

Port of Long Beach Air Quality Improvement Projects Update

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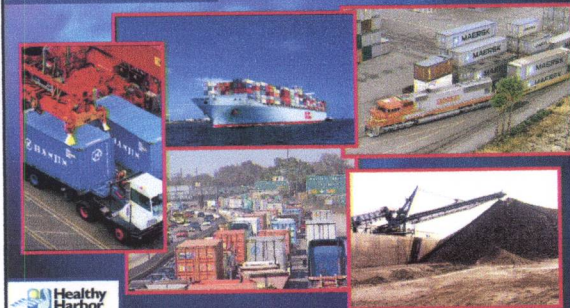


Air Quality Improvement Program-Topics

- Healthy Harbor Program
- Air Quality Improvement Component
- Sources and Challenges
- Target Pollutants
- Petroleum Coke
- Maritime Goods Movement Sources



Sources and Challenges



Target Pollutants: NO_x & PM

- NO_x – Nitrogen Oxides: An ozone precursor that significantly contributes to smog.
- Particulate Matter: PM₁₀ Microscopic particles that includes soot from diesel exhaust. Toxic air contaminant. Also PM >10 microns (e.g. pet coke)
- The South Coast Air basin exceeds Federal Air Quality Standards for both ozone and particulate matter.



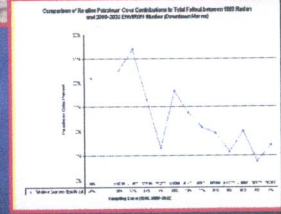
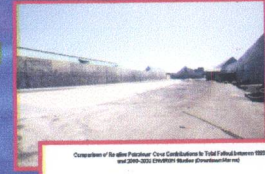
Cleanup of Petroleum Coke

- Required by A Rule 1158 and AB 1775
- Goal to reduce fugitive coke dust fallout
- Required changes in handling, storage, and transport of petroleum coke
- Various compliance deadlines



Program Completed

- All Components completed
- Efforts beyond those required
- Monitoring showed significant decrease in coke fallout
- Decrease from 21% to ~3-5% in 4 yrs.
- Voluntary monitoring to continue 1 yr



Maritime Goods Movement sources

Vessels



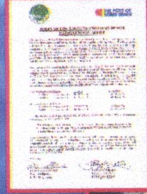
Smoke Stack Emission Reduction Program

- Particulates from smoke stack blows when engine started up
- Complaints/Damage from fallout
- Education/Outreach to vessel masters
- Training security personnel and AQMD reporting



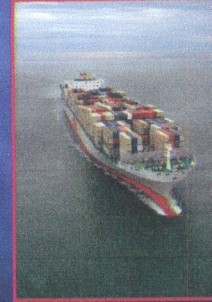
Vessel Speed Reduction Program

- Goal reduce NOx from transiting vessels
- Voluntary-MOU with Ports, Regulatory, MAREX, PMSA, SASC
- Currently ~50% participation
- ~1 ton/day current reduction



Vessel Retrofit Demonstration Project

- Retrofit demonstration project on existing vessel
- Maritime Working Group-CARB, EPA, Ports, Vessel operator
- Goal-NOx and PM reduction
- Fuel emulsification prior to injection



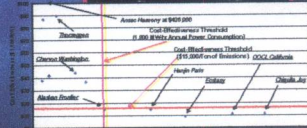
Cold-Ironing Feasibility Study

- Board/Council request to evaluate feasibility of providing shore based power to ships at berth
- Examined various vessels types and operational features.
- Determined cost effectiveness
- Also evaluated other control strategies.




Study Results

- Cold Ironing Feasible and Cost effective for some vessels
- "Frequent Flyers"
- High power demand 1,500,000 kW-hrs/yr
- Cost \$15,000/ton
- Some alternative strategies exist—but with implementation constraints

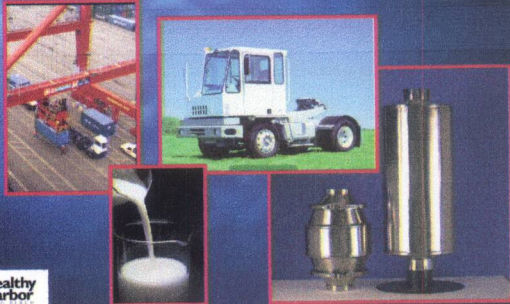



Maritime Goods Movement sources

Terminal and Landside Equipment




Retrofit of Tenant's Diesel Equipment & use of Alternative Fuel

Diesel Retrofit Program Reductions

- 535 Pieces of Equipment
- Primarily yard trucks, side picks, top picks, forklifts
- >80% engines mfg by Cummins
- 25% reduction from DOC
- >50% reduction with emulsified diesel

Retrofit	Program	Reductions
2003/04	tons/year	tons/day
NOx	36.54	0.10
PM	9.23	0.03



Port Owned Equipment

- Port owned and operated equipment limited
- "Practice what we preach"
- Use fleet vehicles with alternative fuels
- CNG & hybrid Security cars
- Vacuum & LPG street sweepers
- O2 Diesel for heavy duty equipment




Important Miscellaneous Air Related Efforts

- Emissions inventory of Port sources
- Requirement for all construction equipment to use ultra low sulphur diesel
- Proposed Port tariff requiring reduction of PM by 30% and NOx by 20%
- LNG yard equipment demonstration project



Maritime Goods Movement sources

Locomotives



Locomotive Fleet Upgrade

- PHL operates locomotives in Port
- Negotiating new agreement
- Replace all old engines with Tier II much cleaner engines
- Include Green Goat (hybrid) and LNG engines as part of fleet
- Future engine purchases equal to/or cleaner

