Airport
Land Use
Commission

c/o Department of Conservation & Development

County Administration Building
651 Pine Street
North Wing, Fourth Floor
Martinez, California 94553-1229

Phone:

Contra
Costa
County

Catherine O. Kutsuris
Director

Aruna Bhat
Deputy Director
Community Develpment Division

DOCKET
09-AFC-3
DATE
RECD. **NOV 30 2009**

CEC Commissioners
C/o Craig Hoffman – CEC Project Manager
Siting, Transmission and Environmental Protection Division
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

Re: Mariposa Energy Project
CEC Docket #09-AFC-03

Dear Commissioners,

The Contra Costa County Airport Land Use Commission, met on October 14, 2009 and November 5, 2009, to review the Mariposa project (CEC Reference number 09-AFC-03).

The California legislature's purpose in authorizing the creation of our Commission is stated in Cal PUC § 21670(a):

> "(1) It is in the public interest to provide for the orderly development of each public use airport in this state and the area surrounding these airports so as to promote the overall goals and objectives of the California airport noise standards adopted pursuant to Section 21669 and to prevent the creation of new noise and safety problems."
>
> "(2) It is the purpose of this article to protect public health, safety, and welfare by ensuring the orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses."

Our review of projects is guided by our 2000 *Contra Costa County Airport Land Use Compatibility Plan* (CLUP), which was drafted with guidance from the last two editions of the *Airport Land Use Planning Handbook* issued by CalTrans Division of Aeronautics.[1] There is relatively little guidance in the current and past editions of the CalTrans Handbook pertaining specifically to power plants, and this project presents us with several issues of first impression.

[1] The consultant who drafted our CLUP (issued December 2000) concurrently drafted the 2002 edition of CalTrans' *Airport Land Use Handbook*, and incorporated much of the guidance of the 2002 edition into our CLUP.

After considering the presentation of the Applicant and the public testimony, we found that we could not come to any determinations with regard to safety issues relative to aircraft operations, project compatibility with our CLUP, or mitigation measures without further information from the CEC, and possibly from CalTrans Division of Aeronautics. Specifically, we felt that we would need from the CEC further information and some analysis of the exhaust plumes from the proposed plant under various conditions, as specified below.

Issues Raised During our Hearing of October 14, 2009

The public testimony and documents submitted by the public indicated that a power plant exhaust plume could cause, under certain conditions, turbulence for an aircraft over flying the plume, could allegedly lead to temporary lose of control of the aircraft, could allegedly lead to loss of power or shutdown of an aircraft engine, and/or could allegedly lead to an accident. Five incidents of aircraft being affected by plumes from five different sources were relayed to us. Of these, the incident relayed by a letter dated October 14, 2009, from Gary Cathey, Chief of CalTrans' Division of Aeronautics appears to be the best documented account of the effects of plume turbulence on aircraft. Mr. Cathey's letter was copied to CEC staff, and is now part of the CEC's record for the project.

The Applicant indicated that it knew of no turbulence problems associated with its power plant in San Diego County, near Brown Field (the Larkspur facility). Applicant indicated that it's San Diego facility is similar in design to the proposed Mariposa plant but one-half the size (two stacks instead of four), and located approximately 1.7 miles south of the east-west runway at Brown Field, away from the approach and departure paths. However, a "Google Maps" inspection of the site indicates that the site is more likely to be 1.7 miles to the east of the Brown Field runway, within about 1,000 ft south of the centerline of the main runway approach path. The proposed Mariposa power plant is approximately 2.7 miles south of the Byron Airport, approximately 1 mile west of the centerline of the main runway approach path of the Byron Airport. Applicants presented data analysis regarding the plumes, and indicated that the Mariposa project would not pose a safety hazard to aircraft.

The Director of Contra Costa County Airports, Keith Freitas, indicated that the Byron Airport hosts a wide variety of aircraft and aviation activities. These include: jets, heavy and light propeller aircraft, helicopters, sail planes (*e.g.*, gliders), ultralights, and sky jumpers. He noted that these aircraft fly at different speeds and different altitudes around the airport, and that these aircraft often deviate significantly from the flight patterns published in our CLUP.[2] The Airport Director also noted that there is a large amount of student training that is conducted at Byron, a large portion of which is done by students based at other airports. The Byron airport does not have a control tower, which provides students from other areas with an opportunity to practice radio skills in an uncontrolled airspace. It will likely be several decades before the Byron airport will qualify for FAA funding and support for a control tower.

[2] The Flight paths in the CLUP are principally used to assess noise impacts and to generate an average noise contours; as such, they are generally considered to be generalized, or average, flight paths.

One of our Commissioners noted that the varieties of aircraft also have different weights and different amounts of wing loading (weight per wing area). Aircraft with the least amount of weight and wing loading, such as ultralights and gliders, are suspected of being more prone to turbulence issues than heavy fixed wing aircraft. Occupants of ultralight aircraft and sky jumpers do not have the benefit of performing their flight activities in enclosed cabins, and may be more susceptible to the heat and combustion gasses of an exhaust plume than occupants of jets, propeller aircraft, helicopters, and sail planes. Also, the wings of most Ultralight aircraft are made of polymer materials, not metal, and because of this might deform when exposed to elevated temperatures. We would ask, therefore, for information and analysis and information about the impact of heat and combustible gases on the ultralight aircraft, the sky jumpers, the propeller aircraft, helicopters and sail planes?

In the past, agencies responsible for waterways and power lines in the central part of Contra Costa County (~20 miles northwest of the proposed Mariposa site) have hired helicopters to perform low-altitude inspections (200 ft to 400 ft) of waterways and power lines in heavily populated areas. It is not known if these agencies perform such activities in eastern Contra Costa County, where there are waterways and power lines near the proposed project site. Such agencies typically do not inform us or the Airport Director of their inspection activities beforehand, and the activities are generally only made aware to the Airport Director by way of noise complaints lodged by local residents after the inspections have occurred. There are relatively few local residents around the propose project site, and almost no noise complaints associated with operations from the Bryon Airport.

Information Request #1: From the hearing, it appears that one or more of the four characteristics of a power plant plume may be causing the aircraft turbulence issues that have been observed: (1) upward draft velocity of the plume, (2) horizontal temperatures gradients in the horizontal flight path of an aircraft through the plume, (3) swirling motion of the plume (*e.g.*, eddies, vortices), and (4) oxygen depletion and/or excess CO2 that can affect the chemical reaction in internal combustion engines. We would like to know which of these characteristics, or other characteristics of which we are not aware, are most relevant to assessing aircraft turbulence issues. We request that CEC staff consult with CalTrans Division of Aeronautics on this request.

Information Request #2: We would like the CEC to perform a calm-wind analysis of the amount of aircraft turbulence that the plume at the Mariposa plant would likely cause at the following elevations of aircraft overflight: 1200 ft, 1000 ft, 800 ft, 600 ft, and 400 ft. The analysis should provide one or more parameters at each altitude that may be used to assess the potential for turbulence. We presume the parameters will pertain to the characteristic(s) identified in information Request #1. We would also like to know if the plumes from the four stacks will remain distinct or merge together at some altitude, and if so, the estimated value of that altitude, as well as the likely impact of any merged plume.

Information Request #3: In order for us to validate the CEC's methodology for plume analysis, we would like the CEC to perform the same type of plume analysis for the power plant on which Mr. Cathey performed his tests. With this, we will be able to correlate Mr. Cathey's test data with the parameters from the analysis. Please contact Mr. Cathey for the details about the power plant involved in his tests. Both information requests #1 and #2 may be done at the temperature conditions of Mr. Cathey's tests.

Information Request #4: We request that CEC repeat information request #1 with a wind of 12 knots. Approximately 54% of the time, "calm" winds of less than 8 knots from all directions prevail at the Byron airport. Approximately 23% of the time, there is wind from the southwest that blows in a range of 8 to 16 knots (average of 12 knots). This wind may have the potential to blow the powerplant plume toward the instrument approach of Byron's main Runway 30. We would like to know how far the plume is shifted at each of the test altitudes. While ultralights and gliders will likely use the shorter cross-wind runway 23 under this wind condition, larger aircraft will likely use the longer runway 30 because of its length. A copy of the wind rose for the Byron Airport, as taken from the latest master plan for the airport, is attached for reference.

Information Request #5: We believe that Byron Airport is heavily accessed by pilots that are not based there and who in all likelihood will not be particular familiar with the Byron Airport's surrounding infrastructure. We would request development of clear scientific data regarding how one would effectively provide meaningful notice to pilots and other fliers regarding potential hazards of flying at less than 1000 feet above stacks such as those proposed here. We believe that it is the proponent/applicant's obligation to demonstrate how pilots unfamiliar with the surrounding infrastructure can be adequately nofitied of gases, plumes and their likely impact, so as to minimize the potential harm to the public.

Information Request #6: To assess potential impacts on ultralights and skydivers, we would like to know the locations of the average 120 °F and average 200 °F isotherms of the plume as a function of altitude, up to at least 6,000 feet if these isotherms extend beyond that altitude. A calm wind assumption and an ambient ground-level temperature of 80°F may be used. A simple two-dimensional plot of the right and left horizontal extents of each isotherm on the X-axis and altitude on the Y-axis is sufficient. This information will help us, the CEC, and the Airport director to develop pilot-notification-based mitigation measures.

In addition to safety issues, we look at building heights, visual hazards, and bird strike hazards in making compatibility determinations. There do not appear to be any height hazards with the project. As to possible visual hazards, the area around the Byron Airport is known to have Tule fog during the winter (mid November through to the start of March). Since Tule fog is a ground-level radiation cooling effect, it appears that the power plant plume would dissipate the Tule fog in the area around the site. However, it is not known whether the Tule fog would provide further cooling of the plume in addition to that assumed by Applicant's vapor-condensation analysis, and whether the plume would draw water content from the Tule fog which, when added with the water content in the plume, would condense at a higher altitude of the plume, and whether such condensation would create a visual obstruction for aircraft. We would also request the CEC's and the applicant's opinion regarding this dynamic and whether there would be any visual impact and whether it would be hazardous.

And, we would request confirmation that there will not be an added effect with water content with the Tule Fog or extra cooling effect, and that the Applicant's vapor-condensation analysis is suitable for Tule fog conditions. If that analysis is not suitable, we would request a modified analysis.

Information Request #7: As to potential bird strike hazards, the area around the Byron Airport appears to have significant bird populations, including endangered species, waterfowl, and birds of prey. The Audubon.org website indicates the area around the

Byron Airport as being an "important bird area." The adjacent Clifton Court Forebay is known to attracted waterfowl during the migration seasons. At this point, we do not know what bird populations, if any, are attracted to the Bethany Reservoir, which is near the project site. Most Contra Costa County studies, such as those associated with Byron Airport and the County's Habitat Conservation Plan, have focused on cataloging threatened and endangered bird species[3] in the area, rather than all bird populations. Accordingly, our further research of all bird populations may be needed.

The congregation of birds around airports, particularly approach and departure paths, has the potential to increase bird strikes with aircraft. Larger birds, such as Canadian geese, waterfowl, and birds of prey, are of particular concern because of their weight. Two principal questions arouse during our meeting. First, would birds be diverted away from the power plant plume (such as because of the plume's heat or effluent content), and would such diversion concentrate birds near the main runway approach path to the Byron Airport? Related to this are questions of whether birds are smart enough to sense the heat of a plume and avoid it, and whether they would expire if they are not smart to avoid a high temperature plume. Second, would birds of prey try to ride the rising plume at its cooler edges as part of their hunting activities? A third question flows from these two principal questions: would the plume kill smaller birds, upon which birds of prey would feed upon, such as during down times of the power plant?

Information Request #8: To help us evaluate potential mitigating measures for this particular power plant, what equipment could be added to cool and/or spread out the plume to reduce temperature and turbulence to overflying aircraft? Would widening the stacks and increasing their heights reduce upward draft velocity? Can a small, variably-controlled amount of water be sprayed at the top of the stack to visually mark the first 200 to 400 feet of the plume?

Future Growth and Economic Impact Forecasts for the Byron Airport

In addition to providing the CEC with a summary of issues raised during the hearing and Information requests, we wanted to inform you of the future growth and economic impact forecasts of the Byron Airport.

Completed in 1994, the Byron Airport was one of the last three airports to be built in California, the last being built in 1996. Cost, site selection, airspace constraints, and environmental review make the process of building a new airport difficult and time consuming. The initial planning for Byron airport began in the late 1970's. A wide-ranging site selection process was conducted in the mid-1980's to identify airport sites in the County. Three sites were identified, including the privately-owned Byron Airpark, now the site of the publicly-owned Byron Airport. Since then, the two other sites have been developed with other land uses, and/or encroached upon by incompatible land uses. Accordingly, there are no other sites within the County for a replacement airport to the Byron Airport. The Byron airpark primarily housed and provided services to ultralights and gliders, which have remained with Byron Airport. Owing to their slower speed and lack of mode C radios (and lack of a motive power in the case of gliders), ultralights and gliders are effectively barred from operating at all airports other than

[3] Threatened and endangered species identified by these studies include: golden eagle, western burrowing owl, ferruginous hawk, northern harrier, white-tailed kite, burrowing owl, California horned lark, loggerhead shrike, tricolored blackbird, and Townsend's big-eared bat.

Byron Airport in the central San Francisco Bay Area. Thus, it is expected that Byron will continue to serve these aircraft in the foreseeable future, and such aircraft will likely grow in number. We would ask that the Commission obtain new studies, or evaluate existing studies, to evaluate the impact of these kinds of facilities (and, in particular, the impact of the gases and plumes they generate) on the particularly vulnerable users of facilities similar to Byron Airport, including ultralight aircraft and sky jumpers, to meaningfully assess the impact on public health and safety.

The Byron Airport currently houses approximately 100 aircraft, and has a waiting list of 50 people for the existing, publicly-operated hangers. (The status of the waiting lists for privately-operated hangers is unknown.) This waiting list will likely prompt the building of additional hangers to support the demand for the airport. The airport has approximately 50,000 annual operations. In 2003, the master plan consultant for the Byron Airport master plan projected operations would go from 40,000 to a value in the range of 40,500 to 46,500 by 2008, and to a value in the range of 43,000 to 64,200 by the year 2023. In retrospect, these estimates appear to have underestimated the actual demand, which may be driven by market forces not anticipated by the consultant. The main runway at Byron is currently 4,500 ft in length, with planned extension to 6,000 feet toward the southeast in the future. This extension would move the existing flight patterns approximately 1,000 feet to the south, toward the proposed Mariposa project site.

The Byron Airport is seen by County Board of Supervisors as an important economic development tool for East Contra Costa County, now and for the future. It is expected to play an important role in the economic development of Antioch, Brentwood, Byron, and Discovery Bay, as well as the growing Mountain House Town in unincorporated San Joaquin County, near Tracy.

The Contra Costa County Airport Land Use Commission would like to continue to be engaged on the discussion process, and therefore reserve the right to raise additional questions as they come up in the process.

Sincerely,

David E. Durant/LC

David E. Durant
Chair, Contra Costa Airport Land Use Commission

Attachment: Byron Airport Wind Rose

cc: Gary Cathey, Chief, CalTrans Division of Aeronautics
Bo Buchynsky, Executive Director, Mariposa Energy, LLC
Contra Costa County Board of Supervisors
Keith Freitas, Director of Airports, Contra Costa County
Patrick Roche, Advanced Planner, Contra Costa County
Contra Costa County ALUC Commissioners
Catherine Kutsuris, Director - DCD
Aruna Bhat, Deputy Director-CD

THE PREPARATION OF THESE DRAWINGS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION (FAA) AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982. THE CONTENTS DO NOT NECESSARILY REFLECT THE VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANYWAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAW.

AIRPORT LAYOUT PLAN

BYRON AIRPORT - CONTRA COSTA COUNTY, CALIFORNIA

DECEMBER 2004

AIRPORT DATA

		EXISTING	ULTIMATE
AIRPORT SERVICE LEVEL (NPIAS)		GENERAL UTILITY II OR GENERAL AVIATION	SAME
ICAO IDENTIFIER CODE		C83	SAME
AIRPORT REFERENCE POINT (A)	LATITUDE (NORTH)	37° 49' 42.429"	37° 49' 40.18"
	LONGITUDE (WEST)	121° 37' 32.959"	121° 37' 27.01"
AIRPORT ELEVATION (ABOVE MEAN SEA LEVEL)		76'	SAME
TAXIWAY WIDTH		35'	50'
MEAN MAX. TEMP. (HOTTEST MONTH)		95° F (July)	SAME
GPS APPROACH ESTABLISHED		YES	SAME
AIRPORT ACREAGE	FEE SIMPLE	1,307	SAME
	EASEMENT	0	1,720
AIRCRAFT SPACES (Approximate)	Based/Transient Tiedowns	34	60
	T-Hangars/Portables	104	210
	Executive/Corporate Hangars	0	35
	FBO Area	0	(a)
	Box Hangars	0	10

(a) It is assumed that FBO aircraft spaces will be provided in the hangar and tiedown areas.

NOTES

(A) Existing runway end coordinates obtained from latest NOAA Airport Obstruction Chart (AOC), surveyed March 1996, published May 1997. Horizontal information in geographic coordinates (latitude and longitude), North America Datum of 1983 (NAD83). Vertical information in feet above mean sea level (MSL), National Geodetic Vertical Datum of 1929 (NGVD29). To convert elevations from NGVD29 to North Americal Vertical Datum of 1988 (NAVD88) equivalent, add 2.4 feet.

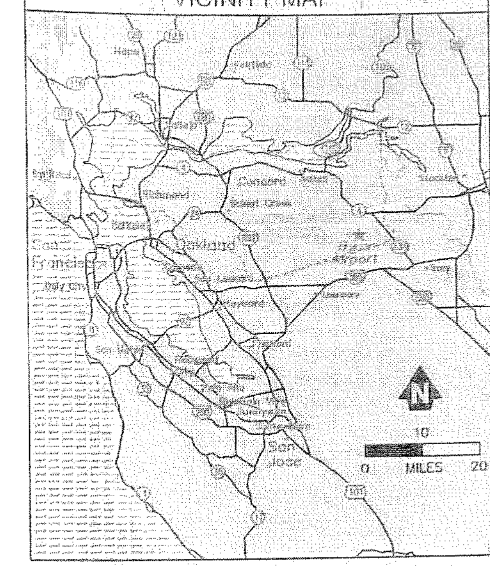
ALP AutoCAD files based in State Plane Coordinate System (SPCS), California Zone 3, U.S. Survey feet, NAD83. CORPSCON conversion utility used to convert between geographic coordinates and SPCS, and to calculate future coordinates.

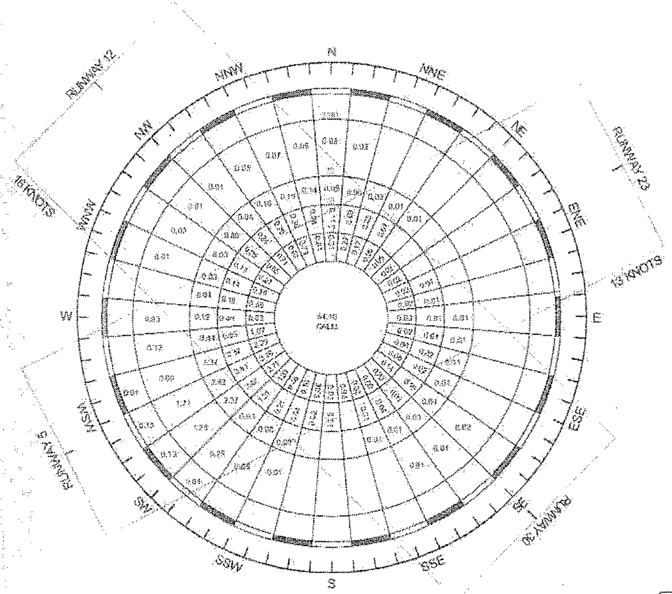
RUNWAY DATA

	RUNWAY 12-30				RUNWAY 5-23			
	EXISTING		ULTIMATE		EXISTING		ULTIMATE	
AIRPORT REFERENCE CODE	B-III		SAME		B-II		SAME	
DESIGN AIRCRAFT (MINIMUM 500 OPERATIONS/YEAR)	Med. Twin		SAME		Light Twin		Med. Twin	
PHYSICAL LENGTH AND WIDTH	4,500' x 100'		6,000' x 100'		3,000' x 75'		3,900' x 75'	
EFFECTIVE GRADIENT	0.4%		0.3%		1.0%		0.8%	
ASPHALT PAVEMENT STRENGTH (1000#) S/D/DT	29.5/-/-		30/45/- EST.		29.5/-/-		30/45/- EST.	
RUNWAY/TAXIWAY SURFACE TYPE	ASPHALT		SAME		ASPHALT		SAME	
APPROACH TYPE: FAR PART 77 CATEGORY AND VISIBILITY MINIMUMS	12: VISUAL [B(V)], 1 MILE (CIRCLING)	30: NONPRECISION [C], 1 MILE	12: NONPRECISION [D], ≥ 3/4 MILE	30: PRECISION [PIR], < 3/4 MILE	5: VISUAL [B(V)], 1 MILE (CIRCLING)	23: VISUAL [B(V)], 1 MILE (CIRCLING)	5: SAME, SAME	23: SAME, SAME
RUNWAY MARKINGS	NONPRECISION		PRECISION		VISUAL		SAME	
FAR PART 77 APPROACH SURFACE SLOPE	12: 34:1	30: 34:1	12: SAME	30: 50:1	5: 20:1	23: 20:1	5: SAME	23: SAME
NAVIGATION AIDS	12: NONE	30: PAPI(3.5°);REIL	12: PAPI/REIL	30: SAME + MALSR	5: NONE	23: PAPI(3.5)	5: SAME	23: SAME
RUNWAY END COORDINATES	12	30	12	30	5	23	5	23
(A) LATITUDE (NORTH)	37° 50' 08.491"	37° 49' 36.888"	SAME	37° 49' 26.35"	37° 49' 20.387"	37° 49' 33.727"	SAME	37° 49' 37.74"
LP = LOW POINT; LONGITUDE (WEST)	121° 37' 53.513"	121° 37' 14.042"	SAME	121° 37' 00.88"	121° 37' 48.413"	121° 37' 15.051"	SAME	121° 37' 05.04"
HP = HIGH POINT; ELEVATION (FEET MSL)	61' HP	46' LP	SAME	42' LP	76' HP	46' LP	SAME	44' LP
TOUCHDOWN ZONE ELEVATION (TDZE) DEFINED AS HIGH POINT OF THE TOUCHDOWN ZONE, FIRST 3000' OF RUNWAY AVAILABLE FOR LANDING	12: 61' MSL	30: 52' MSL	12: SAME	30: 50' MSL	5: 76' MSL	23: 76' MSL	5: SAME	23: 71' MSL
RUNWAY LIGHTING	MIRL		SAME		MIRL		SAME	
RUNWAY MARKING	NONPRECISION		PRECISION		VISUAL		SAME	
RUNWAY SAFETY AREA WIDTH	500'		SAME		150'		SAME	
RUNWAY SAFETY AREA, LENGTH BEYOND RUNWAY END	12: 430' ON ℄	30: 600'	12: 1000'	30: 1000'	5: 300'	23: 300'	5: SAME	23: SAME
RUNWAY OBJECT FREE AREA WIDTH	800'		SAME		500'		SAME	

EST. = ESTIMATED

VICINITY MAP





24-HOUR DATA

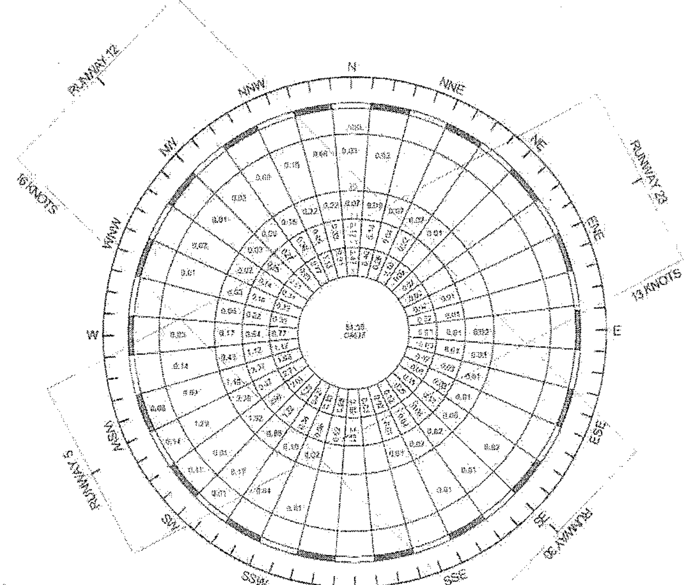
(16,809 Observations)

Runway	12-30					
5-23	Crosswind Component (knots)	0	5.0	10.5	13.0	16.0
	0		52.12%	72.46%	80.59%	89.42%
	5.0	77.00%	89.96%			
	10.5	95.41%		99.38%	99.63%	99.77%
	13.0	97.72%			99.81%	99.91%
	16.0					

WIND COVERAGE

March 22, 1990 - April 25, 1991

Source: On-Site Wind Sensor



6:00 A.M. - 10:00 P.M. DATA

(12,533 Observations)

Runway	12-30					
5-23	Crosswind Component (knots)	0	5.0	10.5	13.0	16.0
	0		52.80%	74.48%	82.52%	90.95%
	5.0	74.65%	88.44%			
	10.5	94.41%		99.23%	99.58%	99.77%
	13.0	97.25%			99.78%	99.80%
	16.0					

SHEET INDEX

APPROVAL

SUBMITTED BY: COUNTY OF CONTRA COSTA	FAA APPROVAL BLOCK
APPROVED: ______ DATE	

Prepared By
LEIGH FISHER ASSOCIATES
A Division of Jacobs Consultancy Inc.
TYLIN INTERNATIONAL | CCS

Prepared For
CONTRA COSTA COUNTY AIRPORTS
CONTRA COSTA COUNTY

Airport Layout Plan Set

BYRON AIRPORT
500 EAGLE COURT
BYRON, CALIFORNIA

Issue Log

DATE	REVISION DESCRIPTION
12/16/2004	FAA REVIEW
03/18/2005	FAA APPROVAL

Drawing Title

COVER, INDEX & DATA