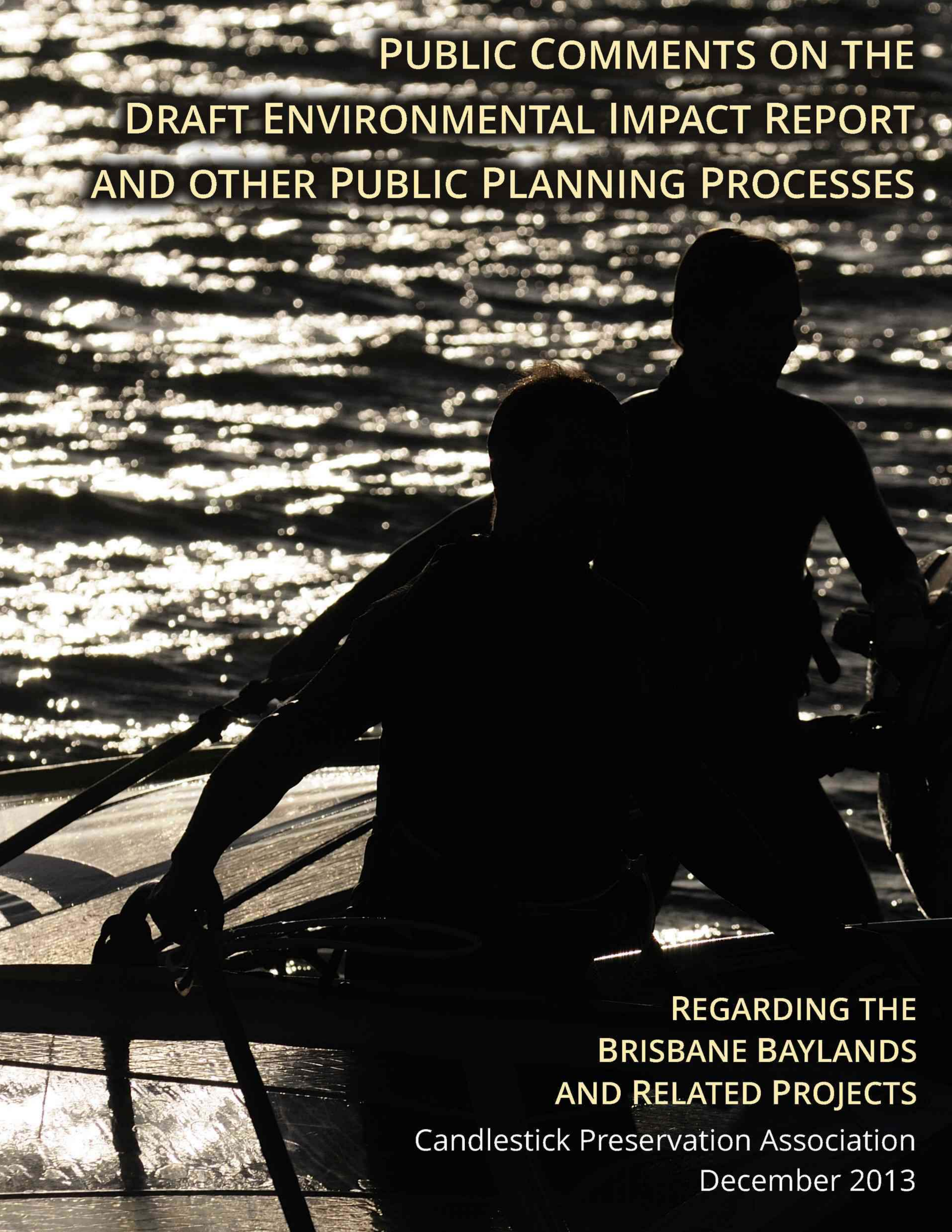

Public Comments on the Draft Environmental Impact Report and other Public Planning Processes

Regarding the Brisbane Baylands and Related Projects

Candlestick Preservation Association

December 2013

Preface

This document contains public Comments for the Baylands area Draft Environmental Impact Report and subsequent planning processes. These Comments apply to the Baylands Project, the Recology expansion, as well as successor and related projects in Brisbane and San Francisco.

We are excited by the potential of the Baylands developments. The Baylands is one of the largest undeveloped urban waterfront sites presently available in the Country. This site could become a paragon of universally beneficial public and private waterfront cooperation. It could create a new standard for development on the Peninsula, embrace and foster the natural resources and recreational activities in the vicinity, and provide a multitude of lifestyle and income benefits for the surrounding communities.

This development could break the trend of "suburban blight" and sterile business park ghost towns that predominate the Peninsula waterfront. To accomplish this, it will not be enough to simply intersperse token green spaces and mixed-use elements as an after-thought. The Project should place public waterfront enjoyment, preservation, and amenities at the core of the development.

Countless examples show that real public lifestyle benefits improve real estate values, city revenues, business incomes, and the quality of life for residents and visitors alike.

These Comments generally refer to any Project in and around the Baylands and vicinity of Candlestick Point State Recreation Area. The intent is that they will be applied where appropriate for specific projects and process stage. It is prohibitively costly to produce separate sets of comments for each stage of each project, especially when the comments will be substantially the same.

These Comments are separated into three parts:

- Part I explores Baylands development alternatives and benefits of general waterfront preservation relative to the status quo of waterfront development on the Peninsula and San Francisco
- Part II examines potential impact of the proposed Project on the recreational windsurfing Resource at Candlestick Point State Recreation Area as well as ways in which the Resource can be preserved
- Part III distinguishes these Comments from those for which the Master Response for the 300 Airport Boulevard project was prepared, a project that underwent a similar wind impact analysis

The general public who participate in planning and entitlement processes often do not have access to funding or resources available to public agencies and private project sponsors. Public participation in these processes is long, complicated, expensive, and usually entirely volunteer-based.

We have faith that the various agencies, officers, representatives, and the general public will receive these Comments with deference to these challenges to public involvement. It is our hope that the spirit and intent of these Comments will prevail over any discrepant details or technical omissions.

We urge all who read these Comments to consider the seriousness of underestimating risks to surrounding natural resources. A margin-of-error in favor of preservation at this stage has been shown time and time again to be one of the best investments a community can make for both public and private long-term interests.

It is always possible to loosen preservation restrictions later but practically impossible to reclaim natural resources once lost.

Capitalized words and phrases are defined in Appendix A. All geographic measurements herein are as accurate as possible but are approximate.

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Part I

A Call for Real Leadership in Waterfront Development

Figure 1: Brisbane Baylands and Vicinity Viewed From the North

1 A Broad View of Peninsula Waterfront Development

Bayfront development on the Peninsula in the vicinity of the Project consists largely of office, hotel, and warehouse business parks with running paths, marinas, and a few small green spaces interspersed throughout. These surroundings are shown in Figure 1.

This use of land provides employment facilities, tax revenue, and ancillary services and retail opportunities. These could be referred to as "income benefits" to the community.

1.1 Sterile Business Park Ghost Towns

This development pattern also produces a sterile business park ghost town feel. Non-income benefits to surrounding communities at large is limited. Most people who live in these communities do not engage with these business parks. The green spaces are often small and little more than lawns with a few benches.

These interspersed green spaces serve more to create views for office employees looking out of their windows than to members of the community who wish to use them for any practical purpose. In short, there are few "lifestyle benefits" to this land use pattern.

These waterfront business parks are ubiquitous on the Peninsula. They are contributing to a phenomenon some are calling "suburban blight." They are known for "a sea of asphalt to get people into their little cubicles and have them do routine office work." Part of the motivation for this land use pattern is from employers who have been generally pleased that such parks are free of distractions for workers.

Instead of encouraging them, many communities in the largest U.S. cities are trying to transform, redevelop, and prevent them from developing or expanding [22]. At the core of this land use reversal is incorporating lifestyle elements and an emphasis on cultivating and preserving substantial usable open spaces.

1.2 Overdeveloped Commodity

The evidence of the vulnerability of this commodity is the incredible drop in demand for suburban office space and commensurate drop in supply. In 1988 and 1989, more than 160 million square feet of new suburban office space was developed. In 2011 and 2012, just over 12 million new square feet was developed – a 20 year low [22].

Substantial Excess Peninsula Business Park Supply

At present, millions of square feet of new suburban business park space that has been developed on the Peninsula is sitting dark and unoccupied. This space spans the range of commodity office to warehouse to laboratory. There is no shortage of available space from new premium development to highly discounted older stock. Throughout the Peninsula, all communities are competing and fighting to offer incentives and give-aways to increase occupancy.

Many communities actively solicit and attempt to poach tenants from nearby communities with new incentives. Larger communities with an existing diverse existing income streams may be able to offer stronger incentives to attract new tenants than smaller communities with fewer sources of income. Communities may also have other incentives such as greater local services option, desirable proximity to housing and transportation, or other factors that are difficult to replicate.

In such a market, net absorption does not tell the who story, because that quantity does not reveal the tenant improvement dollars, tax relief, training subsidies, deferments, or other benefits that private and public agents may use to lure tenants at the expense of revenues.

It should be clear that the "build it and they will come" philosophy has substantial risk with respect to these Peninsula business parks.

Brisbane Ranks First in San Mateo County Office Vacancy Rate

According to Colliers International, as of August 2013, Brisbane ranked #1 in office space vacancy in San Mateo County with over 54% of its office space vacant (460,000 SF available). Brisbane's current vacancy rate is over well four times higher than the average for San Mateo County municipalities.

Collectively in San Mateo County, over 4.4 million square feet of office is currently vacant. Adjacent communities of South San Francisco and Daly City have the 2nd and 3rd highest vacancy rates with combined nearly 1 million square feet of available space. Brisbane 2013 net absorption year-to-date was reported at less than 10% of outstanding vacant space. [12]

Supply and Conflicts Continues to Increase

Despite this incredible abundance of supply, municipalities and developers continue to approve and fund development of new supply. In office space alone, this 4.4 million square feet vacancy figure does not include new projects already approved or under construction. For example, in Downtown Redwood City, the Crossing/900 project will add 300,000 square feet of office space by second quarter of 2015 [12].

Immediately adjacent to the Baylands Project, Visitacion Valley is preparing to move forward with a 24-acre redevelopment that would include a 90,000 square foot retail component that will be presumably anchored by a grocery store. Just to the East, the Executive Park project, for which some phases are already complete, has already and will include expansion with several hundred thousand square feet of commercial office space. Farther to the East, The Hunters Point / Candlestick Point project (detailed below) will include 700,000 square feet of retail and 2.5 million square feet of state-of-the-art commercial business park space.

Some of the interests that are behind the present Baylands Project also have interests in these other adjacent projects (Visitacion Valley and Executive Park). When one developer controls multiple sites in different communities, the developer can phase development and push potential tenants to the sites in a way that benefits the developer most at the possible expense of the different communities.

Where conflicts like this exist, the communities within which these sites are located should not assume that developers will always advance community interests. This “lock-up” strategy is one of the most basic methods of circumventing competition and gaining leverage over communities and tenants.

The preceding project statistics come from the San Francisco Planning Department and the San Francisco Office of Community Investment and Infrastructure.

1.3 Drawbacks of Dependence on Income Benefits

The stream of income benefits to communities from commercial development is dependent on a relatively fixed and brittle commodity. Office and warehouse space is subject to obsolescence in design, competitive threats from other new buildings and incentive programs, and changing business climates.

Generally office and warehouse space begins life as “Class A” and commands the highest rents. Over time, rents typically fall on a relative basis or require continual reinvestment. The development typically becomes less valuable over time.

Communities that depend on such income streams continually risk budget gaps due to income shortfalls. Planning for the future is uncertain given such a risky income stream. Brisbane has recently experienced tenant turnover in Sierra Point and the accompanying problems that occur and will continue to occur with dependence primarily on this form of benefit.

Another risk that accompanies such development plans is that the absorption pace and buildout is unknown. Projected incomes may take longer to materialize. Increasing development pace may create excessive supply, decrease revenue, and increase servicing costs. Importantly, on-site amenities or infrastructure that are tied to specific phases may or may not occur on schedule or at all.

1.4 Effect on Downtown

An obvious risk to development is the cannibalization of existing real estate supply. The introduction of new commercial and residential supply can lure both buyers and tenants away from historic downtowns, for example.

New building is more modern, functional, exciting, and importantly, includes new tenant improvement money that can be a tremendous inducement to locate or relocate. These tenant improvement dollars also attract competitive new tenants from outside of the community.

The collective effects of such development is clearly impossible to fully predict. However, some rules-of-thumb are generally accepted.

For example with retail, it is widely recognized that "malls hurt downtown." In a joint paper by University of Massachusetts and Michigan State [27], the authors write that "[local stores] unable to compete with the mall in terms of prices and variety will inevitably close. Family-owned stores will suffer and few will survive the transition. An overwhelming number of the malls tenants are already in the marketing region, as there are no new markets, only stolen markets. Furthermore, a herd instinct prevails, once a key merchant moves to the mall, others follow suit. Downtowns will be forced to carry specialized goods not offered by the mall, or change its focus..."

1.5 Effect on Sierra Point

Retail and office in Downtown Brisbane will not be the only supply hurt. Existing Sierra Point business park space will also be impacted by the introduction of new supply. Tenants will be eager to move to new facilities and the developers will be eager to court and incentivize them.

Every developer knows that the easiest source of tenants are nearby relocations. It would be shocking, in fact, if such conversations have not already begun.

1.6 Other Options

At the outset, it is clear that "yet another business park" along the waterfront has substantial very real risks to the community. One key to understanding these risks is to realize that the public community and the private developer do not necessarily have the same interests.

However, it is entirely possible for both private developers and the general community to prosper together. Some of the keys to this is to consider the entire possible scope of benefits that both can receive. Benefits to the community, for example, should not be limited to tax and fee revenue.

Benefits to both should also occur regularly over time. Both short-term and long-term gains need to be programmed. It is not realistic to take upfront disproportionate risks for highly uncertain future benefits. These risks to the community include granting approvals and permits that obligate them to provide services while also limiting future opportunities and benefits.

Is there any reason to assume that the current model that dominates the Bay waterfront on the Peninsula is the only option? Does Brisbane have to settle for more of the same while simultaneously taking on substantial risks with little immediate benefit to the vast majority of the community? Does Brisbane have an opportunity to make a mark on the Bay Area and potentially entire Country or does it have to settle for the first thing that comes its way?

Figure 2: Fontana Residential Complex, San Francisco

2 Lessons from the Past

While Figure 1 shows the extent and pervasiveness of these sterile ghost town business parks in the vicinity, waterfront development is not limited to commercial and industrial users.

2.1 Preventing "Manhattanization"

One important lesson from history can be found in San Francisco. Shown in Figure 2 is the controversial Fontana Residential Complex on the North side of the city. This complex when proposed in the 1960's almost single-handedly began a revolution against the "Manhattanization" of San Francisco.

In 1960, the planning director of San Francisco James R. McCarthy sounded the warning: *"San Francisco zoning laws will have to be changed to prevent construction of a 'Chinese Wall' of skyscrapers along its waterfront. We want to avoid what has happened in lower Manhattan in New York, where views of the bay are blocked by high rising buildings."*

Former California State Assemblyman Casper Weinberger argued that the subsequent 40-foot height limit adopted in much of San Francisco *"will preserve for future generations one of the priceless assets of San Francisco, the whole relationship of the City to the Bay, and particularly, the views enjoyed by the public from publicly owned lands, such as Coit Tower and other City-owned recreational spaces."*

In further testimony he continued, *"the Master Plan has for years provided that the height of buildings should generally follow the contour of the land, and that low rise buildings should be built on the low lands, such as the northern waterfront, and high rise at the tops of hills so that the loss of views, etc., will be minimized."* [10]

For scale purposes, the view of Fontana in the figure above is from a distance offshore that is similar to where users of CPSRA engage in windsurfing recreation compared to some of the proposed plans for the Project.

2.2 Preservation Key to Thriving Success

No one can dispute the success that the San Francisco real estate market has enjoyed. Property values and revenues to the City are incredible. This height limit, which was fairly and uniformly applied except at the tops of some hills and certain special districts, has not prevented the City from thriving.

In almost every single "Top-10" list for things to do and see in San Francisco, the views are listed among the best of the best. Picture postcards often show these views taken on Powell Street looking North and framed by cable car. Instead of constraining the potential for the City, the height limit created incredible value for the City and kept the density from overwhelming infrastructure.

This is a tremendously relevant example of how a community applied a long-term perspective and enjoyed great success that benefited not just the City coffers but every resident and visitor.

Figure 3: Candlestick Point and Hunters Point Shipyard Phase II
Shown here is the non-stadium alternative 2010 plan for the Candlestick Point and Hunters Point Shipyard Phase II redevelopment by Lennar Corp. This plan was provided by San Francisco Office of Community Investment and Infrastructure (formerly San Francisco Redevelopment Agency). According to the San Francisco Office of Economic and Workforce Development, this plan would cover 700 acres of waterfront development with 10,500 new residential units, 300 acres of waterfront parks (including a new "Crissy Field of the South"), 700,000 square feet of retail and entertainment, and 2.5 million square feet of commercial/office space.

3 New Waterfront Development Competitive Pressure

There is an idea that new development on the Baylands should be considered separately from the existing supply. Possibly this new space provided by the Project would attract tenants that would not consider the existing space due to various reasons. The new space could be more functional or have different amenities absent from existing options. So possibly it would not cannibalize existing space but attract a new market. Unfortunately, Brisbane is not alone in preparing to bring on-line new state-of-the-art supply as mentioned above.

The adjacent Hunters Point Shipyard / Candlestick Point redevelopment shown in Figure 3 is already underway. It is slated to contain 700,000 square feet of new retail, 2.5 million square feet of commercial space (an amount that is more than 50% of the existing vacant office space in San Mateo County), and 10,500 new residential units.

In addition, it is planned to include 300 acres of waterfront parks, creating a "Crissy Field of the South."

Unless the Baylands Project offers something different or more competitive, it risks succumbing to the same fate as commodity offerings elsewhere on the Peninsula or being subsumed by competitive new entrants such as Hunters Point / Candlestick Point.

Figure 3 shows how the Hunters Point / Candlestick Point open space system is comprehensive, embraces the waterfront, creates a transition between intense commercial and waterfront open space, and clusters development away from the water.

However, the irregular waterfront along Candlestick Point makes it difficult to create large contiguous waterfront spaces in the Candlestick Point areas closest to Highway 101. An advantage that the Baylands Project may have is the proximity to Highway 101 and the site envelope such that access to the waterfront open spaces could be much more visible, regular, and programmed with a wider range of uses.

The shear scale and critical mass that the Hunters Point / Candlestick Point development may achieve along with the support of San Francisco will make it a very formidable competitor for new tenants. Both the public and private developers have extensive experience with developments on these scales and are familiar with many tools that can help bring funding gaps and realize visions quickly and efficiently.

Brisbane needs to have a superior offering and one that embraces the most valuable resource here – the waterfront – rather than walling it off behind a commodity business park. The waterfront needs to add value to all facets of the Project and community, not simply enhancing the desirability of the tall buildings that could easily monopolize it.

Chicago Lakefront Park System

4 Imagining the Possibilities

One of the unquestionably greatest successes of waterfront development in the United States is found in downtown Chicago. The Chicago Lakefront evolution has tremendous parallels to the Baylands.

The Lakefront park system including the world-renowned Millennium Park was built on an industrial wasteland. A landfill, railyard, and shipyard from the 1850's until the late 20th century, the public-private vision that has led to a 250-acre system of open space, museums, trails, entertainment venues, and parks is one of the most successful case-studies of waterfront development in the world.

The Baylands are a complete blank slate of waterfront development potential. This is probably one of the largest regularly-shaped undeveloped urban waterfront sites currently available in the United States. Compared to Chicago, this could be a year-round amenity with weather that is mild and accessible throughout all 12 months, making such open space potentially much more utilized than anywhere else in the Country.

The preceding page contains a brief snapshot of some of the sights of the Chicago Lakefront. The contrast with the aforementioned peninsula development pattern in the vicinity of the Baylands should be immediately obvious.

4.1 Immediate Benefits to All

Access to the waterfront is a public right in California. The views and enjoyment of the same should also be a public right in the City of Brisbane. Creating a Waterfront Preservation District that is more than just a few token patches of lawn with a running trail would be an immediate lifestyle benefit that would encourage a multitude of uses and enrich the lives of everyone in Brisbane and beyond.

The benefits would be immediate, would not be subject to the business park risks mentioned above, and would have large economic impact. There is virtually no substantial waterfront development of this sort on the Peninsula. It would be unique, desirable, and compliment the other tremendous assets that Brisbane has in terms of its natural setting, vibrant community, and proximity to San Francisco and the South Bay.

Not only would direct use of such an area be a benefit, but it would allow filtration of stormwater and catchment of some airborne litter to help improvement of the Bay water quality be a primary focus rather than an afterthought.

The current plan to expand a trash processing plant and monopolize the waterfront with buildings up to 200' above sea level does not provide benefits to all, removes the waterfront from the public space, and ignores that many lessons learned from the waterfront development experiences elsewhere such as in Chicago.

A trash plant, for example, is not the highest and best use for this land. A trash plant is not only a negative amenity for its odors, litter, and unsightliness, but also presents additional risks such as fire and explosion due to the inherent handling of raw and possible hazardous materials [5].

4.2 Real Economic Benefits

San Diego Magazine considered five cities as potential models for new waterfront development. They wrote about Chicago the following in 2011 [25]:

...Chicago has done more than any other American city to foster beauty in its public realm over the past 20 years. The shining example is Millennium Park, the 24-acre jewel in the northwest corner of Grant Park on the site of a former parking lot.

This "art park"–which features world-class commissions created by Anish Kapoor and Jaume Plensa, stunning architecture including a pavilion and bridge by Frank Gehry and an addition to the Art Institute by Renzo Piano, plus brilliant landscape design –has become an economic blockbuster for the North Michigan

Avenue neighborhood since opening in 2004.

The numbers tell a compelling story:

- ***The increase in value of adjacent real estate, directly attributable to Millennium Park, is projected to be $1.4 billion over the next 10 years.***
- ***Hotels will benefit over the next decade to the tune of $482 million to $586 million; retailers, $529 million to $711 million; and restaurants, $672 million to $867 million.***
- ***In its first six months, the park attracted more than 2 million visitors. Now its 3 million annually, including international tourists who spend $300 per day on average, according to City studies.***

Millennium Park and The Bean (the affectionate name for the Kapoor sculpture) have become the new post-card images for the City, as well as a source of enormous civic pride. It's important to note that this public space was achieved over the objections of many who claimed the expenditure was frivolous or wasteful.

What Mayor Richard Daley understands is that investment in creating a beautiful public realm, whether through art, landscape or programming, has created extraordinary value by attracting even greater private investment.

The income benefits include revenue opportunities for everyone, not just for City Hall. Property appreciation throughout the surrounding area is continuing today. The attraction of new and desirable retail and services tenants to existing real estate supply was experienced rather than cannibalization caused by constructing another new mall.


Chicago Lakefront Overlay
Chicago Lakefront
N
San Francisco City and County
San Mateo County
Geneva Ave
Bayshore Blvd
Guadalupe Canyon Pkwy
Valley Dr
Old County Rd
Ice House Hill
Kinder Morgan Energy Tank Farm
Lagoon Way
Brisbane Lagoon
U.S. 101
San Francisco Bay
Sierra Point/ U.S. 101 Interchange
5,000'
0'
Cloud Gate
MILLENNIUM PARK
Lurie Garden
The Art Institute of Chicago
E Jackson Dr
GRANT PARK
Field #7
Project Site
Not a part of Proposed Project
0
1000
Feet
Chicago Lakefront Overlay
- 250 Acres (To Scale)
- Millennium Park
- Grant Park
- Buckingham Fountain
- Maggie Daley Park
- 1,800' x 6,000'
1/2 Scale Area Overlay For Comparison (125 Acres)

5 Alternatives for the Brisbane Baylands

Is Brisbane limited to the existing Peninsula business park development pattern? Would such a concept like the Chicago Lakefront even physically fit or be appropriate on the Baylands?

5.1 Available Area

The Chicago Lakefront park system is roughly 250 acres with a length of approximately 6,000' and a width of 1,800'. The footprint of this park system on the Baylands fits amazingly well. The preceding page shows the Chicago Lakefront park system overlayed onto the Baylands. In addition, the overlay shows a reduced park system area that is 125 acres and 1/2 the width (6,000' by 900').

Because of the intense competition from existing and new supply and the need to create both compelling lifestyle and resilient income benefits with this Project, it is recommended that this half-size area of the Chicago Lakefront park system be adopted as the minimum Waterfront Preservation District area for the Baylands.

5.2 The Only Realistic Option

Clustering and density management are frequently used techniques in urban planning to offset development impact. By clustering development, infrastructure can be shared economically and open space can be consolidated so that larger more usable spaces can be created.

In this case, the irreplaceable waterfront cannot be replicated and incorporated in open space and community amenities that are located behind a wall of buildings. Not every patch of open space is equal. Furthermore the configuration of the open space area is just as important as the sum total area.

Importantly, the overall development would not lose substantial buildable area by simply reallocating and clustering the open space through a Waterfront Preservation District.

By created a Waterfront Preservation District, Brisbane would gain an immediate unique lifestyle amenity that would be a real asset to residents as well as a boost for business and property values. Long-term income from fees and taxes would still accrue over time from commercial development, but the risk of these not materializing as projected would be mitigated but the lifestyle benefits created at the inception of the Project.

A diverse set of benefits to the community is key to mitigate the risk of future changing business climates, new competition, and unaligned public and private interests. The amenity would increase the value of adjacent private development, and both private and public interests would therefore be benefiting at each stage of the Project.

5.3 Phasing Public Space Development

Developing and implementing a plan for such a Waterfront Preservation District would be a daunting task. Many decisions would have to be made and funds would have to be raised. Fortunately, the development of the same could be phased over many years, giving enough time to thoroughly determine the proper course.

The key consideration would be that the area be designated, prepared, and preserved from the outset. Funds for future enrichment of the site could even be raised in the form of assessments on the remaining land.

None of these ideas are revolutionary, impossible, or first-of-a-kind. The establishment of a Waterfront Preservation District for the benefit of the general public would be the first step in a series of many that could occur gradually over time.

5.4 Consider the Alternative

Now imagine for a moment the waterfront almost entirely obliterated or consumed by the status quo development. What tangible impact would this have on most of the citizens of Brisbane? How would the increase supply in commercial space affect existing stock in the City? Would Brisbane become a more or less desirable place to live? Would business have more or less reason to locate in Downtown Brisbane?

For example, imagine a trash plant four times the size of the current Recology facility. By any measure, a trash plant is a negative that detracts and devalues the surroundings. On-site trash processing does not eliminate post-processing transport costs, odor, litter, on-site truck trips, and the fact that the public does not interact with such a development in any meaningfully positive way. It is not an economical or efficient way of processing the waste, which is currently processed with minimal energy in large open-air land tracts in the Central Valley surrounded by farms that consume much of the result of the processing. Onsite power generation or other savings would be offset by the additional costs of processing standards required and monitoring required in such a sensitive urban setting.

Brisbane has everything to gain with the Baylands by creating something truly unique, valuable, desirable, and attractive; and it could do so without having to make all of the difficult decisions today. The alternative would be to create more of the same basic real estate, cannibalize existing supply, eliminate valuable potential waterfront amenity benefits, and become saddled with cost and inconvenience for many years to come.

Brisbane needs real leadership at this critical time to resist the pressures of private interests and the lure of short-term risky gains. This Project will be developed over perhaps 20 to 30 years and will stand for decades after. A long-term view needs to be taken that preserves the resources that exist today. The realistic risks of claims or projections being worse than expected must be carefully considered. Mitigation plans to account for these and other unforeseen risks must be adopted.

Part II

Windsurfing Importance, Impact, and Preservation

Candlestick Windsurfing

1 Introduction

Shifting now to the primary focus of these Comments, this part will examine the potential impacts of the proposed Project on the recreational windsurfing Resource at CPSRA.

The Waterfront Preservation District development pattern would strongly encourage and cultivate a truly remarkable and unique activity that currently coexists with the Baylands. Presently no consideration whatsoever is included for preserving the windsurfing Resource at CPSRA that has existed for 30 years.

The current DEIR claims "no significant impact" would take place on the Resource despite a wall of buildings some 200' above sea level possibly being constructed just 500' immediately upwind along the extent of the shore where windsurfing takes place.

1.1 Embrace Natural Resources

At the very outset and without first discussing technical errors and omissions in the Analysis, we believe the Project should strive to go above and beyond the very minimum of what is required by law in terms of natural resource preservation. The Project should embrace the adjacent recreational activities including the windsurfing Resource.

This Project is not located hundreds of miles inland amidst a sprawling uniform desert landscape. The Baylands is an incredible dynamic and sensitive area full of natural transition at the intersection of mountain, ocean, valley, and bay. It is a rare location with valuable recreational opportunities that exist no where else.

Presently, no consideration and mitigation whatsoever is included for windsurfing. The Project should go out of its way to avoid unforeseen or underestimated impacts to this and other resources and activities. It should voluntarily adopt a margin-of-error to avoid underestimating the risks to present natural and recreational resources. There is no reason why development cannot coexist with these activities and why both users of the natural resources and private project sponsors cannot benefit and prosper together.

The City of Brisbane should not accept highly questionable justification for "no significant impact" while completely ignoring the potential errors or understatements in the Analysis that may very well render the windsurfing Resource at CPSRA unusable or usable merely at a substantially reduced fraction of the present condition.

Once development is in place, whatever damage may occur to natural resources either through known or unforeseen consequences will be practically irreversible.

1.2 Unique, Valuable, and Scarce Resource

These Comments were prepared by many for whom a very important part of their most passionate lifelong interest is in danger. Over 30 years of continual use and history at CPSRA has marked it as one of the premier windsurfing resources in the San Francisco Bay, if not the entire continental United States.

It is one of only three suitable windsurfing locations in San Francisco County, one of four locations regularly used on the Western side of the Bay north of CA-92, and one of the only locations in the entire Bay Area that is not subject to tidal restrictions, boat traffic hazard, or danger of stranding.

It is ideally suited to all skill levels and is routinely used by beginners as well as top-ranked world competitors. The unique topography and siting creates wind flow that is much more regular than anywhere else in the Bay Area. Finally, it is one of the only off-shore wind locations in the Bay making the water condition substantially devoid of wind swell even during periods of high wind.

An Internet forum at iWindsurf.com provides a community where people may post about windsurfing experiences. From 5/22/2008 to 6/19/2013, 4,372 such posts were recorded and analyzed for these Comments. Based on a keyword search over all of the Bay Area windsurfing sites, Candlestick was the second most frequently discussed site, trailing only Berkeley.

1.3 Unrealistic and Incomplete Thresholds, Assumptions, and Methods

Given their dedication to this unique and valuable Resource, the frustration and disappointment among those of the interested public who reviewed the proposed Project and Analysis was staggering. It is unfathomable to imagine that a possible virtual wall of 4,200' of construction up to 200' above sea-level in some areas along the Western edge of the Practical Sailing Area would have "no significant impact" on wind-flow on a site that begins just 500' downwind.

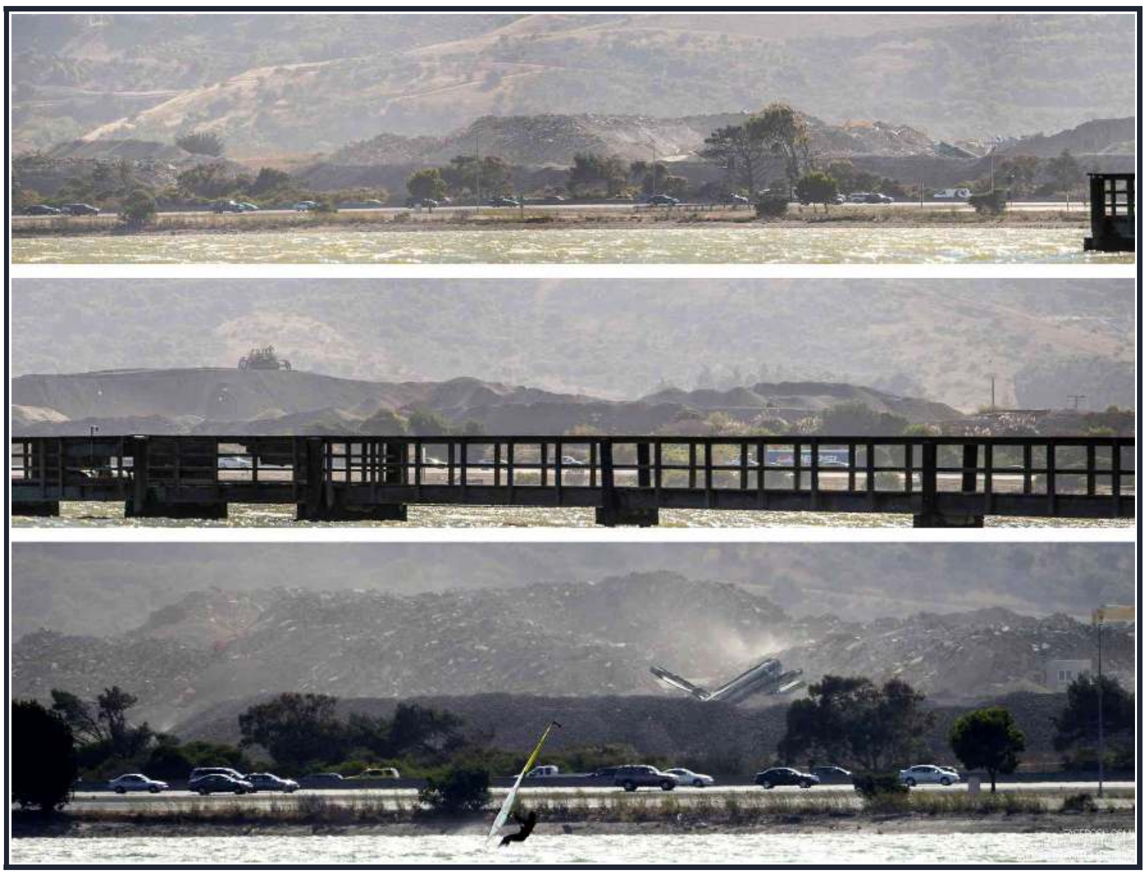

Figure 4: Existing Dirt Walls from Soil Processing on Baylands
Dirt mounds that rise some 50' to 70' above surrounding grades already border portions of the Western area of CPSRA [11]. The proposed Project could expand intense development North and South for a total length of perhaps 4,200' and increase the effective height of obstructions along this Western shore up to 200' above sea level in some portions. This figure is provided for scaling reference.

Only a handful of newly measured impact points specifically tied to the Project were even made in the Practical Sailing Area in the Analysis. The Practical Sailing Area is a fraction of the overall CPSRA, the area most critical and regularly used, and the area closest to the Project and most susceptible to impact.

No measurement points were made in this Practical Sailing Area closer than at least 1,500' from the Project itself. Nonetheless, 58% of the sparse few newly measured Analysis points in this area were projected to be at levels that would contribute to a substantial loss of availability of the Resource as shown herein (greater than a 5% mean wind speed reduction). Furthermore, the unexamined portion of the Practical Sailing Area would be even more impacted as it is closer to the Project and its wind impacts.

The Analysis itself begins with the statement: "there appear to be no specific criteria for minimum wind speeds to support 'good' sailing." With this caveat as a basis, how can the public have any confidence that this is a faithful examination of the potential impacts? If such a statement were true, then how would windsurfers decide where and when to go windsurfing? Do they simply flip a coin? What about professional forecasters? Does the same logic hold true for all sailing vessels? What about for any other weather or natural resource-dependent activity?

Not only is such a statement misleading, it effectively relieves the analyst from justifying the significance threshold used in calculating impacts. In fact, no justification is given in the Analysis for why the selected threshold used is appropriate for this location and how it translates to an actual change in availability of the Resource based on current established conditions for use of the Resource.

With no understanding of what constitutes specific criteria to support "good" sailing tied specifically to this site and its existing conditions and no justification for why the significance threshold is appropriate or meaningful for this location, one should reasonably question how the conclusions of the Analysis could be anything other than arbitrary.

In preparing the Analysis, it seems as though much work went into applying methods used in other projects having a fraction of the scale and much more detail than this Project. The Project and its surrounds encompasses thousands of acres and none of the building footprints, heights, orientations, finished elevations, site plan details, landscaping specifications, or other information is firmly known at this time.

Though the Analysis attempts to model a "worst case" impact scenario, it never explains the methods or justifications for why its chosen assumptions and shortcuts truly fit such an objective. Is it more conservative to model the whole project as a maximum height wall? What about the increased turbulence caused by surface roughness from gaps between buildings and varying building heights?

While work was going into building something that could be placed into a wind tunnel, no primary research was conducted to answer the basic question: "what constitutes minimum specific criteria for "good" sailing at Candlestick Park State Recreation Area?"

No surveys of users of the Resource were conducted, no exploration of existing data sources meaningful to users of the Resource, and no meaningful field tests were conducted or real-world observations made as far as we are aware. While field tests are not specifically required by CEQA, there is a requirement that the impact Analysis bear some realistic and demonstrable direct connection to the potential change in availability of the actual Resource concerned.

1.4 Goal of Comments

It is hard to read the Analysis and not objectively feel through the stark lack of detail and incompleteness as though it was but a token effort to "check the boxes" and placate the public interests with the minimum possible level of thoroughness. Much of the Analysis consists of cut-and-paste reductions of previous EIR even so far as to include substantial data from another EIR that did not even model the Project as far as we know.

We hope these Comments will assist the City of Brisbane and others in making sure that all practical diligence is pursued in evaluating the potential impacts of the Project in the focus of these Comments as with the other potential impacts examined elsewhere in the DEIR.

Though this Project is arguably one of the largest and most ambitious in Brisbane's recent history, we are confident that Brisbane has every desire and all capabilities to meet and exceed the highest standards of excellence for considering and protecting public natural resources.

These Comments start from where the Analysis leaves off. They highlight critical assumptions and potential effects on the Analysis. They attempt to establish a conservative, realistic, calibrated, and actionable criteria for "good" sailing at CPSRA. They examine the potential Project impact on the actual usability and availability of the Resource in concrete absolute terms that are meaningful to the lay public.

Based on this work, these Comments demonstrate that the potential impact due to this Project on the Resource is unsurprisingly quite significant.

2 Methodology and Assumption Deficiencies

The DEIR contains important problems or misunderstandings in analysis methods and assumptions.

2.1 Comparing the Project to 300 Airport Boulevard

The Analysis appears to closely follow the methods and significance thresholds from the recently approved 300 Airport Boulevard project in the City of Burlingame. At the outset, it is important to consider the differences between the Project and 300 Airport Boulevard despite the similar analysis methods and conclusions.

Project is Order of Magnitude Larger

Compared to 300 Airport Boulevard, the Project includes development over potentially 35-40 times more acreage, 10-14 times more buildable square feet, much higher maximum building heights and widths, a windsurfing impact area 4-8 times larger, and a building footprint that is not even known at this time. Unlike 300 Airport Boulevard, the Project is so large that it could not even be modeled in the wind tunnel as one complete piece.

To our knowledge, typical use of wind tunnel modeling for considering structure impacts on pedestrians or windsurfing activity has been limited to much smaller scale projects on the order of tens of acres or less for which specific building footprints and site plan details have been established.

300 Airport Boulevard and Executive Park are examples of such smaller scale projects. By comparison, this Project and its surrounds encompass thousands of acres with few final building and site plan details.

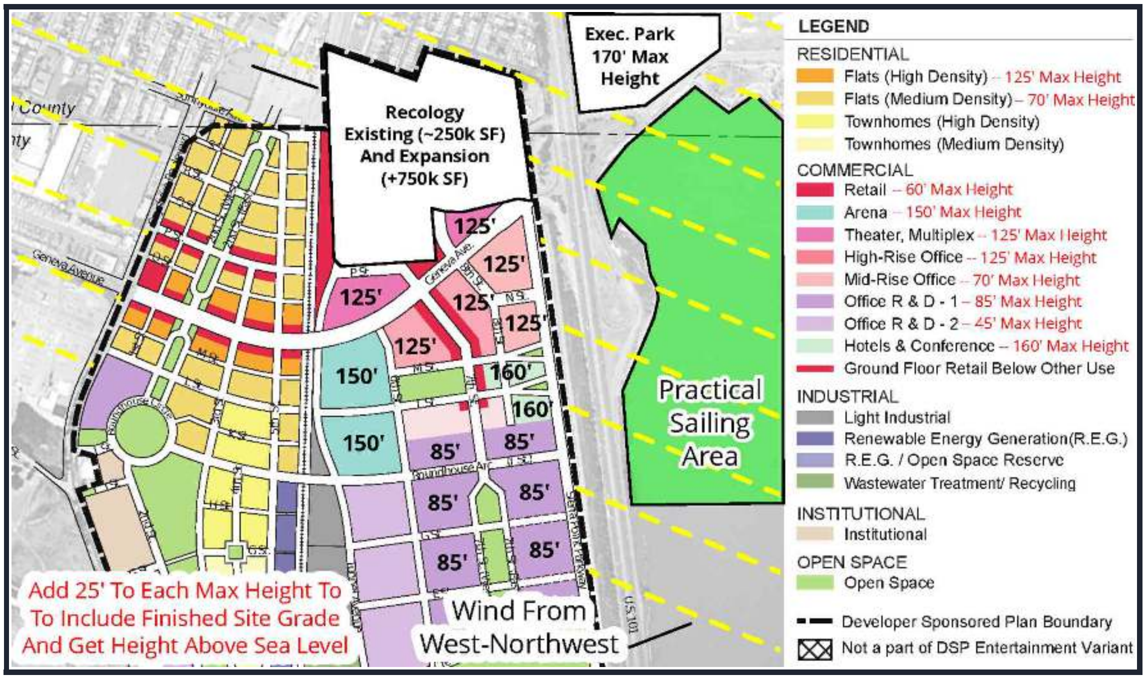

Figure 5: Possible Project Building Heights

The final Project building and site configuration is unknown at this time. One possible configuration from the DEIR is shown here. The building heights, a portion of the Practical Sailing Area, the Recology and expansion area, and the Executive Park project [2] were added along with the West-Northwest wind lines. To obtain building height above sea level, the figures shown should be increased by 25' to account for the projected finished grade elevation above sea level. The final finished grade elevation is actually unknown at this time but could be substantially higher than 25' according to the DEIR. From the North edge of the Recology area to the South edge of the "Office R & D - 1" use shown, there is a virtual wall of projected approximately 4,200' of intense multi-story or high clear span construction at a minimum of approximately 500' from the water's edge and directly in the path of wind flow from the Alemany Gap to the Resource.

No Contingency Factor For Potential Modeling Error

It seems that using a wind tunnel to analyze a Project of this scale and uncertainty cannot yield the same confidence level as for smaller scale projects for which wind tunnel analysis is typically used in environmental impact studies.

Given the large number of simplifying assumptions and shortcuts that were required to obtain results, one could not be as confident that the Analysis accurately projects the likely impact. These assumptions and shortcuts may have drastically altered the conclusions of the Analysis.

Despite this concern, precise measurements were reported in the Analysis with no reported allowance for modeling error, no sensitivity analysis to reveal the potential effect of modeling errors, and no field testing to demonstrate that the model has any connection to reality whatsoever.

Creating prototype models to assess risk before construction is a reasonable way to mitigate uncertainty. However, if the prototype itself is too uncertain in its ability to represent the actual Project, the result of the modeling effort will be of little value [8]. In professional engineering, a contingency factor is usually considered to deal with unaccounted uncertainty.

2.2 Inaccurate Impact Area

The true impact area at CPSRA, herein referred to as the Practical Sailing Area (Figure 6), is much smaller and closer to the Western shore (along Highway 101) than indicated in the sailing area described in the DEIR. The Practical Sailing Area begins immediately off the shore along Highway 101, which places it at a minimum distance of 500' downwind of the Project Area[1].

Figure 6: Practical Sailing Area
The true sailing area used by most sailors most of the time. Sailing closer to shore mitigates equipment failure hazard, makes returning to shore safer especially when wind speeds drop unexpectedly, and provide smoother water less affected by wind swell. The Practical Sailing Area begins roughly 500' downwind of the Project.

The DEIR identifies a subset of area that can be utilized at CPSRA under certain wind conditions for a certain class of sailor and windsurfing equipment. This area was based on GPS tracks of sailing at CPSRA (see Figure 7). However, this area is not typical given most common wind conditions and the classes of sailors and windsurfing equipment most frequently using the site. Most windsurfing activity takes place within a much smaller range closer to the launch site (see Figure 6).

The overwhelming majority of sailors typically do not venture beyond a smaller area closer to the shore due to hazard of equipment failure, the fact that conditions in these downwind and offshore areas are more affected by larger wind swell, and the difficulty of returning to the launch based on the points of sail possible under typical off-shore wind directions.

On lighter wind days, the stronger winds are closer to the Western shore. On stronger wind days, the smoother water also tends to be closer to the Western shore. Also for winds that are angled more to the North, windsurfing reaches typically terminate very close to the Western shore in order to stay upwind and be able to return to the launch.

[1]All linear measurements in these Comments are approximate but as accurate as possible.

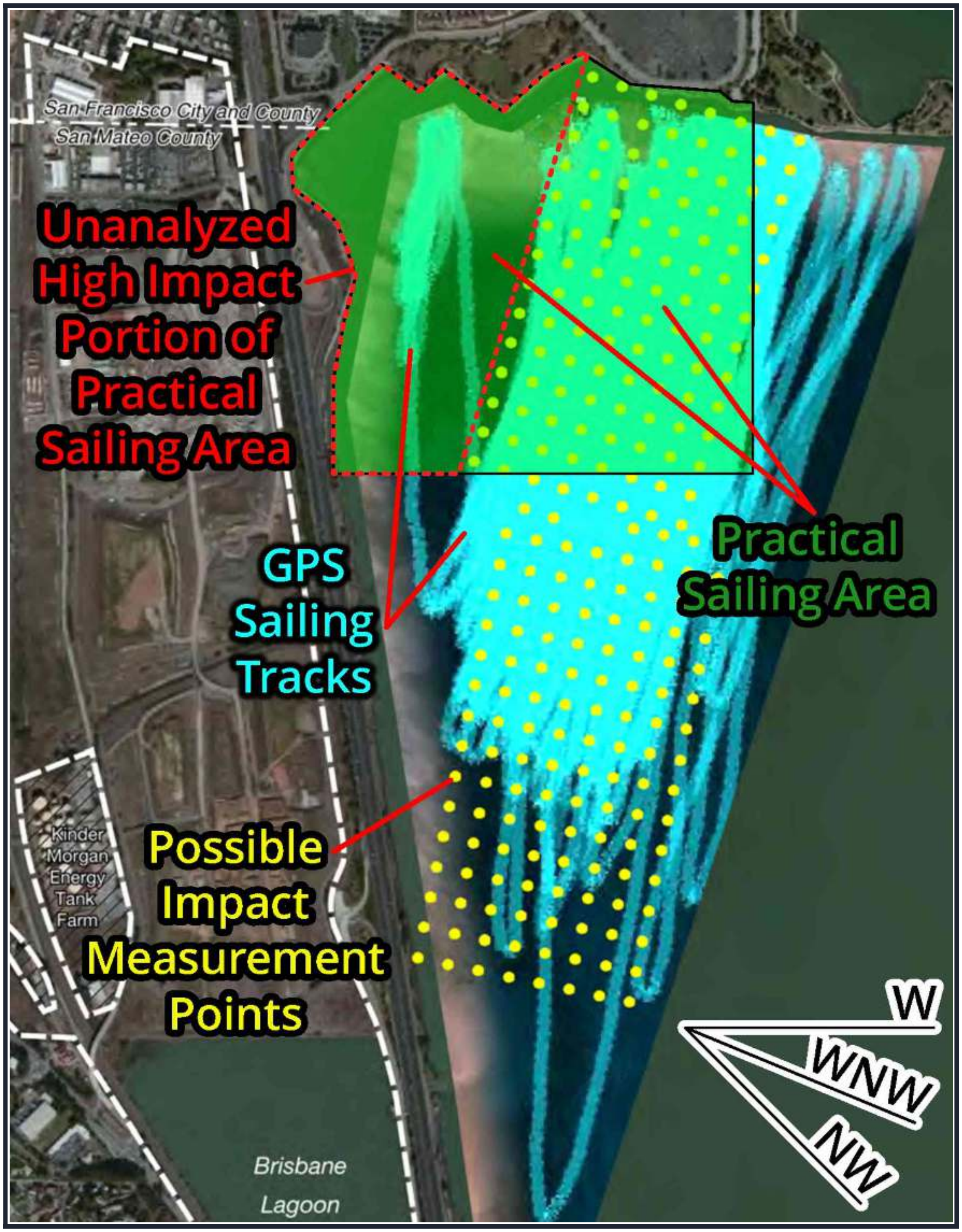

Figure 7: Practical Sailing Area in Context of the Analysis Impact Area
The DEIR used GPS tracks (shown in blue) to inform an impact study area. Possible impact measurement points are shown in yellow. The tracks do not cover the range of wind directions, wind strengths, or equipment common at CPSRA. The tracks cover a possible sailing area for some conditions and equipment, not the exclusive, most practical, most common, or safest area. The DEIR does not assess the entire area covered by these tracks or practically sailable at CPSRA. The unexamined portion of the Practical Sailing Area shown in green would be most impacted by the Project as it is closest. The DEIR took new measurements at only 13 of these yellow points in the Practical Sailing Area on average for each of the primary wind directions (W, WNW, NW).

There is no information about what conditions or equipment were used to produce the GPS tracks. The most regular reach angle recorded in those GPS tracks suggests a West wind. West-Northwest and Northwest winds would reveal a substantially different pattern. The effective sailing area actually shrinks and moves regularly closer to the Western shore for more Northerly prevailing wind conditions.

There is no justification for why the Analysis should only assess some arbitrary sub-area for impacts. For completeness and to be faithful to the public interests, it is just as reasonable to expect that the entire area be examined for impacts, especially considering that the areas that were not examined are closest to the Project and therefore most likely to be negatively impacted.

The Analysis considered some areas that were not covered by GPS tracks, while it ignored other regions that were covered. At best the Analysis starts out with an incomplete and apparently arbitrary area over which to consider impacts.

By comparison, the EIR for the adjacent Executive Park project (approximately 10% the size of the Project) began its wind impact study from the boundaries of that project to an area 1,000' East of the CPSRA launch site, encompassing the entire downwind wake that could potentially impact the CPSRA [2]. The Analysis for this Project does not even attempt to measure any points within 1,000' of the Western shore of the Practical Sailing Area, which would be the area closest to the Project and the most impacted by the Project.

Sailing predominantly within the Practical Sailing Area is not limited to certain types of windsurfing activities or certain skill levels. The Analysis examined a small portion of the total CPSRA sailable area and did not examine those areas most likely to be impacted by the Project. Impact in this Practical Sailing Area is much more critical.

Figure 8: Sailing Upwind at Candlestick
The windsurfer shown above is sailing upwind at CPSRA within the Practical Sailing Area. During stronger wind days such as shown here, smoother water is located upwind. Despite GPS tracks considered in the Analysis that shows sailing in this region, the upwind area closest to the Project and most potentially impacted was largely ignored in the Analysis.

2.3 Sparse and Incomplete Measurement of Potential Project Impacts

Reported measurement of projected impact due specifically to the Project on the Practical Sailing Area was sparse and incomplete. Collectively across the primary wind directions (W, WNW, and NW), less than 25% of the Practical Sailing Area was reported covered by new impact measurement data collected specifically for the Project.

Use of Old Data in Place of New Measurements

To augment the sparse coverage, data from an older EIR [2] that does not model the Project was included. This use of "filler data" was done with the unsubstantiated presumption that it is simply impossible that certain portions of the impact area could be affected by the Project under certain conditions.

This presumption ignores contradictory on-the-ground observations and does not consider the actual Practical Sailing Area being potentially impacted.

Therefore, the conclusions of the Analysis are based to a large extent on measurement data from an EIR that does not model the Project and on large sections of the impact area having no measurement data whatsoever.

Over the 220 acres or more of water area contained in the Practical Sailing Area, zero new impact analysis points were reported for Northwest wind (Figure 9), 12 new impact analysis points were reported for West-Northwest wind (Figure 10), and 28 new impact analysis points were reported for West wind (Figure 11).

Collectively, the new impact analysis data points that were reported cover less than 1/4 of the total Practical Sailing Area for these three primary wind directions.

New Measurements Show Substantial Impact

Notwithstanding the sparse analysis of the Practical Sailing Area, among the reported newly collected measurement data points, negative impacts between 5% and 11% in mean wind speed reduction were shown 58% of the time.

For the desirable West-Northwest primary wind direction, 10 out of 12 of the reported newly collected measurement data points predicted a potential 5% or greater mean wind speed reduction, even though only roughly 1/6 of the Practical Sailing Area was covered by reported measurement data points newly collected specifically for this Project for this primary wind direction.

The Analysis shows increased negative impact closer to Highway 101, yet there are no impact measurement points reported within the Practical Sailing Area within 1,000' of the shore or less meaning some of the most likely impacted areas were not included in the Analysis.

Figure 9: Reported Impact Analysis Points Northwest Wind
Mean wind speed reduction impact reported data points in the Practical Sailing Area from the DEIR for primary wind from the Northwest. No data points were reported for Northwest wind in the Practical Sailing Area. Data points shown are for the 2012 Analysis not including the data from the 2009 Executive Park EIR [2] that does not model the Project as far as we can discern. Percentages refer to change in R-value for the Developer Sponsored Project versus existing conditions.

Figure 10: Reported Impact Analysis Points West-Northwest Wind

Mean wind speed reduction impact reported data points in the Practical Sailing Area from the DEIR for primary wind from the West-Northwest. 12 data points were reported for West-Northwest wind in the Practical Sailing Area. Data points shown are for the 2012 Analysis not including the data from the 2009 Executive Park EIR [2] that does not model the Project as far as we can discern. Percentages refer to change in R-value for the Developer Sponsored Project versus existing conditions.

Figure 11: Reported Impact Analysis Points West Wind
Mean wind speed reduction impact reported data points in the Practical Sailing Area from the DEIR for primary wind from the West. 28 data points were reported for West wind in the Practical Sailing Area. Data points shown are for the 2012 Analysis not including the data from the 2009 Executive Park EIR [2] that does not model the Project. Percentages refer to change in R-value for the Developer Sponsored Project versus existing conditions.

2.4 Vague and Arbitrary Modeling Assumptions

It is unclear what aspects of the Project were modeled in the Analysis. Little detail was provided as to what was included in the model.

In an apparent attempt to deal with the limitations of the wind tunnel, it appears that important portions of the upwind or adjacent topography were not accounted for at all. The Analysis does not model the complex interrelationship of features of the entire system and surroundings even though it states that the cumulative impact on the Resource could be higher. It could not accomplish this because the wind tunnel physically did not allow the Project to be modeled as a complete system but rather required the model to be analyzed in separate pieces.

Due to the chaotic nature of wind and scope of the Project, it is practically impossible to accurately represent the multitude of factors that include channeling wind at different primary directions within the area modeled due to complex topography, micro-systems of persistent vortices, eddies, and wind shadows, variance according to temperature and source of the wind (high pressure gradient or thermal gradient), the impact of substantial wind swell on turbulence [15], the impact of local thermal variation caused by development (e.g. "heat bubbles" due to large areas of paved surface), thermal induced convection cells resulting in upwelling and turbulent eddies, the different characteristics of the upwind topography and the CPSRA during higher and lower wind conditions, and others.

In discussions with ESA, it was revealed that what was modeled was supposed to be the "worst case" in terms of impact to the CPSRA. It is hard to know a priori what constitutes worst case, especially when the criteria for acceptable use of the Resource is not even defined. There are at least two variables of interest including reduction in mean wind speed and increase in wind turbulence intensity. The relationship between these two variables is complex.

One can imagine approximating the Project with a single large wall the height of which represents the maximum possible building height for the entire Project. Presumably this would result in maximum wind speed reduction impact. Alternatively, one can imagine modeling the Project with a series of buildings of varying heights and gaps to try to achieve the maximum surface roughness. Presumably this would result in the maximum wind turbulence intensity increase impact but not necessarily the largest possible wind speed reduction. In absence of the actual site plan and building details, it is unclear how one can evaluate the "worst case" impacts with only a single model that would simultaneously maximize both of these impact variables.

Modeling an Undefined Project with Certainty

As Project site plan and programming details are not yet defined, it is unknown how the Project could be faithfully modeled without a thorough examination of alternatives, which was not reported. The DEIR presents impact results as if they are the only possible outcome.

In reality, the results are highly dependent on the finished base elevation, actual placement and configuration of buildings, heights, orientations, clusterings, density, massings, regularity, streamlining, on-site and off-site topography, open space, landscaping, impervious surface, surrounding development such as inclusion of the Executive Park buildout and proposed Recology expansion, and other factors that are not known at this time.

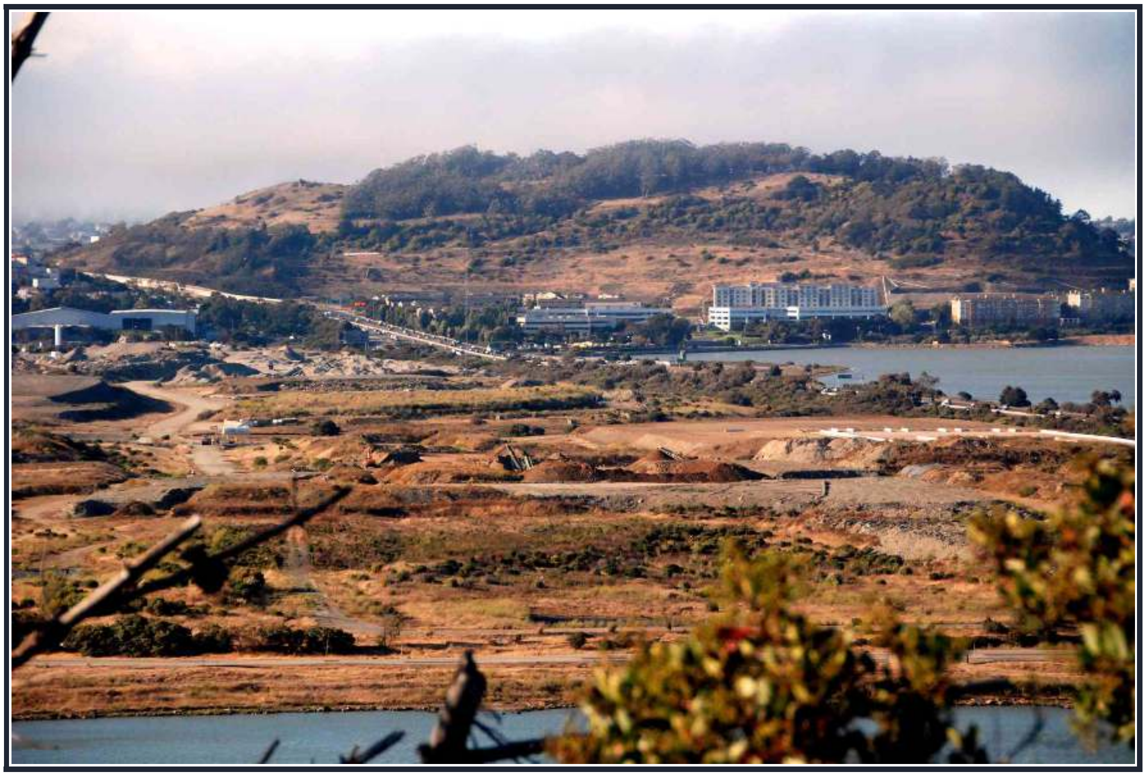

Figure 12: Some of the Existing Upwind Structures and Roughness
The existing upwind conditions include a variety of industrial, commercial, and residential uses in addition to the complex topography including the Alemany Gap and San Bruno Mountain. The current Brisbane Baylands site has been evolving dramatically since 2010 as soil recycling and processing have created mounds of dirt 60' or more from adjacent grades. Modeling this complex topography and surface roughness with the variety of wind sources, conditions, thermal influences, roughness conditions, friction coefficients, seasonal factors, and other components is very complex, especially as the existing conditions continue to change.

Impact Area Not Fully Analyzed

The Analysis does not even attempt to analyze the impact of the Project on certain areas of the CPSRA under certain primary wind directions. The claim in the DEIR that it is impossible under certain wind directions for the Project to have meaningful influence on certain portions of the CPSRA is unsubstantiated and is inconsistent with real observable conditions.

This claim was not verified through field testing, and to our knowledge, none of the results in the model were verified by field testing. It is critical that models of this sort are calibrated and benchmarked to real-world observations to insure they are realistic [7].

The Project and its surrounds is a huge area where wind comes in through the Alemany Gap as well as over and behind the San Bruno Mountain and through the gaps and passes just to the North. Accurately modeling the variety of wind sources through these gaps, the upwind topography, and considering the entire extent of impact on the CPSRA are reasonable requirements that were not fulfilled in the Analysis.

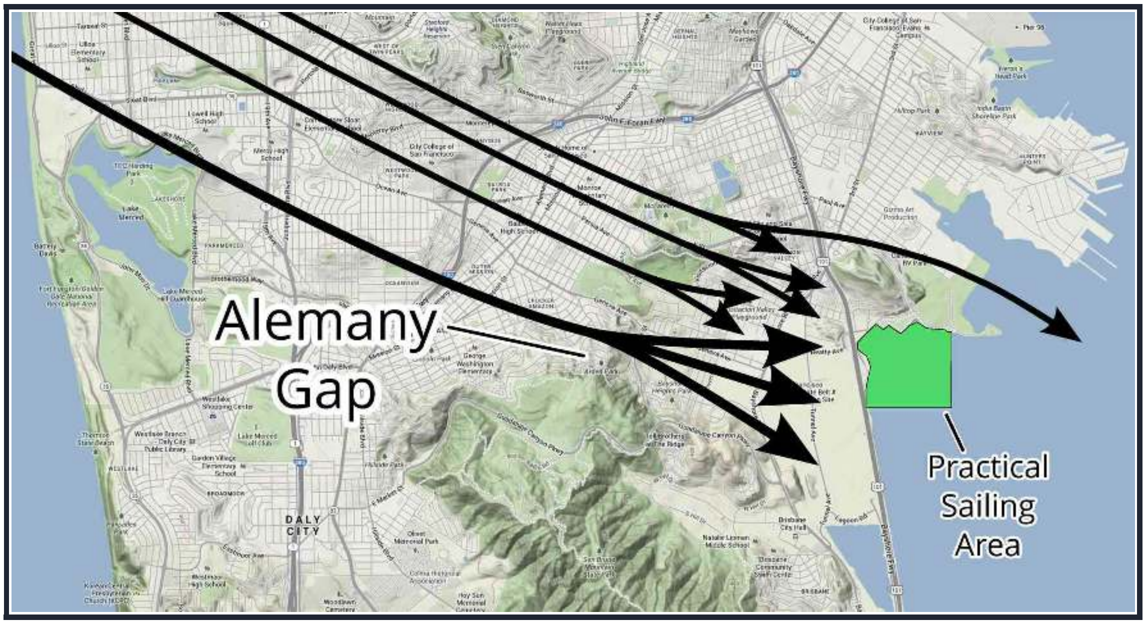

Figure 13: Alemany Gap Wind Funnel
The wind that flows from the Pacific Ocean, over and around Lake Merced, and through the Alemany Gap is the primary wind source for the CPSRA. The Alemany Gap is bounded on the south by the San Bruno Mountain. It is the largest pass through the City of San Francisco. Wind reaches CPSRA from around various passes, hills, valleys, and knobs. Wind at different points in the CPSRA may have arrived through one of many different paths. It is hard to determine which of the several different paths will produce the dominant wind at any specific point in the sailing area. Many factors such as coastal and inland temperatures, wind direction on the coast, pressure gradient, cut-off micro weather systems, and others contribute to the conditions on the water.

It seems likely that these assumptions would cause the Analysis to understate the true extent to which projected impacts under certain wind conditions will be manifest throughout the CPSRA and Practical Sailing Area. Again these assumptions seem as though they had more to do with convenience for modeling the Project and the limitation of the size of the wind tunnel facility that meant the portions of the Project had to be modeled and tested in separate strips.

Over such a large area and with such varied topography including high large knobs, valleys, and mountains in the vicinity, the primary wind direction often changes depending on the location within the CPSRA and Practical Sailing Area. It is well known by sailors at CPSRA that the wind seems to “fan out” of the Alemany Gap creating more westerly flows along the launch shore and more northerly flows towards the shore adjacent to Highway 101. Different maximum upwind points of sail possible throughout the CPSRA demonstrate that it is physically impossible that only a single wind direction prevails for the entire sailing area at any given time.

On some days, the primary wind source is limited to the Alemany Gap. On other days, wind flows over or behind the San Bruno Mountain or more significantly through other passes in addition to the Alemany Gap.

Figure 14: Fog Showing Alemany Gap Wind Patterns
Fog flowing through the Alemany Gap and Visitacion Valley illustrates how the wind that builds along the coast is channeled to CPSRA.

Visible Evidence of Likely Extent of Impacts

Anyone can visit the launch site at CPSRA and view the effects of wind shadows created by upwind structures such as the existing Recology facility or existing upwind topography. Such upwind structures and topographical influence within the Project area could begin as close as 500' West of the Practical Sailing Area.

Figure 15: Upwind Wind Shadows
Large upwind structures such as the Recology trash processing facility create wind shadows that block the wind, creating persistent far-reaching wind shadows or large turbulent wakes. The scale, proximity, and configuration of these upwind structures bear striking similarities to those upwind of Oyster Point Marina and Foster City Lagoon. Office buildings for the likes of Genentech and Visa created wind shadows that forced those sailing sites to be abandoned.

Perturbations in the water are visible from shore or higher vantage points to the West as persistent differences in sun glitter [14] and coloration due to water surface roughness caused by wind flow.

This visible evidences demonstrates both the near and far-reaching influence of upwind structures that is substantially more pervasive and extensive than what is predicted by the Analysis even for existing conditions.

Figure 16: Visible Late Morning Wind Pattern
As wind rises, glassy light-colored water surface turns darker and rougher. Visual inspection of water surface during these transition times reveals how upwind topography affects wind distribution, strength and turbulence.

Visual observation of sailing patterns from shore further confirm the influence of existing upwind features. Dramatic decreases in windsurfing sailing speeds at persistent points in the CPSRA sailing area reveal the effects of the wind shadows and turbulence-inducing upwind features. These wind "holes" are consistent in location. If such disruptions become too common or too large, sailing becomes impossible.

Figure 17: Water Color Patterns Caused By Surface Roughness
Water color reveals surface roughness created by wind flow. Existing upwind topography creates regular substantial longitudinal disruptions that persist throughout the Practical Sailing Area.

Figure 18: Water Color Patterns Caused By Surface Roughness
At a higher vantage point, the variability of existing wind patterns is revealed. Offshore wind near shore is notoriously turbulent and prone to wind shadows and effects of buildings, topography, and vegetation.

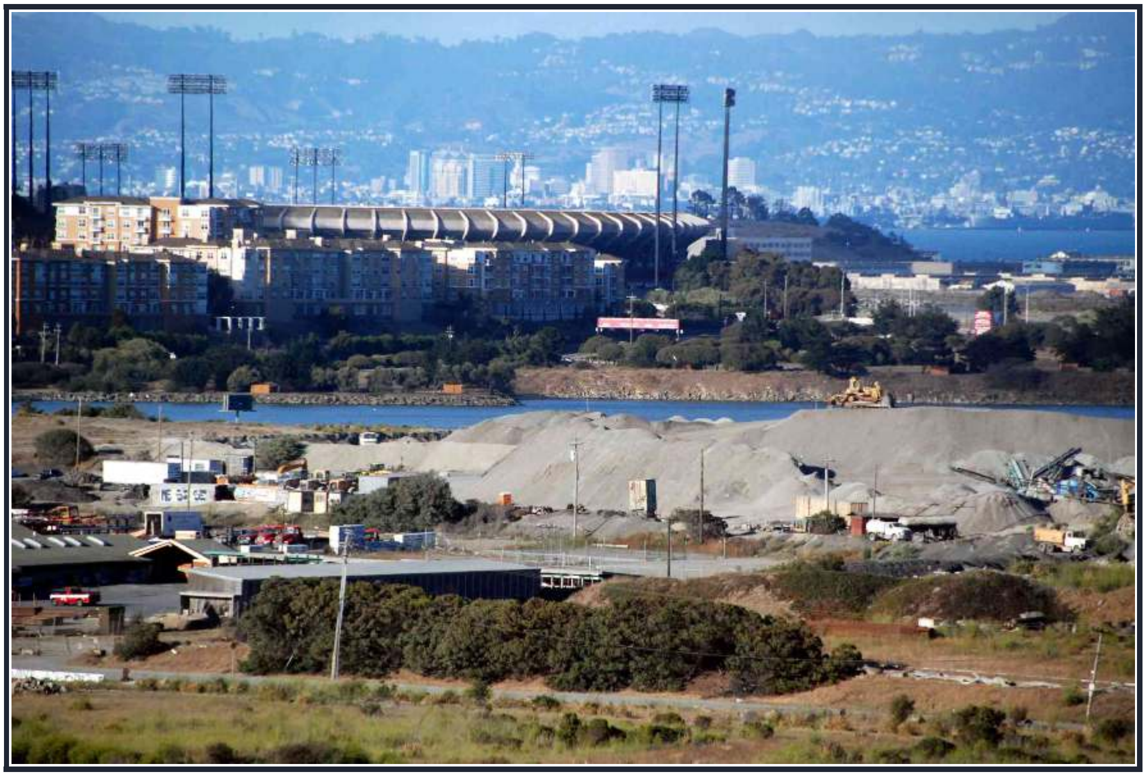

Figure 19: Detail on Existing Upwind Dirt Mounds
Soil processing operations including mounding have already contributed to high turbulence in the Critical Sailing Area that often creates dangerous or impractical sailing conditions.

Additional Limitations of the Analysis Method

Even during a single day many different environmental patterns may occur. The overlap or transition of these environmental patterns is extremely complex. It is also well known that non-stationary wind conditions and seasonal variation introduce complexities that are difficult to model but can be substantial.

Furthermore, it is well known that converting shorter periods of estimates for mean wind speeds to longer periods is not straightforward. The mean wind estimates should be measured for as long as is practical to insure that sampled values span the range of extreme values and converge to an accurate estimate of the true mean. The Analysis was conducted over extremely short periods measured in just a few seconds but extrapolated to consider any other arbitrary substantially longer time frame.

Other issues with the Analysis include using a wind tunnel wind source that does not encompass the wind range for the extreme values regularly experienced at CPSRA. Measurements in this wind tunnel also were done using hot-wire anemometer sensors that are known to have significant biases or limitations under certain conditions. The DEIR acknowledges that the accuracy of these instruments is within 5%. Such a margin is shown herein to have large potential impact on the Resource.

The objective of the DEIR Analysis is not to base a significance claim or lack thereof on presumption or convenient shortcuts. Faithfully and professionally representing the public interest requires engaging in thorough, accurate, unbiased, and representative testing that corresponds to real-world conditions and best engineering practices.

3 Improper Determination of Potential Impact Significance

CEQA guidelines were improperly applied in determining potential significant impacts. An alternate analysis is presented herein.

3.1 Arbitrary and Inappropriate Threshold of Significance

In preceding sections of these Comments, substantial differences were described between this Project in the City of Brisbane and 300 Airport Boulevard in the City of Burlingame. Despite these differences, the threshold for impact significance used in the Project DEIR was substantially or entirely appropriated from the 300 Airport Boulevard DEIR from the City of Burlingame.

This threshold has not been adopted by the City of Brisbane under an official CEQA significance threshold adoption process, has not gone through public review in the City of Brisbane, and does not accurately measure the impact on usability of the Resource as shown below.

The DEIR further states that no universal criteria for acceptable windsurfing activity exists, admitting that "wind standards" of the sort specified by the City of Burlingame are not necessarily transferable.

CEQA requires that the cross-application of such a standard from a source jurisdiction be appropriate for the target jurisdiction. No justification was given for the suitability of such a wind standard for this Project, for the City of Brisbane, and for the Resource.

Relative Wind Speed Reduction is Insufficient Measure

Regarding the significance threshold used by the City of Burlingame, there are two main problems with using relative mean wind speed reduction as a proxy for studying impacts to the Resource:

1. Mean wind speed is just one of many factors in determining availability of the Resource
2. Impacts on availability of the Resource due to changes in mean wind speed are assuredly non-linear[2] [16].

Accepting the logic used in the City of Burlingame threshold would be analogous to implying that a 10% increase in temperature would necessarily cause 10% less snowfall.

Instead of relative change, one must consider absolute pre-impact and post-impact levels of many factors that determine the viability and availability of the Resource.

Basic Requirements of Windsurfing

Windsurfing requires certain minimum lull, mean, and gusts speeds [16] just like aircraft require certain minimum takeoff, stall, and landing speeds [33]. Windsurfing does not operate under the same physics principles as other sailing vessels because of the unique planing hull design and the change in drag that occurs above certain critical speeds (cf. Figure 20).

Windsurfing requires minimum gusts to provide enough impulse to achieve a state of hydro-planing (planing) and perform maneuvers such as turning around; it requires minimum mean speeds to continue in this planing state; and it requires minimum lull wind speeds that are not too frequent such that the windsurfer's momentum would be insufficient to continue planing through the lull.

The behavior of a sailboard below these minimum speeds is dramatically different. The behavior does not change smoothly and proportionally with board speed but changes abruptly at a critical minimum much like at a critical minimum "takeoff speed" an aircraft becomes airborne or below a critical "stall speed" an

[2]Non-linear means that a change in an input factor may not necessarily produce a proportional change in an output quantity.

aircraft cannot stop descending [33].

This planing operating mode of sailboards is very similar to the hydrofoiling state (foilborne sailing) of the America's Cup AC72 catamarans. Minimum speed is required to create hydrofoil lift to offset the weight of the vessel and cargo. Once critical lift has been achieved, the performance and operation of the AC72 is very different from the non-foiling state.

Below planing speeds, the sailboard moves through the water rather than on top of the water and flotation, maneuverability, balance, and the ability to return to the launch or offset tidal currents is severely impacted. If the wind drops below a critical point for too long or too often, it is considered unsailable as too much of the time will be in this sub-planing state. Many sites that have strong wind but possess many regular adversely located wind shadows[3] are effectively unsailable.

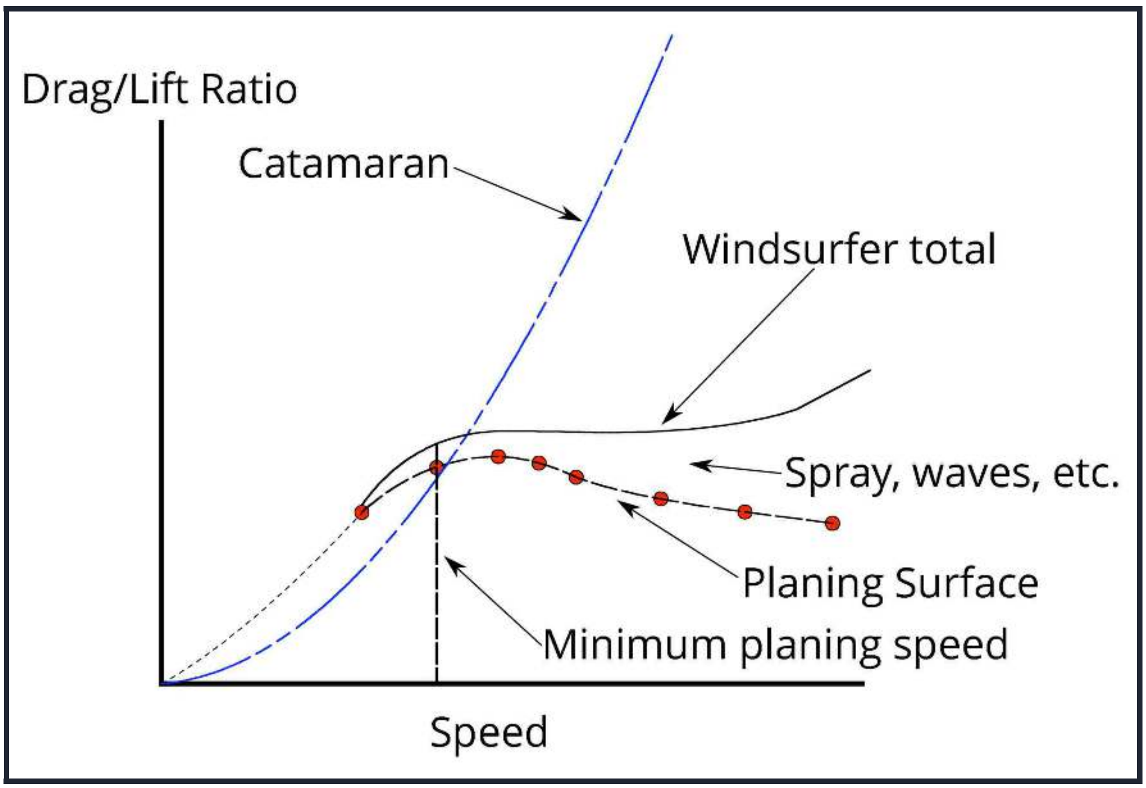

Figure 20: Windsurfer Drag/Lift vs. Speed
Adapted from *An Introduction to the Physics of Windsurfing* lectures by Jim Drake (co-inventor of windsurfing) [16]. Below the minimum planing speed, increased speed increases drag of the windsurfer faster than lift. Above the minimum planing speed, the planing surface (windsurfer hull) begins to experience reduced drag compared to lift as speeds increase. Drag/lift response to speed for a windsurfer is highly non-linear unlike other sailing vessels such as the catamaran profile shown above as well. Relative change in wind speed is not sufficient to determine the ability to continue to achieve a planing state. Furthermore, due to lulls or decreases in mean wind speeds caused by wind shadows or highly turbulent sections, when board speed falls below the minimum planing speed, the sudden reduction in lift can cause an sudden increase in drag and the loss in speed, maneuverability, and flotation will be compounded. More energy is required to achieve the planing state than to keep the planing state.

[3]Wind shadows are extraordinary upwind obstructions that create permanent decreases in wind speed in their wake.

If the regular range of lull-to-gust wind speeds is too severe, as can be caused by high turbulence (cf. [30], [19], [34], [26], [9], [13]), no windsurfing equipment can safely be used to accommodate the range of forces experienced.

Another important consideration is that negative impacts should not only be not too severe, but should also not be too frequent or distributed in such a way as to prevent sufficient uninterrupted use of the Resource. It is not simply a matter of thresholding based on a percentage of sailing area impacted (e.g. a "large portion"), it is critical to consider the actual locations and distribution of these areas.

Gusts and lulls in these Comments refer to the very specific measured quantities known as the maximum and minimum short-term wind speeds within a longer observation. These extreme values are well understood and well studied in wind energy and structural engineering sciences. Gusts and lulls are known to be directly related to turbulence, which is influenced by factors such as surface roughness and upwind obstacles. For more information, see Appendix H.

Figure 21: Planing Windsurfing
Windsurfing operating in planing conditions. Most of the board is lifted above the water. Drag is substantially reduced. Mobility, flotation, and maneuverability is greatly impaired below planing speeds. The ability for a windsurfer to offset tidal effects, avoid obstacles, and navigate back to shore is drastically reduced below planing speeds.

Need for Calibrated Absolute Measurements

The Analysis made no effort to establish critical absolute measurements or thresholds for the Resource but only considered relative changes to a baseline that has not been calibrated to actual sailing conditions. Not calibrated means that the absolute values of a baseline give no information since it is unknown how such values correspond to actual sailing conditions. An uncalibrated value is simply a number.

Each anemometer needs to be calibrated to its sailing location because the exact placement of the anemometer and its operating characteristics make for an unique ability to represent a complex wind system.

For example, there are at least four anemometers that are regularly used to gauge conditions at Crissy Field. The importance and acceptable absolute wind level thresholds of each of these sensors need to be calibrated to prevailing wind direction, season, experience from the past, and other environmental conditions in order to be effective. Using just one of these sensors or using thresholds for one sensor applied to another would give very misleading indications of the true sailing conditions.

Beyond Mean Wind Speed

The Analysis also did not consider the impact on gust and lull wind speeds that is caused by increased turbulence (cf. [30], [19], [34], [26], [18], [9], [13]). These short-term minimum and maximum wind speeds are well studied in the context of wind energy and building loading. The relationship between turbulence-increasing upwind development and gust factors is well known.

To again use the illustrative example of the America's Cup boats, it is crucial for their crew to consider a variety of environmental factors, the absolute not relative levels of each factor, and how these levels compare to known safe operating ranges. Relative mean wind speed (such as "10% windier than yesterday") must be translated to some absolute value (such as "18 knots") in order to be of any use.

In addition to absolute mean wind speed, operating the AC72 safely also hinges on knowing the range of maximum short-term wind speeds known as gusts to avoid precisely the conditions that led to the tragic death of a crewmember this summer [4]. These gust values must also be considered in absolute terms.

The DEIR should not dismiss any level of projected impacts to relative mean wind speed as insignificant. Thresholding the projected change in relative mean wind speed in isolation cannot yield a valid test of significance. There is no way to project the change in availability of the Resource without considering absolute pre-impact and post-impact calibrated wind flow characteristics in the context of reasonable Required Conditions for pre-impact use of the Resource.

3.2 Impacts Projected Using an Appropriate Measure

The chaotic nature of wind systems and the relationship of wind speed to sail force ([20], [17]) mean that even a seemingly small impact in one environmental factor can have a devastating impact on a sailing area.

Understanding Wind Speed Impact on Sail Force

Dismissing a 5% or 10% difference in an environmental factor as arbitrarily "small" is dangerous. This would be akin to describing the difference between 33 and 31 degrees Fahrenheit as insignificant although the difference is less than 10%. Obviously water may freeze at one temperature and may not freeze at the other even though the magnitude of the difference is similarly "small" by some measures. To continue with that analogy, one would also be unable to assess the significance of the two temperatures relative to impact on freezing without considering the atmospheric pressure, presence of solutes in the water, etc.

In the case of windsurfing, the difference in wind force acting on a sail changes quadratically with wind speed. A 10% change in wind speed will produce a change in sail force larger than 10% ([20], [17]). For example, a decrease from 10 mph to 9 mph results in a 19% decrease in sail force[4]. A decrease from 16 mph to 15 mph, while only a 6% decrease in wind speed, results in a 12% decrease in sail force[5].

In addition, the range between lulls and gusts generally increases given higher mean wind speeds and the same wind turbulence intensity. For example, a gust factor of 1.4x would predict gusts of 28 mph for a 20 mph mean wind speed (cf. [30], [19], [34], [26], [18], [9], [13]). After a 10% relative decrease in mean wind speed, the same gust factor would only predict gusts of 25 mph[6]. The decrease from a 28 mph gust to a 25

[4] $1 - 9^2/10^2$
[5] $1 - 15^2/16^2$
[6] 1.4x gust factor applied to a mean wind speed of 18 mph

mph gust results in a 20% reduction in sail force[7].

The reality is even more complex. Typically, a decrease in mean wind speed due to upwind obstruction is met with an increase in wind turbulence intensity (this is confirmed by the Analysis).

To capture the full extent of the potential change in the above example including wind turbulence intensity, consider in addition to a 10% relative mean wind speed decrease, a 10% relative wind turbulence intensity increase is also experienced[8]. This can be accounted for by changing the gust factor from 1.4x to 1.44x[9].

In the above example, the pre-impact lull, mean and gust wind speeds would be in the range of 12, 20, and 28 mph respectively[10]. The post-impact lull, mean, and gust would be in the range of 10, 18, and 26 mph respectively.

So while this change would only suggest a 14% decrease in sail force from gusts, it would suggest a 31% decrease in sail force from lulls. Furthermore, the change would suggest going from pre-impact gusts providing 540% the force of lulls[11] to post-impact gusts providing 680% the force of lulls[12].

	1 Minute Observation			5 Minute Observation			12 Minute Observation		
	Lull	Gust	Sail Force Range	Lull	Gust	Sail Force Range	Lull	Gust	Sail Force Range
$TI_u = 0.10$	16	20	1.6x	15	21	2.0x	14	22	2.5x
$\boldsymbol{TI_u = 0.16}$*****	14	22	2.5x	12	24	4.0x	11	25	5.2x
$TI_u = 0.20$	13	23	3.1x	11	25	5.2x	10	26	6.8x

Table 1: Wind Range and Sail Force Sensitivity Summary

Summary of sensitivity analysis tables showing predicted impact on wind range and sail force range when going from lull wind speed to gust wind speed due to change in turbulence. For example, over a 5 minute period, the difference between experiencing a turbulence intensity of 0.10 vs. 0.20 is the difference between dealing with gust sail force 2x that of lull sail force and dealing with gust sail force over 5x that of lull sail force. Existing conditions from sensor observations shown as "$\boldsymbol{TI_u = 0.16}$*****." The mean wind speed used above is 18. Turbulence intensities are converted to gust factor using the methods described in Appendix H of these Comments. Numbers above reflect effects of rounding.

The conclusion shown by this example is that from a decrease in mean wind speed and an increase in wind turbulence intensity, all critical wind speeds would provide disproportionately less sail force while the sailor would simultaneously have to deal with a much wider range of forces on the sail[13].

Lulls and gusts were not considered in the DEIR, although wind turbulence intensity was considered. Wind turbulence intensity can predict lull and gust values. No such analysis was done in the DEIR.

[7] $1 - 25^2/28^2$

[8] For the purposes of these Comments, an increase in wind turbulence intensity from 0.10 to 0.11 is referred to as a 10% increase in wind turbulence intensity, for example.

[9] $GF' = 1.4 + (1.4 - 1) \times 10\%$

[10] Lulls and gusts relative to a sufficiently strong mean wind speed are treated as symmetric about the mean, which is empirically supported.

[11] $28^2/12^2$

[12] $26^2/10^2$

[13] Windsurfing equipment has a fixed and limited range of wind speeds in which it can be safely and effectively operated.

For more information about lulls, gusts, and gust factors, see Appendix H and the References section of these Comments.

A 5% or 10% difference in mean wind speed around the critical sailability thresholds necessary for a windsurfing site is assuredly important. Such a difference can make or break a decision to commit to a 1.5 hour round-trip drive through traffic. It can mean a successful Sailable Day or a complete waste of time, money, and energy.

Site-Specific Criteria for Sailability

The argument that there are no universal criteria in terms of wind speeds for acceptable windsurfing conditions at all locations is misleading. While it is true that there are no single criteria for all sites, there are absolutely specific criteria for specific locations tied to specific sensors. This is demonstrated by professional forecasting services that predict future sensor values and apply well-known thresholds for predicting future sailable conditions at specific sites.

Each windsurfing location has different requirements for sailability. These requirements include the mean wind speed, range of extreme wind speeds (lulls and gusts), variability in the wind, duration and frequency of the lulls and gusts, temperature, altitude, humidity, length of unobstructed sections of wind exposure, length of reaches, topographical constraints and obstructions, amount and direction of swell or chop in the water, tidal currents, and other factors. The precise relationships between these factors and the operation of a sailing vessel are well-studied in aerodynamic, hydrodynamic, and marine engineering (cf. [20], [17], [16]).

While the DEIR does not consider such standards, it is clear that such standards can be defined. For example, in the related field of AC72 racing, the 34th America's Cup Regatta provided clear minimum and maximum wind ranges that were specific to time of year, tidal condition, and sea state [29]. These standards were relative to local sensors that had been calibrated and thresholded based on the experience of sailors operating at the racing site.

Appropriately Measuring Absolute Impact on Resource Availability

To meaningfully relate relative wind flow changes to absolute post-impact change in the availability of the Resource, several steps are required:

1. Identify a data source that measures absolute levels of wind flow that is calibrated and correlated with on-the-ground conditions at the Resource
2. Establish thresholds of these absolute wind flow levels to determine Required Conditions for use of the Resource prior to impact
3. Select either a historic set of the data or a projection of future data with which to assess impacts
4. Determine the pre-impact availability of the Resource by applying the Required Conditions to the selected data
5. Determine the post-impact availability of the Resource by applying the relative wind flow changes to the selected data and reapplying the Required Conditions to the modified data
6. Compare the change in pre-impact and post-impact availability of the Resource

The DEIR includes none of these steps in the Analysis. However, these steps were performed in a "Sailable Day Impact Analysis" and reported in these Comments. Each step in this Sailable Day Impact Analysis is described below:

Identify a data source that measures absolute levels of wind flow that is calibrated and correlated with on-the-ground conditions at the Resource

In the case of the CPSRA, the single most representative measure for the condition of the Resource is an anemometer maintained by Weatherflow, Inc [35] for the CPSRA. Historic data from this CPSRA Sensor served as the data source required for the Sailable Day Impact Analysis.

CPSRA Sensor data points include lull wind speed, mean wind speed, gust wind speed, observation time, and wind direction. The CPSRA Sensor is calibrated to the Resource such that users of this Resource have intimate knowledge of how the absolute levels of various readings of this sensor correspond to specific on-the-ground sailing conditions.

The CPSRA Sensor is operated by the same company and provides the same level of information as the sensors used in the recent 34th America's Cup Regatta [28].

Establish thresholds of these absolute wind flow levels to determine Required Conditions for use of the Resource prior to impact

A set of absolute minimum Required Conditions for wind flow for a Sailable Day at the Resource relative to this CPSRA Sensor was obtained through a survey of local experts who collectively use the Resource thousands of times per year. These Required Conditions are conservative and reasonable.

Two sets of Required Conditions were considered in the Sailable Day Impact Analysis. One set of Required Conditions included only minimum mean wind speed. The second set included minimum mean wind speed, minimum lull wind speed, and minimum gust wind speed.

These Required Conditions are similar to those used by the 34th America's Cup Regatta in determining minimum acceptable as well as maximum safe racing conditions [29], [28].

> *A Sailable Day is one on which there exists a two-hour window somewhere between the hours of 12pm and 7pm local time containing CPSRA Sensor observations such that 75% of the observations during that two-hour window are Sailable Observations.*
>
> *A Sailable Observation is a CPSRA Sensor observation with a minimum lull wind speed of 10 mph, a minimum mean wind speed of 16 mph, and a minimum gust wind speed of 20 mph and a wind direction either West, West-Northwest, or Northwest.*

Figure 22: Definition of Required Conditions for a Sailable Day

This definition is based on actual historic data, analysis, surveys of the general public who use this resource, and information by expert weather forecasters. It is specific to CPSRA and tied directly to the CPSRA Sensor and its operating parameters. The definition is not transferable to any other sensor or any other sailing site.

Select either a historic set of the data or a projection of future data with which to assess impacts

Three years of historic anemometer CPSRA Sensor data was utilized (years 2011, 2012, and 2012 and months from April through September) [35].

Determine the pre-impact availability of the Resource by applying the Required Conditions to the selected data

Table 2 shows the number of Sailable Days per month and year by applying the Required Conditions to the three-year historic data set.

Determine the post-impact availability of the Resource by applying the relative wind flow changes to the selected data and reapplying the Required Conditions to the modified data

Average impacts of 5% and 10% decrease in mean wind speeds and 5% and 10% increase in wind turbulence intensities[14] were considered as scaling factors to the historic data set. These scaling factors were applied to wind flow data points in the three-year historic data set. The Required Conditions were then reapplied. A sensitivity analysis approach was taken to isolate the impact of different degrees of potential wind changes and different degrees of Required Conditions strictness.

Regarding the selection of 5% and 10% scaling factors, 58% of data points reported in the Analysis for impacts to the Practical Sailing Area that were newly measured to account specifically for the Project show a 5% or greater mean wind speed reduction. Furthermore, the Analysis only measures new impact data points covering less than 25% of the Practical Sailing Area. The uncovered portions of the Practical Sailing Area with no new measurement data points are generally to the West and closer to the Project. According to the Analysis, impacts will be more severe closer to the Project.

This method of scaling historic data and re-applying the Required Conditions to assess impacts to a quantity such as Sailable Days is sanctioned by the reporting of relative wind flow changes in the DEIR. The DEIR states that the projected relative impacts can be applied to any baseline conditions to obtain projected absolute impacts.

Compare the change in pre-impact and post-impact availability of the Resource

Table 3 shows the changes that would have occurred over the past three years under a variety of possible applications of the projected impacts. This method of considering a range of possible impacts is called a sensitivity analysis and is meant to show a range of "best-case" to "worst-case" outcomes. A sensitivity analysis is more appropriate given the uncertainty involved here than projecting a single definitive outcome with no contingency factor as was done in the DEIR.

By considering the most conservative impact scenario of a 5% reduction applied to mean wind speed only, it was found that the number of average annual Sailable Days was reduced by 9%.

By considering a 10% reduction applied to mean wind speed only, a 20% reduction in Sailable Days was found.

By considering the same 5% and 10% wind speed reductions applied to lulls and gusts in addition to mean wind speeds (as is empirically supported by the models detailed in the Appendices to these Comments and by models used to study extreme values as found in [30], [19], [34], [26], [18], [9], and [13]), a reduction in Sailable Days of 22% to 44% respectively was found.

By keeping all data points unchanged except adjusting the lull values so that the lull-mean range was expanded by 5% or 10%, a reduction in Sailable Days of 15% to 16% respectively was found. This method of considering the increase in wind turbulence intensity by a direct proportional scaling of the lull-mean range is supported by models as found in [30], [19], [34], [26], [18], [9], and [13].

[14]For the purposes of these Comments, an increase in wind turbulence intensity from 0.10 to 0.11 is referred to as a 10% increase in wind turbulence intensity, for example.

		Days Sailable	Mean	Lull	Gust	Lull-Gust Range	Lull-Mean Range	Mean-Gust Range
April	2011	12	20	12	28	16	8	8
	2012	14	18	11	25	14	7	7
	2013	20	18	12	24	13	7	6
May	2011	15	20	12	28	16	8	8
	2012	19	19	12	25	13	7	6
	2013	22	19	12	26	14	7	7
June	2011	9	19	12	26	13	7	6
	2012	19	19	12	26	14	7	7
	2013	17	19	12	25	13	6	7
July	2011	13	18	11	23	12	6	5
	2012	10	17	11	22	11	5	5
	2013	12	17	11	23	12	6	6
August	2011	3	17	12	21	9	5	4
	2012	13	17	11	23	11	6	5
	2013	13	18	12	26	14	6	7
September	2011	15	17	11	22	10	6	5
	2012	11	17	11	21	10	6	5
	2013	18	18	12	26	14	6	7
2011		67	19	12	25	13	7	6
2012		86	18	12	24	12	6	6
2013		102	18	12	25	13	6	7
All Years		255	18	12	25	13	7	6

Table 2: Sailable Days Existing Conditions (Base Case)

No adjustment to observed wind speeds. All wind speed values and ranges are averages over the specified time period. *Mean* is the average wind speed during an observation, *lull* is the minimum short-term wind speed during an observation, and *gust* is the maximum short-term wind speed during an observation. Each range is an average difference between the indicated variables during each included observation. The averages include only observations for days that are determined as sailable and within those days, only observations that qualify as sailable within the first two hour sailable window. The threshold for a sailable observation is lull minimum 10, mean minimum 16, and gust minimum 20 along with direction W, WNW, or NW. The threshold for a Sailable Day is a day having at least a single two hour window starting at 12pm and ending at 7pm such that 75% of the observations within the window are sailable. All wind speed values are in miles per hour. Some sums may not reconcile to their constituents due to rounding.

3.3 Significance of Resource Availability Impact

For unique, valuable, and irreplaceable recreational resources, reductions of availability of 10% or more have been considered to be significant under applications of CEQA guidelines.

These Comments make clear that applying such a threshold to relative mean wind speed reductions is nonsense. Impacts to mean wind speed are not the same thing as impacts to availability of the windsurfing Resource. Mean wind speed and windsurfing Resource availability are two different things. Changes to mean wind speed do not necessarily cause proportional changes to windsurfing Resource availability.

However, it is reasonable and meaningful to apply this threshold directly to impacts on actual availability of the Resource based on established Required Conditions as they currently exist.

The Sailable Day quantity defined above adequately measures the availability of the Resource. Projected changes to this quantity directly project the change in availability of the Resource.

The Sailable Day Impact Analysis reported above projects a 9% to 44% decrease in Sailable Days using realistic requirements, analysis methods, and measurements reported in the DEIR.

Based on these findings, it is clear that there is strong potential that the Project as currently described without mitigation would likely have a significant impact on the Resource.

	Average Days Sailable Per Year	Loss of Days Sailable Compared To Existing Conditions
100% of Lull, Mean, Gust Wind Speeds*	**85**	**-**
95% of Lull, Mean, Gust Wind Speeds	68	-17 (-20%)
90% of Lull, Mean, Gust Wind Speeds	48	-37 (-44%)
95% Adjustment to Only Mean Wind Speeds	77	-8 (-9%)
90% Adjustment to Only Mean Wind Speeds	66	-19 (-22%)
5% Increase of Lull-Mean Range	72	-13 (-15%)
10% Increase of Lull-Mean Range	72	-13 (-16%)

Table 3: Sailable Day Impact Analysis Summary

Summary of sensitivity analysis tables showing predicted impact on days sailable from mean wind speed reductions and wind turbulence intensity increases. Existing conditions from sensor observations shown as "100% of Lull, Mean, Gust Wind Speeds*." "Loss of Days" means average annual loss of Sailable Days over the past three years of data analyzed compared to existing conditions. Numbers above reflect effects of rounding.

These projected reductions in Sailable Days, summarized in Table 3, represent a critical and as yet unmitigated threat to the availability and continued viability of this Resource.

4 Windsurfing Sensitivity to Development

The reality is that very few outdoor recreational activities are so impacted by human development than near-shore wind-oriented activities. Windsurfing is incredibly sensitive to environmental conditions and suffers immensely from an increase in turbulence, the introduction of wind shadows, and reduction in mean speeds.

4.1 Special Risk to Off-Shore Wind Sites

Many instances of upwind development have damaged or rendered downwind activities unusable in off-shore wind locations. The infamous case of Aruba, for example, demonstrates how the positioning of hotels along the beach can decimate nearby windsurfing serviced by off-shore wind flow (Figure 23). Even a 1/2 mile offshore, windsurfing in the wake of these hotels is almost impossible. Though wind does pass between the buildings, the wind speeds regularly range from nearly zero to 30 mph in a matter of a few feet along a reach. The minimum reach of unobstructed wind flow is not sufficient to sail. By contrast, the minimum distance between the Project and the Practical Sailing Area is roughly 500'.

Figure 23: Palm Beach, Noord, Aruba
Aruba windsurfing is world famous. It is the home training location for the top-ranked female freestyle windsurfer in the world (Sarah-Quita Offringa) and hosts annual windsurfing and kitesurfing racing and other competitions drawing entrants from the entire Caribbean region. Steady trade winds blow continually throughout the summer months. However development along Palm Beach (shown here) and Hadikurari Beach (to the North) has made windsurfing in the shadow of these buildings nearly impossible. Even low structure and vegetation is immediately distinguishable by the lulls and gusts that they create along ever shortening reaches.

Most remaining sailing locations in the Bay are shielded from potential damage due to shoreline development. This is because the wind source at most sites is on-shore or side-on-shore or there is an accessible "wind line" at a distance of a few hundred yards (e.g. Treasure Island, Crissy Field) to a few miles (e.g. Third Avenue). Candlestick, being one of the few remaining windy off-shore sailing locations, is extremely susceptible to shoreline development. Clean off-shore wind is highly desirable as it keeps wind swell from accumulating so the water state remains relatively calm even in high winds.

Simplifying assumptions used in impact modeling, the lack of contingency factors to account for unmodeled effects, or simply indifference can have devastating consequences on off-shore windsurfing locations. As evidence of this, consider how some former windsurfing sites near to CPSRA have been dramatically impacted by adjacent development. Despite tremendous accessibility and former regular use, sites such as Oyster Point Marina and Foster City Lagoon have been rendered unsailable due to upwind office building construction.

It is critical to avoid the mistakes that have been made in the past in projected impacts. Good engineering practice demands that modeling assumptions be realistic and validated with on-the-ground observations, that a sufficient nexus between the quantity being measured and the actual resource be established, and that a contingency factor for unmodeled effects is included. In our review of the DEIR, we found none of these provisions were included.

4.2 Importance of the Bay Area to Windsurfing in the United States

In the continental United States, only a handful of locations provide the right combination of steady strong wind, accessible and sufficient water, and proper temperature for windsurfing. The San Francisco Bay Area, the Columbia River Gorge in Oregon, Cape Hatteras in North Carolina, Corpus Christi area in South Texas, select locations on the Great Lakes, Lake Isabella in Southern California, and Long Island and Cape Cod on the Northeast Coast comprise nearly the entire list of regions that have more than a few sailable days per year. Within this list, the San Francisco Bay Area undoubtedly provides the highest number of high quality sailable days per year.

4.3 Importance of CPSRA to Windsurfing in the Bay Area

Within the San Francisco Bay Area, Candlestick point has been well known for over 30 years as one of the most consistent, most accessible, and most accommodating windsurfing spots for beginners, intermediates, and experts. It is one of only three windsurfing locations in San Francisco County and is the only one of the three sites that is not affected by tidal currents or dangerous shipping channels. Out of the entire Bay Area, only eight other sites provide usable access and fairly regular sailable conditions. See Table 4 for details.

Site	County	Current or Water Level Restrictions	Skill Level	Water Condition	Boats or Stranding Hazards	Sailable Frequency
Candlestick	S.F.	None	All	Flat	None	Very High
Crissy Field	S.F.	Current	Expert	Very Choppy	Both	Medium
Treasure Is.	S.F.	Current	Expert	Very Choppy	Both	Seasonal
Third Ave	San Mateo	Both	Expert	Large Swell	Both	Medium
Coyote Pt.	San Mateo	Current	All	Chop/Swell	Stranding	Medium
Berkeley	Alameda	None	Beg - Int	Choppy	None	Low
Alameda	Alameda	Level	Beginner	Small Chop	None	Very Low
Pt. Isabel	Alameda	Current	Intermediate	Choppy	Stranding	Low
Larkspur	Marin	Level	Int - Exp	Choppy	Boats	Low

Table 4: San Francisco Windsurfing Locations

Of the nine San Francisco area sailing locations, Candlestick provides by far the highest number of high quality windy days regularly serving all skill levels without tidal concerns or hazards. It is also one of only three locations in San Francisco County. East Bay sailing sites have far weaker winds and much rarer adequate conditions. Other locations are seriously impacted by tidal restrictions, hazards, or limitations on required skill. Former sailing sites such as Oyster Point and Foster City Lagoon have been eliminated by upwind development. Only windsurfing launches in the vicinity that have frequent acceptable sailing conditions are shown. See [21] for more information.

On average, 85 Sailable Days per year (from April through September) are frequented by on average 20 sailors per Sailable Day. This past year (2013) saw 102 Sailable Days, far and away exceeding the number of sailable days at any other site around the Bay. Frequency of Sailable Days derived from recent CPSRA Sensor data is shown in Table 2.

The site is uniquely suited to all skill levels. Children in their early teens as well as seniors in their 70's regularly use this site. This site is also a training location for some of the world's best sailors including US National Champions Wyatt Miller, Tyson Poor, and Bryan Metcalf-Perez and World Top-10 ranked Freestyle sailor Phil Soltysiak. An on-line record of sailability of various San Francisco area locations is accessible through iWindsurf.com.

CPSRA is special because it has an amazing confluence of desirable factors found no where else in the Bay. The water condition is amazingly flat despite having some of the best winds in the Bay. This is because the winds are largely offshore, which prevents wind swell from building in the sailing area. By contrast, most other sites in the Bay suffer from unbuffered exposure to the swell and choppy conditions that predominate the Bay by virtue of the winds, topography, and boating traffic.

Candlestick's consistent winds are fed by the well-known topographical feature referred to as the Alemany Gap, which funnels wind like a wind tunnel directly from the Pacific Ocean. In the Spring, Candlestick is fed by strong Northwest wind weather systems. In the late summer and fall, thermal pressure gradients between the cooler Pacific Ocean and warmer inland valleys create a reliability that borders on clockwork. Very often, Candlestick will be the ONLY windy site in the Bay Area accessible within a reasonable distance.

Other factors that distinguish Candlestick include the fact that it is not dependent on tidal conditions. Virtually every other site in the Bay requires either a minimum water depth or tidal current direction (ebb or flood) in order to be sailable. This has the effect of eliminating many other sites from being sailable on days even when there is wind. Crissy Field, Treasure Island, and 3rd Avenue are typically only sailed during ebb tides. Sites such as Sherman Island are often only sailed on the ebb tide or during especially strong winds. Many of the sites in the North and South Bay are too shallow during low tides due to silt accumulation near the launches. Sites in the East Bay are much less windy in general. When these tidal conditions are adverse during favorable wind periods (typically mid-afternoon), the site is not sailable. However, Candlestick has plenty of water for safe sailing at even extreme low tides and because of the topographical configuration of the sailing area, it does not suffer the extreme limiting currents that accompany ebb or flood conditions at many other sites.

Finally, Candlestick is centrally located so as to service sailors regularly from the North Bay, East Bay, South Bay, Peninsula, and the City of San Francisco. It is at most a 45 minute drive for sailors coming from any of those areas even in most high-traffic periods.

In summary, Candlestick is a keystone to Bay Area windsurfing. No other site in the Bay Area provides such most universal access to high quality conditions on a such a frequent and dependable basis.

Figure 24: Crissy Field Sailing Boating Hazards
Ocean liner freighters such as the one shown here include some of the many boating traffic hazards with which sailors in other sites around the Bay must contend. Ferries, commercial fishing, freighters, recreational traffic, and other vessels are commonplace throughout many locations in the Bay. Candlestick is a shallow basin that receives virtually no boating traffic.

5 Recommended Mitigation for Potential Project Impacts

There are five categories of mitigations proposed in these Comments. All are based on actual requirements used in other EIR and planning documents.

5.1 Site-Specific Final Wind Analysis Studies

Other projects for which similar wind tunnel wind impact studies were conducted were much smaller projects for which specific building footprints and site plan configurations were known or mostly known. Some of these other projects even had elevation sections or orientation and streamlining details depicted for analysis and consideration.

This Project, by contrast, is an order of magnitude larger and less defined. For this reason, the confidence level of the results of the Analysis must be less than for these other projects.

To ensure the same minimum confidence standards of other EIR analyses, prior to specific development within the Project, final wind impact analyses should be conducted to examine the individual development impact along with the surroundings, cumulative development programmed and approved up to that point, and future Project details as well as they are known at that time. These subsequent analyses should be directly tied to the impact on usability of the Resource as it exists today rather than thresholding a related but indirectly connected factor, such as wind speed.

5.2 Alemany Gap Wind Flow

The primary source of wind for the Resource is the Alemany Gap. This topographical feature channels and accelerates wind from the Pacific Ocean directly to CPSRA. Obstructions in the path of flow through and beyond the Alemany Gap would have the most impact on the Resource.

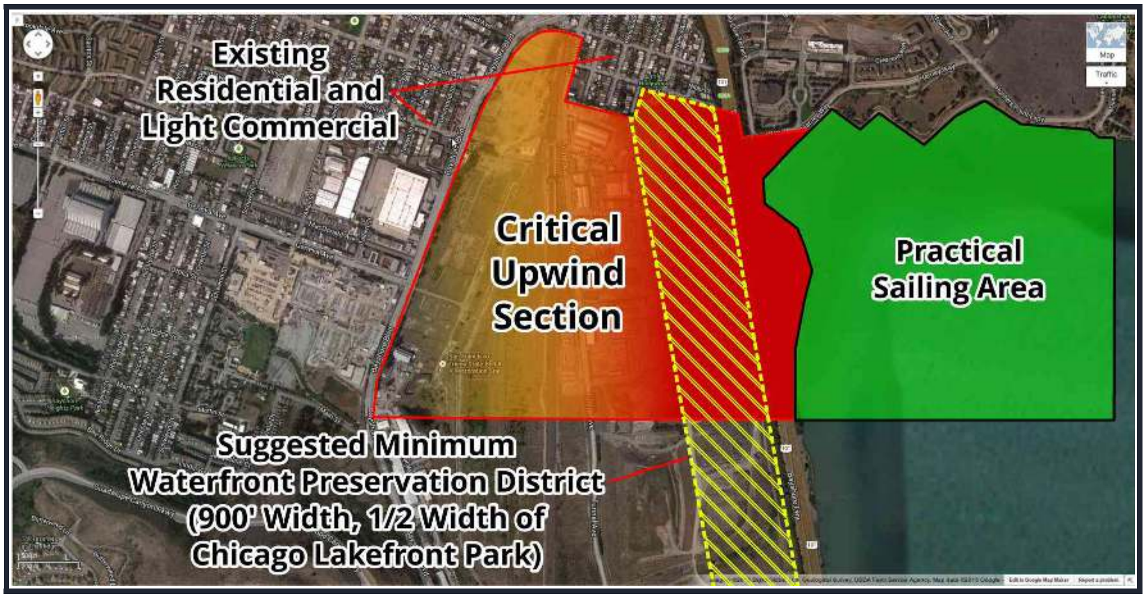

Figure 25: Critical Upwind Section and Proposed Waterfront Preservation District
The Critical Upwind Section and the proposed minimum Waterfront Preservation District immediately upwind of the Practical Sailing Area and downwind of the Alemany Gap. The waterfront is currently a mix of industrial operations but is slated in some proposed plans to be barricaded by a virtual wall of development up to 200' above sea level in some locations according to the DEIR. The Waterfront Preservation District shown at 900', which is half of the width of the Chicago Lakefront Park System. This figure includes areas outside of the Project scope to show non-residential areas that could also developed or redeveloped in the future into commercial or industrial uses.

- The minimum Waterfront Preservation District shown should established with only low vegetation and structures and minimal topographical variation or rise above sea level
- Filtration and catchment systems can be introduced in the Waterfront Preservation District to comprehensively filter and improve runoff and reduce litter that ends in the Bay
- All new development including building and parking areas should be located and clustered outside the Critical Upwind Section as much as possible or as far to the West and South as possible
- Vegetation, other structures, and topography that would present an impediment to wind flow or increase surface roughness should be kept at very low heights and uniform roughness to minimize increased wind turbulence
- Impervious surface area should be kept to an absolute minimum to avoid creating thermal conditions that create convection cells or otherwise interfere with the natural flow of wind through this area
- All industrial processes with the potential for discharging odor, dust, pollution, or other air or water quality impact should be prohibited from this area
- Trip generation that would result in diesel discharge or other air quality impact in this area should be discouraged

Project areas closest to the shoreline should be devoted to a substantial public open space to ensure the accessibility and utility of the shoreline for all. Such public access is critical to a successful waterfront development.

Figure 26: Olympic Sculpture Park, Seattle

Another excellent example of waterfront development is the Olympic Sculpture Park in Seattle. It is a nine acre park on a former brownfield industrial site but is now one of the only green spaces in Downtown Seattle. The site is award-winning and has been called “the best thing to happen to Seattle in years” (Frommer’s travel guide). The potential scale of public waterfront preservation space on the Baylands is an order of magnitude larger.

5.3 Architectural Requirements

In addition to minimizing or eliminating impact in the Critical Upwind Section and proposed Waterfront Preservation District, the following architectural requirements are recommended to mitigate potential impact caused by development activities outside of no-build and open-space areas:

- Building heights and massing should be stepped such that the heights closest to the Bay are minimum and the heights rise as development proceeds West to reconnect air flow to the surface as gradually as possible
- Maximum building heights, topography, and other impacts to wind flow relative to mean sea levels should not exceed the current levels of the so-called “Brisbane dirt mounds”
- Structures should be oriented and streamlined to present minimal wind obstruction and minimal increase in wind turbulence consistent with similar efforts in other nearby jurisdictions
- Overall surface roughness impacts created by development activities should be kept to an overall minimum

- Vegetation should be limited in height and scope to avoid creating additional surface roughness, sudden interruptions in wind flow, or exceptional height

Buildings and substantial development should begin to the West and should be stepped in height so that a wall of development does not obstruct views and access of the shoreline and wind flow to the Resource. This is a practice adopted along many of the most successful waterfronts in the largest cities. Parts of San Francisco's Embarcadero district provides an example of such stepped massing.

Figure 27: Litter from Industrial Operations

5.4 Use Limitations

Figure 28: Discharge of Dust and Particles
High winds carry pollutants throughout the air, water, and land downwind in the vicinity of the Project.

The steady strong winds in this site mean that air quality is particularly sensitive. Hundreds of complaints have been registered against odor and litter created by the existing Recology facility in this vicinity (Figures 33, 29, 27, and 30). This odor is created by transportation and processing of waste material (Figure 32). Litter is created as bits of waste are discharged onto roads and open space and carried by the wind ultimately to the Bay. The "dirt mounds" on this site that process and recycle dirt and construction material create an incredible dust discharge if uncontrolled (cf. Figures 31 and 28). This use also demonstrates the sensitivity of air quality given the high winds.

Users such as Recology have made promises in this and other jurisdictions but have failed to live up to promises. Part of this is due to the limited ability to monitor and enforce such vague but damaging concepts as "odor." See, for example, [32] and [23], which discuss the high expectations and grandiose promises that have led to disgust, anger, and disappointment among the public.

The vast quantities of litter, dust, and incredibly frequency of wide-ranging noxious odor indicate that monitoring and enforcement is simply not working. The existing users have demonstrated how easy it is to circumvent the numerous layers of regulations designed to prevent just these types of abuses. For this reason, it is strongly recommended that these uses not be promoted in this area. Such polluting users are incompatible with the ecologically sensitive and residential surroundings.

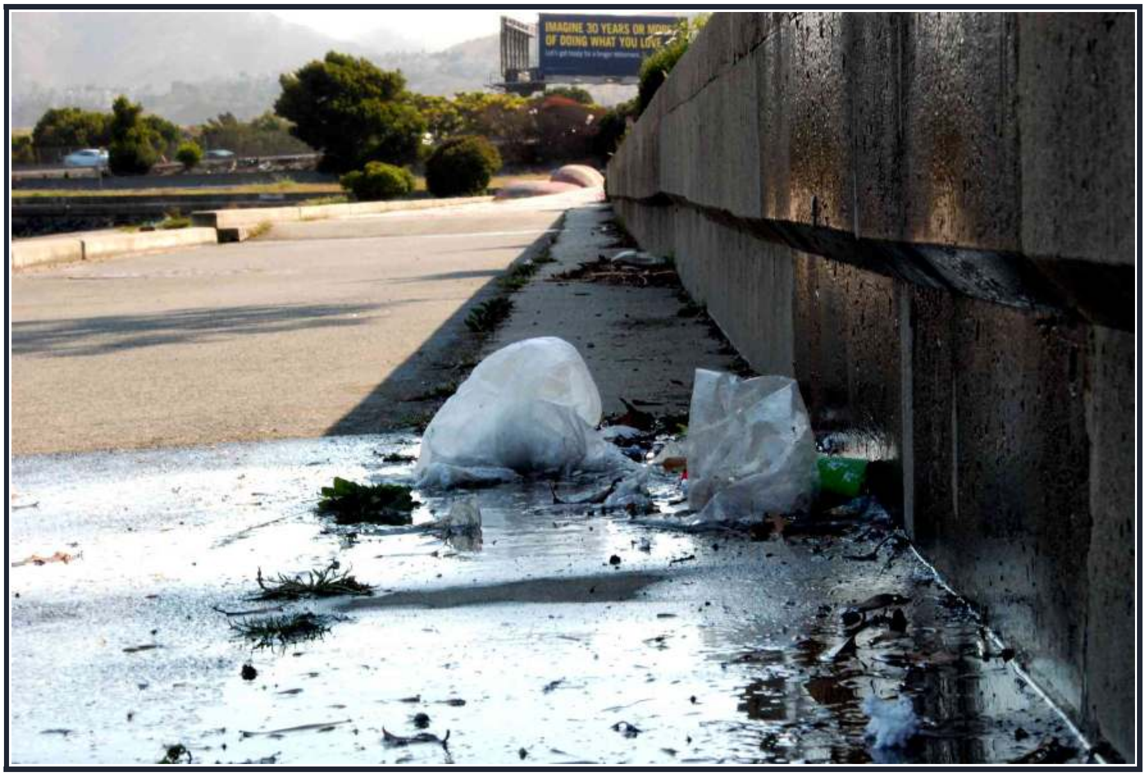

Figure 29: Litter from Industrial Operations

As demonstrated by the discussion above, because of the high winds and proximity to the ecologically sensitive resource, the following restrictions are recommended:

- Uses that have will create odor, litter, dust, gas, fumes, irritants, particles, or exhaust either into the air or Bay should be prohibited
- Any such use that has the potential for such pollution should require a separate EIR process with a qualified expert to review the specific potential impact
- This also includes air turbines or other power generation facilities that could create additional wind turbulence or substantially alter the thermal dynamics of the Project area
- Existing violators should be brought into compliance before any further facility is considered
- Any use with the potential to generate long-ranging exceptional pollution of the sort discussed above should have specific monitoring provisions, budgets, thresholds, enforcement resources, penalties, and condition for use permit revocation and renewal

Figure 30: Litter from Industrial Operations

5.5 Funding for Monitoring, Testing, and Enforcement

Due to the proximity of possible intense industrial and commercial uses to existing and proposed residential and the San Francisco Bay, it is urged that special separately funded locally-administered monitoring, testing, and enforcement programs be established. The on-going funding for these should come from part of the revenue that the City of Brisbane and others will gain from the additional taxes and fees. It is anticipated that the proposed Recology expansion alone could generate hundreds of thousands or even millions of dollars in revenue for the City of Brisbane.

Locally Funded and Administered Monitoring, Testing, and Enforcement

Figure 31: Discharge of Dust and Particles
High winds carry pollutants throughout the air, water, and land downwind in the vicinity of the Project.

The City has recently experienced difficulties enforcing air quality problems with existing industrial users operating currently on the Baylands. Dust and particulates have been discharged regularly over and into the Bay for years in violation of air quality ordinances (see Figure 31). Numerous citations have been issued by authorities but the problem has continued unabated.

A recent thorough examination by the City of the circumstances that led to this situation revealed that a history of non-enforcement and lax specificity in permits were to blame [11]. Brisbane is a small city without the resources of its larger neighbors. It should take special measures to learn from this recent experience to ensure that future generations will not face similar aggravation, hazards, and difficulties.

Other regional enforcement agencies such as the Bay Area Air Quality Management District should not be expected to fill this responsibility. Those agencies are sorely overtaxed and do not have the resources or specific technology needed to institute monitoring systems. They also do not have the fine-grained enforcement authority needed to apply specific penalties to specific infractions.

In conversations with BAAQMD, it was revealed that they have no specific criteria to apply in determining when enforcement becomes an issue for things such as dust discharge or odor. They stated that they only take action “when the violation becomes a public nuisance.” “Public nuisance” is not defined and is generally based on “how many people file complaints.” At the time of this writing and to the best of our knowledge, there is one single BAAQMD field agent responsible for the entire San Francisco County.

Specific Difficulties with Existing Odor

Figure 32: Discharge of Odor
The Recology processing facility creates incredible noxious odor. Hundreds of complaints have been registered with the Bay Area Air Quality Management District regarding this use. The high winds create an ideal situation for the propagation of noxious discharge through the downwind area. Trucks, open doors, and exhaust make it virtually impossible to contain such a use. These upwind uses are repeatedly cited but continue to pollute as it is virtually impossible to cost-effectively monitor and enforce ongoing compliance.

The existing Recology facility adjacent to the Project is one of the most noxious facilities in San Francisco. The high winds cause the odor to spread over many square miles almost every day in the Summer and Fall if not other times as well. This odor envelopes CPSRA (the land and water), adjacent highways and trails, the Candlestick Point stadium area slated for redevelopment, and even on some days as far as Sierra Point.

Commuters on Highway 101 who have the misfortune of having their windows down when passing by the Candlestick Park exit traveling South may notice an unfortunate coincidence: a sign that designates the Brisbane City limits and an overpowering nauseating odor of untreated garbage or the cloying revolting stench of perfume applied to the same. Users of the Bay Trail in this vicinity are also very familiar with this odor as well as the prolific litter that flies off of covered garbage trucks, snags in vegetation, and ultimately blows and washes over the Bay Trail (see Figure 33) and into the Bay.

The Internet forum iWindsurf.com provides a historical account of conditions at various windsurfing sites in the Bay Area from as early as 2008. Posts on this forum from as far back as Summer of 2009 discuss the garbage stench being produced at the current Recology facility. There is apparently no means or no will to hold violators of air quality standards to account in all cases.

Figure 33: Litter along the Bay Trail
Litter and discharge from industrial operations is carried by runoff, wind, or stormwater to the Bay. Uses that contribute such pollution should not be permitted to continue operating in violation.

While the existing Recology treatment facility is outside of the City of Brisbane, recent proposals submitted to the City indicate development on the order of an additional 750,000 square feet in Brisbane City limits. As far as we know, this would quadruple the size of the treatment plant and likely include other types of refuse such as biomass (compost). Biomass processing is notoriously the most noxious type of processing. Compost is literally “rotting garbage.”

Figure 34: Recology Facility Receiving Compost Garbage for Processing
124 acre existing Recology facility in the Central Valley receives municipal compost waste from Berkeley, Livermore, San Francisco, and other parts of Alameda County [31].

In conversations with current and former City of Brisbane officials, we were told that this facility would be "ultra-clean" and the "first of its kind." We were told of assurances that there would be "no odor." We are unsure how this is possible. If garbage is transported, there must be at some point where it is exposed to the air to be offloaded through doors, from trucks, and loaded into treatment systems and vice versa (see Figure 32).

The very idea that 1,000,000 square feet of garbage and compost processing would produce no odor would be mostly quite bizarre if it was not so especially sad that this is actually being seriously considered in exchange for huge potential revenues.

Current Composting Facilities

In Berkeley, municipal compost was processed in the landfill area that is now Cesar Chavez Park. For comparison, this park is 90 acres, substantially larger than the total area available to Recology (including existing facilities). This compost for Berkeley is now handled in the Central Valley in a 124 acre tract of land surrounded by farms. Material is processed in an open-air manner handling roughly 23 tons per day [31].

In order to encourage decomposition, heat, oxygen, and water is required. 540' long rows up to six feet in height are exposed to sunlight and air and are turned and watered constantly.

Figure 35: Central Valley Recology Facility Processing Compost Material

When done incorrectly, the decomposition produces methane in addition to other byproducts of processing and sorting the raw waste that comes in to the facility. Even in a transfer station, it is clear that substantial odor and pollution can result as witnessed by the current Recology facility on the Baylands.

At this industrial scale in the Central Valley location, composting is economical and is efficient since the end product is largely used by the immediately surrounding farms. The idea that transport costs are saved by waste being processed close to where it is generated does not include all the facts. Portions of the waste still needs to be transported to landfills and the finished product still needs to be transported to end users.

Figure 36: Central Valley Recology Facility Processing Compost Material

While there is the presumption that this expanded facility would handle municipal compost biomass, many of these lessons and issues would apply equally to the current facility and expansion to other types of waste processing.

Figure 37: Central Valley Recology Facility Processing Compost Material

How to Enforce No-Odor Obligations

Setting aside the frustration of dealing with apparent short-sidedness, the practicality of ensuring such claims is daunting. We are sure that Brisbane would not simply take Recology at its word. We are sure that Brisbane would be very careful not to quadruple the size of an already incredibly and demonstrably noxious use presently at their doorstep.

Many other jurisdictions dealing specifically with Recology have received similar assurances only to find "nightmare" situations (cf. [32], [23]). The loophole that Recology and similar users seems to exploit is that there are no practical ways to monitor odor and there are no good laws that establish thresholds for odor violations. For example, Brisbane does not physically have the jurisdiction to install odor monitoring facilities and sensors downwind in the vicinity of the facility.

Furthermore, what possible monitoring technology could even be used and what are even acceptable odor limits? Odor is something that is carried by the wind and concentrations can be vastly different just a few meters away.

Notwithstanding the difficulty in even assessing compliance, what kind of penalties would be fair to offset possible odor? Why should the public suffer any odor at all, especially considering that the public most likely impacted will be to the East and South, outside of Brisbane, and not be receiving any stream of revenue?

Though we could not find specific records of requirements and assurances regarding odor during permitting, we were told by residents of the area that when the present Recology facility was first constructed, there were similar promises made that there would be no odor. One cannot imagine that the facility received a permit for operation that specific indicated it was permissible to create the level of pollution that it presently does. We were told there was in fact little or no odor during initial periods of operation. However over time, for whatever reasons, the condition has obviously worsened to the present state.

There is also the issue that the present facility that currently produces incredible odor pollution is outside of the City of Brisbane jurisdiction, being located in the City of San Francisco. Brisbane has therefore no direct authority over those portions of the combined facilities. How can Brisbane require that Recology or its affiliates expend potentially huge sums to tear down or retrofit that facility to create a new supposedly "clean" comprehensive facility? What about the business interruption that would accompany such a modification?

On the other hand, is Brisbane willing to overlook the current noxious polluter at its border while it approves as massive new expansion for the same? What assurance could Brisbane receive that Recology won't simply transfer its "cleaner" processing to the Brisbane facilities while simultaneously taking on the dirtier processing in the adjacent facilities within the City of San Francisco?

We have registered our concern with this garbage treatment proposal on other occasions. In addition to the aforementioned assurances and despite no realistic plan or specificity for guaranteeing the same, we were given the final consolation that "garbage has to be processed somewhere." In the face of such apparently dedicated apologists for what would no doubt amount to a substantial future stream of revenue for Brisbane, we expect to have no productive discussion. Hence, we appeal for rational and objective consideration to the public, stakeholders, and those other officials who might read these Comments.

6 Conclusion

To summarize, the DEIR Analysis incorrectly conflates the quantities of wind speed and turbulence intensity with that of Sailable Days. It measures the Project's impact on wind speed and turbulence intensity but does not measure the impact on Sailable Days or any other equivalently instructive quantity. Assuming that the wind speed and turbulence are interchangeable with or necessarily proportional to Sailable Days is arbitrary, lacks any foundation, does not meet the standards required by CEQA, is misleading, and is certainly not good and faithful professional engineering.

The Analysis does not specify a threshold for significant impact in terms of the Resource itself yet claims that there is no significant impact on the Resource. The Analysis conducted makes an overwhelming number of simplifying assumptions without justification or detail of alternatives or the consequence of these assumptions yet it reports extremely precise results with absolute confidence (i.e. no contingency for error in the assumptions made).

At the very start of the Analysis, the impact area examined does not match the area in which actual activity is predominantly conducted at the Resource and covers an arbitrary portion of the entire CPSRA. Furthermore, even within the possible area to examine, the Analysis only reports a handful of new potential impact measurement points that does not include areas closest to the Project and potentially most significantly impacted. The thoroughness of examining the potential impact area does not match with levels established in other smaller projects, even though this Project much larger scope and substantially less detail and certainty than those other projects.

These Comments demonstrate that especially within the Practical Sailing Area of critical importance, the true potential impact under a reasonable measure such as Sailable Days is between 9% and 44% given wind speed reductions of 5% to 10% and wind turbulence intensity increases of 5% to 10%. These level of wind speed reductions and wind turbulence intensity increases are found within a substantial portion of the Practical Sailing Area under a variety of wind conditions even considering that the Analysis does not analyze the most likely substantially impacted portions of the Practical Sailing Area or under certain wind conditions.

Taken individually or collectively, the risk of a substantial impact to the Resource is demonstrably great and substantially more significant than proposed by the DEIR Analysis. This sailing location is of paramount importance as it is one of the most consistent, most accessible, and highest quality of all of the San Francisco Bay Area, which places it among the very highest in the entire continental United States.

Careful mitigations should be included to ensure that potentially grave damage to this Resource is avoided. Multiple mitigation recommendations are proposed in these Comments. The most critical is to establish a minimum Waterfront Preservation District within the Critical Upwind Section between the Alemany Gap and the Practical Sailing Area and keep it as free from development and other interfering activities as possible.

Other considerations such as architectural streamlining, orienting, and stepped massing are also essential for both wind flow as well as to ensure public view preservation as much as possible.

The establishment of the recommended minimum Waterfront Preservation District will be the key to ensuring that all residents, visitors, and businesses of Brisbane benefit from this project in addition to increasing values for private project sponsors and maintaining recreational opportunities in the water at CPSRA.

Continued reassessment of wind and sailability impact should be conducted at subsequent stages of the Project's development once additional detail and options have be more firmly determined or stages of the Project developed. Not only is it critical to test what could actually be built, but it is critical to validate that some of the many assumptions made in the current Analysis prove to stand up to time and more thoughtful analysis methods.

Importantly, monitoring, testing, and enforcement programs with penalties should be established and funded

through the operations scheduled to be included in the Project. Air and water quality in such a sensitive high-wind area immediately adjacent to the Bay creates a special need that should be dealt at a higher level of scrutiny than that available from existing environmental authorities.
The Project should go above and beyond of what is required to preserve and foster natural resources and activities dependent on the same. The Project and community should embrace the extremely unique and highly sensitive windsports that take place just off of its shores. Benefits for both are not mutually exclusive with thorough consideration and a small amount of forethought. The penalty for failing to do so could be catastrophic for many.

The resources available in these Comments to measure the impact of the Project and propose mitigation are limited. It is the intent of these Comments to demonstrate the extreme need to carefully reevaluate the Analysis done in the DEIR and include substantial mitigation to prevent a disastrous taking of this valuable, unique, and highly sensitive environmental Resource.

It is not the intent to argue the fine points of the Analysis or to claim that the entire Analysis is incorrect. It is the spirit of these Comments that we hope is received and acted upon, that the Analysis should not be accepted without substantial modification and adoption of mitigation measures.

Accepting the DEIR Analysis as-is would not only result in serious unmitigated consequence to the Resource, it would help to establish an irresponsible precedent for accepting incomplete and unsubstantiated presumption in place of good and faithful professional engineering.

Part III

Addressing Master Response of
300 Airport Boulevard Project Final EIR

Introduction

The City of Burlingame also considered impacts on windsurfing recreational activities recently in the vicinity of the Coyote Point windsurfing launch. Burlingame has taken a proactive approach to identify a wind impact standard for future projects and applied this standard to the recently reviewed 300 Airport Boulevard project. As part of that EIR process, public comments were submitted and a Master Response [3] was produced in conjunction with the same consultants being used for this current Project as far as we know.

It is apparent that numerous similar methods and criteria are being applied from that 300 Airport Boulevard EIR to this current DEIR. This section is intended to point out the differences between this Project and that of 300 Airport Boulevard as well as address the differences between the discussion in the Master Response and these Comments.

1 Adequacy of the Significance Threshold

1.1 Threshold Did Not Follow CEQA Adoption Process or Meet Requirements

The Master Response states that "the City, as lead agency, is permitted discretion in establishing significance thresholds and determining how to apply these thresholds in varying settings, so long as it is based on substantial evidence and the application does not foreclose consideration of potentially significant impacts."

It continues by pointing out that the City of Burlingame had adopted a significance threshold of 10% wind speed reduction "over large portions of the windsurfing transit routes or primary board sailing areas." In adopting this significance threshold, the City of Burlingame provided an opportunity for public review and comment.

While there was apparently no public comment and this standard was adopted by the City of Burlingame, no such standard has been adopted or considered by the City of Brisbane, which is the lead agency for this Project. It is unclear why the general public and the City of Brisbane should not be afforded the same opportunity to cooperatively establish the most appropriate wind impact standard.

While these Comments do not speak specifically to the decision made by the City of Burlingame, for the present Project and DEIR, the adoption of this 10% wind speed reduction threshold for the current DEIR is inappropriate because there is not "substantial evidence" that the application of this standard would not "foreclose consideration of potentially significant impacts."

As shown repeatedly in these Comments, based on an actual survey of users of this site that corresponds to the professionally operated and maintained CPSRA Sensor [35], wind speed reductions even in the range of 5% would have very large impacts. Furthermore, the Analysis conducted for this DEIR does not even examine substantial portions of the true area that would be most impacted by the proposed Project.

In other words, there is substantial evidence that the application of this standard WOULD foreclose consideration of potentially significant impacts. The evidence to the contrary presented in the DEIR Analysis is incomplete and inconclusive.

1.2 Wind Turbulence Component Arbitrarily Dismissed

Considering wind turbulence in addition to wind speed reduction was dismissed in the Master Response because "the lack of an established standard for ascribing changes in turbulence to an effect on wind-related recreational activities make it a less appropriate and effective method for determining the significance of wind impacts." If there is no known criteria for evaluating the impact then the responsibility of the DEIR is to determine what that appropriate criteria is or justify why the current body of research, methods, surveys, or resources is insufficient to establish such a criteria.

There are ready models to bridge the gap between wind turbulence intensity and wind gust factors (and corresponding lull wind speeds), for which a windsurfing impact criteria can be established based on a survey of the users of the site or through other means. What minimum efforts were made to try and establish such a connection and criteria that included turbulence and why these efforts failed are unexplained and unclear.

1.3 Absolute Required Operating Conditions Not Identified

These Comments emphasize that the important criteria is not the wind speed reduction or turbulence intensity. These are intermediate factors that contribute to the continued viability of the site. The important quantity in these Comments are the availability of the Resource, herein referred to as Sailable Days, defined by Required Conditions that exist today and that are relative to the specific CPSRA Sensor, which has been operated for many years and is universally known by users of this Resource as the single best representative for sailing conditions at CPSRA.

Relative wind speed reductions tell the public nothing about the ultimate impact on the site. Absolute operating conditions need to be first defined such as was done with the 34th America's Cup Regatta minimum and maximum racing standards relative to the local sensors operated by the same company that operates the CPSRA Sensor [29], [28].

Sensitizing impacts to the historic CPSRA Sensor data with a consistent set of Required Conditions for Sailable Day is a reasonable and practical method for translating the wind speed reduction and turbulence intensity increase to a quantity of importance, namely Sailable Days.

The Master Response does not address such a specific quantity as Sailable Days, it does not address any attempt to establish something like meaningful Required Conditions for use of the Resource in terms of an independently operated long-term sensor such as the CPSRA Sensor, and it does not address the attempt to employ reasonable empirically validated methods of incorporating turbulence intensity into the discussion. All of these things are done in these Comments.

1.4 Evidence of "No Impact" Does Not Consider Substantial Resource Area

Finally, the Analysis in the DEIR does not even report on large sections of the CPSRA or the Practical Sailing Area. The Analysis makes numerous problematic assumptions in methodology highlighted in these Comments that we claim understate the true impact. Notwithstanding possible underestimation, the results as reported when considering the true Practical Sailing Area that is of paramount importance to the Resource, large portions of the Resource would be affected based on the DEIR Analysis.

2 Adequacy of the Wind Study and Evaluation of Turbulence

2.1 Baseline Wind Data

The Master Response describes the use of baseline wind data from the San Francisco Airport sensor as sufficient for establishing "free-stream" wind condition. A similar method of establishing baseline wind data is used in the DEIR. The Master Response continues by saying that a particular local sensor cannot be used for wind tunnel analysis purposes because it does not meet requirements for measuring "free-stream" wind conditions.

These Comments make extensive use of the CPSRA Sensor data as the single most accurate and reliable representative of realistic sailing conditions over millions of square feet of water area at the CPSRA. It is not the intent of these Comments to suggest that the wind tunnel analysis conducted for the DEIR should have used the CPSRA Sensor as the "free-stream" representative sensor.

This CPSRA Sensor is used herein separately from the wind tunnel analysis to consider how direct impacts to changes in wind speeds and turbulence would impact Sailable Days based on actual historic data. The use of this CPSRA Sensor is intended to point out that while the wind tunnel analysis is one method of considering impacts to the Resource, it is not the only way, and because of the numerous simplifying assumptions and complexity of the modeled system that far exceeds that of the 300 Airport Boulevard project, the wind tunnel analysis does not even seem to be an appropriate method for the Analysis.

According to the Master Response, the wind tunnel analysis was conducted for a much smaller project at 300 Airport Boulevard. The current Project is hundreds of acres in scope and the Analysis attempts to model an incredibly varied, dynamic, and complex terrain and wind system. To consider the wind tunnel analysis for the Project as the only source for determining that the Project would have no significant impact is short-sighted and overly aggressive in light of the very simple and very clear demonstration of the sensitivity of this Resource to even small changes in wind speed or turbulence over substantial portions of the Resource through the use of the CPSRA Sensor data.

Lastly, as pointed out elsewhere in these Comments, good engineering practice requires that such a model be validated against the very real-world conditions it is attempting to model. To our knowledge based on discussion with ESA, there was explicitly no attempt to take on-the-ground measurements to validate their wind tunnel model.

2.2 Applicability of Wind Study Results to Range of Wind Speeds

The Master Response reiterates the appropriateness of use of relative wind speed analysis as sufficient for considering the impact on windsurfing sailing. A similar claim is made in the DEIR. Realistically, windsurfing is highly dependent on actual wind speeds such that sailability is not linearly affected by relative changes in the wind speed.

Much like aircraft have specific critical takeoff, stall, and landing speeds, windsurfing has critical planing board speeds required very specific minimums of wind speed. Below these minimum planing speeds, performance is not linearly diminished, but relegated to a completely separate behavior known as non-planing sailing. The Required Conditions specified herein describe the minimum set of conditions required to maintain planing conditions.

Another way to view this is to consider that although the America's Cup boats would operate in some fashion below the minimum race wind speed and tidal conditions, their operation would be severely impacted and no longer indicative of the true capabilities for which the boats are primarily designed.

By failing to specify absolute wind speeds in the Analysis, there is no way to determine if the changes would result in board speed decreases that would fall below this minimum planing speed requirement. However, when applying the same relative wind speed reductions to the CPSRA Sensor historic data set, it is shown that such decreases would in absolute terms yield very substantial decreases in ability to sail in this planing state.

Furthermore, the wind tunnel analysis conducted for the DEIR does not employ wind speeds in the range actually experienced on the ground at CPSRA. This is yet one more simplifying assumption in a dynamic system that is already incredibly complex and difficult to model accurately.

2.3 Measurements of Wind Direction and Turbulence

The Master Response dismisses the increase in wind turbulence intensity projected to occur much in the same fashion as the DEIR. However just a few paragraphs above, the Master Response states that there is a "lack of an established standard for ascribing changes in turbulence to an effect on wind-related recreational activities make it a less appropriate and effective method for determining the significance of wind impacts." If there is no standard for measuring the impact on the increase in turbulence, then the increase they admit occurs should not be dismissed out of hand.

These Comments show through the use of a simple and empirically validated model that has been peer-reviewed in the meteorological scientific community that turbulence intensity is connected to extreme wind values in a fashion than can be readily considered (cf. [9], [18], [24], [26], [34], [19], and [30]). These changes in extreme values (both gusts as well as lulls) can be evaluated against threshold required conditions for sailability as is done herein. Even a "relatively" small increase in turbulence (say from 0.10 to 0.11) would likely increase the range of lull-to-mean wind speeds by a comparable relative amount (0.10 to 0.11 is 0.01 absolute increase or a 10% relative increase).

2.4 Gusts or Gustiness

Gust used in these comments refers to the specific meteorological term defined as the maximum mean wind speed over a specified short-term duration within a longer-term observation. Lull is the minimum mean wind speed over a specified short-term duration within a longer-term observation. Gust or lull is not being used within these Comments interchangeably with turbulence. Turbulence (or turbulence intensity) used herein refers to a statistic of a series of mean wind speeds over a specified longer-term period. While gust and lull refer to extreme values within an observation period, turbulence refers to the distribution of values over a series of observations.

The Master Response states that "Gusts and longer-term changes in wind speed are not generated by wind passing by objects on the ground, and thus are independent of the 300 Airport Boulevard Project and need not be discussed in the Draft EIR." Much scientific study has revealed a strong connection between wind turbulence intensity and gusts and lull. The Master Response and the DEIR both admit that the respective projects will increase turbulence intensity. This in term will increase the range of gusts and lulls based on all scientific models reviewed ([9], [18], [24], [26], [34], [19], and [30]). In the model used in these Comments and described in Appendix H of these Comments, turbulence intensity is shown to be linearly proportional with the range between mean wind speed and gust wind speed and mean wind speed and lull wind speed.

Importantly, critical parameters of the Required Conditions are minimum gust and lull. It is insufficient to describe sailable conditions simply by the mean wind speed. If the lull wind speed is too low or too frequent, sail force and board speed will be insufficient to maintain critical planing speed on a regular basis. Much additional energy is required to propel the board to the planing state. Once planing, the mean wind speed may be sufficient to maintain sufficient sail force to keep the board in planing conditions. This is why the minimum gust is essential to provide enough impulse to begin planing or maintain sufficient momentum.

Increasing turbulence increases the range of extreme values (lulls and gusts relative to the mean wind speed). The importance of lull and gust wind speed to windsurfing is just as important as mean wind speed. To dismiss either or both of these facts demonstrates a fundamental misunderstanding of the Resource being analyzed.

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Appendix

A Definitions of capitalized words and phrases

The following capitalized words and phrases used in these Comments have the meaning as shown.

300 Airport Boulevard	300 Airport Boulevard project/EIR in City of Burlingame [3]
Alemany Gap	Well-known topographical features that funnel wind to the CPSRA
Analysis	Analysis of Project impact on CPSRA for the DEIR
Appendix G	Official "CEQA Environmental Checklist Form"
Article 5	Official "Guidelines for implementation of CEQA"
Baylands	Section of Brisbane, CA and surrounds also including the Project
Brisbane Dirt Mounds	Soil processing mounds on Baylands as of 2nd half of 2013
CEQA	California Environmental Quality Act
Comments	This document providing formal written comments
CPA	Candlestick Preservation Association, author of these Comments
CPSRA	Candlestick Point State Recreation Area
CPSRA Sensor	Anenometer sensor for CPSRA operated by WeatherFlow, Inc.
Critical Upwind Section	Section of the Project between the Alemany Gap and the CPSRA
DEIR	Draft Project EIR and its appendices and supporting memos
ESA	Environmental Sciences Associates, who prepared the Analysis
Executive Park	Executive Park project/EIR in City of San Francisco [2]
Impact	Potential impact of the Project on the Resource
Master Response	Master response to 300 Airport Boulevard DEIR public comments
Mitigation	Mitigation measures proposed herein to offset the Impact
Practical Sailing Area	Realistic portion of the CPSRA critical to the Resource
Project	Proposed Brisbane Baylands project and related projects
Required Conditions	Minimum existing conditions for a Sailable Day
Resource	Collective recreational windsurfing resources at the CPSRA
Sailable Day	Positive application of Required Conditions to CPSRA Sensor data
Sailable Day Impact Analysis	Realistic Resource availability impact study reported herein
Sailing Area	Entire sailing area of the CPSRA
SFBA	San Francisco Boardsailing Association
Survey	Survey of actual users of the Resource defining the Required Conditions
Waterfront Preservation District	Proposed public space along Bay similar to Chicago lakefront

B Lull, mean, and gust wind speed reduction impact analysis

Tables in this section were produced by scaling lull, mean, and gust wind speed values in the CPSRA Sensor historical data observations to 95% or 90% of their recorded values and then reapplying the Sailable Day criteria.

		Days Sailable	Mean	Lull	Gust	Lull-Gust Range	Lull-Mean Range	Mean-Gust Range
April	2011	10 (-2, -17%)	20	12	27	15	8	8
	2012	11 (-3, -21%)	18	11	25	13	7	7
	2013	14 (-6, -30%)	19	12	25	13	7	6
May	2011	14 (-1, -7%)	20	12	28	16	8	8
	2012	18 (-1, -5%)	19	12	25	13	7	6
	2013	19 (-3, -14%)	18	12	26	14	7	7
June	2011	8 (-1, -11%)	19	12	25	13	7	6
	2012	16 (-3, -16%)	18	11	25	13	7	7
	2013	14 (-3, -18%)	19	13	27	14	7	7
July	2011	12 (-1, -8%)	18	12	24	12	6	6
	2012	6 (-4, -40%)	18	12	24	12	6	6
	2013	7 (-5, -42%)	17	11	23	11	6	6
August	2011	2 (-1, -33%)	17	11	21	10	5	4
	2012	11 (-2, -15%)	17	12	23	11	6	5
	2013	12 (-1, -8%)	18	12	25	13	6	7
September	2011	9 (-6, -40%)	17	12	22	11	6	5
	2012	4 (-7, -64%)	17	12	23	11	6	5
	2013	16 (-2, -11%)	18	12	25	13	7	7
2011		55 (-12, -18%)	19	12	25	13	7	6
2012		66 (-20, -23%)	18	12	24	13	6	6
2013		82 (-20, -20%)	18	12	25	13	6	7
All Years		203 (-52, -20%)	18	12	25	13	7	6

Table 5: All Wind Speeds At 95% of Observed Value

Lull, mean, and gust values adjusted. Differences and percent differences in days sailable are relative to the base case (Table 2).

		Days Sailable	Mean	Lull	Gust	Lull-Gust Range	Lull-Mean Range	Mean-Gust Range
April	2011	7 (-5, -42%)	20	12	28	15	8	8
	2012	8 (-6, -43%)	19	12	25	13	7	7
	2013	9 (-11, -55%)	19	12	25	13	7	6
May	2011	10 (-5, -33%)	20	12	28	16	8	8
	2012	10 (-9, -47%)	19	12	26	14	7	7
	2013	18 (-4, -18%)	18	12	25	13	6	7
June	2011	6 (-3, -33%)	19	13	26	14	7	7
	2012	10 (-9, -47%)	18	12	25	14	7	7
	2013	11 (-6, -35%)	20	12	27	15	7	8
July	2011	9 (-4, -31%)	18	12	23	11	6	5
	2012	6 (-4, -40%)	18	12	24	12	6	6
	2013	2 (-10, -83%)	18	12	23	12	6	6
August	2011	1 (-2, -67%)	17	11	21	10	6	4
	2012	6 (-7, -54%)	18	12	23	11	5	6
	2013	9 (-4, -31%)	18	12	25	12	5	7
September	2011	6 (-9, -60%)	17	11	22	11	6	5
	2012	2 (-9, -82%)	17	11	24	13	6	6
	2013	13 (-5, -28%)	18	11	25	14	7	7
2011		39 (-28, -42%)	19	12	25	14	7	7
2012		42 (-44, -51%)	18	12	25	13	7	6
2013		62 (-40, -39%)	18	12	25	14	7	7
All Years		143 (-112, -44%)	19	12	25	13	7	7

Table 6: All Wind Speeds At 90% of Observed Value

Lull, mean, and gust values adjusted. Differences and percent differences in days sailable are relative to the base case (Table 2).

C Mean wind speed reduction impact analysis

Tables in this section were produced by scaling only the mean wind speed values in the CPSRA Sensor historical data observations to 95% or 90% of their recorded values and then reapplying the Sailable Day criteria. Lull and gust wind speed values were not adjusted.

		Days Sailable	Mean	Lull	Gust	Lull-Gust Range	Lull-Mean Range	Mean-Gust Range
April	2011	12 (0, 0%)	19	12	28	16	7	9
	2012	14 (0, 0%)	17	11	25	14	6	8
	2013	17 (-3, -15%)	18	12	25	13	6	7
May	2011	15 (0, 0%)	19	12	28	16	7	9
	2012	19 (0, 0%)	18	12	26	14	6	8
	2013	22 (0, 0%)	18	12	26	14	6	8
June	2011	9 (0, 0%)	18	13	26	13	6	7
	2012	19 (0, 0%)	18	12	26	14	6	8
	2013	15 (-2, -12%)	18	13	26	14	6	8
July	2011	12 (-1, -8%)	18	12	24	12	5	7
	2012	8 (-2, -20%)	17	12	24	12	5	7
	2013	9 (-3, -25%)	16	11	23	12	5	7
August	2011	2 (-1, -33%)	16	11	22	10	5	5
	2012	11 (-2, -15%)	17	12	23	11	5	6
	2013	13 (0, 0%)	18	12	26	13	5	8
September	2011	12 (-3, -20%)	17	12	22	11	5	6
	2012	6 (-5, -45%)	16	11	22	11	5	6
	2013	17 (-1, -6%)	18	12	26	14	6	8
2011		62 (-5, -7%)	18	12	26	14	6	8
2012		77 (-9, -10%)	18	12	25	13	6	7
2013		93 (-9, -9%)	18	12	26	14	6	8
All Years		232 (-23, -9%)	18	12	25	13	6	8

Table 7: Mean Wind Speeds At 95% of Observed Value

Only mean wind speed values adjusted. Differences and percent differences in days sailable are relative to the base case (Table 2).

		Days Sailable	Mean	Lull	Gust	Lull-Gust Range	Lull-Mean Range	Mean-Gust Range
April	2011	12 (0, 0%)	18	12	28	16	6	10
	2012	10 (-4, -29%)	18	12	27	15	5	9
	2013	13 (-7, -35%)	18	13	26	13	5	8
May	2011	15 (0, 0%)	19	12	29	16	6	10
	2012	18 (-1, -5%)	18	13	26	14	5	9
	2013	20 (-2, -9%)	18	12	27	15	5	10
June	2011	8 (-1, -11%)	18	13	27	14	5	9
	2012	19 (0, 0%)	17	12	26	14	5	9
	2013	13 (-4, -24%)	19	13	29	16	6	10
July	2011	10 (-3, -23%)	17	13	25	12	5	8
	2012	6 (-4, -40%)	17	12	25	13	5	8
	2013	5 (-7, -58%)	16	12	24	12	4	8
August	2011	1 (-2, -67%)	17	12	23	11	4	6
	2012	9 (-4, -31%)	17	13	24	12	4	8
	2013	12 (-1, -8%)	17	13	26	13	4	9
September	2011	9 (-6, -40%)	16	12	23	12	4	7
	2012	4 (-7, -64%)	16	12	24	12	4	7
	2013	14 (-4, -22%)	18	13	27	15	5	10
2011		55 (-12, -18%)	18	12	27	14	5	9
2012		66 (-20, -23%)	17	12	26	14	5	9
2013		77 (-25, -25%)	18	13	27	14	5	9
All Years		198 (-57, -22%)	18	12	26	14	5	9

Table 8: Mean Wind Speeds At 90% of Observed Value

Only mean wind speed values adjusted. Differences and percent differences in days sailable are relative to the base case (Table 2).

D Wind turbulence intensity increase impact analysis

Tables in this section were produced by decreasing the lull values in the CPSRA Sensor historical data observations such that the difference between the lull and mean wind speed values of each observation was increased by 5% or 10%. This is consistent with the behavior predictor by the gust factor models detailed in Appendix H. For small changes in wind turbulence intensity, the increase in the difference between mean and gust can be expected to change proportionally to the change in the wind turbulence intensity. Furthermore, the empirical range of lull to gust is roughly symmetric about the mean. Following this change, the Sailable Day criteria was reapplied. Mean and gust wind speed values were not adjusted.

		Days Sailable	Mean	Lull	Gust	Lull-Gust Range	Lull-Mean Range	Mean-Gust Range
April	2011	10 (-2, -17%)	21	12	29	17	9	8
	2012	11 (-3, -21%)	19	12	26	14	7	7
	2013	14 (-6, -30%)	19	12	26	14	7	6
May	2011	14 (-1, -7%)	21	12	29	17	9	8
	2012	19 (0, 0%)	19	12	26	14	7	7
	2013	20 (-2, -9%)	19	12	26	14	7	7
June	2011	9 (0, 0%)	19	12	26	13	7	6
	2012	16 (-3, -16%)	19	12	26	14	7	7
	2013	14 (-3, -18%)	20	12	28	15	8	8
July	2011	12 (-1, -8%)	18	12	24	12	7	6
	2012	8 (-2, -20%)	17	11	23	12	6	6
	2013	10 (-2, -17%)	17	12	23	12	6	6
August	2011	2 (-1, -33%)	17	11	22	10	6	4
	2012	11 (-2, -15%)	18	12	23	11	6	5
	2013	12 (-1, -8%)	19	12	26	13	6	7
September	2011	11 (-4, -27%)	17	11	22	11	6	5
	2012	7 (-4, -36%)	18	12	22	11	6	5
	2013	17 (-1, -6%)	19	12	26	14	7	7
2011		58 (-9, -13%)	19	12	26	14	7	7
2012		72 (-14, -16%)	19	12	25	13	7	6
2013		87 (-15, -15%)	19	12	26	14	7	7
All Years		217 (-38, -15%)	19	12	26	14	7	7

Table 9: Lull-to-Mean Range Increased by 5%

Only lull wind speed values adjusted. Differences and percent differences in days sailable are relative to the base case (Table 2).

		Days Sailable	Mean	Lull	Gust	Lull-Gust Range	Lull-Mean Range	Mean-Gust Range
April	2011	10 (-2, -17%)	21	12	29	17	9	8
	2012	11 (-3, -21%)	19	11	26	15	8	7
	2013	14 (-6, -30%)	19	12	26	14	8	6
May	2011	13 (-2, -13%)	21	12	29	17	9	8
	2012	19 (0, 0%)	19	12	26	14	8	7
	2013	20 (-2, -9%)	19	12	26	15	8	7
June	2011	9 (0, 0%)	19	12	26	14	7	6
	2012	16 (-3, -16%)	19	11	26	14	8	7
	2013	14 (-3, -18%)	20	12	28	16	8	8
July	2011	12 (-1, -8%)	18	11	24	12	7	6
	2012	8 (-2, -20%)	18	11	23	12	7	6
	2013	9 (-3, -25%)	17	12	23	12	6	6
August	2011	2 (-1, -33%)	17	11	22	10	6	4
	2012	11 (-2, -15%)	18	11	23	11	6	5
	2013	12 (-1, -8%)	19	12	26	14	7	7
September	2011	11 (-4, -27%)	17	11	22	11	6	5
	2012	7 (-4, -36%)	18	11	22	11	6	5
	2013	17 (-1, -6%)	19	11	26	14	8	7
2011		57 (-10, -15%)	19	12	26	14	8	7
2012		72 (-14, -16%)	19	11	25	13	7	6
2013		86 (-16, -16%)	19	12	26	14	7	7
All Years		215 (-40, -16%)	19	12	26	14	7	7

Table 10: Lull-to-Mean Range Increased by 10%

Only lull wind speed values adjusted. Differences and percent differences in days sailable are relative to the base case (Table 2).

E Predicted wind lulls and gusts due to wind turbulence intensity

To illustrate the relationship between lull, mean, and gust wind speed values over different observation periods and different turbulence intensities, the model in Appendix H was applied to 1, 5, and 12 minute observation periods with mean wind speeds ranging from 12 to 28 and wind turbulence intensities ranging from 0.10 to 0.20. These tables predict the range of extreme winds at different variables.

3 Second Wind Lull Speed Over 1 Minute Observation Period											
	Turbulence Intensity										
Mean	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20
12	10	10	10	10	10	10	10	9	9	9	9
14	12	12	12	12	12	11	11	11	11	11	10
16	14	14	14	13	13	13	13	13	12	12	12
18	16	16	15	15	15	15	14	14	14	14	13
20	17	17	17	17	16	16	16	16	15	15	15
22	19	19	19	18	18	18	18	17	17	17	16
24	21	21	20	20	20	19	19	19	19	18	18
26	23	22	22	22	21	21	21	20	20	20	19
28	24	24	24	23	23	23	22	22	22	21	21

3 Second Wind Gust Speed Over 1 Minute Observation Period											
	Turbulence Intensity										
Mean	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20
12	14	14	14	14	14	14	14	15	15	15	15
14	16	16	16	16	16	17	17	17	17	17	18
16	18	18	18	19	19	19	19	19	20	20	20
18	20	20	21	21	21	21	22	22	22	22	23
20	23	23	23	23	24	24	24	24	25	25	25
22	25	25	25	26	26	26	26	27	27	27	28
24	27	27	28	28	28	29	29	29	29	30	30
26	29	30	30	30	31	31	31	32	32	32	33
28	32	32	32	33	33	33	34	34	34	35	35

Table 11: Prediction of 3 Second Lull and Gust Wind Speeds Over 1 Minute

3 Second Wind Lull Speed Over 5 Minute Observation Period											
	Turbulence Intensity										
Mean	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20
12	10	9	9	9	9	9	8	8	8	8	7
14	11	11	11	10	10	10	10	9	9	9	9
16	13	13	12	12	12	11	11	11	10	10	10
18	15	14	14	13	13	13	12	12	12	11	11
20	16	16	15	15	15	14	14	13	13	13	12
22	18	17	17	16	16	16	15	15	14	14	13
24	19	19	18	18	18	17	17	16	16	15	15
26	21	20	20	19	19	18	18	17	17	16	16
28	23	22	22	21	20	20	19	19	18	18	17

3 Second Wind Gust Speed Over 5 Minute Observation Period											
	Turbulence Intensity										
Mean	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20
12	14	15	15	15	15	15	16	16	16	16	17
14	17	17	17	18	18	18	18	19	19	19	19
16	19	19	20	20	20	21	21	21	22	22	22
18	21	22	22	23	23	23	24	24	24	25	25
20	24	24	25	25	25	26	26	27	27	27	28
22	26	27	27	28	28	28	29	29	30	30	31
24	29	29	30	30	30	31	31	32	32	33	33
26	31	32	32	33	33	34	34	35	35	36	36
28	33	34	34	35	36	36	37	37	38	38	39

Table 12: Prediction of 3 Second Lull and Gust Wind Speeds Over 5 Minutes

3 Second Wind Lull Speed Over 12 Minute Observation Period											
	Turbulence Intensity										
Mean	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20
12	9	9	9	8	8	8	8	7	7	7	6
14	11	10	10	10	9	9	9	9	8	8	8
16	12	12	12	11	11	10	10	10	9	9	9
18	14	13	13	13	12	12	11	11	11	10	10
20	15	15	14	14	14	13	13	12	12	11	11
22	17	16	16	15	15	14	14	13	13	12	12
24	18	18	17	17	16	16	15	15	14	14	13
26	20	19	19	18	18	17	16	16	15	15	14
28	22	21	20	20	19	18	18	17	16	16	15

3 Second Wind Gust Speed Over 12 Minute Observation Period											
	Turbulence Intensity										
Mean	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20
12	15	15	15	16	16	16	16	17	17	17	18
14	17	18	18	18	19	19	19	19	20	20	20
16	20	20	20	21	21	22	22	22	23	23	23
18	22	23	23	23	24	24	25	25	25	26	26
20	25	25	26	26	26	27	27	28	28	29	29
22	27	28	28	29	29	30	30	31	31	32	32
24	30	30	31	31	32	32	33	33	34	34	35
26	32	33	33	34	34	35	36	36	37	37	38
28	34	35	36	36	37	38	38	39	40	40	41

Table 13: Prediction of 3 Second Lull and Gust Wind Speeds Over 12 Minutes

F Background on the DEIR Process

For the DEIR process, an environmental engineering firm (ESA) made an effort to *study the project's effects on wind conditions at the windsurfing launch site in the Candlestick Point State Recreation Area and in the adjacent sailing area that lies to the east of the project site in the San Francisco Bay.* Their results were provided to the City of Brisbane and the public through the body of the DEIR in Chapter 4 Section M and Appendix J as well as a "Windsurf Tech Memo" dated November 2nd, 2012 prepared by Charles Bennett and Cory Barringhaus [6].

The DEIR attempted to satisfy certain requirements of CEQA [1] including Article 5 and Appendix G. Elements of these documents relevant to these Comments include Article 5 sections 15064 (Determining the significance of the environmental effects caused by a project), 15064.7 (Thresholds of significance), and 15065 (Mandatory findings of significance), as well as Appendix G § Evaluation of Environmental Impacts paragraph (9).

For reference, excerpts of these sections are reproduced below:

Article 5 § 15064 subparagraph (e): "If the physical change causes adverse economic or social effects on people, those adverse effects may be used as a factor in determining whether the physical change is significant. For example, if a project would cause overcrowding of a public facility and the overcrowding causes an adverse effect on people, the overcrowding would be regarded as a significant effect."

Article 5 § 15064.7 subparagraph (a): "A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant."

Article 5 § 15064.7 subparagraph (c): "When adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence."

Appendix G § Evaluation of Environmental Impacts paragraph (9): "The explanation of each issue should identify: a) the significance criteria or threshold, if any, used to evaluate each question; and b) the mitigation measure identified, if any, to reduce the impact to less than significance."

G Definitions of technical symbols and terms

The following technical symbols and terms used in these Comments have the meaning as shown.

T	Duration of observation period
t	Duration of peak gust wind speed u_{max}
$\bar{u}, \bar{u}(T)$	Mean wind speed during an observation period T
$u_{max}, u_{max}(t,T)$	Peak gust wind speed of length t during an observation period T
σ_u	Root mean square of the longitudinal turbulence component to the mean wind speed $\bar{u}$
TI_u	Wind turbulence intensity (longitudinal, in direction of flow), ratio of σ_u over $\bar{u}$
$GF(t,T)$	Gust factor, ratio of u_{max} over $\bar{u}$ given t and T
z_0	Surface roughness length in meters
z	Observation height in meters
$Gust(t,T)$	Peak wind speed of length t during an observation period T
$Lull(t,T)$	Minimum wind speed of length t during an observation period T
F	sail force
ρ	air density, varies with temperature and pressure
S	sail area
C	aerodynamic coefficient depending on angle of sail to wind and sailing angle
V	speed of the wind relative to the sail (apparent wind)

H Selected formulas

Standard practice of relating turbulence intensity to extreme wind speeds known as gusts and lulls is based on elements of "Extreme Value Theory." Simple models from Extreme Value Theory are used to populate the sensitivity analysis tables in these Comments. Though much of this science is explored in the context of hurricane and other violent storms, the winds experienced at CPSRA do range in the near gale category [18] and empirically, these models do reasonably predict the range of values experienced at CPSRA as shown below.

The starting point for this analysis is a simple gust factor formula proposed by [13] that is consistent with empirical observations and assumes a linear dependence on the longitudinal turbulence intensity and a logarithmic dependence on the gust duration t:

$$GF(t = 3 \text{ seconds}, \ T = 12 \text{ minutes}) = 1 + 0.42 \times TI_u \times \ln(720 \ / \ 3) \tag{1}$$

Given sensor observations from sailable periods of an average mean wind speed of 18 mph and average gust of 25 (see Table 2), an implied TI_u of 0.16 is found using the above model. This is within the range found by the wind tunnel tests. This implied turbulence intensity presumably reflects the additional effect of wind swell, which is well known to increase turbulence, in addition to other factors that were not modeled in the wind tunnel test.

Next, a surface roughness length formula given by [36]:

$$z_0 = \exp[\ln(z) - 1/TI_u(z)] \tag{2}$$

At a height z of 2 meters and a turbulence intensity TI_u of 0.16, a surface roughness length z_0 of 0.0039 meters (0.39 cm) is found. This is on the order of [?] for inland seas and WMO (2008) and substantiates the use of the Eq 1 sensitivity analysis calculations in these comments.

Gust wind speeds are predicted from mean wind observations ($\bar{u}$) by:

$$Gust(t, T) = GF(t, T) \times \bar{u}(T) \tag{3}$$

Sailable observations show lulls and gusts to be roughly symmetric around the mean wind speed. Mean wind speeds were far enough from zero so that such symmetry did not suggest negative numbers. Lull wind speeds are predicted by:

$$Lull(t, T) = 2\bar{u}(T) - Gust(t, T) \tag{4}$$

Predicted lull and gust values using this method are consistent with sensor observations. A consequence of this model is that regardless of the actual turbulence intensity, the effect of proportional changes to the turbulence intensity can be examined by simply scaling the range of the mean-gust or lull-mean ranges.

Finally, force exerted on the sail from these wind speeds is given by Bernoulli's equation and is proportional to the square of the apparent wind speed. Apparent wind speed can be greater or less than true wind depending on sailing angle.

$$F = \frac{1}{2} \times \rho \times S \times C \times V^2 \tag{5}$$

I Miscellaneous

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