ATTACHMENT D

ANALYSES SUPPORTING THE "SECOND NOTICE OF PUBLIC AVAILABILITY OF MODIFIED TEXT AND AVAILABILITY OF ADDITIONAL DOCUMENTS AND INFORMATION"

THIS DOCUMENT PROVIDES UPDATES TO THE "NOTICE OF PUBLIC AVAILABILITY OF MODIFIED TEXT AND AVAILABILITY OF ADDITIONAL DOCUMENT AND INFORMATION" POSTED MARCH 26, 2020 AND TO THE INITIAL STATEMENT OF REASON: APPENDIX G HEALTH ANALYSES: CONTROL MEASURE FOR OCEAN-GOING VESSELS AT BERTH POSTED OCTOBER 15, 2019.

July 10, 2020

This is an attachment to the "Second Notice of Public Availability of Modified Text and Availability of Additional Documents and Information" (Second 15-Day Changes) posted July 10, 2020 related to the Proposed At Berth Regulation. This attachment is an update to the "Notice of Public Availability of Modified Text and Availability of Additional Document and Information" posted March 26, 2020 (15-Day Changes) and Appendix G to the Initial Statement of Reasons (ISOR) supporting the Proposed Regulation released October 15, 2019 (ISOR Appendix G). The tables and figures included in this attachment reflect updates to emissions estimates and health outcomes for the Second 15-Day Changes. The information provided in this attachment also updates the health analysis information presented in Chapters V and VI in the ISOR.

UPDATES TO THE HEALTH ANALYSES: CONTROL MEASURE FOR OCEAN-GOING VESSELS AT BERTH

1. Overview of suggested Second 15-Day Changes to the Proposed Regulation that impact the non-cancer mortality and illness estimates.

On October 15, 2019, California Air Resources (CARB) staff posted the Notice of Public Hearing and Proposed Control Measure for Ocean-Going Vessels at Berth Staff Report: Initial Statement of Reasons (ISOR). The ISOR included the Proposed Regulation Order (October 15, 2019 version) and Appendix G: Health Analysis: Control Measure of Ocean-going Vessels At Berth. On March 26, 2020, CARB staff posted proposed changes (15-Day Changes) to the Proposed Regulation. In response to feedback received from CARB's Board during the June 25, 2020 Board Meeting, public comments received during the formal comment period for the 15-Day Changes that began March 26, 2020 and ended May 1, 2020, and further CARB staff-level deliberations, CARB staff made both substantive and non-substantive changes to the Proposed Regulation language. The proposed changes are included in the Second 15-Day Changes package (dated July 10, 2020). This document, Attachment D to the proposed Second 15-Day Changes, provides updates to the 15-Day Changes and to the ISOR Appendix G.

The updates in emissions estimates and health outcomes for the Second 15-Day Changes do not include any updates or changes to methodology. Only changes that affect quantified health outcomes are described in this attachment. Only the tables and charts that change as a result of the Second 15-Day Changes have been provided in this attachment and the table and chart numbers have been maintained from the15-Day Changes and ISOR Appendix G to provide easier comparison.

The proposed Second 15-Day Changes to the At Berth Regulation that affect health outcomes include changes to the implementation dates for containers, refrigerated cargo (reefers), cruise vessels and roll on-roll off/auto carriers (ro-ros). The proposed 15-Day Changes implementation timeline is summarized in Updated Table 1.

Updated Table 1 (Second 15-Day Proposal, July 10, 2020): Implementation Timeline for the Proposed Regulation

2023	2025	2027
Container, Reefer, and Cruise		
	Ro-ro	
	Tankers -POLA/POLB* Terminals	

2023	2025	2027
		Tankers – Remaining Statewide Terminals

* Port of Los Angeles (POLA), Port of Long Beach (POLB)

Specifically, emissions control requirements for container, reefer and cruise vessels will begin January 1, 2023 instead of 2021. In 2023, the control requirements will include all container, reefer and cruise vessels that visit terminals in California that are above the low activity threshold. There were no changes made to the percentage of Terminal Incident Events (TIEs) and Vessel Incident Events (VIEs) granted for each vessel fleet or terminal. However, TIEs and VIEs will begin in 2023 to align with the first year of implementation for the container, reefer and cruise vessels. TIEs are maintained from the 15-Day Changes at 15 percent in 2023 and 2024 and maintained at 5 percent in 2025 and later. Ro-ro vessel requirements begin January 1, 2025 instead of 2024, with TIEs maintained at 5 percent. VIEs are maintained at 5 percent in 2023 and all years later, for all regulated vessel types.

As described in Appendix G, the estimated statewide particulate matter (PM) 2.5 non-cancer mortality and illness impacts are associated with exposure to primary PM 2.5 (diesel PM and boiler PM) and secondary PM 2.5 from nitrogen oxides (NOx) emissions. The following tables show the impact of the updates resulting from the Second 15-Day Changes on the PM 2.5 and NOx emissions by air basin and the associated updates to the avoided PM mortality and illness. Updated Table 24 provides statewide valuation from avoided adverse health outcomes between 2021 and 2032 for the proposed Second 15-Day Changes.

Updated Table 5 (Second 15-Day Proposal, July 10, 2020): At Berth Proposed Regulation PM 2.5 Emissions by Air Basin*
(tons per year)

Year	SF	SC	SCC[1]	SD	SJV
2021	36.89	61.50	2.07	4.74	3.08
2022	37.64	62.98	2.11	4.91	3.14
2023	36.22	58.26	2.28	4.78	3.21
2024	36.93	59.51	2.33	4.95	3.28
2025	35.63	42.50	1.67	3.94	3.36
2026	36.44	43.08	1.71	4.07	3.45
2027	26.69	43.68	1.74	4.20	3.36
2028	27.41	44.33	1.78	4.35	3.45
2029	28.16	45.04	1.81	4.49	3.54
2030	28.93	45.80	1.85	4.64	3.64

2031	29.78	47.23	1.89	4.81	3.75
2032	30.66	48.70	1.92	4.98	3.86

* San Francisco (SF), South Coast (SC), South Central Coast (SCC), San Diego (SD), San Joaquin Valley (SJV)

1. Years 2023-2024 show a slight increase in emissions compared to the Existing Regulation due to the lower projected shore power usage in the Proposed Regulation at the Port of Hueneme.

Updated Table 7 (Second 15-Day Proposal, July 10, 2020): At Berth Proposed Regulation NOx Emissions by Air Basin (tons per year)

Year	SF	SC	SCC[1]	SD	SJV
2021	1212.6	2099.9	93.5	227.1	116.5
2022	1238.1	2147.8	94.8	231.1	119.2
2023	1103.9	1793.2	104.7	216.2	121.7
2024	1123.6	1828.7	106.6	222.5	125.0
2025	1008.4	1201.9	62.5	151.3	128.4
2026	1029.7	1222.2	63.7	155.6	132.3
2027	750.0	1242.2	65.0	160.0	124.8
2028	769.1	1264.5	65.9	164.6	128.9
2029	787.7	1287.4	66.6	168.3	132.6
2030	807.7	1306.6	67.7	147.5	134.3
2031	820.6	1323.7	67.8	150.4	135.3
2032	840.1	1303.8	69.2	153.1	124.2

1. Years 2023-2024 show a slight increase as compared to the Existing Regulation due to the lower projected shore power usage in the Proposed Regulation at the Port of Hueneme.

2. Updates to Regional PM 2.5 Mortality and Illness Analysis for California Air Basins: PM Mortality and Illness: Reduction in Health Outcomes.

California Air Resources Board (CARB) staff estimated the reduction in health outcomes from reduced emissions of PM 2.5 from the second 15-day change version of the Proposed Regulation. These health outcomes include cardiopulmonary mortality, hospital admissions, and emergency room visits. Based on the analysis, staff estimates that the total number of cases statewide that would be reduced due to the implementation of the Proposed Regulation are as follows:

- 237 premature deaths (186 to 290; 95 percent confidence interval (CI)).
- 75 hospital admissions (10 to 139; 95 percent CI).
- 122 emergency room visits (75 to 155; 95 percent CI).

Updated Tables 20 through 22 show the estimated reductions in health outcomes resulting from the Second 15-Day Changes to the Proposed Regulation summed over a 12-year period from 2021 to 2032. The values in parentheses represent the 95 percent confidence interval for each health outcome.

Updated Table 20 (Second 15-Day Proposal, July 10, 2020): Proposed Regulation: Reductions in Health Outcomes from PM 2.5[1,2]

Air Basin	Premature Deaths	Hospital Admissions	Emergency Room Visits
North Coast	0 (0 - 0)	0 (0 - 0)	0 (0 - 0)
Sacramento Valley	0 (0 - 0)	0 (0 - 0)	0 (0 - 0)
San Diego County	1 (0 - 1)	0 (0 - 0)	0 (0 - 0)
San Francisco Bay	4 (3 - 5)	1 (0 - 3)	3 (2 - 3)
San Joaquin Valley	0 (0 - 0)	0 (0 - 0)	0 (0 - 0)
South Central Coast	0 (0 - 0)	0 (0 - 0)	0 (0 - 0)
South Coast	26 (20 - 32)	4 (1 - 8)	11 (5 - 4)
Total	31 (24 - 38)	6 (1 - 11)	14 (7 - 8)

1. PM 2.5 estimates for the South Coast Air Basin were obtained by direct estimation of health outcomes. Other estimates were obtained using incidence per ton (IPT) factors.
2. Due to rounding, numbers may not add up precisely to the totals.

Updated Table 21 (Second 15-Day Proposal, July 10, 2020): Proposed Regulation: Reductions in Health Outcomes from NOx[1]

Air Basin	Premature Deaths	Hospital Admissions	Emergency Room Visits
North Coast	0 (0 - 0)	0 (0 - 0)	0 (0 - 0)
Sacramento Valley	0 (0 - 0)	0 (0 - 0)	0 (0 - 0)
San Diego County	6 (4 - 7)	2 (0 - 3)	2 (2 - 3)
San Francisco Bay	26 (20 - 31)	8 (1 - 15)	14 (9 - 20)
San Joaquin Valley	0 (0 - 1)	0 (0 - 0)	0 (0 - 0)
South Central Coast	2 (1 - 2)	0 (0 - 1)	1 (0 - 1)
South Coast	172 (135 - 210)	59 (7 - 109)	90 (57 - 123)
Total	206 (161 - 251)	69 (9 - 128)	108 (68 - 148)

1. Due to rounding, numbers may not add up precisely to the totals.

Updated Table 22 (Second 15-Day Proposal, July 10, 2020): Proposed Regulation: Total Reductions in Health Outcomes[1,2]

Air Basin	Premature Deaths	Hospital Admissions	Emergency Room Visits
North Coast	0 (0 - 0)	0 (0 - 0)	0 (0 - 0)
Sacramento Valley	0 (0 - 0)	0 (0 - 0)	0 (0 - 0)
San Diego County	6 (5 - 8)	2 (0 - 3)	3 (2 - 4)
San Francisco Bay	30 (24 - 37)	10 (1 - 18)	17 (11 - 23)
San Joaquin Valley	1 (0 - 1)	0 (0 - 0)	0 (0 - 0)
South Central Coast	2 (1 - 2)	0 (0 - 1)	1 (0 - 1)
South Coast	199 (155 - 243)	63 (8 - 117)	102 (62 - 127)
Total	237 (186 - 290)	75 (10 - 139)	122 (75 - 155)

1. PM 2.5 estimates for the South Coast Air Basin were obtained by direct estimation of health outcomes. Other estimates were obtained using incidence per ton (IPT) factors.
2. Due to rounding, numbers may not add up precisely to the totals.

Statewide valuation of health benefits were calculated by multiplying the avoided health outcomes by the valuation per incident. Staff quantified the total statewide valuation due to avoided health outcomes between 2021 and 2032. These values are summarized in Updated Table 24. The spatial distribution of these benefits follow the distribution of emission reductions and avoided adverse health outcomes; therefore, most benefits to individuals would occur in the South Coast and San Francisco Bay Area air basins.

Updated Table 24 (Second 15-Day Proposal, July 10, 2020): Statewide Valuation from Avoided Adverse Health Outcomes between 2021 and 2032 as a Result of the Proposed Regulation[1]

Outcome	Valuation
Avoided Premature Deaths	$2,311,550,000
Avoided Hospitalizations	$4,100,000
Avoided Emergency Room Visits	$102,000
Total Valuation	$ 2,315,752,000

1. Values have been rounded and are based on the 2019 dollar year.