

**PUBLIC COMMENT SINCE
JUNE 3, 2008 COUNCIL MEETING PACKET**

Anne Cardwell - Seeno info

From: Luis Delgado <lfdarchitect@sbcglobal.net>
To: Elizabeth Patterson <elopato@comcast.net>
Date: 6/23/2008 10:30 AM
Subject: Seeno info
CC: Anne Cardwell <acardwell@ci.benicia.ca.us>

Dear Mayor,

I'm not sure if you have seen this article about Seeno. Can you please forward to all of the Council City and city staff. I think it is worth reading.

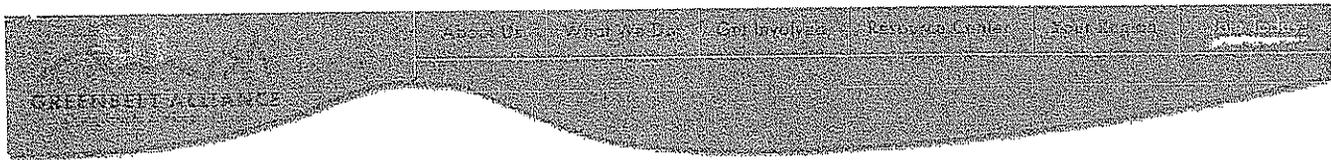
Here is link >>> http://greenbelt.org/resources/press/clippings/clip_2008jan15seeno.html

I really feel that you and Council need to make sure that any conditions that are attached to this project are enforceable by LAW. If they are not, then I would recommend that all project conditions should be made as part of a "DEVELOPEMENT AGREEMENT". Remember that we owe them nothing. They are coming here to build in our City and they will be gone once they get what they want.

Sincerely,

Luis Delgado

VIII-B-258



Home > Resource Center > In the News Home > Greenbelt Alliance in the News

RESOURCE CENTER

- [Introduction](#)
- [Press Room](#)
- [Reports](#)
- [Newsletters](#)
- [Links](#)

RELATED LINKS

- [Press Releases](#)
- [Greenbelt Alliance in Your Region](#)

Sign up for the [Greenbelt Newswire](#) and [Outings Calendar](#):

email address
first name
last name
<input type="button" value="Subscribe"/>



WWW SiteSearch

Greenbelt Alliance in the News

ContraCostaTimes
.com

January 15, 2008

State fines developer Seeno \$3 million

Seeno Construction penalized for environmental violation in Antioch, its fourth in Bay Area since 1996

Simon Read

State officials have reached a \$3 million settlement agreement with the Albert D. Seeno Construction Co. concerning alleged environmental damage at a housing development in Antioch.

The state charged that Seeno didn't have proper permits to do grading work in the Mira Vista subdivision that destroyed ponds and several waterways during various stages of development. The violations were uncovered and investigated by the state Department of Fish & Game.

"This is a great win for us," said Liz Kanter, spokeswoman with the State Water Board. "Because this gentleman is a repeat offender, we decided to go after a larger fine. He did not want a criminal prosecution ... and wanted to settle."

Seeno construction companies have been cited for environmental violations four times since 1996.

In the Mira Vista case, Seeno has agreed to pay \$500,000 to the Central Valley Regional Water Quality and Control Board, \$250,000 to the state Fish and Game Preservation Fund, \$250,000 to the Contra Costa County Fish and Wildlife Propagation Fund, \$250,000 to the state Department of Justice to pay for future environmental enforcement and \$250,000 to the Contra Costa County Treasurer.

In addition to monetary penalties, Seeno has agreed to grant a 60-acre parcel to the East Bay Regional Park District for endowment and preservation purposes, officials said. The company will also train its employees on environmental regulations, and it must conduct biological and wetland assessments of its properties.

"The Seeno company in no way admits any fault or liability in this case but settled this to avoid what can be a very expensive endeavor when you're involved in a legal dispute with the government," said Seeno spokesman Kiley Russell. "This is a business decision to get it behind the company and do what they're good at, which is building homes."

In October 2005, the Department of Fish & Game organized a multiagency

VIII-B-259

inspection of the Mira Vista development.

" During the inspections, water board staff found that three unnamed creeks and four seasonal ponds had been filled in during home construction," Frances McChesney, the board's senior staff counsel, wrote in an e-mail.

Five years ago, Seeno's West Coast Home Builders pleaded guilty to violating the federal Endangered Species Act for the 2001 killing of red-legged frogs and deliberate destruction of a frog habitat at the construction site of the San Marco subdivision in Pittsburg.

" He was fined \$1 million and ordered to write a public apology," Kanter said. "Obviously, that wasn't a deterrent."

Christina Wong, East Bay field representative for **Greenbelt Alliance**, said developers can't be wholly trusted with environmental decisions.

" This is a reminder that we need to be skeptical about the claims developers make," she said. "It's clear that the people of Contra Costa County and their elected officials need to keep a close eye on developers like Albert Seeno, who has a track record of destroying the environment."

Wong said Greenbelt Alliance is working to preserve an open hillside in Pittsburg that Seeno is eyeing for a possible development.

Russell said the company should not be defined solely by its transgressions.

" If you look at the history of the projects," he said, "the incidents are quite small in number compared to the good work they're doing."

###

[Home](#) | [About Us](#) | [What We Do](#) | [Get Involved](#) | [Resource Center](#) | [Your Region](#) | [Join Today](#)

©1985-2008 Greenbelt Alliance, 634 Howard Street, Suite 510, San Francisco CA 94105, 415.543.6771, info@greenbelt.org

Anne Cardwell - Seeno News

From: Luis Delgado <lfdarchitect@sbcglobal.net>
To: Anne Cardwell <anne.cardwell@ci.benicia.ca.us>
Date: 7/3/2008 2:39 PM
Subject: Seeno News
CC: Elizabeth Patterson <elopato@comcast.net>

Anne,

Please forward this link to Council and Planning Commission regarding Seeno tactics.

http://fop3.friendsofpittsburg.org/article.php?art_ID=30

Thanks,

Luis Delgado

VIII-B-261



Home Page About Us Projects News Participate Contact Info

Working to improve the Quality of Life in Pittsburg, California

 Search

What our customers are saying

Lorem ipsum dolor sit amet, consectetur dulce et decorum est e pluribus unum fiat lux semper.

Sally Smith
VP of Marketing, ACME
Outdoors

See what we can do for your brand

Lorem ipsum dolor sit amet, consectetur dulce et decorum

800 555 1212

Critics assail developer over lawsuit

By Lisa Vorderbrueggen
Contra Costa Times

March 13, 2007

East Bay environmentalists reproached home builder Albert Seeno on Monday after learning that he has sued Pittsburg over its traffic impact fees.

Seeno, owner of West Coast Builders and Seecon, has gone to Contra Costa Superior Court to challenge a 60 percent to 78 percent increase in Pittsburg's local traffic impact fee.

Environmentalists, who have had a long and rocky relationship with Seeno, say the lawsuit undercuts key road improvements at the same time that he is unfairly labeling their groups as obstructionists.

Billboards on Seeno land in eastern Contra Costa County call members of Save Mount Diablo, the Greenbelt Alliance and the Sierra Club "radicals" and accuse them of stalling road expansion projects such as the widening of Highway 4. The signs also ask readers to log on to www.widenhwy4.com to participate in a survey that further flays environmentalists as enemies of commuters.

"Seeno and his allies are bashing environmentalists on whether or not freeways should be widened but he is suing over a citywide fee for transportation improvements," said Seth Adams of Save Mount Diablo. "He's a hypocrite."

Greenbelt Alliance field representative Christina Wong echoed Adams' comments.

"The homes that Seeno is building in Pittsburg will have an impact on Pittsburg," she said. "For him to choose not to give back to the city is an unethical way of doing business."

Seeno's suit does not question the city's regional impact fee, which all eastern Contra Costa communities levy on new homes and businesses.

Proceeds of the regional \$16,667 per single-family house fee primarily fund the widening of Highway 4, the bulk of the Buchanan Road bypass and the BART expansion. Seeno sought a lower regional assessment but Pittsburg in 2005 matched its neighbors' fees.

The separate local traffic fee funds \$122 million in planned upgrades such as a new Highway 4 overpass at Range Road, widening the Pittsburg-Antioch highway and a new two-lane road from Kirker Pass in Pittsburg to Somersville in Antioch called the Buchanan bypass.

The city increased the fee from a range, based on density, of \$2,733 to \$4,020 per house to \$4,370 to \$7,170.

Seeno argues in his lawsuit that some of the road improvements have insufficient connection to the developments expected to pay the fees.

Although most of the money will come from the construction of houses south of Highway 4, according to the home builder's lawsuit, the improvements will largely benefit new commercial construction north of the freeway.

He especially opposes the overpass, saying it would benefit relatively few motorists for the \$22 million price tag.

Seeno also calls it improper to impose a local fee for the widening of the Pittsburg-Antioch highway because it's in Antioch, not Pittsburg.

The lack of an adequate link between the projects and the fee makes it a tax, according to the lawsuit, and as such, it requires a two-thirds vote of residents.

Pittsburg City Manager Marc Grisham and Mayor Ben Johnson declined to talk about specifics in the lawsuit.

VIII-B-262

But the men embraced the local traffic fee increase, calling it essential for the city's transportation network.

"It's like anything else," Johnson said. "Everything costs more and we're bringing up the fees to where they should be. We have to get things done and sometimes people don't like it."

Grisham expressed confidence in the city's analysis supporting the fee. The Range Road overpass, he said, will help relieve congestion on the city's two north-south overpasses.

"We wouldn't have put projects on the list if we didn't think they provided benefits," he said.

It's the lawsuit, he said, that's counterproductive.

"Lawsuits cost the city money," Grisham said. "And if we go through this (legal process) and we aren't able to raise the fees, it's not that they don't have to be built; they do ... In my view, it would be great if we had a lot less conflict in this community."

Meanwhile, the www.widenhwy4.com Web site appears to have lost steam.

It hasn't been updated for several weeks. East Bay campaign consultant Dan Lee sent out an e-mail solicitation in February, writing that he needed \$600 because "the funding for this project unexpectedly fell through." Lee declined to comment on the status of the Web site.

The original source of the funds for the signs and the Web site has never been publicly identified.

But the Web site now lists sponsors including Antioch Councilman Arne Simonsen, San Ramon Councilman Dave Hudson and former Antioch Councilman Manny Solis.

Lisa Vorderbrueggen covers politics. Reach her at 925-945-477 or, lvorderbrueggen@ccltimes.com or via her blog at <http://www.cctextra.com/blogs/politicsblog/>.

Some comments posted below may be reviewed before they are displayed, including submissions with hyperlinks or with language that our word filters flag.

Comments:

This is really weird, I thought Seeno was the guy who put up the signs asking to WidenHwy4. Im sure of it. All of the signs were on Seeno private property. Didnt Seeno propose the Buchanan Road Bypass? How can you say want to widen highway 4 and be against it at the same time? What is really going on?

Lets see.... if the current annexation proceedings go through, the Seeno family plans to build approximately 2000 more homes in the hills of Pittsburg. My guess is their plans arent going very well and they now know that we all think Enough is Enough. Or, maybe this is Seenos way of bullying Pittsburg into seeing things his way. I dont really know, only time will tell. I do know that this is all pretty strange.

I say, if you dont like the new fees take your business elsewhere. I would rather see our beautiful hills left alone anyway.

Posted by: Enough is Enough 3/13/2007 11:19 PM.

[Back to top](#)

[Sitemap](#) | [Terms of use](#) | [Privacy policy](#) | [Contact Us](#)

Copyright © 2006-2008 Friends of Pittsburg - [Contact Us](#)

From: Elizabeth Patterson
To: hwg790@comcast.net
Date: 8/28/2008 11:14:41 AM
Subject: Re: Seeno vote

Dear Heather and Jeff,

Thank you for your thoughts on the Seeno Project.

I will share your email with the council members and staff.

Elizabeth Patterson
Mayor

>>> "Heather Graves" <hwg790@comcast.net> 08/27/08 9:35 PM >>>

Dear Mayor Patterson ,

I am writing to urge you to "vote to deny" on Oct 7 when the Seeno project again comes before you. The current plan is outdated and extremely flawed. Lets get something built which will draw technology, not big box retail, something that will employ our citizens for years to come in a sustainable green tech campus. The project as it stands is also bad for East Second Street--air quality will be affected, the grading will be unattractive. Last but not least is the reputation of Seeno for violating federal, state and local laws and their links to felons and drug dealers. They are toying with Benicia and our future so they can make a fast buck and leave us with a decimated open space.

Thank you,
Heather and Jeff Graves
254 Semples Crossing
Benicia

CC: acardwell@ci.benicia.ca.us

Rethinking the Benicia Business Park ...

Green Gateway Business Community

A 21ST CENTURY POSSIBILITY



Prepared by Benicia citizens
organized as the Green Gateway Group

September, 2008

VIII-B-265

Disclosure

The Green Gateway Group fully believes that the Benicia City Council has sufficient data, facts, information, and legal opinion from numerous sources to fully deny the current project as proposed by Discovery Builders.

This document is not intended and shall not be used as grounds for the Benicia City Council to deny the current project as proposed.

We are simply formulating possibilities, based on our research and discussion with visionaries in the industry. We are not presenting an Alternative Project. We are simply taking a positive step in presenting a framework for a 21st Century vision.

Green Gateway Group
September, 2008

GREEN GATEWAY BUSINESS COMMUNITY

A 21st Century Possibility

CONTENTS

Disclosure	p. 2
Introduction and Summary	p. 4
Context and Framework under which this development model was prepared	p. 5
Benicia General Plan	p. 5
California Assembly Bill 32	p. 7
A definition of Sustainability	p. 10
The Green Gateway Business Community - Basics for a 21st Century plan	
Transportation is the key to air quality	p. 11
Protection of habitat, streams	p. 12
A profitable development that serves the City of Benicia	p. 12
Guidelines / Goals / Types of Companies and Businesses	p. 13
Comparison: Seeno and the Green Gateway Vision	p. 14
Sample Sustainability Report Card (Checklist)	p. 15
Maps and Drawings (description)	p. 19
Google Earth Map	p. 20
Map of Key Constraints	p. 21
Clean Technology – Green Innovation for 21 st Century Challenges	p. 22
Overview	p. 22
Green Gateway	p. 22
Green Innovation Zone	p. 22
The Case for Clean Technology	p. 23
Components of the Green Innovation Zone	p. 25
Photos of Campus-Style Projects	p. 27
Advantages for All Parties	p. 32
A Rough Timeline for Development	p. 32
Advocating that Benicia Undertake Development of a Specific Plan	p. 34
Appendices	
A. About Specific Plans	p. 35
B. About the possibility of a Citizen Sponsored Referendum and Ballot Initiative	p. 36

Introduction and Summary

Visionary 21st Century Planning based on a City-Sponsored Specific Plan

Benicia's Green Gateway Group proposes an achievable visionary business community in contrast to the current proposed project for Benicia Business Park. We believe the best way to achieve this goal is to exercise our right as citizens to encourage a Specific Plan. A Form-Based Code would provide the basis for a LEED-ND certified campus-style business community, with mixed-use retail/commercial, research and development, and light industrial uses.

We join our voices with a chorus of local citizens and professionals who have advised a vote to deny the current Seeno plan, which is archaic, unsustainable and unsuited to the future. We believe that Benicia needs a 21st Century alternative that would be forward-looking and specific in its vision. We also recognize that a developer needs to be advised clearly by the citizens as to what we would require, what we want, and what would and would not be acceptable.

To do this, the City Council must deny the current project and direct staff to seek input from all parties, including the public, in the writing of a Specific Plan (a sub-set of our City's General Plan, written for a specific bounded section of the city). When adopted by our City Council, a Specific Plan would make all conditions of approval legally binding according to State of California law, and it would enable the City to conform to "AB32," the California "Global Warming Solutions Act," now approved and codified as Division 25.5 (commencing with Section 38500) of our California Health and Safety Code.

Industry Standard Sustainable Development

Our Green Gateway Business Community example follows current industry standards, calling for sustainable, profitable, green development. It envisions an environmentally sustainable and highly profitable research park, having its uses and activities guided by an overarching concept and focus on the emerging field of clean technology. There should be protections against grading slopes beyond 20% incline (a common development standard), a richer mixed-use layout, road alignment that will encourage greater walking and biking accessibility, an emission-free electric or low-emission hybrid public transit system to serve the entire city of Benicia, and Form-based code to guide the development of a livable and sustainable business *community*.

To make this visionary possibility more tangible in the minds of the public and our City Council and City staff, we plan to present an example of a Site Plan (map) and other illustrative documents, that show the topography and the proposed grading of the current proposed project as it contrasts with our recommended Green Gateway Business Community. And we will present still images of what a new project could look like with the least disruption to the site topography. Finally, we hope to present a rough example of a Specific Plan, showing how a community like Benicia, in partnership with a landowner and developer, can take charge of the direction in which local projects like this one move forward.

Good for the Community, Good for the Owner/Developer, Good for the World

We are hopeful that this work will help to create a profitable 21st Century sustainable development for our beloved town and our beautiful rolling hills. We ALL will be affected by whatever happens to the 527 acres of land at East Second and Lake Herman Road. The community will benefit in the development of a forward looking, campus style business community that will enhance and strengthen our economy and make us all proud of what we can do here in Benicia.

Context and Framework

We offer the following background information as a way of placing the Green Gateway Business Community in the wider context of (1) Benicia's General Plan, (2) California Assembly Bill AB32, the California Global Warming Solutions Act (now a section of our California Health and Safety Code), and (3) an understanding of "sustainability."

1. General Plan goals

Benicia's General Plan governs all forms of community development and lays out goals for Sustainability, Identity and Health and Safety. Our General Plan is the law in Benicia. A summary of relevant and applicable goals follows. The whole General Plan is an integrated document the overarching goal of which is sustainability. All goals and policies contribute to the whole, therefore the following is not an exhaustive list.

Community Development and sustainability - Growth Management

- 2.1 Preserve Benicia as a small sized city
- 2.2 Maintain lands near Lake Herman and north of Lake Herman Road in permanent agriculture/open space
- 2.3 Ensure orderly and sensitive site planning and design for large undeveloped areas of the city
- 2.4 Ensure that development pays its own way

Community Development and Sustainability - Economic Development

- 2.5 Facilitate and encourage new uses and development which provide substantial and sustainable fiscal and economic benefits
- 2.6 Attract and retain a balance of different kinds of industrial uses
- 2.7 Attract and retain industrial facilities that provide fiscal and economic benefit to Benicia

Community Development and Sustainability - Downtown

- 2.12 Strengthen the Downtown as the City's central commercial zone
- 2.13 Support the economic viability of existing commercial centers

Community Development and Sustainability - Circulation

- 2.14 Enhance Benicia's small town atmosphere of pedestrian-friendly streets and neighborhoods
- 2.15 Provide a comprehensive system of pedestrian and bicycle routes which link the various components of the community; employment centers, residential areas, commercial areas, schools, parks, open space
- 2.17 Provide an efficient, reliable and convenient transit system
- 2.18 Encourage the provision of convenient rail service to Benicia with a station near the Benicia Bridge
- 2.21 Encourage Benicia residents and employees to use alternatives to the single occupant automobile
- 2.22 Alleviate traffic near school sites
- 2.24 Continue to provide safe and direct access to the Industrial Park
- 2.26 Ensure that scenic and environmental amenities of I-680 and I-780 are not compromised
- 2.27 Ensure an active community deliberation process in response to Caltrans proposals now and in the future

Community Services - Parks

- 2.31 Maintains safety and parks/open space
- 2.32 Expand the City's park system to accommodate the city's future needs

Community Development and Sustainability - Community Services - Water

- 2.36 Ensure an adequate water supply for current residences and businesses
- 2.37 Identify and preserve groundwater resources
- 2.38 Protect water quality
- 2.40 Ensure adequate wastewater treatment capacity to serve all development shown in the General Plan

Community Development and Sustainability - Community Services - Recycling

- 2.42 Enhance the recycling of solid waste

Community Development and Sustainability - Community Services - Utilities

- 2.43 Allow installation of telecommunications equipment and distribution networks that maintain and protect health, safety and quality of life and avoid visual clutter

Community Identity - Historic Preservation

- 3.1 Maintain and enhance Benicia's historic character

Community Identity - Historic and Archaeological Resources

- 3.2 Protect archaeological (including underwater) sites and resources

Community Identity - Cultural

- 3.3 Increase public awareness of cultural resources and activities
- 3.5 Promote events with wide community attraction

Community Identity - Art

- 3.6 Support and promote the arts as a major element in Benicia's community

Community Identity - Visual character

- 3.7 Maintain and reinforce Benicia's small town visual characteristics
- 3.8 Preserve First Street as the community focal point of Benicia
- 3.9 Protect and enhance scenic roads and highways
- 3.10 Enhance the streetscape along Military East and West
- 3.11 Enhance the eastside
- 3.12 Improve the appearance of the Industrial Park

Community Health and Safety

- 4.1 Make community health and safety a high priority
- 4.6 Prevent and reduce crime in the community
- 4.7 Ensure that existing and future neighborhoods are safe from risks to public health that could result from exposure to hazardous materials
- 4.9 Ensure clean air for Benicia residents
- 4.10 Support improved regional air quality
- 4.11 Minimize harm from geologic hazards
- 4.12 Accommodate runoff from existing and future development
- 4.14 Prevent ground and surface water contamination
- 4.17 Minimize hazardous waste generation
- 4.23 Reduce or eliminate the effects of excessive noise

2. AB 32 - California Global Warming Solutions Act – (Passed by the California Assembly and approved by the Governor September 27, 2006). Our California Health and Safety Code relating to air pollution now mandates a reduction in greenhouse gas emissions back to the "1990 emissions baseline" by 2020. By 2020 the bill would require the state board to adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with this program. The bill defines "greenhouse gas emissions limit" as an authorization, during a specified year, to emit up to a level of greenhouse gases specified by the state board, expressed in tons of carbon dioxide equivalents. (Greenhouse gas or greenhouse gases includes all of the following gases: carbon dioxide, methane, nitrous oxide, hydroflourocarbons, perfluorocarbons, and sulphur hexaflouride.)

Greenhouse gas emissions predominantly come from Transportation (38%), Industry (20%) and Electricity (23%) according to a study of 2002-2004 by the Air Resources Board. When considering any development, it is clear that the City's responsibility lies in encouraging reduction in traffic and alternate transportation solutions, green-tech solutions to building and alternative sources of energy.

The AB32 goal should primarily be achieved through innovative land-use and transportation strategies to (1) reduce per capita "vehicle miles traveled"; and (2) reduce buildings' energy consumption, through following LEED Neighborhood Development Rating System criteria for the entire buildable site area. An example of the kind of plan seeking to meet sustainability criteria under AB32 is the Rohnert Park "Sonoma Mountain Village" development. "Toward Sustainability: The Rohnert Park Story", the presentation by Jake Mackenzie, Mayor, City of Rohnert Park, to the Haagen-Smit Symposium, April 2008.].

From the Attorney General's Office, titled: "The California Environmental Quality Act – Addressing Global Warming Impacts at the Local Agency Level", comes the following recommendations that local agencies can require of development projects in order to carry out their duties under CEQA as they relate to Global Warming and AB32: (See <http://ag.ca.gov>)

Energy Efficiency

- Design buildings to be energy efficient. Site buildings to take advantage of shade, prevailing winds, landscaping and sun screens to reduce energy use.
- Install efficient lighting and lighting control systems. Use daylight as an integral part of lighting systems in buildings.
- Install light colored "cool" roofs, cool pavements, and strategically placed shade trees.
- Provide information on energy management services for large energy users.
- Install energy efficient heating and cooling systems, appliances and equipment, and control systems.
- Install light emitting diodes (LEDs) for traffic, street and other outdoor lighting.
- Limit the hours of operation of outdoor lighting.
- Use solar heating, automatic covers, and efficient pumps and motors for pools and spas.
- Provide education on energy efficiency.

Renewable Energy

- Install solar and wind power systems, solar and tankless hot water heaters, and energy- efficient heating ventilation and air conditioning. Educate consumers about existing incentives.
- Install solar panels on carports and over parking areas.
- Use combined heat and power in appropriate applications.

Water Conservation and Efficiency

- Create water-efficient landscapes.
- Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls.
- Use reclaimed water for landscape irrigation in new developments and on public property.

Install the infrastructure to deliver and use reclaimed water.

- Design buildings to be water-efficient. Install water-efficient fixtures and appliances.
- Use graywater. (Graywater is untreated household waste water from bathtubs, showers, bathroom wash basins, and water from clothes washing machines.) For example, install dual plumbing in all new development allowing graywater to be used for landscape irrigation.
- Restrict watering methods (e.g., prohibit systems that apply water to non-vegetated surfaces) and control runoff.
- Restrict the use of water for cleaning outdoor surfaces and vehicles.
- Implement low-impact development practices that maintain the existing hydrologic character of the site to manage storm water and protect the environment. (Retaining storm water runoff on-site can drastically reduce the need for energy-intensive imported water at the site.)
- Devise a comprehensive water conservation strategy appropriate for the project and location. The strategy may include many of the specific items listed above, plus other innovative measures that are appropriate to the specific project.
- Provide education about water conservation and available programs and incentives.¹⁶

Solid Waste Measures

- Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).
- Provide interior and exterior storage areas for recyclables and green waste and adequate recycling containers located in public areas.
- Recover by-product methane to generate electricity.¹⁷
- Provide education and publicity about reducing waste and available recycling services.¹⁸

Land Use Measures

- Include mixed-use, infill, and higher density in development projects to support the reduction of vehicle trips, promote alternatives to individual vehicle travel, and promote efficient delivery of services and goods.¹⁹
- Educate the public about the benefits of well-designed, higher density development.²⁰
- Incorporate public transit into project design.
- Preserve and create open space and parks. Preserve existing trees, and plant replacement trees at a set ratio.
- Develop "brownfields" and other underused or defunct properties near existing public transportation and jobs.
- Include pedestrian and bicycle-only streets and plazas within developments. Create travel routes that ensure that destinations may be reached conveniently by public transportation, bicycling or walking.²¹

Transportation and Motor Vehicles

- Limit idling time for commercial vehicles, including delivery and construction vehicles.
- Use low or zero-emission vehicles, including construction vehicles.
- Promote ride sharing programs e.g., by designating a certain percentage of parking spaces for ride sharing vehicles, designating adequate passenger loading and unloading and waiting areas for ride sharing vehicles, and providing a web site or message board for coordinating rides.
- Create car sharing programs. Accommodations for such programs include providing parking spaces for the car share vehicles at convenient locations accessible by public transportation.²²
- Create local "light vehicle" networks, such as neighborhood electric vehicle (NEV) systems.
- Provide the necessary facilities and infrastructure to encourage the use of low or zero- emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations).
- Increase the cost of driving and parking private vehicles by, e.g., imposing tolls and parking fees.
- Build or fund a transportation center where various public transportation modes intersect.
- Provide shuttle service to public transit.
- Provide public transit incentives such as free or low-cost monthly transit passes.
- Promote "least polluting" ways to connect people and goods to their destinations.²⁴
- Incorporate bicycle lanes and routes into street systems, new subdivisions, and large developments.
- Incorporate bicycle-friendly intersections into street design.
- For commercial projects, provide adequate bicycle parking near building entrances to promote cyclist safety, security, and convenience. For large employers, provide facilities that encourage bicycle commuting, including, e.g., locked bicycle storage or covered or indoor bicycle parking.
- Create bicycle lanes and walking paths directed to the location of schools, parks and other destination points.
- Work with the school district to restore or expand school bus services.
- Institute a telecommute work program. Provide information, training, and incentives to encourage participation
- Provide incentives for equipment purchases to allow high- quality teleconferences.
- Provide information on all options for individuals and businesses to reduce transportation-related emissions.
- Provide education and information about public transportation.

Off-Site Mitigation

If, after analyzing and requiring all reasonable and feasible on-site mitigation measures for avoiding or reducing greenhouse gas-related impacts, the lead agency determines that additional mitigation is required, the agency may consider additional off-site mitigation. The project proponent could, for example, fund off-site mitigation projects (e.g., alternative energy projects, or energy or water audits for existing projects) that will reduce carbon emissions, conduct an audit of its other existing operations and agree to retrofit, or purchase carbon "credits" from another entity that will undertake mitigation.

The topic of offsets can be complicated, and a full discussion is outside the scope of this

summary document. Issues that the lead agency should consider include:

- The location of the off-site mitigation. (If the off-site mitigation is far from the project, any additional, non-climate related benefits of the mitigation will be lost to the local community.)
- Whether the emissions reductions from off-site mitigation can be quantified and verified.
- Whether the mitigation ratio should be greater than 1:1 to reflect any uncertainty about the effectiveness of the offset.

3. Sustainability defined ...

Sustainability is defined as "development that meets the needs of the present without compromising the future generations to meet their own needs". It is about balance between environmental protections, social equity and economic performance, the three major components of sustainability, and about balance between short and longer term returns on public and private investment.

Environmental Considerations

- Meet US Green Building Council LEED-ND Certification standards for building and site design
- Account for and protect ecological systems and functions
- Incorporate a "green building" approach for future development
- Maximize pedestrian circulation modes
- Provide for alternative/renewable energy use - work toward "energy neutral" development
- Safely and efficiently accommodate traffic with out adverse impact to surrounding community
- Develop alternative public transportation modes and efficient connectivity between them
- Promote water conservation/gray water use

Social Equity

- Create active, vibrant "public places" that gather people and lend a special sense of identity to the community
- Maintain open space and provide wide range of passive and active public recreational opportunities
- Provide employment opportunities that are in synch with community
- Contribute to critically needed solutions to regional transit and transportation issues
- Recognize any regional significance and strive to ensure that it positively impacts its surrounding community (ies)
- Provide site opportunities for public art and education to contribute to public understanding of the site - history, ecology, sustainability mission

Economics

- Enhance a city's tax base and future ability to improve services within the city
- Establish a project which remains economically viable on a long term basis, including excellence in architecture that can stand the test of time
- Build in flexibility so a project can adapt to changing market conditions
- Provide jobs and other choices for residents that may not be available currently

(The above information was adapted from Brisbane, California's Baylands Plan

The Green Gateway Business Community - Basics for a 21st Century plan

Transportation is key to air quality.

Fully 38% of the greenhouse gases in our Bay Area air comes from automobiles. It is simply no longer an acceptable alternative to develop new retail and industrial land usages that fail to take this into account.

A 21st Century development must be planned in such a way as to keep trip generation at a minimum. We need to enable and encourage many if not most of those fewer trips to be made on foot and by bicycle, and on clean-tech public transit. In this way, a primary goal of the Green Gateway Business Community is to provide alternatives to cars.

We propose:

1. A much smaller development, (fewer lots on less acreage, less grading, fewer square feet of building space) with accordingly fewer trips to and from the Business Community (see also the Comparison Table A1 on page 10). In summary, the acreage of the Green Gateway Business Community would comprise:
 - 100 acres of Research & Development and other office and limited industrial use
 - 15 acres of mixed commercial use: hotel, retail (no big box) and office (no residential)
 - 12 acres roads
 - 2 million square yards of grading
 - 400 acres open space
 - 1.5 million square feet of Research and Development, office and other limited industrial building space
 - 300,000 square feet of mixed use (office and retail, but no residential) business space
 - 1.8 million square feet total buildings
2. Plentiful pedestrian and bicycle paths within the Community, and whenever possible, interconnected streets (as opposed to cul-de-sacs). This design would encourage foot and bicycle traffic.
3. Focus most business and industrial uses on cleantech R&D and related commerce, so that Green Gateway becomes known and recognized as a central cleantech hub in the emerging East Bay/Sacramento Green Corridor. By focusing on cleantech R&D and University collaboration, the Park would create a good job match for Benicia's employment demographics, thereby reducing commute traffic. A clean tech green-collar training center would generate a skilled green-collar workforce for the many businesses on site and elsewhere.
4. A distribution of commerce and retail throughout the acreage rather than concentrated near Interstate 680. This retail and commerce would primarily serve the Community itself, and would result in much less traffic off Interstate 680, although high-quality restaurants and other commercial ventures would appeal to hotel and retreat center guests, Benicians and others from nearby cities.
5. An Intermodal Transportation hub and shuttle service – paid for through assessment district financing – (note for example, Emeryville, CA), to cut down on trips from other cities.
6. Minimal parking which would encourage use of connector buses.
7. A citywide local transit system of electric – or hybrid -- short buses (vans or cutaways) and a system of elegantly designed bus stops to serve all of Benicia. Buses would run frequently enough to make car trips to and from the Green Gateway Business Community (and elsewhere in Benicia) unnecessary in most cases.

Protection of Habitat, Streams

Benicians love the hills and open space that surround our beautiful city. For aesthetic reasons, then, as well as the increasingly urgent environmental imperatives, the Green Gateway Business Community will preserve and enhance the natural and pastoral beauty of the original hills, valleys and streams. Those who do business in the community will enjoy a park-like setting.

We propose:

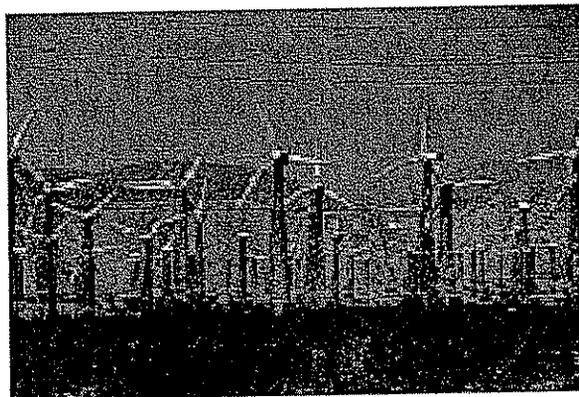
- No grading resulting in slopes over 20%
- 200 foot wide buffers on each side of all creeks, drainages, swales and other wetlands.
- 75% open space
- No extension of Industrial Road to Lake Herman

A profitable development that serves the City of Benicia

Our research shows that the Green Gateway Business Community, while substantially smaller than ventures proposed for this location in the past, meets and exceeds industry standards for profitability. In developers' terms, the project "pencils." Development of 127 acres will enrich the owners, developers, contractors and builders, bring significant new jobs, and serve the City of Benicia and its citizens throughout a 21st Century that promises to unfold like no previous era in human history.

Cleantech R&D is projected to be the most vigorous and growth oriented business sector in the coming decades. Additionally, the activities of cleantech R&D provide a good match for our employment demographics, offering a wide spectrum of jobs for Benicians from skilled labor to scientific and professional. The project will put Benicia on the map as a leader in clean technology, will strengthen the overall economy in Benicia and in the San Francisco Bay Area, and will draw new research and development that is key to combating climate change and growing a more sustainable world.

(For more, refer to "Clean Technology Green Innovation for 21st Century Challenges" pp. 16-20 below)



Guidelines / Goals / Types of Companies and Businesses

GGG Brainstorm

Guidelines

- Leeds Certifications (Gold if possible)
- Form based Code
- Meets the requirements of Benicia's General Plan
- Sustainable under California law (AB32)
- Visionary
- 21st century
- 0 Carbon footprint
- Clean tech / Green tech R&D
- Net positive energy outflow
- This is a venue for Benicia, not for tourists

Goals

- Intermodal transport site
- Connect to electric trolley service that connects BIP, downtown, Yuba, Arsenal, Rose Drive business, Southampton, Community Park etc
- Walking/biking trails
- Connecting streets
- Pay attention to the creek/bridges over the creeks
- Lots of trees
- Keep hills, no more than 20% grading
- Anchor companies placed like a spider web
- Campus style
- Mixed use means retail below, office above (not residential)
- Parks, small areas of rest
- Pool, lake
- Playground
- Vista points
- View corridors
- Use wind, solar
- Community garden

Types of companies/buildings

At a minimum, the Green Gateway Business Community would be **built** green, and every business/occupant would commit to a green operation. An even better option would be for the Community to foster only businesses/occupants that are generating clean-tech research, development and manufacture. Our group favors the latter option. We envision a hotel, conference center and restaurants to serve the Green Gateway, and mixed use distribution of additional retail to serve the business community, along with R&D and light industry.

COMPARISON: SEENO AND THE GREEN GATEWAY VISION

The Green Gateway model would result in an estimated 78% reduction in traffic over Seeno's 2007 proposal based on trip generation alone. With an intermodal transit station, on-campus shuttle service and an electric or hybrid transit system serving all of Benicia, there would be even greater reductions.

The Green Gateway Business Community model is a 21st Century design that will be profitable for the developer within industry standards. The time necessary for all parties to agree on a revised project along these lines, (about a year), will be much less than a protracted lawsuit over the suitability of the currently proposed project.

Seeno 2007	Seeno 2008	Green Gateway Vision
80 lots	80 lots	lots as needed
280 acres light industrial	150 acres light industrial (54% of 2007)	100 acres of primarily Research and Development / clean-tech / light industrial (67% of 2008)
35 acres highway commercial	35 acres highway commercial (no change)	15 acres hotel, mixed use retail and office, no big box, spread throughout the project (43% of 2007/2008)
32 acres roads	30 acres roads (94% of 2007)	12 acres roads (40% of 2008)
180 acres open space	313.2 acres open space (174% of 2007)	400 acres open space (128% of 2008)
527.8 acres total	527.8 acres total	527.8 acres total
9 million square yards grading	4 million square yards grading (44% of 2007)	2 million square yards grading (50% of 2008)
4.44 million sq. ft. light industrial building space	2.4 million sq. ft. light industrial building space (54% of 2007)	1.5 million sq. ft. of primarily Research & Development / clean-tech business space (62% of 2008)
857,000 sq. ft. of commercial building space	857,000 sq. ft. of commercial building space (no change)	300,000 sq. ft. of mixed use retail & office building space (35% of 2007/2008)
5.3 million sq. ft. total building space	3.3 million sq. ft. total building space (62.3% of 2007)	1.8 million sq. ft. total building space (55% of 2008)

Sample: Monterey Sustainability Checklist
A possible source for a report card
comparing Seeno and the Green Gateway Vision

Source: http://www.monterey.org/building/greenbuilding/docs/Monterey_GBP_NonResInstructions.doc

NON-RESIDENTIAL NEW CONSTRUCTION TOTAL POINT REQUIREMENTS

Total Points Possible	69
<i>Action</i>	<i>Points required to receive action</i>
Receipt of Building Permit - New construction project over 500 sq.ft.	15
Green Building Award and Incentive Level	33

GREENPOINTS CHECKLIST FOR NON-RESIDENTIAL PROJECTS

(Based on USGBC's LEED v2.2 Guidelines, directions can be found on the Monterey Green Building Program web site, <http://www.monterey.org/building/greenbuilding/>)

A. Sustainable Sites		Total	Green Gateway Vision	Seeno
		Required		
Prereq 1	Construction Activity Pollution Prevention	1		
Credit 1	Site Selection	1		
Credit 2	Development Density & Community Connectivity	1		
Credit 3	Brownfield Redevelopment	1		
Credit 4.1	Alternative Transportation, Public Transportation Access	1		
Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1		
Credit 4.3	Alternative Transportation, Low-Emitting & Fuel-Efficient	1		
Credit 4.4	Alternative Transportation, Parking Capacity	1		
Credit 5.1	Site Development, Protect or Restore Habitat	1		
Credit 5.2	Site Development, Maximize Open Space	1		
Credit 6.1	Stormwater Design, Quantity Control	1		
Credit 6.2	Stormwater Design, Quality Control	1		
Credit 7.1	Heat Island Effect, Non-Roof	1		
Credit 7.2	Heat Island Effect, Roof	1		
Credit 8	Light Pollution Reduction	1		

		Sustainable Sites Total Available Points	14		
--	--	---	-----------	--	--

B. Water Efficiency		Total			
----------------------------	--	--------------	--	--	--

Credit 1.1	Water Efficient Landscaping, Reduce by 50%		1		
Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation		1		
Credit 2	Innovative Wastewater Technologies		1		
Credit 3.1	Water Use Reduction, 20% Reduction		1		
Credit 3.2	Water Use Reduction, 30% Reduction		1		
		Water Efficiency Total Available Points	5		

C. Energy & Atmosphere		Total			
-----------------------------------	--	--------------	--	--	--

Prereq 1	Fundamental Commissioning of the Building Energy Systems		Required		
Prereq 2	Minimum Energy Performance		Required		
Prereq 3	Fundamental Refrigerant Management		Required		
Credit 1	Optimize Energy Performance		1-10 points		
	10.5% New Buildings or 3.5% Existing Building Renovations		1		
	14% New Buildings or 7% Existing Building Renovations		2		
	17.5% New Buildings or 10.5% Existing Building Renovations		3		
	21% New Buildings or 14% Existing Building Renovations		4		
	24.5% New Buildings or 17.5% Existing Building Renovations		5		
	28% New Buildings or 21% Existing Building Renovations		6		
	31.5% New Buildings or 24.5% Existing Building Renovations		7		
	35% New Buildings or 28% Existing Building Renovations		8		
	38.5% New Buildings or 31.5% Existing Building Renovations		9		
	42% New Buildings or 35% Existing Building Renovations		10		
Credit 2	On-Site Renewable Energy		1-3 points		
	2.5% Renewable Energy		1		
	7.5% Renewable Energy		2		
	12.5% Renewable Energy		3		

Credit 3	Enhanced Commissioning	1		
Credit 4	Enhanced Refrigerant Management	1		
Credit 5	Measurement & Verification	1		
Credit 6	Green Power	1		
	Energy & Atmosphere Total Available Points	17		

D. Materials & Resources

Total

Prereq 1	Storage & Collection of Recyclables	Required		
Credit 1.1	Building Reuse , Maintain 75% of Existing Walls, Floors & Roof	1		
Credit 1.2	Building Reuse , Maintain 100% of Existing Walls, Floors & Roof	1		
Credit 1.3	Building Reuse , Maintain 50% of Interior Non-Structural Elements	1		
Prereq 2	Construction Waste Management , 100% non-hazardous construction material taken to a bonafide facility	Required		
Credit 2.1	Construction Waste Management , Divert 50% from Disposal	1		
Credit 2.2	Construction Waste Management , Divert 75% from Disposal	1		
Credit 3.1	Materials Reuse , 5%	1		
Credit 3.2	Materials Reuse , 10%	1		
Credit 4.1	Recycled Content , 10% (post-consumer + ½ pre-consumer)	1		
Credit 4.2	Recycled Content , 20% (post-consumer + ½ pre-consumer)	1		
Credit 5.1	Regional Materials , 10% Extracted, Proc. & Man. Regionally	1		
Credit 5.2	Regional Materials , 20% Extracted, Proc & Man. Regionally	1		
Credit 6	Rapidly Renewable Materials	1		
Credit 7	Certified Wood	1		
	Materials & Resources Total Available Points	13		

E. Indoor Environmental Quality

Total

Prereq 1	Minimum IAQ Performance	Required		
Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required		
Credit 1	Outdoor Air Delivery Monitoring	1		
Credit 2	Increased Ventilation	1		
Credit 3.1	Construction IAQ Management Plan , During Construction	1		

Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1		
Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1		
Credit 4.2	Low-Emitting Materials, Paints & Coatings	1		
Credit 4.3	Low-Emitting Materials, Carpet Systems	1		
Credit 4.4	Low-Emitting Materials, Composite Wood & Agrifiber Products	1		
Credit 5	Indoor Chemical & Pollutant Source Control	1		
Credit 6.1	Controllability of Systems, Lighting	1		
Credit 6.2	Controllability of Systems, Thermal Comfort	1		
Credit 7.1	Thermal Comfort, Design	1		
Credit 7.2	Thermal Comfort, Verification	1		
Credit 8.1	Daylight & Views, Daylight 75% of Spaces	1		
Credit 8.2	Daylight & Views, Views for 90% of Spaces	1		
	Indoor Environmental Quality Total Available Points	15		

F. Innovation & Design Process

Total

Credit 1.1	Innovation in Design: Provide Specific Title	1		
Credit 1.2	Innovation in Design: Provide Specific Title	1		
Credit 1.3	Innovation in Design: Provide Specific Title	1		
Credit 1.4	Innovation in Design: Provide Specific Title	1		
Credit 2	LEED® Accredited Professional	1		
	Innovation & Design Process Total Available Points	5		
Total Available Non-Residential Points		69		

Maps and Drawings

Table I - Google Earth map (p. 20)

A rough mock-up showing some of what could be

Table II - Map of Key Constraints - showing the Seeno plan (p. 21)

Note especially the red-orange shading showing the current proposal's grading cuts. These cuts are all 30% or over. Many communities have adopted a minimum standard maximum grading of 20%.

The map also shows the streams in blue, with 100 foot green buffer zones on each side of all streams.

The brown shading shows where proposed cuts impinge on existing streams.

Table I – GOOGLEEARTH MOCK-UP, showing some of what could be

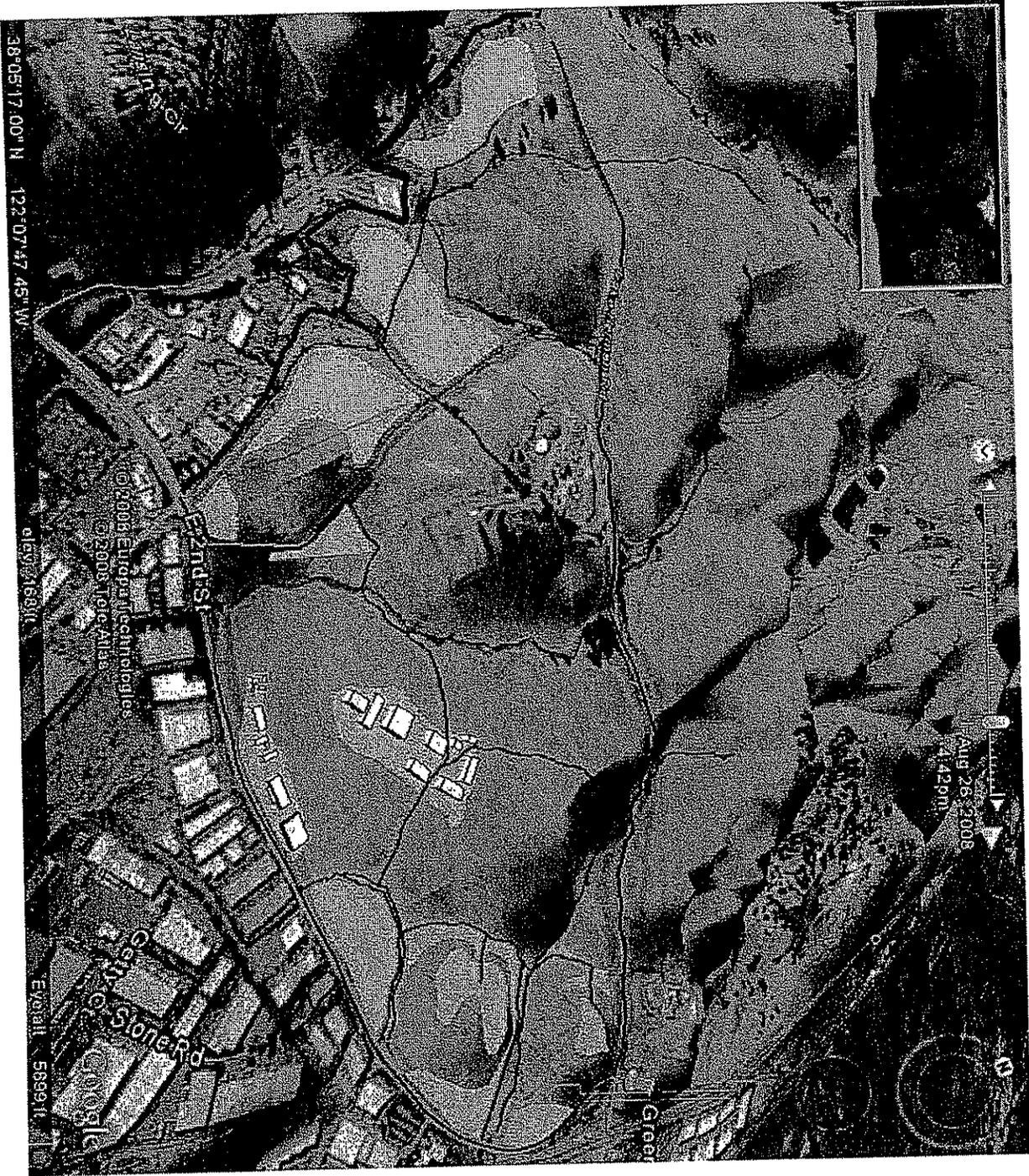
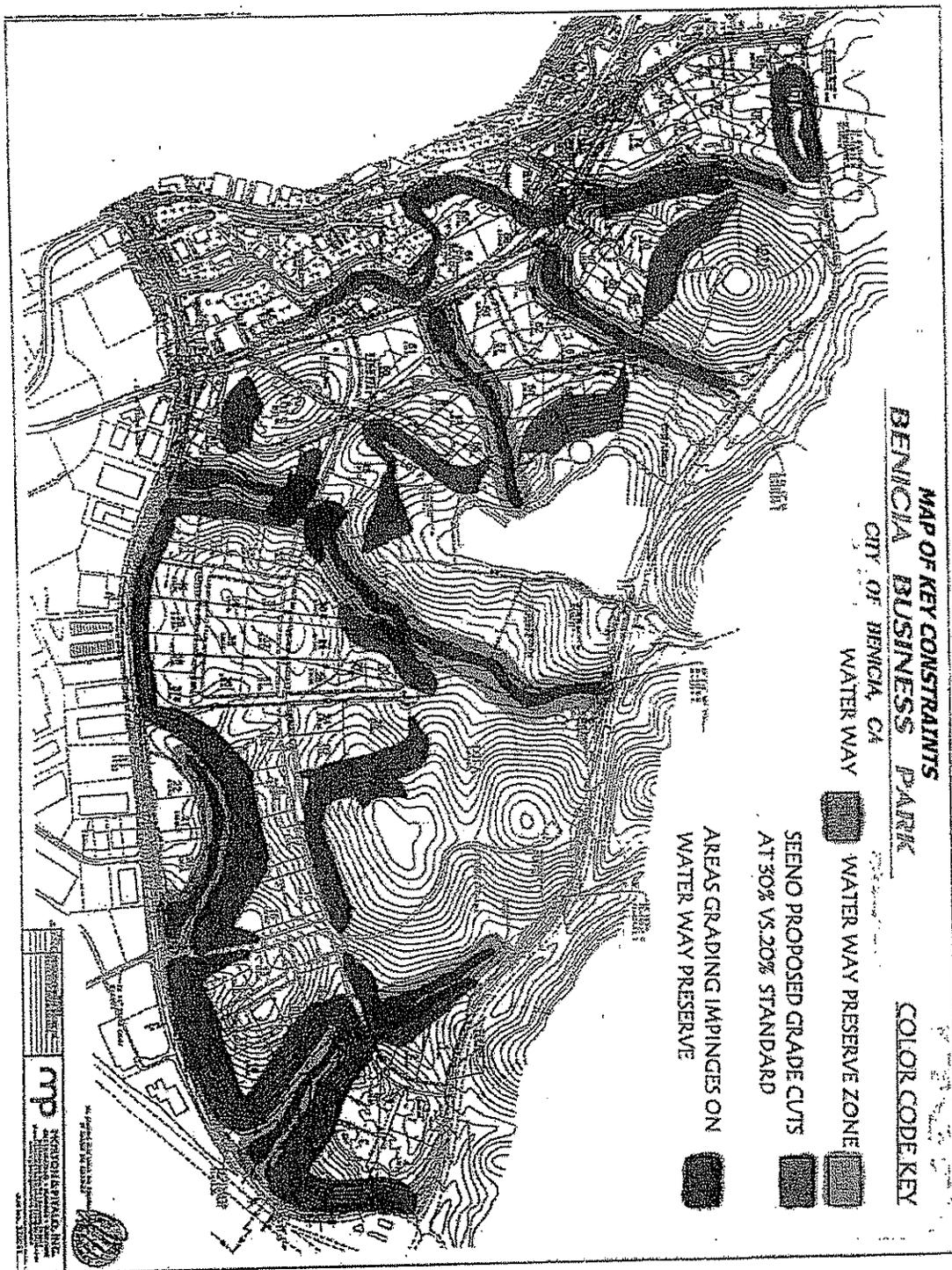


Table II - MAP OF KEY CONSTRAINTS



Clean Technology Green Innovation for 21st Century Challenges

OVERVIEW¹

The most serious challenge that we face in the 21st Century is the dangerous rise in global warming. A parallel and related problem is the sharply increasing price of imported oil. Our over-dependence on fossil fuels lies at the root of both of these problems. Government, industry, and investors are now mobilizing an all out effort to address this problem through the development of new technologies aimed at reducing our use of carbon based fossil fuels. The Bay Area is emerging as a major national leader in this burgeoning new field of clean technology.

Benicia is ideally situated to become an important part of the solution to this challenge. The huge space available in our proposed business park, combined with our proximity to UC Berkeley and UC Davis – two of the key cleantech research centers – creates a golden opportunity for Benicia to focus the activities of its business park on the generation of clean technologies which will help reduce carbon emissions while producing new businesses and high quality "green collar" jobs.

GREEN GATEWAY Portal to Clean Technology Innovation

With cleantech as its overarching theme, Benicia's Green Gateway Business Community could become a major Bay Area focal point for developing, testing, and commercializing clean technologies. The high market demand in this sector is projected to continue to increase, even as other sectors of the economy are sagging. Venture capital investments in cleantech have doubled and tripled in just the last 2-3 years. The State of California actively promotes policies (such as AB 32) that curb greenhouse gas emissions, and offers encouragement and support, and many incentives and rewards, for green business initiatives that help to reduce our consumption of fossil fuels.

A business park with clean technology as its central concept and focus (for both its industrial and its commercial uses) would have an enormously positive economic impact on Benicia:

- Thriving and growing cleantech business activity would provide reliable revenue for the city.
- Cleantech offers a wide spectrum of high quality jobs.
- Cleantech provides good job match for Benicia employment demographics, thus improving housing/jobs balance and reducing commuters.
- Economic multiplier effect: the project and its employees would boost sales at other local businesses and keep money re-circulating in local economy.
- Cleantech businesses would not compete with downtown businesses or contribute to urban decay of our downtown business district.

GREEN INNOVATION ZONE

Green Gateway would be much more than simply a collection of industrial facilities and offices focused on cleantech activities. It would be a comprehensive "green innovation zone" with a full

¹ Our Thanks to Doug Henton of Collaborative Economics (www.coecon.com) whose writings have inspired many of the ideas in this model relating to cleantech as the central concept and focus for the business community.

spectrum of mutually supportive components grouped into the following areas:

Education and Research Commons

A Conference Center and educational campus would offer space for institutions such as UC Berkeley, Lawrence Berkeley Lab, UC Davis, State colleges, and Solano Community College to create an interdisciplinary gathering place for top global talent from academic, business, technical and policy areas. The commons would be a focal point for active idea exchange, research collaborations, and a wellspring for innovations with potential commercial applications. It would offer comprehensive specialized education and training programs, from green-collar job training to post graduate research.

Green Innovation Test Bed

A combination of shared facilities, equipment, and simulation environments would help researchers and entrepreneurs develop and test their new technologies and products. The clean technology field has greater capital equipment needs than many other fields, so cost effective and accessible use of specialized facilities and equipment is particularly important to support innovation.

Green Business Launching Pad

Venture capital-backed early-stage enterprises would benefit from on-site assistance and use of support services, where they could exchange innovative ideas with other start-ups and larger firms, showcase emerging products for potential investors and other collaborators, and introduce products into the global marketplace.

Anchor Innovator Businesses

Large established businesses would act not only as generators of new technologies and products, but also as technology development partners and early customers for the products of new and smaller firms. These anchor firms would also provide a long term presence that would help accelerate development of the other components of the business park.

Green Exposition Center

An Exposition Center would offer demonstrations of new models, products and processes. There is tremendous opportunity to create a comprehensive, practical demonstration to the general public of how people can use clean technology at home, work, and for transportation. The Expo Center would welcome visitors from the region and worldwide to see and experience these existing and emerging green applications.

THE CASE FOR CLEAN TECHNOLOGY

What is Clean Technology?

Establishing a clear accounting of the growing number of businesses with primary activities in providing environmentally sustainable products and services is challenging. According to Clean Edge, a cleantech research firm, clean technology is "a diverse range of products, services, and processes that harness renewable materials and energy sources, dramatically reduce the use of natural resources, and cut or eliminate emissions and wastes."

Cleantech businesses span a wide range of industry categories. They provide services designed to,

- Greatly reduce or eliminate negative ecological impact
- Improve the productive and responsible use of natural resources
- Provide superior performance at lower costs.

Cleantech business activities can be broken down by the following broad segments:

- Energy generation
- Energy Storage
- Energy Infrastructure
- Energy Efficiency
- Transportation
- Water & Wastewater

- Air & Environment
- Materials
- Manufacturing/Industrial
- Agriculture
- Recycling & Waste

[Note: to better attract cleantech companies to our business community, cleantech and allowable cleantech uses should be added to our zoning code for Light Industrial districts (IL)]

Clean Technology Jobs

Clean technology jobs can be found in almost every industry sector and they cover a wide spectrum of jobs including skilled labor, management, office support services, engineering, scientific, and more. Two of the largest industry sectors represented by green business establishments are Professional Scientific & Technical Services (representing 36% of the business establishments and 28% of employment), and Manufacturing (representing 15% of the business establishments and 41% of the employment). Retail Trade represents an additional 9% of green business establishments and 3% of employment. ¹

The type of clean technology business park that is envisioned in this model (with its emphasis on science and engineering innovation and collaboration with Universities) would provide an excellent match for Benicia's education and employment demographics. Census 2000 showed that Benicia's population of 27,000 is above average for both income and education, relative to both the County and the State -- 37% of Benicia adults had a bachelor's degree or higher, compared to 27% in California, and 24% nationally. The Census 2000 data also showed that white-collar professions (management, office, sales, etc.) were predominant among the 14,139 employed residents. By far, the largest occupation category for Benicia residents was management/professional/related, consisting of 46% of the total. Most of these residents currently have to commute out of town for work. The 2000 Census only showed 4080 people who lived and worked in Benicia. ²

Cleantech has Strong Market Potential

The Cleantech Network, in a press release for their report called Cleantech Venture Capital: How Public Policy Has Stimulated Private Investment noted that:

Investments in the clean technology sector soared in 2006, as venture capitalists increased investments by 78 percent to \$2.9 billion. Experts say the market is hot amidst concern about global warming, higher energy prices, improved technology, and public policies enacted at the state and national levels. The report also found that cleantech is now the third largest venture investment category, ahead of telecommunications and medical devices. Venture capital investments in the cleantech sector are projected to exceed \$19 billion by 2010 and create up to 500,000 new jobs. However, further public policy initiatives, such as cap-and-trade, a national renewable energy standard, and increased public funding for research and development, are likely to accelerate cleantech investments.

Research Funding and Commercial Applications

UC Berkeley, Lawrence Berkeley Lab, and UC Davis have all been recipients of large amounts of funding, totaling hundreds of millions of dollars, for clean technology development. For example, in Jan. 2007, the Energy Biosciences Institute was established by BP, and UC Berkeley and LBL will receive \$500 million from BP to host the research center dedicated to developing biofuel technologies. Another project at LBL, the Helios Project, is focused on producing the next generation of super-efficient solar energy technology. Governor Schwarzenegger dedicated \$30 million in bonds for that project in Dec. 2006. In April 2008, the UC Davis Energy Efficiency Center received a boost of \$1.1 million in corporate funding to continue its energy efficiency research in areas related to lighting, cooling, transportation, agriculture, and biomass.

¹ Clean Technology and the Green Economy, March 2008, Collaborative Economics, p.15

² Benicia Economic Development Strategy, Sept.2007. p.2

Much of this innovative research results in products and processes with commercial potential. The UC Davis Center for Entrepreneurship and the Innovation Access Office assists research teams develop their spinoff products into start up businesses at business incubator sites. UC Berkeley and LBL have similar programs and centers to assist in the development of commercial applications for their clean technology research.

Physical Concentration of Clean Technology Activities

Benicia's Green Gateway Research Park could be a physical focal point that provides a "magnet" for talent, companies, and investment. The Park could potentially accelerate the emergence of a cleantech Green Corridor along the East Bay and in the greater Sacramento region.

The concentration of clean technology related activities in a physical hub is important for several reasons:

Visibility. The Park could provide a tangible, visible showcase for potential innovators, investors, and companies. It would help provide a focal point for the media doing stories on clean technology innovation in the region.

Shared equipment and facilities. Clean technology tends to be capital intensive, requiring access to specialized technical equipment for development and testing. For example, the Bay Area solar industry lacks nearby and timely access to testing facilities. The closest testing facility is at Arizona State University and has a six-month waiting list. Access to shared equipment and facilities in one location could not only serve the firms that are currently in the Bay Area, but act as a magnet to draw new companies.

Unplanned innovation. A physical hub of research, development, testing and commercialization for clean technology provides an opportunity for entrepreneurs, investors, technical talent, and others to have unplanned encounters that spark new ideas, partnerships, and business models.

COMPONENTS OF THE GREEN INNOVATION ZONE

The Green Gateway Business Community would consist of five components which together would create a multi-faceted "green innovation zone" – a visible, focal point for clean technology and application in Benicia.

Education and Research Commons

The education and research commons would include a full range of institutions including UC Berkeley, LBL, UC Davis, Sacramento State University, Solano Junior College, and others, who would create an interdisciplinary gathering place for top global talent from academic, business, technical and policy areas. The commons would be a focal point for active idea exchange, research collaborations, specialized education and training of talent and a wellspring for innovations with potential commercial applications. It would offer comprehensive specialized education and training programs, from green-collar job training to post graduate research. The synergy from multiple institutions having presence there could provide an environment for cross-fertilization, a collaborative environment for generating new ideas—a free and open environment to experiment and see what sticks.

Green Innovation Test Bed

A Green Innovation test bed would be a combination of shared facilities, equipment, and simulation environments would help researchers and entrepreneurs develop and test their new technologies and products. The clean technology field has greater capital equipment needs than many other fields, so cost effective and accessible use of specialized facilities and equipment is particularly important to support innovation. No other region has yet assembled the range of equipment and facilities in one place to provide a comprehensive test bed for new clean technology innovations.

The Bay Area's emerging solar technology industry already urgently needs testing and certification facilities closer to the Bay Area – and could benefit immediately from early development of such a facility. U.S. market testing is currently performed at one location, Arizona State University's Photovoltaic Testing Facility. These tests can take six months or longer. By establishing a second testing facility at Benicia's Green Gateway, it would establish Benicia as a hub of the solar industry, act as a magnet to attract innovators and their companies, as well as help firms move more quickly to market.

Green Business Launching Pad

A green business launching pad would be where venture capital-backed early-stage enterprises benefit from on-site assistance and use of support services, exchange innovative ideas with other start-ups and larger firms, showcase emerging products for potential investors and other collaborators, and introduce products into the global marketplace.

The launching pad could go beyond the traditional incubator model. It could not only provide relatively low-cost space, but on-site access to venture capitalists who have satellite offices at the Park, as well as top researchers from around the world, large company decision-makers and mentors, and business support services. They could arrange for use of expensive and specialized development and test equipment and prototype fabrication facilities—much like researchers sign up for time on the Hubble Telescope.

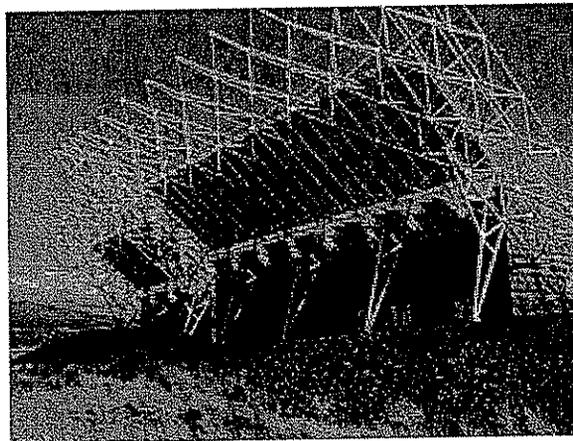
Anchor Innovation Businesses

In addition to new enterprises, the Zone needs larger established businesses would act not only as generators of new technologies and products, but also as technology development partners and early customers for the products of new and smaller firms. These anchor firms would also provide a long term presence that would help accelerate development of the other components of the Green Gateway Business Community.

Green Gateway Business Community could become the Bay Area's new neighborhood for established companies that are becoming new players in clean tech. Firms can establish R&D, as well as prototype fabrication facilities. Larger firms would be attracted to the prospect of access to talent, small entrepreneurial companies (who could be partners or acquisitions), and the exchange of ideas that would be created by the interplay of the components of the Green Innovation Zone.

Green Exposition Center

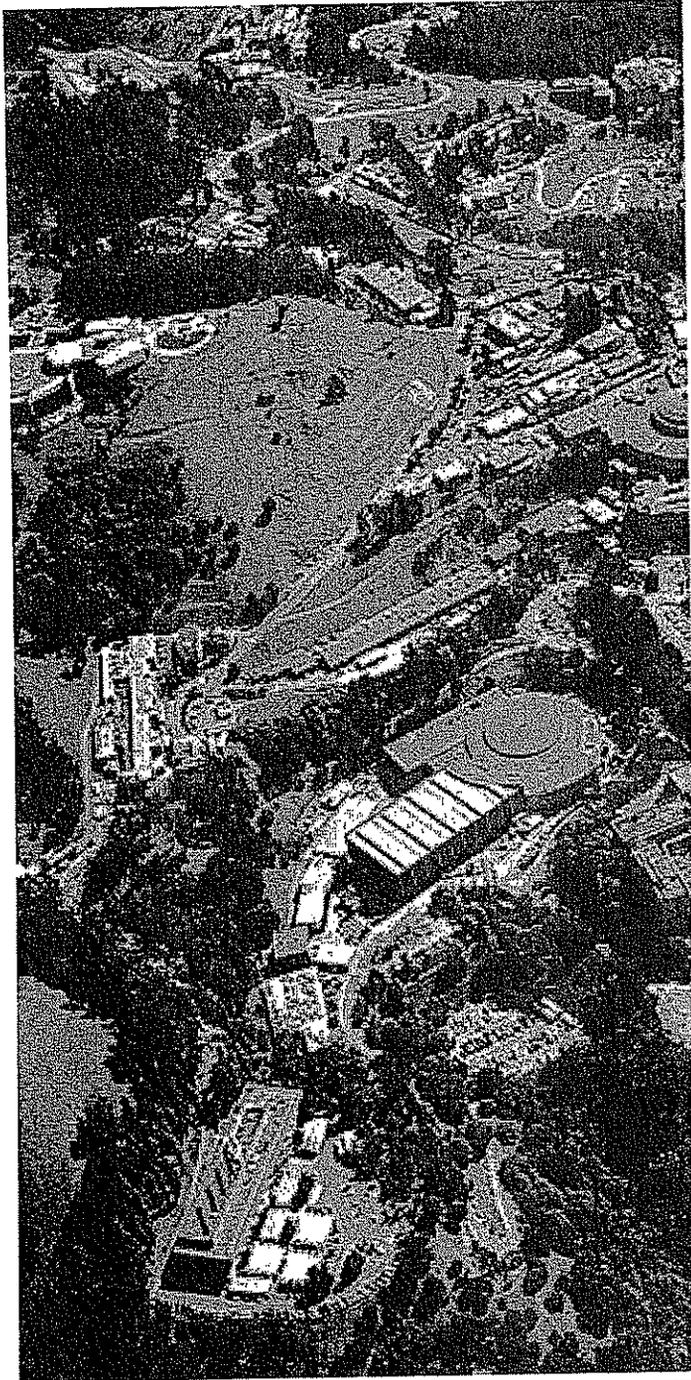
An Exposition Center would offer demonstrations of new models, products and processes. There is tremendous opportunity to create a comprehensive, practical demonstration to the general public of how people can use clean technology at home, work, and for transportation. For example, the Zone can demonstrate "state of the art" smart buildings and green materials, how to create affordable green housing, and welcome visitors from the region and worldwide to see and experience these existing and emerging green applications. Quite possibly, the Expo Center could even become a tourist destination.



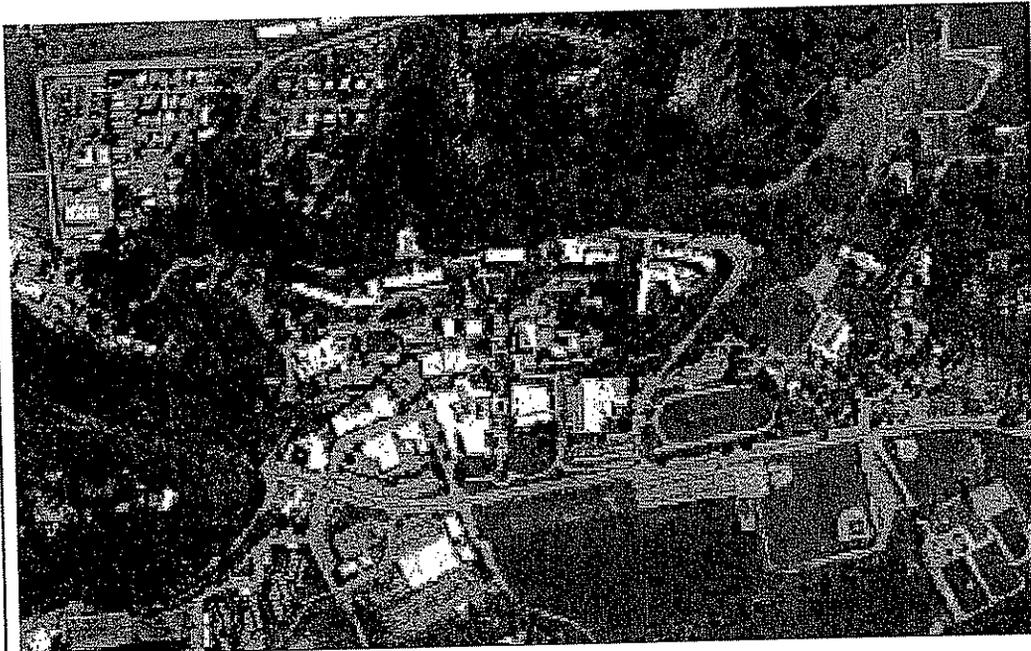
PHOTOS OF CAMPUS-STYLE PROJECTS:

scientific & technical research labs; light industrial facilities; administrative offices & support services

Lawrence Berkeley Laboratory, Berkeley, CA. Large hilly terrain site behind UC Berkeley. Minimum of grading. Dense walkable clusters of mixed use buildings, built into hillsides. Building clusters follow contours of terrain. Pedestrian pathways from one building cluster to another. Winding roads between building clusters follow contour of terrain. Limited parking lot space. Free and convenient shuttle bus system. Shuttle buses run constantly between building clusters and to and from downtown Berkeley, connecting with bus/BART stations. Site has auditorium, various conference rooms, cafeterias, but no large conference center, hotels, or restaurants. These are easily accessible downtown.



Pacific Union College (PUC) in Angwin, northeast of St. Helena, Napa County. Site of proposed Angwin Ecovillage. Scenes of college show walkable, densely clustered campus on hilly terrain



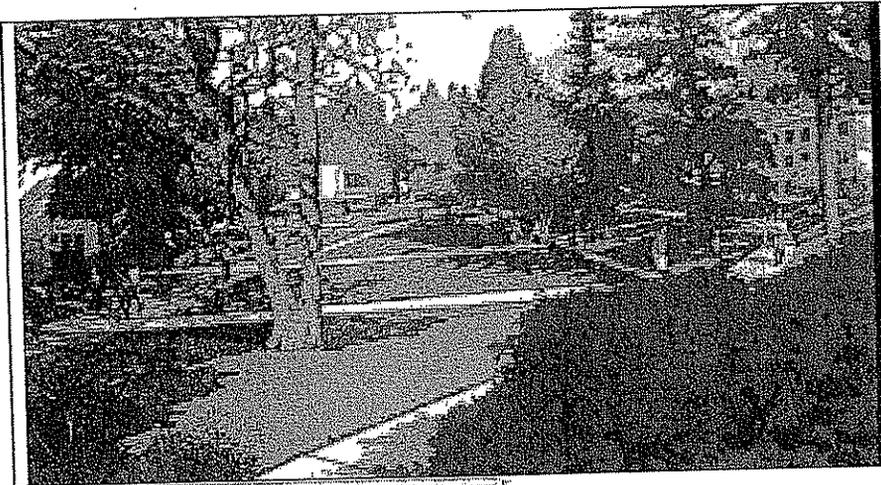
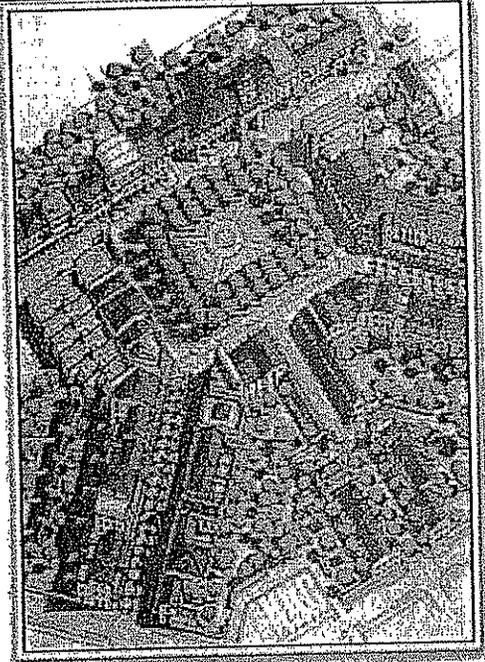
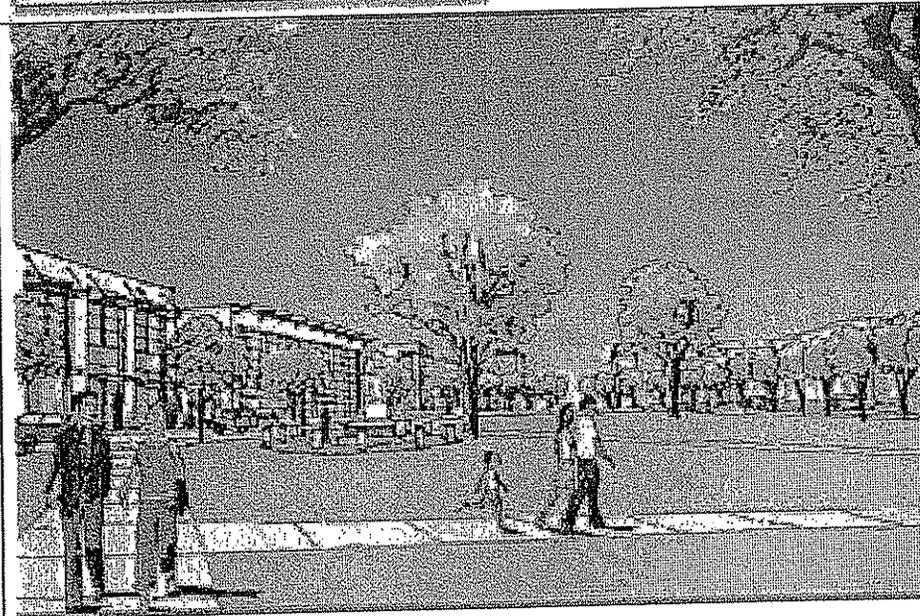


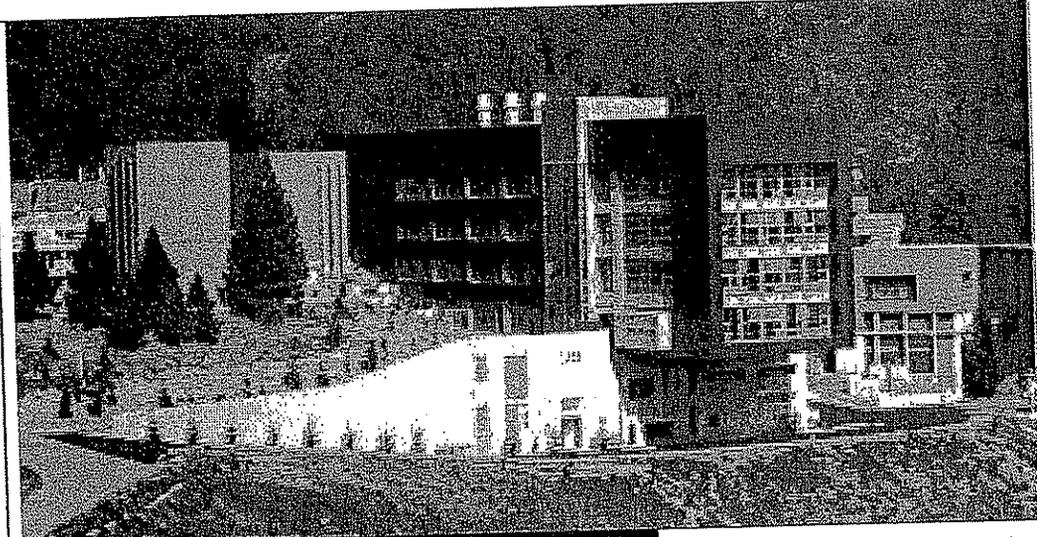
Illustration of courtyard
on PUC campus



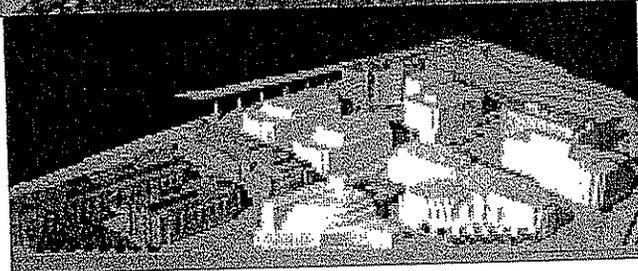
Illustrations of "new urbanism". Example of a walkable,
densely clustered, mixed use community.



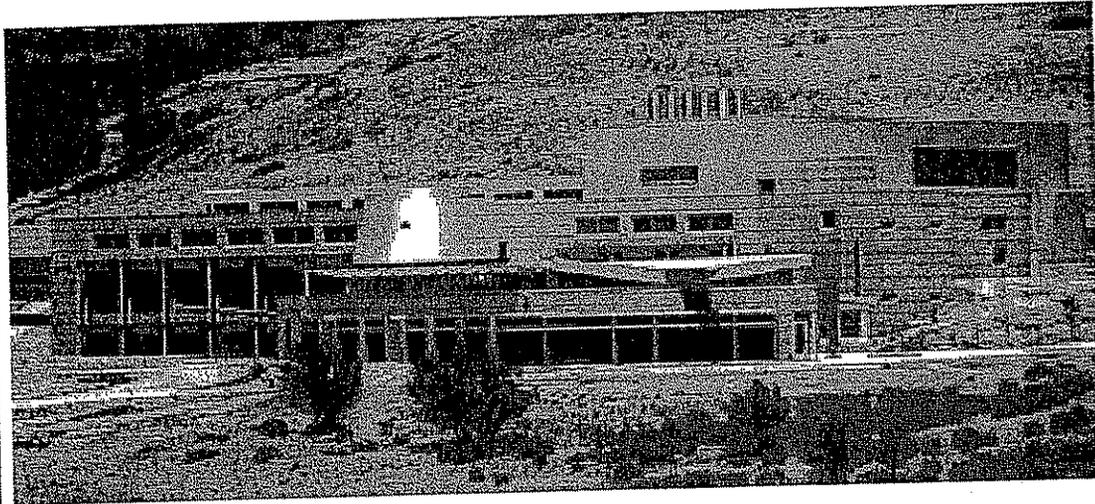
Proposed
Brisbane Baylands
project. Illustration
of courtyard at
proposed R&D
campus (focused
on cleantech
research).



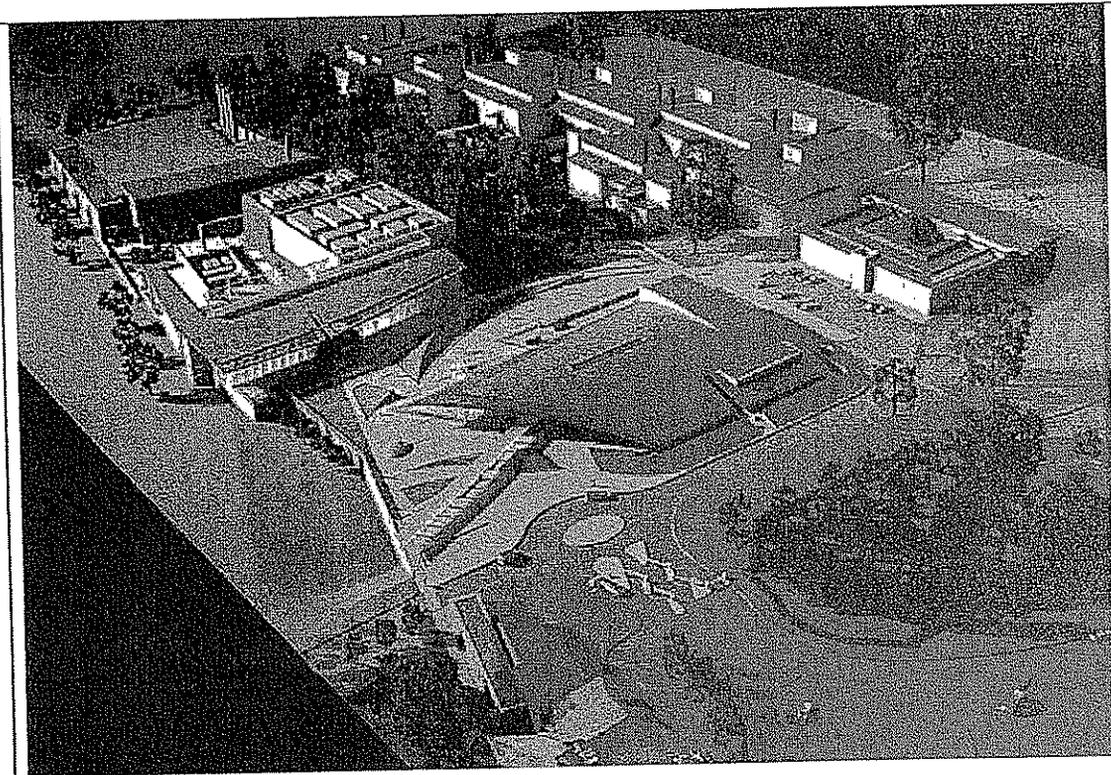
Research building at LBL, built into hillside. No parking lot.



Model of a proposed research center. Clustered buildings, dense, walkable, minimal parking.



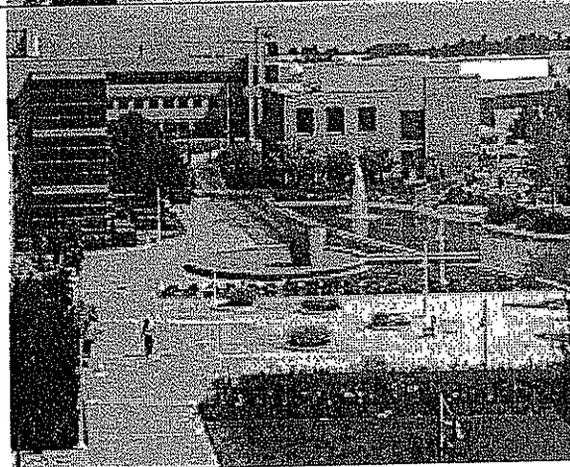
Research lab. Built into hillside. No parking lot.



Wellcome Trust Genome Campus (55 acre): housing Sanger Institute and EBI , in Great Britain.



Pacific Research Center, Newark, CA
(105 acres)



Advantages for All Parties and a Rough Timeline for Development

The world is turning to sustainable development out of necessity. In the 21st century, even small town Benicia must do its part to decrease its carbon footprint. A new plan for Benicia's Green Gateway Business Community could do exactly that with walkable streets, a plan to disburse the retail commercial throughout the project, green technology, and a focus on urging people to utilize alternate ways of getting to work. The vision stresses maintaining increased acres of open space, thereby protecting more habitat and streams and grading less, reducing our carbon footprint by keeping as much undisturbed land as possible. A new plan would conform to state law AB 32, requiring all cities to reduce their carbon footprints to 1990 level by 2020. The Green Gateway Business Community vision is a better model for Benicia and the 21st Century.

A new plan could probably be completed faster than the current project that will be denied. If Seeno decides to sue Benicia for denying the project, it will be tied up in court longer than it would take for the developer to jump on the bandwagon and build a new Green Gateway Business Community. Surely time is important to the developer. Additionally, information from legal experts and those who have monitored the EIR and approval process in Benicia, including the lengthy record of citizen and professional critique, indicates that the City's defense in a suit by Seeno is almost assured of holding, based on CEQA findings, the General Plan inconsistencies, and many other factors.

A rough timeline for a new project could look like this:

October 2008 - Deny the current project based on findings.

October 2008 - February 2009: Start the Specific Plan Process: Direct Staff through a resolution to establish a Specific Plan for Benicia Green Gateway Business Community, convening a stakeholder group consisting of 15 members:

- 3 planning commissioners (chosen by PC),
- 2 EDB members (chosen by EDB),
- 10 public members, 2 chosen by each council member

The Specific Plan Stakeholder Group would review planning principles for LEED-ND, LID, smart growth and R&D campus criteria, staff conditions of approval, alternative site plans and/or specific plans from others, and through as many workshops as necessary, prepare and recommend to Council a Benicia Green Gateway Business Community Specific Plan and a draft Site Plan (map) in 90 days. The process is intended to be collaborative and consensus facilitated.

Direct staff to solicit Request For Proposal for the supplemental EIR concurrently.

The Stakeholder Group process should be facilitated by a skilled mediator, possibly from Sacramento State, Center for Collaborative Policy (see their website, www.csus.edu/ccp, for list of projects they have facilitated.) Another option would be the consultants Dyett and Bhatia who have skillfully led the community of Brisbane through its Specific Plan process for their proposed Brisbane Baylands project (600 acres, industrial/commercial).

February - April 2009 - Draft supplemental EIR, which is intended to cover future projects and should be at a level of detail to meet the requirements. Hold public hearings for supplemental EIR and specific plan. Direct staff to prepare incentive program to expedite future application for new project.

April 2009 - Certify supplemental EIR and adopt specific plan.

April 2009 - Process new application and determine consistency with specific plan. Based on supplemental EIR, no additional environmental review is required and initial study will confirm this.

May - June 2009 - Public hearing by Planning Commission and City Council, approval and entitlements by June, 2009.

June 2009 – March 2010 - Tentative map filed, assessment districts established, grading plans reviewed and approved.

April 2010 – Begin construction.

Perhaps the new Green Gateway Business Community vision could help the city avoid a lawsuit altogether. If the developer knows that we are intent on a new Specific Plan AND that it would save time in the long run, why would they not consider it, especially if the city is very cooperative in providing financial incentives and incentives to expedite approval.

Pride in our City will be enhanced in many ways. We will feel that Benicia is leading the way in green technology in Solano County. We will all be proud of the fact that we have worked together in a project and reached a common goal. We will improve the quality of life in Benicia by being sure that the downtown is protected, that this large development will provide a myriad of choices for Benicians to seek employment and that the 2nd Street and Lake Herman Road exits off 680 will be attractive and well kept. The Council and citizens can be proud that we set high standards and expectations to which the developer must conform.

There is another possible benefit to the new approach; an opportunity for Seeno to build a reputation of teamwork and cooperation with cities. It could also begin its own foray into green tech, finding that it will be a desirable and profitable approach to cities in which it owns property, thereby becoming appropriate to the 21st century.

This new Green Gateway example is a beginning, and provides the Council with an outline of the genesis of a new process. It will take time and effort on the part of the Council and all stakeholders. The more stakeholders that participate, the more consensus there will be in the end. The more consensus, the more enthusiasm for the final product.

The new plan will be a better solution for Benicia.

Advocating that Benicia Undertake Development of a Specific Plan

Everyone agrees that any development in Benicia must conform to Benicia's General Plan. California law provides for a method by which communities can focus on planning and development in a particular neighborhood or bounded parcel, utilizing what is called a Specific Plan. (See appendix A, About Specific Plans.)

A Specific Plan is simply a subset of a community's General Plan. In much the same way as a General Plan, the Specific Plan is written by citizens and interested parties over a period of time, and adopted by the local governing body, in our case, the City Council. It then becomes binding, and is backed by State of California law.

A Specific Plan sets out the guidelines and protections of the community at large, and offers a developer clear requirements and a visionary model for land use, distribution and construction on the property.

A final Specific Plan can be a rather lengthy and technical document, involving careful analyses, professionally designed maps and financial modeling. Costs for gathering input and producing a Specific Plan can be substantial, **and can by law be recouped by the City as fees levied on the landowner/developer and those who purchase and build in the area covered by the Specific Plan.**

The Green Gateway Group strongly urges the preparation and adoption of a Specific Plan as the only way to properly plan for a 21st Century development the citizens of Benicia can be proud of, and the only way to require conformation to California's new AB32 challenges. It is regrettable that this step has not been taken heretofore, but that is no excuse for not undertaking it now. Any development of this size and significance in Benicia will surely impact our community -- and the Bay Area -- far into the future. We must take every precaution to ensure that the planning is first class, and that the project itself will help reduce our city's carbon footprint.

Appendix A About Specific Plans

The Governor's Office of Planning and Research published a document, "General Plan Guidelines," (see http://opr.ca.gov/planning/publications/General_Plan_Guidelines_2003.pdf), which describes the Specific Plan on p. 152 (note our emphasis in ***bold italics***):

SPECIFIC PLANS

A specific plan is a great tool for systematically implementing the general plan within all or a portion of the planning area (§65450, et seq.). ***Any interested party may request the adoption, amendment, or repeal of a specific plan. A plan may be prepared by either the public or private sector, however, responsibility for its adoption, amendment, and repeal lies with the city council or county board of supervisors. As a legislative act, a specific plan can also be adopted by voter initiative and is subject to referendum.***

At a minimum, a specific plan must include a statement of its relationship to the general plan (§65451(b)) and text and diagram(s) specifying all of the following in detail:

- The distribution, location, and extent of the uses of land, including open space, within the area covered by the plan.
- The proposed distribution, location, extent, and intensity of major components of public and private transportation, sewage, water, drainage, solid waste disposal, energy, and other essential facilities proposed to be located within the area covered by the plan and needed to support the land uses described in the plan.
- Standards and criteria by which development will proceed and standards for the conservation, development, and utilization of natural resources, where applicable.
- A program of implementation measures, including regulations, programs, public works projects, and financing measures necessary to carry out the provisions of the preceding three paragraphs (§65451(a)).
- Any other subjects that, in the judgment of the planning agency, are necessary or desirable for general plan implementation (§65452).

For greater detail, see the "**Planner's Guide to Specific Plans**," also published by the Governor's Office of Planning and Research (http://www.opr.ca.gov/planning/publications/specific_plans.pdf).

Appendix B

About the possibility of a Citizen-Sponsored Referendum and a Ballot Initiative

Citizens who have gathered informally under the name Green Gateway Group are hopeful that the City Council will vote no in October, 2008, and thus deny the currently proposed project based on the Planning Commission and City Council findings that the project

- does not adequately mitigate traffic concerns
- does not sufficiently plan for a reduction of the City's carbon footprint to 1990 levels as required by California Assembly Bill 32
- does not meet the requirements of Benicia's General Plan
- does not provide a timely and adequate economic analysis as the basis for the city's signing of a Statement of Overriding Considerations
- etc..

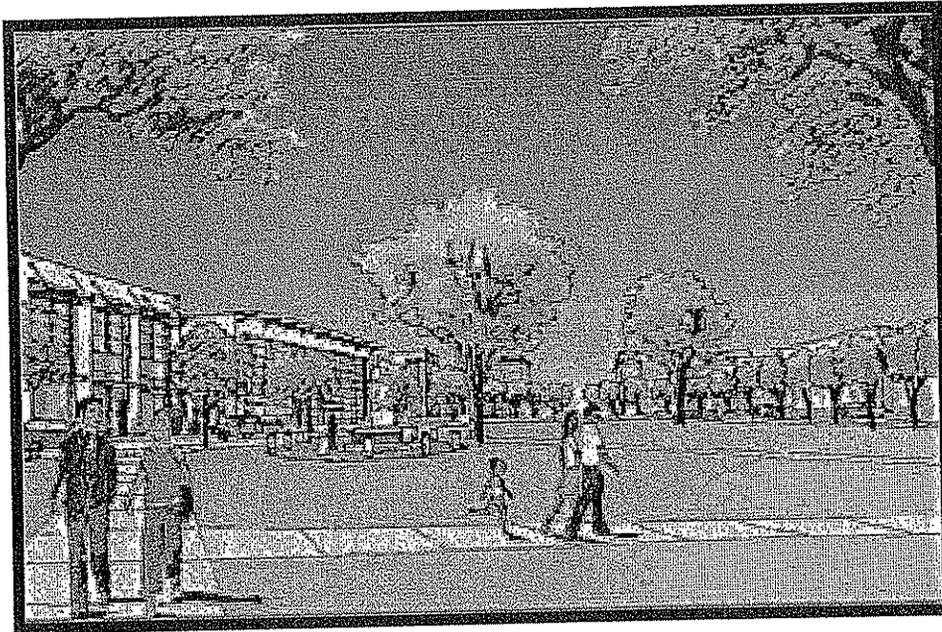
When the Council votes to deny the current proposal, we will eagerly support our city leaders and staff as they undertake a renewed effort to plan for a 21st Century development in the Benicia hills.

Anticipating, however, that our City Council may not vote to deny the current project, we have obtained legal counsel, given thought to a referendum to reverse a Council approval, and prepared a rough draft of a Ballot Initiative, which would impose land use and design standards, conservation easements, and density allowances on the 527 acre parcel. We sincerely hope to have prepared in this way to no avail.

Rethinking the Benicia Business Park ...

Green Gateway Business Community
A 21ST CENTURY POSSIBILITY

ADDENDUM – LATE ADDITIONS



Prepared by Benicia citizens
organized as the Green Gateway Group

September, 2008

VIII-B-301

GREEN GATEWAY BUSINESS COMMUNITY
A 21st Century Possibility

ADDENDUM – LATE ADDITIONS

CONTENTS

Potential Companies, Businesses, Occupants <i>(additional material for p. 13 in the original document)</i>	p. 3
Maps and Drawings	p. 4
Revised Google Earth Map <i>(replaces p. 20 in the original document)</i>	pp. 5-8
Google Earth – Additional 3-D Views <i>(additional material, follows the revised map above)</i>	
Clean Technology – Green Innovation for 21 st Century Challenges Implementation Strategy <i>(additional material, follows p. 26 in the original document)</i>	pp. 9-10
Appendices <i>(Additional material to follow p. 36 in the original document)</i>	
Appendix C: Cleantech Opportunities and Issues – by Amalia Lorentz	pp. 11-12
Appendix D: Article on hopeful Cleantech Hubs in Bay Area	pp. 13-14
Appendix E: Reports and Charts on Cleantech Industry	pp. 15
Appendix F: Inventory of California's Green Industry Firms	p. 16-17
Appendix G: A list of types of green-collar jobs	p. 18
Appendix H: Charts on current and projected growth in cleantech investment	p. 19

Potential Companies, Buildings, Occupants

(additional material for p. 13 in the original document)

At a minimum ...

... the Green Gateway Business Community would be built green, and every business/occupant would commit to a green operation.

An even better option would be ...

... for the Community to foster only businesses/occupants that are focused on clean-technology research, development, manufacture, commerce, education, and related support activities. Our group favors this latter option.

We envision ...

... a hotel, conference center and restaurants to serve the Green Gateway, an education commons, an expo/demonstration center, cleantech testing facilities, and mixed use distribution of additional commerce and retail to serve the business community, along with cleantech R&D and light industry.

Some potential occupants might include ...

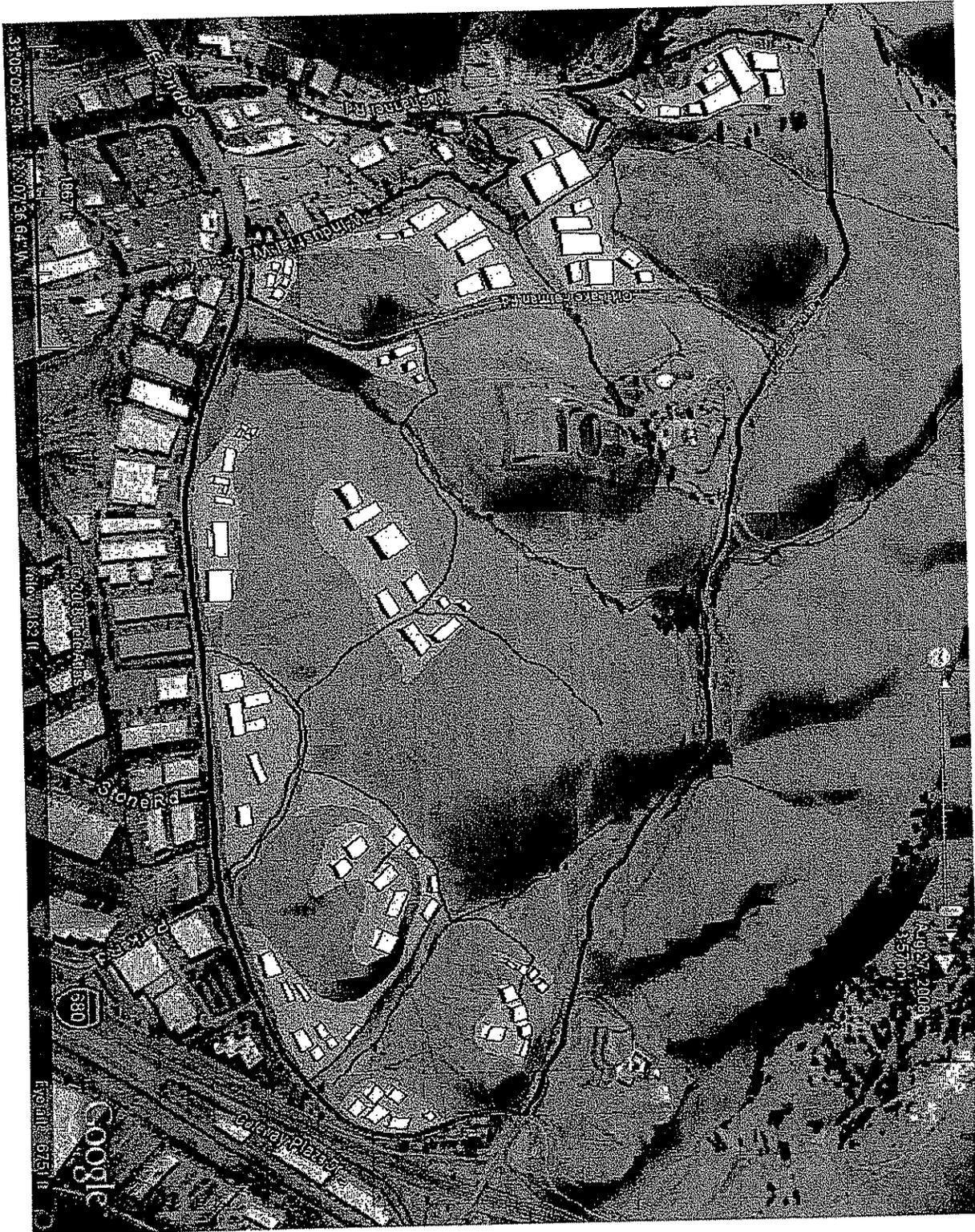
... satellite education centers from UC Berkeley, UC Davis, and other universities and Jr. colleges; green-collar skills training centers; an Expo Center showcasing state of the art demonstration projects from private industry; large areas devoted to testing of large scale solar projects and wind technology; a cleantech business incubator; and many start-up and established companies focusing on cleantech R&D, manufacture, and sales and services relating to a wide range of categories such as energy, transportation, water, air, materials, agriculture, and recycling..

GGBC_20080828_ADDENDUM I

Maps and Drawings

Table III – Revised Google Earth map *(replaces p. 20 in the original document)*

A rough mock-up illustrating some of what could be ... roads and buildings conforming to contour of the land with minimal grading, buildings clustered in mini campuses, etc.



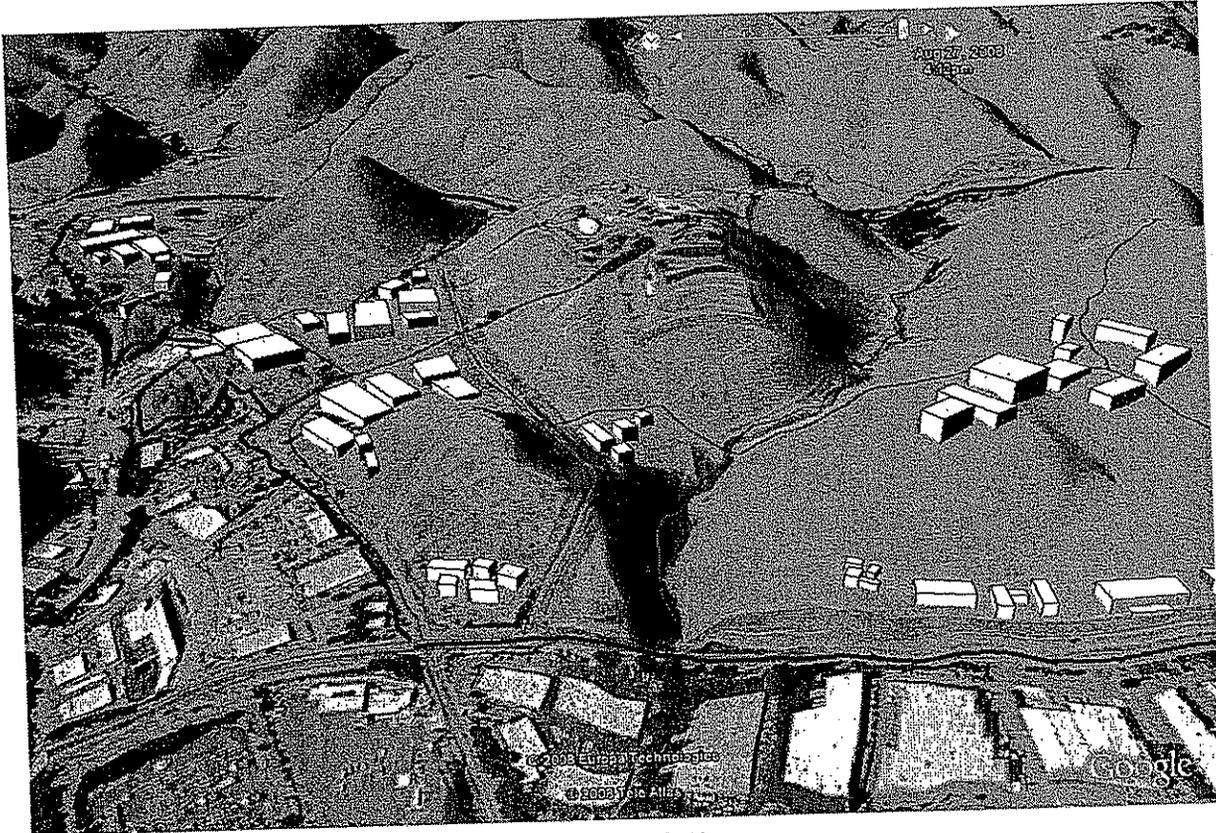
Maps and Drawings

Google Earth maps – Additional 3-D Views *(additional material)*

Rough mock-ups illustrating some 3D views from various close up angles of a potential campus-style Green Gateway project.



Right side: E 2nd Street & Lake Herman Rd.



Left side: East 2nd St. , Reservoir Rd, and Industrial Way



Far left side: (Industrial and Reservoir do not go to L. Herman Rd.)



Aerial whole view.

ADDENDUM

(additional material beginning on p. 26 of the original document)

Clean Technology Green Innovation for 21st Century Challenges

IMPLEMENTATION STRATEGY

Achieving this bold vision would require a concerted public-private partnership with strong city and community leadership and creative thinking. Active private sector participation would be essential in each component of this vision. But first the city must set the right conditions and environment for investment, such as establishing revised zoning language that clearly includes cleantech uses, and a developing a detailed Specific Plan for the site.

All reports confirm that there is strong interest in investment in cleantech, and a growing need for a comprehensive magnet site – a clean technology hub – (particularly in the East Bay/ Capital Corridor region) that would provide an all-in-one location for cleantech industry, commerce, R&D, and education to congregate in one place, providing mutual support and stimulation. But in order to attract that investment to Benicia and recruit businesses and educational institutions, various steps must be taken, with each step providing conditions for the next.

We recommend the following suggested steps:

Launch Green Innovation Zone Working Group.

This group would act as the catalyst to advance the concept, and would include key drivers and stakeholders from the city staff and the community, the developer, the Universities, and other early supporters. The Working Group should be assigned both dedicated staff and resources to advance the concept.

Widely communicate the concept, identifying potential champions.

The Working Group would share the concept to raise the visibility of the effort, inviting additional ideas from potential investors and participants. The Group could organize op/ed pieces and other media coverage, as well as host a signature event, showcasing the possibility of a green innovation zone. In the process, the Group would build a list of champions, aligning university, philanthropic, and corporate interests (technology companies, venture capitalists, etc.) with each of the five specific components of the green innovation zone. At the same time, the Group would broad based community support for the concept.

Build momentum with early wins.

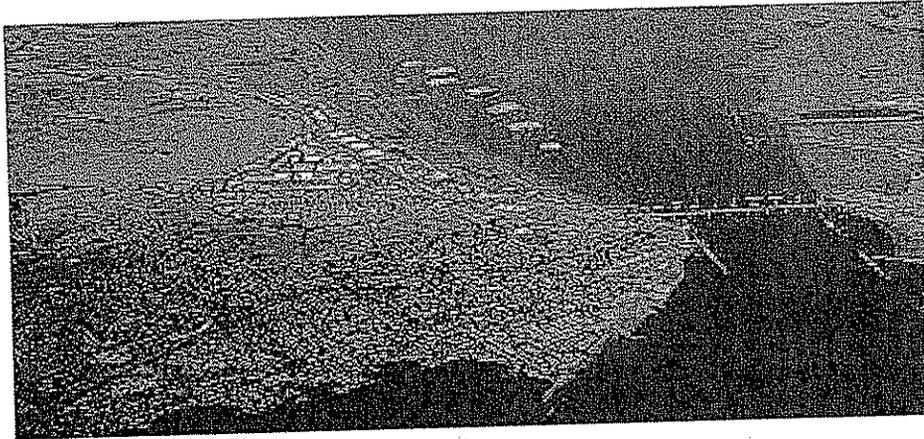
Based on investment trends and Benicia's unique resources, perhaps the most immediate opportunity lies in becoming an East Bay/Solano County focal point for wind and solar technology innovation. Early momentum can be built by developing "letters of intent" with established anchor companies, VCs, start-ups, R&D institutions, and others indicating their interest in being part of the green innovation zone.

Create Green Innovation Zone Leadership Group.

To achieve this vision, it is recommended that a Green Innovation Zone Leadership Group be established to help develop and implement a business plan for the Green Gateway Park. This Leadership Group would include business leaders, venture capitalists, and government officials. Based on the initial communication and outreach activities, the Working Group would recruit public and private leaders to serve on the Green Innovation Zone Leadership Group. The Working Group should provide the support to the Leadership Group as it reviews and refines the concept and develops a business plan for development of the site.

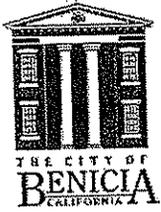
Prepare Green Gateway for private investment.

The Leadership Group must take steps to create the conditions for and remove the obstacles to development. To build support, progress will need to be made to demonstrate that obstacles to development (e.g., financing, access, environmental, and infrastructure concerns) are manageable. At the same time, by building momentum for the concept as outlined above, there can be greater urgency to address key issues and obstacles and prepare Green Gateway for successful development.



Appendix C:

Cleantech Opportunities and Issues



Amalia Lorentz, Economic Development Manager

What is Cleantech and why is it a growth industry?

"Cleantech" is a new business term used to refer to a set of industries or companies whose operations result in an environmentally sensitive, low-emissions, and/or energy-efficient process, product, or innovation. Among other sectors, this can encompass (depending on the specifics of the operation) renewable energy, recycling, water and wastewater treatment, and hybrid (gas-electric) engines. For example, here in Benicia, one company that identifies as cleantech is Pacific Ozone, which has a proprietary process to use ozone as a cleaning agent for water and other liquids. Pacific Rim Recycling could also be considered cleantech. The biggest cleantech sectors statewide are energy efficiency and energy generation, of which solar is the largest component. (From "Clean Technology and the Green Economy" draft, Economic Strategy Panel, 2008. p. 5.)

Cleantech in California has grown in both number of companies and number of jobs since 1990, and experts expect that Assembly Bill 32's impact will accelerate the industry's growth as companies innovate in response to California's forceful greenhouse gas reduction goals. ("California Green Innovation Index", Next 10, 2008. pp. 46-47.) (One strike against continued industry expansion in California is other states' aggressive use of incentives (corporate tax credits, subsidies, etc.), but there is a push among economic development advocates here to reinstate the manufacturing tax credit.)

Cleantech industries can be considered a subset of the "green economy", a.k.a. the source of "green-collar jobs", although the two terms may be starting to be used interchangeably. Generally cleantech implies a higher degree of innovation while green industry implies greater environmental benefit. The definitions are still loose because these industries are not included as separate categories in the North American Industry Classification System (NAICS), the standard method of classifying businesses used by the U.S. Economic Census, Mexico, and Canada. Mainly they get lumped in with "Professional, Scientific, and Technical Services", among other broad categories.

Companies engaged in biotechnology research and development or manufacturing, web-based enterprise, software design, hardware manufacturing, and medical device testing, generally are not considered cleantech uses or part of the green economy (unless the end product in some way meets cleantech criteria).

How and where does cleantech fit in Benicia?

The wide spectrum of types of cleantech means that it can be difficult to assume the companies do or don't fit in existing zoning districts. The existing Zoning Code divides the BIP mainly into Limited (IL) and General (IG) industrial districts, with smaller areas designated as Water-related Industrial (IW) and Industrial Park (IP). "Research and development" (R&D) is currently allowed in all the industrial districts except IW. Benicia's Zoning Code defines R&D as "the research, development, and controlled production of high-technology electronic, industrial, or scientific products or commodities... Uses include biotechnology, films, and nontoxic computer component manufacture". (City of Benicia Zoning Code, p. 17-19.)

Most cleantech uses could fall into a number of categories, including R&D or office, depending on a specific company's operations. Stand-alone office uses are not allowed in any industrial district except IP (which is a very small corner of the BIP covering Bio-Rad). However, those cleantech companies whose operations fit within Benicia's existing definition of R&D are currently allowed uses in the vast majority of the Benicia Industrial Park, including the area within the proposed Benicia Business Park.

Cleantech uses whose operations involve a higher intensity of noise, traffic, visual impact, etc. - for example, another recycling facility or a biodiesel refinery - would possibly be limited to IG-zoned areas, which is the bulk of the existing Benicia Industrial Park although not the proposed Benicia Business Park area.

How can we encourage more cleantech uses in Benicia?

Better defining the uses the community would like to encourage, and clarifying in which districts they are allowed, is a process that would undoubtedly assist in attracting those businesses. As staff and the Economic Development Board have frequently heard from brokers, adding certainty to the development process is good.

A great example of that is in one of our Solano County neighbors. The City of Dixon recently added the specific use of "bioscience" to its Zoning Code, making it allowed in light industrial districts to help bring in those uses to the community. Result: A Genentech research and development campus. The zoning was not necessarily the deciding factor, but according to Dixon City staff, it gave Dixon an advantage because it minimized the corporation's entitlement time and costs. Bioscience, a relatively new industry, otherwise could have been considered to fit - or not fit - into a variety of zoning categories, potentially leading to ambiguity and delays.

As the business community has evolved and grown in the transition to the 21st century, new industries have emerged. Some communities are starting to grapple with the implications in their zoning ordinances - some old uses just don't exist any more, as new ones apply for business licenses that don't fit into any known category. Creating a zoning definition of cleantech is a start; even better would be defining its related subcategories - "cleantech energy infrastructure", "cleantech manufacturing" - so that the ground rules are very clear. This is an emerging field, so there exists the opportunity to help shape the dialogue at the intersection of planning and economic development.

July 2008

Appendix D: Article on hopeful Cleantech Hubs in Bay Area

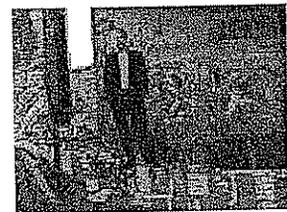
San Francisco Business Times - December 17, 2007
<http://sanfrancisco.bizjournals.com/sanfrancisco/stories/2007/12/17/focus2.html>

SAN FRANCISCO Business Times

Friday, December 14, 2007

Hopeful cleantech hubs proliferate around the bay

San Francisco Business Times - by Lizette Wilson San Francisco
Business Times Contributor



Cleantech is the Bay Area's future, says Scharfman

With more brains and bucks devoted to the topic than any other region, the Bay Area emerged this year as the nation's stickiest cleantech cluster.

California's cleantech companies, the lion's share located in the Bay Area, scored \$726 million in venture capital investment during the first nine months of 2007. That's more than double what Massachusetts companies received and nearly five times that of Texas, which ranked No. 3 in cleantech investments, according to the National Venture Capital Association.

The roster of Bay Area startups focused on solar power, alternative fuel, water purification and other clean technologies is growing quickly while homegrown big boys like **SunPower Corp.** and Amyris Biotechnologies continue to expand -- a trend area policymakers are trying to encourage.

From land-use policies in Brisbane and payroll tax exemptions in San Francisco to political pacts in the East Bay, players across the Bay Area are benefiting from policies that help plant the seeds to grow a green economy.

"We believe that cleantech is the future of the tech economy in the Bay Area," said Jonathan Scharfman, development director for Universal Paragon Corp., which hopes to transform the Brisbane Baylands from a backwater brownfield to a cleantech hub. "We see global, environmental and political forces merging to drive this next generation of innovation and technology."

Universal Paragon decided last year to make clean technology the centerpiece of its proposed development at Baylands -- a 660-acre swath between San Bruno Mountain and Highway 101 bordering San Francisco.

It's a massive undertaking.

Universal Paragon has owned the site since 1989 and is spending \$220 million to install infrastructure and clean up toxics left from the area's days as a Southern Pacific railyard and a

city landfill. Scharfman expects the development agreement with Brisbane will be in place by the end of 2008 with construction beginning in early 2009. The first building should be ready for users by late 2011.

Plans call for 2 million square feet of office space and 650,000 square feet for research and development labs, along with hotel, international exposition space and other uses.

"The Baylands will be a part of the Bay Area cleantech cluster. It's a many-spoked wheel," said Scharfman.

Located four miles south of downtown San Francisco and four miles north of San Francisco International Airport, the Baylands development is a short ride from the cleantech cluster San Francisco hopes to create in the Hunter's Point area.

Already offering payroll tax exemptions and other financial incentives to qualifying companies, San Francisco aims to create a cleantech zone similar to clusters for biotech in Mission Bay and digital entertainment in the Presidio.

And efforts to create a similar cleantech center in the East Bay are accelerating.

Earlier this month, the mayors of Oakland, Berkeley, Emeryville and Richmond said they would work together -- along with officials from **Lawrence Berkeley National Laboratory** and the **University of California, Berkeley** -- to build a regional green economy.

Each city is already pushing its own green agenda

Berkeley officials last month agreed to finance the upfront costs for home and business owners to install solar panels and make other energy efficiency improvements. Zoning changes in West Berkeley and in Oakland at the former Army base and on other industrial lands are also under consideration.

"We want to make this area the Silicon Valley of the green industry," said Paul Rose, spokesman for Oakland Mayor Ron Dellums. "The mayor believes it's imperative to explore public-private partnerships to make this happen."

Bay Area officials aren't the only ones looking for green-collar jobs, Cleantech clusters are developing, albeit more slowly, in Boston, New Mexico, Texas and the Midwest's corn belt.

"I'm getting contacted by state-level government officials every month or so asking me about cleantech -- trying to create a cluster," said Rob Day, a principal with VC firm @Ventures who also writes the cleantechvc.com site.

"They don't want to be left behind or beat out. There's room for multiple winners, but in the end it is a competition."

Appendix E: REPORTS & CHARTS ON CLEANTECH INDUSTRY

CLEAN TECH REPORTS

The reports listed below reveal the strength and extremely promising economic potential of the emerging cleantech phenomenon, globally and particularly in the Bay Area, even during the current economic downturn affecting all other business sectors.

The reports describe a dramatic explosion of University R&D, spin off businesses, government initiatives and grants, venture capital, etc., all focused on cleantech innovations spread across a wide spectrum of industries. So far, most of the action has been focused in the South Bay (Silicon Valley), but they are experiencing increasing pressure to locate elsewhere due to space constraints, housing costs, and traffic congestion.

Benicia is perfectly situated to capitalize on this economic opportunity, as we are situated 40 minutes from both UC Davis and UC Berkeley -- two of the key cleantech research centers -- with 527 acres of vacant land already zoned industrial/commercial. We also have a perfectly matched employment pool, most of whom currently have to commute elsewhere for jobs. And we have comparatively low cost housing and good schools.

Note: to view the reports, click on the links at:

<http://beniciafirst.googlepages.com/cleantechreports&articles>

REPORTS

Clean Technology And the Green Economy, March 2008

Clean Energy Trends 2008, March 2008

California Green Innovation Index, 2008

Sustaining the Bay Area's Competitiveness in a Globalizing World, March 2008

Green Collar Jobs in America's Cities, 2008

Innovative Energy Solutions from the SF Bay Area: Fueling a Clean Energy Future, June 2007

Green Collar Jobs, (Berkeley, CA) 2007

The Economic Development Potential of the Green Sector, June 20

Appendix F: Inventory of California's Green Industry Firms

Source: Cleantech Group, LLC™

How Large is the Industry?

Establishing a clear accounting of the growing number of businesses with primary activities in providing environmentally sustainable products and services is challenging. Exactly what types of businesses are meant when referring to this new and growing industry can vary widely.

What is a "Green" Business?

The scope of businesses examined for this study is based roughly on the definition of Cleantech established by the Cleantech Group, LLC™.

Cleantech is new technology that spans a broad range of products, services and processes that lower performance costs, reduce or eliminate negative ecological impact, and improve the productive and responsible use of natural resources.¹⁰

In addition to new technology firms, this analysis aims to capture other related business activities that either support the wide-spread application of new technologies such as solar system installations or apply new technologies as service providers for instance in emissions monitoring. In addition, specialized business services are developing with a focus on serving the particular needs of green businesses.

Complicating the categorization, the activities of a business often blur across categories.

Typically, industry analyses examine a sample of business establishments defined by a select set of industry codes such as the North American Industry Classification System (NAICS). For indentifying green businesses; however, these codes do not provide sufficient detail.

GREEN INDUSTRY

SEGMENTS

adapted from Cleantech™ *

Energy Generation
Energy Efficiency
Transportation
Green Building
Energy Storage
Environmental Consulting
Water & Wastewater
Finance/Investment
Environmental Remediation
Air & Environment
Business Services
Research & Alliances
Agriculture
Recycling & Waste
Materials
Manufacturing/Industrial

Cleantech Industry Segments

Source: Cleantech Group, LLC™

<p>Energy Generation</p> <ul style="list-style-type: none"> Wind Solar Hydro/Marine Biofuels Geothermal Other <p>Energy Storage</p> <ul style="list-style-type: none"> Fuel Cells Advanced Batteries Hybrid Systems <p>Energy Infrastructure</p> <ul style="list-style-type: none"> Management Transmission <p>Energy Efficiency</p> <ul style="list-style-type: none"> Lighting Buildings Glass Other <p>Transportation</p> <ul style="list-style-type: none"> Vehicles Logistics Structures Fuels 	<p>Water & Wastewater</p> <ul style="list-style-type: none"> Water Treatment Water Conservation Wastewater Treatment <p>Air & Environment</p> <ul style="list-style-type: none"> Cleanup/Safety Emissions Control Monitoring/Compliance Trading & Offsets <p>Materials</p> <ul style="list-style-type: none"> Nano Bio Chemical Other <p>Manufacturing/Industrial</p> <ul style="list-style-type: none"> Advanced Packaging Monitoring & Control Smart Production <p>Agriculture</p> <ul style="list-style-type: none"> Natural Pesticides Land Management Aquaculture <p>Recycling & Waste</p> <ul style="list-style-type: none"> Recycling Waste Treatment
---	---

This data taken from Report: **Clean Technology & the Green Economy, March 2008**
http://www.labor.ca.gov/panel/pdf/DRAFT_Green_Economy_031708.pdf

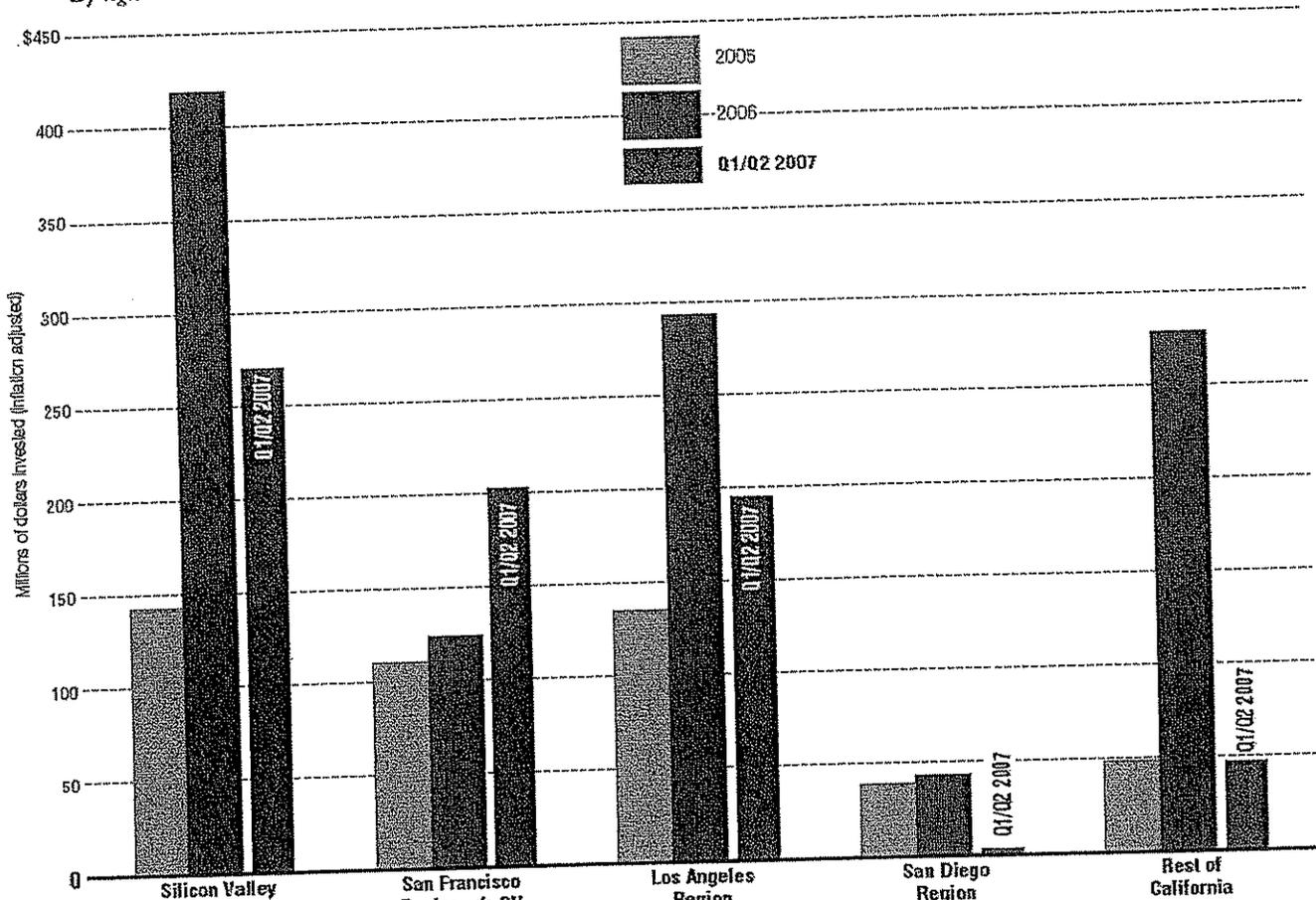
Appendix G: A list of types of green-collar jobs

Green Collar Jobs Are Community-Serving Work-Force Opportunities			
Green Business Sector	Types of Services Providing Green Collar Jobs	Types of Entry Level Green Collar Jobs Currently Available	More Advanced Green Collar Work
Energy	Energy Retrofits HVAC (Heating, Ventilation, Air Conditioning) Solar Installation Water Conservation Whole Home Performance	Customer Service, Evaluation, Installation, Construction, Maintenance, Repair	Energy Partner Journeyman Solar Electrician Service Technician Project Manager
Water	Water Conservation Adaptive Grey Water Reuse	Installation, Construction, Maintenance, Repair	Journeyman Project Manager
Green Building	Construction Demolition & Removal	Construction, Carpentry Demolition, Hauling, Driving	General Contractor Project Manager
Woodworking	Custom architecture, cabinetry, furniture, repairs	Assembly, Sanding, Finishing, Carpentry, Installation	Journeyman Head Carpenter
Green Space	Parks & Open Space Landscaping	Planting, Maintenance Tree Cutting/Pruning	Project Manager Head Gardener
Food	Urban Agriculture Farmers' Markets Specialty Foods Production Baking	Growing, Packaging, Delivery Set-up/Tear-down, Selling Brewing, Roasting, Packaging Baking, Mixing, Cleaning	Production Manager Market Manager Floor Manager Head Baker
Transportation	Bicycle Delivery Bicycle Repair Bio-Diesel/Veggie Fuels Public Transportation	Dispatch and Delivery Assembly and Repair Fuel Production, Distribution Driving, Maintenance, Repair	Messenger/Owner Shop Manager Production Manager Head Mechanic
Non-Toxic Printing	Commercial Printing Services	Binding, Post-Press, Delivery	Press Op, Pre-Press
Non-Toxic Cleaning	Residential & Commercial Cleaning	Cleaning, Customer Service	Team Leader
Waste Stream Diversion	Materials Recycling Materials Re-use	Collection, Sorting, Driving, Loading, Salvaging, Warehouse, Packaging and Composting	Warehouse Manager, Floor/Department Manager

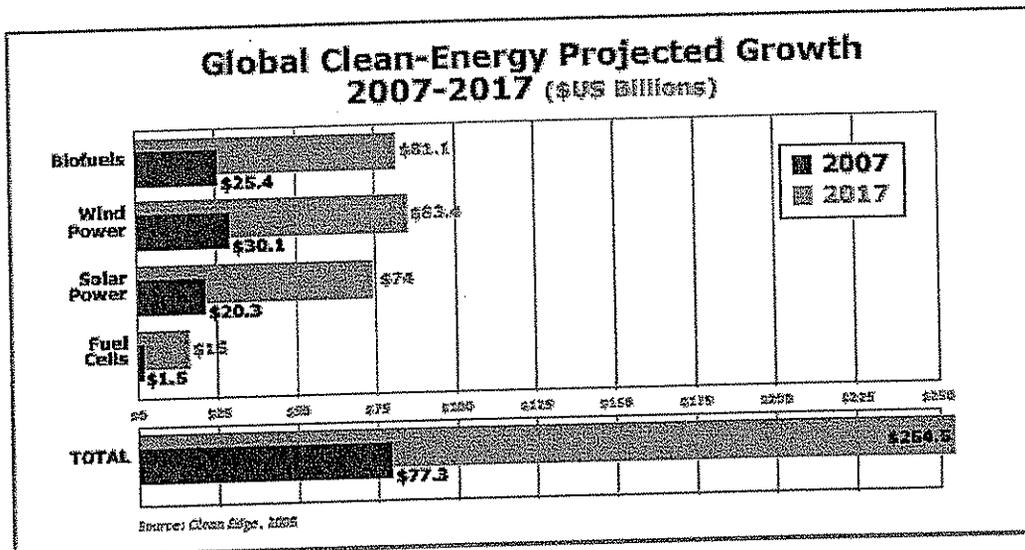
Appendix H: Charts on current and projected growth in cleantech investment

36: Venture Capital Investment in Clean Technology, California

By region



Source: Cleantech Network, LLC



MARK W. KELLEY
ATTORNEY AT LAW
mkkelley@mbdlaw.com
SAN FRANCISCO



E-MAIL AND MAIL

September 12, 2008

Mr. Charlie Knox
Community Development Manager
Community Development Department
City of Benicia
250 East L Street
Benicia, CA 94510

Re: Addendum to Final Environmental Impact Report
Benicia Business Park
Comments by Benicia Unified School District
Our File No.: 1375.10308

Dear Mr. Knox:

The Benicia Unified School District ("District") has asked this office to provide the District's comments to the Addendum to the Final Environmental Impact Report ("Addendum" and "FEIR", respectively) for the proposed Benicia Business Park ("BBP") in the City of Benicia ("City"). The Addendum was prepared to analyze the environmental impacts of the changes proposed by the project sponsor (the "Mitigated Project") in contrast to the 2007 project ("2007 Project") that was analyzed in the FEIR.

GENERAL OBSERVATIONS

The District is concerned with the following issues that it has previously brought to the City's attention, which remain unaddressed in the Addendum. Additionally, the District raises issues that should have been addressed in the Addendum but were not:

- The District has previously communicated to the City its concerns regarding the BBP project. In or about March 4, 2007, Dirk Fulton, on behalf of the Board of Trustees provided extensive comments on the impacts to the District. We

SAN FRANCISCO

71 Stevenson Street
Nineteenth Floor
San Francisco, CA 94105
Tel 415 543.4111
Fax 415.543 4384

LONG BEACH

301 East Ocean Boulevard
Suite 1750
Long Beach, CA 90802
Tel 562 366.8500
Fax 562 366 8505

SAN DIEGO

750 B Street
Suite 2310
San Diego, CA 92101
Tel 619 595 0202
Fax 619 702.6202
www.mbdlaw.com

Charlie Knox
Community Development Manager
City of Benicia
September 12, 2008
Page 2

reiterate those comments and provide an additional copy of that correspondence. The District believes that these issues have not been properly addressed in the FEIR or the Addendum.

- The Mitigated Project's impact on air quality for the District's students and staff in general, and most particularly those attending at working at the Robert Semple Elementary School ("Semple School"), 2015 East Third Street, Benicia, was not addressed in the Addendum.
- The proposed traffic calming measures and the potential impacts of the increased vehicular traffic created by the Mitigated Project, although reduced from the 2007 Project, remain at a significant threshold for the students and staff at Semple School and have not been addressed in any meaningful way in the Addendum. The District will provide more extensive comments on the traffic safety issues presented by the BBP in separate correspondence.
- The Mitigated Project's impact of increased noise level at Semple School was not addressed in the Addendum and as a result, it is unclear as to whether the City is asserting that the Mitigated Project no longer has noise level impacts at this location.
- The FEIR and the Addendum conclude that the Mitigated Project's impacts have been reduced to a less than significant level based in part on vaguely defined site uses. The generalized approach in the FEIR and the Addendum, which is appropriate for a "program" or "tiered" EIR, is inadequate for a project EIR. These documents do not rise to the level of analysis required under CEQA for a project EIR. Since there has been inadequate analysis of a "project" and its impacts, there cannot be defensible conclusions as to whether mitigation of impacts has been achieved until specific project data is available.

COMMENTS ON SPECIFIC SECTIONS OF THE ADDENDUM

- A. The Addendum fails to analyze the cumulative impacts of increased vehicle traffic on air quality at Semple School. (Addendum Section 8.)
1. Section 8 c. Toxic Air Contaminants. The Addendum reaches the conclusion that no new sources of toxic air contaminants will be present as a result of the Mitigated Project. No evidence is provided by which this conclusion is reached. The District requests that this issue be addressed in a more comprehensive manner.
 2. Section 8 d. Operational Emissions – CO Analysis. The Addendum concludes that since the Mitigated Project contains fewer square feet of industrial development that it will be expected to produce less CO and

VIII-B-321

not contribute cumulatively to CO concentrations. There is no reduction in the square footage of commercial development and the fact that the mix of industrial and commercial occupants has not been determined precludes the conclusion that less CO will be produced.

The District again provides the City a copy of the "Traffic-Related Air Pollution Near Busy Roads Study" (May 31, 2004), attached to the letter from Dirk Fulton, which indicates that children attending schools that are located within 500 feet of a road with more than 25,000 cars will suffer a 7% increase in respiratory problems associated with asthma and asthma precursor type symptoms. (American Thoracic Society, Traffic-related Air Pollution near Busy Roads (2004) American Journal of Respiratory and Critical Care Medicine, Vol. 170, pp. 520-526.)

The District reiterates its request, made March 9, 2007, for long term health assessments to ensure student health is maintained and not negatively impacted while attending Semple School.

3. Section 8 e. Demolition and Construction Emissions. The Addendum concludes that due to the lesser amount of grading (from 9 million cubic yards down to 4 million cubic yards of grading) proposed under the Mitigated Project that construction-period air quality impacts would be reduced to a less than significant level.

The District asserts that stating that the reduction in size of the project in conjunction with the implementation of the mitigation measures is not sufficient analysis to support the conclusion reached in the Addendum.

4. Section 8 f. Long-term Emissions Impacts. The Addendum concludes that the Mitigated Project's size, not its design features, results in significant unavoidable emissions of ozone precursors.

The District requests that the City refrain from certifying the Addendum based on the finding made in the FEIR that there will be a significant and unavoidable impact to the regional air quality. The FEIR states that "the potential [is small] for an individual project to significantly deteriorate regional air quality or contribute to significant health risk..." (FEIR at 269.) However, the Addendum states that it is the project's size that is the reason for its result in "significant unavoidable emissions of ozone precursors." (Addendum at 39.) The Addendum, in essence, contradicts the FEIR's finding that it is unlikely that regional air quality or health risk would worsen from the current condition due to emissions from an individual project. (FEIR at 269.) That statement is not analyzed in the FEIR and no supporting documentation is provided. While the

Addendum reaches the same result (approval of the Mitigated Project) as the FEIR does for the 2007 Project, the Addendum makes a contradictory assertion. The similarity between the two environmental documents is that neither contains appropriate analysis to support the conclusion reached.

B. The Addendum fails to analyze the impacts of increased noise on the learning environment at the Semple School. (Addendum Section 9.)

1. Section 9 c. Construction Period Impacts. The Addendum reaches the conclusion that the Mitigated Project will result in similar construction period noise impacts as would the 2007 Project. The FEIR has determined that the 2007 Project could have a significant impact for a short term along 2nd Street.

The District reiterates its previous request (March 9, 2007) that further analysis of potential noise is conducted and that all proposed mitigations be required of the project sponsor.

2. Section 9 d. Operation Impacts. The Addendum concludes without analysis that the reduction in the size of the Mitigated Project and the implementation of Mitigation Measure NOI-2a, 2b, and 2c will ensure that noise impacts are reduced to a less than significant level. The Addendum acknowledges this while stating that transportation modeling data was unavailable at the time the Addendum was written. The District asserts that the Addendum, like the FEIR before it, has failed to properly analyze the cumulative impacts of the increased traffic noise on the students and staff at Semple School.

The proposed Mitigation Measures (FEIR at 285), for the siting of a hotel with proposed outdoor activity (FEIR at 284) may be minimally adequate for a hotel however, the District believes that additional noise mitigation measures may be necessary for students and staff at the Semple School. The proposed and minimally acceptable mitigation measures include construction of a noise barrier, sound wall or sound wall/berm combination around all outdoor activity areas (FEIR at 285). Further, the City standards for "office/industrial facilities with areas that require good speech intelligibility... must be constructed to maintain an interior noise level of 45 dBA CNEL." (FEIR at 285.) To achieve this interior noise level, installation of noise-attenuated ventilation systems should be required of the project applicant to attain mitigation of the impacts of the Mitigated Project on the students and staff at Semple School.

The FEIR acknowledges that the City's General Plan prohibits noise levels in excess of 65dBA CNEL for schools (among other uses). However, no measurement is made of the location of the Semple School despite being recognized as a sensitive receptor under the General Plan. The Addendum concludes, without analysis, that implementation of the four-part Mitigation Measure will ensure that the Semple School is not negatively impacted by the increase in noise from vehicular traffic.

C. FEIR and Addendum include elements of a Program EIR while reaching conclusions as a Project EIR.

1. The CEQA Guidelines define a "program" as "a series of actions that can be characterized as one large project" and related, in pertinent part and applicable here, geographically and as logical parts in the chain of contemplated actions. (CEQA Guidelines, § 15168, subd. (a).) A program EIR is intended to be supplemented with later, more specific, detailed analysis.
 - a. The District asserts that the City has not made clear whether the FEIR is intended to be a program EIR or a project EIR and as a result fails to provide the reader with sufficient information with which to read and evaluate the document.
 - b. Several examples of ambiguous nature of the analysis in the Addendum are: 1) the variety of types and sizes of specific land uses that are assumed for inclusion in the Mitigated Project (Addendum at 6); 2) the lack of specific site plans for the proposed 857,000 square feet of commercial and industrial construction (Addendum at 7); and, 3) infrastructure, such as interior streets, that would not be connected until final phase of development adjacent to the road (Addendum at 9-10).
 - c. CEQA Guidelines, § 15168, subd. (c)(5), states that "A program EIR will be most helpful in dealing with subsequent activities if it deals with the effects of the program as specifically and comprehensively as possible."
2. CEQA Guidelines, §15378, subd.(c) states that the term "project" refers to the activity which is being approved and which may be subject to several discretionary approvals by governmental agencies. Based on this, it is unclear exactly what has been approved by the City due to the

Charlie Knox
Community Development Manager
City of Benicia
September 12, 2008
Page 6

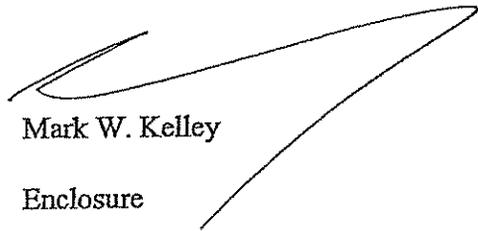
vague nature of the uses proposed and the wide-ranging possible uses that could be constructed within the BBP. Therefore, the District must reiterate its prior comments as to the lack of in-depth analysis of the impacts of noise, air pollution, and traffic on the students and staff at the Semple School.

D. Conclusion

For the foregoing reasons, we believe that the FEIR and the Addendum have failed to meet the requirements of CEQA in that they have not properly considered the impacts of the BBP on the students and staff of the District and in particular, the Semple School. In addition, the FEIR and the Addendum fail to provide adequate mitigation for the impacts on an elementary school, which is recognized as a sensitive receptor to both noise and air pollutants.

Very truly yours,

MILLER BROWN & DANNIS



Mark W. Kelley

Enclosure

cc: Board of Trustees, Benicia Unified School District
Elizabeth Patterson, Mayor, City of Benicia

LAW OFFICES
DIRK A. FULTON
A PROFESSIONAL CORPORATION
555 FIRST STREET #303
BENICIA, CA 94510

TELEPHONE
(707) 747-9003
FACSIMILE
(707) 747-0604

March 9, 2007

Mr. Charles Knox
Planning Director
City of Benicia
250 East L Street
Benicia, CA 94510

Re: Comments on Draft EIR for Seeno Project @ E. 2nd Street and Lake Herman Road (the "Project") -

Dear Mr. Knox,

I write as President of the Board of Trustees for the Benicia Unified School District ("BUSD") in connection with the Project as referenced above.

This letter addresses several student and community health safety issues raised by the draft Environmental Impact Report ("EIR") for the Project. These health and safety concerns are as follows:

Traffic-Generated Air Pollution. The EIR shows that 35% of the traffic generated by the Project will use E. 2nd Street, which abuts the Robert Semple Elementary School. Health effects of traffic-generated air pollution are not thoroughly reviewed in the EIR (pages 265-268). This is so despite the fact that traffic flows on East 2nd Street greatly increase from 11,100 existing ADT to 37,900 ADT at build-out (See EIR Appendix D). The attached health study ("Traffic-Related Air Pollution Near Busy Roads" - see Attachment) shows that children attending schools that are located within 500 feet of a road carrying more than 25,000 cars will suffer a 7% increase in respiratory problems associated to asthma and asthma precursor type symptoms. Lung development in children who show no acute symptoms or respiratory distress can also be affected, with chronic daily exposure to such high levels of air pollutants: PM 2.5 and PM 10, e.g., tiny particle material tailpipe emissions, especially diesel, that can penetrate lung tissue.

Such impacts will directly and immediately affect our young elementary students playing on fields and working in classrooms. These impacts are material and possibly unmitigatable. Extensive long term health assessments are needed to assure student safety.

Traffic Control Issues. During the peak commute hours for the Project, BUSD parents will be dropping-off and delivering their children to and from Robert Semple. The Project, by itself, will generate 2,300 new trips during the morning school "drop-off"

1

2

Mr. Charles Knox
March 9, 2007
Page 2

hour. (See EIR Figure IV 6-7). Yet, no changes are proposed for the intersections at East Second Street and merging arterials of Hillcrest, Seaview, East Tennys and Rankin Way. This adverse and potentially dangerous situation also occurs during the afternoon "pick-up" hour. Accordingly, further traffic studies are needed to guarantee that our safe routes to school are maintained.

2
cont.

Noise Impacts. Robert Semple is already impacted from noise by the 55,000 cars per day on I-780 and the existing 11,000 on East 2nd Street. No mitigations are proposed to protect the children from additional noise generated by this Project (EIR pages 279-282.). Noise studies and mitigations are required to protect the Robert Semple School site as a safe learning community.

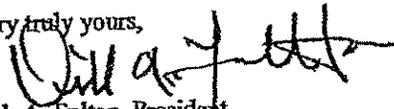
3

Cumulative Impacts. The Project presents significant and material cumulative environmental impacts as to Robert Semple and the health and safety of its students. The school is fronted by I-780 (55,000 ADT) and is within 1/4 mile of the Benicia Valero Refinery. Neither the air quality impacts of the adjacent freeway or of the refinery have ever been adequately studied by any government entity, including the City of Benicia. In combination with the impacts of the Project, these cumulative air, noise, and general safety impacts are weighty. Such impacts must be closely studied over extensive time periods to determine whether or not said impacts may be mitigated. Only then can the community be assured that the health of our children will remain protected.

4

Thank you for the opportunity to provide these comments. I look forward to your detailed response.

Very truly yours,



Dirk A. Fulton, President
Benicia Unified School District

DAF:bt

ATTACHMENT

Traffic-related Air Pollution near Busy Roads The East Bay Children's Respiratory Health Study

Janice J. Kim, Svetlana Smorodinsky, Michael Lipssett, Brett C. Singer, Alfred T. Hodgson, and Bart Ostro

Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, Oakland; and Atmospheric Sciences Department and Indoor Environment Department, Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory, Berkeley, California

Recent studies, primarily in Europe, have reported associations between respiratory symptoms and residential proximity to traffic; however, few have measured traffic pollutants or provided information about local air quality. We conducted a school-based, cross-sectional study in the San Francisco Bay Area in 2001. Information on current bronchitis symptoms and asthma, home environment, and demographics was obtained by parental questionnaire ($n = 1,107$). Concentrations of traffic pollutants (particulate matter, black carbon, total nitrogen oxides [NO_x], and nitrogen dioxide [NO_2]) were measured at 10 school sites during several seasons. Although pollutant concentrations were relatively low, we observed differences in concentrations between schools nearby versus those more distant (or upwind) from major roads. Using a two-stage multiple-logistic regression model, we found associations between respiratory symptoms and traffic-related pollutants. Among those living at their current residence for at least 1 year, the adjusted odds ratio for asthma in relationship to an interquartile difference in NO_x was 1.07 (95% confidence interval, 1.00–1.14). Thus, we found spatial variability in traffic pollutants and associated differences in respiratory symptoms in a region with good air quality. Our findings support the hypothesis that traffic-related pollution is associated with respiratory symptoms in children.

Keywords: air pollution; asthma; bronchitis; epidemiology; vehicle emissions

Numerous epidemiologic studies have documented adverse effects of air pollution on health (1). The majority of these population-based studies have used pollutant concentrations measured at central monitoring sites to estimate exposures and have not, in general, considered local spatial variability in pollutant levels. However, motor vehicle emissions, the principal source of ambient air pollution in most urban areas, are likely to vary substantially within a given community and researchers have begun to document differences in traffic-related pollutants on a neighborhood scale (2, 3).

Recently, a number of epidemiologic studies have reported associations between residential proximity to busy roads and a variety of adverse respiratory health outcomes in children, including respiratory symptoms, asthma exacerbations, and decrements in lung function (4–12). In some reports, truck traffic has been more strongly associated with these adverse outcomes than total vehicular traffic (6, 7, 10, 11).

Most studies have used metrics of proximity to traffic as surrogates of exposure to traffic pollution (e.g., residential prox-

imity to major roads, traffic volume at the nearest road, or modeled levels of traffic pollution). Few have measured pollutant concentrations as part of the exposure assessment or provided information on local air quality (7, 10–12). The majority of studies have been conducted in Europe and Japan, where fleet composition (diesel versus gasoline), emissions factors, fuel specifications, land use, and population distributions near busy roads differ from those in the United States. Regional and microenvironmental concentrations of particulate matter (PM) may be higher in European cities compared with many parts of the United States (13). Therefore, it is important to evaluate the extent to which proximity to traffic may be associated with health impacts in the United States. Previous studies in the United States were conducted in areas of Southern California and the Northeast with significant local air-quality problems; both used metrics of proximity to traffic, not measured pollutant concentrations (8, 14).

The objective of this study was to explore associations between respiratory symptoms and exposures to traffic-related air pollutants among children living and attending schools near busy roads in an urban area with high traffic density but good regional air quality. Some of the results of this study have been previously reported in the form of abstracts (15).

METHODS

Study Design and Health Assessment

We conducted a school-based, cross-sectional study in the San Francisco metropolitan area (Alameda County, CA) in 2001. The study area was comprised of 10 neighborhoods that span a busy traffic corridor. School sites were selected to represent a range of locations upwind and downwind of major roads (Figure 1).

In spring 2001, we enrolled children (grades 3–5) in participating classes ($n = 64$) using methods similar to those used in other school-based studies (16–18). We obtained information on health outcomes (bronchitis symptoms in the past 12 months and physician-confirmed asthma in the past 12 months), demographics, home environmental factors, and activity factors using parental questionnaires (English and Spanish) (for additional information on the study design and health assessment, see the online supplement). The study protocol was approved by the Committee for the Protection of Human Subjects, California Health and Human Services Agency.

Air Pollution from Traffic

We measured concentrations of traffic pollutants (particulate matter [PM_{10} , $\text{PM}_{2.5}$], black carbon [BC], total nitrogen oxides [NO_x], and nitrogen dioxide [NO_2]) at the school sites. PM_{10} and $\text{PM}_{2.5}$ mass concentrations were measured using filter-based samplers, whereas BC concentrations were determined on the PM_{10} filter samples using an established light attenuation method that we validated for fibercell filters (19, 20). NO_x and NO_2 concentrations were determined with passive diffusion samplers (Ozone, Inc., Pompano Beach, FL). Nitric oxide (NO) concentrations were calculated as the difference between NO_x and NO_2 .

Pollutant monitoring was conducted simultaneously at all school sites for 11 1-week intervals in the spring (March–June) and for 8 weeks

(Received in original form March 4, 2004; accepted in final form May 31, 2004)

Correspondence and requests for reprints should be addressed to Bart Ostro, Ph.D., Office of Environmental Health Hazard Assessment, 1515 Clay Street, 16th Floor, Oakland, CA 94612. E-mail: bostro@oehha.ca.gov

This article has an online supplement, which is accessible from this issue's table of contents online at www.atsjournals.org.

Am J Respir Crit Care Med Vol 170, pp 526–536, 2004
Originally published in *Print* on Dec 15, 2004
Internet address: www.atsjournals.org

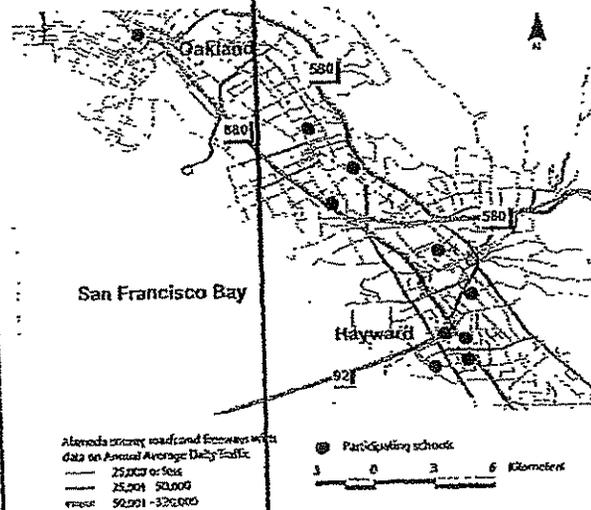


Figure 1. East Bay Children's Respiratory Health Study area. The study region is to the east and across the bay from the city of San Francisco.

in the fall (September–November) of 2001. NO_x and NO_2 were sampled during all weeks at each school. PM_{10} and $\text{PM}_{2.5}$ and the BC concentrations were not measured every week. Study-averaged air pollution concentrations were calculated at each school by first normalizing the data to account for occasional missing values. Additional details are described in the online supplement and elsewhere (21). In preliminary analyses, we also used school location in relationship to prevailing winds and proximity to busy roads as an additional traffic metric.

Data Analysis

We examined associations between pollutants and health outcomes using a two-stage hierarchical modeling strategy. This method has been used in other epidemiologic studies of air pollution when pollutants were measured at the group level (18, 22). In our study, the exposure groups were represented by the neighborhood schools. In the first stage, we initially identified potential confounders (demographic, host, or home environmental variables) associated with health outcomes in this dataset. We then performed explanatory stepwise logistic regressions to develop a model in which individual-level characteristics best predicted the odds of each health outcome. Explanatory variables that remained significant at $p < 0.15$ were retained in the model. We then fit a logistic regression model that included an indicator variable for each school in addition to the individual-level covariates.

In the second stage, the adjusted school-level logits or prevalence rates determined in the first stage were regressed on the school-specific ambient pollutant concentrations. In this manner, we obtained the log odds ratios (ORs) relating asthma or bronchitis symptoms to air pollution, after adjusting for individual-level risk factors.

We calculated adjusted ORs for a change in measured pollutant concentration equal to the interquartile ranges of the pollutant distributions. Analyses were conducted using SAS version 8.2 for Windows (Cary, NC) and STATA, version 8 (College Park, TX).

RESULTS

We distributed 1,574 questionnaires in 64 participating classrooms in the 10 schools. Three children were excluded because their parents spoke neither English nor Spanish. Among the remaining students, there was a response rate of 70.7% (1,111/1,571). Participation rates across schools ranged from 61–83%.

Approximately 30% completed the questionnaire in Spanish. Two children with reported cystic fibrosis were excluded from the analysis. The final analysis sample consisted of 1,109 questionnaires.

Table 1 summarizes the participants' demographic characteristics, prevalence of selected personal and home environmental characteristics, and respiratory health outcomes. Our study population was racially diverse. Approximately 30% of households had incomes below the federal poverty line. Fourteen percent of the parental respondents reported having been told by a doctor that their child had asthma in the preceding 12 months. This represents a measure of period prevalence of asthma and would include some incident cases. Twelve percent of children had bronchitis symptoms in the past year. Of those reporting bronchitis symptoms in the past 12 months, 43% also reported having asthma. Using a slightly different definition of asthma (physician-diagnosed ever, and asthma symptoms, including wheezing, in the past 12 months), 11% of our study population had current asthma.

The estimated pollutant concentrations at the schools are summarized in Table 2. Concentrations of several pollutants (i.e., BC, NO_x , NO, and, to a lesser extent, NO_2) were higher at schools located within 300 m downwind of a freeway compared with those at schools upwind or further from major traffic sources. There was less variation in $\text{PM}_{2.5}$ and PM_{10} . Coconcentrations of BC, NO_x , and NO were highly correlated ($r^2 =$ approximately 0.9 for each interpollutant correlation). The study average $\text{PM}_{2.5}$ (12 $\mu\text{g}/\text{m}^3$) was similar to the annual average concentration of $\text{PM}_{2.5}$ at the central monitoring station, located approximately 15 km south of the study area. NO_x and NO_2 measurements at the school sites away from traffic were similar to levels measured at the regional site (21).

Table 3 summarizes the results of the two-stage hierarchical logistic regression models of the odds of asthma and bronchitis symptoms in the previous year in relationship to six different pollutants, each examined in separate regressions. Results are shown for all subjects, for long-term residents only (1 year or longer at the current address), and for the latter group stratified by sex. In addition to the traffic metric, explanatory variables

TABLE 1. DEMOGRAPHIC, FAMILY, AND HOME CHARACTERISTICS OF THE EAST BAY CHILDREN'S RESPIRATORY HEALTH STUDY RESPONDENTS

Characteristics	All Subjects (n = 1,169) (%)	Subjects Attending Schools	
		Near and Downwind of Major Road (Four Schools, n = 402) (%)	Far or Upwind of Major Roads (Six Schools, n = 767) (%)
Sex			
Female	52.6	51.8	53.1
Race/ethnicity			
White	12.6	11.0	13.5
Black, African American	11.1	7.0	13.4
Hispanic	43.5	47.6	41.2
Asian	14.0	15.5	13.1
Other/multiracial	18.9	18.8	18.9
SES indicators			
Household at/below federal poverty level	31.3	31.8	31.0
Parent's education: high school or less	48.7	51.4	47.1
Family history			
Biological mother with asthma	12.2	9.5	13.7
Maternal smoking during pregnancy	10.3	7.8	11.7
Home indoor environment			
Smoker in the household, since child's birth	17.9	13.1	20.6
Smoker in the household, current	7.2	3.2	9.5
Furry pet	37.3	36.0	38.1
Pests, past 12 mo	63.1	65.4	61.8
Gas stove	63.1	63.6	62.9
Indicator of mold/mildew presence, past 12 mo	44.6	43.5	45.3
Health outcomes			
Chest illness before age 2	23.3	18.8	25.9
Asthma, past 12 mo	14.0	13.9	14.1
Bronchitis, past 12 mo	12.1	13.2	11.5

* Parent responding to the questionnaire.

retained in all of the final models for asthma and bronchitis included chest illness before age 2 years, household mold/moisture, and pests observed in the home in the preceding 12 months. The final models for asthma also included maternal history of asthma. The addition of other potential confounders such as race/ethnicity, socioeconomic variables, maternal smoking during pregnancy, current smoker in the home, air conditioning, and gas stove use yielded similar pollutant effect estimates.

For the full sample, associations were observed between both asthma in the past 12 months and bronchitis symptoms in the past 12 months and the pollutants, especially NO₂, NO, and BC. The effect estimates for PM_{2.5} and PM₁₀ were smaller, which may have been due in part to the smaller concentration ranges among the 10 sites for these pollutants. No multipollutant models were evaluated because of the high interpollutant correlations. Restricting the analysis based on duration of residence (i.e., at

TABLE 2. NEARBY TRAFFIC SOURCES AND AVERAGE POLLUTANT CONCENTRATIONS AT TEN SCHOOLS

School	Major Traffic Source ^a	AADT ^b (#/d)	Distance ^c (m)	< 300 m Downwind	PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	BC ($\mu\text{g}/\text{m}^3$)	NO _x (ppb)	NO ₂ (ppb)	NO ^d (ppb)
	No				30	12	0.7	42	22	19
	Yes	50,000	230	Yes	29	13	0.9	55	24	31
	Yes	20,000	360	No	32	12	0.8	49	21	29
	No				30	12	0.8	41	19	22
	Yes	20,000	130	Yes	30	12	0.9	62	26	36
	No				30	12	0.7	39	21	17
	No				29	11	0.7	33	20	11
	Yes	10,000	350	No	29	12	0.7	45	23	21
	Yes	20,000	200	Yes	30	12	0.9	57	26	31
	Yes	10,000	60	Yes	32	15	1.1	69	31	38
Study average					30	12	0.8	49	23	25

Definition of abbreviations: AADT = annual average daily traffic; BC = black carbon; NO = nitric oxide; NO_x = total nitrogen oxide; NO₂ = nitrogen dioxide; PM_{2.5} = particulate matter of aerodynamic diameter 2.5 μm or less; PM₁₀ = particulate matter of aerodynamic diameter 10 μm or less.

Estimated average pollutant concentrations at each school based on normalized concentrations (see text). Monitoring was conducted for 11 weeks in the spring (March-June) and 8 weeks in the fall (September-November of 2001). The number of weeks underlying our estimates of chronic exposure varied for each measured pollutant: NO_x (18), NO₂ (19), BC (11), PM_{2.5} (10), and PM₁₀ (9).

^a There is also a shopping center and a parking lot abutting the school grounds to the south and a freeway off ramp less than 50 m to the northwest.

^b Includes roads with AADT above 50,000 vehicles per day located within 1,000 m of school. AADT estimate provided by the California Department of Transportation (Cal Trans).

^c Distances were estimated using a geographic information system. Latitude and longitude of the monitors were determined using a global-positioning system device (Garmin GPS 60). In some cases, distances were estimated using aerial photographs or measured using a distance wheel.

^d NO = NO_x - NO₂.

TABLE 3. ODDS RATIOS (95% CONFIDENCE INTERVAL) OF RESPIRATORY ILLNESS BY SCHOOL-BASED AMBIENT AIR POLLUTANT CONCENTRATION USING TWO-STAGE MODEL

Exposure	All Subjects (n = 1,109)		LTR Subjects (n = 677)		LTR Females (n = 462)		LTR Males (n = 403)	
	OR	CI	OR	CI	OR	CI	OR	CI
Bronchitis*								
NO _x	1.05	(1.01, 1.08)	1.06	(1.03, 1.09)	1.07	(1.03, 1.11)	1.03	(0.98, 1.09)
NO ₂	1.02	(0.99, 1.06)	1.03	(1.00, 1.06)	1.04	(1.01, 1.08)	1.02	(0.98, 1.06)
NO	1.05	(1.02, 1.09)	1.06	(1.03, 1.09)	1.07	(1.03, 1.11)	1.04	(0.98, 1.10)
PM ₁₀	1.03	(0.99, 1.07)	1.02	(0.98, 1.07)	1.04	(1.01, 1.09)	1.01	(0.95, 1.06)
PM _{2.5}	1.02	(1.00, 1.05)	1.03	(1.01, 1.05)	1.04	(1.02, 1.05)	1.02	(0.99, 1.05)
BC	1.04	(1.00, 1.08)	1.05	(1.01, 1.08)	1.06	(1.02, 1.10)	1.03	(0.98, 1.08)
Asthma†								
NO _x	1.04	(0.97, 1.11)	1.07	(1.00, 1.14)	1.17	(1.06, 1.29)	1.02	(0.93, 1.13)
NO ₂	1.02	(0.97, 1.07)	1.04	(0.98, 1.10)	1.09	(1.03, 1.15)	1.00	(0.94, 1.07)
NO	1.05	(0.98, 1.12)	1.08	(1.00, 1.15)	1.19	(1.03, 1.36)	1.02	(0.94, 1.12)
PM ₁₀	1.02	(0.96, 1.09)	1.04	(0.97, 1.12)	1.09	(0.92, 1.29)	1.02	(0.94, 1.10)
PM _{2.5}	1.00	(0.97, 1.04)	1.01	(0.97, 1.06)	1.06	(0.99, 1.13)	0.99	(0.95, 1.04)
BC	1.02	(0.96, 1.09)	1.05	(0.99, 1.13)	1.12	(0.95, 1.33)	1.00	(0.93, 1.09)
Asthma (no outlier, school 5)*								
NO _x	1.08	(1.00, 1.17)	1.10	(1.00, 1.20)	1.14	(1.02, 1.28)	1.07	(0.96, 1.19)
NO ₂	1.06	(0.99, 1.13)	1.07	(0.98, 1.17)	1.09	(0.97, 1.22)	1.05	(0.96, 1.16)
NO	1.08	(1.00, 1.17)	1.09	(1.00, 1.19)	1.14	(1.03, 1.26)	1.07	(0.96, 1.18)
PM ₁₀	1.06	(0.97, 1.16)	1.08	(0.98, 1.19)	1.09	(0.96, 1.24)	1.08	(0.97, 1.19)
PM _{2.5}	1.04	(0.96, 1.12)	1.03	(0.94, 1.13)	1.03	(0.91, 1.17)	1.03	(0.94, 1.14)
BC	1.07	(0.98, 1.17)	1.09	(0.99, 1.19)	1.14	(1.02, 1.27)	1.06	(0.95, 1.18)

Definition of abbreviations: BC = black carbon; CI = confidence interval; LTR = long-term resident; OR = odds ratio; NO_x = nitric oxide; NO₂ = total nitrogen oxide; NO_x = nitrogen dioxide; PM₁₀ = particulate matter of aerodynamic diameter 2.5 μm or less; PM_{2.5} = particulate matter of aerodynamic diameter 2.5 μm or less; PM₁₀ = particulate matter of aerodynamic diameter 10 μm or less. Odds ratios are calculated per IQR of average pollutant concentrations as follows: NO_x = 14.9 ppb; NO₂ = 3.6 ppb; NO = 11.6 ppb; PM₁₀ = 1.4 μg/m³; PM_{2.5} = 0.7 μg/m³; BC = 0.15 μg/m³.

For hierarchical analyses of asthma in long-term residents (current address for 1 year or more), only 9 schools were included in the analysis; one school had no cases (due to low numbers and missing values).

* First stage model adjusted for child's respiratory illness before age 2; peax, indicator of mold presence.
† First stage model adjusted for child's respiratory illness before age 2; peax, indicator of mold presence; maternal history of asthma.

least 1 year at current residence) tended to increase the effect estimates slightly in relationship to asthma, especially when the sample was restricted to girls. Stratification by duration of residence or sex did not change the results for bronchitis. Results were similar when nonnormalized pollution values were used (data not shown).

We conducted additional sensitivity analyses, including (1) dropping the one school that was an outlier with respect to the proportion of Hispanic students (89% vs. 21–53% at other schools), (2) using a different definition for current asthma, and (3) stratifying bronchitis by a reported history of asthma. When the "outlier" school was dropped, the magnitude of the ORs for bronchitis did not change much, but the confidence intervals were wider. In the asthma analyses, dropping the outlier school resulted in similar or slightly greater effect estimates. Applying different questionnaire-based asthma definitions showed little change but slightly larger confidence intervals. After stratifying students by whether they also "ever" had asthma, the results suggested that those with a history of asthma were driving the results for bronchitis, but the sample size became too small to make clear inferences. Figures 2 and 3 depict the associations between BC and bronchitis and asthma.

DISCUSSION

To our knowledge, this is the first epidemiologic study in the United States to evaluate relationships between measured traffic-related pollutants and respiratory symptoms. For children residing at their current address for at least 1 year, we found modest but significant increases in the odds of bronchitis symptoms and physician-diagnosed asthma in neighborhoods with

higher concentrations of traffic pollutants. These results are consistent with previous reports of positive associations between proximity to traffic and various respiratory outcomes (4–12). Furthermore, our findings were observed in a region with relatively clean air (low concentrations of ozone and PM) (see the online supplement for details). Although previous epidemiologic studies in the United States exploring chronic respiratory effects of air pollution in children have shown inconsistent results, this might be due in part to exposure misclassification, as these studies used air quality measurements conducted at single fixed-site monitors in each city (11, 18, 22, 23).

Our findings were robust to multiple sensitivity analyses using different questionnaire-based definitions of current asthma and wheezing in the past 12 months. The slight increase in effect estimates for associations between asthma after restricting the analysis to those with longer duration at current residence may be due to a reduction in exposure measurement error. Our study population was very mobile (23% had moved in the preceding 12 months, and only 32% had lived at the same address since before the age of 2 years).

We considered whether there might be bias due to nonresponse or self-reporting. We saw no significant difference in proportions of questionnaires returned in Spanish versus English by school, but there was a modest inverse correlation between pollution concentrations measured at each school and response rate. However, the response rate for individual classrooms within each school varied as well and appeared to depend on the willingness of teachers to encourage participation. Dropping the school closest to a freeway (which also had the highest measured pollutant concentrations, a high percentage of Hispanic students, and the lowest response rate) did not change the effect estimates for

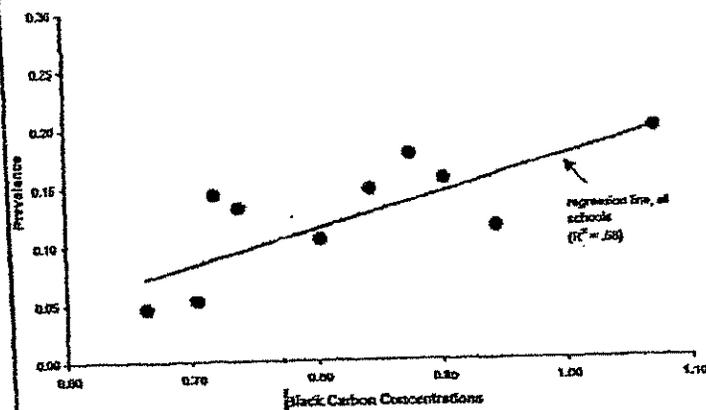


Figure 2. Adjusted school-specific bronchitis prevalence rates versus black carbon, long-term residents.

bronchitis and increased the estimates for asthma. This would suggest that knowledge of potential high traffic exposure probably did not affect parental reporting of the children's respiratory histories. This study was not undertaken in response to public concerns about traffic nor, at the time the study was conducted, was there much local interest in potential health hazards of proximity to traffic. Therefore, reporting and nonresponse biases were unlikely to have unduly influenced our results.

We found increased association with asthma (but not bronchitis) with exposure to traffic air pollutants for girls who had lived at their current addresses at least 1 year compared with boys (Table 3). Several investigators have also reported greater traffic-associated effect estimates for girls versus boys (7, 8, 10, 24, 25). Previous air pollution studies examining the sex-specific effects of air pollution on lung function and lung function growth have been mixed (26, 27). The reasons for the observations in our study are unclear and deserve attention in future studies.

Exposures

We found spatial variability in exposure due specifically to roads with heavy traffic within a relatively small geographic area for

BC, NO_x, NO, and to a lesser extent NO₂. There was less variation in PM_{2.5} across schools; this is consistent with previous observations that PM_{2.5} is more likely to reflect regional air quality (2). The higher effect estimates with BC, NO_x, and NO compared with NO₂ and PM_{2.5} suggest that primary or fresh traffic emissions may play an etiologic role in these relationships. Although NO_x, NO, and BC may serve as indicators of exposure to traffic-related pollutant mixtures, they may also act as etiologic agents themselves (28).

We found that downwind direction was an important determinant of increased exposure to traffic pollutants and that a simple traffic indicator (school location downwind and < 300 m from a major road) gave estimates of ORs similar to or greater than pollutant measurements in preliminary analyses using a one-stage model (data not shown). Within a geographic area with flat terrain and low-rise buildings, the direction of wind in relationship to the traffic source is the most important weather parameter. Other parameters important in air dispersion of traffic pollutants (e.g., atmospheric stability, wind speed, and surface topography) would be relatively similar at the different school sites.

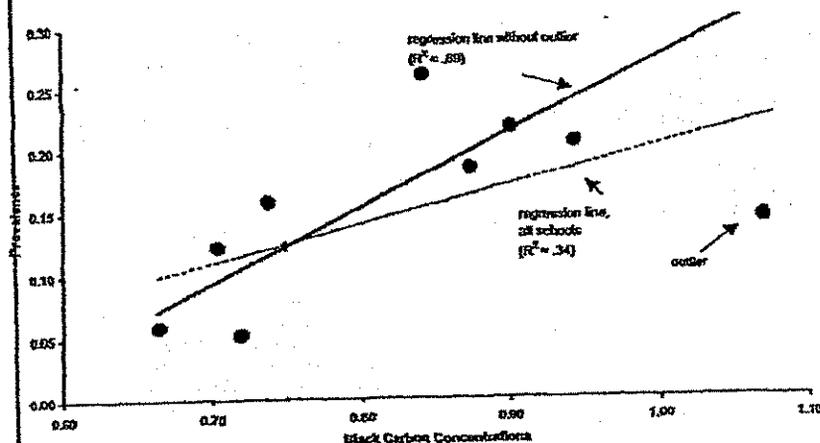


Figure 3. Adjusted school-specific asthma prevalence rates versus black carbon, long-term residents.

A simple single-stage logistic model using pollutant measurements also yielded positive associations between pollutants and symptoms with a much larger effect estimate and smaller confidence intervals.

We assumed that traffic-related pollutants measured at the neighborhood schools would be a good proxy for the children's overall exposure to such pollutants. Children attending the schools in this study generally lived within walking distance and did not use school buses. Therefore, pollutant concentrations in the children's neighborhoods probably tracked those at their schools. The most plausible exposure error in an urban setting would be that subjects who attend schools with very high traffic exposures from a nearby freeway would tend to have similar or lower home exposures, whereas children with low school exposures would tend to live in homes with similar or only slightly higher traffic exposures. This pattern of measurement error would tend to underestimate the association between exposure and outcome (29).

Alternatively, repeated daily exposures for 6-8 hours during the school year may themselves represent biologically important influences on some children's respiratory health, analogous to occupational exposures for susceptible adults. In a recent study of proximity to traffic and respiratory health, Janssen and colleagues found that effect estimates based on the school-to-highway distance were comparable or greater than those based on residence-to-highway distance (11).

The average measurements at each school were used to estimate long-term average traffic air pollutant concentrations. We measured pollutants at each of the 10 sites concurrently (to avoid concerns of week-to-week variability) in two different periods that reflect the major seasonal wind patterns for the area. We found that the rank order (relative values) of the schools did not vary from week to week or season to season, supporting the validity of this approach. Additionally, the NO_x and NO_2 concentrations at schools upwind or further from high traffic roads were similar to NO_x and NO_2 concentrations measured at the closest fixed-site monitor (21). Although there may have been some changes in the absolute traffic volume on major roads in recent years, the principal traffic patterns in the area have not changed. Thus, the relative values (rank order) of the site-specific pollutant concentrations measured in our study are likely to be representative of those in recent years.

The cross-sectional nature of our study design is a further limitation on causal inference, but we observed the same or modest increase in effect estimates for current asthma and bronchitis when we restricted our analysis to those who had lived at their present address for at least a year. Most studies on proximity to traffic and respiratory symptoms have been cross-sectional, and further longitudinal studies are needed to elucidate the role of traffic-related air pollution in the development and exacerbation of asthma and other respiratory symptoms.

Another limitation was that the exposures were assigned at the group level ($n = 10$); however, the multilevel analysis allows adjustment for individual confounders in the first stage of analysis. Moreover, in this respect, this study is comparable with other epidemiologic investigations (e.g., the Harvard Six Cities Study and the Children's Health Study in Southern California) ($n = 12$ communities). Another recent cross-sectional study of traffic-related air pollution and respiratory symptoms included 13 schools (18, 22, 23).

We also lacked information on indoor measurements of traffic-related pollutants. However, recent studies have found high correlations between personal exposures to NO_2 and traffic parameters (30). Others have found that indoor concentrations and exposure to soot (PM from diesel exhaust) is highly correlated with outdoor levels (2).

Other Covariates

Maternal asthma, household mold/moisture, pests, and chest illness before the age of 2 years were important explanatory variables in the final model for current asthma, consistent with previous studies (31-33). We explored whether current levels of traffic pollution could modify the risk of current asthma symptoms depending on past history of chest illness; however, there was not sufficient power to explore interactions based on early medical history. Race/ethnicity and indicators of socioeconomic status were not important predictors of health outcomes in our study. This may be due, in part, to our study design (i.e., the schools were selected to have relatively similar measures of socioeconomic status).

We did not find associations between exposure to environmental tobacco smoke and current asthma; the results of previous cross-sectional studies in school-aged children have been mixed (34). The prevalence of current household smokers in our study was small, however, limiting study power. It is possible that there is some underreporting of household smoking (7% in our study vs. 19% statewide). (35) Alternatively, a substantial portion of our study population was less acculturated Hispanics (30% of parents responded in Spanish), and only 3.6% of Hispanic households reported a history of maternal smoking. Other investigators have also observed very low smoking rates (less than 5%) among less acculturated Hispanics (B. Eskenazi, personal communication) (36). If underreporting does exist, it is possible that residual confounding might have affected our estimates of pollutant/respiratory health outcome relationships. However, the addition to the regression model of variables correlated with exposure to environmental tobacco smoke (e.g., socioeconomic status and race-ethnicity) did not change the pollutant effect estimates, suggesting that significant confounding by environmental tobacco smoke was not likely.

In summary, we found associations between traffic-related pollutants and asthma and bronchitis symptoms in the past 12 months in a highly urbanized region of the United States with good regional air quality, where local air pollution is dominated by vehicular sources. Although the cross-sectional study design, exposure assignment at the group level, small geographic area, and possible unmeasured covariates may limit the generalizability of the study, our findings are consistent with previous investigations in Europe and the United States (11, 14, 37). In addition, our results underscore the limitations of using central air monitoring stations for assigning population exposures. Concentrations of air toxics such as diesel exhaust particles or surrogates such as BC or soot should be more widely monitored. Measurement of personal exposures to traffic pollutants is not feasible in large population-based studies; the use of geographic modeling approaches to estimate exposures for individuals may be a good alternative (38). Future studies that can better characterize exposures to traffic pollutants, and their sources (i.e., diesel versus gasoline engines) will be important to understand better the public health impacts of motor vehicle emissions.

Conflict of Interest Statement: H.K. does not have a financial relationship with a commercial entity that has an interest in the subject of this manuscript; S.S. does not have a financial relationship with a commercial entity that has an interest in the subject of this manuscript; M.L. does not have a financial relationship with a commercial entity that has an interest in the subject of this manuscript; R.C.S. does not have a financial relationship with a commercial entity that has an interest in the subject of this manuscript; A.T.H. does not have a financial relationship with a commercial entity that has an interest in the subject of this manuscript; B.O. does not have a financial relationship with a commercial entity that has an interest in the subject of this manuscript.

Acknowledgments: The authors thank Jackie Hayes and Dorina Eisenhower, Survey Research Center, University of California, Berkeley, for coordinating the survey; Toshiaki Honda, Lawrence Berkeley National Laboratories, for work on the air monitoring study; and Bob McLaughlin, California Department of Health Services,

for work using a geographic information system. Shelley Green, Rob McConnell, Ed Avol, Patrick van Vliet, Bob Gunter, and Paul English provided helpful discussions. The authors also thank the school administrators and teachers for their support and acknowledge study participants and their families.

References

1. Brunekreef B, Holgate ST. Air pollution and health. *Lancet* 2002;360:1233-1242.
2. Fischer P, Hoek G, van Rierwijk J, Briggs D, Lebrecht E, van Wijnen J, Kingham S, Elliott P. Traffic-related differences in outdoor and indoor concentrations of particles and volatile organic compounds in Amsterdam. *Atmos Environ* 2000;34:375-372.
3. Roorda-Knape MC, Janssen N, de Hartog J, van Vliet P, Hanssens H, Brunekreef B. Air pollution from traffic in city districts near major motorways. *Atmos Environ* 1998;32:1921-1930.
4. Wijn M, Reijnders P, Dold S, Wulf A, Niesdal T, von Loeffelholz-Cobberg EF, van Marrewijk E. Road traffic and adverse effects on respiratory health in children. *BMJ* 1993;307:596-600.
5. Weiland SK, Mundt KA, Ruckmann A, Keil U. Self-reported wheezing and allergic rhinitis in children and traffic density in street of residence. *Ann Epidemiol* 1994;4:243-247.
6. Ceccon G, Forastiere F, Apolito N, Bigazzi A, Bisanti L, Cheloni E, Corbo G, Dell'Omo V, Dalmasso P, Volante TF, et al. Road traffic and adverse respiratory effects in children: SIDRIA Collaborative Group. *Occup Environ Med* 1998;55:771-778.
7. van Vliet P, Knaap M, de Hartog J, Janssen N, Hanssens H, Brunekreef B. Motor vehicle exhaust and chronic respiratory symptoms in children living near freeways. *Environ Res* 1997;74:122-132.
8. English P, Neutra R, Scott R, Sullivan M, Walker L, Zhu L. Examining associations between childhood asthma and traffic flow using a geographic information system. *Environ Health Perspect* 1999;107:761-767.
9. Edwards J, Walters S, Griffiths RK. Hospital admissions for asthma in preschool children living close to major roads in Birmingham, UK. *Arch Environ Health* 1994;49:223-227.
10. Brunekreef B, Janssen NA, de Hartog J, Hanssens H, Knaap M, van Vliet P. Air pollution from truck traffic and lung function in children living near motorways. *Epidemiology* 1997;8:298-303.
11. Janssen NA, Brunekreef B, van Vliet P, Aarts F, Meliefste K, Hanssens H, Fischer P. The relationship between air pollution from heavy traffic and allergic sensitization, bronchial hyperresponsiveness, and respiratory symptoms in Dutch schoolchildren. *Environ Health Perspect* 2003;111:1512-1518.
12. Xunster U, Koch T, Raaf U, Ring J, Behrendt H. Traffic-related air pollution is associated with atopy in children living in urban areas. *Epidemiology* 2000;11:64-70.
13. Hoek G, Brunekreef B, Goldbohm S, Fischer P, van den Brundert PA. Association between mortality and indicators of traffic-related air pollution in the Netherlands: a cohort study. *Lancet* 2002;360:1203-1209.
14. Liu S, Mennis JP, Hwang SA, Fitzgerald E, Cayo MR. Childhood asthma hospitalization and residential exposure to state route traffic. *Environ Res* 2002;88:73-81.
15. Kim JJ, Svorodinsky S, Ostro B, Iqbal M, Singer BC, Hodgson AT. Traffic-related air pollution and respiratory health: the East Bay Children's Respiratory Health Study [abstract]. *Epidemiology* 2002;13 (4 Suppl):S100.
16. Ware JH, Ferris BG Jr, Dockery DW, Spengler JD, Stram DO, Speizer FE. Effects of ambient sulfur oxides and suspended particles on respiratory health of preschool children. *Amer Rev Respir Dis* 1986;133: 834-842.
17. Dockery DW, Cunningham J, Damstra AI, Neas LM, Spengler JD, Knutsen P, Ware JH, Rabson M, Speizer FE. Health effects of acid aerosols on North American children: respiratory symptoms. *Environ Health Perspect* 1996;104:500-505.
18. Peters JM, Avol E, Navidi W, London SJ, Gauderman WJ, Linn WS, Margolis H, Rappaport E, Gung H, et al. A study of twelve Southern California communities with differing levels and types of air pollution: I: prevalence of respiratory morbidity. *Am J Respir Crit Care Med* 1999;159:760-767.
19. Guadri E, Dod R, Rosen H, Novakov T. The relationship between optical attenuation and black carbon concentration for ambient and source particles. *Sci Total Environ* 1984;36:197-202.
20. Edwards J, Ogren I, Weisz R, Chaudon R. Particulate air pollutants: a comparison of British "smoke" with optical absorption coefficient and elemental carbon analysis. *Atmos Environ* 1983;17:2337-2341.
21. Singer BC, Hodgson AT, Hotchi T, Kim JJ. Passive measurement of nitrogen oxides to assess traffic-related pollutant exposure for the East Bay Children's Respiratory Health Study. *Atmos Environ* 2004;38: 393-403.
22. Dockery DW, Speizer FE, Stram DO, Ware JH, Spengler JD, Ferris BG Jr. Effects of inhalable particles on respiratory health of children. *Am Rev Respir Dis* 1989;139:587-594.
23. McConnell R, Bernick K, Gibband F, London SJ, Vora H, Avol E, Gauderman WJ, Margolis HG, Linn WS, Thomas DC, et al. Air pollution and bronchitic symptoms in Southern California children with asthma. *Environ Health Perspect* 1999;107:757-760.
24. Costelloe A, Drijver M, Levet E, Brunekreef B. Chronic respiratory symptoms in children and adults living along streets with high traffic density. *Occup Environ Med* 1996;53:241-247.
25. Fezangha G, Rylander L, Norberg S, Eriksson M, Nordvall SL. Air pollution involving nitrogen dioxide exposure and wheezing bronchitis in children. *Int J Epidemiol* 1995;24:1147-1153.
26. Peters JM, Avol E, Gauderman WJ, Linn WS, Navidi W, London SJ, Margolis H, Rappaport E, Vora H, Gung H, et al. A study of twelve Southern California communities with differing levels and types of air pollution: II: effects on pulmonary function. *Am J Respir Crit Care Med* 1999;159:768-775.
27. Gauderman WJ, Gilliland GF, Vora H, Avol E, Stram D, McConnell R, Thomas D, Linn WS, Margolis HG, Rappaport E, et al. Association between air pollution and lung function growth in southern California children: results from a second cohort. *Am J Respir Crit Care Med* 2002;166:76-84.
28. Delino RJ, Gung HJJ, Linn WS, Pelizzari ED, Hu Y. Asthma symptoms in Hispanic children and daily ambient exposures to toxic and criteria air pollutants. *Environ Health Perspect* 2003;111:647-656.
29. Wyler C, Braam-Fahlander C, Kunzli N, Schindler C, Ackermann-Lieblich U, Perruchoud AP, Leuenberger P, Wothrich B. Exposure to motor vehicle traffic and allergic sensitization: the Swiss Study on Air Pollution and Lung Diseases in Adults (SAPALDIA) Team. *Epidemiology* 2000;11:450-456.
30. Rijnders E, Janssen NA, van Vliet PH, Brunekreef B. Personal and outdoor nitrogen dioxide concentrations in relation to degree of urbanization and traffic density. *Environ Health Perspect* 2001;109:411-417.
31. Hornung CG, Blomquist G, Gyntherberg G, Jurevalm B, Malmberg P, Nordvall L, Nielsen A, Fersbagen G, Sundell L. Dampness in buildings and health: Nordic interdisciplinary review of the scientific evidence on associations between exposure to "dampness" in buildings and health effects (NORDDAMP). *Indoor Air* 2001;11:72-86.
32. Martinez FD. Maternal risk factors in asthma. *Ciba Found Symp* 1997; 206:213-229.
33. Martinez F. Viral infections and the development of asthma. *Am J Respir Crit Care Med* 1995;151:1644-1648.
34. Cook DG, Strachan DP. Health effects of passive smoking: 3: parental smoking and prevalence of respiratory symptoms and asthma in school age children. *Thorax* 1997;52:1081-1094.
35. California Department of Health Services. Tobacco control section: California tobacco control update. November 2002. Accessed July 12, 2004. Available at URL: <http://www.dhs.ca.gov/tobacco/documents/TCSupdate.PDF>.
36. Klumert MD, Price MR, Liu AH, Robinson JL. Unraveling the ecology of risks for early childhood asthma among ethnically diverse families in the southwest. *Am J Public Health* 2000;92:792-798.
37. Delino RJ. Epidemiologic evidence for asthma and exposure to air toxics: linkages between occupational, indoor, and community air pollution research. *Environ Health Perspect* 2002;110:573-589.
38. Brauer M, Hoek G, van Vliet P, Meliefste K, Fischer P, Gehring U, Heinrich J, Cyrys J, Bellander T, Lewné M, et al. Estimating long-term average particulate air pollution concentrations: application of traffic indicators and geographic information systems. *Epidemiology* 2003;14:228-239.

COMMENTOR A7
Benicia Unified School District Board of Trustees
Dirk A. Fulton, President
March 9, 2007

A7-1: The Draft EIR addresses traffic emissions impacts in Section IV.H.2.b. (4) Operational Emissions – CO Analysis, and lists the 1-hour and 8-hour CO concentrations for Existing, Existing Plus Project, and Future (2025) Plus Project Conditions for 11 intersections in the project area in Tables IV.H-6, IV.H-7, and IV.H-8 (pages 261 to 264 of the Draft EIR).

The Future (2025) Plus Project peak hour CO concentrations shown in Table IV.H-8, show that the 1-hour CO concentrations at all analyzed intersections (i.e., the intersections that have the potential for the most severe project impacts) are well below State and federal standards. The Future Plus Project 1-hour CO concentrations at the East 2nd Street and Rose Drive and East 2nd Street and Military Street intersections would range from 4.2 parts per million (ppm) to 4.4 ppm, much lower than the State standard of 20 ppm. The 8-hour CO concentrations for these intersections on East 2nd Street would range from 4.3 ppm to 4.7 ppm for future plus project conditions. This too is well below the State standard of 9 ppm. Intersections in the vicinity of Robert Semple Elementary School would be expected to be exposed to similar or lower CO concentrations. The State standards used to evaluate impacts in the Draft EIR take into consideration all types of sensitive receptors, including schools and residences.

The *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005, by the California EPA and ARB, establishes guidelines for siting sensitive land uses near air pollutant sources. This handbook references the study *Traffic-Related Air Pollution and Respiratory Health: East Bay Children's Respiratory Health Study* by Kim, J., et al, 2004, for establishing these guidelines. State law restricts the siting of new schools within 500 feet of a freeway, urban roadways with 100,000 vehicles/day, or rural roadways with 50,000 vehicles/day, with some exceptions. The handbook recommends that new sensitive land uses not be sited within these boundaries. The modeled future plus project Average Daily Trips (ADT) would be 37,900 along East 2nd Street and 55,000 ADT on I-780. These traffic volumes are below the threshold set by the California EPA and ARB for locating schools near busy roadways. Therefore, the project would not be expected to expose sensitive receptors – including elementary school children at Robert Semple School – to hazardous levels of vehicle emissions, including emissions of CO and particulate matter.

A7-2: See Response to Comment A6-1.

A7-3:

The Draft EIR addresses off-site traffic noise impacts on pages 279 to 283. As shown in Impact NOI-2 and in Tables IV.I-8 and IV.I-10, a significant traffic noise impact is identified for sensitive receptors along East 2nd Street under Existing Plus Project and Cumulative Plus Project conditions. The analysis shows that traffic noise levels 50 feet from the centerline of the outermost travel lane would increase by 3.5 dBA and 4.0 dBA respectively.

During review of the Draft EIR, minor typographical errors were identified in the traffic noise modeling values used in the analysis. However, after correction of these minor topographical errors, the noise modeling outputs, as well as the identified significant impacts, remain the same.

To further address the concerns for identified impacts for sensitive receptors located along the segment of East 2nd Street from I-780 to Rose Drive, the following changes will be made to pages 282 to 283 of the Draft EIR. The following revisions do not identify a new environmental impact of the project or introduce a new mitigation measure that would not be adopted by the project sponsor. Therefore, recirculation of the Draft EIR would not be required.

~~In summary, because there are no noise sensitive receptors within the noise contour areas for these roadway segments, the increased traffic noise levels would result in a less than significant impact for off site receptors.~~

The segment of East 2nd Street from I-780 to Rose Drive could also experience a significant increase in traffic noise levels. The cumulative noise model for the project shows that traffic noise levels along East 2nd Street could increase to 71.6 dBA CNEL at 50 feet from the centerline of the outermost travel lane, a 4.0 dBA increase over the Cumulative Without Project scenario. Construction of a sound barrier at least 8 feet high along the property/right-of-way line would reduce the traffic noise impacts to sensitive receptors along this roadway segment to a less-than-significant level. The use of rubberized asphalt along the roadway segment, as an alternate mitigation measure, would also be effective in reducing traffic noise levels to a less-than-significant level. Rubberized asphalt reduces traffic noise through its porous and ductile qualities (refer to the following study for more information: Bollard and Brennan, Inc., 1999. Report on the Status of Rubberized Asphalt., Traffic Noise Reduction in Sacramento County. Prepared for Sacramento County Public Works Department.).

Mitigation Measure NOI-2c: For existing unprotected residential and school land uses along East 2nd Street from I-780 to Rose Drive, one (or more) of the following measures shall be implemented:

- A sound barrier at least 8 feet high shall be constructed along the property/right-of-way line of sensitive receptors along this roadway segment; or

- Rubberized asphalt shall be used to resurface the entire identified roadway segment. (LTS)

Tables IV.I-8, IV.I-9, and IV.I-10 are revised as follows:

Table IV.I-8: Existing Plus Project Traffic Noise Levels

Roadway Segment	ADT	Center line to 70 CNEL (feet)	Center line to 65 CNEL (feet)	Center line to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions
East 2nd St. - Lake Herman Rd. to Park Rd.	19,300	54 56	116	248	69.4 68.7	5.5 4.8
East 2nd St. - Park Rd. to Industrial Way	11,700	< 50*	83 84	178	67.3 66.5	2.9 2.1
East 2nd St. - Industrial Way to Rose Dr.	31,700	77	161	345	70.8	6.3
East 2nd St. - Rose Dr. to I-780 WB On Ramp	25,000	66	138	295	69.8	3.5
East 2nd St. - I-780 EB On Ramp to Military St.	13,300	< 50	60 62	128 129	65.1 64.4	0.0 -0.7
Lake Herman Rd. - East 2nd St. to Reservoir Rd.	13,800	< 50	93 94	199	68.0 67.2	10.3 9.5
Lake Herman Rd. - Reservoir Rd. to Sky Valley Rd.	15,900	< 50	102	218	68.6	7.2
Lake Herman Rd. - Sky Valley Rd. to Columbus Pkwy	16,000	< 50	102	219	68.6	7.0
Reservoir Rd. - Lake Herman Rd. & East 2nd St.	11,200	< 50	81	173	67.1	7.7
Industrial Way - East 2nd St. to Park Rd.	7,400	< 50	< 50	87 88	62.6 61.8	3.7 2.9
Park Rd. - East 2nd St. to Industrial Way	2,400	< 50	< 50	< 50	57.7	5.4
Park Rd. - Industrial Way to Bayshore Rd.	13,300	< 50	60	128	65.1	2.5

* Traffic noise within 50 feet of the roadway centerline requires site-specific analysis.
Source: LSA Associates Inc., September 2006

Table IV.I-9: Cumulative Without Project Traffic Noise Levels

Roadway Segment	ADT	Center line to 70 CNEL (feet)	Center line to 65 CNEL (feet)	Center line to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane
East 2nd St. - Lake Herman Rd. to Park Rd.	7,800	< 50*	64	136	67.7 65.5
East 2nd St. - Park Rd. to Industrial Way	8,300	< 50	66	142	67.7 65.8
East 2nd St. - Industrial Way to Rose Dr.	10,100	< 50	77	162	67.8 65.9
East 2nd St. - Rose Dr. to I-780 WB On Ramp	15,000	< 50	99	210	69.5 67.6
East 2nd St. - I-780 EB On Ramp to Military St.	18,000	< 50	73	157	68.4 66.4
Lake Herman Rd. - East 2nd St. to Reservoir Rd.	1,800	< 50	< 50	52	61.4 59.1
Lake Herman Rd. - Reservoir Rd. to Sky Valley Rd.	4,300	< 50	< 50	92	65.2 62.9
Lake Herman Rd. - Sky Valley Rd. to Columbus Pkwy	4,500	< 50	< 50	94	65.3 63.1
Reservoir Rd. - Lake Herman Rd. & East 2nd St.	2,700	< 50	< 50	67	63.0 60.9
Industrial Way - East 2nd St. to Park Rd.	4,500	< 50	< 50	63	62.4 60.4
Park Rd. - East 2nd St. to Industrial Way	900	< 50	< 50	< 50	55.4 53.4
Park Rd. - Industrial Way to Bayshore Rd.	10,500	< 50	52	110	66.1 64.1

* Traffic noise within 50 feet of the roadway centerline requires site-specific analysis.
Source: LSA Associates Inc., September 2006

Table IV.I-10: Cumulative Plus Project Traffic Noise Levels

Roadway Segment	ADT	Center line to 70 CNEl (feet)	Center line to 65 CNEl (feet)	Center line to 60 CNEl (feet)	CNEl (dBA) 50 feet from Centerline of Outermost Lane	Increase from Cumulative Conditions
East 2nd St. - Lake Herman Rd. to Park Rd.	26,800 21,000	57 59	122 123	263	69.8 69.0	4.5 3.5
East 2nd St. - Park Rd. to Industrial Way	18,500 16,500	< 50 ^a	104 105	224	68.8 68.0	3.0 2.2
East 2nd St. - Industrial Way to Rose Dr.	40,200 36,100	83	176	377	71.4	5.5
East 2nd St. - Rose Dr. to I-780 WB On Ramp	37,300 37,900	86	181	389	71.6	4.0
East 2nd St. - I-780 EB On Ramp to Military St.	28,100 18,000	< 50	73 75	157 158	66.4 65.7	0.0 -0.7
Lake Herman Rd. - East 2nd St. to Reservoir Rd.	15,500 13,800	< 50	93 94	199	68.0 67.2	8.9 8.1
Lake Herman Rd. - Reservoir Rd. to Sky Valley Rd.	20,000 17,100	< 50	107	229	68.9	6.0
Lake Herman Rd. - Sky Valley Rd. to Columbus Pkwy	20,300 15,000	< 50	98	210	68.3	5.2
Reservoir Rd. - Lake Herman Rd. & East 2nd St.	2,700 12,000	< 50	84	181	67.4	6.5
Industrial Way - East 2nd St. to Park Rd.	11,300 8,700	< 50	< 50	97 98	63.3 62.5	2.9 2.1
Park Rd. - East 2nd St. to Industrial Way	3,100 2,100	< 50	< 50	< 50	57.1	3.7
Park Rd. - Industrial Way to Bayshore Rd.	22,700 13,800	< 50	62	132	65.3	1.2

^a Traffic noise within 50 feet of the roadway centerline requires site-specific analysis.
Source: LSA Associates Inc., September 2006

A7-4: See Responses to Comments A7-1 and A7-3. The project would not result in significant cumulative traffic, noise, and air quality-related impacts beyond those identified in the Draft EIR.

Anne Cardwell - For The Record: to Deny Seeno Project

From: Martin Duvall <martyduvall@sbcglobal.net>
To: elizabeth patterson <epatterson@ci.benicia.ca.us>, Jim Erickson
<jim.erickson@ci.benicia.ca.us>
Date: 9/27/2008 9:21 AM
Subject: For The Record: to Deny Seeno Project
CC: "citycouncil@ci.benicia.ca.us" <citycouncil@ci.benicia.ca.us>

Dear City Leaders

Benicia, my lifelong family home, has always benefited from a small town charm.

Somehow, I feel a bit less charmed when trying to get in or out of downtown Benicia at certain peak traffic times at East Second Street - sometimes waiting for 2 or even 3 street light changes to get off of Military East toward the 780 Freeway and Industrial Park. Gridlock? In Benicia?

It truly exists and is soon to get worse when Seeno cavalierly chooses to ignore traffic mitigation on both East second Street and Interstate 780. Imagine the residents on that street that feel this effect all day long? Imagine that corridor when Seeno's proposed business park increases traffic by it's projected numbers?

I am not a traffic crusader, but I point this out as just one glaring issue that effects the everyday quality of life in our town with respect to the Seeno project.

Quality of Life. Far and away, this is the reason most often cited by citizens and visitors alike for appreciating Benicia's many attributes. Quality of Life is a promise many if not all of our elected officials promised to promote and protect.

I believe in property rights and free enterprise, but City's do have domain over what types of developments they allow. I'm no expert on this, but our City has a responsibility to direct developers to accommodate Benicia's requirements. Seeno has a right to develop their property. But to further encroach on the already conspicuous traffic concerns on one of the most crucial traffic arteries in town should be concern enough all on its' own to deny Seeno's project, regardless of all the other reasons that can and have been cited.

There has been much written about the Green Gateway Group's proposal for an alternative project. This citizen's initiative is a first step to aid and entice our City's leaders in doing what is right and required in this case.

Martin E Duvall
9A McKay Way
Benicia, CA 94510
707.344.7096

VIII-B-339

From: Marilyn Bardet <mjbardet@sbcglobal.net>
To: Charlie Knox <Charlie.Knox@ci.benicia.ca.us>
Date: 9/29/2008 1:42:42 PM
Subject: Air Quality: for council packet, Oct 7th

Hello Charlie,

I'm not sure when the deadline is for getting material into the council packet. It's very important that we be able to get to councilmembers the pdf's of power point presentations from the Benicia First forum, "Air Quality and Children's Health", held on Sept 18th. Since we already have multiple "near" sources of pollution in Benicia, the serious cumulative consequences of tailpipe emissions, from the standpoint of AB32 but also from a public health perspective, should be taken into account by council. Considering the level of expertise represented at the forum on such a critical issue, we were very appreciative that all members of council attended the forum, (except the mayor, who was on vacation.)

The three speakers were Jenny Bard, regional air quality director for the American Lung Association of California; Dr. Paul Roberts, Phd, Exec Vice President and Chief Scientific Officer of Sonoma Technologies Inc (specialists in air quality monitoring, working in the US and Mexico); and Dr. Ira Tager, MD, professor of epidemiology, UC Berkeley School of Public Health, Director of the Prevention Research Center.

We made an audio tape of the forum's presentation and also a video. We will be submitting not only the complete video (for future broadcast on Comcast Channel 27), but also, the audio tape, for transcription. We hope to be able to find a transcriber in time before the end of the week, but if not, we will submit the tape. Also, we will be submitting the pdfs of all three speakers' power point presentations, several of which I'm including below. (We are still waiting to receive the third, from Dr. Ira Tager. See below for Dr. Paul Rogers and Jenny Bard's pdfs.)

I'm forwarding here the pdf of Dr. Robert's presentation, called "Near Roadway Exposure to Air Pollution with Examples from a Study of MSATs at Three Schools Next to US 95 in Las Vegas, Nevada". The traffic study, recently completed by Dr. Roberts (Sonoma Tech), represents one year's worth of data collected on roadway pollutants as monitored at three school sites located adjacent to Highway 95 in Las Vegas. Dr. Robert's presentation reviewed the basic findings of the Las Vegas study. This study breaks new ground since it represents results that show trends and patterns derived over a year of air monitoring at specific sites. It is the first long-term study of its kind, (funded from settlement between Sierra Club and Nevada Dept of Transportation). The results are vitally important to understanding health impacts that can be associated to daily chronic exposures to concentrations of key tailpipe pollutants, including "black carbon" (diesel PM) NO/NOx and CO especially for schools and neighborhoods that are located in close proximity to major roadways, (within radiuses out to 500 meters, according to Dr. Ira Tager's presentation). Dr. Roberts also stressed the meteorological and topographic variables that affect dispersion and settling of pollutants, this being highly pertinent to accurate

monitoring for ambient air quality.

We have asked Dr. Ira Tager to forward a pdf of his presentation, which focused on the implications for public health (development of respiratory disease and diminishment of lung development in young children, and also teens between 10 and 18 yrs) of roadway traffic emissions, as statistics from various studies show. Dr. Tager spoke about the Las Vegas study and other studies conducted in the US, and despite offering a scientist's caveats about how facts can be misrepresented, he concluded that, indeed, there are serious health consequences from daily exposures to vehicle traffic, especially diesel particulate emissions. He remarked that effects of roadway pollution are especially of significance within 500 meter "zones" of busy streets, freeways, etc.

Jenny Bard gave an overview of the problem of air pollution, including the effects of ozone and particulate matter derived from diesel emissions but also from wood-burning. She spoke about the Lung Associations support for AB32, the goal of drastically reducing traffic through better land use decisions and developing public transit alternatives. She stressed that getting reductions in "vehicle miles traveled" (goal of AB32), had a complementary benefit of reducing public health risks posed by commuting and traffic generally.

What I've written here is by no means a conclusive summary of the three presentations. Below please find the pdfs of Jenny Bard's and Dr. Robert's powerpoint presentations. I will forward Dr. Taqer's when I receive it, hopefully within the next few days.

I hope you will reproduce these materials for the Council packet. They are highly relevant to the discussion of the latest traffic report to be discussed Oct 7th for the Seeno business park project.

Thank you as always,
Marilyn B

CC: Don Dean <donaldjdean@sbcglobal.net>, Jerry Page <Jkjerome@aol.com>, Anne Cardwell <Anne.Cardwell@ci.benicia.ca.us>, Steve Goetz <sgoetz@sbcglobal.net>

**Near-Roadway Exposure to Air Pollution
with Examples from a Study of MSATs at
Three Schools Next to U.S. 95 in Las Vegas, NV**

Prepared by:
Paul T. Roberts,
Michael C. McCarthy, and Steven G. Brown
Sonoma Technology, Inc.
Petaluma, CA

Presented to:
Benicia First! Forum on Air Quality and Children's Health
Benicia, CA
September 18, 2008

VIII-B-342

STI

Sonoma Technology, Inc.
Air Quality Research Innovative Solutions

Near-Roadway Exposures – Outline

- Near-source (primary) pollutants, in context
- Introduction to U.S. 95 MSAT (Mobile Source Air Toxics) Study
- Monitoring sites at schools, parameters measured
- Typical characteristics of CO, NO/NO_x, and black carbon (BC) at these sites
- Example of upwind/downwind BC concentrations
- Example of hydrocarbon concentrations
- Preliminary summary of MSAT characteristics
- Mitigation Lessons Learned

VIII-B-343

Primary and Regional Pollutants

Potential Sources	Near-Source Pollutants			Ozone Precursors and Other Regional Pollutants
	PM	BC	MSAT	
	Cars/Trucks/Buses	✓	✓	
Rail	✓	✓	✓	✓
Ships	✓	✓	✓	✓
Ag Operations				✓
Refineries	✓	✓	✓	✓
Power Plants (gas)				✓
Forest/Ag/Grass Fires				✓
Fireplaces/Woodstoves	✓	✓	✓	
Wind-blown Dust	✓			✓

VIII-B-344

U.S. 95 Settlement Agreement

Court Settlement Agreement between Sierra Club and NDOT/FHWA regarding urban freeway expansion where three schools are adjacent to roadway

Required components of settlement

- MSAT monitoring study at schools (this study)
- Filtration added to HVAC systems at schools
- Bus retrofit program
- Bus idling education
- FHWA gradient study (with EPA, ongoing research)

VIII-B-345

Introduction to U.S. 95 MSAT Study

MSAT Study Objectives

- Characterize outdoor and indoor concentrations at schools (student exposure)
- Determine U.S. 95 vehicle contributions (before and after new lanes opened)
- Determine MSAT removal efficiencies of new filtration systems

Focus on priority MSATs

- Diesel particulate matter
- Gaseous components: benzene, 1,3-butadiene, acrolein, formaldehyde, and acetaldehyde

VIII-B-346

U.S. 95 MSAT Study Measurements

Routine Network (May 2007-May 2008)

- Semi-continuous black carbon (Aethelometer) (10 sites)
- CO (3 sites)
- NO/NO_x (1 site)
- Meteorological parameters (4 sites)

Intensive Measurements (May/June 2007, January 2008)

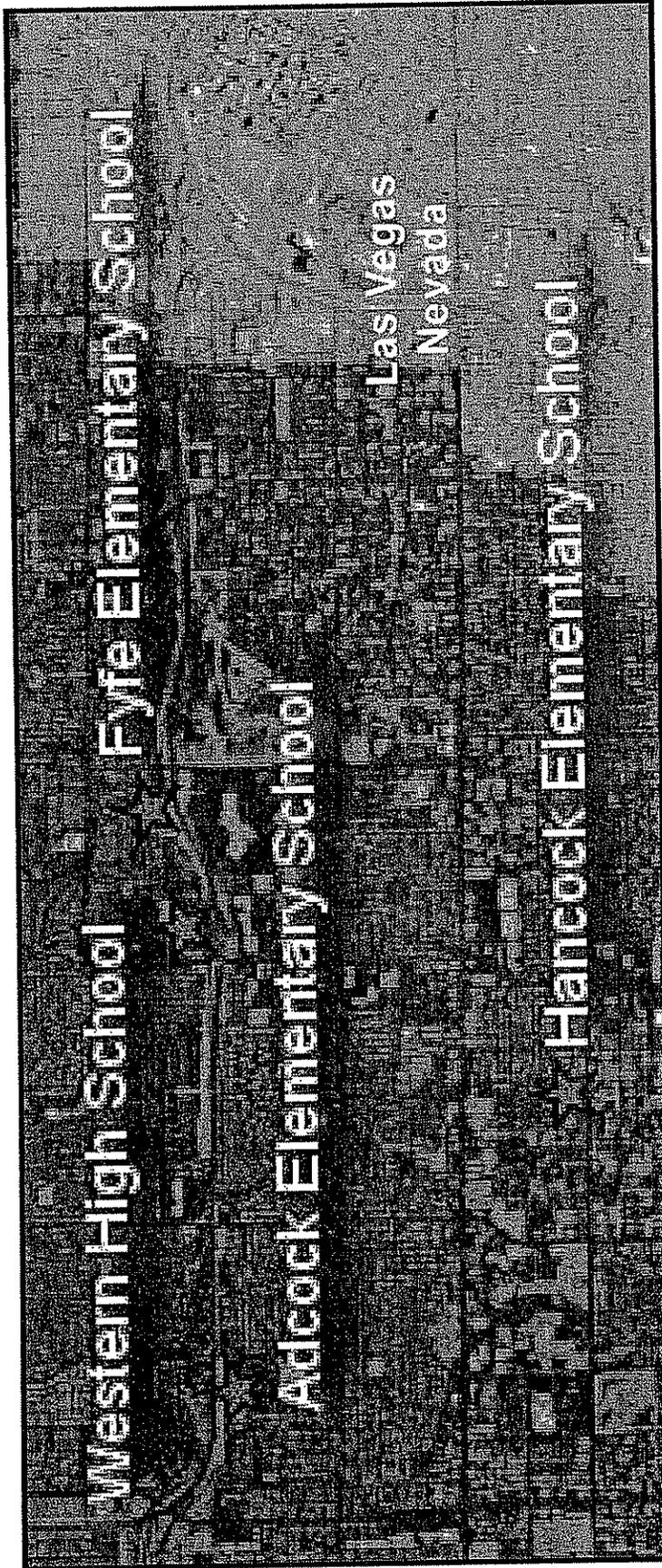
- 2-hr hydrocarbon and carbonyl samples (10 sites)

Routine Traffic Data at Two Locations

- 5-minute traffic counts, by lane, with vehicle-class bins and vehicle speeds

VIII-B-347

Monitoring Sites at Schools



VIII-B-348

Fyfe Elementary School Monitoring Sites



Ambient is 20 meters from sound wall (SW); air inlet is 76 meters from SW.

Legend: ■ Air Inlet ■ Classroom ♦ Ambient

VIII-B-349

Western HS Monitoring Sites

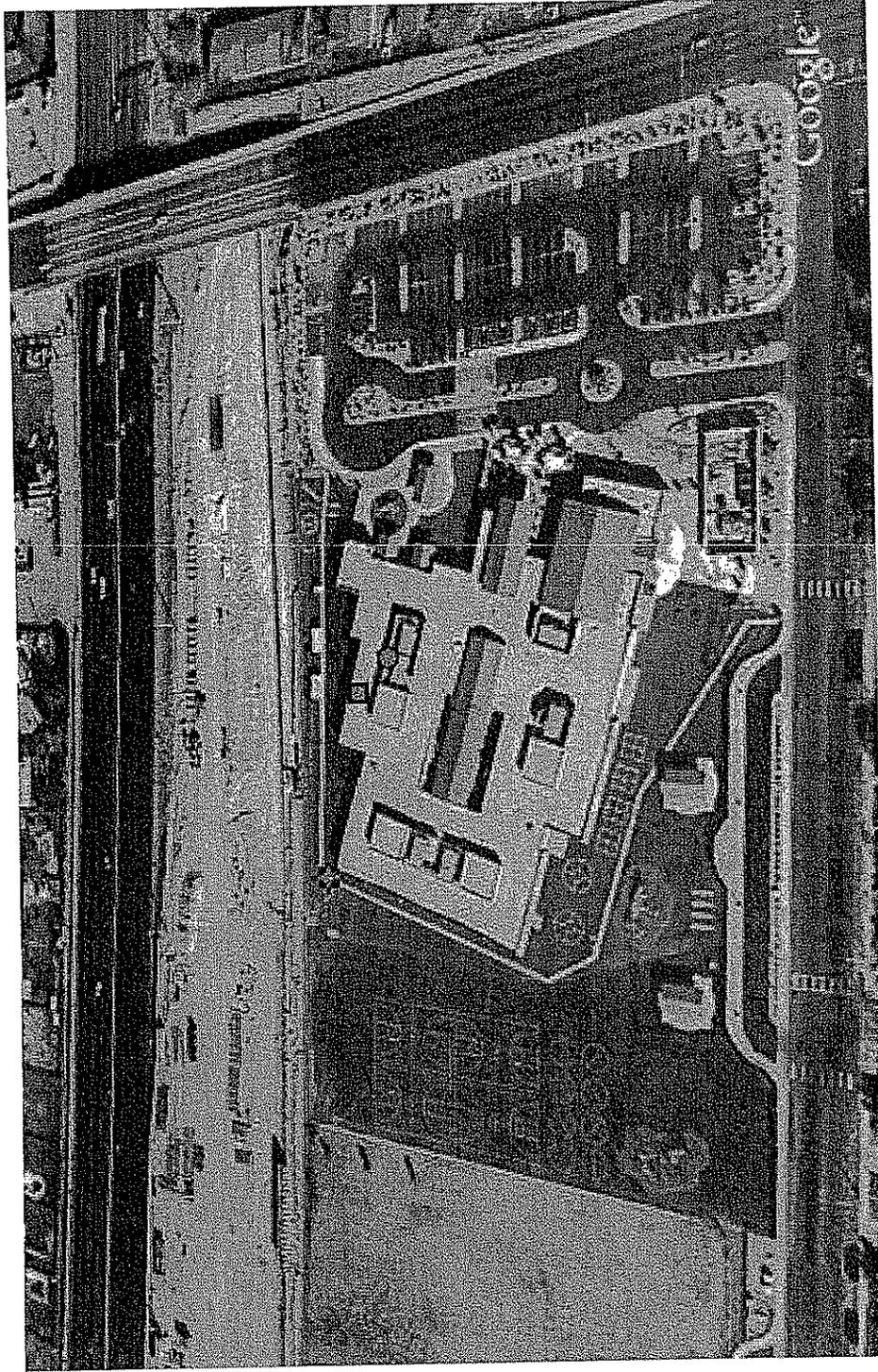


Ambient is 136 meters from sound wall (SW); air inlet is 317 meters from SW.

Legend: ● Air Inlet ■ Classroom ♦ Ambient

VIII-B-350

Adcock Elementary School Monitoring Sites

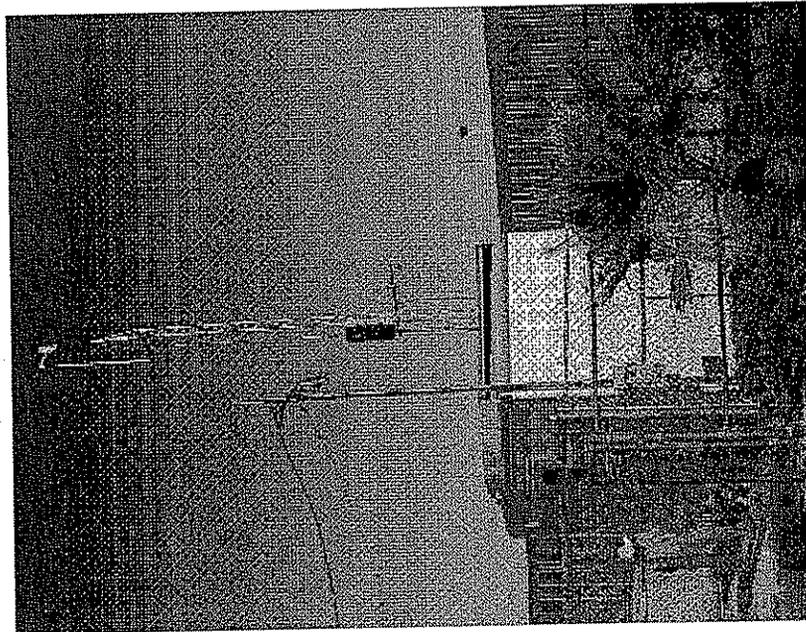


Ambient is 17 meters from sound wall (SW); air inlet was 39 meters from SW;
air inlet for new system is 33 meters from SW.

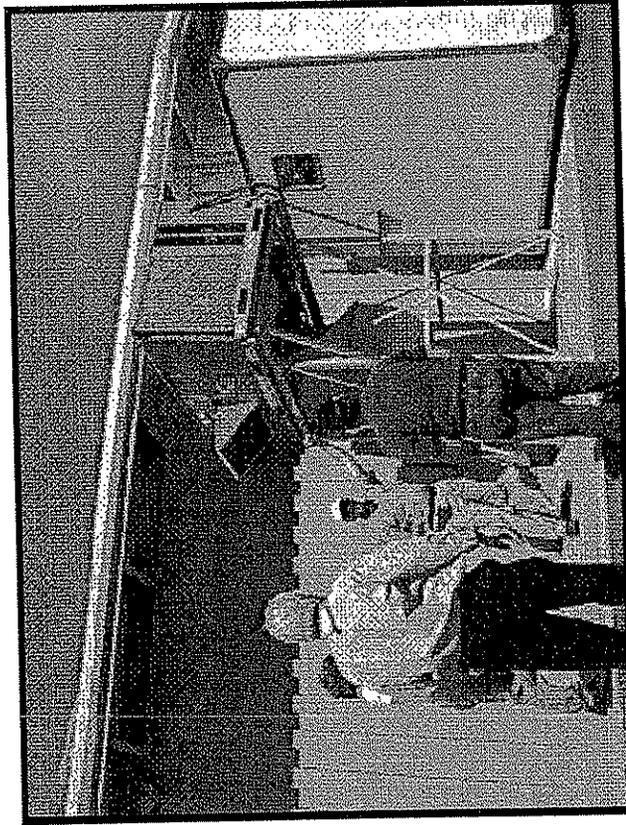
Legend: ▣ Air Inlet ▣ Classroom ♦ Ambient

VIII-B-351

Fyfe Trailer and Shelter Next to Classroom (Before HVAC Changes)



20 meters from sound wall

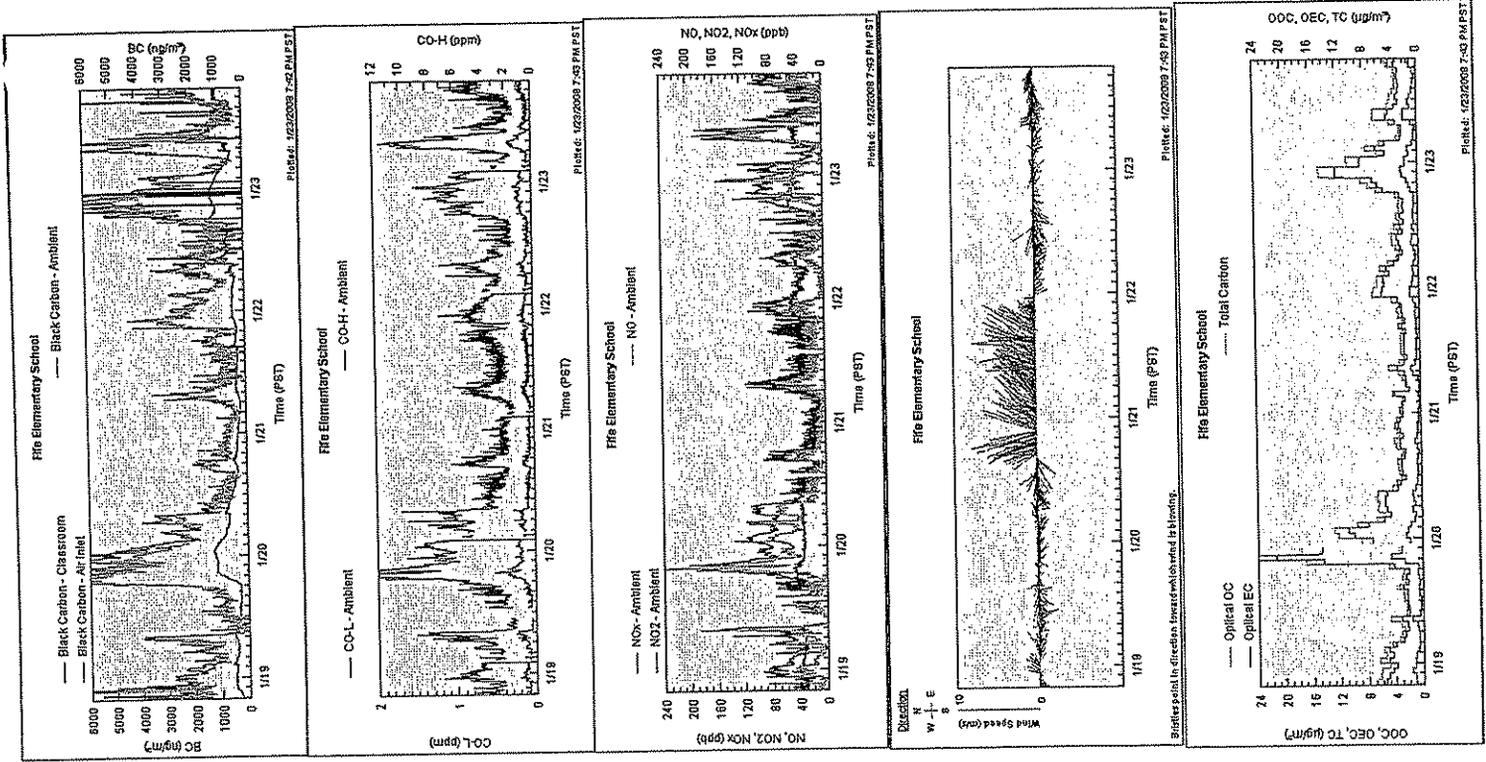


76 meters from sound wall

VIII-B-352

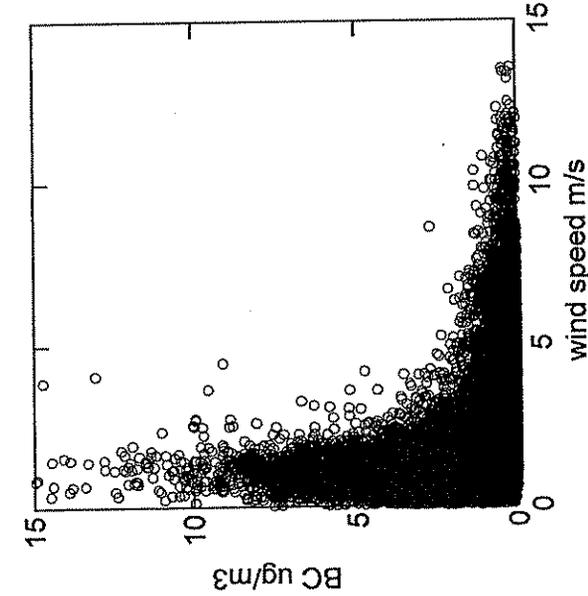
Typical Time-Series of Concentrations at Fyfe in Winter

- BC, CO, NO, OC, and EC profiles are similar.
- Wind speed, wind direction, and source strength have a major influence on concentrations.

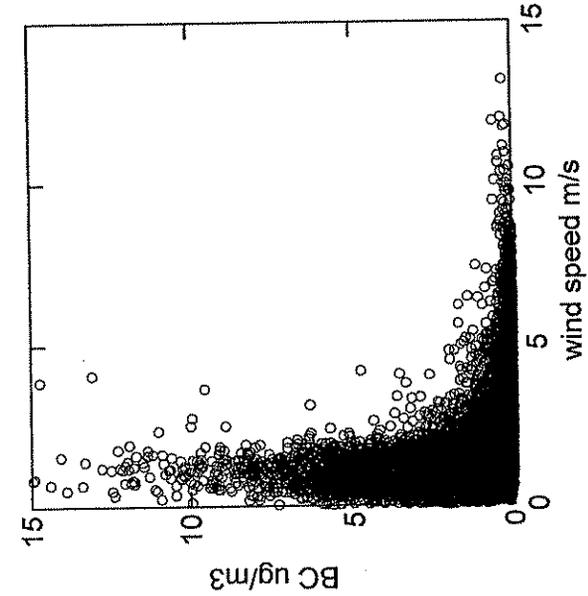


VIII-B-353

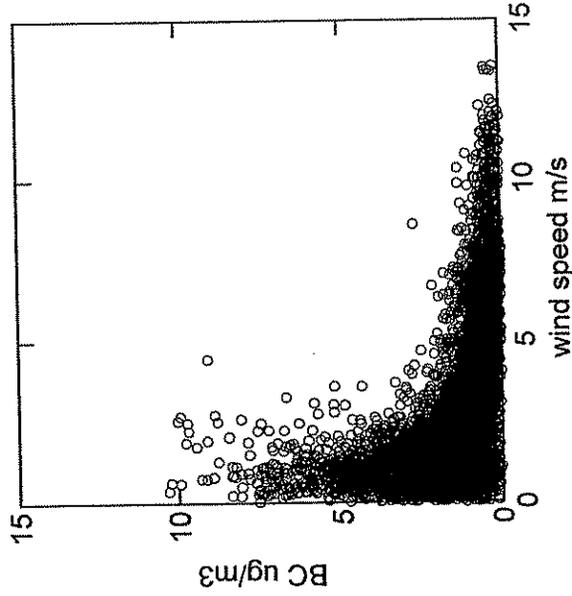
Fyfe, Ambient Monitor, December–Early March



BC vs. windspeed,
all hours,
N=25,780, 5-min



BC vs. windspeed,
all hours, winds
from the north,
N=12,871



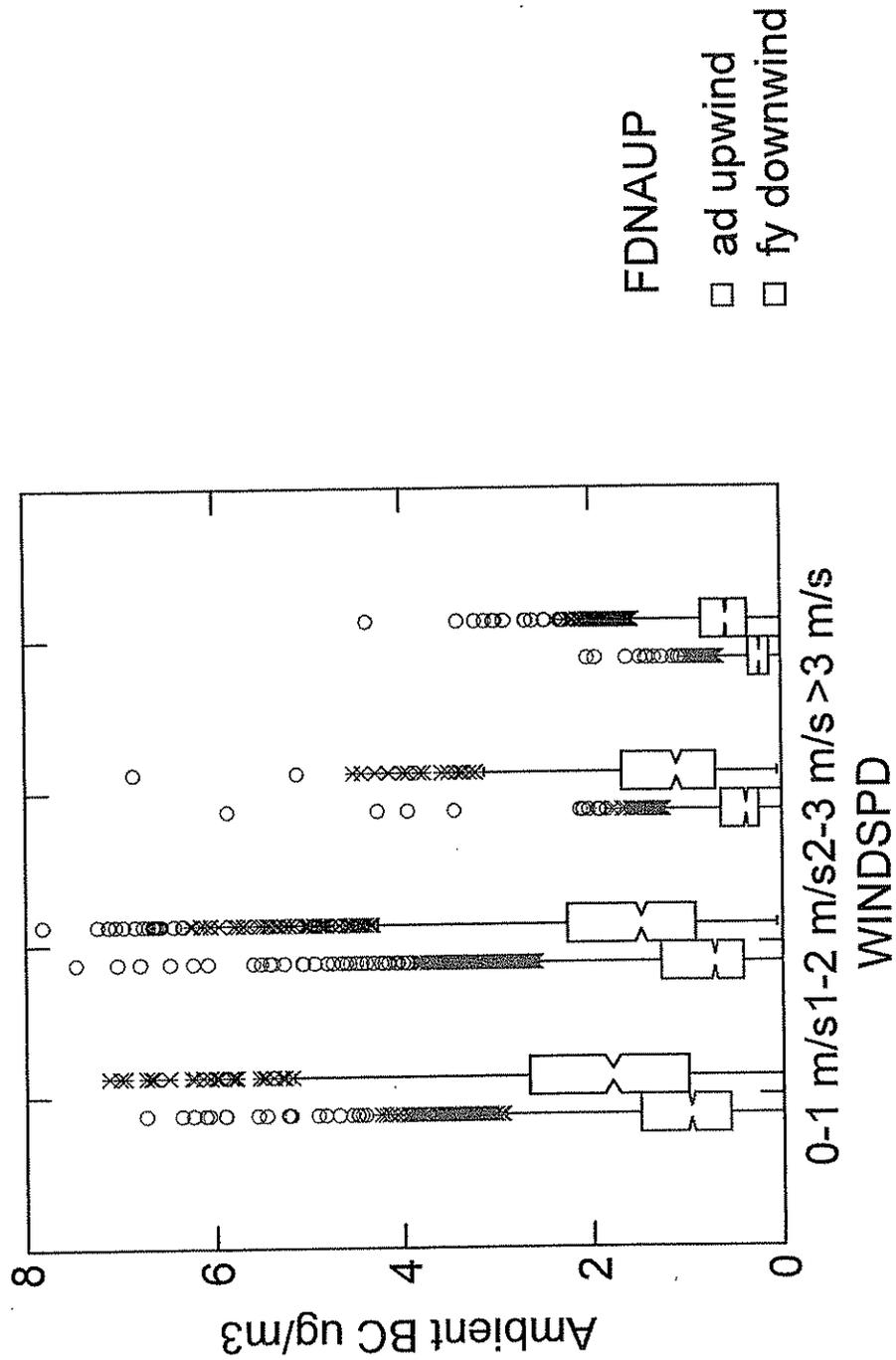
BC vs. windspeed,
all hours, winds
from the south
(freeway), N=6580

VIII-B-354

High BC concentrations are seen at low wind speeds regardless of direction. Also note that concentrations are higher at wind speeds > 2 m/s when winds are from the south (U.S. 95).

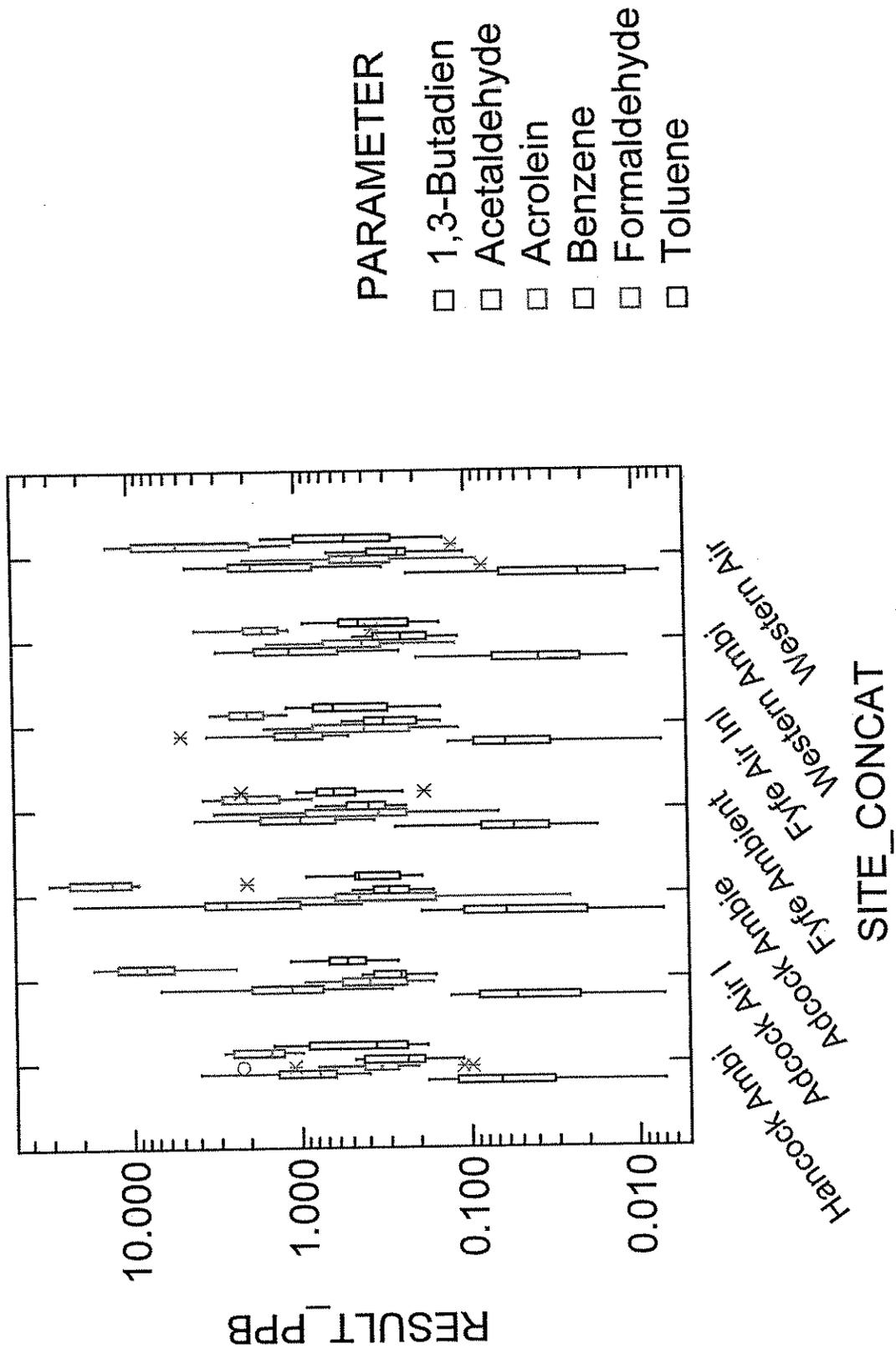
North=290-70 degrees
South=110-250 degrees

BC Concentrations Upwind and Downwind Influence of Wind Speed



VIII-B-355

Winter 0900-1100 Gaseous Concentrations Distribution



VIII-B-356

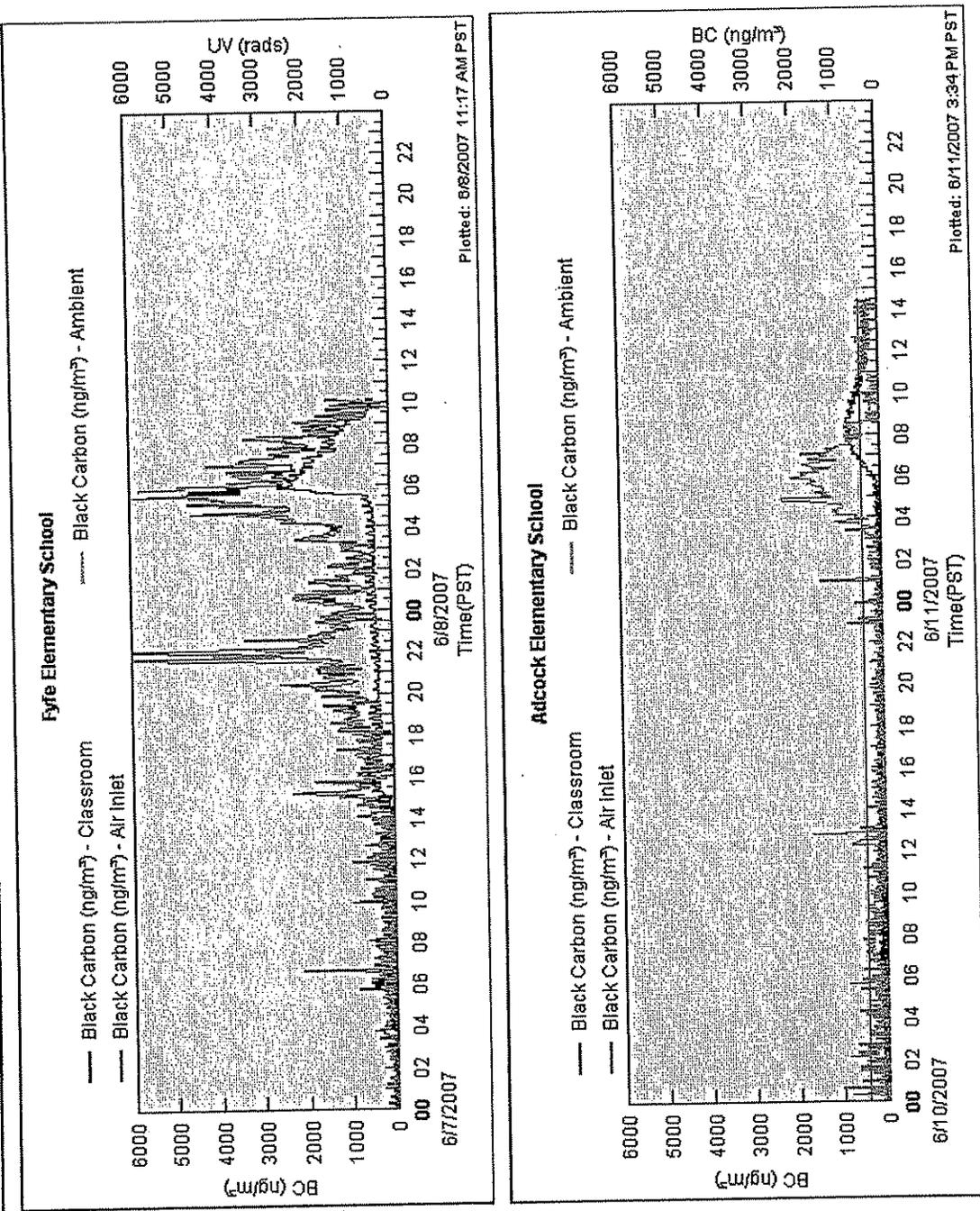
Preliminary Summary of Ambient MSAT Characteristics

- Fresh pollutants go up and down together.
- Morning concentrations dominate indoor and outdoor exposure (summer); overnight and morning concentrations dominate in the winter.
- Expected pollutant gradients are not always evident.
- Low wind speeds often allow high pollutant concentrations on both sides of roadway (with a sound wall).
- Wind conditions and time-of-day have a significant influence on near-roadway exposure.

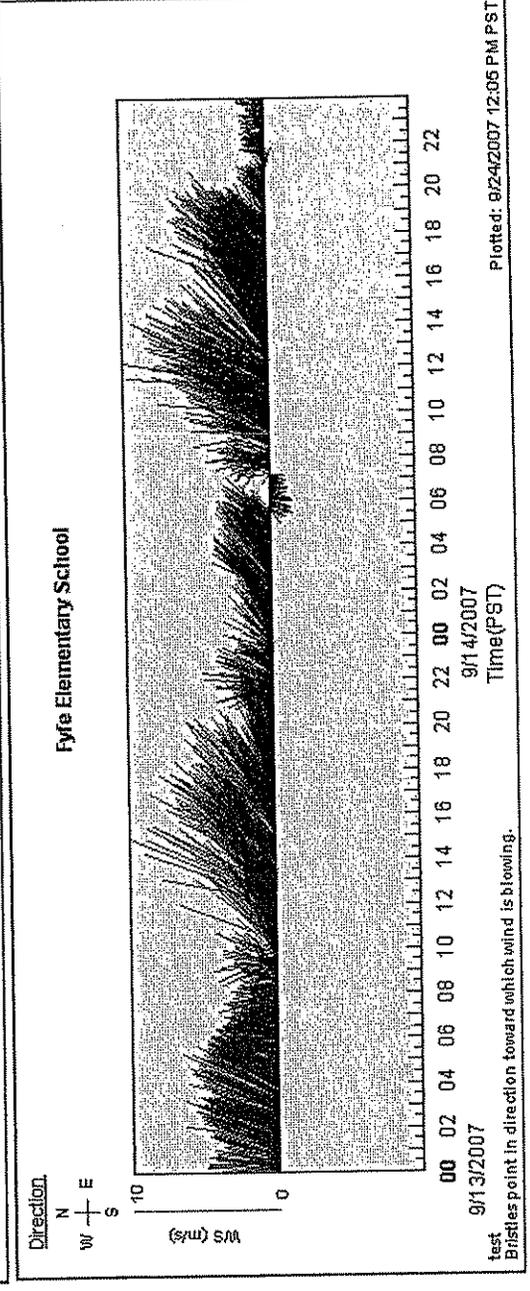
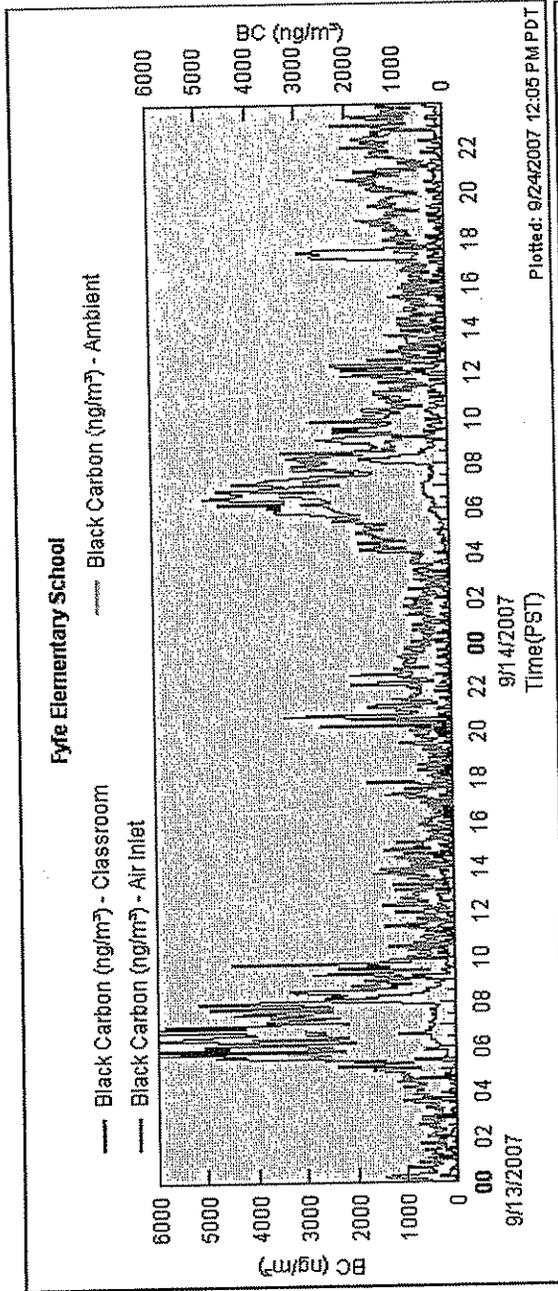
VIII-B-357

Example BC Time-Series Showing Classroom Being Filled with Rush-hour Pollution by HVAC (Before HVAC Changes)

Note HVAC start time and different rate of ambient dilution vs. indoor dilution.

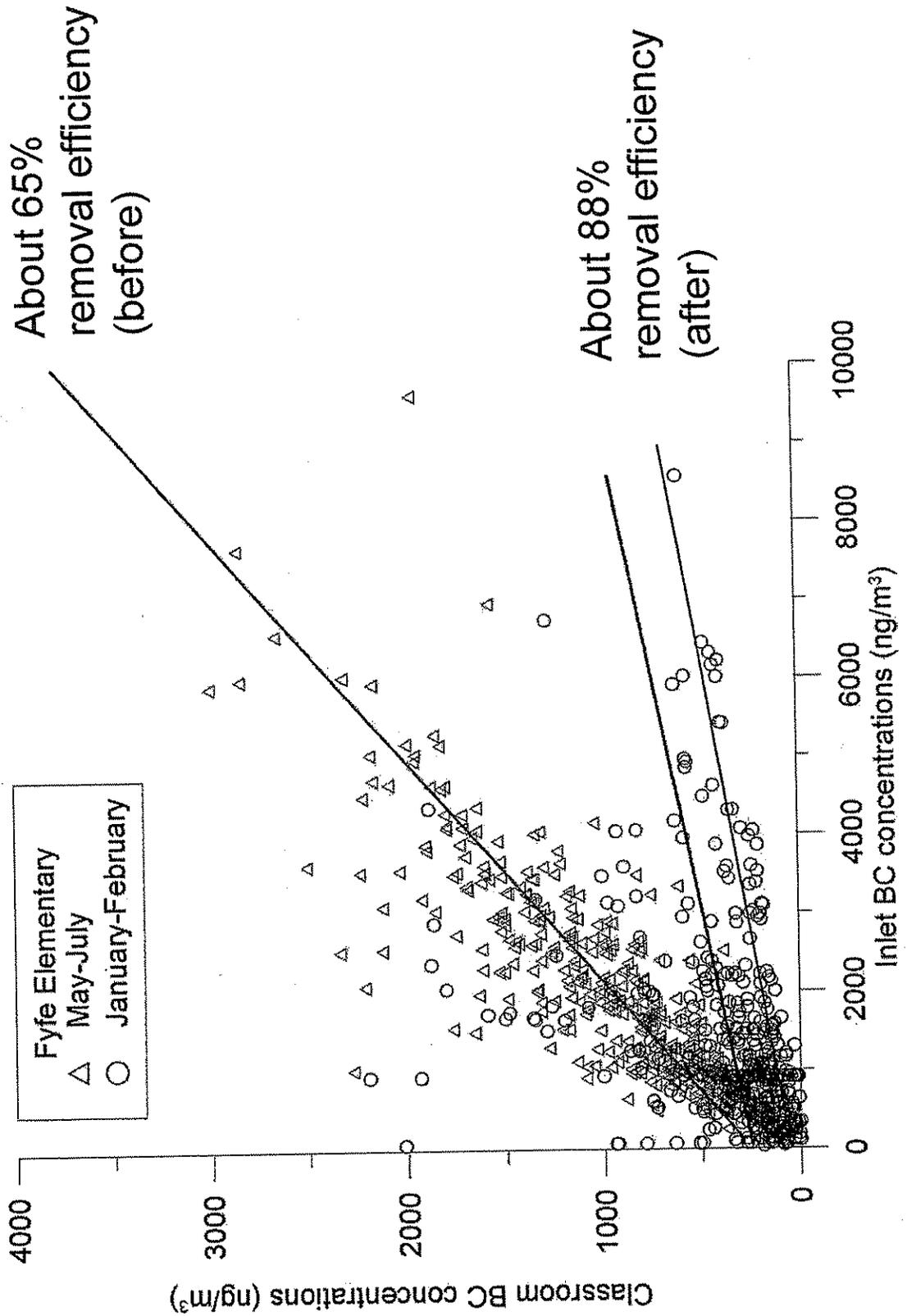


Example BC Time Series Showing Low BC Concentrations in Fyfe Classroom, Except When Door Left Open by the Teacher (After HVAC Changes)



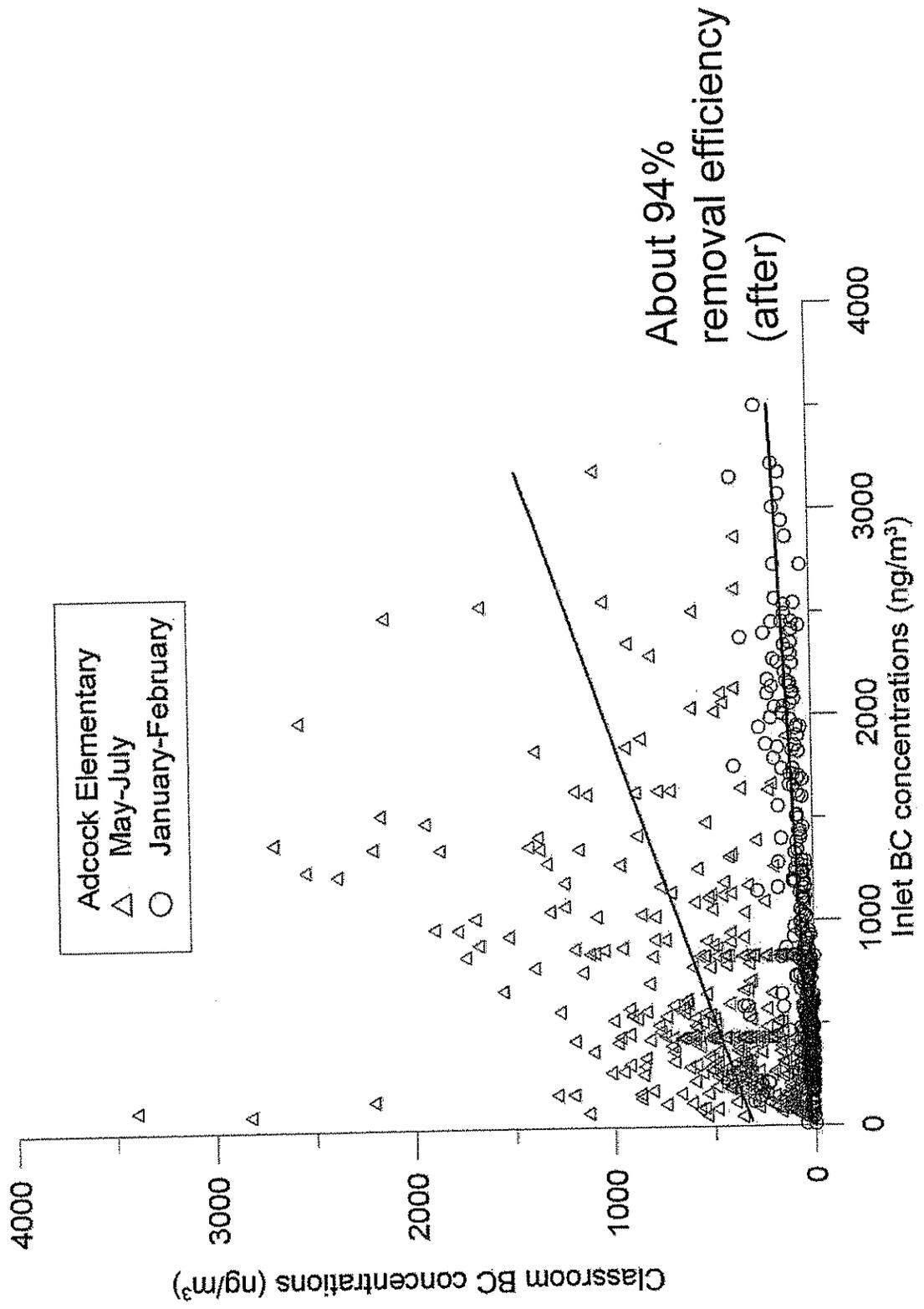
VIII-B-359

Indoor and Air Inlet BC Concentrations at Fyfe Before and After HVAC Changes



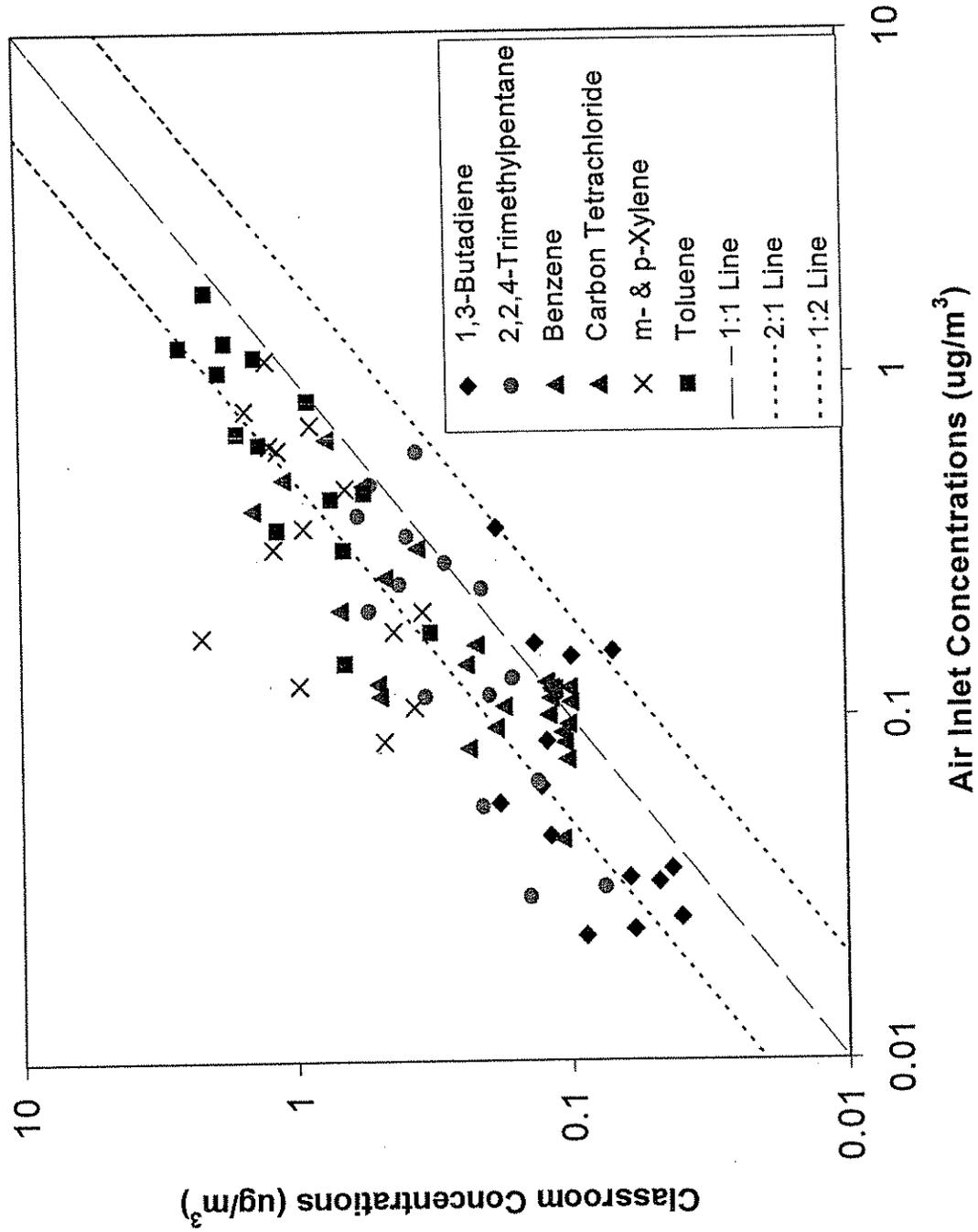
VIII-B-360

Indoor and Air Inlet BC Concentrations at Adcock Before and After HVAC Changes



VIII-B-361

Indoor VOC Concentrations at Adcock (Summer) Higher than Outdoor for All Species Except CCl4



VIII-B-362

Preliminary Summary of MSAT Filtration Characteristics

- Modest BC removal with existing HVAC systems in (summer).
- Significant BC removal with new HVAC filtration (winter).
- Adcock system removes more BC than Western or Fyfe.
- Indoor concentrations are often higher than outdoors for several gaseous MSATs (indoor sources or time lag in system?).

VIII-B-363

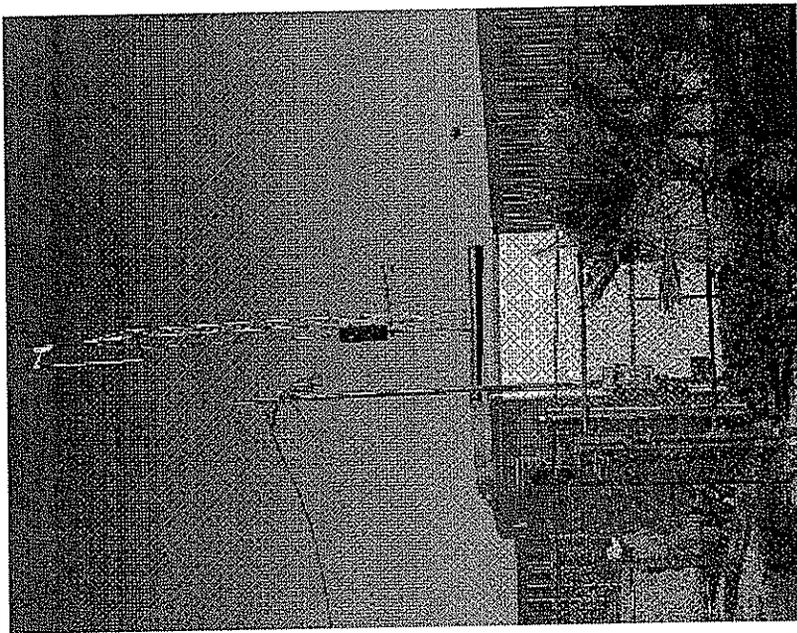
Mitigation Lessons Learned, So Far

- Typical HVAC operation can fill classroom with polluted air early in the morning which can result in higher concentrations indoors (than outdoors) later in morning.
- Leaving classroom doors open to outdoor hall can defeat filtration system.
- Diurnal pattern of pollution is an important consideration for exposure and mitigation (for both classroom and outdoors).

VIII-B-364

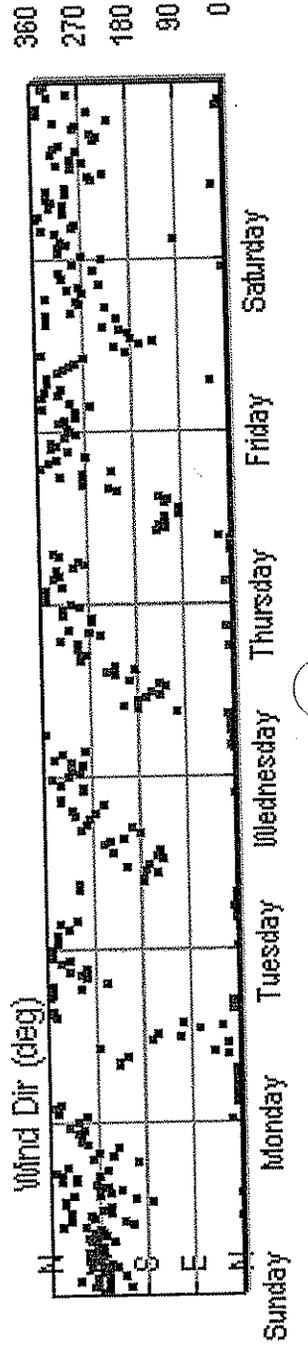
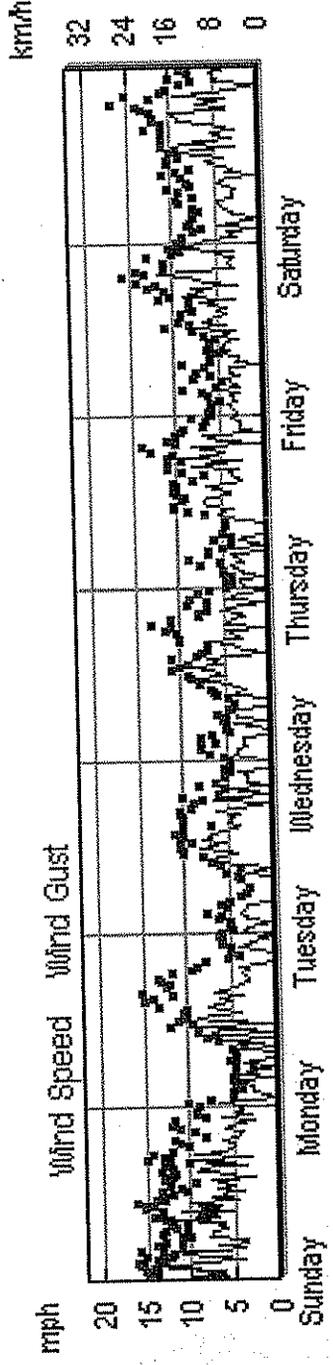
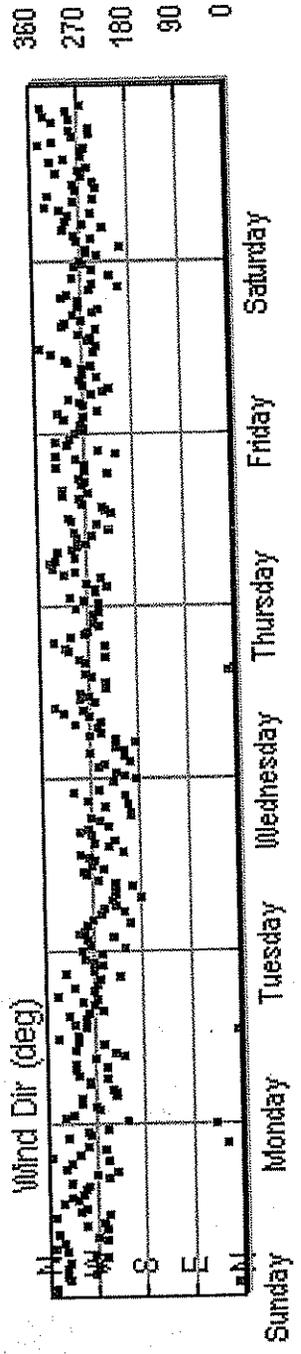
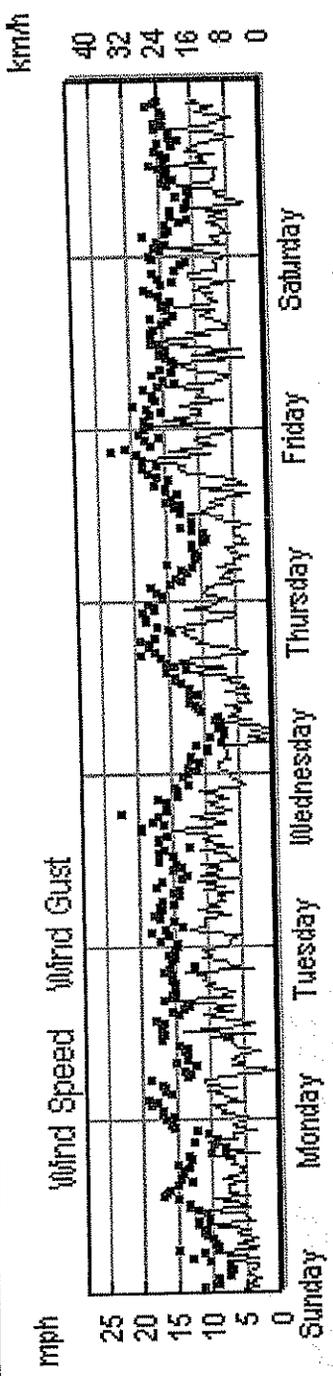
Acknowledgments

This work is funded by the Nevada Department of Transportation (NDOT); John Terry is the NDOT Project Manager. Joanne Spaulding and Jane Feldman (Sierra Club), Pat Mohn (NDOT), and Rich Baldauf (EPA) contributed to the design of this study. Joey Landreneau and David Vaughn (STI) performed the monitoring and sampling.



VIII-B-365

Example of Winds in Benicia; 9/13/08 and 9/6/08 (KCABENIC3)



VIII-B-366



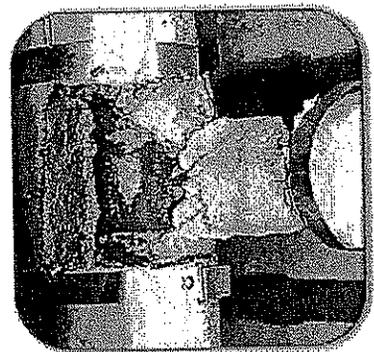
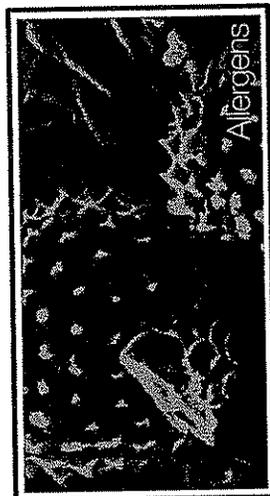
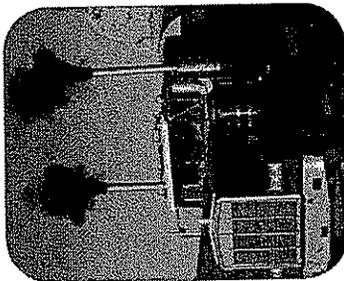
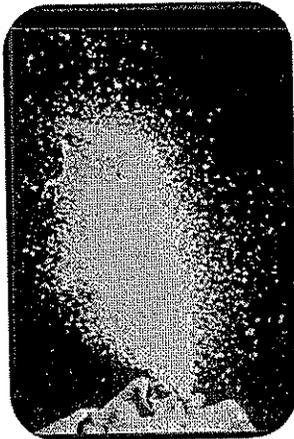
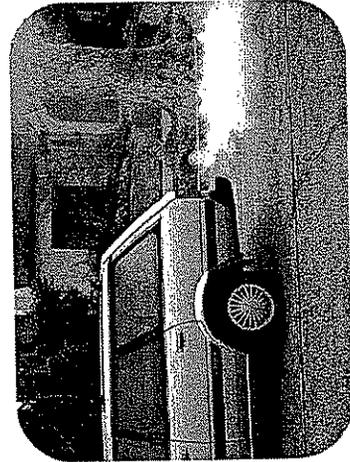
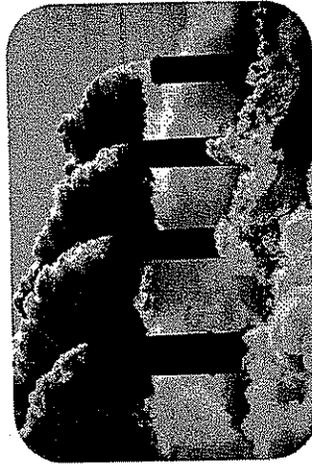
Overview: Air Quality and Health Concerns

**Jenny Bard
Regional Air Quality Director
American Lung Association of California**

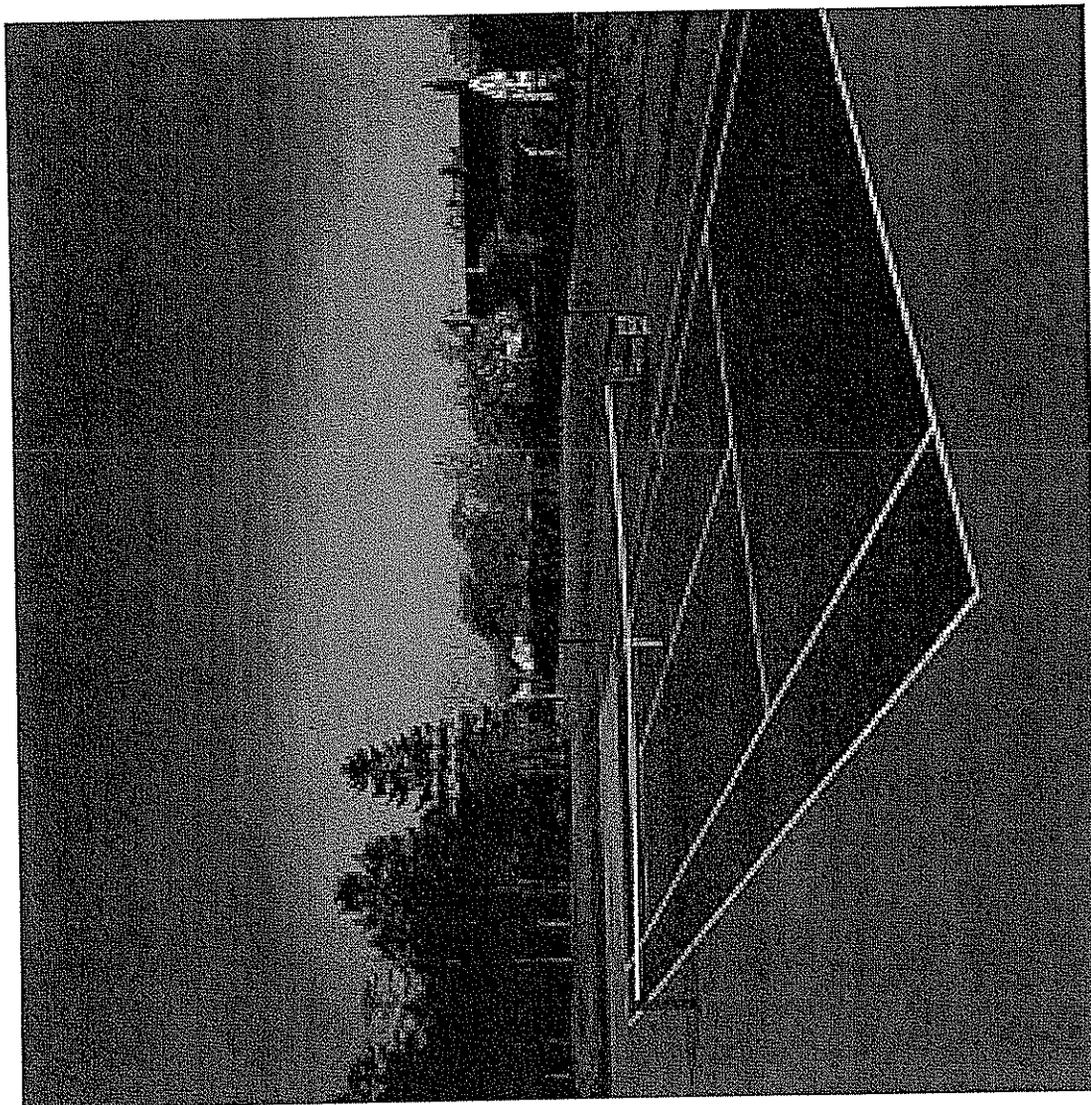
Sept. 18, 2008

We are what we breathe

AMERICAN LUNG ASSOCIATION.



Our lungs are on the line



VIII-B-369

Health Effects of

Second hand Smoke



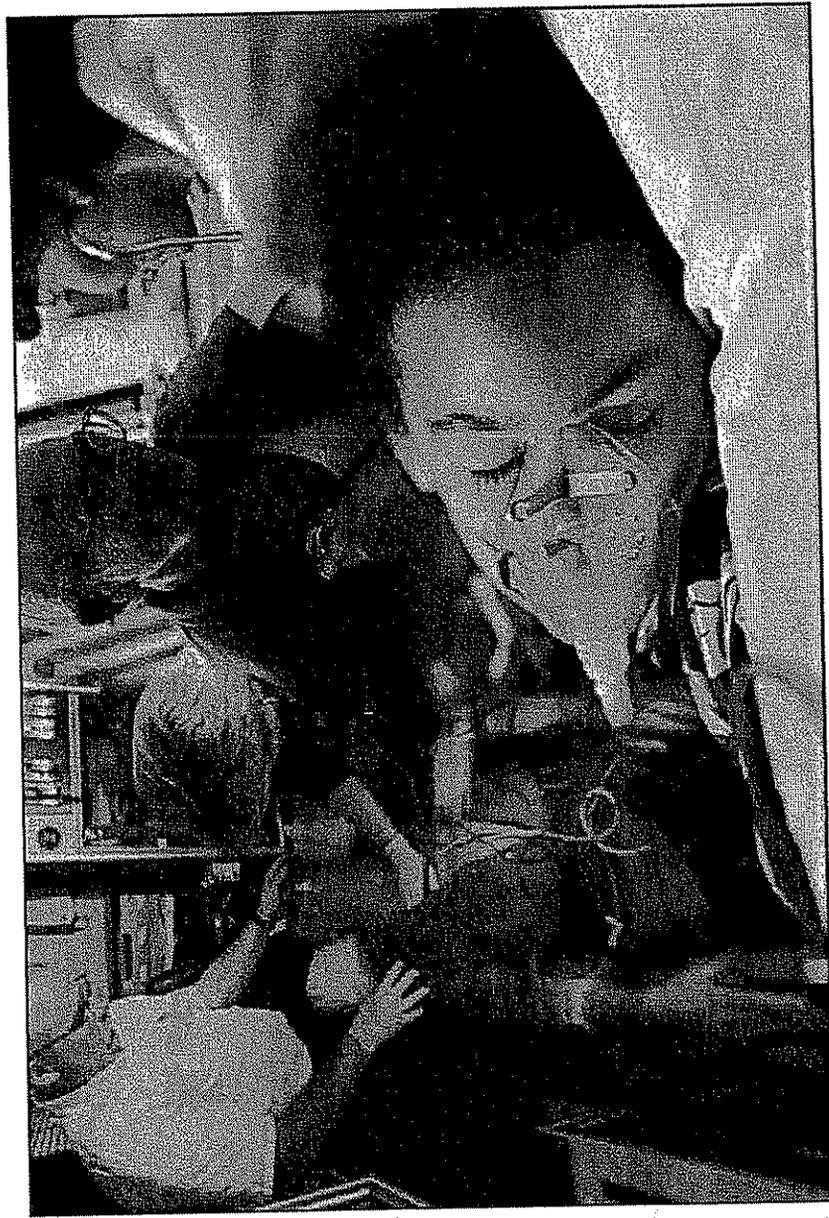
- Shortness of breath and wheezing
- Asthma attacks
- Emergency room visits and hospitalizations
- Long-term lung and cardiovascular disease
- Lung Cancer
- Premature death in seniors and infants

Health Effects of Bad Air



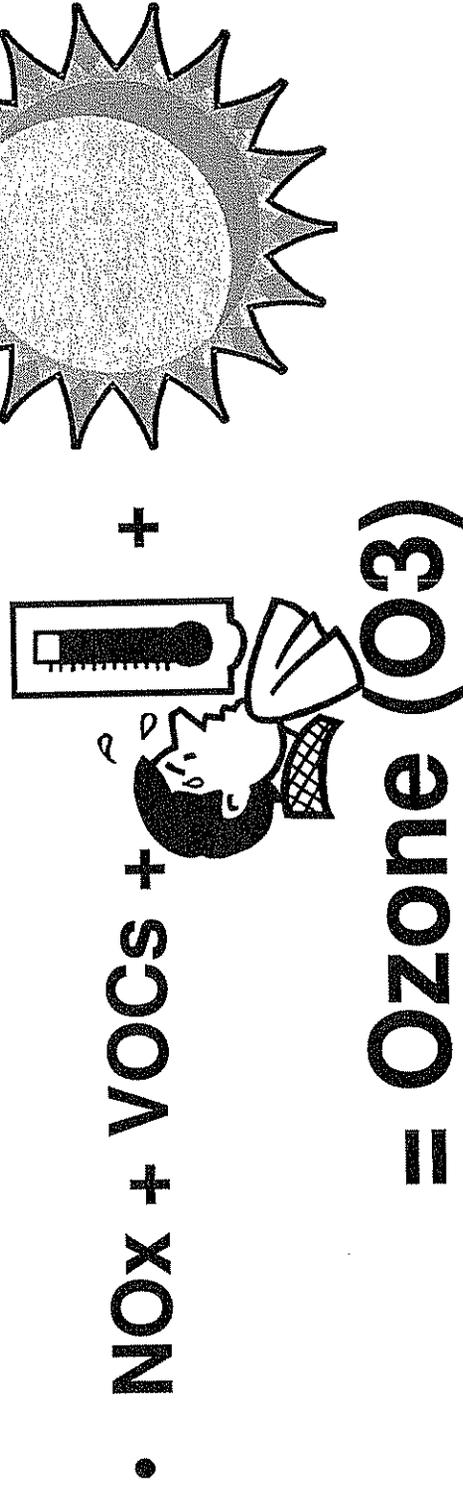
- Shortness of breath and wheezing
- Asthma attacks
- Emergency room visits and hospitalizations
- Long-term lung and cardiovascular disease
- Lung Cancer
- Premature death in seniors and infants

Specific effects of Ozone & PM  AMERICAN LUNG ASSOCIATION.



What is ozone?

- Sometimes called smog
- Created in the atmosphere



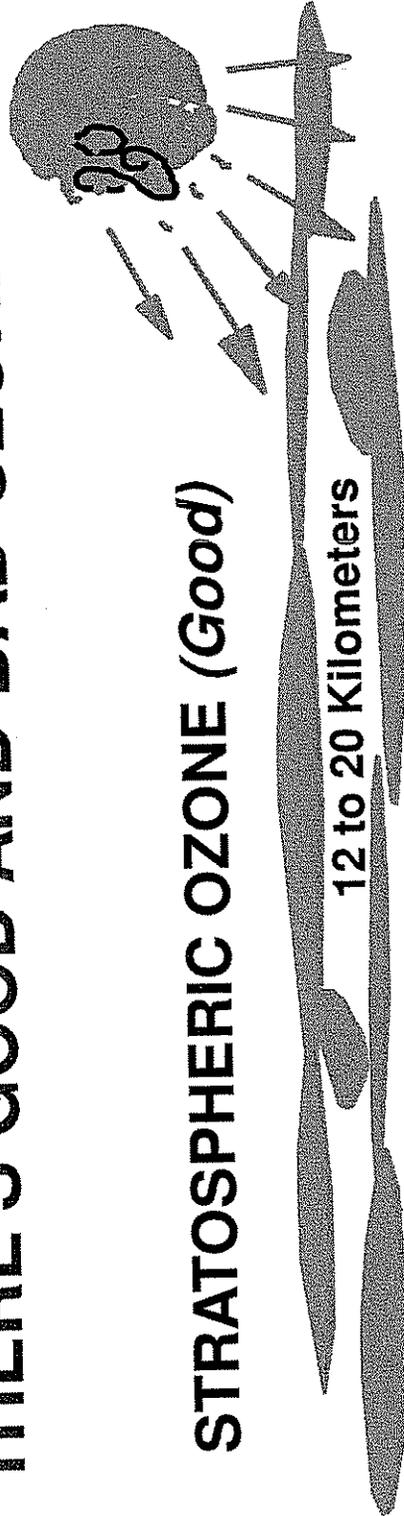
LIKE CHOLESTEROL...



WITH ITS GOOD AND BAD COMPONENTS...

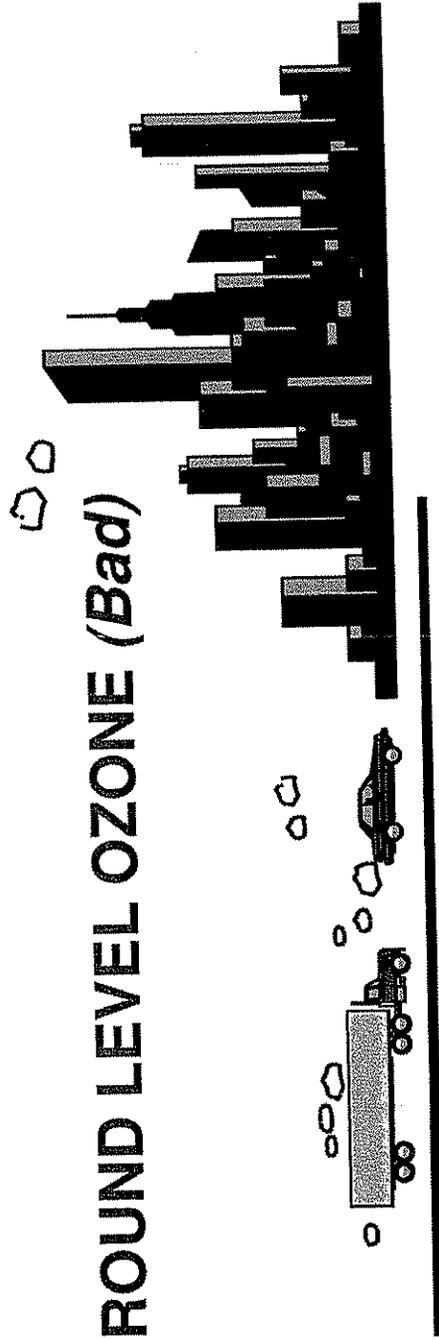
THERE'S GOOD AND BAD OZONE.

STRATOSPHERIC OZONE (*Good*)



12 to 20 Kilometers

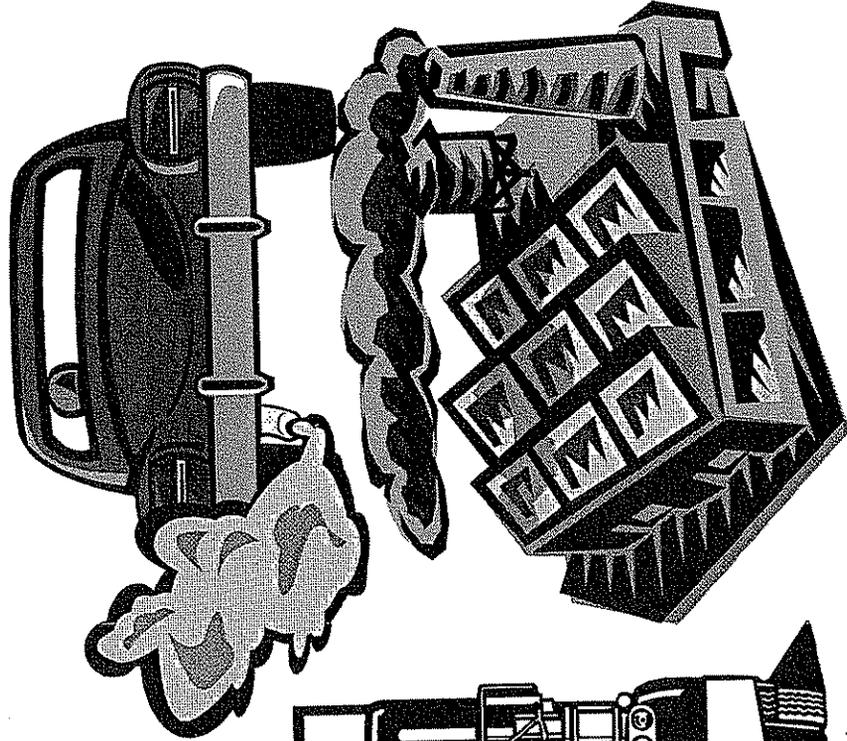
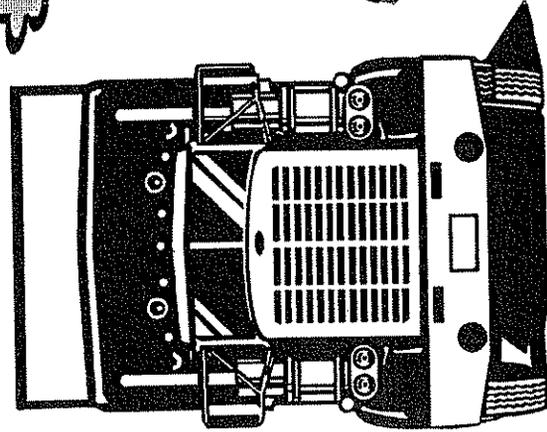
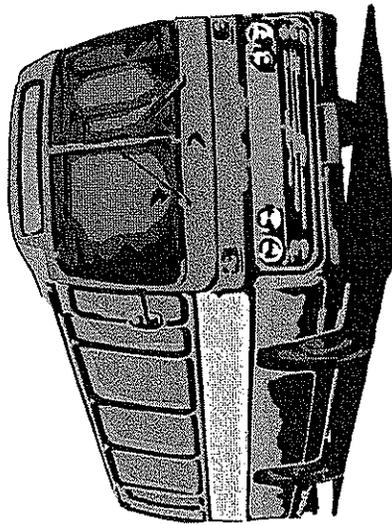
GROUND LEVEL OZONE (*Bad*)



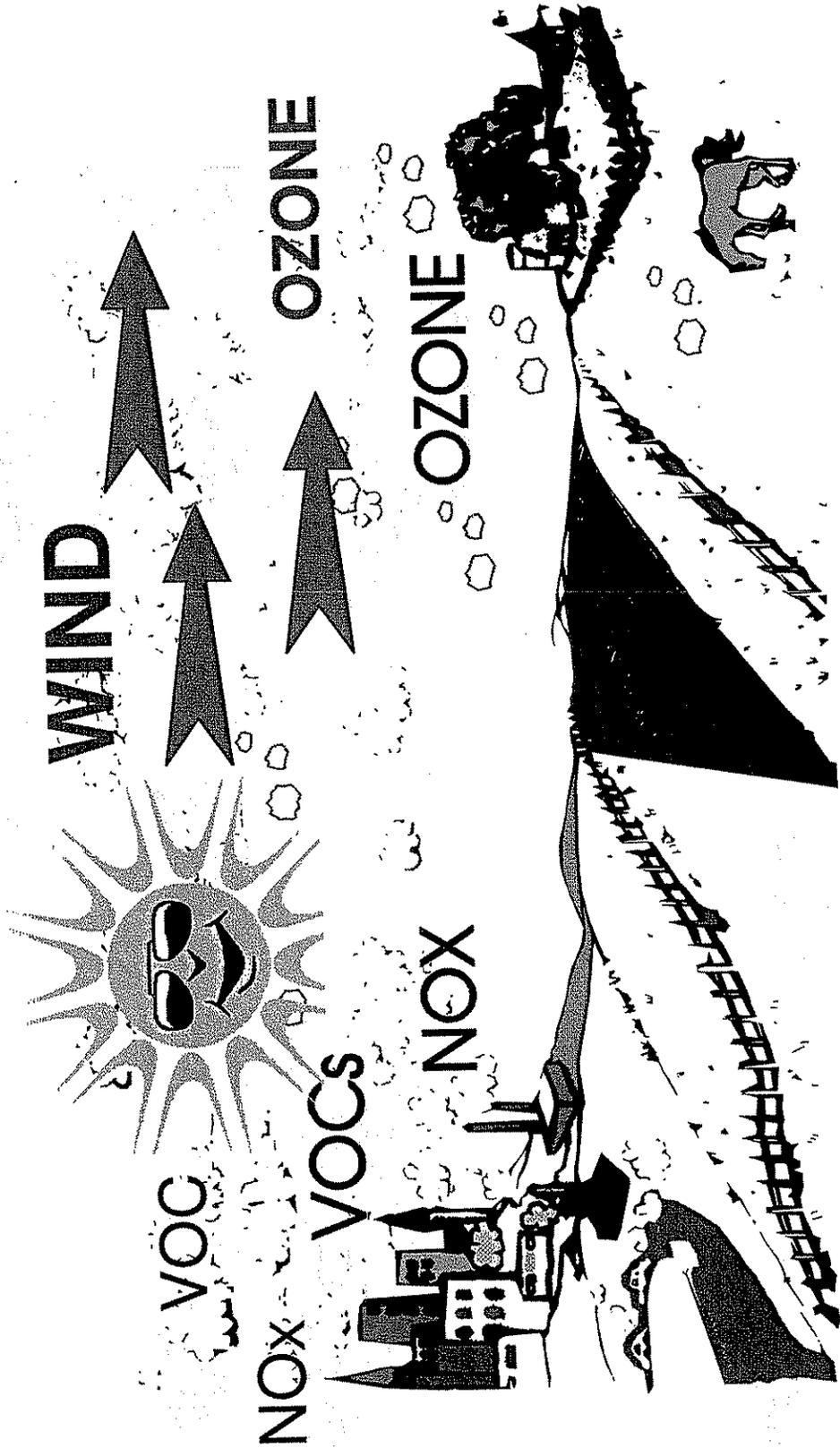
Ozone pollution

AMERICAN
LUNG
ASSOCIATION

- Comes from many sources, including—



Transported long distances

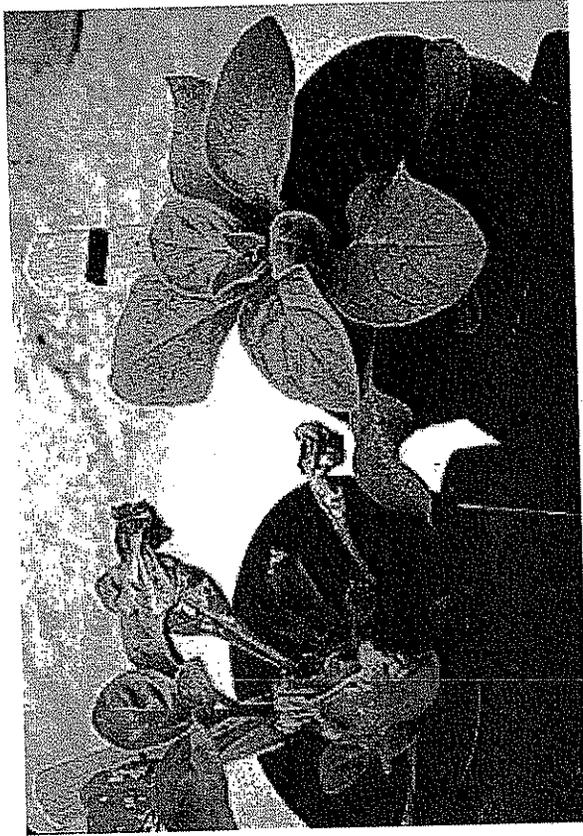


Health effects of ozone



- **Increased risk of early death**
- **Lung inflammation**
- **Reduced lung function**
- **Increased asthma attacks**
- **Increased risk of infection**

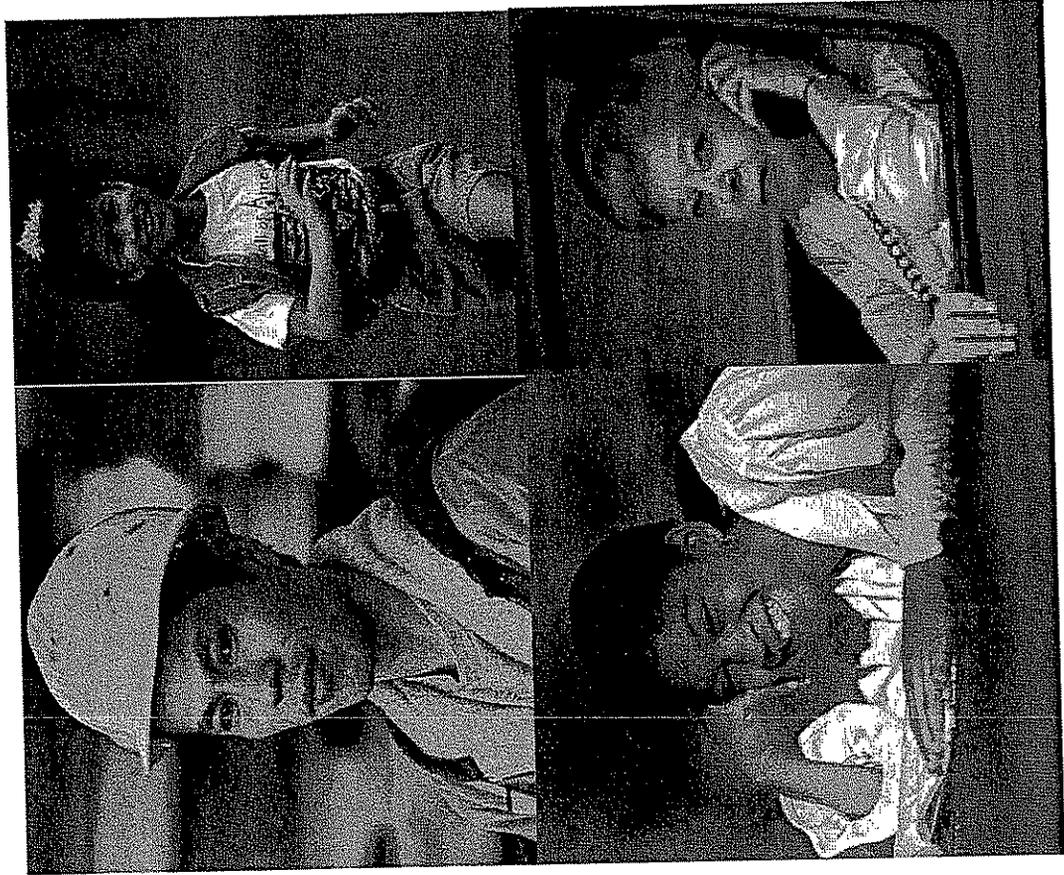
– *Bell et al. 2005; Levy et al, 2005; Ito et al, 2005; US EPA, 2006*



The plant on the left is stunted due to smog exposure. The plant on the right grew in healthy air. Children's lungs respond to smog in a similar way.

Who is at risk from ozone?

AMERICAN
LUNG
ASSOCIATION

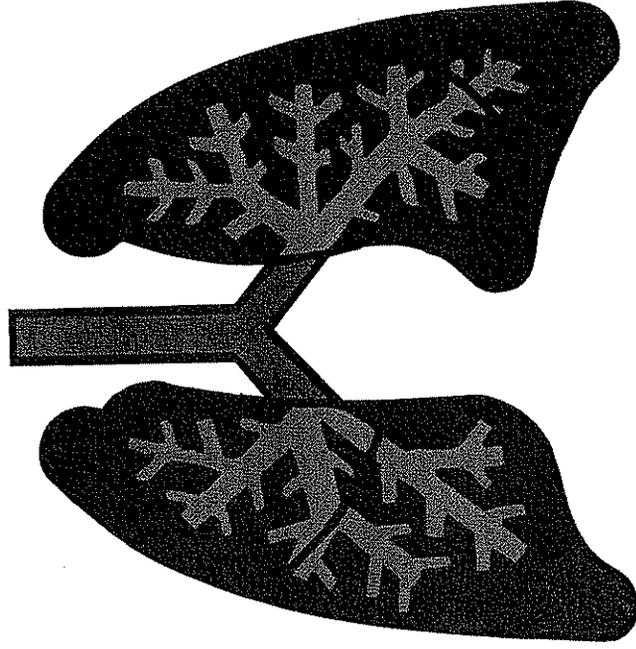


- Adults with Asthma
- Children with Asthma
- Children and teens
- People over 65
- People with chronic lung diseases

What is particle pollution?

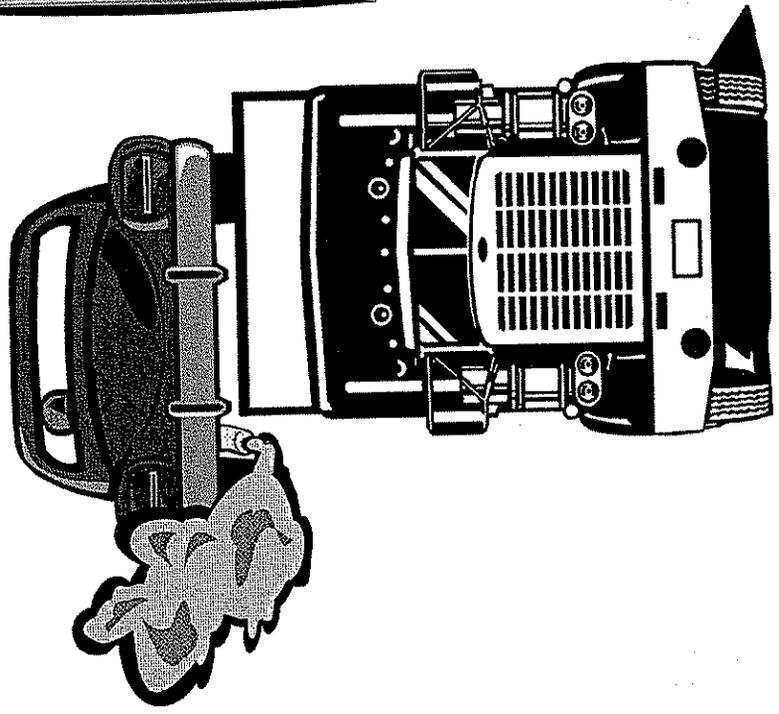
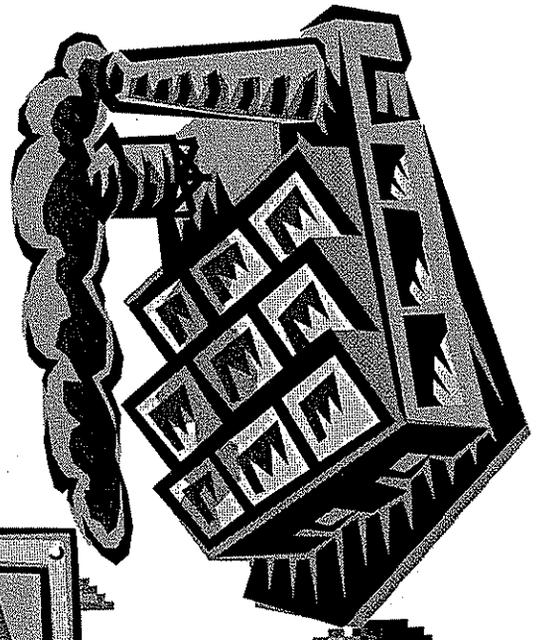
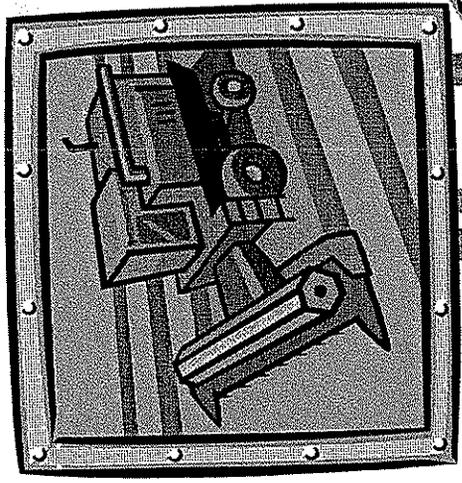
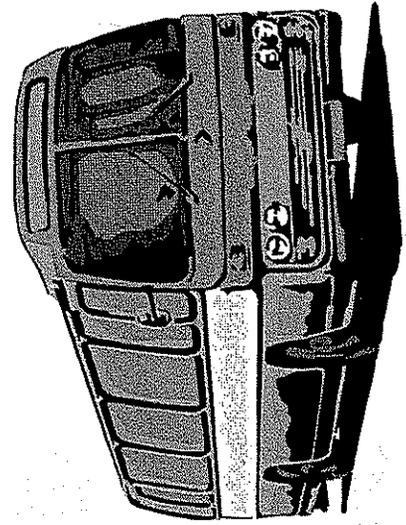


- Microscopic bits of stuff, including aerosols
- Highly transportable—blows anywhere
- Lodges deep inside the lungs



Particle pollution

• Comes from many sources, including—



How big is a particle?

AMERICAN LUNG ASSOCIATION

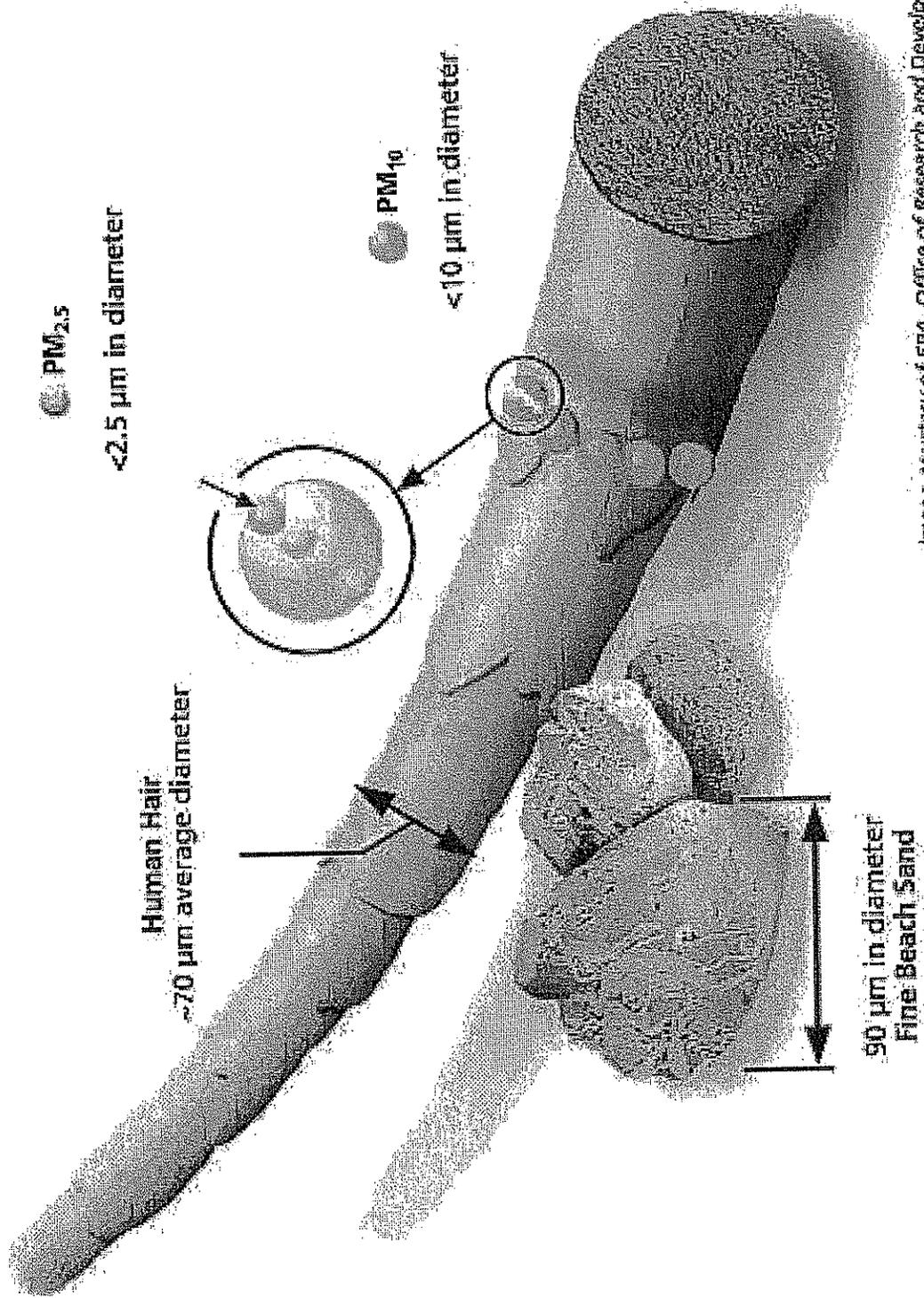
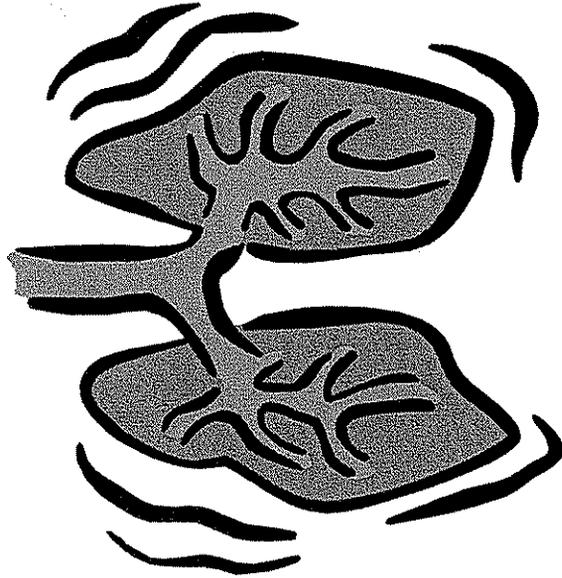


Image courtesy of EPA, Office of Research and Development

Health effects of

particle pollution

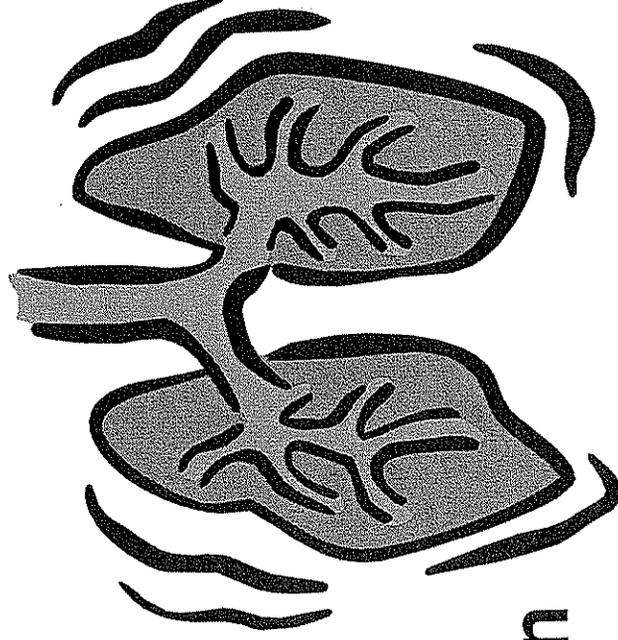


- As many as 24,000 deaths annually in CA
- Increases risk of death at high levels over hours to a few days
- Increases risk of death at lower levels over a long period

-- Health Effects Institute 2000; Dominici F et al, *Am. J. Epidemiol* 2002

Health effects of

particle pollution

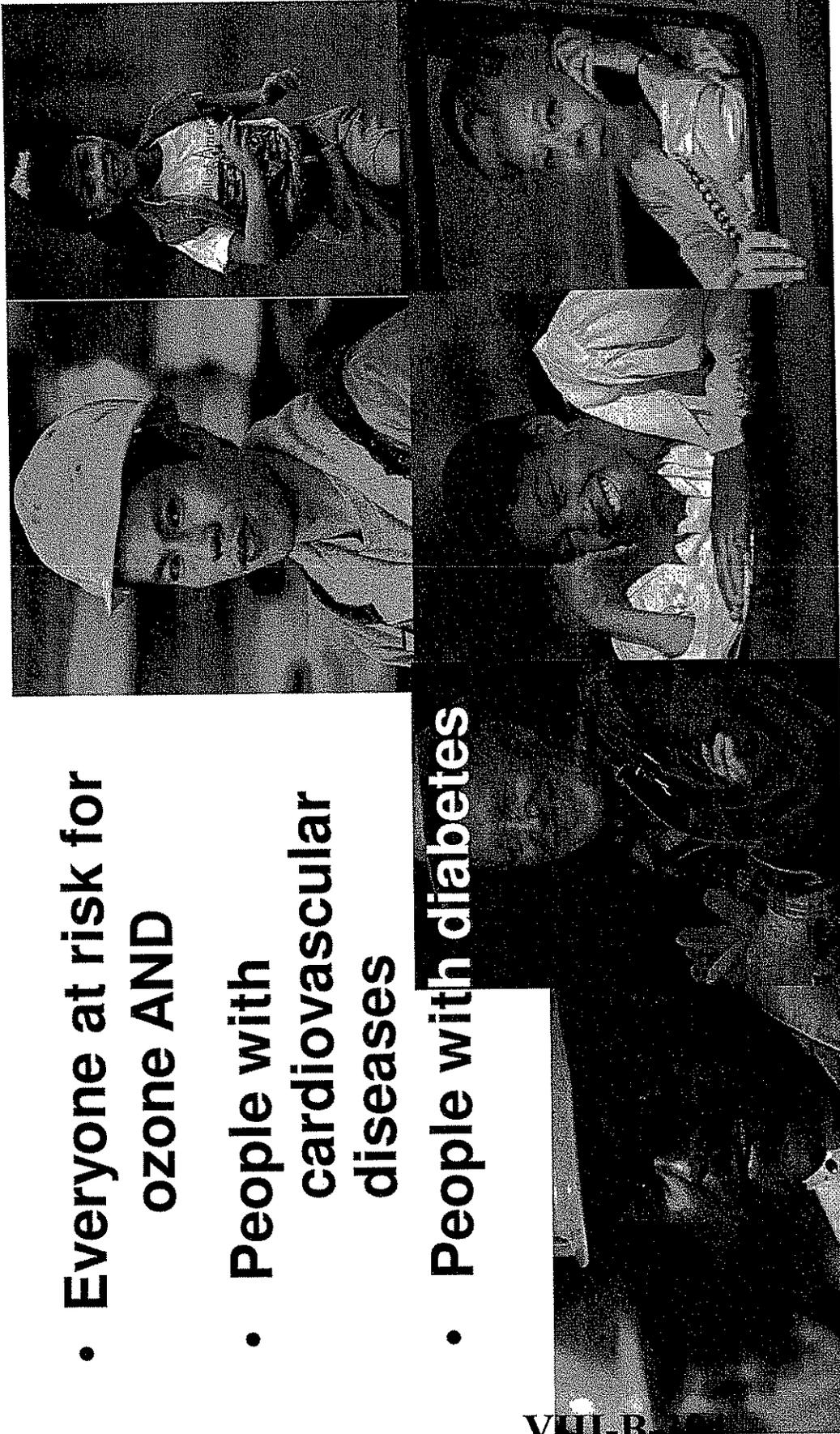


- **Increased risk of :**
 - Lung Cancer
 - Heart attacks
 - Asthma attacks
- **Increased hospitalization & ER visits**
- **Slowed lung function growth in children**
 - Pope and Dockery, JAWMA, 2006

Who is at risk from particles?



- Everyone at risk for ozone AND
- People with cardiovascular diseases
- People with diabetes



Children's Lungs



- Children breathe faster, their lungs are smaller and they are more affected by unhealthy air.
- Air pollution harms children's lungs for life. Exposure to high levels of smog causes delayed lung development and reduced lung function in children.
- Asthma is the most common chronic disease among children in California, and impacts children in low income areas. In Bay Area, one in five children has asthma.
- Children lose 1.3 million school days in California due to unhealthy air. And their parents must stay home to take care of them, resulting in workplace absenteeism.

USC Children's Health Study



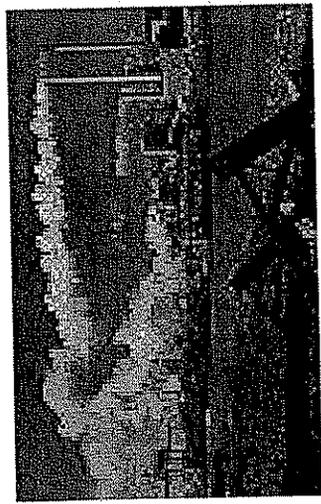
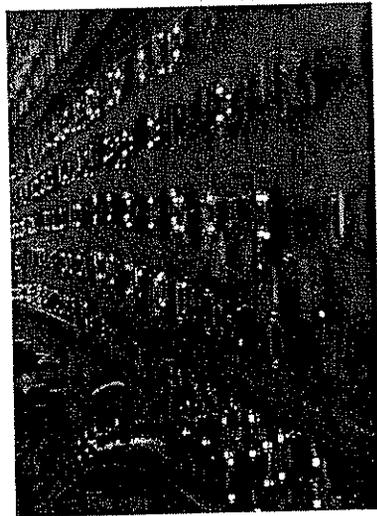
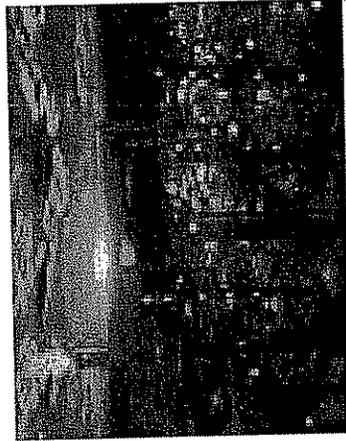
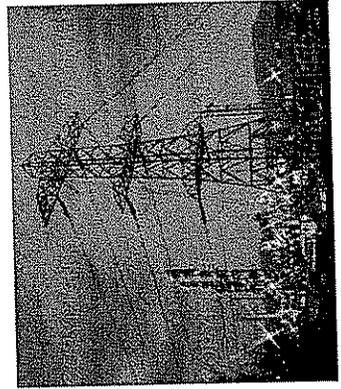
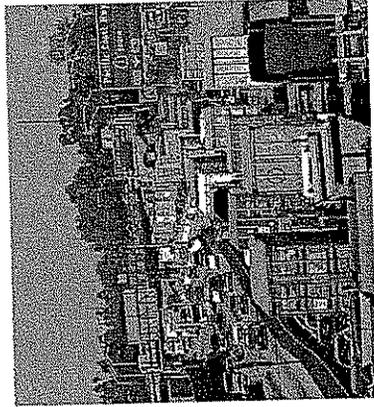
- **Reduced lung function growth from ages 10-18**
- **Up to 20% reduction in lung function growth**
- **Correlated with nitrogen dioxide, PM, acid vapor, ozone**
- **Likely that changes are permanent**
- **Long-term health implications**
- **Greatest effect may occur later in life (reduced lung function – a risk factor for adult respiratory illness and death)**

AMERICAN
LUNG
ASSOCIATION



VIII-B-387

AMERICAN LUNG ASSOCIATION
The major sources of smog and soot also contribute to greenhouse gases



What about Global Warming?

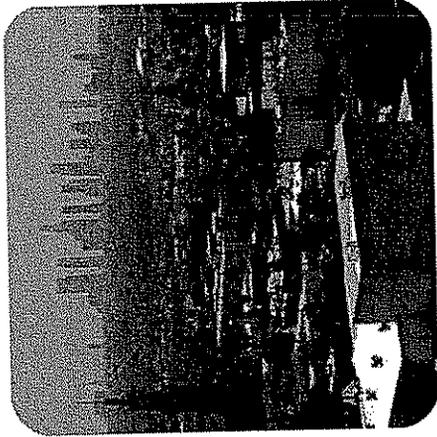


- **Global warming impacts that could harm lung health**
 - Higher levels of ozone and particle pollution
 - Drier climate may lead to increased wildfires
 - Increase in allergens from change in plant growth

Global warming feedback loop



Global warming contributes to...



Unhealthier air, which contributes to...

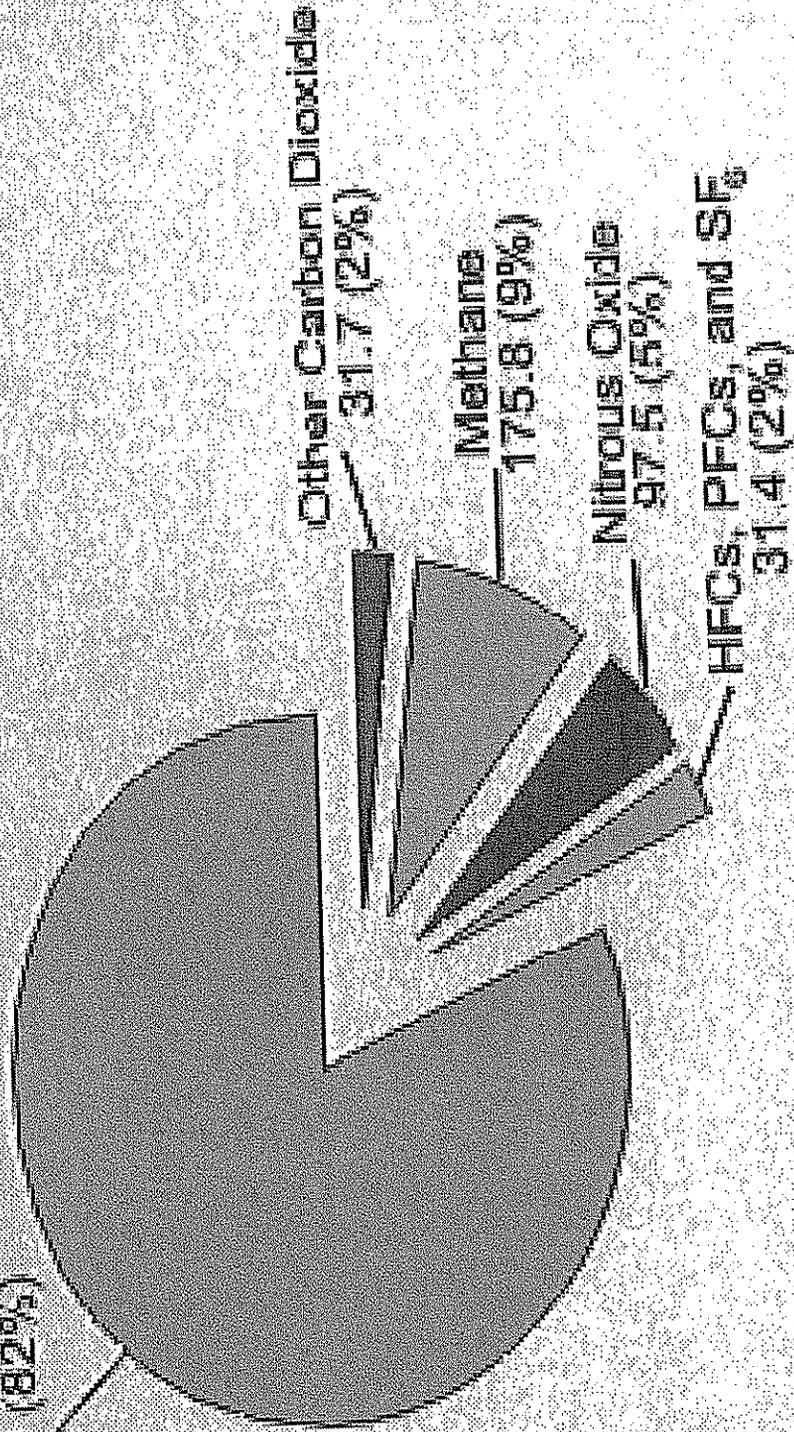


Increased asthma attacks, lung cancer, emphysema, bronchitis and breathing problems

Fossil Fuels Biggest Culprit

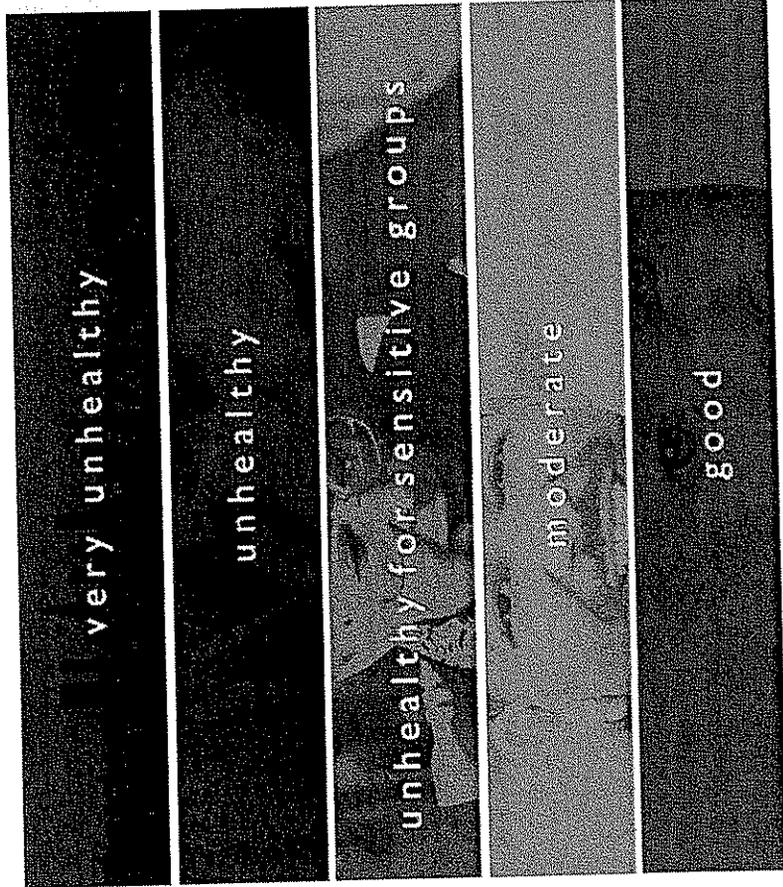


Carbon Dioxide from
Fossil Fuel Combustion
1,547.0 (82%)



Source: Energy Information Administration, Emissions of Greenhouse Gases in the United States 2001 (Washington, DC, 2002)

2008 State of the Air



Californians breathe the worst air in the country

LA - 167 days (ozone)*

Fresno - 114 days (PM)*

Bay Area - 24 days (PM)*

* Exceedances of federal standards 2004-2006

Our public policy priorities



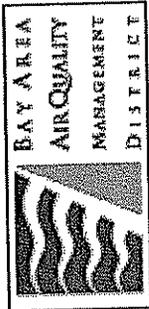
- **Strong, measurable GHG reduction targets**
- **Strong diesel truck regulations**
- **Reducing emissions from ports**
- **Land use planning that dramatically reduces vehicle miles traveled**
- **Clean alternative fuels and zero emission vehicles**

How you can help



- **Drive less and go electric**
- **Walk and bicycle more; take transit**
- **Don't burn wood**
- **Sign a card to support strong diesel truck and bus rule**
- **Join our e-advocacy network to clean up air pollution and support tough GHG targets and land use plans**
- **Join our Healthy Air Walk**
www.healthylairwalk.org

Healthy Air Walk



Healthy Air Walk



800.586.4872 www.healthyairwalk.org



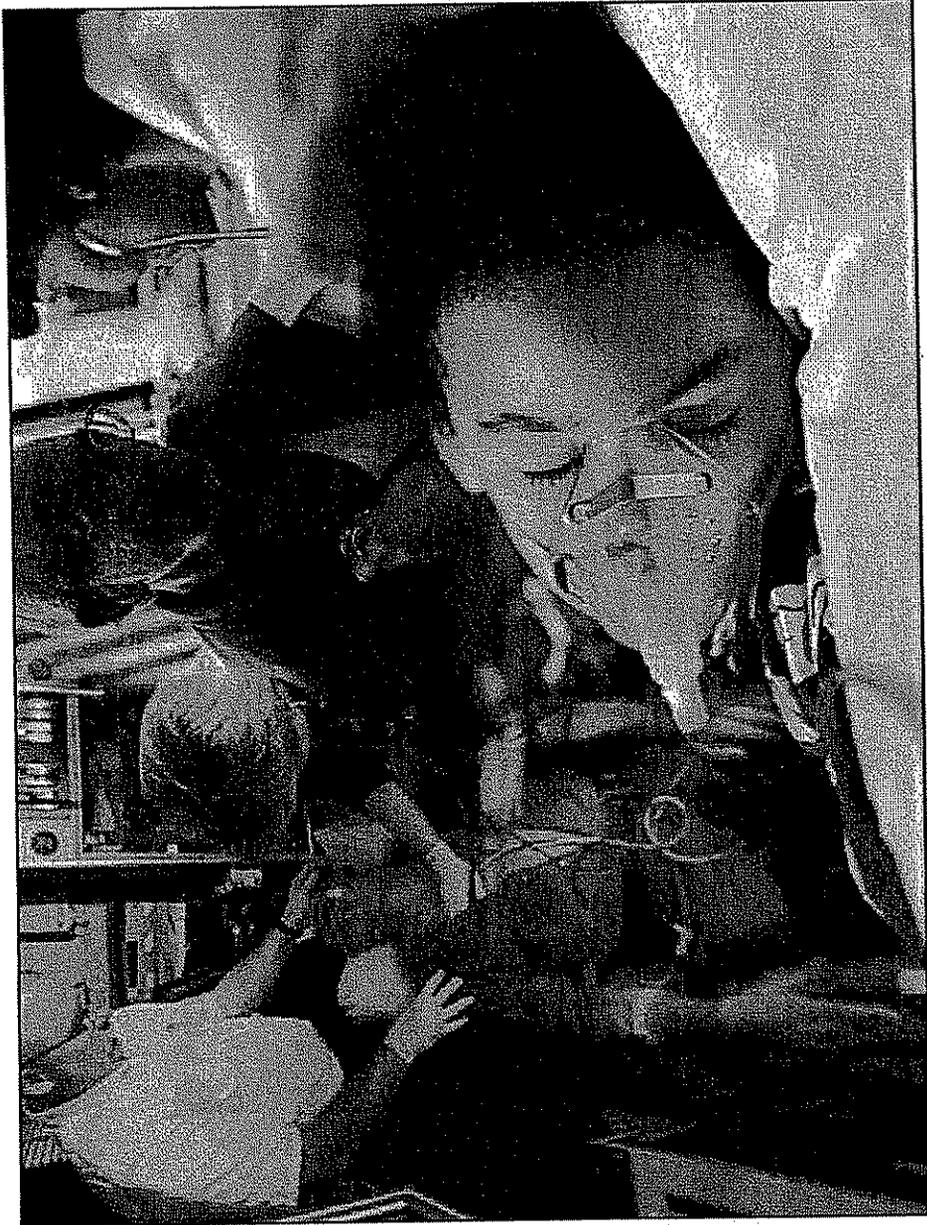
Saturday, October 11
Lake Merritt
Oakland

www.HealthyAirWalk.org

When you can't breathe,

nothing else matters

AMERICAN
LUNG
ASSOCIATION.



VIII-B-396

Sept. 30, 2008

Mayor and Councilmembers

Bernicia Herald

Letter to the editor:

One of my concerns about the up-coming Seeno/Discovery Builders project is about what happens in the four watersheds currently on this property. In the Seeno project, these areas of naturally draining water are scheduled to be filled, with all existing native plant and animal life' extinguished.

The environmental study on this project is inadequate and does not address this issue. Seeno/Discovery Builders is known for ignoring environmental guidelines. How can this affect Bernicia?

Where is this naturally draining water going to end up after Seeno/Discovery Builders eliminates its natural channels? Maybe into Lake Herman, Bernicia's drinking water supply. This issue has been ignored by Seeno/Discovery Builders. Mr. Seeno doesn't live here. We do. We drink the water. This project needs more study of it's environmental impacts.

Please urge our city councilmembers, before Oct. 7, 2008, to vote "no" on the current project and require a thorough environmental assessment on any project, thereby protecting our health.

Sue Johnson
153 Conline Place
745-9349

VIII-B-397

Anne Cardwell - Fwd: Forum Facts from Experts: for council packet

From: Charlie Knox
To: Anne Cardwell; Jayne York
Date: 9/30/2008 1:40 PM
Subject: Fwd: Forum Facts from Experts: for council packet

more from Marilyn

>>> Marilyn Bardet <mjbardet@sbcglobal.net> 9/30/2008 1:21 PM >>>

Charlie,

Here are 3 fact sheets I made, quoting basic info from our 3 main speakers at the Benicia First Forum, Sept 18.

I've also taken the City's land use map (1999) and drawn in the "zone of influence" which Dr. Tager describes as characterizing the outer range of traffic pollution's effects as demonstrated in the So-Cal Children's Health Study. I will be bringing this map in, for reproduction at smaller scale, and for use at the Oct 7th meeting. Meanwhile, here are the fact sheets.

-- Marilyn
for Benicia First

VIII-B-398

Facts from the Benicia First Forum

Air Quality & Children's Health

Sept. 18, 2008

From:

Dr Ira Tager, Md., Epidemiologist, Professor, Director, UC Berkeley School of Public Health
Prevention Research Center

“Lung sacs develop fully in the first 20 weeks of life.”

“Lung function is a better indicator of mortality—better than blood pressure.”

“The Southern California Children’s Health Study was conducted for 10+ years, between 1993 and 2001, and followed 5,500 children for chronic exposures to air pollution. Marker pollutants were diesel PM [particulate matter at 10 and 2.5 microns] and NOX₂. A sub-set of this study, conducted for 8 years involved 1,500 children. The main concern was traffic exposure’s affect on lung function and residential distance to freeways. . . For this study, the “zone of influence” that would characterize effects of traffic pollution was 500 meters from a freeway.”

“Hazards of traffic pollution include tire and brake fragments, tailpipe toxics (NOX, CO, Hydrocarbons and PM [particulate matter]. Allergens and other biological agents add to cumulative effects of roadway pollution.”

About health effects in children and adolescents:

“An 89% increase in asthma risk is associated to living close to a freeway.”

Facts from the Benicia First Forum

Air Quality & Children's Health

Sept. 18, 2008

From:

Dr. Paul Roberts, Phd., Exec Vice Pres. & Chief Scientific Officer, Sonoma Technologies Inc.

Dr. Roberts recently completed the "Mobile Source Air Toxics Study" in Las Vegas, Nevada, which was conducted for one year, monitoring air quality at three schools that are located adjacent to Highway 95. The research was funded by a U.S. 95 Settlement Agreement between the Sierra Club and the Nevada Dept. of Transportation and FHWA [Federal Highway Administration].

The required components of the study were:

- monitoring at the three school sites
- Filtration added to HVAC systems at schools
- Bus retrofit program
- Bus idling education
- FHWA gradient study (with EPA, ongoing research)

"At all three school sites, high black carbon concentrations are seen at low wind speeds regardless of direction."

"Morning concentrations dominate indoor and outdoor exposure (summer); overnight and morning concentrations dominate in winter."

"Low wind speeds often allow high pollutant concentrations on both sides of the roadway (with sound wall)."

"Wind conditions and time-of-day have a significant influence on near-roadway exposure."

Facts from the Benicia First Forum

Air Quality & Children's Health

Sept. 18, 2008

From:

Jenny Bard, Director of Regional Air Quality Programs, American Lung Association of California

“Lungs have 300 million avioii—[if laid out] enough to fill a tennis court.”

“Livermore has the highest ozone level in the Bay Area.”

[Benicia also shows high levels of ozone, as monitored at the Tennys Drive monitoring station.]

“Ozone is made up of nitrogen oxides + volatile organic compounds (VOC's) especially when temperatures are high. With global warming, we can expect more smog, more days of exceedences of federal levels for ozone containment.”

“Wood burning is the greatest cause of particulate emissions (PM) in the Bay Area. Diesel emissions, including PM, are the most harmful emissions in the Bay Area.”

“Black soot on windowsills is likely diesel soot.” [black carbon].

“The smallest particles, PM 2.5 microns, are so tiny they by-pass airway defenses and are absorbed into the bloodstream.”

“We need to protect public health with adequate margin of safety.”

“The Lung Assoc. in California is supporting AB32, for getting greenhouse gas reductions associated to traffic. The secondary benefit to reducing traffic is the reduction of health risks posed by traffic emissions.”

Main Identity

From: <rogmail@att.net>
To: "Anne Cardwell" <Anne.Cardwell@ci.benicia.ca.us>
Sent: Tuesday, September 30, 2008 9:02 AM
Attach: GGBC_20080930 TRAFFIC FINAL.doc
Subject: Final draft of Green Gateway material for Councilmembers' Packet

Hi Ann - thank you for your patience. I believe this is the final draft. The filename for this final draft has today's date - please only use this version.

Thanks,
Roger Straw
Green Gateway Group
www.greengatewaygroup.org
home: 707 748-7350 / cell: 707 373-6826

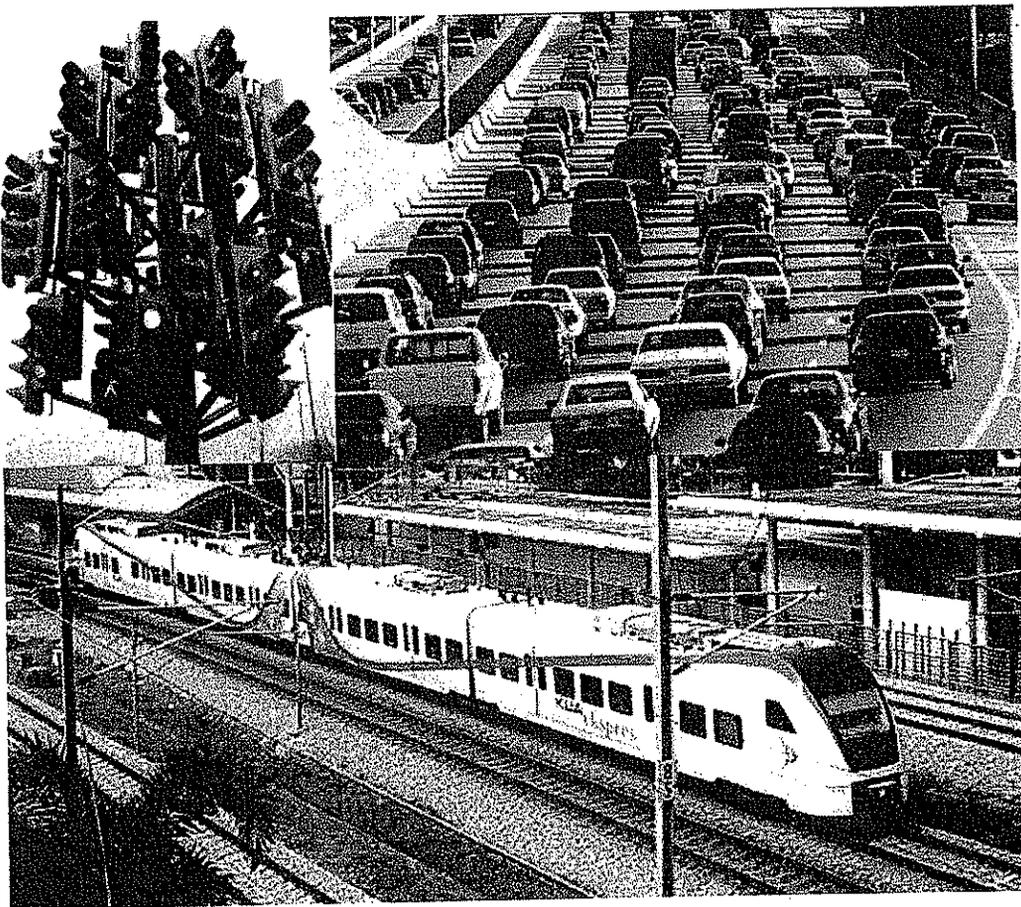
VIII-B-402

9/30/2008

About Traffic and Transportation in Benicia ...

Green Gateway Business Community

A 21ST CENTURY POSSIBILITY



Prepared by Benicia citizens
organized as the Green Gateway Group

October, 2008

VIII-B-403

Disclosure

The Green Gateway Group fully believes that the Benicia City Council has sufficient data, facts, information, and legal opinion from numerous sources to fully deny the current project as proposed by Discovery Builders.

This document is not intended and shall not be used as grounds for the Benicia City Council to deny the current project as proposed.

We are simply formulating possibilities, based on our research and discussion with visionaries in the industry. We are not presenting an Alternative Project. We are simply taking a positive step in presenting a framework for a 21st Century vision.

Green Gateway Group
October, 2008

GREEN GATEWAY BUSINESS COMMUNITY A 21st Century Possibility

ABOUT TRAFFIC & TRANSPORTATION IN BENICIA

CONTENTS

Disclosure	p. 2
Introduction and Summary	p. 4
Traffic References in our September 2008 Study	p. 5
Ozone <i>In</i> Benicia, Ozone <i>From</i> Benicia	
Benicia one of the 10 WORST IN BAY AREA	p. 9
Ozone in Benicia - Nine-month Snapshot	p. 10
Ground-level Ozone Map, Benicia on August 28, 2008	p. 11
Three Worst Ozone Pockets in Bay Area	p. 12
Bay Area Ozone Levels, August 28, 2008	p. 13
Bay Area Ozone Levels, August 28, 2008 (summary)	p. 14
The City of Benicia Citizen Survey	p. 15
Health Effects of Ozone	p. 16
General Plan Consistency Analysis	p. 18
Benicia's New Greenhouse Gas Reduction Targets	p. 23
Appendix - Seeno Timeline, 2007-2008	p. 24

Introduction and Summary

Visionary 21st Century Planning based on a City-Sponsored Specific Plan

Benicia's Green Gateway Group proposes an achievable visionary business community in contrast to the current proposed project for Benicia Business Park.

This Study Focuses on Traffic

Much of the work we have done previously revolves around the need to reduce traffic and thereby reduce greenhouse gas emissions. This study will briefly recap substantial sections from our previous study concerning traffic, beginning on page 5, and then focus on new information on the subject.

The Vision

We believe the best way to achieve the goals envisioned in our study is to exercise our right as citizens to encourage a Specific Plan.

We join our voices with a chorus of local citizens and professionals who have advised a vote to deny the current Seeno plan, which is archaic, unsustainable and unsuited to the future. We believe that Benicia needs a 21st Century alternative that would be forward-looking and specific in its vision. We also recognize that a developer needs to be advised clearly by the citizens as to what we would require, what we want, and what would and would not be acceptable.

This vision is not only important to us as Benicians and world citizens, but it is required of us moving forward in our planning under State of California law "AB32," the California Global Warming Solutions Act, now approved and codified as Division 25.5 (commencing with Section 38500) of our California Health and Safety Code.

Industry Standard Sustainable Development

Our Green Gateway Business Community vision follows current industry standards, calling for sustainable, profitable, green development. It envisions an **environmentally sustainable** and highly profitable research park, having its uses and activities guided by an overarching concept and focus on the emerging field of clean technology. There should be protections against grading slopes beyond 20% incline (a common development standard), a richer mixed-use layout, **road alignment that will encourage greater walking and biking accessibility, an emission-free electric or low-emission hybrid public transit system to serve the entire city of Benicia**, and Form-based code to guide the development of a livable and sustainable business *community*.

Note: for our previous 51-page study, Green Gateway Business Community – A 21st Century Possibility, please go to www.greengatewaygroup.org/ or contact Green Gateway Group chairperson Roger Straw at 707.748.7350.

References to Traffic & Transportation in our September 2008 Study (GGBC)

The Green Gateway vision is heavily dependent on cutting back dramatically on the greenhouse gas emissions Benicia contributes to our Bay Area air. We propose to do this for our own health and safety. We propose to do this to satisfy the requirements of our Benicia General Plan, our Solano County General Plan and California's Global Warming Solutions Act (AB32). *And* we propose to do this on behalf of our "upwind neighbors," and because we belong to the planet and care about the future of Earth. Our September study, Green Gateway Business Community – A 21st Century Possibility, contained too many references to traffic to reiterate here, but we will lay out the basic formulations in the following summary.

Following are excerpts, with material not related to traffic omitted.

Context and Framework (pp. 5-10, GGBC)

1. General Plan goals

Benicia's General Plan governs all forms of community development and lays out goals for Sustainability, Identity and Health and Safety. Our General Plan is the law in Benicia....

Community Development and Sustainability - Circulation

- 2.14 Enhance Benicia's small town atmosphere of pedestrian-friendly streets and neighborhoods
- 2.15 Provide a comprehensive system of pedestrian and bicycle routes which link the various components of the community; employment centers, residential areas, commercial areas, schools, parks, open space
- 2.17 Provide an efficient, reliable and convenient transit system
- 2.18 Encourage the provision of convenient rail service to Benicia with a station near the Benicia Bridge
- 2.21 Encourage Benicia residents and employees to use alternatives to the single occupant automobile
- 2.22 Alleviate traffic near school sites
- 2.24 Continue to provide safe and direct access to the Industrial Park
- 2.26 Ensure that scenic and environmental amenities of I-680 and I-780 are not compromised
- 2.27 Ensure an active community deliberation process in response to Caltrans proposals now and in the future

Community Identity - Visual character

- 3.9 Protect and enhance scenic roads and highways

Community Health and Safety

- 4.1 Make community health and safety a high priority
- 4.7 Ensure that existing and future neighborhoods are safe from risks to public health that could result from exposure to hazardous materials
- 4.9 Ensure clean air for Benicia residents
- 4.10 Support improved regional air quality
- 4.17 Minimize hazardous waste generation
- 4.23 Reduce or eliminate the effects of excessive noise

2. AB 32 - California Global Warming Solutions Act -- (Passed by the California Assembly and approved by the Governor September 27, 2006). Our California Health and Safety Code relating to air pollution now mandates a reduction in greenhouse gas emissions back to the "1990 emissions baseline" by 2020. By 2020 the bill would require the state board to adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with this program. The bill defines "greenhouse gas emissions limit" as an authorization, during a specified year, to emit up to a level of greenhouse gases specified by the state board, expressed in tons of carbon dioxide equivalents. (Greenhouse gas or greenhouse gases includes all of the following gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride.)

Greenhouse gas emissions predominantly come from Transportation (38%)....When considering any development, it is clear that the City's responsibility lies in encouraging reduction in traffic and alternate transportation solutions....

The AB32 goal should primarily be achieved through ...transportation strategies to (1) reduce per capita "vehicle miles traveled"....

From the Attorney General's Office, titled: "The California Environmental Quality Act -- Addressing Global Warming Impacts at the Local Agency Level", comes the following recommendations that local agencies can require of development projects in order to carry out their duties under CEQA as they relate to Global Warming and AB32: (See <http://ag.ca.gov>)

Energy Efficiency

- Install light emitting diodes (LEDs) for traffic, street and other outdoor lighting.

Land Use Measures

- Include mixed-use, infill, and higher density in development projects to support the reduction of vehicle trips, promote alternatives to individual vehicle travel, and promote efficient delivery of services and goods.¹⁹
- Incorporate public transit into project design.
- Include pedestrian and bicycle-only streets and plazas within developments. Create travel routes that ensure that destinations may be reached conveniently by public transportation, bicycling or walking.²¹

Transportation and Motor Vehicles

- Limit idling time for commercial vehicles, including delivery and construction vehicles.
- Use low or zero-emission vehicles, including construction vehicles.
- Promote ride sharing programs e.g., by designating a certain percentage of parking spaces for ride sharing vehicles, designating adequate passenger loading and unloading and waiting areas for ride sharing vehicles, and providing a web site or message board for coordinating rides.
- Create car sharing programs. Accommodations for such programs include providing parking spaces for the car share vehicles at convenient locations accessible by public transportation.²²
- Create local "light vehicle" networks, such as neighborhood electric vehicle (NEV) systems.
- Provide the necessary facilities and infrastructure to encourage the use of low or zero-emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations).
- Increase the cost of driving and parking private vehicles by, e.g., imposing

- tolls and parking fees.
- Build or fund a transportation center where various public transportation modes intersect.
- Provide shuttle service to public transit.
- Provide public transit incentives such as free or low-cost monthly transit passes.
- Promote "least polluting" ways to connect people and goods to their destinations.²⁴
- Incorporate bicycle lanes and routes into street systems, new subdivisions, and large developments.
- Incorporate bicycle-friendly intersections into street design.
- For commercial projects, provide adequate bicycle parking near building entrances to promote cyclist safety, security, and convenience. For large employers, provide facilities that encourage bicycle commuting, including, e.g., locked bicycle storage or covered or indoor bicycle parking.
- Create bicycle lanes and walking paths directed to the location of schools, parks and other destination points.
- Work with the school district to restore or expand school bus services.
- Institute a telecommute work program. Provide information, training, and incentives to encourage participation
- Provide incentives for equipment purchases to allow high- quality teleconferences.
- Provide information on all options for individuals and businesses to reduce transportation-related emissions.
- Provide education and information about public transportation.

3. Sustainability defined ...

Sustainability is defined as "development that meets the needs of the present without compromising the future generations to meet their own needs". It is about balance between environmental protections, social equity and economic performance, the three major components of sustainability, and about balance between short and longer term returns on public and private investment.

Environmental Considerations

- Maximize pedestrian circulation modes
- Provide for alternative/renewable energy use - work toward "energy neutral" development
- Safely and efficiently accommodate traffic with out adverse impact to surrounding community
- Develop alternative public transportation modes and efficient connectivity between them

Social Equity

- Contribute to critically needed solutions to regional transit and transportation issues
- Recognize any regional significance and strive to ensure that it positively impacts its surrounding community (ies)

(The above information was adapted from Brisbane, California's Baylands Plan

Basics for a 21st Century Plan (p. 12, GGBC)

Transportation is key to air quality.

Fully 38% of the greenhouse gases in our Bay Area air comes from automobiles. It is simply no longer an acceptable alternative to develop new retail and industrial land usages that fail to take this into account.

A 21st Century development must be planned in such a way as to keep trip generation at a minimum. We need to enable and encourage many if not most of those fewer trips to be made on foot and by bicycle, and on clean-tech public transit. In this way, a primary goal of the Green Gateway Business Community is to provide alternatives to cars.

We propose:

1. A much smaller development, (fewer lots on less acreage, less grading, fewer square feet of building space) with accordingly fewer trips to and from the Business Community
2. Plentiful pedestrian and bicycle paths within the Community, and whenever possible, interconnected streets (as opposed to cul-de-sacs). This design would encourage foot and bicycle traffic.
3. Focus most business and industrial uses on cleantech R&D and related commerce, so that Green Gateway becomes known and recognized as a central cleantech hub in the emerging East Bay/Sacramento Green Corridor. By focusing on cleantech R&D and University collaboration, the Park would create a good job match for Benicia's employment demographics, thereby reducing commute traffic. A clean tech green-collar training center would generate a skilled green-collar workforce for the many businesses on site and elsewhere.
4. A distribution of commerce and retail throughout the acreage rather than concentrated near Interstate 680. This retail and commerce would primarily serve the Community itself, and would result in much less traffic off Interstate 680, although high-quality restaurants and other commercial ventures would appeal to hotel and retreat center guests, Benicians and others from nearby cities.
5. An Intermodal Transportation hub and shuttle service – paid for through assessment district financing – (note for example, Emeryville, CA), to cut down on trips from other cities.
6. Minimal parking which would encourage use of connector buses.
7. A citywide local transit system of electric -- or hybrid -- short buses (vans or cutaways) and a system of elegantly designed bus stops to serve all of Benicia. Buses would run frequently enough to make car trips to and from the Green Gateway Business Community (and elsewhere in Benicia) unnecessary in most cases.

Guidelines, Goals (p. 14, GGBC)

Guidelines

Sustainable under California law (AB32)
0 Carbon footprint
Net positive energy outflow

Goals

Intermodal transport site
Connect to electric trolley service that connects BIP, downtown, Yuba, Arsenal, Rose Drive business, Southampton, Community Park etc
Walking/biking trails
Connecting streets

Comparison: Seeno and the Green Gateway Vision, (p. 15, GGBC)

The Green Gateway model would result in an estimated 78% reduction in traffic over Seeno's 2007 proposal based on trip generation alone. With an intermodal transit station, on-campus shuttle service and an electric or hybrid transit system serving all of Benicia, there would be even greater reductions.

Ozone *In* Benicia, Ozone *From* Benicia

Source: <http://gate1.baaqmd.gov/aqmet/AQYearly.aspx>

OZONE IN BENICIA - one of the 10 WORST IN BAY AREA

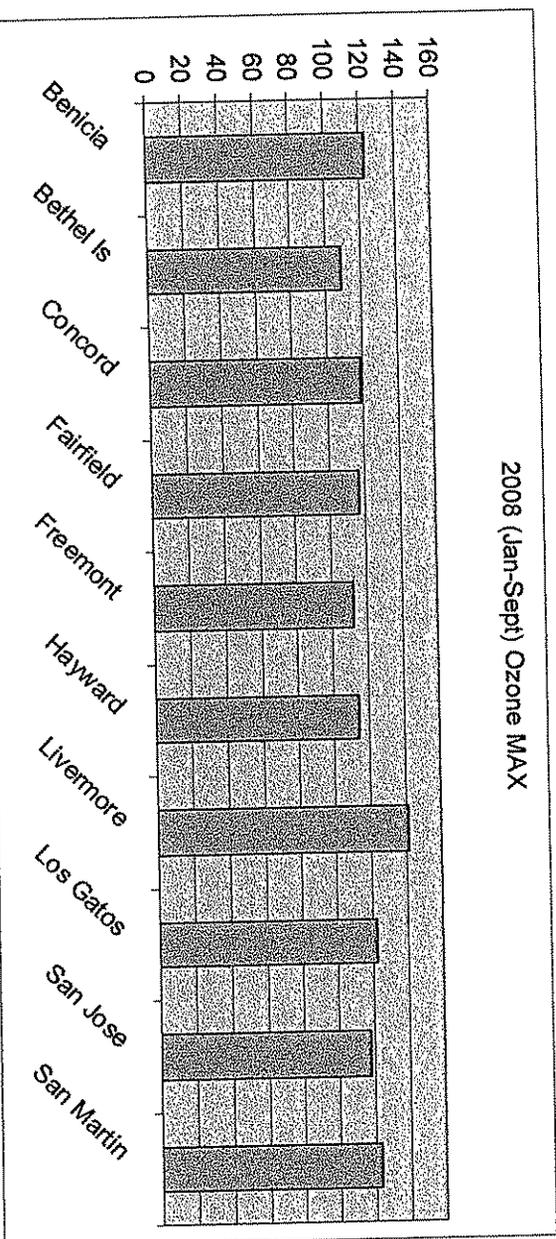
Benicia already has a serious public health ozone problem compared to other Bay Area communities. Please don't approve any measures that will make this problem worse!

The 10 stations listed below consistently have HIGHEST readings of all 23 stations in Bay Area!

2008 (Jan-Sept) Ozone MAX (as of Sept. 29)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Avg MAX	highest MAX
Benicia	45	50	51	87	65	81	123	87	94	76	123
Bethel Is	43	49	56	79	103	96	109	88	86	79	109
Concord	51	47	57	94	73	102	119	84	97	80	119
Fairfield				81	63	77	116	95	85	73	112
Freemont	52	45	55	90	58	76	112	79	89	88	114
Hayward				85	55	74	114	83	88	86	141
Livermore	51	44	54	91	87	91	141	117	97	86	141
Los Gatos	53	46	56	88	79	80	122	81	92	77	122
San Jose	50	43	54	94	64	83	118	83	85	75	118
San Martin				78	91	86	123	95	91		
AVG MAX				88	80	85	126	94	91		

2008 (Jan-Sept) Ozone MAX



Ozone in Benicia

9-Month Ozone Snapshot

Note that Benicia measured one of the highest Maximums in the Bay Area, and ties with Fairfield and Hayward for the highest Average for the year so far. Source: <http://gate1.baaqmd.gov/aqmet/AQYearly.aspx>

Bay Area Air Quality Management District

Ari Quality

<http://gate1.baaqmd.gov/aqmet/AQYearly.aspx>

Ozone: units: ppb

Monthly Maximum/Average Values

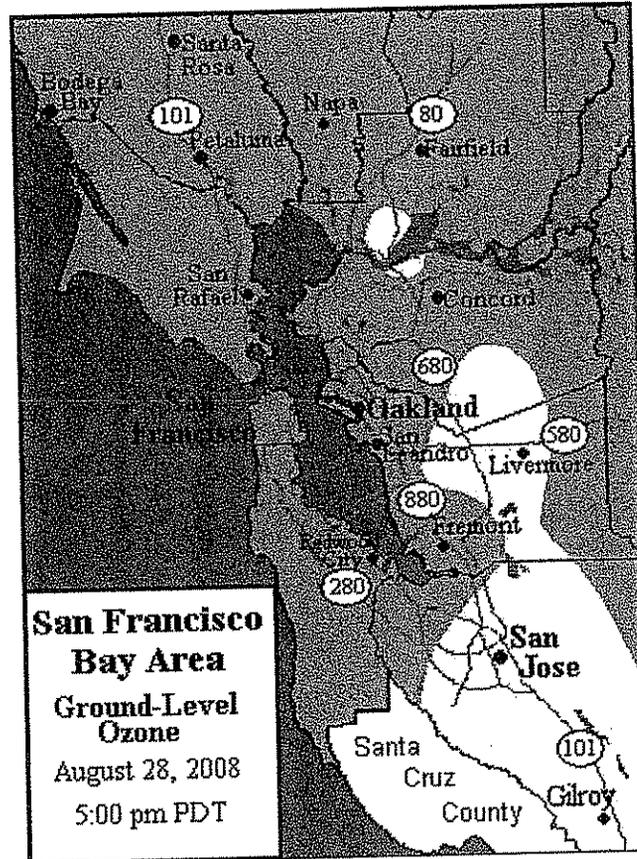
Raw data: Unchecked data that may contain errors

QC data: Validated data

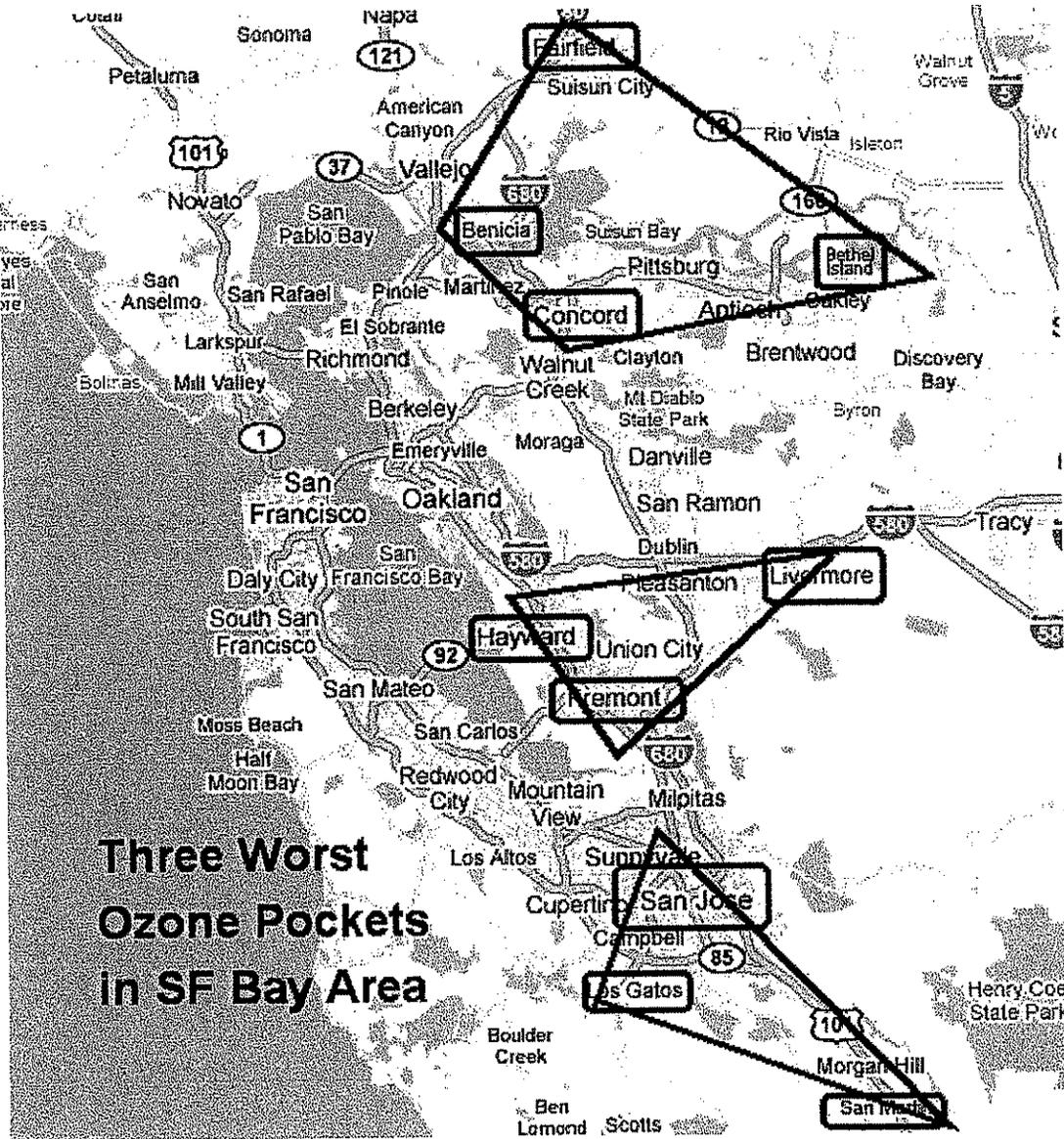
Station:	Year: 2008, Month												Yearly	
	1	2	3	4	5	6	7	8	9	10	11	12	Max	AVG
<u>Benicia</u>	45	50	51	87	65	81	123	87	94				123	32
<u>Berkeley</u>	24	28	33	40	35	38	29	26	38				53	21
<u>Bethel Island</u>	42	40	42	53	47	46	43	35	50				109	31
<u>Concord</u>	14	17	22	29	26	22	19	16	24				119	30
<u>Fairfield</u>	43	49	56	79	103	96	109	88	86				118	32
<u>Fremont</u>	18	22	30	38	36	38	31	23	37				117	24
<u>Gilroy</u>	51	47	57	94	73	102	119	84	97				103	31
<u>Hayward</u>	28	30	29	38	35	36	30	27	36				114	32
<u>Livermore</u>				81	63	77	116	95	85				141	28
<u>Los Gatos</u>				37	34	33	28	26	34				122	26
<u>Napa</u>	52	45	55	90	58	76	112	79	89				107	25
<u>Oakland</u>	17	18	24	34	31	27	22	19	25				86	23
<u>Pittsburg</u>				70	74	91	103	84	86				106	29
<u>Redwood City</u>				36	34	33	28	23	31				82	26
<u>San Francisco</u>				85	55	74	114	83	88				82	24
<u>San Jose</u>				40	38	33	27	24	36				118	23
<u>San Leandro</u>	51	44	54	91	87	91	141	117	97				90	27
<u>San Martin</u>	20	18	26	35	33	34	29	25	31				123	33
<u>Sunnyvale</u>	53	46	56	88	79	80	122	81	82				84	26
<u>Vallejo</u>	19	19	24	32	29	29	26	23	32				85	23
	44	44	50	89	60	73	107	74	88				76	24
	17	18	24	32	31	29	25	22	29				93	27
	50	43	53	83	51	80	86	58	83				84	26
	16	17	23	31	30	24	21	17	25				85	23
	47	45	49	80	77	78	106	80	78				76	24
	19	20	28	36	34	35	30	26	33				93	27
	50	44	53	81	62	82	54	57	78				84	26
	14	16	24	34	30	26	20	17	25				85	23
	51	44	42	73	50	82	51	44	66				76	24
	15	18	25	33	31	26	23	19	26				93	27
	50	43	54	94	64	83	118	83	85				84	26
	19	18	23	32	30	28	23	20	27				85	23
				82	51	84	96	66	81				76	24
				36	33	26	23	19	24				93	27
				78	91	86	123	95	91				84	26
				34	34	33	27	24	31				93	27
	50	43	50	74	57	84	53	50	83				84	26
	18	19	28	38	31	27	23	19	29				85	23
	52	46	50	79	53	74	62	51	85				76	24
	18	18	26	33	29	27	21	18	25				93	27
	48	46	49	76	58	67	75	52	69				84	26
	18	17	22	31	30	29	23	19	28				93	27
				90	67	76	93	68	84				84	26
				34	31	28	23	20	28				93	27
	45	46	51	93	63	88	109	68	91				109	27
	17	20	29	37	26	31	25	22	32				109	27
Day:	1	2	3	4	5	6	7	8	9	10	11	12	Max	AVG

Ozone in Benicia Ground-Level Ozone Map August 28, 2008 5:00 PM

Source is an animated map:
<http://www.epa.gov/airnow/2008/20080828/8a-sfba.gif>



Ozone In and From Benicia The Bay Area's Three Worst Ozone Pockets



**Three Worst
Ozone Pockets
in SF Bay Area**

Bay Area OZONE levels August 28, 2008

(Same day as Benicia Traffic Count)

Regardless of the traffic count, Benicia already has plenty of reason to worry about ozone! A large increase in tailpipe emissions will only make our dangerous ozone levels much worse.



Bay Area Air Quality Management District

Quality
Meteorology
Contact Us

Data Display System

Daily
Monthly
Annual

Air Quality

Ozone: units: ppb

Hourly Average Values and 24-hour changes
Raw data: unchecked data that may contain errors
Thursday, August 28, 2008, Ending Hour (PST)

Daily Max*

Station:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	1Hr	8Hr
North Counties:																										
<u>Napa</u>	11	9	7	3	2	3	9	19	31	47	54	61	63	68	64	54	42	29	15	4	2	3	6			
<u>San Rafael</u>	7	8	3	1	1	2	5	9	18	26	31	41	46	41	47	42	29	26	15	7	3	4	2			
<u>Santa Rosa</u>	11	6	15	5	1	3	8	9	26	41	50	43	40	40	46	43	35	27	14	15	19	16	12			
<u>Vallejo</u>	14	12	9	1	1	2		17	28	33	48	63	63	58	44	53	49	35	26	24	21	11	4			
Coast & Central Bay:																										
<u>Berkeley</u>	11	10	11	3	0	1	4	4	5	12	18	29	26	26	23	24	24	18	14	10	8	8	9			
<u>Oakland</u>	1	1	2	4	1	2	3	6	7	8	19	29	34	38	58	53	45	37	25	12	11	8	3			
<u>San Francisco</u>	13	11	13	1	2	3	5	6	7	13	26	35	44	43	35	28	31	22	10	9	9	6	6			
<u>San Pablo</u>	11	12	15	3	1	2	6		24	31	26	31	39	33	30	24	23	17	11	9	3	3	13			
Eastern District:																										
<u>Benicia</u>	24	22	24	22	20	19	23	21	21	37	54	67	77	87	67	60	58	48	37	30	28	28	29			
<u>Concord</u>	24	22	19	15	15	13	22	27	33	40	43	46	48	49	51	58	65	59	44	32	31	28	28			
<u>Fairfield</u>	20	17	15	5	2	2	4	22	33	38	46	53	60	64	69	74	72	54	44	32	30	27	27			
<u>Livermore</u>	24	17	16	1	2	3	8	23	34	43	58	68	73	89	95	67	52	40	28	27	24	21	22			
<u>Pittsburg</u>	1	2	1	1	1	5	29	32	33	37	42	44	47	54	67	86	87	69	42	29	15	9	8			
South Central Bay:																										
<u>Hayward</u>	0	0	0	0	0	1	3	8	15	22	34	48	59	69	79	68	47	32	17	3	1	0	0			
<u>Redwood City</u>	38	43	37	41	36	32	27	31	22	31	39	47	65	81	83	74	59	51	47	47	45	43	43			
<u>San Leandro</u>	13	7	1	15	12	3	3	7	11	14	18	41	66	58	57	64	52	43	39	28	18	9	24			
Santa Clara Valley:																										
<u>Los Gatos</u>	12	17	17	14	14	12	17	23	29	48	60	77	94	84	83	60	42	35	30	27	12	5	10			
<u>San Jose Central</u>	38	35	20	23	14	8	7	25	33	41	49	58	64	70	78	81	77	51	31	19	26	34	34			
<u>San Martin</u>	40	37	21	2	0	2	5	8	13	22	37	53	69	80	83	77	71	46	26	12	3	4	1			
<u>Sunnyvale</u>	4	5	3	1	1	1	7	18	28	43	54	70	82	95	91	62	51	45	43	43	36	27	7			

* Note: Daily Max 1HR column is for State standard and 8HR is for National 8-Hour standard. Ozone values exceeding the standards are displayed in red in their respective columns.

Bay Area OZONE levels August 28, 2008

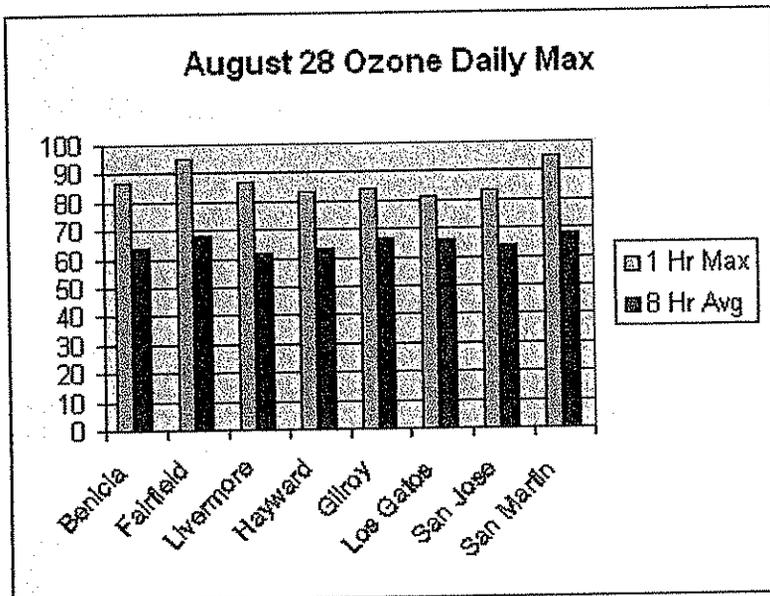
(Same day as Benicia Traffic Count)

This chart summarizes the previous page.

Regardless of the traffic count, Benicia already has plenty of reason to worry about ozone! A large increase in tailpipe emissions will only make our dangerous ozone levels much worse.

Below are the 8 (out of 23) stations with highest Ozone 1-Hr & 8-Hr daily Max

	Aug. 28 Ozone Daily Max	
	1 Hr	8 Hr
Benicia	87	64
Fairfield	95	68
Livermore	87	62
Hayward	83	63
Gilroy	84	67
Los Gatos	81	66
San Jose	83	64
San Martin	95	68



The City of Benicia Citizen Survey

Benicians want the City to **IMPROVE** our air quality, **NOT** make it worse! Following are excerpts from Benicia's Aug. 2006 National Citizen Survey.

~~~~~

Respondents were asked to rate the importance of a number of items.

**How important is it for the City to allocate additional resources to each of the following:**

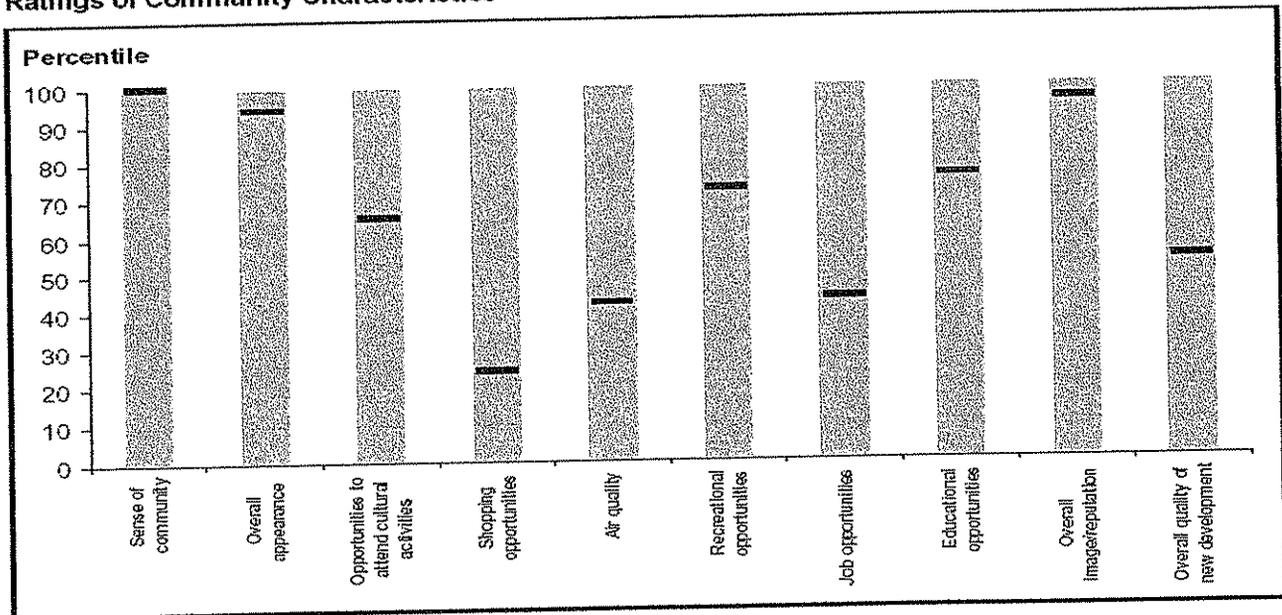
- Protecting the environment (such as air and water quality) -- 84%
- Open space -- 62%
- Streets -- 60%
- Recreation programs and services -- 59%
- Affordable housing -- 56%
- Downtown -- 56%
- Preservation and restoration of public historical structures -- 53%
- Community appearance and beautification -- 50%
- Local access to ferry service -- 49%
- Local access to rail service -- 45%
- Resources and facilities for the arts -- 44%
- New or expanded police station -- 37%

When asked about **potential problems in Benicia**, the three concerns rated by the highest proportion of respondents as a "major problem" were drugs (13% of respondents), toxic waste or other environmental hazards (12%), and too much growth (10%).

## Ratings of Community Characteristics

Air quality was ranked at 40%. Only one other category ranked lower.

Ratings of Community Characteristics



# Health Effects of Ozone

(from BAAQMD, [http://www.sparetheair.org/about/ozone\\_effects.htm](http://www.sparetheair.org/about/ozone_effects.htm) )

Ground-level ozone can cause several types of short-term health effects:

Ozone can irritate the respiratory system. Ozone can cause coughing, irritate your throat, eyes, or nose, and/or cause headaches. These symptoms can last for a few hours after ozone exposure and may even become painful.

Ozone can reduce lung function. "Lung function" refers to the amount of air that you draw in when you take a full breath and the speed at which you are able to blow it out. Ozone can make it more difficult for you to breathe as deeply and quickly as you normally would.

Ozone can aggravate asthma. When ozone levels are high, more asthmatics have asthma attacks that require a doctor's attention or the use of additional medication. Ozone makes people more sensitive to allergens (such as dust mites, pets, and pollen) which are the most common triggers for asthma attacks.

Ozone can inflame and damage the lining of the lung. Ozone's effect on the lining of the lung is comparable to the effect of sunburn on the skin. Ozone damages the cells that line the air spaces in the lung. Within a few days, the damaged cells are repaired, just as our skin recovers from sunburn naturally.

Scientists suspect that ozone may have other effects on people's health, as well. Ozone may aggravate chronic lung diseases, such as emphysema and bronchitis. Also, studies in animals suggest that ozone may reduce the immune system's ability to fight off bacterial infections in the respiratory system.

Most of these effects are considered short-term because they eventually cease once ozone levels subside. However, there is concern that repeated short-term damage from ozone exposure may permanently injure the lung. For example, repeated ozone impacts on the developing lungs of children may lead to reduced lung function as adults.

## Who is most at risk?

**Children.** Children are more sensitive to pollution than adults. Children typically spend more time and are more active outdoors. Pound for pound, they breathe more than adults. They breathe, drink, and eat to grow, not just to maintain themselves. Their air passages are also narrower than adults, so it takes less inflammation or irritation to obstruct a child's airways. Children are also more likely to have asthma or other respiratory illnesses.

**Adults who are active outdoors.** Healthy adults of all ages who exercise or work vigorously outdoors are considered a "sensitive group" because they have a higher level of exposure to ozone than people who are less active outdoors. Ozone is typically a problem in the afternoon due to pollution generated in the morning. People with respiratory diseases, such as asthma. There is no evidence that ozone causes asthma or other chronic respiratory disease, but these diseases do make the lungs more vulnerable to the effects of ozone.

**People with unusual susceptibility to ozone.** Scientists don't yet know why, but some healthy people are simply more sensitive to ozone than others.

## Ozone IN Benicia, Ozone FROM Benicia

# Health effects of ozone

- Increased risk of early death
- Lung inflammation
- Reduced lung function
- Increased asthma attacks
- Increased risk of infection
  - Bell et al. 2005; Levy et al, 2005; Ito et al, 2005; US EPA, 2006

 AMERICAN  
LUNG  
ASSOCIATION.



The plant on the left is stunted due to smog exposure. The plant on the right grew in healthy air. Children's lungs respond to smog in a similar way.

VIII-B-419

# Consistency Analysis Benicia's General Plan and Seeno's 2008 Revised Project

City staff has proposed and Seeno has accepted over 200 conditions for project approval that render binding mitigations for some of the General Plan inconsistencies disclosed in the public record. However, the California Environmental Quality Act (CEQA) does not acknowledge conditions of approval binding mitigation measures. Any condition of approval that is proposed as a mitigation measure must be included and acknowledged in the Final EIR as a mitigation measure and must be part of the EIR's Mitigation Monitoring and Reporting Program. THE FOLLOWING INCONSISTENCIES WITH BENICIA'S GENERAL PLAN THEREFORE REMAIN UNMITIGATED IN SEENO'S FINAL EIR, AND ARE NOT MITIGATED IN THE EIR ADDENDUM.

Note that many of these inconsistencies have been presented to Council previously by Benicia citizen Steven L. Goetz, AICP, and others, and are part of the hearing record. Additional **inconsistencies not previously entered in the hearing record are shown below in boldface type**. And all inconsistencies specifically relating to traffic and its associated environmental effects are presented with highlighted font.

Reducing trip generation and its associated effects is a central aim of Benicia's General Plan. Note the following language from Part I, Chapter 2, on page 59: "...policies in this General plan...call for promoting alternative commute methods and a better jobs/housing balance to minimize freeway travel demand....The intent of the General plan is not to create greater traffic congestion by rejecting all freeway widening, but to address the realities of growing travel demand through site-specific improvements, land use policies that minimize travel demand, and high occupancy vehicle (HOV) travel."

| <b>Goal Policy or Program Language (Bold=new, Highlight=traffic)</b>                                                                                                                                                   | <b>Conclusions based on the Addendum</b>                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Policy 2.14.1 Give priority to pedestrian safety, access, and transit over automobile speed and volume.                                                                                                                | Addendum justifies finding of inconsistency with this General Plan policy. (Previously noted in hearing record.)                           |
| Goal 2.15 Provide a comprehensive system of pedestrian and bicycle routes which link the various components of the community: employment centers, residential areas, commercial areas, schools, parks, and open space. | Addendum justifies finding of inconsistency with this General Plan goal. (Previously noted in hearing record.)                             |
| Policy 2.15.2 Encourage the development of pedestrian paths in hill areas as a way to link neighborhoods to schools, parks, employment centers, and convenience commercial destinations.                               | Addendum assumes this outcome is possible but such features are not proposed as part of the project. (Previously noted in hearing record.) |
| Goal 2.20 Provide a balanced street system to serve automobiles, pedestrians, bicycles and transit, balancing vehicle flow improvements with multi-modal considerations.                                               | The Addendum fails to evaluate this goal. The EIR referred to Policy 2.14.1. (Previously noted in hearing record.)                         |
| <b>Policy 2.20.3 Maintain Lake Herman Road as a rural, two-lane, curving scenic route.</b>                                                                                                                             | <b>The current Seeno proposal includes lane widening at three intersections along Lake Herman Rd.</b>                                      |

| Goal Policy or Program Language (Bold=new, Highlight=traffic)                                                                                                                                                                   | Conclusions based on the Addendum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Goal 2.21 Encourage Benicia residents and employees to use alternatives to the single occupant automobile.</p> <p>Policy 2.21.1 Provide and promote a range of travel alternatives to the use of the private automobile.</p> | <p>Addendum justifies finding of inconsistency with this General Plan goal. (Previously noted in hearing record.)</p> <p>Addendum justifies finding of inconsistency with this General Plan policy. (Previously noted in hearing record.)</p>                                                                                                                                                                                                                                                                                                               |
| <p><b>GOAL 2.22 Alleviate traffic congestion near school sites.</b></p>                                                                                                                                                         | <p><b>The current Seeno project proposal would create serious traffic congestion by Semple school on E. 2nd St.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <p><b>POLICY 2.22.1 Work closely with the School District in addressing traffic congestion near schools.</b></p>                                                                                                                | <p><b>The current Seeno project proposal would create serious traffic congestion by Semple school on E. 2nd St.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <p><b>Program 2.22.A Develop a plan jointly with the School District for reducing traffic congestion at and near school sites.</b></p>                                                                                          | <p><b>The current Seeno project proposal would create serious traffic congestion by Semple school on E. 2nd St.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <p>Policy 2.23.2 Reduce the visibility of parking lots.</p>                                                                                                                                                                     | <p>Addendum assumes adherence to non-binding design guidelines. (Previously noted in hearing record.)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <p>Program 2.23.D Update parking requirements based on actual local parking generation studies wherever appropriate, and consider parking proximity to transit corridors.</p>                                                   | <p>No data provided by Mitigated Project to evaluate its consistency. (Previously noted in hearing record.)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p>Program 2.23.E Allow future parking to be divided into smaller lots with generous internal and perimeter landscaping.</p>                                                                                                    | <p>Addendum assumes adherence to non-binding parking plans. (Previously noted in hearing record.)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p>Program 2.23.F Recommend parking to be located behind or alongside (but not in front of) buildings, where possible.</p>                                                                                                      | <p>No data provided by Mitigated Project to evaluate its consistency. (Previously noted in hearing record.)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p>Program 2.24.A Investigate establishment of Industrial Park bus service.</p>                                                                                                                                                 | <p>Addendum justifies finding of inconsistency with this General Plan program. (Previously noted in hearing record.)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <p>Goal 2.3 Ensure orderly and sensitive site planning and design for large undeveloped areas of the city, consistent with land use designation and other policies of the General Plan.</p>                                     | <p>The Addendum fails to evaluate this goal. The EIR found the 2007 project would be consistent with the land use designations for the site, but would be inconsistent with "numerous" other General Plan goals, policies or programs. This table is provided to show that the Addendum fails to adequately demonstrate the Mitigated Project to be consistent with 28 out of 72 goals, policies and programs included in the General Plan for the purpose of environmental protection (nearly 40% of the total). (Previously noted in hearing record.)</p> |

VIII-B-421

| <b>Goal Policy or Program Language (Bold=new, Highlight=traffic)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Conclusions based on the Addendum</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Policy 2.38.1 Continue to require the use of feasible and practical Best Management Practices to protect receiving waters from adverse effects of construction and urban runoff.</p> <p>Program 2.36.C Continue to implement City-adopted water conservation Best Management Practices (BMP).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>Addendum assumes adherence to non-binding design guidelines. (Previously noted in hearing record.)</p> <p>Addendum assumes adherence to non-binding design guidelines. (Previously noted in hearing record.)</p>                                                                                                                                                                                                                                                                                                                                                             |
| <p><b>GOAL 2.5: Facilitate and encourage new uses and development which provide substantial and sustainable fiscal and economic benefits to the City and the community while maintaining health, safety, and quality of life.</b></p> <p>Sustainable development maintains or enhances economic opportunity and community well-being while protecting and restoring the natural environment upon which people and economies depend. Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs.</p> <p><i>This goal is the heart of the entire General plan. Lemph. added] It is a citywide expression of urban development policy. Nearly every policy and program in the General plan, in some manner, serves to implement this goal.</i></p> <p><b>Program 2.5.B: Target business attraction efforts toward firms that pay high wages and with jobs that relate to the skills and education levels of Benicia residents.</b></p> <p>Program 2.5.C Evaluate future uses on a cost/revenue basis, taking into account economic diversity for the long term and environmental and community costs and benefits.</p> | <p><b>The Seeno project's proposed uses detract from Benicia's air quality and the health, safety and quality of life.</b></p> <p><b>The project as currently proposed suffers from lack of a current economic analysis, and is predicated on needs, uses and expectations of citizens from a previous generation.</b></p> <p><b>The project fails to adequately protect the environment AND the people.</b></p>                                                                                                                                                                |
| <p><b>Program 2.5.D: Continue to offer incentives for locating in Benicia to businesses that maximize jobs or long-term net revenues to the City of Benicia, or both.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p><b>The Seeno project's proposed uses do not conform to our employment demographic and 75% would be filled by out-of-town low wage commuters.</b></p> <p>The EIR failed to evaluate this program. The Addendum does not estimate the cost/revenue for the Mitigated Project, and does not evaluate economic diversity or environmental and community costs and benefits. (Previously noted in hearing record.)</p> <p><b>Without adequate economic analysis, the current project cannot show that it maximizes jobs or long-term net revenues to the City of Benicia.</b></p> |
| <p><b>GOAL 2.7: Attract and retain industrial facilities that provide fiscal and economic benefits to—and meet the present and future needs of—Benicia.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p><b>The Seeno project's proposed uses do not comply with this goal and policy for our industrial areas regarding high wage, high revenue, high tech jobs.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                             |

| Goal Policy or Program Language (Bold=new, Highlight=traffic)                                                                                                                                                                                                                                                                                                                                                                                                                                                | Conclusions based on the Addendum                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>POLICY 2.7.1: Attempt to attract high-wage and high-revenue producing companies to Benicia. This policy applies to emerging occupations such as secondary materials industry, wine industry, alternative transportation, environmental technology, fitness, and tourism. The intent of this policy is to encourage Benicia's participation in studies by the Solano Economic Development Corporation (SEDCORP) related to attracting high-tech jobs and marketing efforts targeted to Benicia.</b></p> | <p>The Seeno project's proposed uses do not comply with this goal and policy for our industrial areas regarding high wage, high revenue, high tech jobs.</p> |
| <p>Goal 3.9.1 Preserve vistas along I-780 and I-680.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <p>Mitigated Project's inconsistency with this goal would be reduced compared to the 2007 project. (Previously noted in hearing record.)</p>                 |
| <p>Policy 3.15.2 Preserve public views of open space and maintain existing vistas (including the Northern Area vistas) wherever possible.</p>                                                                                                                                                                                                                                                                                                                                                                | <p>Mitigated Project's inconsistency with this policy would be reduced compared to the 2007 project. (Previously noted in hearing record.)</p>               |
| <p>Policy 3.15.D Where applicable, require that new developments include view corridors that allow viewing open space from public roadways and public use areas.</p>                                                                                                                                                                                                                                                                                                                                         | <p>Mitigated Project's inconsistency with this policy would be reduced compared to the 2007 project. (Previously noted in hearing record.)</p>               |
| <p>Policy 3.15.6 Restore and maintain natural landscapes in a natural manner.</p>                                                                                                                                                                                                                                                                                                                                                                                                                            | <p>Addendum justifies finding of inconsistency with this General Plan goal. (Previously noted in hearing record.)</p>                                        |
| <p>Goal 3.17 Link regional and local open spaces.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>See Goal 3.17 (Previously noted in hearing record.)</p>                                                                                                   |
| <p>Policy 3.17.1 Attempt to link existing regional and local open spaces using trails and open space corridors.</p>                                                                                                                                                                                                                                                                                                                                                                                          | <p>See Goal 3.17 (Previously noted in hearing record.)</p>                                                                                                   |
| <p>Program 3.17.B Construct trails in open space corridors that link existing regional and local open spaces, where feasible.</p>                                                                                                                                                                                                                                                                                                                                                                            | <p>Addendum assumes this outcome is possible but such features are not proposed as part of the project. (Previously noted in hearing record.)</p>            |
| <p>Policy 3.19.1 Protect essential habitat of special-status plant and animal species.</p>                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>Addendum assumes this outcome is possible but such features are not proposed as part of the project. (Previously noted in hearing record.)</p>            |
| <p>Policy 3.20.2 Restore native vegetation, such as birch grasses and oaks, wherever possible for open spaces of existing developed areas.</p>                                                                                                                                                                                                                                                                                                                                                               | <p>Addendum assumes this outcome is possible but such features are not proposed as part of the project. (Previously noted in hearing record.)</p>            |

VIII-B-423

| <b>Goal Policy or Program Language (Bold=new, Highlight=traffic)</b>                                                                                                                            | <b>Conclusions based on the Addendum</b>                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Policy 3.20.4 Require protection of movement corridors.                                                                                                                                         | No data provided by Mitigated Project to evaluate its consistency. (Previously noted in hearing record.)                                                                                                                                                                                |
| Policy 3.22.1 Avoid development that will degrade existing lakes and streams.                                                                                                                   | Addendum assumes adherence to non-binding design guidelines. (Previously noted in hearing record.)                                                                                                                                                                                      |
| Program 3.22.A Require that all development in watersheds flowing into lakes and unchanneled streams include features to preserve run-off water quality.                                        | Addendum assumes adherence to non-binding design guidelines. (Previously noted in hearing record.)                                                                                                                                                                                      |
| <b>Program 4.10.B: Require that projects with identified significant air quality impacts include all feasible mitigation measures needed to reduce impacts to less than significant levels.</b> | <b>The developer has not been required to include all feasible mitigation measures, for example, provision of free convenient shuttle bus service to main bus stops throughout town. And use of parking fees, minimal parking lots, and other disincentives to discourage auto use.</b> |
| Policy 4.10.2 Encourage designs and land use strategies that reduce automobile use and promote mixed use, jobs/housing balance, telecommuting, bicycle and pedestrian facilities, and transit.  | Addendum assumes this outcome is possible but such features are not proposed as part of the project. (Previously noted in hearing record.)                                                                                                                                              |

**VIII-B-424**

## Benicia's New Greenhouse Gas Reduction Targets

Meeting on September 16, 2008, our City Council adopted a resolution accepting a carefully prepared Greenhouse Gas Emissions Inventory Report and approved Greenhouse Gas Reduction Targets, laying out goals for years 2010 and 2020. The inventory was funded by the Bay Area Air Quality Management District's Climate Protection Grant Program, and conducted by City staff, using Clean Air Climate Protection (CACP) software provided by ICLEI-Local Governments for Sustainability.

The inventory and reduction targets cover wastes and energy usages and resulting emissions related to all city services as well as community-wide wastes and emissions.

According to our new standards, the City and Community hope to meet and/or exceed strict new challenges of the California Global Warming Solutions Act, AB32.

Quoting the City Manager's Executive Summary of September 9, 2008:

Benicia's communitywide greenhouse gas emissions in 2000 were about four million metric tonnes, of which just .2% was attributable to the City's municipal operations. While the community emissions grew to 4.2 million tonnes in 2005, the City's declined almost 20%, to 7400 tonnes. Under a business as usual scenario, the community's emissions in 2010 will increase by 9% from 2005 (to 4.6 million tonnes), and in 2020, the forecasted increase is 21% (to 5.1 million tonnes). To prevent this growth, the recommended reduction targets are:

- 25% below 2000 level in 2010 for City Operations;
- Maintain 2005 level in 2010 for the Community;
- 33% below 2000 level in 2020 for City Operations;
- 10% below 2000 levels by 2020 for the Community.

Benicia has been acclaimed as a leader in Solano County and the Bay Area for moving so quickly to inventory its emissions and to adopt target goals for significant reductions.

**Simply put, and not to labor the point, Green Gateway Group believes the current Seeno proposal will significantly detract from Benicia's achieving these new greenhouse gas reduction targets, and is not in keeping with Benicia's emerging leadership in greenhouse gas reduction efforts in the Bay Area.**

# Appendix A

## Seeno Project Timeline

(Jan. 2007 - June 2008)

Jan. 15, 2007 Seeno/LSA publish DEIR.  
Public Comment period begins on DEIR....

Feb. 24, 2007 Council votes to extend public comment period on DEIR.

May 7, 2007 DEIR Hearing. Council frustrated (esp. Patterson, Schwartzman) that Seeno had not provided sufficient info to questions relating to environmental and GP issues. Council refused to vote on the DEIR, instead they vote to "continue" the hearing until such time as Seeno can come back with more info and answers to their concerns about GP and environmental issues, and a modified project that dispels those concerns.

July 2007 – Seeno/LSA publish Response to Comments document

Aug. 7, 2007 Seeno comes to Council with a slick Powerpoint presentation and hardcopy version of the presentation, but no written report addressing the previous concerns and questions, and with essentially the same project as before. Nevertheless, the Council votes 3-2 to approve DEIR. (Whitney, Hughes, Messina, vs Patterson, Schwartzman)

Dec. 2007 (12/12?) – Seeno/LSA publish Final EIR and Supplemental Response to Comments.  
Public Comment period begins on FEIR...(Jan. 2008)

Feb. 19, 2008 – FEIR Public Hearing. Patterson & Campbell vote yea on Option 2: to defer action on FEIR until the actual final project is brought forward for consideration. Defeated due to lack of 3rd vote.

Schwartzman proposes amendments to Option 1 – directing Seeno to come forward with a CEQA Initial Study based on Hillside Upland alternative project, and adding some additional (nonbinding) environmental conditions and mitigations. Patterson joined him in adding more specific conditions and mitigations.

Option 1 passes (Campbell voting no), Council votes to certify the EIR as complete but noting that the current project as proposed cannot be approved due to numerous conflicts with GP policies.

March 20, 2008 – Seeno submits a project description document briefly outlining revisions to project. This is all the documentation the Planning Commission is provided.

April 10, 2008 – Planning Commission. Seeno gives Powerpoint presentation, and a brief written description of the revised project, but no detailed documentation. Planning Commission votes to deny the project due to lack of information regarding GP inconsistencies, environmental and health and safety impacts, and due to lack of time to review documentation, and Seeno's unwillingness to extend time. They also recommend that Seeno begin work with city staff to refine the project into a more acceptable form and enter into a Development Agreement (contract) with the city.

City staff begins working with Seeno to add over 200 (non binding) "Conditions of Approval" to the project (Seeno declines to enter into Development Agreement).

April 29, 2008 – Seeno/LSA publish Draft EIR Addendum which presents a drastically revised version of the project, partially based on Hillside Uplands alternative, with 50% less industrial, reduced grading, etc. It is essentially a new project, but they claim it is just a mitigated version of same project, so it doesn't need a new EIR.

May 6, 2008 – City Council Initial Public Hearing on revised project Draft EIR Addendum. (By law, Council must vote on project approval by June 3.) City Manager gives update on 216 (?) Conditions of Approval, praises the revised project, and recommends approval. Seeno gives Powerpoint presentation. Public comments. Council discussion.

May 20, 2008 – City Council Hearing on revised Seeno project. BeniciaFirst! gives Powerpoint presentation. Public comments. Mayor asks Seeno for more time to review documents and opportunity to have the Planning Commission review the Conditions of Approval. Seeno declined sending back to PC, or time extension. Council discussion.

June 3, 2008 – City Council Hearing on revised Seeno project. Staff discussion. Public comments. Hearing closed. Council discussion. Patterson proposed a resolution to deny the project (read by Campbell) but no vote was taken.. At 2 AM Seeno agrees to a time extension to Oct. 7 City Council meeting in order to do an additional traffic study in August. Meanwhile, Council noted that they can use the additional time to look at some of their other concerns, and can send the project back to Planning Commission for review. Seeno rejects suggestion of Development Agreement, Specific Plan, or urban decay study. Seeno agrees that at Oct. 7 meeting, Council can discuss all aspects of project, but public can only comment on the traffic study.

**Anne Cardwell - Fwd: More pdfs for Council packet on traffic and air quality**

---

**From:** Charlie Knox  
**To:** Anne Cardwell; Jayne York  
**Date:** 9/30/2008 11:45 AM  
**Subject:** Fwd: More pdfs for Council packet on traffic and air quality

---

>>> Marilyn Bardet <mjbardet@sbcglobal.net> 9/30/2008 11:38 AM >>>

Hi Charlie,

Here are two more fact sheets on tailpipe emissions and the impacts of idling, which is now a targeted campaign by Cal-EPA-ARB. The idling fact sheet is from Missoula City-County Air Quality Advisory Council. Interesting that a small city has such an advisory council on air quality.

--Marilyn  
for Benicia First

**VIII-B-428**

This is the html version of the file  
<http://www.co.missoula.mt.us/ENVHealth/AirQ/AirQualityTopics/TransportationAndBuiltEnv/Idling%20Fact%20Sheet%2012-17-04.doc>.  
Google automatically generates html versions of documents as we crawl the web.

## Idling Fact Sheet

Compiled by the Missoula City-County Air Quality Advisory Council

**Reducing idling reduces air pollution.** Vehicle exhaust contains at least 21 air toxics which, by definition, are hazardous to human health. Major pollutants from automobiles include hydrocarbons, nitrogen oxides, carbon monoxide, and particulate matter, all of which have significant health and environmental impacts. Emissions from **idling** vehicles can be as much as 20 times greater than those from one traveling at 32 mph. Many communities in the United States and Canada have or are considering ordinances that restrict excessive vehicle **idling** in order to improve air quality and protect citizens' health.

**Use the 30-second rule to save gas and reduce emissions.** Contrary to the commonly held misconception, frequent restarting has little impact on engine components such as the battery and starter motor. Your savings in fuel will easily offset the cost of what little wear does result. Remember, when you are **idling**, you are getting zero miles per gallon. The U.S. EPA's website states, "You will save gas by turning the engine off and restarting it again if you expect to idle for more than 30 seconds. You will also prevent pollution by preventing long idles. Try parking your car and going into restaurants, banks, and the like instead of idling in drive-up lanes." When you must wait in a drive thru, turn your engine off.

**The best way to warm up your vehicle is to drive it.** It's a common misconception that **idling** for several minutes is the best way to warm up a vehicle. Not only is extended **idling** unnecessary, but many parts of the vehicle—including wheel bearings, tires, and the suspension system—only warm up once the vehicle is moving. You only need to idle long enough to get the oil circulating—about 30 seconds—before driving away, and it's a good idea to avoid high speeds and fast acceleration until the engine temperature rises. Modern diesel engines also need only a short engine warm up times. To keep windows from fogging up, clear snow from the

air intake on top of your hood (before you start the engine) and open a window slightly as soon as you get in the car. When temperatures are in the teens or colder, use an engine block heater for 2-4 hours to help your car start more easily, get your defroster working faster, improve your winter gas mileage as well as reduce air pollution (see Engine Block Heater Fact Sheet for more details).

**Reducing idling reduces wear and tear on your engine and saves money. Idling creates wear and tear on your engine because fuel doesn't combust completely, and some fuel residue can condense on cylinder walls. Also, excessive idling can cause condensation to form in the exhaust, which may result in corrosion and reduced lifespan of the exhaust system. Idling for 10 minutes a day uses an average of 26 gallons of gas a year. At \$2 a gallon, a driver could save over \$50 a year in gasoline costs just by turning off the engine.**

**Unattended idling vehicles are unsafe, illegal, and vulnerable to theft.** Not only does common sense tell us that leaving a running vehicle unattended can be dangerous, but it is also illegal to do so. Specifically, Missoula's Municipal Code on Unattended Motor Vehicles (10.14.050) states that, "No person driving or in charge of any motor vehicle except a licensed delivery truck or other delivery vehicle, shall permit it to stand unattended without first stopping the engine, locking the ignition and removing the key." Unattended **idling** vehicles are not only unsafe and illegal, they are an open invitation to easy theft!

**Some other things you can do to improve air quality:** (1) Plan ahead to combine errands or avoid the trip altogether; (2) bike, walk, ride the bus, or carpool; (3) maintain your car regularly; (4) drive smoothly and avoid sudden throttling.

**For more information, visit the following websites or call the Health Department at 258-4755.**

Missoula County Environmental Health  
Division—<http://www.co.missoula.mt.us/EnvHealth>

**Missoula Municipal  
Code—[http://www.ci.missoula.mt.us/cityclerk/city\\_code.htm](http://www.ci.missoula.mt.us/cityclerk/city_code.htm)**

**“Idling and climate change go hand in hand,”** Natural Resources Canada, Office of Energy Efficiency— <http://oee.nrcan.gc.ca/transportation/idling/issues/why-idling-problem.cfm?attr=8>

US EPA—<http://www.epa.gov>

**“Your car and clean air: What YOU can do to reduce pollution” (idling info on p.3)**—<http://www.epa.gov/otaq/consumer/18-youdo.pdf>

Mobile source emissions: Past, present, and future (Pollutants):  
<http://www.epa.gov/otaq/inventory/overview/pollutants/index.htm>

Mobile source air toxics: <http://www.epa.gov/otaq/toxics.htm>

National Safety Council, Environmental Health Center, **“Environmentally friendly maintenance and repair”**—<http://www.nsc.org/ehc/mobile/mainrepa.htm>



# Air and Breathing

[Home](#) | [Products & Services](#) | [Modular Nutrition](#) | [Medical Information](#) | [Alpha Nutrition Program](#) | [Logon](#) | [Feedback](#)

We prefer Clean Air, Clean Water and Healthy Food

## Automotive Exhaust Chemicals: disease causing effects

### About Air and Breathing

A short list of the likely pathogens in car exhaust:

Order book, Air and Breathing or Download eBook by Stephen Gislason MD

- Carbon Monoxide
- Nitrogen dioxide
- Sulphur dioxide
- Suspended particles including PM-10, particles less than 10 microns in size.
- Benzene
- Formaldehyde
- Polycyclic hydrocarbons

### Air and Breathing Centers

The Way of Breath  
Atmosphere  
Air Quality  
Cars and Trucks  
Air Pollution  
Climate Change  
Airborne Diseases  
Air Quality inside Buildings  
Environment and Medicine  
Allergy

Food and Lung Disease  
The Alpha Nutrition Program

You are at Alpha Online, a service of Environmed Research Inc. British Columbia Canada

Background Information - Adverse Health Effects of Chronic Exposure to Petroleum Combustion Products. On November 18, 1994, the first-ever conference on "Air Pollution: Impacts on Body Organs and Systems" was held in Washington, D.C. by the National Association of Physicians for the Environment. An abridged version follows. The relevance of this perspective increases with increasing air pollution and climate change. 2008 Update.

Jaffe and Badman at the same conference summarized the effects of polluted air :

"Blood perfuses all of the body's organs and can carry toxic substances as well as beneficial substances, such as oxygen, to them. Air pollution is the source of many materials that may enter the human bloodstream through the nose, mouth, skin, and the digestive tract. Chemicals known to be harmful, such as benzene, lead and other heavy metals, carbon monoxide, volatile nitrites, pesticides, and herbicides. These substances have been shown to produce harmful effects on the blood, bone marrow, spleen, and lymph nodes. Blood cells are constantly undergoing turnover, with new blood cells entering the circulation as mature cells are lost, making the

#### Ads by Google

[Chemical](#)  
[Toxins Health](#)  
[Human Toxins](#)  
[Noise Pollution](#)  
[Air Monitoring](#)

**VIII-B-432**

blood system especially vulnerable to environmental poisoning. For example, lead interferes with normal red blood cell formation by inhibiting important enzymes. In addition, lead damages red blood cell membranes and interferes with cell metabolism in a way that shortens the survival of each individual cell. Each of these harmful effects can result in clinical anemia.

Benzene and other less known hydrocarbons are produced in petroleum refining, and are widely used as solvents and as materials in the production of various industrial products and pesticides. Benzene also is found in gasoline and in cigarette smoke. It has been shown that exposure to benzene is related to the development of leukemia and lymphoma. Benzene has a suppressive effect on bone marrow and it impairs blood cell maturation and amplification. Benzene exposure may result in a diminished number of blood cells or total bone marrow loss. A number of metabolites appear to be involved in this process, and there may be several targets of toxicity, including stem, progenitor, and some stromal cells.

Common air pollutants also have an affect on blood and thus on organs of the body. For example, carbon monoxide binds to hemoglobin two hundred times more avidly than oxygen and distorts the release to the tissues of any remaining oxygen. Thus, CO poisoning is a form of suffocation. Carbon monoxide can exacerbate cardiovascular disease in humans. Some airborne chemicals stimulate the immune system to activate leukocytes and macrophages that can produce tissue damage, especially to the cells that line human blood vessels. The combined effect of these events is to accelerate the changes that eventually lead to hypertension and ischemic heart disease.

Cory-Slechta and Lundberg discussed the adverse effects of pollution on the central nervous system: "The central nervous system (CNS) is the primary target for many serious air pollutants, such as lead, which is a major environmental hazard. Research provided evidence that levels of lead exposure associated with central nervous system effects, particularly as manifest in behavioral changes was lower than previously realized. Blood lead concentrations in children were not considered problematic until they exceeded 30 to 40 micrograms per deciliter (g/dL); however, studies demonstrated

changes in cognitive function at blood concentrations as low as 10 to 15  $\mu\text{g}/\text{dL}$ . While children are more susceptible to lead's CNS effects, adults exhibit similar deficits in learning and memory. Advanced aging increases vulnerability to the toxic effects of lead. In Germany, a large study documented an age-related decline in bone lead concentrations with advancing age. This effect was more pronounced in women than in men, reflecting post-menopausal processes in women which contribute to bone resorption and the release of lead back into the bloodstream. These results mean that brain lead exposure is actually increased during a period of already heightened susceptibility due to concurrent degeneration of other physiological functions, including both CNS and renal functions.

Although lead is the most studied of hundreds of known or suspected neurotoxic air pollutants, other heavy metals, pesticides, and organic solvents also cause neurobehavioral dysfunction. Expanded research in behavioral neurotoxicology is urgently needed. Changes in mood, cognition, and behavior are endpoints that need to be evaluated in addition to cancer rates or mortality data and may be more common. In various studies, increased levels of air pollutants are accompanied by increased psychiatric emergency calls and hospital admissions, behavior changes, and a lessened sense of well-being. Irritating odors and cigarette smoke have been found to increase aggressive behavior, and to decrease helping behavior and altruism, leading to a degradation of social interaction."

Goldstein and Albright discussed immune system effects: "The effects of airborne pollutants on the immune system have been most widely studied in the respiratory tract. An airborne pollutant may enter the respiratory tract as a volatile gas (e.g., ozone, benzene), as liquid droplets (e.g., sulfuric acid, nitrogen dioxide), or as particulate matter (e.g., components of diesel exhaust, aromatic hydrocarbons). These pollutants interact with the immune system and may cause local and systemic responses ranging from overactive immune responses to immunosuppression. Most airborne pollutants are small molecular weight chemicals that must be coupled with other substances (e.g., proteins or conjugates) before they can be recognized by the immune system and cause an effect. Some disorders which may occur because of pollutants in the

respiratory system are the following:

Immunosuppression can be demonstrated following exposure to polycyclic aromatic hydrocarbons (e.g., tetrachlordibenzo-p-dioxin).

Hypersensitivity reactions (e.g., occupational asthma) can occur following exposure to toluene diisocyanate and other volatile chemicals.

There is clearly an underlying genetic basis for susceptibility to immunologic disease resulting from exposure to pollutants, but knowledge in this area is rudimentary at this time. For example, there is little understanding of genetically-determined susceptibility or resistance to pollutant-induced immune disorders. There is a lack of appropriate in vitro models, and it is difficult to identify specific, biologically-active substances that may be linked to immune disorders."

### **Workplace Exposure to Vehicle Exhaust and Chronic Illness**

Here is a summary of a report on one patient with a known chemical exposure, as an example: Mr. A had been exposed to diesel and gasoline engine exhaust in the workplace from 1982 onward and had become too ill to work by Oct. 1993. Improvements to his work environment were not made until 1992, but apparently these were not adequate and he continued to be ill through 1993. He developed a chronic illness in the mid-80's which was slowly progressive and he believed that chemical exposure at work had made him ill.

Mr. A manned a parts counter in a vehicle repair shop. The ventilation of this indoor work-space was judged to be inadequate and Mr A was exposed to significant concentrations of exhaust products which include a number of pathogenic possibilities.

His chief complaints were: chronic fatigue, recurrent flu-like illness, limited exertional tolerance, vertigo, dyspepsia with epigastric pain, chest pain with episodes of shortness of breath, cognitive dysfunction, anxiety. He described progressive dysfunction over several years and was concerned that exhaust exposure at work was making him ill. He described a progressive loss of tolerance for physical exertion - attempts at vigorous exertion left him exhausted, weak, and dizzy with cognitive

dysfunction; recovery from, for example, attempts to play ice-hockey would often take 48 hour or longer. He had trouble concentrating and suffered recent memory loss. He often felt severe fatigue with difficulty concentrating and memory drop outs at work. He withdrew from work Oct. 1993. He was more attentive to food choices and good nutrition and attempted to follow a graded exercise program. He reported benefit by staying away from the work environment and controlling his diet.

Prolonged exposure to exhaust gases seem to induce allergy symptoms or hypersensitivity. Activated immune systems tend to start reacting to airborne and food antigens - exposed patients begin reacting to food materials following a typical pattern of chronic illness, and routinely report intolerance to even short exposures of low concentrations of airborne chemicals. Unfortunately there is very little research to help us understand this problem. Since chronic fatigue syndrome has become a common term, studies have been reported showing a scatter of immune and endocrine abnormalities but no simple diagnostic test has emerged. Tests of indoor air quality were conducted but were inadequate to access his exposure.

**INDEX CHEMICALS** BENZENE AND THE POLYCYCLIC HYDROCARBONS ARE INDEX CHEMICALS - EXAMPLES OF THE MANY CHEMICALS PRESENT IN COMBUSTION PRODUCTS AND WHILE THE DESCRIPTIONS OF THE CHEMICALS ARE VERY GENERAL, THE READER SHOULD HAVE NO DOUBT THAT CHRONIC EXPOSURE CAN PRODUCE PROFOUND AND LONG-LASTING CHANGES IN BIOLOGICAL FUNCTION. THIS INFORMATION IS TAKEN DIRECTLY FROM INFORMATION BULLETINS ISSUED BY THE U.S. AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY DIVISION OF TOXICOLOGY 1600 CLIFTON ROAD, E-29ATLANTA, GEORGIA 30333 USA.

**Benzene** The greatest possibility for high-level exposures is in the workplace... most people are exposed to benzene in tobacco smoke and automobile exhaust. Benzene has been found in at least 337 of 1177 National Priorities List hazardous waste sites. Other environmental sources of benzene include gasoline (filling) stations, vehicle exhaust fumes, tobacco smoke, underground storage tanks that leak, wastewater from industries that use benzene, chemical spills, groundwater next to landfills containing benzene, and possibly some food products that contain benzene naturally. Brief Exposure at High

Levels--Death may occur in humans and animals after brief oral or inhalation exposures to high levels of benzene; however, the main effects of these types of exposures are drowsiness, dizziness, and headaches. These symptoms disappear after exposure stops.

Long-Term Exposures at Various Levels--From overwhelming human evidence and supporting animal studies, the U.S. Department of Health and Human Services has determined that benzene is carcinogenic. Leukemia (cancer of the tissues that form the white blood cells) and subsequent death from cancer have occurred in some workers exposed to benzene for periods of less than 5 and up to 30 years. Long-term exposures to benzene may affect normal blood production, possibly resulting in severe anemia and internal bleeding. In addition, human and animal studies indicate that benzene is harmful to the immune system, increasing the chance for infections and perhaps lowering the body's defense against tumors. Exposure to benzene has also been linked with genetic changes in humans and animals.

Animal studies indicate that benzene has adverse effects on unborn animals. These effects include low birth weight, delayed bone formation, and bone marrow damage. Some of these effects occur at benzene levels as low as 10 parts of benzene per million parts of air (ppm). Although benzene has been reported to have harmful effects on animal reproduction, the evidence for human reproductive effects, such as spontaneous abortion or miscarriage, is too limited to form a clear link with benzene.

Benzene can be measured in the blood and the breath. The body changes benzene to phenol, which can be measured in the urine. Amounts of benzene in blood samples and phenol in urine samples cannot be used as yet to predict what degree of harmful health effects may occur. The meaning of benzene and phenol measurements in blood and urine should be viewed carefully for several reasons: 1) phenol occurs naturally in urine, and amounts of urinary phenol would have to be much higher than usual before any measurement was meaningful; 2) present test methods are limited and raise doubts about the blood level values found in some laboratories; 3) because smoking can raise the background level of benzene in the blood, smoking habits must be considered when evaluating exposure to benzene; 4)

benzene disappears rapidly from the blood and measurements may be accurate only for recent exposures; 5) average amounts of benzene found in the body have not been determined for the general population.

The Environmental Protection Agency (EPA) set the maximum permissible level in drinking water at 5 parts of benzene per billion parts of water (ppb). Because benzene can cause leukemia, EPA established an ultimate goal of 0 ppb for benzene in drinking water and in ambient water such as rivers and lakes. EPA realizes that this goal may be unattainable and has estimated how much benzene in ambient water would be associated with one additional cancer case for every 100,000 persons (6.6 ppb benzene), one case for every 1 million persons (0.66 ppb benzene), and one case for every 10 million persons (0.066 ppb benzene). The National Institute for Occupational Safety and Health (NIOSH) has recommended an occupational exposure limit in air of 0.1 part of benzene per million parts of air (ppm). The Occupational Safety and Health Administration's (OSHA) legally enforceable limit is an average of 1.0 ppm over the standard 8-hour workday, 40-hour workweek.

#### Polycyclic aromatic hydrocarbons (PAHs)

PAHs are a group of chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances. PAHs can be man-made or occur naturally. There is no known use for most of these chemicals except for research purposes. A few of the PAHs are used in medicines and to make dyes, plastics, and pesticides. They are found throughout the environment in the air, water and soil. There are more than 100 different PAH compounds. Although the health effects of the individual PAHs vary, the following 15 PAHs are considered as a group with similar toxicity: acenaphthene, acenaphthylene, anthracene, benzanthracene, benzopyrene, benzofluoranthene, benzoperylene, benzofluoranthene, chrysene dibenzanthracene, fluoranthene, fluorene, indenopyrene, phenanthrene, pyrene.

Several factors will determine whether harmful health effects will occur and what the type and severity of those health effects will be. These factors include the dose (how much), the duration (how long), the route

by which you are exposed (breathing, eating, drinking, or skin contact), the other chemicals to which you are exposed and your individual characteristics such as age, sex, nutritional status, family traits, life style, and state of health. As pure chemicals, PAHs generally exist as colorless, white, or pale yellow-green solids. Most PAHs are found as mixtures of two or more PAHs. They can occur in the air either attached to dust particles, or in soil or sediment as solids. They can also be found in substances such as crude oil, coal, coal tar pitch, creosote, road and roofing tar. Most PAHs do not dissolve easily in water, but some PAHs evaporate into the air. PAHs generally do not burn easily and they will last in the environment for months to years.

PAHs that are attached to dust and other particles in the air and originate from vehicle exhausts, asphalt roads, coal, coal tar, wildfires, agricultural burning and hazardous waste sites. Background levels of PAHs in the air are reported to be 0.02-1.2 milligrams per cubic meter (mg/m<sup>3</sup>) in rural areas and 0.15-19.3 mg/m<sup>3</sup> in urban areas. You may be exposed to PAHs in soil near areas where coal, wood, gasoline, or other products have been burned or from the soil on or near hazardous waste sites, such as former manufactured-gas sites and wood-preserving facilities. PAHs have been found in some drinking water supplies in the United States. The background level of PAHs in drinking water ranges from 4 to 24 nanograms per liter. For most people, the greatest exposure to PAHs occurs in the workplace.

PAHs can enter the body through the lungs. PAHs enter the body quickly and easily by all routes of exposure. The rate at which PAHs enter your body is increased when they are present in oily mixtures and tend to be stored in the kidneys, liver, and fat, with smaller amounts in the spleen, adrenal glands and ovaries. Results from animal studies show that PAHs do not tend to be stored in for a long time and are excreted within a few days in the feces and urine.

The U.S. Department of Health and Human Services has determined that PAHs may be carcinogens. Several of the PAHs, including benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, indeno[1,2,3-cd]pyrene have caused tumors in laboratory animals when they ate them, when they were applied to their skin and when they breathed them in the air for long periods of time.

Reports in humans show that individuals exposed by breathing or skin contact for long periods of time to mixtures of other compounds and PAHs can also develop cancer. Mice fed high levels of benzopyrene during pregnancy had difficulty reproducing and so did their offspring. The offspring from pregnant mice fed benzopyrene also showed other harmful effects, such as birth defects and decreased body weight. Similar effects could occur in humans, but we have no information to show that these effects do occur.

Studies in animals have also shown that PAHs can cause harmful effects on skin, body fluids, and the body's system for fighting disease after both short- and long-term exposure. These effects have not been reported in humans. PAHs are changed into chemicals that can attach to substances within the body. The presence of PAHs attached to these substances can then be measured in body tissues or blood after exposure to PAHs. However, this test is still being developed and it is not known yet how well it works. PAHs or their breakdown products can also be measured in urine. Although these tests can tell that you have been exposed to PAHs, it is not yet possible to use these tests to predict the severity of any health effects that might occur or to determine the extent of your exposure to the PAHs. These tests are not routinely available at a doctor's office because they require special equipment for sampling and detecting these chemicals.

Google™ Search Alpha Online

  
 Alpha Online

This Web Site was developed by Environmed Research Inc. Sechelt, B.C., Canada. Online Since 1995. Orders for printed books and nutrient formulas are placed at Alpha Online. Persona Publications is another division of Environmed with a separate online site for downloading eBooks, music, videos and other digital documents. **Alpha Nutrition ® is a registered trademark of Environmed Research Inc.**

[Create an Account](#) | [Start an Order](#) | [Return to Shopping Cart](#) | [Contact Us](#) | [Order Help](#) | [Logon to my Account](#)

**Anne Cardwell - Fwd: USC summary of Southern California Children's Health Study--for council packet**

---

**From:** Charlie Knox  
**To:** Anne Cardwell; Jayne York  
**Date:** 9/30/2008 12:30 PM  
**Subject:** Fwd: USC summary of Southern California Children's Health Study--for council packet

---

more for the packet

>>> Marilyn Bardet <mjbardet@sbcglobal.net> 9/30/2008 12:00 PM >>>

Charlie,

This article posted by USC refers to the Southern California Children's Health Study, a long-term study undertaken between 1993 and 2001, which deals with lung function development of children chronically exposed to ozone. Dr. Tager discussed this study at Benicia First's forum. He said that 1500 children were studied for lung function over 8 years. For the So-Cal study, he described the "zone of influence" that would characterize effects of traffic pollution as the distance of 500 meters from a freeway.

Dr. Tager cited residential distance to freeways and traffic exposure as highly significant impacts on lung function. "Lung function is a better indicator of mortality--better than blood pressure." (Quote from my notes taken at the forum.) He also said that lung sacs develop fully in the first 20 weeks of life. Lung function is diminished as measured between ages 10 and 18 years.

**VIII-B-441**



## USC News

### Smog May Cause Lifelong Lung Deficits

09/08/04

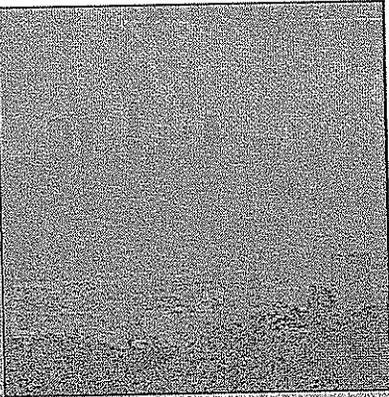
**A long-term USC study following the pulmonary health of children in polluted L.A. areas signals likely health problems in adulthood.**

By Alicia Di Rado

By age 18, the lungs of many children who grow up in smoggy areas are underdeveloped and will likely never recover, according to a study in this week's issue of the New England Journal of Medicine.

The research is part of the Children's Health Study, the longest investigation ever into air pollution and kids' health.

Between 1993 and 2001, study scientists from the Keck School of Medicine of USC tracked levels of major pollutants in 12 Southern California communities while following the pulmonary health of 1,759 children as they progressed from 4th grade to 12th grade.



The 12 communities included some of the most polluted areas in the greater Los Angeles basin, as well as several low-pollution sites outside the area.

Keck School researchers previously found that children who were exposed to more air pollution scored more poorly on respiratory tests. In this latest study, researchers analyzed the same children's respiratory health at age 18, when lungs are almost completely mature.

"Teenagers in smoggy communities were nearly five times as likely to have clinically low lung function, compared to teens living in low-pollution communities," said W. James Gauderman, associate professor of preventive medicine at the Keck School and lead author of the study.

People with clinically low lung function have less than 80 percent of the lung function expected for their age – a significant deficit that would raise concerns during a doctor's exam.

"When we began the study 10 years ago, we had no idea we would find effects on the lung this serious," said John Peters, Hastings Professor of Preventive Medicine in the Keck School, director of the Southern California Environmental Health Sciences Center and senior author of the study.

Study technicians traveled to participating schools every year and tested children's lung function, a measure of how well their lungs work. As an example, someone with sub par lung function cannot exhale and blow up a balloon as quickly or as big as someone with good lung function.

Researchers correlated the students' lung health measurements with levels of air pollutants monitored in the communities during the same time period.

They found greater deficits in lung development in teenagers who lived in communities with higher average levels of nitrogen dioxide, acid vapor, particulate matter with a diameter of less than 2.5 micrometers (about a tenth the diameter of a human hair) and elemental carbon.

"These are pollutants that all derive from vehicle emissions and the combustion of fossil fuels," Gauderman said.

Deficits in lung function have both short- and long-term effects.

"If a child or young adult with low lung function were to have a cold, they might have more severe lung symptoms, or wheezing," Gauderman said. "They may have a longer ease course, while a child with better lung function may weather it much better."

Potential long-term effects are more alarming. "Low lung function has been shown to be second only to smoking as a risk factor for all-cause mortality," Gauderman said.

Lung function grows steadily as children grow up, peaking at about age 18 in women and sometime in the early 20s in men. Lung function stays steady for a short time and then declines by 1 percent a year throughout adulthood.

As lung function decreases to low levels in later adulthood, the risk of respiratory diseases and heart attacks increases.

Researchers are unsure how air pollution may retard lung development.

Gauderman believes chronic inflammation may play a role, with air pollutants irritating small airways on a daily basis. Scientists also suspect that pollutants might dampen the growth of alveoli – tiny air sacs in the lungs.

The research team will continue to follow the study participants into their early 20s, when their lungs will mature and stop developing entirely. The team seeks to find out if the participants begin to experience respiratory symptoms and if those who moved away from a polluted environment show benefits.

The California Air Resources Board, National Institute of Environmental Health Sciences and Hastings Foundation supported the research.

**From:** Marilyn Bardet <mjbardet@sbcglobal.net>  
**To:** Charlie Knox <Charlie.Knox@ci.benicia.ca.us>  
**Date:** 9/30/2008 11:06:10 AM

Charlie,  
Here are (2) different, additional materials for the Council packet in pdf form. I'll be sending more...  
--Marilyn

**CC:** Jerry Page <Jkjerome@aol.com>, Steve Goetz <sgoet@sbcglobal.net>, Anne Cardwell <Anne.Cardwell@ci.benicia.ca.us>

# Air Pollution and Children's Health



A fact sheet by  
CalEPA's Office of Environmental Health Hazard Assessment and  
The American Lung Association of California.



In the past 30 years, state and federal air-quality programs have made great progress in reducing air pollution. However, there has been an increasing awareness in recent years that children may be more susceptible than adults to the harmful effects of air pollutants.

The California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) assesses health risks from environmental contaminants. OEHHA currently is reviewing whether the state's ambient air quality standards are adequate to protect the health of infants and children and is working to identify toxic air contaminants that may cause infants and children to be especially susceptible to illnesses. The American Lung Association of California (ALAC) and its 15 local associations work to prevent lung disease and promote lung health. Since 1904, the American Lung Association has been fighting lung disease through education, community service, advocacy and research.

This fact sheet by OEHHA and ALAC provides information on air pollution and children's health.

## **Why may children be at greater risk than adults from air pollution?**

In many cases, children may have greater exposure than adults to airborne pollutants. Infants and children generally breathe more rapidly than adults, which increases their exposure to any pollutants in the air. Infants and children often breathe through their mouths, bypassing the filtering effect of the nose and allowing more pollutants to be inhaled. Children generally spend significantly more time outdoors than adults, especially during summer months when smog levels are highest.

Children are often more susceptible to the health effects of air pollution because their immune systems and developing organs are still immature. For example, lead that is inhaled is more easily deposited in the fast-growing bones of children. Irritation or inflammation caused by air pollution is more likely to obstruct their narrower airways. It may also take less exposure to a pollutant to trigger an asthma attack or other breathing ailment due to the sensitivity of a child's developing respiratory system. Exposure to toxic air contaminants during infancy or childhood could affect the development of the respiratory, nervous, endocrine and immune systems, and could increase the risk of cancer later in life.

## **What are the major kinds of air pollutants and their impacts on children?**

### **"Criteria" Air Pollutants**

Several common air pollutants are regulated under the state and federal Clean Air Acts and are known as "criteria" air pollutants. Two of the most widespread criteria pollutants are particulate matter (PM) and ozone. PM consists of microscopic particles less than one-seventh the width of a human hair. These particles come from a variety of both manmade and natural sources, such as diesel engines, smoke from fireplaces as well as forest and agricultural fires, and dust from tilled farmland. PM can bypass the body's natural defenses and penetrate deep into the lungs. The elderly, children and people with existing respiratory or cardiac diseases are considered to be especially sensitive to the harmful effects of PM. Recent studies suggest that PM may exacerbate asthma and cause coughs and other respiratory symptoms in children. Recent studies also suggest that prolonged exposure to PM may also affect the growth and functioning of children's lungs. Researchers found that as children grow up in smoggier areas, there is a notable lag in lung function growth.

Ozone is the major component of urban smog. It is formed by chemical reactions in the atmosphere involving sunlight and various gases in motor vehicle exhaust and industrial emissions. Ozone is a powerful respiratory irritant that can cause lung inflammation, transient decreases in lung function, shortness of breath, chest pain, wheezing, coughing and exacerbation of respiratory illnesses such as asthma. Long-term and repeated ozone exposures may lead to chronically reduced lung function.

OEHHA provides detailed analyses of health information on PM, ozone and other common pollutants to the California Air Resources Board (ARB), which sets ambient air quality standards for those pollutants. These air quality standards have been established at levels that are intended to protect the health of all Californians. Unfortunately, PM and ozone levels in most urban areas of California frequently exceed the ambient air quality standards. ARB and local air districts operate regulatory programs under state and federal requirements to reduce airborne levels of these pollutants to the ambient air quality standards.

Other "criteria pollutants" include nitrogen dioxide, carbon monoxide, lead, sulfur dioxide, sulfates and hydrogen sulfide.

ARB is sponsoring a major 10-year study of the effects of air pollution on children's health. Information on this study is available at ARB's web site at <http://www.arb.ca.gov/research/abstracts/98-320.htm>.

### **Toxic Air Contaminants**

California also regulates the emissions of other pollutants, known as toxic air contaminants, which may pose a present or potential hazard to human health or contribute to an increase in deaths or serious illnesses. OEHHA provides assessments of the health risks from various toxic air contaminants to ARB, which can enact control measures designed to reduce the exposure of Californians to these contaminants. More than 200 chemicals are currently listed as toxic air contaminants in California.

Many toxic air contaminants are present in motor vehicle exhaust and industrial emissions, and are formed from the combustion of other chemicals. Among these byproducts of combustion are dioxins and polycyclic organic matter (POM), which may

affect the development of the fetus and increase cancer risks later in life. Particles found in diesel exhaust may make children more susceptible to allergies and asthma. Other toxic contaminants have numerous sources. Acrolein, which may exacerbate asthma, is found in motor vehicle exhaust, tobacco and wood smoke, some industrial emissions, and is also formed in the atmosphere from chemical reactions involving other pollutants. Some toxic air contaminants, such as lead, are naturally occurring in the environment. Lead has been banned as an additive in gasoline and household paint but is present in some industrial emissions. It can cause developmental problems and harm the central nervous system.

### **What is California doing to improve health protection for children?**

The Legislature in 1999 approved the Children's Environmental Health Protection Act (Senate Bill 25), authored by Senator Martha Escutia, which seeks to ensure that California's air quality programs protect the health of infants and children. The Act requires ARB, in consultation with OEHHA, to review all ambient air quality standards to determine whether they adequately protect the health of the public, including children. The Act also requires OEHHA to identify toxic air contaminants that may cause infants and children to be especially susceptible to illness, and it requires ARB to determine the adequacy of existing control measures for toxic air contaminants or the need for new control measures to protect the health of the public, particularly infants and children.

The initial stage of the ambient air quality standards review was completed in December 2000. ARB and OEHHA concluded that PM and ozone may cause health effects in children even at levels meeting the state's ambient air quality standards. The amount of time children play outdoors and their higher breathing rates are some of the reasons why children may be more sensitive to these pollutants than adults. The review also found evidence that levels of nitrogen dioxide (a pollutant in motor vehicle exhaust and many kinds of industrial emissions) that meet the ambient air quality standard may harm asthmatic children.

OEHHA completed a detailed review of the PM standards in May 2002. Based on this review, OEHHA recommended, and ARB adopted, stricter new PM standards in June 2002. (The report containing the results of the PM review and the new standards can be accessed at [www.oehha.ca.gov/air/toxic\\_contaminants/PM10notice.html#may](http://www.oehha.ca.gov/air/toxic_contaminants/PM10notice.html#may)). OEHHA is conducting a detailed review of the ozone standard and is developing recommended revisions to the standard for ARB's consideration. After this is completed, OEHHA will review the nitrogen dioxide standard.

ARB and local air districts may have to develop new regulations to reduce emissions and ultimately reduce airborne levels of these pollutants to comply with the new PM standards and any future new standards for ozone and nitrogen dioxide.

The Act also requires OEHHA to identify toxic air contaminants that may cause infants and children to be especially susceptible to illnesses. ARB will review and, if necessary, revise or adopt any control measures needed to reduce the public's exposure to these contaminants. The Act required OEHHA to identify up to five contaminants in 2001. These contaminants - dioxin, lead, POM, diesel exhaust particles, and acrolein - are briefly discussed in the previous section. More detailed information is available at [www.oehha.ca.gov/air/toxic\\_contaminants/SB25finalreport.htm](http://www.oehha.ca.gov/air/toxic_contaminants/SB25finalreport.htm).

OEHHA is developing guidelines for use in evaluating the adequacy of existing air toxics regulations. Beginning in 2004, OEHHA will annually evaluate selected toxic air contaminants and identify unhealthful levels of exposure to these contaminants. OEHHA will use these evaluations beginning in 2005 to annually update the list of toxic air contaminants that impact infants and children.

The Act also requires ARB to evaluate the adequacy of its current air-quality monitoring program to determine children's exposure to air pollutants, and it created the Children's Environmental Health Center within the California Environmental Protection Agency to coordinate Cal/EPA's activities and provide advice to the Governor and Cal/EPA Secretary on matters of children's environmental health.

In addition to complying with the requirements of the Children's Environmental Health Protection Act, OEHHA is taking two other steps in the area of children's health protection. OEHHA is developing improvements to scientific methods used to gauge cancer risks that children may face from exposure to contaminants in the environment. Also, OEHHA is refining methods to assess health risks from contaminants that may conceivably exist at proposed and existing school sites. These two projects are intended to improve the ability of scientists and regulators to make decisions that protect children from contaminants in the air, water, soil and food as well as elsewhere in the environment.

These efforts represent a commitment by the State of California to ensure that children have the opportunity to grow up in a healthy environment.

Revised November 2003

## **Fresno Asthmatic Children's Environment Study (F.A.C.E.S.)**

The Fresno Asthmatic Children's Environment Study, which began in 2000, is a large epidemiological study of the effects of air pollution on children with asthma. About 300 asthmatic children who reside in the Fresno area of the Central Valley of California will be enrolled in the study. The overall goal of this study is to determine the effects of different components of particulate matter (PM), in combination with other ambient air pollutants, on the natural history of asthma in young children. The study is sponsored by the California Air Resources Board and conducted by investigators at the University of California, Berkeley.

### **Importance of the Fresno Asthmatic Children's Environment Study**

- ◆ The information provided by the study will help the Air Resources Board (ARB) protect public health. The ARB sets California's ambient air quality standards to protect people who are most sensitive to air pollution.
- ◆ Children may be more strongly affected by air pollution because their lungs and bodies are still developing. Understanding the effects of air pollution on children with asthma is essential for setting health standards protective of sensitive populations.

### **The Pollutants Studied**

- ◆ Particulate matter
- ◆ Criteria air pollutants: NO<sub>x</sub>, SO<sub>2</sub>, CO, ozone
- ◆ Polycyclic Aromatic Hydrocarbons (PAHs)
- ◆ Volatile Organic Compounds (VOCs)
- ◆ Environmental Tobacco Smoke
- ◆ Allergens

### **The Information Gathered by the Study**

The study consists of a variety of measurements taken over the course of five years. Measurements taken include skin testing for allergies, lung function testing, and extensive questions about the child's health and home environment. Research staff will also visit the child's home to collect indoor air and dust samples. Children will keep a journal of activities and time spent in different locations throughout the day, as well as symptoms and medication use. Portable spirometers will be used to measure lung function at home.

### **For More Information**

Please contact the ARB's Public Information Office at (916) 322-2990, or visit our web site at <http://www.arb.ca.gov/research/faces/faces.htm>. You may obtain this document in an alternative format by contacting our ADA coordinator at (916) 322-4505 (voice); (916) 324-9531 (TDD, Sacramento area only); or (800) 700-8326 (TDD, outside Sacramento).

Sept. 30, 2008

Dear City Council Members,

The EIR Addendum to the proposed Benicia Business Park states that the project will cause "significant unavoidable air quality impacts that cannot be reduced to a less-than-significant level" by any of the proposed mitigation measures. Specifically, it will cause "long-term project-related emissions from traffic which would exceed the BAAQMD thresholds of significance for ozone precursors." (Ozone is a serious public health risk, and Benicia already has higher levels of ozone than most communities.)

Because the applicant claims they cannot provide mitigations to reduce those emissions below BAAQMD thresholds, CEQA law will require you to sign a Statement of Overriding Considerations if you choose to approve the project. You must affirm in this statement that the economic benefit of the project to the city's tax base and job supply (75% jobs for out-of-town employees) is so great that it "outweighs the unavoidable adverse environmental effects."

In addition, CEQA law requires that your claims of significant economic benefit "must be based on substantial evidence in the administrative record." But the problem is, there has been NO economic analysis performed on the revised 2008 version of this project that would provide that substantial evidence and reliably quantify those glowing economic claims.

I know that all of you are deeply committed to your fiduciary responsibilities and to preserving Benicia's health and quality of life, so I can't understand why any of you would consider signing off on that Statement, and permanently impairing our air quality and public health, when its claim of significant economic benefit is based on sheer speculation.

In fact I was surprised and dismayed that the Council has never once spent any time reviewing the now outdated (2005) economic analysis (which was based on a former and much larger version of the project), and asking the developer to explain and defend its sources of data, assumptions, and projections in the light of today's dire economic climate.

Before signing that Statement, I hope that you will require Seeno/Discovery Builders to produce a new economic analysis to support its glowing revenue claims, one based on their current (smaller) version of the project and on current economic data and projections. Or better yet, since the developer negligently omitted an updated economic analysis from the documentation for the current project, I hope you will simply refuse to sign the unsupported Statement of Overriding Considerations, and thereby deny approval of this poorly designed project.

Sincerely,  
Norma Fox

PS. Project denial would not be the end of the project. Instead, it would finally open the door and allow a fresh start for the developer to work with the City and the community on a new vision for the project, clearly outlined in a detailed Specific Plan. Many details of the community's vision have already been thoroughly described throughout the approval process by many individuals and groups (most recently in a detailed document posted at [www.greengatewaygroup.org](http://www.greengatewaygroup.org)), so the developer would not have to start over with no ideas and a blank slate.

September 30, 2008

Dear City Council Members,

In the Statement of Overriding Conditions that LSA Associates prepared for the Benicia Business Park EIR, they state the following:

#### 4.1 AIR QUALITY

Impact AIR-2: Long-term project-related "regional emissions" would exceed the BAAQMD thresholds of significance for ozone precursors.

*[I might add, there is nothing "regional" about the direct impact those ozone precursors would have on increased levels of ozone here in Benicia.]*

They go on to propose Mitigation Measure AIR-2:

"The BAAQMD CEQA Guidelines identifies potential mitigation measures for various types of projects. The following are considered to be feasible and effective in further reducing vehicle trip generation and resulting emissions from the project."

They then list several mitigations that they will implement which are suggested by the BAAQMD CEQA Guidelines, such as benches and shelters for transit facilities, bicycle lanes, sidewalks, and a Trip Demand Management measure such as a ride-matching program.

Following that list of mitigations, they state that those measures will not be sufficient to reduce ozone precursors to levels below BAAQMD significance threshold. They claim "there is no mitigation available with currently feasible technology to reduce the project's regional air quality impacts to a less than significant level." And based on that claim of no other mitigation available, they are asking you to this extremely harmful air quality impact by signing the Statement of Overriding Considerations.

But an important mitigation measure which is suggested by the BAAQMD CEQA Guidelines is missing from their list of measures that they will implement. That is the provision of a "shuttle service to transit stations" and the establishment of "mid-day shuttle service from worksite to food service establishments." This is a mitigation that is available and feasible and very effective. Lawrence Berkeley Lab has been using this measure for years in Berkeley (ALL of it paid for by the Lab, including the wages for the bus drivers). It has dramatically reduced vehicle traffic at the Lab because it is, free, frequent, convenient, and because parking space for private cars is extremely limited.

Please note that our General Plan program 4.10.B states that the City shall require that projects with significant air quality impacts must include all feasible mitigation measures needed to reduce impact to less than significant levels.

Since Discovery Builders is not willing to include this mitigation measure, please do not sign the Statement of Overriding Considerations !

Thank you,  
Norma Fox

[You can see the BAAQMD CEQA Guidelines at the following link; of particular note is Table 15, on pg.65... [http://www.baaqmd.gov/pln/ceqa/ceqa\\_guide.pdf](http://www.baaqmd.gov/pln/ceqa/ceqa_guide.pdf) ]

**VIII-B-451**

Facts from the Benicia First Forum

## Air Quality & Children's Health

Sept. 18, 2008

**From:**

Dr Ira Tager, Md., Epidemiologist, Professor, Director, UC Berkeley School of Public Health Prevention Research Center

“Lung sacs develop fully in the first 20 weeks of life.”

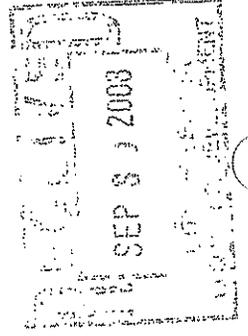
“Lung function is a better indicator of mortality—better than blood pressure.”

“The Southern California Children’s Health Study was conducted for 10+ years, between 1993 and 2001, and followed 5,500 children for chronic exposures to air pollution. Marker pollutants were diesel PM [particulate matter at 10 and 2.5 microns] and NOX<sub>2</sub>. A sub-set of this study, conducted for 8 years involved 1,500 children. The main concern was traffic exposure’s affect on lung function and residential distance to freeways. . . For this study, the “zone of influence” that would characterize effects of traffic pollution was 500 meters from a freeway.”

“Hazards of traffic pollution include tire and brake fragments, tailpipe toxics (NOX, CO, Hydrocarbons and PM [particulate matter]). Allergens and other biological agents add to cumulative effects of roadway pollution.”

About health effects in children and adolescents:

“An 89% increase in asthma risk is associated to living close to a freeway.”



Facts from the Benicia First Forum

## Air Quality & Children's Health

Sept. 18, 2008

**From:**

Dr. Paul Roberts, Phd., Exec Vice Pres. & Chief Scientific Officer, Sonoma Technologies Inc.

Dr. Roberts recently completed the "Mobile Source Air Toxics Study" in Las Vegas, Nevada, which was conducted for one year, monitoring air quality at three schools that are located adjacent to Highway 95. The research was funded by a U.S. 95 Settlement Agreement between the Sierra Club and the Nevada Dept. of Transportation and FHWA [Federal Highway Administration].

The required components of the study were:

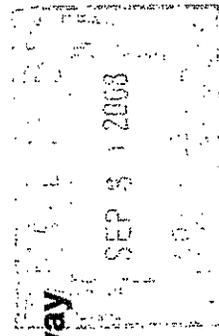
- monitoring at the three school sites
- Filtration added to HVAC systems at schools
- Bus retrofit program
- Bus idling education
- FHWA gradient study (with EPA, ongoing research)

"At all three school sites, high black carbon concentrations are seen at low wind speeds regardless of direction."

"Morning concentrations dominate indoor and outdoor exposure (summer); overnight and morning concentrations dominate in winter."

"Low wind speeds often allow high pollutant concentrations on both sides of the roadway (with sound wall)."

"Wind conditions and time-of-day have a significant influence on near-roadway exposure."



Facts from the Benicia First Forum

## Air Quality & Children's Health

Sept. 18, 2008

**From:**

Jenny Bard, Director of Regional Air Quality Programs, American Lung Association of California

"Lungs have 300 million avioi—[if laid out] enough to fill a tennis court."

"Livermore has the highest ozone level in the Bay Area."

[Benicia also shows high levels of ozone, as monitored at the Tennys Drive monitoring station.]

"Ozone is made up of nitrogen oxides + volatile organic compounds (VOC's) especially when temperatures are high. With global warming, we can expect more smog, more days of exceedences of federal levels for ozone containment."

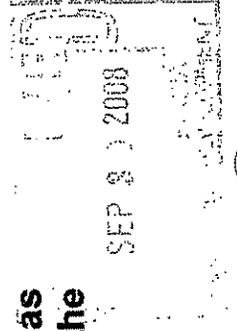
"Wood burning is the greatest cause of particulate emissions (PM) in the Bay Area. Diesel emissions, including PM, are the most harmful emissions in the Bay Area."

"Black soot on windowsills is likely diesel soot." [black carbon].

"The smallest particles, PM 2.5 microns, are so tiny they by-pass airway defenses and are absorbed into the bloodstream."

"We need to protect public health with adequate margin of safety."

"The Lung Assoc. in California is supporting AB32, for getting greenhouse gas reductions associated to traffic. The secondary benefit to reducing traffic is the reduction of health risks posed by traffic emissions."



## Near-Roadway Exposure to Air Pollution with Examples from a Study of MSATs at Three Schools Next to U.S. 95 in Las Vegas, NV

Prepared by:  
Paul T. Roberts,  
Michael C. McCarthy, and Steven G. Brown  
Sonoma Technology, Inc.  
Petaluma, CA

Presented to:  
Benicia First! Forum on Air Quality and Children's Health  
Benicia, CA  
September 18, 2008



Sonoma Technology, Inc.  
Air Quality Research and Innovative Solutions

600000-2419

## Near-Roadway Exposures – Outline

- Near-source (primary) pollutants, in context
- Introduction to U.S. 95 MSAT (Mobile Source Air Toxics) Study
- Monitoring sites at schools, parameters measured
- Typical characteristics of CO, NO/NO<sub>x</sub>, and black carbon (BC) at these sites
- Example of upwind/downwind BC concentrations
- Example of hydrocarbon concentrations
- Preliminary summary of MSAT characteristics
- Mitigation Lessons Learned



Sonoma Technology, Inc.

2

VIII-B-455

RECEIVED  
SEP 23 2008  
10:00 AM  
LORAIN

## Primary and Regional Pollutants

| Potential Sources     | Near-Source Pollutants |    |      | Ozone Precursors and Other Regional Pollutants |
|-----------------------|------------------------|----|------|------------------------------------------------|
|                       | PM                     | BC | MSAT |                                                |
| Cars/Trucks/Buses     | ✓                      | ✓  | ✓    | ✓                                              |
| Rail                  | ✓                      | ✓  | ✓    | ✓                                              |
| Ships                 | ✓                      | ✓  | ✓    | ✓                                              |
| Ag Operations         |                        |    |      | ✓                                              |
| Refineries            | ✓                      | ✓  | ✓    | ✓                                              |
| Power Plants (gas)    |                        |    |      | ✓                                              |
| Forest/Ag/Grass Fires |                        |    |      | ✓                                              |
| Fireplaces/Woodstoves | ✓                      | ✓  | ✓    |                                                |
| Wind-blown Dust       | ✓                      |    |      | ✓                                              |

**STI**

Sierra Technology, Inc.

3

## U.S. 95 Settlement Agreement

Court Settlement Agreement between Sierra Club and NDOT/FHWA regarding urban freeway expansion where three schools are adjacent to roadway

Required components of settlement

- MSAT monitoring study at schools (this study)
- Filtration added to HVAC systems at schools
- Bus retrofit program
- Bus idling education
- FHWA gradient study (with EPA, ongoing research)

**STI**

Sierra Technology, Inc.

4

**VIII-B-456**

## Introduction to U.S. 95 MSAT Study

### MSAT Study Objectives

- Characterize outdoor and indoor concentrations at schools (student exposure)
- Determine U.S. 95 vehicle contributions (before and after new lanes opened)
- Determine MSAT removal efficiencies of new filtration systems

### Focus on priority MSATs

- Diesel particulate matter
- Gaseous components: benzene, 1,3-butadiene, acrolein, formaldehyde, and acetaldehyde

**STI**

Stonham Technology, Inc.

5

## U.S. 95 MSAT Study Measurements

### Routine Network (May 2007-May 2008)

- Semi-continuous black carbon (Aethelometer) (10 sites)
- CO (3 sites)
- NO/NO<sub>x</sub> (1 site)
- Meteorological parameters (4 sites)

### Intensive Measurements (May/June 2007, January 2008)

- 2-hr hydrocarbon and carbonyl samples (10 sites)

### Routine Traffic Data at Two Locations

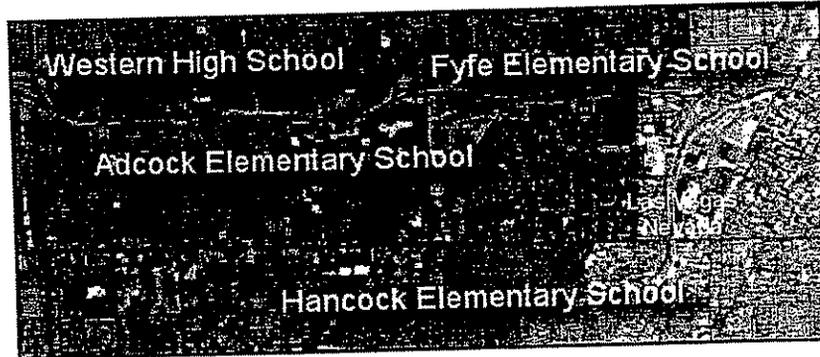
- 5-minute traffic counts, by lane, with vehicle-class bins and vehicle speeds

**STI**

Stonham Technology, Inc.

6

## Monitoring Sites at Schools



**STI**  
Sonoma Technology, Inc.

7

## Fyfe Elementary School Monitoring Sites



Ambient is 20 meters from sound wall (SW); air inlet is 76 meters from SW.

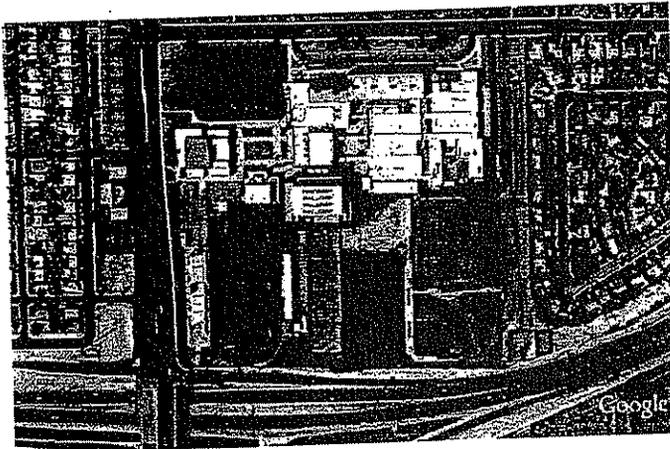
Legend: ◻ Air Inlet   ◻ Classroom   ◆ Ambient

**STI**  
Sonoma Technology, Inc.

8

VIII-B-458

## Western HS Monitoring Sites



Ambient is 136 meters from sound wall (SW); air inlet is 317 meters from SW.

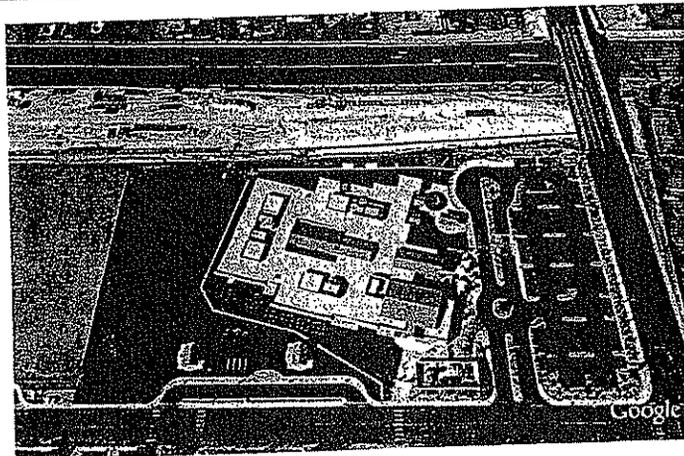
Legend: ◻ Air Inlet ◻ Classroom ◊ Ambient

**STI**

Sonoma Technology, Inc.

9

## Adcock Elementary School Monitoring Sites



Ambient is 17 meters from sound wall (SW); air inlet was 39 meters from SW;  
air inlet for new system is 33 meters from SW.

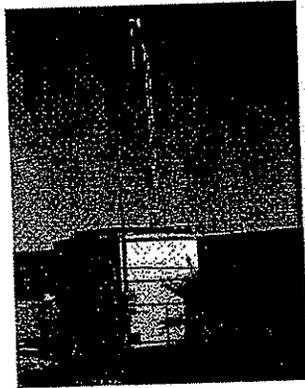
Legend: ◻ Air Inlet ◻ Classroom ◊ Ambient

**STI**

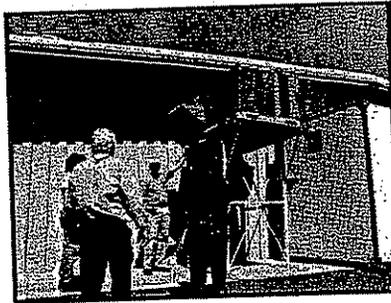
Sonoma Technology, Inc.

10

## Fyfe Trailer and Shelter Next to Classroom (Before HVAC Changes)



20 meters from sound wall



76 meters from sound wall

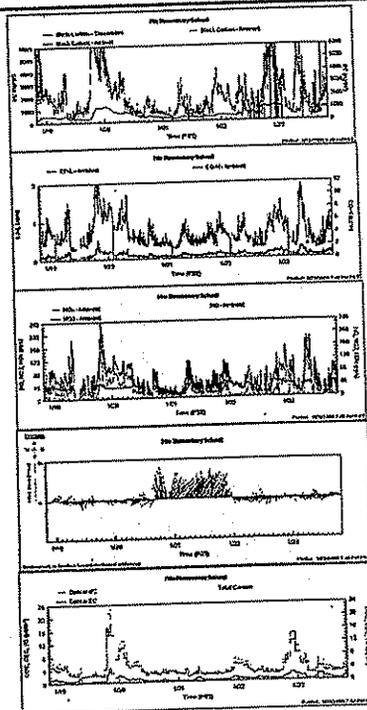
**STI**

Sonoma Technology, Inc.

11

## Typical Time-Series of Concentrations at Fyfe in Winter

- BC, CO, NO, OC, and EC profiles are similar.
- Wind speed, wind direction, and source strength have a major influence on concentrations.

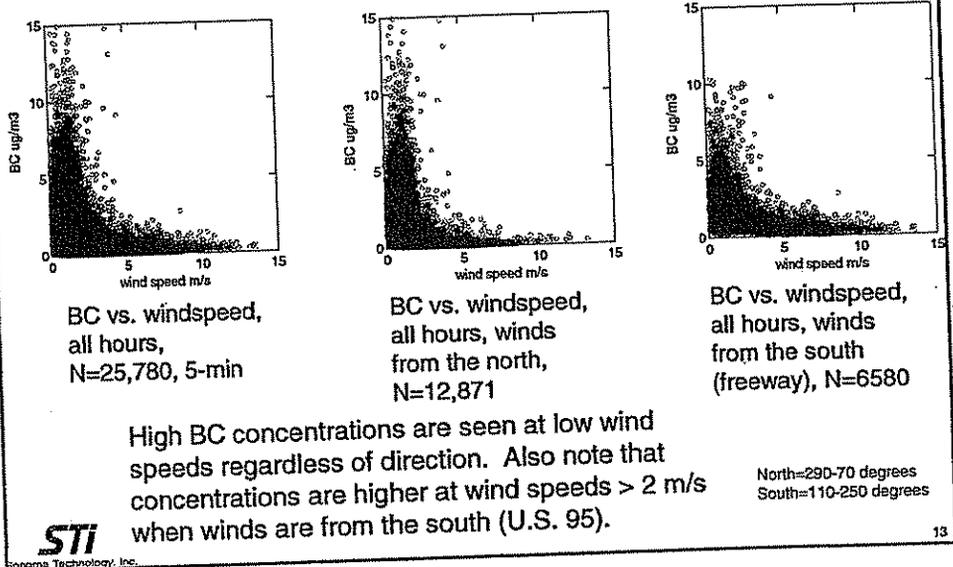


**STI**

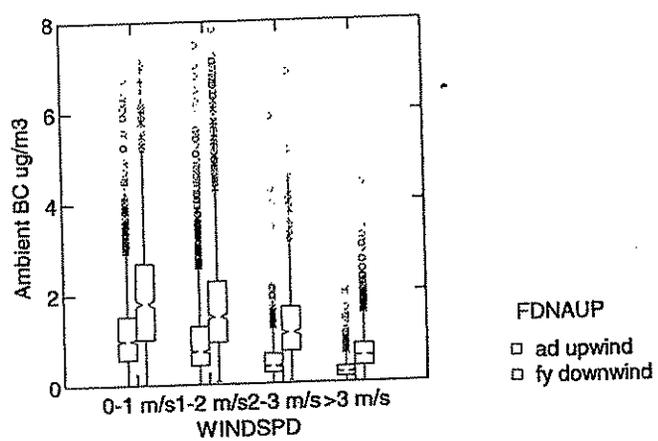
Sonoma Technology, Inc.

12

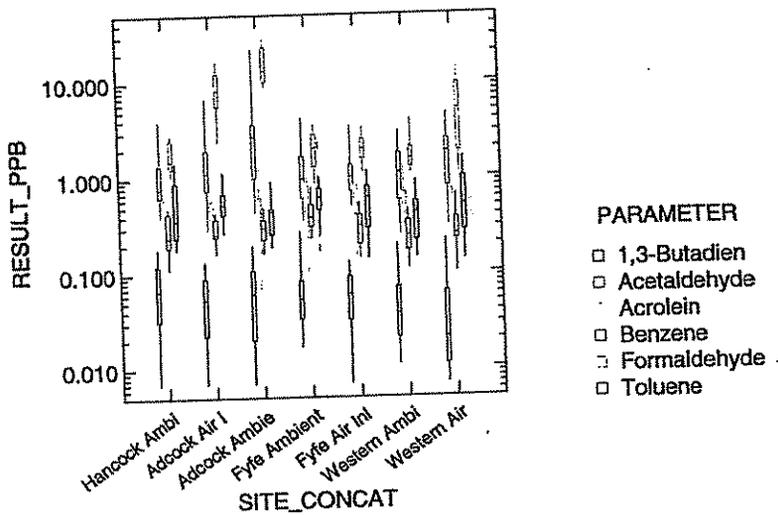
## Fyfe, Ambient Monitor, December–Early March



## BC Concentrations Upwind and Downwind Influence of Wind Speed



## Winter 0900-1100 Gaseous Concentrations Distribution



**STI**

Stroma Technology, Inc.

15

## Preliminary Summary of Ambient MSAT Characteristics

- Fresh pollutants go up and down together.
- Morning concentrations dominate indoor and outdoor exposure (summer); overnight and morning concentrations dominate in the winter.
- Expected pollutant gradients are not always evident.
- Low wind speeds often allow high pollutant concentrations on both sides of roadway (with a sound wall).
- Wind conditions and time-of-day have a significant influence on near-roadway exposure.

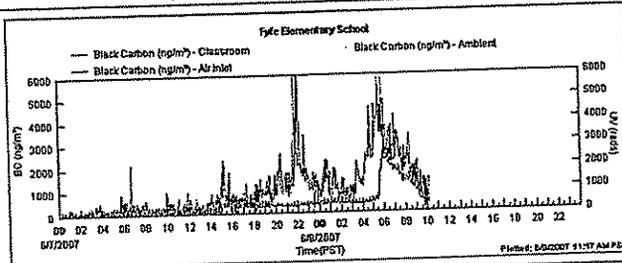
**STI**

Stroma Technology, Inc.

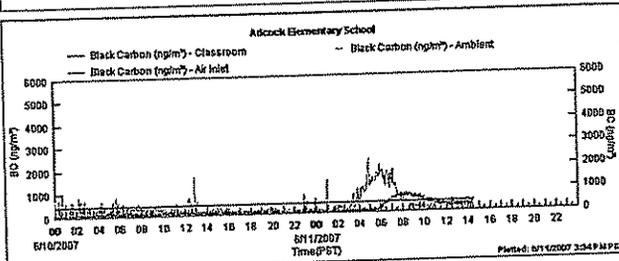
16

VIII-B-462

### Example BC Time-Series Showing Classroom Being Filled with Rush-hour Pollution by HVAC (Before HVAC Changes)



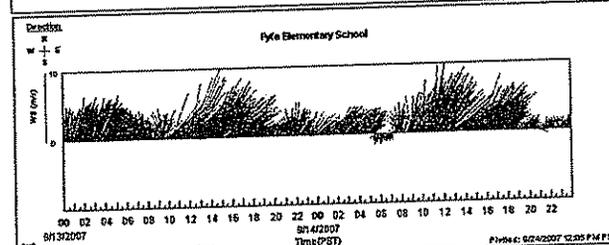
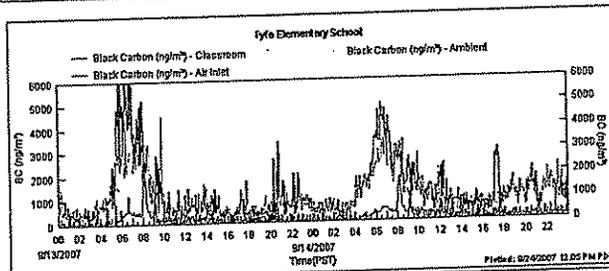
Note HVAC start time and different rate of ambient dilution vs. indoor dilution.



**STI**  
Sonoma Technology, Inc.

17

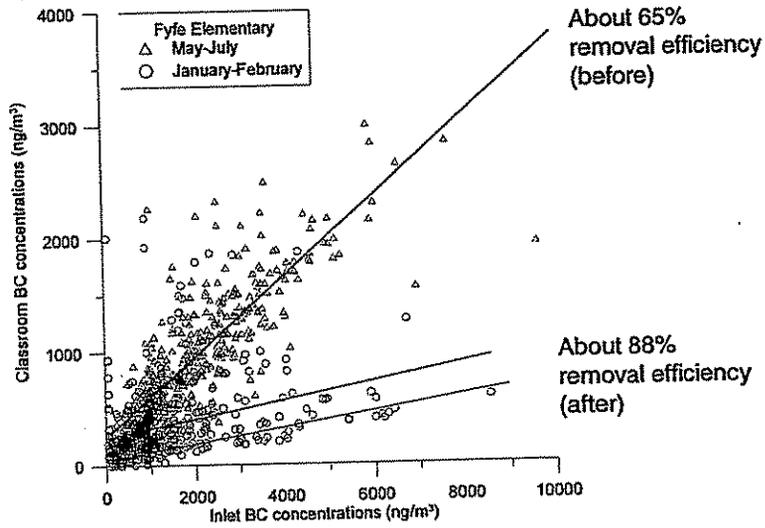
### Example BC Time Series Showing Low BC Concentrations in Fyfe Classroom, Except When Door Left Open by the Teacher (After HVAC Changes)



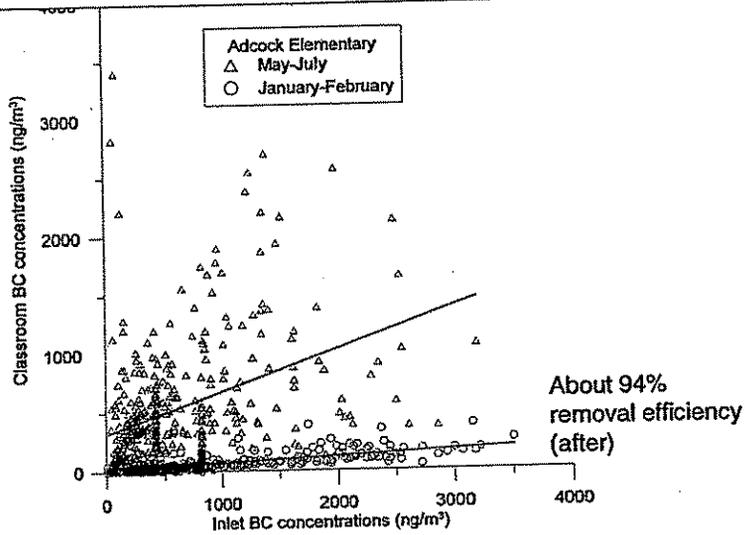
**STI**  
Sonoma Technology, Inc.

18

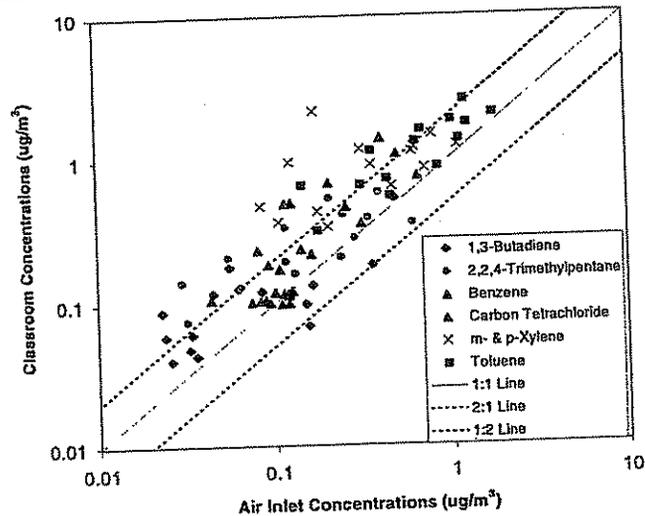
### Indoor and Air Inlet BC Concentrations at Fyfe Before and After HVAC Changes



### Indoor and Air Inlet BC Concentrations at Adcock Before and After HVAC Changes



## Indoor VOC Concentrations at Adcock (Summer) Higher than Outdoor for All Species Except CCl<sub>4</sub>



STI

Science Technology, Inc.

21

## Preliminary Summary of MSAT Filtration Characteristics

- Modest BC removal with existing HVAC systems in (summer).
- Significant BC removal with new HVAC filtration (winter).
- Adcock system removes more BC than Western or Fyfe.
- Indoor concentrations are often higher than outdoors for several gaseous MSATs (indoor sources or time lag in system?).

STI

Science Technology, Inc.

22

## Mitigation Lessons Learned, So Far

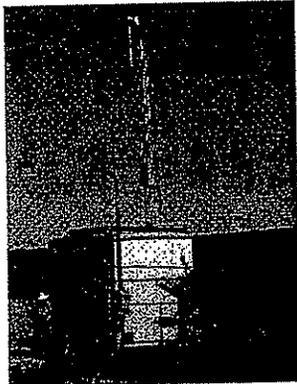
- Typical HVAC operation can fill classroom with polluted air early in the morning which can result in higher concentrations indoors (than outdoors) later in morning.
- Leaving classroom doors open to outdoor hall can defeat filtration system.
- Diurnal pattern of pollution is an important consideration for exposure and mitigation (for both classroom and outdoors).

**STI**

Sierra Technology, Inc.

23

## Acknowledgments



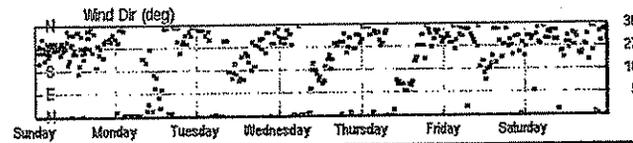
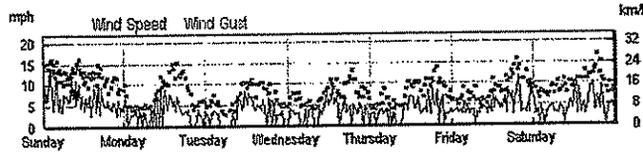
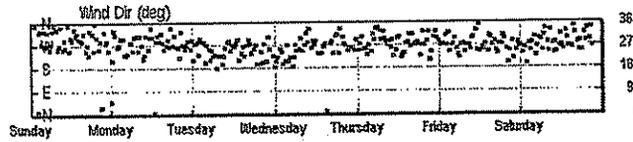
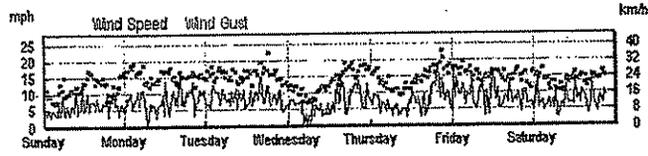
This work is funded by the Nevada Department of Transportation (NDOT); John Terry is the NDOT Project Manager. Joanne Spaulding and Jane Feldman (Sierra Club), Pat Mohn (NDOT), and Rich Baldauf (EPA) contributed to the design of this study. Joey Landreneau and David Vaughn (STI) performed the monitoring and sampling.

**STI**

Sierra Technology, Inc.

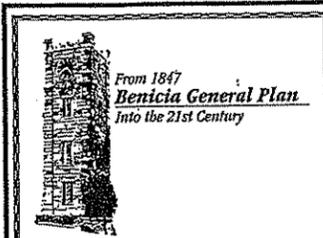
24

Example of Winds in Benicia; 9/13/08 and 9/6/08 (KCABENIC3)



**STI**  
Genome Technology, Inc.

25



Facts from the Benicia First Forum  
**Air Quality & Children's Health**  
 Sept. 16, 2008

From:  
 Dr. Ira Tager, M.D., Epidemiologist, Professor, Director, UC Berkeley School of Public Health  
 Prevention Research Center

"Lung sacs develop fully in the first 20 weeks of life."

"Lung function is a better indicator of mortality—better than blood pressure."

"The Southern California Children's Health Study was conducted for 10+ years, between 1993 and 2001, and followed 6,500 children for chronic exposures to air pollution. Marker pollutants were diesel PM [particulate matter at 10 and 2.5 microns] and NOx. A sub-set of this study, conducted for 8 years involved 1,500 children. The main concern was traffic exposure's effect on lung function and residential distance to freeways. For this study, the 'zone of influence' that would characterize effects of traffic pollution was 500 meters from a freeway."

"Hazards of traffic pollution include tire and brake fragments, tailpipe toxics (NOx, CO, Hydrocarbons and PM [particulate matter]). Allergens and other biological agents add to cumulative effects of roadway pollution."

About health effects in children and adolescents:  
 "An 89% increase in asthma risk is associated to living close to a freeway."

Facts from the Benicia First Forum  
**Air Quality & Children's Health**  
 Sept. 18, 2008

From:  
 Dr. Paul Roberts, Ph.D., Exec Vice Pres. & Chief Scientific Officer, Sonoma Technologies Inc.

Dr. Roberts recently completed the "Mobile Source Air Toxics Study" in Las Vegas, Nevada, which was conducted for one year, monitoring air quality at three schools that are located adjacent to Highway 95. The research was funded by a U.S. 95 Settlement Agreement between the Sierra Club and the Nevada Dept. of Transportation and FHWA [Federal Highway Administration].

The required components of the study were:

- monitoring at the three school sites
- Filtration added to HVAC systems at schools
- Bus retrofit program
- Bus idling education
- FHWA gradient study (with EPA, ongoing research)

"At all three school sites, high black carbon concentrations are seen at low wind speeds regardless of direction."

"Morning concentrations dominate indoor and outdoor exposure (summer); overnight and morning concentrations dominate in winter."

"Low wind speeds often allow high pollutant concentrations on both sides of the roadway (with sound wall)."

"Wind conditions and time-of-day have a significant influence on near-roadway exposure."

Facts from the Benicia First Forum  
**Air Quality & Children's Health**  
 Sept. 16, 2008

From:  
 Jenny Bard, Director of Regional Air Quality Programs, American Lung Association of California

"Lungs have 300 million alveoli—[if laid out] enough to fill a tennis court."

"Livermore has the highest ozone level in the Bay Area."  
 [Benicia also shows high levels of ozone, as monitored at the Yenny Drive monitoring station.]

"Ozone is made up of nitrogen oxides + volatile organic compounds (VOC's) especially when temperatures are high. With global warming, we can expect more smog, more days of exceedances of federal levels for ozone containment."

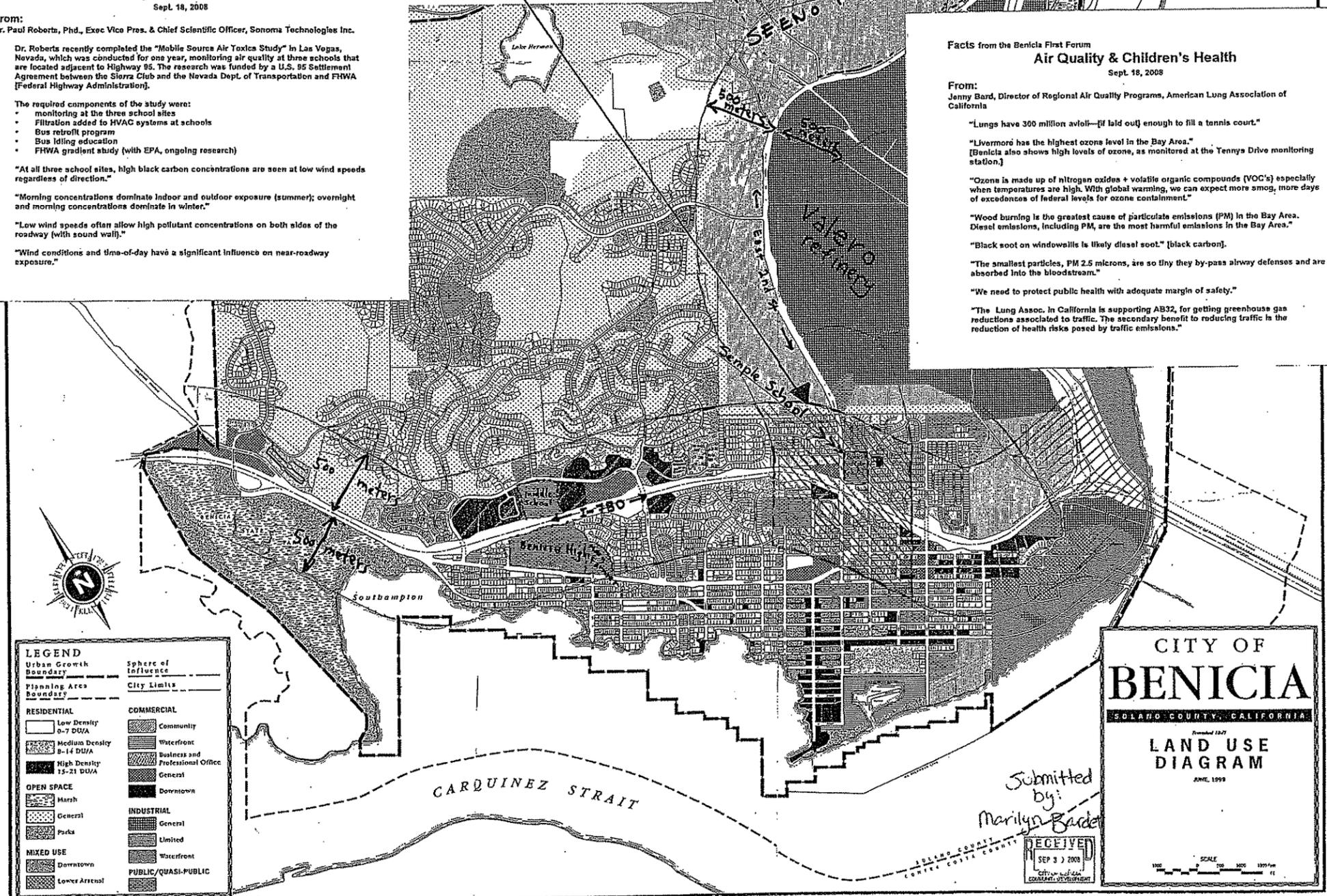
"Wood burning is the greatest cause of particulate emissions (PM) in the Bay Area. Diesel emissions, including PM, are the most harmful emissions in the Bay Area."

"Black soot on windowalls is likely diesel soot." [black carbon].

"The smallest particles, PM 2.5 microns, are so tiny they by-pass airway defenses and are absorbed into the bloodstream."

"We need to protect public health with adequate margin of safety."

"The Lung Assoc. in California is supporting AB32, for getting greenhouse gas reductions associated to traffic. The secondary benefit to reducing traffic is the reduction of health risks posed by traffic emissions."



CITY OF  
**BENICIA**  
 SOLANO COUNTY, CALIFORNIA  
 Revised 1997  
**LAND USE  
 DIAGRAM**  
 JUNE, 1999

Submitted by:  
 Marilyn Bader

RECEIVED  
 SEP 3 2008  
 CITY OF BENICIA

SCALE  
 1" = 100'

VIII-B-4168