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Environmental impacts of international shipping -- The role of ports

Case study of the ports of Los Angeles and Long Beach

This case study was prepared by Bill Sylte, Terry McGuire and Dave Calkins of Sierra Nevada Air Quality Group, LLC, California, United States, as an input to the project "Environmental Impacts of International Shipping – The Role of Ports" of the Working Group on Transport under OECD's Environment Policy Committee.

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FOREWORD

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EXECUTIVE SUMMARY

This case study describes the environmental practices that are were being carried out in late 2009 at the Port of Los Angeles (POLA) and the Port of Long Beach (POLB), sometimes referred to collectively as the San Pedro Bay ports. The importance of the two ports to U.S. and world trade derives primarily from the container cargo volumes they handle. The POLA and POLB are the first and second largest container ports in the U.S., and together they handle 60% of U.S. container traffic. Combined, the POLA and the POLB would be the world's fifth-busiest container port complex.

Environmental activity at the two Southern California ports is carried out by a complex array of government agencies and stakeholders whose jurisdictions frequently overlap and occasionally compete. Air and water regulatory processes are intended to assure open and complete communications between the regulatory agencies and affected parties, though disputes sometimes result in lawsuits challenging federal, State of California and local regulatory decisions as well as port expansion plans.

Air pollution control regulations are driven by the broadly held view that air pollution levels in California can cause extensive, long-term human health damage. The Los Angeles area has what is generally regarded as the most serious overall air quality problem in the U.S. National air quality goals are extremely difficult to attain in the Los Angeles area, despite decades of stringent air pollution control efforts and the substantial improvement that has occurred because of those efforts. While a decade ago relatively little attention was paid to air pollution from port-related sources in California, the situation changed dramatically by 2009 when virtually every port-related emission source—marine vessels, cargo trucks, locomotives, cargo handling equipment, tugs, dredges and other marine equipment—became subject to mandatory emissions reduction requirements that extend well beyond what is required at U.S. ports outside California. The centerpiece of the air pollution control effort is a series of California state regulatory requirements that has already changed the type of fuel used near the California coast, and which will, within 5 to 10 years, result in the replacement of most existing harbor craft engines, cargo trucks and cargo handling equipment, as well as alter port operations. The two ports are heavily committed to supporting accelerated implementation of regulatory requirements and to encouraging the development of new technologies. They adopted the CAAP with the goal of reducing portrelated emissions by 45% over a 5-year period ending in 2012. While the regulatory agencies and the ports are providing financial assistance, the onus for complying with most of the regulatory requirements lies not with the ports themselves, but with service suppliers, terminal operators and shipping lines.

Water quality regulations at the Ports of Los Angeles and Long Beach are also driven by concerns for public health, although less so than air pollution regulations. The regulation of water pollution in California port waters is the purview of numerous agencies of U.S., state, regional, county and city governments. Both the state and federal water quality regulatory programs strive to prevent water-borne threats to the health of human and aquatic life. Although waters of the Ports of Los Angeles and Long Beach are formally designated as impaired under federal law, water quality conditions in and around these ports are generally good.

Liquid waste discharges are controlled by a somewhat complex combination of California and U.S. EPA regulatory provisions. Except for sewage¹, state law prohibits liquid waste discharges in California coastal waters unless vessels

Throughout this document, sewage refers to sanitary sewage unless specifically stated otherwise (such as storm sewage).

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are unable to either store or offload wastes. Federal law prohibits discharging untreated sewage into U.S. waters and California is working with federal authorities to create no discharge zones (NDZs) in which all sewage discharges would be prohibited. In addition, virtually all discharges incidental to vessels' normal operation in port waters (except for sewage) are now regulated pursuant the federal *Clean Water Act* (CWA) by the U.S. EPA through the Vessel General Permit (VGP), which is administered by the U.S. EPA as a part of National Pollutant Discharge Elimination System (NPDES) program. The VGP applies to most commercial vessels that discharge waste into U.S. ocean waters. Most on-shore sources of water pollution are required to obtain individual NPDES permits. The U.S. EPA has delegated the responsibility to implement the NPDES program to the California Water Resources Control Board subject to EPA oversight. ² California's current regulatory approach to managing ballast water and reducing the introduction of non-native invasive species consists of ballast exchange requirements that apply in California coastal waters, and a series of ballast water discharge requirements that phase in between 2009 and 2020.

In adopting the *Global Warming Solutions Act* of 2006, California committed to reducing statewide greenhouse gas emissions to 1990 levels by 2020, about a 30% reduction from business as usual, and the goal of an 80% reduction below 1990 levels by 2050. The operation of ports and other goods movement activities are important contributors to greenhouse gas (GHG) emissions in California and therefore will be affected significantly by State and, eventually national, programs to address climate change. In 2008, pursuant to a legislative mandate (AB 32), the Air Resources Board adopted a "Scoping Plan" that contained an extensive list of measures to reduce GHG emissions, a number of which are specific to ports and goods movement. Planning is underway to change land use and transportation practices to further reduce emissions and to adapt to the climate change impacts that are already occurring. Although California cannot affect climate change significantly by its own GHG reduction programs, it seeks to provide leadership, influence U.S. national policies, and reap the economic awards of developing green technologies.

The expansion and development of the San Pedro Bay ports has greatly affected land use patterns near the ports and the transportation systems of the entire Los Angeles area. Land use in the immediate port area is generally unstructured and quite mixed in its composition. Industrial activities are interspersed with older, residential areas, which in turn see heavy truck, rail and cargo transfer operations. Efforts to improve the communities often conflicts with the desire to expand the capacity of the port onto formerly residential and business areas. Land uses become more residential and commercial in nature as one proceeds further into the Los Angeles Basin and eventually to the hinterlands of Riverside, San Bernardino, and Ventura counties. Concern for the environmental and related impacts of port expansion and the growth in goods movement activities on communities near the port and along transportation corridors has lead to conflict that has played out both in the courts and the political arena.

Approximately three quarters of the container-based goods handled by the San Pedro Bay ports are assigned for delivery outside the Southern California region, while the remainder is distributed almost exclusively by truck to locations within the five-county metropolitan region. Transportation policy therefore reflects the view that there is a substantial environmental advantage to moving containers by rail versus truck, and that the more efficiently containers can be transferred from vessel to rail the better. Both ports have the goal of increasing on-dock rail such that 30% of its cargo would be handled by on-dock facilities by 2030. Nevertheless, port space limitations and the sheer magnitude of projected cargo growth mean that the ports will continue to rely heavily on drayage trucks for container moves to near-dock rail facilities and to other transfer points. A major bottleneck for rail cargo was significantly reduced in 2002 with the opening of the Alameda Corridor, a below grade, dedicated rail link that has sped the movement of freight away from the ports and reduced both surface street traffic congestion and air pollution. A similar but longer special rail corridor, the Alameda Corridor East, is now under construction from downtown Los Angeles to the eastern counties. Longer-term plans foresee such possibilities for truck and rail as dedicated truck lanes, truck-climbing lanes, more off-peak activity at the ports, a high-speed rail transport system using a guide way shared with passenger trains, and the expanded use of a "virtual container yard" to increase the efficiency of truck activity.

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This delegation does not include the vessel general permit (VGP) program that was discussed earlier in this section.

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Hazardous materials that are transported in containers are stored in individual containers specifically manufactured for storing and transporting such material. Hazardous material manifests for inbound containerized hazardous materials are reviewed and approved by the Port Security and the City's Fire Department before they can be unloaded. In addition to port requirements, there are a number of city, state and national requirements that apply to protect workers and the public, including the requirement that facilities which store or handle hazardous material prepare a Risk Management Plan (RMP). The RMPs must contain a hazard assessment of potential "worst-credible" accidents, an accident prevention program and an emergency-response program. Noise issues are dealt with by a series of ordnances and special mitigation practices. The two ports are financial supporters of a large-scale effort to enhance and restore wetlands and coastal wildlife habitats in Southern California. Their participation is considered mitigation for the expansion of their operations and the use/consumption of coastal resources.

ENVIRONMENTAL IMPACTS OF INTERNATIONAL SHIPPING: A CASE STUDY OF THE PORTS OF LOS ANGELES AND LONG BEACH

1. Introduction

- 1. This case study describes the environmental practices that are being carried out at the Port of Los Angeles (POLA) and the Port of Long Beach (POLB), sometimes referred to collectively as the San Pedro Bay ports. It discusses the institutional and policy contexts in which port-related environmental practices occurred in Southern California in the autumn of 2009, and it reviews the regulatory, policy and voluntary initiatives that were being carried out to address the two ports' impacts on air, water, climate change, land use and transportation. In so doing, it discusses how the port operators, local authorities, state authorities, national authorities and other relevant actors address the issues highlighted in Per Kågeson's scoping paper [ENV/EPOC/WPNEP/T(2008)11] entitled "The Environmental Impacts of Seaports".
- 2. The two ports are located adjacent to one another but are operated separately. Their importance to U.S. and world trade derives primarily from the container cargo volume they handle. The POLA and the POLB are the first and second largest container ports in the U.S., collectively handling over 60% of the U.S.'s 22.6 million TEU volume in 2007.³ In terms of world ranking, the POLA and the POLB combined would be the world's fifth-busiest container port complex, behind Singapore, Shanghai, Hong Kong, and Shenzhen. The two ports also handle dry and liquid bulk, break bulk, and automobiles. The POLA also has a large cruise ship terminal, called World Cruise Facility.

2. Institutional Context

- 3. Environmental activity at the two Southern California ports is carried out by a complex array of government agencies and stakeholders. Numerous government agencies are involved, and their jurisdictions frequently overlap and occasionally compete as they deal with port-related environmental issues. What follows is a partial list of government agencies, featuring those that are most important to understanding the activities described in this report.
 - U.S. Environmental Protection Agency (U.S. EPA) A federal (national) government agency that administers, among other mandates, the *Clean Air Act* and the *Clean Water Act*. U.S. EPA engages in direct regulation, for example air emissions standards for locomotives, marine engines and trucks, and it oversees states as they carry out the mandates contained in federal law, such as federally mandated permit programs.
 - U.S. Coast Guard The United States Coast Guard is a multi-mission, maritime service within
 the Department of Homeland Security that is considered one of the nation's five armed services.
 It is charged with maintaining Maritime security, waterway management, vessel safety and some
 domestic and international environmental agreements.

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American Association of Port Authorities website, http://aapa.files.cms-plus.com/Statistics/CONTAINERTRAFFICNORTHAMERICA1990-2008.xls, accessed September 23, 2009.

- Air Resources Board The ARB is California's state air pollution regulatory agency. In recognition of California's unique and serious air quality problems, the federal *Clean Air Act* gives California the authority to adopt its own mobile source emissions standards and fuel requirements, subject to case by case approval by the U.S. EPA. The ARB does not have the authority to regulate interstate locomotives or vehicles registered in other states or to set emissions standards for marine vessels, but it can impose fuel use requirements within the State and in California coastal waters. The ARB also has the lead in controlling pollutants that pose an airborne cancer risk to the public.
- South Coast Air Quality Management District The SCAQMD is the regional air pollution control agency for the Los Angeles area. It has jurisdiction over stationary sources, develops and updates the federally required Air Quality Management Plan (AQMP) for the area, and administers a number of programs that provide incentive grants to retrofit and/or replace older, high polluting equipment with cleaner equipment.
- Water Resources Control Board The State Water Resources Control Board (SWRCB or State Board) and the nine Regional Water Quality Control Boards (RWQCBs or Regional Boards) are responsible for the protection and, where possible, the enhancement of the quality of California's waters. The SWRCB sets state-wide policy, and together with the RWQCBs, implements state and federal laws and regulations.
- Southern California Association of Governments SCAG has overall regional and transportation planning responsibility for most of Southern California, with the exception of San Diego and Santa Barbara counties. Its members are the 175 cities and 6 counties of the Los Angeles region, and it is the largest metropolitan planning agency in the United States. It has a number of responsibilities, but the most relevant to port issues is its charge to maintain a planning process that results in a Regional Transportation Plan and a Regional Transportation Improvement Program. SCAG is also charged with the analysis and determination that all projects and regulations in the region "conform" to the mobile source emission budgets contained in the AQMP. SCAG also serves as a regional clearinghouse for programs that provide federal financial assistance and direct development activities to the region.
- The Ports of Los Angeles (POLA) and Long Beach (POLB) The two ports are governed and administered independently from one another, though in recent years, they have cooperated on a number of environmental issues. The Cities of Los Angeles and Long Beach each appoint a Harbor Commission to oversee its respective ports. The two cities operate the ports under the provisions of the California Tidelands Trust Act, which provides a degree of financial separation between the two cities and their ports. The ports generate their own funds and do not use any tax dollars from the cities' general funds. The *Tidelands Trust Act* states that all the money generated by the Port must be used to further commerce, navigation and fisheries, therefore a major portion of the revenue generated goes toward the continual process of building and renovating the wharves, warehouses and other structures on the waterfront. The ports are sometimes described as landlord ports, because they lease their property to tenants who then operate their own facilities. The ports derive their revenue from rents and by providing such services as dockage, wharfage, pilotage, storage and other services. Neither port has direct regulatory authority over air or water pollution, but can use its contractual authority with tenants and service providers to further environmental policy and/or regulatory goals. Because of the key position of the two ports in U.S. West Coast trade, they can exert considerable leverage on the shipping industry on environmental issues.
- The Cities of Los Angeles and Long Beach The cities control land use adjacent to the ports
 and provide public services to nearby residents. While the cities exert some policy influence
 through their appointment of the Harbor Commissioners that govern the ports, the ports are not

under the direct control of the cities' mayors or city councils. One of the main tools the cities have for influencing port decisions that affect their interests and city residents is the *California Environmental Quality Act* (CEQA), which is described briefly in the next section and discussed elsewhere in this report.

- The California State Lands Commission The Marine Facilities Division of the California State Lands Commission regulates port activities, including marine invasive species and oil transportation.
- 4. The process by which California agencies adopt and amend regulatory requirements is lengthy and contains numerous opportunities for those affected to provide input to the process. The ARB, SCAQMD and SWRCB conduct a number of workshops before making formal regulatory proposals to their governing boards for decision. The rule development process tends to assure open and complete communications between the regulatory agencies and affected parties. Lawsuits challenging California regulatory decisions typically address situations where affected parties contend that the agency has either exceeded its legal authority or abrogated its legal responsibility. Lawsuits tend to be more frequent where sources or operations are being regulated for the first time, as has been the case with a number of port-related regulations.
- 5. Lawsuits have been filed based on allegations that the ports had failed to comply fully with provisions of two environmental disclosure laws, particularly the *California Environmental Quality Act* (CEQA). As discussed elsewhere, the CEQA requires lead agencies to both disclose all environmental impacts fully and, to the extent feasible, mitigate those impacts. CEQA is often a source of lawsuits when the public participation process is not completely successful and stakeholders feel that lead agencies are not responsive to their concerns.

3. Policy Context

- 6. This section describes some of the major policy considerations that have influenced the environmental initiatives discussed in this report. In general, environmental initiatives at the Ports of Los Angeles and Long Beach are driven more by state and local policy influences than national or international concerns.
- 7. In 2006, the State of California produced a Goods Movement Action Plan (GMAP). The GMAP outlines a comprehensive strategy to address the economic and environmental issues associated with moving goods via the state's highways, railways and ports. It set goals for improving the flow of goods throughout California. The plan was developed to promote economic growth, encourage the creation of new, high-paying jobs, and address the environmental challenges of this growing industry. The GMAP identifies approximately 200 actions and projects recommended for further investigation, review or implementation. In aggregate, preliminary findings indicate that the collective capital costs total approximately \$15 billion. Key portions of the GMAP were incorporated in Southern California's 2008 Regional Transportation Plan and therefore will influence Federal funding of key port transportation projects. Environmental improvement was a major element of the GMAP. For example, the total cost for goods movement related air emission reduction strategies, as compiled by the California Air Resources Board (ARB) in a follow up planning effort, was estimated to be between \$6 billion and \$10 billion.
- 8. California also approved large-scale public borrowing to provide State funding for infrastructure and environmental improvement projects. The *Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act* of 2006 authorized the state to issue USD 19.925 billion of state general obligation bonds for specified purposes, including high-priority transportation corridor improvements, and USD 1 billion for air quality improvement projects. Because of the recession and other problems, California has experienced a series of budget crises since the bonding authority was approved, and the

State has slowed down both bond sales and grant awards. Nonetheless, bond-funded financial support has provided considerable impetus to port-related environmental programs, particularly in the air quality area.

- 9. California's environmental regulatory priorities and actions are driven by an array of public concerns, concerns that differ by environmental issue. Air pollution control regulations are driven by the broadly held view that air pollution levels in California can cause extensive, long-term, human health concerns. Human exposure to elevated levels of ozone can damage the tissues of the respiratory tract, causing inflammation and irritation, and result in symptoms such as coughing, chest tightness and worsening of asthma symptoms. Exposure to particulate matter produces even more serious damage, including the increased risk of hospitalization for lung and heart-related illness, and additional emergency room visits for asthma. Particulate exposure is also associated with increased risk of premature deaths, especially in the elderly and people with pre-existing cardiopulmonary disease. In children, studies have shown associations between fine particulate matter exposure and reduced lung function and increased respiratory symptoms and illnesses.
- 10. Although the cancer risk levels associated with exposure to diesel particulate matter (DPM) and other airborne carcinogens is a small fraction of the overall lifetime cancer incidence in the U.S., risk reduction is a major public policy priority in California. In 2006, the ARB produced a report summarizing the health risk associated with DPM and particulate exposure from emissions generated by the two San Pedro Bay Ports. This *health risk assessment* found that the two ports were elevating cancer risk over hundreds of square miles, affecting almost 2 million people, increasing cancer risk by as much as 500 in a million for residents living closest to the ports, and causing 14 to 43 premature deaths each year. The risk assessment produced banner headlines in Los Angeles and added to the focus on port air emissions.
- 11. Water quality regulations at POLA and POLB are also driven by concerns for public health, but less so than air pollution regulations. While two of the largest public concerns in the Los Angeles area are clean beaches and uncontaminated seafood, there is also broad concern for the ecological impacts of water contamination. Such issues as *non-point* urban and industrial area runoff, and the impact of invasive species, are of considerable concern.
- 12. Issues that are more complex drive California's climate change initiatives. While reducing emissions of greenhouse gases is of benefit, California's contribution to the worldwide greenhouse gas inventory is estimated to be less than two percent. The State's impact lies in its leadership within the U.S., setting an example for other states and the U.S. national government to follow. This approach has had some success. California's fuel efficiency standards for passenger cars and light trucks for example, have been incorporated in a national fuel efficiency standard that when formally approved will eventually displace the state program. In addition, California sees a major economic opportunity in green technologies and hopes to recover the cost of its greenhouse gas reduction measures with increased jobs and economic activity. California's climate change plans, policies and programs are discussed in more detail later in this report.
- 13. The two ports have seen considerable pressure to increase their attention to environmental issues during the last six to eight years, and as a result have undergone something of a culture change. A number of factors have been influential:
 - The ARB health risk assessment described above raised public awareness of the amounts of emissions of air pollutants and impacts on the region;
 - Increased pressure from regulatory agencies like the South Coast Air Quality Management District to reduce emissions in support of the Air Quality Management Plan (AQMP);

- Increased public concern in surrounding communities about port expansions and their impacts on noise, traffic congestion, air pollution and environmental justice;⁴
- Several major lawsuits that resulted in agreements to mitigate the environmental impacts of the ports on neighboring communities;
- Concerns raised in the hinterlands about the impacts of freight movement through their communities; and
- Opportunities provided by the Goods Movement Action Plan and the funding the State of California and U.S. Federal Government have made available to fund the infrastructure improvements needed to reduce environmental impacts.
- 14. The lawsuits were major milestones for the relationship between the cities, local communities and the ports. The lawsuits resulted in delays of several major port expansion projects and criticism from green, non-governmental organizations and their political supporters. The lawsuits were based on allegations that the ports had failed to comply fully with provisions of two environmental disclosure laws, the *National Environmental Policy Act* (NEPA) and the more stringent *California Environmental Quality Act* (CEQA). CEQA requires lead agencies, in this case the two ports, to both disclose all environmental impacts fully and to the extent feasible, mitigate those impacts. Settlements stemming from the lawsuits resulted in commitments by the ports, particularly the POLA in a case called *China Shipping*, to extensive mitigation of the impacts of Port expansion. These mitigation practices and the commitments that underlie them have become normal operating procedures for the two ports.
- 15. As the various pressures mounted, the ports decided to take the initiative to adjust their policies and develop the Clean Air Action Plan and other initiatives that supported, rather than resisted, regulatory pressures. The result is what is arguably the most advanced and aggressive set of environmental initiatives of any port complex in the U.S. While the current economic downturn and significant public finance issues in California have slowed the implementation of environmental initiatives since 2008, there are few indications that the basic policy direction discussed in this report will be reversed.

4. Environmental Issues

4.1 Air Pollution

4.1.1 Introduction

While a decade ago relatively little attention was paid to air pollution from port-related sources in California ports, the situation had changed dramatically by 2009. In 2009, virtually every port-related emission source – marine vessels, cargo trucks, locomotives, cargo handling equipment, tugs, dredges and other marine equipment – are subject to mandatory emissions reduction requirements that extend well beyond what is required at other U.S. ports outside California. The centrepiece of the air pollution control effort is a series of California state regulatory requirements that have been adopted by the Air Resources Board, the State's air pollution control agency. These regulatory programs have been supported and enhanced by the regional air pollution control agency in the Los Angeles area (the South Coast Air Quality Management District or SCAQMD), the U.S. EPA and the two ports. While the regulatory agencies and the ports are providing financial assistance, the onus for complying with most of the regulatory

California also has *environmental justice* policies in place to protect low income and minority communities that live in areas with elevated air pollution levels and other environmental problems. Environmental justice is defined by state law as the fair treatment of people of all races, cultures and incomes with respect to the development, adoption, implementation and enforcement of environmental laws, regulations and policies.

requirements lies not with the ports themselves, but with service suppliers, terminal operators and shipping lines.

4.1.2 Background

- The Los Angeles area⁵ has what is generally regarded as the most serious overall air quality 17. problem in the U.S. Air pollution levels in the Los Angeles area frequently exceed national and state ambient air quality standards for ground level ozone and fine particulate matter (PM_{2.5}). The Los Angeles area is also the most populous and industrialized part of California, and the air pollution emissions generated there affect not only regional air quality but also areas downwind, including some parts of the neighboring states of Nevada and Arizona. Owing to the severity of the air pollution problem, the regional Air Quality Management Plan (AQMP) for the Los Angeles area is also one of the most comprehensive and far reaching in the nation.
- 18. National air quality goals are extremely difficult to attain in the Los Angeles area, despite decades of stringent air pollution control efforts and the substantial improvement that has occurred because of those efforts. According to the 2007 AQMP, population exposure to unhealthy levels of ozone has declined by roughly 35% since 1990, and even the most heavily polluted areas of the region have seen almost a 50% decline in the number of days they exceed the national ambient air quality standard for ozone. Average particulate levels have also been declining, though less sharply than ozone. Nevertheless, the current 2007 AQMP estimates that to attain the national ozone standard by 2024 as required by the U.S. Clean Air Act, it will be necessary to reduce regional nitrogen oxides (NO_x) emissions by nearly 90% compared to 2006 levels. To attain the PM_{2.5} standard, it will be necessary to reduce regional NO_x emissions by 55%, and $PM_{2.5}$ emissions by 15%, also compared to 2006 levels⁷.
- The two San Pedro Bay ports are substantial contributors to regional emissions of air pollutants. The Clean Air Action Plan estimates that in 2006 the two ports contributed 9% of the NO_x, 12% of the DPM and 45% of the sulphur oxides (SO_x) produced in the Los Angeles region. 8. Historically, the relative and absolute importance of port-related air emissions has increased considerably since 1990. Non-port related emissions have declined substantially during this period because of both intensive emissions control efforts and the gradual decline in heavy industrial activity in the Los Angeles area. Meanwhile, port-related emissions have grown because of substantially increased port activity and relatively less stringent controls of port-related emissions sources.9 As a result, emissions from the ports have attracted considerable attention since 2000, and the sources of those emissions have been targeted by the AQMP.
- 20. A second and more closely related air pollution issue that affects air quality regulations at ports is the cancer risk to the public that is posed by exposure to diesel particulate matter (DPM). While there are many other sources of airborne cancer risk, DPM stands out. In 1998, the State of California identified DPM as an airborne carcinogen and estimated that it was responsible for roughly 70% of the total

⁵ The area is called the South Coast Air Basin in California law.

²⁰⁰⁷ AQMP, Appendix II, SCAQMD website, www.aqmd.gov/aqmp/07aqmp/index.html, accessed 15 September 2009. The national ambient standard for ozone is a concentration of 0.075 parts per million, measured over 8-hours.

In the Los Angeles area, studies have shown that controlling NOx emissions is critical to reducing the atmospheric formation of both ozone and secondary particulate matter. SOx are also an important contributor to secondary particulate formation.

Final CAAP, San Pedro Bay Ports, 2006.

For example, in 2006 the POLA handled 8.5 million TEUs compared to 2.1 million in 1990. See POLA website www.portoflosangeles.org/maritime/stats.asp, accessed 25 September 2009.

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population-weighted cancer risk in California from all air pollutants combined. Both the level of risk and the contribution of DPM to that risk tend to be higher in urban areas, particularly near facilities where numerous, large diesel engines are in operation. Since virtually every piece of mobile equipment in use at ports uses a diesel engine, DPM emissions at the two San Pedro Bay ports have drawn considerable attention from air regulators.

4.1.3 Planning and Regulatory Activity

21. In response to the air quality problems described above, California has carried out several major initiatives to reduce air emissions from port-related sources. The 2007 AQMP and its predecessors, the state-wide 2000 Diesel Risk Reduction Plan and the 2006 Goods Movement Emissions Reduction Plan, each contained measures designed to reduce nitrogen oxide and/or DPM emissions from port-related equipment. The Goods Movement Emissions Reduction Plan, which was developed by the California Air Resources Board, addressed virtually every port-related source of emissions. It incorporated actions taken at the national and regional levels, but also added commitments to a substantial number of California-specific regulatory actions. In combination, the measures in the Goods Movement Emissions Reduction Plan are expected to reduce public DPM exposure by 80 to 90%, depending on the exposed community. The measures will also provide considerable NO_x and SO_x reductions. Table 1 below provides a list of the most important control strategies that are being carried out under the umbrella of the Goods Movement Emissions Reduction Plan.

Table 1. List of Strategies to Reduce Emissions from Ports and Goods Movement

Strategy	Status (Adopted or Proposed)	Compliance Date	Notes	
MARINE VESSELS				
Vessel Speed Reduction Agreement for Southern California	2001	In effect	Voluntary program encouraged by financial incentives	
ARB Expanded Vessel Speed Reduction Programs	Proposed	2010 or later	Mandatory program to reduce speed to 12 MPH within 24 or 40 miles of ports	
U.S. EPA Emission Standards for Marine Vessel Main Engines	2003	In effect	Affects U.S. flag vessels but are consistent with prior MARPOL Annex VI standards	
Incorporate in IMO Standards more stringent NO _x emissions limits for new vessel main engines and reduce fuel sulfur limits,	2008	2011 to 2016	2008 IMO Annex VI revisions	
U.S. EPA Main Engine Emission Standards	Proposed by EPA and scheduled for finalization in late 2009	2011-2016	Implements new MARPOL Annex VI standards for U.S. flag vessels	
ARB Rule for Ship Main Engine fuel	2005	2009 & 2012	All vessels must use 0.1% S fuel within 24 miles by 2012	
ARB Rule for Ship Auxiliary Engine Fuel	2005	2009 & 2012	All vessels must use 0.1% S fuel within 24 miles by 2012	
Emission Control Area (ECA) or Alternative	Proposed by U.S., Canada & France	2015	Proposed ECA area extends 200 miles from coast line. If the ECA is formally adopted, the 0.1% S limit would eventually displace California rule	
ARB Shore Based Electrical Power Rule	2007	Phase in 2010-2020	Reduce at-berth emissions from auxiliary engines by 80% by 2020	
CARGO HANDLING EQUIPMENT				
U.S. EPA Non-Road Diesel Fuel Rule	2004	2007 & 2010	Reduces sulfur allowed in diesel fuel to 500 ppm in 2007 and to 15 ppm in 2010. Affects all off-road diesel equipment at ports	
ARB Rule for Diesel Cargo Handling Equipment	2005	2007	New equipment must meet EPA standards and in-use equipment (gantry cranes, top picks, etc.) must phase out older engines on an accelerated schedule.	

Strategy	Status (Adopted or Proposed)	Compliance Date	Notes
California Financial Incentives for Cleaner Engines (Carl Moyer Program and others)	2000	Ongoing	Provides grants to equipment owners to retrofit or replace older high-emitting diesel engines. Harbor craft, locomotives and trucks are also eligible
	HAI	RBOR CRAFT	•
ARB Rule on New and In-Use Harbor Craft Engines	2007	2009	Replacement engines must meet EPA emissions standards. In-use harbor craft must replace their engines with new engines on accelerated schedule
U.S. EPA Standards for New Marine Engines	2004	2008 & 2014	Affects tugs and other harbor craft. In-use engines must be upgraded during overhaul; new engines must meet EPA Tier IV off-road standards by 2014
CAAP Cold Ironing Strategy	2006		Tugs home ported at POLA & POLB must use shore power while at berth
	CAI	RGO TRUCKS	
U.S. EPA/ARB Rule for New Heavy-duty On-road Diesel Engines	2000	2007 to 2010	Emission limits require all new trucks to utilize diesel particulate filters and advanced NO _x control systems.
ARB Drayage Truck Replacement Rule	2008	2010-2013	Bans use at ports of trucks with older engines, starting with oldest trucks first. All trucks must be 2007 or newer by 2013. Financial assistance is available to truck owners.
ARB In-use Truck Rule	2008	2011-2023	Accelerates the retirement of all heavy-duty trucks state-wide. Allows some trucks to retrofit with emissions control systems as an interim measure. The ARB was considering extending the compliance schedule in late 2009. Limited financial assistance is available to truck owners.
ARB Truck Idling Rules	2003	2008	Limits idling to 5 minutes by manually shutting down engines or by using automatic shutdown devices
9	LOCOMOT	IVES & RAIL	
U.S. EPA Standards for New Locomotive Engines	2004	2008 & 2015	Affects line haul and switching locomotive engines. In-use engines must be upgraded during overhaul; new engines must meet EPA Tier IV off-road standards by 2015
ARB Fuel Rule for Intrastate Locomotives	2004	2007	Locomotives operating within California must use ultra-low sulfur diesel fuel
Railyard Risk Reduction Plans (MOU between State and Railroads)	2005	2010	Railyards must develop plans to reduce NO _x and DPM risk using such tools as idle restrictions and better maintenance practices. In Los Angeles, locomotives must meet EPA Tier II standards by 2010.
ARB Recommendations to Implement Further Locomotive and Rail Yard Emission Reductions	Currently Proposed	2014— 2020	Involves five measures to retrofit locomotive engines with NO _x and DPM controls and to accelerate the introduction of EPA Tier IV engines
OTHER PORT RELATED SOURCES			
ARB Reefer Rule	2004	2009	Reduces operation of diesel powered refrigeration units on trucks and containers by making electrical grid power available and imposing other operational restrictions.
On-board Incineration Rule	2005	2007	Bans operation of on-board incinerators within 3 miles of California shoreline.

Source: Goods Movement Emissions Reduction Plan, updated with information from the California Air Resources Board website, www.arb.ca.gov/planning/gmerp/gmerp.htm, accessed September 8, 2009.

22. As shown in the above table, nearly all of the port-related emission reductions measures are already in effect or are in the process of being implemented. Collectively, the measures represent a comprehensive effort by California to reduce port-related emissions through regulatory action and present a major challenge to the ports and the maritime industry. Regional agencies like the SCAQMD and SCAG have linked their planning efforts to elements of the State's regulatory program. The two San Pedro Bay

Ports have joined to assist their service providers, tenants, shipping lines and vessel operators to comply with the new regulations and to encourage early action to reduce emissions. Many regulations rely on a combination of regulatory mandates and financial incentives to accelerate the retirement of older, dirtier engines and replace them with engines meeting new, stringent national emissions standards.

4.1.4 Port Activity

23. In November 2006, the POLA and POLB port commissions adopted the San Pedro Bay Ports Clean Air Action Plan (CAAP). The CAAP is a commitment by the two ports to cooperate with the regulator agencies and use their authority to accelerate the implementation of some of the most important and potentially effective, regulatory measures listed and described in the table above. The goal of the CAAP is to reduce port-related emissions, particularly NO_x, DPM and SO_x by about 45% over a 5-year period ending in 2012. An overview of the CAAP is provided below. 10

"In the final action plan, the ports developed commitments and milestones for achieving air emission reductions and have committed to use pollution-based impact fees so that polluters pay their part to improve air quality.

The ports agreed to develop tariff-based incentives and requirements, such as vessel speed reduction incentives and port-mandated fuel requirements, to curb harmful air emissions, and committed to work with the air quality regulatory agencies (AQMD, CARB and EPA) to establish San Pedro Bay air quality standards, as well as mechanisms for tracking improvements in air quality.

The Plan commits the ports to invest hundreds of millions of dollars in air quality improvement programs, along with the local air district, the State and port-related industry.

Under the Plan, the ports will endeavor to eliminate dirty diesel trucks from San Pedro Bay cargo terminals within five years by helping to finance a new generation of clean or retrofitted vehicles.

The Plan also calls for all major container cargo and cruise ship terminals at the ports to be equipped with shoreside electricity within five to ten years, so that vessels at berth can shut down their dirty, diesel-powered, auxiliary engines and plug into clean electricity. The Port of Long Beach will develop shore-side electricity for ships at 10 to 16 Long Beach berths in five years; the Port of Los Angeles will facilitate shore-side electricity for ships at 15 berths within five years. To reduce emissions of air pollutants, ships will also be required to reduce their speeds when entering or leaving the harbor region, use low-sulfur fuels, and employ other emissionreduction measures and technologies."

The program to replace all the older, diesel trucks with newer, clean trucks is a centerpiece of the CAAP, and it has moved forward amid considerable controversy and litigation. The core of the program is the phase-out of older trucks by banning their use on port property. By 2012, only trucks that comply with U.S. EPA emission standards for 2007 model year trucks will be allowed to haul cargo at the two ports. The CAAP supports the CARB regulatory requirement with a program of financial incentives that help truck owners replace existing truck engines with 2007 compliant trucks and engines. While substantial state funding is provided, the two ports are also levying a controversial, USD 35 per Twenty-Foot Equivalent Unit (TEU) container Clean Trucks Fee to provide a local source of funding. 11 The fee is paid by cargo owners and collected by terminal operators. According to POLA, the program is moving forward

¹⁰ San Pedro Bay Ports Clean Air Action Plan, POLA website, www.portoflosangeles.org/environment/caap.asp, accessed 10 September 2009.

¹¹ This fee is in addition to the USD 15-18 "Cargo Infrastructure Fee" that is discussed elsewhere in this report.

rapidly despite the controversy and on-going and still unresolved legal actions, with close to 60% of the cargo at the port being handled by 2007-compliant trucks as of mid-2009.

- 25. Until June 2009, the two ports provided financial incentives to vessel operators to use low-sulfur fuel in their main engines as they approached the ports. The program covered the differential between the cost of regular and compliant fuels. However, since the use of low-sulfur fuel within 24 miles of the California coast is now a state-wide regulatory requirement, the financial incentive program has been discontinued. POLB continues to operate its *Green Flag Program* that provides reduced docking fees to vessels that comply with a voluntary speed limit of 12 knots in Southern California waters. Both ports continue to install the dockside infrastructure needed for container and passenger vessels to plug-in to shore power during their visits. This infrastructure is being used on a voluntary basis at present until "cold ironing" *i.e.* the use of shore power becomes mandatory under California regulatory requirements.
- 26. The ports are also carrying out a number of efforts to promote new and innovative air pollution control technologies, the greater use of electrification, and the use alternative-fuelled equipment, like compressed natural gas engines. These efforts both support the short-term goals of the CAAP and encourage technologies and practices that could reduce emissions in the more distant future.
- 27. For example, the two ports have developed a Technology Advancement Program (TAP) to support development and demonstration of new technologies in the port environment. The TAP is primarily funded by both Ports, but the SCAQMD and other agencies provide additional funding.
- 28. The POLA and SCAQMD have helped the *Balqon Corporation* develop a heavy-duty, electric, short-haul drayage truck, which the Port says is the first of its kind to be used at any port worldwide. It can pull a 60,000-pound cargo container at a top speed of 40 mph, and has a range between 30 to 60 miles per battery charge. In 2009, after successful prototype testing the POLA took delivery of the first of 25 trucks. ¹² These trucks will help the port meet the emissions reduction goals of the CAAP.
- 29. The two ports and the Alameda Corridor Transportation Authority are calling for technology ideas to one day replace the diesel trucks that travel between Port marine terminals and a local rail yard with a pollution-free cargo-moving system. The Port officially issued a "Request for Concepts and Solutions" on 3 June 2009, outlining the goals and requirements of the project, known as the zero-emission container mover system (ZECMS). The proposed technologies might include electric guide ways, zero-emission trucks or electrified rail, all of which use electricity to power the movement of cargo, rather than diesel-fueled trucks.
- There are numerous grant programs operated particularly by the U.S. EPA and California air 30. agencies, the ARB and SCAQMD that provide incentive funds to demonstrate new technologies and to assist operators with conversions and retrofits of mobile equipment to alternative fuels or other low emission technologies. Most categories of emission sources that operate at the two ports are eligible for these grants. Some of the grant programs contain restrictions that do not allow their funds to be used to comply with regulatory requirements, but others can be used to support both regulatory requirements and the measures contained in CAAP. While it is beyond the scope of this report to describe them in detail, a description additional links to these programs http://portoflosangeles.org/environment/grants.asp. Information on U.S. EPA's National Clean Diesel Campaign can be found at www.epa.gov/otag/rfp.htm.

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POLA web page, http://portoflosangeles.org/environment/etruck.asp, accessed 17 September 2009.

4.1.5 Conclusions

31. A major, concerted effort is underway to reduce air pollutant emissions from the two San Pedro Bay Ports. At its core is a California regulatory program that has already changed the type of fuel used near the California coast, and which will, within 5 to 10 years, result in the replacement of most existing harbor craft engines, cargo trucks and cargo handling equipment and alter port operations. Although financial assistance is available from a variety of local, state and national sources, compliance will also impose costs on service providers, tenants, shipping lines and vessel operators. The two ports are heavily committed to supporting accelerated implementation of regulatory requirements and to encouraging the development of new technologies.

4.2 Climate Change

- 32. The widely recognized issues related to global warming and climate change affect all nations of the world. California has committed to reducing state-wide greenhouse gas emissions to 1990 levels by 2020, about a 30% reduction from *business as usual*, and the state has adopted a goal of an 80% reduction below 1990 levels by 2050. The ports and goods movement activities overall, are a major source of GHG emissions and therefore will be affected significantly by State and other programs to address climate change.
- 33. Both ports and their parent cities are undertaking major efforts to address climate change. In addition to the Scoping Plan measures described below, both cities have Climate Action Plans in affect. For example, in May 2007, the City of Los Angeles adopted Green LA: An Action Plan to Fight Global Warming. Green LA directs the Port to develop an individual Climate Action Plan, consistent with the goals of Green LA, to explore opportunities to reduce greenhouse gas (GHG) emissions from municipal operations. In December 2007, the POLA present a staff Climate Action Plan. As part of that plan and its numerous GHG reduction measures, the POLA began reporting annual emissions inventories in 2008 (for 2006 emissions) and thence quarterly status reports. Similar actions have been taking by POLB and both ports are following the adopted San Pedro Bay Ports Clean Air Action Plan. The Los Angeles Harbor Climate Action Plan can be viewed at www.portoflosangeles.org/DOC/REPORT_Climate_Action_Plan.pdf.
- 34. Since 2006, many new state laws, policies and regulations to reduce GHGs have been enacted that greatly affect the two ports. They include the Scoping Plan under the *California Global Warming Solutions Act* of 2006 (AB 32) and adopted 12 December 2008; SB 375, a bill passed on 30, September 2008 that implements the transportation portions of AB 32 through GHG emission reduction targets and better land use planning; the SCAQMD's December 2008 adoption of interim GHG significance thresholds; and the Southern California Association of Government's (SCAG) Compass Blueprint. The most immediate and far-reaching impacts of climate change strategies are contained in the Scoping Plan under AB32. Table 2 below identifies several of the more relevant measures affecting the ports. In some cases, the measures were consciously adopted by California to reduce both conventional air pollutants and GHG emissions.

Table 2. List of Scoping Plan Measures to Reduce GHG Emissions related to Ports

		Implementatio	
Measure	Status	n Date	Notes
Ship Electrification at Ports*	2007	Phase in 2010- 2020	The regulation requires most container, passenger, and refrigerated cargo ships to shut off their auxiliary engines while at dock and receive power from the electrical grid.
Port Drayage Trucks*	2008	2010-2013	Phase 1 requires all pre-1994 model year drayage trucks to be replaced or retired with newer model year trucks. Phase 2 requires all engines to meet or exceed the 2007 California and federal engine emission standards by 31 December 2013.
Clean (green) Ships	Not yet propos	TBD	Reduce fuel consumption and associated CO ₂ emissions through a variety of technologies and strategies that improve the efficiency of oceangoing vessels.
Vessel Speed Reduction*	Propos ed	2010 or later	ARB would evaluate emission reduction benefits of a VSR measure for vessels entering and leaving California ports and vessels traveling along the California coast within 24 to 40 nautical miles.
System-wide Goods Movement Efficiency Improvements	2009- 2012	2012-2015	Ports and agencies will develop and implement programs to achieve system-wide reductions in GHG emissions from goods movement activities. These programs will be in addition to existing measures for goods movement sources, and be developed over time through a public process.
Maintenance and Design Efficiencies for Commercial Harbor Craft Operators	2009- 2011	2010-2011	Educate harbor craft owners to reduce GHGs by vessel speed optimization, optimized scheduling, regular engine maintenance, improved hull surface smoothness, and reduced hull fouling (seaweed and barnacles)
Cargo Handling Equipment*	2010	2010-2011	For cargo-handling equipment at ports and intermodal rail yards, ARB will develop a new measure to restrict unnecessary idling, which will reduce fuel consumption and associated greenhouse gases, criteria pollutants, and toxic air contaminants.
Regional Transportation-related GHG Targets	Sept. 2010	2011-2016	Implement SB 375 for local entities and regional governments by developing and implementing various transportation and land use strategies to reduce vehicle GHG emissions.

^{*} Measures adopted by California to reduce both conventional air pollutants and greenhouse gases

35. In addition to the greenhouse gas emission reduction goals and planning requirements that are in California law, Governor Schwarzenegger, by Executive Order S-13-08, ordered State agencies to develop the California Climate Adaptation Strategy (CAS). As the first draft of the CAS plan has just come out (August 2009), it is far less developed than the adopted AB32 Scoping Plan. Consequently, California's efforts to adapt to expected climate change impacts through careful planning and preparation must occur in plan parallel ongoing mitigation efforts. The draft **CAS** be found can www.climatechange.ca.gov/adaptation/. Several of the other climate change related programs are discussed in the Land Use section in the next chapter.

4.3 Water Quality

4.3.1 Introduction

36. Current water quality conditions in the Ports of Los Angeles and Long Beach waters are generally good. Dissolved oxygen concentrations are close to those in the nearby ocean, with few exceptions (copper and zinc), concentrations of dissolved metals do not exceed California criteria, and concentrations of dissolved organic compounds above regulatory limits are rarely detected. Recent

exceedances of bacteriological contamination criteria have been localized. 13 Nevertheless, the two harbors are classified as "impaired" waters for purposes of federal law. A detailed presentation of water quality conditions in the Los Angeles and Long Beach harbors is presented in Appendix A to the Ports' Water Resources Action Plan. 14

- 37. A number of U.S. and California government agencies have regulations to protect and enhance water quality in and around the State's port waters. These regulations focus on water pollution from vessels and from onshore sources. Although the ports do not have direct regulatory authority over water quality, they are responsible for housekeeping activities (such as street sweeping) and ensuring, through their contracting and leasing authority, that port tenants comply with regulatory requirements.
- 38. The California Water Resources Control Board (WRCB or State Board) and the nine Regional Water Quality Control Boards (RWQCBs or Regional Boards) are responsible for implementing California's water quality protection program.

4.3.2 U.S. EPA Vessel General Permits

- On 30 March 2005, a U.S. District Court¹⁵ ruled in favor of the Northwest Environmental 39. Advocates in a lawsuit that asserted that under the U.S. Clean Water Act (CWA), the U.S. EPA could not exclude discharges incidental to the normal operation of vessels from the National Pollutant Discharge Elimination System (NPDES) permit requirements. The U.S. EPA's response to that decision significantly altered the regulation of discharges from vessels into ocean waters in California and the rest of the U.S.
- 40. In response to the Court's action, in December 2008, the U.S. EPA issued the 2008 Vessel General Permit (VGP). 16 The VGP, which is implemented by the U.S. EPA, will affect nearly 100,000 vessels using U.S. ports including the San Pedro Bay ports. The Before the VGP can be effective in a state, that state must certify that the VGP conditions are sufficient to protect the quality of the state's waters and to comply with its water quality standards, or waive certification. The EPA has approved California's certification thereby providing for full implementation of the VGP in the State.
- The VGP establishes effluent limits for 26 vessel discharge streams, including ballast water and 41. gray water discharges and effluents from various ship processes (but not including sewage). 18 Discharges covered by the VGP are aquatic nuisance species in ballast waters, substances typically found in wastewater (such as solids and organic matter), metals, nutrients, pathogens and toxic pollutants.

¹³ Resources Action Plan, Ports of Long Beach and Los Angeles, Final Plan, 2009. www.polb.com/civica/filebank/blobdload.asp?BlobID=6610.

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¹⁵ Northern District Court of California in Northwest Environmental Advocates et al. v. EPA, 30 March 2005. On 23 July 2008, the Ninth Circuit Court of Appeals upheld that decision.

¹⁶ www.epa.gov/npdes/pubs/vessel vgp permit.pdf.

¹⁷ The VGP applies to all vessels operating as a means of transportation, except that discharges incidental to the normal operations of recreational vessels are exempt (although non-incidental discharges are not exempt). All commercial fishing vessels and all other vessels less than 79 feet in length are subject only to the ballast water discharge requirements of the VGP.

¹⁸ ibid 15.

4.3.3 Ballasting

- 42. Ballast tanks are filled (and emptied) with seawater to enhance large vessels' stability when traveling with light cargo and fuel loads and to improve vessel trim, maneuverability and stability. Ballast tanks are also filled to offset off-loading of cargo and use of fuel and to facilitate travel through shallow waters.
- 43. Large vessels can have ballast capacities of over one million gallons. Although that entire capacity is not typically discharged into port waters, ships calling on California ports can carry large quantities of water containing non-indigenous species *non-indigenous species* (NIS) from far distant seas. These NIS may be invasive or nuisance organisms. As of 2005, 267 non-indigenous marine and estuarine animals were reported in California waters, some of which (such as the Chinese Mitten Crab) pose serious threats to the ecology and infrastructure of California's waters.
- 44. California's current regulatory approach to managing ballast water and reducing the introduction of NIS consists of ballast exchange requirements that currently apply in California coastal waters, and ballast water discharge requirements that phase in between 2009 and 2020. California's requirements tend to be more specific and stringent than those of other U.S. states and of other countries.
- 45. Ballast exchange is flushing biologically rich water loaded at another port with less biologically active water from the open ocean. This technique may reduce the organism content of ballast water by 70 to 99%, 19 and most vessels can implement this management technique without structural alteration.
- California has two ballast water exchange requirements, one that applies to vessels traveling within the Pacific Coast Region, and another for all other vessels. ²⁰ In order for ballast water to be discharged into port waters, it must have been exchanged in waters at least 200 meters deep, and at least 50 nautical miles from land for Pacific Coast Region vessels, or waters at least 200 meters deep and 200 nautical miles from land for other vessels. The purpose of the Pacific Coast Region rule is to recognize that the organisms contained in ballast water picked up by vessels traveling between West Coast ports are not particularly foreign to California, and to avoid requiring such vessels to go 200 nautical miles offshore to do exchanges. California ballast water regulations are applicable within California's territorial boundaries, which extend three nautical miles beyond the State's coast. ²¹
- 47. California's phase-in of ballast water discharge requirements begins with interim requirements that ballast water be treated or disinfected so that it meets specific biological requirements.²² These requirements limit the numbers of organisms (micro and macro) per water volume; for example, the water may contain no more than 0.01 living organisms of sizes between 10 and 50 micrometers per milliliter of water and no more than 1,000 bacteria per 100 milliliters. These interim requirements became applicable on 1 January 2009 for vessels constructed after that date and having ballast capacities of less than 5,000

²⁰⁰⁹ Biennial Report to the California Marine Invasive Species Program, California State Lands Commission. January 2009.

California Code of Regulations, Title 2, Division 3, Chapter 1, Article 4.6, Sections 2280 et seq. & California State Lands Commission, Marine Facilities Division Publication: California's Marine Invasive Species Program, Ballast Water Management.

www.waterboards.ca.gov/academy/courses/wqstandards/materials/water_us_ca/ca_water_042508.pdf. Accessed 15 September 2009.

²² California Code of Regulations, Title 2, Division 3, Chapter 1, Article 4.7, Sections 2291 et seq.

metric tonnes.²³ There are progressively later effective dates through 1 January 2016 for vessels constructed before 1 January 2009.

48. The final regulations, which become effective after 1 January 2020, require that ballast water discharged into waters under California's jurisdiction be treated to contain *no* (zero) detectable, living organisms. Until the above-described requirements become effective, ballast water management relies primarily on ballast exchange.²⁴

4.3.4 Liquid Waste Discharge from Vessels

- 49. Discharges due to routine vessel operation of the crew and passengers include sewage, gray water (wastewater comprised of sources such as shower, laundry and kitchen wastes), and bilge water (water that accumulates in the bottom of a vessel's hull and originating from deck runoff and leakage). Discharges of these wastes into port waters may include organic, biological, chemical, and toxic pollutants. Liquid waste discharges are controlled by a complex combination of California and U.S. EPA regulatory provisions.
- 50. The California Clean Coast Act²⁵ prohibits the discharge of wastewater from oceangoing vessels (cruise ships and vessels of 300 gross registered tons or greater) within the State's three-mile zone, providing the vessel either has sufficient holding tank capacity or it is berthed near an onshore sewage reception facility, and the ship has the means to discharge to that facility. Wastewater is defined as treated and untreated sewage and other liquid wastes including sewage sludge, hazardous wastes and oily bilge water. If a vessel that has adequate holding capacity or access to an onshore facility discharges sewage into state waters, that discharge must be reported and the operator is subject to a penalty. Vessels that have neither adequate holding capacities nor access to onshore facilities may discharge sewage into the waters and are not required to report it.²⁶
- The federal CWA prohibits the discharge of untreated sewage from vessels greater than 65 feet in length into navigable waters of the U.S., which includes territorial seas within three miles of shore. ²⁷ In order for sewage to be discharged, it must be treated with an approved, Type II marine sanitation device (MSD). A Type II device is a system that, by maceration and disinfection, produces an effluent containing less than 200 fecal coliform bacteria per 100 milliliters and not more than 150 milligrams of suspended solids per liter. The U.S. Coast Guard enforces the CWA's prohibition on discharging untreated sewage. The Coast Guard also enforces the prohibition of <u>any</u> sewage discharge into no discharge zones (NDZs). There are 10 estuarial, NDZs in California, although neither Los Angeles nor Long Beach Harbor is among them. ²⁸
- 52. The CWA further provides that no state may require more stringent control of sewage (black water) discharges unless the Administrator of the U.S. EPA approves. Because California's discharge requirements could be more stringent than CWA requirements in some situations, the California State

www.epa.gov/owow/oceans/regulatory/vessel_sewage/vsdnozone.html#ca. Accessed 3 August 2009.

Regulations pending before the State Lands Commission would change this date to 1 January 2010.

Personal Communication, Terry McGuire, Sierra Nevada Air, with Maurya Falkner, Marine Facilities Division California Marine Invasive Species Program, California State Lands Commission. 29 July 2009.

²⁵ California Public Resources Code, Division 38, Section 72400 et seq.

This provision begs the question of whether the Act rewards vessels that do not invest in adequate holding capacities or equipment to allow them to discharge to onshore sewage reception facilities.

www.epa.gov/region09/water/no-discharge/. Accessed 31 July 2009.

Water Resources Control Board submitted an application to the Administrator of the U.S. EPA seeking approval for California's implementation of the California *Clean Coast Act* provisions that apply to sewage. ²⁹ The application states:

The State Water Board requests that it be granted authority to regulate these (sewage and sewage sludge) discharges in order to preserve and protect water quality for the many beneficial uses of all of the State's coastal waters, and to maintain conformity with applicable water quality standards established in statewide and regional water quality control plans and policies.³⁰

- 53. The U.S. EPA interprets the CWA to provide that the appropriate mechanism for a state to impose more stringent requirements on the discharge of sewage from vessels is through the creation of NDZs rather than by state law. Accordingly, the Water Resources Control Board and the U.S. EPA now consider the State's application for EPA approval to be a request for the EPA to establish additional NDZs in California waters. The U.S. EPA is currently in the rulemaking process to approve this request. It appears that the practical difference between the Administrator approving the State's enforcement of the *Clean Coast Act* provisions and approving the State's request for NDZs is that California would enforce the former, and the U.S. Government (Coast Guard) would enforce the latter.
- 54. Because the CWA requirement for EPA approval applies only to sewage (black water), the discharge prohibitions of the California *Clean Coast Act* which apply to gray water, bilge water, hazardous wastes and other wastes (medical wastes, dry cleaning wastes and photography laboratory chemicals) are in effect. The California Toxics Rule³² establishes receiving water standards to protect aquatic life from acute and chronic consequences of the discharge of toxic substances.
- 55. In summary, California has sought to impose stringent liquid wastes discharge limits on ocean-going vessels. Except for sewage, state law prohibits liquid waste discharges in California coastal waters unless vessels are unable to either store or offload wastes. Federal law prohibits discharging untreated sewage into U.S. waters and California is working with federal authorities to create NDZs in which all sewage discharges would be prohibited.

4.3.5 Solid Waste Disposal from Vessels

- 56. Routine operations of crew and passengers create solid wastes from activities such as food preparation and ship operations and from cargo-related activities such as spillage and disposal of packing materials. Disposal of these wastes into port waters may include organic, biological, chemical and toxic pollutants.
- 57. The *Clean Water Act* and the *Marine Plastic Pollution Research and Control Act* regulate solid waste disposal in U.S. waters. These laws implement the protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL). This law prohibits any vessel from jettisoning plastic wastes overboard within 200 miles of the U.S. shoreline or garbage within three miles of the shoreline. The U.S. Coast Guard enforces these requirements.

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State Water Resources Control Board Clean Water Act Section 312(f)(4)(A) Application. www.waterboards.ca.gov/publications forms/publications/legislative/docs/2007/supplemental_leg_report_final.pdf. Accessed 31 July 2009.

www.swrcb.ca.gov/water_issues/programs/npdes/docs/sb771/cwa312epa_ap.pdf.

^{31 &}lt;u>www.calepa.ca.gov/pressroom/Releases/2009/Feb25.pdf.</u>

http://ci.santa-rosa.ca.us/doclib/Documents/ut_irwp_PEIR_Appendix_C_1_California_Toxics.pdf.

4.3.6 Spillage

- Various port activities related to the transfer, loading and unloading of fuel and cargo could result in spillage. Spillage of fuel or liquid cargo such as petroleum may result from compartment leakage and from improper transfer operations. These wastes may include organic, biological, chemical and toxic pollutants.
- 59. The *Oil Pollution Control Act* set forth in the U.S. Code of Federal Regulations requires vessel owners to report hazardous waste spills and makes them responsible for cleanup and damages. Ports and their tenants are responsible for oil contamination resulting from activities at their facilities, including spilling and dumping of pollutants such as oil, oil-based paint and chemical agents. The U.S. Coast Guard administers these requirements.

4.3.7 Hull Fouling

- 60. California is also concerned with non-indigenous organisms such as worms, crabs and amphipods that attach themselves to the submerged portions of vessels. On the other hand, hull cleaning to remove such organisms is also of concern because it can introduce toxic substances into the water.
- 61. California requires³³ that hull fouling be regularly removed according to the following:
 - Before the expiration date (or extensions thereof) of a vessel's full-term safety certificate,
 - Before the expiration date (or extension thereof) of a vessel's U.S. Coast Guard certificate of inspection,
 - Within five years of a vessel's last out-of-water, dry-docking.
- 62. Commercial vessels operating in California waters must submit annual hull husbandry reports.³⁴
- 63. In-water hull cleaning is not allowed in the Los Angeles or Long Beach harbors because they are listed as "impaired"; that is in need of remediation³⁵. This prohibition applies only to underwater cleaning operations, not to deck and hull washing above the water line.³⁶ The VGP (discussed earlier) prohibits all in-water hull cleaning after 2011 in California (except for propeller cleaning) unless it is conducted using the best available technologies that are economically feasible (as required by Section 401 of the CWA) as determined by the California State Lands Commission and the State Water Resources Control Board.
- 64. The ports' direct responsibilities regarding hull fouling are limited to the ports' general housekeeping activities.

California Invasive Species Program, Fouling Removal and Hull Husbandry Reporting, California State Lands Commission. 15 July 2009.

California Code of Regulations: Title 2, Division 3, Chapter 1, Article 4.8, Section 2298.

The "impaired waters" designation is made by the U.S. EPA, based upon California's recommendation, as required by the CWA.

Pursuant to Section 303(d) of the CWA, the California State Water Resources Control Board has designated waters in parts of the Los Angeles and Long Beach harbors as not meeting water quality standards. www.swrcb.ca.gov/water-issues/programs/tmdl/docs/2002reg4303dlist.pdf.

4.3.8 Shore-side Contamination Sources

- 65. Port waters are also contaminated by onshore sources. The most significant of such sources are discharges of industrial wastes into rivers and streams tributary to the port waters, landside runoff from storm sewers, overflow of combined sewers during peak runoff, and the atmospheric deposition of air pollutants. Over 140 storm sewerage outfalls discharge a variety of pollutants into port waters, including nutrients such as nitrogen and phosphorous, which stimulate aquatic plant and algae growth. In cases where combined sewers are used, large amounts of sewage may overflow into the waters during high storm flows. Polluted rivers and streams that flow into the port, and deposition of nitrogen oxides from polluted air, may also introduce nitrogen and phosphorous nutrients.
- Multiple and often overlapping levels of local, state, and federal agencies regulate shore side sources. In the case of the San Pedro Bay ports, those agencies are the U.S. EPA and the Coast Guard, which implement laws such as the CWA, the State and Regional Water Boards, which are delegated responsibilities under federal law and also implement state laws such as the Porter-Cologne Water Quality Act, and various regional, county and city agencies.
- Although port waters are formally considered impaired as described above, many water quality parameters are quite good.³⁷ Dissolved oxygen concentrations are typically six to eight milligrams per liter. Metal concentrations vary widely by year, storm, outfall, and metal, but with only few exceptions, they range from undetectable to below the limits contained in the California Toxics rule. Concentrations of organic compounds are normally below detection limits, the only exception being tributylin (TBT), which has been used as a marine anti-foulant in hull paints. During dry weather, concentrations of coliform indicator bacteria are usually below the detection limits, but may sometimes become elevated following periods of heavy rain.
- 68. The U.S. EPA has delegated the responsibility to implement the NPDES program to the California Water Resources Control Board subject to EPA oversight. ³⁸ This program requires that all sources that discharge wastes into inland and ocean waters obtain NPDES permits. Discrete and identifiable sources are permitted as point sources, and sources comprising distributed sources, such as storm water runoff, are *non-point sources*. Water pollutants covered include typical sewage-related contaminates such as pathogenic bacteria, biological oxygen demand (BOD), total dissolved solids, toxic substances and other substances such as ammonia and chlorine. Each permit issued establishes source discharge limits based on receiving water quality and carrying capacity and on available control technology. Permits must be renewed every five years.
- 69. NPDES permits must be consistent with total maximum daily loads (TMDL) that are established as part of water quality plans developed by the U.S. EPA and the California Water Resources Control Board. States must list bodies of water that do not attain standards prescribed by Section 303(d) of the CWA, and they must establish TMDLs which reflect the pollutant load reductions necessary from point and non-point sources to attain water quality standards. The TMDLs are then allocated among permitted sources. The Los Angeles and Long Beach Harbors are listed as bodies of water in which standards are not attained for a number of pollutants.³⁹

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http://www.polb.com/civica/filebank/blobdload.asp?BlobID=6611.

This delegation does not include the vessel general permit (VGP) program that was discussed earlier in this section.

www.swrcb.ca.gov/water issues/programs/tmdl/docs/303dlists2006/epa/r4 06 303d reqtmdls.pdf.

- 70. The General Industrial and Municipal Storm Water Permit programs at both ports require port managements and tenants to implement a number of housekeeping measures to reduce the pollutants introduced into storm water runoff by maintenance and fueling operations. Such measures include inspections, periodic area sweeping, pavement cleaning, materials and waste inventories, storage and handling procedures (such as spill and drip prevention), control of wash down activities and collection of errant product and cargo-related debris.
- 71. The ports manage discharges from the port properties. Contractors, tenants, and port activities must follow best management practices for the design, construction, and maintenance of facilities in order to minimize the contamination of port waters. The ports regularly monitor the water quality of sewage outfalls that discharge into the harbors.
- 72. The Ports of Long Beach and Los Angeles have jointly developed a Water Resources Action Plan to target pollution sources in those harbors. ⁴⁰ That plan requires the ports to develop guidance manuals by mid-2010 to specify best management practices (BMPs) to prevent pollution from port facilities and vessel berthing areas such as spill prevention from fueling, equipment maintenance and cargo handling. BMPs will also be developed for the design of new and redeveloped facilities within the ports.

4.3.9 Conclusions

- 73. The regulation of water pollution in California port waters is the purview of numerous agencies of U.S., state, regional, county and city governments. These agencies' requirements are complex, often overlapping, and sometimes conflicting. California state law currently prohibits the discharge of liquid wastes except for sewage from many vessels. The U.S. EPA is currently in the rulemaking process to establish NDZs that would make sewage discharges a violation of federal law. Nearly all direct discharges by ships into port waters, except for sewage, are also regulated by U.S. EPA administered vessel general permits.
- 74. Regulation of all sources of water pollution from vessels operating in California is at least comparable with that of other countries. The *zero living organisms* limit on ballast water discharges that becomes effective in 2020 is as stringent as possible. The ports are developing best management practices manuals to deal with port housekeeping.

5. Land Use and Transport

5.1 Introduction and Overview

75. This chapter will discuss the environmental impacts of the ports of Los Angeles and Long Beach on the surrounding communities as well as the metropolitan Los Angeles region. Various activities that have occurred within the ports have greatly influenced the land use and transportation systems of the region over the century since the ports were established. The quite progressive efforts to "green" the ports during the past twenty years provide insight and experience that other expanding ports around the world might emulate.

5.1.1 Existing Land Use and Demographics of the Port Subregion

76. The Greater Los Angeles area currently has about 18 million residents located over 34,000 square miles in five counties. Residents in the immediate port area reside in either the City of Los Angeles or the City of Long Beach. The portion of nearby residents in the City of Los Angeles was 207,000 in 2008

Water Resources Action Plan, Port of Los Angeles and Port of Long Beach, August 2009.

compared to 182,000 residents in the same area in 1990. The Los Angeles population is equally divided between the communities of San Pedro and Wilmington-Harbor City. The City of Long Beach, which had a total population of 493,000 in 2008, has a relatively small portion of the city's population in the immediate vicinity of its port. The populations of the two council districts that are adjacent to the port totalled 112,000. In summary, the immediate port area has only 1.7% of the total population of Greater Los Angeles. Figure 1 shows the major ports-related transportation facilities in the Los Angeles Basin.



Figure 1. Major Ports-Related Transportation Facilities in the Los Angeles Basin

Source: © 2007 DeLorme (www.delorme.com) TOPO USA®

77. The land use in the immediate port area is extremely varied and somewhat haphazard in structure. The western side of the port is the community of San Pedro, which has a relatively old commercial area bordering the main channel of the Los Angeles harbour and with increasingly upscale residential neighbourhoods as one proceeds up the hills to the west. The industrial suburbs of Wilmington and Harbor City border the port complex north of the West and East basins of Los Angeles harbour. In addition to port activities, there are large oil refineries, oil extraction sites, heavy industries, electric-generating facilities, wastewater treatment plants, and military reservations occupying areas adjacent to the residents. On the northeast boundaries of the port complex is the City of Long Beach, which also has a combination of older residential neighbourhoods and increasingly modernizing downtown area separated from the Port of Long

Beach (POLB) by the Los Angeles River channel. Long Beach has made major changes to its shoreline, beaches, and recreational facilities, partly funded by oil and port revenues.

- Angeles Basin and eventually to the hinterlands of Riverside, San Bernardino, and Ventura counties, become less dominated by heavy manufacturing and more residential and commercial in nature. A relatively short three miles west of the Port of Los Angeles (POLA) are the very upscale residential areas of the Palos Verdes Peninsula—Palos Verdes Estates, Rancho Palos Verdes and Rolling Hills. While they at times suffer the air pollution impacts of the ports, favourable meteorological conditions from the Pacific Ocean tend to keep the upscale communities residents relatively smog-free. Beach communities continue along the coast north of the peninsula until reaching the Los Angeles International Airport, 20 miles distant. Immediately north of the ports, toward downtown Los Angeles, lie the more mixed residential and light industrial communities of Torrance, Carson, Compton, and Inglewood. Major transportation corridors, such as the Harbor Freeway (I-110) and the Alameda rail corridor (discussed later in this Section), connect the ports to the heart of the Los Angeles Basin. To the east of the City and Port of Long Beach is Orange County, a rapidly growing residential and light manufacturing area of 3.2 million persons.
- 79. Unlike many world ports, there are no navigable inland waterways (rivers, canals, etc.) that serve POLA and POLB.
- 5.1.2 Existing Transportation Systems Servicing the Ports
- 80. The two ports are served by a complex network of transportation facilities that include rail, roadways and airports. The environmental impacts of these various facilities will be discussed in detail later in this chapter. Growth of the two ports has put an increasing strain on existing facilities to accommodate the shipping requirements. As noted earlier the San Pedro Bay ports currently receive over 60% of all waterborne container imports to the United States and, while the volume of container traffic declined during the current economic situation, it has been projected to triple by 2030. More detailed information on cargo forecasts is included in the Southern California Association of Governments report, Multi-County Goods Movement Action Plan. Despite the size of the local market, approximately 77% of the container-based goods handled by the San Pedro Bay ports are assigned for delivery outside the Southern California region. The remainder is distributed, almost exclusively by truck, to locations within the five-county metropolitan region.
- 81. There is a substantial environmental advantage to rail versus truck transport. Diesel-powered trains are two to four times more fuel-efficient and emit two to three times less pollution than trucks on a ton-mile basis. A major bottleneck to transporting cargo by rail from the ports was significantly reduced with the opening of the Alameda Corridor in 2002. Further improvements in rail transport will occur when the Alameda Corridor-East is completed from the downtown Los Angeles terminus of the existing Alameda Corridor through the San Gabriel Valley to San Bernardino County. Other direct improvements are the construction of on-dock rail yards and near-dock rail yards located within five miles of the ports.
- 82. The most common form of transporting cargo from the ports during the past 50 years has been by truck. Trucks utilize various highways and streets to move cargo to specific locations, especially in the metropolitan area. As traffic from the ports has greatly multiplied, serious impacts to the environment and transportation systems have been created. This will be discussed in more detail later in the chapter. The

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www.scag.ca.gov/goodsmove/pdf/mcgmap/mcgmap execsumm.pdf.

San Pedro Bay Ports *Rail Study Update, Executive Summary*, Parsons, December 2006, ES-3.

⁴³ Ibid, ES-4.

major transportation corridors serving the ports include Interstate 110 (the Harbor Freeway), which is connected directly to the POLA by State Highway 47, and the Vincent Thomas bridge; Interstate 710 (the Long Beach Freeway which terminates within the POLB; and State Highway 103 (the Terminal Island Freeway) which exits the center of the two ports and extends north to the Southern California International Gateway project (a new, near dock rail facility to take pressure off of I-710). Figure 2 shows the San Pedro Bay Ports and the communities adjacent to the ports.

83. Finally, several major airports are relatively close to the port area. These include Long Beach (15 miles), Los Angeles International (20 miles), John Wayne (34 miles) and Bob Hope in Burbank (37 miles). Thus far, air cargo transferred from the ports is minimal.



Figure 2. San Pedro Bay Ports and Adjacent Communities

Source: © 2007 DeLorme (<u>www.delorme.com</u>) TOPO USA®.

5.2 Land Use Impacts

84. Land use in communities adjacent to many older seaports are generally unstructured and quite mixed in their composition. Industrial activities tend to be interspersed with older, residential areas, and they all are frequented with heavy truck, rail, and even air transfer facilities. Efforts to improve the communities often conflicts with the desire to expand the capacity of the port onto formerly residential and business areas. The ports of Long Beach and Los Angeles match the above description in terms of land uses, but they are attempting to increase the efficiencies of their current land uses to address some of these concerns. Ports often look to the U.S. EPA and State programs known as "brownfields", an approach that supports cleaning-up former industrial tracts of land that are both contaminated and abandoned. With very

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few large expanses of "greenfield" (uncontaminated) properties remaining in the near vicinity of the two ports, the brownfield concept is not only practical but also can use existing infrastructure such as utilities and potential funds for pollution clean-up. One such project is located within the POLA at the Southwest Marine Terminal Island Facility.

- 85. The POLB was one of the earlier implementers of the brownfield concept. In 1994, the Port acquired 725 acres that had been used for oil and gas production and disposing of contaminating materials. The contaminated area was remediated on-site by the Port. Contaminated soils were safely removed and used to create a 30-acre landfill. The port has a goal to remove, treat and render suitable for beneficial reuse other contaminated soils and sediments in the harbor. A major effort is underway to remove contaminated sediments from the West Basin and reuse acceptable material as structural material underneath the new Pier T terminal.
- 86. The POLB has a comprehensive recycling and solid waste management program. The Port has allocated specific funds to a community aesthetic mitigation program, reduction of air quality impacts (discussed elsewhere in this report), and financial incentives to replace, re-power or retrofit diesel powered trucks. The port has developed a comprehensive land use plan that considers the need for commerce and recreation, consolidation of liquid bulk storage facilities, and includes an academic and government marine research lab.

5.2.1 Environmental Statement Protocols Related to Land Use

- 87. Perhaps the most significant program that affects expansion and modification of ports in the United States is the *National Environmental Policy Act* (NEPA) and, in California, its somewhat more restrictive counterpart, the *California Environmental Quality Act* (CEQA). NEPA applies to projects in which federal funding, permitting, or on-going oversight is involved. Because of these two important laws, the lead agency, usually a port or city, must prepare either an Impact Report (EIR) under CEQA, or a combined Environmental Impact Statement (EIS) under NEPA and an EIR before undertaking any significant project. As noted elsewhere, the EIS/EIR must disclose all environmental impacts to decision makers and under CEQA, the lead agency must mitigate any impacts that are negative and significant.
- 88. The POLB has a highly regarded and detailed Environmental Protocol that provides guidance to agencies and consultants in preparing an EIR. An important focus of this protocol is the air quality impacts of the proposed project. Project impacts are considered significant if they increase ambient air pollution above state or federal standards or are inconsistent with adopted air quality strategies and regulations. The POLA also has a refined and detailed environmental review process.
- 89. Some of the land use-related factors considered in an EIS/EIR are: areas of influence; significance criteria or thresholds; mitigation measures; cumulative impacts; and post-mitigation tracking. Although Greenhouse Gas emission (GHG) reductions are not currently addressed in detail in the Protocol, new guidelines and threshold levels from the State will certainly apply to future project reviews.
- 90. The requirement to mitigate significant impacts has increased the attention the ports pay to adjacent communities. In some circumstances, the lead agency has the option of reducing impacts (air quality/water quality) at a location offsite from the proposed project. This may be more cost-effective than expensive changes onsite and yet can provide equal or greater protection of the environment. Some examples of offsite wildlife habitat remediation are discussed in Section 6.3.

5.2.2 San Pedro Bay Ports Clean Air Action Plan (CAAP)

91. As noted in the Air Quality discussion, in 2006, with assistance from the South Coast AQMD, the California Air Resources Board (CARB), and the U.S. EPA, the two ports adopted a very

comprehensive plan (CAAP) to improve air quality in both the port area as well as the rest of the South Coast Air Basin. 44 While the CAAP is essentially an air pollution reduction strategy that accelerates many of the existing air pollution programs, the CAAP can also affect land use and transportation issues. For example, manufacturing sources currently located in the port region will need to add additional pollution controls. Some sources may either not be able to afford the changes or decide to relocate to other areas of the air basin. The composition of the truck and rail transportation system may be altered by the CAAP as considerable funds are provided to clean up or reduce diesel-powered equipment or vehicles. Finally, state bond money for transportation projects may accelerate an improvement of the traffic system of the region.

5.2.3 Growth Inducement

92. The expansion of the two ports during the past thirty years has undoubtedly induced growth of industry, business and residential areas in the immediate vicinity of the ports, as well as the rest of the Los Angeles basin and the hinterlands. There are both positive and negative impacts from this growth. Traffic on various highways exiting the port region has become more congested despite infrastructure improvements. This is especially true on Interstate Highways 405, 110, and 710. Increased truck and rail traffic in the streets of the adjacent communities of Wilmington, San Pedro, and Long Beach has been detrimental to the fabric of those locales. On the positive side, the economy of the South Bay has been stimulated by the rapid expansion of the ports. Terminal improvements have removed obstacles to domestic and international trade and thus provided economic expansion in the basin. Environmental documents (EIS/EIR) on port expansion projects must consider their growth inducement impacts.

5.2.4 Recent Regulatory and Legislative Developments affecting the Ports

- 93. Most of the new regulations and laws relating to climate change and were discussed in the previous chapter. However, several programs directly affect planning activities of the ports and are briefly noted here.
- 94. Various state agencies have adopted, or are in the process of developing, programs that will support the Scoping Plan and the SB 375 process. These include new, State CEQA guidelines for global warming at the program and project level; the California Transportation Commission's January 2008 guidelines for addressing climate change requirements in Regional Transportation Plans (RTP); and the Attorney General's guidance to ensure regional planners and local governments address climate change in their plans and decisions. These various programs will have major impacts on future development of the ports and their ability to meet environmental requirements.
- Ocalifornia's climate change legislation (AB 32) asks local governments, such as the Cities of Long Beach and Los Angeles, to play a key, partnership role in implementing the Scoping Plan. Land use planning and urban growth decisions will have very large impacts on future GHG emissions, particularly in the years after 2020. The Air Resources Board will soon assign each region of the state GHG emission reductions targets for the transportation sector. SB 375, a *sequel* to AB 32, provides guidance on how local governments can meet the Air Resources Board's targets. The guidance focuses on reducing emissions from autos and light-duty trucks and is therefore a complement to the measures in the Scoping Plan that address trucks, rail and ships.
- 96. Finally, the SCAG Compass Blueprint has many provisions that are directly related to future port development. "Blueprints" are broad scale regional development plans that have or are being developed for most of the urban regions of California. The SCAG blueprint's current emphasis is the *Two Percent Strategy*, which focuses on the priority 2 percent of the region's land area. The ports are included in the

www.portoflosangeles.org/environment/caap.asp.

Two Percent Opportunity Areas with the POLA in the Los Angeles City South area and the POLB in the Gateway Cities area.

5.3 Transport Impacts

97. This section discusses various aspects of the landside transportation links to the two ports. These links can have a major impact on the adjacent communities depending on whether they quickly carry freight through the area or cause serious congestion to local streets and highways. The San Pedro Bay ports are attempting to accommodate the increased activity through developing a transportation infrastructure to minimize impacts on those communities while accommodating the increased demands. While ideally the incoming freight on ships could be trans-loaded onto rail or trucks for specific destinations, the reality is that there is very limited space at the ports for large trans-loading operations and goods must be loaded onto drayage trucks with their consequent environmental impacts. Several recent studies commissioned by the ports provide some insight on dealing with this problem.

5.3.1 San Pedro Bay Rail Study

- 98. To assist the ports in finding ways to increase and enhance the rail proportion of transport, an update of earlier rail studies was completed in December 2006.⁴⁵ This study was also a complement to the earlier described CAAP. The ports engage in three types of rail loading: (1) on-dock rail yards that load cargo onto trains in the marine terminal, thus eliminating any truck trips on local roadways, (2) near-dock rail yards that are within five miles of the terminal and can serve both ports, and (3) off-dock rail yards, usually located 25-50 miles from terminal, such as in downtown Los Angeles.
- 99. The study found that any cargo that is moved by train from the Port benefits the overall transportation system by reducing the truck trips, total truck mileage, and their associated impacts. It further found that each on-dock, a double-stack, *through* train could eliminate 750 truck trips and can be at least twice as fuel-efficient and clean as trucks on a ton per mile basis. The report found that where docks have limited space, on-dock rail service can interfere with other terminal traffic flows and reduce overall terminal efficiency. Nevertheless, they are considered the preferable option from an environmental perspective and the ports are pursuing on-dock rail as a high priority. The goal is to increase the percentage of container cargo handled by on-dock rail from 24% in 2006 to 30% by 2030.
- 100. Near-dock has advantage of combining cargo from various terminals and building trains that can go anywhere in the nation with that cargo. However, there is only one near-dock facility serving the ports—the Intermodal Container Transfer Facility which handles eight percent of the ports' cargo.
- 101. As on-dock capacity increased, the off-dock share of the ports throughput has declined to less than 11%. Current off-dock rail yards are located in downtown Los Angeles, and are operated by Union Pacific (UP) and by Burlington Northern-Santa Fe (BNSF). Moving cargo by truck to these off-dock facilities results in additional congestion on the region's roadways.
- 102. To accommodate the future growth of the ports, two new, on-dock rail and two near-dock rail facilities are planned. The Rail Study Update also examined several non-traditional rail concepts. One option was an *inland* shuttle train, with would serve an inland port for use to distribute local cargo. The second option was an inland rail yard to sort trains. This concept would allow creating multi-destination trains by block at the on-dock rail yard, then block-swap (the organization of trains headed to the ports into terminal specific trains) at the inland yard to create single destination trains. Similarly, in-bound trains to the ports could be sorted out at these inland rail yards.

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www.portoflosangeles.org/DOC/REPORT SPB Rail Study ES.pdf.

5.3.2 Regional Transportation Plans and Goods Movement Policy

- 103. The Southern California Association of Governments (SCAG) has overall regional and transportation planning responsibility for most of Southern California. Several major planning programs affecting transportation near ports are the 2005 Goods Movement Policy, the 2008 Regional Transportation Plan (RTP) and the 2004 Compass Blueprint process (discussed in the previous section). While most of their programs are advisory to the local cities, they can be a major player in transportation funding and land use decisions.
- The 2008 RTP contains a major supplement document on Goods Movement and a sub-section in that document on Maritime Activity. ⁴⁶ This report is one of the most current sources of cargo forecasts, future on-dock rail plans and rail network capacity forecasts. Truck-related activities are also included. The share of California's containerized cargo handled by the two ports will remain essentially the same through 2030 slightly less than 87%. Total cargo (general, liquid bulk and dry bulk) is equal between the two ports 52% at POLA and 48% at POLB. Freight rail, as well as passenger rail, is projected in the RTP to have major increases over the next 30 years due to rapid expansion of the ports and greater use of passenger commuter rails in the basin. In 2000, a key crossover point 65 miles northeast of the ports handled 121 freight trains daily. This traffic is projected to climb to 266 freight trains per day in 2025, a situation that will result in severe congestion on the crossover, as well as on a mountain pass leading to the desert and points east.
- 105. The ports projected growth overwhelms the ability of on-dock rail capacity enhancements to provide relief. After completing all planned on-dock enhancements at the two ports (an increase of over five-fold between 2005 and 2030), the ports will still have 2.2 million TEUs that could be moved by on-dock rail if it was available. This will necessitate development of additional near-dock or off-dock intermodal yards in the region.
- The SCAG Goods Movement report discusses the impacts of port related trucking in some detail. The largest truck traffic appears to be between the marine terminals and intermodal yards further into the basin. However, the vast scattering of manufacturing facilities throughout the basin generates secondary truck trips that affect the many freight corridors of the region. There is also a significant amount of truck movement to return the empty containers from the off-dock, intermodal yards to the port terminals. The RTP examined the two major corridors that carry the largest concentration of port truck traffic volumes in the basin–Interstate 710 (Long Beach Freeway) and State Route 60 (Pomona Freeway). With its proximity to the ports, I-710 carries a great amount of the truck traffic. Over 17% of all vehicles in freeway segments closest to the port are trucks, and 94% of those trucks are port trucks. The total heavy-duty truck traffic along I-710 is projected to double by 2025, accounting for over 35% of all vehicles travelling the high volume portions of I-710. State Highway 60, which is located much farther from the ports, had a 2003 truck volume 8.8% of all vehicles and port trucks comprise only 6.7% of the total truck volume. With the projected increases in truck volume, especially on I-710, the development of dedicated truck lanes, perhaps limited to clean technology trucks, is earning serious consideration.

5.3.3 Alameda and Alameda-East Corridors

107. The model program for reducing rail transport congestion in Southern California was the creation of the Alameda Corridor. The project addresses the extreme congestion that developed along the twenty-mile corridor between the ports and downtown Los Angeles. SCAG initiated the concept with the creation in 1981 of a Ports Advisory Committee (PAC) to examine both highway and rail access to and from the ports. Phase one, which dealt with highway/truck access, recommended a cost-effective set of highway

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www.scag.ca.gov/rtp2008/pdfs/finalrtp/reports/fGoods Movement.pdf.

improvements such as street widening and freeway enhancements. Phase two, the rail access study, was completed in 1984 and focused on impact of train traffic on the various cities between the ports and downtown Los Angeles. After reviewing several routing alternatives, the PAC recommended consolidating all trains onto an up-graded right of way. SCAG created an Alameda Corridor Task Force that developed plans for a consolidated, below ground-level rail corridor and created in 1989 the Alameda Corridor Transportation Authority (ACTA) www.acta.org. The Alameda Corridor opened in April 2002. Total cost of this facility was USD 2.4 billion, with nearly half of that sum from revenue bonds. ⁴⁷ The railroads agreed to pay a container-based user fee for access to the Alameda Corridor, which is being used to retire the revenue bonds. The ACTA clearly stated that "the Alameda Corridor project was intended to consolidate train traffic and eliminate at-grade conflicts, which it did successfully. It never was aimed at removing the truck traffic from the freeways."

108. The project is notable for its *Mid-Corridor Trench*, a belowground, triple-tracked rail line that is 10 miles long, 33 feet deep and 50 feet wide. The Alameda Corridor allows trains to bypass 90 miles of early 20th century branch rail lines and avoiding more than 200 at-grade railroad crossings where cars and trucks previously had to wait for long freight trains to pass slowly. An important use of the corridor is to take cargo containers to and from the ports. The corridor has a maximum speed of 40 miles per hour, has reduced air pollution from idling cars and trucks by 54%, and cut travel time to 45 minutes from two hours between the ports and downtown Los Angeles. A study was performed in 2005 to analyze the air pollution impact of the Alameda Corridor. Cumulative NO_x and PM₁₀ emission reductions from improved rail efficiency in 2002-04 were estimated to 732 and 28 metric tonnes per year, respectively. Likewise, cumulative emission reduction benefits from traffic delay elimination from NO_x and PM from 2002 to 2004 are 330 and 16 metric tonnes per year, respectively.

109. However, the USC study⁴⁹ notes that the researchers "were unable to find any independent performance reviews or studies that pass any conclusive judgment on the Corridor's performance. It would be premature and overly simple to accept it as a complete success or to write it off as a complete failure. It may be partially both: a success of public-private partnership in financing and building an infrastructure mega-project and a failure of a mega-project in living up to the mega-expectations generated during its development (particularly regarding reduction in traffic congestion)."

110. The relative success of the Alameda Corridor, along with the need for similar congestion relief between the terminus of the corridor in downtown Los Angeles and important routing of those freight trains eastward toward San Bernardino and Riverside counties and on to the hinterlands, has resulted in planning for the Alameda Corridor East. A construction authority, known as the Alameda Corridor East (ACE) Construction Authority, is overseeing numerous safety upgrades and traffic signal control measures. The project is currently under construction and will grade separate many of the crossings along UP's main east-west lines through the San Gabriel Valley. Many of these crossings, which are currently at grade, tie up traffic on north-south streets for long periods, multiple times a day as the long freight trains pass on their way to and from the massive UP yards in the cities of Vernon and Commerce. Included as part of the Alameda Corridor East project is the half-billion dollar San Gabriel Trench, which will submerge the track through the cities of Alhambra and San Gabriel. The project will connect the ports to the transcontinental rail network and greatly improve distribution of cargo by 2020. Importantly, over 200 metric tons of air pollutants will be eliminated annually from the air basin.

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The Alameda Corridor: A Blueprint for the Future?, White paper by Ajay Agarwal, Genevieve Giuliano, and Christian Redfearn, USC School of Policy, Planning and Development, June 2004.

Alameda Corridor Air Quality Benefits Final Report, Weston Solutions, Inc., June 10, 2005.

The Alameda Corridor white paper, pg. 25.

5.3.4 Regional Strategies to Improve Goods Movement from Port Activities

- 111. The 2008 RTP identifies several regional truck and rail strategies for addressing the growth in goods movement, especially from the POLB and POLA, over the next 25 years. Several are already underway or completed, but the vast majority will need additional analysis, policy support, and sources of funding to succeed. These strategies generally have a dual benefit—reducing both air pollutant emissions and relieving future congestion. The following briefly describes each strategy.
- 112. Truck Strategies: The majority of goods movement in the Los Angeles Metropolitan region is by on-road trucks. Trucks account for at least one trip segment in 75% of the port related movements. Although trucks consist of only 15% of the total vehicles on the highways, they consume up to 40% of the total roadway capacity. Proposals include:
 - Dedicating freeway lanes for clean technology trucks. Consideration is being given to I-710, I-15 (Cajon Pass) and an east-west corridor through the San Gabriel and Pomona valleys. A study of the I-710 freeway with a dedicated truck way indicated that it would return \$4.66 for every dollar invested. The benefits include less accidents, congestion, vehicle operating costs and air quality.
 - Truck climbing lanes. Reduces congestion by allowing other vehicles to move at faster speeds and reduce lane weaving.
 - Extend hours and have five additional off-peak shifts per week, thereby shifting 40% truck activities. Existing Pier Pass program, which collects USD 20 per TEU from all importers or exporters, would be refunded in part to containers that leave/arrive at the terminal in these new off-peak hours. The off-peak shifts might occur on weekends during the day, or possibly after 5 pm on weekdays (which may have a noise impact on nearby residents).
 - Create a "virtual container yard" which would be an internet-based matching service for empty containers. This would reduce the number of vehicle miles travelled (VMT) associated with the movement of empty containers.
- 113. Rail Strategies: Several of the infrastructure needs for rail transport were noted in the previous section and in the separate analysis of the Alameda and Alameda-East corridors. However, there are some additional operational enhancements for rail transport that could be considered. Proposals include:
 - More efficient and increased use of on-dock rail yards
 - Shuttle train pilot project to transport containers currently being trucked to warehouses in San Bernardino and Riverside counties by a short-haul rail line to an inland rail yard and thus reduce truck transfer distances.
 - Additional rail-highway grade crossing separations
 - Track and signal improvements throughout the harbour area
 - New intermodal rail yards

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Southern California Regional Goods Management Policy Paper, SCAG, February 2005, pg. 5.

 Construct a High Speed Rail Transport system that would use a shared guide way with passenger trips, following the Alameda Corridor/I-710 corridor to Union Station in downtown Los Angeles, then east as freight-only to San Bernardino.⁵¹

5.4 Summary of Key Findings for Land Use and Transport

114. The following are findings on the Land Use and Transport impacts on the ports of Los Angeles and Long Beach:

- The impacted communities immediately adjacent to the POLB and POLA have about 300,000 residents.
- Land use adjacent to the ports is quite mixed-residential, industrial, commercial, and light industrial.
- Fairly equal split between the two ports on total cargo handled-48% at POLB and 52% at POLA.
- Containerized imports are triple 1995 levels, and could triple again by 2030.
- Rail transport is much more fuel efficient and less air pollutants than trucks.
- Major highway and rail corridors have, or will shortly, become more efficient for both rail and truck movement.
- There are limited opportunities to expand ports on undeveloped land, so they are focused on the brownfields programs.
- NEPA and CEQA requirements for developing environmental impact statements have major impact on port development and planning.
- A comprehensive emission reduction plan, known as the San Pedro Ports Clean Air Action Plan, is having major influence on port development strategies.
- Legislation and policies resulting from Climate Change legislation, such as the AB32 Scoping Plan, the SB375 GHG emission allocations, and the SCAG Compass Blueprint, will likely have impact on future development of the ports.
- Both ports have limited space available for large trans-loading to trucks or on-dock rail, so loads often first go onto drayage trucks before reaching a destination for long-haul rail and thus add to the environmental problems of the region.
- Since rail transport is more efficient and less polluting than truck transport, the ports have prioritized on-dock rail as the preferable option, despite limited space and interference with other traffic flows.
- Goal is for 30% of cargo to be handled by on-dock rail by 2030.
- The ports are planning to expand rail service with 2 on-dock and 2 near-dock rail facilities.
- The share of containerized cargo handled by the ports is slightly less than 87% of all California with little change in that proportion through 2030.
- The region is seriously considering adding truck-only lanes for clean technology trucks on the two major freeways that leave the ports: I-710 and State Highway 60.

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Final 2008 Regional Transportation Plan: Making the Connections, SCAG, Appendix F, <u>HSRT/Alternative Technology Systems for Passenger and Freight</u>.

- The Alameda Corridor has been a success story for the region, cutting travel time to downtown Los Angeles by rail by 45 minutes and reducing air pollution from idling trucks and cars by 54%.
- A similar but longer special rail corridor is now under construction from downtown Los Angeles to the eastern counties, the Alameda Corridor East.
- SCAG's 2008 RTP identified several strategies to improve truck and rail traffic caused by the
 rapid growth of the port's cargo. They include dedicated truck lanes, truck climbing lanes, more
 off-peak shifts the ports, and a "virtual container yard" for internet-base matching for empty
 containers.
- Rail strategies include more on-dock rail yards, shuttle trains to inland rail yards, improved grade crossings and signals, and a high-speed rail transport system using shared guide way with passenger trains.

6. Other Environmental Issues

6.1 Hazardous Cargo

- 115. The container cargo that is handled at the two San Pedro Bay ports includes, but is not limited to, items such as fireworks; industrial chemicals (gases, liquids, and solids); solvents; petroleum products; paints; cleaners; and pesticides. Hazardous materials that are transported in containers are stored in individual containers specifically manufactured for storing and transporting the material. In addition, shipping companies prepare, package, and label hazardous materials shipments in accordance with U.S. statutory requirements. All hazardous materials in containers must be properly manifested. Hazardous material manifests for inbound containerised hazardous materials are reviewed and approved by the Port Security and the City's Fire Department before they can be unloaded.
- 116. In addition to container cargo, the ports handle numerous liquid bulk cargos, some of which that are potentially hazardous. The two ports receive and export refined and partially refined petroleum products on a large scale. The POLA, for example, has approximately 150 liquid storage tanks on site. The region surrounding the Port (the Los Angeles Basin) also contains a number of oil and gas production fields, which have been operating for nearly a century. These petroleum production facilities include storage vessels, pipelines, processing activities and truck activity. Although these facilities and pipelines are engineered according to various safety standards and undergo extensive environmental review prior to their approval, they nonetheless handle materials that pose risks to people, the environment, and property in the vicinity.
- 117. In addition to port requirements, there are a number of city, State and national requirements that apply to protect workers and the public, including the requirement that facilities that store or handle hazardous material prepare a Risk Management Plan. Risk Management Plans were first required by California in 1986 and have since been supplemented by a parallel Federal government requirement. A Risk Management Plan contains a hazard assessment of potential "worst-credible" accidents, an accident prevention program, and an emergency-response program.
- 118. The risks associated with expanding port activities and their interaction with non-port operations in the vicinity of the ports are also dealt with during project-level reviews conducted for NEPA and CEQA, the two environmental disclosure laws discussed earlier.

6.2 Noise

119. There are many sources of noise at the two ports during normal operations, including rail car wheel squeal, slamming containers, the operation of cargo handling equipment, locomotive operation and

train assembly, vessel whistles and heavy-duty truck traffic. Additional noise occurs during construction activities associated with port improvements and expansion. Nearly all types of construction equipment produce high levels of noise with such equipment as pile drivers and rock drills standing out.

- 120. These impacts are dealt with in several ways. First, citywide noise laws or "ordinances" are imposed by the cities of Los Angeles and Long Beach. They limit noise-producing activities depending on the time of day and the day of the week. These ordinances effectively limit major construction activities to the 7AM through 9PM periods on most days, and prohibit it altogether on Sundays and national holidays. Maximum ambient noise levels are capped for residential, hospital and school zones at all times. Second, the project-level reviews conducted for NEPA and CEQA typically include noise measurements, noise modeling and, in situations where noise impacts are considered "significant", the use of mitigation. Examples of mitigation measures include further reducing operating hours, using noise suppression technologies, constructing noise barriers and other actions. CEQA guidelines define thresholds of significance that vary by time of day and what kind of land use is affected.
- 121. Public input is routinely obtained from Community Advisory Committees, which provide a forum to discuss and address both routine noise issues and the adequacy of mitigation during construction activities.

6.3 Wetlands and Wildlife Habitat

122. Both ports support activities that enhance wildlife habitats in Southern California. The ports support biological studies and surveys of marine life in and around the ports. One of the most important activities is their involvement in wetlands (salt water marshes) and wildlife habitat restoration projects in Southern California. Over the years, urban development has destroyed or degraded many of the coastal wildlife habitats in Southern California and there is a large-scale effort to enhance and restore those that remain. The two ports are investing millions of dollars in several large restoration efforts that are currently underway. In exchange for this support, the ports gain the right to expand their own operations; their contribution to the enhancement of the coastal environment is considered mitigation for their use/consumption of coastal resources.

6.4 Multimedia Policies

- 123. The Port of Long Beach adopted its "Green Port Policy" in 2005. It serves as a guide for decision making and a framework for what the port terms are "environmentally friendly" Port operations. The Green Port Policy includes six basic program elements, each with an overall goal:
 - Protect, maintain, or restore aquatic ecosystems and marine habitats.
 - Reduce harmful air emissions from Port activities.
 - Improve the quality of Long Beach Harbor waters.
 - Remove, treat, or render suitable for beneficial reuse contaminated soils and sediments in the Harbor District.
 - Interact with and educate the community regarding Port operations and environmental programs.
 - Implement sustainable practices in design and construction, operations, and administrative practices throughout the Port.