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HYDROELECTRIC PROJECT**

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**PROCESSED CLIMATIC DATA
OCTOBER 1982 - SEPTEMBER 1983**

**VOLUME III
KOSINA CREEK STATION
(No. 0640)**

R&M
R&M CONSULTANTS, INC.
ENGINEERS GEOLOGISTS PLANNERS SURVEYORS

UNDER CONTRACT TO

HARZA-EBASCO
SUSITNA JOINT VENTURE

FINAL REPORT

JUNE 1984
DOCUMENT No. 1090

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ALASKA POWER AUTHORITY

TK
1425
.58
A23
no. 1090

SUSITNA HYDROELECTRIC PROJECT

**PROCESSED CLIMATIC DATA
OCTOBER 1982 - SEPTEMBER 1983**

**VOLUME 3
KOSINA CREEK STATION (No. 0640)**

Report by
R&M Consultants, Inc.

Under Contract to
Harza-Ebasco Susitna Joint Venture

Prepared for
Alaska Power Authority

Final Report
June 1984

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NOTICE

**ANY QUESTIONS OR COMMENTS CONCERNING
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SUSITNA PROJECT OFFICE**

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

TASK 4 - HYDROLOGY

PROCESSED CLIMATIC DATA (1983)
OCTOBER 1982 - SEPTEMBER 1983

VOLUME INDEX

VOLUME 1: 0610 - SUSITNA GLACIER STATION
VOLUME 2: 0620 - DENALI STATION
VOLUME 3: 0640 - KOSINA CREEK STATION
VOLUME 4: 0650 - WATANA STATION
VOLUME 5: 0660 - DEVIL CANYON STATION
VOLUME 6: 0665 - SHERMAN STATION
VOLUME 7: 0686.5 - EKLUTNA LAKE STATION

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

PROCESSED CLIMATIC DATA - KOSINA CREEK STATION
OCTOBER 1982 - SEPTEMBER 1983

TABLE OF CONTENTS	PAGE
Volume Index	ii
List of Figures	iv
Acknowledgments	v
 I. BACKGROUND	 I-1
A. Purpose	I-1
B. History of Kosina Creek Station (No. 0640)	I-1
 II. ANNUAL DATA SUMMARIES - KOSINA CREEK STATION	 II-1
 III. REPORT PREPARATION	 III-1
A. Description of Symbols Used in Annual and Monthly Summaries	III-1
B. Data Computation Standards (Climate)	III-3
 IV. INTERPRETATION OF DATA - WATER YEAR 1983	 IV-1
A. General Notes on Interpreting Data	IV-1
B. Notes on Interpreting Kosina Creek Station Data	IV-6
 V. MONTHLY CLIMATIC DATA SUMMARIES Kosina Creek Station - Water Year 1983	 V-1

LIST OF FIGURES

Figure	Description	Page
I-1	Station Location Map	I-2

Acknowledgments

These climatic data were collected under contract to Acres American, Incorporated (through February 1983) and under contract to Harza-Ebasco Joint Venture (after February) for the Alaska Power Authority's Susitna Hydroelectric Feasibility Study. The data recorders are Model 5100 Weather Wizards manufactured by Meteorology Research, Incorporated (MRI), now part of Belfort Instrument Company. All sensors were supplied by MRI or were replacements obtained from MRI's suppliers. Field maintenance and data collection were performed by the hydrology staff of R&M Consultants, Incorporated. Data reduction and processing were performed by Lisa Fotherby, Len Story, Bob Butera, Carl Schoch, and Jeff Coffin, using computer programs developed by Mark Holmstrand. The computer hardware used was a Hewlett-Packard 9845B system. Review comments were provided by Khalid Jawed of Harza-Ebasco.

I. BACKGROUND

A. Purpose

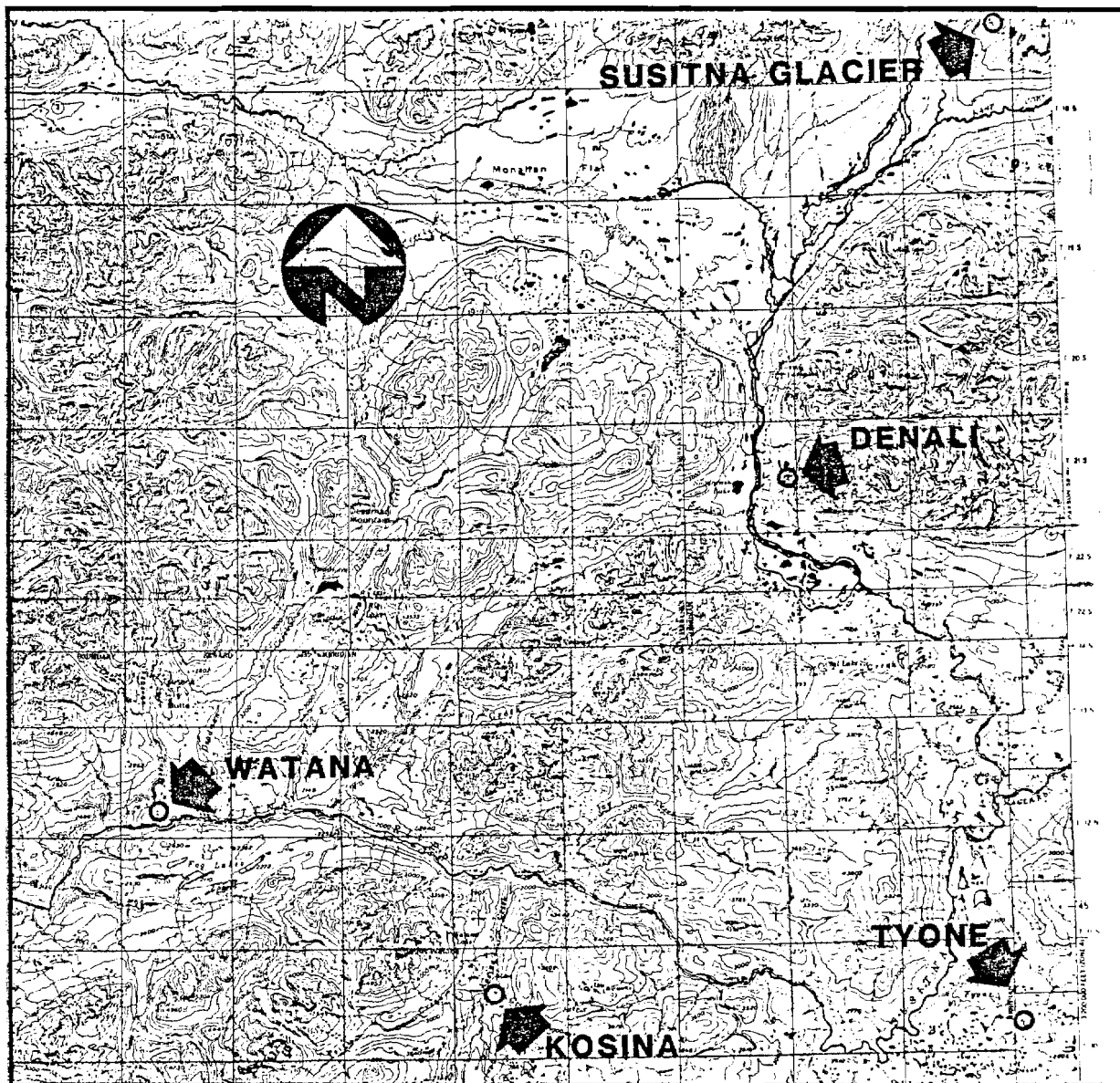
The Kosina climate station was installed to aid the Alaska Department of Fish and Game (ADF&G) with their caribou studies in the area and to satisfy hydrology data requirements for the area south of the Susitna River in the Talkeetna Mountain drainages.

B. History of Kosina Creek Station (No. 0640)

The station was installed on August 25, 1980. It sits on a bluff approximately $\frac{1}{2}$ mile upstream of where Tsisi and Gilbert Creeks join together to form Kosina Creek and approximately 6 miles upstream of the Kosina-Susitna confluence (see Figure I-1). The mouth of Kosina Creek is at Susitna River Mile 206.9. Kosina Creek station is at an elevation of 2,600 feet above mean sea level.

Previous data for this station are:

Report	Period Covered
1. Processed Climatic Data Volume 4 Kosina Creek Station March 1982 (R&M Consultants)	August 1980 - Sept. 1981
2. Processed Climatic Data Volume 4 Kosina Creek Station December 1982 (R&M Consultants)	Oct. 1981 - Sept. 1982



TALKEETNA MTS. AND HEALY QUADRANGLES APPROX. SCALE 1" = 11 MILES

CLIMATE STATIONS UPPER SUSITNA BASIN



Figure 1-1

PREPARED BY:

R&M
R&M CONSULTANTS, INC.
ENGINEERS GEOLOGISTS PLANNERS SURVEYORS

PREPARED FOR:

HARZA-EBASCO
SUSITNA JOINT VENTURE

II. ANNUAL DATA SUMMARIES

KOSINA CREEK STATION (No. 0640)

SUMMARY OF CLIMATE DATA RECORDED AT KOSINA STATION (NO. 640)
WATER YEAR 1983

Month	Temperature			Wind					P'val. Dir. (True)	Mean RH (%)	Mean DP (°C)	Precip. (mm)	Total Solar Energy (WH/m2)	Month
	Max. (°C)	Min. (°C)	Mean (°C)	Res. Dir. (°True)	Res. Speed (m/sec)	Avg. Speed (m/sec)	Max. Gust Dir. (°True)	Max. Gust Speed (m/sec)						
OCT	3.6	-24.7	-9.1	175M	0.8M	2.5M	317M	11.4M	SSW(M)	76	-12.5	M	43,353	OCT
NOV	-0.2	-27.7	-12.5	178	2.4	2.9	087	10.2	S	84	-14.5	M	17,810	NOV
DEC	1.6	-28.7	-12.8	161	2.7	3.6	101	16.5	S	87	-14.6	M	9,503	DEC
JAN	-4.4M	-35.6M	-16.9M	165M	2.5M	3.3M	103M	14.0M	S(M)	77M	-19.9M	M	14,470M	JAN
FEB	-0.9M	-25.8M	-13.0M	176M	2.6M	3.1M	135M	12.7M	S(M)	82M	-15.3M	M	33,884M	FEB
MAR	0.3M	-24.7M	-11.3M	182M	2.7M	3.0M	090M	10.2M	S(M)	77	-14.5	M	89,788M	MAR
APR	M	M	M	M	M	M	M	M	M	M	M	M	M	APR
MAY	M	M	M	M	M	M	M	M	M	M	M	M	M	MAY
JUN	M	M	M	M	M	M	M	M	M	M	M	M	M	JUN
JUL	M	M	M	M	M	M	M	M	M	M	M	M	M	JUL
AUG	M	M	M	M	M	M	M	M	M	M	M	M	M	AUG
SEP	M	M	M	M	M	M	M	M	M	M	M	M	M	SEP
Annual	M	M	M	M	M	M	M	M	M	M	M	M	M	Annual

Note: Refer to Section III of report for explanation of symbols used.

SUMMARY OF CLIMATE DATA RECORDED AT KOSINA STATION (NO. 640)
WATER YEAR 1982

Month	Temperature			Wind						Mean RH (%)	Mean DP (°C)	Precip. (mm)	Total Solar Energy (WH/m2)	Month
	Max. (°C)	Min. (°C)	Mean (°C)	Res. Dir. (°True)	Res. Speed (m/sec)	Avg. Speed (m/sec)	Max. Gust Dir. (°True)	Max. Gust Speed (m/sec)	P'val. Dir. (True)					
OCT	M	M	M	M	M	M	M	M	M	M	M	M	M	OCT
NOV	0.9M	-26.9M	-13.3M	173M	2.1M	2.5M	105M	15.9M	S(M)	48M	-22.0M	M	21,294M	NOV
DEC	M	M	M	M	M	M	M	M	M	M	M	M	M	DEC
JAN	-11.1M	-34.6M	-21.7M	161M	3.2M	3.5M	091M	15.2M	SSE(M)	M*	M*	M	22,743M	JAN
FEB	3.1M	-34.0M	-16.8M	176M	1.8M	3.2M	288M	15.9M	S(M)	M*	M*	M	44,299M	FEB
MAR	1.5	-26.0	-12.1	176	2.3	2.9	087	12.1	S	M*	M*	M	91,494	MAR
APR	7.6	-25.6	-6.9	182	1.8	2.5	272	13.3	S	M*	M*	6.6	150,232	APR
MAY	14.4	-11.2	1.5	201	0.9	2.3	067	10.2	SSW	M*	M*	18.6	190,796	MAY
JUN	24.5	-2.0	8.4	060	1.0	2.9	247	13.3	NNE	M*	M*	37.2	154,737	JUN
JUL	25.2	-1.0	10.4	021	1.3	2.6	247	12.1	NNE	M*	M*	60.4	140,600	JUL
AUG	19.5	-0.1	9.1	020	0.6	2.3	093	10.2	NNE	M*	M*	38.8	133,283	AUG
SEP	16.3M	-5.6M	4.4M	096M	1.2M	2.6M	091M	17.1M	E(M)	M*	M*	75.4M	64,718M	SEP
Annual	M	M	M	M	M	M	M	M	M	M	M	M	M	Annual

* Months when RH values were reported in the annual report but where subsequent review indicated the data were unusable.

Note: Refer to Section III of report for explanation of symbols used.

SUMMARY OF CLIMATE DATA RECORDED AT KOSINA STATION (NO. 640)
WATER YEAR 1981

Month	Temperature			Wind						Mean RH (%)	Mean DP (°C)	Precip. (mm)	Total Solar Energy (WH/m2)	Month
	Max. (°C)	Min. (°C)	Mean (°C)	Res. Dir. (°True)	Res. Speed (m/sec)	Avg. Speed (m/sec)	Max. Gust Dir. (°True)	Max. Gust Speed (m/sec)	P'val. Dir. (True)					
OCT	M	M	M	161M	1.1M	2.3M	098M	12.1M	SSW(M)	M*	M*	M	30,777M	OCT
NOV	M	M	M	185	1.7	2.7	313	11.4	S	83M	-11.9M	M	16,210	NOV
DEC	M	M	M	161M	3.1M	3.7M	102M	15.9M	SSE(M)	61M	-28.1M	M	17,173M	DEC
JAN	M	M	M	M	M	M	M	M	M	M	M	M	M	JAN
FEB	-2.4M	-29.9M	-12.1M	166M	2.0M	2.6M	093M	10.2M	S(M)	72M	-16.1M	M	75,686M	FEB
MAR	M	M	M	M	M	M	M	M	M	M	M	M	M	MAR
APR	M	M	M	M	M	M	M	M	M	M	M	M	M	APR
MAY	M	M	M	M	M	M	M	M	M	M	M	M	M	MAY
JUN	M	M	M	M	M	M	M	M	M	M	M	M	M	JUN
JUL	16.2M	-0.5M	9.7M	011M	1.4M	2.5M	107M	10.8M	NNE(M)	65M	2.6M	102.6M	110,508M	JUL
AUG	24.7	-5.0	9.0	067	1.4	2.8	092	12.1	N	56M	-0.5M	103.6	112,374	AUG
SEP	16.6	-14.1	2.9	110	0.5	2.4	323	13.3	SSW	46M	-8.5M	28.2	76,018	SEP
Annual	M	M	M	M	M	M	M	M	M	M	M	M	M	Annual

* Months when RH values were reported in the annual report but where subsequent review indicated the data were unusable.

Note: Refer to Section III of report for explanation of symbols used.

SUMMARY OF CLIMATE DATA RECORDED AT KOSINA STATION (NO. 640)
WATER YEAR 1980

Month	Temperature			Wind						Mean RH (%)	Mean DP (°C)	Precip. (mm)	Total Solar Energy (WH/m ²)	Month
	Max. (°C)	Min. (°C)	Mean (°C)	Res. Dir. (°True)	Res. Speed (m/sec)	Avg. Speed (m/sec)	Max. Gust Dir. (°True)	Max. Gust Speed (m/sec)	P'val. Dir. (True)					
OCT														OCT
NOV														NOV
DEC														DEC
JAN														JAN
FEB														FEB
MAR														MAR
APR														APR
MAY														MAY
JUN														JUN
JUL														JUL
AUG	M	M	M	M	M	M	M	M	M	M	M	M	M	AUG
SEP	11.1	-8.7	3.1	120	0.4	2.3	317	13.3	S	M*	M*	56.4	65,841	SEP
Annual	M	M	M	M	M	M	M	M	M	M	M	M	M	Annual

* Months when RH values were reported in the annual report but where subsequent review indicated the data were unusable.

Note: Refer to Section III of report for explanation of symbols used.

III. REPORT PREPARATION

A. DESCRIPTION OF SYMBOLS USED IN ANNUAL AND MONTHLY SUMMARIES

Annual Summary

Blank entries for monthly values indicate the station had not yet been installed at the site or that it had been removed prior to that month. Installation and removal dates are noted on the table as well.

M Insufficient or partial data. M follows average and/or total values if 1-9 daily values were missing data for all or part of the day. M appears alone for the month if 10 or more daily values were missing or contained missing data. Parentheses surround the M where other letters may cause confusion (i.e. in prevailing direction). M follows average and/or total values for the year if any month was missing data. M appears alone for the year if any month was missing enough data to require it to have an M alone or if three or more months were missing any data.

Monthly Summaries

Blank entries for three-hourly, daily, or monthly values (generally just for relative humidity or dewpoint) indicate the R.H. and D.P. data have been deleted for the period. For further explanation, refer to the section "Interpretation of Data."

M Insufficient or partial data. M follows average and/or total values if any readings for the period were missing and would have been required for determination of the table value. M follows the summary values for the month if 1-9 daily values had M's appended to them or had asterisks in their place. M appears alone in place of the monthly values if all daily values had blank entries or asterisks. Parentheses surround the M where other letters may cause confusion (i.e in prevailing direction).

**** Erroneous or missing data (may be from 2 to 6 asterisks, depending on number of digits possible in the value). Appears in place of the value if all readings required for determination of the table value were missing.

- A dash in the hourly precipitation table indicates the volume for that hour is not known, but the cumulative total of precipitation over the interval of consecutive dashed hours is included in the next hour where a value is reported. Similarly, a dash for precipitation in the monthly summary table indicates the volume for that day is not known, but the cumulative total over the interval of consecutive dashed days is included in the next day where a value is reported.

B. DATA COMPUTATION STANDARDS (CLIMATE)

Graphical Data Plot

Graphical representation of valid recorded and/or computed data.

Hourly Precipitation Summary Table

Hourly precipitation values are calculated as the difference between valid (current and preceding) consecutive hourly readings. When either of these hourly precipitation readings is invalid, no value is reported for the current hour.

Monthly Summary Table

1. Maximum daily and monthly temperatures are determined from all valid recorded temperatures.
2. Minimum daily and monthly temperatures are determined from all valid recorded temperatures.
3. Mean daily and monthly temperatures are determined from all valid recorded temperatures. The mean daily temperature is determined from the mean of the maximum and minimum temperatures. The mean monthly temperature is determined from the mean of all reported daily mean temperatures.
4. Resultant daily and monthly wind directions and speeds are summed vectorially from all valid readings.
5. Average daily and month wind speeds are determined for all valid readings (arithmetic mean).

6. Maximum daily and monthly gust speeds are determined from all valid readings. Associated directions are the resultant directions from the recording interval in which the peak interval gust was observed.
7. Prevailing daily and monthly directions are determined from all valid readings. The reported value is the most frequent direction observed.
8. Mean daily and monthly relative humidities are determined from all valid readings (arithmetic mean).
9. Mean daily and monthly dewpoint temperatures are determined from all valid readings (arithmetic mean). Dewpoints are omitted when the wind speed is less than 1 m/s, when the dewpoint calculates to a value greater than the recorded temperature, or when the dewpoint calculates to less than minus 47 degrees or more than 27 degrees Centigrade.
10. Daily and monthly precipitation values are determined from all valid readings.
11. Daily and monthly solar energy values are determined from all valid readings. Daily solar energy is determined by averaging the recorded solar intensity and converting the units. The monthly value is the sum of the daily values.

Three-Hour Summary Tables

1. The temperature reported is the temperature recorded at the specified time.

2. The dewpoint temperature reported is the dewpoint calculated at the specified time. Dewpoints are omitted when the wind speed is less than 1 m/s, when the dewpoint is calculated to a value greater than the recorded temperature, or when the dewpoint calculates to less than minus 47 degrees or more than 27 degrees centigrade, or when either the temperature or R.H. reading is invalid.
3. The relative humidity reported is the humidity recorded at the specified time.
4. The wind direction reported is the three-hour vectorial resultant sum of data recorded up to the specified time.
5. The wind speed reported is the three-hour vectorial resultant of data recorded up to the specified time.
6. The gust direction reported is the direction of the maximum gust recorded during the preceding three-hour period.
7. The gust reported is the maximum recorded during the three-hour period.
8. The radiation reported is the solar radiation intensity recorded at the specified time.

Wind Frequency Summary Table

1. Reported data are determined from all valid readings.

Wind Rose Graphical Plot

1. Plot is a graphical representation of the wind frequency summary table.

General Notes

1. The following are the data ranges assumed valid, based on reasonable expectations for the parameters in south-central Alaska; data outside these ranges are not used:

Time: 0000 through 2400 hours - at specified time intervals.

Temperature: -50 through +35 °C

Wind Speed: 0 through 99.9 meters per second and less than or equal to GUST

Direction: 0 through 360 degrees

Relative Humidity: 0 through 99 percent

Precipitation: 0 through 99.8 mm. Precipitation during recording interval (15 or 30 minutes) should not exceed 30 mm.

Solar: 0 through 150 milliwatts/cm²

Gust: 0 through 99.9 m/sec

Battery: 9 through 14.5 volts

2. Accuracy of the MRI (Meteorology Research, Inc.) sensors and processor are as follows:

Temperature: ±1°C

Wind Speed: ±0.5 meters per second

Wind Direction: ±1% of full scale

Relative Humidity: ±6%

Precipitation: $\pm 1\%$ up to 76.2 mm/hr, $\pm 5\%$ from 76.2 mm/hr to 254 mm/hr

Solar Radiation: $\pm 5 \text{ mw cm}^{-2}$

Tape Recorder Error Rate: 1 bit in 10^7

3. The following are the direction ranges used in the prevailing direction, wind frequency and wind rose summaries:

DIRECTION	COMPASS HEADING
North	350 through 11
North-Northeast	12 through 34
Northeast	35 through 56
East-Northeast	57 through 79
East	80 through 101
East-Southeast	102 through 124
Southeast	125 through 146
South-Southeast	147 through 169
South	170 through 191
South-Southwest	192 through 214
Southwest	215 through 236
West-Southwest	237 through 259
West	260 through 281
West-Northwest	282 through 304
Northwest	305 through 326
North-Northwest	327 through 349

IV. INTERPRETATION OF DATA

A. GENERAL - Notes on Interpreting Data

1. General

- a. Many of the sensors or the methods of measuring various parameters have peculiarities that affect how the data should be interpreted. The user is encouraged to become familiar with the methods of summation for each parameter and each table. These are described in the section "Data Computation Standards."
- b. The estimates of usable data for the current year in Table IV.1 at the end of this section were prepared by reviewing the published summary tables for each month. Precipitation estimates came from the hourly table; estimates for usable percentages of temperature, relative humidity, and solar radiation data were based on the 3-hour summaries; wind estimates came from comparison with the other parameters and a cursory review of the raw-data printout; and usable longwave radiation estimates were from the raw data.
- c. An enhancement that has been added to this year's series of reports is use of symbols to indicate where data are missing from parameter totals or averages in the summary tables. This is intended to assist the data user in evaluating the quality of the data.

Estimates that are below 90% are reported to the nearest 5%, estimates above 90% are to the nearest 1%. If the data are nearly all good, except for infrequent "bugs," this is

indicated by a "99 + " value. If the estimate is quite rough, this is denoted by a "±" after the value.

2. **Precipitation** - Precipitation data for most stations are reported for April through September only. The stations do not have heaters in their precipitation sensors (tipping buckets), so they are unable to record precipitation when the temperature is below freezing. The sensors are calibrated to tip for 0.2 mm of rainfall and not for snowfall. The sub-freezing temperatures may cause a loss or a delay of the recorded precipitation. Winds frequently blow snow away from or out of (or occasionally into) the collector, and snow collected in the bucket may not be melted and recorded until the next occurrence of warm weather, possibly days or weeks later. The months of October through March very often have sub-freezing temperatures on nearly every day of the month, so their precipitation records have been omitted. It should be noted that even in the months where precipitation data are reported (i.e. April through September), the occurrence of sub-freezing temperatures could affect the timing and the recorded amount of precipitation. The user should exercise caution and make note of the concurrent temperatures in interpreting the precipitation records.

An exception to the normal system of recording winter precipitation is at the Watana Station (No. 0650). That site is equipped with a Wyoming wind gage to eliminate the effects of the wind on the snow, and it also has an AC-powered heater on the precipitation bucket to melt snow that falls into it. The Watana data are thus published for the whole year. Details on the Watana data are included in "Notes on Interpreting Watana Station Data," in the Watana report.

3. **Relative Humidity and Dewpoint** - The relative humidity (R.H.) sensors used are printed circuit elements which sense changes in R.H. by changes in impedance. The sensors, manufactured by Phys-Chem Research Corporation, have chemically-treated surfaces which degrade with time, and are thus very difficult to keep in calibration. Many of the months throughout the year (and at all stations) therefore display significant variations in R.H. patterns. Though the data are generally of poor quality throughout the 1983 year, they are believed to be useful as indicators of the true humidity and have for that reason been left in the report.

When the calibration of the R.H. sensor is too high, readings near the top end (i.e. approaching 100%) may go "over the top" and be read as, say, 110% (if the calibration is high by 10 points). Having only two digits in which to record the R.H., the Weather Wizard will report this as "10," which will drastically affect the computation of instantaneous dewpoint, average R.H., and average dewpoint values. The graphical plot of R.H. will also be misleading, with periodic "spikes" down to very low values. Each plot may be interpreted, however, by mentally adjusting the entire plot downward an appropriate amount to keep the maximum values at 100%. The approximate amount of such adjustment for each month is noted in the following section, "Notes on Interpreting Kosina Creek Station Data". Because the R.H. and dewpoint values in the monthly summary tables are numerical averages, they are not easily interpreted and have been deleted for the days when RH was "overtopped". Values in the three-hour summaries have been retained since they are instantaneous readings; they should, however, be adjusted by the same amount indicated for the plots.

An additional consideration with respect to dewpoint is the fact that it is not computed when the reported wind speed falls below

1 m/sec, due to inadequate aspiration of the R.H. sensor. This typically causes elimination of at least one dewpoint value on nearly every day of data-collection. However, to avoid undue congestion in the table, daily values have not been individually noted as containing missing records; only the monthly average has been so designated. The same applies to R.H.

4. **Solar Radiation** - Daily and monthly solar radiation values are the cumulative total energy, computed from all valid readings for the period. Either the daily or monthly value can be significantly above or below the true energy value if there are large segments of missing readings (i.e. from the period of very low intensity at night or the period of very high intensity at mid-day). A check should be made, therefore, of the "Usable Data" table and of the graphical plot to get a feel for the frequency and timing of lost solar radiation data. Caution should be used when a significant amount of data is missing.

Another frequent concern in the processing of solar data is the presence of non-zero minimum values. Since the sensors have a stated accuracy of $\pm 1\%$ of the full-scale value of 140 mW/cm^2 , they often record a reading of 0 (during night) as 1 or even 2 mW/cm^2 . This also can bias the daily or monthly totals, making the computed energy much higher than the true solar energy. This type of error in the data is difficult to adjust automatically, but the user can compensate for it in his interpretation by reviewing the instantaneous radiation readings printed in the 3-hour summary tables. If the 3-hour values never drop below 1, even in the winter time, the sensor is very likely reading high. An error of $+1 \text{ mW/cm}^2$ on every reading will cause the computed daily total energy to be high by $240 \text{ watt-hr./cm}^2$. The user can adjust the numbers used accordingly.

5. **Wind Speed and Direction** - The wind frequency summary table in each month's report notes the number of wind observations used in preparing the table. Since data for this year have all been recorded at 15-minute intervals, there were 4 readings recorded per hour and 96 readings per day. This gives a maximum possible number of observations for each month as follows (dependent on the number of days in the month):

Month	Max. Possible # of Observations
October, December, January, March May, July, August (31 days)	2976
November, April, June, September (30 days)	2880
February (28 days)	2688
February in leap years (29 days)	2784

B. Notes on Interpreting KOSINA CREEK Station Data

1. **General** - The station was removed June 14 to use as a replacement for other stations and was not re-installed until November 1983, so the entire record for that period was lost.
2. **Precipitation** - Data are presented for April, despite the occurrence of sub-freezing temperatures on several days. This may give errors in the reporting of the timing or the amount of precipitation, and the user should be aware of this in interpreting and applying the data.
3. **Relative Humidity** - Data looked good for the year's period of record except in December. December's plot looks suspiciously flat and too high, but the data have been retained as indicators.
4. **Solar Radiation** - The minimum (nightly) value for solar radiation intensity is generally 1 mw/cm^2 throughout the year. As explained in the General Notes (Section IV.A), this gives daily totals that are too high by 240 watt-hours per day. Inspection should be made of the night-time values in the 3-hour tables (to see whether "1" appears in place of "0"), and then the daily and monthly totals should be adjusted accordingly.

TABLE IV.1
SUSITNA HYDROELECTRIC PROJECT - CLIMATE DATA PROCESSING
APPROXIMATE PERCENTAGES OF USABLE DATA

Station: Kosina

Water Year: 1983

	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>YEAR</u>
Temperature	100	100	100	99+	99	99+	30	70	45	0	0	0	62
Wind Speed	100	100	100	99+	99	99+	30	70	45	0	0	0	62
Wind Direction	99+	100	100	99+	99	100	30	70	45	0	0	0	62
Relative Humidity	100	100	100	99+	99	100	30	70	45	0	0	0	62
Precipitation	0	0	0	0	0	0	30	70	45	0	0	0	12(1)
Solar Radiation	100	100	100	99+	99	100	30	70	45	0	0	0	62
Peak Gust	100	100	100	99+	99	100	30	70	45	0	0	0	62
Longwave	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Unit not installed
@ site after 6/14/83

(1) Maximum possible recovery percentage is 50% for the year since precipitation bucket is not heated and measurement of sub-freezing precipitation (generally during Oct. - Mar.) is not possible.

V. MONTHLY CLIMATIC DATA SUMMARIES

KOSINA CREEK STATION, WATER YEAR 1983

No precipitation data for October

(See INTERPRETATION OF DATA).

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING October, 1982

DAY 01

DAY 02

DAY 03

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.							
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.						
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S						
0300	-3.3	-5.0	88	180	1.5	181	2.5	1	0300	-1.6	-3.2	89	188	.9	207	1.9	1	0300	-3.2	-4.6	90	189	1.3	206	2.5	1
0600	-2.2	-4.1	87	181	1.4	160	3.2	1	0600	-2.8	*****	91	191	.9	173	1.9	1	0600	-3.3	-4.6	91	194	1.5	184	3.2	1
0900	-.4	*****	83	241	.3	226	1.9	15	0900	.2	-2.2	84	199	1.0	202	2.5	32	0900	-1.1	*****	86	208	1.2	200	2.5	12
1200	3.2	-4.3	58	058	.4	013	3.2	23	1200	3.0	-2.5	67	033	.1	241	2.5	21	1200	-.3	-2.2	87	359	1.6	000	3.8	11
1500	2.8	-3.5	63	002	1.7	010	3.2	12	1500	1.6	-1.6	79	004	2.0	345	4.4	8	1500	.1	-2.9	80	059	2.9	062	5.1	6
1800	1.3	-3.3	71	004	1.3	018	2.5	1	1800	-.6	-2.2	89	348	2.0	337	3.8	1	1800	-1.8	-3.4	84	045	1.8	066	4.4	1
2100	0.0	*****	82	093	.1	059	1.9	1	2100	-2.2	-2.8	96	344	.5	353	1.9	1	2100	-1.9	-3.2	91	020	.6	345	2.5	1
2400	-.7	-2.6	87	233	.5	201	1.9	1	2400	-3.0	-4.0	93	146	1.8	138	3.2	1	2400	-3.0	*****	95	348	1.3	001	3.2	1

DAY 04

DAY 05

DAY 06

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.							
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.						
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S						
0300	-3.2	*****	93	209	.4	333	1.3	1	0300	-3.3	-5.6	84	108	3.0	102	5.7	1	0300	-5.0	*****	71	342	.8	000	1.9	1
0600	-4.1	-5.1	93	161	.8	156	1.9	1	0600	-3.4	-5.1	88	123	1.9	133	3.8	1	0600	-5.4	*****	77	337	.1	008	1.3	1
0900	-2.3	-4.6	84	150	1.3	153	2.5	11	0900	-1.2	-6.9	65	079	1.0	103	2.5	24	0900	-3.6	*****	70	231	.4	224	1.9	13
1200	-.1	-4.7	71	072	1.2	112	5.1	23	1200	-1.5	-7.2	65	078	2.5	065	4.4	13	1200	.6	-8.2	52	210	.4	210	3.2	36
1500	-1.0	-5.9	69	115	3.3	099	5.7	8	1500	-.8	-7.4	61	046	1.9	046	4.4	11	1500	1.5	-7.6	51	217	1.7	225	3.8	21
1800	-1.6	-6.0	72	148	2.0	162	4.4	1	1800	-3.0	-8.4	66	060	2.3	059	3.8	1	1800	-1.3	-6.8	66	167	1.7	173	3.8	1
2100	-2.2	-5.7	77	127	1.5	133	3.2	1	2100	-4.0	-9.0	68	051	.8	107	1.9	1	2100	-1.4	-6.9	66	120	2.5	086	5.7	1
2400	-2.7	-4.9	85	108	1.9	088	5.1	1	2400	-4.7	*****	73	086	.9	035	2.5	0	2400	-2.4	-6.7	72	104	5.1	106	8.9	1

DAY 07

DAY 08

DAY 09

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	-3.4	-7.0	76	098	7.4	085 10.8	1 0300	-5.1	-5.7	96	159	1.2	146 3.2	1 0300	-4.2	-5.2	93	192	.9	192 4.4
0600	-4.2	-6.5	84	101	6.4	099 9.5	0 0600	-4.6	-5.4	94	026	1.3	018 3.2	1 0600	-3.7	-4.7	93	193	2.6	205 4.4
0900	-4.0	-6.2	85	103	5.5	110 10.2	7 0900	-5.3	*****	79	042	1.9	039 4.4	8 0900	-1.7	-3.4	88	182	1.6	184 2.5
1200	-1.3	-4.8	77	091	4.3	085 7.6	25 1200	-3.9	-8.2	72	035	2.1	027 3.8	26 1200	-.8	-2.9	86	010	.7	356 2.5
1500	-1.1	-4.3	79	084	5.5	083 10.2	4 1500	-4.1	-7.9	75	338	.7	088 3.2	11 1500	-1.4	-2.4	93	001	2.0	001 3.2
1800	-1.9	*****	90	149	.5	107 5.7	1 1800	-5.1	-7.5	83	210M	1.1M	203M 2.5M	1 1800	-1.8	-2.4	96	019	2.4	030 3.8
2100	-2.5	-3.4	94	324	.5	035 3.8	0 2100	-5.0	-5.8	94	213	1.0	195 2.5	1 2100	-2.4	-3.1	95	021	1.9	019 3.2
2400	-3.5	*****	95	338	.5	026 3.2	1 2400	-3.7	-4.3	96	336	.9	343 3.2	1 2400	-2.9	-3.6	95	015	1.5	026 2.5

R & M CONSULTANTS, INC.

SUSTITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING October, 1982

DAY 10

DAY 11

DAY 12

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-3.7	-4.6	94	031	2.0	032	3.2	1	0300	-7.1	-8.5	90	193	1.0	211	2.5	1
0600	-4.5	****	95	046	1.5	034	3.2	1	0600	-7.6	-9.3	88	187	1.9	186	4.4	0
0900	-4.3	-6.8	83	028	3.2	034	6.3	9	0900	-6.7	-9.0	84	196	3.5	194	5.1	7
1200	-3.2	-7.9	70	026	4.3	022	7.6	54	1200	-5.8	-8.2	83	206	2.0	197	5.1	8
1500	-4.2	-7.5	78	030	3.7	026	5.7	7	1500	-3.4	-5.4	86	119	1.1	238	7.0	3
1800	-5.9	-8.2	84	025	2.3	019	4.4	0	1800	-4.2	-4.9	95	079	.4	096	5.7	1
2100	-6.9	-8.3	90	019	1.7	026	3.8	1	2100	-3.3	-4.6	91	197	1.0	175	4.4	1
2400	-7.0	-8.2	91	280	.3	014	1.9	1	2400	-8.4	-10.1	88	128	2.7	110	7.6	1

DAY 13

DAY 14

DAY 15

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-3.7	-4.8	92	027	3.0	025	8.3	1	0300	-8.3	-10.4	85	200	2.4	199	4.4	1
0600	-4.4	-6.4	86	337	3.4	317	7.6	1	0600	-9.4	-11.3	86	195	3.8	193	5.7	1
0900	-4.8	-7.7	80	323	5.9	317	11.4	12	0900	-9.4	-13.7	71	178	2.9	189	5.1	20
1200	-5.1	-8.8	75	332	4.8	316	10.2	20	1200	-6.8	-10.3	76	175	1.9	154	4.4	16
1500	-5.4	-9.1	75	359	2.5	344	6.3	10	1500	-6.2	-8.6	83	207	2.0	202	3.2	10
1800	-6.9	-9.3	83	047	1.7	038	4.4	0	1800	-6.9	-8.3	90	182	1.6	185	2.5	1
2100	-7.3	****	84	154	.3	119	2.5	0	2100	-8.6	-10.1	89	183	2.3	190	3.8	0
2400	-8.3	-10.0	88	201	1.0	204	2.5	1	2400	-8.4	-10.3	86	191	3.4	198	5.7	1

DAY 16

DAY 17

DAY 18

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-7.4	-11.1	75	228	2.0	223	3.8	1	0300	-5.3	-6.9	89	175	2.0	179	3.8	0
0600	-8.2	-11.4	78	242	1.2	247	4.4	1	0600	-4.2	-5.6	90	170	2.1	176	4.4	1
0900	-7.0	-9.9	80	183	2.2	154	5.7	8	0900	-3.6	-5.3	88	179	.7	164	1.9	7
1200	-6.2	-9.4	78	114	4.1	112	7.0	17	1200	-1.3	-4.1	81	350	1.6	354	3.2	19
1500	-6.4	-9.0	82	121	3.8	120	6.3	8	1500	-1.6	-4.8	79	006	.7	026	3.8	7
1800	-8.4	-10.2	87	162	2.9	124	5.1	0	1800	-2.8	-6.3	77	199	1.0	281	3.2	1
2100	-7.5	-9.6	85	177	2.8	177	4.4	1	2100	-5.0	-8.2	78	182	2.5	189	5.7	1
2400	-5.8	-8.4	82	175	3.4	179	6.3	1	2400	-7.5	-10.5	79	186	3.5	184	6.3	1

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING October, 1982

DAY 19

DAY 20

DAY 21

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-6.5	-8.8	84	163	.7	132	3.2	1	0300	-5.7	-10.8	67	340	4.7	332	9.5	1
0600	-6.2	-8.2	86	174	1.8	172	3.2	0	0600	-9.1	-13.2	72	199	1.4	188	3.8	0
0900	-4.1	-6.1	86	184	2.0	181	3.2	10	0900	-9.5	-13.9	70	187	2.5	186	4.4	11
1200	-2.6	-4.9	84	182	2.0	183	3.2	17	1200	-5.8	-13.2	56	287	1.4	321	7.0	28
1500	-3.0	*****	87	189	1.3	180	2.5	7	1500	-7.5	-13.9	60	323	6.0	325	9.5	5
1800	-3.5	-5.1	89	296	.4	237	2.5	1	1800	-9.3	-14.8	64	340	2.7	322	7.0	1
2100	-4.2	-7.3	79	134	.5	171	4.4	1	2100	-13.4	-17.5	71	144	1.9	195	4.4	1
2400	-5.5	-9.6	73	347	2.1	336	7.0	1	2400	-15.1	-18.7	74	162	3.1	146	5.1	1

DAY 22

DAY 23

DAY 24

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-17.7	-20.5	79	172	1.7	150	4.4	1	0300	-17.3	-21.6	69	118	2.7	084	8.3	1
0600	-14.8	-18.4	74	186	1.6	187	2.5	1	0600	-18.8	-21.8	77	206	2.8	208	5.1	1
0900	-11.3	*****	49	140	.4	150	1.9	16	0900	-18.6	-23.7	64	212	2.0	208	3.8	18
1200	-10.7	-18.4	53	218	.9	177	3.2	29	1200	-13.7	-19.6	61	201	2.2	200	3.8	26
1500	-11.6	-18.8	55	166	2.3	166	4.4	7	1500	-14.5	-20.2	62	198	2.5	195	3.8	7
1800	-15.4	-19.4	71	193	1.9	168	3.8	1	1800	-17.5	-21.2	73	180	2.5	176	5.1	1
2100	-15.1	-19.5	69	181	1.6	124	5.1	1	2100	-18.7	-22.3	73	186	1.9	203	5.1	1
2400	-15.3	-19.5	70	123	4.1	117	7.0	1	2400	-20.0	-23.6	73	183	2.9	185	5.1	1

DAY 25

DAY 26

DAY 27

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-16.5	-19.1	80	158	3.0	139	5.7	1	0300	-17.0	-24.1	54	295	5.5	279	10.2	1
0600	-16.3	-18.8	81	144	2.8	138	5.1	1	0600	-17.6	-24.1	57	302	5.2	313	10.2	1
0900	-14.9	-17.7	79	180	1.7	197	3.2	8	0900	-15.4	-23.1	52	300	3.7	288	8.3	14
1200	-11.8	-17.4	63	158	1.5	163	4.4	13	1200	-15.7	-23.6	51	307	5.8	325	9.5	23
1500	-12.4	-19.2	57	323	5.3	320	8.9	7	1500	-17.1	-24.9	51	307	5.4	301	8.3	6
1800	-14.2	-21.1	56	296	4.9	302	8.9	1	1800	-19.4	-26.0	56	305	5.4	304	8.3	1
2100	-16.0	-22.6	57	317	4.9	310	8.9	1	2100	-21.6	-27.4	59	226	3.8	247	7.0	1
2400	-16.3	-23.5	54	302	6.1	301	10.8	1	2400	-21.7	-27.7	58	192	3.5	193	6.3	1

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING October, 1982

DAY 28

DAY 29

DAY 30

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW
0300	-19.7	-24.1	68	107	4.9	098	7.6	1	0300	-13.6	-15.2	88	173	.4	159	2.5	1
0600	-20.0	-24.2	69	116	6.1	116	8.9	1	0600	-13.7	-15.1	89	357	.8	017	3.2	1
0900	-20.0	-23.4	74	112	5.4	096	8.9	4	0900	-16.0	-18.8	79	275	.4	226	3.8	11
1200	-19.1	-22.5	74	181	2.8	143	6.3	12	1200	-14.5	-18.7	70	195	1.4	180	3.2	23
1500	-17.7	-20.9	76	191	3.5	192	4.4	4	1500	-14.7	-18.8	71	193	2.4	204	3.8	8
1800	-15.6	-18.1	81	188	3.4	194	5.7	1	1800	-18.3	-20.3	84	187	2.5	210	4.4	0
2100	-14.8	-17.5	80	173	2.8	186	4.4	1	2100	-20.2	-22.6	81	195	2.4	182	4.4	0
2400	-13.3	-16.0	80	167	2.9	174	5.1	1	2400	-18.8	-21.0	83	200	2.7	187	4.4	1

DAY 31

HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD
DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW
0300 -21.7 -25.5 71 197 2.4 216 3.8 1					
0600 -21.1 -25.1 70 187 2.3 161 5.1 1					
0900 -18.8 -24.4 61 199 2.3 188 3.8 16					
1200 -17.2 -22.5 63 194 2.4 168 5.1 24					
1500 -18.5 -21.7 76 179 2.8 199 4.4 3					
1800 -19.2 -21.8 80 199 2.9 167 5.1 1					
2100 -19.8 -22.0 83 194 2.4 221 4.4 0					
2400 -18.5 -21.2 79 204 2.5 161 7.0 1					

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

MONTHLY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING October, 1982

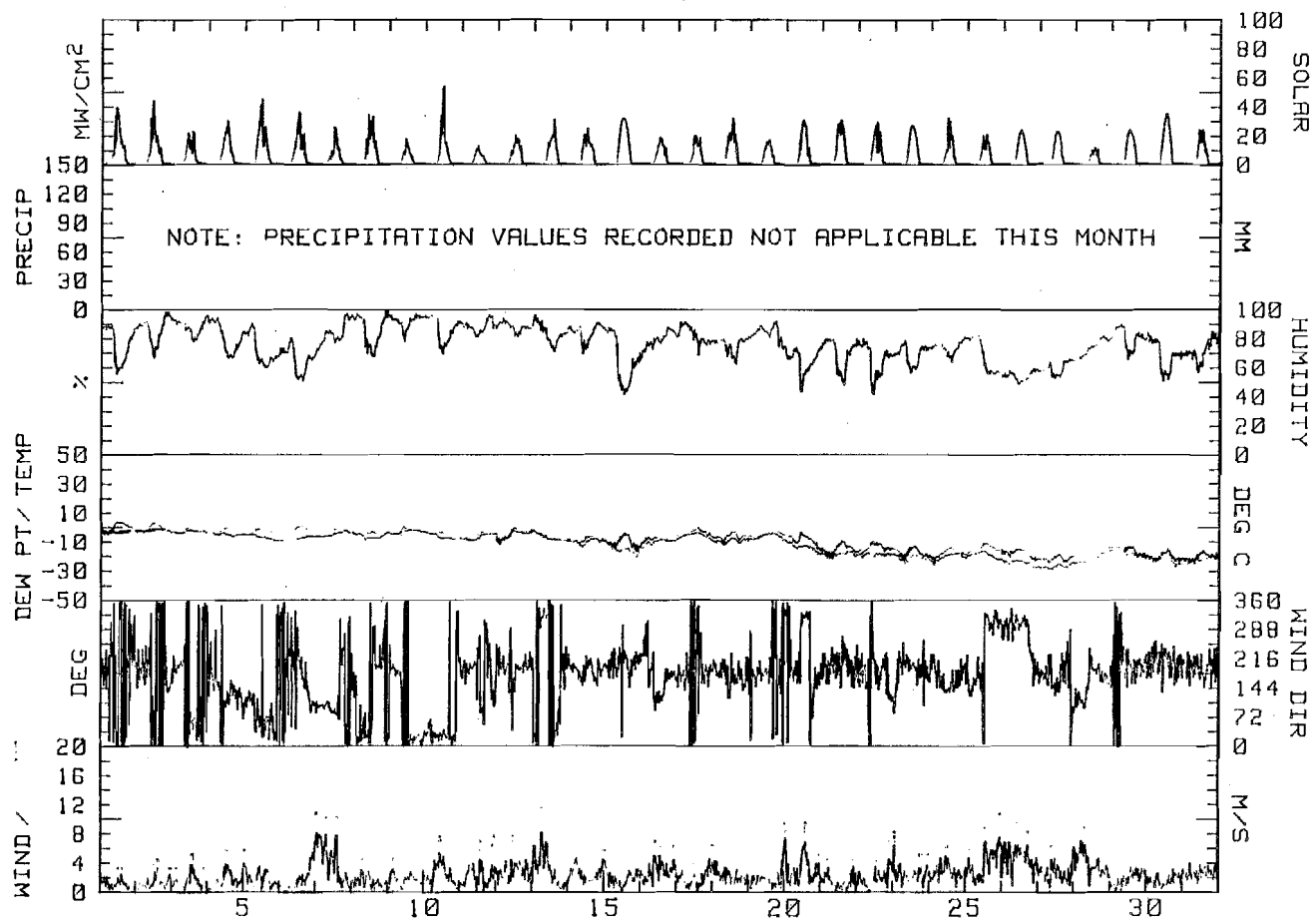
DAY	MAX. TEMP. DEG C	MIN. TEMP. DEG C	MEAN TEMP. DEG C	RES. WIND DIR. DEG	RES. WIND SPD. M/S	AVG. WIND SPD. M/S	MAX. GUST DIR. DEG	MAX. GUST SPD. M/S	P'VAL DIR.	MEAN RH %	MEAN DP DEG C	PRECIP MM	DAY'S SOLAR ENERGY DAY WH/SQm
1	3.6	-3.4	.1	234	.0	1.2	160	3.2	N	75	-3.9	****	1868 1
2	3.2	-3.1	.1	029	.0	1.4	345	4.4	N	86	-2.4	****	1738 2
3	.8	-3.6	-1.4	047	.4	1.6	062	5.1	SSW	88	-3.5	****	1168 3
4	0.0	-4.5	-2.3	126	1.4	1.7	099	5.7	SE	78	-5.4	****	1505 4
5	-4	-4.7	-2.6	077	1.5	1.9	102	5.7	ESE	72	-6.9	****	1988 5
6	1.5	-6.1	-2.3	133	1.0	1.7	106	8.9	SSW	62	-7.5	****	1675 6
7	-7	-4.3	-2.5	095	3.6	4.2	085	10.8	E	83	-5.3	****	1040 7
8	-2.5	-5.7	-4.1	031M	.5M	1.5M	039M	4.4M	NNE(M)	86	-6.5	****	1643 8
9	.5	-4.2	-1.9	021	.4	1.9	192	4.4	NNE	93	-3.5	****	823 9
10	-3.0	-7.2	-5.1	027	2.3	2.5	022	7.6	NNE	86	-6.7	****	1713 10
11	-2.7	-8.4	-5.6	175	1.4	2.2	110	7.6	SSW	88	-7.2	****	705 11
12	0.0	-11.1	-5.6	196	2.6	3.0	092	7.6	SSW	88	-5.7	****	1120 12
13	-1.9	-8.4	-5.2	344	2.2	3.2	317	11.4	NW	84	-7.6	****	1383 13
14	-6.1	-12.3	-9.2	189	2.5	2.6	193	5.7	SSW	84	-10.4	****	1408 14
15	-4.1	-16.2	-10.2	204	1.9	2.0	201	5.7	SSW	67	-16.0	****	2135 15
16	-5.8	-11.1	-8.5	161	2.2	3.0	112	7.0	S	80	-10.5	****	1183 16
17	.6	-7.5	-3.5	183	1.2	1.9	184	6.3	S	83	-6.5	****	1158 17
18	-2.5	-9.5	-6.0	178	2.2	2.4	204	6.3	S	76	-9.9	****	1553 18
19	-2.1	-6.7	-4.4	185	.7	1.7	336	7.0	S	84	-6.9	****	1033 19
20	-3.5	-16.0	-9.8	302	.9	3.3	332	9.5	S	65	-14.1	****	1553 20
21	-9.3	-19.4	-14.4	194	1.4	1.6	157	4.4	SSW	73	-19.2	****	1658 21
22	-9.4	-17.9	-13.7	165	1.6	2.0	117	7.0	SSE	67	-19.1	****	1415 22
23	-12.7	-21.9	-17.3	186	2.2	2.6	084	8.3	SSW	69	-21.5	****	1643 23
24	-13.5	-23.0	-18.3	166	2.6	2.9	140	6.3	SSE	74	-20.9	****	1248 24
25	-11.1	-18.5	-14.8	291	1.7	3.9	301	10.8	NW	67	-19.7	****	1098 25
26	-15.0	-22.9	-19.0	290	3.9	4.9	279	10.2	WNW	54	-25.0	****	1415 26
27	-18.5	-24.0	-21.3	164	2.3	2.8	084	8.3	S	60	-27.1	****	1330 27
28	-13.3	-20.3	-16.8	145	3.3	4.1	116	8.9	S	74	-21.4	****	703 28
29	-12.9	-21.4	-17.2	197	1.4	1.9	210	4.4	SSW	79	-19.0	****	1415 29
30	-14.6	-24.7	-19.7	205	1.6	1.8	225	4.4	SSW	69	-24.9	****	1895 30
31	-16.0	-24.6	-20.3	194	2.5	2.7	161	7.0	S	72	-23.9	****	1238 31
MONTH	3.6	-24.7	-9.1	175M	.8M	2.5M	317M	11.4M	SSW(M)	76	-12.5	****	43353

GUST VEL. AT MAX. GUST MINUS 2 INTERVALS 8.9
GUST VEL. AT MAX. GUST MINUS 1 INTERVAL 10.8
GUST VEL. AT MAX. GUST PLUS 1 INTERVAL 10.2
GUST VEL. AT MAX. GUST PLUS 2 INTERVALS 8.9

NOTE: RELATIVE HUMIDITY READINGS ARE UNRELIABLE WHEN WIND SPEEDS ARE LESS THAN ONE METER PER SECOND. SUCH READINGS HAVE NOT BEEN INCLUDED IN THE DAILY OR MONTHLY MEAN FOR RELATIVE HUMIDITY AND DEW POINT.

**** SEE NOTES AT THE BACK OF THIS REPORT ****

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
October, 1982



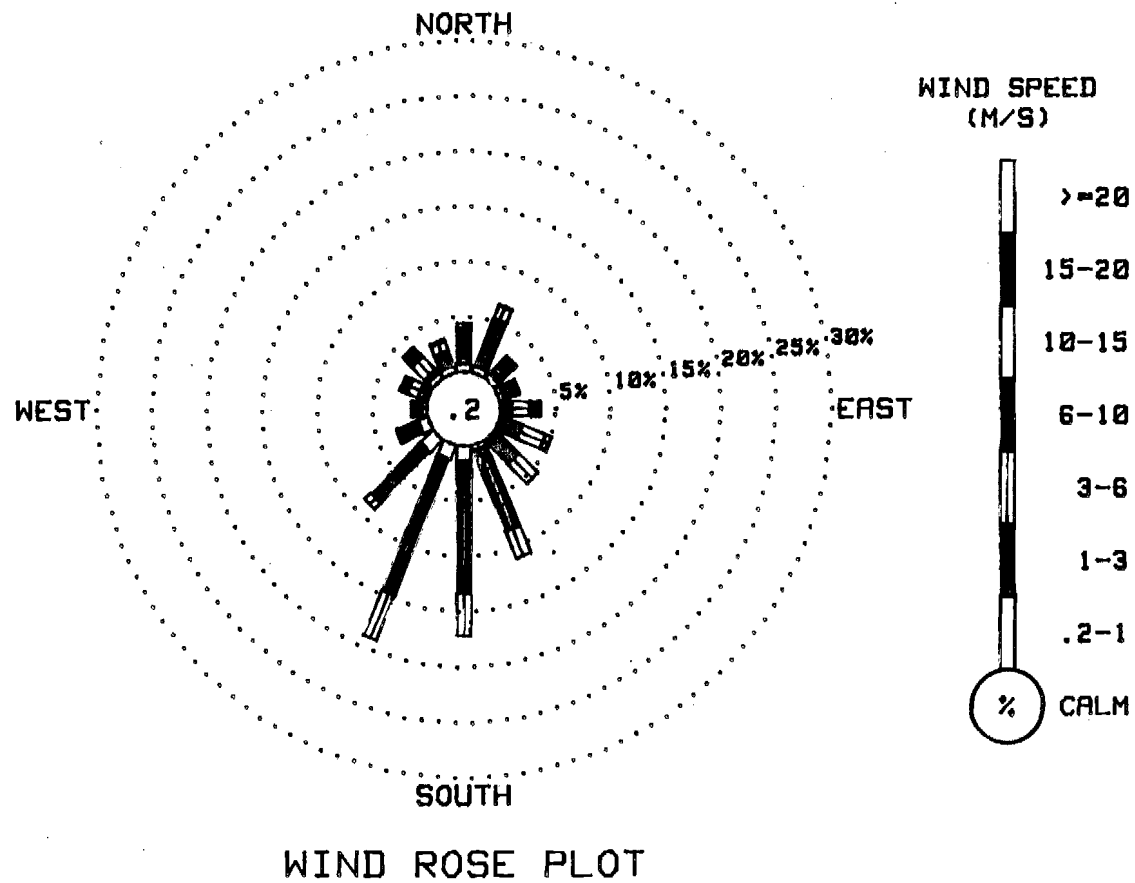
R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

WIND FREQUENCY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING October, 1982

DIRECTION	VELOCITY (M/S)							TOTAL
	0.2 TO 1.0	1.0 TO 3.0	3.0 TO 6.0	6.0 TO 10.0	10.0 TO 15.0	15.0 TO 20.0	20.0 OR GREATER	
N	.71	3.23	.44	0.00	0.00	0.00	0.00	4.37
NNE	.61	4.64	1.24	.10	0.00	0.00	0.00	6.59
NE	.50	1.88	.37	0.00	0.00	0.00	0.00	2.76
ENE	.47	.91	.44	.07	0.00	0.00	0.00	1.88
E	.20	.84	1.61	.94	0.00	0.00	0.00	3.60
ESE	.34	1.78	2.32	.61	0.00	0.00	0.00	5.05
SE	.30	2.72	2.46	0.00	0.00	0.00	0.00	5.48
SSE	.50	7.84	2.62	0.00	0.00	0.00	0.00	10.97
S	1.35	11.91	3.90	0.00	0.00	0.00	0.00	17.15
SSW	1.35	13.25	4.34	0.00	0.00	0.00	0.00	18.94
SW	1.58	6.39	.81	0.00	0.00	0.00	0.00	8.78
WSW	.94	1.92	.17	0.00	0.00	0.00	0.00	3.03
W	.44	.84	.10	.03	0.00	0.00	0.00	1.41
WNW	.44	.47	1.08	.71	0.00	0.00	0.00	2.69
NW	.61	.40	1.68	1.18	0.00	0.00	0.00	3.87
NNW	.67	1.38	.94	.20	0.00	0.00	0.00	3.20
CALM								.24
TOTAL	11.00	60.41	24.52	3.83	0.00	0.00	0.00	100.00

NOTE: ALL FREQUENCIES ARE EXPRESSED IN PERCENT
2973 VALID WIND OBSERVATIONS USED TO DEVELOP FREQUENCY SUMMARY

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
October, 1982



No precipitation data for November

(See INTERPRETATION OF DATA).

R & M CONSULTANTS, INC.

SUSTITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING November, 1982

DAY 01

DAY 02

DAY 03

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-17.7	-20.5	79	216	3.1	218	5.1	1	0300	-5.4	-6.8	90	191	2.6	197	3.8	1
0600	-15.8	-18.6	79	203	3.8	197	5.7	0	0600	-5.2	-6.0	94	190	1.5	197	3.2	1
0900	-13.1	-15.5	82	205	3.7	204	5.7	6	0900	-4.1	-5.1	93	160	1.6	177	3.2	3
1200	-9.3	-13.2	73	212	2.2	224	5.1	11	1200	-5.0	-7.9	80	120	.7	134	5.1	13
1500	-10.3	-12.5	84	207	3.8	188	6.3	2	1500	-7.0	-8.1	92	136	3.5	127	5.7	1
1800	-9.2	-11.1	86	210	3.0	211	5.7	0	1800	-7.5	-8.2	95	159	2.8	184	4.4	1
2100	-4.7	-7.8	79	129	.9	094	6.3	1	2100	-9.2	-10.7	89	176	2.5	183	5.7	1
2400	-5.8	-7.6	87	203	1.8	201	3.8	1	2400	-10.9	-12.8	86	183	4.0	188	5.7	1

DAY 04

DAY 05

DAY 06

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-5.2	-6.0	94	323	.2	240	3.8	1	0300	-7.3	-8.8	89	161	1.9	139	4.4	1
0600	-6.5	-7.5	93	094	5.5	087	10.2	0	0600	-9.4	-10.8	90	153	3.6	132	5.1	1
0900	-7.2	-8.0	94	102	6.3	101	9.5	3	0900	-9.2	-12.6	76	173	2.3	156	3.8	8
1200	-6.1	-7.8	88	129	4.6	128	7.0	7	1200	-8.8	-13.3	70	174	2.5	176	5.1	12
1500	-6.2	-7.5	91	143	2.5	133	5.7	2	1500	-11.6	-14.7	78	192	2.2	196	3.8	2
1800	-6.7	-7.8	92	190	1.8	191	3.2	1	1800	-14.6	-16.6	85	166	3.1	169	4.4	0
2100	-6.7	-8.0	91	182	1.8	194	2.5	1	2100	-14.7	-16.8	84	174	2.8	167	5.1	1
2400	-7.1	-8.1	93	186	1.4	150	2.5	0	2400	-14.6	-17.0	82	174	2.9	154	5.7	0

DAY 07

DAY 08

DAY 09

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-20.3	-22.9	80	193	2.2	192	4.4	0	0300	-18.4	-20.2	86	164	3.3	144	5.7	1
0600	-19.7	*****	82	188	1.8	158	4.4	1	0600	-16.8	-18.7	85	157	2.7	101	7.6	1
0900	-21.9	-25.9	70	178	2.2	171	5.1	11	0900	-16.4	-18.5	84	197	2.9	177	5.1	3
1200	-19.3	-23.4	70	187	2.6	174	5.7	25	1200	-15.3	-17.4	84	199	3.7	202	5.1	7
1500	-19.0	-21.7	79	166	2.8	145	5.7	2	1500	-14.0	-15.9	86	188	3.9	195	5.7	2
1800	-22.1	-24.2	83	191	2.9	189	5.1	1	1800	-13.3	-15.4	84	181	3.4	190	5.1	0
2100	-22.0	-24.0	84	205	2.7	171	4.4	1	2100	-11.9	-13.6	87	177	2.9	192	5.7	1
2400	-20.3	-22.4	83	207	3.0	212	5.7	1	2400	-9.8	-11.0	91	355	.8	221	7.0	1

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING November, 1982

DAY 10

DAY 11

DAY 12

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-16.1	-17.6	88	171	3.0	159	5.1	0	0300	-10.9	-13.2	83	187	2.7	181	4.4	1
0600	-15.5	-17.2	87	177	2.5	189	5.1	1	0600	-9.5	-11.6	85	186	3.5	192	5.7	1
0900	-14.7	-16.3	88	168	3.7	162	7.0	4	0900	-8.2	-9.9	88	176	3.0	186	4.4	3
1200	-11.7	-13.2	89	142	3.1	141	7.0	9	1200	-6.9	-9.3	83	175	1.7	180	3.8	8
1500	-12.0	-13.5	89	146	4.0	124	8.3	1	1500	-8.4	-10.3	86	183	1.9	158	3.8	2
1800	-12.5	-14.2	87	144	3.8	130	7.6	1	1800	-11.2	-12.8	88	176	2.3	143	5.1	1
2100	-12.6	-14.2	88	194	2.4	201	3.8	1	2100	-10.1	-11.6	89	182	2.6	151	4.4	1
2400	-11.8	-13.8	85	185	2.1	175	3.8	1	2400	-8.9	-10.0	92	148	3.3	136	7.0	1

DAY 13

DAY 14

DAY 15

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-7.6	-9.4	87	196	2.1	193	4.4	0	0300	-9.8	-10.9	92	190	1.7	214	3.2	1
0600	-10.9	-12.0	92	210	2.4	195	5.7	1	0600	-8.9	-10.7	87	200	2.0	203	3.8	1
0900	-6.6	-7.9	91	214	2.5	219	5.1	3	0900	-8.7	*****	90	190	1.8	194	3.8	3
1200	-6.7	-8.1	90	227	2.5	244	4.4	7	1200	-8.5	*****	88	207	1.3	219	3.2	15
1500	-6.3	-7.7	90	196	3.8	199	7.0	1	1500	-10.1	-11.0	93	211	1.2	203	3.2	1
1800	-5.8	-7.3	89	194	2.9	196	5.1	1	1800	-9.4	-10.6	91	194	1.8	142	4.4	0
2100	-5.8	-7.3	89	189	2.8	187	5.7	1	2100	-7.4	*****	87	196	1.1	194	3.2	1
2400	-7.5	-9.2	88	195	3.0	192	5.1	0	2400	-8.0	*****	92	224	.6	194	2.5	1

DAY 16

DAY 17

DAY 18

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-17.0	-18.5	88	206	1.8	220	3.2	0	0300	-19.0	-21.3	82	175	2.5	163	5.1	1
0600	-16.0	-17.7	87	192	2.1	199	4.4	0	0600	-20.5	-23.3	78	195	2.7	170	5.7	1
0900	-16.4	-18.8	82	197	2.3	182	3.8	8	0900	-22.5	-25.8	74	203	2.3	181	6.3	7
1200	-14.2	-17.5	76	195	1.9	182	3.8	18	1200	-19.4	-24.1	66	206	2.1	194	3.8	20
1500	-18.0	-20.6	80	212	2.1	214	4.4	2	1500	-20.8	-24.7	71	194	2.4	217	4.4	1
1800	-19.1	-21.1	84	202	2.0	206	4.4	1	1800	-19.2	-24.1	65	204	2.0	207	3.8	1
2100	-16.0	-18.0	85	189	2.1	185	4.4	1	2100	-21.0	-26.0	64	189	2.7	182	5.7	1
2400	-18.6	-20.5	85	200	2.2	182	4.4	1	2400	-21.4	-26.4	64	190	2.7	190	6.3	0

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING November, 1982

DAY 19

DAY 20

DAY 21

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-24.4	-28.9	66	169	4.2	151	8.3	1	0300	-20.4	-24.3	71	160	5.6	167	8.3	1
0600	-25.4	-29.7	67	168	4.5	164	7.6	1	0600	-18.5	-23.3	66	160	5.5	155	7.6	1
0900	-26.3	-30.4	68	156	5.0	140	8.3	4	0900	-17.7	-22.8	64	160	5.2	163	8.3	2
1200	-24.9	-30.0	62	182	3.4	146	7.6	14	1200	-16.0	-21.4	63	162	5.2	159	7.6	7
1500	-24.1	-28.0	70	160	4.3	140	7.6	1	1500	-17.0	-21.5	68	149	4.8	160	7.0	1
1800	-24.6	-28.5	70	170	4.3	137	8.3	1	1800	-16.0	-20.7	67	150	4.3	147	7.0	1
2100	-22.4	-26.5	69	169	4.2	139	7.6	1	2100	-18.1	-22.2	70	144	5.3	140	7.6	1
2400	-21.5	-25.5	70	174	4.3	174	7.0	1	2400	-14.3	-19.4	65	149	4.7	153	7.0	1

DAY 22

DAY 23

DAY 24

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-10.3	-13.4	78	169	3.1	146	5.7	1	0300	-8.3	-11.1	80	182	2.3	183	4.4	0
0600	-10.4	-13.2	80	170	3.1	171	5.7	0	0600	-6.9	-9.3	83	181	1.6	154	3.8	1
0900	-10.8	-13.4	81	159	3.8	162	6.3	2	0900	-7.5	-9.8	84	179	2.2	139	4.4	1
1200	-10.0	-12.9	79	157	4.3	165	6.3	6	1200	-6.7	-9.3	82	183	2.0	186	3.8	4
1500	-9.4	-12.4	79	160	3.5	154	5.7	1	1500	-6.3	-9.0	81	172	2.3	182	3.8	1
1800	-8.9	-11.9	79	163	2.8	155	5.7	1	1800	-5.8	-7.2	90	178	2.8	179	4.4	0
2100	-8.2	-11.0	80	166	2.7	177	3.8	1	2100	-5.8	-7.1	91	158	2.4	144	3.8	1
2400	-9.9	-12.4	82	155	3.1	142	5.1	1	2400	-5.1	-6.4	91	186	2.1	179	3.8	1

DAY 25

DAY 26

DAY 27

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-7.3	-8.4	92	191	4.4	189	6.3	0	0300	-13.8	-15.5	87	208	2.3	190	6.3	1
0600	-8.1	-8.6	96	187	4.0	198	7.0	1	0600	-16.9	-18.3	89	208	2.8	208	5.1	1
0900	-10.0	-10.8	94	158	3.3	148	5.7	2	0900	-15.2	-16.6	89	203	3.0	169	5.1	2
1200	-9.6	-10.7	92	215	2.0	210	3.8	6	1200	-12.8	-15.1	83	199	3.7	198	5.1	15
1500	-10.3	-11.4	92	175	3.6	152	6.3	1	1500	-13.4	-15.0	88	201	3.7	193	5.7	1
1800	-10.2	-11.1	93	164	3.9	154	7.0	1	1800	-13.4	-15.1	87	198	3.3	187	5.7	1
2100	-12.9	-13.8	93	157	5.0	146	8.3	1	2100	-11.5	-13.3	87	172	3.0	146	5.7	1
2400	-9.3	-11.4	85	171	3.0	145	8.9	0	2400	-10.1	-11.7	88	156	3.7	147	6.3	1

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING November, 1982

DAY 28

DAY 29

DAY 30

DAY 28										DAY 29										DAY 30									
HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.										
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD			
DEG C	DEG C	%	DEG	M/S	DEG	M/S	MW		DEG C	DEG C	%	DEG	M/S	DEG	M/S	MW		DEG C	DEG C	%	DEG	M/S	DEG	M/S	MW				
0300	-11.8	-13.1	90	180	2.5	148	5.1	1	0300	-9.2	-10.2	93	188	2.6	167	4.4	1	0300	-8.4	-9.6	91	178	2.2	136	6.3	0			
0600	-14.9	-16.2	90	209	2.2	222	4.4	1	0600	-10.7	-11.8	92	149	4.1	140	6.3	0	0600	-9.9	-10.8	93	189	2.1	141	7.0	1			
0900	-13.8	-15.1	90	199	2.1	179	5.1	2	0900	-10.1	-11.5	90	150	4.5	147	6.3	1	0900	-9.1	-10.2	92	176	1.7	175	3.8	1			
1200	-15.2	-17.0	86	184	2.5	168	5.7	4	1200	-11.0	-12.3	90	161	3.3	154	5.7	4	1200	-9.4	-10.3	93	160	.8	016	3.2	3			
1500	-10.5	-12.1	88	191	2.2	195	5.1	1	1500	-11.8	-13.3	89	163	4.0	144	6.3	1	1500	-10.4	-11.2	94	354	1.0	357	3.2	1			
1800	-10.3	-11.7	90	165	3.0	152	5.1	1	1800	-10.6	-11.7	92	166	3.1	145	6.3	1	1800	-11.7	-12.6	93	005	1.8	348	3.2	1			
2100	-10.1	-11.3	91	186	2.6	211	3.8	1	2100	-11.8	-12.9	92	181	2.8	195	5.1	1	2100	-12.6	-13.5	93	006	1.6	004	3.2	0			
2400	-10.6	-11.5	93	198	2.6	210	4.4	1	2400	-11.1	-12.2	92	196	2.9	208	4.4	1	2400	-12.7	*****	93	007	.8	032	2.5	1			

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

MONTHLY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING November, 1982

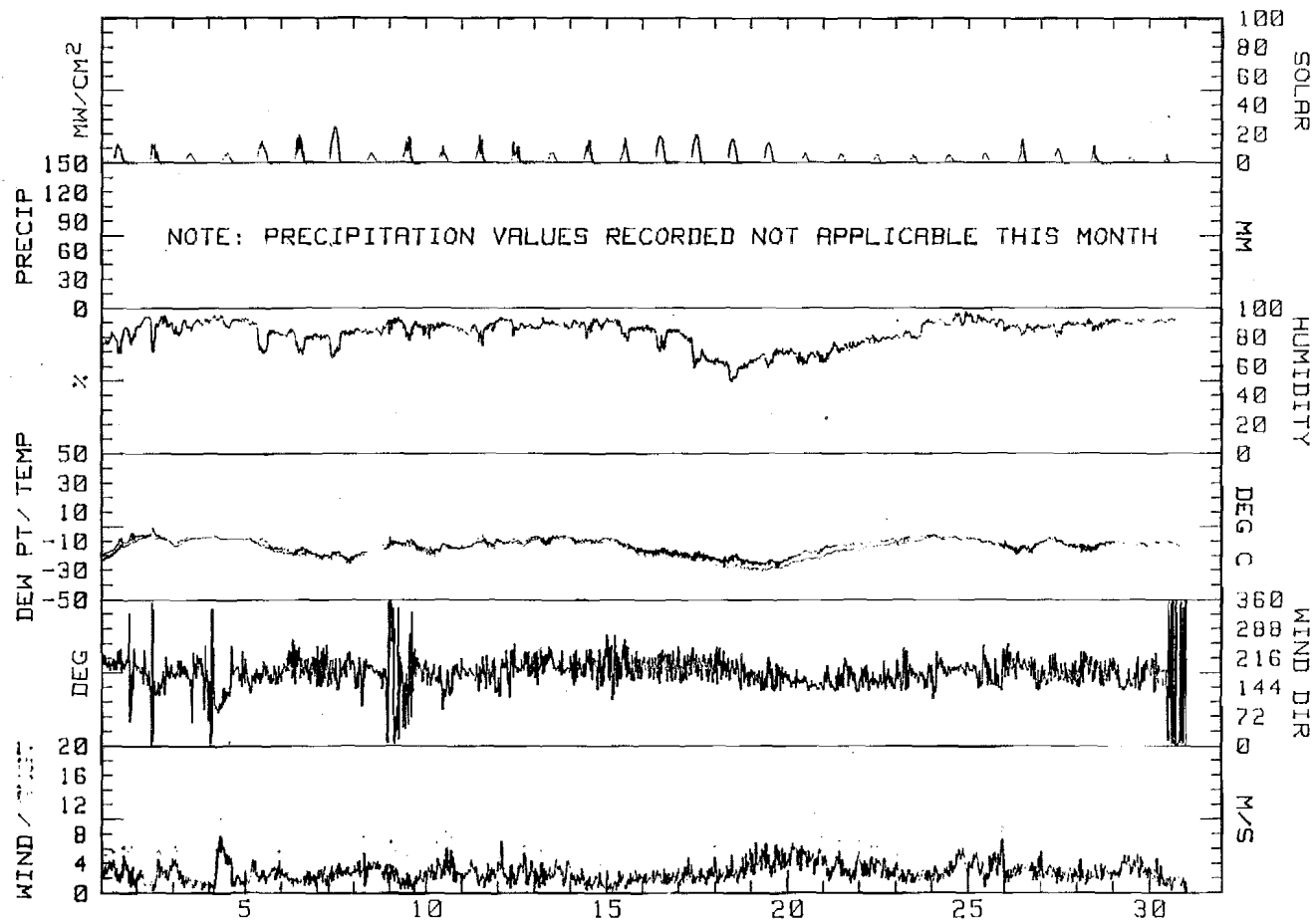
DAY	MAX. TEMP. DEG C	MIN. TEMP. DEG C	MEAN TEMP. DEG C	RES. WIND DIR. DEG	RES. WIND SPD. M/S	AVG. WIND SPD. M/S	MAX. GUST DIR. DEG	MAX. GUST SPD. M/S	P'VAL DIR.	MEAN RH %	MEAN DP DEG C	PRECIP MM	DAY'S SOLAR ENERGY WH/SDM	DAY
1	-3.9	-19.9	-11.9	205	2.7	3.0	188	6.3	SSW	80	-14.3	****	693	1
2	-2	-10.9	-5.6	168	2.2	2.6	127	5.7	S	90	-7.9	****	613	2
3	-5.1	-11.5	-8.3	181	1.6	1.8	172	6.3	S	89	-8.8	****	453	3
4	-5.1	-7.5	-6.3	125	2.5	3.2	087	10.2	E	92	-7.6	****	445	4
5	-6.4	-14.9	-10.7	170	2.6	2.7	154	5.7	S	83	-13.0	****	798	5
6	-13.2	-20.0	-16.6	198	1.9	2.0	179	4.4	SSW	80	-19.3	****	833	6
7	-16.1	-24.9	-20.5	190	2.4	2.7	174	5.7	SSW	79	-22.7	****	1293	7
8	-6.5	-19.6	-13.1	182	2.7	3.3	101	7.6	S	85	-16.9	****	455	8
9	-7.6	-16.1	-11.9	176	.6	2.0	013	5.7	SSW	88	-13.1	****	715	9
10	-10.9	-18.1	-14.5	163	2.9	3.3	124	8.3	S	88	-15.1	****	515	10
11	-5.2	-12.9	-9.1	176	2.6	2.7	136	7.0	S	86	-11.5	****	655	11
12	-6.0	-11.6	-8.8	191	2.6	2.9	133	8.9	SSW	89	-10.4	****	583	12
13	-5.0	-11.8	-8.4	202	2.7	2.8	199	7.0	SSW	89	-8.6	****	468	13
14	-6.7	-10.9	-8.8	199	1.4	1.6	142	4.4	SSW	89	-10.5	****	645	14
15	-7.3	-17.1	-12.2	196	1.5	1.7	164	4.4	S	87	-14.2	****	655	15
16	-14.2	-20.3	-17.3	199	2.1	2.2	199	4.4	SSW	83	-19.2	****	965	16
17	-16.7	-23.2	-20.0	194	2.4	2.5	181	6.3	SSW	71	-23.8	****	995	17
18	-18.3	-26.8	-22.6	185	2.9	3.1	170	7.6	SSW	60	-28.0	****	870	18
19	-21.5	-27.7	-24.6	168	4.2	4.5	151	8.3	S	67	-28.5	****	758	19
20	-14.3	-21.2	-17.8	155	5.0	5.1	167	8.3	SSE	67	-22.2	****	440	20
21	-10.7	-14.1	-12.4	162	3.2	3.4	139	7.0	SSE	73	-16.2	****	413	21
22	-7.5	-11.8	-9.7	162	3.3	3.4	162	6.3	SSE	79	-12.6	****	365	22
23	-5.1	-11.1	-8.1	177	2.2	2.3	183	4.4	S	84	-9.1	****	330	23
24	-5.0	-8.5	-6.8	190	3.5	3.6	192	7.0	SSW	92	-7.6	****	380	24
25	-6.9	-14.2	-10.6	175	3.5	3.8	145	8.9	SSE	92	-10.6	****	400	25
26	-9.7	-18.3	-14.0	192	3.0	3.3	190	6.3	SSW	87	-15.3	****	580	26
27	-6.4	-14.3	-10.4	179	2.6	2.7	158	5.1	S	88	-11.7	****	503	27
28	-9.0	-16.8	-12.9	188	2.4	2.6	168	5.7	SSW	90	-13.7	****	413	28
29	-8.9	-12.8	-10.9	166	3.3	3.5	140	6.3	SSE	92	-11.9	****	318	29
30	-7.8	-12.7	-10.3	165	.2	1.7	141	7.0	N	92	-11.4	****	268	30
MONTH	-2	-27.7	-12.5	178	2.4	2.9	087	10.2	S	84	-14.5	****	17810	

GUST VEL. AT MAX. GUST MINUS 2 INTERVALS 8.9
GUST VEL. AT MAX. GUST MINUS 1 INTERVAL 8.9
GUST VEL. AT MAX. GUST PLUS 1 INTERVAL 8.9
GUST VEL. AT MAX. GUST PLUS 2 INTERVALS 7.6

NOTE: RELATIVE HUMIDITY READINGS ARE UNRELIABLE WHEN WIND SPEEDS ARE LESS THAN ONE METER PER SECOND. SUCH READINGS HAVE NOT BEEN INCLUDED IN THE DAILY OR MONTHLY MEAN FOR RELATIVE HUMIDITY AND DEW POINT.

**** SEE NOTES AT THE BACK OF THIS REPORT ****

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
November, 1982



R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

WIND FREQUENCY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING November, 1982

DIRECTION	VELOCITY (M/S)							TOTAL
	0.2	1.0	3.0	6.0	10.0	15.0	20.0	
	TO 1.0	TO 3.0	TO 6.0	TO 10.0	TO 15.0	TO 20.0	OR GREATER	
N	.24	.87	.17	0.00	0.00	0.00	0.00	1.28
NNE	.17	.49	.07	0.00	0.00	0.00	0.00	.73
NE	.03	.21	0.00	0.00	0.00	0.00	0.00	.24
ENE	.07	.14	.03	0.00	0.00	0.00	0.00	.24
E	0.00	.28	.21	.49	0.00	0.00	0.00	.97
ESE	.17	.24	.42	.10	0.00	0.00	0.00	.94
SE	.14	1.28	5.45	.56	0.00	0.00	0.00	7.43
SSE	.28	7.43	11.56	.63	0.00	0.00	0.00	19.90
S	.35	18.30	10.87	0.00	0.00	0.00	0.00	29.51
SSW	.35	17.53	8.96	.07	0.00	0.00	0.00	26.91
SW	.35	7.57	.94	0.00	0.00	0.00	0.00	8.85
WSW	.31	1.56	.07	0.00	0.00	0.00	0.00	1.94
W	.17	.10	0.00	0.00	0.00	0.00	0.00	.28
WNW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	.07	0.00	0.00	0.00	0.00	0.00	.07
NNW	.17	.42	.07	0.00	0.00	0.00	0.00	.66
CALM								.03
TOTAL	2.81	56.49	38.82	1.84	0.00	0.00	0.00	100.00

NOTE: ALL FREQUENCIES ARE EXPRESSED IN PERCENT
2880 VALID WIND OBSERVATIONS USED TO DEVELOP FREQUENCY SUMMARY

WIND ROSE PLOT

No precipitation data for December

(See INTERPRETATION OF DATA).

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING December, 1982

DAY 01

DAY 02

DAY 03

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	TEMP.	POINT	RH	DIR.	SPD.	DIR.	TEMP.	POINT	RH	DIR.	SPD.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	DEG C	DEG C	%	DEG.	M/S
0300	-14.0	-15.0	92	002	1.3	006	3.2	1	0300	-19.7	-21.3	87	198	2.1	211	5.1	1
0600	-14.4	-15.4	92	009	1.7	015	3.8	1	0600	-20.2	-22.0	86	168	3.2	166	5.7	1
0900	-15.9	-17.1	91	011	.8	022	3.2	1	0900	-19.8	-21.4	87	177	2.4	165	5.1	1
1200	-16.0	-17.2	91	001	1.7	014	2.5	2	1200	-23.5	-25.3	85	156	3.9	144	5.7	4
1500	-16.8	-18.1	90	340	1.0	355	2.5	1	1500	-23.0	-24.7	86	168	3.7	163	6.3	1
1800	-22.1	-23.8	86	160	1.3	126	3.2	1	1800	-23.4	-25.2	85	174	3.3	169	7.0	1
2100	-25.1	-26.9	85	205	1.9	207	3.8	1	2100	-23.4	-25.2	85	183	3.1	165	6.3	1
2400	-22.4	-24.1	86	202	1.9	196	3.2	1	2400	-23.6	-25.5	84	193	2.3	194	4.4	1

DAY 04

DAY 05

DAY 06

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	DEG C	DEG C	%	DEG.	M/S
0300	-28.7	-30.9	81	194	2.6	153	5.1	1	0300	-17.5	-20.0	81	196	2.9	175	4.4	1
0600	-27.0	-29.1	82	177	3.4	160	5.7	0	0600	-17.0	-19.1	84	201	2.6	179	4.4	1
0900	-25.8	-28.0	82	173	3.7	169	5.7	1	0900	-15.1	-17.3	83	200	2.7	204	4.4	1
1200	-26.9	-29.6	78	182	3.2	173	5.1	8	1200	-14.3	-17.0	80	192	2.3	198	3.8	5
1500	-25.7	-28.0	81	175	3.4	170	5.7	1	1500	-14.2	-16.6	82	186	2.4	188	4.4	1
1800	-24.0	-26.3	81	182	3.0	168	5.7	1	1800	-11.9	-14.4	82	179	2.4	177	3.8	1
2100	-22.2	-24.7	80	173	3.6	156	6.3	1	2100	-11.0	-12.8	87	183	2.4	200	3.8	0
2400	-19.4	-22.1	79	197	2.8	189	5.1	1	2400	-10.5	-12.1	88	181	2.1	198	3.8	1

DAY 07

DAY 08

DAY 09

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	DEG C	DEG C	%	DEG.	M/S
0300	-7.7	-9.2	89	098	1.9	109	9.5	1	0300	-8.4	-9.2	94	191	2.1	177	3.8	1
0600	-7.4	-8.2	94	143	2.5	109	8.3	0	0600	-6.7	-7.8	92	206	2.0	208	3.8	1
0900	-4.6	-5.0	97	110	2.2	113	8.9	1	0900	-6.5	-7.8	91	182	2.0	191	3.8	1
1200	-2.9	-3.8	94	103	6.9	102	15.2	4	1200	-6.5	-8.2	88	172	2.1	152	3.8	4
1500	-2.6	-3.6	93	094	4.0	104	10.8	0	1500	-3.9	-5.5	89	219	2.3	229	4.4	1
1800	-2.9	-3.9	93	086	6.0	079	10.2	1	1800	-2.9	-4.8	87	119	3.6	120	9.5	1
2100	-5.0	-5.7	95	142	2.6	113	6.3	1	2100	-1.7	-3.6	87	107	1.5	122	10.2	1
2400	-6.6	-7.6	93	194	2.1	196	3.8	0	2400	-3.6	-4.2	96	358	1.3	014	7.6	1

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING December, 1982

DAY 10

DAY 11

DAY 12

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.							
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.						
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S						
0300	-16.8	-19.2	82	172	2.8	160	5.1	1	0300	-11.0	-13.2	84	177	1.1	223	3.8	1	0300	-9.7	-9.9	91	153	3.8	149	7.0	0
0600	-13.8	-16.8	78	184	2.5	167	5.1	1	0600	-9.9	-12.5	81	189	3.4	193	8.9	1	0600	-10.1	-12.0	86	091	5.5	112	12.7	0
0900	-14.9	-16.6	87	177	2.6	155	5.7	1	0900	-11.3	-13.5	84	121	4.3	107	9.5	1	0900	-10.4	-12.6	84	100	7.2	094	14.0	1
1200	-16.0	-17.0	92	172	3.1	157	5.1	5	1200	-11.2	-13.5	93	145	1.9	109	6.3	3	1200	-8.7	-11.7	79	145	2.6	117	8.3	4
1500	-13.1	-14.6	89	192	2.4	188	5.7	1	1500	-11.3	-13.3	85	121	5.8	125	8.3	1	1500	-8.3	-11.1	80	094	7.8	092	13.3	1
1800	-12.1	-14.4	83	209	2.4	213	6.3	1	1800	-13.2	-14.9	87	153	4.7	122	8.9	1	1800	-9.9	-11.7	87	066	2.9	095	11.4	1
2100	-9.4	-11.5	85	208	2.0	222	5.1	0	2100	-11.8	-13.8	85	192	4.4	205	6.3	0	2100	-12.9	-14.2	90	101	5.6	089	10.2	1
2400	-9.3	-11.8	82	208	2.2	235	5.7	1	2400	-11.2	-12.4	91	182	4.1	187	7.0	1	2400	-12.6	-13.9	90	204	3.6	200	5.7	1

DAY 13

DAY 14

DAY 15

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.							
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.						
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S						
0300	-5.5	-6.8	91	235	2.0	203	5.7	1	0300	-10.1	-11.2	92	194	3.4	192	6.3	1	0300	-5.6	-8.7	79	124	1.8	093	7.6	1
0600	-7.4	-8.1	95	307	1.1	323	10.2	1	0600	-10.8	-11.6	94	194	4.8	193	7.0	1	0600	-7.1	-9.5	83	121	3.4	111	7.0	1
0900	-8.4	-9.1	95	109	1.9	087	8.3	1	0900	-11.0	-12.1	92	182	4.0	185	5.7	1	0900	-6.8	-9.4	92	123	4.0	132	8.3	1
1200	-8.7	-9.5	94	208	2.0	132	5.1	3	1200	-8.3	-10.1	87	178	3.2	177	5.1	3	1200	-7.2	-9.2	86	195	1.7	136	5.7	4
1500	-9.6	-10.7	92	199	4.6	199	7.0	1	1500	-8.3	-10.1	87	165	3.1	145	5.1	1	1500	-10.2	-12.1	86	225	2.6	275	5.7	1
1800	-9.9	-11.0	92	199	5.0	202	7.0	0	1800	-7.6	-10.5	80	175	2.6	165	4.4	1	1800	-11.9	-13.5	88	208	2.3	200	4.4	1
2100	-8.7	-9.9	91	199	3.1	202	5.7	1	2100	-8.0	-12.5	70	161	3.6	153	6.3	1	2100	-12.8	-14.0	91	205	2.4	211	3.8	0
2400	-8.3	-9.4	92	197	3.8	205	5.7	1	2400	-5.1	-9.0	74	156	2.3	134	5.1	1	2400	-11.2	-12.1	93	185	2.8	189	5.1	1

DAY 16

DAY 17

DAY 18

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.							
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.						
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S						
0300	-5.9	-7.6	88	190	1.6	155	3.8	1	0300	-9.4	-11.0	88	196	2.6	166	5.1	1	0300	-12.4	-13.5	92	175	3.2	158	5.7	1
0600	-7.8	-9.3	89	116	2.3	083	10.8	1	0600	-10.5	-12.0	89	176	2.4	159	4.4	0	0600	-14.4	-15.4	92	202	2.1	207	3.8	0
0900	-7.9	-9.7	87	086	.1	084	11.4	1	0900	-11.0	-12.5	89	183	2.6	173	4.4	1	0900	-14.3	-15.2	93	208	2.0	181	3.8	1
1200	-12.1	-13.6	89	179	3.1	198	7.0	3	1200	-11.8	-12.9	92	177	3.3	200	5.1	4	1200	-15.1	-16.4	90	213	1.8	205	3.8	4
1500	-13.2	-14.5	90	201	3.7	208	5.7	1	1500	-8.3	-9.7	90	156	3.8	150	5.7	1	1500	-13.4	-14.6	91	210	2.0	216	3.2	1
1800	-12.1	-13.4	90	210	3.6	212	5.7	1	1800	-7.1	-8.3	91	159	2.7	159	4.4	1	1800	-11.9	-12.8	93	185	2.5	172	5.7	1
2100	-11.3	-12.6	90	205	3.2	202	4.4	1	2100	-10.4	-11.6	91	156	3.4	147	6.3	1	2100	-13.0	-13.8	94	174	3.9	169	6.3	1
2400	-9.4	-11.0	88	190	3.2	201	4.4	1	2400	-10.9	-11.8	93	140	5.3	154	7.6	0	2400	-14.6	-15.6	92	189	2.6	173	4.4	1

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING December, 1982

DAY 19

DAY 20

DAY 21

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	TEMP.	POINT	RH	DIR.	SPD.	DIR.	TEMP.	POINT	RH	DIR.	SPD.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	DEG C	DEG C	%	DEG.	M/S
0300	-17.3	-18.4	91	197	2.3	196	4.4	0	0300	-14.3	-16.6	83	202	2.3	202	4.4	0
0600	-17.7	-18.8	91	208	2.2	186	3.8	1	0600	-14.7	-17.5	79	203	3.0	184	6.3	1
0900	-19.5	-19.6	91	176	2.8	163	4.4	1	0900	-15.3	-17.8	81	173	4.0	150	7.0	1
1200	-16.2	-17.4	91	196	2.7	180	4.4	3	1200	-16.7	-19.9	76	164	3.7	159	5.7	7
1500	-15.1	-16.4	90	188	2.7	195	3.8	1	1500	-17.3	-19.4	84	180	3.2	161	5.7	1
1800	-16.3	-17.7	89	164	2.3	159	4.4	1	1800	-16.9	-18.7	86	177	2.8	166	5.7	1
2100	-13.5	-15.4	86	184	2.4	202	3.8	1	2100	-14.6	-16.2	88	183	2.5	149	5.1	1
2400	-13.7	-16.1	82	186	2.9	198	4.4	1	2400	-15.8	-17.5	87	184	3.2	177	5.1	1

DAY 22

DAY 23

DAY 24

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	DEG C	DEG C	%	DEG.	M/S
0300	-19.5	-21.4	85	168	3.8	156	7.6	1	0300	-24.2	-26.1	84	184	2.4	170	4.4	1
0600	-20.3	-22.2	85	164	5.4	162	8.3	1	0600	-24.0	-25.8	85	202	1.9	198	3.2	1
0900	-23.1	-24.9	85	160	6.4	153	9.5	1	0900	-22.5	-24.3	85	202	2.4	159	3.8	1
1200	-22.9	-24.7	85	154	6.6	139	9.5	7	1200	-19.4	-21.0	87	191	2.7	158	5.1	7
1500	-23.2	-25.2	84	164	4.7	152	7.6	1	1500	-21.6	-23.3	86	180	2.8	161	5.1	1
1800	-22.6	-24.4	85	170	3.7	151	6.3	1	1800	-22.3	-24.1	85	179	2.8	154	5.7	1
2100	-22.9	-24.9	84	176	3.8	160	6.3	1	2100	-21.9	-23.8	85	191	2.6	177	5.1	1
2400	-24.9	-26.8	84	186	3.1	168	5.1	1	2400	-17.0	-18.7	87	188	2.5	216	3.8	1

DAY 25

DAY 26

DAY 27

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	DEG C	DEG C	%	DEG.	M/S
0300	-15.8	-17.1	90	178	2.1	212	3.8	0	0300	-15.8	-17.1	90	155	4.0	152	7.0	1
0600	-16.3	-17.5	91	185	2.1	192	5.1	1	0600	-15.2	-16.8	88	188	2.9	183	4.4	1
0900	-17.3	-18.6	90	169	3.3	162	5.7	1	0900	-15.0	-16.3	90	170	1.9	157	5.7	1
1200	-17.4	-19.5	84	160	3.9	149	7.0	6	1200	-13.8	-15.2	89	199	3.1	202	5.1	2
1500	-19.6	-21.1	88	154	5.2	147	8.3	1	1500	-12.6	-14.5	86	194	3.6	197	5.1	1
1800	-17.4	-18.8	89	151	5.8	140	8.9	1	1800	-11.8	-13.1	90	197	2.9	199	4.4	1
2100	-15.6	-16.8	91	193	2.9	183	5.1	0	2100	-9.3	-11.1	87	193	4.4	194	5.7	1
2400	-15.8	-17.0	91	155	4.0	143	8.3	1	2400	-8.1	-9.8	88	204	3.8	195	5.7	1

R & M CONSULTANTS, INC.
SUSTIYNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING December, 1982

DAY 28

DAY 29

DAY 30

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	TEMP.	POINT	RH	DIR.	SPD.	DIR.	TEMP.	POINT	RH	DIR.	SPD.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	DEG C	DEG C	%	DEG.	M/S
0300	-2	-1.8	89	110	6.0	097 11.4	1 0300	.7	-1.4	86	098 6.0	090 12.7	0 0300	-7.4	-8.6	91	176 2.5
0600	.8	-1.3	86	114	6.4	112 11.4	1 0600	-1.3	-3.5	85	109 9.7	108 14.0	0 0600	-6.7	*****	90	196 1.8
0900	.4	-1.2	89	097	8.6	098 14.0	1 0900	-1.2	-3.3	86	111 7.4	115 12.7	1 0900	-6.8	-8.1	91	183 2.7
1200	.1	-1.4	90	098	8.9	091 13.3	3 1200	-1.3	-3.7	84	113 4.4	094 12.1	4 1200	-8.1	-10.8	81	196 3.5
1500	.6	-1.0	89	107	9.9	102 14.0	1 1500	.6	-2.8	85	095 4.7	091 10.8	1 1500	-10.1	-12.6	82	202 3.3
1800	.4	-1.1	90	105	10.4	098 15.2	1 1800	-1.3	-3.4	86	119 2.7	100 7.0	1 1800	-8.7	-11.7	79	191 3.6
2100	1.0	-.8	88	097	10.8	084 16.5	1 2100	-5.1	-6.5	90	195 2.6	205 5.7	1 2100	-10.1	-12.9	80	182 3.0
2400	1.3	-.6	87	109	4.9	098 11.4	1 2400	-6.3	-7.6	91	186 2.1	155 4.4	1 2400	-9.8	-11.6	87	168 2.5

DAY 31

HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.
DEG C	DEG C	%	DEG.	M/S	DEG.
0300	-10.9	-12.4	89	181	2.2
0600	-9.6	-11.4	87	185	2.1
0900	-12.0	-14.2	84	210	2.5
1200	-9.3	-12.4	78	185	3.6
1500	-12.0	-14.9	79	194	4.3
1800	-10.7	-13.0	83	177	3.3
2100	-9.3	-11.7	83	169	2.6
2400	-8.4	-11.1	81	174	2.4

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

MONTHLY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING December, 1982

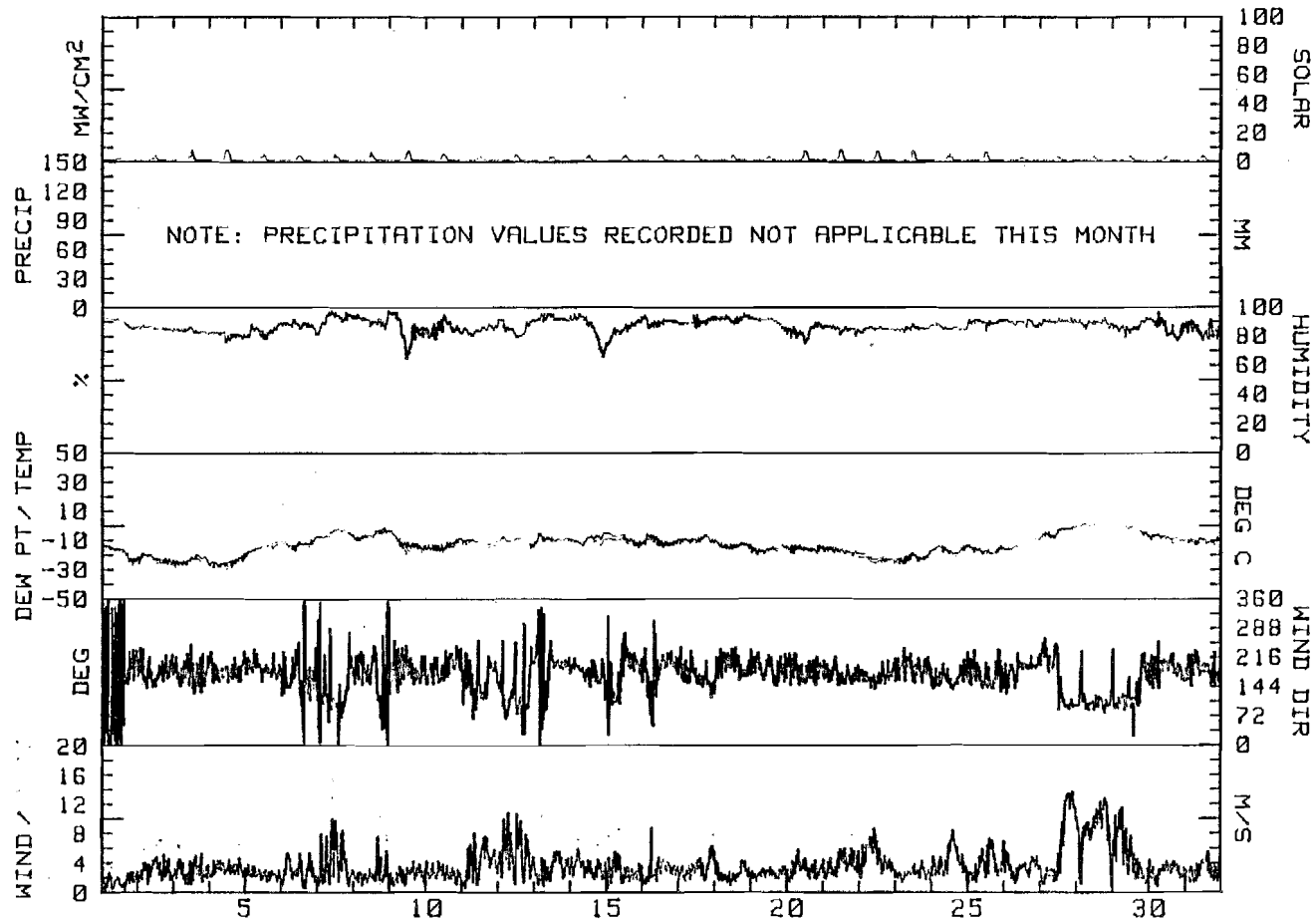
DAY	MAX. TEMP. DEG C	MIN. TEMP. DEG C	MEAN TEMP. DEG C	RES. WIND DIR. DEG	RES. WIND SPD. M/S	AVG. WIND SPD. M/S	MAX. GUST DIR. DEG	MAX. GUST SPD. M/S	P'VAL	MEAN RH %	MEAN DP DEG C	PRECIP MM	DAY'S SOLAR ENERGY WH/SGH	DAY
1	-12.6	-25.3	-19.0	329	.2	1.6	015	3.8	N	89	-19.5	****	255	1
2	-19.0	-26.4	-22.7	175	2.9	3.1	169	7.0	S	86	-24.2	****	270	2
3	-19.7	-27.0	-23.4	173	2.8	3.0	170	6.3	S	84	-25.5	****	333	3
4	-19.3	-28.7	-24.0	181	3.2	3.3	156	6.3	S	81	-27.3	****	455	4
5	-10.4	-20.9	-15.7	189	2.4	2.5	175	4.4	S	83	-16.8	****	325	5
6	-7.6	-17.3	-12.5	159	2.3	2.9	117	8.9	SSE	87	-14.0	****	305	6
7	-2.0	-8.5	-5.3	110	3.1	4.1	102	15.2	ESE	92	-6.2	****	291	7
8	-1.3	-9.5	-5.4	169	1.3	2.6	122	10.2	S	91	-7.1	****	325	8
9	-3.5	-16.8	-10.2	183	2.2	2.4	152	5.7	S	83	-14.0	****	380	9
10	-9.0	-17.0	-13.0	189	2.4	2.6	213	6.3	SSW	85	-15.5	****	333	10
11	-9.4	-13.2	-11.3	154	3.3	4.2	107	9.5	SSW	84	-13.4	****	245	11
12	-6.7	-14.7	-10.7	109	4.0	5.5	094	14.0	E	85	-12.0	****	303	12
13	-5.1	-11.8	-8.5	201	2.5	3.3	323	10.2	SSW	92	-9.8	****	275	13
14	-4.6	-13.2	-8.9	178	3.3	3.5	193	7.0	S	85	-10.9	****	275	14
15	-4.5	-15.0	-9.8	168	2.0	2.9	132	8.3	SSW	85	-10.9	****	278	15
16	-5.9	-14.3	-10.1	190	2.3	3.1	084	11.4	SSW	89	-12.0	****	295	16
17	-6.0	-12.2	-9.1	164	3.1	3.4	154	7.6	SSE	90	-10.8	****	283	17
18	-9.6	-15.8	-12.7	191	2.4	2.6	169	6.3	S	92	-14.4	****	288	18
19	-13.0	-19.0	-16.0	187	2.5	2.6	196	4.4	SSW	90	-17.5	****	255	19
20	-13.9	-19.2	-16.6	182	3.0	3.2	150	7.0	S	83	-18.2	****	378	20
21	-14.6	-20.4	-17.5	168	3.8	4.0	161	7.6	SSE	85	-19.2	****	400	21
22	-18.6	-25.8	-22.2	166	4.6	4.8	153	9.5	SSE	85	-24.0	****	378	22
23	-17.0	-26.2	-21.6	189	2.5	2.6	154	5.7	SSW	85	-23.8	****	380	23
24	-13.5	-19.6	-16.6	160	4.1	4.3	142	9.5	SSE	86	-18.5	****	290	24
25	-13.3	-19.6	-16.5	163	3.6	3.8	140	8.9	SSE	90	-18.2	****	353	25
26	-8.1	-17.0	-12.6	188	3.2	3.4	152	7.0	SSW	89	-14.8	****	233	26
27	-.4	-8.8	-4.6	113	4.8	6.4	101	16.5	E	90	-5.8	****	238	27
28	1.5	-1.6	-.1	103	9.2	8.5	084	16.5	E	89	-1.3	****	258	28
29	1.6	-7.4	-2.9	115	4.4	5.1	108	14.0	ESE	86	-3.7	****	275	29
30	-5.6	-10.8	-8.2	188	2.8	3.0	147	5.7	S	85	-10.3	****	268	30
31	-7.8	-12.9	-10.4	185	2.8	3.0	198	6.3	S	84	-12.6	****	290	31
MONTH	1.6	-28.7	-12.8	161	2.7	3.6	101	16.5	S	87	-14.6	****	9503	

GUST VEL. AT MAX. GUST MINUS 2 INTERVALS 15.9
GUST VEL. AT MAX. GUST MINUS 1 INTERVAL 14.6
GUST VEL. AT MAX. GUST PLUS 1 INTERVAL 15.9
GUST VEL. AT MAX. GUST PLUS 2 INTERVALS 15.9

NOTE: RELATIVE HUMIDITY READINGS ARE UNRELIABLE WHEN WIND SPEEDS ARE LESS THAN ONE METER PER SECOND. SUCH READINGS HAVE NOT BEEN INCLUDED IN THE DAILY OR MONTHLY MEAN FOR RELATIVE HUMIDITY AND DEW POINT.

**** SEE NOTES AT THE BACK OF THIS REPORT ****

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
December, 1982



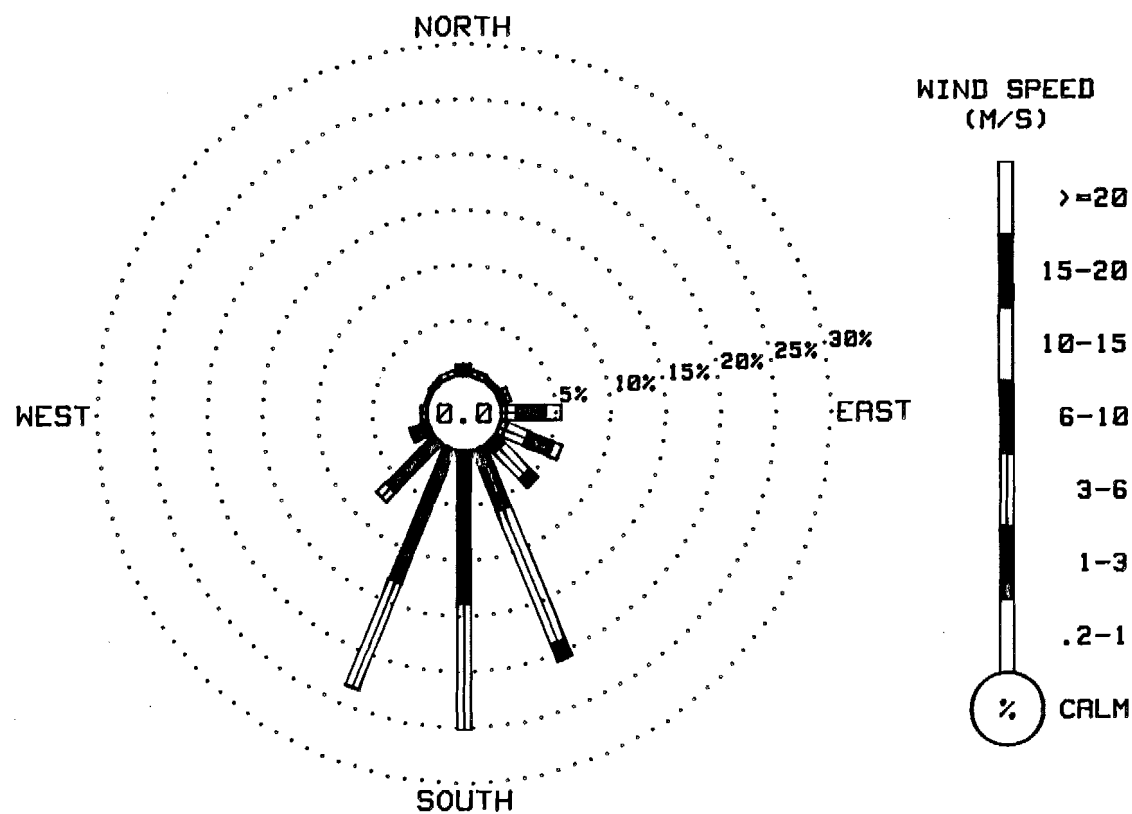
R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

WIND FREQUENCY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING December, 1982

DIRECTION	VELOCITY (M/S)							TOTAL
	0.2 TO 1.0	1.0 TO 3.0	3.0 TO 6.0	6.0 TO 10.0	10.0 TO 15.0	15.0 TO 20.0	20.0 OR GREATER	
N	.10	.81	.13	0.00	0.00	0.00	0.00	1.04
NNE	.03	.47	.10	0.00	0.00	0.00	0.00	.60
NE	.13	.24	.07	0.00	0.00	0.00	0.00	.44
ENE	.10	.30	.20	.40	0.00	0.00	0.00	1.01
E	0.00	.47	.94	2.59	1.44	0.00	0.00	5.44
ESE	.03	.60	2.12	2.39	.91	0.00	0.00	6.05
SE	.03	1.08	3.36	1.04	0.00	0.00	0.00	5.51
SSE	.10	5.91	12.94	1.65	0.00	0.00	0.00	20.60
S	.03	13.78	11.29	0.00	0.00	0.00	0.00	25.10
SSW	0.00	12.97	10.28	.03	0.00	0.00	0.00	23.29
SW	.07	6.05	1.18	0.00	0.00	0.00	0.00	7.29
WSW	.13	1.58	.03	0.00	0.00	0.00	0.00	1.75
W	.07	.47	.03	0.00	0.00	0.00	0.00	.57
WNW	.03	.20	.03	0.00	0.00	0.00	0.00	.27
NW	.10	.30	.07	0.00	0.00	0.00	0.00	.47
NNW	.07	.50	0.00	0.00	0.00	0.00	0.00	.57
CALM								0.00
TOTAL	1.04	45.73	42.78	8.10	2.35	0.00	0.00	100.00

NOTE: ALL FREQUENCIES ARE EXPRESSED IN PERCENT
2976 VALID WIND OBSERVATIONS USED TO DEVELOP FREQUENCY SUMMARY

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
December, 1982



No precipitation data for January

(See INTERPRETATION OF DATA).

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING January, 1983

DAY 01

DAY 02

DAY 03

HOURLY	DEW	WIND	WIND	GUST	MAX.	HOURLY	DEW	WIND	WIND	GUST	MAX.	HOURLY	DEW	WIND	WIND	GUST	MAX.									
NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD									
DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW									
0300	-7.9	-10.1	84	166	1.8	147	4.4	1	0300	-6.8	-8.3	89	096	3.2	097	7.6	1	0300	-9.7	-10.8	92	141	1.0	069	5.7	1
0600	-6.9	-8.3	90	172	1.8	150	4.4	0	0600	-8.7	-10.1	90	142	4.1	141	5.7	0	0600	-9.2	-9.7	96	249	1.6	244	3.2	1
0900	-6.6	-9.2	82	198	2.4	152	4.4	1	0900	-8.1	-9.3	91	175	3.1	145	5.7	1	0900	-9.2	-10.4	91	327	1.4	273	5.7	1
1200	-6.7	-8.7	86	200	3.2	197	4.4	4	1200	-10.0	-11.1	92	186	3.0	190	5.1	4	1200	-9.9	-11.4	89	020	1.6	068	5.7	4
1500	-5.8	-7.6	87	195	3.3	195	4.4	1	1500	-11.5	-12.6	92	188	3.2	163	6.3	1	1500	-11.5	*****	91	197	.4	230	3.2	1
1800	-5.6	*****	89	171	2.1	199	4.4	1	1800	-9.7	-10.8	92	180	2.9	145	5.7	1	1800	-12.1	-12.8	95	327	.6	262	1.9	1
2100	-6.0	-7.0	93	116	2.2	090	7.6	1	2100	-8.7	-9.9	91	147	4.1	144	6.3	1	2100	-12.5	*****	93	002	1.0	003	1.9	1
2400	-5.4	-6.8	90	080	1.5	201	8.3	0	2400	-8.0	-9.1	92	162	1.2	158	5.7	1	2400	-13.1	-14.2	92	128	1.5	141	3.8	1

DAY 04

DAY 05

DAY 06

HOURLY	DEW	WIND	WIND	GUST	MAX.	HOURLY	DEW	WIND	WIND	GUST	MAX.	HOURLY	DEW	WIND	WIND	GUST	MAX.									
NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD	NDNG TEMP. POINT RH DIR. SPD. DIR. GUST RAD									
DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW	DEG C DEG C % DEG. M/S DEG. M/S MW									
0300	-13.4	-14.4	92	141	2.6	143	5.1	1	0300	-24.4	-27.5	75	183	2.3	168	5.1	1	0300	-25.7	-28.5	77	216	1.9	205	3.8	1
0600	-14.0	-15.4	89	155	.4	146	3.8	1	0600	-23.9	-26.8	77	192	2.0	196	4.4	1	0600	-23.4	-26.1	78	255	.8	238	2.5	1
0900	-19.1	-20.1	92	152	.9	134	3.8	1	0900	-26.2	-29.0	77	200	1.8	168	4.4	1	0900	-22.7	-25.5	78	157	2.3	133	5.1	1
1200	-20.2	-22.1	85	210	1.7	215	3.8	6	1200	-28.0	-31.3	73	198	1.9	192	3.8	3	1200	-22.5	-25.1	79	118	3.6	110	5.7	3
1500	-21.9	-23.8	85	191	2.0	181	4.4	1	1500	-24.3	-27.6	74	201	2.4	214	4.4	1	1500	-22.7	-25.1	81	135	4.1	112	5.7	1
1800	-25.8	-27.7	84	190	2.2	184	4.4	0	1800	-26.7	-29.8	75	198	1.6	210	3.8	1	1800	-22.5	-25.0	80	126	4.5	127	6.3	1
2100	-24.8	-27.1	81	188	2.1	154	4.4	1	2100	-27.0	-29.9	76	225	2.6	221	4.4	1	2100	-22.7	*****	81	122	3.6	128	6.3	1
2400	-25.0	-27.7	78	196	2.2	153	4.4	1	2400	-27.7	-30.6	76	205	2.0	217	3.8	1	2400	-23.0	-25.6	79	103	3.6	109	6.3	1

DAY 07

DAY 08

DAY 09

HOURLY									HOURLY									HOURLY											
DEW		WIND		WIND		GUST		MAX.		DEW		WIND		WIND		GUST		MAX.		DEW		WIND		WIND		GUST		MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD		NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD		NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	
	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW			DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW			DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-24.8	-27.5	78	105	4.8	098	8.3	1		0300	-26.0	-29.0	76	137	5.1	123	8.9	1		0300	-34.0	-37.2	72	174	2.7	155	6.3	1	
0600	-25.8	-28.8	76	113	4.6	096	7.6	1		0600	-29.1	-32.1	75	150	4.4	136	8.3	1		0600	-35.6	-38.8	72	190	2.7	161	6.3	1	
0900	-25.5	-28.3	77	130	2.4	159	7.0	1		0900	-29.4	-32.5	74	164	4.1	145	6.3	1		0900	-33.7	-37.2	70	203	2.2	177	4.4	1	
1200	-24.9	-28.2	74	123	4.7	116	7.6	7		1200	-29.5	-33.8	66	194	2.5	170	5.7	8		1200	-33.0	-36.7	69	157	4.4	150	7.0	8	
1500	-28.2	-31.0	77	149	4.1	147	6.3	1		1500	-30.2	-33.3	74	185	1.7	145	4.4	1		1500	-32.7	-36.5	68	185	2.5	168	6.3	1	
1800	-28.7	-31.7	75	144	5.2	141	8.9	1		1800	-31.2	-34.1	75	225	1.7	234	3.8	1		1800	-33.7	-37.5	68	169	3.2	161	6.3	1	
2100	-25.6	-28.2	79	131	1.7	103	6.3	1		2100	-30.1	-32.8	77	214	1.6	233	3.2	1		2100	-32.7	-36.8	66	183	2.5	155	5.1	1	
2400	-24.4	-27.3	77	140	5.1	136	8.3	1		2400	-31.9	-34.8	75	187	1.9	224	3.8	1		2400	-33.8	-38.0	65	189	2.9	166	6.3	1	

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING January, 1983

DAY 10

DAY 11

DAY 12

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	-33.1	-37.2	66	212	1.3	254	1	0300	-29.2	-32.7	71	171	3.2	1	0300	-25.4	-28.2	77	175	2.2
0600	-32.4	-36.9	64	165	3.5	153	1	0600	-24.2	-29.5	61	187	2.5	1	0600	-28.9	-31.5	78	176	2.4
0900	-31.0	-35.5	64	190	2.3	164	1	0900	-22.6	-28.4	59	205	1.9	1	0900	-25.8	-28.4	79	208	2.2
1200	-28.7	-31.7	75	171	3.6	147	5	1200	-25.4	-31.8	55	264	1.6	5	1200	-23.9	-27.3	73	123	3.6
1500	-28.5	-31.9	72	157	4.8	150	1	1500	*****	*****	**	***	*****	1	1500	-26.8	-29.7	76	123	4.6
1800	-30.9	-34.0	74	148	5.0	141	1	1800	-20.8	-27.5	55	287	4.9	1	1800	-29.4	-32.4	75	178	3.3
2100	-30.3	-33.3	75	160	4.6	156	1	2100	-22.3	-24.9	79	169	1.2	1	2100	-28.1	-31.1	75	181	3.4
2400	-30.8	-33.7	75	172	3.4	175	1	2400	-24.1	-26.3	82	156	2.4	1	2400	-25.9	-29.4	72	165	4.0

DAY 13

DAY 14

DAY 15

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	-25.7	-29.5	70	175	4.0	148	1	0300	-21.9	-24.8	77	145	5.1	1	0300	-22.1	-25.0	77	175	3.3
0600	-28.0	-31.2	74	175	2.2	136	1	0600	-19.2	-23.6	68	154	4.6	1	0600	-19.2	-22.2	77	161	4.1
0900	-27.7	-31.2	72	240	2.0	268	1	0900	-16.1	-20.4	69	165	4.1	1	0900	-16.8	-19.7	78	173	3.3
1200	-27.0	-31.4	66	209	1.9	149	7	1200	-16.1	-18.9	79	155	2.3	4	1200	-13.6	-16.5	79	177	3.7
1500	-26.0	-29.8	70	236	1.8	246	1	1500	-17.3	-20.2	78	063	3.2	1	1500	-11.4	-13.6	84	177	3.1
1800	-26.9	-30.2	73	212	2.4	217	1	1800	-18.8	-22.0	76	117	4.6	1	1800	-10.1	-11.7	88	179	2.8
2100	-25.8	-28.6	77	193	2.7	171	1	2100	-20.2	-23.5	75	104	7.1	1	2100	-8.1	-10.3	84	164	2.6
2400	-24.0	-26.7	78	162	4.0	151	1	2400	-22.6	-25.7	76	146	4.9	1	2400	-12.3	-15.2	79	129	2.9

DAY 16

DAY 17

DAY 18

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	-13.0	-15.4	82	134	6.5	132	1	0300	-9.7	-10.8	92	186	1.6	0	0300	-9.1	-10.3	91	184	1.5
0600	-13.7	-15.8	84	176	4.5	156	1	0600	-10.1	-11.5	90	209	1.2	0	0600	-8.3	-9.7	90	119	2.1
0900	-11.6	-13.9	83	179	3.3	185	1	0900	-9.1	-10.5	90	210	.8	1	0900	-8.8	-10.3	89	183	1.4
1200	-10.1	-12.0	86	167	3.1	183	6	1200	-10.1	-11.5	90	190	.9	6	1200	-7.0	-9.1	85	233	.6
1500	-9.5	-10.6	92	163	4.3	138	1	1500	-9.7	-11.3	88	206	1.7	1	1500	-6.1	-8.8	81	106	6.9
1800	-11.8	-13.3	89	167	3.4	142	1	1800	-9.8	-11.6	87	192	2.0	1	1800	-7.1	-9.4	84	096	5.5
2100	-10.3	-11.8	89	186	3.2	185	1	2100	-10.5	-12.1	88	186	3.4	1	2100	-6.6	-8.3	88	085	1.6
2400	-9.2	-10.6	90	152	3.3	142	1	2400	-9.3	-10.4	92	185	2.2	1	2400	-8.3	-9.5	91	146	.4

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING January, 1983

DAY 19

DAY 20

DAY 21

HOUR	DEW	WIND	WIND	GUST MAX.	HOUR	DEW	WIND	WIND	GUST MAX.	HOUR	DEW	WIND	WIND	GUST MAX.
NDNG TEMP.	POINT RH	DIR.	SPD.	DIR.	NDNG TEMP.	POINT RH	DIR.	SPD.	DIR.	NDNG TEMP.	POINT RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S
0300	-9.0	-10.5	89	131	1.5	113	7.6	1	0300	-16.0	-17.3	90	171	2.8
0600	-9.5	-10.6	92	118	3.1	100	7.6	1	0600	-16.3	-17.8	88	188	2.4
0900	-9.0	-10.0	93	182	1.5	218	3.2	1	0900	-15.6	-17.2	88	197	2.3
1200	-8.4	-9.6	91	115	1.7	117	5.7	6	1200	-13.3	-15.2	86	177	2.3
1500	-11.0	-12.1	92	138	.8	150	4.4	1	1500	-15.9	-17.3	89	200	3.1
1800	-11.9	-12.8	93	141	3.0	141	5.1	1	1800	-15.1	-16.9	86	179	3.2
2100	-11.0	-11.9	93	158	2.4	147	4.4	1	2100	-15.2	-17.0	86	193	1.9
2400	-16.3	-17.3	92	174	2.4	155	5.1	1	2400	-15.9	-18.0	84	171	2.7

DAY 22

DAY 23

DAY 24

HOUR	DEW	WIND	WIND	GUST MAX.	HOUR	DEW	WIND	WIND	GUST MAX.	HOUR	DEW	WIND	WIND	GUST MAX.
NDNG TEMP.	POINT RH	DIR.	SPD.	DIR.	NDNG TEMP.	POINT RH	DIR.	SPD.	DIR.	NDNG TEMP.	POINT RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S
0300	-13.7	-20.4	57	175	3.6	149	5.7	1	0300	-12.3	-21.1	48	171	3.5
0600	-14.2	-20.7	58	158	4.3	148	7.0	1	0600	-10.4	-19.1	49	175	3.4
0900	-13.8	-20.9	55	178	3.2	166	5.7	2	0900	-9.1	-19.2	44	177	3.8
1200	-11.8	-20.7	48	187	2.4	168	4.4	10	1200	-10.9	-21.4	42	155	4.3
1500	-11.1	-19.3	51	184	3.5	154	6.3	2	1500	-7.9	-19.9	38	185	3.6
1800	-14.1	-21.8	52	163	5.0	147	7.6	1	1800	-9.6	-20.8	40	187	4.1
2100	-10.9	-17.6	49	179	3.4	159	8.3	1	2100	-12.3	-23.5	39	158	4.6
2400	-11.3	-19.9	49	161	5.3	151	8.3	1	2400	-12.1	-22.0	44	156	4.5

DAY 25

DAY 26

DAY 27

HOUR	DEW	WIND	WIND	GUST MAX.	HOUR	DEW	WIND	WIND	GUST MAX.	HOUR	DEW	WIND	WIND	GUST MAX.
NDNG TEMP.	POINT RH	DIR.	SPD.	DIR.	NDNG TEMP.	POINT RH	DIR.	SPD.	DIR.	NDNG TEMP.	POINT RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S
0300	-16.2	-23.2	55	176	2.0	196	7.0	1	0300	-13.1	-17.7	88	144	5.6
0600	-20.1	-26.0	59	145	5.4	134	8.3	1	0600	-11.4	-16.3	87	086	4.5
0900	-14.7	-21.1	58	202	3.2	144	8.9	2	0900	-12.8	-17.6	87	093	4.3
1200	-15.1	-21.5	58	135	3.8	100	8.9	12	1200	-13.1	-17.4	70	165	2.9
1500	-17.8	-23.5	61	169	2.0	129	5.1	2	1500	-12.6	-16.4	73	174	2.9
1800	-19.4	-24.6	63	178	3.3	154	6.3	1	1800	-12.8	-16.0	77	144	4.5
2100	-14.3	-19.6	64	203	2.2	147	5.7	1	2100	-13.6	-16.5	79	195	2.9
2400	-14.6	-19.7	65	155	4.1	149	8.3	1	2400	-13.4	-16.0	81	190	4.6

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING January, 1983

DAY 28

DAY 29

DAY 30

DAY 28										DAY 29										DAY 30											
HOUR	DEW		WIND		WIND		GUST		MAX.	HOUR	DEW		WIND		WIND		GUST		MAX.	HOUR	DEW		WIND		WIND		GUST		MAX.		
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD		NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD		NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD			
	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW			DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW			DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW			
0300	-8.9	-10.0	92	158	3.8	148	5.7	1	0300	-13.1	-13.9	94	174	2.7	154	5.7	1	0300	-13.0	-13.9	93	136	2.7	126	7.0	0					
0600	-8.2	-9.2	93	166	3.5	147	5.7	1	0600	-12.6	-13.5	93	169	2.5	156	5.1	1	0600	-14.3	-15.3	92	154	3.0	143	5.7	1					
0900	-9.3	-10.4	92	188	2.5	177	5.1	2	0900	-10.2	-11.7	89	186	2.5	163	5.7	3	0900	-14.4	-15.4	92	215	1.5	206	5.1	2					
1200	-7.5	-9.3	87	163	3.1	143	5.7	9	1200	-9.8	-13.2	76	183	2.8	161	6.3	17	1200	-11.8	-14.3	82	174	2.6	117	7.6	15					
1500	-5.3	-7.0	88	159	3.0	145	5.7	2	1500	-10.7	-13.2	82	190	2.5	193	4.4	3	1500	-13.6	-15.0	89	128	4.1	097	8.9	2					
1800	-6.9	-8.6	88	174	3.9	180	6.3	1	1800	-11.1	-13.6	82	168	3.2	158	6.3	1	1800	-15.1	-16.7	88	196	3.2	193	5.7	1					
2100	-12.3	-13.4	92	199	4.5	196	7.6	0	2100	-13.5	-14.8	90	161	4.1	181	7.6	1	2100	-12.7	-14.4	87	184	2.7	192	5.1	1					
2400	-11.9	-12.8	93	210	2.4	199	4.4	1	2400	-12.3	-13.6	90	167	2.7	188	5.1	1	2400	-11.1	-13.0	86	189	3.6	192	5.7	1					

DAY 31

HOUR	DEW		WIND		WIND		GUST		MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	
	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-10.3	-11.8	89	194	3.7	192	5.7	1	
0600	-8.5	-9.9	90	183	2.5	190	4.4	1	
0900	-8.6	-10.4	87	193	2.9	174	6.3	3	
1200	-9.2	-12.0	80	178	3.4	169	6.3	12	
1500	-8.4	-10.9	82	217	2.1	203	5.1	3	
1800	-11.1	-12.7	88	195	3.8	200	6.3	1	
2100	-9.4	-11.2	87	206	2.6	215	5.1	1	
2400	-10.3	-12.1	87	198	2.1	193	4.4	1	

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

MONTHLY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING January, 1983

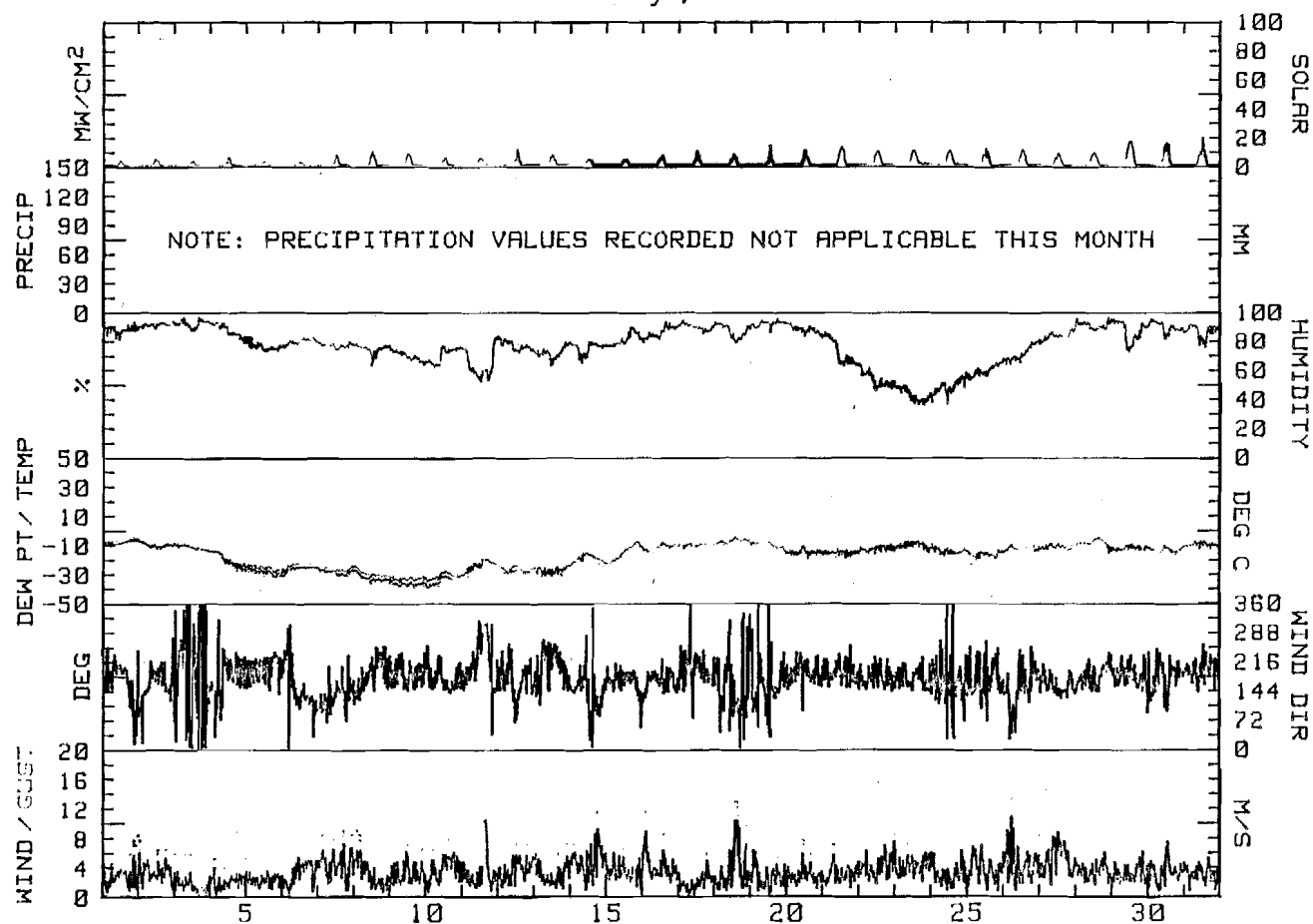
DAY	MAX. TEMP. DEG C	MIN. TEMP. DEG C	MEAN TEMP. DEG C	RES. WIND DIR. DEG	RES. WIND SPD. M/S	AVG. WIND SPD. M/S	MAX. GUST DIR. DEG	MAX. GUST SPD. M/S	P'VAL DIR.	MEAN RH %	MEAN DP DEG C	PRECIP MM	DAY'S SOLAR ENERGY WH/50M
1	-4.4	-8.1	-6.3	173	1.9	2.6	201	6.3	SSW	88	-8.1	****	288
2	-5.6	-11.5	-8.6	159	2.7	3.4	097	7.6	SSW	91	-10.0	****	310
3	-7.9	-13.1	-10.5	348	.2	1.5	069	5.7	N	92	-11.3	****	290
4	-12.7	-25.9	-19.3	181	1.6	2.0	143	5.1	S	87	-21.2	****	333
5	-23.1	-29.4	-26.3	201	2.1	2.2	168	5.1	SW	76	-28.7	****	293
6	-22.3	-28.7	-25.5	132	2.6	3.2	127	6.3	SE	79	-26.2	****	263
7	-23.0	-28.8	-25.9	129	3.9	4.3	141	8.9	SE	77	-28.6	****	380
8	-23.9	-33.1	-28.5	170	2.5	3.1	123	8.9	S	74	-32.6	****	478
9	-31.1	-35.6	-33.4	179	2.8	3.0	150	7.0	S	69	-36.9	****	488
10	-27.6	-35.3	-31.5	165	3.4	3.7	141	7.6	SSE	70	-34.8	****	360
11	-19.7M	-31.4M	-25.6M	220M	1.6M	3.0M	306M	12.7M	S(M)	64M	-29.3M	****	380M
12	-23.6	-29.6	-26.6	161	2.8	3.5	142	7.0	S	76	-29.6	****	423
13	-23.7	-31.2	-27.5	193	2.3	3.0	148	7.6	SW	72	-30.8	****	433
14	-15.4	-24.2	-19.8	131	3.9	4.9	072	11.4	SSE	75	-22.7	****	365
15	-7.3	-22.9	-15.1	168	3.1	3.3	147	7.0	S	81	-17.7	****	323
16	-8.0	-14.4	-11.2	163	3.8	4.0	132	11.4	S	86	-13.2	****	395
17	-8.4	-12.5	-10.5	193	1.7	1.9	196	5.7	S	89	-11.4	****	395
18	-4.6	-9.6	-7.1	115	2.1	3.5	103	14.0	E	87	-9.2	****	405
19	-7.8	-16.3	-12.1	144	1.9	2.6	113	7.6	SE	92	-11.4	****	388
20	-10.7	-18.9	-14.8	184	2.5	2.8	113	7.6	S	88	-16.6	****	453
21	-12.5	-18.7	-15.6	189	2.9	3.0	186	7.0	S	72	-19.4	****	670
22	-9.5	-16.0	-12.8	171	3.8	4.0	159	8.3	SSE	53	-20.3	****	580
23	-7.4	-15.2	-11.3	170	3.9	4.1	151	8.3	SSE	43	-20.8	****	688
24	-9.4	-17.1	-13.3	163	2.3	3.0	140	7.6	SSE	49	-22.8	****	628
25	-13.7	-20.1	-16.9	165	3.0	3.7	144	8.9	SE	60	-22.5	****	580
26	-9.8	-14.9	-12.4	146	3.2	4.4	083	13.3	SE	71	-16.7	****	588
27	-8.8	-13.1	-11.0	151	4.8	5.0	137	10.2	SE	84	-13.2	****	478
28	-4.8	-15.1	-10.0	176	3.2	3.5	196	7.6	SSE	91	-9.9	****	530
29	-9.1	-14.3	-11.7	174	2.9	3.0	181	7.6	S	86	-13.9	****	905
30	-10.2	-15.5	-12.9	168	2.6	3.3	097	8.9	SSW	89	-14.7	****	688
31	-7.0	-12.4	-9.7	194	2.8	3.0	174	6.3	SSW	86	-11.5	****	708
MONTH	-4.4M	-35.6M	-16.9M	165M	2.5M	3.3M	103M	14.0M	S(M)	77M	-19.9M	****	14470M

GUST VEL. AT MAX. GUST MINUS 2 INTERVALS 9.5
GUST VEL. AT MAX. GUST MINUS 1 INTERVAL 12.1
GUST VEL. AT MAX. GUST PLUS 1 INTERVAL 12.7
GUST VEL. AT MAX. GUST PLUS 2 INTERVALS 12.1

NOTE: RELATIVE HUMIDITY READINGS ARE UNRELIABLE WHEN WIND SPEEDS ARE LESS THAN ONE METER PER SECOND. SUCH READINGS HAVE NOT BEEN INCLUDED IN THE DAILY OR MONTHLY MEAN FOR RELATIVE HUMIDITY AND DEW POINT.

**** SEE NOTES AT THE BACK OF THIS REPORT ****

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
January, 1983



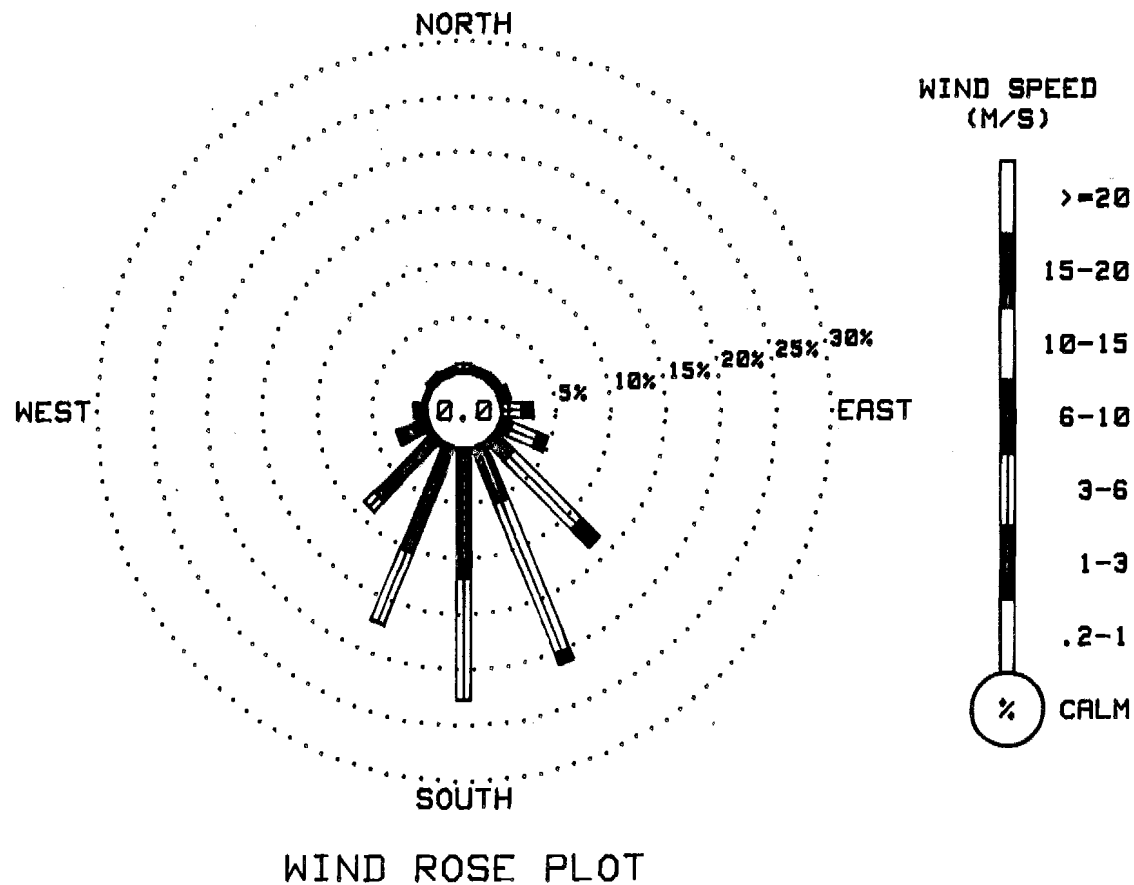
R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

WIND FREQUENCY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING January, 1983

DIRECTION	VELOCITY (M/S)							TOTAL
	0.2 TO 1.0	1.0 TO 3.0	3.0 TO 6.0	6.0 TO 10.0	10.0 TO 15.0	15.0 TO 20.0	20.0 OR GREATER	
N	.34	.51	0.00	0.00	0.00	0.00	0.00	.84
NNE	.13	.37	.13	0.00	0.00	0.00	0.00	.64
NE	.07	.30	.34	0.00	0.00	0.00	0.00	.71
ENE	.34	.34	.30	.03	0.00	0.00	0.00	1.01
E	.13	.64	1.18	.91	.10	0.00	0.00	2.96
ESE	.10	1.08	2.53	.84	.10	0.00	0.00	4.65
SE	0.00	2.39	8.73	2.22	0.00	0.00	0.00	13.34
SSE	.10	5.32	14.62	1.01	0.00	0.00	0.00	21.06
S	.30	11.39	10.95	.03	0.00	0.00	0.00	22.68
SSW	.10	10.18	6.87	.03	0.00	0.00	0.00	17.18
SW	.27	7.31	1.25	0.00	0.00	0.00	0.00	8.83
WSW	.24	2.59	.20	0.00	0.00	0.00	0.00	3.03
W	.10	.91	.20	0.00	0.00	0.00	0.00	1.21
WNW	.03	.24	.13	.03	0.00	0.00	0.00	.44
NW	.20	.37	0.00	.10	.10	0.00	0.00	.77
NNW	.20	.40	.03	0.00	0.00	0.00	0.00	.64
CALM	-----	-----	-----	-----	-----	-----	-----	0.00
TOTAL	2.66	44.34	47.47	5.22	.30	0.00	0.00	100.00

NOTE: ALL FREQUENCIES ARE EXPRESSED IN PERCENT
2968 VALID WIND OBSERVATIONS USED TO DEVELOP FREQUENCY SUMMARY

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
January, 1983



No precipitation data for February

(See INTERPRETATION OF DATA) .

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING February, 1983

DAY 01

DAY 02

DAY 03

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.							
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.						
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S						
0300	-7.5	-9.8	84	180	2.7	147	5.7	1	0300	-5.5	-7.8	84	322	.5	267	5.1	1	0300	-7.9	-9.0	92	202	2.8	216	5.7	0
0600	-1.7	-7.8	63	135	2.1	111	8.3	1	0600	-5.2	-7.0	87	078	2.0	099	8.3	1	0600	-9.9	-10.6	95	213	3.0	173	5.1	1
0900	-5.2	-9.6	71	080	3.9	093	10.8	3	0900	-6.6	-7.4	94	132	1.0	146	6.3	2	0900	-10.0	-10.7	95	208	3.9	199	6.3	4
1200	-5.7	-10.1	71	046	1.8	019	7.0	14	1200	-6.3	-7.8	89	166	3.4	157	7.6	18	1200	-10.8	-12.0	91	193	4.1	191	6.3	10
1500	-7.3	-9.9	82	175	3.0	155	10.8	2	1500	-5.5	-6.9	90	181	1.8	140	5.7	3	1500	-9.2	-10.8	88	184	3.2	177	5.1	3
1800	-5.9	-8.0	85	194	4.4	213	6.3	1	1800	-6.8	-7.6	94	186	2.8	194	5.7	1	1800	*****	*****	**	***	****	168	2.5	***
2100	-5.3	-6.7	90	185	2.0	168	3.8	1	2100	-7.3	-8.1	94	185	3.7	154	7.0	1	2100	*****	*****	**	***	****	***	****	***
2400	-5.8	-7.1	91	147	3.0	147	5.1	1	2400	-8.4	-9.1	95	197	4.3	199	7.0	0	2400	-6.2	-9.2	79	161	2.1	136	5.1	1

DAY 04

DAY 05

DAY 06

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	
0300	-4.8	*****	74	164	1.5	170	0300	-11.8	-13.5	87	177	2.4	156	0300	-9.9	-11.4	89	196	4.9	196	7.0
0600	-7.0	-10.0	79	094	2.0	109	0600	-8.7	-11.5	80	211	1.6	230	0600	-7.9	-8.7	94	179	3.8	193	6.3
0900	-6.8	-9.5	81	100	4.0	079	0900	-6.8	-10.8	73	165	1.7	153	0900	-7.0	-7.8	94	181	1.9	174	3.2
1200	-9.0	-10.6	88	098	1.4	069	1200	-5.2	-10.7	65	184	1.1	102	1200	-4.1	-7.7	76	067	.2	002	5.1
1500	-10.9	-12.4	89	191	3.5	206	1500	-5.7	-9.2	76	092	3.9	108	1500	-6.1	-8.1	86	058	2.5	084	9.5
1800	-8.9	-10.5	88	192	4.3	189	1800	-7.4	-9.4	86	107	4.2	086	1800	-6.0	-7.5	89	274	.4	091	5.7
2100	-8.4	-10.1	88	199	3.1	179	2100	-13.4	-14.7	90	163	1.7	091	2100	-6.4	-8.1	88	260	1.3	215	3.2
2400	-6.6	-8.9	84	190	2.9	198	2400	-10.6	-11.4	94	198	3.3	198	2400	-7.6	-8.8	91	202	2.3	199	4.4

DAY 07

DAY 08

DAY 09

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	-8.0	-9.1	92	202	2.9	200	0300	-8.6	-9.1	96	130	1.6	080	0300	-10.1	-12.3	84	154	.7	149
0600	-7.9	*****	93	197	1.9	191	0600	-8.3	-8.8	96	184	1.5	173	0600	-13.2	-15.3	84	177	1.3	151
0900	-8.5	-9.2	95	206	1.1	228	0900	-8.0	*****	95	100	.6	151	0900	-14.2	-16.6	82	180	2.4	150
1200	-6.9	*****	86	175	.6	121	1200	-9.8	-11.6	87	084	.5	060	1200	-12.6	-15.3	80	192	2.4	223
1500	-8.1	-9.2	92	181	2.4	190	1500	-8.8	-9.9	92	202	.9	138	1500	-13.7	-16.3	81	189	3.2	188
1800	-8.9	-9.4	96	191	3.1	194	1800	-9.2	-10.8	88	169	1.6	149	1800	-15.2	-17.3	84	193	3.5	197
2100	-6.7	-7.5	94	183	2.3	119	2100	-8.1	-10.2	85	200	1.8	204	2100	-16.6	-18.7	84	191	2.3	170
2400	-7.6	-8.4	94	090	5.1	096	2400	-9.8	*****	85	148	1.6	166	2400	-16.1	-18.1	85	201	1.7	221

R & M CONSULTANTS, INC.
SUSTITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING February, 1983

DAY 10

DAY 11

DAY 12

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-13.5	-14.5	92	198	1.8	199	3.2	1	0300	-17.2	-18.7	88	166	2.6	150	5.7	1
0600	-13.8	-14.7	93	173	1.2	202	2.5	1	0600	-16.4	-17.6	91	185	1.7	166	5.1	0
0900	-14.8	-16.0	91	198	1.2	190	2.5	2	0900	-17.9	*****	75	177	1.1	142	3.8	5
1200	-12.6	-14.6	85	195	.9	224	1.9	7	1200	-16.8	-19.9	77	197	1.5	155	5.1	11
1500	-12.8	-14.3	89	192	1.0	142	2.5	3	1500	-17.9	-21.1	76	191	1.8	153	4.4	6
1800	-17.3	-18.2	93	180	2.1	153	4.4	1	1800	-19.0	-20.4	89	204	1.8	182	3.8	1
2100	-15.0	-16.8	86	189	1.4	160	3.2	1	2100	-20.7	-22.3	87	179	2.4	157	5.7	1
2400	-14.3	*****	87	182	1.5	150	3.2	1	2400	-18.2	-20.1	85	187	2.2	163	4.4	1

DAY 13

DAY 14

DAY 15

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-23.4	-25.5	83	186	2.1	162	4.4	0	0300	-21.3	-24.2	77	202	2.0	163	4.4	1
0600	-24.3	-26.0	86	200	1.7	177	5.1	1	0600	-21.8	-24.6	78	174	2.8	158	5.7	1
0900	-22.4	-25.0	79	205	2.0	178	5.1	7	0900	-19.7	-24.4	66	184	2.4	169	5.7	10
1200	-21.3	-25.4	69	188	2.1	158	5.1	16	1200	-18.0	-23.7	61	191	2.1	156	5.1	22
1500	-20.4	-25.1	66	180	2.1	165	5.1	8	1500	-18.1	-22.9	66	197	1.7	214	3.8	12
1800	-22.7	-25.2	80	204	1.7	190	4.4	1	1800	-21.1	-23.5	81	171	3.1	156	5.7	1
2100	-23.6	-26.2	79	198	1.9	164	6.3	1	2100	-21.1	-24.1	77	196	2.7	162	5.7	1
2400	-23.1	-25.9	78	195	1.7	210	3.8	1	2400	-20.7	-24.1	74	198	2.6	168	5.7	1

DAY 16

DAY 17

DAY 18

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-20.6	-23.9	75	178	4.7	154	8.3	1	0300	-21.9	-25.0	76	161	7.4	150	10.8	1
0600	-20.6	-23.9	75	166	4.3	140	8.3	1	0600	-23.0	-26.0	76	148	8.6	135	12.7	1
0900	-20.3	-24.2	71	138	7.9	141	10.2	11	0900	-21.9	-26.0	69	157	7.4	157	10.8	11
1200	-18.7	-22.2	74	144	7.1	144	10.2	24	1200	-21.7	-25.8	69	156	6.8	153	10.8	24
1500	-19.4	-24.1	66	153	6.4	137	9.5	9	1500	-21.1	-25.3	69	150	6.9	155	10.2	9
1800	-21.1	-25.1	70	159	6.1	142	9.5	1	1800	-22.6	-26.4	71	150	6.7	146	10.2	1
2100	-20.4	-24.6	69	151	7.0	139	10.2	1	2100	-21.2	-25.2	70	174	4.1	163	8.9	1
2400	-20.8	-24.3	73	139	8.2	142	10.8	1	2400	-22.8	-26.6	71	169	4.5	155	8.9	1

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING February, 1983

DAY 19

DAY 20

DAY 21

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-15.0	-17.5	81	197	3.9	197	6.3	1	0300	-10.4	-12.6	84	158	4.6	145	8.9	1
0600	-14.8	-17.2	82	187	3.3	185	5.7	0	0600	-12.2	-13.9	87	136	3.3	136	7.0	0
0900	-11.9	-14.5	81	183	4.3	186	5.7	10	0900	-14.3	-17.0	80	178	3.5	211	7.0	13
1200	-10.5	-13.6	78	189	4.7	195	7.6	21	1200	-13.4	-16.4	78	192	3.8	178	6.3	18
1500	-11.3	-14.2	79	185	4.5	194	7.6	10	1500	-11.9	-15.3	76	187	3.1	191	4.4	11
1800	-12.5	-14.1	88	164	3.8	153	6.3	1	1800	-12.7	-15.0	83	178	3.9	181	7.0	1
2100	-13.8	-15.8	85	178	3.0	144	5.7	1	2100	-11.8	-14.4	81	192	2.8	173	4.4	1
2400	-11.6	-14.4	80	176	2.8	166	5.1	0	2400	-12.2	-14.9	80	191	3.9	197	6.3	1

DAY 22

DAY 23

DAY 24

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-11.6	-13.4	87	175	3.0	171	5.7	1	0300	-15.7	-16.7	92	198	2.8	210	5.7	1
0600	-10.9	-12.5	88	190	2.4	172	3.8	0	0600	-13.8	-14.7	93	184	2.2	189	4.4	1
0900	-10.1	-14.7	69	170	2.9	152	5.7	16	0900	-13.2	-15.9	80	203	2.2	217	4.4	13
1200	-8.4	-13.2	68	175	2.7	152	5.1	29	1200	-9.7	-13.9	71	180	3.2	192	5.1	29
1500	-7.2	-11.5	71	194	3.0	167	4.4	12	1500	-6.3	-11.2	68	184	2.6	116	8.9	13
1800	-8.1	-10.0	86	205	3.0	200	4.4	0	1800	-8.3	-11.6	77	178	1.7	059	7.6	1
2100	-9.2	-11.1	86	204	2.7	170	5.1	0	2100	-11.5	-14.1	81	207	1.5	141	6.3	1
2400	-13.1	-14.3	91	226	3.0	216	5.7	1	2400	-11.5	-13.4	86	157	3.3	147	7.6	1

DAY 25

DAY 26

DAY 27

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-11.5	-12.8	90	165	3.4	142	6.3	1	0300	-9.3	-11.2	86	210	3.3	207	5.7	0
0600	-11.9	-13.0	92	187	2.2	168	5.7	1	0600	-12.0	-13.3	90	200	1.7	230	5.1	1
0900	-13.6	-17.2	74	186	2.6	174	4.4	21	0900	-6.7	-15.0	52	209	1.4	223	3.8	24
1200	-9.2	-13.6	70	192	3.1	188	5.7	37	1200	-7.8	-12.7	68	131	3.3	104	7.6	29
1500	-8.3	-12.1	74	200	2.7	200	4.4	15	1500	-10.5	-13.6	78	143	3.5	103	9.5	11
1800	-11.6	-13.4	87	183	2.2	154	3.8	1	1800	-13.0	-14.6	88	199	2.9	214	5.7	1
2100	-14.9	-16.2	90	190	2.3	154	5.1	1	2100	-14.6	-15.8	91	201	2.9	205	5.1	1
2400	-11.2	-13.0	87	215	3.1	204	5.1	1	2400	-14.9	-15.9	92	191	2.7	201	5.7	1

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING February, 1983

DAY 28

HOUR	DEW	WIND	WIND	GUST	MAX.		
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST
	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	-8.2	-8.7	96	143	3.4	153	5.7
0600	-8.7	*****	97	143	1.5	179	3.8
0900	-8.7	-10.1	90	131	3.0	140	6.3
1200	-7.5	-9.6	85	154	3.6	147	5.7
1500	-7.1	-9.1	86	153	2.5	146	5.1
1800	-8.5	-9.3	94	191	1.8	190	3.8
2100	-8.4	-10.2	87	172	2.5	152	4.4
2400	-9.2	*****	91	172	1.2	156	2.5

R & M CONSULTANTS, INC.

SUSTITNA HYDROELECTRIC PROJECT

MONTHLY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING February, 1983

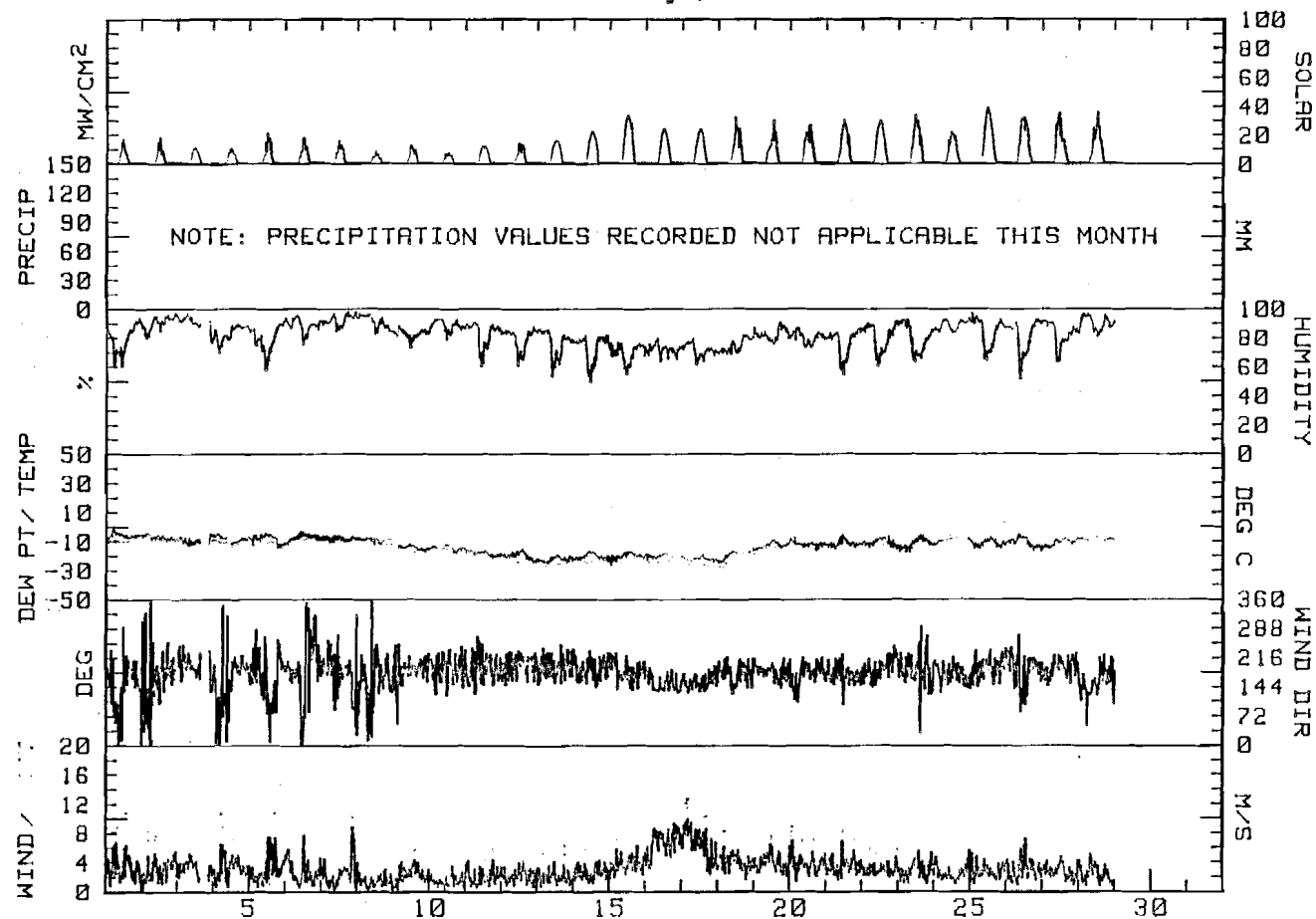
DAY	MAX. TEMP. DEG C	MIN. TEMP. DEG C	MEAN TEMP. DEG C	RES. WIND DIR. DEG	RES. WIND SPD. M/S	AVG. WIND SPD. M/S	MAX. GUST DIR. DEG	MAX. GUST SPD. M/S	P'VAL DIR.	MEAN RH %	MEAN DP DEG C	PRECIP MM	DAY'S SOLAR ENERGY DAY WH/SQM
1	-9	-9.4	-5.2	152	2.0	3.3	093	10.8	SSE	80	-8.7	****	708 1
2	-4.2	-9.4	-6.8	175	1.9	2.9	099	8.3	SSW	91	-8.1	****	735 2
3	-4.7M	-13.0M	-8.9M	196M	3.1M	3.4M	199M	6.3M	SSW(M)	91M	-10.3M	****	819M 3
4	-4.3	-11.9	-8.1	163	2.1	3.3	109	10.8	SSW	84	-10.4	****	610 4
5	-4.3	-14.1	-9.2	151	1.8	3.1	086	10.8	SSE	80	-11.0	****	848 5
6	-3.7	-11.9	-7.8	188	1.4	2.7	084	9.5	S	89	-8.9	****	813 6
7	-6.3	-10.0	-8.2	171	1.7	2.6	096	10.2	S	93	-8.9	****	755 7
8	-7.3	-11.4	-9.4	163	1.1	1.5	080	5.7	S	91	-10.1	****	468 8
9	-8.8	-17.3	-13.1	188	2.2	2.3	197	5.7	S	83	-16.1	****	680 9
10	-11.8	-17.4	-14.6	188	1.4	1.5	153	4.4	SSW	89	-15.7	****	508 10
11	-15.0	-21.4	-18.2	185	1.8	2.1	150	5.7	S	83	-20.2	****	780 11
12	-15.3	-24.5	-19.9	200	2.1	2.2	201	5.1	SSW	80	-22.4	****	753 12
13	-19.4	-25.3	-22.4	194	1.9	2.1	164	6.3	S	77	-25.3	****	1033 13
14	-16.6	-23.9	-20.3	188	2.4	2.5	158	5.7	SSW	73	-23.9	****	1360 14
15	-16.8	-25.8	-21.3	182	3.4	3.6	145	8.3	S	70	-24.0	****	1958 15
16	-18.0	-22.4	-20.2	151	6.3	6.6	142	10.8	SE	72	-23.6	****	1413 16
17	-18.6	-24.3	-21.5	157	6.5	6.7	135	12.7	SSE	72	-25.6	****	1425 17
18	-14.3	-25.3	-19.8	177	3.8	4.0	173	8.3	S	75	-22.4	****	1398 18
19	-9.0	-16.3	-12.7	183	3.7	3.9	195	7.6	S	83	-15.2	****	1240 19
20	-7.2	-16.3	-11.8	176	3.4	3.8	145	8.9	S	81	-14.6	****	1425 20
21	-6.1	-15.1	-10.6	173	3.3	3.6	127	8.3	S	77	-14.9	****	1613 21
22	-6.7	-15.1	-10.9	193	2.7	2.9	171	5.7	S	81	-13.3	****	1770 22
23	-6.0	-17.5	-11.8	184	2.4	2.9	116	8.9	SSW	80	-14.3	****	1778 23
24	-4.9	-12.6	-8.8	178	2.3	2.5	195	5.7	SSE	89	-9.3	****	1295 24
25	-7.1	-15.0	-11.1	190	2.6	2.8	142	6.3	S	84	-13.4	****	2253 25
26	-5.4	-16.8	-11.1	182	2.4	3.0	103	9.5	SSW	82	-13.4	****	1993 26
27	-7.7	-15.8	-11.8	191	2.6	2.7	151	5.7	SSW	83	-13.4	****	1765 27
28	-6.6	-10.0	-8.3	154	2.3	2.6	140	6.3	SSE	90	-9.5	****	1695 28
MONTH	-9M	-25.8M	-13.0M	176M	2.6M	3.1M	135M	12.7M	S(M)	82M	-15.3M	****	33684M

GUST VEL. AT MAX. GUST MINUS 2 INTERVALS 10.8
GUST VEL. AT MAX. GUST MINUS 1 INTERVAL 10.8
GUST VEL. AT MAX. GUST PLUS 1 INTERVAL 11.4
GUST VEL. AT MAX. GUST PLUS 2 INTERVALS 10.2

NOTE: RELATIVE HUMIDITY READINGS ARE UNRELIABLE WHEN WIND SPEEDS ARE LESS THAN ONE METER PER SECOND. SUCH READINGS HAVE NOT BEEN INCLUDED IN THE DAILY OR MONTHLY MEAN FOR RELATIVE HUMIDITY AND DEW POINT.

**** SEE NOTES AT THE BACK OF THIS REPORT ****

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
February, 1983



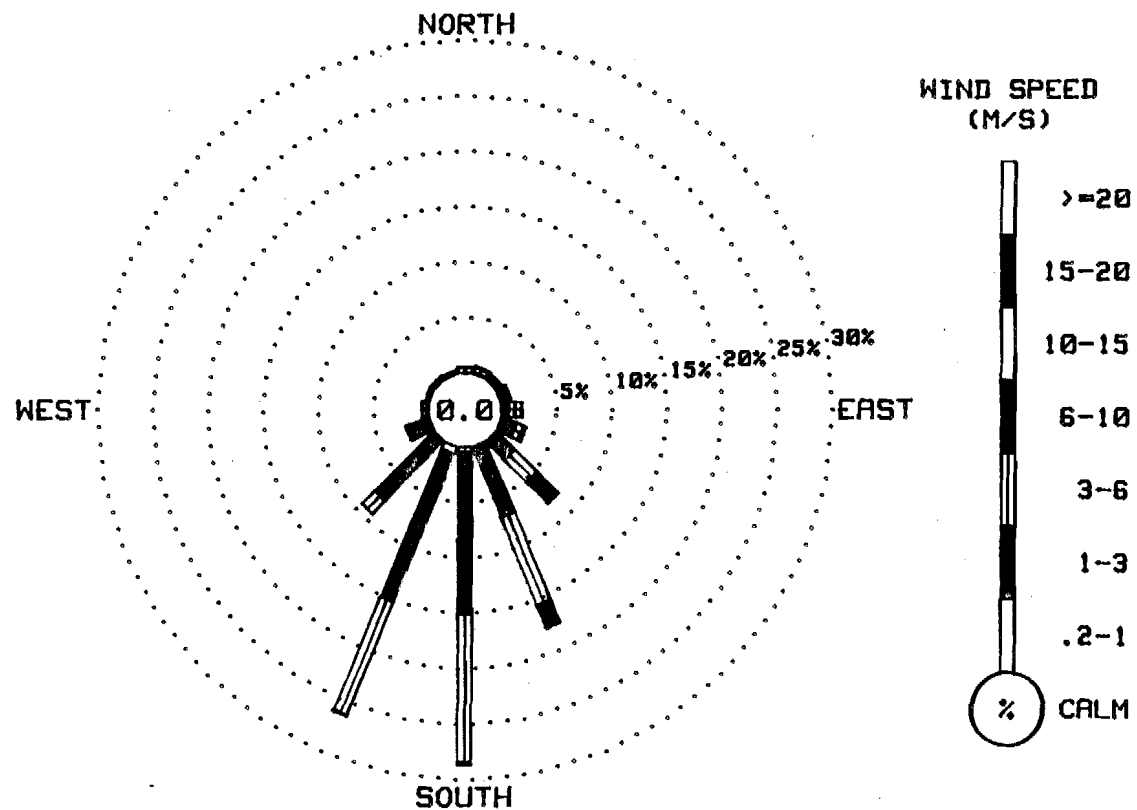
R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

WIND FREQUENCY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING February, 1983

DIRECTION	VELOCITY (M/S)							TOTAL
	0.2 TO 1.0	1.0 TO 3.0	3.0 TO 6.0	6.0 TO 10.0	10.0 TO 15.0	15.0 TO 20.0	20.0 OR GREATER	
N	0.00	.49	.04	0.00	0.00	0.00	0.00	.53
NNE	.08	.45	.11	0.00	0.00	0.00	0.00	.64
NE	.19	.15	.23	0.00	0.00	0.00	0.00	.56
ENE	.08	.38	.38	.04	0.00	0.00	0.00	.86
E	.23	.38	.60	.64	0.00	0.00	0.00	1.84
ESE	.30	1.09	.75	.26	0.00	0.00	0.00	2.40
SE	.19	2.14	2.89	2.70	0.00	0.00	0.00	7.92
SSE	.34	6.53	8.56	2.21	0.00	0.00	0.00	17.64
S	.41	14.60	13.28	.30	0.00	0.00	0.00	28.59
SSW	.68	14.41	10.96	.11	0.00	0.00	0.00	26.15
SW	.30	7.28	1.61	0.00	0.00	0.00	0.00	9.19
WSW	.30	1.61	.26	0.00	0.00	0.00	0.00	2.18
W	.08	.49	0.00	0.00	0.00	0.00	0.00	.56
WNW	.04	.26	0.00	0.00	0.00	0.00	0.00	.30
NW	.04	.30	0.00	0.00	0.00	0.00	0.00	.34
NNW	0.00	.30	0.00	0.00	0.00	0.00	0.00	.30
CALM								0.00
TOTAL	3.23	50.84	39.66	6.27	0.00	0.00	0.00	100.00

NOTE: ALL FREQUENCIES ARE EXPRESSED IN PERCENT
2665 VALID WIND OBSERVATIONS USED TO DEVELOP FREQUENCY SUMMARY

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
February, 1983



No precipitation data for March

(See INTERPRETATION OF DATA).

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING March, 1983

DAY 01

DAY 02

DAY 03

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.							
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.						
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S						
0300	-8.6	-9.3	95	201	.8	218	2.5	1	0300	-14.4	-15.2	94	182	1.8	157	3.2	1	0300	-19.4	-20.5	91	164	4.5	152	7.0	1
0600	-8.8	*****	91	186	1.2	180	3.2	0	0600	-16.8	-17.8	92	200	1.7	216	3.2	1	0600	-19.4	-20.6	90	170	3.3	140	6.3	1
0900	-8.3	-10.5	84	194	1.8	169	3.8	12	0900	-15.8	-17.4	88	212	1.6	216	3.2	22	0900	-21.7	-23.7	84	216	2.9	211	4.4	21
1200	-5.8	-9.0	78	201	4.3	204	7.0	25	1200	-14.1	-18.4	78	198	1.5	170	3.2	37	1200	-18.0	-22.0	71	201	3.2	227	5.1	36
1500	-6.7	-8.7	86	159	1.7	168	3.2	12	1500	-13.8	-18.1	70	170	2.0	143	5.7	22	1500	-17.0	-20.4	75	199	3.0	187	5.1	19
1800	-8.5	-9.0	96	133	1.7	148	3.8	0	1800	-16.1	-17.5	89	186	2.1	161	5.1	1	1800	-20.2	-21.7	88	206	2.8	202	5.1	1
2100	-9.6	*****	96	273	.3	355	2.5	1	2100	-18.8	-20.4	87	184	2.2	191	4.4	1	2100	-24.1	-25.7	87	208	2.6	211	4.4	1
2400	-10.9	-11.4	96	199	.8	146	3.8	1	2400	-19.4	-20.4	92	192	2.8	173	6.3	1	2400	-20.8	-22.2	89	202	2.4	195	5.1	1

DAY 04

DAY 05

DAY 06

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.							
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.						
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S						
0300	-21.5	-23.0	88	181	3.1	191	5.1	1	0300	-16.7	-17.8	91	162	4.8	144	8.3	1	0300	-15.1	-17.2	84	184	3.2	188	5.1	1
0600	-24.1	-25.7	87	194	2.5	200	5.1	1	0600	-15.7	-16.7	92	169	4.9	152	7.0	1	0600	-15.8	-17.4	88	174	3.7	146	8.3	1
0900	-21.0	-23.5	80	198	2.5	209	4.4	19	0900	-14.4	-16.5	84	177	3.8	161	7.0	13	0900	-13.3	-16.6	76	190	3.2	164	5.7	20
1200	-16.1	-18.8	80	208	3.2	195	5.7	26	1200	-11.8	-14.4	81	174	4.6	166	7.0	20	1200	-10.7	-15.3	69	175	3.5	192	5.7	40
1500	-15.9	-18.1	83	155	4.6	155	7.6	28	1500	-11.1	-13.7	81	158	5.2	154	7.0	14	1500	-10.9	-14.8	73	176	3.4	145	5.7	16
1800	-16.8	-18.1	90	156	5.4	150	8.3	1	1800	-12.8	-15.1	83	157	4.5	151	7.0	1	1800	-11.4	-14.3	79	193	3.5	189	5.1	1
2100	-18.6	-19.7	91	148	6.1	143	8.9	0	2100	-15.2	-17.3	84	182	3.1	170	6.3	0	2100	-13.7	-16.1	82	196	3.3	203	5.1	1
2400	-20.1	-21.3	90	166	4.7	155	8.3	1	2400	-13.3	-15.7	82	194	3.4	179	5.7	1	2400	-13.1	-15.2	84	195	3.3	211	5.1	1

DAY 07

DAY 08

DAY 09

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.							
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.						
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S						
0300	-13.5	-15.5	85	177	2.9	159	5.7	1	0300	-15.8	-18.8	78	174	4.9	183	7.6	1	0300	-14.4	-21.0	57	184	2.7	167	6.3	1
0600	-13.3	-15.3	85	181	3.3	168	6.3	1	0600	-17.7	-20.6	78	165	5.1	166	8.9	1	0600	-17.2	-23.1	60	172	3.3	147	8.9	1
0900	-12.3	-17.7	64	196	2.3	162	5.1	26	0900	-14.8	-20.3	63	174	4.8	167	7.6	24	0900	-13.1	-19.8	57	144	6.2	134	9.5	24
1200	-11.0	-15.9	67	171	4.0	197	7.0	38	1200	-11.7	-17.3	63	167	5.0	145	8.3	38	1200	-11.4	-18.9	54	154	4.5	139	7.6	38
1500	-10.0	-15.1	66	175	3.4	165	5.1	17	1500	-9.6	-15.9	60	182	3.9	182	7.0	20	1500	-10.9	-18.0	56	203	1.6	100	7.6	20
1800	-16.2	-18.4	83	185	3.1	168	5.1	1	1800	-13.6	-19.3	62	187	2.7	160	5.1	1	1800	-16.5	-21.0	68	195	3.0	129	5.1	1
2100	-15.0	-18.1	77	184	3.0	178	7.0	1	2100	-14.4	-20.8	58	178	2.7	172	6.3	1	2100	-20.1	-23.5	74	204	2.1	179	5.1	1
2400	-14.3	-17.4	77	191	3.2	166	7.0	1	2400	-15.5	-21.5	60	174	2.6	167	6.3	1	2400	-19.4	-23.1	72	186	2.4	162	5.1	1

R & M CONSULTANTS, INC.

SUSTITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING March, 1983

DAY 10

DAY 11

DAY 12

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG.	M/S	MW
0300	-17.9	-21.7	72	189	2.5	172	5.7	1	0300	-15.8	-18.0	83	179	2.9	165	5.1	1
0600	-16.0	-19.4	75	167	2.6	171	5.7	1	0600	-11.8	-14.3	82	180	2.9	153	5.1	1
0900	-12.8	-17.1	70	182	3.4	153	6.3	16	0900	-9.5	-12.9	76	172	3.0	173	5.1	18
1200	-10.0	-15.9	62	164	3.0	152	5.1	31	1200	-6.4	-9.9	76	191	2.2	185	4.4	34
1500	-10.7	-16.0	65	152	3.6	150	5.1	13	1500	-8.1	-11.1	79	194	3.8	201	5.7	13
1800	-14.0	-17.5	75	170	2.5	161	3.8	1	1800	-8.6	-10.0	90	183	3.7	192	5.7	0
2100	-14.4	-16.9	81	178	2.7	152	5.1	0	2100	-10.6	-11.5	93	183	3.0	195	5.1	1
2400	-14.2	-16.8	81	182	2.6	173	4.4	1	2400	-12.6	-13.7	92	186	3.5	197	5.1	1

DAY 13

DAY 14

DAY 15

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG.	M/S	MW
0300	-8.4	-10.6	84	193	2.2	218	3.8	0	0300	-10.1	-12.2	85	205	1.9	196	4.4	1
0600	-10.9	-12.8	86	173	3.3	155	6.3	1	0600	-10.5	-12.4	86	176	2.2	145	5.7	1
0900	-5.9	-10.8	68	162	3.9	154	6.3	30	0900	-9.8	-14.4	69	186	2.6	179	6.3	22
1200	-3.1	-9.5	61	142	4.8	140	7.0	40	1200	-6.4	-12.7	61	179	2.4	195	3.8	40
1500	-5.1	-9.2	73	185	2.8	141	4.4	22	1500	-6.5	-10.7	72	198	2.4	182	3.8	18
1800	-9.7	-12.1	83	195	2.3	194	5.1	1	1800	-6.7	-9.3	82	190	2.5	195	4.4	0
2100	-10.2	-12.4	84	202	2.5	199	4.4	1	2100	-9.3	-11.7	83	183	2.5	184	3.8	0
2400	-10.9	-13.2	83	202	2.3	211	4.4	1	2400	-11.0	-12.6	88	195	2.2	164	4.4	1

DAY 16

DAY 17

DAY 18

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG.	M/S	MW
0300	-5.9	-6.6	95	175	2.6	164	4.4	1	0300	-8.4	-10.3	86	183	2.8	201	5.1	1
0600	-8.6	-9.4	94	161	2.9	169	5.1	1	0600	-9.6	-11.4	87	185	2.6	157	5.7	1
0900	-5.1	-10.4	66	191	2.1	159	4.4	30	0900	-8.5	-13.5	67	168	3.5	181	5.7	30
1200	-5.4	-9.1	75	173	2.6	179	5.1	38	1200	-6.2	-12.9	59	190	2.1	164	4.4	43
1500	-5.4	-9.0	76	183	2.1	166	3.8	22	1500	-5.5	-10.4	68	188	2.0	172	3.2	25
1800	-7.0	-8.4	90	168	2.4	162	4.4	1	1800	-8.7	-10.9	84	177	2.3	162	3.8	1
2100	-7.6	-9.0	90	183	2.1	173	3.8	1	2100	-11.4	-13.0	88	176	2.8	170	5.1	1
2400	-7.4	-9.1	88	180	2.9	191	5.1	1	2400	-12.1	-13.3	91	182	2.4	167	4.4	1

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING March, 1983

DAY 19

DAY 20

DAY 21

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	-13.4	-16.0	81	198	2.5	213	0300	-10.1	-11.9	87	193	2.7	193	0300	-10.3	-12.4	85	188	2.8	187
0600	-14.3	-16.4	84	184	2.9	182	0600	-9.7	-11.6	86	190	2.7	177	0600	-11.3	-13.2	86	190	2.7	186
0900	-12.8	-19.1	59	196	2.8	166	0900	-8.4	-12.4	73	170	2.9	153	0900	-8.4	-13.0	69	180	3.6	160
1200	-9.2	-16.6	55	200	2.9	203	1200	-7.7	-12.4	69	196	2.8	140	1200	-7.5	-12.7	66	205	3.1	175
1500	-7.4	-14.7	56	193	2.9	198	1500	-7.6	-12.1	70	199	3.2	192	1500	-6.7	-11.8	67	196	3.2	198
1800	-11.8	-14.3	82	190	2.1	190	1800	-10.7	-12.5	87	179	2.2	158	1800	-10.4	-12.9	82	195	3.0	199
2100	-14.0	-15.9	86	194	2.4	196	2100	-11.8	-13.7	86	184	2.6	168	2100	-11.8	-14.7	79	191	2.4	190
2400	-11.2	-13.2	85	191	3.1	162	2400	-10.2	-12.1	86	209	2.6	205	2400	-12.5	-15.1	81	198	2.5	213

DAY 22

DAY 23

DAY 24

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	-15.0	-17.5	81	199	2.5	220	0300	-13.9	-16.5	81	193	2.3	176	0300	-12.9	-15.6	80	173	2.2	156
0600	-12.5	-15.4	79	202	2.4	210	0600	-13.8	-16.5	80	201	2.9	204	0600	-11.8	-14.7	79	165	2.9	165
0900	-9.3	-15.6	60	194	2.5	192	0900	-12.4	-18.6	60	197	2.4	209	0900	-9.7	-13.8	72	156	3.7	157
1200	-7.1	-13.5	60	204	2.6	186	1200	-8.7	-15.3	59	201	2.8	215	1200	-6.1	-11.6	65	139	5.0	132
1500	-7.0	-12.6	64	216	3.0	202	1500	-7.8	-13.6	63	205	3.1	205	1500	-5.5	-11.2	64	146	3.8	147
1800	-9.7	-12.8	78	199	3.2	205	1800	-10.9	-14.1	77	179	2.3	192	1800	-8.4	-11.7	77	158	3.2	151
2100	-13.1	-15.8	80	198	2.6	194	2100	-13.6	-15.9	83	193	1.8	175	2100	-8.5	-11.5	79	180	2.3	147
2400	*****	*****	82	198	2.0	219	2400	-12.9	-15.2	83	215	1.9	206	2400	-11.7	-14.5	80	184	2.1	163

DAY 25

DAY 26

DAY 27

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	-16.5	-18.0	88	199	2.0	171	0300	-13.8	-16.2	82	206	3.2	203	0300	-9.5	-14.5	67	119	2.0	118
0600	-13.2	-15.2	85	206	2.5	203	0600	-12.9	-15.6	80	217	3.3	197	0600	-11.8	-16.3	69	154	1.2	083
0900	-10.8	-17.4	58	198	2.1	193	0900	-4.9	-15.9	42	233	1.7	214	0900	-10.0	-19.0	48	230	2.0	230
1200	-8.7	-14.8	61	212	2.2	211	1200	-2.3	-15.8	35	260	1.0	194	1200	-7.5	-15.5	53	208	1.8	141
1500	-7.7	-12.7	67	201	3.2	191	1500	-5.1	-13.2	53	107	5.0	097	1500	-5.8	-14.9	49	208	1.8	183
1800	-10.8	-13.7	79	193	3.7	190	1800	-7.1	-12.5	65	137	2.1	134	1800	-9.0	-13.8	68	193	2.3	191
2100	-9.9	-12.7	80	180	3.2	187	2100	-9.5	-13.4	73	135	4.3	144	2100	-13.4	-16.7	76	201	2.4	206
2400	-12.4	-15.0	81	205	2.4	197	2400	-10.2	-13.9	74	134	5.0	125	2400	-15.3	-17.8	81	206	3.3	206

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING March, 1983

DAY 28

DAY 29

DAY 30

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.							
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-13.5	-16.2	80	189	3.1	199	5.7	1	0300	-13.1	-14.8	87	199	2.5	211	5.1	1	0300	-12.8	-14.3	89	183	2.2	184	3.8	1
0600	-13.6	-16.3	80	172	2.9	156	5.1	3	0600	-13.7	-15.6	86	173	2.8	160	5.7	4	0600	*****	*****	83	203	2.3	204	3.8	5
0900	-11.8	-17.0	65	166	3.4	150	5.7	29	0900	-7.3	-15.3	53	208	2.4	182	5.1	41	0900	-10.0	-17.1	56	192	2.4	166	5.1	42
1200	-5.7	-13.3	55	187	2.5	153	5.7	49	1200	-4.5	-10.5	63	074	1.7	090	10.2	51	1200	-6.8	-13.7	58	206	3.2	202	4.4	52
1500	-6.1	-12.8	59	195	2.3	195	3.8	32	1500	-5.7	-11.2	65	113	3.7	095	9.5	32	1500	-5.7	-12.2	60	198	2.7	201	3.8	33
1800	-8.7	-12.6	73	180	2.3	172	4.4	2	1800	-9.2	-12.0	80	192	3.3	207	5.1	2	1800	-8.5	-12.1	75	193	2.6	194	4.4	3
2100	*****	*****	83	177	2.6	166	5.1	1	2100	-11.1	-13.0	86	181	2.6	163	4.4	1	2100	-12.0	-14.6	81	193	2.4	208	4.4	1
2400	-13.4	-15.7	83	180	2.7	155	5.1	1	2400	-13.1	-14.8	87	183	2.2	159	4.4	1	2400	-11.4	-13.9	82	185	2.3	194	3.8	1

DAY 31

HOUR	DEW	WIND	WIND	GUST	MAX.			
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW
0300	-10.7	-13.5	80	194	2.5	197	4.4	1
0600	-9.7	-12.8	78	197	2.7	190	4.4	4
0900	-7.5	-11.9	71	207	2.8	174	4.4	28
1200	-3.0	-9.7	60	200	2.8	192	3.8	51
1500	-3.3	-7.8	71	199	2.6	208	3.8	24
1800	-8.3	-11.1	80	189	3.0	181	4.4	3
2100	-9.0	-11.5	82	181	2.5	154	5.1	1
2400	-10.6	-12.5	86	183	2.6	162	6.3	1

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

MONTHLY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING March, 1983

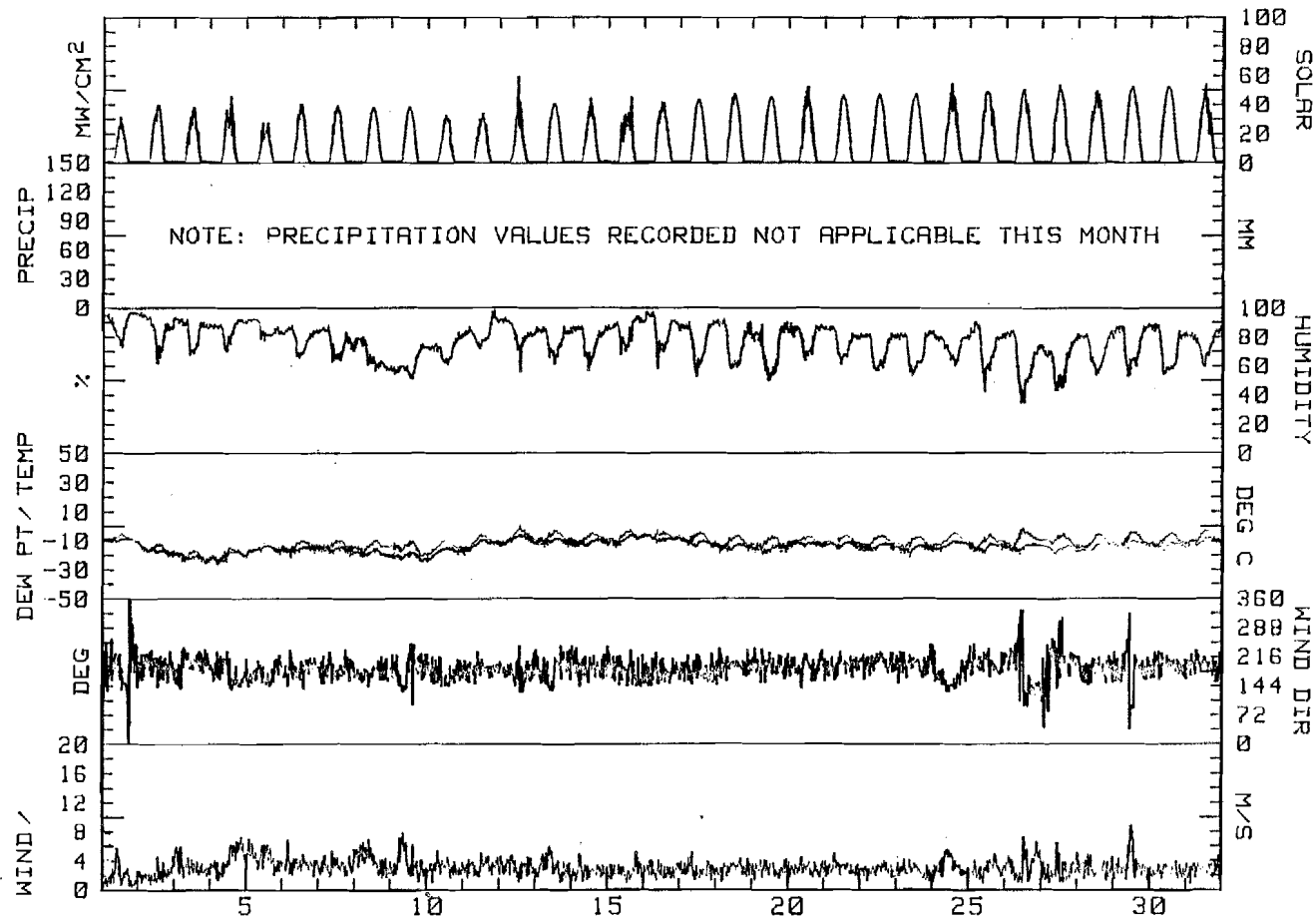
DAY	MAX. TEMP. DEG C	MIN. TEMP. DEG C	MEAN TEMP. DEG C	RES. WIND DIR. DEG	RES. WIND SPD. M/S	AVG. WIND SPD. M/S	MAX. GUST DIR. DEG	MAX. GUST SPD. M/S	P'VAL DIR.	MEAN RH %	MEAN DP DEG C	PRECIP MM	DAY'S SOLAR ENERGY WH/SQM	DAY
1	-5.0	-10.9	-8.0	185	1.4	1.8	204	7.0	S	88	-9.5	****	1618	1
2	-10.4	-19.5	-15.0	189	1.9	2.1	173	6.3	SSW	86	-17.0	****	2513	2
3	-16.8	-24.1	-20.5	193	2.9	3.2	152	7.0	SSW	84	-22.1	****	2260	3
4	-14.8	-24.7	-19.8	169	3.8	4.1	143	8.9	SSW	86	-20.9	****	2223	4
5	-10.9	-18.8	-14.9	170	4.2	4.4	144	8.3	SSE	86	-16.1	****	1593	5
6	-9.9	-20.2	-15.1	185	3.4	3.5	146	8.3	S	79	-16.2	****	2408	6
7	-9.6	-17.5	-13.6	182	3.1	3.3	197	7.0	S	76	-16.5	****	2500	7
8	-9.6	-18.7	-14.2	174	3.9	4.0	166	8.9	S	86	-19.0	****	2558	8
9	-10.2	-20.9	-15.6	172	3.0	3.5	134	9.5	S	61	-21.1	****	2573	9
10	-9.7	-21.1	-15.4	172	2.8	3.0	153	6.3	SSE	72	-18.0	****	2048	10
11	-5.7	-17.4	-11.6	184	3.1	3.2	201	5.7	S	83	-12.9	****	2153	11
12	.3	-12.5	-6.1	177	2.9	3.1	187	6.3	S	83	-9.5	****	2175	12
13	-3.1	-12.5	-7.8	176	2.8	3.1	140	7.0	SSW	78	-11.0	****	2883	13
14	-4.7	-12.6	-8.7	188	2.3	2.5	179	6.3	S	78	-11.7	****	2530	14
15	-2.5	-13.2	-7.9	177	2.3	2.4	144	5.7	S	85	-9.4	****	2503	15
16	-2.9	-8.7	-5.8	176	2.4	2.5	169	5.1	S	85	-8.8	****	2848	16
17	-4.0	-13.2	-8.6	180	2.5	2.7	157	5.7	S	78	-11.8	****	3100	17
18	-6.2	-17.0	-11.6	194	2.8	2.8	192	5.1	SSW	76	-14.6	****	3388	18
19	-7.3	-16.2	-11.8	193	2.7	2.8	162	5.7	S	73	-16.0	****	3288	19
20	-6.9	-12.9	-9.9	190	2.7	2.8	140	5.7	SSW	80	-12.6	****	3030	20
21	-6.2	-13.9	-10.1	193	2.9	3.0	160	6.3	SSW	77	-13.1	****	3245	21
22	-6.4	-15.0	-10.7	202	2.6	2.7	220	4.4	SSW	72	-14.8	****	3415	22
23	-7.5	-16.1	-11.8	198	2.4	2.5	176	5.1	SSW	72	-15.8	****	3525	23
24	-4.7	-14.5	-9.6	158	3.0	3.2	132	7.0	SSE	74	-13.2	****	3248	24
25	-5.8	-16.5	-11.2	198	2.6	2.7	191	5.7	SSW	74	-14.8	****	3645	25
26	-2.0	-15.1	-8.6	156	2.2	3.3	097	8.9	SE	64	-14.6	****	3560	26
27	-4.9	-15.5	-10.2	195	1.8	2.5	141	9.5	SSW	64	-15.8	****	3665	27
28	-5.0M	-16.7M	-10.9M	180	2.7	2.8	199	5.7	SSW	72	-15.1	****	3563	28
29	-4.0	-14.3	-9.2	171M	2.0M	3.3M	090M	10.2M	SSW(M)	76	-13.1	****	4058	29
30	-4.5M	-14.8M	-9.7M	195	2.5	2.6	166	5.1	SSW	73	-14.0	****	4210	30
31	-2.9	-13.8	-8.4	194	2.7	2.8	162	6.3	SSW	76	-11.3	****	3470	31
MONTH	.3M	-24.7M	-11.3M	182M	2.7M	3.0M	090M	10.2M	S(M)	77	-14.5	****	89788	

GUST VEL. AT MAX. GUST MINUS 2 INTERVALS 7.6
GUST VEL. AT MAX. GUST MINUS 1 INTERVAL 9.5
GUST VEL. AT MAX. GUST PLUS 1 INTERVAL 9.5
GUST VEL. AT MAX. GUST PLUS 2 INTERVALS 9.5

NOTE: RELATIVE HUMIDITY READINGS ARE UNRELIABLE WHEN WIND SPEEDS ARE LESS THAN ONE METER PER SECOND. SUCH READINGS HAVE NOT BEEN INCLUDED IN THE DAILY OR MONTHLY MEAN FOR RELATIVE HUMIDITY AND DEW POINT.

**** SEE NOTES AT THE BACK OF THIS REPORT ****

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
March, 1983



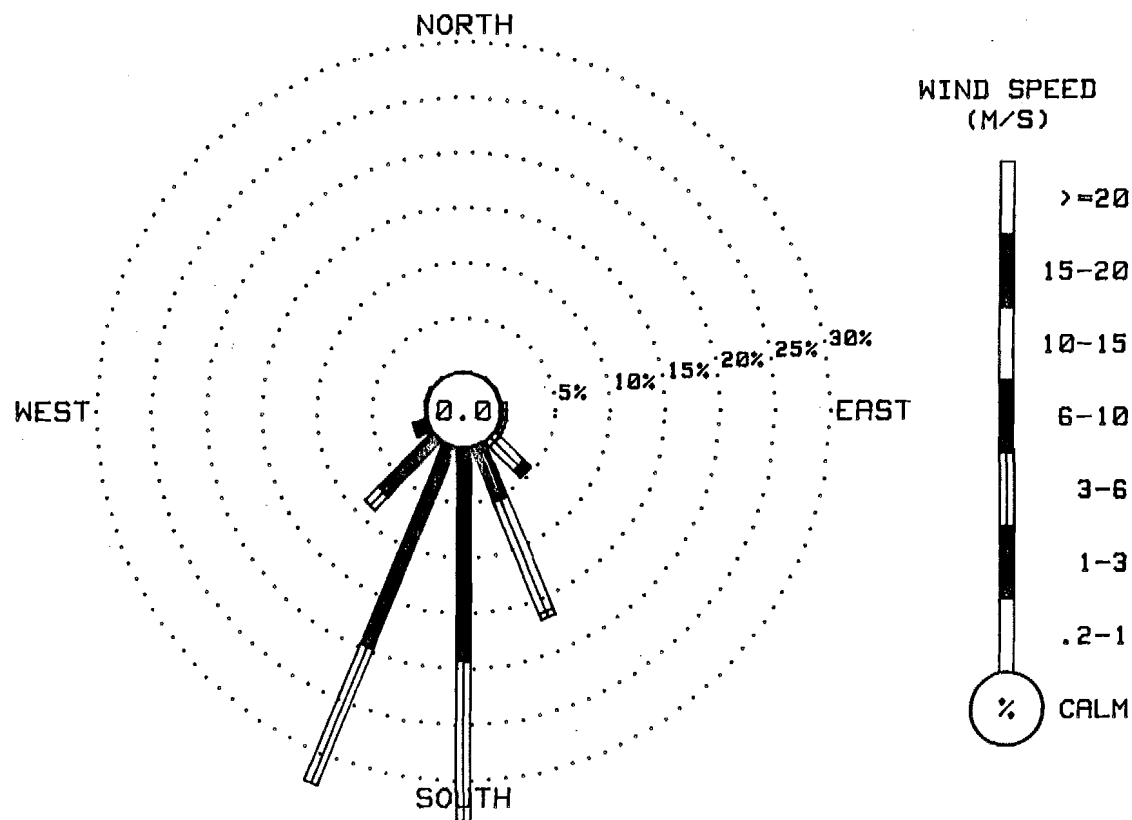
R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

WIND FREQUENCY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING March, 1983

DIRECTION	VELOCITY (M/S)							TOTAL
	0.2 TO 1.0	1.0 TO 3.0	3.0 TO 6.0	6.0 TO 10.0	10.0 TO 15.0	15.0 TO 20.0	20.0 OR GREATER	
N	.03	.07	0.00	0.00	0.00	0.00	0.00	.10
NNE	0.00	.03	0.00	0.00	0.00	0.00	0.00	.03
NE	.03	.03	.03	0.00	0.00	0.00	0.00	.10
ENE	0.00	.03	.07	0.00	0.00	0.00	0.00	.10
E	0.00	.07	.13	.40	0.00	0.00	0.00	.61
ESE	.03	.20	.44	0.00	0.00	0.00	0.00	.67
SE	.10	.61	3.07	.84	0.00	0.00	0.00	4.61
SSE	0.00	5.36	10.85	.57	0.00	0.00	0.00	16.77
S	.20	19.03	14.35	0.00	0.00	0.00	0.00	33.58
SSW	.13	19.54	13.07	0.00	0.00	0.00	0.00	32.74
SW	.20	6.84	1.68	0.00	0.00	0.00	0.00	8.72
WSW	.17	1.11	.10	0.00	0.00	0.00	0.00	1.38
W	.03	.13	0.00	0.00	0.00	0.00	0.00	.17
WNW	.07	.13	.03	0.00	0.00	0.00	0.00	.24
NW	.03	.03	0.00	.03	0.00	0.00	0.00	.10
NNW	0.00	.07	0.00	0.00	0.00	0.00	0.00	.07
CALM								0.00
TOTAL	1.04	53.28	43.82	1.85	0.00	0.00	0.00	100.00

NOTE: ALL FREQUENCIES ARE EXPRESSED IN PERCENT
2969 VALID WIND OBSERVATIONS USED TO DEVELOP FREQUENCY SUMMARY

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
March, 1983



WIND ROSE PLOT

[illegible]

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING April, 1983

DAY 01

DAY 02

DAY 03

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	-8.7	-11.1	83	200	2.1	170	0300	-10.3	-13.2	79	179	3.1	160	0300	-11.3	-13.9	81	178	2.5	172
0600	-8.2	-11.0	80	194	2.4	198	0600	-7.9	-11.5	75	174	2.8	172	0600	-8.1	-11.9	74	181	2.4	150
0900	*****	*****	54	202	2.5	198	0900	-3.7	-12.2	52	170	2.9	155	0900	-6.1	-14.9	50	190	2.5	168
1200	-3.1	-10.2	58	205	2.2	207	1200	-2	-9.2	51	180	1.8	162	1200	-2.4	-10.0	56	248	2.1	236
1500	-2.8	-8.6	64	184	2.6	177	1500	-5	-8.4	55	175	1.7	180	1500	-1.7	-8.9	58	139	1.8	096
1800	-5.3	-8.5	78	179	3.2	184	1800	-4.1	-8.9	69	166	2.6	151	1800	-7.5	-9.9	83	196	3.4	189
2100	-7.5	-10.5	79	171	4.1	176	2100	-7.2	-10.4	78	175	2.8	182	2100	-3.4	-6.7	78	190	2.7	182
2400	-8.9	-12.2	77	181	3.3	199	2400	-10.1	-12.9	80	170	3.0	159	2400	-4.2	-5.9	88	139	1.4	141

DAY 04

DAY 05

DAY 06

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	-1.3	-5.1	75	107	7.1	098	0300	-11.5	-12.4	93	179	2.7	155	0300	-11.1	-13.3	84	182	2.3	159
0600	-1.4	-4.1	82	106	8.9	103	0600	-10.4	-12.6	84	197	2.2	153	0600	-11.1	-13.4	83	175	2.7	166
0900	.2	*****	77	129	2.6	099	0900	-7.6	-10.6	79	212	2.5	224	0900	-6.8	-14.3	55	179	2.5	158
1200	.1	-1.7	88	094	7.5	085	1200	-2.3	-9.2	59	225	2.3	171	1200	-4.2	-12.6	52	176	2.2	195
1500	.9	-1.5	84	102	3.0	097	1500	-5.0	-8.9	74	208	2.9	191	1500	-4.2	-11.2	58	196	1.6	220
1800	-2.5	-2.9	97	254	5.6	258	1800	-6.0	-9.5	76	191	3.8	207	1800	-8.3	-11.3	79	184	2.8	188
2100	-4.0	-5.1	92	033	4.3	043	2100	-8.6	-11.4	80	164	3.2	148	2100	-9.8	-12.5	81	171	3.3	147
2400	-6.8	-7.8	93	157	1.1	178	2400	-9.1	-11.6	82	177	1.7	195	2400	-10.2	-13.5	77	170	3.2	150

DAY 07

DAY 08

DAY 09

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	-10.3	-13.9	75	182	3.0	211	0300	*****	*****	76	172	2.8	158	0300	-10.6	-13.5	79	184	1.6	158
0600	-11.0	-15.4	70	177	3.2	149	0600	*****	*****	74	185	1.8	190	0600	-9.2	-11.7	82	189	1.4	175
0900	-5.7	-16.4	43	183	2.4	155	0900	*****	*****	43	146	1.3	185	0900	-7.5	-12.5	67	197	1.6	193
1200	-3.4	-13.2	47	180	2.1	152	1200	-2.5	-14.7	39	213	1.3	225	1200	-2.4	-12.5	46	219	1.0	190
1500	-4.3	-11.8	56	182	2.0	187	1500	-2.3	-11.6	49	219	1.4	211	1500	-2.5	*****	59	215	1.8	212
1800	-7.7	-12.2	70	177	2.7	185	1800	-7.4	-11.2	74	180	2.2	174	1800	-7.6	-8.6	93	338	.7	023
2100	-10.0	-13.6	75	170	3.1	156	2100	-8.4	-12.0	75	166	3.1	174	2100	-10.2	-11.0	94	171	2.3	177
2400	-11.0	-14.7	74	165	3.1	155	2400	-9.3	-12.4	78	179	2.7	175	2400	-12.8	-14.0	91	179	2.8	173

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING April, 1983

DAY 10

DAY 11

DAY 12

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.
0300	-14.3	-15.7	89	195	2.4	179 3.8	0300	*****	*****	**	***	****	***	0300	*****	*****	**	***	****
0600	*****	*****	69	185	2.1	203 3.8	0600	*****	*****	**	***	****	***	0600	*****	*****	**	***	****
0900	*****	*****	**	***	****	***	0900	*****	*****	**	***	****	***	0900	*****	*****	**	***	****
1200	*****	*****	**	***	****	***	1200	*****	*****	**	***	****	***	1200	*****	*****	**	***	****
1500	*****	*****	**	***	****	***	1500	*****	*****	**	***	****	***	1500	*****	*****	**	***	****
1800	*****	*****	**	***	****	***	1800	*****	*****	**	***	****	***	1800	*****	*****	**	***	****
2100	*****	*****	**	***	****	***	2100	*****	*****	**	***	****	***	2100	*****	*****	**	***	****
2400	*****	*****	**	***	****	***	2400	*****	*****	**	***	****	***	2400	*****	*****	**	***	****

DAY 13

DAY 14

DAY 15

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.
0300	*****	*****	**	***	****	***	0300	*****	*****	**	***	****	***	0300	*****	*****	**	***	****
0600	*****	*****	**	***	****	***	0600	*****	*****	**	***	****	***	0600	*****	*****	**	***	****
0900	*****	*****	**	***	****	***	0900	*****	*****	**	***	****	***	0900	*****	*****	**	***	****
1200	*****	*****	**	***	****	***	1200	*****	*****	**	***	****	***	1200	*****	*****	**	***	****
1500	*****	*****	**	***	****	***	1500	*****	*****	**	***	****	***	1500	*****	*****	**	***	****
1800	*****	*****	**	***	****	***	1800	*****	*****	**	***	****	***	1800	*****	*****	**	***	****
2100	*****	*****	**	***	****	***	2100	*****	*****	**	***	****	***	2100	*****	*****	**	***	****
2400	*****	*****	**	***	****	***	2400	*****	*****	**	***	****	***	2400	*****	*****	**	***	****

DAY 16

DAY 17

DAY 18

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.
0300	*****	*****	**	***	****	***	0300	*****	*****	**	***	****	***	0300	*****	*****	**	***	****
0600	*****	*****	**	***	****	***	0600	*****	*****	**	***	****	***	0600	*****	*****	**	***	****
0900	*****	*****	**	***	****	***	0900	*****	*****	**	***	****	***	0900	*****	*****	**	***	****
1200	*****	*****	**	***	****	***	1200	*****	*****	**	***	****	***	1200	*****	*****	**	***	****
1500	*****	*****	**	***	****	***	1500	*****	*****	**	***	****	***	1500	*****	*****	**	***	****
1800	*****	*****	**	***	****	***	1800	*****	*****	**	***	****	***	1800	*****	*****	**	***	****
2100	*****	*****	**	***	****	***	2100	*****	*****	**	***	****	***	2100	*****	*****	**	***	****
2400	*****	*****	**	***	****	***	2400	*****	*****	**	***	****	***	2400	*****	*****	**	***	****

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING April, 1983

DAY 19

DAY 20

DAY 21

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.					
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	MAX.
	DEG C	DEG C	%	DEG.	M/S	DEG.		DEG C	DEG C	%	DEG.	M/S	DEG.		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW
0300	*****	*****	**	***	*****	***	0300	*****	*****	**	***	*****	***	0300	*****	*****	**	***	*****	***	*****	***
0600	*****	*****	**	***	*****	***	0600	*****	*****	**	***	*****	***	0600	*****	*****	**	***	*****	***	*****	***
0900	*****	*****	**	***	*****	***	0900	*****	*****	**	***	*****	***	0900	*****	*****	**	***	*****	***	*****	***
1200	*****	*****	**	***	*****	***	1200	*****	*****	**	***	*****	***	1200	*****	*****	**	***	*****	***	*****	***
1500	*****	*****	**	***	*****	***	1500	*****	*****	**	***	*****	***	1500	*****	*****	**	***	*****	***	*****	***
1800	*****	*****	**	***	*****	***	1800	*****	*****	**	***	*****	***	1800	*****	*****	**	***	*****	***	*****	***
2100	*****	*****	**	***	*****	***	2100	*****	*****	**	***	*****	***	2100	*****	*****	**	***	*****	***	*****	***
2400	*****	*****	**	***	*****	***	2400	*****	*****	**	***	*****	***	2400	*****	*****	**	***	*****	***	*****	***

DAY 22

DAY 23

DAY 24

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.		
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	
	DEG C	DEG C	%	DEG.	M/S	DEG.		DEG C	DEG C	%	DEG.	M/S	DEG.	DEG C	DEG C	%	DEG.	M/S	
0300	*****	*****	**	***	****	***	0300	*****	*****	**	***	****	***	0300	*****	*****	**	***	****
0600	*****	*****	**	***	****	***	0600	*****	*****	**	***	****	***	0600	*****	*****	**	***	****
0900	*****	*****	**	***	****	***	0900	*****	*****	**	***	****	***	0900	*****	*****	**	***	****
1200	*****	*****	**	***	****	***	1200	*****	*****	**	***	****	***	1200	*****	*****	**	***	****
1500	*****	*****	**	***	****	***	1500	*****	*****	**	***	****	***	1500	*****	*****	**	***	****
1800	*****	*****	**	***	****	***	1800	*****	*****	**	***	****	***	1800	*****	*****	**	***	****
2100	*****	*****	**	***	****	***	2100	*****	*****	**	***	****	***	2100	*****	*****	**	***	****
2400	*****	*****	**	***	****	***	2400	*****	*****	**	***	****	***	2400	*****	*****	**	***	****

DAY 25

DAY 26

DAY 27

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.						
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	
	DEG C	DEG C	%	DEG.	M/S	DEG.		DEG C	DEG C	%	DEG.	M/S	DEG.		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	*****	*****	**	***	****	***	0300	*****	*****	**	***	****	***	0300	*****	*****	**	***	****	***	****	***	****
0600	*****	*****	**	***	****	***	0600	*****	*****	**	***	****	***	0600	*****	*****	**	***	****	***	****	***	****
0900	*****	*****	**	***	****	***	0900	*****	*****	**	***	****	***	0900	*****	*****	**	***	****	***	****	***	****
1200	*****	*****	**	***	****	***	1200	*****	*****	**	***	****	***	1200	*****	*****	**	***	****	***	****	***	****
1500	*****	*****	**	***	****	***	1500	*****	*****	**	***	****	***	1500	*****	*****	**	***	****	***	****	***	****
1800	*****	*****	**	***	****	***	1800	*****	*****	**	***	****	***	1800	*****	*****	**	***	****	***	****	***	****
2100	*****	*****	**	***	****	***	2100	*****	*****	**	***	****	***	2100	*****	*****	**	***	****	***	****	***	****
2400	*****	*****	**	***	****	***	2400	*****	*****	**	***	****	***	2400	*****	*****	**	***	****	***	****	***	****

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING April, 1983

DAY 28

DAY 29

DAY 30

DAY 28							DAY 29							DAY 30						
HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	*****	*****	**	***	****	***	0300	*****	*****	**	***	****	***	0300	*****	*****	**	***	****	***
0600	*****	*****	**	***	****	***	0600	*****	*****	**	***	****	***	0600	*****	*****	**	***	****	***
0900	*****	*****	**	***	****	***	0900	*****	*****	**	***	****	***	0900	*****	*****	**	***	****	***
1200	*****	*****	**	***	****	***	1200	*****	*****	**	***	****	***	1200	*****	*****	**	***	****	***
1500	*****	*****	**	***	****	***	1500	*****	*****	**	***	****	***	1500	*****	*****	**	***	****	***
1800	*****	*****	**	***	****	***	1800	*****	*****	**	***	****	***	1800	*****	*****	**	***	****	***
2100	*****	*****	**	***	****	***	2100	*****	*****	**	***	****	***	2100	*****	*****	**	***	****	***
2400	*****	*****	**	***	****	***	2400	*****	*****	**	***	****	***	2400	*****	*****	**	***	****	***

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

MONTHLY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING April, 1983

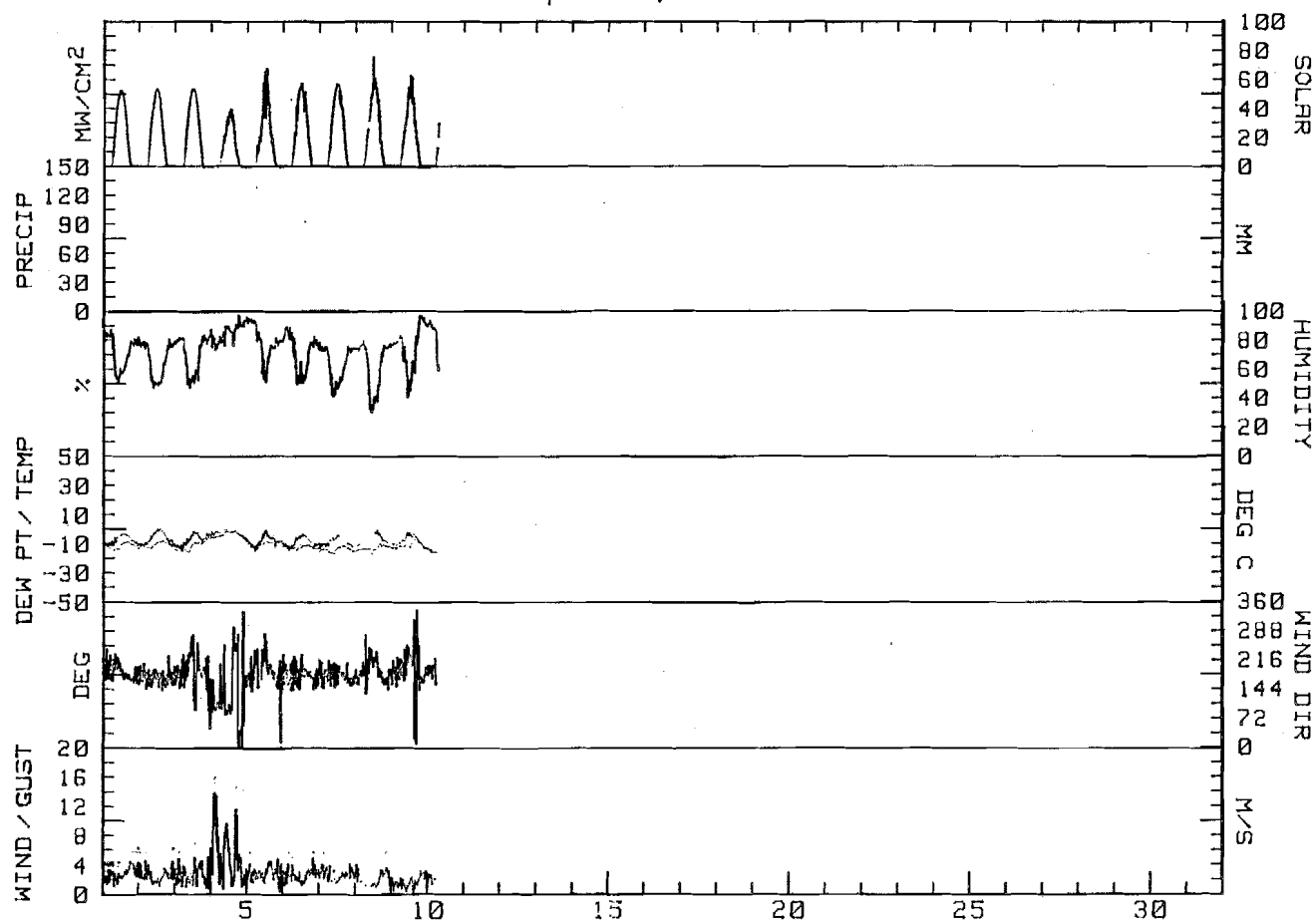
DAY	MAX. TEMP. DEG C	MIN. TEMP. DEG C	MEAN TEMP. DEG C	RES. WIND DIR. DEG	RES. WIND SPD. M/S	AVG. WIND SPD. M/S	MAX. GUST DIR. DEG	MAX. GUST SPD. M/S	P'VAL DIR.	MEAN RH %	MEAN DP DEG C	PRECIP MM	DAY'S SOLAR ENERGY WH/SQM	DAY
1	-2.4M	-11.4M	-6.9M	187M	2.8 M	2.9M	176M	5.7M	S(M)	73	-10.7	0.0	4210	1
2	1.1	-11.1	-5.0	173	2.6	2.7	160	6.3	S	67	-11.0	0.0	4325	2
3	-.9	-14.2	-7.6	186	2.1	2.7	096	7.0	S	71	-10.9	0.0	4383	3
4	1.8	-7.5	-2.9	104	3.2	5.4	098	15.9	E	86	-3.7	.4	2853	4
5	.1	-14.2	-7.1	192M	2.5M	2.9M	148M	6.3M	S(M)	79	-10.5	0.0	3908	5
6	-2.7	-13.4	-8.1	178	2.6	2.7	166	5.7	S	72	-12.4	0.0	4453	6
7	-3.1M	-12.6M	-7.9M	176M	2.7 M	2.8M	149M	5.7M	S(M)	64	-13.5	0.0	4600	7
8	.1	-11.3	-5.6	180M	2.2 M	2.4M	174M	5.7M	S (M)	63	-12.2	0.0	4426	8
9	-1.6	-12.8	-7.2	192	1.4	1.8	158	3.8	S	79	-11.2	0.0	4068	9
10	-12.2M	-14.5M	-13.4M	193M	2.3M	2.4M	179M	3.8M	SSW(M)	85M	-14.6M	0.0M	1129M	10
11	-7.9M	-20.2M	-14.1M	***	***	***	***	***	***	**	***	***	***	11
12	****	****	****	***	***	***	***	***	***	**	****	****	****	12
13	****	****	****	***	***	***	***	***	***	**	****	****	****	13
14	****	****	****	***	***	***	***	***	***	**	****	****	****	14
15	****	****	****	***	***	***	***	***	***	**	****	****	****	15
16	****	****	****	***	***	***	***	***	***	**	****	****	****	16
17	****	****	****	***	***	***	***	***	***	**	****	****	****	17
18	****	****	****	***	***	***	***	***	***	**	****	****	****	18
19	****	****	****	***	***	***	***	***	***	**	****	****	****	19
20	****	****	****	***	***	***	***	***	***	**	****	****	****	20
21	****	****	****	***	***	***	***	***	***	**	****	****	****	21
22	****	****	****	***	***	***	***	***	***	**	****	****	****	22
23	****	****	****	***	***	***	***	***	***	**	****	****	****	23
24	****	****	****	***	***	***	***	***	***	**	****	****	****	24
25	****	****	****	***	***	***	***	***	***	**	****	****	****	25
26	****	****	****	***	***	***	***	***	***	**	****	****	****	26
27	****	****	****	***	***	***	***	***	***	**	****	****	****	27
28	****	****	****	***	***	***	***	***	***	**	****	****	****	28
29	****	****	****	***	***	***	***	***	***	**	****	****	****	29
30	****	****	****	***	***	***	***	***	***	**	****	****	****	30
MONTH	1.8M	-20.2M	-7.8M	173M	2.2M	2.9M	098M	15.9M	S(M)	73M	-11.1M	.4M	38353M	

GUST VEL. AT MAX. GUST MINUS 2 INTERVALS 14.6
GUST VEL. AT MAX. GUST MINUS 1 INTERVAL 15.2
GUST VEL. AT MAX. GUST PLUS 1 INTERVAL 15.2
GUST VEL. AT MAX. GUST PLUS 2 INTERVALS 15.2

NOTE: RELATIVE HUMIDITY READINGS ARE UNRELIABLE WHEN WIND SPEEDS ARE LESS THAN ONE METER PER SECOND. SUCH READINGS HAVE NOT BEEN INCLUDED IN THE DAILY OR MONTHLY MEAN FOR RELATIVE HUMIDITY AND DEW POINT.

**** SEE NOTES AT THE BACK OF THIS REPORT ****

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
April, 1983



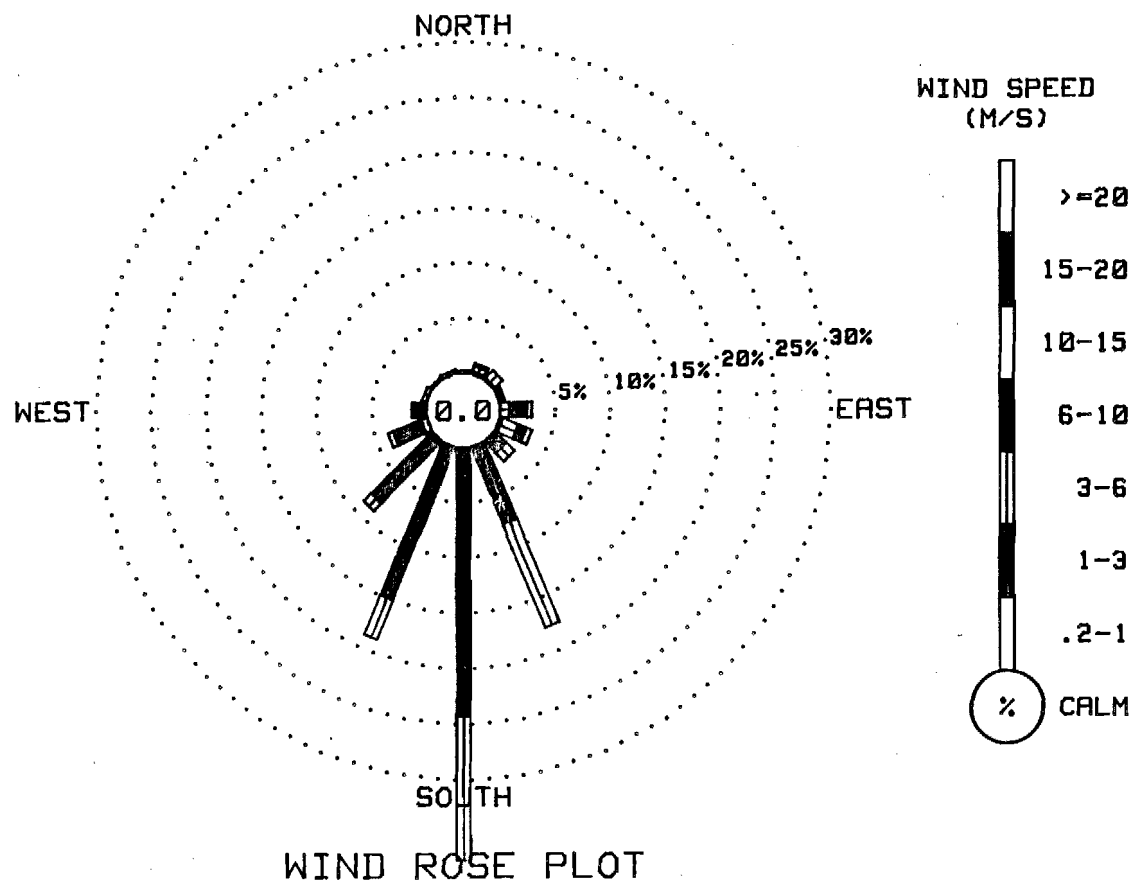
R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

WIND FREQUENCY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING April, 1983

DIRECTION	VELOCITY (M/S)							TOTAL
	0.2 TO 1.0	1.0 TO 3.0	3.0 TO 6.0	6.0 TO 10.0	10.0 TO 15.0	15.0 TO 20.0	20.0 OR GREATER	
N	0.00	.12	.12	0.00	0.00	0.00	0.00	.24
NNE	.24	.48	.24	0.00	0.00	0.00	0.00	.97
NE	.12	0.00	.97	0.00	0.00	0.00	0.00	1.09
ENE	.24	.24	0.00	0.00	0.00	0.00	0.00	.48
E	0.00	0.00	.85	1.57	.48	0.00	0.00	2.91
ESE	0.00	.24	1.57	.73	.61	0.00	0.00	3.15
SE	0.00	1.45	1.09	0.00	0.00	0.00	0.00	2.54
SSE	0.00	7.51	10.17	0.00	0.00	0.00	0.00	17.68
S	.12	24.09	12.95	0.00	0.00	0.00	0.00	37.17
SSW	.24	14.65	3.87	0.00	0.00	0.00	0.00	18.77
SW	.12	7.75	.97	0.00	0.00	0.00	0.00	8.84
WSW	.61	2.18	.36	.12	.48	0.00	0.00	3.75
W	0.00	1.09	.24	0.00	0.00	0.00	0.00	1.33
WNW	0.00	.48	0.00	0.00	0.00	0.00	0.00	.48
NW	.12	.12	0.00	0.00	0.00	0.00	0.00	.24
NNW	0.00	.36	0.00	0.00	0.00	0.00	0.00	.36
CALM	-----	-----	-----	-----	-----	-----	-----	0.00
TOTAL	1.82	60.77	33.41	2.42	1.57	0.00	0.00	100.00

NOTE: ALL FREQUENCIES ARE EXPRESSED IN PERCENT
826 VALID WIND OBSERVATIONS USED TO DEVELOP FREQUENCY SUMMARY

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
April, 1983



[illegible]

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDWG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDWG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW
0300	*****	*****	**	***	*****	***	*****	***	0300	*****	*****	**	***	*****	***	*****	***
0600	*****	*****	**	***	*****	***	*****	***	0600	*****	*****	**	***	*****	***	*****	***
0900	*****	*****	**	***	*****	***	*****	***	0900	*****	*****	**	***	*****	***	*****	***
1200	*****	*****	**	***	*****	***	*****	***	1200	*****	*****	**	***	*****	***	*****	***
1500	*****	*****	**	***	*****	***	*****	***	1500	*****	*****	**	***	*****	***	*****	***
1800	*****	*****	**	***	*****	***	*****	***	1800	*****	*****	**	***	*****	***	*****	***
2100	*****	*****	**	***	*****	***	*****	***	2100	*****	*****	**	***	*****	***	*****	***
2400	*****	*****	**	***	*****	***	*****	***	2400	*****	*****	**	***	*****	***	*****	***

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING May, 1983

DAY 10

DAY 11

DAY 12

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	*****	*****	**	***	****	***	*****	***	0300	-5	-5.1	71	229	.4	090	1.9	1
0600	*****	*****	**	***	****	***	*****	***	0600	2.4	*****	53	205	.8	217	2.5	27
0900	*****	*****	**	***	****	***	*****	***	0900	7.5	*****	31	247	.3	224	1.9	57
1200	7.9	-7.9	32	129M	1.4M	095M	3.2M	73	1200	8.2	-12.3	22	148	1.7	167	4.4	61
1500	7.4	-5.8	39	201	1.5	143	3.8	52	1500	8.5	-13.2	20	204	1.8	156	3.8	41
1800	7.5	-6.0	38	243	2.8	248	4.4	17	1800	7.6	-10.8	26	237	2.3	241	4.4	11
2100	2.4	-4.5	60	213	1.7	191	3.2	1	2100	3.3	-4.9	55	195	1.7	194	2.5	1
2400	-2	-5.0	70	193	1.6	151	3.8	1	2400	2.6	*****	56	186	.9	167	2.5	1

DAY 13

DAY 14

DAY 15

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	.9	-2.2	80	180	1.8	194	3.2	1	0300	3.5	*****	74	210	1.4	228	2.5	1
0600	4.3	-2.5	61	172	1.8	159	3.2	24	0600	3.8	-4	74	219	.8	250	1.9	13
0900	7.7	-2.7	48	140	1.2	126	4.4	43	0900	7.9	*****	56	259	.6	201	2.5	40
1200	9.3	-3.4	41	156	2.8	149	5.7	69	1200	8.6	-1.0	51	164	.3	132	4.4	30
1500	8.2	-3.7	43	162	3.5	158	6.3	22	1500	8.9	-1.3	49	041	1.2	086	5.1	24
1800	7.8	-2.9	47	121	3.2	135	5.1	10	1800	6.1	1.5	72	092	1.3	268	6.3	10
2100	4.9	-2.2	60	182	1.0	154	3.2	1	2100	4.5	*****	72	157	1.4	164	3.2	1
2400	2.1	-1.7	76	191	1.3	176	2.5	0	2400	3.4	1.4	87	171	1.5	213	3.8	1

DAY 16

DAY 17

DAY 18

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	.8	-3.1	75	210	1.6	228	3.8	1	0300	-1	-4	98	003M	1.1M	009M	1.9M	1
0600	2.1	-3.2	68	049	.2	125	5.1	24	0600	2.0	*****	87	178M	.7M	144M	2.5M	20
0900	4.6	-3.4	56	115	3.6	115	7.0	41	0900	3.5	-1	77	008	1.0	032	2.5	26
1200	3.9	-1.6	67	120	4.1	110	7.0	22	1200	5.8	1.6	74	028	.9	025	4.4	48
1500	4.3	.8	78	350	.2	147	4.4	21	1500	5.1	.5	72	015	1.4	088	5.1	30
1800	2.6	.6	87	354	2.1	010	3.8	6	1800	2.8	.2	83	018	2.5	024	5.7	7
2100	.9	-3	92	265	.9	258	1.9	1	2100	1.6	-7	85	025	1.6	009	4.4	1
2400	.2	-5	95	350	.2	132	1.9	1	2400	.8	*****	89	202	1.0	157	2.5	1

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING May, 1983

DAY 19

DAY 20

DAY 21

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	-1.1	-3.2	86	195	1.2	214	3.2	1	0300	2.6	-8.78	78	019	1.3	347	4.4	1
0600	3.0	*****	67	195	1.0	202	2.5	32	0600	5.3	-2.8	56	011	1.1	028	4.4	20
0900	5.7	-2.1	57	015	1.1	009	5.1	64	0900	7.9	-7.9	32	287	3.5	260	12.7	18
1200	7.8	-7.6	33	188	.3	328	3.8	66	1200	11.1	-7.3	27	266	7.5	266	11.4	90
1500	8.5	-9.6	27	231	2.7	234	6.3	53	1500	10.5	-7.8	27	273	6.6	260	11.4	59
1800	7.7	-6.2	37	272	4.8	272	7.6	27	1800	8.8	-8.0	30	284	4.6	276	8.3	6
2100	5.1	-4.8	49	265	4.6	251	8.9	1	2100	7.9	-8.3	31	278	3.0	266	7.0	2
2400	3.2	-6.76	037	1.1	031	5.1	1	2400	4.1	-4.9	52	234	1.4	271	6.3	1	2400
				</													

DAY 22

DAY 23

DAY 24

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	1.7	*****	88	033	1.5	033	3.8	1	0300	1.2	-6.88	88	049	1.7	043	3.8	1
0600	2.6	.5	86	009	.6	004	1.9	7	0600	1.5	-8.85	85	037	1.8	034	3.8	10
0900	4.9	*****	66	022	.8	038	2.5	21	0900	4.9	-2.4	59	021	3.1	023	5.1	67
1200	7.4	.6	62	060	1.6	103	5.1	51	1200	6.0	-2.9	53	060	3.1	060	7.0	46
1500	7.2	-1.2	55	062	3.3	092	8.3	24	1500	7.5	-5.0	41	092	4.1	109	8.9	48
1800	3.8	1.2	83	013	2.7	005	6.3	3	1800	6.2	-6.5	40	122	5.1	113	8.3	13
2100	2.7	.6	86	025	1.0	016	3.8	1	2100	3.6	-5.9	50	104	4.9	093	7.6	1
2400	2.2	*****	85	057	.9	052	3.2	0	2400	.9	-5.3	63	137	1.1	096	5.7	1

DAY 25

DAY 26

DAY 27

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.		
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD		
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW			
0300	-5	-7.5	59	170	1.3	135	2.5	2	0300	1.3	-6.87	116	1.3	140	4.4	1	0300	.9	
0600	3.1	-5.8	52	187	.3	173	2.5	23	0600	2.1	*****	85	186	1.1	148	3.2	8	0600	3.4
0900	8.7	-6.1	35	013	2.2	003	3.8	36	0900	2.3	-1.84	238	.4	188	2.5	13	0900	6.3	
1200	9.9	-7.9	28	350	1.8	034	6.3	25	1200	4.7	.7	75	017	2.9	024	6.3	41	1200	7.3
1500	9.4	-3.0	42	045	.6	150	8.9	24	1500	5.2	-6.66	014	1.6	021	7.0	24	1500	7.5	
1800	5.8	1.6	74	347	1.3	263	8.3	20	1800	6.8	-2.7	51	228	2.0	238	5.1	15	1800	6.8
2100	4.3	.5	76	180	2.2	193	6.3	1	2100	3.3	-9.74	037	2.6	040	7.0	1	2100	5.2	
2400	3.4	.5	81	152	1.4	123	3.8	1	2400	.7	*****	84	165	.7	136	3.2	0	2400	4.4

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING May, 1983

DAY 28

DAY 29

DAY 30

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MM		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MM	
0300	4.1	****	81	134	.8	130	3.2	2	0300	3.3	-5	76	199	1.6	232	3.2	2
0600	6.2	2.3	76	145	.8	119	3.8	34	0600	7.6	1.9	67	191	1.5	145	4.4	10
0900	7.3	2.0	69	125	1.8	115	5.1	19	0900	12.5	2.3	50	115	4.0	111	8.3	57
1200	11.9	-1.0	41	176	3.1	181	6.3	85	1200	14.1	1.0	41	119	5.9	116	10.2	24
1500	13.2	-3.3	32	161	3.5	176	7.0	17	1500	14.9	.2	37	125	5.1	126	8.9	16
1800	9.8	2.0	58	119	4.2	115	10.8	6	1800	14.2	-4	37	116	4.2	119	8.3	12
2100	7.7	1.1	63	064	.8	006	3.8	1	2100	11.2	-7	44	113	4.3	122	8.9	1
2400	6.4	.3	65	134	2.0	110	4.4	1	2400	10.5	-1	46	130	3.2	135	7.0	1

DAY 31

HOUR	DEW	WIND	WIND	GUST	MAX.			
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MM
0300	6.0	3.7	85	357	1.4	020	3.8	1
0600	7.1	3.2	76	026	1.0	032	4.4	6
0900	5.8	2.6	80	026	3.2	026	6.3	4
1200	8.5	4.4	75	016	2.2	018	6.3	38
1500	14.0	-6.3	24	095	5.6	114	14.0	56
1800	12.3	-10.1	20	133	8.7	120	14.0	24
2100	7.7	-1.8	51	101	3.5	137	8.3	1
2400	4.2	-1.3	67	104	1.4	023	5.7	1

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

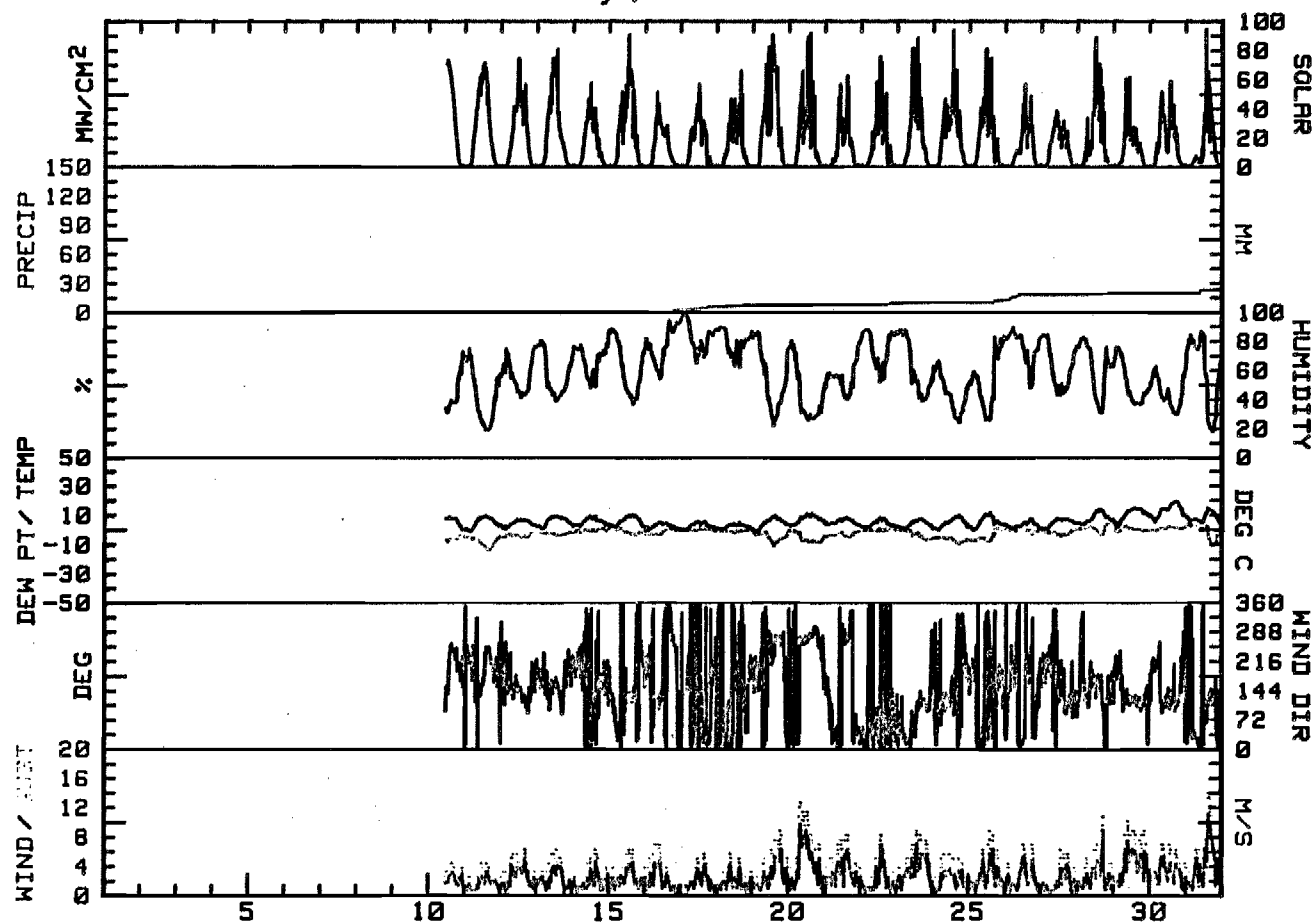
MONTHLY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING May, 1983

DAY	MAX. TEMP. DEG C	MIN. TEMP. DEG C	MEAN TEMP. DEG C	RES. WIND DIR. DEG	RES. WIND SPD. M/S	AVG. WIND SPD. M/S	MAX. GUST DIR. DEG	MAX. GUST SPD. M/S	P'VAL DIR.	MEAN RH %	MEAN DP DEG C	PRECIP MM	DAY'S SOLAR ENERGY WH/SQM	DAY
1	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	1
2	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	2
3	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	3
4	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	4
5	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	5
6	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	6
7	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	7
8	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	8
9	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	9
10	8.6M	-5.5M	4.1M	215M	1.7M	2.1M	248M	4.4M	SW (M)	48M	-5.7M	0.0M	6744M	10
11	9.6	-1.6	4.0	202	1.1	1.5	167	4.4	SW	37	-9.4	0.0	6175	11
12	7.1	0.0	3.6	147	1.9	2.3	116	6.3	SE	57	-3.7	0.0	5043	12
13	9.7	.7	5.2	159	1.9	2.2	158	6.3	SSE	57	-2.5	0.0	5445	13
14	9.8	1.8	5.8	165	.5	1.6	268	6.3	SW	67	-.0	.4	3643	14
15	10.5	.5	5.5	120	1.0	2.1	128	6.3	SE	61	-1.4	0.0	5788	15
16	5.4	-.7	2.4	116	.7	2.1	115	7.0	ESE	75	-1.5	2.6	3470	16
17	5.8	-.1	2.9	018M	.9M	1.7M	024M	5.7M	NNE(M)	83	.1	3.8	3543	17
18	5.1	.2	2.7	014	.5	1.6	037	5.7	N	79	-1.0	1.2	3498	18
19	9.9	-1.8	4.1	258	1.4	2.6	251	8.9	W	53	-5.0	.4	6738	19
20	11.3	2.2	6.8	279	3.2	4.0	260	12.7	W	40	-6.1	0.0	4793	20
21	8.5	2.3	5.4	346	1.1	3.0	266	8.3	NNE	56	-2.9	0.0	3280	21
22	8.7	1.6	5.2	039	1.5	1.8	092	8.3	NNE	74	.1	1.6	3868	22
23	7.8	.1	4.0	084	2.5	3.4	109	8.9	NNE	61	-3.5	1.0	4555	23
24	10.1	-.2	5.0	130	.9	1.9	094	5.7	ESE	41	-7.0	0.0	5253	24
25	11.9	-.5	5.7	068	.2	2.3	150	8.9	NNE	54	-3.9	2.2	4620	25
26	7.8	.7	4.3	041	.4	2.1	021	7.0	NNE	75	-.6	5.8	3290	26
27	8.0	-.1	4.0	146	1.0	1.7	220	6.3	ESE	61	-2.2	0.0	3408	27
28	14.1	3.4	8.8	140	1.9	2.6	115	10.8	ESE	60	.5	1.2	4875	28
29	15.1	2.0	8.6	126	3.5	3.9	116	10.2	ESE	51	.4	0.0	3211	29
30	19.5	5.3	12.4	139	2.0	2.9	104	7.0	ESE	45	1.1	0.0	4383	30
31	15.1	3.8	9.5	090	2.4	3.8	114	14.0	NNE	58	-.8	3.4	3595	31
MONTH	19.5M	-1.8M	5.4M	128M	.6M	2.0M	114M	14.0M	ESE(M)	59M	-2.5M	23.6M	99211M	

GUST VEL. AT MAX. GUST MINUS 2 INTERVALS 10.2
GUST VEL. AT MAX. GUST MINUS 1 INTERVAL 13.3
GUST VEL. AT MAX. GUST PLUS 1 INTERVAL 14.0
GUST VEL. AT MAX. GUST PLUS 2 INTERVALS 13.3

NOTE: RELATIVE HUMIDITY READINGS ARE UNRELIABLE WHEN WIND SPEEDS ARE LESS THAN ONE METER PER SECOND. SUCH READINGS HAVE NOT BEEN INCLUDED IN THE DAILY OR MONTHLY MEAN FOR RELATIVE HUMIDITY AND DEW POINT.

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
May, 1983



R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

WIND FREQUENCY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING May, 1983

DIRECTION	VELOCITY (M/S)							TOTAL
	0.2 TO 1.0	1.0 TO 3.0	3.0 TO 6.0	6.0 TO 10.0	10.0 TO 15.0	15.0 TO 20.0	20.0 OR GREATER	
N	.78	4.52	1.36	0.00	0.00	0.00	0.00	6.66
NNE	.68	5.49	3.30	0.00	0.00	0.00	0.00	9.48
NE	.97	3.64	.68	0.00	0.00	0.00	0.00	5.30
ENE	.63	1.60	.73	0.00	0.00	0.00	0.00	2.96
E	.29	2.33	1.65	.19	0.00	0.00	0.00	4.47
ESE	.78	4.03	6.51	.63	.10	0.00	0.00	12.05
SE	.63	5.20	4.37	.58	.05	0.00	0.00	10.84
SSE	.53	5.78	1.65	.10	0.00	0.00	0.00	8.07
S	1.07	5.39	.87	0.00	0.00	0.00	0.00	7.34
SSW	1.46	6.27	.24	0.00	0.00	0.00	0.00	7.97
SW	1.41	4.96	.63	0.00	0.00	0.00	0.00	7.00
WSW	1.36	3.01	.68	.10	0.00	0.00	0.00	5.15
W	.92	1.26	2.14	1.31	0.00	0.00	0.00	5.64
WNW	.58	.92	1.02	0.00	0.00	0.00	0.00	2.53
NW	.53	.97	.24	0.00	0.00	0.00	0.00	1.75
NNW	.34	2.09	.19	0.00	0.00	0.00	0.00	2.62
CALM								.19
TOTAL	12.97	57.48	26.29	2.92	.15	0.00	0.00	100.00

NOTE: ALL FREQUENCIES ARE EXPRESSED IN PERCENT
2058 VALID WIND OBSERVATIONS USED TO DEVELOP FREQUENCY SUMMARY
2976 WIND OBSERVATIONS WOULD HAVE BEEN CORRECT FOR 15 MINUTE DATA.

WIND ROSE PLOT

[illegible]

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING June, 1983

DAY 01

DAY 02

DAY 03

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	1.0	-2.6	77	160	2.0	141	3.8	2	0300	5.1	-4.0	52	192	1.8	188	3.8	2	0300	3.8	2.0
0600	7.3	-3.9	45	158	1.4	145	5.1	33	0600	6.5	-2.2	62	015	1.1	358	2.5	16	0600	3.7	.9
0900	9.8	-4.7	36	081	2.4	111	7.0	66	0900	9.7	.6	53	004	2.1	000	3.8	19	0900	2.6	.2
1200	11.6	-6.9	27	136	2.8	087	6.3	48	1200	10.5	3.6	62	356	1.7	006	3.8	20	1200	5.1	2.3
1500	14.8	-10.1	17	159	1.4	096	5.7	57	1500	8.7	5.1	78	188	3.8	192	9.5	4	1500	4.9	2.1
1800	15.3	-10.4	16	317	1.7	030	6.3	25	1800	7.3	5.4	88	215	1.2	214	6.3	8	1800	4.3	.6
2100	11.1	-7.8	26	332	2.5	323	5.7	3	2100	5.9	5.0	94	004	2.0	025	4.4	1	2100	3.2	-1.1
2400	6.0	-5.1	45	200	1.9	196	5.1	1	2400	4.6	3.7	94	031	2.8	039	5.1	1	2400	2.7	-.4

DAY 04

DAY 05

DAY 06

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	
	DEG C	DEG C	%	DEG.	M/S	DEG.		DEG C	DEG C	%	DEG.	M/S	DEG.		DEG C	DEG C	%	DEG.	M/S	DEG.	
0300	2.1	-1.0	80	055	2.2	056	5.1	1	0300	3.3	-.2	78	037	1.8	033	3.8	3	0300	4.9	.7	74
0600	2.6	-1.2	76	048	2.8	047	5.7	12	0600	5.8	.2	67	028	2.3	039	5.1	31	0600	4.2	-.9	69
0900	4.5	-1.3	66	036	3.1	030	5.7	30	0900	9.4	-2.3	44	022	3.4	031	7.0	67	0900	9.1	-4.6	38
1200	7.6	-2.2	50	322	1.6	018	5.7	34	1200	10.7	-2.1	41	018	5.0	355	9.5	41	1200	10.5	-7.8	27
1500	7.9	-1.1	53	008	3.3	347	7.6	41	1500	12.0	-3.5	34	013	3.7	030	8.3	48	1500	11.7	-10.6	20
1800	6.2	-1.4	58	270	2.9	251	7.6	7	1800	10.0	-3.1	40	285	5.1	270	10.2	16	1800	10.2	-11.8	20
2100	4.3	-.3	72	024	3.4	029	8.3	1	2100	8.4	-2.6	46	269	3.9	252	10.8	1	2100	6.0	-8.5	35
2400	3.4	.1	79	332	1.4	285	5.1	1	2400	6.2	.4	66	035	.8	145	4.4	1	2400	3.3	-6.4	49

DAY 07

DAY 08

DAY 09

HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.		HOUR	DEW	WIND	WIND	GUST	MAX.	
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S
0300	1.8	*****	61	168	1.7	145	3.2	2	0300	1.8	-4.3	64	186	1.4	149	3.2	3	0300	1.9	-.7
0600	7.0	-7.2	36	176	1.2	159	3.2	34	0600	8.0	-6.3	36	185	.9	223	2.5	34	0600	1.7	-.9
0900	9.4	-7.9	29	029	2.0	035	4.4	66	0900	11.3	-7.6	26	024	1.6	026	3.8	43	0900	2.3	-.3
1200	12.9	-8.4	22	005	2.0	347	7.6	85	1200	11.1	-8.3	25	359	1.5	339	4.4	25	1200	4.2	.4
1500	12.8	-11.7	17	346	2.5	356	5.7	29	1500	10.7	-8.1	26	358	1.5	359	3.8	11	1500	4.1	1.1
1800	13.2	-11.4	17	294	2.6	276	5.7	29	1800	9.2	-6.0	34	336	2.1	336	4.4	8	1800	5.0	-.2
2100	8.5	-8.7	29	318	3.2	314	6.3	3	2100	6.3	-3.4	50	326	3.8	313	6.3	1	2100	4.3	-.8
2400	3.7	-7.2	45	032	.5	335	3.8	1	2400	3.0	.2	82	345	3.7	331	7.6	1	2400	4.0	-4.0

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING June, 1983

DAY 10

DAY 11

DAY 12

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	2.3	-1.5	76	099	.8	166	4.4	2	0300	2.0	-1.1	80	182	1.9	160	3.2	3
0600	4.5	-.3	71	189	2.1	200	3.8	18	0600	6.7	-.5	60	189	.9	005	3.8	36
0900	4.6	-.8	68	177	2.5	186	5.7	24	0900	8.4	-.4	54	113	1.7	087	5.1	69
1200	9.4	-3.3	41	221	3.6	224	7.0	25	1200	6.3	.5	66	029	1.2	104	5.7	18
1500	9.3	-2.4	44	201	3.7	201	7.6	13	1500	7.2	2.1	70	014	1.4	014	5.1	11
1800	6.0	1.0	70	165	3.3	119	10.2	7	1800	6.6	1.6	70	178	.4	206	6.3	5
2100	4.2	.7	78	208	2.1	159	4.4	1	2100	6.6	1.8	71	203	2.1	230	5.7	2
2400	2.9	.1	82	169	1.9	227	3.8	1	2400	4.2	.7	78	150	.6	194	2.5	1

DAY 13

DAY 14

DAY 15

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	2.8	-1.7	72	176	2.0	168	3.2	4	0300	4.0	*****	79	087	.4	104	3.2	2
0600	7.0	-2.5	51	184	.6	181	2.5	34	0600	5.1	*****	79	156	.2	150	1.3	10
0900	11.4	-3.3	36	014	1.7	010	3.8	73	0900	9.8	.9	54	014	1.1	025	3.2	62
1200	13.0	-9.5	20	220	.8	168	7.0	27	1200	*****	*****	**	***	***	142M 6.3	***	1200
1500	14.7	-10.1	17	172	1.2	147	5.1	43	1500	*****	*****	**	***	***	***	***	1500
1800	11.9	-6.2	28	209	2.0	208	5.7	12	1800	*****	*****	**	***	***	***	***	1800
2100	9.9	-3.5	39	035	1.6	074	10.2	2	2100	*****	*****	**	***	***	***	***	2100
2400	6.0	-.7	62	039	1.4	036	4.4	1	2400	*****	*****	**	***	***	***	***	2400

DAY 16

DAY 17

DAY 18

HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	*****	*****	**	***	***	***	***	***	0300	*****	*****	**	***	***	***	***	***
0600	*****	*****	**	***	***	***	***	***	0600	*****	*****	**	***	***	***	***	***
0900	*****	*****	**	***	***	***	***	***	0900	*****	*****	**	***	***	***	***	***
1200	*****	*****	**	***	***	***	***	***	1200	*****	*****	**	***	***	***	***	***
1500	*****	*****	**	***	***	***	***	***	1500	*****	*****	**	***	***	***	***	***
1800	*****	*****	**	***	***	***	***	***	1800	*****	*****	**	***	***	***	***	***
2100	*****	*****	**	***	***	***	***	***	2100	*****	*****	**	***	***	***	***	***
2400	*****	*****	**	***	***	***	***	***	2400	*****	*****	**	***	***	***	***	***

R & M CONSULTANTS, INC.

SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING June, 1983

DAY 19

DAY 20

DAY 21

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	*****	*****	**	***	****	***	*****	***	0300	*****	*****	**	***	****	***	*****	***
0600	*****	*****	**	***	****	***	*****	***	0600	*****	*****	**	***	****	***	*****	***
0900	*****	*****	**	***	****	***	*****	***	0900	*****	*****	**	***	****	***	*****	***
1200	*****	*****	**	***	****	***	*****	***	1200	*****	*****	**	***	****	***	*****	***
1500	*****	*****	**	***	****	***	*****	***	1500	*****	*****	**	***	****	***	*****	***
1800	*****	*****	**	***	****	***	*****	***	1800	*****	*****	**	***	****	***	*****	***
2100	*****	*****	**	***	****	***	*****	***	2100	*****	*****	**	***	****	***	*****	***
2400	*****	*****	**	***	****	***	*****	***	2400	*****	*****	**	***	****	***	*****	***

DAY 22

DAY 23

DAY 24

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	*****	*****	**	***	****	***	*****	***	0300	*****	*****	**	***	****	***	*****	***
0600	*****	*****	**	***	****	***	*****	***	0600	*****	*****	**	***	****	***	*****	***
0900	*****	*****	**	***	****	***	*****	***	0900	*****	*****	**	***	****	***	*****	***
1200	*****	*****	**	***	****	***	*****	***	1200	*****	*****	**	***	****	***	*****	***
1500	*****	*****	**	***	****	***	*****	***	1500	*****	*****	**	***	****	***	*****	***
1800	*****	*****	**	***	****	***	*****	***	1800	*****	*****	**	***	****	***	*****	***
2100	*****	*****	**	***	****	***	*****	***	2100	*****	*****	**	***	****	***	*****	***
2400	*****	*****	**	***	****	***	*****	***	2400	*****	*****	**	***	****	***	*****	***

DAY 25

DAY 26

DAY 27

HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.	HOUR	DEW	WIND	WIND	GUST	MAX.
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW		DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	
0300	*****	*****	**	***	****	***	*****	***	0300	*****	*****	**	***	****	***	*****	***
0600	*****	*****	**	***	****	***	*****	***	0600	*****	*****	**	***	****	***	*****	***
0900	*****	*****	**	***	****	***	*****	***	0900	*****	*****	**	***	****	***	*****	***
1200	*****	*****	**	***	****	***	*****	***	1200	*****	*****	**	***	****	***	*****	***
1500	*****	*****	**	***	****	***	*****	***	1500	*****	*****	**	***	****	***	*****	***
1800	*****	*****	**	***	****	***	*****	***	1800	*****	*****	**	***	****	***	*****	***
2100	*****	*****	**	***	****	***	*****	***	2100	*****	*****	**	***	****	***	*****	***
2400	*****	*****	**	***	****	***	*****	***	2400	*****	*****	**	***	****	***	*****	***

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

THREE HOUR SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING June, 1983

DAY 28

DAY 29

DAY 30

DAY 28								DAY 29								DAY 30										
HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.	HR	DEW	WIND	WIND	GUST	MAX.									
NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD	NDNG	TEMP.	POINT	RH	DIR.	SPD.	DIR.	GUST	RAD									
DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW	DEG C	DEG C	%	DEG.	M/S	DEG.	M/S	MW			
0300	*****	*****	**	***	****	***	****	***	0300	*****	*****	**	***	****	***	****	***	0300	*****	*****	**	***	****	***	****	***
0600	*****	*****	**	***	****	***	****	***	0600	*****	*****	**	***	****	***	****	***	0600	*****	*****	**	***	****	***	****	***
0900	*****	*****	**	***	****	***	****	***	0900	*****	*****	**	***	****	***	****	***	0900	*****	*****	**	***	****	***	****	***
1200	*****	*****	**	***	****	***	****	***	1200	*****	*****	**	***	****	***	****	***	1200	*****	*****	**	***	****	***	****	***
1500	*****	*****	**	***	****	***	****	***	1500	*****	*****	**	***	****	***	****	***	1500	*****	*****	**	***	****	***	****	***
1800	*****	*****	**	***	****	***	****	***	1800	*****	*****	**	***	****	***	****	***	1800	*****	*****	**	***	****	***	****	***
2100	*****	*****	**	***	****	***	****	***	2100	*****	*****	**	***	****	***	****	***	2100	*****	*****	**	***	****	***	****	***
2400	*****	*****	**	***	****	***	****	***	2400	*****	*****	**	***	****	***	****	***	2400	*****	*****	**	***	****	***	****	***

R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

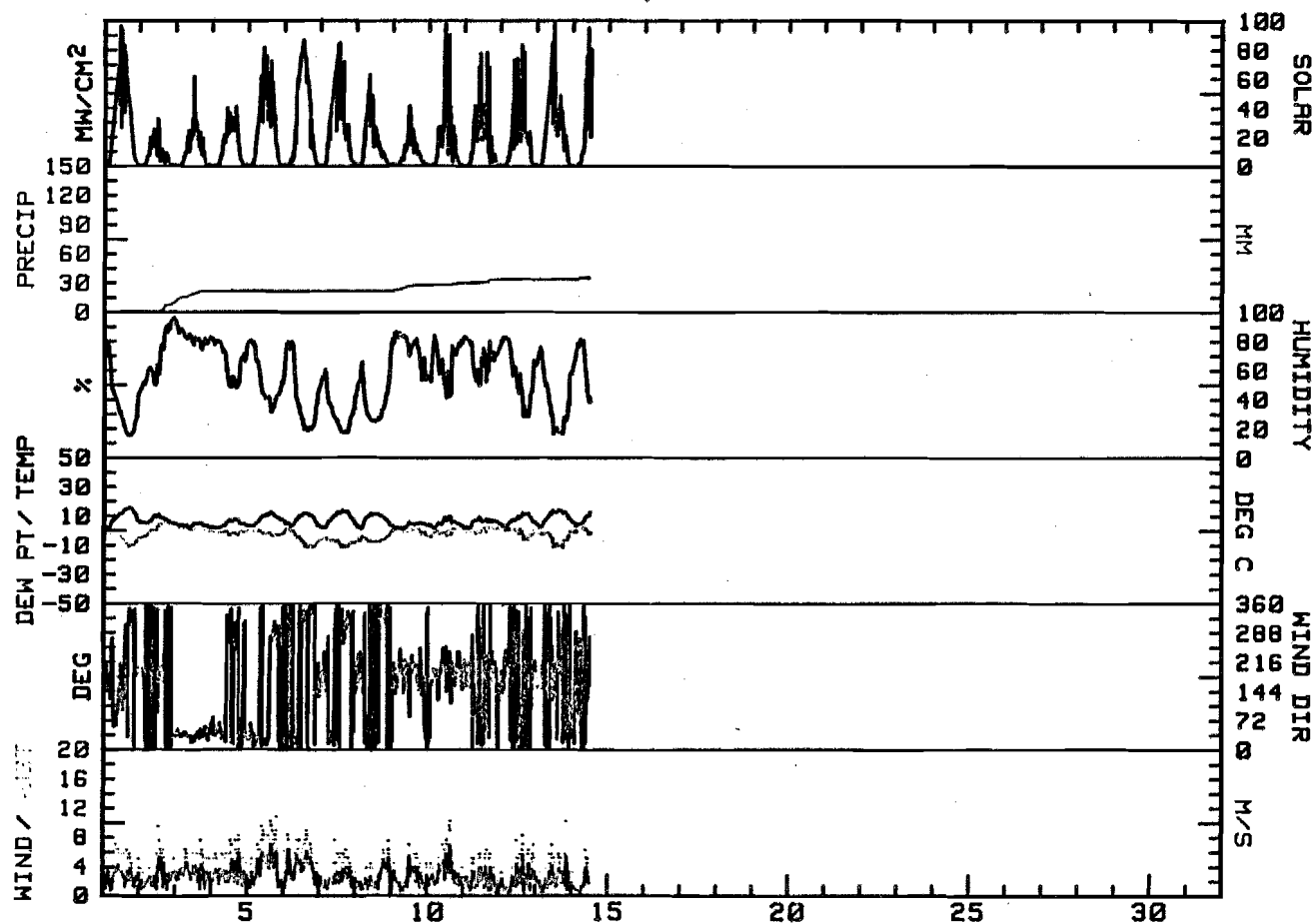
MONTHLY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING June, 1983

DAY	MAX. TEMP. DEG C	MIN. TEMP. DEG C	MEAN TEMP. DEG C	RES. WIND DIR. DEG	RES. WIND SPD. M/S	AVG. WIND SPD. M/S	MAX. GUST DIR. DEG	MAX. GUST SPD. M/S	P'VAL DIR.	MEAN RH %	MEAN DP DEG C	PRECIP MM	DAY'S SOLAR ENERGY WH/SGM	DAY
1	15.7	.4	8.1	147	.7	2.5	111	7.0	SSE	37	-6.2	0.0	7593	1
2	11.8	4.6	8.2	006	.4	2.4	192	9.5	N	70	1.9	11.2	1865	2
3	5.6	2.5	4.1	036	3.0	3.1	039	7.6	NE	82	1.2	10.2	2865	3
4	8.5	1.9	5.2	012	1.9	3.0	029	8.3	NE	66	-1.2	0.0	3350	4
5	12.9	3.1	8.0	352	2.1	3.6	252	10.8	NNE	53	-1.6	0.0	6565	5
6	12.5	2.6	7.6	355	3.0	3.7	019	8.9	NNW	42	-6.1	0.0	7243	6
7	14.3	1.8	8.1	335	1.0	2.3	347	7.6	NNW	32M	-8.3M	0.0	6360	7
8	11.9	1.2	6.6	342	1.4	2.2	331	7.6	NNW	41	-5.9	.2	3603	8
9	6.0	.9	3.5	179	1.5	2.2	086	7.0	SSW	75	-.6	6.6	2203	9
10	10.2	1.8	6.0	189	2.3	2.9	119	10.2	S	66	-.8	1.8	3990	10
11	9.6	1.6	5.6	156	.5	2.0	206	6.3	S	68	.4	3.2	4208	11
12	12.7	3.0	7.9	016	.2	2.0	092	8.3	SW	55	-1.3	1.0	4458	12
13	14.7	2.1	8.4	154	.3	2.1	074	10.2	S	39	-5.2	0.0	5998	13
14	12.9M	3.0M	8.0M	111M	.4M	1.3M	142M	6.3M	ENE	59M	-.1M	1.4M	5311M	14
15	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	15
16	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	16
17	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	17
18	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	18
19	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	19
20	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	20
21	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	21
22	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	22
23	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	23
24	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	24
25	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	25
26	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	26
27	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	27
28	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	28
29	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	29
30	*****	*****	*****	***	****	****	***	****	***	**	*****	****	*****	30
MONTH	15.7M	.4M	6.8M	011M	.5M	2.6M	252M	10.8M	NNE	56M	-2.4M	35.6M	65608M	

GUST VEL. AT MAX. GUST MINUS 2 INTERVALS 7.6
GUST VEL. AT MAX. GUST MINUS 1 INTERVAL 8.9
GUST VEL. AT MAX. GUST PLUS 1 INTERVAL 6.3
GUST VEL. AT MAX. GUST PLUS 2 INTERVALS 5.7

NOTE: RELATIVE HUMIDITY READINGS ARE UNRELIABLE WHEN WIND SPEEDS ARE LESS THAN ONE METER PER SECOND. SUCH READINGS HAVE NOT BEEN INCLUDED IN THE DAILY OR MONTHLY MEAN FOR RELATIVE HUMIDITY AND DEW POINT.

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
June, 1983



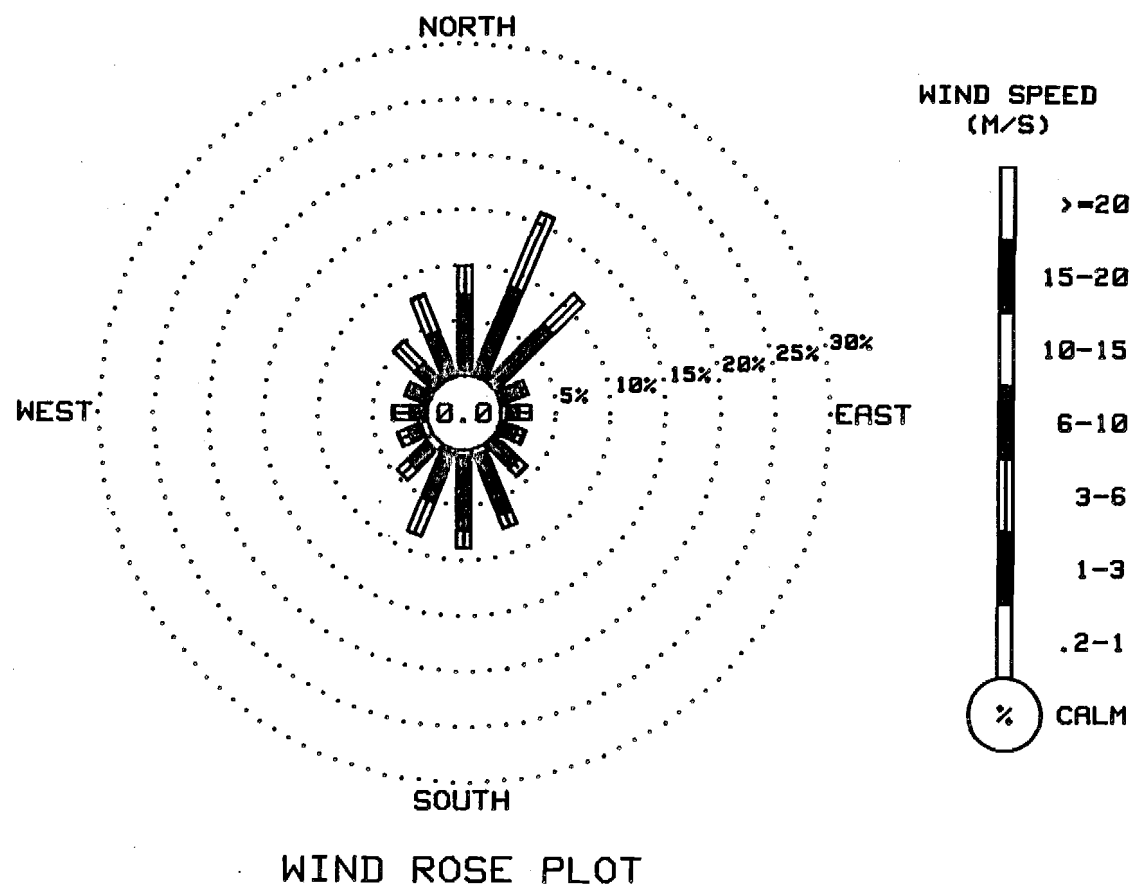
R & M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT

WIND FREQUENCY SUMMARY FOR KOSINA WEATHER STATION
DATA TAKEN DURING June, 1983

DIRECTION	VELOCITY (M/S)							TOTAL
	0.2	1.0	3.0	6.0	10.0	15.0	20.0	
	TO 1.0	TO 3.0	TO 6.0	TO 10.0	TO 15.0	TO 20.0	OR GREATER	
N	.46	6.80	2.63	0.00	0.00	0.00	0.00	9.88
NNE	.23	8.42	7.26	.08	0.00	0.00	0.00	15.98
NE	.39	6.95	3.94	0.00	0.00	0.00	0.00	11.27
ENE	.31	1.85	.46	0.00	0.00	0.00	0.00	2.63
E	.54	1.08	1.08	0.00	0.00	0.00	0.00	2.70
ESE	.23	1.47	.62	.15	0.00	0.00	0.00	2.47
SE	.15	2.93	.93	.08	0.00	0.00	0.00	4.09
SSE	.62	5.79	1.24	0.00	0.00	0.00	0.00	7.64
S	.54	6.72	1.54	0.00	0.00	0.00	0.00	8.80
SSW	.39	4.71	3.32	0.00	0.00	0.00	0.00	8.42
SW	.85	2.39	1.31	0.00	0.00	0.00	0.00	4.56
WSW	.69	1.24	.93	.08	0.00	0.00	0.00	2.93
W	.08	1.47	1.47	.15	0.00	0.00	0.00	3.17
WNW	.31	1.47	.46	.08	0.00	0.00	0.00	2.32
NW	0.00	2.47	2.63	.08	0.00	0.00	0.00	5.17
NNW	0.00	4.32	3.47	.15	0.00	0.00	0.00	7.95
CALM								0.00
TOTAL	5.79	60.08	33.28	.85	0.00	0.00	0.00	100.00

NOTE: ALL FREQUENCIES ARE EXPRESSED IN PERCENT
1295 VALID WIND OBSERVATIONS USED TO DEVELOP FREQUENCY SUMMARY
2880 WIND OBSERVATIONS WOULD HAVE BEEN CORRECT FOR 15 MINUTE DATA.

R&M CONSULTANTS, INC.
SUSITNA HYDROELECTRIC PROJECT
KOSINA WEATHER STATION
June, 1983



No data for July

(see INTERPRETATION OF DATA)

No data for August

(see INTERPRETATION OF DATA)

No data for September

(see INTERPRETATION OF DATA)