

# PXP

## 2010 ANNUAL REPORT

Inglewood Oil Field  
Meteorological Station  
Annual Audit and Data Validation

Baldwin Hills CSD Condition E.2.j

April 2011

Prepared for:

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**SUBMITTED**

## 1.0 INTRODUCTION

### 1.1 BACKGROUND, CSD CONDITIONS

Plains Exploration and Production (PXP) installed and operates a Meteorological Station at the Inglewood Oil Field. Installation and operation of the station are required in the Baldwin Hills Community Standards District (CSD). The station design was approved by the South Coast Air Quality Management District (SCAQMD), that has authority over air quality in the South Coast Air Basin, and that approval was provided to the Los Angeles County, who oversees implementation of the CSD.

The CSD Section E.2.j states:

*“j. Meteorological Station. The operator shall maintain and operate a meteorological station at the oil field in good operating condition and in compliance with all applicable Environmental Protection Agency (“EPA”) and SCAQMD rules, regulations, and guidelines, and to the satisfaction of the director. The operator shall conduct an audit of the meteorological station on an annual basis and submit the results of the audit to the SCAQMD and the director. The operator shall maintain the data files for the meteorological station for a period of not less than 10 years. All such data shall be available upon request to the SCAQMD and the director.”*

The CSD Section L.2.d further defines the schedule for the project:

*“d. Meteorological Station. Within 120 days following the effective date, or at such later date as may be approved by the director for good cause shown, the operator shall submit to the SCAQMD a design for the installation of a meteorological station at the oil field that shall meet all the requirements of the United States Environmental Protection Agency (“EPA”) guidelines on meteorological data as outlined in EPA Publication “Meteorological Monitoring Guidance for Regulatory Modeling Applications” (EPA-454/R-99-005) as published in February 2000. The operator shall take such actions as may be necessary to promptly secure SCAQMD approval of such design. The meteorological station shall be installed and fully operational within 180 days of receipt of approval of the design from the SCAQMD, or at such later date as may be approved by the director for good cause shown.”*

### 1.2 PURPOSE OF THE METEOROLOGICAL STATION

Meteorological data from the West Los Angeles station for 1981 was used in the preparation of the health risk assessment (HRA) for the Baldwin Hills CSD Environmental Impact Report (EIR), in conjunction with the Hotspots Analysis and Reporting Program (HARP) Model five-year (1985-1989) meteorological dataset from Los Angeles International Airport. The PXP's meteorological station will collect data more representative of the conditions at the oil field, so that after a five-year period a determination can be made if the oil field meteorological conditions are significantly different to warrant a rerun of the HRA, per the CSD Condition E.2.k:

*“k. Updated Health Risk Assessment. After every five years of operation of the meteorological station, the operator shall provide the previous five years of meteorological data to the SCAQMD and the director. If the SCAQMD or the director determines that the previous five years of meteorological data from the oil field could result in significant changes to the health risk assessment that was conducted as part of the Baldwin Hills Community Standards District Environmental Impact Report, then the county may elect to re-run the health risk assessment using the previous five years of meteorological data from the meteorological station.”*

The purpose of the Meteorological Station is therefore two-fold:

1. To provide the local representative wind speed and direction data in order to efficiently and effectively resolve potential odor complaints; and,
2. To collect the representative meteorological data to determine if Inglewood Oil Field conditions are significantly different and a re-run of the HRA performed for the Baldwin Hills CSD EIR is warranted.

### **1.3 COMPLIANCE**

The required Meteorological Station design was submitted to the Director and the SCAQMD on March 25, 2009, which is within the CSD required deadline of 120 days of the CSD effective date. The design of the station is compliant with the United States Environmental Protection Agency (EPA) guidelines on meteorological data as outlined in EPA Publication "Meteorological Monitoring Guidance for Regulatory Modeling Applications" (EPA-454/R-99-005, February 2000). The station design was approved by the County and the SCAQMD on July 21, 2009.

The station was installed per the approved design, including the sensor sensitivities and accuracies. The station was fully operational within the CSD deadline: within 180 days after the approval of the design. The station installation started at the end of December 2009 and the station operation and meteorological data collection in full compliance started on Jan. 21, 2010.

The station collects the necessary data to enable preparation of a field-specific HRA, if a rerun of the EIR HRA is determined necessary as discussed above. The primary meteorological parameters that are measured by the PXP's meteorological station, per the EPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV (1995), are as follows:

- Wind speed (horizontal);
- Wind direction;
- Temperature
- Temperature difference (delta temperature); and,
- Solar radiation.

This report presents the required annual audit and data analysis per the CSD Section E.2.j requirements, for the data collected during 2010, the first year of the station operation.

## 2.0 METEOROLOGICAL STATION INSTALLATION & OPERATION

### 2.1 METEOROLOGICAL STATION LOCATION AND INSTRUMENTATION



**Figure 1**  
**Meteorological**  
**Station at PXP's**  
**Inglewood Oil Field**

The station is comprised of a 10-meter (33 feet) tower, meteorological sensors mounted on the tower, and the data logger. Figure 1 shows a photo of the PXP meteorological station in April 2010.

The location of the meteorological station is on the well pad of well #129 on Vickers Lease, see the maps on Figure 2 "Field view" and Figure 3 "Close-up view". Coordinates of the station location are 34° 00' 32.00"N, 118° 22' 43.30" W. The location is at an elevation of 122 meters (400 ft) above sea level, is free from vegetation, and is over 100 m (330 feet) away from the closest obstruction. This location meets the EPA requirement that the distance from the closest obstruction to the station is at least 10 times the height of the closest obstruction.

The station tower is mounted on a secure foundation, equipped with a lightning rod grounding system. The tower is specifically designed to support meteorological instruments. The station is powered from the grid. The sensors are secured to the station tower with the mounting arms specifically designed to support meteorological instruments.

There are five required sensors mounted on the station tower:

- one wind direction sensor,
- one wind speed sensor,
- two temperature sensors to measure ambient temperature and temperature difference (delta temperature) at 2 meters and 10 meters, and
- one solar radiation sensor.

The two temperature sensors are shielded from direct sun with air-aspirated shields. These shields prevent heating of the temperature sensors by direct sun exposure and thus distorting the actual temperature measurement.

## **2.2 METEOROLOGICAL STATION OPERATION AND MAINTENANCE**

After the startup of the station operation it was closely monitored for consecutive 2 days. Once it was determined that the meteorological station was measuring the data and operating properly, the data was reviewed at the end of each week for 4 weeks, and then on a monthly basis.

During this initial data review, the data was reviewed for correct ranges and orders of magnitude, no gaps, and that it was being recorded.

Throughout 2010, the EHS Department conducted a weekly visual inspection for the following parameters:

- proper rotation, no noise or off-center rotation of the wind anemometer and wind direction vane,
- that there are no obstructions to the sensors, and
- for overall cleanliness and orderly look of the instruments, tower and the data logger.

PXP maintains identical sensor duplicates for each of the sensors installed on the station. This is done so that when it is time for the scheduled calibration, an identical calibrated sensor can be installed quickly, while the one that needs to be calibrated is sent to the vendor facility. A PXP technician is assigned to maintain the station and the instruments.

Met One Instruments Inc. (Met One), the vendor who provided the station and its instruments, will be contacted if a sensor needs maintenance or repair. Met One also calibrates the sensors, in their specialized laboratory. The vendor specified that calibration is recommended every 12 months of use. PXP follows the recommended schedule. Recently calibrated sensors were installed in January 2010, before the station operation start. These sensors were replaced with newly calibrated sensors in November 2010. The sensors that were in use were sent to the vendor for re-calibration. The next calibration is scheduled for November 2011 per the vendor's recommendation.

PXP maintains logs of all meteorological station events, as follows. The EHS Department maintains a log of sensor malfunctions (none in 2010), repairs (none in 2010), maintenance (none in 2010), and calibration events, including shipments to the vendor for calibration.

## **2.3 DATA COLLECTION, ANALYSIS AND ARCHIVING**

Data from the sensors is transmitted to a datalogger mounted at the base of the tower. The datalogger is located in a weatherproof case, equipped with a lock for security and to prevent data tampering. The datalogger computes and records hourly averages from all the station sensors. The data stored in the data logger is transmitted to the PXP computer system in real time, via the radio system available at the Inglewood Oil Field. Therefore, the collected meteorological data can be viewed in real time by the facility operators in the control room or the EHS personnel on an office computer. Additionally, the data can be transferred directly from the

data logger to a laptop computer at the tower and then transferred to a different data storage means.

During January through June 2010, the assigned PXP personnel looked at the met station real time data daily and visually checked for proper operation and any anomalies (zero readings, power outages, too high or too low points or out of normal range data points). Every month, the data was reviewed for anomalies and out-of-range or missing data by an independent contractor (InterAct). Any missing or anomalous data were flagged. The wind speed and direction data was also plotted as wind roses (see Attachment 2).

The data stored in the data logger is retrieved on a regular basis, in time to ensure that the data logger memory is not full and it does not start recording over the earlier recorded and un-retrieved data. A software package compatible with the station data logger is used to interface with the data logger, view, evaluate, print and export the collected meteorological data in comma-separated values (CSV) format, which is accessible via Microsoft Excel software. For the data received from the datalogger in real time remotely, the software automatically collects the data from the station, and stores averaged hourly values from each meteorological instrument in a database. This enables the user to view the data at any time and generate various meteorological charts and graphs using the collected data.

The collected data on a monthly basis is sent to an off-site storage, to prevent accidental deletion or damage. This data will be stored for a period of five years. After the first five years, the data will be evaluated and compared with the AQMD West Los Angeles and LAX meteorological stations data to determine if the HRA re-run is warranted. The overall storage time of the collected data will be 10 years from the collection time.

## **2.4 INSTALLATION AND ACCEPTANCE TRAINING**

The station installation was performed under the supervision of the representative of the meteorological instrumentation vendor – Met One Instruments Inc. (Met One) (<http://www.metone.com>). Acceptance testing and training on the met station operation, maintenance and procedures, sensors maintenance, calibration as well as meteorological data storage, retrieval and viewing was ongoing during station installation by the Met One training and maintenance representative in December 2009. Training and data review was again conducted on May 4, 2010 by the Met One representative. The April training was done to audit the station operation, verify the settings, data logger operation and data collection and storage, and address any questions.

### 3.0 ANALYSIS OF DATA COLLECTED IN 2010

In 2010, meteorological data was collected from January 21 (startup date after initial installation) to December 31 of 2010.

At the end of the year, the collected data was analyzed for errors and inconsistencies per the EPA specifications on meteorological data validation. The data points that were flagged on a monthly basis throughout the year were reviewed in more detail.

#### 3.1 DATA VALIDATION TECHNIQUES

The data was also compared to the AQMD's meteorological contractor T&B Systems data from a station located at the Los Angeles Airport (LAX) and available on the Internet at <http://tbsys.serveftp.net/tbsysnet/pamsdata.htm>; this set of data was QAQC'ed and recommended for use in the PXP data validation effort by Kevin Durkee of the AQMD. The AQMD-recommended data set for 2010 is from 1/1/10 to 9/30/10. Thus the AQMD station data set from 1/21/10 to 9/30/10 was used for comparison.

Data validation was performed per the EPA's *Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV: Meteorological Measurements* (1995). The methods included

- evaluating minimum, maximum and average for the whole data set for each meteorological parameter
- plotting the data versus time and looking for anomalies, data outliers such as too high or too low values, "no-activity", zero data, unusual spikes, unusual inactivity or repeated data for prolonged time periods, etc.
- comparisons with the upper and/or lower limit on the allowed data ranges, normal changes/variations in parameters, see Attachment 1 for the details on the various data validation techniques
- plotting wind roses and comparing with wind roses from other weather stations in Los Angeles area, see Attachment 2
- comparison with the validated/QCQA'ed data for the same period of time from the AQMD meteorological station which is located near LAX (T&B Systems).

#### 3.2 DATA GAPS AND ANOMALIES

Using the techniques described above, several data gaps and anomalies were identified in the 2010 data. See Table 1 below for the summary.

**Table 1 Summary of Data Anomalies and Gaps**

2010 Data gap date, time	Data description	Action on the station or data
1/26, 20:00 (8:00 pm)	Wind speed at 65 mph was considered in error (too high)	Discarded & filled with an average between immediately previous and immediately following data points
1/21 – 4/20/2010, all hours	Temperature difference (delta T). Data logger was collecting data on the incorrectly specified channel thus data was not saved. The channel was set as a default by the station vendor and not adjusted during installation.	Met One technician made a permanent change on the data logger programming to start recording and saving the data as of 5/1/2010
6/28; 9:00am	Temperature value was out of scale at 6.1 deg F, as all other values through the whole year were in the 40 to 107 deg F range.	Discarded, and filled with average between immediately previous and immediately following data points
(1) 6/22; 9:00am (2) 9/1; 23:00 (11pm)	Wind direction is at (1) 4 degrees and (2) 6 degrees, while all other values around are in the 230-270 degree range	Although the data point is out of sequence, it was kept, as it is not unusual that the wind direction changes quickly & the average hourly could seem anomalous
9/28; 15:00 – 16:00 (3pm – 4pm)	Temperature readings: 3pm – 94.9 °F 4pm – 83.4 °F 5pm – 76.0 °F Difference between reading at 3pm and 4pm is -11 °F	Although this is an unusually high temperature change in one hour, this seems like a natural progression to a colder evening temperature at 5pm 76 °F. Thus data points were kept as recorded
10/4, 15:00 – 20:00 (3pm – 8pm)	All sensors' data missing due to power outages	Data from all sensors were missing. Data gaps were filled with an average between immediately previous and immediately following after the gap data points, that were considered reliable for the specific sensor, but for the solar. Solar radiation was zeroed for the night time.
10/6; 8:00 – 15:00 (8am – 3pm)		
11/24; 1:00 – 4:00am		
12/10; 2:00 – 6:00am		
11/2; 11:00 - 13:00 (11am – 1pm)	Temperature readings: 11am – 87.0 °F Noon – 58.4 °F 1pm – 90.3 °F Difference between reading at 11:00am and noon is -28 °F and noon and 1pm is 31 °F	Temperature at noon Flagged. Discarded. Filled in w/ an average between 11am and 1 pm.

The anomalous data values were deleted. The data gaps due to power outages and the gaps from the deleted anomalous data were filled in with averages between the last reliable (non-anomalous) data point and the first after the gap data point that was considered reliable. For the solar radiation missing data – the night data was filled in with zeros. Table 1 summarizes the identified data gaps and anomalies.

After the erroneous and missing data gaps were filled in as discussed above, the following data ranges and averages resulted, see Table 2, which also contains the 2010 AQMD (T&B Systems at LAX) station data ranges for comparison purposes.

**Table 2 Year 2010 Data Summary: PXP Met Station Data as Compared to AQMD Met Station Data (Ref. T&B Systems)**

Parameter	Range	AQMD St.	PXP St.	Notes / Conclusions
Wind Speed, mph	Average	8.1	7.7	At PXP slightly slower average wind speed, however no calms. Maximum wind speed is ~20% higher at the AQMD station
	Minimum	0.0	1.0	
	Maximum	35.1	27.9	
Wind Direction, degrees	Average	209.6	184.8	Wind direction correlates well although at LAX, winds have strong west-southwest component, while PXP station shows more of a southwest component (see wind roses in Attachment 2).
	Minimum	0.2	0.1	
	Maximum	360.0	359.7	
Temperature, deg F	Average	59.7	61.6	Max temperature slightly higher, Min temp. slightly lower, and average higher. Small diff., good correlation.
	Minimum	42.0	40.9	
	Maximum	95.3	107.1	
Delta Temperature, deg F	Average	No data	-0.8	No data on temperature difference is provided for the AQMD station, thus no comparison.
	Minimum	No data	-4.9	
	Maximum	No data	5.3	
Solar Radiation, w/m <sup>2</sup>	Average	248.2	213.6	Solar radiation is slightly lower. AQMD station is on the Coast, thus the conditions are less cloudy. The difference is small.
	Minimum	0.0	0.0	
	Maximum	1115.0	1016.5	

Although, the maximum wind speed data obtained from the PXP station is approximately 20% lower than the maximum wind speed obtained from the AQMD station, the difference in the averages is small, approximately 5%. Thus it appears that the AQMD station location is characterized by stronger wind gusts, although normal wind speeds are similar to the PXP location.

PXP wind speed and direction data was plotted as wind roses (see Attachment 2), and compared to the AQMD weather station wind roses (they are plotted on one sheet next to each other for each of the seasons – Winter, Spring, Summer and Fall). Attachment 2 presents the resulting graphs. It can be seen that the winds have similar patterns, with the winds at the LAX stronger (higher speed), as compared to the winds at the PXP location. Pattern of the wind directions vary slightly.

Temperatures obtained from both stations correlate well and differ by small percentages.

Obtained solar radiation data correlates well with the sunrise and sunset times in the area during the various seasons. The solar radiation data is within the similar ranges as the AQMD data for 2010.

The EPA allows for 10% missing data, to consider the data valid for further studies. Table 3 below summarizes the missing data. For all the sensors except for the temperature differential (delta T), the missing or discarded data is significantly less than 10%, at 0.3%, and thus meets the EPA requirement.

**Table 3 Year 2010 PXP Met Station Missing Data**

Parameter	Value	Notes
Total Hours (data points) of data	8281	Jan 21 – Dec 31
<b>Wind Speed, Wind Direction, Temperature, and Solar Radiation</b>		
Number of missing data points	23 - 26	All data is missing during 23 hours. Additional 2 wind speed data points and one temperature data point were discarded
Percentage (%) missing data	<0.5%	The missing data <10% = valid
<b>Delta Temperature Only</b>		
Number of missing data points	Overall: 2400 May 1 – Dec 31: 24	All data is missing during 2400 hours (100 days)
Percentage (%) missing data	Overall: 29% May 1 – Dec 31: 0.4%	The missing data >10%. Conclusion: 2010 delta temperature data should not be used for Health risk analysis because a significant percentage of data is missing. However, data from May 1 through December 31, 2010 is valid because the missing data is below 10% (at 0.4%).

Upon initial data review, erroneous recording of delta temperature was not noticed because it was within an acceptable range and order of magnitude as compared to typical/normal delta temperature data. Delta temperature data typically consists of numbers of small magnitude, e.g., -1.8 to 1.8 degrees F over 10 meters. The delta temperature data over the first months of monitoring was mostly within this range with some outliers that were flagged. Upon monitoring delta temperature over 2-3 months, however, an anomaly was suspected. It was determined that the instruments vendor needs to be consulted.

Upon inspection of the data logger, the vendor representative determined that the data channel for the delta temperature data recording was not changed from the factory default setting after the installation. The channel for delta temperature data was reset by the representative, thus the data was correctly recorded starting May 1, 2010.

## **4.0 CONCLUSIONS**

The PXP station is collecting the CSD required data. The process of maintaining the station in a good working condition is developed and is being practiced per the CSD requirements. The collected data is being stored as required. The majority of data is valid and can be used. Data for delta temperature for the following period should be used: May 1 – December 31, 2010.

Because the station initially started collecting data in January 21, not the full year data is available. Thus, 2010 year data is not recommended for use in a new HRA analysis.

## **5.0 REFERENCE**

1. EPA. 1995. Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV: Meteorological Measurements.
2. EPA. 2000. Meteorological Monitoring Guidance for Regulatory Modeling Applications, EPA-454/R-99-005.

**SUBMITTED**



Figure 2 PXP Meteorological Station Location – Field View

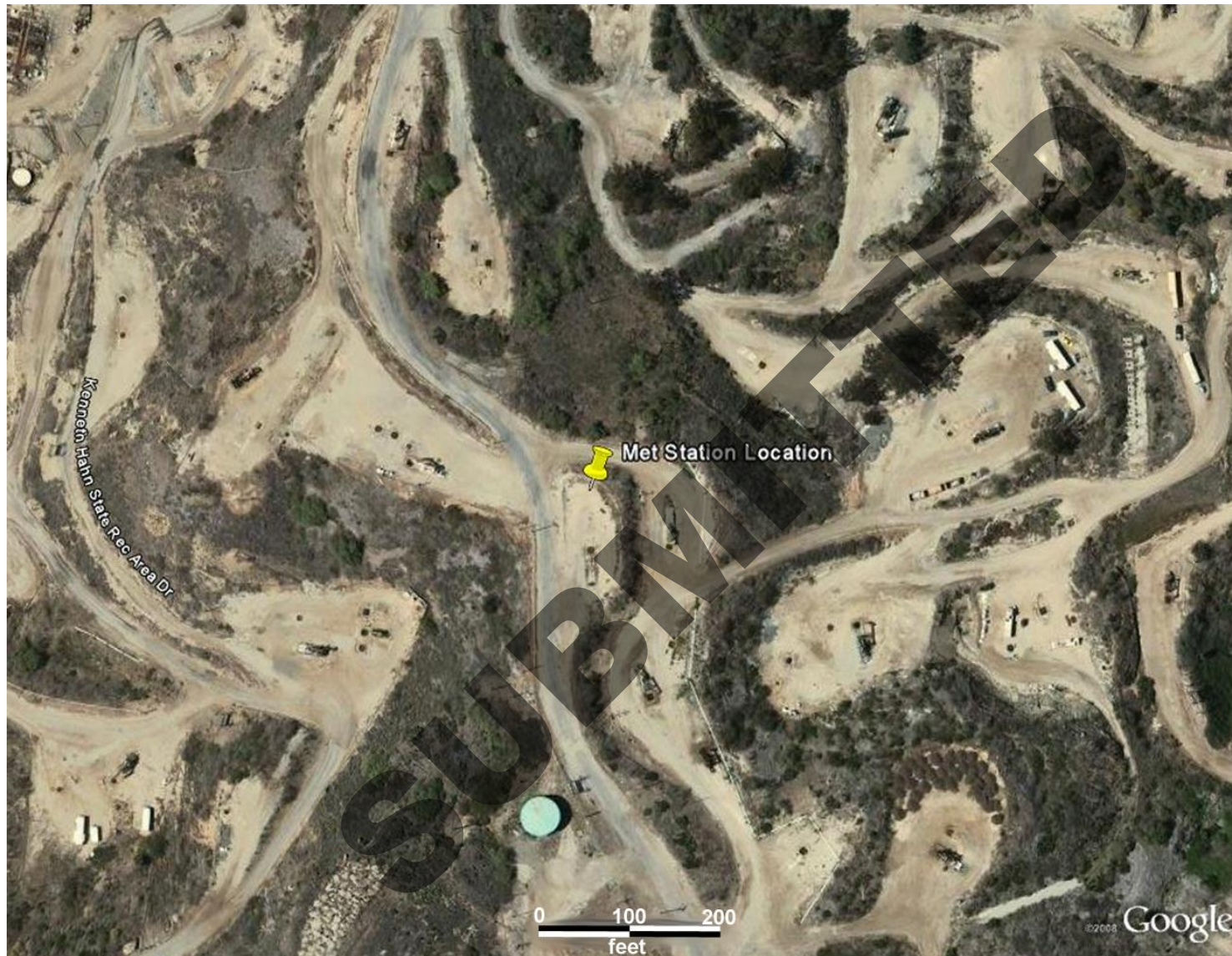


Figure 3 PXP Meteorological Station Location – Close-up View

## ATTACHMENT 1

### Data Validation Techniques

Variable	Criteria: flag data if the value
Wind Speed	<ul style="list-style-type: none"> <li>- is less than zero or greater than 25 m/s (56 mph)</li> <li>- does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours</li> <li>- does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours</li> <li>- correlates well with data from other stations in the same area</li> </ul>
Wind Direction	<ul style="list-style-type: none"> <li>- is less than zero or greater than 360°</li> <li>- does not vary by more than 1 degree for more than 3 consecutive hours</li> <li>- does not vary by more than 10 degrees for 18 consecutive hours</li> <li>- correlates well with data from other stations in the same area</li> </ul>
Temperature	<ul style="list-style-type: none"> <li>- is greater than the local record high</li> <li>- is less than the local record low</li> <li>- is greater than a 5 °C (9 °F) change from the previous hour</li> <li>- does not vary by more than 0.5 °C (0.8 °F) for 12 consecutive hours</li> <li>- correlates well with data from other stations in the same area</li> </ul>
Temperature Difference	<ul style="list-style-type: none"> <li>- is greater than 0.1 °C/m (1.8 °F for 10 meters) during the daytime</li> <li>- is less than -0.1 °C/m (-1.8 °F for 10 meters) during the night time</li> <li>- is greater than 5.0 °C (9.0 °F) or less than -3.0 °C (-5.4 °F)</li> </ul>
Radiation	<ul style="list-style-type: none"> <li>- is greater than zero at night</li> <li>- is greater than the maximum possible for the season and latitude</li> <li>- correlates well with data from other stations in the same area</li> </ul>

Source: [http://www.webmet.com/met\\_monitoring/863.html](http://www.webmet.com/met_monitoring/863.html)

## ATTACHMENT 2

### Wind Roses: T&B Systems, PAMS Monitoring Network Surface Wind Data, 2010 as compared with PXP Wind Data, 2010

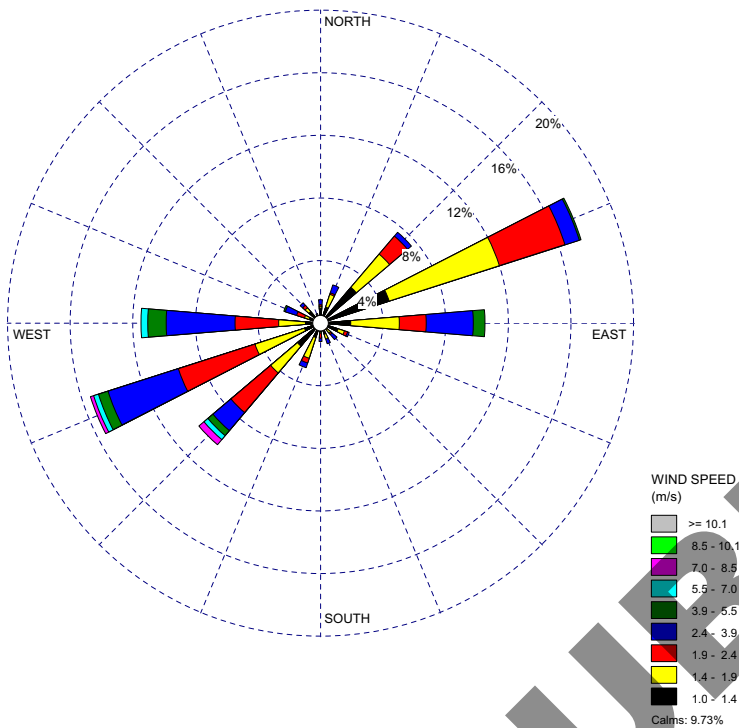
**IMPORTANT NOTES** on reading the wind roses:

The graphs' colored segments show the winds as BLOWING FROM that direction.

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WIND ROSE PLOT:  
**WINTER - Jan and February only - 2010**  
 Data from LAX - T&B Systems (AQMD contractor)

DISPLAY:  
 Wind Speed  
 Direction (blowing from)

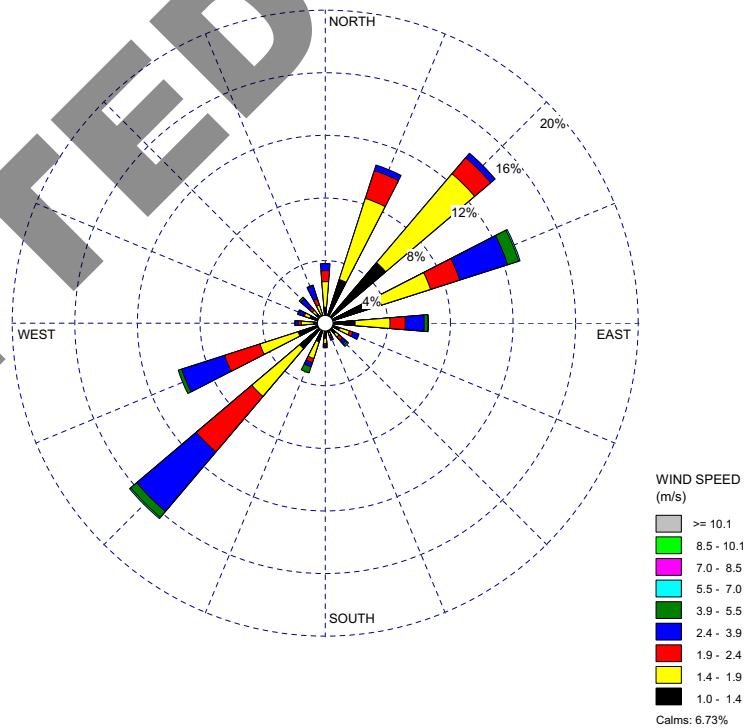


COMMENTS: 24 HOURS - ALL DAY Night: 0:00-6:00am Morning: 7:00am-Noon Afternoon: Noon-18:00 Evening: 19:00-23:00	DATA PERIOD: <b>2010</b> <b>Jan 1 - Feb 28</b> <b>00:00 - 23:00</b>	COMPANY NAME: <b>PXP, 5640 S. Fairfax Ave., Los Angeles, CA</b>
	CALM WINDS: <b>9.73%</b>	MODELER: <b>InterAct, tel. 805-658-5600</b>
	AVG. WIND SPEED: <b>1.82 m/s</b>	TOTAL COUNT: <b>935 hrs.</b>
		PROJECT NO.: <b>Met Data Validation-CSD</b>

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:  
**PXP Inglewood Oil Field - WINTER - DEC, JAN & FEB**  
 Data from MetOne Instruments Meteorological Station

DISPLAY:  
 Wind Speed  
 Direction (blowing from)

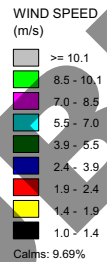
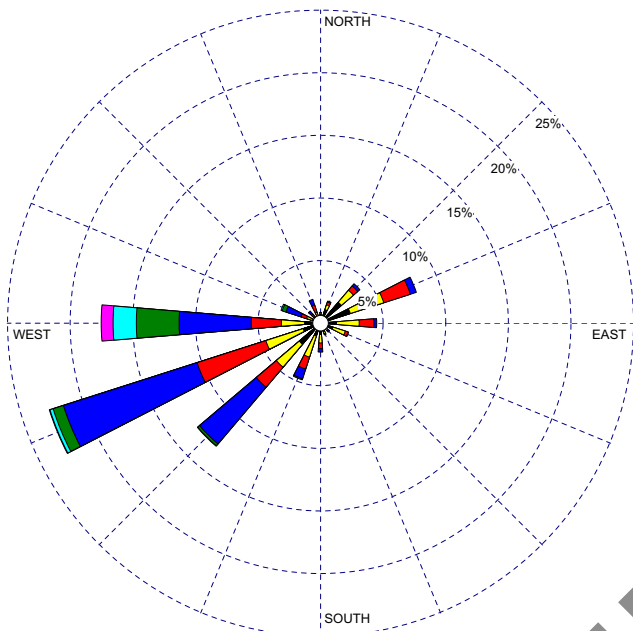


COMMENTS: WINTER MONTHS 24 HOURS - ALL DAY Night: 0:00-6:00am Morning: 7:00am-Noon Afternoon: Noon-18:00 Evening: 19:00-23:00	DATA PERIOD: <b>2010</b> <b>Check Date Range Report</b> <b>00:00 - 23:00</b>	COMPANY NAME: <b>PXP, 5640 S. Fairfax Ave., Los Angeles, CA</b>
	CALM WINDS: <b>6.73%</b>	MODELER: <b>InterAct, tel. 805-658-5600</b>
	AVG. WIND SPEED: <b>1.70 m/s</b>	TOTAL COUNT: <b>2154 hrs.</b>
		PROJECT NO.: <b>Baldwin Hills CSD</b>

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:  
**SPRING - 2010**  
 Data from LAX - T&B Systems (AQMD contractor)

DISPLAY:  
**Wind Speed**  
**Direction (blowing from)**

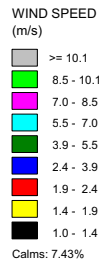
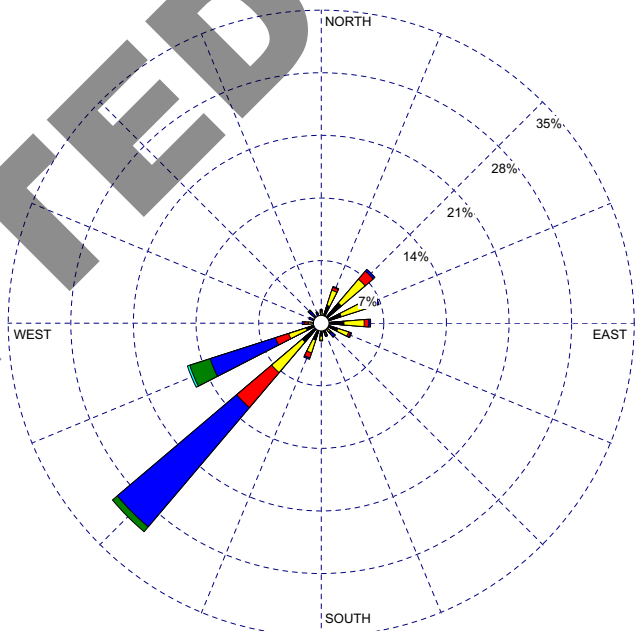


COMMENTS: 24 HOURS - ALL DAY Night: 0:00-6:00am Morning: 7:00am-Noon Afternoon: Noon-18:00 Evening: 19:00-23:00	DATA PERIOD: <b>2010</b> <b>Mar 1 - May 31</b> <b>00:00 - 23:00</b>	COMPANY NAME: <b>PXP, 5640 S. Fairfax Ave., Los Angeles, CA</b>	
		MODELER: <b>InterAct, tel. 805-658-5600</b>	
	CALM WINDS: <b>9.69%</b>	TOTAL COUNT: <b>2208 hrs.</b>	
	AVG. WIND SPEED: <b>2.08 m/s</b>		PROJECT NO.: <b>Met Data Validation-CSD</b>

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:  
**PXP Inglewood Oil Field - SPRING - MARCH, APR, MAY**  
 Data from MetOne Instruments Meteorological Station

DISPLAY:  
**Wind Speed**  
**Direction (blowing from)**

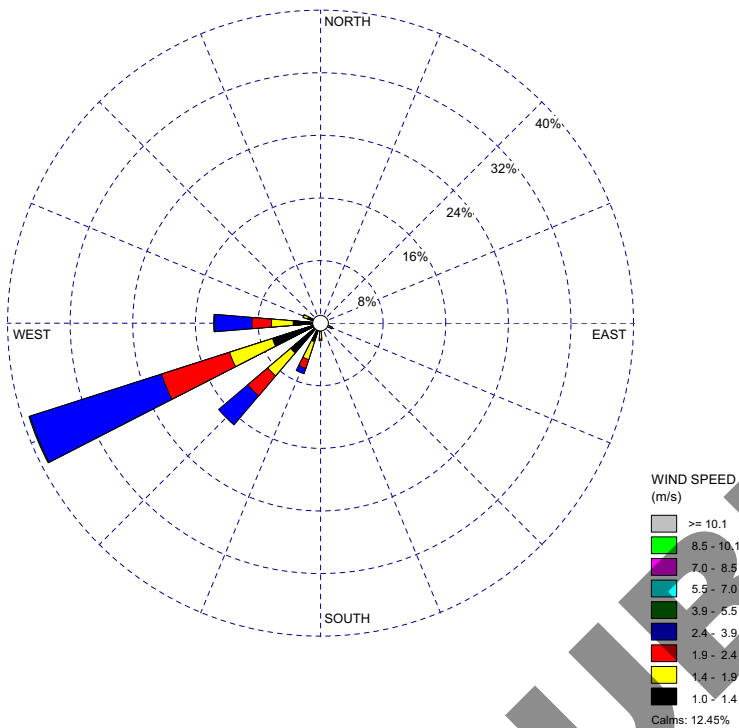


COMMENTS: SPRING MONTHS 24 HOURS - ALL DAY Night: 0:00-6:00am Morning: 7:00am-Noon Afternoon: Noon-18:00 Evening: 19:00-23:00	DATA PERIOD: <b>2010</b> <b>Mar 1 - May 31</b> <b>00:00 - 23:00</b>	COMPANY NAME: <b>PXP, 5640 S. Fairfax Ave., Los Angeles, CA</b>	
		MODELER: <b>InterAct, tel. 805-658-5600</b>	
	CALM WINDS: <b>7.43%</b>	TOTAL COUNT: <b>2208 hrs.</b>	
	AVG. WIND SPEED: <b>1.90 m/s</b>		PROJECT NO.: <b>Baldwin Hills CSD</b>

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:  
**SUMMER - 2010**  
 Data from LAX - T&B Systems (AQMD contractor)

DISPLAY:  
 Wind Speed  
 Direction (blowing from)

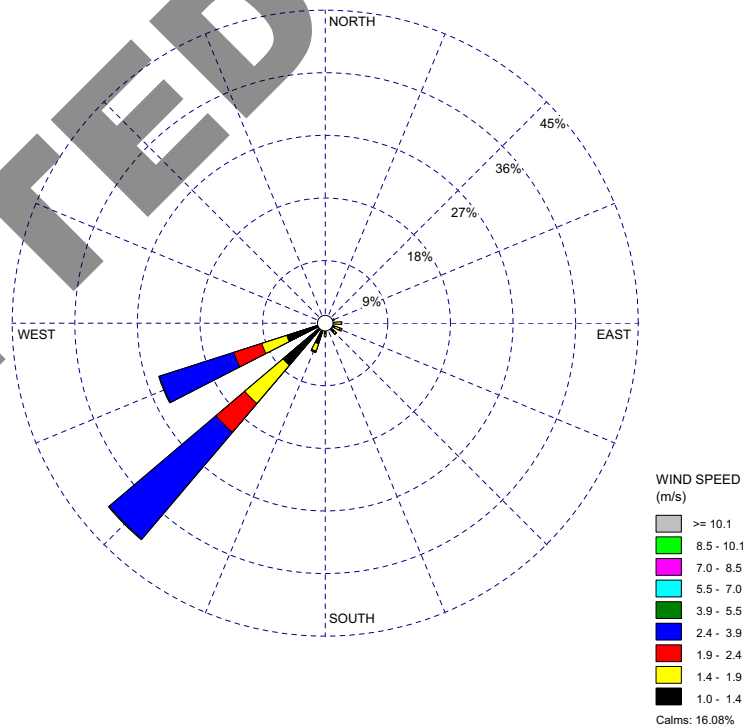


COMMENTS: 24 HOURS - ALL DAY Night: 0:00-6:00am Morning: 7:00am-Noon Afternoon: Noon-18:00 Evening: 19:00-23:00	DATA PERIOD: <b>2010</b> <b>Jun 1 - Aug 31</b> <b>00:00 - 23:00</b>	COMPANY NAME: <b>PXP, 5640 S. Fairfax Ave., Los Angeles, CA</b>
	CALM WINDS: <b>12.45%</b>	MODELER: <b>InterAct, tel. 805-658-5600</b>
	AVG. WIND SPEED: <b>1.68 m/s</b>	TOTAL COUNT: <b>2208 hrs.</b>
		PROJECT NO.: <b>Met Data Validation-CSD</b>

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:  
**PXP Inglewood Oil Field - SUMMER - JUN, JULY, AUGUST**  
 Data from MetOne Instruments Meteorological Station

DISPLAY:  
 Wind Speed  
 Direction (blowing from)

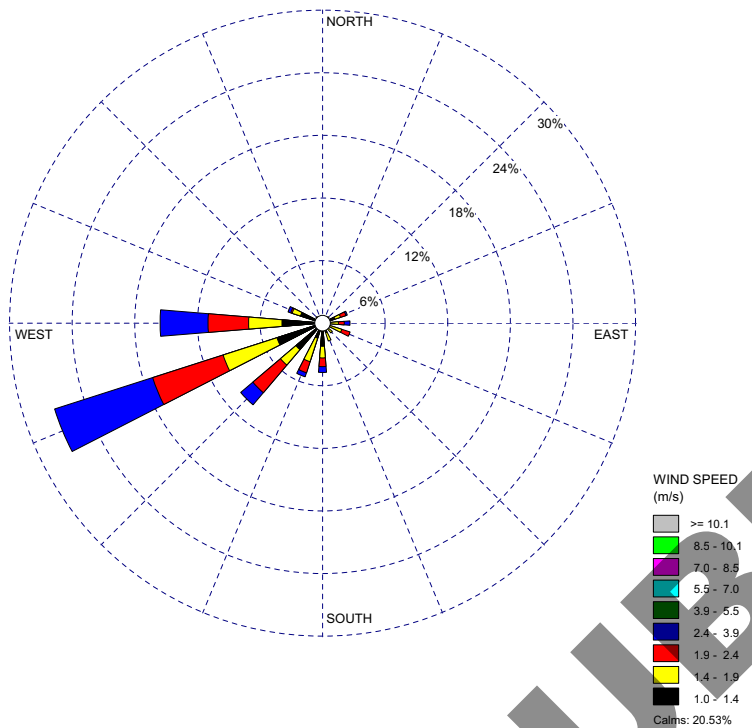


COMMENTS: SUMMER MONTHS 24 HOURS - ALL DAY Night: 0:00-6:00am Morning: 7:00am-Noon Afternoon: Noon-18:00 Evening: 19:00-23:00	DATA PERIOD: <b>2010</b> <b>Jun 1 - Aug 31</b> <b>00:00 - 23:00</b>	COMPANY NAME: <b>PXP, 5640 S. Fairfax Ave., Los Angeles, CA</b>
	CALM WINDS: <b>16.08%</b>	MODELER: <b>InterAct, tel. 805-658-5600</b>
	AVG. WIND SPEED: <b>1.64 m/s</b>	TOTAL COUNT: <b>2208 hrs.</b>
		PROJECT NO.: <b>Baldwin Hills CSD</b>

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:  
**FALL - September only - 2010**  
 Data from LAX - T&B Systems (AQMD contractor)

DISPLAY:  
**Wind Speed**  
**Direction (blowing from)**

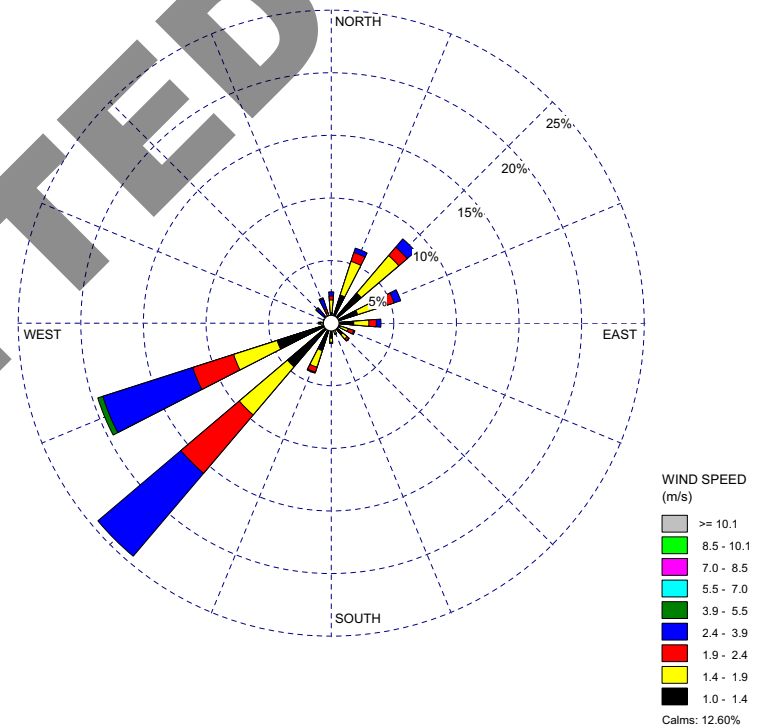


COMMENTS: 24 HOURS - ALL DAY Night: 0:00-6:00am Morning: 7:00am-Noon Afternoon: Noon-18:00 Evening: 19:00-23:00	DATA PERIOD: <b>2010</b> <b>Sep 1 - Oct 31</b> <b>00:00 - 23:00</b>	COMPANY NAME: <b>PXP, 5640 S. Fairfax Ave., Los Angeles, CA</b>
	CALM WINDS: <b>20.53%</b>	MODELER: <b>InterAct, tel. 805-658-5600</b>
	AVG. WIND SPEED: <b>1.41 m/s</b>	TOTAL COUNT: <b>721 hrs.</b>
		PROJECT NO.: <b>Met Data Validation-CSD</b>

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:  
**PXP Inglewood Oil Field - FALL - SEPT, OCT, NOVEMBR**  
 Data from MetOne Instruments Meteorological Station

DISPLAY:  
**Wind Speed**  
**Direction (blowing from)**



COMMENTS: FALL MONTHS 24 HOURS - ALL DAY Night: 0:00-6:00am Morning: 7:00am-Noon Afternoon: Noon-18:00 Evening: 19:00-23:00	DATA PERIOD: <b>2010</b> <b>Sep 1 - Nov 30</b> <b>00:00 - 23:00</b>	COMPANY NAME: <b>PXP, 5640 S. Fairfax Ave., Los Angeles, CA</b>
	CALM WINDS: <b>12.60%</b>	MODELER: <b>InterAct, tel. 805-658-5600</b>
	AVG. WIND SPEED: <b>1.58 m/s</b>	TOTAL COUNT: <b>2166 hrs.</b>
		PROJECT NO.: <b>Baldwin Hills CSD</b>

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