	1.5
SE	1.2	0.3	0.0	0.0	1.5
SSE	2.8	0.8	0.4	0.1	4.2
S	4.4	3.4	1.7	0.8	10.3
SSW	5.6	6.7	4.7	0.8	17.9
SW	8.5	3.9	1.2	0.3	13.8
WSW	7.0	1.6	0.1	0.0	8.7
W	5.9	3.2	0.1	0.0	9.3
WNW	2.2	2.2	0.7	0.0	5.0
NW	2.6	1.5	0.4	0.0	4.4
NNW	2.0	2.3	0.1	0.1	4.6

TOTAL 52.7 34.5 10.5 2.3

LEGEND

SCALE: 1:50

Table 40
WIND ROSE, THIRD QUARTER 1979
(July - September)
Station #1, 100 feet

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	0.3	1.1	1.4	0.8	3.6
NNE	0.2	1.7	1.9	0.8	4.6
NE	0.3	1.5	1.8	1.0	4.6
ENE	0.5	1.1	0.6	0.2	2.4
E	0.3	0.8	0.2	0.2	1.5
ESE	0.6	0.9	1.0	0.2	2.7
SE	0.3	1.3	1.0	1.2	3.8
SSE	0.3	2.1	1.5	4.2	8.1
S	0.2	1.9	5.3	12.0	19.4
SSW	0.5	2.3	7.7	8.1	18.6
SW	0.2	2.0	3.9	2.7	8.8
WSW	0.5	1.4	1.9	0.8	4.6
W	0.3	1.5	1.2	0.9	3.9
WNW	0.2	1.8	1.6	0.9	4.5
NW	0.2	1.9	2.1	0.9	5.1
NNW	0.3	1.6	1.7	0.2	3.8
TOTAL	5.2	24.9	34.8	35.1

LEGEND

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=====	> 12

SCALE: 1:50

Table 41

WIND ROSE, FOURTH QUARTER 1979
(October - December)
Station #1, 100 feet

	LE	3.0	GE	GE	
	3.0	7.0	7.0	12.0	TOTAL
N	1.3	1.2	0.7	0.6	3.8
NNE	1.1	2.8	1.3	1.0	6.2
NE	0.7	3.7	1.1	0.4	5.9
ENE	1.9	1.9	0.5	0.1	4.4
E	1.4	1.5	0.1	0.1	3.1
ESE	1.1	1.3	0.2	0.0	2.6
SE	1.2	1.2	0.4	0.1	2.9
SSE	0.7	1.5	1.2	1.5	4.9
S	0.6	1.8	5.6	10.0	18.0
SSW	0.8	3.4	7.4	4.7	16.3
SW	0.7	2.9	2.3	0.6	6.5
WSW	0.8	2.0	0.9	0.6	4.3
W	0.6	1.7	1.2	0.5	4.0
WNW	0.5	2.2	2.1	0.8	5.6
NW	0.9	2.4	2.4	0.5	6.2
NNW	0.6	2.5	1.9	0.3	5.3

TOTAL 14.9 34.0 29.3 21.8

SCALE: 1:50

Table 42
WIND ROSE, SECOND HALF 1979
(July - December)

Station #1, 100 feet

	LE	3.0	GE	GE	
	3.0	7.0	7.0	12.0	TOTAL
N	0.9	1.2	1.0	0.6	3.7
NNE	0.6	2.3	1.6	0.9	5.4
NE	0.5	2.6	1.4	0.7	5.2
ENE	1.2	1.5	0.5	0.1	3.3
E	1.0	1.1	0.2	0.2	2.5
ESE	0.9	1.1	0.6	0.2	2.8
SE	0.8	1.2	0.7	0.6	3.3
SSE	0.6	1.8	0.4	2.8	6.6
S	0.7	1.8	5.4	10.9	18.8
SSW	0.6	2.9	7.5	6.3	17.3
SW	0.5	2.5	3.0	1.7	7.7
WSW	0.6	1.7	1.3	0.6	4.2
W	0.5	1.6	1.2	0.6	3.9
WNW	0.4	2.0	1.8	0.8	5.0
NW	0.6	2.1	2.3	0.6	5.6
NNW	0.5	2.1	1.8	0.3	4.7
TOTAL	10.9	29.5	31.7	27.9

LEGEND

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SCALE: 1:50

Table 43

WIND ROSE, THIRD QUARTER 1979
(July - September)
Station #1, 33 feet

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	0.4	1.5	1.5	0.4	3.8
NNE	0.5	1.9	1.3	0.7	4.4
NE	0.2	1.5	0.8	0.5	3.0
ENE	0.6	1.0	0.5	0.0	2.1
E	0.5	0.7	0.1	0.1	1.4
ESE	0.3	0.6	0.2	0.0	1.1
SE	0.1	1.1	0.5	0.6	2.3
SSE	0.6	1.7	1.7	2.3	6.3
S	1.3	2.9	4.9	4.4	13.5
SSW	1.4	8.2	11.7	4.0	25.3
SW	1.0	7.3	4.8	1.8	14.9
WSW	0.7	1.9	1.1	0.6	4.3
W	0.7	1.9	1.9	0.5	5.0
WNW	0.3	2.3	1.5	0.1	4.2
NW	0.4	2.7	1.1	0.4	4.6
NNW	0.2	1.8	1.4	0.4	3.8
TOTAL	9.2	39.0	35.0	16.8

LEGEND

SCALE: 1:50

Table 44
WIND ROSE, FOURTH QUARTER 1979
(October - December)
Station #1, 33 feet

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	1.0	2.5	0.7	0.4	4.6
NNE	1.4	2.8	1.2	0.5	5.9
NE	1.8	3.1	0.5	0.2	5.6
ENE	1.4	1.1	0.2	0.1	2.8
E	1.5	0.5	0.0	0.0	2.0
ESE	1.2	0.6	0.0	0.0	1.8
SE	1.9	0.7	0.1	0.1	2.8
SSE	1.9	1.2	0.7	0.7	4.5
S	2.1	3.2	4.5	2.9	12.7
SSW	2.1	9.7	9.1	2.1	23.0
SW	1.6	7.1	3.0	0.4	12.1
WSW	0.8	2.3	0.5	0.3	3.9
W	0.8	1.7	0.8	0.2	3.5
WNW	0.7	2.3	1.2	0.2	4.4
NW	1.2	3.8	0.8	0.3	6.1
NNW	1.0	2.1	1.0	0.2	4.3
TOTAL	22.4	44.7	24.3	8.5

LEGEND

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SCALE: 1:50

Table 45

WIND ROSE, SECOND HALF 1979
(July - December)
Station #1, 33 feet

	LE	3.0	GE	GE	
	3.0	7.0	7.0	12.0	TOTAL
N	0.7	2.1	1.1	0.4	4.3
NNE	1.0	2.4	1.3	0.6	5.3
NE	1.0	2.4	0.6	0.3	4.3
ENE	1.0	1.0	0.3	0.0	2.3
E	1.0	0.6	0.1	0.1	1.8
ESE	0.8	0.6	0.2	0.0	1.6
SE	1.1	0.9	0.3	0.4	2.7
SSE	1.3	1.4	1.2	1.5	5.4
S	1.7	3.1	4.7	3.6	13.1
SSW	1.7	9.0	10.3	3.0	24.0
SW	1.3	7.2	3.8	1.0	13.3
WSW	0.7	2.1	0.8	0.4	4.0
W	0.8	1.8	1.3	0.3	4.2
WNW	0.5	2.3	1.3	0.2	4.3
NW	0.8	3.3	0.9	0.3	5.3
NNW	0.6	2.0	1.2	0.3	4.1

TOTAL 16.0 42.2 29.4 12.4

LEGEND

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SCALE: 1:50

Table 46
 WIND ROSE, THIRD QUARTER 1979
 (July - September)
 Station #2, 33 feet

	NE	3.0	GE	GE	
	3.0	7.0	7.0	12.0	TOTAL
N	0.3	1.7	1.3	0.5	3.8
NNE	0.5	1.4	1.3	0.4	3.6
NE	0.5	1.2	0.9	0.4	3.0
ENE	0.7	0.5	0.9	0.0	2.1
N	0.5	0.7	0.2	0.0	1.4
ESE	1.0	0.4	0.5	0.0	1.9
SE	0.8	0.9	0.7	0.2	2.6
SSE	0.5	1.2	1.2	0.8	3.7
S	1.7	4.1	2.7	0.8	9.3
SSW	1.7	11.7	13.1	1.1	27.6
SW	2.6	8.5	6.3	1.0	18.4
WSW	2.3	1.9	1.3	0.9	6.4
W	1.6	2.1	1.3	0.4	5.4
WNW	0.7	2.5	0.9	0.2	4.3
NW	0.8	1.1	1.1	0.0	3.0
NNW	0.8	1.7	0.9	0.1	3.5
TOTAL	17.0	41.6	34.6	6.8

LEGEND

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- - - - -	3-7
- - - - -	7-12
=====	> 12

SCALE: 1:50

Table 47

WIND ROSE, FOURTH QUARTER 1979
(October - December)
Station #2, 33 feet

	LE	3.0	GE	GE	
	3.0	7.0	7.0	12.0	TOTAL
N	2.1	1.5	0.6	0.4	4.6
NNE	1.1	2.4	0.7	0.0	4.2
NE	1.7	2.9	0.5	0.0	5.1
ENE	0.8	0.9	0.1	0.0	1.8
E	1.0	0.5	0.1	0.0	1.6
ESE	0.6	0.1	0.0	0.0	0.7
SE	0.8	0.3	0.0	0.1	1.2
SSE	1.6	1.0	0.5	0.3	3.4
S	2.5	3.1	1.4	0.8	7.8
SSW	3.9	9.7	8.5	0.8	22.9
SW	5.8	6.1	2.8	0.3	15.0
WSW	4.7	1.5	0.5	0.1	6.8
W	4.0	2.9	0.8	0.0	7.7
WNW	2.0	2.8	1.2	0.3	6.3
NW	2.1	3.0	1.0	0.0	6.1
NNW	1.6	2.5	0.6	0.1	4.8
TOTAL	36.3	41.2	19.3	3.2

LEGEND

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- - - - -	3-7
- - - - -	7-12
=====	> 12

SCALE: 1:50

Table 48

WIND ROSE, SECOND HALF 1979
(July - December)
Station #2, 33 feet

	LE 3.0	3.0 7.0	GE 7.0	GE 12.0	TOTAL
N	1.4	1.6	0.8	0.4	4.2
NNE	0.9	2.0	0.9	0.2	4.0
NE	1.2	2.2	0.6	0.2	4.2
ENE	0.7	0.7	0.4	0.0	1.8
E	0.8	0.6	0.1	0.0	1.5
ESE	0.8	0.2	0.2	0.0	1.2
SE	0.8	0.5	0.3	0.1	1.7
SSE	1.2	1.1	0.8	0.5	3.6
S	2.3	3.5	1.9	0.8	8.5
SSW	3.1	10.4	10.2	0.9	24.6
SW	4.6	7.0	4.1	0.6	16.3
WSW	3.8	1.6	0.8	0.4	6.6
W	3.1	2.6	1.0	0.2	6.9
WNW	1.5	2.7	1.1	0.2	5.5
NW	1.6	2.3	1.1	0.1	5.1
NNW	1.3	2.2	0.7	0.1	4.3

TOTAL 29.1 41.2 25.0 4.7

LEGEND

————	< 3
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- . - . -	7-12
=====	> 12

SCALE: 1:50

Table 49

WIND ROSE, COMPOSITE, SECOND HALF 1979.
Stations #1 and #2, 33 feet

	LE	3.0	GE	GE	
	3.0	7.0	7.0	12.0	TOTAL
N	1.1	1.8	1.0	0.4	4.3
NNE	1.0	2.2	1.1	0.4	4.7
NE	1.1	2.3	0.6	0.2	4.2
ENE	0.9	0.9	0.4	0.0	2.2
E	0.9	0.6	0.1	0.0	1.6
ESE	0.8	0.4	0.2	0.0	1.4
SE	1.0	0.7	0.3	0.3	2.3
SSE	1.3	1.3	1.0	1.0	4.6
S	2.0	3.3	3.4	2.3	11.0
SSW	2.4	9.6	10.3	2.0	24.3
SW	2.8	7.1	4.0	0.8	14.7
WSW	2.2	1.9	0.8	0.4	5.3
W	1.8	2.2	1.1	0.2	5.3
WNW	1.0	2.5	1.2	0.1	4.8
NW	1.2	2.8	1.0	0.1	5.1
NNW	0.9	2.1	1.0	0.2	4.2
TOTAL	22.4	41.7	27.5	8.4

LEGEND

—————	< 3
- - - - -	3-7
- . - . -	7-12
=====	> 12

SCALE: 1:50

Table 50

WIND ROSE, COMPOSITE, YEAR 1979
Stations #1 and #2, 33 feet

	LE	3.0	GE	GE	
	3.0	7.0	7.0	12.0	TOTAL
N	0.7	1.0	0.5	0.2	2.4
NNE	0.6	1.3	0.6	0.2	2.7
NE	0.7	1.5	0.4	0.1	2.7
ENE	0.7	1.2	0.7	0.3	2.9
E	0.6	0.7	0.6	0.7	2.6
ESE	0.7	1.2	2.0	2.9	6.8
SE	0.9	4.2	3.0	1.5	9.6
SSE	0.9	3.3	1.2	1.2	6.6
S	1.4	2.8	3.4	3.5	11.1
SSW	1.3	5.7	5.6	6.3	18.9
SW	1.6	4.6	2.5	3.9	12.6
WSW	1.2	1.9	0.8	1.7	5.6
W	1.0	2.0	0.9	0.2	4.1
WNW	0.7	2.1	0.8	0.1	3.7
NW	0.9	3.3	0.7	0.1	5.0
NNW	0.5	1.5	0.6	0.1	2.7

TOTAL 14.4 38.3 24.3 23.0

APPENDIX B. FIGURES

1. Maximum and minimum temperature (F°), July - September, 1979.
2. Maximum and minimum temperature (F°), October - December, 1979.
3. Mean daily temperature (F°), July - September, 1979.
4. Mean daily temperature (F°), October - December, 1979.
5. Mean daily temperature (°C), Station A-04, 100 ft., July - September, 1979.
6. Mean daily temperature (°C), Station A-04, 33 ft., July - September, 1979.
7. Mean daily temperature (°C), Station A-04, 10 ft., July - September, 1979.
8. Mean daily temperature (°C), Station A-04, 100 ft., October - December, 1979.
9. Mean daily temperature (°C), Station A-04, 33 ft., October - December, 1979.
10. Mean daily temperature (°C), Station A-04, 10 ft., October - December, 1979.
11. Mean daily temperature (°C), Station A-07, 33 ft., July - September, 1979.
12. Mean daily temperature (°C), Station A-07, 33 ft., October - December, 1979.

FIGURE 1

MAXIMUM AND MINIMUM TEMPERATURE (°F), JULY - SEPTEMBER, 1979

FIGURE 2

MAXIMUM AND MINIMUM TEMPERATURE (°F); OCTOBER - DECEMBER, 1979

FIGURE 3

MEAN DAILY TEMPERATURE (°F), JULY - SEPTEMBER, 1979

FIGURE 4

MEAN DAILY TEMPERATURE ($^{\circ}\text{F}$), OCTOBER - DECEMBER, 1979

FIGURE 5

MEAN DAILY TEMPERATURE ($^{\circ}\text{C}$), STATION A-04
100 FT., JULY - SEPTEMBER, 1979

FIGURE 6

MEAN DAILY TEMPERATURE ($^{\circ}\text{C}$), STATION A-04
33 FT., JULY - SEPTEMBER, 1979

FIGURE 7

MEAN DAILY TEMPERATURE ($^{\circ}\text{C}$), STATION A-04
10 FT., JULY - SEPTEMBER, 1979

FIGURE 8

MEAN DAILY TEMPERATURE ($^{\circ}\text{C}$), STATION A-04
100 FT., OCTOBER - DECEMBER, 1979

FIGURE 9

MEAN DAILY TEMPERATURE ($^{\circ}\text{C}$), STATION A-04
33 FT., OCTOBER - DECEMBER, 1979

FIGURE 10

MEAN DAILY TEMPERATURE ($^{\circ}\text{C}$), STATION A-04
10 FT., OCTOBER - DECEMBER, 1979

FIGURE 11

MEAN DAILY TEMPERATURE ($^{\circ}\text{C}$), STATION A-07
33 FT., JULY - SEPTEMBER, 1979

FIGURE 12

MEAN DAILY TEMPERATURE (°C), STATION A-07
33 FT., OCTOBER - DECEMBER, 1979

APPENDIX C. MAPS

1. General Station Locations.
2. Meteorological Stations in Relationship to retort research areas.

MAP I
GENERALIZED STATION LOCATIONS

SECTION 2, T14S, R22E, UTAH COUNTY, UTAH

GEOKINETICS INC.

0 500' 1000' 2000'
SCALE

METEOROLOGICAL STATIONS IN RELATIONSHIP
TO RETORT RESEARCH AREAS
MAP #2

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NE SEC. CORNER, SEC. 2, T14S,
R22E, UINTAH COUNTY, UTAH

GEOKINETICS INC.

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