



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

BOARD OF DIRECTORS
AD HOC COMMITTEE ON PORT EMISSIONS

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THURSDAY
APRIL 5, 2007
9:30 A.M.

FOURTH FLOOR CONFERENCE ROOM
DISTRICT OFFICES

AGENDA

1. **CALL TO ORDER – ROLL CALL**

2. **PUBLIC COMMENT PERIOD** (*Public Comment on Non-Agenda Items Pursuant to Government Code § 54954.3*) Members of the public are afforded the opportunity to speak on any agenda item. All agendas for regular meetings are posted at District headquarters, 939 Ellis Street, San Francisco, CA, at least 72 hours in advance of a regular meeting. At the beginning of the regular meeting agenda, an opportunity is also provided for the public to speak on any subject within the Committee's subject matter jurisdiction. Speakers will be limited to three (3) minutes each.

3. **PRESENTATION ON EMISSIONS FROM PORTS AND MARITIME ACTIVITY IN THE SAN FRANCISCO BAY AREA**
Henry Hilken/4642
hhilken@baaqmd.gov

The Committee will receive information on emissions from ports and maritime activity in the San Francisco Bay Area. This is an informational item.

4. **DISCUSSION OF SAN FRANCISCO BAY AREA GREEN PORTS INITIATIVE**

Brian Bunger/4797
bbunger@baaqmd.gov

The Committee will receive information and discuss the new initiative for green ports.

5. **COMMITTEE MEMBER COMMENTS/OTHER BUSINESS**

Any member of the Committee, or its staff, on his or her own initiative or in response to questions posed by the public, may ask a question for clarification, make a brief announcement or report on his or her own activities, provide a reference to staff regarding factual information, request staff to report back at a subsequent meeting concerning any matter or take action to direct staff to place a matter of business on a future agenda. (Gov't Code § 54954.2).

6. **TIME AND PLACE OF NEXT MEETING AT THE CALL OF THE CHAIR**
7. **ADJOURNMENT**

**CONTACT CLERK OF THE BOARDS - 939 ELLIS STREET
SAN FRANCISCO, CA 94109**

**(415) 749-4965
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www.baaqmd.gov**

- To submit written comments on an agenda item in advance of the meeting.
- To request, in advance of the meeting, to be placed on the list to testify on an agenda item.
- To request special accommodations for those persons with disabilities notification to the Clerk's Office should be given at least three working days prior to the date of the meeting so that arrangements can be made accordingly.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Memorandum

To: Chairperson Miley and Members
of the Ad Hoc Committee on Port Emissions

From: Jack P. Broadbent
Executive Officer/APCO

Date: March 29, 2007

Re: Information on Emissions from Ports and Maritime Activities in the
San Francisco Bay Area

RECOMMENDED ACTION:

None.

DISCUSSION

Emissions from ports and maritime activity in the San Francisco Bay Area Air Basin are diverse and growing. The Bay Area has five active commercial ports, one cruise ship terminal, and several industrial wharves serving refineries, steel and chemical facilities. The five commercial ports are Oakland, Richmond, San Francisco, Benicia, and Redwood City. The cruise ship terminal is located at Pier 35 in San Francisco. The bay also has several main vessel anchorages designated by the United State Coast Guard to accommodate vessels undertaking fuel transfer operations, maintenance or crew changes. The main anchorage is located south of the Bay Bridge between Alameda and San Francisco. Lastly, the bay is the entry point for the inland ports of Sacramento and Stockton. In 2005, the Bay Area was visited by 3,331 ocean going vessels. Many of the vessels visited more than one location within the Bay or the inland ports during their visits, accounting for a higher number of vessel movements. Table 1 shows visits to ports, industrial wharves and anchorages, counting separately each visit by a vessel. In addition to the large, ocean-going vessels, operations by tugs, supply vessels, barges, ferries and fishing vessels contribute to maritime emissions.

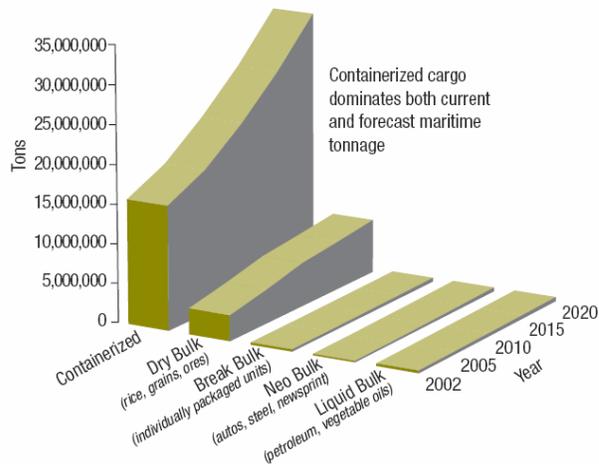
Table 1
2005 Ship Visits

Port/Facility	Vessel Movements	Percentage of total
Port of Oakland	1966	41.4%
Port of Richmond	286	6.0%
Port of San Francisco – Cargo	117	2.5%
Port of San Francisco – Cruise Ships	70	1.5%
Port of Benicia	63	1.3%
Port of Redwood City	60	1.3%
Anchorages	958	20.2%
Refineries	857	18.0%
Industrial Wharves	116	2.4%
Port of Stockton	197	4.1%
Port of Sacramento	62	1.3%
<i>Totals</i>	<i>4,752</i>	<i>100%</i>

Source: San Francisco Bay Maritime Exchange, *Golden Gate Ship Traffic*, 2005

Bay Area maritime cargo includes containerized cargo at Oakland and San Francisco, bulk cargoes at San Francisco, Richmond, Redwood City, and Benicia, and crude petroleum products, raw sugar, bay sand and other materials handled at private terminals. Up until 2006, export cargo volumes at Oakland exceed import cargo volumes. However, increased imports from Asian countries and aggressive marketing by the Port of Oakland to capture “first port of call” business indicate that the importation business will increasingly overshadow exports. Growth in containerized cargo is forecast at 5 percent per year and, as can be seen in Figure 1, will continue to dominate future maritime trade. It should be noted that while petroleum represents only a small amount of the annual tonnage, and is projected to grow slowly, it requires more vessel trips per ton than do dry bulk goods.

Figure 1
Bay Area Seaport Tonnage Forecasts



Source: Bay Area Seaport Plan, 2003

Emissions

Emissions related to maritime activity generally comes from five types of sources – ocean going vessels, harbor craft (tugs and supply boats), off-road cargo handling equipment, trucks and locomotives. Stationary generators are used to operate pumps or other equipment at the refineries and industrial facilities. Table 2 on the next page provides estimates from the Air Resources Board (ARB) of daily regional emissions in 2005 and project emissions in 2020 from port activities. The project emissions in 2020 assume that no additional international, federal, state or local regulations are adopted beyond those in place by October, 2005.

Current efforts to control emissions

In 2006, ARB adopted the *Goods Movement Emission Reduction Plan*, which set out a mix of voluntary and regulatory measures to reduce emissions from maritime activities. An important consideration in developing measures to reduce emissions from any source is to recognize that voluntary measures work best when there is a regulatory compliance deadline looming that acts as both motivator and backstop to achieving needed emission reductions. The measures in ARB’s plan include emission standards for new engines, a mix of regulations and incentives to retrofit existing engines with abatement devices, and more extensive use of low sulfur fuels. Use of low sulfur fuels reduces particulate matter emissions from diesel engines. A list of ARB’s adopted and proposed measures is provided in Attachment 1.

The federal Environmental Protection Agency is expected to propose new, tighter emission standards for new engines used in locomotives and marine vessels. It is also expected that EPA will receive authority in 2007 to begin defining sulfur emission control areas, which will require use of low sulfur fuels in large ocean going vessels. The Pacific coast of the United States may be designated as a sulfur emission control area.

The Air District currently enforces regulations requiring vapor recovery during liquid transfers from ship-to-ship or ship-to-shore, control of fugitive dust during maintenance, and opacity limits for vessel exhaust. The Air District has also taken other steps to reduce emissions related to maritime activity. The Air District has partnering with the Port of Oakland to implement clean fuels such as liquefied natural gas and emulsified diesel fuels in trucks. The replacement of older marine engines in tugs, ferries, fishing vessels and supply boats has been a major focus of the Carl Moyer Program grants, and staff is recommending a grant to the Port of San Francisco to install shore power connections for cruise ships. The Air District is cooperating with other coastal Air Districts in underwriting a demonstration of abatement technology for engines on container ships, and is actively working with ARB, EPA Region 9, and the federal Maritime Administration in identifying additional demonstrations. The Air District is also collaborating with ARB in health risk assessments covering the Port of Oakland and western Oakland.

Table 2
San Francisco Bay Area Maritime Emissions
 (tons per day)

Emission Source	2005	2020
Diesel PM		
Ships	1.7	3.8
Harbor Craft	1.4	0.7
Cargo Handling Equipment	0.1	< 0.1
Trucks	2.6	0.4
Locomotives	0.3	0.3
NOx		
Ships	20.8	41.7
Harbor Craft	25.4	16.4
Cargo Handling Equipment	3.3	1.1
Trucks	60.1	23.8
Locomotives	13	12.9
SOx		
Ships	13.1	28.4
Harbor Craft	0.1	0.1
Cargo Handling Equipment	< 0.1	< 0.1
Trucks	0.5	0.1
Locomotives	0.2	< 0.1

Source: CARB, *Goods Movement Emission Reduction Plan*, 2006

CONCLUSION

Maritime activity in the Bay Area is expected to grow significantly during the next 15 years, especially international trade with Asia. This growth will be accompanied with increases in emissions of NO_x, SO_x and diesel PM. Emissions of carbon dioxide are also expected to increase and need to be better characterized. There are a number of regulatory and voluntary efforts underway to limit the growth in the emissions even while maritime activity increases. While these efforts are a positive step forward, there are no assurances that they will succeed in sufficiently controlling maritime emissions.

BUDGET CONSIDERATION / FINANCIAL IMPACT

None.

Respectfully submitted,

Jack P. Broadbent
Executive Director/APCO

Prepared by: Michael Murphy
Reviewed by: Henry Hilken

Attachment

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Attachment 1
CARB Regulatory Activity to Control Port-related Emissions

Pollution Source: Summary	Regulatory activity	Current Status
Heavy Duty On Road Vehicles	Emission standards for new engines	Coordinated MY 2007 ARB and EPA standards require use of diesel particulate filters, bringing PM rates to near-zero levels. MY 2010 standards will bring emissions to near-zero rates for NOx. Some natural gas engines are already compliant with MY 2010 standards.
	Fuel Requirements and specifications	15 ppm sulfur diesel standard fuel in California
	Commercial Vehicle Idling: limits idling of commercial trucks and buses to no more than 5 minutes	Adopted. Went into effect 1/1/2005
	School Bus Idling: no heavy duty vehicle idling within 1000 feet of schools	Adopted. Effective 7/16/2003
	Onboard Diagnostic System Initial requirements with MY2007 engines, more extensive requirements for MY2010 engines	Adopted. Went into effect 2/15/2006
	Heavy duty vehicle inspections	Begun in 1998
	ATCM – Heavy duty trucks at port and intermodal rail facilities	Currently under development. No workshops currently scheduled
	ATCM – Heavy duty commercial trucks	Currently under development. Next workshop scheduled for 4/11/2007 & 4/17/2007
Cargo Handling Equipment	New engine emission standards	Coordinate CARB and EPA standards adopted in 2000 and 2004, with varying compliance timelines depending on horsepower. Final Tier 4 standards will bring emissions down to near-zero levels by 2015 on average.
	ATCM - Cargo handling equipment	Adopted. Effective 12/31/2006
	ATCM – transportation refrigeration units	Adopted. Effective 12/10/2004.

Attachment 1
CARB Regulatory Activity to Control Port-related Emissions

Locomotives	New engine emissions standards	Adopted by EPA. New, tighter standards expected in 2007.
	Memorandum of Understanding between ARB and railroads	Signed June 30, 2005 BNSF and UP agree to reduce idling emissions from 99% of locomotives by 2008; community notices; health risk assessments; visible smoke limits
	California Diesel Regulation for Harbor Craft and Intrastate Locomotives	Adopted. Effective 1/1/2006 in SCAQMD; 1/1/2007 for the rest of the state. Requires the use of ULSD (<15 ppm sulfur)
Harbor Craft	New engine emission standards	Adopted by EPA. New, tighter standards expected in 2007.
	ATCM – Main and auxiliary engines	Proposed adoption in 2007
	California Diesel Regulation for Harbor craft and Intrastate Locomotives	Adopted. Effective 1/1/2006 in SCAQMD; 1/1/2007 for the rest of the state. Requires the use of ULSD (<15 ppm sulfur)
Ocean Going Vessels	New engine emission standards	Current modest NOx standards adopted by International Maritime Organization effective 1/1/2000. Proposed EPA standards to be released in 2007.
	ATCM – Auxiliary Engines	Adopted. Effective 1/1/2007 Requires low-sulfur marine fuel oil when vessels within 24 nautical miles of California shores
	ATCM – Main Engines	Proposed for adoption in 2007. Workshop on 3/20/2007
	ATCM – Shore power	Proposed for adoption in 2007. Workshop on 3/20/2007
	ATCM – On-board Incinerators	Adopted.
	ATCM – Vessel speed reduction	Proposed. No development timeline set.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Memorandum

To: Chairperson Miley and Members
of the Ad Hoc Committee on Port Emissions

From: Jack P. Broadbent
Executive Officer/APCO

Date: March 29, 2007

Re: Discussion of Air District's San Francisco Bay Area Green Ports Initiative

RECOMMENDED ACTION:

None.

BACKGROUND

As discussed generally with the Board of Directors at its January 17, 2007, retreat, the Air District will pursue a regulatory initiative to reduce emissions at marine ports throughout the Bay Area. The Committee will receive and discuss the regulatory concept for port emissions as set forth in the attached San Francisco Bay Area Green Ports Initiative.

BUDGET CONSIDERATION / FINANCIAL IMPACT

None.

Respectfully submitted,

Jack P. Broadbent
Executive Director/APCO

San Francisco Bay Area Green Ports Initiative

The San Francisco Bay Area is home to several marine ports. Emissions from the ports contribute to air pollution levels above State and federal air quality standards and unacceptable levels of health risk in the surrounding communities. Diesel particulate matter (DPM) is a pollutant of particular concern, both because DPM emissions from the ports and port-related activities are regionally significant and because health risk from DPM is a serious concern for the affected local areas. Criteria pollutants of most concern are particulate matter (PM), oxides of nitrogen (NO_x), which contribute to ozone and particulate matter pollution, and oxides of sulfur (SO_x), which contribute to PM pollution.

It is important to note that the risk to human health posed by any activity is related not only to the quantity of emissions generated but also to how close the release point is to the receptors. In many cases, the risks are higher for activities that contribute lower overall emissions but are carried out closer to workers and nearby residents. For example, diesel truck traffic, which releases emissions at ground level and often passes close to port neighbors, may pose higher risks than berthing and maneuvering, which release emissions from relatively tall stacks at some distance from workers and residents.

Ports and Air Pollution

Emissions from marine ports and related activities come from a number of sources including ocean going vessels, tugs, service vessels, cargo handling equipment, heavy-duty diesel trucks, locomotives and refrigeration units on trailers and containers. Directly emitted pollutants from these activities adversely affect local and regional air quality. Indirectly, the maritime activities also contribute to regional background levels of particulate matter, especially through entrainment of roadside particles and secondary particulate formation from NO_x and SO_x emissions.

The District's current estimates of region wide port emissions that occurred in 2005 are:

Pollutant	Emission (tons/day)	Percent of Regional Mobile Source Emissions
NO _x :	123	26%
SO _x :	14	79%
DPM:	6	35%

Source: CARB, *Goods Movement Emission Reduction Plan*, 2006

Action Plans

The District will propose regulations by the end of the first quarter of 2008 establishing air quality goals to reduce air pollution and health risks from marine port activities and requiring the ports to develop comprehensive action plans to meet those goals. Each plan shall ensure the port maximizes the benefits of existing and future State, federal and international regulatory standards. Further, the plans will be required to include specific commitments that capture and expand on current efforts by the ports to reduce air pollution as necessary to achieve the goals.

Goals – In order to protect air quality generally, and to address impacts on adjacent and other affected communities, the District will develop emission reduction goals for existing and new or expanded marine ports that will:

- Reduce health risks by reducing exposure to DPM and other toxic air contaminants
- Achieve “fair share” reductions of criteria pollutants relative to other facilities operating in the District
- Reduce greenhouse gas emissions

The specific goals will be developed during 2007 through a public process initiated by the District for use by the ports in developing their plans. These goals may be in the form of percentage reductions, mass emission limits, emission rates, or other limits as appropriate, and will be updated from time-to-time as necessary to incorporate new data and information, new science or new policy objectives. As a part of this process, each port, in consultation with the District, will be required to develop a comprehensive inventory of emissions from port activities and conduct a health risk assessment using existing data and resources to the maximum extent possible.

Plan Components – Each action plan shall include specific components to reduce emissions and the local and regional effects of air pollution in the Bay Area. Specifically, the plan will be required to contain the following components:

- A quantification of emission reductions and other benefits of compliance with all applicable State, federal and international standards and requirements
- Commitments to take additional actions as necessary to meet the emission reductions and health risk improvement goals established by the District. In preparing these commitments the port shall consider all available measures to reduce emissions and health risks, focusing on the most significant sources and health risks. This shall include but not be limited to the following:
 - Modification of operations to reduce emissions and to reduce localized impacts
 - Use of leases and other market participant mechanisms to accelerate use of cleaner ship engines, harborcraft and fuels used in these sources
 - Cold ironing or other clean technologies for ships at berth
 - Accelerate the pace of replacing, repowering and retrofitting diesel engines in the trucks and off-road equipment that service the ports
 - Vessel speed reduction policies
 - Replace or retrofit locomotive engines to meet the most stringent standards on accelerated schedule
 - Use of container fees and other incentives to provide resources to achieve plan commitments
- A schedule of milestones for any commitment expected to take more than one year to complete
- A mechanism for monitoring and measuring emission reductions and progress against plan
- A commitment to conduct a periodic review of the plan that includes the following:
 - Quantification of emission reductions achieved
 - An update of emissions inventories and health risk assessments
 - Modifications as necessary (1) to address deficiencies in implementation and (2) to address any changes in the goals established by the District

Attachment

San Francisco Bay Green Ports Initiative Regulatory Authority

Authority to establish source category-specific emission standards for vehicles, engines and other mobile sources operating at marine ports resides primarily with State, federal and international entities. State and federal agencies have adopted or plan to adopt stringent standards for many sources of port-related air pollution. International efforts to reduce air pollution from oceangoing vessels, though less aggressive, are also anticipated to result in improvements. These actions include NOx emissions limits for oceangoing vessels and sulfur limits for fuels used in those vessels established by the International Maritime Organization; emission standards for new locomotives, new trucks and some vessels promulgated by the U.S. Environmental Protection Agency; and emissions standards for new trucks and retrofit requirements for existing trucks, cargo handling equipment, and marine auxiliary engine fuels adopted by the California Air Resources Board. Standards for new vehicles, engines and equipment used at the ports and in port-related service will reduce emissions but the full benefits will not be realized for some time even with the accelerated turnover being driven by the airborne toxic control measures (ATCM).

The District has a number of authorities that can be used to expedite, increase and supplement these source category emission reductions. In addition to the broad general authority reflected in Health and Safety Code § 40000 (“local and regional authorities have the primary responsibility for control of air pollution from all sources, other than emissions from motor vehicles.¹”), the California Clean Air Act requires nonattainment areas to control emissions from indirect sources.² State law also directs the District to implement transportation control measures.³ Additional State and federal authorities include the California Environmental Quality Act and the conformity provisions of the federal Clean Air Act.⁴ These authorities can be used to ensure that the benefits of State and federal regulations are maximized in the Bay Area. They also provide the basis for calling on port owners and operators to overlay those source-specific standards with operational and other controls to reduce health risks expeditiously in affected areas and to achieve “fair share” reductions of emissions that cause ozone and particulate matter pollution.

¹ A “motor vehicle” is a self-propelled device that operates on the highway and not on stationary rails or tracks. Health & Saf. Code § 39039 and Veh. Code §§ 415, 670.

² Health & Saf. Code § 40910 et seq., specifically §40918. An “indirect source” is defined in federal law to include any “facility, building, structure, installation, real property, road or highway which attracts, or may attract mobile sources of air pollution.” 42 U.S.C. § 7410(a)(5)(C).

³ Health & Saf. Code § 40233. Transportation control measures include strategies to reduce vehicle use, miles traveled or idling, and traffic congestion.

⁴ 42 U.S.C. § 7506(c)(1), 7506(c)(2).