

*[Summary of an Environmental Report]*

## Emission Inventories from the Port of Oakland (POAK) and the San Pedro Bay Ports (SPBP)

A comparison between the emissions inventories of the Port of Oakland (POAK) and the San Pedro Bay Ports (SPBP) reveals problems that each port may need to address to help achieve National Ambient Air Quality Standards (NAAQS). Such a comparison also highlights what each port might learn from the other in terms of effective strategies to reduce emissions.

Starcrest Consulting Group, LLC produced a report comparing (a) the POAK contributions to San Francisco Bay Area Air Basin (Bay Area) emissions *VERSUS* (b) the SPBP contributions to South Coast Air Basin (South Coast) emissions. (The SPBP consists of two ports: the Port of Los Angeles and the Port of Long Beach.)

Most emissions at ports come from five diesel-fueled source categories: ocean-going vessels (OGVs); on-road heavy-duty vehicles; cargo handling equipment; harbor craft; and locomotives. The **Table** below shows the 2015 total regional emissions for the Bay Area and South Coast, as well as the contributions from the POAK and SPBP to their corresponding regional emission totals. The pollutant categories analyzed were: particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>); oxides of nitrogen (NO<sub>x</sub>); oxides of sulfur (SO<sub>x</sub>); and carbon dioxide equivalent (CO<sub>2e</sub>). The results in the Table show that the POAK's relative contributions to the Bay Area emissions are consistently less than the SPBP's relative contributions to the South Coast emissions. Additional analysis (not shown here) revealed that OGVs, compared to other sources, contributed a larger percentage to the POAK's emissions than they did to the SPBP's emissions in the categories of PM<sub>2.5</sub>, NO<sub>x</sub>, and CO<sub>2e</sub>. This difference in OGV contribution was probably due the vessel speed reduction program at the SPBP, which has been more effective than the similar program at the POAK.

By analyzing data over time, Starcrest revealed that the total emissions within each air basin had decreased from 2005 to 2015 in all categories except CO<sub>2e</sub>. In addition, the relative contributions of both the POAK and the SPBP to their respective air basins had

Pollutant Category	2015 Total Regional Emissions*		Contribution to Regional Total	
	Bay Area Air Basin	South Coast Air Basin	POAK	SPBP
<b>PM<sub>2.5</sub></b>	16,724	23,641	0.4%	1.1%
<b>NO<sub>x</sub></b>	94,243	160,446	3.6%	8%
<b>SO<sub>x</sub></b>	8,129	6,444	1.7%	5.7%
<b>CO<sub>2e</sub></b>	84.7 MMT	155 MMT	0.3%	0.8%

\*All emissions expressed in tons, except CO<sub>2e</sub>, in million metric tons (MMT).

significantly decreased for PM<sub>2.5</sub> and SO<sub>x</sub>, remained approximately the same for CO<sub>2e</sub>, but increased for NO<sub>x</sub>.

The Environmental Protection Agency (EPA) sets the NAAQS for carbon monoxide, ozone, particulate matter, lead, nitrogen dioxide, and sulfur dioxide. The EPA then designates the degree to which each regional air basin has attained or not attained these standards. In regions not attaining the NAAQS, pollution control agencies must develop state implementation plans (SIPs) for improvement. The Bay Area Air Quality Management District (AQMD) has attained all NAAQS except for the 2015 8-hour ozone standard, but it is within 5% of this standard. The South Coast region is classified as having “extreme” nonattainment for ozone and “serious” nonattainment for PM<sub>2.5</sub>. As a result, the EPA has required the South Coast AQMD to attain the 2008 standards for ozone and PM<sub>2.5</sub> by 2032 and 2025, respectively.

Both the Bay Area and South Coast AQMDs’ current plans do not address the 2015 8-hour ozone NAAQS, as the EPA has not yet designated their attainment status for this standard. The Bay Area will likely see an additional 15–20% reduction in NO<sub>x</sub> emission over the next 3 to 5 years, such that additional measures will likely be unnecessary to meet the 2008 8-hour ozone standard. In contrast, the South Coast AQMD needs to implement strategies to reduce NO<sub>x</sub> emissions by 118 tons per day to meet the 2008 8-hour ozone standard. Their 2016 plan proposes measures to achieve NO<sub>x</sub> reductions by up to 142 tons per day.

The Bay Area and South Coast AQMD plans show that reduction of NO<sub>x</sub> emissions is the most efficient means for attaining the NAAQS. Many control strategies focus on reducing emissions from diesel engines, which contribute significantly to NO<sub>x</sub> and are used to power a large proportion of port equipment.

While not part of the California state implementation plan requirements, California has also adopted greenhouse gas reduction targets: to reduce greenhouse gas emissions from their 1990 levels by 40% by 2030 and by 80% by 2050. The Bay Area AQMD 2017 plan has committed to these goals and timeframes. The POAK and SPBP contribute little to the overall statewide greenhouse gas emissions (0.46%) and should see adequate greenhouse gas reductions through the state and district efforts.

In conclusion, the Bay Area AQMD has nearly attained all of the NAAQS and should attain the final ozone standard with few or no additional NO<sub>x</sub> control measures. However, the POAK should continue to research and prioritize possible NO<sub>x</sub> reduction strategies and ensure that its contribution to Bay Area NO<sub>x</sub> does not increase. Much can be learned from the emission reduction programs the SPBP has implemented and is developing to help the South Coast AQMD with its significant air quality challenge and nonattainment of NAAQS. The SPBP’s current and future strategies to fund emission reductions may also point to funding mechanisms that could help the POAK.