TOWN OF OYSTER BAY
BETHPAGE COMMUNITY PARK
INTERIM REMEDIAL MEASURE - CONSTRUCTION AREA

REMEDIAL ACTION –
COMMUNITY AIR MONITORING PLAN

NOVEMBER 1, 2006

Prepared For:

Town of Oyster Bay
Department of Public Works

H2M GROUP

Engineers • Architects • Scientists • Planners • Surveyors

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TABLE OF CONTENTS

TABLES

APPENDICES

H2MGROUP

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NOVEMBER 1, 2006

1.0 OBJECTIVE

The intent and objective of environmental/ambient air monitoring during this project is to monitor air quality during soil excavation activities at Bethpage Community Park, Bethpage, New York in order to provide a measure of protection for the community from potential airborne contaminant releases as a result of remedial work activities. Air monitoring for Volatile Organic Compounds (VOCs) and particulates (particulate matter less than 10 microns in size) (PM-10) will be conducted at one fixed location and two transient locations downwind of the soil handling and excavation areas to monitor possible contaminant migration. Environmental air monitoring and observations of visible emissions during excavation activities will be performed according to methods contained in this plan.

2.0 AIR MONITORING METHODOLOGY

2.1 Air Monitoring Locations / Wind Rose Analysis

For the duration of the remedial work at Bethpage Community Park, air monitoring will be performed for VOCs and particulates. The monitoring network will comprise three (3) stations operating simultaneously. The monitoring stations will include one downwind monitoring station in a fixed position and two downwind transient stations. The location of the fixed station is based on a review of historical wind conditions. The transient monitoring stations will be moved depending on current site wind conditions and site construction activities.

In addition to the monitoring stations, an on-site weather station will be utilized in an upwind location to record weather conditions including wind speed, wind direction and

ambient air temperature. All monitoring stations and the weather station will continuously collect data and log one and 15-minute averages through remote telemetry to a central computing station.

An analysis of historical wind data was performed to identify the prevailing wind direction that is likely to be expected during the site remedial work at Bethpage Community Park. Climatic wind data for the United States, as compiled by the National Climatic Data Center (NCDC, http://www.ncdc.noaa.gov), was reviewed. The climatic wind data is reported by the NCDC for the period 1930 through 1996 for many cities across the United States and is summarized on a monthly basis. Prevailing wind direction, mean wind speed and peak gusts are provided. Climatic data recorded at Long Island's MacArthur Airport in Islip, NY was used to evaluate anticipated wind conditions at Bethpage Community Park. Climatic data for Long Island was also available for LaGuardia and John F. Kennedy (JFK) Airports. However, the climatic data from Islip was deemed to be more pertinent to Bethpage Community Park considering the geographical similarities between Bethpage and Islip. Bethpage and Islip are both situated more geographically central to Long Island and are less influenced by shore wind conditions. LaGuardia is situated on the northern shore of Long Island whereas JFK is situated on the south shore.

A copy of the NCDC Climatic Wind Data for the United States in tabular form is provided in Appendix A. A wind rose analysis summarizing the most recent ten-year period, based on the NCDC data, is also provided in Appendix A. A summary of the climatic data for Islip is provided in Table 2.1.1.

Table 2.1.1. Climatic Wind Data for Islip for the Period 1930-1996.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind Speed	10	10	11	11	9	9	8	8	8	9	10	10
Prevailing Wind Direction	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	NW	SW	SW	SW

* Data Provided by the National Climatic Data Center, Asheville, NC (http://www.ncdc.noaa.gov).

In Table 2.1.1., prevailing wind direction indicates the direction from which the wind is blowing. As shown, the prevailing wind direction at Bethpage Community Park is anticipated to varying depending on the month of the year. Based on this historical climatic data, the fixed air monitoring location will be moved on a monthly basis during the remedial project. For example, during the months of November and December, the air monitoring station will be positioned to the Northeast (NE) of the ongoing remedial excavation at the property boundary based on a prevailing wind direction from the Southwest. Likewise, for January through June, the fixed air monitoring station will be positioned East Southeast (ESE) of the ongoing remedial excavation at the property boundary based on a prevailing wind direction from the West Northwest.

2.2 Daily Monitoring Guidelines

Air monitoring will be performed continually at the site for the duration of the remediation project whenever site activity involves ground intrusive activity, which as outlined in the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan (attached as Appendix A), is defined to include, but not limited to soil/waste excavation and handling, trenching or test pits and the installation of soil borings or monitoring wells. Monitoring at additional times may be conducted if deemed appropriate given the site conditions. For the remedial project at Bethpage Community Park, intrusive activity shall include site clearing (i.e., overburden removal), soil excavation, soil handling or any activity with the potential to emit VOCs or PM-10. During non-operational hours, air monitoring will not be performed. However, any

excavated or stockpiled soils during these hours will be covered with poly sheeting to minimize or prevent VOC or dust generation. Operational hours were site activity may occur are anticipated to be between 7:00 AM and 7:30 PM.

Prior to each days work, the anticipated daily site activity will be evaluated to identify areas of high emission potential, i.e., areas of excavation, soil handling, etc. In addition, a daily wind direction evaluation will be made to identify the current wind direction. This will be accomplished by use of the on-site weather station. The daily weather forecast for Bethpage provided by the National Weather Service (www.erh.noaa.gov) will also be checked. Once wind direction and areas of high emission potential have been established, the two transient monitoring stations will be positioned and the collection of real-time readings for VOCs and particulates will be initiated. Site work will commence only after air monitoring has been initiated at all monitoring stations.

Once excavation work begins, the work areas will be visually evaluated for dust emissions and suppression measures being applied by the excavation contractor. Site observations and notes regarding the daily air monitoring program will be documented on preprinted log sheets. This is in addition to the computerized regular data logging of VOC and particulate levels.

Periodically throughout the day, the location of excavation work or the general wind direction may change, as recorded by the on-site weather station. Accordingly, the location of the transient air monitoring stations will be adjusted to compensate for the change in location of site activity or when a consistent change of approximately 15 to 30 minutes duration is noted in the daily wind direction. The transient monitoring stations will be positioned downwind of the site activity within approximately 10 feet of the property boundary. If the daily wind direction corresponds with the prevailing wind direction determined by the wind rose analysis, the transient monitoring stations will be adjusted to be closer to the site activity rather than have multiple monitoring stations in close proximity to one another.

2.3 Air Sampling Equipment and Calibration

Air Monitoring for VOCs and particulates will be performed to provide sufficient coverage of intrusive activities that have the potential to emit volatile organics or dust. As identified in Section 2.1., the monitoring network will comprise three (3) stations operating simultaneously. The monitoring stations will include one downwind monitoring station in a fixed position and two downwind transient stations near the property boundary. Each monitoring station will comprise real-time air monitoring instruments. The specific air monitoring equipment is summarized in Table 2.3.1.

Table 2.3.1. Air Monitoring Equipment

Analyte	Sampling Equipment	Duration	Comments
VOCs	MiniRAE 2000 PID	Continuously during site activity	Real Time Analysis
Particulates/Dust (PM-10)	TSI DustTRAK Aerosol Monitor	Continuously during site activity	Real Time Analysis

As shown in Table 2.3.1, each air monitoring station will include a MiniRAE 2000 PhotoIonization Detector (PID) and TSI DustTRAK Aerosol Monitor for particulates. A separate upwind monitoring station will include a Davis Vantage Pro2 Weather Station to record wind speed, wind direction, rainfall, temperature and humidity. All monitoring instruments will be connected with radiofrequency (RF) transmitters (Campbell Scientific CR206). An RF receiver will be located in the on-site field office trailer connected with a computer running Campbell Scientific LoggerNet 3.3 software for datalogging. The data collected for VOCs and particulates will include a one-minute running average to evaluate immediate emission conditions and 15-minute running averages for comparison to appropriate action levels.

Data for VOC and particulate concentrations recorded at the monitoring stations will be continuously transmitted to the on-site computer and saved electronically. Input from the

monitoring stations will also be viewed as a real-time graphical depiction on a computer screen within the site office trailer. Visual alarms will be programmed into the datalogging software to provide an alert when minimum thresholds for VOCs or particulates concentrations are encountered. Action levels and response actions are discussed in Section 3.1. Monitoring the one-minute averages along with the 15-minutes averages will enable a quick response to implement or increase dust suppression actions to minimize the likelihood for a 15-minutes average excursion for dust.

To ensure quality measurements from the monitoring instruments, a regular calibration schedule will be maintained in accordance with the manufacturer's recommendations for the MiniRAE 2000 PID and TSI DustTRAK. A summary of the calibration schedule and requirements is provided in Table 2.3.2.

Table 2.3.2. Air Monitoring Equipment Calibration Schedule

Sampling Equipment	Calibration Requirements
MiniRAE 2000 PID	Factory Service: Once per year. General Calibration (zero air and calibration gas): Once per day or more, as needed. 10.6 eV Lamp: Clean once every three months for normal use or monthly for heavy use. PID Sensor: Clean sensor pins when cleaning lamp or if inaccurate readings after calibration. Sampling Pump: Factory calibration/cleaning once per year.
TSI DustTRAK Aerosol Monitor	Factory Service: Once per year. General Calibration (zero air): Once per day or more, as needed. Replace Internal Filters: Once per 700 hours at 1,000 $\mu g/m^3$ concentration. Clean Nozzle: Once per 350 hours at 1,000 $\mu g/m^3$ concentration. Check Flow Rate (1.7 L/min): Once per month. Sampling Pump: Factory calibration and cleaning once every two years.

3.0 AIR MONITORING DATA EVALUATION

3.1 Air Quality Action Levels and Responses

Action levels for VOC concentrations will be based on the NYSDOH Generic Community Air Monitoring Plan. The initial threshold for VOC action is 5 parts per million (ppm). If the ambient air concentration of total VOCs at the downwind monitoring location exceeds

5 ppm for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases below 5 ppm, work activities can resume with continued monitoring.

If total VOC levels at the downwind monitoring location persist at levels in excess of 5 ppm but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After this, work activities can resume provided that the total VOC concentration downwind of work area is below 5 ppm for the 15-minute average. If the VOC level is above 25 ppm at the downwind monitoring location, activities will be shut down.

If the 15-minute average VOC concentration is recorded above the initial threshold of 5 ppm and persists above this threshold for greater than 15 consecutive minutes, then contaminant specific monitoring will be performed as soon as possible. Air sampling equipment will be maintained on-site during the course of the project. A vacuum "summa" canister sample will be collected in accordance with EPA Method TO-15 over an extended period (i.e., up to 8 hours) at the downwind property boundary monitoring location. This sample will be analyzed for the target compound list of volatile organics.

Particulate (PM-10) concentrations will also be compared to Action levels and responded to, as outlined in the (NYSDOH) Generic Community Air Monitoring Plan. The initial threshold for particulate/dust action is 100 micrograms per cubic meter (ug/m^3). If the downwind particulate level is 100 ug/m^3 for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed in accordance with the Dust Control Plan prepared for this project. Work may continue with dust suppression techniques provided that downwind particulate levels do not exceed 150 ug/m^3 and provided that no visible dust is migrating form the work area.

If dust suppression techniques have been employed and downwind particulate levels are greater than 150 ug/m^3, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are

successful in reducing the downwind particulate concentration to less than 150 ug/m^3 and in preventing visible dust migration.

All daily written logs, and one and 15-minute averages that are to be electronically datalogged will be maintained for review by New York State Department of Environmental Conservation (NYSDEC) and NYSDOH personnel.

3.2 Notification

The NYSDEC will be promptly notified prior to any modification of the CAMP and of any corrective actions required for CAMP compliance, and VOC and particulate monitoring. The NYSDEC will also be notified if contaminant-specific monitoring is performed in response to an exceedence of the VOC threshold identified above.

3.3 Quality Assurance

All data from the monitoring equipment including one and 15-minutes averages of VOC and particulate concentrations will be downloaded and saved on a minimum daily basis. Electronic files will be maintained on-site and copies will be transferred to H2M's computer server through the internet. Hand written daily logs will also be completed on preprinted log forms documenting the field calibration of each unit, the background conditions at the start of each day (i.e., temperature, wind direction, precipitation), and positioning of the monitoring stations. Should an instrumentation failure occur, the equipment will be repaired or replacement equipment will be procured as soon as possible. Rental equipment may be used in the interim until a permanent fix can be implemented. If a failure occurs in the automated datalogging system, VOC and particulate concentrations will be manually recorded from each monitoring station on preprinted log forms. A full-time environmental professional will be on-site during all air monitoring operational hours to ensure compliance with the CAMP.

To ensure quality measurements from the VOC and dust monitoring equipment, a regular calibration schedule will be maintained, as discussed in Section 2.3. The TSI DustTRAK

particulate monitors used as part of this air monitoring program are laser photometers that provide effective, real-time mass measurements. Photometers are precision instruments that use light-scattering technology and respond linearly to mass concentrations across their detection range, which is typically 0.001 to 100 mg/m^3. Photometers provide a real-time measurement of the particulate mass concentration in air. This is especially important during an active remedial project so that immediate response actions can be implemented when elevated dust or particulate concentrations are detected.

For quality assurance purposes, confirmation measurements of particulates (PM-10) will be made on a weekly basis utilizing a gravimetric technique. In this manner, a filter sample will be collected using a sampling pump in immediate proximity to the fixed monitoring station and analyzed in accordance with NIOSH Method 0500. The filter sampling results will be compared and correlated with the air monitoring results from the real-time particulate monitor.

H2MGROUP

APPENDIX A

NATIONAL CLIMATIC DATA CENTER (NCDC) –
CLIMATIC WIND DATA FOR THE UNITED STATES AND WIND ROSE

NATIONAL CLIMATIC DATA CENTER
151 PATTON AVENUE ROOM 120
ASHEVILLE, NC 28801-5001
(NCDC)
PHONE : (828) 271-4800 INTERNET : orders@ncdc.noaa.gov
FACSIMILE : (828) 271-4876 WEB site : http://www.ncdc.noaa.gov

November 1998

CLIMATIC WIND DATA FOR THE UNITED STATES

The climatic wind data contained in this summary was extracted from the NCDC's Local Climatological Data publication, Navy & Air Force climatic briefs, and other sources. Locations are not all inclusive and wind data may be available for sites not listed in this summary. The total period of this summary is 1930-1996. The period of record (POR) for which wind data is summarized varies for individual sites and may begin and end at any time during the 1930-1996 period. All available wind data is provided regardless of POR or source. Updated data for many sites can be obtained from post 1996 Local Climatological Data annual publications.
In the table, prevailing wind directions (DIR) are given in compass points; mean wind speeds (SPD) and peak gust (PGU) are in miles per hour (mph). When peak gust (PGU) wind velocities are not available, fastest-mile or 5-second winds may be substituted. This will be indicated by a $ for fastest-mile and # for 5-second winds preceding PGU (ie: $PGU = fastest-mile winds). Wind types may be combined to reflect the highest reported wind. When appropriate wind data is not available, an N/A will appear in lieu of data.
Conversion tables of miles per hour to knots and compass points to degrees are provided at the end of this wind table.

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		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
ALABAMA														
Birmingham	DIR	N	N	N	N	N	N	N	N	N	S	S	S	N
	SPD	8	9	9	9	7	6	6	6	7	6	7	8	7
	$PGU	49	59	65	56	65	56	57	50	50	43	52	41	65
Huntsville	DIR	ESE	ESE	ESE	N	N	N	ESE	ESE	ESE	S	S	S	ESE
	SPD	9	10	10	9	8	7	6	6	7	7	8	9	8
	#PGU	43	43	40	48	45	56	64	45	46	55	43	48	64
Mobile	DIR	N	N	N	N	SE	SE	SE	SE	S	S	S	S	S
	SPD	10	11	11	10	9	6	7	7	8	8	9	10	9
	#PGU	45	61	55	46	62	60	64	53	60	59	48	43	64
Montgomery	DIR	NW	NW	NW	NW	NW	NW	S	S	S	S	S	S	WNW
	SPD	8	8	8	7	6	6	6	5	6	6	7	7	7
	PGU	43	66	54	60	60	60	55	59	41	73	56	48	73
Ozark/	DIR	NW	N	S	S	S	W	W	E	ENE	E	NNW	NW	E
Ft Rucker	SPD	6	6	7	6	5	3	3	3	3	5	5	6	5
	PGU	46	64	74	61	71	60	58	60	82	48	52	44	82
ALASKA														
Anchorage	DIR	N	N	N	S	SSE	SSE	SSE	SSE	SSE	N	N	N	N
	SPD	6	7	7	7	8	8	7	7	7	7	7	6	7
	PGU	64	61	75	44	43	46	40	44	48	55	55	55	75
Barrow	DIR	ENE	ENE	ENE	ENE	ENE	E	E	E	ENE	ENE	ENE	ENE	ENE
	SPD	12	11	11	12	12	12	12	12	13	13	12	12	12
	PGU	58	74	56	47	41	43	55	47	66	54	53	61	74
Cold Bay	DIR	SSE	SE	SE	NNW	SSE	SSE	SSE	SSE	SSE	NNW	NNW	SSE	SSE
	SPD	18	18	17	17	16	16	16	16	17	17	18	18	17
	PGU	85	83	76	85	72	69	58	81	95	87	75	85	95

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Fairbanks	DIR	N	N	N	N	N	SW	SW	SW	N	N	N	N	N
	SPD	3	4	5	6	8	7	7	6	6	5	4	3	5
	PGU	47	49	46	40	44	48	63	54	51	40	46	38	63
Juneau	DIR	ESE	ESE	ESE	ESE	ESE	ESE	E	E	ESE	ESE	ESE	ESE	ESE
	SPD	8	8	8	9	8	8	8	8	8	9	9	9	8
	PGU	40	44	40	40	40	32	32	38	120	49	58	55	120
Kodiak	DIR	NW	NW	NW	NW	NW	E	ENE	NW	NW	NW	WNW	WNW	NW
	SPD	13	13	12	12	10	9	8	8	10	12	13	13	11
	PGU	75	83	82	67	59	52	52	67	78	70	82	83	83
Nome	DIR	E	NE	E	N	N	WSW	WSW	SW	N	N	N	E	N
	SPD	11	11	10	10	10	10	10	10	11	11	12	10	11
	PGU	59	66	59	52	46	35	39	56	52	59	59	53	66
ARIZONA														
Flagstaff	DIR	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW
	SPD	6	6	6	7	7	6	5	4	5	5	6	6	6
	#PGU	45	34	49	41	41	44	36	36	34	36	33	40	49
Phoenix	DIR	E	E	E	E	E	E	E	E	W	W	W	W	E
	SPD	5	6	7	7	7	7	7	7	6	6	5	5	6
	#PGU	39	29	38	46	36	33	52	46	43	40	34	32	52
Tucson	DIR	SE	SE	SE	SE	SE	SSE	SSE	SE	SE	SE	SE	SE	SE
	SPD	8	8	8	9	9	9	8	8	8	8	8	8	8
	PGU	55	48	53	55	55	47	66	76	71	49	46	47	76
Winslow	DIR	SE	SE	WSW	SW	SW	SW	WSW	SW	SW	SE	SE	SE	SE
	SPD	7	9	11	11	11	11	9	8	8	8	7	7	9
	PGU	56	63	58	56	53	52	59	43	40	49	46	52	63
Yuma	DIR	N	N	WNW	W	WNW	SSE	SSE	SSE	SSE	N	N	N	N
	SPD	7	7	8	8	8	9	10	9	7	7	7	7	8
	$PGU	41	50	43	47	38	42	61	60	57	47	47	47	61
ARKANSAS														
Blytheville	DIR	N	N	S	S	S	S	S	S	N	N	S	N	S
	SPD	9	9	9	9	7	7	5	6	6	6	8	8	7
	PGU	58	68	87	82	61	61	58	48	54	46	60	76	87
Fort Smith	DIR	E	E	E	E	E	E	E	E	E	E	E	E	E
	SPD	8	9	10	9	8	7	6	6	7	7	8	8	8
	#PGU	51	41	40	53	52	67	51	33	49	47	41	56	67
Little Rock	DIR	WSW	WSW	S	S	S	SW	SW	S	NE	S	S	WSW	S
	SPD	8	9	9	9	8	7	7	6	7	7	8	8	8
	$PGU	44	57	56	65	61	60	56	54	50	58	49	48	65
N. Little Rock	DIR	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
	SPD	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
	$PGU	25	25	28	30	30	21	30	28	24	24	27	25	30
CALIFORNIA														
Alameda NAS	DIR	NNW	W	W	W	W	W	W	W	W	W	W	NNW	W
	SPD	7	7	8	9	9	9	9	9	8	7	6	6	8
	PGU	69	68	58	53	53	49	40	40	48	63	70	71	71

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Barstow/ Daggett/San Bernardino	DIR	W	W	W	W	W	W	W	W	W	W	W	W	W
	SPD	8	9	13	14	14	14	13	12	10	10	9	8	10
	PGU	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
Bakersfield	DIR	ESE	ESE	ESE	ESE	NNW	NNW	NNW	NNW	NNW	NNW	NW	NW	NW
	SPD	5	6	7	7	8	8	7	7	6	6	5	5	6
	PGU	35	44	38	40	40	41	25	30	35	38	35	46	46
Bishop	DIR	N	N	N	N	N	N	N	N	N	N	S	S	N
	SPD	8	8	10	11	9	9	8	8	8	9	8	7	9
	PGU	60	63	58	62	62	54	60	70	47	52	66	68	70
Camp Pendleton MCAS	DIR	W	W	W	W	SSW	WSW	SSW	WSW	WSW	W	W	WSW	W
	SPD	5	5	6	7	7	7	7	6	6	5	5	5	6
	PGU	46	45	43	51	32	26	23	30	33	35	40	46	51
China Lake NAS	DIR	SW	S	SSW	SSW	W	SSW	SSW	SSW	SSW	SSW	SW	SW	SSW
	SPD	5	6	7	8	8	7	7	6	6	5	5	3	6
	PGU	77	79	81	74	82	68	60	58	69	68	71	71	82
Edwards AFB	DIR	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
	SPD	5	6	8	9	10	9	9	8	7	6	6	5	7
	PGU	60	67	74	60	62	59	59	61	75	75	55	57	75
Eureka	DIR	SE	SE	N	N	N	N	N	NW	N	N	SE	SE	N
	SPD	7	7	8	8	8	7	7	6	6	6	6	6	7
	PGU	70	60	72	53	60	51	45	45	49	52	62	62	72
Fairfield/ Travis AFB	DIR	N	N	WSW	WSW	WSW	SW	SW	WSW	SW	SW	N	N	SW
	SPD	6	7	7	8	12	14	14	14	10	7	6	6	9
	PGU	69	75	67	61	53	54	53	52	54	59	62	62	75
Fresno	DIR	ESE	ESE	NW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	ESE	WNW
	SPD	5	6	7	7	8	8	7	7	6	5	5	5	6
	PGU	43	40	49	46	43	40	28	28	29	39	54	45	54
Long Beach	DIR	WNW	WNW	W	S	S	S	S	WNW	WNW	WNW	WNW	WNW	WNW
	SPD	6	6	7	7	7	7	7	7	6	6	6	5	6
	PGU	43	40	49	46	43	40	28	28	29	38	54	45	44
Los Angeles IAP	DIR	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	WSW
	SPD	7	7	8	9	8	8	8	8	7	7	7	7	8
	PGU	51	57	62	59	49	40	31	33	39	46	60	49	62
Los Angeles City Office	DIR	NE	W	W	W	W	W	W	W	W	W	W	NE	W
	SPD	7	7	7	7	6	6	5	5	5	6	6	7	6
	$PGU	49	40	47	40	39	32	21	24	27	48	42	44	49
Marysville/ Beal AFB	DIR	SSE	SSE	SSE	SSE	SSE	S	S	S	S	NNW	SSE	NNW	SSE
	SPD	5	5	6	6	6	6	5	5	5	3	5	5	5
	PGU	59	62	51	53	43	44	38	35	48	53	64	67	67
Monterey/ Fort Ord	DIR	SE	SW	W	W	W	W	W	W	W	W	SW	SE	W
	SPD	5	5	7	8	9	8	8	7	6	6	5	5	7
	PGU	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
Mountain View/ Moffett NAS	DIR	N	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW
	SPD	5	5	6	6	7	7	7	7	5	5	5	3	6
	PGU	64	64	51	49	44	46	38	39	38	55	53	62	64
Palmdale	DIR	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
	SPD	8	9	12	13	13	13	12	10	9	8	8	8	10
	PGU	46	63	46	46	46	46	46	46	38	46	46	46	63

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Pt. Mugu NAS	DIR	NE	W	W	W	W	W	W	W	W	W	W	NE	W
	SPD	6	6	6	6	6	5	5	5	5	5	5	6	6
	PGU	70	56	54	58	51	40	38	29	46	49	64	67	70
Red Bluff	DIR	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	NW	NW	NW	SSE
	SPD	9	9	10	10	9	9	8	8	8	8	8	8	9
	PGU	47	55	60	47	45	41	39	35	43	48	54	49	60
Redding	DIR	N	N	N	N	S	S	S	S	S	S	NNW	NNW	N
	SPD	7	7	8	7	8	8	7	7	6	7	6	7	7
	PGU	70	64	74	47	54	60	36	46	44	66	58	85	85
Riverside/	DIR	NNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NNW	NNW
March AFB	SPD	3	3	3	5	5	5	5	5	3	3	3	3	3
	PGU	53	52	55	46	44	45	49	41	45	47	51	56	56
Sacramento	DIR	SE	SE	SE	SE	SE	SE	SE	SE	SE	SW	SW	SW	SE
	SPD	7	8	9	9	9	10	9	9	8	7	6	7	8
	$PGU	60	51	66	45	74	47	36	38	42	68	70	70	74
San Diego	DIR	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW
	SPD	6	7	8	8	8	8	8	7	7	7	6	6	7
	PGU	64	46	44	40	40	35	30	29	35	32	37	44	64
San Clemente	DIR	WNW	WNW	WNW	W	W	W	W	W	W	W	W	W	W
	SPD	7	7	9	8	8	8	7	7	7	7	7	6	7
	PGU	47	53	51	52	49	36	32	32	33	47	46	53	53
San	DIR	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW
Francisco AP	SPD	8	9	11	13	14	14	14	13	12	10	8	8	11
	PGU	61	69	64	54	58	51	52	45	44	58	60	74	74
San Nicholas	DIR	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW
	SPD	9	10	13	13	12	12	10	10	9	9	9	8	10
	PGU	60	74	62	64	64	60	52	47	54	58	60	63	74
Santa Ana/	DIR	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	WSW
El Toro	SPD	3	5	5	5	5	5	5	3	3	3	3	3	3
MCAS	PGU	66	61	48	52	46	33	31	36	46	46	63	68	68
Santa	DIR	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
Barbara	SPD	5	6	7	8	7	7	7	6	6	6	5	5	6
	PGU	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
Santa Maria	DIR	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	WNW	W	WNW	WNW	WNW
	SPD	6	7	8	9	9	8	7	6	6	6	6	6	7
	PGU	54	58	53	47	45	45	41	35	38	37	38	52	58
Stockton	DIR	SE	SE	WNW	WNW	W	W	WNW	WNW	WNW	WNW	SE	SE	WNW
	SPD	7	6	8	8	9	9	8	8	7	6	6	6	7
	PGU	46	40	39	35	35	35	29	30	33	37	40	44	46
COLORADO														
Alamosa	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	5	7	8	9	9	9	7	6	6	6	6	5	7
	#PGU	49	46	52	61	57	49	57	44	43	48	55	45	61
Colorado	DIR	N	N	N	N	N	N	N	N	N	N	N	N	N
Springs	SPD	10	10	11	12	11	10	9	9	9	10	10	10	10
	#PGU	55	53	47	68	49	53	57	55	55	70	57	59	70

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Denver	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	10	10	10	11	10	10	9	9	9	10	9	10	10
	PGU	55	52	59	62	60	60	55	52	56	51	49	51	62
Grand Junction	DIR	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE
	SPD	6	7	8	9	10	10	9	9	9	8	7	6	8
	PGU	41	59	53	78	62	74	64	74	64	57	49	45	78
Pueblo	DIR	W	W	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE
	SPD	7	8	10	11	10	9	9	8	8	7	7	8	8
	#PGU	53	48	56	55	49	54	60	52	48	55	44	49	60
CONNECTICUT														
Bridgeport	DIR	W	W	NW	NW	NW	NW	WSW	WSW	WSW	WSW	WSW	WSW	WSW
	SPD	13	13	13	13	11	10	10	10	11	12	12	12	12
	PGU	61	61	69	63	51	48	59	68	49	56	61	64	69
Hartford	DIR	NW	NW	NW	NW	NW	NW	N	N	N	S	S	S	NW
	SPD	9	10	10	10	9	8	7	7	7	8	9	9	9
	PGU	58	63	62	60	51	53	89	55	66	72	64	55	89
DELAWARE														
Dover AFB	DIR	WNW	NNW	NNW	WNW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	NNW	SSW
	SPD	8	8	9	8	7	6	6	5	6	6	7	8	7
	PGU	68	79	85	59	62	67	71	60	69	59	59	70	85
Wilmington	DIR	WNW	NW	WNW	WNW	WNW	S	S	S	WNW	NW	NW	WNW	WNW
	SPD	10	10	11	11	9	8	7	7	8	8	9	9	9
	#PGU	49	54	56	53	51	31	55	38	38	41	47	40	56
DISTRICT OF COLUMBIA														
Washington National AP	DIR	NNW	NW	NNW	S	S	S	S	S	S	S	S	NW	S
	SPD	10	11	11	11	10	9	9	8	9	9	10	10	10
	PGU	51	49	55	48	60	59	63	53	54	58	59	56	63
Washington Dulles IAP	DIR	NW	NW	NW	NW	NW	NW	NW	NW	S	S	S	S	NW
	SPD	8	9	9	9	7	7	6	6	6	7	8	8	7
	PGU	52	53	58	48	59	78	56	46	43	44	56	56	78
FLORIDA														
Apalachicola	DIR	N	N	SE	SE	SE	SW	W	SW	NE	NE	N	N	N
	SPD	8	9	9	9	8	7	6	6	8	8	8	8	8
	PGU	41	49	41	43	61	38	41	68	68	44	85	47	85
Daytona Bch	DIR	N	N	ESE	ESE	ESE	E	ESE	ESE	ENE	ENE	NW	WNW	ESE
	SPD	9	10	10	10	9	8	7	7	8	9	9	9	9
	PGU	52	58	77	49	69	67	67	68	48	56	47	43	77
Cocoa Beach/ Patrick AFB	DIR	NNW	N	SE	E	E	E	E	E	E	E	N	NNW	E
	SPD	8	9	9	9	8	7	6	6	7	9	8	8	8
	PGU	52	58	48	52	62	97	69	69	74	74	68	49	97
Fort Myers	DIR	E	E	SW	E	E	E	ESE	E	E	NE	NE	NE	E
	SPD	8	9	9	9	8	7	7	7	7	8	8	8	8
	PGU	40	39	46	39	40	46	45	44	92	45	31	35	92
Gainesville	DIR	WNW	WNW	W	W	W	W	W	W	ESE	ESE	E	E	W
	SPD	7	8	8	8	7	6	6	6	6	7	7	6	7
	PGU	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

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Jacksonville	DIR	WNW	NW	WSW	ESE	SE	WSW	SW	SW	ENE	NE	NE	NW	WSW
	SPD	8	9	9	9	8	8	7	7	8	8	8	8	8
	PGU	55	62	66	67	56	58	69	61	55	47	46	45	69
Key West	DIR	NE	NE	NE	NE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE
	SPD	12	12	12	12	11	10	10	9	10	11	12	12	11
	PGU	58	52	75	63	52	51	51	56	58	67	69	48	75
Miami	DIR	NNW	NNW	ESE	ESE	ESE	ESE	ESE	ESE	E	ENE	E	NNW	ESE
	SPD	10	10	11	11	10	8	8	8	8	9	10	9	9
	PGU	45	61	59	55	46	58	56	115	62	47	49	46	115
Orlando	DIR	N	N	N	N	N	N	N	N	S	S	S	S	N
	SPD	8	9	9	9	8	7	6	6	7	8	8	8	8
	PGU	48	51	62	53	68	62	74	62	56	40	41	43	74
Panama City/	DIR	N	N	SSE	S	S	WSW	WSW	E	ENE	N	N	N	N
Tyndall AFB	SPD	7	7	8	7	6	6	6	5	6	6	6	7	6
	PGU	54	60	59	63	60	69	64	78	79	49	69	53	79
Pensacola	DIR	N	N	N	N	N	N	ESE	ESE	ESE	SE	SE	SE	N
NAS	SPD	10	11	11	12	10	10	8	7	9	9	9	10	10
	PGU	35	35	35	35	32	32	35	35	53	35	35	34	53
Tallahassee	DIR	N	N	S	S	S	N	S	N	ENE	N	N	N	N
	SPD	7	7	8	7	6	5	5	5	6	6	6	6	6
	PGU	44	51	53	48	41	76	67	64	83	58	68	36	83
Tampa	DIR	ENE	ENE	ENE	ENE	E	E	E	E	E	E	W	W	E
	SPD	9	9	10	9	9	8	7	7	8	8	8	8	8
	PGU	44	46	58	49	51	61	60	48	45	53	60	37	61
Vero Beach	DIR	N	N	ESE	SE	ESE	ESE	ESE	ESE	ENE	ENE	ESE	NW	ESE
	SPD	9	9	10	10	9	8	7	7	7	9	9	8	8
	PGU	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
W. Palm Bch	DIR	NW	NW	NW	NW	SE	SE	SE	SE	ESE	ESE	ESE	ESE	ESE
	SPD	10	11	11	11	10	8	8	8	9	10	11	10	10
	#PGU	46	40	43	38	39	53	32	41	52	45	46	48	53
GEORGIA														
Albany NAS	DIR	NW	NW	SSW	SSW	SSW	SW	SSW	ENE	ENE	NE	NE	NW	ENE
	SPD	7	8	8	7	6	6	6	5	6	6	6	6	6
	PGU	54	55	64	89	62	61	55	72	44	49	56	45	89
Athens	DIR	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WSW	WSW	WSW	WSW	WNW
	SPD	8	9	9	8	7	7	6	6	7	7	8	8	7
	PGU	55	54	83	60	52	58	78	56	55	47	59	45	83
Atlanta	DIR	NW	NW	NW	WNW	NW	W	W	E	E	E	NW	NW	NW
	SPD	10	11	11	10	9	8	8	7	8	9	9	10	9
	PGU	55	68	61	61	72	60	77	63	45	56	56	47	77
Augusta	DIR	W	WNW	WNW	S	SE	SE	WSW	SE	NE	NNW	WNW	WNW	WSW
	SPD	7	8	8	7	6	6	6	5	5	6	6	6	6
	#PGU	44	43	48	43	52	49	45	33	38	52	49	40	52
Brunswick/	DIR	WNW	W	W	SSE	SSE	SSE	SSW	SSE	NE	NNE	NNE	NNE	SW
Glynco NAS	SPD	7	8	8	7	7	7	6	6	6	6	6	6	7
	PGU	48	48	56	64	61	49	62	64	61	45	60	41	64

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Columbus	DIR	ENE	ENE	NW	NW	WNW	WNW	S	S	E	E	ENE	ENE	ENE
	SPD	7	8	8	7	7	6	6	6	6	7	7	7	7
	#PGU	53	37	44	40	46	62	39	40	38	52	40	33	62
Macon	DIR	WNW	WNW	WNW	WNW	WNW	WNW	WSW	ENE	ENE	ENE	WNW	WNW	WNW
	SPD	8	9	9	9	7	7	7	7	6	7	7	7	8
	#PGU	46	44	43	72	64	36	41	51	39	45	54	33	72
Savannah	DIR	W	W	WNW	WNW	S	S	S	S	S	S	SW	SW	W
	SPD	9	9	9	9	8	8	7	7	7	8	8	8	8
	PGU	51	49	68	53	68	66	63	58	54	61	62	48	68
Valdosta/	DIR	WNW	NNW	SSW	WSW	E	WSW	SSW	WSW	NNE	NNE	ENE	NNE	ENE
Moody AFB	SPD	5	6	6	5	5	3	3	3	3	5	5	5	5
	PGU	51	56	55	60	59	75	51	55	53	51	63	45	75
HAWAII														
Barbers PT	DIR	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
NAS	SPD	9	9	10	10	9	9	10	9	9	9	9	9	9
	PGU	69	59	59	45	44	45	43	52	48	41	70	52	70
Kaneohe Bay	DIR	E	E	E	E	E	E	ENE	ENE	E	E	E	E	E
MCAS	SPD	8	9	12	10	10	10	10	10	9	9	9	8	9
	PGU	96	75	59	60	47	41	46	53	40	54	92	64	96
Hilo	DIR	SW	SW	SW	SW	SW	SW	WSW	SW	SW	SW	SW	SW	SW
	SPD	8	8	8	8	8	7	7	7	7	7	7	7	7
	PGU	47	55	40	40	41	32	36	36	37	33	36	45	55
Honolulu	DIR	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
	SPD	10	10	11	12	12	13	13	13	11	11	11	10	11
	PGU	41	46	51	41	39	35	40	36	49	35	40	46	51
Kahului	DIR	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
	SPD	13	14	14	15	17	17	18	17	16	13	14	13	15
	PGU	54	46	52	49	44	47	46	45	44	46	51	54	54
Lihue	DIR	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
	SPD	11	12	13	13	13	13	14	13	12	12	12	12	12
	PGU	66	59	54	47	40	39	41	38	115	40	51	53	115
Pearl Harbor/	DIR	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
Hickam AFB	SPD	9	10	12	13	12	13	14	13	12	12	10	10	12
	PGU	52	53	49	47	40	43	51	41	38	40	81	49	81
Wahiawa/	DIR	NW	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Wheeler AFB	SPD	7	7	8	7	8	8	8	8	7	7	6	7	7
	PGU	46	38	46	31	31	31	38	38	31	31	31	31	46
IDAHO														
Boise	DIR	ESE	ESE	ESE	ESE	ESE	ESE	NW	NW	NW	NW	NW	NW	ESE
	SPD	8	9	10	10	9	9	8	8	8	8	8	8	9
	PGU	59	45	53	58	49	54	71	54	49	47	54	47	71
Lewiston	DIR	S	E	E	WNW	WNW	WNW	WNW	WNW	WNW	E	E	S	WNW
	SPD	6	7	6	7	6	6	6	5	5	5	6	6	6
	PGU	72	64	60	58	54	54	59	51	59	59	59	63	72
Pocatello	DIR	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW
	SPD	10	11	11	12	11	10	9	9	9	10	11	10	10
	PGU	68	60	64	66	61	70	66	68	51	51	58	58	70

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
ILLINOIS														
Chicago O'Hare	DIR	W	W	W	NE	NE	NE	SW	SW	S	S	S	W	S
	SPD	12	12	12	12	11	9	9	8	9	10	11	11	11
	PGU	58	54	84	69	55	63	54	64	58	57	62	53	84
Chicago Midway AP	DIR	W	W	W	W	SSW	SW	SW	SW	S	S	SSW	W	W
	SPD	12	12	12	12	10	10	8	8	9	10	11	11	10
	$PGU	50	51	54	50	54	50	46	54	48	45	60	50	60
Moline	DIR	WNW	WNW	WNW	WNW	S	S	S	S	S	S	WNW	WNW	WNW
	SPD	11	11	12	12	10	9	8	7	8	9	11	11	10
	PGU	59	54	69	69	60	59	52	81	49	61	52	56	81
Peoria	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	11	11	12	12	10	9	8	7	8	9	11	11	10
	PGU	53	53	68	69	61	63	67	54	75	56	62	59	75
Rantoul/ Chanute AFB	DIR	W	WNW	W	S	S	S	SW	S	S	S	S	S	S
	SPD	12	12	12	13	10	9	7	7	8	9	10	10	10
	PGU	70	60	71	87	62	78	54	79	60	58	62	58	87
Rockford	DIR	WNW	WNW	WNW	WNW	WNW	S	S	S	S	S	S	S	S
	SPD	11	11	12	12	10	9	8	8	8	9	10	10	10
	PGU	51	54	54	58	81	54	92	58	58	52	59	62	92
Springfield	DIR	WNW	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	13	12	13	13	11	10	8	8	9	10	13	12	11
	PGU	51	51	71	63	67	59	60	69	54	53	58	60	71
INDIANA														
Columbus/ Bakalar AFB	DIR	S	S	S	S	S	SSW	SSW	SSW	S	S	S	S	S
	SPD	9	9	10	10	8	7	6	6	7	7	9	9	8
	PGU	38	54	46	46	38	46	38	38	31	46	46	38	54
Evansville	DIR	NW	NW	NW	S	SSW	SW	WSW	SW	S	S	S	NW	S
	SPD	9	9	10	10	8	7	6	6	6	7	9	9	8
	#PGU	51	64	61	62	69	74	56	44	55	48	70	56	74
Fort Wayne	DIR	W	W	W	W	SW	SW	SW	SW	SW	SW	W	W	SW
	SPD	11	11	12	12	10	9	8	7	8	9	11	11	10
	PGU	58	56	59	60	59	58	54	59	46	63	58	58	63
Indianapolis	DIR	WSW	WSW	SW	SW	WSW	WSW	SW	SW	SW	SW	SW	SW	SW
	SPD	11	11	12	12	10	9	8	7	8	9	11	11	10
	#PGU	61	53	62	74	62	62	55	70	46	49	67	64	74
Peru/ Grissom AFB	DIR	W	W	W	W	N	S	W	S	S	S	W	W	W
	SPD	12	10	10	10	8	7	6	5	6	8	9	10	8
	PGU	68	64	62	69	60	60	64	74	58	51	60	64	74
South Bend	DIR	SW	SW	SW	SW	SSW	SSW	SW	SW	SW	SW	SW	SW	SW
	SPD	12	11	12	12	10	9	8	8	9	10	11	11	10
	PGU	59	58	54	66	86	71	66	92	63	59	74	54	92
IOWA														
Des Moines	DIR	NW	NW	NW	NW	S	S	S	S	S	S	NW	NW	S
	SPD	12	11	13	13	11	10	9	9	10	10	12	11	11
	PGU	55	62	58	66	54	58	83	63	54	60	62	55	83
Dubuque	DIR	S	S	NW	S	S	S	S	S	S	S	S	S	S
	SPD	11	13	13	12	10	9	9	8	9	11	11	11	11
	PGU	58	52	62	68	74	55	74	62	58	54	55	56	74

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Sioux City	DIR	NW	NW	NW	NW	NW	SSE	SSE	SE	SE	NW	NW	NW	NW
	SPD	11	11	12	13	12	11	9	9	10	11	11	11	11
	#PGU	63	58	68	69	60	60	67	60	60	61	58	69	69
Waterloo	DIR	NW	NW	NW	NW	NW	NW	NNW	NNW	NNW	NW	NW	NW	NW
	SPD	12	11	12	12	11	10	8	8	9	10	11	11	11
	PGU	58	58	54	63	74	83	64	51	49	55	59	53	83
KANSAS														
Concordia	DIR	N	N	N	N	N	N	S	S	S	S	S	S	S
	SPD	12	12	14	14	12	11	11	11	12	12	12	12	12
	#PGU	60	52	54	64	45	62	67	47	51	57	48	45	67
Dodge City	DIR	NNW	NNW	NNW	N	N	N	S	S	S	S	S	S	S
	SPD	11	11	12	12	11	11	10	10	11	10	11	11	11
	#PGU	66	57	48	61	54	70	79	75	59	54	53	49	79
Goodland	DIR	W	NNW	NNW	NNW	SSE	SSE	SSE	SSE	S	NNW	NNW	NNW	SSE
	SPD	13	13	14	14	14	13	12	11	12	12	12	12	13
	#PGU	64	51	53	54	96	51	71	92	46	60	56	62	96
Topeka	DIR	N	N	N	N	N	N	N	N	N	N	N	N	N
	SPD	10	10	12	12	10	10	9	8	9	9	10	10	10
	#PGU	49	47	43	47	51	66	62	65	40	52	45	41	66
Wichita	DIR	N	N	N	N	N	N	N	N	S	S	S	S	N
	SPD	10	10	11	11	9	9	9	8	9	9	10	10	9
	#PGU	59	49	49	58	53	59	101	63	46	53	54	44	101
KENTUCKY														
Ft. Campbell	DIR	N	N	N	S	S	S	SSW	S	S	S	S	S	S
	SPD	7	6	7	7	5	5	3	3	3	5	6	7	6
	PGU	58	53	64	58	58	62	58	74	53	46	61	52	74
Jackson	DIR	SW	SW	S	S	S	S	S	S	S	S	S	S	S
	SPD	8	8	8	8	7	6	6	6	6	7	8	8	7
	PGU	55	60	53	58	49	60	55	46	39	48	51	60	60
Lexington	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	11	11	11	11	9	8	7	7	8	8	10	10	9
	PGU	53	56	49	61	59	64	56	51	40	44	53	54	64
Louisville	DIR	WNW	WNW	WNW	WNW	NW	NW	S	S	S	S	S	S	S
	SPD	10	10	10	10	8	7	7	6	7	7	9	9	8
	#PGU	43	47	43	45	53	39	44	49	32	41	48	38	53
Paducah	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	10	9	10	10	8	7	6	6	6	7	9	9	8
	#PGU	51	54	60	64	84	58	59	51	52	52	63	58	84
LOUISIANA														
Alexandria/ England AFB	DIR	NNW	NNW	S	S	S	S	S	SSE	NNE	SSE	SSE	SSE	SSE
	SPD	5	6	6	5	3	3	2	2	3	3	5	5	3
	PGU	60	51	64	67	72	83	51	54	55	48	60	51	83
Baton Rouge	DIR	N	N	N	N	ESE	ESE	S	S	ESE	ESE	S	S	ESE
	SPD	9	9	9	9	8	7	6	6	7	7	8	8	8
	#PGU	37	32	49	36	37	46	40	32	34	41	35	31	49
Lake Charles	DIR	N	N	S	S	S	S	S	S	NE	NE	N	N	S
	SPD	10	10	10	10	9	8	7	6	7	8	9	10	9
	PGU	49	62	58	70	55	61	49	56	58	49	69	46	70

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
New Orleans	DIR	ENE	ENE	N	N	S	S	S	S	S	S	S	S	S
	SPD	9	10	10	10	8	7	6	6	7	8	9	9	8
	PGU	48	49	53	62	60	63	51	66	58	49	44	48	66
Shreveport	DIR	S	S	S	S	S	S	S	S	SE	SE	S	S	S
	SPD	9	10	10	10	9	8	7	7	7	7	9	9	9
	PGU	54	54	58	81	83	66	66	56	54	51	63	64	83
MAINE														
Bangor IAP	DIR	NW	NW	NW	S	S	S	S	S	S	S	N	NW	S
	SPD	9	9	9	9	8	8	7	7	7	8	8	8	8
	PGU	52	44	54	49	53	48	39	39	53	54	64	56	64
Caribou	DIR	NW	NW	NW	NW	NW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW
	SPD	12	12	13	12	11	10	10	9	10	11	11	12	11
	PGU	30	28	29	32	37	35	32	24	25	29	33	39	39
Portland	DIR	W	W	W	W	NNW	NNW	NNW	NNW	NW	NW	NW	NW	NW
	SPD	9	9	10	10	9	8	8	8	8	9	9	9	9
	#PGU	53	56	44	47	44	39	38	40	41	47	72	43	72
MARYLAND														
Baltimore	DIR	WNW	NW	WNW	WNW	W	WNW	W	W	S	NW	WNW	WNW	WNW
	SPD	10	10	11	11	9	8	8	8	8	9	9	9	9
	PGU	53	51	58	54	55	46	68	55	45	47	64	77	77
Camp Springs	DIR	NW	NW	NW	NW	S	S	S	S	S	N	NW	NW	NW
	SPD	8	9	9	9	7	7	6	5	6	7	8	9	7
	PGU	69	71	79	71	79	74	85	69	68	54	62	66	85
Patuxent	DIR	NNW	NW	NNW	NW	SSE	S	S	S	S	NNW	NNW	NNW	NNW
River NAS	SPD	8	8	8	9	7	7	6	6	6	7	7	8	7
	PGU	71	70	71	72	89	81	82	79	67	126	63	67	126
MASSACHUSETTS														
Boston	DIR	WNW	WNW	WNW	WNW	SSW	WSW	WSW	WSW	WSW	WNW	WNW	WNW	WNW
	SPD	14	14	14	14	12	12	11	11	11	12	13	14	13
	PGU	67	58	81	55	56	68	60	64	76	59	63	78	81
Chicope Fls/	DIR	WNW	WNW	WNW	WNW	S	S	S	S	S	N	WNW	N	S
Westover AFB	SPD	7	7	8	8	7	6	6	5	5	6	6	7	6
	PGU	70	64	72	70	69	68	55	71	69	56	79	62	79
Falmouth/	DIR	W	NW	WNW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	WSW
Otis AFB	SPD	10	10	12	10	9	8	8	8	8	8	9	10	9
	PGU	69	68	72	67	62	47	53	52	84	59	63	62	84
Fort Devens	DIR	WNW	NNW	NNW	NNW	N	WNW	SSW	SSW	SSW	WNW	WNW	WNW	WNW
	SPD	5	5	6	6	5	3	3	3	3	3	5	5	5
	PGU	56	48	49	60	46	49	49	46	54	44	47	51	60
Milton/	DIR	W	NW	NW	NW	S	S	SW	SW	SW	NW	W	W	NW
Blue Hill	SPD	17	17	17	17	15	14	13	13	14	15	16	17	15
	PGU	91	81	109	84	69	74	86	78	115	71	78	79	115
Worcester	DIR	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW
	SPD	12	13	13	12	11	10	9	9	10	10	11	12	11
	PGU	62	66	66	64	61	58	68	69	71	62	62	62	71

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
MICHIGAN														
Alpena	DIR	WNW	WNW	WNW	ESE	ESE	ESE	WNW	WSW	WSW	S	WSW	WSW	WNW
	SPD	9	9	9	10	9	8	7	7	8	8	9	9	9
	PGU	44	54	47	52	53	58	51	60	45	47	53	54	60
Detroit	DIR	WSW	SW	WNW	SW	NE	SW	SW	SW	SW	SW	WSW	SW	SW
	SPD	12	12	12	12	10	9	9	8	9	10	11	11	10
	PGU	66	51	60	64	58	56	59	47	54	56	58	59	66
Flint	DIR	W	W	WNW	WSW	WSW	SSW	SW	SSW	SSW	S	SW	SW	WSW
	SPD	11	11	11	11	10	9	8	8	9	10	11	11	10
	PGU	52	54	69	68	54	76	69	71	53	67	55	52	76
Grand Rapids	DIR	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	S	S	WSW	S	WSW
	SPD	12	11	11	11	10	9	8	8	8	9	11	11	10
	PGU	55	55	56	63	68	63	51	61	52	60	55	56	68
Houton Lake	DIR	W	W	W	W	NW	NW	NW	NW	W	W	W	W	W
	SPD	10	9	10	10	9	8	8	7	8	9	10	9	9
	PGU	46	48	55	54	60	58	58	59	46	54	59	55	60
Lansing	DIR	SW	W	W	W	W	W	W	W	S	SW	SW	SW	W
	SPD	12	12	12	12	10	9	9	8	9	10	12	12	11
	PGU	55	51	61	70	59	67	60	62	47	58	53	54	70
Marquette	DIR	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
	SPD	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
	$PGU	44	31	40	44	34	38	35	37	35	38	31	35	44
Muskegon	DIR	WNW	WNW	E	E	SW	SW	SW	SSW	ESE	ESE	SE	WNW	WNW
	SPD	12	11	12	12	10	9	9	9	9	10	12	12	11
	PGU	53	67	59	61	54	55	58	63	51	55	56	55	67
Oscoda/	DIR	SSW	SSW	WNW	WNW	ENE	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW
Wurtsmith	SPD	8	8	8	8	7	6	6	5	6	7	8	8	7
AFB	PGU	74	61	58	67	59	83	74	55	61	59	60	66	83
KI Sawyer	DIR	SSW	N	N	N	N	S	SSW	SSW	S	S	SSW	SSW	S
AFB	SPD	9	8	9	9	8	7	6	7	7	8	9	9	8
	PGU	67	64	61	68	69	62	64	49	51	62	66	56	69
Sault Ste.	DIR	ESE	NW	NW	NW	WNW	WNW	WNW	WNW	NW	ESE	ESE	ESE	WNW
Marie	SPD	9	9	10	10	9	8	8	7	8	9	10	9	9
	PGU	56	56	59	58	55	52	54	56	54	61	61	58	61
MINNESOTA														
Duluth	DIR	WNW	NW	E	E	E	ESE	WNW	ESE	WNW	WNW	WNW	NW	WNW
	SPD	12	12	12	13	12	11	10	10	11	12	12	12	11
	PGU	56	47	71	60	59	69	64	46	60	70	55	49	71
International	DIR	WNW	WNW	WNW	WNW	WNW	WNW	ENE	ENE	S	S	S	S	WNW
Falls	SPD	9	9	9	10	9	8	7	7	8	9	10	9	9
	PGU	53	45	52	51	58	56	62	67	46	46	47	41	67
Minneapolis/	DIR	NW	NW	NW	N	ESE	ESE	S	S	S	NW	NW	NW	NW
St. Paul	SPD	11	10	11	12	11	11	10	9	10	11	11	10	11
	PGU	67	55	60	61	67	53	62	71	52	57	66	48	71
Rochester	DIR	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW
	SPD	13	13	13	14	12	11	10	10	11	12	13	13	12
	PGU	69	55	68	85	74	69	71	64	64	62	67	56	85

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
St. Cloud	DIR	NW	NW	NW	NW	S	S	S	S	S	NW	NW	NW	NW
	SPD	8	8	9	10	9	8	7	7	7	9	9	8	8
	PGU	58	48	46	78	51	74	55	53	45	54	53	53	78
MISSISSIPPI														
Biloxi/	DIR	N	N	SSE	SSE	SSE	SSW	SSW	N	NNE	NNE	N	N	N
Keesler AFB	SPD	7	7	7	7	6	6	5	5	5	5	6	7	6
	PGU	69	62	58	70	68	67	64	128	98	59	54	53	128
Jackson	DIR	N	N	N	N	NNW	NNW	NNW	NNW	S	S	S	S	NNW
	SPD	8	8	9	8	7	6	6	5	6	6	7	8	7
	#PGU	40	34	40	54	33	47	41	40	36	34	33	46	54
Meridian	DIR	S	S	S	S	S	S	S	S	N	N	S	S	S
	SPD	7	8	8	7	6	5	5	5	5	5	7	7	6
	#PGU	53	55	64	66	47	64	66	56	38	45	54	68	68
Tupelo	DIR	N	N	N	N	S	S	S	S	S	S	S	S	S
	SPD	7	8	8	8	7	6	6	5	6	6	7	7	7
	#PGU	53	39	39	36	43	40	54	34	43	45	38	31	54
MISSOURI														
Columbia	DIR	WNW	WNW	WNW	S	S	S	S	S	S	S	S	WNW	S
	SPD	11	11	12	12	9	9	8	8	9	10	11	11	10
	PGU	53	63	66	69	58	95	64	62	54	59	51	55	95
Kansas City	DIR	SSW	SSW	S	S	S	S	S	S	S	S	S	S	S
	SPD	11	11	12	12	10	10	9	9	10	11	11	11	11
	PGU	58	56	63	62	59	67	75	54	63	60	52	55	75
St. Louis	DIR	WNW	WNW	WNW	WNW	S	S	S	S	S	SSE	WNW	WNW	WNW
	SPD	11	11	12	11	9	9	8	7	8	9	10	10	10
	PGU	53	66	66	71	62	60	72	53	49	58	64	55	72
Springfield	DIR	SSE	SSE	SSE	SSE	SSE	S	S	SSE	SSE	SSE	SSE	SSE	SSE
	SPD	12	12	13	12	10	10	9	9	9	10	11	11	11
	PGU	48	52	52	53	49	61	72	59	49	48	53	48	72
MONTANA														
Billings	DIR	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
	SPD	13	12	11	11	11	10	9	9	10	11	12	13	11
	PGU	59	62	62	59	60	54	71	69	61	64	58	70	71
Glasgow	DIR	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE
	SPD	10	10	11	12	12	11	10	11	11	11	10	10	11
	#PGU	37	51	53	67	48	53	55	55	44	46	49	62	67
Great Falls	DIR	SW	SW	SW	SW	SW	SW	SW	SW	WSW	WSW	SW	SW	SW
	SPD	15	14	13	13	11	11	10	10	11	13	15	15	13
	#PGU	53	48	52	57	39	51	49	47	36	49	54	59	59
Havre	DIR	SW	SW	SW	SW	E	SW	SW	W	E	SW	SW	SW	SW
	SPD	10	10	10	11	10	10	9	9	9	10	10	10	10
	$PGU	47	58	52	59	54	63	71	59	52	52	54	48	71
Helena	DIR	W	ENE	W	W	W	ENE	W	ENE	W	ENE	W	W	ENE
	SPD	7	7	8	9	9	9	8	7	7	7	7	7	8
	#PGU	48	45	45	40	51	57	53	51	47	54	47	57	57
Kalispell	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	4	5	6	7	7	7	6	6	6	5	5	5	6
	#PGU	39	36	36	40	34	38	32	44	32	40	36	57	57

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Missoula	DIR	ESE	WNW	WNW	NW	WNW	WNW	NW	WNW	WNW	NW	WNW	ESE	WNW
	SPD	5	6	7	8	7	7	7	7	6	5	5	5	6
	PGU	56	45	55	63	56	67	59	61	53	61	47	76	76
NEBRASKA														
Grand Island	DIR	N	N	N	N	N	N	N	N	S	S	S	S	S
	SPD	12	12	13	14	13	12	11	10	11	11	12	12	12
	#PGU	64	59	61	60	80	77	72	66	46	61	51	49	80
Lincoln	DIR	N	N	N	N	N	N	N	N	N	N	N	N	N
	SPD	9	9	11	12	10	9	9	8	9	9	9	9	9
	#PGU	53	52	52	47	83	56	71	53	56	57	40	49	83
Norfolk	DIR	NNW	NNW	NNW	NNW	S	S	S	S	S	NNW	NNW	NW	S
	SPD	12	12	14	14	12	11	10	10	11	11	12	12	12
	PGU	60	56	63	66	54	59	78	82	71	56	55	60	82
N. Platte	DIR	WNW	WNW	NW	NW	N	N	N	N	SSE	SSE	S	S	NW
	SPD	9	10	12	13	12	10	10	9	10	10	10	9	10
	PGU	64	55	64	76	72	64	68	74	58	68	60	56	76
Omaha(Eppley)	DIR	NNW	NNW	N	N	NNW	NNW	SSE	SSE	S	S	S	S	SSE
	SPD	11	11	12	13	11	10	9	9	9	10	11	11	11
	$PGU	57	57	73	65	73	72	109	66	47	62	56	52	109
ScottsBluff	DIR	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	ESE	ESE	WNW
	SPD	11	11	13	13	12	11	9	9	9	10	11	11	11
	PGU	68	62	59	63	63	70	68	66	54	60	61	66	70
Valentine	DIR	NW	NNW	NNW	NNW	S	SSE	SSE	S	S	WNW	WNW	WNW	NW
	SPD	9	9	10	10	10	10	9	8	10	9	9	9	9
	#PGU	53	63	52	60	41	45	39	60	51	55	37	51	63
NEVADA														
Elko	DIR	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
	SPD	5	6	7	7	7	7	6	6	5	5	5	5	6
	PGU	40	39	41	48	55	61	37	35	58	35	40	50	61
Ely	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	10	10	11	11	10	10	10	10	10	9	9	9	10
	#PGU	47	48	49	52	46	48	61	43	49	34	38	46	61
Las Vegas	DIR	WSW	WSW	WSW	SW	SW	S	S	S	WSW	WSW	WSW	WSW	WSW
	SPD	7	9	11	11	12	11	11	10	9	8	8	7	9
	PGU	54	67	82	69	72	59	71	90	49	61	68	54	90
Reno	DIR	S	S	S	S	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW
	SPD	6	6	8	8	8	8	7	7	6	5	5	6	7
	PGU	90	66	71	64	70	67	67	58	54	81	70	75	90
Winnemucca	DIR	S	S	S	S	S	S	S	S	W	W	W	W	S
	SPD	7	8	9	9	9	9	8	8	8	7	7	7	8
	#PGU	53	46	47	46	39	44	51	58	53	54	52	63	63
Tonopah	DIR	WNW	WNW	WNW	WNW	WNW	S	S	S	S	WNW	WNW	WNW	WNW
	SPD	6	8	9	9	9	8	8	6	6	6	7	6	7
	PGU	48	58	62	56	56	56	53	52	54	51	63	60	63

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
NEW HAMPSHIRE														
Concord	DIR	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW
	SPD	7	8	8	8	7	6	6	5	5	6	7	7	7
	PGU	52	60	49	61	52	59	53	45	52	48	53	58	61
Mount Washington	DIR	W	W	W	W	W	W	W	W	W	W	W	W	W
	SPD	46	45	42	36	30	28	26	25	29	34	40	46	35
	PGU	173	166	180	231	164	136	110	142	174	161	163	178	231
Portsmouth/ Pease AFB	DIR	W	W	W	W	W	W	W	W	W	W	W	W	W
	SPD	8	8	8	8	7	6	6	6	6	6	7	8	7
	PGU	64	66	60	56	56	46	61	58	75	59	63	62	75
NEW JERSEY														
Atlantic City AP	DIR	WNW	WNW	WNW	S	S	S	S	S	S	NW	WNW	WNW	WNW
	SPD	11	11	12	12	10	9	8	8	8	9	10	11	10
	PGU	54	53	66	53	55	64	81	46	69	56	63	58	81
Atlantic City State Marina	DIR	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
	SPD	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
	PGU	58	60	87	63	52	64	52	67	78	77	64	67	87
Trenton	DIR	NW	NW	NW	S	S	S	S	S	S	N	NW	NW	S
	SPD	10	10	11	10	9	8	8	8	8	8	9	9	9
	$PGU	57	51	49	47	40	43	46	43	56	60	64	52	64
McGuire AFB	DIR	WNW	WNW	WNW	WNW	WSW	WSW	WSW	SSW	WSW	WSW	WNW	WNW	WNW
	SPD	8	8	8	8	6	6	5	5	5	6	7	8	7
	PGU	56	61	62	64	71	82	78	81	76	87	84	64	87
Newark	DIR	WNW	WNW	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW
	SPD	11	11	12	11	10	10	9	9	9	10	10	11	10
	PGU	54	60	62	58	58	83	69	68	67	53	63	60	83
NEW MEXICO														
Alamagordo/ Holloman AFB	DIR	N	SSE	SSE	WSW	S	S	SSE	S	S	S	SSE	SSE	SSE
	SPD	5	5	6	6	6	6	5	5	5	3	5	3	5
	PGU	77	56	59	77	79	63	66	69	52	58	67	56	79
Albuquerque	DIR	N	N	N	SW	S	E	E	E	ESE	N	N	N	N
	SPD	8	9	10	11	10	10	9	8	8	8	8	8	9
	PGU	70	63	77	64	70	68	72	63	61	55	63	71	77
Clayton	DIR	W	W	W	SW	SW	SW	SW	SW	SSW	SW	W	SW	SW
	SPD	12	12	13	15	13	12	11	11	12	12	13	13	12
	PGU	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
Clovis/ Cannon AFB	DIR	W	W	W	W	W	S	S	SSE	SSW	WSW	W	W	W
	SPD	9	9	9	10	9	8	7	6	7	8	9	9	8
	PGU	69	70	84	68	75	74	76	79	81	74	68	77	84
Roswell AFB	DIR	S	S	S	S	S	SSE	SE	SE	S	SSE	S	S	S
	SPD	6	8	9	9	9	9	8	7	7	7	7	6	8
	PGU	58	62	75	62	66	71	60	64	69	58	54	60	75
NEW YORK														
Albany	DIR	WNW	WNW	WNW	WNW	S	S	S	S	S	S	S	WNW	S
	SPD	10	10	11	10	9	8	8	7	8	8	9	9	9
	PGU	58	56	53	56	49	59	77	73	47	56	58	56	77

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Binghamton	DIR	WNW	WNW	WNW	WNW	NW	SW	SW	SW	S	S	NW	WNW	WNW
	SPD	11	11	11	11	10	9	8	8	9	9	11	11	10
	PGU	51	52	52	52	54	59	74	51	48	46	62	48	74
Buffalo	DIR	W	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	W	W	WSW
	SPD	14	13	13	12	11	11	10	10	10	11	12	13	12
	PGU	71	55	72	74	61	59	53	71	62	61	12	66	74
Islip	DIR	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	NW	SW	SW	SW	WNW
	SPD	10	10	11	11	9	9	8	8	8	9	10	10	9
	PGU	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
Newburgh/ Stewart AFB	DIR	W	W	WNW	W	WSW	WSW	WSW	WSW	WSW	W	W	W	W
	SPD	10	10	12	10	9	8	7	7	7	8	9	10	9
	PGU	71	71	72	63	76	97	79	68	70	86	97	66	97
NY Central Park	DIR	NW	NW	NW	NW	SW	SW	SW	SW	SW	W	W	NW	NW
	SPD	9	9	10	9	7	7	7	6	7	8	7	8	8
	PGU	52	51	63	46	44	41	46	43	52	46	58	64	64
NY JFK	DIR	NW	NW	NW	S	S	S	S	S	S	WSW	NW	NW	S
	SPD	13	13	14	13	12	11	10	10	10	11	12	13	12
	PGU	52	60	61	52	71	49	54	47	58	49	67	60	71
NY LaGuardia	DIR	NW	NW	NW	NW	S	S	S	S	NE	WNW	WNW	NW	NE
	SPD	14	14	14	13	12	11	11	11	11	12	13	14	13
	PGU	59	59	71	63	56	56	49	72	64	64	76	77	77
Niagara Falls IAP	DIR	W	WSW	SW	SW	SW	SW	SW	SW	SW	W	W	W	SW
	SPD	13	12	12	10	9	9	9	8	9	9	12	12	10
	PGU	67	59	69	59	64	48	55	48	44	45	64	52	69
Plattsburgh AFB	DIR	W	WSW	SW	SW	SW	SW	SW	SW	SW	W	W	W	SW
	SPD	13	12	12	10	9	9	9	8	9	9	12	12	10
	PGU	67	59	69	59	64	48	55	48	44	45	64	52	69
Rochester	DIR	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW
	SPD	12	12	12	12	10	9	9	8	9	9	11	11	10
	PGU	63	52	68	67	64	52	51	62	51	56	67	53	68
Rome/ Griffiss AFB	DIR	WNW	WNW	WNW	WNW	WNW	WNW	WNW	ESE	ESE	ESE	WNW	ESE	WNW
	SPD	7	7	7	7	6	5	5	3	5	6	7	7	6
	PGU	68	67	76	64	69	84	59	64	69	76	60	56	84
Syracuse	DIR	WSW	WSW	WSW	WSW	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WSW
	SPD	11	11	11	11	9	8	8	8	8	9	10	10	9
	#PGU	54	49	49	44	44	39	37	47	44	43	51	46	54
Suffolk Co AFB	DIR	NW	NW	NNW	SW	SW	SW	SW	SW	SW	SW	W	W	SW
	SPD	10	10	10	10	9	9	8	8	9	9	9	9	9
	PGU	58	61	60	58	43	40	44	40	76	48	62	61	76
NORTH CAROLINA														
Asheville	DIR	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW
	SPD	10	10	9	9	7	6	6	6	6	7	8	9	8
	PGU	55	54	64	51	44	52	60	43	37	58	49	49	64
Cape Hatteras	DIR	N	N	N	NNE	NNE	NNE	NNE	NNE	NNE	SW	SW	SW	NNE
	SPD	12	12	12	12	11	11	10	10	11	11	12	11	11
	PGU	59	58	63	60	46	55	45	98	87	66	78	60	98
Charlotte	DIR	SW	SW	S	SW	SW	S	SW	S	NE	NE	SW	SW	SW
	SPD	8	8	9	9	8	7	7	7	7	7	7	8	8
	PGU	49	53	60	56	52	52	52	77	87	40	51	47	87

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Cherry Point MCAS	DIR	N	N	S	SSW	SSW	SSW	SSW	SSW	NNE	NNE	N	N	SSW
	SPD	6	7	7	7	6	6	5	5	5	6	6	6	6
	PGU	58	66	68	81	64	81	66	104	107	86	59	68	107
Fayetteville Pope AFB	DIR	WSW	WSW	W	SW	SW	WSW	SW	SW	NE	N	N	WSW	SW
	SPD	5	6	6	6	5	5	3	3	3	3	5	5	5
	PGU	77	64	68	55	62	59	64	64	53	70	59	55	77
Goldsboro/ Seymour Johnson AFB	DIR	N	N	N	SW	S	S	S	S	NNE	N	N	W	N
	SPD	6	7	7	7	6	5	5	5	5	5	5	6	6
	PGU	72	75	64	64	52	52	60	59	46	66	54	69	75
Greensboro	DIR	SSW	SSW	SSW	SSW	SW	SSW	SSW	SSW	NNE	NNE	SSW	SSW	SSW
	SPD	8	9	9	9	8	7	7	6	7	7	8	7	8
	PGU	63	48	43	46	59	51	59	39	54	60	53	47	63
Raleigh	DIR	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
	SPD	8	9	9	9	8	7	7	6	7	7	8	7	8
	#PGU	51	62	52	56	64	48	45	61	67	40	41	45	67
Wilmington	DIR	N	N	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
	SPD	9	9	10	10	9	8	8	7	8	8	8	8	8
	PGU	49	49	70	53	54	64	78	41	74	52	59	49	78
NORTH DAKOTA														
Bismarck	DIR	WNW	WNW	WNW	WNW	WNW	NW	NW	NW	NW	NW	NW	NW	NW
	SPD	10	10	11	12	11	10	9	9	10	10	10	10	10
	PGU	69	62	64	56	69	58	61	62	84	55	56	63	84
Fargo	DIR	N	SSE	N	N	SSE	SSE	SSE	SSE	SSE	SSE	SSE	S	SSE
	SPD	13	13	13	14	13	12	11	11	12	13	13	12	12
	PGU	60	59	53	53	62	66	70	60	62	61	53	61	70
Grand Forks	DIR	N	N	N	N	N	N	S	N	N	N	N	N	N
	SPD	10	10	10	10	9	9	8	8	9	10	10	10	9
	PGU	62	66	72	71	63	53	62	62	68	63	63	59	72
Minot AFB	DIR	NW	NW	NW	N	N	W	W	W	W	WNW	NW	NW	NW
	SPD	12	12	10	10	9	9	8	8	9	10	9	10	9
	PGU	74	81	61	71	66	71	77	85	62	63	63	67	85
Williston	DIR	SSW	SSW	SSW	SSW	N	N	N	N	N	N	N	N	N
	SPD	10	10	10	11	11	10	9	10	10	10	9	9	10
	PGU	62	54	58	62	62	69	70	59	60	60	53	63	70
OHIO														
Akron/Canton	DIR	WSW	WSW	W	SW	S	SW	SW	SW	S	S	WSW	WSW	SW
	SPD	12	11	11	11	9	8	8	8	8	9	11	12	10
	PGU	54	53	60	60	56	60	68	60	52	51	63	58	68
Cincinnati	DIR	SSW	SSW	SSW	SSW	SW	SSW	SW	SW	SSW	SSW	SSW	SSW	SSW
	SPD	11	10	11	11	9	8	7	7	7	8	10	10	9
	PGU	51	55	64	61	53	60	51	47	45	45	56	59	64
Cleveland	DIR	WSW	SW	SSW	N	N	SW	SW	SW	SW	SSW	WSW	WSW	SW
	SPD	12	12	12	12	10	9	9	8	9	10	12	12	11
	PGU	55	58	63	69	54	56	67	49	45	52	59	63	69
Columbus	DIR	W	W	W	N	S	S	S	S	S	S	S	S	S
	SPD	10	9	10	10	8	7	6	6	6	7	9	9	8
	PGU	51	51	53	52	52	40	47	59	38	39	53	55	59

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Dayton	DIR	W	SSW	WNW	S	SW	SSW	WSW	SW	S	S	SSW	S	SSW
	SPD	11	11	12	11	10	9	8	7	8	9	11	11	10
	PGU	49	52	67	62	60	60	58	51	48	43	55	62	67
Mansfield	DIR	WSW	WSW	WSW	WSW	W	W	SW	SW	SW	SW	SSW	SSW	WSW
	SPD	14	13	13	12	10	10	9	8	9	10	12	13	11
	#PGU	59	58	62	68	55	68	64	68	48	52	69	64	69
Toledo	DIR	WSW	WSW	ENE	ENE	ENE	WSW	WSW	WSW	WSW	SW	WSW	WSW	WSW
	SPD	11	11	11	11	10	9	8	8	7	8	10	10	10
	PGU	62	52	64	59	58	55	66	75	54	49	55	56	75
Youngstown	DIR	WSW	WSW	WSW	WSW	WSW	WSW	W	W	W	SSW	SW	SW	WSW
	SPD	12	11	11	11	9	8	8	7	8	9	11	11	10
	PGU	51	54	58	64	56	58	66	44	52	49	53	58	66
OKLAHOMA														
Altus AFB	DIR	N	NNE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	N	N	SSE
	SPD	8	9	9	9	8	7	7	6	7	7	8	7	8
	PGU	76	94	64	69	92	78	76	71	69	52	64	76	94
Burns Flat/ Clinton	DIR	S	N	S	S	S	S	S	S	S	S	S	S	S
	SPD	12	12	14	14	14	12	9	9	10	10	10	12	12
	PGU	52	62	68	68	70	60	67	54	60	47	51	56	70
Enid/Vance AFB	DIR	N	N	S	S	S	S	S	S	S	S	S	N	S
	SPD	10	12	12	12	9	10	9	9	9	10	9	10	10
	PGU	61	62	61	86	81	90	86	81	71	83	66	67	90
Oklahoma City	DIR	N	N	N	N	S	S	SSE	SSE	SSE	SSE	S	S	S
	SPD	13	14	15	15	13	12	11	11	12	12	13	13	13
	#PGU	53	47	62	47	57	51	49	52	40	51	56	47	62
Tulsa	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	10	11	12	12	11	10	9	9	9	10	11	10	10
	#PGU	47	46	45	63	44	55	55	41	40	46	44	41	63
OREGON														
Astoria	DIR	E	E	E	E	ESE	ESE	ESE	ESE	WNW	WNW	NW	NW	ESE
	SPD	9	9	9	9	8	9	9	8	7	7	9	9	8
	#PGU	50	54	58	61	44	45	30	28	29	67	56	67	67
Burns	DIR	E	E	E	E	NW	NW	NW	NW	NW	NW	WNW	WNW	NW
	SPD	6	N/A	8	N/A	9	7	N/A	7	6	6	6	6	N/A
	PGU	46	50	62	47	52	47	45	58	44	48	71	74	74
Eugene	DIR	S	S	S	S	S	S	S	S	N	N	N	N	S
	SPD	8	8	8	8	8	8	8	8	8	7	8	8	8
	PGU	58	48	45	44	45	41	51	39	36	52	51	56	58
Klamath Falls Kingsey Fld	DIR	SSE	SSE	SSE	WSW	WNW	NNW	NNW	NNW	NNW	NNW	SSE	SSE	NNW
	SPD	6	7	8	8	8	7	7	6	6	5	6	6	7
	PGU	54	60	60	54	60	43	41	52	41	66	56	61	66
Medford	DIR	N	N	NW	WNW	WNW	WNW	WNW	WNW	WNW	N	N	N	WNW
	SPD	4	5	5	6	6	6	6	5	5	4	4	4	5
	PGU	47	45	53	48	39	53	46	36	36	35	52	56	56
Pendleton	DIR	SSE	SSE	SSE	SSE	W	W	W	W	W	W	W	W	W
	SPD	7	8	9	10	9	9	9	8	8	7	8	7	8
	PGU	76	53	74	61	60	59	62	55	56	56	58	62	76

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Portland	DIR	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE
	SPD	10	9	8	8	7	7	8	7	7	7	9	10	8
	PGU	63	61	59	51	46	40	32	31	44	52	52	71	71
Salem	DIR	S	S	S	S	S	N	N	N	N	S	S	S	S
	SPD	8	8	8	7	7	7	7	6	6	6	8	8	7
	PGU	61	49	52	41	45	36	36	32	39	47	58	68	68
PENNSYLVANIA														
Allentown	DIR	W	W	WNW	WSW	SW	WSW	SW	WSW	SW	WSW	WSW	W	WSW
	SPD	10	11	11	11	9	8	7	7	7	8	9	10	9
	PGU	54	60	55	68	51	58	66	48	60	63	78	62	78
Avoca/	DIR	SW	SW	NW	SW	SW	SW	WSW	SW	SW	SW	SW	SW	SW
Wilkes-Barre	SPD	9	9	10	9	8	8	7	7	7	8	8	9	8
Scranton	PGU	74	53	61	64	64	58	58	51	54	52	61	64	74
Erie	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	13	12	12	11	10	9	9	9	10	11	13	13	11
	PGU	55	62	64	55	54	52	69	53	61	61	69	60	69
Middletown/	DIR	NW	NW	NW	NW	NW	NW	NW	WNW	NW	NW	NW	NNW	NW
Harrisburg	SPD	8	8	9	8	7	6	5	5	5	5	7	7	7
	PGU	44	31	37	35	47	58	25	46	27	30	29	46	58
Philadelphia	DIR	WNW	WNW	WNW	WNW	WNW	WNW	SW	SW	SW	SW	SW	SW	SW
	SPD	10	11	11	11	10	9	8	8	8	9	10	10	10
	PGU	59	51	69	49	67	54	60	47	53	63	61	63	69
Pittsburgh	DIR	W	W	W	W	W	W	WSW	WSW	WSW	WSW	SW	SW	W
	SPD	11	11	11	11	9	8	7	7	8	8	10	10	9
	PGU	54	59	60	60	61	63	83	56	48	49	62	55	83
Williamsport	DIR	W	W	W	W	WNW	WNW	W	W	W	W	W	W	W
	SPD	9	9	9	9	8	7	7	6	6	7	8	8	8
	PGU	54	49	60	60	51	56	58	61	54	45	63	64	64
RHODE ISLAND														
Providence	DIR	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW
	SPD	11	11	12	12	11	10	9	9	9	9	10	11	10
	#PGU	60	61	60	58	49	54	51	63	81	58	61	64	81
Quonset Pt	DIR	WNW	WNW	WNW	S	S	S	SW	SW	SW	SW	WNW	WNW	SW
NAS	SPD	10	10	12	12	10	9	8	8	8	9	9	10	9
	PGU	75	68	84	72	67	56	56	98	107	61	85	75	107
SOUTH CAROLINA														
Beaufort	DIR	W	W	S	S	S	S	S	S	N	N	N	W	S
MCAS	SPD	6	6	7	6	5	5	5	5	5	5	5	6	6
	PGU	52	69	53	67	63	61	53	63	137	47	53	49	137
Charleston	DIR	NNE	NE	SSW	S	S	S	S	S	NNE	NNE	NNE	NNE	SSW
AP	SPD	9	10	10	10	8	8	8	7	8	8	8	8	9
	PGU	53	48	69	48	49	55	59	64	98	47	59	44	98
Charleston	DIR	W	N	W	W	S	S	SSW	S	N	N	N	W	W
City Office	SPD	8	8	8	8	8	7	7	6	7	7	7	7	7
	PGU	44	54	44	44	55	81	67	38	43	40	38	47	81

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Columbia	DIR	WSW	WSW	SW	SW	WSW	SW	SW	SW	NE	NE	WSW	WSW	WSW
	SPD	7	8	8	8	7	7	6	6	6	6	6	7	7
	PGU	54	69	69	61	59	78	64	56	70	54	51	49	78
Greenville/	DIR	SW	SW	SW	SW	NE	NE	NE	NE	NE	NE	NE	NE	SW
Spartanburg	SPD	8	9	9	9	8	7	7	6	7	7	8	8	8
	PGU	49	47	59	71	53	60	66	58	45	48	53	41	71
Myrtle Beach	DIR	N	N	N	S	S	S	SSW	S	NNE	N	N	N	N
AFB	SPD	5	6	7	6	6	6	5	3	5	5	5	5	6
	PGU	54	104	60	47	59	58	60	47	76	43	48	54	104
SOUTH DAKOTA														
Aberdeen	DIR	S	S	S	S	S	S	S	S	N	N	N	N	N
	SPD	13	13	14	15	13	12	11	11	11	12	12	12	12
	#PGU	61	66	55	53	56	43	56	44	44	60	45	55	66
Huron	DIR	NW	NW	NNW	NNW	NW	NW	N	N	SSE	SSE	SSE	SSE	SSE
	SPD	12	11	13	13	13	11	11	11	11	11	12	11	12
	PGU	56	62	55	64	60	63	82	76	54	52	58	60	82
Rapid City	DIR	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW
	SPD	11	11	13	13	12	11	10	10	11	11	11	11	11
	PGU	68	70	66	67	61	67	72	69	70	73	63	71	73
Sioux Falls	DIR	NW	NW	WNW	WNW	NNW	NNW	N	N	S	S	S	S	S
	SPD	11	11	12	13	12	11	10	10	10	11	12	11	11
	PGU	67	58	56	64	53	71	66	47	53	61	58	53	71
TENNESSEE														
Bristol	DIR	WSW	W	WSW	WSW	WSW	WSW	WSW	ENE	ENE	ENE	WSW	WSW	WSW
	SPD	6	7	7	7	5	5	4	4	4	5	6	6	6
	PGU	55	49	52	63	46	59	54	48	54	49	53	48	63
Chattanooga	DIR	N	N	S	S	S	S	S	S	S	N	S	S	S
	SPD	7	7	8	7	6	5	5	4	5	5	6	6	6
	PGU	41	48	45	53	54	56	46	51	51	43	54	41	56
Knoxville	DIR	WSW	WSW	WSW	SW	WSW	SW	WSW	WSW	NE	NE	NE	WSW	WSW
	SPD	8	8	9	9	7	6	6	6	6	6	7	7	7
	PGU	53	53	53	76	48	58	52	86	39	59	64	58	86
Memphis	DIR	N	N	S	SSW	S	SSW	SW	SSW	N	SSE	S	S	S
	SPD	10	10	11	10	9	8	8	7	8	8	9	10	9
	PGU	40	49	49	69	48	71	45	69	43	59	51	49	71
Nashville	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	9	9	10	9	8	7	7	6	6	7	8	9	8
	PGU	48	47	56	67	55	52	58	70	47	48	60	54	70
Oak Ridge	DIR	SW	ENE	SW	SW	SW	SW	SW	E	E	E	E	SW	SW
	SPD	5	5	5	6	4	4	4	4	4	3	4	4	4
	PGU	42	31	34	50	29	31	26	35	39	41	51	39	51
TEXAS														
Abilene	DIR	N	N	S	S	SSE	S	S	S	S	S	S	S	S
	SPD	12	13	14	14	13	13	11	10	11	11	12	12	12
	PGU	51	52	61	56	76	64	63	52	68	58	49	59	76
Amarillo	DIR	SW	SW	SW	N	N	N	SSW	SSW	SSW	S	S	S	SW
	SPD	13	14	15	15	14	14	12	11	12	13	13	13	13
	#PGU	54	55	51	62	49	68	53	53	52	61	52	57	68

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Austin	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	10	10	11	10	9	9	8	8	8	8	9	9	9
	PGU	52	55	56	51	63	54	44	47	81	46	49	63	81
Brownsville	DIR	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	SSE	SSE	SSE	SSE	NNW
	SPD	11	12	13	14	13	12	12	10	9	10	11	11	11
	#PGU	47	38	44	43	45	36	37	36	55	40	44	39	55
Corpus	DIR	N	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	N	SE
Christi	SPD	12	13	14	14	13	12	12	11	10	11	12	12	12
	PGU	52	60	54	67	60	61	49	48	61	53	60	54	67
Dallas/	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
Ft. Worth	SPD	11	12	13	12	11	11	10	9	10	10	11	11	11
	PGU	66	54	53	66	71	58	54	81	51	63	68	55	81
Del Rio	DIR	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
	SPD	9	10	11	11	11	11	11	10	9	9	9	8	10
	$PGU	37	37	52	37	48	38	38	60	47	46	43	43	60
El Paso	DIR	NNE	W	W	W	W	SE	ESE	N	S	N	NNE	N	N
	SPD	8	9	11	11	10	9	8	8	8	8	8	8	9
	#PGU	86	60	69	66	55	69	63	48	62	53	54	61	86
Galveston	DIR	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
	SPD	12	12	12	12	12	11	10	9	10	10	11	11	11
	$PGU	53	60	50	68	66	62	68	91	100	66	72	50	100
Houston	DIR	N	N	N	N	SE	SE	SE	SE	SE	SE	SE	SE	SE
	SPD	8	9	9	9	8	8	7	6	7	7	8	8	8
	PGU	44	61	51	56	52	68	52	78	44	58	46	56	78
Laredo AFB	DIR	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
	SPD	9	10	12	13	14	14	14	13	10	10	9	9	12
	PGU	46	46	46	54	46	46	46	46	46	38	46	38	54
Lubbock	DIR	SW	WSW	S	S	S	S	S	S	S	S	S	WSW	S
	SPD	13	14	15	15	15	14	12	10	11	12	13	13	13
	PGU	59	64	77	71	74	85	72	59	58	52	63	64	85
Midland/	DIR	S	S	S	S	S	SSE	SSE	SSE	SSE	S	S	S	S
Odessa	SPD	10	11	13	13	13	12	11	10	10	10	10	10	11
	PGU	59	55	74	67	74	71	82	63	82	69	59	47	82
Port Arthur	DIR	N	N	N	N	N	N	N	N	S	S	S	S	N
	SPD	11	11	11	12	10	9	7	7	8	9	10	10	10
	PGU	56	54	53	59	62	76	69	55	58	47	54	51	76
San Angelo	DIR	SSW	SSW	S	S	S	S	S	S	S	S	S	SSW	S
	SPD	10	11	12	12	12	11	10	9	9	9	10	10	10
	#PGU	55	59	61	67	76	71	56	67	52	68	74	53	76
San Antonio	DIR	N	N	SE	SE	SE	SE	SSE	SSE	SE	SSE	N	N	SSE
	SPD	9	9	10	10	10	10	9	8	8	8	8	8	9
	#PGU	51	56	64	47	55	51	54	49	71	44	52	48	71
Sherman	DIR	S	S	SSE	SSE	SSE	SSE	S	SSE	SSE	SSE	S	S	SSE
	SPD	12	12	13	13	12	10	9	9	9	9	10	10	10
	PGU	84	81	71	74	62	71	71	58	60	48	83	62	84
Waco	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	12	12	13	13	12	11	11	10	10	10	11	11	11
	#PGU	47	39	44	43	58	53	45	45	55	44	48	40	58

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Wichita Falls	DIR	N	N	N	N	S	S	S	S	SE	SE	S	S	S
	SPD	11	12	13	13	12	12	11	10	10	11	11	11	11
	#PGU	51	62	52	53	56	55	74	52	64	52	63	52	74
UTAH														
Salt Lake City	DIR	SE	SE	SE	SE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE
	SPD	8	8	10	9	9	10	10	10	9	8	8	8	9
	PGU	59	54	59	54	69	58	63	67	61	63	54	49	69
Wendover AFB	DIR	ENE	ENE	WNW	WNW	WNW	E	ESE	ESE	ESE	ESE	W	ENE	E
	SPD	5	6	7	8	8	8	7	7	6	5	5	5	6
	PGU	49	51	59	51	67	59	51	68	49	52	59	52	68
VERMONT														
Burlington	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	10	10	10	10	9	9	8	8	9	9	10	10	9
	PGU	51	54	54	44	54	45	60	41	52	51	62	51	62
VIRGINIA														
Hampton/ Langley AFB	DIR	N	N	N	SSW	SSW	SSW	SW	SW	N	N	SSW	N	SSW
	SPD	9	9	10	9	8	8	7	7	8	8	8	9	8
	PGU	70	64	76	71	79	64	56	78	70	96	63	66	96
Lynchburg	DIR	SW	W	SW	SW	SW	SW	SW	SW	N	NE	SW	SW	SW
	SPD	8	8	8	9	7	7	6	6	6	7	7	7	7
	PGU	48	46	56	53	59	74	64	46	44	48	64	47	74
Norfolk	DIR	N	N	NE	S	S	SSW	SW	SW	NE	NE	SW	N	SW
	SPD	11	12	12	12	10	10	9	9	10	10	11	11	11
	PGU	69	56	66	56	66	69	63	63	67	69	55	53	69
Quantico MCAS	DIR	NW	NW	NW	S	S	S	S	S	NW	NW	NW	NW	NW
	SPD	7	7	8	8	7	6	6	6	6	6	6	6	7
	PGU	61	62	58	45	75	60	55	58	53	71	48	55	75
Richmond	DIR	N	N	N	S	S	S	S	S	N	N	N	N	S
	SPD	8	9	9	9	8	8	7	7	7	7	8	8	8
	PGU	48	48	67	49	79	53	61	48	49	49	54	49	79
Roanoke	DIR	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW
	SPD	9	10	10	10	8	7	7	6	6	7	8	9	8
	PGU	56	59	52	77	59	72	45	39	54	44	55	53	77
WASHINGTON														
Everett/ Paine Fld	DIR	SE	SSE	SSE	SSE	N	N	N	N	N	SE	SE	SE	SSE
	SPD	8	8	8	8	7	7	7	7	7	7	7	8	7
	PGU	51	62	46	55	46	40	35	30	39	81	51	46	81
Olympia	DIR	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW
	SPD	7	7	7	7	7	7	6	6	6	6	7	7	7
	PGU	58	43	51	43	38	38	32	37	38	45	47	66	66
Quillayute	DIR	NE	NE	NE	NE	S	S	S	S	WNW	WNW	WNW	WNW	S
	SPD	7	7	6	6	6	6	5	5	5	5	6	6	6
	PGU	55	56	46	40	41	44	26	48	36	44	54	58	58
Seattle/ Tacoma	DIR	S	S	S	SSW	SSW	SSW	SSW	SSW	N	S	S	S	S
	SPD	10	10	10	10	9	9	8	8	8	9	9	10	9
	PGU	64	46	46	44	39	33	29	38	39	45	52	60	64

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Seattle City	DIR	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
Office	SPD	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
	PGU	51	49	54	44	46	37	39	33	33	41	63	46	63
Spokane	DIR	NE	NE	ENE	ENE	SW	SW	SW	SW	SW	SW	SW	SW	SW
	SPD	9	9	10	10	9	9	9	8	8	8	9	8	9
	PGU	56	51	52	62	53	49	51	47	47	62	56	63	63
Walla Walla	DIR	S	S	S	S	S	S	S	S	S	S	S	S	S
	SPD	5	6	6	6	6	6	5	5	5	5	5	5	5
	$PGU	49	47	62	41	37	37	36	35	51	54	67	47	67
Whidbey	DIR	ESE	SE	SSE	W	W	W	W	W	W	SE	ESE	SE	W
Island NAS	SPD	7	8	8	7	6	6	5	5	5	6	8	8	6
	PGU	69	67	62	61	54	45	53	51	59	70	70	69	70
Yakima	DIR	W	W	W	W	W	W	W	W	W	W	W	W	W
	SPD	6	6	8	9	8	8	8	8	7	7	6	5	7
	PGU	55	56	51	52	69	51	59	44	55	54	58	61	69
WEST VIRGINIA														
Beckley	DIR	WNW	WNW	SE	WNW	SE	WSW	WSW	SE	SE	SE	SE	SE	SE
	SPD	10	10	10	10	8	7	7	7	7	8	9	10	9
	PGU	51	62	48	48	56	53	51	46	48	43	60	53	62
Charleston	DIR	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW
	SPD	7	7	8	7	6	5	5	4	5	5	6	7	6
	#PGU	46	32	38	43	41	37	46	21	30	39	37	29	46
Elkins	DIR	WNW	WNW	WNW	NW	NW	WNW	WNW	WNW	WNW	WNW	WNW	W	WNW
	SPD	7	8	8	8	6	5	4	4	4	5	7	8	6
	PGU	56	49	48	69	60	69	47	46	44	46	59	52	69
Huntington	DIR	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	WSW
	SPD	8	8	8	8	6	6	5	5	5	6	7	8	7
	PGU	51	53	54	52	55	56	56	49	41	44	55	51	56
WISCONSIN														
Green Bay	DIR	W	W	SSW	SSW	NNE	NNE	NNE	NNE	NNE	NNE	SSW	SSW	SSW
	SPD	11	10	11	11	10	9	8	8	9	10	11	10	10
	PGU	46	46	55	49	81	49	56	54	47	44	49	53	81
La Crosse	DIR	NW	NW	NW	S	S	S	S	S	S	S	S	S	S
	SPD	9	9	10	11	10	9	8	7	8	9	10	9	9
	PGU	45	37	40	53	58	63	52	63	40	39	46	43	63
Madison	DIR	WNW	WNW	WNW	S	S	S	S	S	S	S	S	WNW	S
	SPD	11	10	11	12	10	9	8	8	9	10	11	10	10
	PGU	46	62	67	63	63	70	83	64	64	62	52	58	83
Milwaukee	DIR	WNW	WNW	WNW	N	NNE	NNE	SW	SW	SSW	SSW	WNW	WNW	WSW
	SPD	13	12	13	13	12	10	10	10	10	11	12	12	12
	PGU	54	46	77	64	54	56	81	69	58	53	56	59	81
WYOMING														
Casper	DIR	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW
	SPD	17	15	14	12	12	11	10	10	11	12	15	16	13
	PGU	67	64	63	64	64	64	62	62	63	62	60	66	67

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Cheyenne	DIR	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	WNW	WNW	WNW
	SPD	15	15	15	14	13	11	10	10	11	12	14	15	13
	PGU	77	70	75	64	71	84	79	61	62	71	76	74	84
Lander	DIR	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW
	SPD	5	5	7	8	8	8	7	7	7	6	6	6	7
	PGU	86	69	63	83	67	63	66	67	64	53	59	66	86
Sheridan	DIR	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW
	SPD	8	8	9	10	9	8	7	7	8	8	8	8	8
	PGU	71	69	68	69	63	54	59	58	67	64	73	69	73

****

CONVERSION TABLE OF MILES PER HOUR (MPH) TO KNOTS (KTS)

MPH	0	1	2	3	4	5	6	7	8	9
MPH	KTS	KTS	KTS	KTS	KTS	KTS	KTS	KTS	KTS	KTS
0	0	1	2	3	3	4	5	6	7	8
10	9	10	10	11	12	13	14	15	16	17
20	17	18	19	20	21	22	23	23	24	25
30	26	27	28	29	30	30	31	32	33	34
40	35	36	36	37	38	39	40	41	42	43
50	43	44	45	46	47	48	49	50	50	51
60	52	53	54	55	56	56	57	58	59	60
70	61	62	63	63	64	65	66	67	68	60
80	70	70	71	72	73	74	75	76	76	77
90	78	79	80	81	82	83	83	84	85	86

(eg: 25 mph = 22 kts)

CONVERSION TABLE OF COMPASS POINTS (16) TO WHOLE DEGREES

N = 35-01 **E** = 08-10 **S** = 17-19 **W** = 26-28
NNE = 02-03 **ESE** = 11-12 **SSW** = 20-21 **WNW** = 29-30
NE = 04-05 **SE** = 13-14 **SW** = 22-23 **NW** = 31-32
ENE = 06-07 **SSE** = 15-16 **WSW** = 24-25 **NNW** = 33-34

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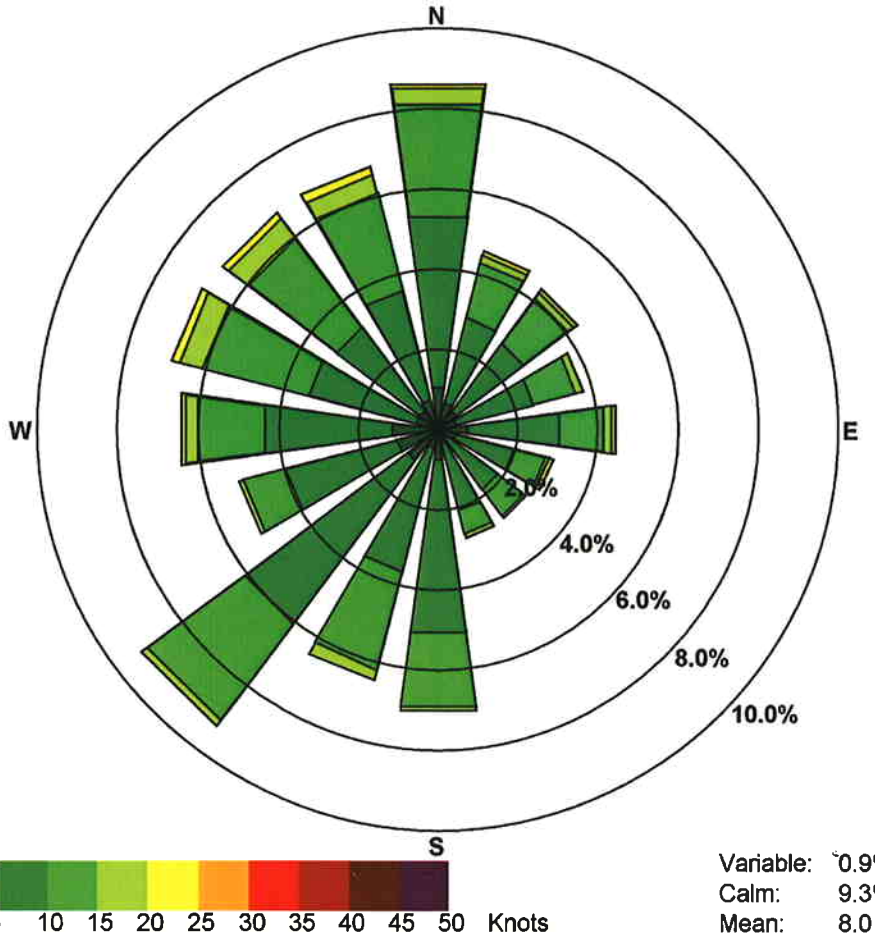
ISLIP LONG ISL MACARTHUR AP

10-year summary



Variable: 0.9%
Calm: 9.3%
Mean: 8.0 KT

Zoom In | Zoom Out | Print

Graph Help

H2M GROUP

APPENDIX B

NEW YORK STATE DEPARTMENT OF HEALTH (NYSDOH) –

GENERIC COMMUNITY AIR MONITORING PLAN

New York State Department of Health
Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.