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PUBLIC HEALTH & ENVIRONMENTAL MITIGATION

PART 1: KEY ACTIONS

Legend:	***Immediate means within 1-2 years*** ***Near term means by 2010*** ***Mid term means by 2015*** ***Long term means by 2020***

A. Ocean Going Vessels

Action	***Timeframe***	***Cost (millions)***	***Impact***	***Comments***
Reduce vessel speed in harbor	Implemented in LA/LB, in Near term expand elsewhere	Savings	NOx reduction tbd	
Lower sulfur fuel (0.1% or 1000 ppm by 2010) for marine auxiliary engines	Immediate (adopt), near term (implement)	$165-171 capital cost plus cost of distillate	22 tpd SOx, 3 tpd PM, 2 tpd NOx	
Ratify MARPOL Annex 6	Immediate	n/a	n/a	Prerequisite for SECA designation
Sulfur Emission Control Area (SECA) designation for Pacific Coast or broader	Mid term	n/a	tbd	Analysis underway; would cap sulfur content for all vessels at 1.5%, 1500 ppm
Dedicate cleanest vessels to California service	Near, Mid and Long term (100 ships by 2010, ~400 ships by 2015, ~800 ships by 2020)	tbd	Increasing reductions of NOx, VOC and PM, per ship	
Increase use of cleaner fuels in all vessels	Near, mid and long term	Tbd	tbd	
Increase on-shore power or alternative emission reduction methods	Near term (20-40%), long term (~100%)	tbd	Substantial reductions in NOx and PM	
Retrofit existing main engines (all ships) during major maintenance	Mid and long term	tbd		

Retrofit main engines and/or auxiliary engines of frequent flyers	Mid and long term	tbd	Up to 90% NOx and VOC reduction; PM tbd	
Consider offshore cargo splitting to reduce trans-shipments through California	Tbd	Tbd	Tbd	
Pursue all opportunities to increase on-dock efficiency, reduce vehicle miles traveled, idling times, cargo lifts, etc.	Tbd	Tbd	tbd	

B. Harbor Craft

Action	***Timeframe***	***Cost (millions)***	***Impact***	***Comments***
Require cleaner fuel	Adopted	2-3 *(includes intrastate loco fuel rule)*	2 tpd NOx 1.7 tpd Sox 0.6 tpd PM *(includes intrastate loco fuel rule)*	
Retire, replace or retrofit older engines	Immediate (adoption), long term (full implementation	tbd	tbd	ARB rulemaking under development
Use shore power when not actively assisting other vessels	Near term	Tbd	tbd	
New engine standards	Mid term	Tbd	Tbd	Proposed by US EPA, final rule pending
Expand incentive programs to accelerate progress	Near, Mid and Long Term	Tbd	tbd	10% of Carl Moyer funds already reserved for goods movement projects

C. Rail yard Operations and Line-Haul Locomotives

Action	*Timeframe*	*Cost (millions)*	*Impact*	*Comments*
Lower sulfur fuel for captive instate locomotives	Adopted	*See harbor craft fuel rule above*	*See harbor craft fuel rule above*	
Implement 1998 Railroad MOU for South Coast Air Basin	Adopted	Not available	65% reduction in NOx by 2010 vs. baseline projection	
Implement 2005 Statewide MOU for Railyard Risk Reduction	Adopted	Not available	20% reduction in PM at or near major railyards	
Low-sulfur fuel for all locomotives (15 ppm)	Near term (adoption), long term (full implementation	tbd	tbd	
Tier 3 federal rulemaking for line haul locomotives (new engine and rebuild standards)	Near term (adoption), long term (full implementation)	tbd	tbd	
Upgrade engines in switcher locomotives	Mid term	Tbd	tbd	
Retrofit existing engines with diesel PM devices	Mid term	Tbd	Tbd	Feasibility testing underway
Consider cleaner fuels, particularly captive fleets and/or new facilities	Mid and long term	Tbd	Tbd	Under consideration for t Southern California International Gateway near dock rail facility
Accelerated turn-over of California Tier 0, 1 and 2 locomotives to Tier 3 (or equivalent)	Long term	Tbd	tbd	By agreement with RR companies, post US EPA rulemaking

D. Cargo Handling Equipment

Action	*Timeframe*	*Cost (millions)*	*Impact*	*Comments*
Retire, retrofit or repower higher emitting engines	Immediate (adopt), long term (full implem)	$71	6.1 tpd NOx 0.23 tpd PM	
Fork lift rule for gas-fired equipment	Immediate (adopt, mid term (implem)	Tbd	tbd	
Upgrade to 80% diesel PM control or better	Mid term	Tbd	tbd	Particulate traps currently not available for most pieces of equipment
Consider use/conversion to alternative fuels, especially for new facilities	Near, Mid and Long term	Tbd	tbd	Proposed for Southern California International Gateway near-dock rail project
Increase penetration of zero or near zero equipment	Long term	Tbd	tbd	

E. On-Road Heavy Duty Vehicles

Action	*Timeframe*	*Cost (millions)*	*Impact*	*Comments*
Implement CA/USEPA 2007 and 2010 emission standards	Adopted	$7600 *(10% share of national $70.6B 30-year cost)*	209 tpd NOx 8.5 tpd VOC 8.3 tpd PM	
Prohibit foreign-certified trucks from operating in California per AB 1009, Pavley (2004)	Immediate	$20.3	1.1 tpd NOx 0.04 tpd PM, plus prevents future increases	ARB rulemaking set for January 2006
Retire, retrofit or repower short haul trucks	Near and Mid term	$1000-1500	tbd	Extensive subsidies required for successful implementation
5 minute idling limitation	Adopted	Savings		

F. Off-Road Motor Vehicles

Action	***Timeframe***	***Cost (millions)***	***Impact***	***Comments***
Implement CA/USEPA standards for new offroad diesel engines in 2007 and later model years	Adopted	2700 *(10% share of national $27.1B 30-year cost)*	73 tpd NOx 6.9 tpd PM 3.0 tpd ROG	
Require green equipment for goods movement related construction and maintenance	Near term	tbd	tbd	Can state mandate?
Retire, retrofit or repower existing offroad engines	Near term (adoption), long term (full implementation	Tbd	tbd	ARB rulemaking underway

PUBLIC HEALTH & ENVIRONMENTAL MITIGATION

PART 2:
CRITERIA FOR SELECTING HIGHEST PRIORITIES

Threat to public health (exposure weighted)

Emission reduction potential

Immediacy of reductions

Technological feasibility

Fuel availability

Cost-effectiveness (measured by $$/ton reduced and/or $$/lives saved)

State authority to implement

Enforceability

PUBLIC HEALTH & ENVIRONMENTAL MITIGATION

PART 3:
METRICS FOR EVALUATING PROGRESS

Total tons of emissions reduced (NOx, PM, SOx, sulfate, VOC)

Percent of mortality risk reduced

Percent of cancer risk reduced

Ambient pollution measurements within affected communities

Number of Vehicles Retired, Retrofitted, Repowered, or Converted to Alternative Fuel

Pieces of Equipment Retired, Retrofitted, Repowered, or Converted to Alternative Fuel

Number of Frequent Flyer Vessels Retrofitted, Repowered

Number of Harbor Craft Retrofitted, Repowered, Replaced, or Converted to Alternative Fuel

Types of fuel utilized (e.g., sulfur content) and diesel-equivalent gallons consumed

Extent of electrification, measured by MWs consumed and net emissions reduced