

Wind Resource Summary for Luverne Site

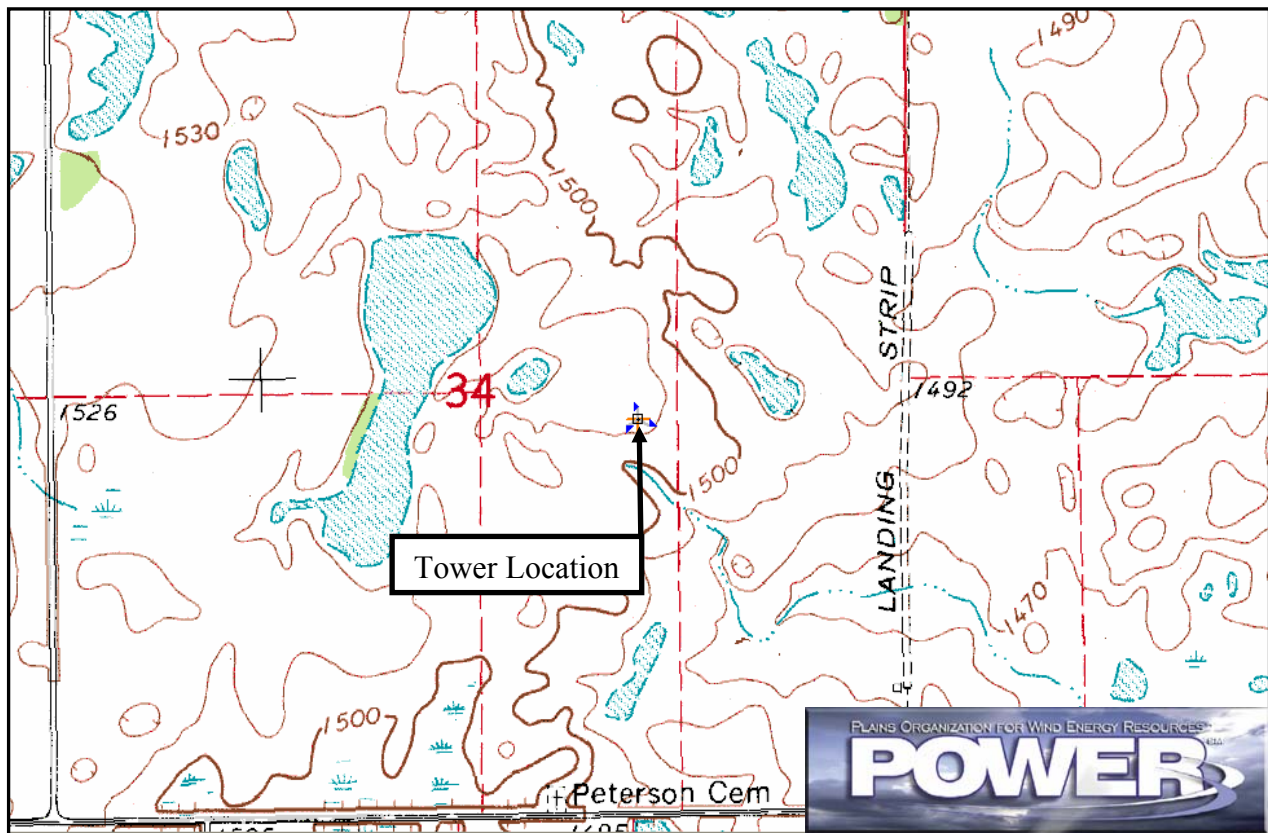
Griggs/Steele Wind Development Group, LLC

Summers^a 2000, 2001, 2002 & 2003

Site Description:

Latitude: N 47° 19' 57"	Township: 145 N
Longitude: W 97° 54' 27"	Range: 57 W
Elevation: 1510 feet	Section: 34
Tower Type: NRG Tilt-up	Tower Height: 131 feet

The monitoring site is 5.7 miles north-northeast of the town of Luverne, North Dakota. The tower is instrumented at three levels: 33 ft (10 m), 98 ft (30 m), and 131 ft (40 m). The site is 3.2 miles east of the Sheyenne River on the Pembina Escarpment. The land around the site is primarily cultivated fields with many small ponds and lakes in the area.



Summary Wind Data:	33 ft AGL ^b	98 ft AGL	131 ft AGL
Mean Wind Speed	10.3 mph	13.0 mph	14.5 mph
Maximum, 60-min Mean Wind Speed	40.0 mph at 131 ft AGL – 6/9/2002 2:00 a.m.		
Estimated Wind Power Class ^c	Class 2 (231 W/m ² at 131 ft AGL)		

^a Summer is defined as the months of June, July and August. Summer 2000 begins with July 2000.

Data recovery rates at 33, 98, and 131 feet were 93%, 93%, and 68%, respectively.

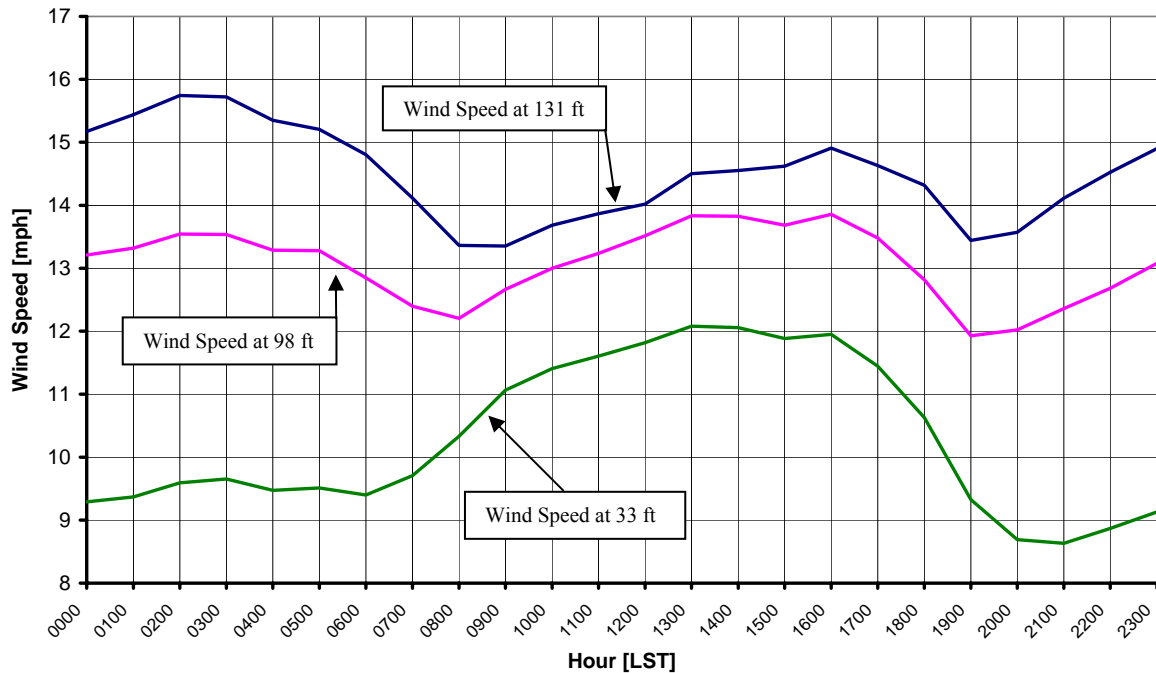
^b Above ground level.

^c Air temperature was not factored into calculations.

Average Hourly Wind Speeds

LST ^d	131 ft AGL		98 ft AGL		33 ft AGL	
	mph	m/s	mph	m/s	mph	m/s
0000	15.2	6.78	13.2	5.90	9.3	4.15
0100	15.4	6.90	13.3	5.95	9.4	4.19
0200	15.7	7.04	13.5	6.05	9.6	4.29
0300	15.7	7.03	13.5	6.05	9.7	4.32
0400	15.4	6.86	13.3	5.94	9.5	4.23
0500	15.2	6.80	13.3	5.94	9.5	4.25
0600	14.8	6.62	12.8	5.74	9.4	4.20
0700	14.1	6.31	12.4	5.54	9.7	4.34
0800	13.4	5.97	12.2	5.46	10.3	4.62
0900	13.4	5.97	12.7	5.66	11.1	4.95
1000	13.7	6.12	13.0	5.81	11.4	5.10
1100	13.9	6.20	13.2	5.92	11.6	5.19
1200	14.0	6.27	13.5	6.04	11.8	5.28
1300	14.5	6.48	13.8	6.18	12.1	5.40
1400	14.6	6.50	13.8	6.18	12.1	5.39
1500	14.6	6.54	13.7	6.12	11.9	5.31
1600	14.9	6.66	13.9	6.19	12.0	5.34
1700	14.6	6.54	13.5	6.03	11.4	5.12
1800	14.3	6.40	12.8	5.73	10.6	4.75
1900	13.4	6.01	11.9	5.33	9.3	4.17
2000	13.6	6.07	12.0	5.37	8.7	3.88
2100	14.1	6.31	12.4	5.52	8.6	3.86
2200	14.5	6.49	12.7	5.67	8.9	3.96
2300	14.9	6.66	13.1	5.85	9.1	4.08

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^d Local standard time.



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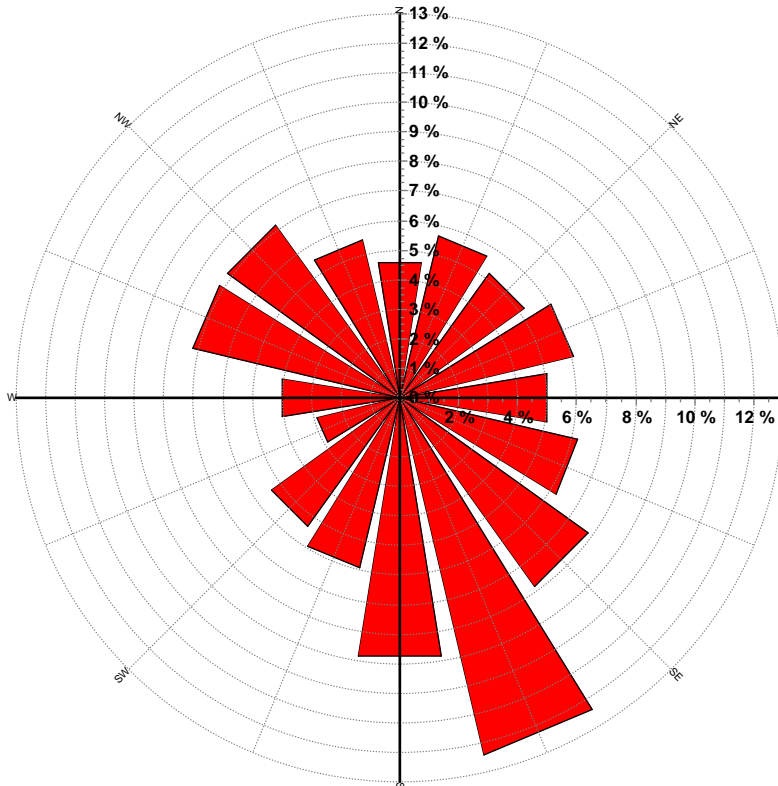
Wind Directional Frequency*

Winds from the... Frequency (%)

NNW	5.5
NW	7.2
WNW	7.2
W	4.0
WSW	2.9
SW	5.4
SSW	5.9
S	8.9
SSE	12.4
SE	7.9
ESE	6.2
E	5.0
ENE	6.0
NE	5.2
NNE	5.6
N	4.6

* Wind direction vane inoperative during Summers 2002 and 2003.

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Wind Rose for 131 ft AGL
Summers 2000 & 2001



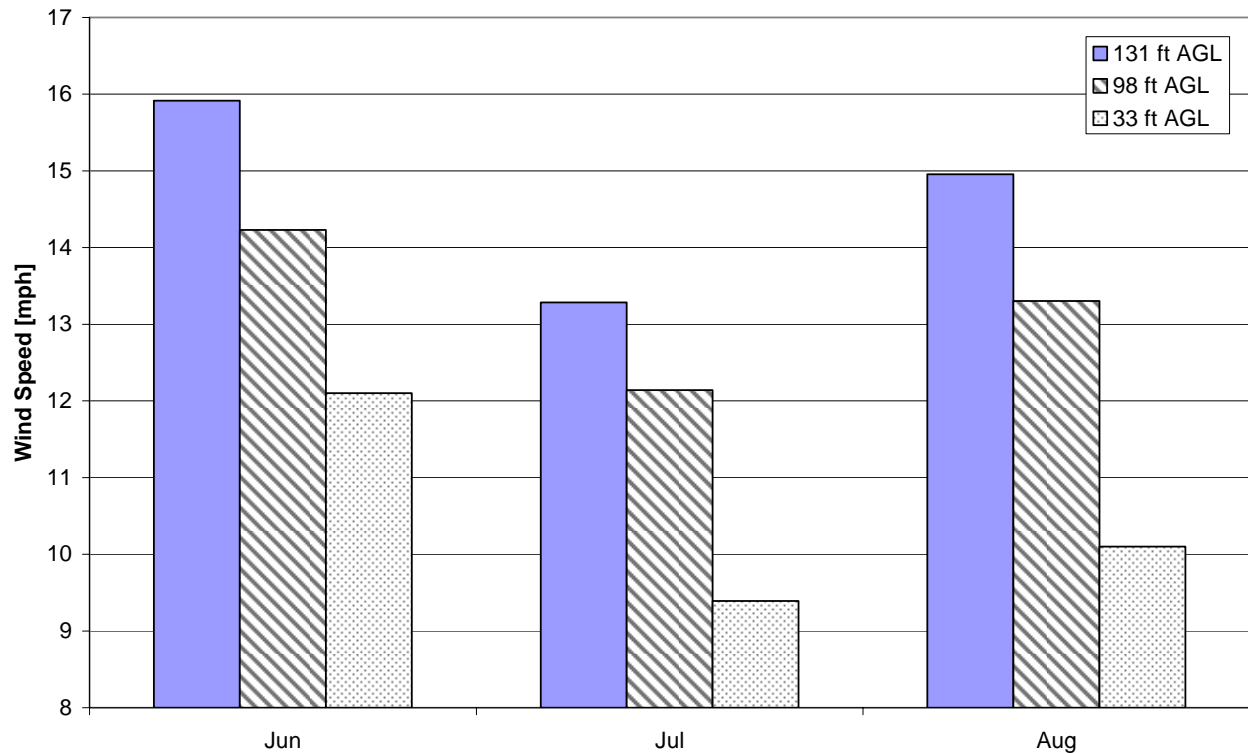
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Monthly Wind Speed Averages

Month	131 ft AGL		98 ft AGL		33 ft AGL	
	mph	m/s	mph	m/s	mph	m/s
Jun	15.9	7.11	14.2	6.36	12.1	5.41
Jul	13.3	5.94	12.1	5.43	9.4	4.20
Aug	15.0	6.69	13.3	5.95	10.1	4.52

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