Port of
LONG BEACH
THE PORT OF CHOICE

AIR EMISSIONS INVENTORY - 2021

August 2022

Prepared by:

STARCREST CONSULTING GROUP, LLC

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Heather Tomley
Matthew Arms

Authors:	Archana Agrawal, Principal, Starcrest Guiselle Aldrete, Consultant, Starcrest Bruce Anderson, Principal, Starcrest Jill Morgan, Consultant, Starcrest Rose Muller, Consultant, Starcrest Joseph Ray, Principal, Starcrest
Contributors:	Steve Ettinger, Principal, Starcrest Ray Gorski, Consultant, Starcrest Ruselle Hansen, Consultant, Starcrest
Document Preparation:	Denise Anderson, Consultant, Starcrest
Cover:	Melissa Silva, Principal, Starcrest
Photos:	Port of Long Beach Melissa Silva, Principal, Starcrest

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Please note that there may be minor inconsistencies, due to rounding, associated with emission estimates, percent contribution, and other calculated numbers between the various sections, tables, and figures of this report. In 2021, emissions from articulated tug barges (ATB) are removed from the ocean going vessels category and added to the harbor craft category. This change, along with revisions to harbor craft emissions estimation methodology, are made per California Air Resources Board (ARB) latest adoption of amendments to the Commercial Harbor Craft Regulation (2022 CARB CHC regulation amendment) which defined ATBs as commercial harbor craft. A detailed Methodology Report is available on the Port's website[1]. This 2021 Air Emission Inventory correlates with Version 3 of the Methodology Report.

EXECUTIVE SUMMARY

In 2021, record cargo volumes, supply chain disruptions, and COVID-19 restrictions that reduced working capacity at the docks resulted in unprecedented levels of supply chain congestion, which in turn led to the highest levels of emissions seen at the Port in more than 10 years. Following the 2020 shutdowns due to COVID-19, a wave of consumerism ensued which triggered a cargo surge in the latter part of 2020 and continued into 2021. Numerous supply chain disruptions that started during the COVID-19 shutdowns, continued through 2021, such as lack of chassis, too many empty containers at the terminals, not enough warehouse space inland, and workers out sick or in quarantine due to COVID-19. Further, in order to protect workers during the COVID-19 pandemic, limits on the number of gangs that could work a vessel continued in 2021. All of these factors resulted in longer vessel stays at berth, as it took the terminals more time to load and unload vessels with fewer dockworkers per ship, and high numbers of vessels at anchorage, and long waits at anchorage for berths to become available. Vessel congestion and record container cargo throughput led to a ripple effect throughout the logistics chain, resulting in activity increases in cargo-handling equipment and truck activity as the system struggled to keep up.

Emissions Comparison to Previous Year

In 2021, the Port of Long Beach reported a record 9.4 million twenty-foot equivalent units (TEUs). Relative to the previous year, containerized cargo throughput is up 16%. The average TEU per call increased by 25%, while containership calls are lower by 7%, which correlates to larger ships calling the Port in 2021 as compared to 2020.

Table ES.1: 2020-2021 Container Throughput and Vessel Call Comparison

Year	Container Throughput (TEU)	All Arrivals	Containership Arrivals	Average TEU per Call
2020	8,113,315	1,855	982	8,262
2021	9,384,368	1,905	912	10,290
Change (%)	**16%**	**3%**	**-7%**	**25%**

[1] *www.polb.com/environment/air/#emissions-inventory*

Calendar year 2021 proved to be another challenging year for supply chain and goods movement which resulted in increased emissions as compared to the previous year, most notably for ocean-going vessels (OGVs). The major factors that resulted in significantly higher emissions for 2021 included:

1) large number of vessels, mainly containerships, at anchorage or loitering.
2) container ships staying at berth longer than usual and less using shore power.
3) increased use of cargo handling equipment to keep up with container surge.
4) longer truck turn times at terminals.

Table ES.2 compares the 2021 emissions to the previous year. Emissions increased across the board for all source categories, except for locomotives and trucks for some pollutants.

Table ES.2: 2020-2021 Air Emissions Comparison by Source Category

	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e MT
2020								
Ocean-going vessels	75	69	42	3,604	194	306	136	294,838
Harbor craft	7	6	7	361	0	63	11	33,969
Cargo handling equipment	4	4	3	245	1	742	31	121,060
Locomotives	20	19	20	536	0	127	31	44,453
Heavy-duty vehicles	6	6	6	1,023	4	256	39	383,451
Total	**112**	**104**	**78**	**5,769**	**200**	**1,493**	**248**	**877,772**
2021								
Ocean-going vessels	133	122	72	5,587	270	527	217	551,049
Harbor craft	9	9	9	383	0	70	14	37,500
Cargo handling equipment	6	5	4	284	2	1,128	35	142,802
Locomotives	20	19	20	556	1	137	31	47,684
Heavy-duty vehicles	6	5	6	951	4	307	46	409,849
Total	**174**	**160**	**111**	**7,761**	**277**	**2,168**	**345**	**1,188,884**
Change between 2020 and 2021 (percent)								
Ocean-going vessels	77%	77%	71%	55%	39%	72%	60%	87%
Harbor craft	36%	38%	36%	6%	10%	11%	26%	10%
Cargo handling equipment	30%	30%	32%	16%	18%	52%	16%	18%
Locomotives	-0.3%	-0.5%	-0.3%	4%	7%	7%	2%	7%
Heavy-duty vehicles	-2%	-2%	-3%	-7%	6%	20%	18%	7%
Total	**55%**	**54%**	**42%**	**35%**	**38%**	**45%**	**39%**	**35%**

Below are source category specific explanations for the emission changes when comparing 2021 to 2020:

- For OGVs, the significantly higher emissions are due to supply chain congestion[2] which resulted in a record number of vessels visiting anchorages and vessels staying longer at berth and anchorage which is further explained in a subsection of this executive summary. In 2021, 25 vessels called the Port with propulsion engines that meet the Tier III NO_x emission standard which are 75% cleaner than the Tier II engine standard. This is the most Tier III vessels calling the Port to date. It was also the first time for the Port to participate in the Environmental Ship Index (ESI) Program which has access to data, such as sulfur content used and a vessel's EIAPP certificate that provides the actual NO_x emissions rate.

- For harbor craft, overall hours of operation for most vessel types increased resulting in higher emissions compared to 2020 due to more crew boats visiting anchorages, tugboats assisting with additional shifts from anchorage to berth, ferries and excursion vessels beginning to resume to pre COVID schedule. For the first time, ATBs were taken out of the OGV emissions inventory and added to the harbor craft emissions inventory to be consistent with CARB methodology. For comparison purposes, ATBs were removed from 2020 OGV emissions and added to the 2020harbor craft emissions inventory to be able to compare emissions.

- For CHE, hours of use for equipment were higher due to the record container throughput in 2021 which led to an increase in emissions for all pollutants. There was no significant turnover of equipment in 2021. Some terminals used renewable diesel which has a lower carbon intensity than conventional diesel for the first time in 2021.

- For locomotives, the changes in emissions were due primarily to a combination of decreases in the line haul fleet composite emission factors resulting from line haul fleet mix improvement, offset by a 14% increase in the number of containers moved by on-dock rail (on-dock lifts) which resulted in higher rail activity. These offsetting factors resulted in decreases of PM and increases of other pollutants.

- For heavy-duty vehicles, the emissions of some pollutants (Table ES.2) decreased due to fleet turnover to newer trucks which resulted in a higher percentage of newer trucks making more of the container moves, which lowered the fleet composite emission factors, especially of PM and NO_x. Other pollutants increased because they are not greatly affected by model year, and the increases in port throughput, the number of truck trips, and the number of vehicle miles traveled (VMT) are reflected in the resulting emission estimates. Increases in emissions were limited by an increase in the use of on-dock rail compared with 2020, which shifted some additional cargo from truck to rail.

[2] *https://www.pmsaship.com/uncategorized/congestion-fact-sheet/*

Emissions Comparison to Baseline Year

The Port of Long Beach 2021 Air Emissions Inventory results and a comparison to the Port's baseline 2005 air emissions inventory are presented in Table ES.3. Overall, criteria pollutant emissions are significantly lower when comparing 2021 to 2005, but greenhouse gas emissions (shown as CO_2e) are higher in 2021.

Table ES.3: 2005-2021 Air Emissions Comparison by Source Category

	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e MT
2005								
Ocean-going vessels	866	693	595	6,655	6,848	531	234	386,935
Harbor craft	36	35	36	699	3	225	52	35,001
Cargo handling equipment	47	44	47	1,289	11	398	65	103,710
Locomotives	43	40	43	1,273	76	179	66	60,579
Heavy-duty vehicles	205	196	205	5,273	37	1,523	318	391,610
Total	**1,197**	**1,008**	**926**	**15,188**	**6,975**	**2,856**	**735**	**977,836**
2021								
Ocean-going vessels	133	122	72	5,587	270	527	217	551,049
Harbor craft	9	9	9	383	0	70	14	37,500
Cargo handling equipment	6	5	4	284	2	1,128	35	142,802
Locomotives	20	19	20	556	1	137	31	47,684
Heavy-duty vehicles	6	5	6	951	4	307	46	409,849
Total	**174**	**160**	**111**	**7,761**	**277**	**2,168**	**345**	**1,188,884**
Change between 2005 and 2021 (percent)								
Ocean-going vessels	-85%	-82%	-88%	-16%	-96%	-1%	-7%	42%
Harbor craft	-74%	-74%	-74%	-45%	-88%	-69%	-72%	7%
Cargo handling equipment	-88%	-88%	-92%	-78%	-85%	183%	-45%	38%
Locomotives	-53%	-54%	-53%	-56%	-99%	-23%	-53%	-21%
Heavy-duty vehicles	-97%	-97%	-97%	-82%	-89%	-80%	-86%	5%
Total	**-85%**	**-84%**	**-88%**	**-49%**	**-96%**	**-24%**	**-53%**	**22%**

Table ES.4 summarizes and compares vessel arrivals and containerized cargo throughput in twenty-foot equivalent units (TEU) at POLB in 2005 and 2021. Relative to 2005 levels, containerized cargo throughput is up 40%, while containership arrivals to POLB are down 32%. Indicative of the larger vessels calling at POLB, the average number of TEU per vessel call doubled in 2021 as compared to 2005 with an average 10,290 TEU per containership call. The 2005 arrivals do not match previous year reports due to removal of ATBs from the OGV source category.

Table ES.4: 2005-2021 Container Throughput and Vessel Call Comparison

Year	Container Throughput (TEU)	All Arrivals	Containership Arrivals	Average TEU per Call
2005	6,709,818	2,617	1,332	5,037
2021	9,384,368	1,905	912	10,290
Change (%)	**40%**	**-27%**	**-32%**	**104%**

The criteria pollutant reductions over the last 16 years continued to be significant despite a 40% increase in TEU throughput in 2021 as compared to 2005. Several factors contributed to the lower emissions between 2005 and 2021:

- For OGVs, the primary reasons for emission reductions are fuel switching, shore power, fewer vessel calls, newer vessels and high participation in the Port's Green Flag Program that incentivizes shipping lines to slow down within 20 and 40 nautical miles. In 2021, 25 vessels called the Port with engines meeting the Tier III NO_x emission standard which is 75% cleaner than the Tier II engine standard. The CO_2e emissions are higher in 2021 than in 2005 due to higher auxiliary engine and boiler emissions at berth and at anchorage due to longer stays and supply chain congestion that required vessels to wait at anchorage. CO_2e emissions normally increase with increased activity and fuel consumed as there is no CO_2 standard for marine engines and lower sulfur fuel mainly reduces PM and sulfur emissions, but it doesn't reduce CO_2e emissions. Use of shore power at berth does reduce CO_2e emissions.

- For harbor craft, the emissions in 2021 are lower than 2005 emissions due to the repowers that have occurred as required by the CARB Harbor Craft Regulation or funding incentives, removal of older vessels due to attrition, and more efficient operations. There are no CO_2 standards for engines or control measures for harbor craft, therefore, the CO_2e emissions increased along with increased activity.

- For CHE, implementation of CAAP measures requiring equipment to meet Tier 4 engine standards through leases, CARB's Cargo Handling Equipment Regulation that also phased in Tier 4 CHE, along with funding incentives, resulted in replacement of older equipment with cleaner units, retrofits, and repowers, combined with efficiency in operations, led to lower emissions. The increase in CO emissions from cargo handling equipment is attributed to increased usage of several gasoline-fueled equipment with higher CO emission rates compared to diesel equipment. The increase in CO_2e reflects increased activity and the fact that there are no lower CO_2 emission standards and limited emission control measures available. In 2021, a few terminal operators started using renewable diesel which has a lower carbon intensity than conventional diesel.

- For locomotives, the decreases in fleet-wide emissions from line haul locomotives are due to rail companies meeting the terms of the memorandum of understanding (MOU) with CARB that resulted in Tier 2 locomotive fleet average emissions by 2010, and the replacement of older switching locomotives with new low-emission and ultra-low emission switchers.

- For HDV, the 2012 implementation of the final phase of the Port's Clean Truck Program (CTP) and substantial funding awarded towards truck replacement resulted in significant turnover of older trucks to newer and cleaner trucks as compared to 2005. Also, as part of a Port Tariff amendment in 2018, all new trucks that register in the Ports' Drayage Truck Registry are required to be 2014 model year or newer. The share of mileage driven by 2014 and newer model year trucks increased to 48% in 2021.

Additional Comparison of 2021-2020 OGV Emissions

In 2021, OGVs accounted for 72% of NO_x and 65% DPM emissions. In 2020, port-wide, OGVs accounted for 62% of NO_x and 54% of DPM emissions Considering this unusual increase in OGV emissions year-over-year, and to ensure transparency, a more substantial discussion of OGV emissions is included in this report. This section will provide more context as to why the OGV emissions were significantly higher in 2021. Table ES.5 presents the comparison of OGV emissions by mode which shows that the 2021 hoteling at anchorage emissions are particularly higher than in 2020. At berth and at anchorage, the auxiliary engines and auxiliary boilers are used, while propulsion engines which are larger engines that use more energy, are turned off.

Table ES.5: 2020-2021 OGV Emissions by Mode Comparison

Mode	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e tonnes
2020								
Total Transit	17	15	15	1,633	43	112	55	64,899
Total Maneuvering	3	3	3	256	7	23	16	10,853
Total Hotelling at-berth	36	33	12	956	95	94	37	144,891
Total Hotelling at-anchorage	19	18	12	760	49	76	29	74,195
Total	**75**	**69**	**42**	**3,604**	**194**	**306**	**136**	**294,838**
2021								
Total Transit	16	15	14	1,521	33	106	50	65,454
Total Maneuvering	3	3	3	253	6	22	14	11,466
Total Hotelling at-berth	48	44	16	1,289	102	132	53	204,301
Total Hotelling at-anchorage	67	61	38	2,524	129	266	101	269,828
Total	**133**	**122**	**72**	**5,587**	**270**	**527**	**217**	**551,049**
Change between 2020 and 2021 (percent)								
Total Transit	-5%	-5%	-7%	-7%	-23%	-5%	-9%	1%
Total Maneuvering	-4%	-4%	-5%	-1%	-22%	-4%	-8%	6%
Total Hotelling at-berth	34%	34%	36%	35%	7%	40%	40%	41%
Total Hotelling at-anchorage	241%	241%	229%	232%	164%	251%	253%	264%
Percent change, %	**77%**	**77%**	**71%**	**55%**	**39%**	**72%**	**60%**	**87%**

Table ES.5 highlights the following findings by vessel operation mode for 2021 as compared to 2020:

- Transit and maneuvering emissions are lower in 2021 for most pollutants, potentially due to NO_x EIAPP certificates and fuel sulfur content data for vessels provided to the Port through participation in the ESI Program
- The hoteling emissions at berth are higher in 2021 due to various factors: a) there were less vessels using shore power due to less frequent callers and less shore power ready vessels; b) average auxiliary engine time on during shore power event was higher in 2021 compared to 2020; c) vessels spent longer time at berth, which means there are more emissions from auxiliary boilers as they are still being used at berth since shore power only impacts the auxiliary engines; d) vessels that were shore power capable were not commissioned due to travel restrictions due to the COVID-19 pandemic; e) there were times that the vessels had to unplug from shore power due to Governor Newsom's emergency proclamation to relieve demand on the electrical grid during extreme weather events and due to frequent shifts from one berth to another.
- The hoteling emissions at anchorage are significantly higher in 2021 due to supply chain congestion which made containerships wait at anchorage when they normally would not go to anchorage. At anchorage, there are no options to minimize the emissions from auxiliary engine and auxiliary boilers. Anchorage activity is further discussed below.

In 2021, anchorage calls are 47% are higher compared to 2021, especially for containerships which saw a 174% increase. For some vessel types, such as cruise, auto carrier, RORO, general cargo and miscellaneous, there was actually less vessel calls at anchorage in 2021.

Table ES.6: 2021-2020 Anchorage Calls Comparison

Vessel Type	2020 Anchorage	2021 Anchorage	2020-2021 Change
Containership	257	704	174%
Tanker	542	561	4%
Cruise	13	12	-8%
Bulk Carrier	158	194	23%
Auto Carrier/RoRo	21	10	-52%
General cargo/Misc	32	20	-38%
Total	**1,023**	**1,501**	**47%**

Based on the high number of vessels off the coast of southern California in summer and fall of 2021, a new container vessel queuing process[3] was implemented mid-November 2021 to increase safety and improve air quality near the ports of Long Beach and Los Angeles. Because this process was adopted late in the year, the impact of queuing on vessel activity and emissions are reflected only for the last two months of 2021 and may not reflect full impact of this system. The full impact of the vessel queuing system will be more evident in next year's 2022 emissions inventory.

Table ES.7 and Figure ES.1 compare the average days at anchorage for containerships for 2020 and 2021.

Table ES.7: 2021-2020 Containerships Average Days at Anchorage Comparison

Container Category	2020 Anchorage Avg Days	2021 Anchorage Avg Days	2020-2021 Change
Container - 1000	2.5	5.2	104%
Container - 2000	2.3	6.1	167%
Container - 3000	2.9	5.1	74%
Container - 4000	4.3	6.6	55%
Container - 5000	3.4	6.7	95%
Container - 6000	2.3	9.0	299%
Container - 7000	0.0	6.7	100%
Container - 8000	2.0	4.3	116%
Container - 9000	2.7	4.1	50%
Container - 10000	1.7	6.7	300%
Container - 11000	5.0	6.9	38%
Container - 12000	0.8	5.2	596%
Container - 13000	3.4	5.9	73%
Container - 14000	3.9	7.0	79%
Container - 15000	2.6	6.7	156%
Container - 16000	0.0	0.0	0%
Container - 19000	2.0	6.7	234%
Container - 20000	0.0	0.0	0%
Container - 23000	0.0	0.0	0%

33 *www.mxsocal.org/*

Figure ES.1 compare the average days at anchorage for containerships while Figure ES.2 compares the average days at berth. Containerships are shown by TEU capacity.

Figure ES.1: Average Days at Anchorage for Containerships by TEU size

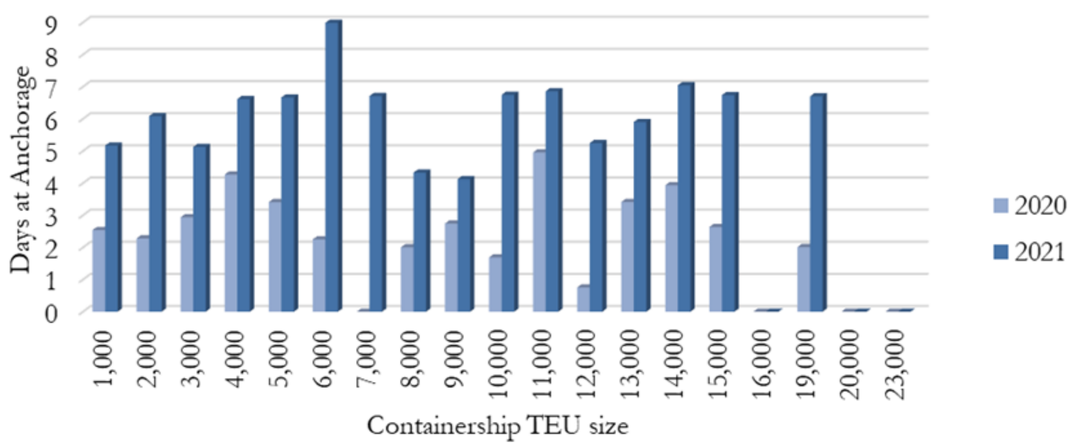


Figure ES.2: Average Days at Berth for Containerships by TEU size

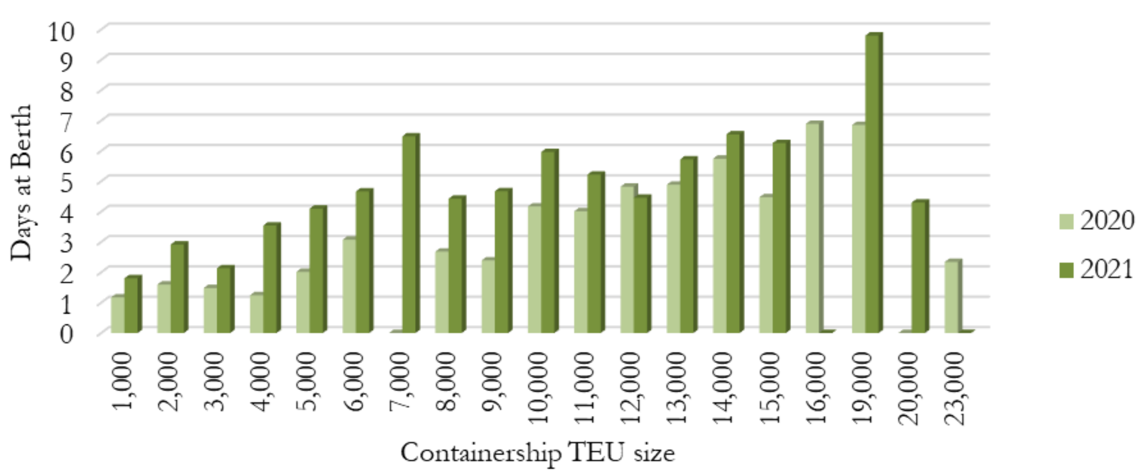


Table ES.8 compares the average days at berth for containerships.

Table ES.8: 2021-2020 Containerships Average Days at Berth Comparison

Container Category	2020 Berth Time Avg Days	2021 Berth Time Avg Days	2020-2021 Change
Container - 1000	1.2	1.8	54%
Container - 2000	1.6	2.9	82%
Container - 3000	1.5	2.1	44%
Container - 4000	1.2	3.5	184%
Container - 5000	2.0	4.1	103%
Container - 6000	3.1	4.7	52%
Container - 7000	0.0	6.5	100%
Container - 8000	2.7	4.4	65%
Container - 9000	2.4	4.7	95%
Container - 10000	4.2	6.0	43%
Container - 11000	4.0	5.2	30%
Container - 12000	4.8	4.5	-8%
Container - 13000	4.9	5.7	17%
Container - 14000	5.7	6.5	14%
Container - 15000	4.5	6.3	40%
Container - 16000	6.9	0.0	-100%
Container - 19000	6.9	9.8	43%
Container - 20000	0.0	4.3	100%
Container - 23000	2.3	0.0	-100%

Emissions Metrics

To track operational efficiency improvements and the effectiveness of the emissions reduction strategies and measures, emissions are also estimated in total emissions per unit of cargo handled through the Port. Table ES.9 compares the tons of emissions per 10,000 TEU in 2005, 2020, and 2021.

Table ES.9: Emissions Efficiency Metric Comparison, tons per 10,000 TEU

Year	PM_{10}	$PM_{2.5}$	DPM	NO_x	SO_x	CO	HC	CO_2e
2005	1.78	1.50	1.38	22.64	10.40	4.26	1.10	1,457
2020	0.14	0.13	0.10	7.11	0.25	1.84	0.31	1,082
2021	0.19	0.17	0.12	8.27	0.30	2.31	0.37	1,267
CAAP Progress	**-90%**	**-89%**	**-91%**	**-63%**	**-97%**	**-46%**	**-66%**	**-13%**
Previous Year	**34%**	**34%**	**23%**	**16%**	**20%**	**26%**	**20%**	**17%**

Progress Towards CAAP Goals

Tables ES.10 and ES.11 summarize the air emissions reductions of DPM, NO_x, and SO_x associated with good movement sources and compared to the established CAAP San Pedro Bay (SPB) Emissions Reduction Standards for 2014 and 2023 from the baseline year 2005.

As a result of the implementation of CAAP measures and regulations, 2021 emission reduction levels of DPM and SO_x surpassed the 2023 SPB Emission Reduction Standards. The NO_x emission reductions of 49% in 2021 and failed to meet the 2023 standard by a great margin predominantly due to high vessel emissions at anchor and berth.

Table ES.10: 2021 Emissions Reductions Compared to San Pedro Bay CAAP

Pollutant	2021 Actual Reductions	2023 Emission Reduction Standard
DPM	88%	77%
NO_x	49%	59%
SO_x	96%	93%

Table ES.11: 2005-2021 Emissions Reductions Compared to San Pedro Bay CAAP by Source Category

Category	2005		2021
DPM (tons)			
Ocean-going vessels	595		72
Harbor craft	36		9
Cargo handling equipment	47		4
Locomotives	43		20
Heavy-duty vehicles	205		6
Total	**926**		**111**
Cumulative DPM Emissions Reduction Achieved in 2021			**88%**
CAAP San Pedro Bay DPM Emissions Reduction Standards		**2023**	**77%**
NO_x (tons)			
Ocean-going vessels	6,655		5,587
Harbor craft	699		383
Cargo handling equipment	1,289		284
Locomotives	1,273		556
Heavy-duty vehicles	5,273		951
Total	**15,188**		**7,761**
Cumulative NO_x Emissions Reduction Achieved in 2021			**49%**
CAAP San Pedro Bay NO_x Emissions Reduction Standards		**2023**	**59%**
SO_x (tons)			
Ocean-going vessels	6,848		270
Harbor craft	3		0
Cargo handling equipment	11		2
Locomotives	76		1
Heavy-duty vehicles	37		4
Total	**6,975**		**277**
Cumulative SO_x Emissions Reduction Achieved in 2021			**96%**
CAAP San Pedro Bay SO_x Emissions Reduction Standards		**2023**	**93%**

SECTION 1 INTRODUCTION

The Port of Long Beach (Port or POLB) annual activity-based emissions inventories serve as the primary tool to track the Port's efforts to reduce air emissions from goods movement-related sources through implementation of measures identified in the San Pedro Bay Ports Clean Air Action Plan (CAAP) and regulations promulgated at the state and federal levels. To quantify the annual air emissions, the Port relies on operational information provided by Port tenants and operators. Development of the annual air emissions estimates is coordinated with a technical working group (TWG) comprised of representatives from the Port, the Port of Los Angeles, and the following air regulatory agencies: U.S. Environmental Protection Agency, Region 9 (EPA), California Air Resources Board (CARB), and the South Coast Air Quality Management District (South Coast AQMD). Through collaboration with the TWG, the ports seek the consensus of the air regulatory agencies regarding the methodologies used to develop the emissions estimates.

Emissions from the following goods movement-related emission source categories are evaluated:

- Ocean-going vessels (OGV)
- Harbor craft
- Cargo handling equipment (CHE)
- Rail locomotives
- Heavy-duty vehicles (HDV)

Exhaust emissions of the following pollutants, including greenhouse gases, are quantified in the inventory:

- Particulate matter (PM) (10-micron, 2.5-micron)
- Diesel particulate matter (DPM)
- Oxides of nitrogen (NO_x)
- Oxides of sulfur (SO_x)
- Hydrocarbons (HC)
- Carbon monoxide (CO)
- Carbon dioxide equivalent (CO_2e)

Greenhouse gas emissions are presented in units of metric tons (MT) of carbon dioxide equivalents, which weight each gas by its global warming potential (GWP) value relative to CO_2. To normalize these values into a single greenhouse gas value, CO_2e, the GHG emission estimates are multiplied by the following values and summed.[4]

- CO_2 – 1
- CH_4 – 25
- N_2O - 298

[4] U.S. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019*, EPA 430-R-21-005, published 2021.

Geographical Domain

Figure 1.1 shows the Port of Long Beach emissions inventory domain. For OGV and harbor craft, the geographical domain lies within the harbor and up to the South Coast Air Basin (SoCAB) over-water boundary, comprised of an over-water area bounded in the north by the southern Ventura County line at the coast and in the south with the southern Orange County line at the coast. For rail locomotives and on-road trucks, emissions are estimated from the Port to the cargo's first point of rest within the SoCAB or up to the basin boundary, whichever comes first.

Figure 1.1: Port of Long Beach Emissions Inventory Domain

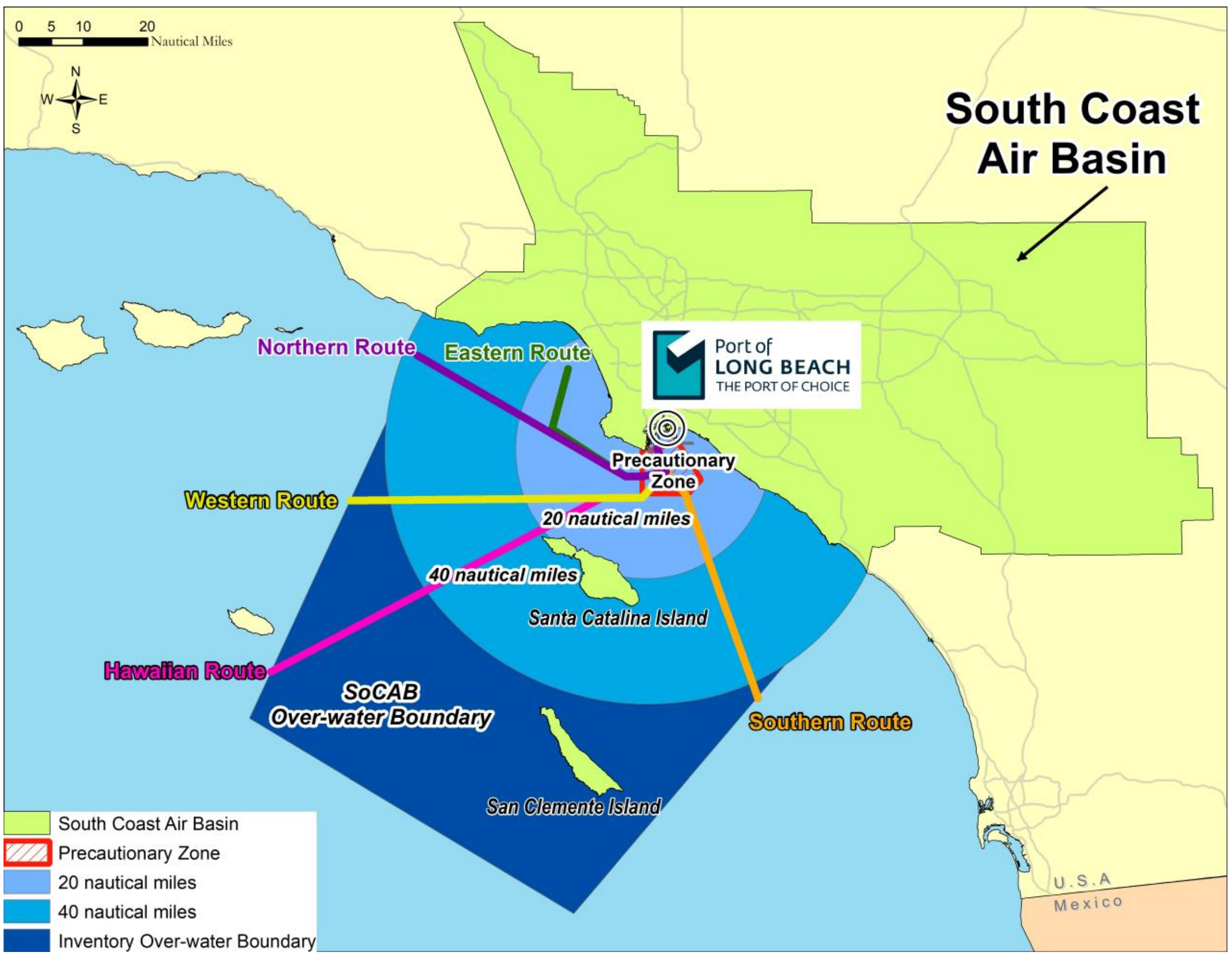


Figure 1.2 shows the location of the anchorage areas for San Pedro Bay Ports. Vessel emissions at anchorage are included in the air emissions inventory report as part of the OGV emissions.

Figure 1.2: Anchorage Areas

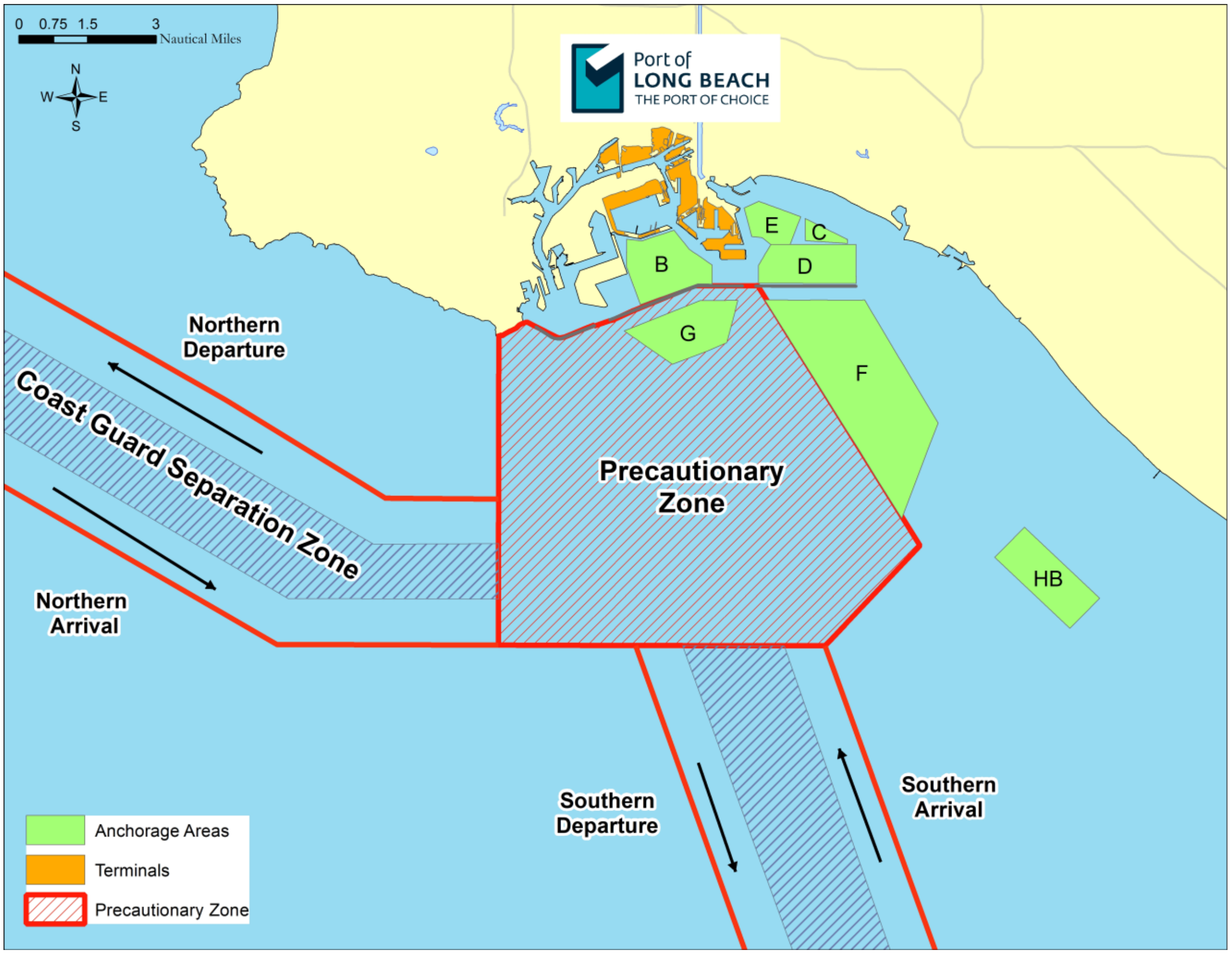


Figure 1.3 shows the land area of active Port terminals in 2021. The geographical scope for cargo handling equipment is the terminals and facilities on which they operate.

Figure 1.3: Port of Long Beach Terminals

SECTION 2 OCEAN-GOING VESSELS

Source Description

Vessels are grouped by the type of cargo they transport:

- Auto carrier
- Containership
- General cargo
- Miscellaneous vessel
- Bulk carrier
- Cruise vessel
- Reefer vessel
- Roll-on roll-off vessel (RoRo)
- Tanker

Emissions are estimated from vessel main engines (propulsion), auxiliary engines, and auxiliary boilers (boilers). For 2021, containerships and tankers continued to be the predominant vessels with 75% of total movements.

Emissions Estimation Methodology

The methodology to estimate 2021 emissions from OGVs is described in Section 2 of the San Pedro Bay Ports Emissions Inventory Methodology Report Version 3. The following improvements were made in estimating 2021 OGV emissions:

- Emission factors for steam powered main engines were updated to be consistent with CARB and EPA's latest methodology.
- Updated auxiliary engine and auxiliary boiler default loads with the Port's Vessel Boarding Program (VBP) data collected since the completion of the 2020 EI.
- Use of actual sulfur content of the fuel used by vessels and EIAPP NO_x certificates information obtained from vessels participating in ESI program, first time at the Port of Long Beach.
- Additional distance and associated emissions occurring outside the 40 nautical mile zone and within the EI boundary are included from vessels transiting to/from Hawaiian ports using the alternative Hawaiian route instead of traditional western route.

Tables 2.1 and 2.2 list the emission factors for propulsion and auxiliary engines using 0.1% sulfur marine gas oil (MGO) fuel, respectively. The emission factors are per EPA's Ports Emissions Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions (September 2020)[5].

Table 2.1: OGV Emission Factors for Propulsion Engines using, g/kWh

Engine Category	Tier	Model Year Range	PM_{10}	$PM_{2.5}$	DPM	NO_x	SOx	CO	HC	CO_2	N_2O	CH_4
Slow speed propulsion	Tier 0	1999 and older	0.184	0.169	0.184	17.0	0.362	1.4	0.6	593	0.029	0.012
Slow speed propulsion	Tier I	2000 to 2011	0.184	0.169	0.184	16.0	0.362	1.4	0.6	593	0.029	0.012
Slow speed propulsion	Tier II	2011 to 2016	0.184	0.169	0.184	14.4	0.362	1.4	0.6	593	0.029	0.012
Slow speed propulsion	Tier III		0.184	0.169	0.184	3.4	0.362	1.4	0.6	593	0.029	0.012
Medium speed propulsion	Tier 0	1999 and older	0.187	0.172	0.187	13.2	0.401	1.1	0.5	657	0.029	0.01
Medium speed propulsion	Tier I	2000 to 2011	0.187	0.172	0.187	12.2	0.401	1.1	0.5	657	0.029	0.01
Medium speed propulsion	Tier II	2011 to 2016	0.187	0.172	0.187	10.5	0.401	1.1	0.5	657	0.029	0.01
Medium speed propulsion	Tier III	2016 and newer	0.187	0.172	0.187	2.6	0.401	1.1	0.5	657	0.029	0.01
Gas turbine	na	All	0.010	0.009	0.000	5.7	0.587	0.2	0.1	962	0.075	0.002
Steam propulsion	na	All	0.160	0.147	0.000	2.0	0.587	0.2	0.1	962	0.075	0.002

Table 2.2: Emission Factors for Auxiliary Engines using 0.1% S, g/kWh

Engine Category	Tier	Model Year Range	PM_{10}	$PM_{2.5}$	DPM	NO_x	SO_x	CO	HC	CO_2	N_2O	CH_4
Medium Auxiliary	0	1999 and older	0.19	0.17	0.19	13.8	0.42	1.10	0.40	696	0.029	0.008
Medium Auxiliary	I	2000 to 2010	0.19	0.17	0.19	12.2	0.42	1.10	0.40	696	0.029	0.008
Medium Auxiliary	II	2011 to 2015	0.19	0.17	0.19	10.5	0.42	1.10	0.40	696	0.029	0.008
Medium Speed Main	III	2016 and newer	0.19	0.17	0.19	2.6	0.42	1.10	0.40	696	0.029	0.008
High Auxiliary	0	1999 and older	0.19	0.17	0.19	10.9	0.42	0.90	0.40	696	0.029	0.008
High Auxiliary	I	2000 to 2010	0.19	0.17	0.19	9.8	0.42	0.90	0.40	696	0.029	0.008
High Auxiliary	II	2011 to 2015	0.19	0.17	0.19	7.7	0.42	0.90	0.40	696	0.029	0.008
High Auxiliary	III	2016 and newer	0.19	0.17	0.19	2.0	0.42	0.90	0.40	696	0.029	0.008

Table 2.3: Emission Factors for Auxiliary Boilers using 0.1% S, g/kWh

Engine Category	PM_{10}	$PM_{2.5}$	DPM	NO_x	SOx	CO	HC	CO_2	N_2O	CH_4
Steam boilers	0.202	0.186	0	1.97	0.587	0.2	0.1	962	0.075	0.002

5 *www.epa.gov/state-and-local-transportation/port-emissions-inventory-guidance*

Geographical Domain

The geographical domain or overwater boundary for OGVs includes the berths and waterways in the Port proper as shown in Figure 1.2 and all vessel movements within the forty nautical mile (nm) arc from Point Fermin and the SoCAB as shown in Figure 1.1. The northern boundary is the Ventura County line, and the southern boundary is the Orange County line. It should be noted that although the overwater boundary extends further off the coast to incorporate the South Coast air quality modeling domain, most of the vessel movements occur within the 40 nm arc.

Data and Information Acquisition

The primary sources of data and operational information for OGV were obtained from:

- Marine Exchange of Southern California
- Vessel Speed Reduction Program
- Jacobsen Pilot Service
- IHS Markit Maritime data
- Port Vessel Boarding Program (VBP)
- Port of Long Beach tanker loading information
- Terminal shore power activity data, including usage of alternative at-berth emission control technology (AMECS)
- Automatic Identification System (AIS) data provided by Marine Exchange of Alaska

For the 2021 EI, AIS data was obtained and analyzed to ensure that all of the vessel activity occurring within the EI geographical domain is included. The supply chain congestion that occurred in 2021 resulted in vessels spending a prolonged period of time at anchorage or within undesignated anchorage and loitering areas within the emissions inventory study area boundary.

Loitering occurs when a vessel is no longer underway in open water, but is not at anchor, and the main engine is turned off. The decision for a vessel to loiter is at the discretion of the ship's captain and most often occurs when there are no available berths or anchorages. Anchoring mainly occur within the designated anchorage areas near the Ports or the designated contingency anchorage areas, as not to impede other vessel traffic. Due to similarities in vessel operations, time spent by vessels drifting and associated emissions are included under anchorage emissions.

Emission Estimates

Summaries of the 2021 OGV emissions estimates are presented in Tables 2.4 through 2.6. In 2021, an additional study was conducted for anchorage and loitering emissions to ensure that activity provided by SoCal Marine Exchange (MarEx) included all of the anchorage and loitering occurring within the geographical scope. An analysis of the activity data in AIS and the SoCal MarEx revealed that the majority of vessel activity is captured by the SoCal MarEx. Only a few vessel activities were identified in AIS feed that were not included in MarEx. Additional emissions based on AIS activity are shown below in a separate row. The additional loitering/anchorage emissions shown in the tables below were added to the vessel emissions in the portwide emissions table in the executive summary and comparison sections.

Table 2.4: 2021 Ocean-going Vessel Emissions by Vessel Type, tons and metric tons

Vessel Type	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e MT
Auto Carrier	2	2	2	132	4	14	7	7,568
Bulk	6	6	5	345	14	32	11	23,731
Containership	73	68	45	3,475	130	323	139	305,100
Cruise	4	4	3	213	11	21	8	15,913
General Cargo	1	1	1	50	2	5	2	3,154
RoRo	1	1	0	34	3	3	1	5,386
Tanker	44	40	15	1,276	105	124	48	185,699
Total	**132**	**121**	**71**	**5,525**	**268**	**521**	**215**	**546,551**
Additional loitering/anchorage	1	1	1	61	2	6	2	4,498
Total	**133**	**122**	**72**	**5,587**	**270**	**527**	**217**	**551,049**

Table 2.5: 2021 Ocean-going Vessel Emissions by Emissions Source, tons and metric tons

Engine Type	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e MT
Auxiliary Engine	60	55	60	3,518	104	369	134	214,585
Auxiliary Boiler	60	55	0	622	138	63	32	281,446
Main Engine	12	11	11	1,385	26	88	49	50,519
Additional loitering/anchorage	1	1	1	61	2	6	2	4,498
Total	**133**	**122**	**72**	**5,587**	**270**	**527**	**217**	**551,049**

Table 2.6 lists the 2021 OGV emissions by mode. Due to container surge and supply chain congestions in 2021, the hoteling at berth and anchorage emissions are significantly higher than previous years. Anchorage emissions in the table below also include the time vessels spent loitering.

Table 2.6: 2021 Ocean-going Vessel Emissions by Mode, tons and metric tons

Mode	Engine Type	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e MT
Transit	Auxiliary Engine	4.7	4.3	4.7	276.5	8.4	28.6	10.4	16,646
Transit	Auxiliary Boiler	0.5	0.4	0.0	5.0	0.9	0.5	0.3	2,240
Transit	Main Engine	10.6	9.8	9.3	1,239.9	23.9	77.1	39.0	46,568
Total Transit		**15.8**	**14.5**	**14.0**	**1,521.4**	**33.2**	**106.3**	**49.7**	**65,454**
Maneuvering	Auxiliary Engine	1.6	1.5	1.6	93.7	2.8	9.7	3.5	5,638
Maneuvering	Auxiliary Boiler	0.2	0.2	0.0	2.6	0.5	0.3	0.1	1,167
Maneuvering	Main Engine	1.3	1.2	1.2	144.9	1.9	11.3	10.1	3,951
Total Maneuvering		**3.1**	**2.8**	**2.8**	**241.2**	**5.2**	**21.3**	**13.8**	**10,756**
Hotelling at-berth	Auxiliary Engine	16.4	15.1	16.4	964.6	30.8	99.4	36.1	57,743
Hotelling at-berth	Auxiliary Boiler	31.1	28.6	0.0	324.0	71.5	32.8	16.4	146,559
Hotelling at-berth	Main Engine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Total Hotelling at-berth		**47.5**	**43.7**	**16.4**	**1,288.6**	**102.3**	**132.3**	**52.5**	**204,301**
Hotelling at-anchorage	Auxiliary Engine	37.5	34.5	37.5	2,183.4	62.4	231.6	84.2	134,559
Hotelling at-anchorage	Auxiliary Boiler	28.0	25.7	0.0	290.7	64.9	29.4	14.7	131,480
Hotelling at-anchorage	Main Engine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Total Hotelling at-anchorage		**65.5**	**60.3**	**37.5**	**2,474.0**	**127.3**	**261.0**	**98.9**	**266,039**
Additional loitering/anchorage		1.2	1.1	0.9	61.5	2.5	5.9	2.3	4,498
Total		**133.1**	**122.5**	**71.7**	**5,587**	**270.5**	**526.7**	**217.2**	**551,049**

Operational Profiles

Table 2.7 presents the numbers of arrivals, departures, and shifts associated with vessels at the Port in 2021. An arrival is a vessel that arrives from the sea to a berth or to anchorage prior to shifting to a berth.

Table 2.7: 2021 Total OGV Activities

Vessel Type	Arrival	Departure	Shift	Total
Auto Carrier	165	166	35	366
Bulk	212	218	255	685
Bulk - Heavy Load	8	7	6	21
Bulk - Self Discharging	29	29	9	67
Container - 1000	42	43	32	117
Container - 2000	171	166	129	466
Container - 3000	86	86	46	218
Container - 4000	148	148	258	554
Container - 5000	42	47	101	190
Container - 6000	19	19	31	69
Container - 7000	3	3	5	11
Container - 8000	72	72	44	188
Container - 9000	24	27	36	87
Container - 10000	77	81	118	276
Container - 11000	53	48	89	190
Container - 12000	11	11	24	46
Container - 13000	77	78	87	242
Container - 14000	75	78	110	263
Container - 15000	7	8	18	33
Container - 19000	3	3	4	10
Container - 20000	2	2	1	5
Cruise	74	76	14	164
General Cargo	57	59	32	148
RoRo	28	28	3	59
Tanker - Chemical	121	119	209	449
Tanker - Handysize	7	6	10	23
Tanker - Panamax	51	44	108	203
Tanker - Aframax	130	131	209	470
Tanker - Suezmax	79	82	152	313
Tanker - VLCC	32	31	122	185
Total	**1,905**	**1,916**	**2,297**	**6,118**

Auxiliary engines are used to provide electricity to equipment onboard the vessel. Actual VBP data, if available, is used to estimate emissions from auxiliary engines. For berth hoteling emissions, the actual shore power records are used if the vessel connected to shore power. If actual VBP data or shore power data is not available, default values are used. Table 2.8 presents the auxiliary engine load defaults by vessel type and by mode used to estimate emissions in 2021. These defaults values are call-weighted average of VBP data points for each vessel type and mode of operation. For vessel types with no VBP data available, a suitable default was estimated by interpolating VBP data from the closest containership size class.

Table 2.8: 2021 Average Auxiliary Load Defaults by Mode, kW

Vessel Type	Transit	Maneuvering	Berth Hotelling	Anchorage Hotelling
Auto Carrier	613	1,547	1,120	628
Bulk	288	330	501	271
Bulk - Heavy Load	462	1,223	272	253
Bulk - Self Discharging	305	807	179	305
Container - 1000	1,721	1,522	963	1,000
Container - 2000	1,634	2,036	663	1,012
Container - 3000	2,027	1,542	1,294	713
Container - 4000	1,251	2,490	814	704
Container - 5000	1,214	2,129	949	982
Container - 6000	1,943	2,583	1,007	1,274
Container - 7000	1,649	2,575	1,066	1,050
Container - 8000	1,674	2,731	1,387	1,484
Container - 9000	1,597	2,322	1,107	1,114
Container - 10000	1,382	1,797	1,007	1,028
Container - 11000	2,092	2,647	1,152	1,526
Container - 12000	1,981	2,583	1,671	1,620
Container - 13000	1,643	2,439	1,154	1,165
Container - 14000	1,763	2,552	1,295	1,224
Container - 15000	2,075	2,427	905	1,130
Container - 19000	2,000	2,800	1,200	1,100
Container - 20000	2,050	2,870	1,230	1,128
General Cargo	406	799	603	180
RoRo	132	396	229	132
Tanker - Chemical	422	559	1,395	343
Tanker - Handysize	662	682	1,050	560
Tanker - Panamax	485	553	832	384
Tanker - Aframax	505	615	986	463
Tanker - Suezmax	667	568	689	509
Tanker - VLCC	630	741	1,011	585

Table 2.9 presents the 2021 load defaults for the auxiliary boilers by vessel type and by mode, which are produced by calculating the call-weighted average of VBP data points.

Table 2.9: Auxiliary Boiler Load Defaults by Mode, kW

Vessel Type	Transit	Maneuvering	Berth Hotelling	Anchorage Hotelling
Auto Carrier	85	187	323	314
Bulk	52	122	156	156
Bulk - Heavy Load	35	94	125	125
Bulk - Self Discharging	44	103	132	132
Container - 1000	148	296	760	376
Container - 2000	79	142	323	180
Container - 3000	188	180	888	361
Container - 4000	161	335	490	487
Container - 5000	223	446	484	477
Container - 6000	280	544	761	757
Container - 7000	308	590	733	727
Container - 8000	241	442	558	554
Container - 9000	286	526	555	513
Container - 10000	278	418	598	598
Container - 11000	196	330	473	478
Container - 12000	284	507	569	569
Container - 13000	257	357	580	594
Container - 14000	379	552	696	696
Container - 15000	234	365	401	401
Container - 19000	38	144	848	848
Container - 20000	39	148	869	869
General Cargo	56	127	169	168
RoRo	67	148	259	251
Tanker - Chemical	94	137	421	261
Tanker - Handysize	144	287	3,089	323
Tanker - Panamax	262	382	3,547	538
Tanker - Aframax	196	259	4,976	390
Tanker - Suezmax	144	99	8,170	516
Tanker - VLCC	240	116	8,262	467

Tankers' boilers produce steam for steam-powered liquid cargo pumps when discharging, steam powered inert gas fans, and to heat fuel for pumping. Less steam is needed when liquid cargo is being loaded. Since loading and discharging data was available for the tankers that visited the Port, a lower boiler load of 875 kW was used for tankers known to be loading cargo while at berth, while the higher boiler load listed in the table was used as a default for the tanker calls that were discharging cargo.

The default loads do not include loads from diesel electric tankers. Diesel electric crude oil tankers have significant auxiliary equipment/load differences than typical motor vessels. Specific auxiliary engine loads, collected from VBP, are used for diesel electric tankers for both the auxiliary engine and auxiliary boilers. All of the diesel electric tankers that called the Port used VBP data in 2021.

The additional anchorage and loitering activities assessed from AIS data used the anchorage hoteling loads while at anchor or loitering. As part of our assessment of loitering activity, we asked several container vessels about main, auxiliary, and auxiliary boiler operations. The responses received from vessels indicted that the auxiliary engine and auxiliary boiler loads during loitering are similar to the loads that a vessel would have at anchor and the main engine is not in use. When the vessel repositions during a loitering event, the vessel is considered to be underway, and the main engine is turned on intermittently. As mentioned earlier, analyses and comparison of AIS data and MarEx data concluded that majority of vessel drifting activity identified in AIS data is included in MarEx feed. Due to similarities in vessel operations, time spent by vessels drifting and associated emissions are included under anchorage

The cruise industry resumed passenger service in the Port of Long Beach on August 21, 2021. Table 2.10 lists the auxiliary engine defaults for all cruise ships (diesel electric and non-diesel electric) engaged in passenger service at the Port in 2021. These auxiliary engine defaults values are produced by calculating the call-weighted average of VBP data by mode of operation for each cruise vessel size group. Auxiliary engine kW loads for cruise ship activity in the Port area prior to August 21, 2021, were reduced by 31% due to the reduced demand for hotel services for vessels not carrying passengers. This reduction was determined by conducting a comparison of pre-COVID POLB at-berth shore power kW values with the values during the COVID period. This comparison showed an average 31% reduction in kW energy use. Even at reduced loads, hotel activities remain relatively constant across all modes (transit, maneuvering, berth, and anchor) so this reduction was applied directly to all modes for cruise ships operating in the Port during this time frame.

Table 2.10: Cruise Ship Average Auxiliary Engine Load Defaults, kW

Passenger Range	Transit	Maneuvering	Berth Hotelling	Anchorage Hotelling
<1,500	3,994	5,268	3,069	2,289
1,500 < 2,000	7,000	9,000	5,613	na
2,000 < 2,500	11,000	11,350	6,900	na
2,500 < 3,000	9,781	8,309	6,089	5,916
3,000 < 3,500	8,292	10,369	8,292	7,475
3,500 < 4,000	9,945	11,411	10,445	10,191
4,000 < 4,500	12,500	14,000	12,000	9,900
4,500 < 5,000	13,000	14,500	13,000	na

Table 2.11 presents the load defaults for the auxiliary boilers for diesel electric cruise ships. The default averages presented are an operational average, meaning they factor in if a vessel reported that they do not use their auxiliary boiler in a certain mode. In 2021, all of the cruise vessels that visited the Port were diesel electric.

Table 2.11: Cruise Ship Auxiliary Boiler Load Defaults by Mode for, kW

Passenger Range	Transit	Maneuvering	Berth Hotelling	Anchorage Hotelling
<1,500	992	784	867	766
1,500 < 2,000	1,070	1,145	1,951	976
2,000 < 2,500	1,382	1,773	3,005	1,506
3,000 < 3,500	697	1,199	895	431
3,500 < 4,000	401	347	1,984	1,068
4,000 < 4,500	0	0	989	868
4,500 < 5,000	0	0	503	503

Vessel hotelling times at-berth, regardless of shore power usage, are shown in Table 2.12. The RoRos include ready reserve vessels that are home based at the Port and use shore power. The ready reserve vessels are in stand-by status, ready to support national emergencies and thus the high hours at berth and shore power use.

Table 2.12: 2021 At-Berth Hotelling Times, hours and days

Vessel Type	Min Hours	Max Hours	Avg Hours	Avg Days
Auto Carrier	5	77	18	0.8
Bulk - General	5	366	84	3.5
Bulk - Heavy Load	5	800	251	10.5
Bulk - Self Discharging	2	69	32	1.3
Container - 1000	1	323	43	1.8
Container - 2000	5	668	70	2.9
Container - 3000	1	312	51	2.1
Container - 4000	0	1,054	85	3.5
Container - 5000	4	361	98	4.1
Container - 6000	8	299	112	4.7
Container - 7000	130	180	156	6.5
Container - 8000	1	360	106	4.4
Container - 9000	0	305	112	4.7
Container - 10000	4	367	143	6.0
Container - 11000	0	372	125	5.2
Container - 12000	20	203	107	4.5
Container - 13000	1	404	137	5.7
Container - 14000	2	446	157	6.5
Container - 15000	11	726	150	6.3
Container - 19000	10	215	162	6.8
Container - 20000	39	142	104	4.3
Cruise	1	683	74	3.1
General Cargo	4	130	45	1.9
RoRo	12	6,033	526	21.9
Tanker - Chemical	3	189	46	1.9
Tanker - Handysize	10	102	41	1.7
Tanker - Panamax	4	144	47	2.0
Tanker - Aframax	3	311	56	2.3
Tanker - Suezmax	4	337	36	1.5
Tanker - VLCC	5	169	44	1.8

The time spent at anchorage are listed in Table 2.13 with a new column for average number of days at anchorage.

Table 2.13: 2021 At-Anchorage Hotelling Times, hours

Vessel Type	Min Hours	Max Hours	Avg Hours	Avg Days	Anchorage Activity Count
Auto Carrier	4	330	53	2.2	9
Bulk - General	3	610	94	3.9	187
Bulk - Heavy Load	0	0	0	0.0	0
Bulk - Self Discharging	6	20	12	0.5	7
Container - 1000	7	469	124	5.2	21
Container - 2000	2	710	146	6.1	76
Container - 3000	8	537	123	5.1	22
Container - 4000	1	711	159	6.6	170
Container - 5000	2	933	160	6.7	67
Container - 6000	13	1,228	216	9.0	23
Container - 7000	27	253	161	6.7	4
Container - 8000	1	312	104	4.3	30
Container - 9000	14	284	99	4.1	25
Container - 10000	11	390	162	6.7	70
Container - 11000	3	423	165	6.9	52
Container - 12000	8	344	126	5.2	16
Container - 13000	2	353	142	5.9	53
Container - 14000	9	429	169	7.0	66
Container - 15000	13	262	162	6.7	6
Container - 19000	94	244	161	6.7	3
Container - 20000	0	0	0	0.0	0
Cruise	1	363	91	3.8	12
General Cargo	11	185	50	2.1	20
RoRo	6	6	6	0.3	1
Tanker - Chemical	1	551	57	2.4	122
Tanker - Handysize	6	72	29	1.2	9
Tanker - Panamax	2	428	84	3.5	89
Tanker - Aframax	6	513	64	2.7	170
Tanker - Suezmax	3	263	54	2.2	106
Tanker - VLCC	9	503	97	4.0	65
Total					**1,501**

For this EI, a frequent caller is a vessel that made six or more calls in one calendar year. Table 2.14 shows that 6% of vessels that called the Port in 2021 are frequent callers (i.e., six or more calls/year).

Table 2.14: 2021 Percentage of Frequent Callers

Vessel Type	Frequent Vessels	Total Vessels	Percent Frequent Vessels
Auto Carrier	1	108	1%
Bulk - General	1	186	1%
Bulk - Heavy Load	0	5	0%
Bulk - Self Discharging	2	4	50%
Container - 1000	2	16	13%
Container - 2000	9	33	27%
Container - 3000	6	11	55%
Container - 4000	4	54	7%
Container - 5000	1	21	5%
Container - 6000	0	10	0%
Container - 7000	0	1	0%
Container - 8000	5	20	25%
Container - 9000	0	14	0%
Container - 10000	0	23	0%
Container - 11000	0	23	0%
Container - 12000	0	7	0%
Container - 13000	4	26	15%
Container - 14000	2	34	6%
Container - 15000	0	4	0%
Container - 19000	0	3	0%
Container - 20000	0	2	0%
Cruise	3	4	75%
General Cargo	0	40	0%
RoRo	1	3	33%
Tanker - Chemical	4	71	6%
Tanker - Handysize	0	4	0%
Tanker - Panamax	0	32	0%
Tanker - Aframax	5	44	11%
Tanker - Suezmax	4	35	11%
Tanker - VLCC	0	20	0%
Total	**54**	**858**	
Average			**6%**

Table 2.15 presents the percent of engine tier by vessel type for arrivals/shift at the Port in 2021. In 2021, 4% of the calls were from vessels with certified Tier III main engines with 25 vessels with Tier III engines. NO_x emissions for Tier III vessels are 75% cleaner than Tier II vessels when operating at or above 25% main engine load. The no tier column includes steamships.

Table 2.15: 2021 Percent of OGV Activity by Main Engine Tier and Vessel Type

Vessel Type	IMO Tier 0	IMO Tier I	IMO Tier II	IMO Tier III	No Tier	Calls Count
Auto Carrier	7%	78%	8%	7%	0%	165
Bulk - General	4%	39%	56%	1%	0%	212
Bulk - Heavy Load	25%	63%	12%	0%	0%	8
Bulk - Self Discharging	10%	28%	62%	0%	0%	29
Container - 1000	26%	57%	17%	0%	0%	42
Container - 2000	0%	52%	1%	0%	47%	171
Container - 3000	12%	16%	29%	43%	0%	86
Container - 4000	10%	83%	7%	0%	0%	148
Container - 5000	0%	100%	0%	0%	0%	42
Container - 6000	0%	100%	0%	0%	0%	19
Container - 7000	0%	100%	0%	0%	0%	3
Container - 8000	0%	56%	44%	0%	0%	72
Container - 9000	0%	25%	75%	0%	0%	24
Container - 10000	0%	38%	62%	0%	0%	77
Container - 11000	0%	49%	51%	0%	0%	53
Container - 12000	0%	27%	73%	0%	0%	11
Container - 13000	0%	29%	71%	0%	0%	77
Container - 14000	0%	19%	72%	9%	0%	75
Container - 15000	0%	0%	0%	100%	0%	7
Container - 19000	0%	0%	100%	0%	0%	3
Container - 20000	0%	0%	100%	0%	0%	2
Cruise	17%	45%	38%	0%	0%	74
General Cargo	9%	60%	31%	0%	0%	57
RoRo	0%	0%	93%	0%	7%	28
Tanker - Chemical	1%	24%	72%	3%	0%	121
Tanker - Handysize	57%	43%	0%	0%	0%	7
Tanker - Panamax	0%	73%	27%	0%	0%	51
Tanker - Aframax	0%	50%	50%	0%	0%	130
Tanker - Suezmax	15%	72%	8%	5%	0%	79
Tanker - VLCC	0%	19%	78%	3%	0%	32
Total	**5%**	**49%**	**38%**	**4%**	**4%**	**1,905**

SECTION 3 HARBOR CRAFT

Source Description

Harbor craft are commercial vessels that spend the majority of their time within or near the port and harbor, except for articulated tug barges (ATBs). In 2021, ATBs were added to the harbor craft inventory to be consistent with the CARB Commercial Harbor Craft (CHC) regulation[6] (CARB 2022 CHC regulation amendment) adopted in March 2022. Emissions from the following types of diesel-fueled harbor craft were quantified:

- Assist tugboats
- Articulated tug barge (ATB)
- Crew and supply boats
- Ferry vessels
- Excursion vessels
- Government vessels
- Harbor tugboats
- Ocean tugboats
- Work boats

Emissions Estimation Methodology

The methodology to estimate 2021 emissions from harbor craft is described in Section 3 of the San Pedro Bay Ports Emissions Inventory Methodology Report Version 3. The Port's harbor craft emission calculation methodology is consistent with CARB methodology[7]. In 2021, emission factors, fuel correction factors, load factors and useful life values were updated by CARB and are used to estimate the Port's 2021 emissions.

Geographical Domain

Emissions are estimated for harbor craft operating within the South Coast Air Basin over-water boundary.

Data and Information Acquisition

Harbor craft owners and operators were contacted to obtain key physical and operational parameters, including:

- Type of harbor craft
- Engine count
- Engine horsepower (or kilowatts) for main and auxiliary engines
- Engine model year
- Operating hours in calendar year 2021

[6] *www.arb.ca.gov/rulemaking/2021/chc2021*

[7] Appendix H - 2021 Update to the Emission Inventory for Commercial Harbor Craft: Methodology and Results, *www.arb.ca.gov/sites/default/files/barcu/regact/2021/chc2021/apph.pdf*

Emission Estimates

Table 3.1 summarizes the estimated harbor craft vessel emissions by vessel type and engine type.

Table 3.1: 2021 Harbor Craft Emissions by Vessel and Engine Type, tons and metric tons

Harbor Craft	Engine Type	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e MT
Assist tugboat	Auxiliary	0.3	0.3	0.3	12.1	0.0	3.2	0.4	1,859
	Propulsion	1.7	1.6	1.7	78.1	0.1	16.8	2.9	9,078
Assist tugboat Total		**2.0**	**1.9**	**2.0**	**90.2**	**0.1**	**20.0**	**3.3**	**10,937**
ATB	Auxiliary	0.0	0.0	0.0	0.5	0.0	0.1	0.0	69
	Propulsion	2.1	2.1	2.1	36.1	0.0	5.2	3.1	2,466
ATB Total		**2.2**	**2.1**	**2.2**	**36.6**	**0.0**	**5.3**	**3.1**	**2,536**
Barge - ATB	Auxiliary	0.0	0.0	0.0	0.4	0.0	0.1	0.0	28
	Propulsion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Barge Total		**0.0**	**0.0**	**0.0**	**0.4**	**0.0**	**0.1**	**0.0**	**28**
Crew Boat	Auxiliary	0.1	0.1	0.1	2.6	0.0	0.7	0.1	362
	Propulsion	0.8	0.8	0.8	39.6	0.0	6.7	1.2	3,662
Crew boat Total		**0.9**	**0.8**	**0.9**	**42.2**	**0.0**	**7.4**	**1.3**	**4,025**
Excursion	Auxiliary	0.1	0.1	0.1	1.6	0.0	0.5	0.1	176
	Propulsion	0.2	0.2	0.2	8.3	0.0	1.5	0.3	803
Excursion Total		**0.3**	**0.3**	**0.3**	**9.9**	**0.0**	**2.0**	**0.4**	**978**
Ferry	Auxiliary	0.1	0.1	0.1	2.2	0.0	0.6	0.1	317
	Propulsion	1.4	1.3	1.4	77.3	0.1	13.6	2.6	7,402
Ferry Total		**1.5**	**1.4**	**1.5**	**79.4**	**0.1**	**14.2**	**2.6**	**7,719**
Government	Auxiliary	0.0	0.0	0.0	0.8	0.0	0.2	0.0	109
	Propulsion	0.2	0.2	0.2	11.6	0.0	2.5	0.4	1,464
Government Total		**0.2**	**0.2**	**0.2**	**12.4**	**0.0**	**2.7**	**0.5**	**1,573**
Ocean tugboat Total	Auxiliary	0.1	0.1	0.1	2.0	0.0	0.4	0.1	230
	Propulsion	1.3	1.2	1.3	62.6	0.0	8.3	1.6	4,104
Ocean tugboat Total		**1.4**	**1.3**	**1.4**	**64.6**	**0.0**	**8.7**	**1.7**	**4,334**
Harbor tugboat	Auxiliary	0.2	0.2	0.2	7.7	0.0	2.3	0.3	1,149
	Propulsion	0.7	0.7	0.7	36.2	0.0	6.5	1.2	3,831
Harbor tugboat Total		**1.0**	**0.9**	**1.0**	**43.9**	**0.0**	**8.8**	**1.4**	**4,981**
Work boat	Auxiliary	0.0	0.0	0.0	0.2	0.0	0.1	0.0	33
	Propulsion	0.1	0.1	0.1	3.1	0.0	0.5	0.1	357
Work boat Total		**0.1**	**0.1**	**0.1**	**3.4**	**0.0**	**0.6**	**0.1**	**390**
Harbor Craft Total		**9.4**	**8.9**	**9.4**	**383.1**	**0.4**	**69.7**	**14.4**	**37,500**

Operational Profiles

Table 3.2 lists the harbor craft engine count by USEPA marine engine emissions standards tier level and engine type in 2021.

Table 3.2: 2021 Harbor Craft Engine Tier Count

Engine Tier	Auxiliary Engine Count	Propulsion Engine Count	Total Engine Count
Unknown	24	0	24
Tier 0	22	12	34
Tier 1	8	11	19
Tier 2	36	112	148
Tier 3	116	55	171
Tier 4	0	10	10
Total	**206**	**200**	**406**

Table 3.3 summarizes the energy consumption (kWh) per engine tier for 2021 harbor craft that operated at the Port. The kWh for engines with unknown tier were based on default engine kW and/or engine model year. Tier 2 to Tier 4 engines consumed 86% of the total harbor craft related energy for 2021.

Table 3.3: Harbor Craft Energy Consumption by Engine Tier, kWh and %

Engine Tier	2021 kWh	2021 % of Total
Tier 0	3,113,001	5.9%
Tier 1	4,443,548	8.4%
Tier 2	23,450,610	44.4%
Tier 3	16,963,046	32.2%
Tier 4	4,790,600	9.1%
Total	**52,760,806**	**100%**

Tables 3.4 and 3.5 summarize the characteristics of main and auxiliary engines, respectively, by vessel type operating at the Port in 2021. Averages of the model year, horsepower, or operating hours are used as default values when specific data is not available. Defaults were used for 0.3% of model year values (one auxiliary engine), 0.3% of horsepower values (one auxiliary engine), and 3% of operating hours (four propulsion engines and 5 auxiliary engines). Several companies operate harbor craft in the harbors of both the Ports of Long Beach and Los Angeles. For harbor vessels that share the work at both Ports in San Pedro Bay, the total hours are divided equally between the two ports.

Table 3.4: 2021 Propulsion Engine Characteristics by Harbor Craft Type

			Propulsion Engines								
Harbor	Vessel	Engine	Model year			Horsepower			Annual Operating Hours		
Craft Type	Count	Count	Minimum	Maximum	Average	Minimum	Maximum	Average	Minimum	Maximum	Average
Assist tugboat	17	34	1999	2019	2012	2,000	3,433	2,675	362	1,807	1,180
ATB Tug	8	16	2001	2018	2009	2,200	6,000	4,558	26	632	191
Crew boat	17	43	2003	2021	2011	290	1,450	615	124	1,897	921
Excursion	9	16	1980	2021	2006	150	500	354	295	2,100	870
Ferry	12	26	2008	2015	2010	180	2,680	1,851	54	1,516	806
Government	4	8	2013	2016	2014	803	2,012	1,408	207	2,296	1,136
Ocean tugboat	4	8	2004	2007	2006	1,800	2,000	1,869	250	1,500	1,013
Harbor tugboat	20	40	2004	2019	2011	300	3,386	1,243	35	3,948	963
Work boat	5	9	2008	2015	2011	210	671	477	67	662	404
Total	**96**	**200**									

Table 3.5: 2021 Auxiliary Engine Characteristics by Harbor Craft Type

			Auxiliary Engines								
Harbor	Vessel	Engine	Model year			Horsepower			Annual Operating Hours		
Craft Type	Count	Count	Minimum	Maximum	Average	Minimum	Maximum	Average	Minimum	Maximum	Average
Assist tugboat	17	37	2010	2019	2015	54	369	206	124	2,420	1,351
ATB Tug	8	19	2001	2018	2011	102	800	306	9	210	82
Barge ATB		36	2001	2001	2001	95	371	271	2	49	21
Crew boat	17	22	2004	2021	2012	13	180	67	5	2,700	1,003
Excursion	9	9	1980	2015	2007	43	90	59	358	2,700	1,474
Ferry	12	18	2008	2017	2011	18	120	67	435	3,297	946
Government	4	12	2013	2019	2013	16	2012	865	16	3,723	642
Ocean tugboat	4	8	2004	2007	2006	60	150	90	250	1,500	1,013
Harbor tugboat	20	37	2004	2018	2011	15	429	159	84	3,013	942
Work boat	5	8	1979	2015	2004	40	101	70	36	672	449
Total	**96**	**206**									

SECTION 4 CARGO HANDLING EQUIPMENT

Source Description

Cargo handling equipment (CHE) typically operate at Port terminals or railyards to move cargo such as containers, general cargo, and bulk cargo to and from marine vessels, railcars, and on-road trucks. The majority of CHE are composed of off-road equipment not designed to operate on public roadways. This inventory includes CHE powered by engines fueled by diesel, gasoline, propane or electricity.

Emissions Estimation Methodology

The emissions calculation methodology used to estimate CHE emissions is consistent with CARB's latest methodology for estimating emissions from CHE.[8] Details of the methodology to estimate emissions from CHE is described in Section 4 of the San Pedro Bay Ports Emissions Inventory Methodology Report Version 3[9].

Geographical Domain

Emissions are estimated for CHE operating within Port terminals and facilities.

Data and Information Acquisition

The maintenance and/or CHE operating staff of each terminal were contacted to obtain equipment count and activity information on the CHE specific to their terminal or facility operations for the 2021 calendar year.

[8]CARB, Appendix B: Emission Estimation Methodology for Cargo Handling Equipment Operating at Ports and Intermodal Rail Yards in California at *www.arb.ca.gov/regact/2011/cargo11/cargoappb.pdf* , viewed 22 July 2017

Emission Estimates

A summary of CHE emissions by terminal type is presented in Table 4.1.

Table 4.1: 2021 CHE Emissions by Terminal Type, tons and metric tons

Terminal Type	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e MT
Auto	0.0	0.0	0.0	0.0	0.0	0.2	0.0	12
Break-Bulk	0.3	0.3	0.3	8.9	0.0	14.2	1.1	3,379
Container	5.3	4.7	3.6	273.3	1.6	1,103.8	33.8	137,444
Cruise	0.0	0.0	0.0	0.1	0.0	2.2	0.0	96
Dry Bulk	0.0	0.0	0.0	0.1	0.0	0.9	0.0	201
Liquid	0.0	0.0	0.0	0.5	0.0	1.2	0.1	41
Other	0.0	0.0	0.0	1.0	0.0	5.2	0.3	1,629
Total	**5.6**	**5.1**	**3.9**	**283.9**	**1.7**	**1,127.7**	**35.4**	**142,802**

Table 4.2 presents the CHE emissions by equipment and engine type. Emissions from boom lifts are included in the miscellaneous propane category. Emissions from rail car movers are included under the miscellaneous diesel category.

Table 4.2: 2021 CHE Emissions by Equipment Type, tons and metric tons

Port Equipment	Engine Type	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e MT
Cone vehicle	Diesel	0.0	0.0	0.0	1.1	0.0	1.9	0.1	166
Crane	Diesel	0.0	0.0	0.0	0.0	0.0	0.1	0.0	13
Excavator	Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Forklift	Diesel	0.1	0.1	0.1	6.7	0.0	10.3	0.7	1,912
Forklift	Gasoline	0.0	0.0	0.0	0.2	0.0	5.4	0.1	187
Forklift	Propane	0.0	0.0	0.0	1.6	0.0	11.5	0.4	389
Loader	Diesel	0.1	0.1	0.1	1.4	0.0	4.3	0.4	1,910
Man lift	Diesel	0.0	0.0	0.0	0.3	0.0	0.4	0.0	60
Man lift	Gasoline	0.0	0.0	0.0	0.0	0.0	0.2	0.0	52
Material handler	Diesel	0.0	0.0	0.0	0.8	0.0	0.2	0.0	115
Miscellaneous	Diesel	0.0	0.0	0.0	0.1	0.0	0.1	0.0	7
Rail pusher	Diesel	0.0	0.0	0.0	0.3	0.0	0.3	0.0	110
RTG crane	Diesel	1.1	1.0	1.1	102.8	0.2	29.7	6.4	13,186
Side handler	Diesel	0.0	0.0	0.0	0.3	0.0	0.1	0.0	35
Skid steer loader	Diesel	0.0	0.0	0.0	0.1	0.0	0.1	0.0	15
Sweeper	Diesel	0.0	0.0	0.0	1.6	0.0	1.3	0.2	626
Sweeper	Propane	0.0	0.0	0.0	0.0	0.0	0.2	0.0	18
Top handler	Diesel	1.3	1.1	1.3	99.5	0.6	110.4	16.2	50,927
Tractor	Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
Tractor	Propane	0.0	0.0	0.0	0.1	0.0	1.7	0.0	39
Truck	Diesel	0.2	0.2	0.2	5.6	0.0	3.3	0.6	1,561
Yard tractor	Diesel	1.0	0.9	1.0	51.7	0.7	163.2	9.3	52,715
Yard tractor	Gasoline	1.7	1.5	0.0	9.6	0.2	782.8	0.8	18,801
Yard tractor	Propane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2
Total		**5.6**	**5.1**	**3.9**	**283.9**	**1.7**	**1,127.7**	**35.4**	**142,802**

Operational Profiles

Table 4.3 is a summary of all the CHE engines by fuel type, including electric equipment. In 2021, there were a total of 1,462 CHE of which 17% are electric, 7% are powered by propane engines, 11% are powered by gasoline engines, and 65% are powered by diesel engines. Further details of the 2021 pieces of electric equipment are listed in Table 4.4. By the end of 2021, there were six RTG cranes that were converted to electric that are not shown as electric in the table since they also worked as diesel equipment in 2021. Electric yard tractors demonstrated at terminals were not included in the inventory.

Table 4.3: 2021 CHE Engines by Fuel Type

Equipment	Electric	Propane	Gasoline	Diesel	Total
Forklift	9	88	24	108	229
RTG crane	0	0	0	65	65
Side handler	0	0	0	3	3
Top handler	2	0	0	195	197
Yard tractor	0	2	138	499	639
Sweeper	1	7	0	13	21
Other	237	7	2	62	308
Total	**249**	**104**	**164**	**945**	**1,462**
Percent of Total	**17%**	**7%**	**11%**	**65%**	

Table 4.4: 2021 Electric Equipment Count

Equipment	2021 Electric Count
Automated guided vehicle	72
Automatic stacking crane	69
Cone vehicle	3
Crane	7
Electric pallet jack	2
Forklift	9
Miscellaneous	1
Ship to shore crane	77
Sweeper	1
Top handler	2
Truck	6
Total	**249**

Table 4.5 summarizes the characteristics of fossil fueled (i.e. diesel, gasoline, and propane) CHE data collected for the 2021 calendar year. The average values shown in the following tables are population-weighted and are used as default. For equipment without specific operational information available, default values associated with the specific equipment and engine type are used. Defaults were used for 0.2% of model year values, 6% of horsepower values, and less than 1% of operating hour values.

Table 4.5: 2021 Engine Characteristics for Fossil Fueled CHE Operating at the Port

Equipment	Engine Type	Count	Power (hp) Min	Power (hp) Max	Power (hp) Average	Model Year Min	Model Year Max	Model Year Average	Annual Operating Hours Min	Annual Operating Hours Max	Annual Operating Hours Average
Cone vehicle	Diesel	5	35	35	35	2016	2016	2016	2,058	4,573	3,241
Crane	Diesel	3	173	450	319	1985	2020	2007	0	290	148
Excavator	Diesel	1	na	na	na	2016	2016	2016	0	0	0
Forklift	Diesel	108	43	382	170	1995	2020	2013	10	3,808	630
Hybrid RTG crane	Diesel	20	169	250	230	2016	2019	2017	1737	4,164	3,302
Loader	Diesel	14	96	579	348	1985	2021	2014	2	3,000	1,209
Man Lift	Diesel	15	48	100	73	2000	2021	2015	0	535	200
Material handler	Diesel	2	371	717	544	2005	2008	2007	133	657	395
Miscellaneous	Diesel	1	13	13	13	2010	2010	2010	1,678	1,678	1,678
Rail pusher	Diesel	3	150	260	202	2013	2013	2013	213	1,334	649
RTG crane	Diesel	45	503	1,043	641	1998	2021	2009	0	7,896	4,088
Side handler	Diesel	3	205	205	205	2002	2006	2005	50	303	173
Skid steer loader	Diesel	3	67	73	70	2011	2020	2015	1	500	234
Sweeper	Diesel	13	34	300	185	2002	2020	2014	4	1,944	604
Top handler	Diesel	195	250	388	343	2000	2020	2013	0	4,691	2,235
Tractor	Diesel	1	59	59	59	2009	2009	2009	80	80	80
Truck	Diesel	14	177	525	348	2006	2020	2011	0	1,973	1,048
Yard tractor	Diesel	499	164	250	215	2007	2021	2014	0	3,854	2,180
Forklift	Gasoline	24	59	72	64	2002	2016	2012	65	968	526
Man Lift	Gasoline	2	82	82	82	2000	2004	2002	35	110	73
Yard tractor	Gasoline	138	335	335	335	2011	2020	2014	9	2,712	1,462
Forklift	Propane	88	42	141	76	1987	2018	2006	20	1,375	268
Sweeper	Propane	7	47	114	65	2004	2016	2012	26	208	73
Tractor	Propane	7	57	101	95	1996	1997	1996	154	200	185
Yard tractor	Propane	2	173	173	173	2009	2009	2009	2	46	24
Total		**1,213**									

Table 4.6 is a summary of the emission reduction technologies[10] utilized in cargo handling equipment as retrofits to existing equipment, including diesel particulate filters (DPF) and BlueCAT retrofit for large-spark ignition (LSI) engines. Hybrid equipment, on-road engine, and renewable diesel counts have also been included in the table. In 2021, renewable diesel was used by some terminals for the first time during latter part of the year.

Table 4.6: 2021 CHE Emission Reduction Technologies by Equipment Type

Equipment	Hybrid Equipment	On-Road Engines	ULSD Fuel	Renewable Diesel	DPF Retrofit	BlueCAT Retrofit
Forklift	0	0	94	14	17	16
RTG crane	20	0	50	15	16	0
Side handler	0	0	0	3	3	0
Top handler	0	0	113	82	37	0
Yard tractor	0	253	383	116	0	0
Sweeper	0	0	12	1	0	0
Other	0	4	61	1	4	7
Total	**20**	**257**	**713**	**232**	**77**	**23**

Table 4.7 summarizes the distribution of diesel-powered CHE equipped with off-road diesel engines by USEPA non-road engine emission standards tier level. The table also includes on-road diesel engines. On-road engines are generally lower in emissions than the off-road engines of the same model year.

Table 4.7: 2021 Count of Diesel-Powered CHE by Type and Engine Emission Standard

Equipment Type	Unknown Tier	Tier 0	Tier 1	Tier 2	Tier 3	Tier 4i	Tier 4f	On-road	Total Diesel
Yard tractor	2	0	0	0	0	1	243	253	499
Forklift	10	3	3	12	5	14	61	0	108
Top handler	34	0	2	26	6	61	66	0	195
Other	17	2	0	1	6	8	24	4	62
RTG crane	1	0	20	2	0	13	29	0	65
Side handler	0	0	1	0	2	0	0	0	3
Sweeper	4	0	1	1	1	0	6	0	13
Total	**68**	**5**	**27**	**42**	**20**	**97**	**429**	**257**	**945**
Percent of Total	**7%**	**1%**	**3%**	**4%**	**2%**	**10%**	**45%**	**27%**	

[10] *www.arb.ca.gov/diesel/verdev/vt/cvt.htm*

Table 4.8 summarizes the energy consumption (kWh) for all of the equipment by engine tier. For diesel equipment, the equipment with higher tier levels (newer equipment) and those with on-road engines are generally used more than older equipment, which contributes to reduced emissions due to cleaner engine standards in newer equipment. In 2021, 80% of the energy consumed was by equipment with Tier 4i, Tier 4f, and on-road engines.

Table 4.8: Equipment Energy Consumption by Engine Type and Diesel Engine Standard, kWh and %

Engine Type	Engine Tier	kWh	% of Total
Diesel	Tier 0	34,294	0.02%
Diesel	Tier 1	7,955,909	4%
Diesel	Tier 2	5,366,862	3%
Diesel	Tier 3	2,588,189	1%
Diesel	Tier 4i	29,431,289	16%
Diesel	Tier 4f	76,189,083	42%
Diesel	Onroad	40,114,171	22%
Gasoline		19,147,622	11%
Propane		495,920	0.27%
Total		**181,323,340**	**100%**

SECTION 5 RAILROAD LOCOMOTIVES

Source Description

Railroad locomotives are used to move trains transporting intermodal (containerized) freight and lesser amounts of dry bulk, liquid bulk, and carload (boxcar) freight to, from, and within the Port. Railroad locomotive activities at the Port consist of two different types of operations: the initiation or termination of long-distance cargo movements, known as line haul, and the short-distance movement of rail cars, such as the assembling and disassembling of trains in and around the Port, known as switching.

Rail operators Burlington Northern Santa Fe (BNSF) and Union Pacific (UP) provide line haul service to and from the Port and operate switching services at their off-port locations. Pacific Harbor Line (PHL) performs most of the switching operations within the Port.

Emissions Estimation Methodology

The methodology used to estimate 2021 emissions from rail locomotives closely follows the methodology as described in Section 5 of the San Pedro Bay Ports Emissions Inventory Methodology Report Version 3.

Geographical Domain

Emissions from railroad locomotives are estimated for movements of cargo by rail locomotives within Port boundaries, directly to or from port-owned properties such as terminals and on-port rail yards, or to and from the SoCAB boundary. The inventory does not include rail movements of cargo that occur solely outside the Port, such as off-port rail yard switching, and movements that neither begin nor end at a Port property, such as east-bound line hauls that initiate in central Los Angeles intermodal yards. Figure 1.1 in Section 1 of this report illustrates the geographical domain.

Data and Information Acquisition

Information from the following general sources was used to estimate emissions associated with Port-related activities of locomotives:

- Previous emissions studies
- Port cargo statistics
- Input from railroad operators
- Information published by EPA, the Surface Transportation Board, and other sources as cited in this report
- California Air Resources Board Memorandum of Understanding (CARB MOU)[11] line-haul fleet compliance data

The Port continues to use the most recent, locally specific data available, including MOU compliance data reflective of actual recent line haul fleet mix characteristics in the SoCAB. In addition, PHL has provided fuel consumption information for each locomotive in service in each calendar year, along with the engine tier levels of the locomotives. Table 5.1 lists the number of locomotives of each tier level that were operated in 2021, and the percentage of fuel used by locomotives in each tier. Discussion of the tiers and a list of tier-specific emission factors are included in Section 5 of the San Pedro Bay Ports Emissions Inventory Methodology Report Version 3.

Table 5.1: PHL Switching Fleet Mix, 2021

Locomotive Tier Level /Power Type	Count	% of Fuel Consumed
Genset	6	2%
Tier 3	0	0%
Tier 3+	17	96%
Tier 4	1	2%
Totals	**24**	**100%**

[11] *www.arb.ca.gov/resources/documents/rail-emission-reduction-agreements*
The 1998 Locomotive NO_x Fleet Average Emissions Agreement in the South Coast Air Basin, signed by CARB, Union Pacific Railroad (UP) and BNSF Railway (BNSF), accelerated the introduction of cleaner locomotives into the South Coast Air Basin. Under the Agreement, UP and BNSF agreed to operate locomotive fleets that "on average" meet a Tier 2 NO_x emission standard, or 5.5 g/bhp-hr by 2010 (and through 2030). The railroads submit detailed information on the locomotives operated in the SoCAB to demonstrate compliance with the agreement.

Emission Estimates

A summary of estimated emissions from locomotive operations related to the Port is presented in Table 5.2.

Table 5.2: 2021 Locomotive Emissions, tons and metric tons

Activity Component	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e MT
On-Port Emissions								
Switching	0.3	0.3	0.3	22.2	0.0	8.4	1.3	2,804
Line Haul	5.5	5.0	5.5	146.5	0.1	35.3	8.2	12,361
On-Port Subtotal	5.8	5.3	5.8	168.7	0.2	43.7	9.6	15,165
Off-Port (Regional) Emissions								
Switching	0.2	0.2	0.2	6.5	0.0	1.1	0.4	358
Line Haul	14.3	13.1	14.3	381.2	0.4	91.9	21.4	32,161
Off-Port Subtotal	14.4	13.3	14.4	387.6	0.4	92.9	21.8	32,519
Total	**20.2**	**18.6**	**20.2**	**556.4**	**0.5**	**136.6**	**31.4**	**47,684**

Operational Profiles

The goods movement rail system in terms of the activities that are carried out by locomotive operators is the same as described in detail in Section 5 of the San Pedro Bay Ports Emissions Inventory Methodology Report Version 3.

Table 5.3 presents the CARB MOU compliance information submitted annually by BNSF and UP on pre-Tier 0 through Tier 4 locomotive fleet composition, showing a weighted average NO_x emission factor of 5.56 g/bhp-hr.[12] The 2020 reports were used instead of 2021 because of the timing of the inventory data collection phase and of the posting of the compliance reports by CARB. The ultra-low emission locomotives (ULEL) are also included in the table but are not used in developing the line haul emission factors because the ULELs are believed to all be in switching service.

[12]Notes from railroads' MOU compliance submissions:
1. For more information on the U.S. EPA locomotive emission standards, *www.epa.gov/oms/locomotives.htm*.
2. Number of locomotives is the sum of all individual locomotives that visited or operated within the SCAB at any time during 2020.

Table 5.3: CARB MOU Compliance Data, Megawatt-hours (MWh) and g NO_x/bhp-hr

Engine Tier	Number of Locomotives	Megawatt-hours (MWh)	% MWh by Tier Level	Wt'd Avg NO_x (g/bhp-hr)	Tier Contribution to Fleet Average (g/bhp-hr)
BNSF					
Pre-Tier 0	298	955	0.4%	13.0	0.06
Tier 0	61	5,317	2.4%	11.2	0.27
Tier 1	1,248	59,960	27%	6.1	1.65
Tier 2	1,737	79,605	36%	4.7	1.69
Tier 3	1,300	58,929	27%	3.8	1.01
Tier 4	283	16,691	7.5%	1.0	0.08
ULEL	0	0	0%	-	-
Total BNSF	**4,927**	**221,457**	**100%**		**4.76**
UP					
Pre-Tier 0	10	226	0.1%	15.0	0.02
Tier 0	584	18,528	10%	8.4	0.87
Tier 1	1,546	67,626	38%	7.2	2.73
Tier 2	1,326	52,172	29%	5.2	1.52
Tier 3	886	29,087	16%	4.9	0.80
Tier 4	250	10,591	5.9%	1.1	0.07
ULEL	0	0	0%		0.00
Total UP	**4,602**	**178,230**	**100%**		**6.01**
		ULEL Credit Used			0.50
		UP Fleet Average			**5.51**
Both railroads, excluding ULELs and ULEL credits					
Pre-Tier 0	308	1,181	0%	13.4	0.04
Tier 0	645	23,845	6%	9.0	0.54
Tier 1	2,794	127,586	32%	6.7	2.13
Tier 2	3,063	131,777	33%	4.9	1.61
Tier 3	2,186	88,016	22%	4.2	0.92
Tier 4	533	27,282	6.83%	1.0	0.071
Total both	**9,529**	**399,687**	**100%**		**5.31**

Emission factors for particulate matter (PM_{10}), HC, and CO were calculated using the tier-specific emission rates for those pollutants published by USEPA[13] to develop weighted average emission factors using the MWh figures provided in the railroads' submissions. These results are presented in Table 5.4.

Table 5.4: Fleet MWh and PM, HC, CO Emission Factors, g/hp-hr

Engine Tier	MWh	% of MWh	EPA Tier-specific PM_{10} (g/bhp-hr)	EPA Tier-specific HC (g/bhp-hr)	EPA Tier-specific CO (g/bhp-hr)	Fleet Composite PM_{10} (g/bhp-hr)	Fleet Composite HC (g/bhp-hr)	Fleet Composite CO (g/bhp-hr)
Pre-Tier 0	1,181	0%	0.32	0.48	1.28	0.001	0.00	0.00
Tier 0	23,845	6%	0.32	0.48	1.28	0.019	0.03	0.08
Tier 1	127,586	32%	0.32	0.47	1.28	0.102	0.15	0.41
Tier 2	131,777	33%	0.18	0.26	1.28	0.059	0.09	0.42
Tier 3	88,016	22%	0.08	0.13	1.28	0.018	0.03	0.28
Tier 4	27,282	7%	0.015	0.04	1.28	0.000	0.00	0.09
Totals	**399,687**	**100%**				**0.199**	**0.30**	**1.28**

Emission factors for $PM_{2.5}$ and DPM were calculated as fractions of PM_{10}, with $PM_{2.5}$ calculated as 94% of PM_{10} consistent with CARB methodology and DPM equal to PM_{10} because all PM emissions from diesel engines are defined as DPM. Rounding of emission factors before and after the conversion resulted in the emission factor values shown. Table 5.5 summarizes the emission factors for line haul locomotives, presented in units of g/bhp-hr.

Table 5.5: Emission Factors for Line Haul Locomotives, g/bhp-hr

	PM_{10}	$PM_{2.5}$	DPM	NO_x	SO_x	CO	HC	CO_2	N_2O	CH_4
EF, g/bhp-hr	0.199	0.183	0.199	5.31	0.005	1.28	0.30	489	0.013	0.040

[13] EPA Office of Transportation and Air Quality, "Emission Factors for Locomotives" EPA-420-F-09-025 April 2009.

On-Port Line Haul Activity
As described in the San Pedro Bay Ports Emissions Inventory Methodology Report, estimates of the number of trains per year, locomotives per train, and on-port hours per train are multiplied together to calculate total locomotive hours per year. This activity information for 2021 is summarized in Table 5.6.

Table 5.6: 2021 Estimated On-Port Line Haul Locomotive Activity

Activity Measure	Inbound	Outbound	Total
Trains per Year	2,434	2,006	4,440
Locomotives per Train	3	3	N/A
Hours on Port per Trip	1	2.5	N/A
Locomotive Hours per Year	7,302	15,045	22,347

Out-of-Port Line Haul Activity
Table 5.7 lists the estimated totals of travel distance, out-of-port trains per year, out-of-port million gross tons (MMGT), out-of-port MMGT-miles, gallons of fuel used, and horsepower-hours. Fuel consumption is calculated by multiplying gross ton-miles by the average fuel consumption factor of 0.953 gallons per thousand gross ton-miles.[14] Overall horsepower hours are calculated by multiplying the fuel used by the fuel consumption conversion factor of 20.8 hp-hr/gal.

Table 5.7: 2021 Gross Ton-Mile, Fuel Use, and Horsepower-hour Estimate

	Distance miles	Trains per year	MMGT per year	MMGT-miles per year
Alameda Corridor	21	4,220	31	651
Central LA to Air Basin Bounda	84	4,220	31	2,604
Million gross ton-miles				**3,255**
Estimated gallons of fuel (millions)				**3.10**
Estimated million horsepower-hours				**64.5**

[14] Union Pacific, *Class I Railroad Annual Report R-1 to the Surface Transportation Board for the Year Ending Dec. 31, 2016,* and BNSF, *Class I Railroad Annual Report R-1 to the Surface Transportation Board for the Year Ending Dec. 31, 2016, www.prod.stb.gov/reports-data/economic-data/annual-report-financial-data/*

SECTION 6 HEAVY-DUTY VEHICLES

Source Description

Heavy-duty vehicles (HDVs), or trucks, are used to move cargo, particularly containerized cargo, to and from the marine terminals. Trucks also transfer containers between terminals and off-port railcar loading facilities. The local activity is often referred to as drayage. During their daily operations, trucks are driven onto and through the terminals, where they deliver and/or pick up cargo. They are also driven on the public roads within the Port boundaries and on the public roads outside the Port.

The majority of trucks that service the Port's terminals are diesel-fueled vehicles. Alternatively fueled trucks, primarily those fueled by liquefied natural gas (LNG) also service the SPBP. The emission estimates prepared using this methodology reflect the use of both types of fuel.

Emissions Estimation Methodology

The methodology used to estimate 2021 emissions from HDVs is described in Section 6 of the San Pedro Bay Ports Emissions Inventory Methodology Report Version 3. HDV emission estimates are based on estimates of vehicle miles traveled (VMT), average speeds, CARB's on-road vehicle Emission Factors model (EMFAC) and HDV model year information specific to the San Pedro Bay ports. The most recent version of the model, EMFAC2021, reflects CARB's current understanding of motor vehicle travel activities and their associated emission levels. A new feature of this version of the model is the ability to produce emission factors for natural gas fueled trucks in addition to the more common diesel fueled trucks.

Geographical Domain

The two major geographical components of truck activities evaluated for this inventory are:

- **On-terminal operations**, which include waiting for terminal entry, transiting the terminal to drop off and/or pick up cargo, and departing the terminals.

- **On-road operations**, consisting of travel on public roads within the SoCAB. This also includes travel on public roads within the Port boundaries and those of the adjacent Port of Los Angeles (POLA). The activity of on-road trucks included within the geographical domain is from the Port to the cargo's first point of rest within SoCAB or up to the basin boundary, whichever comes first.

Data and Information Acquisition

Information regarding the activity of trucks while they are on terminal, such as average times and distances traveled through the terminal, is collected during in-person and/or telephone interviews with terminal personnel. For on-road operations, the volumes (number of trucks), distances, and average speeds on roadway segments between defined intersections are estimated using trip generation and travel demand models that have been developed for these purposes. The trip generation model is used to develop truck trip numbers for container terminals, while the terminal interviews are used to obtain trip counts associated with non-container terminals.

The model year distribution of HDVs operating at the Port is developed using radio frequency identification (RFID) call information gathered at the San Pedro Bay Ports' container terminals and truck/engine model year data from the Port Drayage Truck Registry (PTDR). The RFID call information is only collected at container terminals, so it is assumed for the inventory that trucks calling at other Port terminals have the same general distribution of model years.

Emission Estimates

Tables 6.1 through 6.3 summarize the vehicle miles traveled and emissions associated with overall HDV activity, emissions associated with container terminal activity, and emissions associated with other Port terminals, respectively.

Table 6.1: 2021 HDV Emissions, tons and metric tons

Activity Location	Vehicle Miles Traveled	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e MT
On-Terminal	5,326,745	0.2	0.2	0.2	188	0.4	175.0	23.4	48,214
On-Road	223,724,822	5.4	5.2	5.4	763	3.5	132.3	22.7	361,635
Total	**229,051,567**	**5.6**	**5.4**	**5.6**	**951**	**3.9**	**307.3**	**46.1**	**409,849**

Table 6.2: 2021 HDV Emissions Associated with Container Terminals, tons and metric tons

Activity Location	Vehicle Miles Traveled	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e MT
On-Terminal	5,226,023	0.2	0.2	0.2	183	0.4	170.5	22.8	47,067
On-Road	196,277,851	4.8	4.6	4.7	671	3.0	116.5	20.0	317,455
Total	**201,503,874**	**5.0**	**4.7**	**4.9**	**854**	**3.5**	**287.0**	**42.8**	**364,521**

Table 6.3: 2021 HDV Emissions Associated with Non-Container Port Terminals, tons and metric tons

Activity Location	Vehicle Miles Traveled	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2 e MT
On-Terminal	100,722	0.004	0.004	0.004	5	0.010	4.5	0.6	1,147
On-Road	27,446,970	0.7	0.6	0.7	92	0.4	15.8	2.7	44,180
Total	**27,547,693**	**0.7**	**0.6**	**0.7**	**97**	**0.4**	**20.3**	**3.3**	**45,328**

Operational Profiles

To estimate the 2021 emissions from HDVs, operational profiles were developed for on-terminal truck activity using data and information collected from terminal operators. The on-road truck activity profiles were developed using trip generation and travel demand models to estimate the number of on-road VMT.

The model year distribution of HDVs was determined using RFID information collected at Port terminals to track the number of truck calls, and truck model year information from the PDTR. The distribution of the model years of the trucks that called at the SPBP terminals during 2021 is presented in Figure 6.1. The call weighted average age of the trucks in 2021 was approximately 7 years.

Figure 6.1: 2021 Model Year Distribution of HDV Fleet

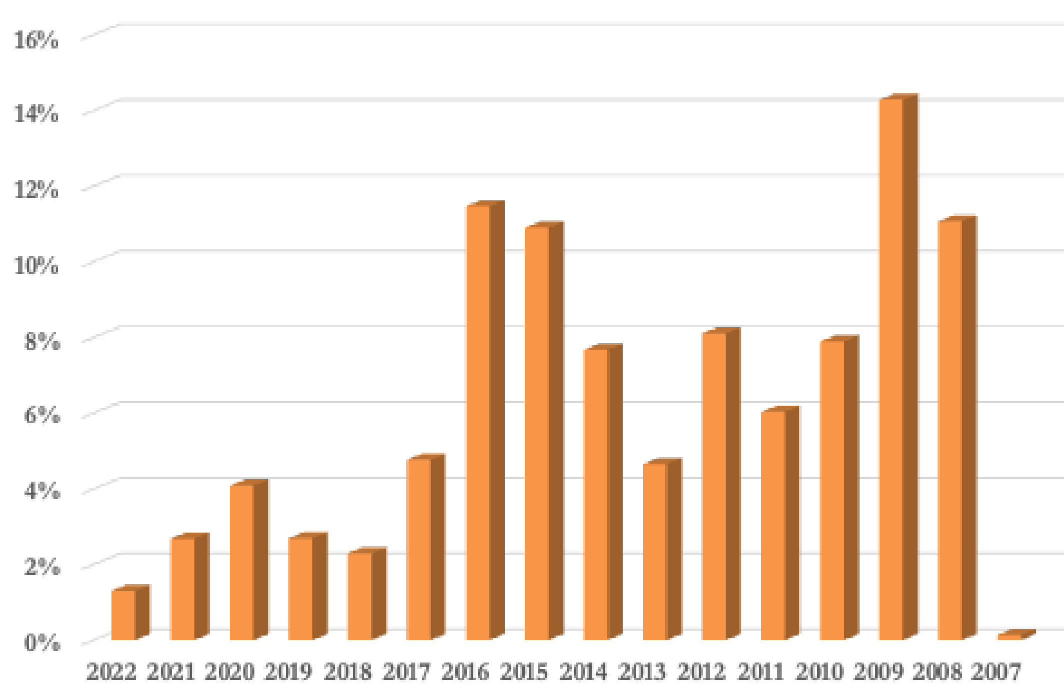


Table 6.4 shows the range and average of reported operating characteristics of on-terminal truck activities at Port container terminals, while Table 6.5 shows the same summary data for non-container terminals and facilities. Trucks may have wait times when coming into the terminal (gate in) and also on their way out (gate out). Once inside the terminal, there is also time involved loading and/or unloading cargo.

Table 6.4: 2021 Summary of Reported Container Terminal Operating Characteristics

	Speed (mph)	Distance (miles)	Gate In (hours)	Unload/Load (hours)	Gate Out (hours)
Maximum	15	3.5	0.43	1.12	0.05
Minimum	7	0.5	0.15	0.33	0.03
Average	10	1.4	0.24	0.80	0.04

Table 6.5: 2021 Summary of Reported Non-Container Facility Operating Characteristics

	Speed (mph)	Distance (miles)	Gate In (hours)	Unload/Load (hours)	Gate Out (hours)
Maximum	10	0.5	0.08	0.50	0.08
Minimum	5	0.0	0.00	0.00	0.00
Average	7	0.2	0.01	0.11	0.01

In 2021, a total 4,051,323 truck calls were associated with container terminals and 454,080 truck calls were associated with non-container facilities. The total number of truck calls associated with container terminals is estimated by the trip generation model on which truck travel VMT estimates are based, while non-container terminal truck calls were obtained from the terminal operators. The non-container terminal number includes activity at the Port's temporary empty container depot and chassis support facilities that operated in 2021, totaling approximately 247,000 calls. The chassis yards are used for pickup, delivery and maintenance of chassis.

Table 6.6 provides the on-terminal operating parameters, listing total estimated VMT and hours of idling on-terminal and waiting at entry gates. The idling times are likely to be over-estimated because the idling estimates are based on the entire time that trucks are on terminal (except for driving time), which does not account for times that trucks are turned off while on terminal. To date, no other data sources have been identified to provide a reliable estimate of the average percentage of time the trucks' engines are turned off while on terminal.

Table 6.6: 2021 Estimated On-Terminal VMT and Idling Hours by Terminal

Terminal Type	Total Miles Traveled	Total Hours Idling (all trips)
Container	2,167,554	538,792
Container	1,075,430	681,106
Container	771,396	1,460,510
Container	462,941	172,831
Container	446,287	830,094
Container	302,416	937,490
Auto	5,440	9,350
Break Bulk	3,500	2,940
Break Bulk	2,500	800
Break Bulk	1,500	0
Break Bulk	600	120
Break Bulk	20	0
Dry Bulk	12,920	680
Dry Bulk	1,132	906
Dry Bulk	321	186
Dry Bulk	40	440
Liquid Bulk	5,400	4,320
Liquid Bulk	3,125	375
Liquid Bulk	1,350	0
Other	51,548	96,911
Other	5,607	4,766
Other	4,947	0
Other	771	2,186
Total	**5,326,745**	**4,744,801**

Table 6.7 summarizes the speed-specific composite emission factors developed from the EMFAC2021 model and the port-specific model year distribution. These composite emission factors are developed using model year specific emission factors for the T7 POLA vehicle category of EMFAC2021 which also applies to POLB drayage trucks. They reflect the use of diesel and natural gas fuel, based on evaluation of the Port's Clean Truck Program (CTP) activity records and the Port Drayage Truck Registry (PDTR).

Table 6.7: 2021 Speed-Specific Composite Exhaust Emission Factor, g/hr and g/mi

Speed range (mph)		PM_{10}	$PM_{2.5}$	DPM	NO_x	SO_x	CO	HC	CO_2	N_2O	CH_4	Units
Idle		0.0061	0.0059	0.0038	24.8177	0.0518	29.8487	3.5880	6,169	0.9057	1.1897	g/hr
> 0	5	0.0301	0.0288	0.0297	12.1792	0.0322	3.9806	1.0735	3,611	0.5790	0.4958	g/mi
5	10	0.0270	0.0258	0.0266	9.6771	0.0277	3.1707	0.7742	3,103	0.4968	0.3280	g/mi
10	15	0.0230	0.0220	0.0227	7.1820	0.0229	2.3040	0.4960	2,547	0.4073	0.1946	g/mi
15	20	0.0204	0.0195	0.0202	5.8293	0.0200	1.7736	0.3517	2,224	0.3554	0.1371	g/mi
20	25	0.0188	0.0180	0.0186	4.9611	0.0181	1.4081	0.2637	2,010	0.3210	0.1052	g/mi
25	30	0.0181	0.0173	0.0179	4.2959	0.0167	1.1259	0.2033	1,848	0.2950	0.0848	g/mi
30	35	0.0181	0.0173	0.0180	3.7800	0.0156	0.9033	0.1596	1,722	0.2749	0.0706	g/mi
35	40	0.0189	0.0181	0.0188	3.4012	0.0148	0.7308	0.1276	1,629	0.2599	0.0603	g/mi
40	45	0.0204	0.0195	0.0203	3.1496	0.0142	0.6016	0.1042	1,566	0.2497	0.0525	g/mi
45	50	0.0225	0.0215	0.0224	3.0228	0.0139	0.5104	0.0871	1,530	0.2440	0.0465	g/mi
50	55	0.0253	0.0242	0.0252	3.0183	0.0139	0.4536	0.0748	1,522	0.2425	0.0417	g/mi
55	60	0.0289	0.0277	0.0289	3.1663	0.0141	0.4426	0.0728	1,551	0.2471	0.0416	g/mi
60	65	0.0333	0.0319	0.0333	3.4558	0.0147	0.4498	0.0750	1,612	0.2566	0.0417	g/mi
65	70	0.0333	0.0319	0.0333	3.4716	0.0147	0.4500	0.0750	1,612	0.2566	0.0417	g/mi

SECTION 7 SUMMARY OF 2021 EMISSION RESULTS

The Port of Long Beach 2021 Air Emissions Inventory results are presented in this section. Table 7.1 summarizes the 2021 air emissions associated with the goods movement-related sources at the Port, by category.

Table 7.1: 2021 Emissions by Source Category, tons and metric tons

Category	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e MT
Ocean going vessels	133	122	72	5,587	270	527	217	551,049
Harbor craft	9	9	9	383	0	70	14	37,500
Cargo handling equipment	6	5	4	284	2	1,128	35	142,802
Locomotives	20	19	20	556	1	137	31	47,684
Heavy-duty vehicles	6	5	6	951	4	307	46	409,849
Total	**174**	**160**	**111**	**7,761**	**277**	**2,168**	**345**	**1,188,884**

Table 7.2 shows the emissions percent contribution by source category. Of the total portwide emission sources, ocean-going vessels are the largest source of DPM, NO_x and CO_2e emissions. Rail locomotives are the second highest source of DPM emissions. HDV are the second highest source of NO_x and CO_2e emissions.

Table 7.2: 2021 Emissions Percent Contributions by Source Category

Source Category	DPM		NO_x		SO_x		CO_2e	
	tons	%	tons	%	tons	%	MT	%
Ocean going vessels	72	65%	5,587	72%	270	97.7%	551,049	46%
Harbor craft	9	9%	383	5%	0	0.1%	37,500	3%
Cargo handling equipment	4	4%	284	4%	2	0.6%	142,802	12%
Rail locomotives	20	18%	556	7%	1	0.2%	47,684	4%
Heavy-duty vehicles	6	5%	951	12%	4	1.4%	409,849	34%
Total	**111**	**100%**	**7,761**	**100%**	**277**	**100.0%**	**1,188,884**	**100%**

To place the maritime industry-related emissions into context, the following figures compare the Port's contributions to the total emissions in the South Coast Air Basin by major emission source category. Due to rounding, the percentages may not total 100%.

Figure 7.1: 2021 PM_{10} Emissions in the South Coast Air Basin, %

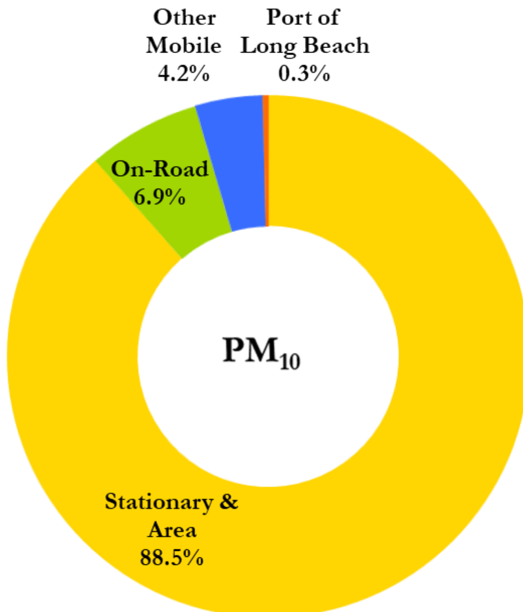


Figure 7.2: 2021 $PM_{2.5}$ Emissions in the South Coast Air Basin, %

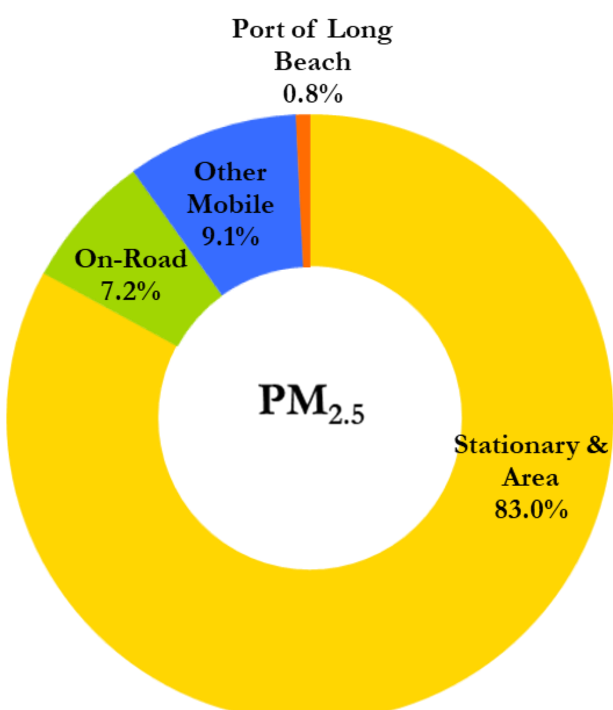


Figure 7.3: 2021 DPM Emissions in the South Coast Air Basin, %

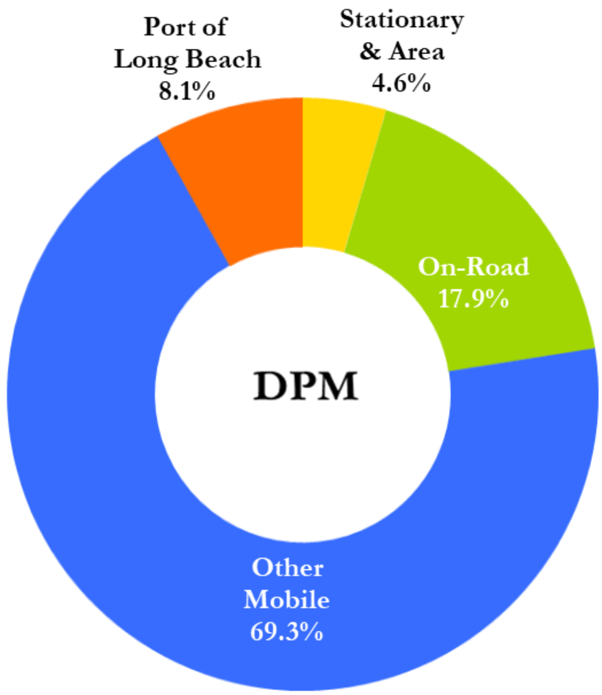


Figure 7.4: 2021 NO_x Emissions in the South Coast Air Basin, %

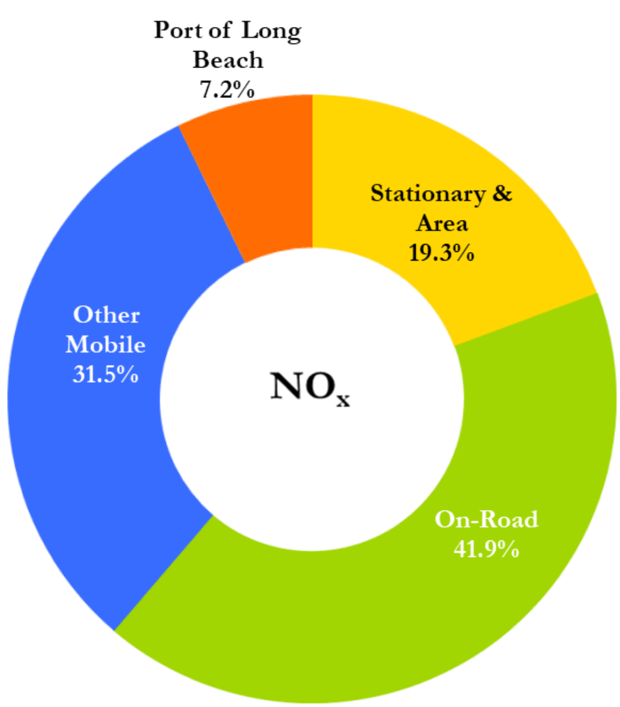
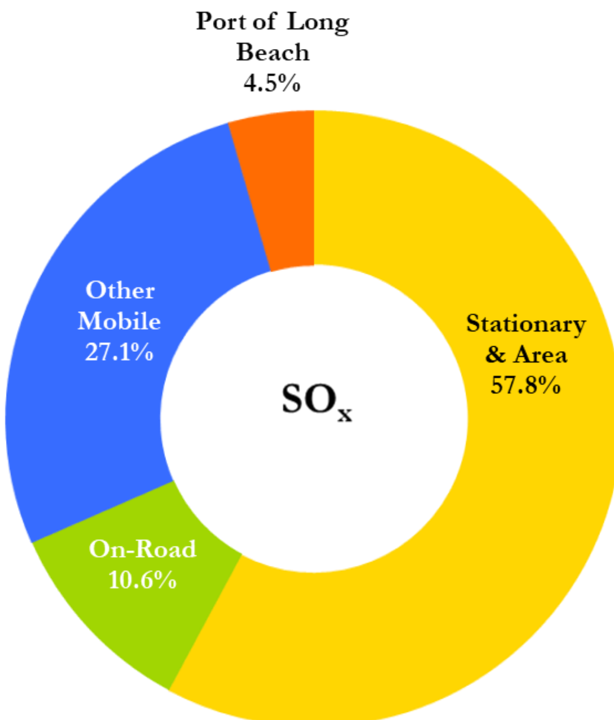


Figure 7.5: 2021 SO_x Emissions in the South Coast Air Basin, %



Tables 7.3 through 7.8 list the percent emissions contribution. The 2021 SoCAB emissions are based on the 2016 AQMP Appendix III[15], except for the SoCAB on-road emission estimates which were updated to take into consideration EMFAC2021[16] and commercial harbor craft emissions which were updated based on CARB's revisions during the 2022 CARB CHC regulation amendment. Thus, the SoCAB total emissions shown on the bottom row of the tables do not exactly match 2016 AQMP Appendix III values. It should be noted that SoCAB on-road heavy-duty diesel PM_{10} and $PM_{2.5}$ emissions do not include brake and tire wear emissions consistent with the Port's HDV emissions.

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[15]SCAQMD, *Final 2016 AQMP Appendix III, Base & Future Year Emissions Inventories*, March 2017. Except on-road emissions based on EMFAC2014 are replaced with EMFAC2021 estimates.
[16]ARB, *www.arb.ca.gov/emfac/*

Table 7.3: 2021 PM_{10} Emissions Contribution, tons and %

Category	Subcategory	PM_{10}	Percent PM_{10} Emissions of Total Category	Port	SoCAB AQMP
OGV	Auto carrier	2	2%	1%	0.00%
OGV	Bulk vessel	6	5%	4%	0.01%
OGV	Containership	75	56%	43%	0.14%
OGV	Cruise	4	3%	3%	0.01%
OGV	General cargo	1	1%	1%	0.00%
OGV	RoRo	1	1%	1%	0.00%
OGV	Tanker	44	33%	25%	0.08%
OGV	**Subtotal**	**133**	**100%**	**76%**	**0.25%**
Harbor Craft	Assist tug	2	21%	1%	0.00%
Harbor Craft	ATB	2	23%	1%	0.00%
Harbor Craft	Barge	0	0%	0%	0.00%
Harbor Craft	Harbor tug	1	10%	1%	0.00%
Harbor Craft	Ferry	2	16%	1%	0.00%
Harbor Craft	Ocean tugboat	1	15%	1%	0.00%
Harbor Craft	Government	0	2%	0%	0.00%
Harbor Craft	Excursion	0	3%	0%	0.00%
Harbor Craft	Crewboat	1	10%	1%	0.00%
Harbor Craft	Work boat	0	1%	0%	0.00%
Harbor Craft	**Subtotal**	**9**	**100%**	**5%**	**0.02%**
CHE	RTG crane	1	20%	1%	0.00%
CHE	Forklift	0	3%	0%	0.00%
CHE	Top handler, side pick	1	22%	1%	0.00%
CHE	Other	0	7%	0%	0.00%
CHE	Yard tractor	3	48%	2%	0.01%
CHE	**Subtotal**	**6**	**100%**	**3%**	**0.01%**
Locomotives	Switching	0	2%	0%	0.00%
Locomotives	Line haul	20	98%	11%	0.04%
Locomotives	**Subtotal**	**20**	**100%**	**12%**	**0.04%**
HDV	On-Terminal	0.2	3%	0%	0.00%
HDV	On-road	5.4	95%	3%	0.01%
HDV	**Subtotal**	**6**	**100%**	**3%**	**0.01%**
Port	**Total**	**174**		**100%**	**0.3%**
SoCAB AQMP	**Total**	**53,600**			

Table 7.4: 2021 $PM_{2.5}$ Emissions Contribution, tons and %

Category	Subcategory	$PM_{2.5}$	Percent $PM_{2.5}$ Emissions of Total Category	Port	SoCAB AQMP
OGV	Auto carrier	2	2%	1%	0.01%
OGV	Bulk vessel	6	5%	4%	0.03%
OGV	Containership	69	56%	43%	0.33%
OGV	Cruise	4	3%	3%	0.02%
OGV	General cargo	1	1%	1%	0.00%
OGV	RoRo	1	1%	1%	0.01%
OGV	Tanker	40	33%	25%	0.19%
OGV	**Subtotal**	**122**	**100%**	**76%**	**0.58%**
Harbor Craft	Assist tug	2	21%	1%	0.01%
Harbor Craft	ATB	2	23%	1%	0.01%
Harbor Craft	Barge	0	0%	0%	0.00%
Harbor Craft	Harbor tug	1	10%	1%	0.00%
Harbor Craft	Ferry	1	16%	1%	0.01%
Harbor Craft	Ocean tugboat	1	14%	1%	0.01%
Harbor Craft	Government	0	2%	0%	0.00%
Harbor Craft	Excursion	0	3%	0%	0.00%
Harbor Craft	Crewboat	1	9%	1%	0.00%
Harbor Craft	Work boat	0	1%	0%	0.00%
Harbor Craft	**Subtotal**	**9**	**100%**	**6%**	**0.04%**
CHE	RTG crane	1	20%	1%	0.00%
CHE	Forklift	0	3%	0%	0.00%
CHE	Top handler, side pick	1	23%	1%	0.01%
CHE	Other	0	7%	0%	0.00%
CHE	Yard tractor	2	48%	1%	0.01%
CHE	**Subtotal**	**5**	**100%**	**3%**	**0.02%**
Locomotives	Switching	0	2%	0%	0.00%
Locomotives	Line haul	18	98%	11%	0.09%
Locomotives	**Subtotal**	**19**	**100%**	**12%**	**0.09%**
HDV	On-Terminal	0.2	3%	0%	0.00%
HDV	On-road	5.1	95%	3%	0.02%
HDV	**Subtotal**	**5**	**100%**	**3%**	**0.03%**
Port	**Total**	**160**		**100%**	**0.8%**
SoCAB AQMP	**Total**	**20,970**			

Table 7.5: 2021 DPM Emissions Contribution, tons and %

Category	Subcategory	DPM	Percent DPM Emissions of Total Category	Port	SoCAB AQMP
OGV	Auto carrier	2	2%	2%	0.1%
OGV	Bulk vessel	5	6%	4%	0.3%
OGV	Containership	46	64%	42%	3.4%
OGV	Cruise	3	5%	3%	0.2%
OGV	General cargo	1	1%	1%	0.1%
OGV	RoRo	0	0%	0%	0.0%
OGV	Tanker	15	20%	13%	1.1%
OGV	**Subtotal**	**72**	**100%**	**65%**	**5.3%**
Harbor Craft	Assist tug	2	21%	2%	0.1%
Harbor Craft	ATB	2	23%	2%	0.2%
Harbor Craft	Barge	0	0%	0%	0.0%
Harbor Craft	Harbor tug	1	10%	1%	0.1%
Harbor Craft	Ferry	2	16%	1%	0.1%
Harbor Craft	Ocean tugboat	1	15%	1%	0.1%
Harbor Craft	Government	0	2%	0%	0.0%
Harbor Craft	Excursion	0	3%	0%	0.0%
Harbor Craft	Crewboat	1	10%	1%	0.1%
Harbor Craft	Work boat	0	1%	0%	0.0%
Harbor Craft	**Subtotal**	**9**	**100%**	**9%**	**0.7%**
CHE	RTG crane	1	28%	1%	0.1%
CHE	Forklift	0	3%	0%	0.0%
CHE	Top handler, side pick	1	32%	1%	0.1%
CHE	Other	0	9%	0%	0.0%
CHE	Yard tractor	1	27%	1%	0.1%
CHE	**Subtotal**	**4**	**100%**	**4%**	**0.3%**
Locomotives	Switching	0	2%	0%	0.0%
Locomotives	Line haul	20	98%	18%	1.5%
Locomotives	**Subtotal**	**20**	**100%**	**18%**	**1.5%**
HDV	On-Terminal	0.2	3%	0%	0.0%
HDV	On-road	5.3	95%	5%	0.4%
HDV	**Subtotal**	**6**	**100%**	**5%**	**0.4%**
Port	**Total**	**111**		**100%**	**8.1%**
SoCAB AQMP	**Total**	**1,363**			

Table 7.6: 2021 NO_x Emissions Contribution, tons and %

Category	Subcategory	NO_x	Percent NO_x Emissions of Total Category	Port	SoCAB AQMP
OGV	Auto carrier	132	2%	2%	0.1%
OGV	Bulk vessel	345	6%	4%	0.3%
OGV	Containership	3,536	63%	46%	3.3%
OGV	Cruise	213	4%	3%	0.2%
OGV	General cargo	50	1%	1%	0.0%
OGV	RoRo	34	1%	0%	0.0%
OGV	Tanker	1,276	23%	16%	1.2%
OGV	**Subtotal**	**5,587**	**100%**	**72%**	**5.2%**
Harbor Craft	Assist tug	90	24%	1%	0.1%
Harbor Craft	ATB	37	10%	0%	0.0%
Harbor Craft	Barge	0	0%	0%	0.0%
Harbor Craft	Harbor tug	44	11%	1%	0.0%
Harbor Craft	Ferry	79	21%	1%	0.1%
Harbor Craft	Ocean tugboat	65	17%	1%	0.1%
Harbor Craft	Government	12	3%	0%	0.0%
Harbor Craft	Excursion	10	3%	0%	0.0%
Harbor Craft	Crewboat	42	11%	1%	0.0%
Harbor Craft	Work boat	3	1%	0%	0.0%
Harbor Craft	**Subtotal**	**383**	**100%**	**5%**	**0.4%**
CHE	RTG crane	103	36%	1%	0.1%
CHE	Forklift	9	3%	0%	0.0%
CHE	Top handler, side pick	100	35%	1%	0.1%
CHE	Other	11	4%	0%	0.0%
CHE	Yard tractor	61	22%	1%	0.1%
CHE	**Subtotal**	**284**	**100%**	**4%**	**0.3%**
Locomotives	Switching	29	5%	0%	0.0%
Locomotives	Line haul	528	95%	7%	0.5%
Locomotives	**Subtotal**	**556**	**100%**	**7%**	**0.5%**
HDV	On-Terminal	174	18%	2%	0.2%
HDV	On-road	752	79%	10%	0.7%
HDV	**Subtotal**	**951**	**100%**	**12%**	**0.9%**
Port	**Total**	**7,761**		**100%**	**7.2%**
SoCAB AQMP	**Total**	**107,336**			

Table 7.7: 2021 SO_x Emissions Contribution, tons and %

Category	Subcategory	SO_x	Percent SO_x Emissions of Total Category	Port	SoCAB AQMP
OGV	Auto carrier	4	1%	1%	0%
OGV	Bulk vessel	14	5%	5%	0%
OGV	Containership	132	49%	48%	2%
OGV	Cruise	11	4%	4%	0%
OGV	General cargo	2	1%	1%	0%
OGV	RoRo	3	1%	1%	0%
OGV	Tanker	105	39%	38%	2%
OGV	**Subtotal**	**270**	**100%**	**97.7%**	**4%**
Harbor Craft	Assist tug	0.10	29%	0%	0%
Harbor Craft	ATB	0.02	7%	0%	0%
Harbor Craft	Barge	0.00	0%	0%	0%
Harbor Craft	Harbor tug	0.05	13%	0%	0%
Harbor Craft	Ferry	0.07	21%	0%	0%
Harbor Craft	Ocean tugboat	0.04	12%	0%	0%
Harbor Craft	Government	0.01	4%	0%	0%
Harbor Craft	Excursion	0.01	3%	0%	0%
Harbor Craft	Crewboat	0.04	11%	0%	0%
Harbor Craft	Work boat	0.00	1%	0%	0%
Harbor Craft	**Subtotal**	**0**	**100%**	**0%**	**0%**
CHE	RTG crane	0.2	9%	0%	0%
CHE	Forklift	0.0	2%	0%	0%
CHE	Top handler, side pick	0.6	34%	0%	0%
CHE	Other	0.1	3%	0%	0%
CHE	Yard tractor	0.9	52%	0%	0%
CHE	**Subtotal**	**2**	**100%**	**1%**	**0%**
Locomotives	Switching	0.0	6%	0%	0%
Locomotives	Line haul	0.5	94%	0%	0%
Locomotives	**Subtotal**	**1**	**100%**	**0%**	**0%**
HDV	On-Terminal	0.4	10%	0%	0%
HDV	On-road	3.4	88%	1%	0%
HDV	**Subtotal**	**4**	**100%**	**1%**	**0%**
Port	**Total**	**277**		**100%**	**4.5%**
SoCAB AQMP	**Total**	**6,160**			

Table 7.8: 2021 CO_2e Emissions Contribution, metric tons and %

Category	Subcategory	CO_2e	Percent Emissions of Total Category	Port
OGV	Auto carrier	7,568	1%	1%
OGV	Bulk vessel	23,731	4%	2%
OGV	Containership	309,599	56%	26%
OGV	Cruise	15,913	3%	1%
OGV	General cargo	3,154	1%	0%
OGV	RoRo	5,386	1%	0%
OGV	Tanker	185,699	34%	16%
OGV	**Subtotal**	**551,049**	**100%**	**46%**
Harbor Craft	Assist tug	10,937	29%	1%
Harbor Craft	ATB	2,536	7%	0%
Harbor Craft	Barge	28	0%	0%
Harbor Craft	Harbor tug	4,981	13%	0%
Harbor Craft	Ferry	7,719	21%	1%
Harbor Craft	Ocean tugboat	4,334	12%	0%
Harbor Craft	Government	1,573	4%	0%
Harbor Craft	Excursion	978	3%	0%
Harbor Craft	Crewboat	4,025	11%	0%
Harbor Craft	Work boat	390	1%	0%
Harbor Craft	**Subtotal**	**37,500**	**100%**	**3%**
CHE	RTG crane	13,186	9%	1%
CHE	Forklift	2,488	2%	0%
CHE	Top handler, side pick	50,962	36%	4%
CHE	Other	4,646	3%	0%
CHE	Yard tractor	71,519	50%	6%
CHE	**Subtotal**	**142,802**	**100%**	**12%**
Locomotives	Switching	3,162	7%	0%
Locomotives	Line haul	44,522	93%	4%
Locomotives	**Subtotal**	**47,684**	**100%**	**4%**
HDV	On-Terminal	44,846	11%	4%
HDV	On-road	356,640	89%	30%
HDV	**Subtotal**	**401,486**	**100%**	**34%**
Port	**Total**	**1,188,884**		**100%**

SECTION 8 COMPARISON OF 2021 AND 2005 FINDINGS AND EMISSION ESTIMATES

This section provides a comparison of the emission estimates for 2021 and 2005 by source category. The baseline year used to compare every annual inventory is 2005. Due to the OGV and harbor craft factor updates, the 2005 emissions were recalculated using 2005 activity data with the latest emission factors to provide a valid basis for comparison. For OGV, emissions were re-estimated to reflect the 2021 main steam engine emission factors and to remove ATB activity. For harbor craft, 2005 emissions were re-estimated to be consistent with the 2022 CARB CHC regulation amendment, including adding ATBs and using the latest emission factor, load factor and useful life values.

Table 8.1: 2005-2021 Port Emissions Comparison by Source Category, tons, metric tons and %

	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e MT
2005								
Ocean-going vessels	866	693	595	6,655	6,848	531	234	386,935
Harbor craft	36	35	36	699	3	225	52	35,001
Cargo handling equipment	47	44	47	1,289	11	398	65	103,710
Locomotives	43	40	43	1,273	76	179	66	60,579
Heavy-duty vehicles	205	196	205	5,273	37	1,523	318	391,610
Total	**1,197**	**1,008**	**926**	**15,188**	**6,975**	**2,856**	**735**	**977,836**
2021								
Ocean-going vessels	133	122	72	5,587	270	527	217	551,049
Harbor craft	9	9	9	383	0	70	14	37,500
Cargo handling equipment	6	5	4	284	2	1,128	35	142,802
Locomotives	20	19	20	556	1	137	31	47,684
Heavy-duty vehicles	6	5	6	951	4	307	46	409,849
Total	**174**	**160**	**111**	**7,761**	**277**	**2,168**	**345**	**1,188,884**
Change between 2005 and 2021 (percent)								
Ocean-going vessels	-85%	-82%	-88%	-16%	-96%	-1%	-7%	42%
Harbor craft	-74%	-74%	-74%	-45%	-88%	-69%	-72%	7%
Cargo handling equipment	-88%	-88%	-92%	-78%	-85%	183%	-45%	38%
Locomotives	-53%	-54%	-53%	-56%	-99%	-23%	-53%	-21%
Heavy-duty vehicles	-97%	-97%	-97%	-82%	-89%	-80%	-86%	5%
Total	**-85%**	**-84%**	**-88%**	**-49%**	**-96%**	**-24%**	**-53%**	**22%**

Table 8.2 provides a comparison of the number of vessel calls and container cargo throughput as well as the average TEUs per containership call between 2005 and 2021. Compared to 2005, container throughput is up 40%, while overall containership arrivals to POLB are down 32%. The average number of containers per containership is 10,290 TEU per call in 2021, indicative of larger vessels calling at POLB. The 2005 and 2020 arrivals do not match the previously published 2020 EI report as ATBs are now part of the harbor craft inventory and not counted as an ocean-going vessel. Compared to 2020, there were less containership calls, but total arrivals increased in 2021 due to tankers and cruise ships returning to normal schedules.

Table 8.2: Container Throughput and Vessel Call Comparison

Year	Container Throughput (TEU)	All Arrivals	Containership Arrivals	Average TEU per Call
2005	6,709,818	2,617	1,332	5,037
2020	8,113,315	1,855	982	8,262
2021	9,384,368	1,905	912	10,290
CAAP Progress	**40%**	**-27%**	**-32%**	**104%**
Previous Year	**16%**	**3%**	**-7%**	**25%**

Table 8.3 presents the total net change in emissions for all pollutants. Except for CO_2e emissions, overall criteria pollutant emissions are lower in 2021 compared to 2005. Compared to previous year, emissions increased significantly for all pollutants due supply chain congestion throughout 2021.

Table 8.3: Emissions Comparison, tons, metric tons and %

Year	PM_{10}	$PM_{2.5}$	DPM	NO_x	SO_x	CO	HC	CO_2e
2005	1,197	1,008	926	15,188	6,975	2,856	735	977,836
2020	112	104	78	5,769	200	1,493	248	877,772
2021	174	160	111	7,761	277	2,168	345	1,188,884
CAAP Progress	**-85%**	**-84%**	**-88%**	**-49%**	**-96%**	**-24%**	**-53%**	**22%**
Previous Year	**55%**	**54%**	**42%**	**35%**	**38%**	**45%**	**39%**	**35%**

The following paragraphs summarize the overall reasons for the differences in 2005 and 2021 emissions by source category.

Ocean-Going Vessels

Emissions from OGVs were lower in 2021 compared to 2005 levels as a result of significantly increased participation in the Port's Green Flag incentive and ESI programs, CARB's low sulfur marine fuel regulation requiring distillate fuels used by ocean going vessels with a maximum sulfur content of 0.1%, North American Emission Control Area (ECA), and implementation of the CARB's control measure for OGV at-berth regulation. Emission reductions have also occurred due to increased vessel efficiency and utilization due to the deployment of larger container vessels that has resulted in fewer vessel calls. Impacts from COVID-19 also contributed to emission changes in 2021 and are discussed in more detail in the emissions comparison to previous year subsection.

Harbor Craft

Harbor craft emissions decreased for all pollutants, except for CO_2e. The decrease is due to the turnover to newer engines which have lower emission standards and the use of lower sulfur content fuel. Between 2005 and 2021, fleet turnover was accelerated as a result of CARB's in-use harbor craft regulations and grant funding made available, such as Carl Moyer and EPA grants, for the replacement of older engines with newer and cleaner engines. The increase in CO_2e emissions is related to the impact from the introduction of cleaner engines for NO_x and PM, but that do not have lower standards for CO_2 and the increase in energy consumption in 2021 as compared to 2005.

Cargo Handling Equipment

Cargo handling equipment emissions decreased for all pollutants, except for CO and CO_2e. The decrease is due to fleet turnover to newer CHE which have lower emission standards and use of lower sulfur content fuel. Between 2005 and 2021, fleet turnover was accelerated as a result of the continued replacement and retrofit of existing equipment with cleaner engines and implementation of CAAP Tier 4 measures, green leases, grant funding, and the CARB in-use CHE regulation resulted in a cleaner fleet. The increase in CO emissions from cargo handling equipment is attributed to the increased activity of gasoline fueled equipment with higher CO emission rates compared to diesel equipment. The increase in CO_2e is mainly due to the increase in energy consumption in 2021 as compared to 2005 and lack of any CO_2e emission standards. Mid-2021, several terminals started using renewable diesel, which has lower carbon intensity and lowers CO_2e emissions.

Locomotives

Emissions from rail locomotives were lower in 2021 compared to 2005 due in part to the turnover of locomotives to cleaner ultra-low emissions switching locomotives in the PHL and UP fleets. In addition, use of cleaner fuels and cleaner line haul locomotives by both UP and BNSF contributed to the reduced emissions.

Heavy-Duty Vehicles

Truck emissions were significantly lower in 2021 compared to 2005 due to the implementation of the Port's Clean Trucks Program that progressively banned older, higher-emitting trucks from Port terminals. The most recent stage requires that newly registered trucks, as of 2018, must be model year 2014 or newer. The CTP and engine emission standards are responsible for most reductions, including the particulate and NO_x decreases, while fuel sulfur standards, specifically the introduction of ultra-low sulfur diesel fuel (ULSD), are responsible for the SO_x reduction. Other factors include normal fleet turnover and decreased total vehicle miles travelled due to the increase in utilization of on-dock rail and changes in regional travel patterns since 2005.

Emissions Comparison to Previous Year

Between 2020 and 2021, OGV emissions increased significantly due to more vessels at anchorage, as well as more time at berth and at anchorage. These factors can be attributed mainly to impacts resulting from supply chain disruptions and demand in consumer goods which resulted in container surges. Table 8.4 compares the 2021 emissions to the previous year which shows the emission are higher in 2021 for most source categories.

Table 8.4: 2020-2021 Air Emissions Comparison by Source Category

	PM_{10} tons	$PM_{2.5}$ tons	DPM tons	NO_x tons	SO_x tons	CO tons	HC tons	CO_2e MT
2020								
Ocean-going vessels	75	69	42	3,604	194	306	136	294,838
Harbor craft	7	6	7	361	0	63	11	33,969
Cargo handling equipment	4	4	3	245	1	742	31	121,060
Locomotives	20	19	20	536	0	127	31	44,453
Heavy-duty vehicles	6	6	6	1,023	4	256	39	383,451
Total	**112**	**104**	**78**	**5,769**	**200**	**1,493**	**248**	**877,772**
2021								
Ocean-going vessels	133	122	72	5,587	270	527	217	551,049
Harbor craft	9	9	9	383	0	70	14	37,500
Cargo handling equipment	6	5	4	284	2	1,128	35	142,802
Locomotives	20	19	20	556	1	137	31	47,684
Heavy-duty vehicles	6	5	6	951	4	307	46	409,849
Total	**174**	**160**	**111**	**7,761**	**277**	**2,168**	**345**	**1,188,884**
Change between 2020 and 2021 (percent)								
Ocean-going vessels	77%	77%	71%	55%	39%	72%	60%	87%
Harbor craft	36%	38%	36%	6%	10%	11%	26%	10%
Cargo handling equipment	30%	30%	32%	16%	18%	52%	16%	18%
Locomotives	-0.3%	-0.5%	-0.3%	4%	7%	7%	2%	7%
Heavy-duty vehicles	-2%	-2%	-3%	-7%	6%	20%	18%	7%
Total	**55%**	**54%**	**42%**	**35%**	**38%**	**45%**	**39%**	**35%**

The major factors that resulted in significantly higher emissions included:

1) large number of vessels, mainly containerships, at anchorage or loitering.
2) container ships staying at berth longer than usual and less using shore power.
3) increased use of cargo handling equipment to keep up with container surge.
3) longer truck turn times at terminals.

The supply chain congestion that occurred in 2021 resulted in vessels spending a prolonged period of time at anchorage or within undesignated anchorage and loitering areas within the emissions inventory study area boundary. The anchorage calls and vessels loitering continue to be monitored and the expectation is for the vessel count at anchorage to lessen as port congestion is reduced.

Table 8.5 compares the average days at anchorage for containerships for 2020 and 2021. On average, containerships spent more time at anchorage in 2021 which resulted in higher emissions for hoteling at anchorage. Prior to 2020, containerships spent a minimal amount of time at anchorage as the vessels would usually call directly to the berth and there would be no waiting period at anchorage.

Table 8.5: 2021-2020 Containerships Average Days at Anchorage Comparison

Container Category	2020 Anchorage Avg Days	2021 Anchorage Avg Days	2020-2021 Change
Container - 1000	2.5	5.2	104%
Container - 2000	2.3	6.1	167%
Container - 3000	2.9	5.1	74%
Container - 4000	4.3	6.6	55%
Container - 5000	3.4	6.7	95%
Container - 6000	2.3	9.0	299%
Container - 7000	0.0	6.7	100%
Container - 8000	2.0	4.3	116%
Container - 9000	2.7	4.1	50%
Container - 10000	1.7	6.7	300%
Container - 11000	5.0	6.9	38%
Container - 12000	0.8	5.2	596%
Container - 13000	3.4	5.9	73%
Container - 14000	3.9	7.0	79%
Container - 15000	2.6	6.7	156%
Container - 16000	0.0	0.0	0%
Container - 19000	2.0	6.7	234%
Container - 20000	0.0	0.0	0%
Container - 23000	0.0	0.0	0%

Table 8.6 compares the average days at berth for containerships.

Table 8.6: 2021-2020 Containerships Average Days at Berth Comparison

Container Category	2020 Berth Time Avg Days	2021 Berth Time Avg Days	2020-2021 Change
Container - 1000	1.2	1.8	54%
Container - 2000	1.6	2.9	82%
Container - 3000	1.5	2.1	44%
Container - 4000	1.2	3.5	184%
Container - 5000	2.0	4.1	103%
Container - 6000	3.1	4.7	52%
Container - 7000	0.0	6.5	100%
Container - 8000	2.7	4.4	65%
Container - 9000	2.4	4.7	95%
Container - 10000	4.2	6.0	43%
Container - 11000	4.0	5.2	30%
Container - 12000	4.8	4.5	-8%
Container - 13000	4.9	5.7	17%
Container - 14000	5.7	6.5	14%
Container - 15000	4.5	6.3	40%
Container - 16000	6.9	0.0	-100%
Container - 19000	6.9	9.8	43%
Container - 20000	0.0	4.3	100%
Container - 23000	2.3	0.0	-100%

In 2021, there were 3% more vessel calls than in 2020, but the shifts mainly from anchorage were 78% higher and anchorage calls 47% higher in 2021. The higher shift calls and anchorage counts in 2021 also attributed to the higher emissions for ocean going vessels. Figure 8.1 shows anchorage calls trend.

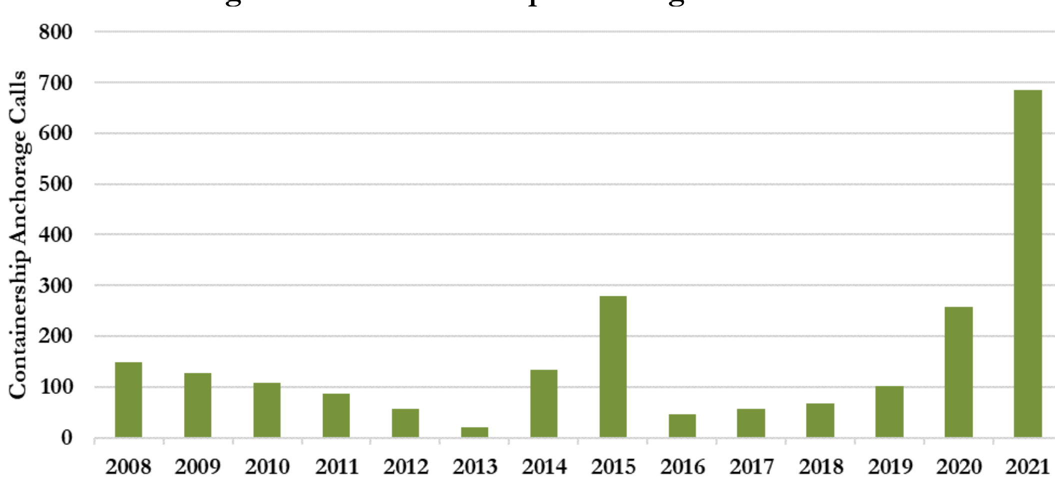
Table 8.7: 2021-2020 Shift Calls Comparison

Vessel Type	2020 Shift	2021 Shift	2020-2021 Change
Containership	339	1,133	234%
Tanker	667	810	21%
Cruise	13	14	8%
Bulk Carrier	188	270	44%
Auto Carrier/RoRo	43	38	-12%
General cargo/Misc	41	32	-22%
Total	**1,291**	**2,297**	**78%**

Table 8.8: 2021-2020 Anchorage Calls Comparison

Vessel Type	2020 Anchorage	2021 Anchorage	2020-2021 Change
Containership	257	704	174%
Tanker	542	561	4%
Cruise	13	12	-8%
Bulk Carrier	158	194	23%
Auto Carrier/RoRo	21	10	-52%
General cargo/Misc	32	20	-38%
Total	**1,023**	**1,501**	**47%**

Figure 8.1: Containership Anchorage Calls Trend



Below are source category specific explanations for the emission changes when comparing 2021 to 2020:

- For OGVs, the total calls were higher by 3% in 2021. Compared to 2020, there was a significant increase in cruise calls. The significantly higher emissions are due to supply chain congestion which resulted in a record number of vessels waiting at anchorage and vessels staying longer at berth and anchorage. In 2021, 25 vessels called the Port with propulsion engines that meet the Tier III NO_x emission standard which are 75% cleaner than the Tier II engine standard. The vessels with Tier III engines included three auto carriers, three bulk vessels, ten containerships, and nine tankers.

- For harbor craft, overall hours of operation were higher in 2021. For the first time, ATBs were added to the inventory to be consistent with CARB methodology. ATBs were also added to the 2020 activity to be able to compare emissions.

- For CHE, hours of use for equipment were higher due to the record container throughput in 2021 which led to an increase in emissions for all pollutants. Some terminals used renewable diesel which has a lower carbon intensity than conventional diesel for the first time in 2021.

- For locomotives, the changes in emissions were due primarily to a combination of decreases in the line haul fleet composite emission factors resulting from line haul fleet mix improvement, offset by a 16% increase in the number of containers moved by on-dock rail (on-dock lifts) which resulted in higher rail activity. These offsetting factors resulted in decreases of PM and increases of other pollutants.

- For heavy-duty vehicles, the emissions of some pollutants (shown in the table above) decreased due to fleet turnover to include a higher percentage of newer trucks making more of the container moves, which lowered the fleet composite emission factors, especially of PM and NO_x. Other pollutants increased because they are not greatly affected by model year, and the increases in port throughput, the number of truck trips, and the number of VMT are reflected in the resulting emission estimates. Increases were limited by an increase in the use of on-dock rail compared with 2020, which shifted some additional cargo from truck to rail, compared with 2020.

Ocean-Going Vessels

Overall energy consumption (in terms of kWh) by OGV emission sources in 2005, 2020, and 2021 are shown in Table 8.9. The kWh associated with the Advanced Maritime Emission Control System (AMECS) technology generators are included with the auxiliary engine kWh shown in the table. The main engine activity has decreased since 2005 mainly due to the VSR program and fewer vessel calls. The auxiliary engine and boiler activity increased compared to 2005 and previous year. This is due to larger vessels staying longer at berth, more and longer anchorage calls, and no program or regulation to decrease the boiler activity or emissions. Shore power at berth for containerships and cruise ships was not enough to lower the overall use of auxiliary engines. In 2021, there were many vessels that were not shore power ready or needed commissioning, but due to COVID-19 restrictions, were not able to be commissioned. There were no additional barges with alternative capture and control systems that could be used either. In 2021, there were only three calls that used AMEC system for evaluation of the system and provide data to CARB.

Table 8.9: OGV Energy Consumption Comparison by Emission Source, kWh

Year	All Emission Sources	Main Eng	Aux Eng	Boiler
2005	506,332,609	148,941,469	228,719,799	128,671,341
2020	356,442,939	70,020,681	142,362,160	144,060,098
2021	661,244,863	70,783,418	304,519,130	285,942,314
CAAP Progress	**31%**	**-52%**	**33%**	**122%**
Previous Year	**86%**	**1%**	**114%**	**98%**

Table 8.10 summarizes the distribution of main engine IMO NO_x standards tier calls (Tier). The No Tier column represents vessels that do not have diesel engines, such as steamships. Tier I refers to calls by vessels meeting or exceeding Tier I standards (vessels constructed from 2000-2010), Tier II refers to calls by vessels meeting or exceeding Tier II standards (vessels constructed from 2011-2015), and Tier III refers to calls by vessels meeting or exceeding the Tier III standards, which are in effect in the North American ECA for vessels constructed on or after January 1, 2016.

Table 8.10: OGV Main Engine Calls by IMO NO_x Tiers

Year	IMO Tier 0	IMO Tier I	IMO Tier II	IMO Tier III	No Tier
2005	54%	42%	0%	0%	4%
2020	7%	51%	37%	2%	3%
2021	5%	49%	38%	4%	4%

In 2021, 25 vessels met the Tier III NO_x emissions standards: one auto carrier, seven containerships and seven tanker vessels. NO_x emissions for Tier III vessels are 75% cleaner than Tier II vessels when operating at or above 25% main engine load. The increase in Tier II and Tier III vessels continued in 2021.

The various emission reduction strategies for ocean-going vessels that were in effect in 2021 are listed in Table 8.11. In 2021, the percentage of vessels compliant with the vessel speed reduction program (VSR) is less than 2020. The number of vessels utilizing shore power decreased in 2021 mainly due to a decrease in frequent callers, vessels that were not shore power capable, not being able to commission shore power capable vessels due to COVID-19, and sometimes having to stop shore power due to Governor's emergency proclamation during extreme heat periods. In 2021, the Port incorporated the international Environmental Ship Index (ESI) into the Port's Green Ship Incentive Program.

Table 8.11: OGV Emission Reduction Strategies

Year	Shore Power	VSR 20 nm	VSR 40 nm	ESI	EIAPP Main Eng	EIAPP Aux Eng
2005	0%	68%	0%	0%	0%	0%
2020	46%	96%	91%	0%	0%	0%
2021	36%	94%	88%	47%	60%	58%

The following OGV emission reductions strategies are listed:

- Shore Power refers to vessel calls using shore power at berth, instead of running their diesel-powered auxiliary engines.
- VSR refers to the vessels reducing their transit speed to 12 knots or lower within 20 and 40 nm of Point Fermin as part of the Port's Green Flag Program.
- ESI refers to the number of vessel calls that participated in the ESI program which evaluates the environmental performance of a vessel.
- Engine International Air Pollution Prevention (EIAPP) certificates refer to the number of vessel calls using ship-specific NO_x emission factors for main and auxiliary engines, where vessel specific EIAPP certificates with actual NO_x rating were available through the ESI program or the VBP.

Harbor Craft

As shown in Table 8.12, compared to 2005, the harbor craft vessel and engine population count (including ATBs) operating at the Port in 2021 increased by 4%, and total engine count increased by 35%. There was a 9% increase in the overall energy consumption (kWh) from 2005 to 2021. Compared to previous year, the energy consumption increased by 11% and the number of vessels and engines remained the same.

Table 8.12: Harbor Craft Count and Energy Consumption Comparison

Year	Vessel Count	Engine Count	Total kWh
2005	92	301	48,556,571
2020	96	406	47,579,743
2021	96	406	52,760,806
CAAP Progress	**4%**	**35%**	**9%**
Previous Year	**0%**	**0%**	**11%**

Table 8.13 summarizes the distribution of engines based on EPA's engine standards. Since 2005, the percentage of Tier 2 and Tier 3 engines increased significantly due to the introduction of newer vessels with newer engines into the fleet and replacements of existing higher-emitting engines with cleaner engines. Over the years, with better data collection techniques and better record keeping required with grant funded repowers, the number of engines of unknown tier level has decreased significantly. Considerable increase in overall activity as well as activity for Tier 0 engines mainly due to older ATB fleet mix in 2021 compared to 2020 has resulted in emissions increase.

Table 8.13: Harbor Craft Engine Tier Change, %

	2005 Engine Count	2020 Engine Count	2021 Engine Count	2005-2021 % Change	2020-2021 % Change
Unknown	102	32	24	-76%	-25%
Tier 0	86	4	34	-60%	750%
Tier 1	102	30	19	-81%	-37%
Tier 2	11	176	148	1245%	-16%
Tier 3	0	158	171	100%	8%
Tier 4	0	6	10	100%	67%
Total	**301**	**406**	**406**	**35%**	**0%**

Table 8.14 compares the harbor craft energy consumption (kWh) by engine tier. In 2021, 86% of energy consumed by harbor craft is from Tier 2 to Tier 4 engines.

Table 8.14: Engine Energy and Activity Change, kWh and %

Engine Tier	2005 kWh	2005 % of Total	2020 kWh	2020 % of Total	2021 kWh	2021 % of Total
Tier 0	31,357,757	64.6%	36,598	0.1%	3,113,001	5.9%
Tier 1	16,937,667	34.9%	4,828,169	10.1%	4,443,548	8.4%
Tier 2	261,146	0.5%	27,013,056	56.8%	23,450,610	44.4%
Tier 3	0	0.0%	14,891,120	31.3%	16,963,046	32.2%
Tier 4	0	0.0%	810,800	1.7%	4,790,600	9.1%
Total	**48,556,571**	**100%**	**47,579,743**	**100%**	**52,760,806**	**100%**

Cargo Handling Equipment

Between 2005 and 2021, there was a 16% increase in the equipment count to accommodate an increase in TEU throughput and operational changes at the Port over the years. The largest increase is in electric equipment added at the Port. In 2021, there were 249 pieces of electric equipment operating at the Port or 17% of the total CHE. There was a 35% increase in energy consumption for fossil-fueled equipment, measured as total kWh. Table 8.15 shows the energy consumption (in kWh) from fossil-fueled equipment. It does not include electric equipment consumption. Compared to previous year, there was an 18% increase in energy consumption, higher than the increased TEU throughput (16%), and may be due to the surge in activity at container terminals that occurred towards the end of the year.

Table 8.15: CHE Count and Energy Consumption Comparison

Year	Equipment Count	Activity (kWh)
2005	1,259	134,618,521
2020	1,454	153,095,569
2021	1,462	181,323,340
CAAP Progress	**16%**	**35%**
Previous Year	**1%**	**18%**

Table 8.16 shows the equipment energy consumption (kWh) comparison for diesel fueled equipment by diesel engine tier and by non-diesel fueled equipment for calendar years 2021 and 2005. Among diesel equipment, 80% of the energy consumed in 2021, is from equipment with on-road engines and Tier 4 engines.

Table 8.16: CHE Energy Consumption Comparison by Engine Tier, kWh

Engine Type	Engine Tier	2005 kWh	2005 % of Total	2020 kWh	2020 % of Total	2021 kWh	2021 % of Total
Diesel	Tier 0	12,023,155	9%	37,506	0.02%	34,294	0.02%
Diesel	Tier 1	65,059,472	48%	5,366,775	4%	7,955,909	4%
Diesel	Tier 2	49,337,838	37%	5,455,806	4%	5,366,862	3%
Diesel	Tier 3	41,636	0.03%	1,947,016	1%	2,588,189	1%
Diesel	Tier 4i	0	0%	26,480,555	17%	29,431,289	16%
Diesel	Tier 4f	0	0%	60,990,523	40%	76,189,083	42%
Diesel	Onroad	6,610,773	5%	37,011,823	24%	40,114,171	22%
Gasoline		3,866	0.003%	15,203,199	10%	19,147,622	11%
Propane		1,541,782	1%	602,366	0%	495,920	0.3%
Total		**134,618,521**	**100%**	**153,095,569**	**100%**	**181,323,340**	**100%**

Tables 8.17 and 8.18 compare the CHE emission reduction technologies and fuels used in 2021 with those used in 2005. There was a significant increase in the number of CHE equipped with cleaner on-road engines in 2021. All of the DPF retrofits installed are on equipment at Tier 3 or lower level. Improved data from the terminals provided dates for the retrofit for existing equipment. This is not a reflection of older equipment added to the terminals' existing fleets. Not shown in the tables, in 2021, there were 232 diesel powered equipment that used renewable diesel for the first time for part of the year, 6 electric RTG cranes that were converted from existing conventional diesel RTGs, and electric equipment that may have been in demonstration phase and not fully incorporated into the fleet yet. In order not to double count equipment, the electric RTGs will be included in future inventories. But for 2021, they were counted as diesel since they did operate using diesel engines for part of the year and their emissions are included.

Table 8.17: CHE Emission Reduction Technology Equipment Count Comparison

Equipment	2005 On-road Engine	2020 On-road Engine	2021 On-road Engine	2005 DPF Retrofit	2020 DPF Retrofit	2021 DPF Retrofit	2005 BlueCAT Retrofit	2020 BlueCAT Retrofit	2021 BlueCAT Retrofit	2005 Hybrid	2020 Hybrid	2021 Hybrid
Forklift	0	0	0	0	17	17	0	16	16	0	0	0
RTG crane	0	0	0	0	16	16	0	0	0	0	20	20
Side handler	0	0	0	0	6	3	0	0	0	0	0	0
Top handler	0	0	0	0	38	37	0	0	0	0	0	0
Yard tractor	53	267	253	0	0	0	0	0	0	0	0	0
Other	0	4	4	0	4	4	0	7	7	0	0	0
Total	**53**	**271**	**257**	**0**	**81**	**77**	**0**	**23**	**23**	**0**	**20**	**20**

Table 8.18: CHE Equipment Count by Fuel Type and Electric Equipment Comparison

Equipment	2005 ULSD	2020 ULSD	2021 ULSD	2005 Propane Engine	2020 Propane Engine	2021 Propane Engine	2005 Gasoline Engine	2020 Gasoline Engine	2021 Gasoline Engine	2005 Electric Equipemnt	2020 Electric Equipemnt	2021 Electric Equipemnt
Forklift	0	110	94	122	97	88	1	24	24	3	8	9
RTG crane	0	56	50	0	0	0	0	0	0	0	0	0
Side handler	0	7	0	0	0	0	0	0	0	0	0	0
Top handler	0	192	113	0	0	0	0	0	0	0	2	2
Yard tractor	0	505	383	0	2	2	0	135	138	0	6	0
Other	0	74	73	11	15	14	1	2	2	2	219	238
Total	**0**	**944**	**713**	**133**	**114**	**104**	**2**	**161**	**164**	**5**	**235**	**249**
Percent	**0%**	**64%**	**49%**	**11%**	**8%**	**7%**	**0%**	**11%**	**11%**	**0%**	**16%**	**17%**

Table 8.19 shows a comparison of CHE counts by equipment type. In total, there was a 15% increase in equipment count from 2005 to 2021, with the largest increase for top handlers, sweepers and electric equipment. Electric equipment account for 17% of the total equipment at the Port in 2021. Compared to previous year, the total equipment counts increased by 1% due more electric equipment.

Table 8.19: CHE Equipment Count

Equipment	2005	2020	2021
Forklift	295	231	220
RTG crane	85	56	65
Side handler	43	7	3
Top handler	113	192	195
Yard tractor	641	642	639
Sweeper	15	20	21
Electric	na	235	249
Other	67	71	70
Total	**1,259**	**1,454**	**1,462**

Table 8.20 shows the electric equipment count for 2021, previous year and 2005. In 2005, the count of the electric ship to shore cranes was not included in the 2005 EI.

Table 8.20: CHE Count of Electric Equipment

Equipment	2005 Electric	2020 Electric	2021 Electric
AGV	0	72	72
ASC	0	55	69
Cone vehicle	0	0	3
Crane	0	6	7
Electric pallet jack	2	2	2
Forklift	3	8	9
Man Lift	0	2	0
Material handler	0	1	1
Ship to shore crane	na	74	77
Sweeper	0	1	1
Top handler	0	2	2
Truck	0	6	6
Yard tractor	0	6	0
Total	**5**	**235**	**249**

Locomotives

Table 8.21 shows the various throughput comparisons for rail transportation in 2005 and 2021. The total port throughput between calendar years 2005 and 2021 was higher by 40% in 2021. The on-dock rail throughput was higher in 2021 than in 2005. The on-dock rail percent of total throughput increased from 16% to 20% between 2005 and 2021.

Table 8.21: Container Throughput Comparison, TEU and %

	2005	2020	2021	2005-2021 Change	2020-2021 Change
Total Port Throughput	6,709,818	8,113,315	9,384,368	40%	16%
Total On-Dock Rail*	1,094,765	1,584,517	1,835,438	68%	16%
% On-Dock	16%	20%	20%		

*Based on average of 1.8 TEUs per container

Heavy-Duty Vehicles

Emissions from the HDV source category continue to be far lower than in 2005 due largely to the following factors affecting the overall age of the truck fleet.

- Newer fleet of trucks due to the Port's Clean Trucks Program (CTP). As of 2018, newly registered trucks must be model year 2014 or newer. As of 2021, 48% of calls were made by trucks of model year 2014 and newer.
- The terminals optimized their gate systems and they use radio frequency identification (RFID) readers to identify trucks complying with the CTP provisions, which helped reduce idling time.
- Terminal automation reduces wait times and limits turn times compared with traditional terminal operations.

The CTP and engine emission standards are responsible for most of the reductions, including the particulate and NOx decreases, while sulfur fuel standards, specifically the introduction of ultra-low sulfur diesel fuel (ULSD), are responsible for the SOx reduction.

Table 8.22 shows total port-wide estimated on-terminal idling times reported in 2005, 2020 and 2021. The 2021 port-wide idling time is based on an improved source of data regarding the time spent by trucks while on terminal (turn time) which, relates to time that may not solely be time spent idling. Turn times were likely also lengthened by congestion seen at the Port resulting from supply chain disruptions. Total idling increased 45% as compared to the previous year and 23% since 2005. The increase in idling since 2005 may be due in part to the increase in TEU throughput, which resulted in more truck trips. Both the increase since 2005 and the recent increase since 2020 are partly due to improved and more accurate data sources. Continued improvement in data sources may provide more information regarding actual on-terminal idling times (as opposed to turn times).

Table 8.22: HDV Total Idling Time Comparison, hours and %

EI Year	Total Idling Time (hours)
2005	3,854,273
2020	3,266,977
2021	4,744,801
CAAP Progress	**23%**
Previous Year	**45%**

Table 8.23 compares the vehicle miles traveled by heavy-duty trucks in 2005, 2020 and 2021. Reported on-terminal VMT in 2021 was higher than in 2005 because of increased throughput and because several terminals re-evaluated their operations and provided higher estimates of average on-terminal driving distances. Compared to previous year, the on-road VMT is higher by 5% mainly due to increased throughput, with the increase being limited by increased use of on-dock rail, which shifted container moves from truck to rail.

Table 8.23: HDV Vehicle Miles Traveled Comparison, miles and %

Activity Location	2005 VMT	2020 VMT	2021 VMT	2005-2020 Change	2020-2021 Change
On-Terminal	2,866,476	4,908,691	5,326,745	86%	9%
On-Road	213,716,895	212,665,468	223,724,822	5%	5%
	216,583,371	**217,574,159**	**229,051,567**	**6%**	**5%**

Table 8.24 presents the call-weighted age of the truck fleet. Compared to 2005, the average age of trucks visiting the Port has decreased from 11 to 7 years due to the Port's Clean Trucks Program launched in October 2008 requiring the progressive ban of pre-2007 trucks after 2008 and the most recent requirement that newly registered trucks, as of 2018, must be model year 2014 or newer.

Table 8.24: Call-Weighted HDV Age

Year	Call-Weighted Average Age (years)
2005	11
2020	7
2021	7

SECTION 9 METRICS

To measure the effectiveness of emissions reduction strategies and progress towards the San Pedro Bay Emission Reduction Standards, the Port has established metrics to track emissions per unit of work by source category. Since port operations are varied with a mix of container and non-container cargo, the metrics listed in this section are based on TEU throughput and metric tons of cargo moved through the Port. Table 9.1 compares the amount of throughput in 2021 and 2005 in TEU.

Table 9.1: Container and Cargo Throughput and Change, %

Year	Throughput Container (TEU)
2005	6,709,818
2020	8,113,315
2021	9,384,368
CAAP Progress	**40%**
Previous Year	**16%**

Tables 9.2 shows the port-wide tons of emissions per 10,000 TEU in 2005, 2020 and 2021. The tons of emissions per 10,000 TEU of cargo decreased, an improvement from 2005 and 2021.

Table 9.2: Emission Efficiency Metric Comparison, annual tons per 10,000 TEU

Year	PM_{10}	$PM_{2.5}$	DPM	NO_x	SO_x	CO	HC	CO_2e
2005	1.78	1.50	1.38	22.64	10.40	4.26	1.10	1,457
2020	0.14	0.13	0.09	7.03	0.24	1.83	0.31	1,074
2021	0.18	0.17	0.12	8.18	0.29	2.28	0.37	1,250
CAAP Progress	**-90%**	**-89%**	**-92%**	**-64%**	**-97%**	**-46%**	**-67%**	**-14%**
Previous Year	**34%**	**35%**	**24%**	**16%**	**20%**	**25%**	**20%**	**16%**

SECTION 10 CAAP PROGRESS

The Port's annual emissions inventories serve as the primary tool to track progress towards achieving the Clean Air Action Plan's San Pedro Bay Standards. These standards consist of the following emission reduction goals:

- Mass Emissions Reduction Standards:
  - By 2014, reduce emissions by 72% for DPM, 22% for NO_x, and 93% for SO_x from 2005 levels
  - By 2023, reduce emissions by 77% for DPM, 59% for NO_x, and 93% for SO_x from 2005 levels

The reduction of goods movement-related emissions in 2021 compared to 2005 can be attributed to a number of initiatives, including emissions reduction programs identified in the CAAP and implemented by the Port, such as the Clean Trucks Program, Green Flag Vessel Speed Reduction Program, as well as CARB regulations requiring the use of shore power for vessels at berth and the use of cleaner vessel fuels.

Economic forecasts indicate cargo volumes through the Port of Long Beach will increase in upcoming years. While emission reductions are expected to continue in the future toward meeting the CAAP goals, the rapid rate of emission reductions in recent years may not continue as cargo volumes increase. However, continued implementation of the CAAP and regulatory programs will continue to provide emissions benefits from goods movement-related sources and may offset impacts from the projected growth in trade.

The mass emissions reduction standards are represented as a percentage reduction of emissions from 2005 levels. Table 10.1 summarizes the standardized estimates of emissions by source category for calendar years 2005 and 2021 using the 2021 methodology. In 2021, the Port met and exceeded the CAAP 2023 DPM and SO_x emission reduction standards. The NO_x emission reductions for the Port of Long Beach are at 49% in 2021 and was not able to surpass the 2023 standard due to supply chain congestion and high vessel emissions at anchor and berth.

Table 10.1: 2005-2021 Emissions in tons and Reductions in % Compared to CAAP San Pedro Bay Emissions Reduction Standards

Category	2005		2021
DPM (tons)			
Ocean-going vessels	595		72
Harbor craft	36		9
Cargo handling equipment	47		4
Locomotives	43		20
Heavy-duty vehicles	205		6
Total	**926**		**111**
Cumulative DPM Emissions Reduction Achieved in 2021			**88%**
CAAP San Pedro Bay DPM Emissions Reduction Standards		**2023**	**77%**
NO_x (tons)			
Ocean-going vessels	6,655		5,587
Harbor craft	699		383
Cargo handling equipment	1,289		284
Locomotives	1,273		556
Heavy-duty vehicles	5,273		951
Total	**15,188**		**7,761**
Cumulative NO_x Emissions Reduction Achieved in 2021			**49%**
CAAP San Pedro Bay NO_x Emissions Reduction Standards		**2023**	**59%**
SO_x (tons)			
Ocean-going vessels	6,848		270
Harbor craft	3		0
Cargo handling equipment	11		2
Locomotives	76		1
Heavy-duty vehicles	37		4
Total	**6,975**		**277**
Cumulative SO_x Emissions Reduction Achieved in 2021			**96%**
CAAP San Pedro Bay SO_x Emissions Reduction Standards		**2023**	**93%**

APPENDIX A:
REGULATORY AND SAN PEDRO BAY PORTS CLEAN AIR ACTION PLAN (CAAP) MEASURES

APPENDIX A: REGULATORY AND SAN PEDRO BAY PORTS CLEAN AIR ACTION PLAN (CAAP) MEASURES

This appendix summarizes the current regulatory initiatives and Port measures related to port activity that influenced 2020 emissions. Almost all goods movement-related emissions in and around the port come from five emission source categories: OGVs, HDVs, CHE, harbor craft, and locomotives. The responsibility for the emissions control of the majority of these sources falls under the jurisdiction of local (South Coast Air Quality Management District [South Coast AQMD]), state (CARB), or federal (U.S. Environmental Protection Agency [EPA]) agencies.

Clean Air Action Plan (CAAP) Strategies

The CAAP 2017 Update[1] contains strategies from all sources that move cargo through the ports, including the deployment of zero and near-zero emission trucks and cargo handling equipment, and the expansion of programs that reduce ship emissions. The focus of the Update is to work in collaboration with industry stakeholders, regulatory agencies, local communities, and environmental groups to reduce emissions and combat climate change. The CAAP 2017 strategies that affect emission reductions for the Ports include:

- Advancing the Clean Trucks Program to phase out older trucks and transition to near-zero emissions in the early years and zero-emissions by 2035. Under this program, the boards of harbor commissioners of the City of Long Beach and the City of Los Angeles adopted the Clean Truck Fund Rate of $10 per loaded TEU moved by truck in and out of port terminals. There are certain exemptions for use of low NO_x and zero emissions trucks. Collection of the CTF rate began on April 1, 2022. Currently, Port staff are working on strategies to implement the Clean Truck Fund rates and develop priorities and guidance for distributing funds to incentivize transition to near-zero and zero-emission trucks.
- Requiring terminal operators to purchase zero-emissions equipment if feasible, or near-zero or cleanest available when procuring new equipment.
- Further reducing emissions from ships at-berth, and transitioning the oldest, most polluting ships out of the San Pedro Bay fleet.
- Accelerating the deployment of cleaner engines and operational strategies to reduce harbor craft emissions.
- Expanding use of on-dock rail to shift more cargo leaving the port to go by rail.

[1] *www.cleanairactionplan.org/documents/final-2017-clean-air-action-plan-update.pdf*

San Pedro Bay Emissions Reduction Standards
The 2017 CAAP Update did not alter the 2010 CAAP Update goals that set health risk and emission reduction standards but did incorporate two new emission targets to reduce GHGs from port-related sources as described below.

Health Risk Reduction Standard
To complement the CARB's Air Pollution Reduction Programs including the Diesel Risk Reduction Plan, the Ports of Long Beach and Los Angeles have developed the following standard for reducing overall goods movement-related health risk impacts, relative to 2005 emissions level:

- By 2020, reduce the population-weighted cancer risk attributed to port-related DPM pollution by 85% in highly impacted communities located proximate to port sources and throughout the residential areas in the port region.

Emission Reduction Standard
Consistent with the ports' commitment to meet their fair-share of mass emission reductions of air pollutants, the Ports of Long Beach and Los Angeles developed the following standards for reducing air pollutant emissions from goods movement-related activities, relative to 2005 emission levels:

- By 2014, reduce emissions of NO_x by 22%, of SO_x by 93%, and of DPM by 72% to support attainment of the national fine particulate matter ($PM_{2.5}$) standards.
- By 2023, reduce emissions of NO_x by 59%, of SO_x by 93%, and of DPM by 77% to support attainment of the national and federal 8-hour ozone standards and national fine particulate matter ($PM_{2.5}$) standards.

2017 CAAP Update New Emission Reduction Targets
- Reduce GHGs from port-related sources to 40% below 1990 levels by 2030
- Reduce GHGs from port-related sources to 80% below 1990 levels by 2050

Regulatory Programs by Source Category

The following tables summarize current regulatory programs and CAAP measures by major source category that influenced 2021 emissions from goods movement-related operations at the Port and/or will impact emissions in the near future.

Table A.1: OGV Emission Regulations, Standards and Policies

Agency	Regulation/Standard/Policy	Targeted Pollutants	Implementation Year	Impact
IMO	**NO_x Emission Standard for Marine Engines** *www.imo.org/en/OurWork/Environment/Pages/Nitrogen-oxides-(NOx)-%E2%80%93-Regulation-13.aspx*	NO_x	2011 – Tier 2 2016 – Tier 3 for ECA only	Sets NO_x emission standard for auxiliary and propulsion engines over 130 kW output power on newly built vessels
IMO	**Low Sulfur Fuel Requirements for Marine Engines** *www.imo.org/en/OurWork/Environment/Pages/Sulphur-oxides-(SOx)-%E2%80%93-Regulation-14.aspx*	DPM PM SO_x	2012 ECA – 1% Sulfur 2015 ECA – 0.1% Sulfur	Significantly reduces emissions due to low sulfur content in fuel by creating Emissions Control Area (ECA)
IMO	**Energy Efficiency Design Index (EEDI) for International Shipping** *www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Technical-and-Operational-Measures.aspx*	CO_2 and other pollutants	2013	Increases the design efficiencies of ships relating to energy and emissions
IMO	**Initial IMO Strategy on reduction of GHG emissions from ships – Resolution MEPC 304 (72)** *www.unfccc.int/sites/default/files/resource/250_IMO%20submission_Talanoa%20Dialogue_April%202018.pdf*	GHG	2050 – 50%	Initial IMO Strategy on reduction of GHG emissions from ships by 50% in 2050 from 2008 level. The ultimate goal is to phase out GHG
EPA	**Emission Standards for Marine Diesel Engines above 30 Liters per Cylinder (Category 3 Engines);** *www.epa.gov/regulations-emissions-vehicles-and-engines/domestic-regulations-emissions-marine-compression*	DPM PM NO_x SO_x	2011 – Tier 2 2016 – Tier 3	Auxiliary and propulsion on US-Flagged new built vessels; Use of low sulfur fuel

Table A.1 (continued): OGV Emission Regulations, Standards and Policies

Agency	Regulation, Standard, or Policy	Targeted Pollutants	Implementation Year	Impact
CARB	**Regulation to Reduce Emissions from Diesel Auxiliary Engines on Ocean-Going Vessels While At-Berth at a California Port** *www.arb.ca.gov/regact/2007/shorepwr07/shorepwr07.htm* and *www.arb.ca.gov/ports/shorepower/forms/regulatoryadvisory/regulatoryadvisory12232013.pdf*	All	2014 – 50% 2017 –70% 2020 – 80%	Vessels must use Shore power (or equivalent) requirement to reduce at-berth emissions. Compliance levels based on fleet percentage visiting the port.
CARB	**New 2020 At-Berth Regulation** *www.arb.ca.gov/our-work/programs/ocean-going-vessels-berth-regulation*	All	2023 – 100% container, reefer, and cruise 2025 – Ro-Ro and LALB tankers	All container, reefer, cruise, Ro-Ro, and tanker vessel and regulated terminal operator will have an obligation to meet the requirements
CARB	**Ocean-going Ship Onboard Incineration** *www.arb.ca.gov/ports/shipincin/shipincin.htm*	DPM PM HC	2007	Vessels operators cannot incinerate within 3 nm of the California coast
SPBP CAAP	**CAAP Measure – OGV 1** **Vessel Speed Reduction (VSR) Program** *www.cleanairactionplan.org/strategies/ships/*	All	2008	Vessel operators within 20 nm and 40 nm of Point Fermin
SPBP CAAP	**CAAP Measure – OGV 2** **Reduction of At-Berth OGV Emissions** *www.cleanairactionplan.org/strategies/ships/*	All	2014	Shore power requirements. Vessel operators and terminals
SPBP CAAP	**CAAP Measure – OGV 5 and 6** **Cleaner OGV Engines and OGV Engine Emissions Reduction Technology Improvements** *www.cleanairactionplan.org/strategies/ships/*	DPM PM NO_x	2012	Vessel operators who choose to participate in technology demonstrations and/or Green Ship Incentive Program

Table A.2: Harbor Craft Emission Regulations, Standards and Policies

Agency	Regulation, Standard, or Policy	Targeted Pollutants	Implementation Year	Impact
EPA	**Emission Standards for Harbor Craft Engines** *www.epa.gov/ regulations-emissions-vehicles-and-engines/domestic-regulations-emissions-marine-compression*	All	2009 – Tier 3 2014 – Tier 4 for 800 hp or greater	Commercial marine diesel engines with displacement less than 30 liters per cylinder
CARB	**Low Sulfur Fuel Requirement for Harbor Craft** *www.arb.ca.gov/regact/carblohc/carblohc.htm*	DPM PM NO_x SO_x	2006 – 15 ppm	Use of low sulfur diesel fuel in commercial harbor craft operating in SCAQMD
CARB	**Regulation to Reduce Emissions from Diesel Engines on Commercial Harbor Craft** *www.arb.ca.gov/regact/2010/chc10/chc10.htm*	DPM PM NO_x	2009 to 2020 - Depending on engine model year	This regulation will be fully implemented by 2022
CARB	**Amendments to the Commercial Harbor Craft Regulation** *www.ww2.arb.ca.gov/our-work/programs/commercial-harbor-craft*		2023 to 2032	New requirements for harbor craft in a phased approach dependent on engine model year and vessel type
SPBP CAAP	**CAAP Measure – HC 1 Performance Standards for Harbor Craft** *www.cleanairactionplan.org/strategies/harbor-craft/*	All	2009 to 2020 - Depending on engine model year	Modernization of harbor craft operating in San Pedro Bay Ports.

Table A.3: Cargo Handling Equipment Emission Regulations, Standards and Policies

Agency	Regulation, Standard, or Policy	Targeted Pollutants	Implementation Year	Impact
EPA	**Emission Standards for Non-Road Diesel Powered Equipment** *www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-emissions-nonroad-vehicles-and-engines*	All	2008-2015	All non-road (also known as off-road) equipment.
CARB	**Regulation for Cargo Handling Equipment Operating at Ports and Intermodal Railyards** *www.arb.ca.gov/regact/2011/cargo11/cargo11.htm*	All	2007-2017; Opacity test compliance from 2016-on	All cargo handling equipment operating at ports and intermodal railyards.
CARB	**New Emission Standards, Test Procedures, for Large Spark Ignition (LSI) Engine Forklifts and Other Industrial Equipment** *www.arb.ca.gov/regact/2008/lsi2008/lsi2008.htm*	All	2007 – Phase 1 2010 – Phase 2	Emission standards for large spark-ignition engines 25 hp or greater.
CARB	**Fleet Requirements for Large Spark Ignition Engines** *www.arb.ca.gov/regact/2010/offroadlsi10/lsifinalreg.pdf*	All	2009-2013	More stringent emissions requirements for fleets of large spark ignition engine equipment fleets.
SPBP CAAP	**CAAP Measure – CHE1 Performance Standards for CHE** *www.cleanairactionplan.org/strategies/cargo-handling-equipment/*	All	2007-2014	Turnover to Tier 4 cargo handling equipment per lease renewal agreement
SPBP CAAP	**CAAP Measure – Transition to Cleaner Equipment** *www.cleanairactionplan.org/about-the-plan/*	All	2020-2030	Turnover to zero emissions CHE, if feasible, or near zero emissions or cleanest available if ZE/NZE not yest feasible

Table A.4: Railroad Locomotives Emission Regulations, Standards and Policies

Agency	Regulation, Standard, or Policy	Targeted Pollutants	Implementation Year	Impact
EPA	**Emission Standards for New and Remanufactured Locomotives and Locomotive Engines- Latest Regulation** *www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-emissions-locomotives*	DPM NO_x	2011 through 2013 – Tier 3 2015 – Tier 4	All new and remanufactured locomotive engines.
EPA	**Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel** *www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-emissions-nonroad-vehicles-and-engines*	SOx PM	2010	All locomotive engines
CARB	Low Sulfur Fuel Requirement for Intrastate Locomotives *www.arb.ca.gov/msprog/offroad/loco/loco.htm#intrastate*	SO_x NO_x PM	2007	Intrastate locomotives, mainly switchers
CARB	**Statewide 1998 and 2005 Memorandum of Understanding (MOUs)** *www.arb.ca.gov/msprog/offroad/loco/loco.htm#intrastate*	NO_x	2010	UP and BNSF locomotives
SPBP CAAP	**CAAP Measure – RL1 Pacific Harbor Line (PHL) Rail Switch Engine Modernization** *www.cleanairactionplan.org/strategies/trains/*	PM	2010	PHL switcher engines
SPBP CAAP	**CAAP Measure – RL2 Class 1 Line-haul and Switcher Fleet Modernization** *www.cleanairactionplan.org/strategies/trains/*	All	2023 – Tier 3	Class 1 locomotives at ports
SPBP CAAP	**CAAP Measure – RL3 New and Redeveloped Near-Dock Rail Yards** *www.cleanairactionplan.org/strategies/trains/*	All	2020 – Tier 4	New near-dock rail yards

Table A.5: Heavy-Duty Vehicles Emission Regulations, Standards and Policies

Agency	Regulation, Standard, or Policy	Targeted Pollutants	Implementation Year	Impact
CARB/EPA	**Emission Standards for New 2007+ On-Road Heavy-Duty Vehicles** *www.arb.ca.gov/msprog/onroadhd/reducstd.htm*	NO_x PM	2007 2010	All new on-road diesel heavy-duty vehicles
CARB	**Heavy-Duty Vehicle On-Board Diagnostics (OBD and OBDII) Requirement** *www.arb.ca.gov/msprog/obdprog/section1971_1_clean2013.pdf*	NOx PM	2010+	All new on-road heavy-duty vehicles
CARB	**Ultra-Low Sulfur Diesel Fuel Requirement** *www.arb.ca.gov/regact/ulsd2003/ulsd2003.htm*	All	2006 - ULSD	All on-road heavy-duty vehicles
CARB	**Drayage and Truck and Bus Regulation** (amended in 2011 and 2014) *www.arb.ca.gov/msprog/onroad/porttruck/drayagevtruckbus.pdf*	All	Phase in started in 2009	All drayage trucks operating at California ports
CARB	**Low NOx Software Upgrade Program** *www.arb.ca.gov/msprog/hdsoftware/hdsoftware.htm*	NO_x	Starting 2005	1993 to 1998 on-road heavy-duty vehicles that operate in California
CARB	**Heavy-Duty Vehicle Greenhouse Gas Emission Reduction Regulation** *www.arb.ca.gov/cc/hdghg/hdghg.htm*	CO_2	Phase 1 starting in 2012	Heavy-duty tractors that pull 53-foot+ trailers in CA

Table A.5 (continued): Heavy-Duty Vehicles Emission Regulations, Standards and Policies

SPBP CAAP	**CAAP Measure – HDV1 Performance Standards for On-Road Heavy-Duty Vehicles; Clean Truck Program** *www.cleanairactionplan.org/strategies/trucks/*	All	Phase-in starting in 2008	On-road heavy-duty vehicles that operate at POLB must have 2007 or newer engines by 2012.
SPBP CAAP	**CAAP Measure –Clean Truck Fund Rate** *https://cleanairactionplan.org/strategies/trucks/*	NO_x	2022	Rate collection for trucks; low NOx and ZE trucks exempt

APPENDIX B:
CARGO HANDLING EQUIPMENT DATA

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
AGV	Gottwald	CT 70 BN	Electric					2919	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3102	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3337	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3181	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3353	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3446	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3058	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3668	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3728	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3527	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3515	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3516	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3489	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3619	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3717	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3795	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3754	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3452	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3589	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3570	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3563	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3516	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3722	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3170	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3703	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3486	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3467	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					2789	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3426	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3573	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					2864	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3568	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3509	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3405	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					2741	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3474	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3320	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3636	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3610	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3480	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3628	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3545	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3294	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					2661	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3349	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3500	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3588	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3556	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3686	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3719	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3482	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3490	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3682	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3413	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3671	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3697	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3641	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3665	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					2873	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3364	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					2779	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3315	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3376	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3589	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3542	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3246	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3566	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3567	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3619	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					2576	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3611	CHE Electric				
AGV	Gottwald	CT 70 BN	Electric					3627	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3356	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3296	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3432	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3211	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3463	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3346	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3610	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3676	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3852	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3726	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					2673	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3001	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3080	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3408	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3194	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3413	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3035	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3097	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					742	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3833	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					2984	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3733	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3367	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3546	CHE Electric				

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
Automatic Stacking Crane	ZPMC		Electric					3229	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					2965	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3065	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3753	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3484	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3606	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3111	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3893	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3442	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3813	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3628	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3349	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3695	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3628	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					2921	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					2693	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					2691	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3728	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3309	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3169	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3877	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3353	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3811	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3826	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3580	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3846	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3736	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3763	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					4083	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3870	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					3868	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					1761	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					1789	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					1506	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					1689	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					1247	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					1248	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					1189	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					1121	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					896	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					900	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					726	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					803	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					461	CHE Electric				
Automatic Stacking Crane	ZPMC		Electric					490	CHE Electric				
Cone Vehicle	Motrec		Diesel	Kubota	V1505-ET04	2016	35	2058	CHE Diesel				
Cone Vehicle	Motrec		Diesel	Kubota	V1505-ET04	2016	35	3616	CHE Diesel				
Cone Vehicle	Motrec		Diesel	Kubota	V1505-ET04	2016	35	3573	CHE Diesel				
Cone Vehicle	Motrec		Diesel	Kubota	V1505-ET04	2016	35	2386	CHE Diesel				
Cone Vehicle	Motrec		Diesel	Kubota	V1505-ET04	2016	35	4573	CHE Diesel				
Cone Vehicle	Motrec		Electric					31	CHE Electric				
Cone Vehicle	Motrec		Electric					63	CHE Electric				
Cone Vehicle	Motrec		Electric					18	CHE Electric				
Crane	American	325	Electric			1980	0	0	CHE Electric				
Crane	Gottwald	330EG	Electric			2006	0	0	CHE Electric				
Crane	Linkbelt	HSP-8015	Diesel	GMC	50435001	1985	334	0	CHE Diesel				
Crane	ZPMC		Electric					2266	CHE Electric				
Crane	ZPMC		Electric					2714	CHE Electric				
Crane	ZPMC		Electric					2748	CHE Electric				
Crane	ZPMC		Electric					2331	CHE Electric				
Crane	ZPMC		Electric					641	CHE Electric				
Crane	Linkbelt	HTC86110	Diesel			2020	450	5	CHE Diesel				
Crane	Terex	RT555	Diesel	Cummins	QSB 6.7	2016	173	290	CHE Diesel				
Electric Pallet Jack	Toyota	8HBE30	Electric	Toyota	AC drive motor	2013	0	47	CHE Electric				
Electric Pallet Jack	Toyota	8HBE30	Electric	Toyota	AC drive motor	2013	0	442	CHE Electric				
Excavator	CAT	336F	Diesel			2016			CHE Diesel				
Forklift	Toyota	7FBEU15	Electric	Toyota	AC drive motor	1995	0	714	CHE Electric				
Forklift	Toyota		Electric	Taylor-Dunn	DC Drive Motor	1995	0	267	CHE Electric				
Forklift	Toyota	7FBEU20	Electric	Toyota	AC drive motor	1995	0	572	CHE Electric				
Forklift	Toyota	7FBEU15	Electric	Toyota	AC drive motor	2013	0	270	CHE Electric				
Forklift	Raymond		Electric	Raymond	AC drive motor	2012	0	1481	CHE Electric				
Forklift	Toyota	8FGU30	LPG	Toyota	4Y ECS	2013	57	350	CHE Propane				
Forklift	Toyota	8FGU30	LPG	Toyota	4Y ECS	2013	57	348	CHE Propane				
Forklift	Toyota	8FGU30	LPG	Toyota	4Y ECS	2014	57	198	CHE Propane				
Forklift	Toyota	8FGU30	LPG	Toyota	4Y ECS	2014	57	37	CHE Propane				
Forklift	Toyota		Electric	Toyota		2020	0	616	CHE Electric				
Forklift	Toyota		Electric	Toyota			0	105	CHE Electric				
Forklift	Linde	H50D	Diesel	VW	1.75L	2008		250	CHE Diesel				
Forklift	Linde	H50D	Diesel	VW	1.75L	2008		250	CHE Diesel				
Forklift	Mitsubishi	FG45K1	LPG	Nissan	5 T	2006	117	300	CHE Propane				
Forklift	Mitsubishi	FG45K1	LPG	Nissan	5 T	2006	117	300	CHE Propane				
Forklift	Mitsubishi	FG45K1	LPG	Nissan	5 T	2006	117	300	CHE Propane				
Forklift	Mitsubishi	FG45K1	LPG	Nissan	5 T	2006	117	300	CHE Propane				
Forklift	Mitsubishi	FG45K1	LPG	Nissan	5 T	2006	117	300	CHE Propane				
Forklift	Mitsubishi	FG45K1	LPG	Nissan	5 T	2006	117	300	CHE Propane				
Forklift	Mitsubishi	FG45K1	LPG	Nissan	5 T	2006	117	300	CHE Propane				
Forklift	Mitsubishi	FG45K1	LPG	Nissan	5 T	2006	117	300	CHE Propane				
Forklift	Mitsubishi	FG45K1	LPG	Nissan	5 T	2006	117	300	CHE Propane				
Forklift	Mitsubishi	FG45K-LP	LPG	Nissan	TB45L	2007	117	300	CHE Propane				
Forklift	World	FD100	Diesel	Cummins	QSF3.8	2019	130	250	CHE Diesel				
Forklift	World	FD100	Diesel	Cummins	QSF3.8	2019	130	250	CHE Diesel				
Forklift	Taylor	tx-330m	Diesel	Cummins	16 T	2013	170	250	CHE Diesel				
Forklift	Taylor	tx-330m	Diesel	Cummins	16 T	2013	170	250	CHE Diesel				
Forklift	Taylor	tx-330m	Diesel	Cummins	16 T	2013	170	250	CHE Diesel				
Forklift	Taylor	tx-330m	Diesel	Cummins	16 T	2013	170	250	CHE Diesel				
Forklift	Taylor	tx-330m	Diesel	Cummins	16 T	2013	170	250	CHE Diesel				

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
Forklift	Taylor	tx-330m	Diesel	Cummins	16 T	2013	170	250	CHE Diesel				
Forklift	Taylor	tx-330m	Diesel	Cummins	16 T	2013	170	250	CHE Diesel				
Forklift	Taylor	TX360M	Diesel	Cummins	QSB6.7	2019	225	250	CHE Diesel				
Forklift	Taylor	TX360M	Diesel	Cummins	QSB6.7	2019	225	250	CHE Diesel				
Forklift	Taylor	TX360M	Diesel	Cummins	QSB6.7	2019	225	250	CHE Diesel				
Forklift	Taylor	TX360M	Diesel	Cummins	QSB6.7	2019	225	250	CHE Diesel				
Forklift	Taylor	TX360M	Diesel	Cummins	QSB6.7	2019	225	250	CHE Diesel				
Forklift	Taylor	XH400RC	Diesel	Cummins	QSB6.7	2018	225	250	CHE Diesel				
Forklift	Taylor	XH400RC	Diesel	Cummins	QSB6.7	2018	225	250	CHE Diesel				
Forklift	Taylor	XH400RC	Diesel	Cummins	QSB6.7	2018	225	250	CHE Diesel				
Forklift	Taylor	XH400RC	Diesel	Cummins	QSB6.7	2018	225	250	CHE Diesel				
Forklift	Taylor	XH400RC	Diesel	Cummins	QSB6.7	2018	225	250	CHE Diesel				
Forklift	Wiggins	W360YXL	Diesel	Volvo	TAD570-72VE	2018	215	250	CHE Diesel				
Forklift	Taylor	27 T	Diesel		27 T	2017	250	150	CHE Diesel				
Forklift	Taylor	27 T	Diesel		27 T	2017	250	150	CHE Diesel				
Forklift	Taylor	27 T	Diesel		27 T	2017	250	150	CHE Diesel				
Forklift	Taylor	27 T	Diesel		27 T	2017	250	150	CHE Diesel				
Forklift	Taylor	X550M	Diesel	Cummins	QSL9	2018	250	250	CHE Diesel				
Forklift	Taylor	X550RC	Diesel	Cummins	QSB6.7	2018	225	250	CHE Diesel				
Forklift	Taylor	X550RC	Diesel	Cummins	QSB6.7	2019	225	250	CHE Diesel				
Forklift	Taylor	X550RC	Diesel	Cummins	QSB6.7	2019	225	250	CHE Diesel				
Forklift	Taylor	TX550RC	Diesel	Cummins	QSB6.7	2019	225	250	CHE Diesel				
Forklift	Taylor	X620RR	Diesel	Cummins	QSL9	2017	250	250	CHE Diesel				
Forklift	Taylor	36 T	Diesel		36 T	2016	250	150	CHE Diesel				
Forklift	Hyster	H210D	Diesel	Cummins	QSB4.5	2017	160	2147	CHE Diesel				
Forklift	Hyster	H210D	Diesel	Cummins	QSB4.5	2014	160	2529	CHE Diesel				
Forklift	Hyster	H210D	Diesel	Cummins	QSB4.5	2014	160	1770	CHE Diesel				
Forklift	Hyster	H155FT	Diesel	Kubota	V3800	2017	106	270	CHE Diesel				
Forklift	Hyster	H155XL2	Diesel	Kubota	V3800	2015	106		CHE Diesel				
Forklift	Hyster	H210HD	Diesel	Kubota	V3800	2015	106	2352	CHE Diesel				
Forklift	Hyster	H155XL2	Diesel	Kubota	V3800	2014	93	1963	CHE Diesel				
Forklift	Hyster	H210D	Diesel	Cummins	QSB4.5	2013	160	2756	CHE Diesel				
Forklift	Hyster	H210D	Diesel	Cummins	QSB4.5	2013	160	1037	CHE Diesel				
Forklift	Hyster	H190D	Diesel	Cummins	QSB6.7	2007	155		CHE Diesel	1/1/2014			
Forklift	Hyster	H210D	Diesel	Cummins	QSB4.5	2016	160	1729	CHE Diesel				
Forklift	Hyster	H210D	Diesel	Cummins	QSB4.5	2017	160	1835	CHE Diesel				
Forklift	Hyster	H 210HD	Diesel	Cummins	QSB4.5	2016	160	3808	CHE Diesel				
Forklift	Linde	H80D	Diesel	Duetz	BF6M2012	2007	100		CHE Diesel	1/1/2017			
Forklift	Linde	H80D	Diesel	Duetz	BF6M2012	2007	100	54	CHE Diesel	1/1/2017			
Forklift	Linde	H80D	Diesel	Duetz	BF6M2012	2007	100	270	CHE Diesel	12/1/2015			
Forklift	Toyota	5FGC25	LPG		5 T	1987	54	60	CHE Propane		2012		
Forklift	Toyota	42-5FG25	LPG		3 T	1987	54	60	CHE Propane		2012		
Forklift	Toyota	5FGC25	LPG		5 T	1987	54	0	CHE Propane		2012		
Forklift	Toyota	42-5FG25	LPG		3 T	1987	54	0	CHE Propane		2012		
Forklift	Toyota	5FGC25	LPG		5 T	1987	54	60	CHE Propane		2012		
Forklift	Toyota	5FGC25	LPG		5 T	1987	54	60	CHE Propane		2012		
Forklift	Toyota	42-5FG25	LPG		3 T	1987	54	0	CHE Propane		2012		
Forklift	Toyota	42-5FG25	LPG		3 T	1987	54	0	CHE Propane		2012		
Forklift	Clark	CGP25	LPG	Mitsubishi	4G64	1999	50	200	CHE Propane		2012		
Forklift	Clark	CGP25	LPG	Mitsubishi	4G64	1999	50	100	CHE Propane		2012		
Forklift	Toyota	42-4FGC25	LPG		5 T	1987	54	0	CHE Propane		2012		
Forklift	Toyota	42-4FGC25	LPG		3 T	1987	54	0	CHE Propane		2012		
Forklift	Toyota	7FGC070	LPG	Impco	Vortec	2008	95	200	CHE Propane				
Forklift	Toyota	7FGC070	LPG	Impco	Vortec	2008	95	200	CHE Propane				
Forklift	Toyota	7FGC070	LPG	Impco	Vortec	2008	95	150	CHE Propane				
Forklift	Taylor		Diesel	Cummins	QSB6.7	2008	200	200	CHE Diesel				
Forklift	Taylor		Diesel	Cummins	QSB6.7	2008	200	200	CHE Diesel				
Forklift	Hyster	XL2	Diesel	Hyster	7.5 T	1995	120	250	CHE Diesel				
Forklift	Caterpillar	DP160N2	Diesel	Perkins	4068/2200	2018	173	96	CHE Diesel				
Forklift	Wiggins	W110YM-12	Diesel	Volvo	TAD570VE	2019	215	180	CHE Diesel				
Forklift	Wiggins	W110YM-12	Diesel	Volvo	TAD570VE	2019	215	209	CHE Diesel				
Forklift	Caterpillar	GP25N5	LPG	GCT	JNFXB02.548D	2018	62	80	CHE Propane		8/21/2013		
Forklift	Caterpillar	GP25N5	LPG	GCT	JNFXB02.548D	2018	62	100	CHE Propane		8/21/2013		
Forklift	Caterpillar	P33000D	Diesel	Caterpillar	6M60-TLA3T	2008	148	32	CHE Diesel				
Forklift	Caterpillar	P33000D	Diesel	Caterpillar	6M60-TLA3T	2008	148	32	CHE Diesel				
Forklift	Clark	C25L	LPG	GM	DPSIB2.7GLP	2013	96	122	CHE Propane				
Forklift	Clark	C25L	LPG	GM	DPSIB2.7GLP	2013	96	46	CHE Propane				
Forklift	Clark	C25L	LPG	GM	DPSIB2.7GLP	2013	96	120	CHE Propane				
Forklift	Clark	C25L	LPG	GM	DPSIB2.7GLP	2014	96	117	CHE Propane				
Forklift	Clark	C25L	LPG	GM	DPSIB2.7GLP	2014	96	47	CHE Propane				
Forklift	Clark	C25L	LPG	GM	DPSIB2.7GLP	2014	96	222	CHE Propane				
Forklift	Clark	C25L	LPG	GM	DPSIB2.7GLP	2014	96	264	CHE Propane				
Forklift	Caterpillar	GP30	LPG	Mitsubishi	3MCFB2350MEA	2003	57	168	CHE Propane		8/21/2013		
Forklift	Caterpillar	GP30	LPG	Mitsubishi	3MCFB2350MEA	2003	57	184	CHE Propane		8/6/2013		
Forklift	Genie	GTH1056	Diesel	Deutz	TCD3.6L4	2015	121	240	CHE Diesel				
Forklift	Genie	GTH1056	Diesel	Deutz	TCD3.6L4	2015	121	280	CHE Diesel				
Forklift	Clark	C25L	LPG	GM	DPSIB2.7GLP	2013	96	128	CHE Propane				
Forklift			LPG				84	230	CHE Propane				
Forklift	Taylor	TXH-350L	Diesel	Volvo	TAD1371-75VE	2013	382	164	CHE Diesel				
Forklift			LPG		QSB 6.7	2013	74	120	CHE Propane				
Forklift			LPG		QSB 6.7	2013	74	104	CHE Propane				
Forklift			LPG		QSB 6.7	2013	74	280	CHE Propane				
Forklift			LPG		QSB 6.7	2013	74	150	CHE Propane				
Forklift			LPG		QSB 6.7	2013	74	194	CHE Propane				
Forklift	Taylor	TX360M	Diesel	Volvo	TAD1371-75VE	2014	382	269	CHE Diesel				
Forklift	Hyster		Diesel	Kubota		2018	73	295	CHE Diesel				
Forklift	Hyster		Diesel	Kubota		2018	73	219	CHE Diesel				
Forklift	Hyster		Diesel	Kubota		2018	73	306	CHE Diesel				
Forklift	Hyster		Diesel	Kubota		2018	73	327	CHE Diesel				
Forklift	Taylor		Diesel	Cummins	QSB6.7	2018	173	1451	CHE Diesel				
Forklift	Taylor		Diesel	Cummins	QSB6.7	2018	173	2243	CHE Diesel				
Forklift	Clark		Diesel	Duetz	TD3.6L4	2018	74	599	CHE Diesel				
Forklift	Clark		Diesel	Duetz	TD3.6L4	2018	74	101	CHE Diesel				
Forklift	Taylor	X2805	Diesel			2019		385	CHE Diesel				
Forklift	Mitshubishi	K25	Gasoline	Nissan	6,000 lb	2013	59	875	CHE Gasoline				
Forklift	Mitshubishi	K25	Gasoline	Nissan	6,000 lb	2013	59	697	CHE Gasoline				

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
Forklift	Mitshubishi	K25	Gasoline	Nissan	6,000 lb	2013	59	968	CHE Gasoline				
Forklift	Mitshubishi	K25	Gasoline	Nissan	6,000 lb	2013	59	963	CHE Gasoline				
Forklift	Mitshubishi	K25	Gasoline	Nissan	7000 lb	2013	59	917	CHE Gasoline				
Forklift	Mitshubishi	K25	Gasoline	Nissan	7000 lb	2013	59	343	CHE Gasoline				
Forklift	Mitsubishi	FG40N	Gasoline			2016		848	CHE Gasoline				
Forklift	Mitsubishi	H80XM	Gasoline			2002		578	CHE Gasoline				
Forklift	Mitsubishi	FG40N	Gasoline	Nissan	8,000 lb	2012	59	208	CHE Gasoline				
Forklift	Taylor	T300M	Diesel	Cummins	QSB5.9	2004	165	1840	CHE Diesel			6/1/2021	
Forklift	Taylor	T300M	Diesel	Cummins	QSB5.9	2004	165	1867	CHE Diesel	6/6/2014		6/1/2021	
Forklift	Taylor	TXH350L	Diesel	Cummins	QSB6.7	2015		790	CHE Diesel			6/1/2021	
Forklift	Taylor	HX360L	Diesel	Cummins	QSB6.7	2018		1150	CHE Diesel			6/1/2021	
Forklift	Taylor	X-300M	Diesel	Cummins	QSB6.7	2017	220	2410	CHE Diesel			6/1/2021	
Forklift	Taylor	X-300M	Diesel	Cummins	QSB6.7	2017	220	1280	CHE Diesel			6/1/2021	
Forklift	Taylor	X-300M	Diesel	Cummins	QSB6.7	2017	220	1027	CHE Diesel			6/1/2021	
Forklift			Diesel			2018	220	1015	CHE Diesel			6/1/2021	
Forklift	Mitsubishi	FG25	LPG	Mitsubishi	4G63	1992	42	20	CHE Propane				
Forklift	Mitsubishi	FG25	LPG	Mitsubishi	4G63	1992	42	159	CHE Propane				
Forklift	Mitsubishi	FG35	LPG	GM	GM4.3	1992	58	0	CHE Propane				
Forklift	Mitsubishi	FG40N	Gasoline	Mitsubishi	TB45	2011	72	400	CHE Gasoline				
Forklift	Mitsubishi	FG40N	Gasoline	Mitsubishi	TB45	2011	72	468	CHE Gasoline				
Forklift	Mitsubishi	FG35N	Gasoline	Mitsubishi	TB45	2016	72	300	CHE Gasoline				
Forklift	Mitsubishi	FG35N	Gasoline	Mitsubishi	TB45	2016	72	204	CHE Gasoline				
Forklift	Mitsubishi	FG35N	Gasoline	Mitsubishi	TB45	2016	72	252	CHE Gasoline				
Forklift	Mitsubishi	K25	Gasoline		6,000 lb	2013		318	CHE Gasoline				
Forklift	Mitsubishi	K25	Gasoline		6,000 lb	2013		519	CHE Gasoline				
Forklift	Mitsubishi	K25	Gasoline		6,000 lb	2013		292	CHE Gasoline				
Forklift	Mitsubishi	K25	Gasoline		6,000 lb	2013		613	CHE Gasoline				
Forklift	Mitsubishi	K25	Gasoline		6,000 lb	2013		607	CHE Gasoline				
Forklift	Mitsubishi	K25	Gasoline		7,000 lb	2013		65	CHE Gasoline				
Forklift	Mitsubishi	K25	Gasoline		7,000 lb	2013		649	CHE Gasoline				
Forklift	Mitsubishi	K25	Gasoline		7,000 lb			551	CHE Gasoline				
Forklift	Mitsubishi	K25	Gasoline		7,000 lb	2013		662	CHE Gasoline				
Forklift	Mitsubishi	FG40N	Gasoline		8,000 lb	2012		330	CHE Gasoline				
Forklift	Taylor	T-300M	Diesel			2003	165	391	CHE Diesel	9/10/2014		6/1/2021	
Forklift	Taylor	TX300M	Diesel	Cummins		2014		1549	CHE Diesel			6/1/2021	
Forklift	Taylor	TX300M	Diesel	Cummins		2014		1611	CHE Diesel			6/1/2021	
Forklift	Taylor	TX300M	Diesel	Cummins		2014		703	CHE Diesel			6/1/2021	
Forklift	Taylor	XL360L	Diesel	Cummins	QSB6.7	2018	173	456	CHE Diesel			6/1/2021	
Forklift	Taylor	XL360L	Diesel	Cummins	QSB6.7	2018	173	187	CHE Diesel			6/1/2021	
Forklift	Hyster	H60FT	LPG	Mazda	2.2	2014	46	222	CHE Propane				
Forklift	Hyster	H60FT	LPG	Mazda	2.2	2014	46	266	CHE Propane				
Forklift	Hyster	H60FT	LPG	Mazda	2.2	2014	46	336	CHE Propane				
Forklift	Hyster	H60FT	LPG	Mazda	2.2	2014	46	139	CHE Propane				
Forklift	Hyster	H60FT	LPG	Mazda	2.2	2014	46	172	CHE Propane				
Forklift	JLG Skytrak	8042 T4F	Diesel	Cummins	QSF3.8	2015	110	201	CHE Diesel				
Forklift	JLG Skytrak	8042 T4F	Diesel	Cummins	QSF3.8	2015	110	164	CHE Diesel				
Forklift	Hyster	H360-48HD2	Diesel	Cummins	QSB6.7	2015	164	311	CHE Diesel				
Forklift	Hyster	H360-48HD2	Diesel	Cummins	QSB6.7	2015	164	271	CHE Diesel				
Forklift	Hyster	H360-48HD2	Diesel	Cummins	QSB6.7	2015	164	253	CHE Diesel				
Forklift	Hyster	H360-48HD2	Diesel	Cummins	QSB6.7	2015	164	465	CHE Diesel				
Forklift	Mitsubishi	FG30K	LPG	Mitsubishi	4G64	2000		76	CHE Propane				
Forklift	Hyster	Fortis 80	LPG	Kubota	WG3800	2014	46	672	CHE Propane				
Forklift	Hyster	H60FT	LPG	Kubota	WG3800	2015	46	137	CHE Propane				
Forklift	Hyster	H60FT	LPG	Kubota	WG3800	2015	46	93	CHE Propane				
Forklift	Hyster	H60FT	LPG	Kubota	WG3800	2015	46	27	CHE Propane				
Forklift	Hyster	H60FT	LPG	Kubota	WG3800	2015	46	143	CHE Propane				
Forklift	Hyster	H60FT	LPG	Kubota	WG3800	2015	46	126	CHE Propane				
Forklift	Hyster	H60FT	LPG	Kubota	WG3800	2015	46	172	CHE Propane				
Forklift	Hyster	N40ZRS2	Electric					328	CHE Electric				
Forklift	Hyster	N40ZRS2	Electric					254	CHE Electric				
Forklift	Hyster	H80FT	LPG	Kubota	WG3800	2015	98	586	CHE Propane				
Forklift	Hyster	H80FT	LPG	Kubota	WG3800	2015	98	627	CHE Propane				
Forklift	Hyster	H80FT	LPG	Kubota	WG3800	2015	98	415	CHE Propane				
Forklift	Hyster	H100XM	LPG	Vortec	5 T	2002	117	307	CHE Propane				
Forklift	Hyster		LPG		5 T	2010	117		CHE Propane				
Forklift	Yale		LPG		5 T	2002	117		CHE Propane				
Forklift	Yale	GLP100	LPG	Vortec	5 T	2005	117	483	CHE Propane				
Forklift	Yale	GLP100	LPG	Vortec	5 T	2005	117	447	CHE Propane				
Forklift	Taylor		Diesel	Cummins	11.5 T	2002	173	2050	CHE Diesel	8/25/2014			
Forklift	Taylor	THD360L	Diesel	Cummins	11.5 T	2002	173	1912	CHE Diesel	8/25/2014			
Forklift	Taylor	TX360M	Diesel	Cummins	11.5 T	2007		88	CHE Diesel	12/1/2011			
Forklift	Taylor	TH350L	Diesel	Cummins	11.5 T	2005	150	252	CHE Diesel	8/25/2014			
Forklift	Taylor	TH350L	Diesel	Cummins	11.5 T	2005	150	673	CHE Diesel	8/25/2014			
Forklift	Yale	GLP100	Diesel	Vortec	5 T	2012	117	53	CHE Diesel				
Forklift	Taylor	T520M	Diesel	Cummins	25 ton	2008		96	CHE Diesel	12/1/2011			
Forklift	Hyster	H80XM	LPG	GM	6 cyl	2004	94	120	CHE Propane				
Forklift	Caterpillar	GP30K	LPG		6,000 lb	2000	62	137	CHE Propane				
Forklift	Caterpillar	GP30K	LPG		6,000 lb	2000	62	364	CHE Propane				
Forklift	Caterpillar	PG55N1	LPG	GCT	12000 lbs	2017	141		CHE Propane				
Forklift	Taylor	X550M	Diesel	Isuzu	55000 lbs	2015	100	1760	CHE Diesel				
Forklift	Doosan		Diesel	Yanmar		2019	43	150	CHE Diesel				
Forklift	Toyota	8FGU30	LPG	Toyota	4Y	2018	57	1375	CHE Propane				
Forklift	Toyota	8FGU30	LPG	Toyota	4Y	2010	57	118	CHE Propane				
Forklift		4,500 lbs	Diesel			1996	50	10	CHE Diesel				
Forklift			LPG			1995	120	624	CHE Propane				
Forklift	Hyster		Diesel			1995	60	520	CHE Diesel				
Forklift	Hyster	H35xm	LPG	Case	5 T	1995	45	52	CHE Propane				
Forklift	Toyota	7Fgu25	LPG	Toyota	5 T	2004	50	52	CHE Propane				
Forklift	Hyster	H155XL	LPG	Perkins	1004-4	2012	103	150	CHE Propane				
Forklift	Hyster	H210HD	Diesel	Cummins	QSB6.7-155	2002	155	200	CHE Diesel	1/1/2014			
Forklift	Hyster	H210HD	Diesel	Perkins	1106C-E60TA	2003	155	225	CHE Diesel	1/1/2014			
Forklift	Hyster	H210HD	Diesel	Perkins	1106C-E60TA	2003	155	225	CHE Diesel	1/1/2014			
Forklift	Hyster	H210HD	Diesel	Perkins	1106C-E60TA	2003	155	225	CHE Diesel	1/1/2014			
Forklift	Hyster	H210HD	Diesel	Perkins	1106C-E60TA	2003	155	225	CHE Diesel	1/1/2013			
Forklift	Clark	C25L	LPG		5000 lbs	2015	75	413	CHE Propane				
Forklift	Clark	C25L	LPG		5000 lbs	2015	75	124	CHE Propane				

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
Forklift	Taylor	X280M	Diesel	Cummins	QSB4.5-C173 Tier	2020	173	832	CHE Diesel				
Forklift	Clark	C25L	LPG	Cummins	5000 lbs	2010	70	565	CHE Propane				
Forklift	Clark	C25L	LPG	Cummins	5000 lbs	2016	70	694	CHE Propane				
Forklift	Clark	C25L	LPG	Cummins	5000 lbs	2016	70	783	CHE Propane				
Forklift	Clark	C25L	LPG	Cummins	5000 lbs	2016	70	950	CHE Propane				
Forklift	Clark	C25L	LPG	Cummins	5000 lbs	2016	70	1083	CHE Propane				
Forklift	Taylor	X280M	Diesel			2020	173	410	CHE Diesel				
Hybrid RTG	MIT-Paceco	KTA 19	Diesel	Caterpillar	C7.1	2016	250	3420	CHE Diesel				
Hybrid RTG	MIT-Paceco	KTA 19	Diesel	Caterpillar	C7.1	2016	250	3636	CHE Diesel				
Hybrid RTG	MIT-Paceco	KTA 19	Diesel	Caterpillar	C7.1	2016	250	3964	CHE Diesel				
Hybrid RTG	MIT-Paceco	KTA 19	Diesel	Caterpillar	C7.1	2016	250	4003	CHE Diesel				
Hybrid RTG	MIT-Paceco	KTA 19	Diesel	Caterpillar	C7.1	2016	250	3416	CHE Diesel				
Hybrid RTG	MIT-Paceco	KTA 19	Diesel	Caterpillar	C7.1	2016	250	3417	CHE Diesel				
Hybrid RTG	MIT-Paceco	KTA 19	Diesel	Caterpillar	C7.1	2016	250	3856	CHE Diesel				
Hybrid RTG	MIT-Paceco	KTA 19	Diesel	Caterpillar	C7.1	2016	250	4122	CHE Diesel				
Hybrid RTG	Paceco-Mitsui		Diesel	Caterpillar	C7.1	2016	250	4164	CHE Diesel				
Hybrid RTG	Paceco-Mitsui		Diesel	Caterpillar	C7.1	2016	250	3890	CHE Diesel				
Hybrid RTG	Paceco-Mitsui		Diesel	Caterpillar	C7.1	2016	250	3957	CHE Diesel				
Hybrid RTG	Paceco-Mitsui		Diesel	Caterpillar	C7.1	2016	250	3791	CHE Diesel				
Hybrid RTG	Paceco-Mitsui		Diesel	Caterpillar	C7.1	2016	250	3797	CHE Diesel				
Hybrid RTG	Paceco-Mitsui		Diesel	Caterpillar	C7.1	2016	250	3485	CHE Diesel				
Hybrid RTG	Paceco-Mitsui		Diesel	Caterpillar	C7.1	2016	250	3987	CHE Diesel				
Hybrid RTG	ZPMC	RC50.8/66	Diesel	Cummins	QSB5-G11	2019	169	1775	CHE Diesel			6/1/2021	
Hybrid RTG	ZPMC	RC50.8/66	Diesel	Cummins	QSB5-G11	2019	169	1742	CHE Diesel			6/1/2021	
Hybrid RTG	ZPMC	RC50.8/66	Diesel	Cummins	QSB5-G11	2019	169	2070	CHE Diesel			6/1/2021	
Hybrid RTG	ZPMC	RC50.8/66	Diesel	Cummins	QSB5-G11	2019	169	1737	CHE Diesel			6/1/2021	
Hybrid RTG	ZPMC	RC50.8/66	Diesel	Cummins	QSB5-G11	2019	169	1811	CHE Diesel			6/1/2021	
Loader	Caterpillar	988 K	Diesel	Caterpillar	C18	2021	579	2	CHE Diesel				
Loader	Caterpillar	950M	Diesel	Caterpillar	C7.1	2016	174	919	CHE Diesel				
Loader	Catepillar	950B	Diesel	Caterpillar		1985	200	250	CHE Diesel				
Loader	Caterpillar	914M	Diesel			2019	96	70	CHE Diesel				
Loader	Caterpillar	980M	Diesel	Caterpillar	C13	2015	418	377	CHE Diesel				
Loader	Caterpillar	980M	Diesel	Caterpillar	C13	2015	418	1565	CHE Diesel				
Loader	Caterpillar	980M	Diesel	Caterpillar	C13	2015	418	541	CHE Diesel				
Loader	Caterpillar	980M	Diesel	Caterpillar	C13	2017	420	724	CHE Diesel				
Loader	Caterpillar	980M	Diesel	Caterpillar	C13	2020	420	2239	CHE Diesel				
Loader	Caterpillar	980M	Diesel	Caterpillar	C13	2015	418	1525	CHE Diesel				
Loader	Caterpillar	972M	Diesel	Caterpillar		2017	272	1510	CHE Diesel				
Loader	CAT	982-M	Diesel		C-13	2014		3000	CHE Diesel				
Loader	CAT	980-M	Diesel		C-13	2014		3000	CHE Diesel				
Loader	John Deere	844L	Diesel			2020			CHE Diesel				
Man Lift	JLG	600S	Diesel	Perkins	404-22T	2009	62	25	CHE Diesel				
Man Lift	JLG	1500SJ	Diesel	Deutz	TCD2.9 L4	2014	74	535	CHE Diesel				
Man Lift	JLG	860SJ	Diesel			2013	62	442	CHE Diesel				
Man Lift	JLG	185SJ	Diesel	Deutz	TCD 3.6L4	2017	100	153	CHE Diesel				
Man Lift	JLG	1500SJ	Diesel			2013	74	187	CHE Diesel				
Man Lift	Genie	S60	Gasoline	Ford	LRG425-EFI	2000	82	35	CHE Gasoline				
Man Lift	JLG	600S	Gasoline	Ford	LRG425-EFI	2004	82	110	CHE Gasoline				
Man Lift	JLG	1350SJP	Diesel	Deutz	TCD2.9L4	2017	99	450	CHE Diesel			6/1/2021	
Man Lift	JLG		Diesel			2013		144	CHE Diesel				
Man Lift	JLG		Diesel			2021		109	CHE Diesel				
Man Lift	JLG		Diesel			2020		25	CHE Diesel				
Man Lift	JLG		Diesel			2000		74	CHE Diesel				
Man Lift	JLG		Diesel			2012		7	CHE Diesel				
Man Lift	JLG		Diesel			2020			CHE Diesel				
Man Lift	JLG	600S	Diesel	Deutz	TD2.9L4	2014	67	0	CHE Diesel				
Man Lift	Genie		Diesel			2011	48	250	CHE Diesel				
Man Lift	Genie	S-85	Diesel			2009			CHE Diesel				
Material Handler	Caterpillar	345CMH	Diesel	Caterpillar	C13	2005	371	657	CHE Diesel	9/15/2011			
Material Handler	Caterpillar	375-L	Diesel	Caterpillar	C15	2008	717	133	CHE Diesel	6/22/2011			
Miscellaneous	Al John		Electric			2008	0	0	CHE Electric				
Miscellaneous	Peco		Diesel	Kubota		2010	13	1678	CHE Diesel				
Rail pusher	RailKing	RK 330	Diesel	Cummins	QSB6.7 195	2013	195	1334	CHE Diesel				
Rail pusher	TRKMOB	Titan T4	Diesel			2013	150	399	CHE Diesel				
Rail pusher	TRKMOB	Titan T4i	Diesel			2013	260	213	CHE Diesel				
Rub-trd Gantry Crane	Kone		Diesel	Cummins	QSX15	2021	503	1838	CHE Diesel				
Rub-trd Gantry Crane	Kone		Diesel	Cummins	QSX15	2021	503	1302	CHE Diesel				
Rub-trd Gantry Crane	Kone		Diesel	Cummins	QSX15	2021	503	1984	CHE Diesel				
Rub-trd Gantry Crane	Kone		Diesel	Cummins	QSX15	2021	503	2162	CHE Diesel				
Rub-trd Gantry Crane	Kone		Diesel	Cummins	QSX15	2021	503	0	CHE Diesel				
Rub-trd Gantry Crane	Kone		Diesel	Cummins	QSX15	2021	503	0	CHE Diesel				
Rub-trd Gantry Crane	Kone		Diesel	Cummins	QSX15	2021	503	0	CHE Diesel				
Rub-trd Gantry Crane	Kone		Diesel	Cummins	QSX15	2021	503	0	CHE Diesel				
Rub-trd Gantry Crane	Kone		Diesel	Cummins	QSX15	2021	503	0	CHE Diesel				
Rub-trd Gantry Crane	ZPMC	RC50.8/66	Diesel	Caterpillar	3412	2003	946	4100	CHE Diesel			6/1/2021	
Rub-trd Gantry Crane	ZPMC	RC50.8/66	Diesel	Caterpillar	3412	2003	946	3872	CHE Diesel			6/1/2021	
Rub-trd Gantry Crane	ZPMC	RC50.8/66	Diesel	Caterpillar	3412	2004	1043	1440	CHE Diesel			6/1/2021	
Rub-trd Gantry Crane	ZPMC	RC50.8/66	Diesel	Caterpillar	3412	2004	1043	960	CHE Diesel			6/1/2021	
Rub-trd Gantry Crane	ZPMC	RC50.8/66	Diesel	Caterpillar	3412	2004	1043	160	CHE Diesel			6/1/2021	
Rub-trd Gantry Crane	ZPMC	RC50.8/66	Diesel	Caterpillar	3412	2004	1043	2720	CHE Diesel	4/26/2013		6/1/2021	
Rub-trd Gantry Crane			Diesel			2002		4025	CHE Diesel	4/26/2013		6/1/2021	
Rub-trd Gantry Crane	ZPMC	RC50.8/66	Diesel	Caterpillar	3412	2005	1043	2880	CHE Diesel	4/24/2013		6/1/2021	
Rub-trd Gantry Crane	ZPMC	RC50.8/66	Diesel	Caterpillar	3412	2005	1043	2240	CHE Diesel	4/22/2013		6/1/2021	
Rub-trd Gantry Crane	ZPMC	RC50.8/66	Diesel	Caterpillar	3412	2005	1043	3040	CHE Diesel	3/15/2013		6/1/2021	
Rub-trd Gantry Crane	ZPMC	RC40.6/64	Diesel	Cummins	KTA19	1998	615	5490	CHE Diesel	12/27/2013			
Rub-trd Gantry Crane	ZPMC	RC40.6/64	Diesel	Cummins	KTA19	1998	615	6119	CHE Diesel	11/22/2013			
Rub-trd Gantry Crane	Paceco	RT 4023-81-5	Diesel	CAT	C15	2013	515	4652	CHE Diesel				
Rub-trd Gantry Crane	Paceco	RT 4023-81-5	Diesel	CAT	C15	2013	515	4877	CHE Diesel				
Rub-trd Gantry Crane	Paceco	RT 4023-81-5	Diesel	CAT	C15	2013	515	5429	CHE Diesel				
Rub-trd Gantry Crane	Paceco	RT 4023-81-5	Diesel	CAT	C15	2013	515	5540	CHE Diesel				
Rub-trd Gantry Crane	Paceco	RT 4023-81-5	Diesel	CAT	C15	2013	515	5241	CHE Diesel				
Rub-trd Gantry Crane	ZPMC	RC40.6/64	Diesel	Cummins	KTA19	1998	615	4174	CHE Diesel	2/26/2014			
Rub-trd Gantry Crane	Paceco	RT 4023-81-5	Diesel	CAT	C15	2013	515	5621	CHE Diesel				
Rub-trd Gantry Crane	Paceco	RT 4023-81-5	Diesel	CAT	C15	2013	515	5064	CHE Diesel				
Rub-trd Gantry Crane	Paceco	RT 4023-81-5	Diesel	CAT	C15	2013	515	5201	CHE Diesel				
Rub-trd Gantry Crane	Paceco	RT 4023-81-5	Diesel	CAT	C15	2013	515	5314	CHE Diesel				

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
Rub-trd Gantry Crane	Paceco	RT 4023-81-5	Diesel	CAT	C15	2013	515	5218	CHE Diesel				
Rub-trd Gantry Crane	Paceco	RT 4023-81-5	Diesel	CAT	C15	2013	515	5771	CHE Diesel				
Rub-trd Gantry Crane	Paceco	RT 4023-81-5	Diesel	CAT	C15	2013	515	5282	CHE Diesel				
Rub-trd Gantry Crane	Paceco	RT 4023-81-5	Diesel	CAT	C15	2013	515	5380	CHE Diesel				
Rub-trd Gantry Crane	ZPMC	RC40.6/64	Diesel	Cummins	KTA19	1999	615	338	CHE Diesel	1/31/2014			
Rub-trd Gantry Crane	ZPMC	RC40.6/64	Diesel	Cummins	KTA19	1999	615	4816	CHE Diesel	6/24/2013			
Rub-trd Gantry Crane	ZPMC	RC40.6/64	Diesel	Cummins	KTA19	1999	615	4261	CHE Diesel	1/31/2014			
Rub-trd Gantry Crane	ZPMC	RC40.6/64	Diesel	Cummins	KTA19	1999	615	5409	CHE Diesel	1/31/2014			
Rub-trd Gantry Crane	ZPMC	RC40.6/64	Diesel	Cummins	KTA19	1998	615	3909	CHE Diesel	11/4/2013			
Rub-trd Gantry Crane	ZPMC	RC40.6/64	Diesel	Cummins	KTA19	1998	615	4735	CHE Diesel	11/1/2013			
Rub-trd Gantry Crane	ZPMC	RC40.6/64	Diesel	Cummins	KTA19	1998	615	5075	CHE Diesel	10/21/2013			
Rub-trd Gantry Crane	ZPMC	RC40.6/64	Diesel	Cummins	KTA19	1998	615	3100	CHE Diesel	1/27/2014			
Rub-trd Gantry Crane	ZPMC		Diesel			2005	515	6891	CHE Diesel				
Rub-trd Gantry Crane	ZPMC		Diesel			2005	515	7896	CHE Diesel				
Side pick	Taylor	TECSP157/8	Diesel	Cummins	B5.9C	2002	205	165	CHE Diesel	3/2/2013		6/1/2021	
Side pick	Taylor	TECSP157/8	Diesel	Cummins	QSBB5.9C	2006	205	50	CHE Diesel	5/2/2013		6/1/2021	
Side pick	Taylor	TECSP157/8	Diesel	Cummins	QSBB5.9C	2006	205	303	CHE Diesel	5/2/2013		6/1/2021	
Skid Steer Loader	Caterpillar	246 D	Diesel	Caterpillar	C3.3B	2020	73	200	CHE Diesel				
Skid Steer Loader	Caterpillar	226D	Diesel		C2.2	2015	67	1	CHE Diesel				
Skid Steer Loader	CAT	226-B	Diesel			2011		500	CHE Diesel				
STS Crane			Electric					107	CHE Electric				
STS Crane			Electric					1534	CHE Electric				
STS Crane			Electric					2288	CHE Electric				
STS Crane			Electric					1960	CHE Electric				
STS Crane			Electric					2777	CHE Electric				
STS Crane			Electric					2577	CHE Electric				
STS Crane			Electric					1723	CHE Electric				
STS Crane			Electric					1540	CHE Electric				
STS Crane			Electric					3210	CHE Electric				
STS Crane			Electric					3862	CHE Electric				
STS Crane			Electric					3514	CHE Electric				
STS Crane			Electric					3377	CHE Electric				
STS Crane			Electric					1555	CHE Electric				
STS Crane			Electric					910	CHE Electric				
STS Crane			Electric					0	CHE Electric				
STS Crane			Electric						CHE Electric				
STS Crane			Electric						CHE Electric				
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STS Crane			Electric						CHE Electric				
STS Crane			Electric						CHE Electric				
STS Crane	ZPMC		Electric					763	CHE Electric				
STS Crane	ZPMC		Electric					1565	CHE Electric				
STS Crane	ZPMC		Electric					2448	CHE Electric				
STS Crane	ZPMC		Electric					2640	CHE Electric				
STS Crane	ZPMC		Electric					1525	CHE Electric				
STS Crane	ZPMC		Electric					2422	CHE Electric				
STS Crane	ZPMC		Electric					2229	CHE Electric				
STS Crane	ZPMC		Electric					2287	CHE Electric				
STS Crane	ZPMC		Electric					2416	CHE Electric				
STS Crane	ZPMC		Electric					2591	CHE Electric				
STS Crane	ZPMC		Electric					2417	CHE Electric				
STS Crane	ZPMC		Electric					1593	CHE Electric				
STS Crane	ZPMC		Electric					422	CHE Electric				
STS Crane	ZPMC		Electric					329	CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				
STS Crane	ZPMC		Electric						CHE Electric				

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
STS Crane	ZPMC		Electric						CHE Electric				
Sweeper	Tennant	800	LPG	Tennant	Gas/LP Ford 2.3 liter			40	CHE Propane				
Sweeper	Tennant	5700XP	Electric	Tennant	AC drive motor		0	0	CHE Electric				
Sweeper	Tymco	DST-6	Diesel	Isuzu	6HKIX	2008	260	974	CHE Diesel				
Sweeper	Tenant	800	LPG	Impco	3.0L	2009	70	30	CHE Propane				
Sweeper	Tennant	6650XP	LPG	GM		2004	55	73	CHE Propane				
Sweeper	Nilfisk	SC8000	LPG	Kubota		2016	47	82	CHE Propane				
Sweeper	Nilfisk	SC8000	LPG	Kubota		2016	47	26	CHE Propane				
Sweeper	TYMCO		Diesel	Cummins		2015	200	258	CHE Diesel				
Sweeper	TYMCO		Diesel	John Deere		2015	75	258	CHE Diesel				
Sweeper	Schwarze	S3481	Diesel	Isuzu	4HEZXS	2002	190	395	CHE Diesel			6/1/2021	
Sweeper	Advance		LPG			2015	114	208	CHE Propane				
Sweeper	Elgin	Crosswind	Diesel			2019	220	40	CHE Diesel				
Sweeper	Tennant	Centurion	Diesel			2005	180	105	CHE Diesel				
Sweeper	Tymco		Diesel			2016		976	CHE Diesel				
Sweeper	Peterbuilt		Diesel			2013		1944	CHE Diesel				
Sweeper	Tymco		Diesel			2019		1027	CHE Diesel				
Sweeper	Mar-Co	Powerboss	Diesel			2020		4	CHE Diesel				
Sweeper	Tymco	600	Diesel			2018	210	500	CHE Diesel				
Sweeper	Johnson	VS562	Diesel	Cummins	B6.7	2019	300	1116	CHE Diesel				
Sweeper	Armadillo		Diesel	Kubota		2019	34	260	CHE Diesel				
Sweeper	Tennant	S30	LPG	GM	1.6L	2013	55	50	CHE Propane				
Top handler	TAYLOR	THDC 955	Diesel	Cummins	M11-C	2000	275	60	CHE Diesel	1/1/2014			
Top handler	Taylor		Diesel	Volvo	TAD 1360VE	2011	343	39	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD 1360VE	2011	343	170	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD 1360VE	2011	343	241	CHE Diesel				
Top handler	Taylor		Diesel		TAD 1360VE	2013	343	188	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2015	382	648	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2015	382	2152	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2015	382	2128	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2015	382	2669	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2015	382	2718	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2015	382	2782	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2015	382	2875	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2015	382	2950	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2015	382	2488	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2015	382	2	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2015	382	2480	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2015	382	2855	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2016	382	2488	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2016	382	2169	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2016	382	2748	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2016	382	2486	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2016	382	2543	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2016	382	2580	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2016	382	2096	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2016	382	2191	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2016	382	2337	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2016	382	2379	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2016	382	2255	CHE Diesel				
Top handler	Taylor		Diesel	Volvo	TAD1371-75VE	2016	382	2207	CHE Diesel				
Top handler	Taylor		Diesel			2019	382	2960	CHE Diesel				
Top handler	Taylor		Diesel			2019	382	3620	CHE Diesel				
Top handler	Taylor		Diesel			2019	382	1516	CHE Diesel				
Top handler	Taylor		Diesel			2019	382	2916	CHE Diesel				
Top handler	Taylor		Diesel			2019	382	3191	CHE Diesel				
Top handler	Taylor		Diesel			2020	382	1384	CHE Diesel				
Top handler	Taylor		Diesel			2020	382	1012	CHE Diesel				
Top handler	Taylor		Diesel			2020	382	1040	CHE Diesel				
Top handler	Taylor		Diesel			2020	382	288	CHE Diesel				
Top handler	Taylor		Diesel			2020	382	1737	CHE Diesel				
Top handler	Taylor		Diesel			2011	330	2317	CHE Diesel			6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSMII-C	2006	335	747	CHE Diesel	4/27/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSMII-C	2006	335	1624	CHE Diesel	1/28/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSMII-C	2005	330	1804	CHE Diesel	4/27/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSMII-C	2006	335	2123	CHE Diesel	2/13/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSMII-C	2005	335	361	CHE Diesel	12/1/2012		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSMII-C	2005	335	1068	CHE Diesel	4/27/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2002	300	1637	CHE Diesel	4/27/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2002	300	835	CHE Diesel	4/27/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2004	300	1813	CHE Diesel	4/27/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2004	300	1942	CHE Diesel	4/27/2013		6/1/2021	
Top handler	Taylor		Diesel			2011	330	2000	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2011	330	1753	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2011	330	2102	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2011	330	1932	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2011	330	0	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2011	330	2130	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2011	330	2300	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2011	330	2663	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2011	330	1915	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2011	330	2644	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2011	330	2689	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2011	330	876	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2011	330	2332	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2012	330	2683	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2018		2725	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2018		2430	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2019		3498	CHE Diesel			6/1/2021	
Top handler	Taylor	XLC976	Diesel	Volvo	TAD1371VE	2017	285	900	CHE Diesel			6/1/2021	
Top handler	Taylor	XLC976	Diesel	Volvo	TAD1371VE	2017	285	868	CHE Diesel			6/1/2021	
Top handler	Taylor	XLC976	Diesel	Volvo	TAD1371VE	2017	285	1201	CHE Diesel			6/1/2021	
Top handler	Taylor	XLC976	Diesel	Volvo	TAD1371VE	2017	285	1003	CHE Diesel			6/1/2021	
Top handler	Taylor	XLC976	Diesel	Volvo	TAD1371VE	2017	285	1795	CHE Diesel			6/1/2021	
Top handler	Taylor	XLC976	Diesel	Volvo	TAD1371VE	2017	285	2246	CHE Diesel			6/1/2021	
Top handler	Taylor	XLC976	Diesel	Volvo	TAD1371VE	2017	285	1206	CHE Diesel			6/1/2021	

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
Top handler	Taylor	XLC976	Diesel	Volvo	TAD1371VE	2017	285	1098	CHE Diesel			6/1/2021	
Top handler	Taylor	XLC976	Diesel	Volvo	TAD1371VE	2017	285	1794	CHE Diesel			6/1/2021	
Top handler	Taylor	XLC976	Diesel	Volvo	TAD1371VE	2017	285	960	CHE Diesel			6/1/2021	
Top handler	Taylor	XLC976	Diesel	Volvo	TAD1371VE	2017	285	1050	CHE Diesel			6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2001	275	237	CHE Diesel	4/24/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2001	275	204	CHE Diesel	4/29/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2001	275	1608	CHE Diesel	4/25/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2001	275	679	CHE Diesel	4/25/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2002	300	222	CHE Diesel	4/30/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2003	300	1676	CHE Diesel	4/29/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2003	300	270	CHE Diesel	4/29/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2003	300	1818	CHE Diesel	4/19/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2004	300	1097	CHE Diesel	4/27/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2004	300	873	CHE Diesel	4/22/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2004	335	720	CHE Diesel	4/22/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2004	335	1324	CHE Diesel	4/27/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2004	335	1162	CHE Diesel	4/27/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2007	275	192	CHE Diesel	12/1/2012		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	M11-C	2000	275	1358	CHE Diesel	7/31/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2002	300	1676	CHE Diesel	12/1/2012		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2002	300	1146	CHE Diesel	12/1/2012		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2002	300	116	CHE Diesel	4/27/2013		6/1/2021	
Top handler	Taylor	THDC 955	Diesel	Cummins	QSM11-C	2007	275	580	CHE Diesel	12/1/2012		6/1/2021	
Top handler	Taylor		Diesel			2014		1929	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2014		2163	CHE Diesel			6/1/2021	
Top handler	Taylor		Diesel			2014		1892	CHE Diesel			6/1/2021	
Top handler	Taylor	XLC-976	Diesel	Cummins		2015		2660	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2015		2771	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2015		2999	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2015		3302	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2015		2714	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2015		2168	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2018		3218	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2018		3371	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2018		3846	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2019		1949	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2019		3292	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2019		2781	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2019		3404	CHE Diesel			6/1/2021	
Top handler			Electric			2019		1419	CHE Electric				
Top handler			Electric			2019		1723	CHE Electric				
Top handler	TXLC 976		Diesel			2020		2006	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2020		2413	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2020		2615	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2020		2974	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2020		2232	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2020		2880	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2020		2918	CHE Diesel			6/1/2021	
Top handler	TXLC 976		Diesel			2020		3088	CHE Diesel			6/1/2021	
Top handler	Hyster	HY	Diesel	Cummins	QSL9 350	2013	335	47	CHE Diesel				
Top handler	Hyster	HY	Diesel	Cummins	QSL9 350	2013	335	4	CHE Diesel				
Top handler	Hyster	HY	Diesel	Cummins	QSL9 350	2013	335	1123	CHE Diesel				
Top handler	Hyster	HY	Diesel	Cummins	QSL9-350	2013	350	0	CHE Diesel				
Top handler	Hyster	RS 45-31CH	Diesel	Cummins	QSL9-350	2013	350	117	CHE Diesel				
Top handler	Taylor	THDC-9555	Diesel	Cummins	QSM-11	2004	300	275	CHE Diesel	4/11/2012			
Top handler	Taylor	THDC-9555	Diesel	Cummins	QSM-11	2004	300	590	CHE Diesel	3/29/2012			
Top handler	Taylor	THDC-9555	Diesel	Cummins	QSM-11	2004	300	804	CHE Diesel	4/26/2012			
Top handler	Taylor	THDC-9555	Diesel	Cummins	LT 10-C	2006	250	503	CHE Diesel	4/9/2012			
Top handler	Taylor	TXC976	Diesel			2008		1560	CHE Diesel	2/1/2011			
Top handler	Taylor	TXC976	Diesel			2008		706	CHE Diesel	2/1/2011			
Top handler	Taylor	TXC976	Diesel			2008		760	CHE Diesel	2/1/2011			
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	2443	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	991	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	2784	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3069	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	2892	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3549	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3354	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3695	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3139	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3076	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3633	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	4084	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	2257	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3523	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3650	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3110	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3303	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3016	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3465	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	2566	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3268	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3493	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3893	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3187	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	2749	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3572	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3270	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3400	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	2515	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3392	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3630	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3268	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3757	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3123	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3514	CHE Diesel				

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3379	CHE Diesel				
Top handler	Taylor	TXLC976	Diesel	Volvo	TAD-1360VE	2012	343	3976	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2017	388	3133	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2017	388	2396	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2017	388	4496	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2017	388	3761	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2017	388	3776	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2017	388	3892	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2017	388	4691	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2017	388	3074	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2017	388	3482	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2017	388	4289	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2018	388	3586	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2018	388	4072	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2018	388	2781	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2018	388	4646	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2019	388	4351	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2019	388	3514	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2019	388	2965	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2019	388	3176	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2019	388	3318	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2019	388	3678	CHE Diesel				
Top handler	Taylor	XLC 976	Diesel	Volvo	TAD-1371VE	2019	388	3341	CHE Diesel				
Top handler	Taylor	XEC207/8	Diesel			2020		1620	CHE Diesel				
Top handler	Taylor	XEC207/8	Diesel			2020		1679	CHE Diesel				
Top handler	Taylor	XEC207/8	Diesel			2018		770	CHE Diesel				
Top handler	Taylor	XEC207/8	Diesel			2019		115	CHE Diesel				
Tractor	Mitsubishi	FG30BLP	LPG	Mitsubishi	N/A	1996	57	154	CHE Propane		8/6/2013		
Tractor	United Tractor	SM-50F	LPG	Ford	CSG6491	1996	101	200	CHE Propane		8/22/2012		
Tractor	United Tractor	SM-50F	LPG	Ford	CSG6491	1996	101	200	CHE Propane		8/23/2012		
Tractor	United Tractor	SM-50F	LPG	Ford	CSG6491	1996	101	160	CHE Propane		8/21/2012		
Tractor	United Tractor	SM-50F	LPG	Ford	CSG6491	1996	101	198	CHE Propane		4/27/2010		
Tractor	United Tractor	SM-50F	LPG	Ford	CSG6491	1996	101	200	CHE Propane		2/10/2016		
Tractor	Kubota	M59	Diesel	Kubota	2403M	2009	59	80	CHE Diesel				
Tractor	United Tractor	SM-50-F	LPG			1997	101	0	CHE Propane		7/13/2010		
Truck	Taylor-Dunn	B0-210-36	Electric	Taylor-Dunn	DC Drive Motor	2008	0	52	CHE Electric				
Truck	Taylor-Dunn	B0-210-36	Electric	Taylor-Dunn	DC Drive Motor	2008	0	0	CHE Electric				
Truck	Taylor-Dunn	MX-016-00	Electric	Taylor-Dunn	DC Drive Motor	2008	0	78	CHE Electric				
Truck	Taylor-Dunn	MX-016-00	Electric	Taylor-Dunn	DC Drive Motor	2009	0	77	CHE Electric				
Truck	Taylor-Dunn	MX-016-00	Electric	Taylor-Dunn	DC Drive Motor	2009	0	35	CHE Electric				
Truck	Taylor-Dunn	B5-440-48	Electric	Taylor-Dunn	DC Drive Motor	2016	0	496	CHE Electric				
Truck	Freightlinger	ISB6.7	Diesel	Cummins	M2106	2011	300	0	CHE On Road Diesel				
Truck	Terex	TR45	Diesel	Cummins	QSK19	2009	525	1360	CHE Diesel				
Truck	Terex	TR45	Diesel	Cummins	QSK19	2009	525	1243	CHE Diesel				
Truck	Terex	TR45	Diesel	Cummins	QSK19	2009	525	1162	CHE Diesel				
Truck	Ford	F750	Diesel	Ford	4V-F Series	2020	300	536	CHE Diesel				
Truck	McClellan		Diesel	Cummins	L9	2018	177	1250	CHE On Road Diesel	1/21/2014			
Truck	Sterline		Diesel			2006	300	841	CHE On Road Diesel	1/21/2014			
Truck	International	Transtar	Diesel			2011		1443	CHE Diesel				
Truck	International	Transtar	Diesel			2011		1973	CHE Diesel				
Truck	International	Workstar	Diesel			2009		794	CHE Diesel				
Truck	Freightliner	Combo	Diesel			2016		1100	CHE Diesel				
Truck	Kenworth	Combo	Diesel			2006		1304	CHE Diesel				
Truck	Ford	F750	Diesel	Ford	6.7	2016	270	1410	CHE Diesel				
Truck	Ford	F-750	Diesel	Caterpillar	3126	2006	210	250	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB6.7	2019	225	250	CHE Diesel				
Yard tractor	Capacity	6BTA	Diesel	Cummins	ISB6.7	2013	200		CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	ISB240	2007	200	50	CHE On Road Diesel				
Yard tractor	Kalmar		Diesel	Cummins	ISB240	2007	200	150	CHE On Road Diesel				
Yard tractor	Ottawa	Commando 50	LPG	Ford V10		2009	173	2	CHE Propane				
Yard tractor	Ottawa	Commando 50	LPG	Ford V10		2009	173	46	CHE Propane				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1254	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1343	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1227	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1480	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1486	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1439	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1303	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1465	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	153	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1150	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	971	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1402	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1332	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1630	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1355	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	791	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1766	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1553	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	979	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1564	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1737	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173	1638	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2015	173		CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1815	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1317	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	2149	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1886	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1692	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1470	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1559	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1617	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1484	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1894	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1889	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	2129	CHE Diesel				

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1831	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1851	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	2030	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1470	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1109	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1645	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1534	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1183	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	2197	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1878	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	2204	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	2211	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1806	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2018	173	1774	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1794	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1912	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1991	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2151	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2531	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2220	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1321	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1938	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1257	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2454	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1705	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2384	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2325	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2539	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1291	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1302	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2094	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1929	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1831	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2232	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	869	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2543	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2153	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2365	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2674	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2675	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2300	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2361	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2388	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2597	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2053	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2401	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2524	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1407	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	393	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2522	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2606	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2296	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2075	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2364	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2261	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1688	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2419	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2556	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2434	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2570	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2268	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2022	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2357	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2187	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2013	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2294	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2212	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1755	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2123	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2551	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1918	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2081	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2232	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2068	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1879	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2069	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	1867	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2524	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2007	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2147	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2019	173	2009	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2021	173	726	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2021	173	487	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2021	173	495	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2021	173	312	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2021	173	192	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2021	173	531	CHE Diesel				
Yard tractor	Kalmar		Diesel	Cummins	QSB6.7	2021	173	571	CHE Diesel				
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2382	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2027	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	1916	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2545	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2244	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	88	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2043	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2020	CHE On Road Diesel			6/1/2021	

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2218	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2199	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2509	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	1988	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	0	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2596	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2243	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	1540	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	1819	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2104	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	1929	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2458	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2285	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	3385	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2025	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	1461	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	1281	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2691	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB Tier 3	2007	200	2938	CHE On Road Diesel			6/1/2021	
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	548	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1281	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1322	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	0	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1539	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1601	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1213	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1714	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1593	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1580	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1154	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1468	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1558	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	919	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1619	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	9	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1327	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1408	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1648	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1186	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	479	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1477	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1693	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1721	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1575	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1491	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1045	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	673	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1452	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1097	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1627	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1578	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1292	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1213	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1771	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1443	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	2096	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	2301	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	1198	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	2031	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	1928	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	2358	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	2338	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	1948	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	2020	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	2156	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	2529	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	1392	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	1943	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	1968	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	2168	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	2318	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	2380	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	2148	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	2044	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2018	335	2712	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2019	335	0	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2019	335	1744	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2019	335	2454	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2019	335	2301	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2019	335	1919	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2019	335	2474	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2019	335	1978	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2019	335	1416	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2019	335	2197	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2019	335	1366	CHE Gasoline				
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	802	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	1042	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	1978	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	1943	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	2022	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	2242	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	1936	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	1850	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	1958	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	1762	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	1771	CHE Diesel			6/1/2021	

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	2197	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	2642	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	1041	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	2184	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa	T2	Diesel	Cummins	QSB6.7225	2016	225	2311	CHE Diesel			6/1/2021	
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1026	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1258	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1091	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1342	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1038	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1240	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1238	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1047	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1064	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1116	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1099	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1362	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1109	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1032	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1050	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1492	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1101	CHE Gasoline				
Yard tractor	Capacity	TJ7000	Diesel	Edelbrock	454 Engine	2017	204	102	CHE Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Edelbrock	454 Engine	2017	204	795	CHE Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Edelbrock	454 Engine	2017	204	300	CHE Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2008	173	1427	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2008	173	2049	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2008	173	1704	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2008	173	1943	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2008	173	1807	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2008	173	1829	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2008	173	2099	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2008	173	2318	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2007	173	2078	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2007	173	1900	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2007	173	1866	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2007	173	2364	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2007	173	2126	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2007	173	2172	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2007	173	2587	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2007	173	2851	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2007	173	2031	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2007	173	2032	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2007	173	2367	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2007	173	2028	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2007	173	2720	CHE On Road Diesel			6/1/2021	
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB6.7	2007	173	2466	CHE On Road Diesel			6/1/2021	
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	229	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	966	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	353	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	836	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	899	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1022	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	674	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1020	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	0	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	801	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	993	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	0	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1051	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	895	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	868	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	951	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	2105	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	527	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1688	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1444	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1503	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1080	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	167	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	941	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	2009	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	2052	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1975	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	2154	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1730	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1240	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1702	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1837	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	804	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1543	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1456	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1801	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	2111	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1426	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	2087	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1721	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	0	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	2018	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1521	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1921	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	527	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1583	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1951	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2020	335	1915	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy		2019	335	1742	CHE Gasoline				

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
Yard tractor	Dina		Gasoline	Chevy		2019	335	2030	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	922	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1052	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	679	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1023	CHE Gasoline				
Yard tractor	Dina		Gasoline	Chevy	454-FI	2011	335	1122	CHE Gasoline				
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1930	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1069	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2963	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2497	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1914	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2021	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2468	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2004	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2595	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2426	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1843	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2544	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1932	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	287	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1862	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2132	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1987	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2125	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2652	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2497	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2246	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1712	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2473	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2805	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2094	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1437	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1905	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1770	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2596	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2350	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2747	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1724	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2304	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2142	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1835	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2083	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2463	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2499	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1816	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1965	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2088	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2471	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2995	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2311	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	1749	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2211	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2263	CHE Diesel			6/1/2021	
Yard tractor	Kalmar/Ottawa		Diesel	Cummins	6.7 QSB	2016	225	2378	CHE Diesel			6/1/2021	
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	3071	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	3115	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2531	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2666	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2839	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	1874	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	3064	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2604	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	3265	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	3302	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2917	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	3102	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	3025	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	3149	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2831	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2827	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2461	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2838	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2859	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2492	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2658	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2501	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2089	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2769	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2976	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2458	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	3290	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2934	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	3147	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	3054	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	3306	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2708	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2994	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	0	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	2685	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	1077	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	853	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	1380	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	1	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	17	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	28	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	0	CHE On Road Diesel				

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	11	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	116	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	172	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	0	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	340	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	206	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	183	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	57	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	0	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	277	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	331	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	523	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	313	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	609	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	741	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	145	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	178	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	0	CHE On Road Diesel				
Yard tractor	Ottawa	YT-50	Diesel	Cummins	ISB6-720	2014	250	0	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3192	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2746	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2894	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2589	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3159	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2303	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2905	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2788	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2838	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2351	CHE On Road Diesel				
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB 6.7	2007	240	3200	CHE On Road Diesel				
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB 6.7	2007	240	2629	CHE On Road Diesel				
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB 6.7	2007	240	2778	CHE On Road Diesel				
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB 6.7	2007	240	3393	CHE On Road Diesel				
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB 6.7	2007	240	2991	CHE On Road Diesel				
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB 6.7	2007	240	1127	CHE On Road Diesel				
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB 6.7	2007	240	2595	CHE On Road Diesel				
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB 6.7	2007	240	3225	CHE On Road Diesel				
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB 6.7	2007	240	3026	CHE On Road Diesel				
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB 6.7	2007	240	3071	CHE On Road Diesel				
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB 6.7	2007	240	3208	CHE On Road Diesel				
Yard tractor	Capacity	TJ7000	Diesel	Cummins	ISB 6.7	2007	240	2953	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2007	240	2648	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2007	240	2934	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2007	240	2426	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2007	240	2990	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2007	240	3523	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	243	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2923	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2889	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3146	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2959	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2732	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2854	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3854	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2867	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3055	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3348	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2826	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2044	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3057	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3087	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2686	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2571	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2031	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2850	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2385	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2434	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2971	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3164	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2981	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2431	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2181	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2818	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2997	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2502	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3206	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3016	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2815	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2221	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3015	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2862	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3058	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2370	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2708	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3087	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3008	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	55	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2481	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2982	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2933	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3144	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2833	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	3162	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2008	240	2689	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2803	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2567	CHE On Road Diesel				

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2613	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2740	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	3098	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2927	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2769	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	3499	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2438	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2686	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	3121	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2801	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2348	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2864	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	3204	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	1728	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2952	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2921	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2996	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2515	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	1824	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2745	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2343	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2011	240	2417	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2918	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2762	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2616	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2713	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2483	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	3204	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	3275	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2867	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2637	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2966	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2695	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2941	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2624	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2883	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	3131	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	3134	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2765	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2926	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2826	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2694	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	3235	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	3013	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2258	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	3091	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2701	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2908	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2615	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2803	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	3134	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	3084	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2501	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2480	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	3000	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2773	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	3012	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	1821	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2587	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	2930	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	ISB 6.7	2012	240	3400	CHE On Road Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB 6.7	2016	225	2559	CHE Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB 6.7	2016	225	3288	CHE Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB 6.7	2016	225	1812	CHE Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB 6.7	2016	225	2789	CHE Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB 6.7	2016	225	2838	CHE Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB 6.7	2016	225	2776	CHE Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB 6.7	2016	225	2910	CHE Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB 6.7	2016	225	2643	CHE Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB 6.7	2016	225	2954	CHE Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB 6.7	2016	225	2298	CHE Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB 6.7	2016	225	2781	CHE Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB 6.7	2016	225	3038	CHE Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB 6.7	2016	225	2084	CHE Diesel				
Yard tractor	Capacity	TJ9000	Diesel	Cummins	QSB 6.7	2016	225	3167	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	2784	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	3137	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	3319	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	2952	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	3059	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	3107	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	3167	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	2149	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	2628	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	2492	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	3103	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	2779	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	3279	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	2175	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2019	225	553	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	3106	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	3357	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	3051	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	3203	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	2726	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	2901	CHE Diesel				

Port Equip Type	Equip Make	Equip Model	Engine Type	Engine Make	Engine Model	EngineYear	HP	Annual Hours	Category	DPF level 3	Blue Cat	RD80/BD20	RD99
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	3071	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	2927	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	2531	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	2928	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	2634	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	2312	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	2784	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	2985	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	3180	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	3074	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	2634	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	2613	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	2978	CHE Diesel				
Yard tractor	Ottawa	4x2	Diesel	Cummins	QSB 6.7	2020	225	2717	CHE Diesel				
Yard tractor	Ottawa	T2	Diesel	Cummins	QSB6.7 Tier 4 Fina	2015	164	294	CHE Diesel				
Yard tractor	Ottawa	T2	Diesel	Cummins	QSB6.7 Tier 4 Fina	2017	164	341	CHE Diesel				
Yard tractor	Kalmar	YT-30	Diesel	Cummins	ISB6.7 200	2012	200	521	CHE On Road Diesel				
Yard tractor	Kalmar	YT-30	Diesel	Cummins	ISB6.7 200	2013	200	396	CHE On Road Diesel				
Yard tractor	Kalmar	YT-30	Diesel	Cummins	QSB6.7	2017	164	344	CHE Diesel				
Yard tractor	Kalmar	YT-30	Diesel	Cummins	ISB6.7 200	2013		1150	CHE On Road Diesel				
Yard tractor	Kalmar	YT-30	Diesel			2021		1106	CHE Diesel				
Yard tractor	Kalmar	YT-30	Diesel			2021		1070	CHE Diesel				